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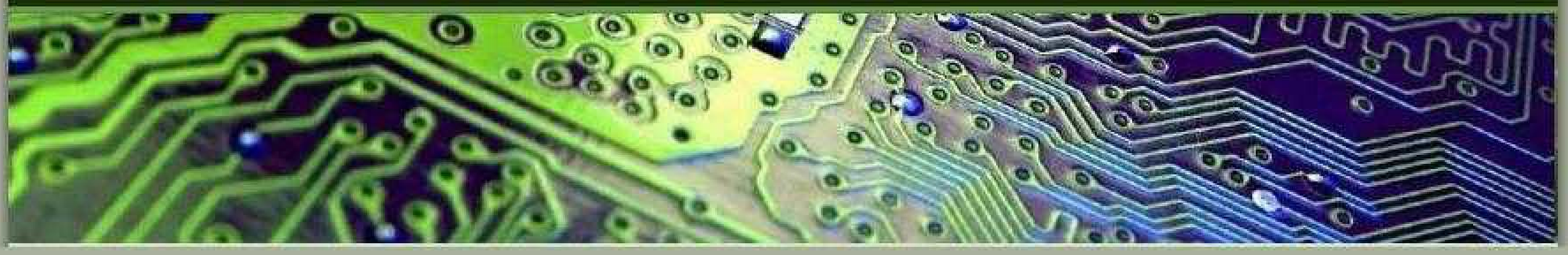

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1936
✦ Official ✦
Radio Service Manual

Complete Directory of All
1935-1936 Radio Receivers

FULL RADIO SERVICE GUIDE

Vol. No. 6

HUGO GERNSBACK
Editor

N. H. LESSEM
Associate Editor

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. . . Introduction . . .

IN the preparation of this volume unusual care and effort were exercised to obtain and incorporate all such information which would be of material assistance to the radio technician and serviceman in repairing radio receivers and allied apparatus. Not only the sets manufactured in 1935 and 1936, but advance 1937 models and older sets which were not available for publication in previous volumes of the OFFICIAL RADIO SERVICE MANUAL will be found here.

Wherever the information was at all obtainable, such data as Intermediate Frequency Peaks, Socket Voltages, Wiring Diagrams, Point-to-Point Resistance Values, Service Data, Production Changes, etc., has been included.

As in previous Manuals, the index in this volume is cumulative, including material printed in the 1931, 1932, 1933, 1934, and 1935 volumes as well as the present one. To differentiate between the various volumes, a Roman numeral is placed after the page number of each set listed. Thus page 237-V indicates the two-hundred and thirty-seventh page in the 1935 Manual. It is important to remember that the listing of the sets in the earlier manuals has been brought up to date; so that if some of the model numbers in the index do not correspond with the sets on the pages in question, then it is to be assumed that the sets so listed in the index are identical with the ones shown on the pages. To give an arbitrary example; if Atwater Kent Model 37 is indicated in the index as being listed on page 30, and page 30 merely shows model 38, then it is to be assumed that models 37 and 38 are identical. A careful notation of this point will prevent apparent discrepancies in the index from being encountered.

Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

As will be noted, the sets in this Manual have been listed in the index in an entirely different manner. Not only is the page number of each set given but the exact nature of the information on the page is indicated. For example; reference to Emerson Model 105 in the index shows at a glance that the schematic diagram is on page 339-VI (Volume six, 1936 edition) and that the alignment proceedure, socket voltages and parts list are on page 340-VI. In some cases the alignment data and other pertinent information may follow the schematic by several pages; the index, however, will quickly reveal the location of the required data. Sets in all future Manuals will be listed in this same manner.

At the back of the book will be found a complete tube chart of practically every tube ever manufactured, as well as a complete index of trade names under the title "Who Makes Them". Reference to this index will reveal the name of the manufacturer of any radio receiver which bears merely a trade name such as "Silvertone" and the like.

—THE EDITORS.

INDEX

1931, 1932, 1933, 1934, 1935 and 1936 Manuals

THIS INDEX includes material printed in the 1931, 1932, 1933, 1934, and 1935 Manuals, as well as the present volume. To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data is Volume III.

A

A. C. DAYTON CO.

AC—63 79-1
AC—65 79-1
AC—66 78-1
XL—5 Battery 80-1
XL—10 Battery 80A-1s
XL—20 Battery 77-1
XL—25 Battery 77-1
XL—30 Battery 77-1
XL—50 AC 80B-1s
XL—60 Battery 80B-1s

ACME ELECTRIC CO.

7—AC 81-1
88—Screen Grid 81-1

ADVANCE ELECTRIC CO.

A—Auto Receiver 27-V
B—Superheterodyne 28-V
E 28-V
77 ..... 27-V
88 ..... 27-V
89 ..... 27-V

AIR KING PRODS, Inc.

Atlas 31-V
37-39 ..... 29-V
52-54 ..... 30-V

ALL-AMERICAN MOHAWK CORP.

All Electric, 1926 ..... 352-III
B—7 Lyric Battery 136-II
B—9 Lyric Battery 358C-1s
Chieftain Battery 350-III
C—6 Lyric AC 136-II
C—6 Lyric AC 343-III
"D" 4H-11s
"D" AC 84A-1s
DC Lyric 137-II
Forte, Lorraine & Soverign 7 Tube Battery 355-III
"H" AC 84B-1s
"H" 41-II
"J" Lyric AC 134-II
"J" Junior 4J-11s
"K" AC 138-II
"K" 4K-11s
Kellogg Type 354-III
Navajo Battery 351-III
"P" AC 139-II
"P" 4L-11s
R 350-III
S—6 Lyric AC 135-II
S—7 Lyric AC 133-II
S—8 Lyric AC 132-II
S-10 ..... 358-III
S-63 Lyric 357-III
S-80 ..... 4N-11s
Sextette 6 tube 352-III
Sextette & Duet 6 tube 354-III
"W" 6 & 8 Tube AC 82-1s
5 tube VA circuit 351-III
7 tube 110 V. D. C. 356-III
44 Battery 84B-1s
60 AC 82-I
61 AC 82-I
62 AC 82-I
65 AC 82-I
66 AC 82-I
70 AC 83-I
78 AC 83-I
75 AC 83-I
77-6 tube A. C. 355-III
80 AC 82-I
83 AC 82-I
84 AC 82-I
85 AC 82-I
86 AC 82-I
88 AC 82-I
90 AC—60 Cycles 83-I, 130-II, 131-II
90 AC—25 Cycles 84-I, 130-II, 131-II
96 AC 84-I, 131-II
115 Battery 353-III
115 Electric 353-III
226—227 Mohawk 85-I
226—7 Contact Power Pack 361-III
226—12 Contact Power Pack 361-III
7 220 DC Volts 4M-11s

ALLIED RADIO CORP.

A. S.-30-G 32-V
D-8—Schematic 37-VI
F-9501 ..... 43-V
F-9503 ..... 43-V
F-9505 ..... 41-V
F-9511 ..... 41-V
F-9513 ..... 41-V
F-9515 ..... 41-V
F-9523—Schematic 41-VI
F-9525 ..... 44-V
F-9527 ..... 44-V
F-9541 ..... 42-V
F-9551 ..... 33-V
F-9553 ..... 33-V
F-9555 ..... 33-V
F-9612 ..... 34-V
F-9613 ..... 34-V
F-9618 ..... 35-V
F-9619 ..... 35-V
F-9630 ..... 36-V
F-9631 ..... 36-V
F-9632 ..... 36-V
F-9633 ..... 36-V
F-9634 ..... 36-V
F-9635 ..... 36-V
F-9640 ..... 37-V
F-9641 ..... 37-V
F-9642 ..... 37-V
F-9643 ..... 37-V
F-9644 ..... 37-V
F-9645 ..... 37-V
F-9650 ..... 38-V
F-9651 ..... 38-V
F-9652 ..... 38-V
F-9653 ..... 38-V
F-9660 ..... 39-V
F-9661 ..... 39-V
F-9662 ..... 39-V
F-9663 ..... 39-V
F-9664 ..... 39-V
F-9665 ..... 39-V
F-9670 ..... 40-V
F-9671 ..... 40-V
F-9672 ..... 40-V
F-9673 ..... 40-V
F-9751 ..... 41-V
F-9761 ..... 45-V
F-9767 ..... 45-V
F-9775 ..... 41-V
F-9777 ..... 41-V
F-9779 ..... 41-V
G-9501—Schematic 42-VI
G-9503—Schematic 41-VI
G-9505—Schematic 42-VI
G-9511—Schematic 41-VI
G-9513—Schematic 41-VI
G-9515—Schematic 39-VI
G-9517—Schematic 39-VI
G-9521—Schematic 42-VI
G-9533—Schematic 40-VI
G-9545—Schematic 37-VI
G-9547—Schematic 37-VI
G-9549—Schematic 37-VI
G-9551—Schematic 38-VI
G-9553—Schematic 44-VI
G-9557—Schematic 44-VI
G-9561—Schematic 38-VI
G-9561—Schematic 43-VI
G-9563—Schematic 38-VI
G-9565—Schematic 38-VI
G-9563—Schematic 43-VI
G-9565—Schematic 43-VI
G-9567—Schematic 38-VI
G-9567—Schematic 43-VI
G-9571—Schematic 43-VI
G-9573—Schematic 43-VI
G-9575—Schematic, Service Notes 45-VI
G-9595—Schematic, Service Notes 45-VI
G-9599—Auto Radio—Schematic, Alignment, Schematic, Alignment, Service Notes 46-VI
G-9601—Schematic, Service Notes 45-VI
G-9605—Schematic, Service Notes 45-VI
G-9611—Schematic 47-VI
G-9613—Schematic 47-VI
G-9615—Schematic 48-VI
G-9643—Schematic, Socket Voltages 49-VI
G-9645—Schematic, Socket Voltages 49-VI
G-9801—Schematic 50-VI
G-9851—Schematic 56-VI
G-9852—Schematic 56-VI
G-9855—Schematic 56-VI
G-9858—Schematic 56-VI
G-9863—Schematic 57-VI
G-9875—Schematic 59-VI
G-9876—Schematic 59-VI
G-9881—Schematic 39-VI
G-9882—Schematic 39-VI
G-9886—Schematic 47-VI
G-9887—Schematic 47-VI
G-9898—Schematic 47-VI
H-9803—Schematic 41-VI
H-9805—Schematic 51-VI
H-9811—Schematic 39-VI
H-9812—Schematic 39-VI
H-9813—Schematic 52-VI
H-9815—Schematic 53-VI
H-9817—Schematic 54-VI
H-9818—Schematic 54-VI
H-9822—Schematic 54-VI
H-9850—Schematic, Chassis Layout 55-VI
H-9852—Schematic, Chassis Layout 55-VI
H-9853—Schematic, Chassis Layout 55-VI
H-9854—Schematic, Chassis Layout 55-VI
H-9855—Schematic, Chassis Layout 55-VI
H-9856—Schematic, Chassis Layout 55-VI
H-9858—Schematic, Chassis Layout 55-VI
H-9872—Schematic 58-VI
H-9873—Schematic 58-VI
H-9874—Schematic 58-VI
H-9875—Schematic 58-VI
H-9876—Schematic 58-VI
P 41-V
P-32V 41-V
P Battery 41-V

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

ALLIED RADIO (cont'd)

PA—Schematic 43-VI
PB—Schematic 43-VI
R—Schematic 38-VI
T 42-V
U 43-V
UE—Schematic 44-VI
V 44-V
W 45-V
80—Schematic 38-VI
101—Schematic 39-VI
102—Schematic 39-VI
633—Schematic 40-VI

AMERICAN BOSCH MAGNETO CORP.

See United American Bosch Corp.

AMERICAN TRANSFORMER COMPANY

ABC Hi-Power Box 26-I
PF—524A Amplifier 145-II
PF—250 Amplifier 334-I
PF—281 Amplifier 144-II
PP—250 Amplifier 144-II
Approved Audio Circuits 334A-Is
De Luxe Recording Amplifier 143-II
Hum Reduction Chart....145-II
Pick Up Matching Circuit 143-II
Plate Supply Transformer Connection 334B-Is
2 AP Amplifier 342-I
21 D Hi-Power Box 342-I
25 A Amplifier 334A-Is

AMRAD CORPORATION

S—522 Battery 94-I
S—733 Battery 95-I
5 AC Neutrodyne 92-I
6 AC Concerto Nocturne....92-I
7 AC Neutrodyne 93-I, 96A-IIs
6 DC Neutrodyne 92-I
7 DC Neutrodyne 93-I
80 Battery 94-I
81 AC Bell Canto Series..96-I
82 Battery 94-I
83 Battery 94-I
84 AC 96A-Is
2364 Amplifier 95-I
3475 Tuner 95-I
3500-1 Battery 95-I
3500-2 Battery 95-I
3730 Tuner 95-I
3590 Battery 95-I
7100 AC 94-I, 309-III
7191 Power Unit..95-I, 293-III

ARMY, ACEVES & KING, Inc.

Riser Circuit for Multicoupler installation ..295-II

ANSLEY RADIO LAB.

DC Electric 146-II
MD—1 ....146-II
Model V1 ....46-V

APPARATUS DESIGN CO.

Confidence Radio Tube Tester 47-V

ANSLEY RADIO CORP.

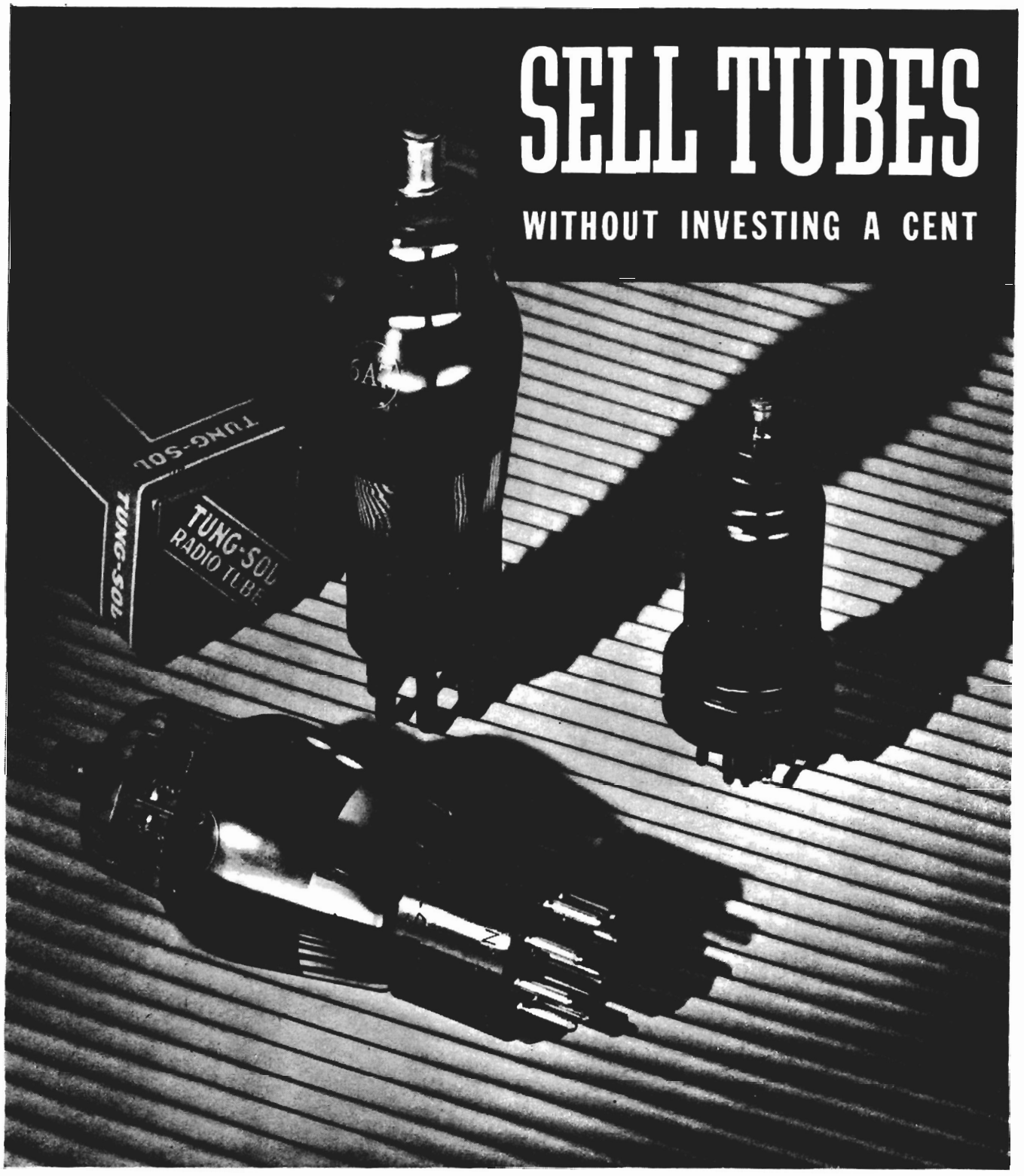
B-1—Portable Battery Set 60-VI
D-1—four (4) Tubes 61-VI
D-1—six (6) Tubes 62-VI
D-3 ....63-VI
D-4 ....63-VI
D-6 ....63-VI
D-12 ....61-VI
DC Electric 146-II
MD—1 ....146-II
U-10 ....64-VI
Model V1 ....46-V

ARGUS RADIO CORP.

B—125 ....326-I
B—195 ....326-I

ATWATER KENT MFG. CO.

"D-1" DC 164-II
"D-2" DC 165-II
"F" AC 166-II
"H-1" AC 66-V
"H-2" AC 67-V
"L-1" AC 165-II
"L-2" 57-IV
"P" AC 166-II
"Q-2" Battery 164-II
Output Measuring Circuit 58-IV, 59-IV
Electric Valves of Condensers and resistors 1924-1932 inclusive 168A-168X-IIs
I. F. Chart of A. K. Sets 142-VI
Metal Tube Symbols in A. K. Diagrams 142-VI
19 No. 4880 Battery 97-I
20 No. 4640 Battery 97-I
20 Compact Battery 97-I
20 Compact No. 7960 ..196I-Is
21 No. 7780 Battery 98-I
30 Battery 99-I
32 Battery 98-I
33 Battery 99-I
35 ....99-I, 342-III
36 AC 98-I, 340-III
37 AC 100-I, 306-III, 310-III, 340-III, 346-III
37C 100-I, 306-III, 310-III, 340-III, 346-III
37F 100-I, 306-III, 310-III, 340-III, 346-III
38 AC 100-I, 340-III, 346-III
40 AC 101-I, 310-III, 340-III, 341-III, 346-III
40F 101-I, 310-III, 340-III, 341-III, 346-III
41 Battery 102-I
41 DC..298-III, 302-III, 306-III
41 Second Type Power Unit 103-I
41 Third Type Power Unit 103-I
42 AC....101-I, 340-III, 344-III
42F 101-I, 340-III, 344-III
43 AC..102-I, 4JJ-IIs, 4KK-IIs
44 AC....101-I, 340-III, 344-III
44F 101-I, 340-III, 344-III
45 ....101-I, 340-III, 344-III
44 Second Type Power Unit 103-I
46 ....4JJ-IIs, 4KK-IIs
47 ....4JJ-IIs, 4KK-IIs
48 Battery 99-I
49 Battery 99-I
50 Battery 103-I
52 AC 101-I, 340-III
53 ....4JJ-IIs, 4KK-IIs
55 AC....104-I, 306-III, 342-III
55C AC 104-I
55F Early Type AC....160-II
55F Later Type AC.... 160-II
55FC Early Type AC....160-II
55FC Later Type AC....160-II
56 ....101-I, 340-III, 340-III, 341-III, 346-III
57 ....101-I, 340-III, 340-III, 341-III, 346-III
60 Early Type AC....167-II
60 Later Type AC 162-II, 342-III
60C Early Type AC 167-II
60C Later Type AC 162-II
60C Third Type AC....328-I
61 Early Type DC 161-II
61 Later Type DC 161-II
61C Early Model DC 161-II
61C Later Model DC....161-II
66 AC 163-II
67 Early Type Battery....162-II
67 Later Type Battery....163-II
67C Early Type Battery 162-II
67C Later Type Battery 163-II
70 AC 312-III
70 DC 312-III
80 AC 153-III
80F 153-II
81 Auto Set 150-II
81B 150-II
81C 150-II
82 AC 151-II
82D DC 152-II
82F 151-II
82Q 18-IV, 19-IV
83 AC 153-II, 327-III
83F 153-II
84 Early Type AC....149-II
94 Later Type AC....155-II
84D DC 152-II
84F 155-II
84Q Battery 154-II
85 AC 156-II, 327-III
85F 156-II
85Q Battery 157-II
86 ....20-IV
86F 20-IV
87 AC 158-II
87D 21-IV, 22-IV
89 AC 159-II
89F 159-II
89P AC 159-II
90 ....23-IV
90F 23-IV
91 ....24-IV
91B 24-IV
91C 24-IV
92 ....25-IV
92F 26-IV
93 S. W. Converter 27-IV
94 ....28-IV
94F 28-IV
96 Third Type 29-IV
96F 30-IV
99 Third Type 31-IV
99F 31-IV
99P 31-IV
112—Schematic 66-VI
112 (2nd half) Schematic 67-VI
112—Under-chassis view 55-VI
112—Alignment 68-VI
112—Alignment (cont'd.) 69-VI
112—Parts List 70-VI
126—Auto Radio Schematic 71-VI
126—Auto Radio—Chassis Layout, Trimmers 72-VI
126—Under Chassis View, Parts List 73-VI
135Z—Schematic 74-VI
135Z—Under Chassis View 75-VI
135Z—Chassis Layout, Alignment 77-VI
135Z—Parts List 78-VI
136—Auto Radio—Schematic 71-VI
136—Auto Radio, Chassis Layout, Trimmers 72-VI
136—Under Chassis View, Parts List 73-VI
145—Schematic 79-VI
145—Under Chassis View, Chassis Layout 80-VI
145—Alignment 81-VI
145—Alignment (Cont'd.) 82-VI
145—Alignment (Cont'd.) 83-VI
145—Alignment, (Concluded) Parts List 84-VI
155 Third Type 32-IV
165 ....33-IV
165Q 48-V
165—(2nd type)—Schematic 85-VI
165 (2nd type)—Chassis, Layout Parts List, Trimmers 86-VI
185 (2nd type)—Schematic 85-VI
185 ....33-IV
185A 49-V
188 Second Type 34-IV, 35-IV, 36-IV, 37-IV
188F Second Type 34-IV 35-IV, 36-IV, 37-IV
206 (1st type)—Schematic 87-VI
206 (1st type)—Under Chassis View, Chassis Layout 80-VI
206 (2nd type)—Schematic 89-VI
206 (2nd type)—Under Chassis View, Alignment, Chassis Layout..90-VI
206—Alignment 81-VI
206—Alignment (Continued) 82-VI
206—Alignment (Continued) 83-VI
206—Parts List 91-VI
215Z—Schematic 74-VI
215Z—Under Chassis View 75-VI
215Z—Chassis Layout, Alignment 77-VI
215Z—Parts List 78-VI
217 ....50-V
217D 51-V
228D 152-II
228F 25-IV, 26-IV
228Q 18-IV, 19-IV
237Q—Schematic 92-VI
237Q—Alignment, Parts List 93-VI
246 ....38-IV, 39-IV
260 Third Type 40-IV
260F 40-IV
266 ....38-IV, 39-IV
275 ....52-V
285Q—Schematic 94-VI
285Q—Alignment, Parts List 95-VI
286—Schematic 96-VI
286—Alignment, Chassis Layout, Parts List....97-VI
305Z—Schematic 76-VI
305Z—Under Chassis View 75-VI
305Z—Chassis Layout, Alignment 77-VI
305Z—Parts List 78-VI
310 ....53-V
317 (early)—Schematic..98-VI
318—Schematic 99-VI
318—Alignment, Chassis & R. F. Transformer Circuits 100-VI



TUNG-SOL
Tone-flow radio Tubes

TUNG-SOL LAMP WORKS, INC.
Radio Tube Division
SALES OFFICES: Atlanta, Boston, Charlotte, Chicago, Cleveland, Dallas, Detroit. Kansas City, Los Angeles, New York.
General Office: Newark, N. J.

Tubes must be made right in order to be sold successfully on such a basis. Tung-Sol tubes were the first and are today the only line sold nationally on consignment.

There are still desirable locations where independent service organizations who can meet requirements may be appointed as Tung-Sol agents. Ask your nearest Tung-Sol tube wholesaler who will supply details.

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ATWATER KENT (cont'd)

325—Schematic 79-VI
325—Under Chassis View, Chassis Layout 80-VI
325—Alignment 81-VI
325—Alignment (Continued) 82-VI
325—Alignment (Continued) 83-VI
325—Alignment (Concluded) Parts List 84-VI
328 (2nd type)—Schematic 101-VI
337 (early)—Schematic 98-VI
356—Schematic 96-VI
356—Alignment, Chassis Layout, Parts List 97-VI
376 (1st type)—Schematic 87-VI
376 (1st type)—Under Chassis View, Chassis 88-VI
387 (2nd type)—Schematic 104-VI
387 (2nd type)—Chassis, Parts List, Trimmers 305-VI
415Q—Schematic 94-VI
415Q—Alignment, Parts List 95-VI
416 Auto Radio—Schematic 71-VI
416 Auto Radio, Chassis Layout, Trimmers 72-VI
416—Under Chassis View, Parts List 73-VI
424 ..... 55-V
425 ..... 56-V
427 ..... 50-V
427D 51-V
427Q 54-V
427Q (2nd type)—Schematic 104-VI
427Q (2nd type)—Chassis, Parts List, Trimmers 105-VI
435 (early)—Schematic 406-VI
446 Auto Radio—Schematic 71-VI
446—Auto Radio—Chassis Layout, Trimmers 72-VI
446—Under Chassis View, Parts List 73-VI
447—Schematic 99-VI
447—Alignment, Chassis, & R. F. Transformer Circuits 100-VI
448 ..... 41-IV
465Q—Schematic 107-VI
465Q—Under Chassis View, Trimmers 108-VI
465Q—Alignment 109-VI
465Q—Parts List 110-VI
467Q—Schematic 92-VI
467Q—Under Chassis View, Alignment, Parts List 93-VI
469 Second Type 42-IV
469F 42-IV
469D 43-IV, 45-IV, 46-IV, 47-IV
469Q 44-IV, 45-IV, 46-IV, 47-IV
475—Schematic 111-VI
475—Alignment, Parts List, Chassis, Layout 112-VI
480 ..... 48-IV 49-IV, 50-IV, 51-IV
485Q—Schematic 113-VI
485Q—Alignment, Parts List, Trimmers 114-VI
510 ..... 53-V
511—Tun-o-matic, Schematic (1st half) 116-VI
511—Tun-o-matic, Schematic (2nd half) 117-VI
511—Tun-o-matic, Schematic of remote control 115-VI
511—Tun-o-matic, (Late Type) Under-chassis view 118-VI
511—Tun-o-matic—Alignment 119-VI
511—Tun-o-matic—Parts List 70-VI
511—Tun-o-matic—Service notes 120-VI
515Q—Schematic 113-VI
515Q—Alignment, Parts List, Trimmers 114-VI
525 (2nd type)—Chassis, Parts List, Trimmers 86-VI
525 (2nd type)—Schematic 85-VI
525 ..... 33-IV
525Q 48-V
534 ..... 57-V
545—Schematic 121-VI
545—Under Chassis View, Trimmers 122-VI
555 Second Type 52-IV
556—Auto Radio—Schematic 123-VI
556—Auto Radio—Chassis Layout, Trimmers 72-VI
558 ..... 53-IV
558D 43-IV 45-IV, 46-IV, 47-IV
558Q 44-IV, 45-IV, 46-IV, 47-IV
559—Schematic 124-VI
559—Under Chassis View 125-VI
559—Parts List 91-VI
565Z—Schematic 76-VI
565Z—Under Chassis View 75-VI
565Z—Chassis Layout, Alignment 77-VI
565Z—Parts List 78-VI
567 ..... 23-IV
567F 23-IV
577—Schematic 99-VI
577—Alignment, Chassis & R. F. Transformer Circuits 100-VI
612 ..... 54-IV, 60-IV
625Q—Schematic 102-VI
625Q—Trimmers, Parts List, Chassis 103-VI
627 ..... 55-IV
636 ..... 58-V
649 (early)—Schematic 126-VI
655Q—Schematic 107-VI
655Q—Under Chassis View, Trimmers 108-VI
655Q—Alignment 109-VI
655Q—Parts List 110-VI
657—Schematic 127-VI
657Q—Alignment, Trimmers, Parts List, Under Chassis View 128-VI
665 ..... 56-V
666 ..... 59-V
667 ..... 50-V
667D 51-V
708 ..... 60-V
711 ..... 61-V
735—Schematic 111-VI
735—Alignment, Parts List, Chassis Layout 112-VI
747Q—Schematic 127-VI
747Q—Alignment, Trimmers, Parts List, Under Chassis View 128-VI
768Q—Schematic 129-VI
768Q—Under Chassis View, Trimmers 130-VI
768Q—Alignment 109-VI
768Q—Parts List 110-VI
776—Auto Radio—Schematic 131-VI
776—Auto Radio—Chassis Trimmers 132-VI
776—Auto Radio—Alignment, Parts List 133-VI
788 ..... 63-V
808 ..... 60-V
808A 64-V
810—Schematic 134-VI
812 ..... 57-IV, 60-IV
816 ..... 65-V
825—Schematic 135-VI
825—Under Chassis Layout, Trimmers 136-VI
825—Alignment 81-VI
825—Alignment (Cont'd.) 82-VI
825—Parts List 91-VI
854—Schematic 137-VI
854—Chassis Layout, Under Chassis View, Alignment 138-VI
856 (early)—Schematic 139-VI
926 ..... 65-V
936 ..... 65-V
944—Schematic 140-VI
944—Under Chassis Layout, Trimmers 141-VI
944—Alignment 81-VI
944—Alignment (Cont'd.) 84-VI
944—Parts List 91-VI
976 (early)—Schematic 139-VI
978Q—Schematic 129-VI
978Q—Under Chassis View, Trimmers 130-VI
978Q—Alignment 109-VI
978Q—Parts List 110-VI

AUDIOLA RADIO CO.

(Now Fairbanks Morse Appliance, Inc.)

Audiola Junior 329-III
Junior 5 Tube AC 169-II
Super-Het, 8 Tube AC 176-II, 140B-Is
SW Chassis 368-III
4T31RF 168-II
4T32 ..... 364-III
6B 76-V
6S 76-V
6M 76-V
6T—31 Pentode 168-II
6T—Jr. No. 2 ..... 70-V
8T Super-Het 173-II
9T 45 Super-Het 1931 ..... 175-II
9T Pentode Super-Het 1931 ..... 172-II
10T Super-Het 171-II
13S6 ..... 362-III
13S7 ..... 170-II
13S9 ..... 363-III
23S7 ..... 68-V
23S8 ..... 70-V
23S8Q 71-V
23S10 ..... 71-V
23S12 ..... 71-V
23T5 ..... 368-III
23T5 SW 364-III
31 ..... 170-II, 140-A-IIs
32S11 ..... 367-III
33A6 Auto 73-V
33S5 ..... 73-V
33S6 Auto 72-V
33S6B 74-V
33S7 ..... 72-V
33S8—32V 68-V
33S10 ..... 75-V
52 ..... 69-V
53 ..... 69-V
346 ..... 76-V
347 ..... 77-V

AUTOCRAT RADIO CO.

55A 78-V
S 78-V

AUTOMATIC RADIO MFG. CO., Inc.

A5—Schematic 144-VI
C-4—Schematic 143-VI
C45, V45 ..... 176F-IIs
C46, V46 ..... 176F-IIs
J50—Schematic 144-VI
J60—Schematic 144-VI
J-80—Auto Radio—Schematic, Alignment 145-VI
P25 ..... 176B-IIs
P34 ..... 176D-IIs
P35 ..... 176D-IIs
S-6—Schematic 143-VI
Tom Thumb Auto Radio 79-V
Tom Thumb Midget 176H-IIs
Tom Thumb Portable 340-I
44 ..... 176F-IIs

AZTEC RADIO COMPANY

5 Tube Pentode 177-II
376 (2nd type)—Schematic 89-VI
376—Alignment (1st type) 81-VI
376—Under Chassis View, Alignment, Chassis (2nd type) 90-VI
376 (2nd type)—Alignment (Continued) 83-VI
385Q—Schematic 102-VI
385Q—Chassis, Parts List, Trimmers 103-VI
387 ..... 54-V
756 ..... 62-V
756B 62-V

B

NATHANIAL BALDWIN CO.

80 ..... 324-I

BALKEIT RADIO CO.

C 90-V
D-5 ..... 91-V
"E" 178B-IIs
F 92-V
KP 370-III
L7, LC7 ..... 178A-IIs
L8 ..... 369-III
Legion 93-V
M 371-III
S. G. 6 Midget 178B-IIs
38 ..... 80-V
41A 81-V
42E 82-V
42G 82-V
45 ..... 83-V
48 ..... 84-V
52-I 85-V
55 ..... 86-V
59 ..... 87-V
69 ..... 88-V
100 ..... 89-V

BEEDE ELECTRICAL INSTRUMENT CORP.

Preston Model 1931 ..... 140-II

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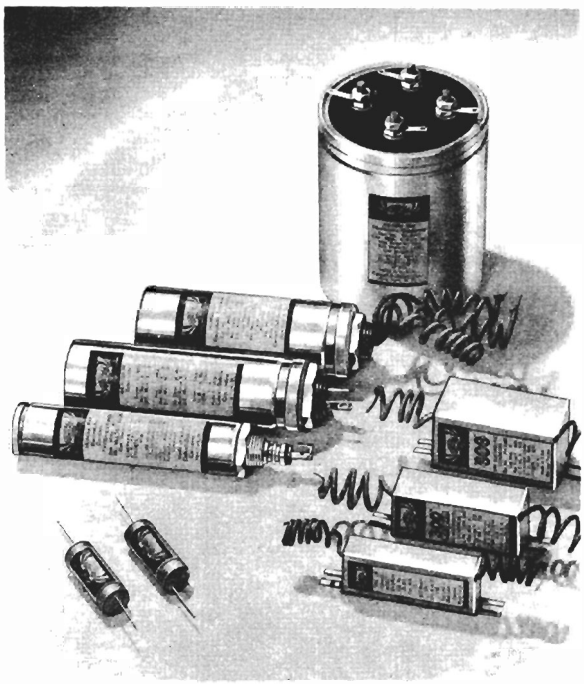

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BELMONT RADIO CORPORATION

40 ..... 178-II, 182A-IIs
40A 94-V
41A 94-V
42A 94-V
45 ..... 179-II
46 ..... 179-II
47 ..... 182A-IIs
48 ..... 182A-IIs
50 ..... 180-II
50A 182B-IIs
50B 182C-IIs
50C 182D-IIs
53 ..... 95-V
60 ..... 182E-IIs, 182F-IIs
65 ..... 181-II
66 ..... 181-II
70 ..... 182-II
110 ..... 182G-IIs
401—Schematic, Alignment, Chassis Layout 146-VI
401 Series B—Schematic, Chassis Layout, Alignment 147-VI
420 ..... 96-V
425 ..... 97-V
430 ..... 98-V
430 ..... 98-V
440 ..... 99-V
522—Battery Set—Schematic, Parts List, Alignment 148-VI
525 ..... 4HA-IIs
540 ..... 100-V
550 ..... 101-V
560 ..... 4HA-IIs
566—Auto Set—Schematic, Alignment 149-VI
575 ..... 102-V
578 Series A—Schematic 150-VI
580—Auto Set—Schematic, Chassis Layout, Alignment 151-VI
585—Series A-B-C—Schematic 152-VI
585—Series D—Schematic, Parts List, Chassis Layout, Alignment 153-VI
586—Series A—Schematic, Alignment 154-VI
625 ..... 103-V
640 ..... 104-V
650 ..... 105-V
660 ..... 106-V
666—Auto Set—Schematic, Chassis Layout, Alignment, Parts List 155-VI
670 ..... 107-V
670A 107-V
675 ..... 108-V
680—Auto Set—Schematic, Chassis Layout, Alignment, Service Notes..156-VI
686—Series A, B—Schematic, Parts List, Chassis Layout 157-VI
690—Auto Set—Schematic, Chassis Layout, Alignment, Service Notes..158-VI
750 ..... 109-V
770—Series A—Schematic, Alignment 159-VI
775 ..... 110-V
777—Series A-B-C—Schematic, Chassis Layout, Service Notes 160-VI
778—Series A—Schematic, Parts List, Chassis Layout 161-VI
786—Series A—Schematic, Parts List, Chassis Layout 157-VI
880—Series A, Auto Set Schematic 162-VI
880—Series B, Auto Set Schematic 162-VI
880—Series C, Auto Set Schematic, Chassis Layout, Alignment, Parts List 163-VI
1050 ..... 111-V
1070—Series A—Schematic, Chassis Layout, Parts List, Trimmers 164-VI
1070—Series A—Alignment 165-VI

BOND RADIO CO.

6TA 112-V
33 ..... 112-V
34 ..... 112-V

BRANDES PRODUCTS CORP.

B—10 ..... 198A-IIs
B—11 ..... 178-II
B—12 ..... 178-II
B—15 ..... 198A-IIs
B—16 ..... 198A-IIs
"B" Power Unit 197-II
Columbia Electric Phonograph 197-II
Columbia C—5 ..... 198-II
Columbia 950 ..... 198-II
K—24 ..... 189-II
K—38 ..... 190-II
K—42 ..... 191-II
K—48 ..... 61-IV
K—60 ..... 193-II
K—62 ..... 193-II
K—70 ..... 194-II
K—72 ..... 194-II
K—80 ..... 195-II
K—82 ..... 195-II
K—90 ..... 190-II
K—92 ..... 190-II
K—110 ..... 113-V
K—112 ..... 113-V
K—114 ..... 114-V
K—120 ..... 113-V
K—130 ..... 115-V
K—132 ..... 115-V
K—133 D. C. 116-V
K—143 D. C. 116-V
6 Tube AC 185-II
7 Tube AC 183-II, 184-II
7 Tube Power Pack & Audio Amplifier 117-V
25 ..... 188-II

BREMER - TULLY MFG. CO.

Counterphase, 6 ..... 106-I
Counterphase, 8 ..... 106-I
S—81 ..... 110B-Is, 110C-Is
S—82 ..... 110B-Is, 110C-Is
6—40 Receiver 107-I
6—40 Power Unit 106-I
7—70 ..... 108-I
7—71 ..... 108-I
8—20A 107-I
8—21A 107-I
81 ..... 110A-Is
82 ..... 110A-Is
820A 297-III, 346-III

BROWNING DRAKE CORP.

4 Tube Battery 180C-Is
JR 372-III, 4PP-IIs
MB—30 ..... 108A-Is
20 ..... 376-III, 4MM-IIs
34 ..... 350-I
36 ..... 350-I
38 ..... 350-I
40 ..... 373-III, 4NN-IIs
54 ..... 374-III
69 ..... 108B-Is
70 ..... 108B-Is
71 ..... 108B-Is
80 ..... 375-III, 400-IIs
100 ..... 372-III, 4PP-IIs

BRUNSWICK-BALKE-COLLENDER CO.

N—1102 ..... 199-II
RPA—1A 265-I
RPA—4 ..... 265-I
RPA—5 (AP—952) 200-II
3 ..... 276-I
10 ..... 267-I, 204-II
11 ..... 203-II
12 ..... 203-II
14 AC Receiver 202-II
14 Power Unit 109-I, 201-II
14 DC Receiver 206-II
15 Battery 205-II
16 ..... 203-II
21 AC Receiver 202-II
21 Power Unit 109-I, 201-II
21 DC Receiver 206-II
31 DC Receiver 206-II
31 Combination Panatrope 110-I

BRUNSWICK RADIO CORP.

(Wilco Radio Co.)

B—15 ..... 110K-Is
DC—15 ..... 110L-Is
R—1 ..... 110J-Is
S—14 ..... 110C-Is
S—21 ..... 110C-Is
S—31 ..... 110C-Is
SPU—X—60 ..... 110G-Is
SPU—X—341 ..... 110G-Is
SPU—X—355 ..... 110F-Is
SPU—X—900 ..... 110D-Is
SPU—X—901 ..... 110D-Is
SPU—X—902 ..... 110J-Is
X—882 Chassis 110F-Is
X—1101 Chassis 110D-Is
X—1103 Chassis 110E-Is
X—1104 Chassis 110J-Is
2KRO 110H-Is
2KR6 ..... 110H-Is
3KR8 ..... 110F-Is
3KRO 110H-Is
3NC8 ..... 110E-Is
3NW8 ..... 110-Is
5KR 110H-Is
5KR6 ..... 110H-Is
5KRO 110H-Is
5NO 110D-Is
10 A. C. 333-III
14 ..... 295-III, 323-III
15 ..... 315-III, 321-III, 328-III, 110J-Is
17 ..... 207-II
21 ..... 295-III, 323-III
22 A. C. 312-III, 315-III, 316-III, 319-III, 321-III, 110J-Is
24 ..... 207-II
25 ..... 207-II
31 ..... 312-III, 323-III
31 A. C. 320-III

BUCKINGHAM RADIO CORP.

Model 9 ..... 348-I

BULOVA CLOCK COMPANY

C751 ..... 378-III
M501 ..... 377-III
M701 ..... 377-III

BUSH AND LANE PIANO CO.

10 De Luxe 111-I
12 Screen Grid 111-I

C

CANADIAN MARCONI CO.

III 370E-Is
IV 370E-Is
V 370C-Is
VI 370E-Is
VII 370C-Is
VIII 370F-Is
IX 370F-Is
X Tuner 370A-Is
X—Power Unit 370F-Is
XI 370B-Is
XI Tuner 370B-Is
XI Power Unit 370D-Is
XII 370A-Is
XII Power Unit 370D-Is
XIV DC 360-I
XV 361-I
XVI Tuner 361-I
XVI Power Unit 361-I
XVII 361-I
XVIII 361-I
10 De Luxe 111-I
12 Screen Grid 111-I
19 DC 370-I
20 Chassis 363-I
20 Power Unit 363-I
21 Chassis 364-I
21 Power Unit 365-I
22 Chassis 366-I
22 Power Unit 367-I
23 Chassis 368-I
23 Power Unit 369-I
26 ..... 379-III
26 SW 379-III
26 SW & 27 SW converter units 380-III
27 SW receiver 381-III, 382-III
28 ..... 373-I
29 ..... 373-I
31-31 SW 383-III
31 SW converter 384-III
32 ..... 385-III
32B 214E, 214M-IIs
33 ..... 214E, 214M-IIs
33AW 214E, 214M-IIs
34 ..... 214E, 214M-IIs
35 ..... 214E, 214M-IIs
36 ..... 214E, 214M-IIs
37 ..... 214E, 214M-IIs
70 ..... 374-I
80 ..... 376-I
89 ..... 376-I
90 ..... 377-I
99 ..... 378-I
110 ..... 379-I
120 ..... 380-I

CANADIAN RADIO CORP.

"Buckingham"—Schematic, Parts List 166-VI
"Champlain"—Schematic, Parts List 167-VI
Connought (Chassis 80)

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CANADIAN RADIO (cont'd)

Schematic, Parts List 175-VI
"Countess" (Chassis 83) Schematic, Parts List 168-IV
"Dutchess" (Chassis 76) Schematic, Parts List 169-VI
"Earl" (Chassis 81) Schematic, Parts List 172-VI
"Empress" (Chassis 72) Schematic, Parts List 169-VI
Frontenac (Chassis 52) Schematic, Parts List 177-VI
Jaques Cartier (Chassis 58) Schematic, Parts List 173-VI
Jolliette (Chassis 53) Schematic, Parts List 175-VI
Kent (Chassis 77) Schematic, Parts List 174-VI
Knight (Chassis 79) Schematic, Parts List 173-VI
Laurier (Chassis 57) Schematic, Parts List 174-VI
"Madelaine" (Chassis 59) Schematic, Parts List 172-VI
Marquis (Chassis 77) Schematic, Parts List 174-VI
Montcalm (Chassis 54) Schematic, Parts List 176-VI
Papineau (Chassis 58) Schematic, Parts List 173-VI
Richelieu (Chassis 57) Schematic, Parts List 174-VI
Viscount (Chassis 79) Schematic, Parts List 173-VI
"Wales" (Chassis 71) Schematic, Parts List 170-VI
7 Tube Battery Set Schematic, Parts List 171-VI
Ten-45 (Chassis 29) Schematic, Parts List 172-VI
Ten-50 (Chassis 28) Schematic, Parts List 173-VI
Ten-51 (Chassis 31) Schematic, Parts List 172-VI
Ten-55 (Chassis 28) Schematic, Parts List 173-VI
Ten-57 (Chassis 27) Schematic, Parts List 174-VI
Ten-58 (Chassis 27) Schematic, Parts List 174-VI
Ten-59 (Chassis 27) Schematic, Parts List 174-VI
Ten-60 (Chassis 26) Schematic, Parts List 175-VI
Ten-65 (Chassis 24) Schematic, Parts List 176-VI
Ten-66 (Chassis 24) Schematic, Parts List 176-VI
Ten-85 (Chassis 23) Schematic, Parts List 177-VI
213D 123-V
505 118-V
507 119-V
508 120-V
511 121-V
513C 122-V

CANADIAN WESTINGHOUSE CO., Ltd.

6 Tube AC, 1928 Model 372-I
B64—Schematic, Socket Voltages, Wiring Diagram 179-VI
B74—Schematic, Trimmers 180-VI
B74—Wiring Diagram 181-VI
B74—Socket Voltages 182-VI
B-83 132-V
B-103 133-V
B265A—Schematic 202-VI
B265A—Wiring Diagram 203-VI
B285A—Schematic 206-VI
B285X—Schematic 206-VI
B365A—Schematic 208-VI
B365A—Wiring Diagram 209-VI
B365X—Schematic 208-VI
B365X—Wiring Diagram 209-VI
B634—Schematic, Socket Voltages, Wiring Diagram 179-VI
Service Oscillator No. H25405 388-III
Universal Tube Tester 386-III
W55A 371-I
W57 371-I
W58 371-I
W60 371-I
W165A—Wiring Diagram 191-VI
W165X—Wiring Diagram 191-VI
W165Y—Wiring Diagram 191-VI
W175A—Schematic, Socket Voltages 192-VI
W175X—Schematic, Socket Voltages 192-VI
W175Y—Schematic, Socket Voltages 192-VI
W175A—R. F. Wiring Diagram 193-VI
W175X—R. F. Wiring Diagram 193-VI
W175Y—R. F. Wiring Diagram 193-VI
W175A—A. F. Wiring Diagram 194-VI
W175X—A. F. Wiring Diagram 194-VI
W175Y—A. F. Wiring Diagram 194-VI
W195Y—Schematic, Socket Voltages 197-VI
W255A—Wiring Diagram 201-VI
W255X—Wiring Diagram 201-VI
W255Y—Wiring Diagram 201-VI
W275A—Schematic, Socket Voltages 204-VI
W275X—Schematic, Socket Voltages 204-VI
W275Y—Schematic, Socket Voltages 204-VI
W275A—A. F. Wiring Diagram 194-VI
W275X—A. F. Wiring Diagram 194-VI
W275Y—A. F. Wiring Diagram 194-VI
W295X—Schematic, Socket Voltages 207-VI
W295Y—Schematic, Socket Voltages 207-VI
W565X—Schematic 215-VI
W565X—Alignment, Socket Voltages 216-VI
18 Power Unit 372-I
28 373-I
29 373-I
44—Schematic, Wiring Diagram 178-VI
53 62-IV, 63-IV
54 124-V
55 371-I
61 400-III
64 125-V
69 373-I
70 374-I
71 410-III
73 126-V
80 375-I
81 410-III
82 64-IV, 65-IV
83 127-V
84—Schematic, Service Data 183-VI
84—Socket Voltages, Service Data 184-VI
89 376-I
90 377-I
99 378-I
101 416-III
102 66-IV, 67-IV
103 128-V
104 129-V
110 379-I
112 SW Converter 68-IV
120 380-I
122 69-IV, 70-IV, 71-IV
122A 130-V
124—Schematic (1st half), Service Data 186-VI
124—Schematic (2nd half), Socket Voltages 187-VI
155A—Schematic, Socket Voltages 188-VI
155A—Wiring Diagram 189-VI
155X—Schematic, Socket Voltages 188-VI
155X—Wiring Diagram 189-VI
165A—Schematic, Socket Voltages 190-VI
165X—Schematic, Socket Voltages 190-VI
165Y—Schematic, Socket Voltages 190-VI
185X—Schematic, Service Data 195-VI
195X—Wiring Diagram, Service Data 196-VI
195Y—Wiring Diagram, Service Data 196-VI
W195X—Schematic, Socket Voltages 197-VI
254A—Schematic, Socket Voltages 198-VI
254A—Wiring Diagram 199-VI
254X—Schematic, Socket Voltages 198-VI
254X—Wiring Diagram 199-VI
255A—Schematic, Speaker Connections 200-VI
255X—Schematic 200-VI
255Y—Schematic 200-VI
275A—R. F. Wiring Diagram 205-VI
275X—R. F. Wiring Diagram 205-VI
275Y—R. F. Wiring Diagram 205-VI
295X—Wiring Diagram, Service Data 196-VI
295Y—Wiring Diagram, Service Data 196-VI
410A—Schematic, Wiring Diagram 210-VI
410A—Service Data, Chassis Layout, Socket Voltages 211-VI
465A—Schematic, Socket Voltages 212-VI
465A—Wiring Diagram 213-VI
465X—Schematic, Socket Voltages 212-VI
465X—Wiring Diagram 213-VI
511A—Schematic 214-VI
511X—Schematic 214-VI
534 124-V
634 125-V
801 433-III

CAPEHART CORP.

CK 135-V
Standard Amplifier 136-V
28GB Orchestrope 350-I
120 440-II
140 441-II
181 442-III
181½ 442-III
200, 200 Phono Radio 4HB-IIs
202 (W 864)—Schematic 217-VI
203 (W 869)—Schematic 218-VI
203—Amplifier (W 870) Schematic 219-VI
400 350C-Is, 350D-Is
400B S 134-V
400D—Schematic of Bass Amplifier (W 867) 220-VI
400D—Schematic of Tuner (W 877) 221-VI
400D—Schematic of Treble Amplifier (W 868) 220-VI
401 350C-Is, 350D-Is
402 350C-Is, 350D-Is

CARTER GENEMOTOR CORP.

Directions for installing Genemotor 72-IV
1135A 137-V
1180A 137-V
1235A 137-V
1280A 137-V
2635 137-V
2680A 137-V
4635A 137-V
4680A 137-V

CENTRAL RADIO LAB.

Volume Control Replacement Data, 537—544-II

CLEARTONE RADIO CORP.

60 Golderest 112-I
70 Clearodyne 113-I
80 112-I
100 Cleartone 113-I
110 Compact 114-I
112 114-I

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COLONIAL RADIO CORP.

Colonial D. C. 306-III
C-399 ..... 162-V
C-495 ..... 163-V
C-595 ..... 159-V
C-695 ..... 160-V
C-995 ..... 161-V
T-345 ..... 162-V
T-397 ..... 163-V
16 Battery 116B-1s
31 AC 115-I, 299-III
31 DC 116-I, 300-III, 340-III
32 AC 117-I, 302-III, 304-II 308-III, 313-III, 317-III, 318-III, 320-III
32 D.C. 302-III, 308-III, 313-III, 317-III, 320-III
33 ..... 309-III, 139-III, 321-III
33 A.C. 330-I, 307-III, 314-III
34 ..... 319-III, 321-III
36 ..... 314-III
47 ..... 327-III
56 ..... 138-V
62 ..... 139-V
106B 140-V
106 Power Supply 140-V
128B 141-V
136 ..... 142-V
150 ..... 143-V
164 ..... 144-V
164B 144-V
182 ..... 145-V
250 ..... 146-V
250 AC 147-V
250 AC Extended Range 148-V
250 AC—DC Extended Range 149-V
279 ..... 146-V
279 AC 147-V
300 ..... 146-V
300 AC 147-V
300 AC Extended Range 148-V
300 AC—DC Extended Range 149-V
301 AC 147-V
400 ..... 150-V
500 ..... 146-V
501 AC 152-V
501 ..... 151-V
600 ..... 153-V
600A 153-V
601 ..... 154-V
602 ..... 155-V
650 ..... 156-V
700 ..... 157-V
700 AC 158-V
701 ..... 157-V
701 AC 158-V
702 ..... 157-V
702 AC 158-V
1560 ..... 138-V
1562 ..... 138-V
1564 ..... 138-V
1580 ..... 139-V
1582 ..... 139-V
1584 ..... 139-V
1586 ..... 139-V

COLUMBIA PHONO. & RADIO CORP.

C—1 6 Tubes 60 Cycles 118-I
C—2 7 Tubes 60 Cycles 118-I
C—3 6 Tubes 25 Cycles 118-I
C—4 7 Tubes 25 Cycles 119-I
C—5 ..... 119-I
C—6 6 Tube DC 123-I
C—7 6 Tube DC 123-I
C—25—31 ..... 209-II
C—25—32 ..... 209-II
C—25—33 ..... 208-II
C—25—34 ..... 208-II
C—31 ..... 209-II
C—32 ..... 209-II
C—33 ..... 208-II
C—34 ..... 208-II
C-80-A 210E-IIs
C-80-B 210F-IIs
C-90-A, C-90-B 210C-IIs
C—100 ..... 536-II
C-120 B Chassis 164-V
C-800 ..... 210D-IIs
300 Phonograph 120-I
900 Phonograph 122-I
901 Phonograph 122-I
902 Phonograph 121-I
930 Phonograph 120-I
931 Phonograph 120-I
950 Combination 121-I
980 Combination 124-I
980 Power Pack 123-II

COLUMBIA RADIO CO.

AC—5 ..... 165-V
Screen Grid 8, 118B-1s, 125-I

CONSOLIDATED INDUSTRIES PRODUCTS, Ltd.

See also De Forest-Crosley Ltd.

514 ..... 166-V
608-A-B-C-D 73-IV
608-G 74-IV
708-A-B-F 75-IV
801 ..... 76-IV
802 ..... 76-IV
840 ..... 167-V
850 ..... 167-V
853 ..... 167-V
855 ..... 77-IV
885B 77-IV
902-A-F-B 168-V
905 ..... 78-IV
907 ..... 79-IV

CONTINENTAL RADIO CORP.

(Radio Service Engineers)
(Slagle Radio Co.)

L5—Chassis Layout, Schematic 222-VI
L6—Schematic, Chassis Layout. 223-VI
L7—Schematic, Chassis Layout 224-VI
M1—Schematic, Chassis Layout 225-VI
Model Nine 126-I
R-20 ..... 169-V
R-25 ..... 169-V
R-30 ..... 169-V
RP-40 ..... 169-V
Tam Luner 170-V
X8—Schematic, Chassis Layout 226-VI
Z2—Schematic, Chassis Layout 227-VI
Z4 (revised)—Schematic, Layout 228-VI
11 Tube Model 129-I
29-A with 171-L 126-I
29-A with 250-L 127-I
29-B with 171-L 126-I
29-B with 250-L 127-I
29-C with 171-L 127-I
29-C with 250-L 128-I
29-D with 250-L 128-I
29 Series Circuit Data, 128-I

S. H. COUCH CO., Inc.

Mik—2 ..... 174-V
Mik—3 ..... 174-V
Mix—2 ..... 174-V
410 ..... 171-V
430 ..... 171-V
435 ..... 173-V
470 ..... 172-V
475 ..... 172-V
480 ..... 173-V
485 ..... 173-V

CROSLEY RADIO CORP.

AC-7 ..... 130-I
AC-7A 130-I
A156—Schematic, Parts List, Operating Voltages 253-VI
A166—Schematic, Parts List, Operating Voltages 254-VI
Buddy 140-I, 333-III
Chum 140-I, 333-III
RFL-90 ..... 381-I
Roamio 211-II
Showbox 299-III 328-III, 342-III
Showchest 299-III
V 131-I
XI 131-I
XJ 210-II
XL 210-II
2C1—Schematic, Operating Voltages, Parts List 229-VI
3B 131-I
3C 131-I
3R3 ..... 131-I
4A1—Schematic, Operating Voltages, Parts List 230-VI
4B1—Schematic, Parts List 231-VI
4-29 ..... 132-I
5A1—Schematic 232-VI
5A3—Roamio, Schematic 233-VI
5A3—Roamio, Operating Voltages, Part List 234-VI
5B3—Schematic, Parts List 235-VI
5C2—Schematic, Operating Voltages, Parts List 236-VI
5H1—Schematic, Parts List, Under Chassis Layout, Operating Voltages 237-VI
5M3—Operating Voltages, Parts List, Schematic 238-VI
5V1—Schematic, Operating Voltages, Parts List 239-VI
5V2—Schematic, Parts List, Operating Voltages 240-VI
5-38 ..... 131-I
6B1—Battery Set, Schematic, Parts List 241-VI
6B1—Battery Set, Chassis Layout, Under Chassis View 242-VI
6B1—Battery Set, Alignment 243-VI
6H2—Schematic, Parts List, Under Chassis View, Operating Voltages 244-VI
6H3—Schematic, Parts List 245-VI
6V2 ..... 175-V
6-60 ..... 139-I
6-85 ..... 139-I
7H2—Schematic, Parts List, Under Chassis View, Operating Voltages 246-VI
7H3—Schematic. Parts List. Operating Voltages 247-VI
7V2—Schematic, Parts List 248-VI
7 ..... 444-III
7-1 ..... 451-III
7-2 ..... 451-III
8B3—Schematic, Parts List 249-VI
8H1—Schematic, Chassis Layout, Operating Voltages, Parts List 250-VI
10 ..... 176-V
20 ..... 210-II
21 ..... 210-II
22 ..... 210-II
26 ..... 138D-1s
27 ..... 445-III
28 ..... 445-III
28 Series B 212-II
30S 132-I
31S 132-I
33S 132-I
34S 132-I
38 ..... 177-V
40S 132-I, 133-I
41 ..... 139-I
41A 139-I
41S 132-I, 133-I
42 ..... 139-I
42S 132-I, 133-I
47 ..... 210A & B-IIs
51 ..... 131-I
53 ..... 354-I
54 ..... 354-I
55 ..... 138C-1s
56 ..... 138C-1s
57 ..... 354-I
58 ..... 138A-1s
59 ..... 138D-1s
60S 134-I
61S 134-I
62S 134-I
63S 134-I
76 ..... 138D-I
77 ..... 213-II, 138F-1s
77-1 ..... 138A-1s
77A, 77B, 77L 138F-1s
82S 132-I, 133-I
84 ..... 138F-1s
84C, 84D 138F-1s
90 ..... 80-IV
91 ..... 138-1s, 80-IV
92 ..... 80-IV
92 Battery 212-II
92 Series B 212-II
95 96 Auto 214B-IIs
98 ..... 178-V
99 ..... 179-V
102 ..... 180-V
103—Schematic, Operating Voltages, Parts List 251-VI
104 Power Unit 213-II
104R Power Unit 213-II
105 Power Unit 213-II
105R Power Unit 213-II
106 Power Unit 213-II
119—Schematic 252-VI
120 ..... 138E-1s
121 Series A 445-III
121 Series B 212-II
121-1 Series B 212-II
122 ..... 214-II, 215-II
123 ..... 214-II, 215-II
124 ..... 215-II, 342-III
124-1 ..... 81-IV, 82-IV
125 ..... 444-III
126 ..... 446-III
126-1 ..... 446-III
127 ..... 448-III
128 ..... 447-III
129, 129-1 ..... 83-IV
130-1 ..... 181-V
131 ..... 447-III
32 ..... 85-IV
132-1 ..... 85-V
133 ..... 86-IV
134 434-1 ..... 87-IV
135 ..... 89-IV
136-1 ..... 90-IV

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

CROSBY RADIO (cont'd)

137 ....91-IV
141 ....92-IV
143 ....162-V
146-146-1 ....93-IV, 94-IV
147 ....95-IV
148 ....96-IV
150 ....97-IV
154 ....98-IV
155 ....99-IV
156 ....99-IV
156 ....100-IV
157 ....101-IV
158 ....102-IV
159 ....183-V
160 ....103-IV
163 ....104-IV
164 ....184-V
166 ....185-V
167 ....186-V
168 ....187-V
169 ....188-V
170 ....189-V
171 ....190-V
172 ....191-V
173 ....192-V
173-5 ....192-V
174 ....193-V
175 ....194-V
176 ....195-V
178 ....196-V
179 ....197-V
180 ....198-V
181—Schematic, Operating Voltages, Parts List....255-VI
182 ....199-V
184—Parts List, Schematic, Operating Voltages 256-VI
287 Speaker 215-II
297 Speaker 215-II
305-J Speaker 215-II
306-J Speaker 215-II
306-M Speaker 215-II
401 ....133-I
401A 140-I
415—Schematic, Parts List, Chassis Layout, Operating Voltages 257-VI
425—Schematic, Parts List, Operating Voltages....258-VI
435—Schematic, Parts List, Operating Voltages, Chassis Layout, Under Chassis View 259-VI
505—Schematic, Parts List 263-VI
505—Alignment, Chassis Layout, Under Chassis View 264-VI
515—Schematic, Parts List 260-VI
515—Alignment, Chassis Layout, Under Chassis View 261-VI
516—Schematic, Parts List 262-VI
525—Schematic, Parts List 263-VI
525—Alignment, Chassis Layout, Under Chassis Layout 264-VI
526—Schematic, Parts List, Operating Voltages 265-VI
534—Schematic 266-VI
534—Chassis Layout, Under Chassis Layout, Parts List 267-VI
534—Alignment 268-VI
535—Schematic, Parts List, Chassis Layout, Under Chassis Layout, Operating Voltages 269-VI
545—Schematic, Parts List, Chassis Layout, Under Chassis Layout, Operating Voltages 270-VI
555—Schematic, Parts List, Under Chassis Layout, Operating Voltages 271-VI
601 ....135-I
602 AC 210-II, 140-I
605—Schematic, Parts List, Chassis Layout, Under Chassis Layout, Operating Voltages 272-VI
608 ....133-I
609 ....137-I, 306-III
610 ....137-I, 306-III
615—Schematic, Parts List, Chassis Layout, Under Chassis Layout 273-VI
616—Schematic, Parts List, Operating Voltages 274-VI
626—Schematic, Parts List, Operating Voltages 275-VI
635—Schematic, Parts List 276-VI
635—Alignment 277-VI
645—Schematic, Parts List, Operating Voltages, Chassis Layout, Under Chasis Layout 278-VI
655—Schematic, Parts List, Chassis Layout, Under Chassis Layout 279-VI
704 ....137-I
704A 134-I
704B 136-I
705 ....211-II, 136A-Is
706 ....136-I
714—Schematic, Parts List 280-VI
715—Schematic, Parts List 281-VI
715—Alignment 282-VI
725—Schematic 283-VI
725—Parts List, Chassis, Layout, Under Chassis Layout, Operating Voltages 284-VI
804 ....136-Is, 137-I
814....Schematic, Parts List 285-VI
815—Schematic, Parts List, Operating Voltages 286-VI
855—Schematic, Parts List, Operating Voltages 287-VI
865—Schematic, Parts List, Operating Voltages 288-VI
915—Schematic 289-VI
915—Parts List, Chassis Layout Under Chassis Layout, Operating Voltages 290-VI
916—Schematic, Parts List, Operating Voltages 291-VI
955—Parts List, Schematic Operating Voltages 292-VI
1014—Centurion, Schematic 293-VI
1014—Centurion, Chassis Layout, Under Chassis Layout, Parts List 294-VI
1014—Centurion, Alignment Parts List 295-VI
1016—Schematic, Parts List, Operating Voltages 296-VI
1055—Schematic 297-VI
1055—Parts List, Operating Voltages, Chassis Layout, Under Chassis Layout 298-VI
1155—Schematic, Parts List, Operating Voltages 299-VI
5515—Schematic, Parts List 260-VI
5515—Alignment, Chassis Layout, Under Chassis View 261-VI
5516—Schematic, Parts List 262-VI
5526—Schematic, Parts List, Operating Voltages....265-VI
5555—Schematic, Parts List, Operating Voltages, Under Chassis Layout 271-VI
6516—Schematic, Parts List 262-VI
6615—Schematic, Parts List, Operating Voltages 300-VI
6625—Schematic, Parts List, Operating Voltages 301-VI

D

DAVEN RADIO CO.

Bass Note Circuit....136B-Is

DAY FAN ELECTRIC CO.

See also General Motors Radio Corp.

A-5003 ....216-II
5050 ....216-II
5066 ....217-II
5069 ....217-II
5072 ....218-II
5091 ....218-II

DE FOREST CROSLEY, Ltd.

See also Consolidated Industries Products, Ltd.

Bandbox Jr. 382-I
Balmoral 382-I
Barcarolle 383-I
Berwick 382-I, 384-I
Concerto 384-I
Conway 381-I
Etude 384-I
Etude Power Unit 383-I
Hastings 381-I, 383-I
Hastings Power Unit 382-I
Minuet 383-I
Nocturne 384-I
Opera 384-I
Serenata 344-III
Sonata 384-I
Symphony 383-I, 384-I
Warwick 381-I
Windsor 381-I
DC-5 ....381-I
C-6 ....381-I
400 ....385-I
402 ....389-I
403 ....389-I
410 ....385-I
410 Motor Board 391-I
420 ....385-I
500 ....452-III
501 ....452-III
603 ....392-I
605 ....392-I
700 ....388-I, 393-I
701 ....394-I
702 ....395-I
705 ....396-I
707 ....397-I
740 ....386-I
740B 398-I
741 ....399-I
742 ....400-I
743 ....401-I
750 ....386-I
750 Motor Board 402-I
762 ....403-I
766 ....404-I
800 ....387-I
810 ....387-I
810 Motor Board 388-I
810B 405-I
810B Motor Board 406-I
902 Chassis—Model A, B & F 218A, 218F-IIs

DE FOREST RADIO COMPANY

CS-5 ....353-I
D-17 ....353-I
F-5 ....353-I

DELCO APPLIANCE CORP.

Automobile Set 184-I
Police Set 76A-Is
RA-3 ....288A-IIs, 244-II
RB-B & RA-B 2V 466-III
RB-1 & RC-1 110 V. A. C. 469-III
RB-3 ....238A-IIs, 244-II
RC-3 ....283A-IIs, 244-II
3002 ....219-II

DELCO RADIO CORP.

See United Motors

DELTA MFG. CO.

Class "B" Audio Amplifier 200-V

DETROLA RADIO CORP.

4 Tube Standard 201-V
Roadmaster 510D-IIs
2B—Schematic, Battery Connections 302-VI
4F—Schematic, Chassis Layout 303-VI
4H—Schematic, Chassis Layout 303-VI
4J—Schematic, Chassis Layout 303-VI
4W—Schematic, Chassis Layout 304-VI
4Y—Schematic, Chassis Layout 304-VI
5D—Schematic, Socket Voltages, Chassis Layout 305-VI
5L—Schematic, Chassis Layout 304-VI
5W—Schematic, Socket Voltages 302-VI
5WG—Schematic, Alignment 314-VI
5X—Schematic, Alignment, Socket Voltages 306-VI
6A—Auto Set, Schematic, Alignment, Socket Voltage 307-VI
6M—Auto Set, Schematic 308-VI
6R—Auto Set, Schematic 308-VI
6W—Schematic, Socket Voltages 309-VI
6X—Schematic, Socket Voltages 309-VI
7A—Schematic, Socket Voltages 310-VI
100—Schematic 311-VI
100A—Schematic 311-VI
103—Schematic 312-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

DETROLA RADIO (cont'd)

106—Schematic, Chassis Layout 313-VI
106E—Schematic, Chassis Layout 313-VI
109—Schematic 312-VI
110—Schematic, Chassis Layout 312-VI
114—Schematic 311-VI
120—Schematic, Chassis Layout 314-VI
121—Schematic, Chassis Layout 314-VI

DE WALD

See Pierce-Airo

E

EARL RADIO CORP.

See Chas. Freshman Co., Inc.

ECHOPHONE RADIO MFG. CO.

F 5-II
S-3 ..... 0-II
S-3 Improved 31-II
S-4 ..... 22-II
S-5 ..... 23-II
40 ..... 26-II
60 ..... 27-II
80 ..... 24-II
90 ..... 28-II
1731 ..... 02-V
1734 ..... 03-V
1734A 03-V
1800 ..... 293-V
7110 ..... 204-V
7114 ..... 205-V
7124 ..... 206-V
7126 ..... 207-V
7127 ..... 207-V

THOMAS A. EDISON, Inc.

See Splitdorf Electric Mfg. Co.

C-1 ..... 142-I
C-2 ..... 142-I, 143-I
C-4 ..... 141-I
R-1 ..... 142-I
RT-1 ..... 143-I
R-2 ..... 142-I, 143-I
R-4 AC 141-I
R-4 DC 140D-Is
R-5 AC 141-I
R-5 DC 140D-Is
R-6 ..... 140B-Is, 140C-Is
R-7 ..... 140B-Is, 140C-Is

ELECTRAD, Inc.

A-250 ..... 208-V
B-235 Tuner 299-II
B-245 Amplifier 229-II
C-250 ..... 208-V
C-250 Amplifier 230-II
D-450 ..... 209-V
E-250 Amplifier 230-II
E-450 ..... 209-V
Loftin-White Circuit 63-I
Replacement Resistor Information ..... 545 to 547-II
250 Amplifier 358B-Is
250 Push Pull 358B-Is

ELECTRIC SPEC. EXPORT CO.

R-502 ..... See Balkeit 59

ELECTRICAL RESEARCH LABORATORIES, Inc.

Battery operated screen grid receiver 232A-II, 232B-II, 232C-II
6 Tube Super, Car Radio Schematic 315-VI
19A—Schematic, Operating Voltages 316-VI
31B—Schematic, Under Chassis Layout 317-VI
32B—Schematic 318-VI
33B—Schematic, Trimmers 319-VI
34B—Auto Set—Schematic, Operating Voltages, Trimmers 320-VI
35B—Battery Set, Schematic, Trimmers 321-VI
36L—Schematic, Operating Voltage, Trimmers 322-VI
37B—Schematic 318-VI
38B—Battery—Schematic, Trimmers 323-VI
39B—Battery Set, Schematic, Trimmers 324-VI
40-A—Schematic, Operating Voltages, Trimmers 325-VI
57LW—Schematic 326-VI
224 ..... 142A-Is
225 ..... 142B-Is
248 Revised 231-II
250 ..... 231-II
271 ..... 142D-Is
271A 232-II
570X 210-V
599 ..... 211-V
622 ..... 212-V
623 ..... 212-V
634 ..... 213-V
635 ..... 213-V
5001 ..... 214-V
5002 ..... 214-V
5800—Schematic 327-VI
6200—Schematic 326-VI
7700—Schematic 327-VI

ELECTRICAL LAB., Inc.

6 Volt Eliminator 215-V
32 Volt Eliminator 215-V
32 Volt DC Converter 216-V
110 Volt DC Converter 216-V
331 ..... 215-V
332 ..... 215-V

EMERSON ELECTRIC MFG. CO., Inc.

DM4AD-108 "B" Power Unit 217-V

EMERSON RADIO & PHONOGRAPH CORP.

A310 (Chassis)—Schematic 353-VI
A130 (Chassis A)—Alignment, Parts List, Socket Voltage 354-VI
A132 (Chassis A)—Schematic 353-VI
A132 (Chassis A)—Alignment, Parts List, Socket Voltage 354-VI
AC-5 ..... 220-V
AW-7 ..... 224-V
B-10 ..... 105-IV
B-AC-10 ..... 105-IV
C-134 (Chassis C) Schematic 355-VI
C134 (Chassis C)—Alignment, Socket Voltages, Parts List 356-VI
C-136 (Chassis C) Schematic 355-VI
C-136 (Chassis C)—Alignment, Socket Voltages, Parts List 356-VI
C-138 (Chassis C) Schematic 355-VI
C-138 (Chassis C)—Alignment, Socket Voltages, Parts List 356-VI
C-139 (Chassis C) Schematic 355-VI
C-139 (Chassis C)—Alignment, Socket Voltages, Parts List 356-VI
C-140 (Chassis C) Schematic 355-VI
C-140 (Chassis C)—Alignment, Socket Voltages, Parts List 356-VI
C-142 (Chassis C) Schematic 355-VI
DC-4 ..... 106-VI
D-5 ..... 220-V
D-S5 ..... 231-V
E-128 Auto Set, Schematic, Parts List, Alignment 352-VI
F 356-I
H-5 ..... 107-IV
H-5L 218-V
J 471-III
K-S 471-III
L-AC-4 ..... 108-IV
L-AC5 ..... 109-IV
L-117LW—Schematic, Parts List, Socket Voltages 348-VI
L-122LW—Schematic, Parts List, Socket Voltages 348-VI
L-133LW—Schematic, Parts 348-VI
L-135LW—Schematic, Parts List, Socket Voltages 348-VI
L-141LW—Schematic, Parts List, Socket Voltages 348-VI
L-456 ..... 106-IV
L-457 ..... 106-IV
L-458 ..... 108-IV
L-459 ..... 106-IV
L-460 ..... 108-IV
L-556 ..... 109-IV
L-557 ..... 109-IV
L-559 ..... 109-IV
L-755 ..... 233-V
M-AC-7 ..... 110-IV
M-755 ..... 110-IV
S-7 ..... 234-V
S-755 ..... 234-V
T 471-III
T-S 471-III
V-6D 222-V
V-4 ..... 227-V
V-4-LA 235-V
W-6 ..... 236-V
W-6L 225-V
Emerson 315-III
Mickey Mouse 226-V
3LW 218-V
4B 219-V
5A—Schematic, Socket Voltages 329-VI
5J 221-V
6A—Auto Set, Schematic, Socket Voltages 330-VI
6B 223-V
23 ..... 219-V
26 ..... 220-V
28 ..... 221-V
30 ..... 107-IV
30AW 232-V
33AW 232-V
33LW 218-V
34C (Chassis C6 & D6) Schematic 331-VI
34C (Chassis C6 & D6) Parts List, Socket Voltages 332-VI
34F7 (Chassis F7) Schematic, Parts List, Socket Voltages 333-VI
36 (Chassis B5)—Schematic, Socket Voltages 334-VI
38 ..... 222-V
39 ..... 231-V
40 ..... 236-V
41D 220-V
42 ..... 222-V
45 ..... 223-V
49 (Chassis U6)—Schematic, Socket Voltages 335-VI
50L 233-V
50S 234-V
59 ..... 231-V
71 ..... 224-V
101 (Chassis C6 & D6) Schematic 331-VI
101 (Chassis C6 & D6) Parts List, Socket Voltages 332-VI
101F7 (Chassis F7) Schematic Parts List, Socket Voltages 333-VI
101U (Chassis U6E) Schematic, Socket Voltages, Parts List 336-VI
102 (Chassis A8) Schematic 337-VI
102 (Chassis A8)—Parts List, Socket Voltages 332-VI
103 (Chassis F5)—Battery Set, Schematic, Socket Voltages 338-VI
104 (Chassis A8) Schematic 337-VI
104 (Chassis A8)—Parts List, Socket Voltages 332-VI
105 (Chassis A-11) Schematic 339-VI
105 (Chassis A-11)—Alignment, Socket Voltages, Parts List 340-VI
106 (Chassis U6B) Schematic, Socket Voltages 341-VI
107 (Chassis U6A) Schematic, Socket Voltages 342-VI
107 AC (Chassis E5) Schematic, Parts List, Socket Voltage 343-VI
108 (Chassis U5A) Schematic, Parts List 344-VI
109 (Chassis U4A) Schematic, Alignment, Socket Voltage, Parts List 345-VI
110 (Chassis U5A) Schematic, Parts List 344-VI
111 (Chassis U6A) Schematic, Socket Voltages 342-VI
114 (Chassis E5)—Schematic, Parts List, Socket Voltage 343-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

EMERSON RADIO (cont'd)

116 (Chassis G5)—Schematic 346-VI
117 (Chassis C5)—Schematic, Socket Voltages, Parts List 347-VI
117-LW—Schematic, Parts List, Socket Voltage 348-VI
118 (Chassis U4B) Schematic, Parts List 349-VI
119—Schematic, Socket Voltages 350-VI
119 (Chassis U6A, Revised) Alignment 351-VI
250 107-IV
250AW 232-V
250LW 218-V
300 107-IV
321AW 232-V
231LW 218-V
350AW 232-V
350LW 218-V
375 236-V
375LW 225-V
409 226-V
410 226-V
411 226-V
415 235-V
416 235-V
420 227-V
456 232-V
667 228-V
678 Auto-Motorboat 299-V
770 224-V
965 230-V

EVEREADY

(See National Carbon)

F

FADA RADIO & ELECTRIC CORP.

ABC 6-Volt Unit 154-I
C Electric Unit 60 Cycles 154-I
C Special 150-I, 151-I
E—180 Power Unit 149-I
E—420 Power Unit 149-I
J—Electric Unit 25 Cycles 154-I
KA—60 154B-Is
KF 236E-IIs
KG 326-III
KO KOC 236-IIs
KOC-110 DC 237-V
KU 235-IIs
KW 237-IIs
KX AC 60 Cycles 238-V
KY 10 tube, First production 236B-IIs
KY 10 tube, Second production 236C-IIs
NA-141 239-V
NA-142 239-V
NE-151 240-V
NE-152 240-V
R—60 152-I
R—80—A 152-I
RC 11 tube chassis 236D-IIs
RE 7 tube chassis 236A-IIs
RG 241-V
RH 242-V
RK 243-V
RL 111-IV
RN 244-V
RP 245-V
RP—62—UA or CA 153-I
RP—65—UA—or CA 153-I
RS 246-V
RU 247-V
RV 248-V
RW 249-V
RX 251-V
RY 250-V
SF-45/72—UA or CA 150-I
SF-45/75—UA or CA 150-I
SF—50/80—A 152-I
SF—50/80—B 153-I
Fedalette 111-IV
Neutrodyne, 5 Tubes 154-Is
Motoset 101 243-V
Motoset 102 245-V
Motoset 104B 248-V
7 AC 150-I, 151-I
10 60 Cycles 144-I, 299-III, 307-III
10Z 25 Cycles 144-I
11 60 Cycles 144-I
11Z 25 Cycles 144-I
15 307-III, 309-III
16 60 Cycles 144-I, 299-III, 300-III, 301-III, 307-III
16Z 25 Cycles 144-I
17 60 Cycles 144-I
18 DC 145-I
20 60 Cycles 146-I, 300-III, 301-III
20Z 25 Cycles 146-I
22 Battery 145-I
25 60 Cycles 146-I, 309-III
25 with M-250Z 147-I
25Z 25 Cycles 147-I
25 with M-250Z 147-I
32 60 Cycles 144-I, 320-III
30Z 25 Cycles 144-I
31 60 Cycles 144-I
31Z 25 Cycles 144-I
32 60 Cycles 144-I, 320-III
32Z 25 Cycles 144-I
35 60 Cycles 147-I, 304-III, 307-III, 309-III
25Z 25 Cycles 147-I
40 Using P-250 and 7-A 148-I
41 60 Cycles, 154B-Is, 317-III
42 60 Cycles 154B-Is, 313-III, 317-III
43 236E-IIs, 326-III
44 317-III, 320-III
45 331-III
46 60 Cycles 154B-Is, 316-III, 317-III, 320-III
47 60 Cycles, 154B-Is, 317-III
48 331-III
49 238F-II, 331-III
50 AC 148-I, 149-I, 344-III
51 236-IIs
53 236-IIs
55 241-V
57 236-IIs
62—R 154-I
66Q 154-I
70 AC 148-I, 149-I
71 AC 148-I, 149-I
72 AC 148-I, 149-I
73 236A-IIs
74 242-V
75 60 Cycles 150-I
76 242-V
77 60 Cycles 150-I
78 236D-IIs
78-10 249-V
79 236D-IIs
79-10 249-V
83 242-V
85 236A-IIs
86—V 154-I
86—W 154-I
87 242-V
88 242-V
89 242-V
93 251-V
95 251-V
97 242-V
97-10 249-V
98 236A-IIs
103 111-IV
105 244-V
106 244-V
107 244-V
112 246-V
131 AC-DC 247-V
132 AC-DC 247-V
133 249-V
134 249-V
135 249-V
155—Schematic 357-VI
160 154A-Is
160X—Schematic, Parts List 358-VI
160Y—Schematic, Parts List 358-VI
160Z—Schematic, Parts List 358-VI
166—Auto Set, Schematic, Parts List 359-VI
170X—Schematic, Parts List 360-VI
170Z—Schematic, Parts List 360-VI
170Y—Schematic, Parts List 360-VI
171 237-V
173 237-V
192—A Battery 149-I
192 BS Battery 149-I
192—S Battery 149-I
192X—Schematic, Parts List 361-VI
192Y—Schematic, Parts List 361-VI
192Z—Schematic, Parts List 361-VI
262—UA or CA 153-I
265—A Battery 151-I
265—UA or CA 153-I
266—Schematic 362-VI
460—A Battery 152-I
472—UA or CA 150-I
475—A Battery 151-I
475—UA or CA 152-I
480—A 152-I
761 236E-IIs
762 236E-IIs
764 236E-IIs
766 326-III
767 326-III
1450—Schematic 363-VI
1451—Schematic 364-VI
1452—Schematic 365-VI
1453—Schematic 366-VI
1460—Schematic 367-VI
1461—Schematic 368-VI
1462—Schematic 369-VI
1463—Schematic 370-VI
1470—Schematic 371-VI
1471—Schematic 372-VI
1480—Schematic 373-VI
1481—Schematic 374-VI

FAIRBANKS MORSE HOME APPLIANCE, Inc.

(See Audiola Radio Co.)

C6—Schematic 375-VI
C6—Parts List 376-VI
C6—Socket Voltages 377-VI
64—Schematic 375-VI
64—Parts List 376-VI
64—Socket Voltages 377-VI
74—Schematic 377-VI
74—Parts List 376-VI
74—Socket Voltages 377-VI
4015 (Chassis 40) Schematic 378-VI
4015 (Chassis 41) Schematic, Service Data 379-VI
5416 (Chassis 54) Schematic 380-VI
5416 (Chassis 54), Socket Voltages, Service Data 381-VI
5445 (Chassis 54) Schematic 380-VI
5445 (Chassis 54), Socket Voltages, Service Data 381-VI
5619 (Chassis 56), Schematic, Socket Voltages 382-VI
5645 (Chassis 56), Schematic, Socket Voltages 382-VI
6416 (Chassis 64), Schematic, Battery Connections 383-VI
6416 (Chassis 64) Alignment 384-VI
6416 (Chassis 64), Alignment (continued) 385-VI
6445B (Chassis 64) Schematic, Battery Connections 383-VI
6445B (Chassis 64) Alignment 384-VI
6445B (Chassis 64), Alignment (continued) 385-VI
6616 (Chassis 66), Schematic 380-VI
6616 (Chassis 66), Socket Voltages, Service Data 381-VI
6645 (Chassis 66), Schematic 380-VI
6645 (Chassis 66), Socket Voltages, Service Data 381-VI
6717 (Chassis 67), Schematic, Socket Voltages 386-VI
6746 (Chassis 67), Schematic, Socket Voltages 386-VI
7117 (Chassis 71), Schematic 387-VI
7146 (Chassis 71), Schematic 387-VI
10,049 (Chassis 100) Schematic 388-VI
10,050 (Chassis 100) Schematic 388-VI
11,049 (Chassis 110) Schematic 389-VI
11050 (Chassis 110) Schematic 389-VI

FANSTEEL PRODUCTS CO.

A Receiver 108C-Is
A-3 Receiver 352-I
A-5 Receiver 352-I
A-7 Receiver 352-I
AB 6-135 Form A 104A-Is
AB 6-135 Form B 104A-Is
AB 6-180 Form A 26-I
B-135 104B-Is
B-180 Form B 104B-Is
B, Model D Power Unit 104B-Is
BW 101B-Is
BX 104A-Is
B-11 104B-Is
C Receiver 105-I
F Receiver 105-I
KX 104A-Is
Socket Power "A" Supply 23-I

FEDERAL RADIO CORP.

D Ortho Sonic 155-I
D Series Filament 155-I
E Series Filament 158-I
F Series Filament 157-I
H 157-I
K 156-I
L 136B-Is
M 158-I

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

FEDERATED PURCHASER, Inc.

SA-120 ..... 259-V
3A-121 ..... 259-V
SA-122 ..... 259-V
SA-123 ..... 259-V
SA-1200 ..... 256-V
SW-88 ..... 257-V
2 ..... 234-II
5 ..... 254-V
6A 252-V
7A 253-V
8A 253-V
9A 266-V
10 ..... 254-V
12A 252-V
13A 253-V
24A 253-V
26A 253-V
32A 256-V
35 ..... 233-II
36A 256-V
38A 252-V
39A 257-V
40 ..... 233-II
43A 257-V
44A 257-V
53 ..... 258-V
54 ..... 258-V
58 ..... 258-V
59 ..... 255-V
67 ..... 255-V
79 ..... 259-V
80 ..... 259-V
86A 257-V
87A 257-V
92A 264-V
93 ..... 260-V
93A 264-V
94 ..... 260-V
94A 264-V
96 ..... 260-V
97 ..... 260-V
100 ..... 261-V
104 ..... 262-V
107 ..... 233-II
120 Amplifier 258-V
125 ..... 263-V
126 ..... 262-V
424 (Climax) 261-V
460 ..... 264-V
470 ..... 260-V
471 ..... 260-V
472 ..... 260-V
473 ..... 260-V
474 ..... 260-V
708 ..... 265-V
728 ..... 266-V
734 ..... 261-V
745 ..... 266-V
749 ..... 265-V
1000 ..... 253-V

FIRST NATIONAL RADIO CORP.

(See Balkelt)

FORD MOTOR CO.

B-18805 ..... 268-V
Center Control 269-V
Glove Box 267-V
Glove Box (Grigsby-Grunow) 270-V
Glove Box (Zenith) 271-V
Police Auto Radio 272-V
408805-B 267-V

FORDSON RADIO Inc.

Goldentone 280-V
Warwick 281-V

P (330001 & up) 274-V
P-32V (350001 & up) 274-V
P Battery (173501 & up) 274-V
R 2 Types 275-V
U 276-V
V 277-V
V All Wave 278-V
W All Wave 279-V
X 280-V
5 Tube Superhet 281-V
6T 112-IV, 113-IV
6TA 273-V

FRANKLIN RADIO CORP.

D32 ..... 292-V
D33 ..... 293-V
H30 ..... 294-V
H-32 ..... 292-V
33B 282-V
55U 283-V
63L 284-V
65VL 285-V
65VU 286-V
94 ..... 287-V
94 All Wave 288-V
100 ..... 289-V
106 ..... 290-V
200 ..... 291-V

FREED-EISMAN RADIO CORP.

See Also Freed Tel. & Radio Corp.

FE-15 ..... 114-IV
FE-18 ..... 114-IV
FE-96 ..... 473-III
FE-98 ..... 474-III
NR-5 ..... 166A-Is
NR-6 ..... 159-I
NR-7 ..... 159-I
NR-9 ..... 159-I
NR-9A 159-I
NR-10 ..... 160 I
NR-11 ..... 160-I
NR-12 ..... 160-I
NR-20 ..... 161-I
NR-55 ..... 166B-Is
NR-78 ..... 166B-Is
NR-80 AC 166A-Is, 308-III
NR-80 DC 164-I
NR-85 ..... 166-I
NR-95 ..... 165-I
NR-215 ..... 163-I
NR140 ..... 163-I
30 ..... 162-I
30N 162-I
40 ..... 162-I
40N 162-I
48N 162-I
50 ..... 162-I
53 ..... 166-I
90-S 165-I
91 D. C. 472-III
92 A. C. 472-III
130 ..... 163-I
351P—Schematic 390-VI
357P—Schematic 391-VI
369S—Schematic 392-VI
470 ..... 165-I
457 Power Unit 164-I
800 ..... 166-I

FREED TEL. & RADIO CORP.

4 Tube Auto Set 295-V
6 Tube Auto Super 296-V
360 ..... 297-V
360X 297-V
A-7 ..... 298-V
A-9 ..... 298-V

JESSE FRENCH & SONS PIANO CO.

G Junior Model 355-I
H-1 ..... 232-II
H-2 ..... 431-III
U-1 ..... 480-III
5-093 ..... 475-III

CHAS. FRESHMAN CO., Inc.

Earl Models:

Earl DC 308-III
21 ..... 167-I
21 DC 312-III
22 ..... 167-I
24 DC 175-I
31 ..... 167-I
31 DC 175-I
32 ..... 167-I
33S AC 176-I
33 DC 175-I
41 ..... 170-I

Freshman Models:

G 169-I
H-9 ..... 171-I
K 172-I
M 170-I
N 168-I
Q 176A-Is
Q-15 ..... 173-I
Q-16 ..... 173-I, 313-III, 314-III
QD-16S 168-I, 172-I
Equaphase 171-I, 308-III
Masterpiece 171-I, 308-III
2N 173-I, 220-III
3N-12 ..... 176A-Is
3Q-15 ..... 174-I
3Q-16 ..... 174-I
21 AC 174-I
21 DC 175-I
22 ..... 174-I
31 ..... 176-I
31S 176-I
32 ..... 176-I
32S 176-I
41 ..... 176-I
121 ..... 175-I

G

GALVIN MFG. CORP.

Dual 6 ..... 310-V
"Golden Voice" Schematic 393-VI
J8 ..... 311-V
JB 309-V
S10 ..... 312-V
Super 6 ..... 313-V
Twin 8 ..... 314-V
Motorola 482-III
4T-47A 487-III
5T-71 ..... 482-III
5 Tube Split Case Set 299-V
6T-12PL 299-V
6 Tube Set 486-III
7 Tube Set 488-III
7T-38 ..... 300-V
7T-38A 300-V
7T-47A 301-V
34 ..... 302-V
44 ..... 303-V
50—Schematic 394-VI
51 ..... 304-V
55 ..... 304-V
57—Schematic 395-VI
57—Alignment 396-VI
60—Schematic 397-VI
61 ..... 483-III
61 Motorola 264E-IIs
62—Schematic 395-VI
62—Alignment 396-VI
66 ..... 305-V
75—Schematic 395-VI
75—Alignment 396-VI
77 ..... 306-V
77A 307-V
77A Series B 308-V
78 ..... 309-V
79—Schematic 395-VI
79—Alignment 396-VI
80—Schematic 398-VI
88 ..... 484-III
100—Schematic 396-VI
100—Alignment 396-VI
110—Schematic 396-VI
110—Alignment 396-VI

GAROD RADIO CO.

EA 188D-Is
M31—Schematic 400-VI
M31LW—Schematic 400-VI
M-32—Schematic 401-VI
M32LW—Schematic 401-VI
M33—Schematic 401-VI
M33LW—Schematic 400-VI
26—Schematic 399-VI
31—Socket Voltages, Alignment 403-VI
31LW—Alignment, Socket Voltage 403-VI
32—Alignment, Socket Voltage 403-VI
32LW—Alignment, Socket Voltage 403-VI
33—Alignment, Socket Voltages 403-VI
33LW—Alignment, Socket Voltages 403-VI
49—Schematic 399-VI
49M—Schematic, Alignment, Chassis Layout, Socket Voltages 402-VI
60—Schematic 403-VI
66—Schematic 404-VI
104M—Schematic, Alignment, Chassis Layout, Socket Voltages 405-VI
311M—Schematic 406-VI
511A—Schematic, Alignment Socket Voltages, Chassis Layout 407-VI
514M—Schematic 408-VI
514M—Alignment 409-VI
520—Schematic 410-VI
520—Alignment, Socket Voltages, Chassis Layout 411-VI

GENERAL ELECTRIC CO.

A52—Schematic 420-VI
252—Wiring Diagram 421-VI
A53—Schematic 426-VI
A53—Wiring Diagram 427-VI
A53—Alignment 428-VI
A54—Schematic 429-VI
A54—Wiring Diagram 430-VI
A54—Alignment 431-VI
A55—Schematic 420-VI
A55—Wiring Diagram 421-VI
A-[illegible] 341-V

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

GENERAL ELEC. (cont'd)

A63—Schematic 444-VI
A63—Wiring Diagram....445-VI
A63—Alignment, Socket Voltages 446-VI
A64—Schematic 447-VI
A64—Wiring Diagram....448-VI
A64—Alignment, Socket Voltages 449-VI
A64—Alignment (cont'd), Service Data, Socket Voltages, (cont'd)....450-VI
A65—Schematic 444-VI
A65—Wiring Diagram....445-VI
A65—Alignment, Socket Voltages 446-VI
A67—Schematic 447-VI
A67—Wiring Diagram....448-VI
A67—Alignment, Socket Voltages 449-VI
A67—Alignment (cont'd), Service Data, Socket Voltages (cont'd)....450-VI
A70—Schematic 456-VI
A70—Wiring Diagram....457-VI
A70—Service Data, Alignment 458-VI
A70—Socket Voltages, Alignment (cont'd), Service Data (cont'd) 459-VI
A75—Schematic 456-VI
A75—Wiring Diagram....457-VI
A75—Service Data, Alignment 458-VI
A75—Socket Voltages, Alignment (cont'd) Service Data (cont'd) 459-VI
A-81 ....315-V
A82—Schematic 471-VI
A82—Wiring Diagram....472-VI
A82—Service Data, Alignment 473-VI
A82—Alignment (cont'd), Service Data (cont'd) 474-VI
A82—Socket Voltages, Parts List, Wiring Diagram of "Sentry Box" 475-VI
A83—Schematic 476-VI
A83—Wiring Diagram....477-VI
A83—Service Data, Alignment 478-VI
A83—Socket Voltages, Service Data 479-VI
A85—Schematic 476-VI
A85—Wiring Diagram....477-VI
A85—Service Data, Alignment 478-VI
A85—Socket Voltages, Service Data 479-VI
A87—Wiring Diagram....472-VI
A87—Service Data, Alignment 473-VI
A87—Alignment (cont'd), Service Data (cont'd) 474-VI
A87—Socket Voltages, Parts List, Wiring Diagram of "Sentry Box" 475-VI
A88—Schematic 480-VI
A88—Wiring Diagram....481-VI
A88—Wiring Diagram of "Sentry Box" 482-VI
A88—Service Data on Phonograph 483-VI
A88—Assembly Wiring Diagram 484-VI
A88—Service Data, Alignment 485-VI
A88—Alignment (cont'd) 486-VI
A88—Service Notes, Parts List 487-VI
A-90 ....316-V
A125—Schematic 493-VI
A125—Wiring Diagram....494-VI
A125—Wiring Diagram of "Sentry Box" 495-VI
A125—Socket Voltages....496-VI
A208—Schematic 499-VI
B-40 ....115-IV, 116-IV
B-52 ....317-V
B-81 ....318-V
B-86 ....318-V
BX 117-IV
C-30 ....319-V
C-41 ....320-V
C-60 ....321-V
C-61 ....322-V
C-62—Schematic, Socket Voltages 439-VI
C62—Wiring Diagram....440-VI
C-70 ....323-V
D50—Schematic 412-VI
D50—Wiring Diagram, Socket Voltages 413-VI
D51—Schematic 418-VI
D51—Wiring Diagram, Socket Voltages 419-VI
D52—Schematic 418-VI
D52—Wiring Diagram, Socket Voltages 419-VI
D72—Schematic 463-VI
D72—Wiring Diagram....464-VI
D72—Service Data, Alignment 465-VI
D72—Alignment (contd), Socket Voltages, Service Data 466-VI
E-52 Phono Circuit 234-II
E61—Schematic 435-VI
E61—Wiring Diagram....436-VI
E61—Service Data, Alignment, Socket Voltages 437-VI
E61—Alignment (cont'd), Socket Voltages (cont'd), Parts List 438-VI
E62—Schematic 435-VI
E62—Wiring Diagram....436-VI
E62—Service Data, Alignment, Socket Voltages 437-VI
E62—Alignment (cont'd), Socket Voltages (cont'd), Parts List 438-VI
E68—Schematic 435-VI
E68—Wiring Diagram....436-VI
E68—Service Data, Alignment, Socket Voltages 437-VI
E68—Alignment (cont'd), Socket Voltages (cont'd), Parts List 438-VI
E71—Schematic 460-VI
E71—Wiring Diagram....461-VI
E71—Socket Voltages....462-VI
E72—Schematic 460-VI
E72—Wiring Diagram....461-VI
E72—Socket Voltages....462-VI
E76—Schematic 460-VI
E76—Wiring Diagram....461-VI
E76—Socket Voltages....462-VI
E81—Schematic 467-VI
E81—Wiring Diagram....468-VI
E81—Service Data, Alignment, Socket Voltages 469-VI
E81—Alignment (cont'd), Socket Voltages (cont'd) 470-VI
E86—Schematic 467-VI
E86—Wiring Diagram....468-VI
E86—Service Data, Alignment, Socket Voltages 469-VI
E86—Alignment (cont'd) Socket Voltages, (cont'd) 470-VI
E87—Schematic 471-VI
E155—Schematic 497-VI
E155—Alignment, Chassis Layout 498-VI
H-31 ....266A-Is, 266H-Is
H-32 ....242-II
H-51 ....266D-Is, 266H-Is
H-51R 238-II, 239-II
H-71 ....266B-Is, 266G-Is
H-71R 238-II, 239-II
H-72 ....238F-IIs, 238G-IIs
H-91 ....242A to 2421-IIs
H-91R ....242A to 2421-IIs
J-70 ....238C, D, E-IIs
J-72 ....324-V
J-75 ....238C, D, E-IIs
J-80 ....238H-IIs, 2381-IIs
J-82 ....325-V
J-85 ....238H-IIs, 2381-IIs
J-86 ....325-V
J-88 ....325-V
J-100 ....326-V
J-105 ....326-V
J-107 ....326-V
J-109 118-IV, 119-IV, 120-IV
J-125 "Convention" Model 424N-IIs
K-40 ....327-V
K-40-A 121-IV
K-43 ....328-V
K-48 ....329-V
K-50 ....330-V
K-50-P 122-IV
K-51 ....330-V
K-51-P 122-IV
K-55 ....332-V
K-53 ....331-V
K-54-P 123-IV
K-55 ....332-V
K-58 ....333-V
K-60 ....334-V
K-60-P 124-IV
K-62 ....243-II
K-63 ....335-V
K-64 ....336-V
K-65 ....334-V
K-65-P 124-IV
K-66 ....337-V
K-78 ....338-V
K-79 ....339-V
K-80 ....340-V
K-80-X 340-V
K-85 ....340-V
K-105 ....342-V
K-106 ....341-V
K-107 ....343-V
K-126 ....344-V
L-50 ....125-IV
L-51 ....125-IV
L-53 ....345-V
M-40 ....346-V
M-41 ....347-V
M-49 ....348-V
M50—Schematic 414-VI
M50—Wiring Diagram....415-VI
M50—Service Data, Alignment 416-VI
M50—Alignment (cont'd), Socket Voltages 417-VI
M-51 ....349-V
M52—Schematic 422-VI
M52—Wiring Diagram....423-VI
M52—Service Data, Socket Voltages 424-VI
M52—Alignment 425-VI
M55—Schematic 414-VI
M55—Wiring Diagram....415-VI
M55—Service Data, Alignment 416-VI
M55—Alignment (cont'd), Socket Voltages 417-VI
M-56 ....349-V
M-61 ....350-V
M61 (1935 Production) Schematic 451-VI
M61 (1935 Production) Wiring Diagram 452-VI
M61 (1935 Production) Service Data, Alignment 453-VI
M61—Alignment (cont'd), Socket Voltages 454-VI
M61—Alignment (cont'd), Parts List, Socket Voltages (cont'd) 455-VI
M62—Schematic 441-VI
M62—Wiring Diagram....442-VI
M62—Alignment, Socket Voltages 443-VI
M-63 ....351-V
M-65 ....352-V
M66—Schematic 451-VI
M66—Wiring Diagram....452-VI
M66—Service Data, Alignment 453-VI
M66—Alignment (cont'd), Socket Voltages 454-VI
M66—Alignment (cont'd), Parts List, Socket Voltages (cont'd) 455-VI
M-67 ....350-V
M-68 ....353-V
M-81 ....354-V
M-86 ....354-V
M-89 ....355-V
M-106 ....356-V
M106 (1935 Production) Schematic 490-VI
M106 (1935 Production) Wiring Diagram 491-VI
M106 (1935 Production) Socket Voltages 492-VI
M107 (1935 Production) Schematic 490-VI
M107 (1935 Production) Wiring Diagram 491-VI
M107 (1935 Production) Socket Voltages 492-VI
M-125 ....357-V
M-128 ....358-V
M-128R 359-V
M-129 ....360-V
M655—Schematic 441-VI
M655—Wiring Diagram 442-VI
M655—Alignment, Socket Voltages 443-VI
N60—Schematic 432-VI
N60—Alignment 433-VI
N60—Service Notes, Socket Voltages, Parts List....434-VI
S-22 ....266G-Is
S-42 ....266G-Is
S-42-B 236F-IIs
S-132 ....238J-IIs
T-12 ....241-II
T-12D 238B-IIs
T-12E 361-V
T-41 ....240-II

GENERAL HOUSEHOLD UTILITIES CO.

2A 369-V
5A 363-V
5B 364-V
5C 365-V
7A 366-V
8A 367-V
9A 368-V
9B 369-V
30 Apex 370-V
99 ....371-V
99A 371-V
470 (Chassis 4C) Schematic, Chassis Layout, Under Chassis Layout 500-VI
500 ....363-V
501 ....364-V
501 (Chassis 5B) Schematic, Chassis Layout, Under Chassis Layout 501-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

GEN. HOUSEHOLD (cont'd)

502 ..... 365-V
503 ..... 365-V
513 ..... 372-V
520 (Chassis 5B) Schematic, Chassis Layout, Under Chassis Layout 501-VI
530 (Chassis 5B) Schematic, Chassis Layout, Under Chassis Layout 501-VI
550 (Chassis 5B) Schematic, Chassis Layout, Under Chassis Layout 501-VI
580 (Chassis 5G) Schematic 502-VI
581 (Chassis 5G) Schematic 502-VI
620 (Chassis 6HB) Schematic 503-VI
621 (Chassis 6HB) Schematic 503-VI
640 (Chassis 6J) Schematic 504-VI
641 (Chassis 6J) Schematic 504-VI
680 (Chassis 6G) Schematic 505-VI
681 (Chassis 6G) Schematic 505-VI
700 ..... 366-V
701 ..... 366-V
720 (Chassis 7DB) Schematic 506-VI
721 (Chassis 7DB) Schematic 506-VI
760 (Chassis 7C) Schematic 507-VI
760 (Chassis 7C) Chassis Layout, Under Chassis Layout 708-VI
760 (Chassis 7C) Alignment, Coil-Switch Assembly 709-VI
761 (Chassis 7C) Schematic 507-VI
761 (Chassis 7C) Chassis Layout, Under Chassis Layout 508-VI
761 (Chassis 7C) Alignment, Coil-Switch Assembly 509-VI
801 ..... 367-V
871 (Chassis 8E) Schematic 510-VI
871 (Chassis 8E) Chassis Layout Under Chassis Layout 511-VI
871 (Chassis 8E) Alignment, Coil Switch Assembly 512-VI
901 ..... 368-V
902 ..... 368-V
1101 ..... 369-V
1151 (Chassis 11A) Schematic, Socket Voltages 513-VI
1152 (Chassis 11A) Schematic, Socket Voltages 513-VI
1171 (Chassis 11C) Schematic 514-VI
1171 (Chassis 11C), Chassis Layout, Under Chassis Layout 515-VI
1171 (Chassis 11C), Alignment, Coil Swith Assembly 516-VI
1241 (Chassis 12A) Schematic 517-VI
1241 (Chassis 12A), Chassis Layout, Under Chassis Layout 518-VI
1241 (Chassis 12A), Alignment, Coil, Switch Assembly 519-VI

GENERAL MOTORS PRODS. OF CANADA

135 ..... 373-V

GENERAL MOTORS RADIO CORP.

General Motors Models:

A Chassis 184-I
MA Little General 488-III
S-2-A 246-II
S-2-B 246-II
S-10-A 176C-IIs
S-10-B 176C-IIs
120 ..... 374-V
130 ..... 374-V
140 ..... 374-V
211 ..... 176E-IIs
216 ..... 245-II
217 ..... 245-II
219 ..... 245-II
220 ..... 176G-IIs
250 ..... 245-II
251 ..... 246-II
252 ..... 244-II
253 ..... 244-II
254 ..... 244-II
255 ..... 244-II
256 ..... 244-II
257 ..... 244-II
258 ..... 244-II
281 Converter 242J-IIs

Day Fan Models:

See also Day Fan Elec. Co.

Motor Generator Set 181-I
OEM-7 ..... 177-I
OEM-11 ..... 177-I
Power Supply System 182-I
Six 179-I
Seven 179-I
5 AC 181-I
5 Tube, 1925 Model 177-I
6 Tube, DC 181-I
6 Tube, 32 Volts 182-I
6-61 ..... 180-I
6 AC 180-I, 181-I
6B 180-I
6 Junior 180-I, 181-I
7 Tube 179-I
8 AC 183-I
35 ..... 181-I
527 ..... 179-I
5044 ..... 178-I
5055 ..... 358A-Is
5057 ..... 183-I
5080 ..... 183-I

GILFILLAN BROS., Inc.

GN6 ..... 176B-Is
4 Tube T. R. F. Schematic 520-VI
5 Tube All-Wave Super (Later) Schematic 521-VI
5 Tube Superhet, 1934-35 ..... 375-V
6 Tube, All Wave Superhet, 1934-35 ..... 376-V
6 Tube All Wave Super (Later) Schematic 522-VI
7 Tube All Wave Super, Schematic 523-VI
7-A—Schematic 520-VI
8 Tube, All Wave Superhet, 1934-35 ..... 377-V
32 ..... 378-V
35 ..... 378-V
41 ..... 378-V
42A—Schematic 524-VI
43A—Schematic 524-VI
52A—Schematic 525-VI
54A—Schematic 525-VI
60 ..... 185-I
60 Car Radio, Schematic 526-VI
60A Car Radio, Schematic 526-VI
63B—Schematic 525-VI
63X—Schematic 525-VI
76A—Schematic 525-VI
77A—Schematic 525-VI
78B—Schematic 527-VI
78X—Schematic 527-VI
96B—Schematic 527-VI
96X—Schematic 527-VI
97B—Schematic 527-VI
97X—Schematic 527-VI
100 ..... 185-I
105 ..... 176B-Is
106 ..... 176B-Is
116X—Schematic, Alignment 528-VI
117X—Schematic, Alignment 528-VI
510—Schematic, Socket Voltages 520-VI

GRAYBAR ELECTRIC CO.

Graybarette 4 ..... 126-IV
H-34 ..... See RCA 80
8 ..... 247-II, 266G-Is
10-69, 10-88, 10-99, See RCA R74, R76, R77
100 ..... See RCA R50, R55
700 ..... 266A-Is, 266H-Is
770 ..... 266D-Is, 266A-Is
900 ..... 266B-Is, 266H-Is

GRAY & DANIELSON MFG. (Remler)

R-14 ..... 220F-Is
Infradyne, 1927 ..... 220F-Is
Infradyne, 1928 ..... 220F-Is

A. H. GREBE & CO.

AH-1 ..... 188B-Is, 188C-Is
CR-6 ..... 186-I
CR-13 ..... 186-I
CR-18 ..... 186-I
MU-1 ..... 187-I
RORN Amplifier 186-I
SK-4 ..... 188-I, 188A-Is
Synchrophase 7AC 188-I, 189-I
Battery Set, 1923 ..... 187-I
671B Power Unit 188B-Is

GRIGSBY-GRUNOW CO.

Old Power Units 25-I
Noise Eliminators 192A-Is
49 ..... 379-V
50 ..... 192B-Is, 314-III
51 ..... 192B-Is
52 ..... 192B-Is, 333-III
55 ..... 258A-IIs
56 ..... 258A-IIs
57 ..... 258A-IIs
58 ..... 258A-IIs
7P3 Power Unit 194-I, 341-III
7P6 Power Unit 194-I, 341-III
7BP3 Power Unit 190-I, 341-III
7BP6 Power Unit 190-I, 341-III
8P3 Power Unit 195-I
8P6 Power Unit 195-I
9P3 Power Unit 399-III
9P6 Power Unit 339-III
10 S. W. Converter 258A-IIs
11 ..... 182H-IIs
15 ..... 250-II
15B 250-II
20 ..... 248-II, 318-III, 329-III, 345-III, 346-III
21 ..... 333-III
22 ..... 248-II, 318-III, 329-III, 345-III, 346-III
23 ..... 248-II, 318-III, 329-III, 345-III, 346-III
25 ..... 256-II
25B 258B-IIs, 258D-IIs
30 ..... 249-II, 251-II
31 ..... 249-II, 251-II
35 ..... 258C-IIs, 258D-IIs
44 ..... 379-V
59 ..... 386-V
60 ..... 252-IIs, 190-I, 323-III, 333-III
61 ..... 252-II, 190-I
62 ..... 252-II, 190-I
66 ..... 380-V
67 ..... 385-V
68 ..... 385-V
69 ..... 385-V
70 ..... 190-I, 333-III, 344-III
70B 191-I
71 ..... 299-III, 344-III
72 ..... 191-I, 294-III, 299-III, 340-III, 344-III
75 ..... 386-V
80 ..... 190-I
85 ..... 387-V
86 ..... 387-V
90 ..... 191-I, 192A-Is, 307-III, 312-III, 324-III, 333-III
90B 254-II, 192-I
91 ..... 299-III
92 ..... 299-III, 340-III
93 ..... 299-III
95 ..... 381-V
100 ..... 192-I
100B 193-I, 312-III
101 ..... 192-I
102 ..... 193-I, 312-III
103 ..... 193-I, 312-III
105 ..... 381-V
110 Auto Radio, 255-II, 256-II
111 Auto Radio 382-V
114 Auto Radio 382-V
116 Auto Radio 127-IV, 128-IV, 129-IV
116A Auto Radio 130-IV
118 Car Radio, Schematic 529-VI
120 ..... 257-II, 490-III
120B 490-III
130 ..... 196-I
130A 196-I
131 ..... 319-III
132 ..... 319-III, 324-III
150 ..... 250-II
151 ..... 250-II
153 ..... 250-II
154 ..... 250-II
155 ..... 250-II
156 ..... 250-II
160 ..... 253-II
163 ..... 253-II
180 ..... 193-I
181 ..... 193-I
194 ..... 379-V
195 ..... 386-V
196 ..... 385-V
200 ..... 258E-IIs, 182I-IIs
201 ..... 258-IIs, 182I-IIs
203 ..... 258-IIs, 182I-IIs
204 ..... 258-IIs, 182I-IIs
210 ..... 258F-IIs
211 ..... 258F-IIs
214 ..... 258F-IIs
215 ..... 258F-IIs
220 Chassis ..... 250A to 250H-IIs
221 Chassis ..... 250A to 250H-IIs
223 Chassis ..... 250A to 250H-IIs
230A 196-I
233 ..... 196-I
251 ..... 256-II
253 ..... 256-II
254 ..... 256-II
251B 258B-IIs, 258D-IIs

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

GRIGSBY-GRUNOW (cont'd)

253B 258B-IIs, 258D-IIs
254B 258B-IIs, 258D-IIs
290 ..... 489-III, 4LL-IIs
291 Madison 489-III, 4LL-IIs
293 Adams 489-III, 4LL-IIs
294 Monroe 489-III, 4LL-IIs
300 ..... 131-IV, 132-IV, 133-IV
303 ..... 131-IV, 132-IV, 133-IV
304 ..... 131-IV, 132-IV, 133-IV
307 ..... 131-IV, 132-IV, 133-IV
310A 134-IV, 136-IV
310B 135-IV, 136-IV
320 ..... 137-IV
324 ..... 137-IV
330 ..... 138-IV, 193-IV, 140-IV
331 ..... 138-IV, 193-IV, 140-IV
336 ..... 138-IV, 193-IV, 140-IV
340 ..... 141-IV, 142-IV, 143-IV, 144-IV
340B 141-IV, 142-IV, 143-IV, 144-IV
351 ..... 258C-IIs
353 ..... 258C-IIs
360 ..... 145-IV, 146-IV, 147-IV
366 ..... 145-IV, 146-IV, 147-IV
370 ..... 148-IV
371 ..... 148-IV
373 ..... 148-IV
380 ..... 384-V
381 ..... 384-V
390 ..... 150-IV, 151-IV, 152-IV
393 ..... 150-IV, 151-IV, 152-IV
400 ..... 153-IV, 154-IV, 155-IV
400A 156-IV
411 ..... 153-IV, 154-IV, 155-IV
413 ..... 153-IV
440 ..... 379-V
460 ..... 385-V
461 ..... 485-V
463 ..... 385-V
490 ..... 383-V
491 ..... 383-V
493 ..... 383-V
500 ..... 386-V
520 Chassis 381-V
560 ..... 386-V
566 ..... 386-V
570 Automatic, Schematic 530-VI
599 ..... 386-V
600—Schematic 531-VI
608—Schematic 531-VI
666 ..... 385-V
776 ..... 385-V
800 ..... 387-V
886 ..... 385-V
996 ..... 385-V
998 ..... 387-V

GULBRANSEN CO.
See also Wells-Gardner

Champion Junior 196G-Is
V6Z2 Auto Set 391-V
05A Series 388-V
052A 389-V
06W 390-V
5 Tube DC 258Q-IIs, 258P-IIs
8 Tube Model 196H-Is
8 Tube Chassis 258Q-IIs, 258R-IIs
9-in Line 197-I
13 258G-IIs, 258H-IIs, 2581-IIs
20 258J-IIs, 258K-IIs, 258L-IIs
60 ..... 258-II
63 ..... 258-II
80A 258M-IIs, 258N-IIs, 258P-IIs
724 ..... 196H-Is

HALLICRAFTERS, Inc.

S8A "Communications Set" Schematic 533-VI
S9 "Super SKYRIDER" Schematic 534-VI
5PA "Sky-BUDDY" Schematic 532-VI

HALSON RADIO MFG. COMPANY

Long & Broadcast 495-III
NS40 ..... 392-V
NS50 ..... 399-V
NS60 ..... 399-V
Roadmaster 400-V
20B 392-V
410 ..... 393-V
515 ..... 491-III
515 SW 492-III
516 D. C. 493-III
520 ..... 394-V
530 ..... 395-V
610 ..... 396-V
615 ..... 494-III
620 ..... 397-V
630 ..... 398-V

HAMMARLUND MFG. CO.

Comet 258S-IIs, 264A-IIs 264B-IIs, 264C-IIs, 264-IIs
Comet Pro 496-III
Comet Pro AVC 401-V
Comet Pro Battery 402-V
Comet Pro Crystal 403-V
Comet Pro Standard 404-V
Hi-Q 5 Tube Battery, 356C-Is
Hi-Q 6 Tube Battery, 356C-Is
Hi-Q 6 Power Unit 356C-Is
Hi-Q 30 AC 51-I
Hi-Q 30 Battery 356D-Is
Hi-Q 31 AC 356-I
"Super-Pro"—Schematic, (1st Half) 536-VI
"Super-Pro"—Schematic, (2nd Half) 537-VI
"Super-Pro"—Alignment 535-VI
"Super-Pro"—Alignment (cont'd), Chassis Layout 538-VI
"Super-Pro"—Parts List 539-VI
"Super-Pro"—Parts List (concluded), Socket Voltages, Trimmers, Battery Connections 540-VI
Z-4 Commander 356D-Is

HATRY & YOUNG, Inc.

Short Wave 6 ..... 188D-Is

HETRO ELECTRIC INDUSTRIES, Inc.

Series M1935 Air-Ace, Schematic, Socket Voltages, Chassis Layout 554-VI
Series M1936 Air-Ace, Schematic, Chassis Layout, Socket Voltages 555-VI
Series V—5 tube AC Superhet, Schematic, Chassis Layout 556-VI
Series 6B5 Air-Ace Schematic, Alignment, Chassis Layout 551-VI
5 Tube A.C.-D.C. (175-550 Meters)—Schematic 547-VI
5 Tube A.C.-D.C. (200-2000 Meters)—Schematic 548-VI
6 Tube AC-DC—Schematic, Socket Voltages, Chassis Layout, Alignment 549-VI
6 Tube AC Superhet Schematic, Socket Voltages, Alignment, Chassis Layout 550-VI
6LB-1935—Schematic, Chassis Layout 552-VI
6LB-1936—Schematic, Chassis Layout 553-VI
6SB-1935—Schematic, Chassis Layout 552-VI
6SB-1936—Schematic, Chassis Layout 553-VI
239—Schematic 557-VI
295—Schematic 558-VI
297—Schematic 559-VI

HICKOCK ELECTRICAL INSTRUMENT CO.

SG-4700 ..... 440-II
4949 Ohm-Capacity-Volt meter 441-II

HIGH FREQUENCY LAB.

Mastertone, 1929 ..... 356B-Is
Mastertone, 1931 ..... 356A-Is
Nine-in-Line, Battery 356B-Is
225 ..... 498-III
226 ..... 497-III
227 ..... 499-III
238 ..... 498-III
242 ..... 497-III
280 ..... 499-III

HI-LO RADIO CO.

4 Tube AC-DC 405-V
34TDDA 405-V

CHAS. HOODWIN CO. (Aero)

Aero Pentode Auto B 500-III
Aero World Wide Series Radio 501-III
Aerodyne AC7 ..... 196N-Is
International All-Wave 196K-Is
Low Power Trans., 1931 196L-Is
Metropolitan AC Four 196K-Is
One Tube Transmitter, 267-II
Pentode Power Amplifier 502-III
Pentode Power Amplifier model B 502-III
Pentode Transmitter 503-III
Short Wave Adapters 196M-Is
Short Wave Converters 196L-Is
Trio AC Three 196N-Is
Two Tube Transmitter 268-II
Two Tube 15 watt Trans. 196K-Is
World Wide One Tube 267-II
4 Tube Midget 406-V
4T Series A 506-III
5 Tube Midget 406-V
5T-1933 Series A 504-III
6-33 A. V. C. 505-III
6 Tube Battery Superhet as of April 1st 407-V
6 Tube AC Superhet 407-V
6 Tube, 32 Volt Superhet 408-V
11 Tube International, prior April 1, 1933 ..... 409-V
11 Tube International, after April 1, 1933 ..... 410-V
110 Volt D. C. 504-III
1929-1930 Auto Radio 196L-Is
1931 Auto Radio 196O-Is
1931 Midget 196O-Is
1932 Converter 503-III

HERBERT H. HORN RADIO MFG. CO.

5A—Schematic 546-VI
7MT—Schematic 541-VI
9MT—Schematic 542-VI
9MTC—Schematic 542-VI
15 ..... 358D-Is
16MT—Schematic 543-VI
49 ..... 265-II
57—Schematic 544-VI
58 ..... 411-V
59 ..... 265-II, 458-II
66MT—Schematic 545-VI
69 ..... 548-II
70 ..... 412-V
71 ..... 412-V
79 ..... 549-II
99 ..... 549-II
101 ..... 413-V
101B 414-V
102 ..... 414-V
109 ..... 549-II
110 ..... 413-V
535—Schematic 546-VI
536—Schematic 546-VI

HOWARD RADIO CO.

A-12—Schematic 566-VI
AA-25—Schematic 566-VI
AP 157-IV
AVH 261-II
B-13—Schematic 567-VI
CC-23—Schematic 567-VI
CC-24—Schematic 567-VI
D-8—Schematic 564-VI
D8 (Series A)—Schematic 565-VI
F (Series A)—Schematic 560-VI
"Grand" (Series 2) Schematic (Tuner) 561-VI
"Grand"—Schematic (Amplifier), Schematic (Power Unit) 562-VI
HA2—Schematic 569-VI
HA4—Schematic 569-VI
H 260-II
K 158-IV, 159-IV
L 160-IV, 161-IV
M 162-IV
O 261-II
Q 417-V
SG-A 196A-Is
SG-B Midget 196S-Is, 259-II
SG-T 258U-IIs
SG-6 ..... 196D-Is
W (Explorer) 418-V
W—Explorer (2nd Revise) Schematic 563-VI
X2 ..... 419-V
X3 ..... 419-V
X6 ..... 419-V
X8 ..... 419-V
Y3 ..... 419-V
Z 420-V
Highwayman 421-V
8 Green Diamond 196-Is
19 Tube All Wave De Luxe 415-V
45 ..... 258T-IIs
47A—Schematic 568-VI
50 Series 1, Schematic 568-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

HOWARD RADIO (cont'd)

50SW (Series 2), Schematic 568-VI
52—Schematic 569-VI
52-57 416-V
57A—Schematic 570-VI
57 AUS—Schematic 570-VI
E57 (Series 1), Schematic, Alignment 571-VI
58—Schematic 572-VI
60 Combination 263-II
60 (Series 1), Schematic 570-VI
60 SW (Series 1) Schematic 571-VI
67—Schematic 575-VI
77C—Schematic 573-VI
77T—Schematic 573-VI
99C—Schematic 574-VI
99T—Schematic 574-VI
135 264-II
502—Schematic 569-VI
626—Schematic 575-VI
1626—Schematic 575-VI

HUDSON ROSS, Inc.

38 See Bakeit Model 38
48 See Bakeit Model 48
59 See Bakeit Model 59

I

IMPERIAL FURNITURE CO.

3SB5 422-V

INSULINE CORP. OF AMERICA

AC-108-250 V. 423-V
Americus AC-DC 424-V
Atlantic AC-DC 425-V
Auxiliary Tube Tester 426-V
Broadcast & Long Wave Combination AC 269-II
Broadcast & Long Wave Combination DC 270-II
DC-220 V. & 110 V. 427-V
Gnome AC-DC 428-V
Insulette BC & LW 272-II
Latinic AC-DC 429-V
Mascot 272-II
Midget, 110 V. AC 271-II
Midget, 110 V. DC 270-II
Midget, 220 V. DC 271-II
Short Wave Set AC 340-I
Una-Radio Nine 340-V
62-JW—Schematic 576-VI
63-AW—Schematic 576-VI
95C—Schematic 577-VI
95D—Schematic 577-VI
810—Schematitc 578-VI
850—Schematic 578-VI
1100-SW—Schematic 579-VI
1150-LW—Schematic 579-VI

INTERNATIONAL RADIO CORP.

20—Schematic 580-VI
25—Schematic 580-VI
26—Schematic, Alignment, Socket Voltages 581-VI
40 Jewel, Schematic 585-VI
52—Schematic, Alignment, Socket Voltages 582-VI
53—First Production, Schematic 583-VI
53—Later Production, Schematic 583-VI
53—Alignment Data, Socket Voltages 584-VI
56—Schematic 580-VI
60—Schematic 585-VI
61—Schematic, Alignment, Socket Voltages 586-VI
65—Schematic 587-VI
66—Schematic, Socket Voltages 588-VI
70—Schematic 588-VI
72—Schematic, Alignment 589-VI
77—Schematic, Alignment, Socket Voltages 590-VI
80—Schematic 591-VI
85—Schematic, Alignment, Socket Voltages 592-VI
90—Schematic, Alignment, Socket Voltages 593-VI
105—Schematic 594-VI
105—Alignment, Socket Voltages, Trimmers 595-VI
120—Schematic 596-VI
120—Alignment, Socket Voltages, Trimmers 597-VI
400 Series, Schematic, Alignment, Battery Connections 598-VI
553—First Production, Schematic 583-VI
553—Later Production, Schematic 583-VI
533—Alignment Data, Socket Voltages 584-VI
666—Schematic, Socket Voltages 588-VI
777—Schematic, Alignment, Socket Voltages 590-VI
778—Schematic, Alignment, Socket Voltages 590-VI
779—Schematic, Alignment, Socket Voltages 590-VI
1050—Schematic 594-VI
1050—Alignment, Socket Voltages, Trimmers 595-VI
1200—Schematic 596-VI
1200—Alignment, Socket Voltages, Trimmers 597-VI
2200—Schematic 596-VI
2200—Alignment, Socket Voltages, Trimmers 597-VI

J

JACKSON-BELL, Ltd.

5 507-III
5A 507-III
8 287B-IIs
25 508-III
26 509-III
27 510-III
28 511-III
29 513-III
33 515-III
50 278C-IIs
59 516-III
60 274-II
62 354-I, 517-III
63 517-III
64 517-III
68 278D-IIs
69 DC 278E-IIs, F-IIs
79 278G-IIs
84 Peter Pan 275-II
86 518-III
87 276-II
88 277-II
89 278H-IIs
89A 278-II
96 519-III
99 520-III
645M 2781-IIs
845 520-III
845S 278J-IIs
8S 278A-IIs

JACKSON RADIO & TELEVISION CO.

See also Steinite Radio Co.

J104 449-V
J105 449-V
LK447 449-V
SF547 449-V
401A 449-V
504B 449-V

JENKINS & ADAIR, Inc.

A Amplifying Panel 196F-Is
"AM" Amplifying Panel 450-V
C-6 Transmitter 521-III
C-12 Condenser Transmitter 273-II
D Amplifying Panel, 196F-Is
D-6 521-III
GL-35 273-II
S-259 451-V
Level Indicator Panel 196E-Is
Portable Type Remote Amplifier 453-V
Type 3 Elp. Portable Film Record Amplifier 452-V
Type A Crystal Panel 454-V
Type P. R. Amplifier 455-V
3-B Mixing Panel 196E-Is

JEWELL ELECTRICAL INSTRUMENT CORP.

See also Weston Electrical Inst. Corp.

WD209 Tube Checker 442-II
214 Tube Checker 522-III
444 Tester 441-II
533 Tube Checker 523-III
534 Tube Checker 524-III
538 Tube Checker 522-III
560 Oscillator 442-II

K

KARADIO CORPORATION

55—Schematic 599-VI
57-B—Sheriff, Schematic 600-VI
65—Schematic 601-VI
66—Schematic 601-VI
88—Schematic 602-VI
160—Schematic 599-VI

KELLER-FULLER MFG. CO., Ltd.

14F Radiette 355-I
20 279-II
30 525-III
40 525-III
50 328B-Is
60 328B-Is
70 280-II
80 281-II

KELLOGG SWITCHBOARD & SUPPLY CO.

B Chassis 199-I
Wave Master 201-I
6 Tube Battery 198-I
7 Tube AC 198-I
7 Tube RFL 201-I
523 200-I
524 Power Unit 199-I
525 Power Unit 199-I
526 200-I
527 Power Unit 199-I
528 Power Unit 199-I
533 200A-Is
534 200A-Is
535 200A-Is
536 200A-Is

KING MFG. CORP.

E 207-I
F 208-I
FF 220E-Is
G 211-I
H 209-I
J 210-I
Monarch 210-I
Power Packs 211-I
10 KI 206-I
25 206-I
30 206-I
61 206-I
62 206-I
71 206-I
80 207-I
81 207-I
82 208-I
97 210-I
98 210-I
218 287-II

KINGSTON RADIO CO., Inc.

55—Schematic 603-VI
500 457-V
600A 458-V
600B 458-V
610A 458-V
700A 459-V
700B 459-V
Gypsy 460-V

COLIN B. KENNEDY CORPORATION

6 203-I
7 Comet DC 204-I
10 205-I
20 204-I, 205-I
23 DC 282-II
24 258V-IIs, W-IIs
26 283-II
30 204B-Is
32 204B-Is
34 SW 284-II
36 DC 282-II
38 DC 282-II
40 DC 282-II
42 285-II
50 282-II
52 285-II
53 SW 526-III
54 286-II
54A SW 527-III
55 527-III
56 258X-IIs
60 286-II
62 331-II, 528-III
62A 530-III
63 530-III
64 531-III

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

COLIN B KENNEDY (cont'd)

64B 531-III
66 ..... 532-III
66A 532-III
66B 532-III
80 ..... 204B-Is
110 ..... 202-I
220 ..... 202-I
281 ..... 202-I
430 ..... 403-I
431 ..... 203-I
435 ..... 204-I
521 ..... 204-I
525 ..... 204-I
526 ..... 319-III
632 ..... 325-III
826B 204A-Is

KOLSTER RADIO, Inc.

B-10 ..... 217-I
B-15 ..... 290A-IIs, 217-I
B-16 ..... 290A-IIs, 217-I
K-20 ..... 218-I, 218A-Is, 299-III, 307-III, 310-III, 312-III
K-21 ..... 218-I, 299-III
K-22 ..... 218-I, 218A-Is
K-23 ..... 218-I
K-24 ..... 218-I
K-25 ..... 218-I, 218A-Is
K-27 ..... 218-I, 218A-Is
K-28 ..... 218-I
K-30 ..... 218B-Is
K-32 ..... 218B-Is
K-37 ..... 218A-Is
K-42 ..... 218B-Is
K-43 ..... 215-I, 315-III, 319-III
K-44 ..... 215-I
K-45 ..... 216-I
K-60 ..... 288-II
K-62 ..... 288-II
K-63 ..... 533-III
K-65 ..... 310-III
K-70 ..... 289-II
K-72 ..... 289-II
K-73 ..... 533-III
K-80 ..... 290-II
K-82 ..... 290-II
K-83 ..... 534-III
K-90 ..... 291-II
K-92 ..... 291-II
K-93 ..... 534-III
K-103 ..... 533-III
K-110 ..... 461-V
K-112 ..... 461-V
K-113 ..... 462-V
K-120 ..... 461-V
K-122 ..... 461-V
K-123 ..... 462-V
K-130 ..... 463-V
K-132 ..... 463-V
K-140 ..... 264F-IIs
K-142 ..... 264F-IIs
K-165, International 464-V
K-175, International 465-V
6 Battery 213-I
6H 214-I
6K 212-I, 340-III
7A 214-I
7B 214-II
7 AC 213-I
8 A, B, C 214-I
930 Columbia 212-I

L

LANG RADIO COMPANY

BA-5 AC 293-II
BD-6 AC 292-II
DC-6 ..... 163-IV
F-9 DC 293-II
J-7 DC 292-II
M-7 AC 292-II
R-8 DC 293-II
UG-5H 466-V
502UA 466-V

C. R. LEUTZ, Inc.

Seven Seas Console 338-I
Universal Trans-Oceanic 338-I

LINCOLN RADIO CORP.

DC-8 ..... 358C-Is
R9 ..... 467-V
SW-33 ..... 468-V
10 De Luxe 538-III
31 ..... 357-I
32 S. W. 538-III

LONG RADIO CO.

70 Cardinal 108D-Is

M

MASTER RADIO MFG. CO., Ltd.

424 Master Model 355-I

McMILLAN RADIO CO.

8 AC 219-I
900 ..... 219-I

MIDWEST RADIO CORP.

Battery 6, Model 486-V
Battery 7, 2V. Model 487-V
Battery 8, 2V. Model 488-V
Pentode 9 (1931-32) 489-V
"Royale"—Schematic 604-VI
Ultra 5 ..... 552-II
Ultra 6 ..... 554-II
Ultra 7 ..... 544-II
Ultra 8 Battery 558-II
Unitune 5 ..... 552-II
Unitune 8 ..... 556-II
Z4 (S. W. Converter) 485-V
AC6 ..... 476-V
AC6 (Midget) 477-V
6 DC 469-V
6-34 ..... 470-V
7 Tube All-Wave 1936 Schematic 605-VI
7-36—Schematic 606-VI
7-37—Schematic, Parts List 616-VI
8AC 478-V
8-33AC 479-V
9AC 550-II, 562-II
9AC (171 Type) 480-V
9AC (1 SG 226 Type) 481-V
9AC (1 SG 227 Type) 480-V
9AC (4 SG 1930-31) 482-V
9-34 ..... 471-V
10-A—Schematic 607-VI
10-35—Schematic 608-VI
10-37—Schematic 609-VI
10 AC 483-V
11 AC 560-II
11-36—Schematic 610-VI
12 AC 484-V
14-37—Schematic 611-VI
16 ..... 472-V
16-32 ..... 473-V
16-33 ..... 473-V
16-34 ..... 474-V
16-35—Schematic 612-VI
18 Tube Set "Imperial" Schematic 613-VI
18-36—Schematic 614-VI
35 S. W.—Schematic 615-VI
746-M 475-V
747-M 475-V

MILLS NOVELTY CO.

Phonograph Wiring 218C-Is, 218D-Is

MISSION BELL RADIO CO., Inc.

6A 490-V
10 ..... 491-V
10A 492-V
11 ..... 493-V
14 ..... 494-V
19 ..... 495-V
19A 495-V
25A 496-V
40 ..... 497-V

MONTGOMERY WARD & CO.

See also Wells-Gardner

AE-10 ..... 547-III
AE-11 ..... 536-V
AE-51 ..... 536-V
AE-52 ..... 536-V
AE-53 ..... 536-V
AE-54 ..... 536-V
Balboa 218M-Is
Cavalier 300CC-IIs
Challanger ..... 300Z, AA, BB-IIs
Challanger, Jr. 300R-IIs
Collegian 300X-IIs
Commander 300CC-IIs
Caronet 300CC-IIs
Dictator 300Y-IIs
Fantasy 298-II
Granada ..... 300Z, AA, BB-IIs
Minstrel 298-II
Princess 300R-IIs
Seranader 300Y-IIs
Solo 298-II
Soverign 300-II
Troubador 300S-IIs, 300T-IIs
062 ..... 501-V
11 ..... 539-III
12 ..... 539-III
13 ..... 498-V
15 ..... 498-V
16 ..... 498-V
16X 498-V
17 ..... 541-III
18 ..... 498-V
18X 498-V
20 ..... 296-II
22 ..... 499-V
26P 297-II
26PX 297-II
26W 300R-IIs
26-360 ..... 297-II
26-367 ..... 297-II
27W 300X-IIs
27 WX 300X-IIs
49 ..... 535-V
51 ..... 500-V
62 ..... 501-V
62-010 ..... 500-V
62-020 ..... 500-V
62-030 ..... 300S-II, 300T-IIs
62-040 ..... 300-II
62-050 ..... 300Z, AA, BB-IIs
62-055 ..... 535-V
62-060 ..... 300R-IIs
62-070 ..... 300R-IIs
62-078 ..... 503-V
62-080 ..... 499-V
62-090 ..... 499-V
62-2 ..... 542-III
62-7 ..... 544-III
62-8 ..... 544-III
62-9 ..... 544-III
62-11 ..... 300C, D, E, F-IIs
62-12 ..... 300C, D, E, F-IIs
62-13 ..... 300A, 300B-IIs
62-14 ..... 300C, D, E, F-IIs
62-15 ..... 300A, 300B-IIs
62-16 ..... 300A 300B-IIs
62-17 ..... 300A, 300B-IIs
62-18 ..... 300A, 300B-IIs
62-18X 300A, 300B-IIs
62-19 ..... 300C, D, E, F-IIs
62-20 ..... 300L, M, N-IIs
62-20X ..... 300L, M, N-IIs
62-21 ..... 300G, H, I-IIs
62-22 ..... 300G, H, I-IIs
62-22X ..... 300G, H, I-IIs
62-23 ..... 300J, 300K-IIs
62-24 ..... 296-II
62-25 ..... 300L, M, N-IIs
62-26 ..... 300U, V, W-IIs
62-27 ..... 300C, D, E, F-IIs
62-29 ..... 539-III
62-30 ..... 300G, H, I-IIs
62-30X ..... 300G, H, I-IIs
62-34 ..... 545-III
62-35 ..... 539-III
62-36 ..... 545-III
62-36X 545-III
62-38 ..... 546-III
62-38X 546-III
62-40 ..... 300C, D, E, F-IIs
62-41 ..... 502-V
62-42 ..... 300G, H, I-IIs
62-42X ..... 300G, H, I-IIs
62-43 ..... 300G, H, I-IIs
62-43 ..... 503-V
62-43X 503-V
62-44 ..... 546-III
62-44X 546-III
62-45 ..... 507-V
62-46 ..... 300U, V, W-IIs
62-47 ..... 507-V
62-48 ..... 300G, H, I-IIs
62-48X ..... 300G, H, I-IIs
62-49 ..... 504-V
62-50 ..... 546-III
62-50X 546-III
62-51 ..... 506-V
62-52 ..... 300-O, P, Q-IIs
62-53 ..... 505-V
62-57 ..... 503-V
62-59 ..... 539-III
62-61 ..... 539-III
62-64 ..... 506-V
62-64-X 506-V
62-67 ..... 509-V
62-68 ..... 504-V
62-68X 504-V
62-69 ..... 517-V
62-70 ..... 507-V
62-70X 507V
62-71 ..... 505-V
62-72 ..... 507-X
62-72-X 507-V
62-74 ..... 505-V
62-74-X 505-V
62-75 ..... 502-V
62-76 ..... 508-V
62-79 ..... 517-V
62-80 ..... 509-V
62-81 ..... 510-V
62-82 ..... 511-V
62-83 ..... 512-V
62-84 ..... 517-V

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MONTGO'RY WARD (cont'd)

62-84-X 517-V
62-86 ..... 513-V
62-86X 513-V
62-88 ..... 504-V
62-89 ..... 514-V
62-90 ..... 507-V
62-91 ..... 515-V
62-92 ..... 503-V
62-93 ..... 516-V
62-94 ..... 517-V
62-94-X 517-V
62-96 ..... 518-V
62-97 ..... 519-V
62-97X 519-V
62-98 ..... 520-V
62-99 ..... 519-V
62-99X 519-V
62-100 ..... 499-V
62-101 ..... 521-V
62-101X 521-V
62-103 ..... 522-V
62-104 ..... 523-V
62-105 ..... 522-V
62-106 ..... 524-V
62-107 ..... 524-V
62-114—Schematic, Chassis Layout, Socket Voltages 617-VI
62-116—Schematic, Chassis Layout, Socket Voltages 617-VI
62-118 ..... 525-V
62-120—Schematic, Chassis Layout, Socket Voltages, Service Notes 618-VI
62-121 ..... 524-V,
62-122—Schematic, Chassis Layout, Socket Voltages, Service Notes 618-VI
62-126—Schematic, Chassis Layout, Socket Voltages, Service Notes 618-VI
62-128—Schematic, Chassis Layout, Socket Voltages, Service Notes 618-VI
62-132 ..... 526-V
62-134 ..... 527-V
62-134X 527-V
62-135—Schematic, Chassis Layout, Service Notes 619-VI
62-135X—Schematic, Chassis Layout, Service Notes 619-VI
62-136—Schematic, Socket Voltages, Service Data 620-VI
62-137 ..... 526-V
62-138—Schematic, Socket Voltages, Service Data 620-VI
62-139 ..... 527-V
62-139X 527-V
62-140 ..... 528-V
62-140X 528-V
62-147—Series A-B-C—Schematic 621-VI
62-147X—Series A-B-C Schematic 621-VI
62-148 ..... 528-V
62-148X 528-V
62-150—Schematic, Chassis Layout, Service Notes 619-VI
62-150X—Schematic, Chassis Layout, Service Notes 619-VI
62-154—Schematic, Chassis Layout, Service Notes 619-VI
62-154X—Schematic, Chassis Layout, Service Notes 619-VI
62-156—Series A-B-C, Schematic 621-VI
62-156X—Series A-B-C, Schematic 621-VI
62-164—Series A-B-C, Schematic 621-VI
62-164X—Series A-B-C, Schematic 621-VI
62-166—Schematic 622-VI
62-169—Schematic, Service Data 623-VI
62-171—Schematic, Service Data 623-VI
62-173—Schematic 624-VI
62-175—Schematic 624-VI
62-176—Schematic 624-VI
62-177—Schematic 624-VI
62-181 ..... 300-II
62-188—Schematic 624-VI
62-193—Schematic 624-VI
62-178—Schematic 625-VI
62-179—Schematic 626-VI
62-181—Schematic 625-VI
62-185—Schematic 627-VI
62-185—Chassis Layout, Socket Voltages, Service Data 628-VI
62-187—Schematic 627-VI
62-187—Chassis Layout, Socket Voltages, Service Data 628-VI
62-189—Schematic 625-VI
62-190—Schematic 627-VI
62-190—Chassis Layout, Socket Voltages, Service Data 628-VI
62-192—Schematic 629-VI
62-194—Schematic 626-VI
62-195—Schematic 629-VI
62-196—Schematic 627-VI
62-196—Chassis Layout, Socket Voltages, Service Data 628-VI
62-197—Schematic 630-VI
62-197—Schematic 631-VI
62-197—Socket Voltages, Service Data, Trimmers 632-VI
62-198—Schematic, Service Data 633-VI
62-199—Schematic, Socket Voltages, Service Data 634-VI
62-202—Schematic 635-VI
62-203—Schematic 636-VI
62-205—Schematic 636-VI
62-206—Schematic 626-VI
62-207—Schematic 637-VI
62-208—Schematic 636-VI
62-209—Schematic 637-VI
62-211—Schematic 625-VI
62-212—Schematic 636-VI
62-215—Schematic 638-VI
62-216—Schematic 626-VI
62-217—Schematic 636-VI
62-218—Schematic 626-VI
62-219—Schematic 636-VI
62-221—Schematic 637-VI
62-225—Schematic, Service Data 639-VI
62-229—Schematic 640-VI
62-232 300S-IIs, 300T-IIs
62-242—Schematic 641-VI
62-360 ..... 529-V
62-367 ..... 529-V
62-520 ..... 296-II
62-1040 ..... 299-II
62-1838 300-V, W-IIs
62-3145 300CC-IIs
62-3235 300S-IIs, 300T-IIs
62-3295 300Y-IIs
62-3335 300-II
77 ..... 530-V
87 ..... 531-V
95 ..... 530-V
102 ..... 532-V
123 ..... 533-V
131 ..... 533-V
133 ..... 533-V
142 ..... 533-V
144 ..... 533-V
181 ..... 300-II
187 ..... 300-II
500 ..... 300Y-IIs
626 ..... 297-III
726 ..... 297-III
811 ..... 298-II
811X 298-II
839 ..... 534-V
921 ..... 534-V
923 ..... 534-V
924 ..... 534-V
1111 ..... 298-II
1111X 298-II
1238 ..... 300U, V, W-IIs
1238X ..... 300U, V, W-IIs
1355 ..... 298-II
1355X 298-II
1500 ..... 300X-IIs
1522-1562 ..... 218M-Is
1838 ..... 300U, V, W-IIs
1922 ..... 535-V
1955 ..... 298-II
2655 ..... 547-III
2822 ..... 218M-Is
2827 ..... 218M-Is
2895 ..... 218M-Is
2897 ..... 218M-Is
2955 ..... 218N-Is
2855X 218N-Is
2957 ..... 218N-Is
2957X 218N-Is
3035 ..... 218N-Is
3037 ..... 318N-Is
3065 ..... 218N-Is
3067 ..... 218N-Is
10,000 ..... 300Y-IIs
11,000 ..... 300Z, AA, BB-IIs
14,000 ..... 300CC-IIs
15,000 ..... 300X-IIs
62,000 ..... 300CC-IIs

MOTOMETER GAUGE & EQUIPMENT CORP.

10A Motovox 164-IV
10E Motovox 164-IV

N

NATIONAL CARBON CO. Inc.

Eveready 315-II
Eveready Tube Tables 630-III, 631-III
1 ..... 220-I
2 ..... 220-I
3 ..... 220-I
20 ..... 220E-Is
21 ..... 220E-Is
30 ..... 221-I
30C 221-I
40 ..... 221-I
50 Series 537-V
1929 ..... 340-III

NATIONAL CO., Inc.

AC SW-3 538-V
AC SW-58 539-V
AGS 540-V
AGSX 541-V
DC SW-3 538-V
DC SW-34 539-V
FBX 542-V
FBXA 542-V
MB-29 ..... 220B-Is
MB-30 ..... 220B-Is
SW-3 ..... 220A-Is
SW-4 ..... 220A-Is
SW-5 ..... 220C-Is
Auto Receiver 220C-Is
Browning Drake 4 Tube Bat. 301-II
Browning Drake 5 Tube Bat. 301-II
One Tube Reflex 301-II
Television Receiver 220C-Is

NATIONAL TRANSFORMER CO.

Midget Six 358E-Is
Screen Grid 8 ..... 358F-Is

NOBLITT-SPARKS INDUSTRIES, Inc.

7—Car Radio—Schematic, Socket Voltages, Service Data 642-VI
7—Car Radio—Chassis Layout, Under Chassis Layout 643-VI
10A 543-V
15 ..... 544-V
16—Car Radio—Schematic, Parts List 644-VI
16—Car Radio—Socket Voltages, Service Data 645-VI
17—Car Radio—Schematic Socket Voltages, Service Data 646-VI
17—Car Radio—Chassis Layout, Under Chassis Layout 647-VI
18—Car Radio—Schematic, Socket Voltages, Service Data 648-VI
20A 545-V
20B 546-V
25 ..... 547-V
27—Car Radio—Schematic, Socket Voltages, Service Data 649-VI
27—Car Radio—Under Chassis Layout, Chassis Layout 650-VI
28—Car Radio—Schematic, Socket Voltages, Service Data 651-VI
28—Car Radio—Chassis Layout, Under Chassis Layout 652-VI
30A 548-V
33—Car Radio—Schematic, Socket Voltages, Service Data 653-VI
35 (Above Serial E31577H) 549-V
37—Car Radio—Schematic, Socket Voltages, Service Data 654-VI
37—Car Radio—Chassis Layout, Under Chassis Layout 655-VI
41—Schematic, Socket Voltages, Alignment 656-VI
45 (Above Serial E403561) 550-V
51—Schematic, Socket Voltages, Alignment 657-VI
51—Chassis Layout, Under Chassis Layout 658-VI
51B—Socket Voltages, Schematic, Service Data 659-VI

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NOBLITT-SPARKS (cont'd)

61—Schematic, Socket Voltages,Service Data 660-VI
61—Under Chassis Layout, Chassis Layout 661-VI
61B—Schematic, Socket Voltages, Service Data 662-VI
61B—Chassis Layout, Under Chassis Layout 663-VI
61M—Schematic, Socket Voltages, Service Data 664-VI
61M—Chassis Layout, Under Chassis Layout 665-VI
62—Schematic, Socket Voltages, Service Data 660-VI
62—Chassis Layout, Under Chassis Layout 661-VI
62B—Schematic, Socket Voltages, Service Data 662-VI
62B—Chassis Layout, Under Chassis Layout 663-VI
62M—Schematic, Socket Voltages, Service Data 664-VI
62M—Chassis Layout, Under Chassis Layout 665-VI
81—Schematic, Socket Voltages, Service Data 666-VI
81—Chassis Layout, Under Chassis Layout 667-VI
81M—Schematic, Socket Voltages, Service Data 668-VI
81M—Chassis Layout, Under Chassis Layout 669-VI

O

OZARKA, Inc.

S-5 358G-1s
S-7 358G-1s
S. W. Converter 567-III
V-16 567-III
5A Viking 358G-1s
78 358I-1s
89 358H-Is, 343-III
90 358H-1s
91 290B-IIs
91 AC 302-II, 358I-1s
92 AC 561-III
93A 562-III
93B 565-III
93 Battery 566-III
94 A. V. C. 566-III
95WDI 302-II

P

PACENT ELECTRIC CO., Inc.

Booth connections, film reproducer 303-II, 304-II
C-62 Power Supply 555-V
C-66 Power Supply 555-V
C-1005 Amplifier 556-V
C-1100 Jr. Amplifier 560-V
Disc and film reproducer 305-II
Disc and Film Control Box 557-V
Disc Film & Fader 558-V
Disc and P.E.C. Lamp and Projector with Booster 559-V
Fader for use with Disc and Film 552-V
Fader for use with Disc only 552-V
New Type Rectifier 554-V
Old Type Rectifier 554-V
PEC Booster 551-V
PEC Booster Heater Supply 560-V
PEC & Exciter Lamp Circuit 555-V
Speaker & MDA Service 558-V
2MDA-F Control Circuit 551-V
2MDA-F Harness 553-V
2MD4-F AC Service Harness 552-V
4MDA-F Amplifier 555-V
4MDA-F Harness 553-V
4 Speaker & MDA Service 554-V
10-2 Power Supply 555-V
20 Power Supply 555-V
63 P. E. C. Amplifier-Push Pull 556-V
65 Amplifier 559-V
70 Amplifier 560-V
1010 Power Supply 557-V
1015 Amplifier 551-V
1015 Power Supply 551-V
1020 S. P. U. 559-V
1063 P. E. C. Amplifier Push Pull 556-V
1070 Amplifier 558-V

PACKARD BELL

35—Schematic 670-VI
48—Schematic 671-VI
65—Auto Set— Schematic 670-VI

PACKARD MOTOR CAR CO.

See Philco Radio

PATTERSON RADIO CO.

PR-10 565-V
PR-16—Schematic, Socket Voltages 672-VI
PR-16—Alignment 673-VI
PR-16—Alignment (cont'd) 674-VI
50 AW 563-V
60 Series 561-V
60 AW 561-V
64 AW 561-V
70 AW 562-V
74 AW 562-V
75-AW—Schematic, Alignment 675-VI
75-AW-A—Schematic 676-VI
80 Series 653-V
80 AW 563-V
84 AW 563-V
85-AW—Schematic 677-VI
85-AW-A— Schematic 676-VI
86-AW—Schematic, Socket Voltages, Alignment 678-VI
104 AW 564-V
105-AW—Schematic 679-VI
106-AW—Schematic, Socket Voltages 680-VI
107 AW 562-V
126-AW—Schematic, Socket Voltages 680-VI
175-AW—Schematic, Alignment 675-VI
175-AW-A—Schematic 676-VI
185-AW—Schematic 677-VI
185-AW-A—Schematic 676-VI
186-AW—Schematic, Socket Voltages, Alignment 678-VI
207 AW 562-V
210 AW 562-V
275-AW—Schematic, Alignment 675-VI
275-AW-A—Schematic 676-VI
285-AW—Schematic 677-VI
285-AW-A—Schematic 676-VI
286-AW—Schematic, Socket Voltages, Alignment 678-VI
375-AW—Schematic, Alignment 675-VI
375-AW-A—Schematic 676-VI
385-AW—Schematic 677-VI
385-AW-A—Schematic 676-VI
386-AW—Schematic, Socket Voltages, Alignment 678-VI
510 AW 564-V
1105-AW—Schematic 679-VI
1106-AW—Schematic, Socket Voltages 680-VI
1126-AW—Schematic, Socket Voltages 680-VI
2105-AW—Schematic 679-VI
2106-AW—Schematic, Socket Voltages 680-VI
2126-AW—Schematic, Socket Voltages 680-VI
3105-AW—Schematic 679-VI
3106-AW—Schematic, Socket Voltages 680-VI
3126-AW—Schematic, Socket Voltages 680-VI
9507 AW 562-V

PFANSTIEHL PRODUCTS CO.

34 230F-1s
50 230F-1s

PHILCO RADIO & TELEVISION CORP.

Baby Grand 310-III, 317-III
Combination 315-III
Neutrodyne Plus 344-III
3 566-V
4 S.W. Converter 310A-IIs
5 230F-1s
7 569-III, 168-IV
14 187-IV
14X 187-IV
14LZX 187-IV
15 310I-IIs, 310J-IIs, 310K-IIs
16 170-IV, 171-IV, 172-IV, 173-IV
16 Code 125 & 126 567-V
16 (Codes 125, 126, 127), Schematic 685-VI
19—Schematic 686-VI
17 568-V
18 569-V
18 Code 24 570-V
19LZ 183-IV
19LZX 183-IV
20 226B-1s
20A 226B-1s
21 226B-1s
22L 570-III, 187-IV, 188-IV
23X 570-III
28 571-V
29 572-V
30 309-II
32 573-V
34 574-V
34A 574-V
35 310-II
36 310-II
37 174-IV
37-60—Schematic 687-VI
37-60—Alignment, Trimmers 688-VI
37-61—Schematic 689-VI
37-61—Alignment, Trimmers 690-VI
37-89—Schematic, Parts List 691-VI
37-600—Schematic, Chassis Layout 692-VI
37-602—Schematic, Parts List 693-VI
37-604—Schematic 694-VI
37-610—Schematic 695-VI
37-610—Alignment, Trimmers 696-VI
37-620—Schematic 697-VI
37-620—Alignment, Trimmers 698-VI
37-640—Schematic 699-VI
37-640—Alignment, Trimmers 700-VI
38 (code 123) Battery Set, Schematic 686-VI
38 575-V
38A 575-V
39—Battery Set—Schematic, Socket Voltages 701-VI
40 222-I
41 DC 222-I
42 DC 222-I
43 175-IV, 176-IV, 177-IV, 178-IV
43-121 175-IV, 176-IV, 177-IV, 178-IV
44 576-V
45 577-V
46 226G-1s
46E 226G-1s
47 571-III
48 179-IV, 180-IV 181-IV, 182-IV, 183-IV
49 578-V
50 306-II
50A 306-II
51 310B-IIs, 310C-IIs
51A 310B-IIs, 310C-IIs
52 310B-IIs, 310C-IIs
53 184-IV, 185-IV
54 579-V
57 580-V
59 581-V
60 582-V
65 223-I, 226B-Is, 308-III
66 583-V
70 326A-IIs 326C-IIs, 226K-Is, 332-IIs
70A 326A-IIs 326B-IIs, 226K-IIs
70 (With A. V. C.), Schematic, Socket Voltages, Parts List 702-VI
70A (With A. V. C.), Schematic, Socket Voltages, Parts List 702-VI
71 573-III, 187-IV, 188-IV
76 221-I, 318-III, 345-III
76A 223-I, 318-III, 345-III
77 224-I, 317-III, 345-III
77A 224-I
80 308D-IIs, 308E-IIs, 308F-IIs, 188-IV, 189-IV
81 190-IV, 191-IV
82 224-I
84 584-V
86 224-I
87 225-I, 295-III, 305-III, 308-III

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

PHILCO RADIO (cont'd)

89—Schematic 686-VI
89 (Code 123), Schematic, Socket Voltages 703-VI
90 ..... 326C-IIs, 326D-IIs, 226L-Is, 333-III
90A 226L-Is
91 ..... 310L-IIs 310M-IIs, 310N-IIs, 187-IV
91A 187-IV
91X 310L-IIs, 310M-IIs, 310N-IIs, 187-IV
95 ..... 226C-Is, 227-I, 345-III
95E 226C-Is
96 ..... 226-I, 226C-Is, 318-III, 345-III
96A 226-I, 226C-Is
96E 226C-Is
96X 226-I, 226C-Is, 318-III, 345-III
97—Schematic, Socket Voltages 704-VI
111 ..... 226D-Is, 226H-Is, 318-III, 333-III, 445-III
111A 226D-Is, 226H-Is
112 ..... 226I-Is, 332-III
112A 226I-Is
112X 331-III
116-B (Code 121), Schematic 705-VI
116-X (Code 122), Schematic 706-VI
118 ..... 585-V
128 ..... 585-V
144 ..... 586-V
201—Schematic, Parts List 707-VI
211 ..... 226F-Is
211A 226F-Is
212 ..... 226J-Is
212A 226J-Is
220 ..... 226E-Is
220A 226E-Is
270 ..... 226J-Is
270A 226J-Is
296 ..... 226-I, 226C-Is
296A 226-I, 226C-Is
296E 226C-Is
470 ..... 310D-IIs, 310E-IIs
470A 310D-IIs, 310E-IIs
490 ..... 310F-IIs, 310G-IIs
500 ..... 587-V
501 ..... 588-V
503 ..... 589-V
504 ..... 590-V
505 ..... 591-V
506 ..... 592-V
507 ..... 593-V
511 ..... 227-I
512 ..... 227-I
513 ..... 227-I
514 ..... 227-I
515 ..... 227-I
521 ..... 227-I
531 ..... 227-I
551 ..... 227-I
571 ..... 227-I
600—Schematic, Parts List, Under Chassis Layout, Socket Voltages 708-VI
602—Schematic, Parts List, Under Chassis Layout, Socket Voltages 709-VI
610 (Early Production), Schematic, Socket Voltages 710-VI
610 (Later Production), Schematic 711-VI
611—Schematic, Socket Voltages 712-VI
620 (Early Production), Schematic, Socket Voltages 713-VI
620 (Later Production), Schematic, Socket Voltages 714-VI
623—Battery Set, Schematic, Socket Voltages 715-VI
624 (Battery Set), Schematic, Socket Voltages 716-VI
625—Schematic, Socket Voltages 717-VI
630 (Early Production), Schematic 718-VI
630 (Later Production), Schematic 719-VI
635—Schematic, Socket Voltages 720-VI
640—Schematic 721-VI
641—Schematic, Socket Voltages 722-VI
642 (32-Volt Set), Schematic, Socket Voltages 723-VI
643—Battery Set, Schematic, Socket Voltages 724-VI
645—Schematic, Socket Voltages 725-VI
650—Schematic 726-VI
651—Schematic, Socket Voltages 727-VI
655—Schematic, Socket Voltages 728-VI
660—Schematic, Socket Voltages 729-VI
665—Schematic, Socket Voltages 730-VI
680—Schematic 731-VI
680—Alignment, Chassis Layout 732-VI

AUTOMOBILE MODELS

(Transitone)

802—Schematic, Parts List, Under Chassis Layout 734-VI
805—Schematic, Parts List, Under Chassis Layout 735-VI
806—Schematic, Parts List, Under Chassis Layout 736-VI
808—Schematic, Alignment, Chassis Layout 737-VI
809—Schematic, Chassis Layout Alignment, Parts List 738-VI
816—Schematic, Alignment, Under Chassis Layout 739-VI
817—Schematic, Parts List, Under Chassis Layout 740-VI
818—Schematic, Parts List, Under Chassis Layout 741-VI
818K—Schematic, Parts List, Under Chassis Layout 742-VI
819—Schematic, Parts List, Under Chassis Layout 743-VI
819H—Schematic, Parts List, Under Chassis Layout 743-VI

Power Units:

AB-423 ..... 226A-Is
AB-463 ..... 226A-Is
AB-623 ..... 266A-Is
AB-663 ..... 266A-Is
B-253 ..... 266A-Is
B-603 ..... 266A-Is
DAB 226A-Is
DB 226A-Is
180 Volt "B" 226A-Is
Battery Life Chart 308 76-O-Is
By-Pass Condenser Data 326E-IIs
Chassis Data 326F-IIs
Oscillator Calibration 326G-IIs
Resistor Data 76-O-IIs
3 ..... 307-III
5 ..... 165-IV, 166-IV, 167-IV
6 ..... 168-IV
6F 168-IV
8 ..... 169-IV
9 ..... 169-IV
10 ..... 594-V
11 ..... 595-V
12 ..... 169-IV
700 ..... 596-V
800 ..... 597-V
AC 206 (Studebaker de Luxe) 598-V
AC 206 Code 122 ..... 599-V
AC 236 ..... 607-V
AC 989 (Nash) 598-V
B-6 ..... 168-IV
DP Code 121 & 122 ..... 601-V
EG 167-IV
G 602-V
G Code 122 ..... 603-V
NR-109 ..... 75-I
PA (Packard) 606-V
TR-105 ..... 75-I
Chrystler, 6 Code CA & CB 602-V
Chrysler, Code CU & CV 602-V
DeSota, Code SE 603-V
Dodge, Code DR & DS 602-V
Hupmobile G 603-V
Hupmobile H 604-V
Hupmobile R 607-V
Nash, 110 Series 607-V
Nash, 1189 AC 607-V
Nash, 1200 Series 607-V
Nash, 1289 ..... 607-V
Nash, AC 989 ..... 593-V
Nash, AC 989 Code 122 ..... 600-V
Packard de Luxe PA 605-V
Packard, Standard PB 606-V
Pierce Arrow 598-V
Plymouth, Code PE & PF 602-V
Studebaker de Luxe 598-V
Studebaker de Luxe, Code 122 ..... 599-V
Studebaker, Jr. (236) 607-V
Philco Speaker Data 608, 609, 610, 611-V

PIERCE AIRO, Inc.

BAC 633-V
BAG 634-V
BAH 635-V
BAH-9 ..... 636-V
BLG 637-V
CAB 313-II
KAD 639-V
KAF 640-V
AC LW-15-6 ..... 632-V
14-45 ..... 311-II
24-45 ..... 352-I
40 ..... 612-V
41 ..... 613-V
50 ..... 614-V
51 ..... 615-V
52 ..... 616-V
53 ..... 617-V
54 ..... 618-V
55 ..... 619-V
56 ..... 620-V
58 ..... 621-V
60 ..... 622-V
61 ..... 623-V
61B 623-V
245AC 628-V
273DC 313-II
403—Schematic 744-VI
404—Schematic 744-VI
447M 313-II
500A 624-V
506R—Schematic 744-VI
515—Schematic 745-VI
517—Schematic 746-VI
518—Schematic 747-VI
520—Schematic 747-VI
524 ..... 355-I
532-3—DC 638-V
534-5 ..... 312-II
535-6—AC 629-V
547 ..... 314-II
547A 314-II
553-4 ..... 625-V
605—Schematic 748-VI
609—Schematic 748-VI
610—Schematic, Parts List, Alignment 749-VI
610LW—Schematic, Parts List, Alignment 749-VI
611—Schematic, Chassis Layout 750-VI
611W—Schematic, Chassis Layout 750-VI
612—Schematic 746-VI
612LW—Schematic 746-VI
615—Schematic 746-VI
615LW—Schematic 746-VI
616—Schematic 745-VI
616—Schematic 751-VI
617—Schematic 751-VI
618—Schematic, Alignment 752-VI
619—Schematic 752-VI
624AC 630-V
632DC 358C-Is
637-8 ..... 319-II
640 ..... 626-V
646-7 ..... 315-II
646-7AC-MEX 631-V
724 ..... 316-II
724-1 ..... 627-V
727DC 317-II
734-5 ..... 318-II
746-7 ..... 320-II
804—Schematic, Socket Voltages 753-VI
804—Alignment 754-VI
805—Schematic, Socket Voltages 753-VI
805—Alignment 754-VI

PILOT RADIO CORP.

X-63—Schematic, Parts List, Chassis Layout 759-VI
X-63—Alignment, Socket Voltages 760-VI
X-65—Schematic, Parts List, Chassis Layout 759-VI
X-65—Alignment, Socket Voltages 760-VI
X-68—Schematic, Parts List, 762-VI
X-69—Schematic, Parts List, 762-VI
X-73—Schematic, Chassis Layout 764-VI
X-73—Parts List, Socket Voltage 765-VI
X-75—Schematic, Chassis Layout 764-VI
X-75—Parts List, Socket Voltage 765-VI
X114—Schematic, Socket Voltages, Parts List 773-VI
X-114—Alignment, Chassis Layout 744-VI
X-115—Schematic, Socket Voltage, Parts List 773-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

PILOT RADIO (cont'd)

X-115—Alignment, Chassis Layout 774-VI
7 ..... 641-V
8 ..... 641-V
41—Schematic, Parts List, Under Chassis Layout 755-VI
43—Schematic, Alignment, Socket Voltages 756-VI
53 ..... 642-V
55 ..... 642-V
63—Schematic, Socket Voltages 757-VI
63—Alignment, Chassis Layout 758-VI
65—Schematic, Socket Voltages 757-VI
65—Alignment, Chassis Layout 758-VI
68—Schematic, Socket Voltages, Chassis Layout 761-VI
69—Schematic, Socket Voltages, Chassis Layout 761-VI
73—Schematic, Socket Voltages, Chassis Layout, Parts List 763-VI
75—Schematic, Socket Voltages, Chassis Layout, Parts List 763-VI
81 ..... 641-V
84 ..... 641-V
92—Schematic 766-VI
93—Schematic 766-VI
103—Schematic, Socket Voltages, Parts List 767-VI
103—Alignment, Chassis Layout 768-VI
105—Alignment, Chassis Layout 768-VI
108—Schematic, Parts List, Socket Voltages 769-VI
108—Alignment, Chassis Layout 770-VI
109—Schematic, Parts List, Socket Voltage 769-VI
109—Alignment, Chassis Layout 770-VI
114—Schematic, Socket Voltages, Parts List 771-VI
114—Alignment, Chassis Layout 772-VI
115—Schematic, Socket Voltages, Parts List 771-VI
115—Alignment, Chassis Layout 772-VI
123—Schematic, Socket Voltages, Chassis Layout 775-VI
153—Schematic, Chassis Layout 776-VI
155—Schematic, Chassis Layout 776-VI
183—Schematic, Socket Voltages, Chassis Layout 777-VI
185—Schematic, Socket Voltages, Chassis Layout 777-VI
203—Schematic, Parts List, Chassis Layout, Socket Voltages 778-VI
205—Schematic, Parts List, Chassis Layout, Socket Voltage 778-VI
213—Schematic, Parts List, Chassis Layout 779-VI
213—Alignment, Socket Voltages 780-VI
215—Parts List, Schematic, Chassis Layout 779-VI
215—Alignment, Socket Voltages 780-VI
253—Schematic, Chassis Layout 781-VI
253—Parts List, Socket Voltages 782-VI
255—Schematic, Chassis Layout 781-VI
255—Parts List, Socket Voltages 782-VI
364—Schematic, Parts List 783-VI
364—Alignment, Socket Voltages, Chassis Layout 784-VI
365—Schematic, Parts List 783-VI
365—Alignment, Socket Voltage, Chassis Layout 784-VI

PILOT RADIO & TUBE CORP.

C-151 ..... 230B-Is
C-153 ..... 230A-Is
C-154 ..... 230A-Is
C-157 ..... 230D-Is
C-157A 230D-Is
C-157B 230D-Is
C-158 ..... 230D-Is
C-162 ..... 230B-Is
K-106 ..... 230-I
K-108 ..... 230-I
K-II Super Wasp 228-I
K-113 ..... 228-I
K-115 AC Super Wasp 73-I
K-139 ..... 230E-Is
PE-6 ..... 228-I
S-141 Universal 230E-Is
S-155 ..... 230D-Is
S-155A 230D-Is
S-155B 230D-Is
S-156 ..... 230D-Is
S-164 ..... 230B-Is
SG-8 ..... 229-I
SG-105 ..... 230-I
V-191 Converter 580-III
W-145 P.A. Amplifier 230C-Is
A. C. Dragon 575-III
Automobile Receiver 229-I
Grimes DC New Yorker 229-I
Pilotone 6 ..... 228-I
Pre-Selector 358J-Is
SW Converter 321-II, 230C-Is
5 Tube TRF Midget 321-II
5 Tube BC & Long Wave Midget 320E-Is
6 Tube Midget 354-I
7 Tube D. C. 580-III
7 Tube Super, 110v. DC 323-II
7 Tube Super, 220v. DC 322-II
10 AC 644-V
11 Dragon DC 194-IV
11-A DC 194-IV
11-R DC 194-IV
35 ..... 195-IV
39 ..... 195-IV
41 ..... 196-IV

PRIESS RADIO CO.

Nine-in-Line 375-I

R

RADIOBAR CO. OF AMERICA

106 ..... 645-V
210 ..... 648-V
210B 649-V
210C 649-V
506 ..... 645-V
508 (1934) 647-V
508 (1935) 646-V
510 (1934) 648-V
510 (1935) 648-V
526 ..... 645-V
528 (1934) 649-V
528 (1935) 646-V

RADIO CHASSIS, Inc.

Auto Set 650-V

RADIO PRODUCTS CO.

L Tube Checker 433-II
880 ..... 443-II

RADIO RECEPTOR, Inc.

AR-3 ..... 363-II
C Announcer 352-II
CAM-3 ..... 352-II
H-1 ..... 358-II
MM3-PMX3 ..... 361-II
P-50-W 359-II
PMA-1 ..... 357-II
PMA-1 AX-1 Panel 359-II
PMA-1 AX-2 Panel 358-II
PM-2 ..... 354-II
PSA-2 ..... 362-II
PWA-1 ..... 356-II
PX-245 ..... 360-II
PXP-245, 355-II, 356-II, 361-II
PXP-250A 355-II
PXY-1 ..... 652-V
PYP-245 ..... 357-II, 362-II
PYP-245R 354-II
PYP-250 ..... 364-II
R-25-28 ..... 651-V
R-80-81 ..... 353-II
RS-81 ..... 364-II
RXP-171 ..... 360 II
70 ..... 653-V
150 ..... 654-V

RADIO TECHNIC LABORATORY

Television Receiver 445D-IIs

RADIO TRADING CO.

53 Twinplex 655-V
308 ..... 656-V
2115 ..... 655-V
2140 ..... 657-V
2143 ..... 658-V
2174 ..... 659-V
2177 ..... 660-V
S-307 ..... 661-V

RCA-PHOTOPHONE, Inc.

PG-5 ..... 343-II, 345-II
PG-6 ..... 348-II, 351-II
PG-7 ..... 349-II
PG-10 ..... 350-II
PG-13 ..... 347-II
4-PA50A1 ..... 344-II
4-PK1A2 ..... 341-II

RCA-VICTOR, Inc.

A4-4229 ..... 701-V
ACR-136—Schematic, Assembly Wiring Diagram 922-VI
ACR-136—Wiring Diagram 923-VI
ACR-136—Socket Voltages, Trimmers 924-VI
AP-736 ..... 238-I
AP-777C 335-I
AP-810 ..... 249-I
AP-935 ..... 256-I
AP-937 ..... 246-I
AP-947 ..... 241-I
AP-951 ..... 236-I, 256-I
AP-951A 236-I
AP-952 ..... 236-I, 241-I
AP-974A 236-I
AP-997 ..... 236-I, 241-I
AP-997A 236-I
AP-997C 328-I
AR-812 ..... 249-I
AR-1145 ..... 332-II
AR-5006 ..... 702-V
AUR-1 ..... 675-V
BC-6-4—Schematic, Chassis Layout 796-VI
BC-6-4—Socket Voltages, Battery Connection 798-VI
BC-6-6—Schematic 799-VI
BC-6-6—Wiring Diagram 800-VI
BC-6-6—Socket Voltages, Power Unit Details 801-VI
BC-6-6—Alignment 802-VI
BT-6-3—Schematic, Chassis Layout 796-VI
BT-6-3—Wiring Diagram 797-VI
BT-6-3—Socket Voltages, Battery Connection 798-VI
BT-6-5—Schematic 799-VI
BT-6-5—Wiring Diagram 800-VI
BT-6-5—Socket Voltages, Power Unit Details 801-VI
BT-6-5—Alignment 802-VI
BT-6-10—Schematic, Chassis Layout 796-VI
BT-6-10—Wiring Diagram 797-VI
BT-6-10—Socket Voltages, Battery Connection 798-VI
BT-7-8—Schematic, Service Data 815-VI
BT-7-8—Chassis Layout, Socket Voltages, Battery Connections 816-VI
BT-7-9—Schematic, Service Data 815-VI
BT-7-9—Chassis Layout, Socket Voltages, Battery Connections 816-VI
C-6-2—Schematic, Service Data 807-VI
C-6-2—Wiring Diagram 808-VI
C-6-2—Socket Voltages 809-VI
C-6-8—Schematic, Service Data 810-VI
C-6-12—Schematic, Service Data 813-VI
C-6-12—Wiring Diagram, Socket Voltages, Chassis Layout 814-VI
C-7-6—Schematic, Service Data 822-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

RCA-VICTOR (cont'd)

C-7-6—Wiring Diagram, Chassis Layout 823-VI
C-7-6—Socket Voltages, Alignment 824-VI
C-8-15—Schematic, Chassis Layout 833-VI
C-8-15—Wiring Diagram, Alignment 834-VI
C-8-15—Alignment (cont'd), Socket Voltages 835-VI
C-8-17—Schematic, Chassis Layout 836-VI
C-8-17—Wiring Diagram 837-VI
C-8-19—Schematic 838-VI
C-8-19—Wiring Diagram 839-VI
C-8-20—Schematic 838-VI
C-8-20—Wiring Diagram 839-VI
C-9-4—Schematic, Chassis Layout 841-VI
C-9-4—Wiring Diagram 842-VI
C-9-4—Alignment 843-VI
C-9-4—Alignment (cont'd), Socket Voltages 844-VI
C-9-6—Schematic, Chassis Layout 845-VI
C-9-6—Wiring Diagram 846-VI
C-11-1—Schematic 866-VI
C-11-1—Wiring Diagram 867-VI
C-11-1—Alignment, Socket Voltages 868-VI
C-13-2—Schematic 880-VI
C-13-2—Wiring Diagram 881-VI
C-13-2—Socket Voltages 882-VI
C-15-3—Schematic, Chassis Layout 883-VI
C-15-3—Wiring Diagram, Service Data 884-VI
C-15-3—Socket Voltages 885-VI
CE-29 ..... 592-III
D-7-7—Schematic, Service Data 817-VI
D-7-7—Chassis Layout, Socket Voltages 818-VI
D-7-7—Assembly Wiring Diagram 819-VI
D-7-7—Motor Board Adjustments 820-VI
D-7-7—Alignment 821-VI
D-8-28—Schematic, Service Data 830-VI
D-8-28—Assembly Wiring Diagram 831-VI
D-8-28—Phono-Motor Details. Socket Voltages 832-VI
D-9-19—Schematic 853-VI
D-9-19—Chassis Layout, Wiring Diagram 854-VI
D-9-19—Pickup Details, Assembly Wiring Diagram 855-VI
D-9-19—Phono-Motor Details, Socket Voltages 856-VI
D-11-2—Schematic 869-VI
D-11-2—Wiring Diagram 870-VI
D-11-2—Chassis Layout, Socket Voltages, Pickup Details 871-VI
D-11-2—Assembly Wiring Diagram 872-VI
D11-2—Phonograph Details 873-VI
D11-2—Alignment 874-VI
D-11-2—Alignment (cont'd) 875-VI
D-11-2—Alignment (concluded) 876-VI
D-22-1—Schematic (1st Half) 886-VI
D-22-1—Schematic (2nd Half) 887-VI
D-22-1—Wiring Diagram 888-VI
D-22-1—Power Amplifier, Wiring Diagram 889-VI
D-22-1—Socket Voltages 890-VI
D-22-1—Assembly Wiring Diagram 891-VI
D-22-1—Service Data Color Codes 892-VI
D-22-1—Alignment 893-VI
D-22-1—Alignment (cont'd) 894-VI
D-22-1—Alignment (cont'd) 895-VI
D-22-1—Alignment (cont'd) 896-VI
D-22-1—Chassis Layout, Wiring Diagram of Amplifier, Alignment (concluded) 897-VI
H-6 (Auto Set), Schematic, Service Data 803-VI
H-6 (Hudson), Auto Set—Wiring Diagram, Socket Voltages 804-VI
JMV-97A 703-V
M-30 ..... 300DD-IIs
M-34 ..... 197-IV, 198-IV, 199-IV
M-101—Schematic, Socket Voltages 908-VI
M-101—Wiring Diagram, Chassis Layout, Service Hints 909-VI
M-105 ..... 704-V
M-107 ..... 705-V
M-116 ..... 706-V
M-123 ..... 707-V
P-31 ..... 596-III
PG-62 ..... 200-IV, 201-IV
PG-62D1—Schematic, Socket Voltages 899-VI
PG-62D1—Wiring Diagram 900-VI
PG-75—Schematic, Socket Voltages, Service Data 901-VI
PG-75—Wiring Diagram 902-VI
PG-75—Service Data (concluded) 903-VI
PT-15 ..... 202-IV
R-3-C 708-V
R-4 ..... 326H-IIs
R-5 AC 334-II, 226J-Is
R-5 DC 336-II
R-6 ..... 326H-IIs
R-7 AC 266G-Is
R-7A AC 327-II
R-7 DC 327-II
R-8 ..... 126I to 326M-IIs
R-9 DC 337-II
R-10 AC 584-III
R-11 ..... 335-II, 330-III
R-12 ..... 326I to 326M-IIs
R-14 ..... 242A-Is
R-15 ..... 266D-Is
R-17-M 709-V
R-18-W 710-V
R-20 ..... 326N to 326P-IIs, 234-I
R-21 ..... 326N to 326P-IIs, 264-I, 347-III
R-22 ..... 711-V
R-24 ..... 203-IV, 204-IV 205-IV, 206-IV, 207-IV
R-25-DC 712-V
R-27 ..... 208-IV, 209-IV
R-28 ..... 210-IV, 211-IV
R-28-BW 210-IV.211-IV
R-28-BWC 210-IV, 211-IV
R-28-P 713-V
R-28-W 212-IV, 213-IV
R-32 ..... 240-I, 266-I 297-III, 341-III, 342-III
R-35 ..... 266E-Is
R-37 ..... 214-IV, 215-IV
R-37-P 714-IV
R-38 ..... 214-IV, 215-IV
R-38-P 714-V
R-39 ..... 266E-Is
R-42 ..... 240-I, 242A-Is
R-43 ..... 333-II
R-45 ..... 341-III
R-50 ..... 338-II, 260-I, 330-III
R-51-B 715-V
R-53-B 715-V
R-55 ..... 338-II, 330-III
R-70 ..... 216-IV
R-71 ..... 604-III
R-71-B 217-IV, 218-IV
R-72 ..... 604-III
R-73 ..... 219-IV, 220-IV
R-73-A 219-IV, 220-IV
R-74 ..... 221-IV 222-IV, 223-IV, 224-IV
R-75 ..... 225-IV, 226-IV
R-75-A 225-IV, 226-IV
R-76 ..... 221-IV 222-IV, 223-IV, 224-IV
R-77 ..... 221-IV 222-IV, 223-IV, 224-IV
R-78 ..... 424N-IIs, 583-III
R-78-A 424N-IIs, 583-III
R-80 ..... 266A-Is
R-90 ..... 227-IV, 228-IV
R-90-P 716-V
R-92 ..... 717-V
R-93 (Duo Junior), Schematic, Wiring Diagram 904-VI
R-93 (Duo Junior), Adaptation to RCA Sets 905-VI
R-95—"Electrola"—Schematic, Socket Voltages 906-VI
R-95—"Electrola"—Phono-Motor Details, Assembly Wiring Diagram 907-VI
RAE-26 ..... 718-V
RAE-59 ..... 326Q-IIs, 326R-IIs
RAE-68 ..... 340-II
RAE-79 ..... 606-III
RAE-84 ..... 229-IV, 230-IV, 231-IV
RE-17 ..... 266I-Is
RE-18 ..... 719-V
RE-20 ..... 720-V
RE-35 ..... 321-III
RE-39 ..... 321-III
RE-40 ..... 232-IV, 233-IV
RE-45 ..... 240-I, 297-III 316-III, 324-III, 344-III
RE-57 ..... 266E-Is, 321-III
RE-75 ..... 240-I
RE-80 ..... 243-IV, 235-IV
RE-81 ..... 326-IV, 237-IV
RK-24—Phono-Oscillator—Schematic, Wiring Data 898-VI
RO-23 ..... 585-III
RPA-1A 265-I
RPA-4 ..... 265-I
SW-3 ..... 203-IV, 204-IV, 205-IV, 206-IV, 207-IV
SWA-2 ..... 616-III
T-4-8—Schematic, Service Data 785-VI
T-4-8—Wiring Diagram, Socket Voltages 786-VI
T-4-8A—Schematic, Wiring Diagram, Socket Voltages 787-VI
T-4-9—Schematic, Service Data 785-VI
T-4-9—Wiring Diagram, and Socket Voltages 786-VI
T-4-9A—Schematic, Wiring Diagram, Socket Voltages 787-VI
T-4-10—Schematic, Socket Voltages 788-VI
T-4-10—Wiring Diagram 789-VI
T-5 ..... 339-II
T-5-2—Schematic, Service Data 794-VI
T-5-2—Socket Voltages, Alignment 795-VI
T-6-1—Schematic, Service Data 807-VI
T-6-1—Wiring Diagram 808-VI
T-6-1—Socket Voltages 809-VI
T-6-7—Schematic, Service Data 810-VI
T-6-9—Schematic, Service Data 811-VI
T-6-9—Wiring Diagram 812-VI
T-6-11—Schematic, Service Data 813-VI
T-6-11—Wiring Diagram, Socket Voltages, Chassis Layout 814-VI
T-7-5—Schematic, Service Data 822-VI
T-7-5—Wiring Diagram, Chassis Layout 823-VI
T-7-5—Socket Voltages, Alignment 824-VI
T-8-14—Schematic, Chassis Layout 833-VI
T-8-14—Wiring Diagram, Alignment 834-VI
T-8-14—Alignment (cont'd), Socket Voltages 835-VI
T-8-16—Schematic, Chassis Layout 836-VI
T-8-16—Wiring Diagram 837-VI
T-8-18—Schematic 838-VI
T-8-18—Wiring Diagram 839-VI
T-9-7—Schematic 847-VI
T-9-7—Wiring Diagram 848-VI
T-9-7—Socket Voltages 849-VI
T-9-8—Schematic 850-VI
T-9-8—Wiring Diagram 851-VI
T-9-8—Socket Voltages 852-VI
T-9-9—Schematic, Chassis Layout 845-VI
T-9-9—Wiring Diagram 846-VI
T-9-10—Schematic, Chassis Layout 841-VI
T-9-10—Wiring Diagram 842-VI
T-9-10—Alignment 843-VI
T-9-10—Alignment (cont'd), Socket Voltages 844-VI
T-10-1—Schematic 857-VI
T-10-1—Wiring Diagram 858-VI
T-10-1—Socket Voltages 859-VI
T-10-1—Alignment, Chassis Layout 860-VI
T-10-1—Alignment (cont'd) 861-VI
T-10-1—Alignment (cont'd) 862-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

RCA-VICTOR (cont'd)

T-10-3—Schematic, Chassis Layout 863-VI
T-10-3—Wiring Diagram 864-VI
T-10-3—Alignment, Socket Voltages 865-VI
T-11-8—Schematic 877-VI
T-11-8—Wiring Diagram 878-VI
T-11-8—Socket Voltages, Chassis Layout 879-VI
4 Tube 220V DC 721-V
Alhambra 1 ..... 231-I
Alhambra 11 ..... 233-I
Auditorium Phonograph ..... 340R to 340V-IIs
Borgia 11 ..... 231-I
Electrola Cromwell 231-I
Florenza 233-I
Radiola AR 243-I
Radiola RS 243-I
Radiola Grand 245-I
Radiola Senior 243-I
S. W. Adapter 617-III
Theremin 328-II
9 Tube General Purpose All-Wave Set, Schematic, Chassis Layout, Service Data 840-VI
4X—Schematic, Wiring Diagram 790-VI
4X—Alignment, Socket Voltages 791-VI
4X—Alignment (cont'd), Service Data 792-VI
4X3—Schematic, Wiring Diagram 790-VI
4X3—Alignment, Socket Voltages 791-VI
4X3—Alignment (cont'd), Service Data 792-VI
4X4—Schematic, Wiring Diagram 790-VI
4X4—Alignment, Socket Voltages 791-VI
4X4—Alignment (cont'd), Service Data 792-VI
5M (Auto Set), Schematic 793-VI
6M—Schematic, Service Data 805-VI
6M—Service Data, Alignment 806-VI
6M2—Schematic, Service Data 805-VI
6M2—Service Data, Alignment 806-VI
7U—Schematic, Wiring Diagram 825-VI
7U—Assembly Wiring Diagram 826-VI
7U—Socket Voltages, Pickup Data, Chassis Layout 827-VI
7U—Service Data 828-VI
7U—Motor Board Adjustment 829-VI
103—Schematic, Socket Voltages 910-VI
7-1 ..... 231-I
7-2 ..... 233-I
7-3 ..... 234-I
7-10 ..... 234-I
7-11 ..... 236-I
7-25 ..... 237-I
7-26 ..... 234-I, 242-I
7-30 ..... 234-I
9-1 ..... 233-I
9-15 ..... 237-I
9-18 ..... 241-I
9-25 Electrola 232-I
9-40 Electrola 232-I
9-54 ..... 239-I, 242-I
9-55 ..... 238-I
10-51 ..... 240-I
10-69 ..... 239-I, 240-I
10-70 ..... 235-I, 242-I
12-15 ..... 236-I
12-25 ..... 235-I
14 ..... 325-III
16 ..... 234-I, 246-I, 296-III
17 ..... 237-I, 252-I, 296-III, 308-III, 340-III
18 ..... 236-I
252-I, 296-III, 308-III
18 AC 299-III, 300-III
18 DC 262-I, 305-III
20 ..... 247-I, 340-III
22 ..... 264-I
24 ..... 249-I
25 AC 330-II
25 Battery 250-I
26 ..... 249-I
28 ..... 331-II
235-I, 242B-Is, 254-I, 266F-Is
30 ..... 247-I
30A 264-I, 301-III, 313-III
32 ..... 309-III, 340-II
33 ..... 251-I, 305-III
33 DC 353-I
35 ..... 342-III
41 ..... 257-I, 340-III
41 AC 299-III, 310-III
41 DC 261-I
42 ..... 326-III
44 ..... 266-I, 267-I, 295-III, 298-III, 302-III, 340-III
44 AC 301-III, 310-III
45 ..... 214-III, 309-III
46 ..... 298-III, 302-III, 319-III, 332-III
46 AC 301-III, 310-III
46 DC 251-I
47 ..... 255-I, 259-I, 315-III
48 ..... 322-III, 325-III, 326-III, 600-III
50 ..... 340-III
51 ..... 260-I, 305-III
51 DC 201-I
60 ..... 252-I
310-III, 318-III, 328-III
62 ..... 262-I, 303-III, 310-III
64 ..... 256-I, 302-III, 310-III
66 ..... 263-I, 316-III
67 ..... 248-I, 258-I, 316-III
68 ..... 331-III
80 ..... 325-III
82 ..... 266D-Is, 325-III
86 ..... 266 B, C-Is, 325-III
99X 331-III
100 ..... 662-V
100A Speaker 324-II
100B Speaker 325-II
101 ..... 662-V
102 ..... 663-V
103—Wiring Diagram 911-VI
103 Speaker 325-II
104 ..... 325-II
104 RCA 254-I
105 ..... 257-I
106 ..... 326-II, 266F-Is
110 ..... 664-V
111 ..... 664-V
112 ..... 665-V
114 ..... 666-V
115 ..... 664-V
117—Schematic, Socket Voltages 912-VI
117—Wiring Diagram 913-VI
118 ..... 667-V
119—Schematic 914-VI
119—Wiring Diagram 915-VI
120 ..... 668-V
121 ..... 669-V
122 ..... 669-V
124 ..... 670-V
125—Schematic, Service Data 916-VI
125—Wiring Diagram 917-VI
125—Socket Voltages, Speaker Wiring 918-VI
126B 671-V
127 ..... 672-V
128—Schematic, Service Data 928-VI
128—Wiring Diagram 929-VI
128—Socket Voltages, Trimmers 930-VI
128E—Schematic 919-VI
128E—Wiring Diagram 920-VI
128E—Trimmers, Socket Voltages 921-VI
135B 674-V
140 ..... 675-V
141 ..... 675-V
141E 675-V
142B 676-V
143—Schematic, Service Data 925-VI
143—Wiring Diagram 926-VI
143—Socket Voltages, Trimmers 927-VI
210 ..... 678-V
211 ..... 667-V
214—Schematic, Socket Voltages 912-VI
214—Wiring Diagram 913-VI
220 ..... 679-V
221 ..... 680-V
222 ..... 679-V
223 ..... 681-V
224 ..... 673-V
224E—Schematic 919-VI
224E—Wiring Diagram 920-VI
224E—Trimmers, Socket Voltages 921-VI
225—Schematic, Service Data 916-VI
225—Wiring Diagram 917-VI
225—Socket Voltages, Speaker Wiring 918-VI
226—Schematic, Service Data 928-VI
226—Wiring Diagram 929-VI
226—Socket Voltages, Trimmers 930-VI
235B 674-V
236B—Schematic, Service Data 931-VI
236B—Wiring Diagram 932-VI
236B—Socket Voltages 933-VI
240 ..... 675-V
241B 676-V
242—Schematic, Service Data 925-VI
242—Wiring Diagram 926-VI
242—Socket Voltages, Trimmers 927-VI
243—Schematic, Service Data 925-VI
243—Wiring Diagram 926-VI
243—Socket Voltages, Trimmers 927-VI
260 ..... 682-V
261 ..... 683-V
262—Schematic 934-VI
262—Wiring Diagram 935-VI
262—Socket Voltages 936-VI
262 (Supplementary), Schematic, Schematic 937-VI
262 (Supplementary), Wiring Diagram 938-VI
263—Schematic 934-VI
263—Wiring Diagram 935-VI
263—Socket Voltages 936-VI
280 ..... 685-V
281 ..... 686-V
300 ..... 687-V
301 ..... 688-V
310 ..... 689-V
320 ..... 690-V
321 ..... 691-V
322 "Duo" 692-V
322E—"Duo"—Schematic, Service Data 939-VI
322E—"Duo"—Wiring Diagram, Service Data 940-VI
322E—"Duo"—Assembly Wiring Diagram 941-VI
322E—"Duo"—Socket Voltages, Alignment, Trimmers 942-VI
322E—"Duo"—Alignment (cont'd) 943-VI
327 220 V. DC 693-V
330 ..... 694-V
331 ..... 695-V
340 ..... 696-V
340E 696-V
341 "Duo" 697-V
380 "Duo" 698-V
380HR "Duo" 699-V
381 "Duo" 700-V
II 244-I
III 243-I
IIIA 245-I
IV 244-I
V 244-I
VI 244-I
VII 243-I
VIIB 339-II, 246-I
VIII 249-I
IX 245-I

CENTRALIZED RADIO:

AF-6100 ..... 340N to 340P-IIs
AF-6175 Speaker 340C-IIs
ER-124A ..... 340I to 340M-IIs
ER-1240 ..... 340D to 340H-IIs
ER-1240-AZ 238-IV, 239-IV, 240-IV
RF Distribution System 329-II
RF-5100 DC 340A-IIs
RF-5600 ..... 340B-IIs

READRITE METER WORKS

245 Set & Tube Tester 444-II
400 Tube Tester 445-II
450 Short Checker 444-II
550 Oscillator 445-II
600-700 Tester 446-II

REMINGTON RADIO & TEL. CORP.

See Radio Bar Co. of America

REMLER COMPANY, Ltd.

Adjustment diagrams, ... 366B-IIs
Cameo Screen Grid 366R-IIs
10 ..... 618-III
10-3 (Cameo) 722-V
10-4 (World Cruiser) 723-V
11 ..... 619-III
14 ..... 341-I, 332-III
15 ..... 366-II
17 ..... 620-III
19 ..... 310H-IIs
21 (Minuette) 365-II
21-3 (Minuette) 724-V
26 AC-DC (Scotty) 725-V

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

REMBLER CO. (cont'd)

27 (Scotty) 726-V
30 ..... 727-V
35 ..... 728-V
36—Auto Set—Schematic 944-VI
37—Auto Set—Schematic 944-VI
40 (Scotty) 727-V
42—Schematic, Socket Voltages, Service Data 945-VI
42—Short-Wave—Schematic, Socket Voltages 946-VI
43—Schematic 947-VI
44—Schematic, Socket Voltages 948-VI
44A—Schematic, Socket Voltages 949-VI
45 kc. Super 340-I
51—Schematic, Socket Voltages 950-VI
53—Schematic 947-VI
53C—Schematic 947-VI
62—Schematic, Socket Voltages 951-VI
63—Schematic, Socket Voltages 952-VI
88—Schematic 947-VI

ROBERTSON-DAVIS CO.

Melo-Heald, 11 Tube Super 357-I

ROGERS-MAJESTIC CORP., Ltd.

645 ..... 729-V
832 ..... 730-V
833 ..... 731-V
840 ..... 732-V

ROLA COMPANY

80 ..... 367-II
90 ..... 367-II

S

SAMSON ELECTRIC COMPANY

See also S. H. Couch Co.

PAM-5 ..... 371-II
PAM-9 ..... 369-II
PAM-16 ..... 372-II
PAM-16N 370-II
PAM-17 ..... 372-II
PAM-17M 370-II
PAM-19 ..... 374-II
PAM-25 ..... 373-II
PAM-M1K1 ..... 375-II

SANGAMO ELECTRIC CO.

250 Amplifier 450-II
3 Stage Amplifier 450-II

E. H. SCOTT RADIO LABORATORIES

All-Wave Super 196P-Is

SEARS, ROEBUCK & CO.

F 200B-Is
FF 200B-Is
G 200B-Is
H 200B-Is
J 200B-Is
36 ..... 376A-IIs, B-IIs
36P ..... 376C-IIs, D-IIs
37 ..... 376E-IIs, F-IIs, I-IIs
37P 376D-IIs
39-125 ..... 621-III
40 ..... 623-III
41 ..... 376G-IIs, I-IIs, 628-III
41P 376H-IIs
42 ..... 628-III
43 ..... 623-III
44 ..... 376J-IIs, K-IIs
46 ..... 627-III
47 ..... 376L-IIs, M-IIs, N-IIs
48 ..... 376L-IIs, M-IIs, N-IIs
49 ..... 625-III
50 AVC ..... 376-O-IIs, P-IIs
62 ..... See Colonial Radio Corp.
65 ..... 733-V
69 ..... 733-V
105 ..... 734-V
106 ..... 735-V
107 ..... 736-V
108 ..... 737-V
109 ..... 738-V
110 ..... 739-V
111 ..... 739-V
112 ..... 740-V
1570 ..... 733-V
1572 ..... 733-V
1574 ..... 733-V
1580 See Colonial Radio Corp.
1582 See Colonial Radio Corp.
1586 See Colonial Radio Corp.
1586 See Colonial Radio Corp.
1590 ..... 741-V
1592 ..... 741-V
1620 ..... 742-V
1622 ..... 742-V
1700 ..... 743-V
1703 ..... 744-V
1704 ..... 745-V
1705 ..... 746-V
1706 ..... 747-V
1707 ..... 747-V
1708 ..... 748-V
1708A 775-V
1709 ..... 748-V
1710 ..... 749-V
1711 ..... 750-V
1711A 751-V
1712 ..... 752-V
1713 ..... 752-V
1714 ..... 753-V
1715 ..... 754-V
1720 ..... 755-V
1721 ..... 756-V
1722 ..... 757-V
1722X 758-V
1724 ..... 759-V
1725 ..... 755-V
1729 ..... 760-V
1732 ..... 757-V
1732X 758-V
1750 ..... 761-V
1760 ..... 762-V
1781—Schematic 953-VI
1782—Schematic 953-VI
1802 ..... 763-V
1803 ..... 763-V
1804 ..... 764-V
1805 ..... 764-V
1806 ..... 765-V
1820 ..... 764-V
1821 ..... 766-V
1823 ..... 765-V
1826 ..... 764-V
1827 ..... 766-V
1828 ..... 767-V
1829 ..... 765-V
1840 ..... 768-V
1850 ..... 770-V
1851 ..... 770-V
1854 ..... 769-V
1855 ..... 771-V
1857 ..... 772-V
1858 ..... 773-V
1904—Schematic 954-VI
1904A—Schematic 954-VI
1905—Schematic 955-VI
1906—Schematic 954-VI
1909—Schematic 956-VI
1912—Schematic 956-VI
1915—Schematic 955-VI
1917—Schematic 957-VI
1918—Schematic 958-VI
1918A—Schematic 959-VI
1919 (Chassis 345-X), Schematic 960-VI
1920—Schematic 961-VI
1922—Schematic 962-VI
1922A—Schematic 963-VI
1923—Schematic 964-VI
1926—Schematic 961-VI
1928—Schematic 965-VI
1929 (Chassis 345-X), Schematic 960-VI
1932—Schematic 962-VI
1932A—Schematic 963-VI
1933—Schematic 964-VI
1933A—Schematic 966-VI
1936—Schematic 958-VI
1936 (Battery Set), Schematic 967-VI
1942—Schematic 968-VI
1942 (Chassis 391-X), Schematic 969-VI
1944 (Chassis 391-X), Schematic 969-VI
1945—Schematic 970-VI
1946—Schematic 971-VI
1947—Schematic 972-VI
1948—Schematic 972-VI
1954—Schematic 954-VI
1955—Schematic 955-VI
1962—Schematic 956-VI
1964—Schematic 954-VI
1964A—Schematic 954-VI
1965—Schematic 955-VI
1967—Schematic 957-VI
1967—Schematic 973-VI
1967A—Schematic 974-VI
1967A—Parts List 975-VI
1968A—Schematic 959-VI
1971—Auto Set—Schematic 976-VI
1972—Schematic 968-VI
1972 (Chassis 391-X), Schematic 969-VI
1978—Schematic 965-VI
1980—Schematic 961-VI
1982A (Chassis 345-X), Schematic 960-VI
1982A—Schematic 963-VI
1982—Schematic 962-VI
1983—Schematic 964-VI
1983A—Schematic 966-VI
1992—Schematic 962-VI
1992A—Schematic 963-VI
1993—Schematic 964-VI
1994—Schematic 968-VI
1996 (Battery Set), Schematic 967-VI
1998—Schematic 977-VI
1999 (Chassis 345-X), Schematic 960-VI
4400—Auto Set—Schematic, Chassis Layout, Trimmers, Socket Voltages 978-VI
7062 ..... 743-V
7064 ..... 744-V
7065 ..... 755-V
7070 ..... 745-V
7071 ..... 745-V
7072 ..... 745-V
7073 ..... 745-V
7074 ..... 745-V
7075 ..... 774-V
7076 ..... 774-V
7077 ..... 774-V
7078 ..... 774-V
7090 ..... 750-V
7090A 751-V
7091 ..... 774-V
7092 ..... 774-V
7093 ..... 774-V
7094 ..... 774-V
7118 ..... 775-V
7141—Schematic, Chassis Layout, Socket Voltages 979-VI
7142—Schematic, Chassis Layout, Socket Voltages 979-VI
7154—Chassis Layout, Schematic 980-VI
7158—Schematic, Chassis Layout 981-VI
7176—Schematic, Service Notes 982-VI

SENTINEL RADIO CORP.

5-Tube Superhet 766-V
7-Tube Band Pass 495-II
7-Tube Super 493-II
8-Tube Super 494-Is
8 ..... 346B-Is
9 ..... 346B-Is
11 ..... 346A-Is
12 ..... 346A-Is
15 ..... 346A-Is
16 ..... 346A-Is
31 ..... 346B-Is
33 ..... 346B-Is
104 ..... 346A-Is
108A 241-IV
109 ..... 241-IV
114 ..... 777-V
264 ..... 242-IV
244 ..... 495-IIs, 348-Is
513 ..... 243-IV
550 ..... 244-IV
570 ..... 778-V
590 ..... 779-V
599 ..... 780-V
602 ..... 781-V
610 ..... 245-IV
630 ..... 782-V
634 ..... 782-V
635 ..... 782-V
660 ..... 346-I
666C 495A-IIs, 346-I
1040 ..... 783-V
5000 ..... 784-V
5100 ..... 784-V
5200 ..... 785-V
5700 ..... 786-V
6100 ..... 787-V
6300 ..... 788-V

SHORT WAVE AND TELEVISION LAB.

Baird Television Receiver 376-II

SILVER-MARSHALL, Inc.

A 382-II
D 387-II
F 388-II
G 390-II
Q 394A-IIs
R 394B-IIs

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

SILVER-MARSHALL (cont'd)

SMD-1 ..... 380-II
9-Tube Super, 1929 ..... 268A-Is
30 ..... 268-I
30-B 378-I, 268G-Is
33-A 268A-Is
34-A 268B-Is
35-A 268B-Is
36-A 268C-Is
37 ..... 268E-Is
38 ..... 268E-Is
39 ..... 268E-Is
60 ..... 268-I
75 ..... 268-I
95 ..... 268-I
630 ..... 268G-Is
677B 394-II
679 ..... 394-II
679B 391-II
683 ..... 383-II
684 ..... 384-II
686 ..... 389-II
690 ..... 340-I
692 ..... 385-II
712 ..... 268D-Is
714 ..... 268E-Is
716 ..... 383-II
720 ..... 59-I
722 AC 286D-Is
722 DC 379-II
724 ..... 268D-Is
726 SW 381-II
737 ..... 393-II
738 ..... 392-II
739 ..... 386-II
782-16 ..... 377-II

SILVER MARSHALL MFG. CO.

Z-10 ..... 789-V
Z-13 ..... 246-IV

SIMPLEX RADIO CO.

F 790-V
H 368-II
H-AC 794-V
J 791-V
K 368-II
L 394A-IIs
N 247-IV
N-DC 247-IV
P-AC 792-V
P Battery 793-V
P-32V 794-V
Q 794-V
R-AC 795-V
R-DC 796-V
T 797-V
U AC-DC 798-V
V 799-V
V All-Wave AC-DC 800-V
W All-Wave 801-V
X 802-V

SLAGLE RADIO CO.

See Continental Radio Corp.

SONORA PHONOGRAPH CO., Inc.

A-36 ..... 268H-Is, 335-III
A-44 ..... 313-III, 326-III
B-31 ..... 274-I
E-AC 268H-Is
Combination 320-III
2-RP-25 ..... 269-I
3-R 270-I
3-RP 271-I
4-R 270-I
5-R 272-I
7-P 273-I
30 ..... 336-III
32 ..... 336-III
36 ..... 336-III
40 ..... 335-III, 366-III
44 ..... 300-III, 335-III, 336-III
46 ..... 335-III, 336-III

SPARKS-WITHINGTON COMPANY

AC-7 ..... 249-IV
AC-62 ..... 249-IV
AC-63 ..... 249-IV
AR-19 ..... 396-II
AR-50 ..... 831-V
AR-50A 831-V
Sparks Ensemble 280-I, 280A-Is
Sparton DC 306-III
Sparton Tube Tables 638-II
Tubes used in Sparton Receivers 634-III
635-III, 636-III, 637-III
5 ..... 397-II
5-15 ..... 281-I
5-26 ..... 281-I
6-15 ..... 278-I
6-26 ..... 278-I
7—Schematic 984-VI
9 ..... 397-II
9-30 ..... 276-I
9A 410-II
9X 803-V
10 ..... 403-II
12 ..... 645-III
13 ..... 803-V
14 ..... 803-V
14A 803-V
15 ..... 408-II
15X 803-V
16 ..... 647-III
16AW Broadcast 617-III
16AW Short Wave 639-III, 640-III
17 ..... 804-V
18 ..... 804-V
25 ..... 413-II
26 ..... 413-II
26AW Short Wave 639-III, 640-III
27 ..... 805-V
27A 805-V
28 Triolian 424R-IIs
30 ..... 407-II
30A 407-II
30B 407-II
31 ..... 404-II
32 ..... 404-II
33 ..... 806-V
33A 807-V
33B 807-V
34 ..... 808-V
35 ..... 809-V
36 ..... 810-V
39 ..... 275-I
40 ..... 406-II, 310R-IIs
41 ..... 654-III
41A 811-V
42 ..... 812-V
43 ..... 813-V
45 ..... 641-III
49 ..... 276-I
51 ..... 405-II
52 ..... 405-II
53 ..... 814-V
54 ..... 815-V
55 AC 816-V
56 ..... 643-III
57 ..... 817-V
58—Schematic 983-VI
60 Converter 648-III
61 ..... 818-V
62—Schematic 984-VI
63—Schematic 984-VI
65T—Schematic 985-VI
66T—Schematic 985-VI
67 ..... 819-V
68 ..... 819-V
69 ..... 279-I
70—Schematic 986-VI
71 ..... 820-V
71B 820-V
72 ..... 821-V
74 ..... 822-V
75A 823-V
76 ..... 824-V
77—Schematic 986-VI
78 ..... 825-V
79A 279-I
80 ..... 826-V
81 ..... 827-V
82 ..... 828-V
83 ..... 826-V
84 ..... 826-V
85X 826-V
86X 826-V
89 ..... 279-I
89A 275-I, 345-III
101 ..... 649-III
103 ..... 398-II
104 ..... 829-V
109 ..... 279-I
109 De Luxe 279-I
110 ..... 281-I
111X 804-V
134—Schematic 987-VI
136—Schematic 987-VI
210 ..... 329-III
235 ..... 409-II
301-AC 280D-Is 300-III, 311-III
301-DC 277-I
333 ..... 830-V
400 ..... 323-III
410-AC 411-II
410-DC 400-II
420-AC 411-II
420-DC 400-II
475A 823-V
478 ..... 825-V
478A 823-V
506—Schematic 988-VI
516—Schematic, Parts List 989-VI
516X—Schematic, Parts List 989-VI
536—Schematic 990-VI
536X—Schematic 990-VI
546X—Schematic, Parts List 989-VI
564 ..... 395-II
570 ..... 395-II
574 ..... 401-II
578 ..... 398-II
589 ..... 280C-Is
591 ..... 414-II, 331-III
593 ..... 414-II
594—Schematic 988-VI
600-AC 412-II, 322-III
600-DC 402-II
610-AC 412-II
610-DC 402-II
616—Schematic 991-VI
616M—Schematic, Parts List 992-VI
616MX—Schematic, Parts List 992-VI
616X—Schematic 991-VI
620-AC 412-II, 322-III
620-DC 402-II
620X 803-V
636MX—Schematic, Parts List 993-VI
655—Schematic, Parts List 994-VI
666—Schematic 991-VI
666M—Schematic, Parts List 992-VI
666MX—Schematic, Parts List 992-VI
666X—Schematic 991-VI
691 ..... 819-V
716X—Schematic, Parts List 995-VI
726X—Schematic, Parts List 996-VI
737 ..... 399-II, 412-II, 321-III, 322-III
740 ..... 395-II, 321-III, 322-III
740-DC 402-II
750 ..... 395-II
750A 804-V
750X 804-V
750-DC 402-II
766—Schematic, Parts List 995-VI
766X—Schematic, Parts List 995-VI
776—Schematic, Parts List 996-VI
776X—Schematic, Parts List 996-VI
785—Schematic 997-VI
870 ..... 401-II
870A 804-V
870X 804-V
930 ..... 651-III, 652-III, 653-III, 310-III
931-AC 280B-Is
931-DC 277-I, 300-III
966—Schematic, Parts List 998-VI
1016X—Schematic, Parts List 999-VI
1066—Schematic, Parts List 999-VI
1116X—Schematic, Parts List 1000-VI
1166—Schematic, Parts List 1000-VI
1176—Schematic, Parts List 1000-VI
1176XP—Schematic, Parts List 1000-VI
1176XS—Schematic, Parts List 1000-VI
1186—Schematic, Parts List 1000-VI
1196—Schematic, Parts List 1000-VI
1466—Schematic, Parts List 1001-VI
1476—Schematic, Parts List 1001-VI

SPIEGEL, MAY, STERN CO.

Melrose, same as Apex—306-I

SPLITDORF ELECTRIC MFG. CO.

M-5 ..... 322A-Is
M-6 ..... 322B-Is
PAD-4 ..... 322-I
R-100 ..... 322B-Is
R-200 ..... 322-I
RV-695 ..... 322A-Is
Abbey 322-I
Inherently Electric 324A-Is
171 ..... 324-I

STAIRS-WINTERS CO.

Television Receiver 455C-IIs

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STANDARD RADIO CORP.

29 ..... 342-I

STANDARD RADIO MFG. CORP. Ltd. (Rogers)

See also Rogers-Majestic, Ltd.

Advanced Chassis 414A-IIs
220 ..... 414B-IIs
250 ..... 414C-IIs
400 ..... 414C-IIs
451 ..... 414E-IIs
545 ..... 414F-IIs
640 ..... 578C-IIs
831 ..... 578C-IIs

STAR RAIDER RADIO SERVICE

See Continental Radio Corp.

STARCK RADIO CO.

Starck 345-III

STEINITE RADIO CO.

See also Jackson Radio & Television Co.

Steinite 345-III
10 ..... 282B-Is
15 ..... 415-II
20 ..... 416-II
26 ..... 417-II
28 ..... 418-II
40C Power Pack 282A-Is
50A 282-I
60 Power Pack 282A-Is
70 ..... 282B-Is
88 ..... 282B-Is
95 ..... 282B-Is
102A 822-1
102C Power Pack 282A-Is
61 ..... 283-I
262 ..... 283-Is
991 ..... 283-I
992 ..... 283-I
993 ..... 283-I

STENODE CORPORATION OF AMERICA

Stenode Receiver 419-II

STERLING MFG. CO.

4 ..... 284-I
5 D3A Receiver 499D-II
517 Mutual Conductance Tester 466-II
B 268F-Is

STEWART WARNER CORP.

R-100 All Lettered Models 290A-Is
R-101A 423-II
R-101B 423-II
R-116X 840-V
R-116XH 840-V
R-102A 254-IV
R-102B 254-IV
R-102E 254-IV
R-104 ..... 254-IV, 256-IV
R-106 ..... 257-IV, 258-IV
R-110 ..... 836-V
R-111 ..... 838-V
R-112 ..... 837-V
R-113 ..... 839-V
R-114 ..... 839-V
R-115 ..... 838-V
R-116 ..... 840-V
R-116 AL 840-V
R-116XL 840-V
R-117 ..... 841-V
R-119 ..... 842-V
R-119A 842-V
R-119EF 842-V
R-120 ..... 843-V
R-123 ..... 844-V
R-125 ..... 845-V
R-126 ..... 846-V
R-127 ..... 847-V
R-1322—Auto Radio, "Firestone,"—Schematic, Parts List, Socket Voltage 1006-VI
R-1332—Auto Set—Schematic, Socket Voltages, Parts List 1007-VI
R-1431—Auto Radio, "Firestone"—Schematic, Parts List, Operating Voltages 1017-VI
Servicing with the Jewell 199 ..... 424P, Q-IIs
SW Converter 424-II
0200 ..... 832-V
0201 ..... 833-V
50, 51, 58 series 105, 424-O-IIs
100C 834-V
100CF 834-V
105 ..... 250-IV
108 ..... 251-IV
108X 251-IV
109 ..... 252-IV, 253-IV
110 ..... 835-V
110B 836-V
110E 836-V
202A 422-II
202B 422-II
202E 422-II
300 ..... 286-I
301A 424-II
301B 424-II
301E 424-II
305 ..... 286-I
310 ..... 286-I
315 ..... 286-I
320 ..... 286-I
325 ..... 286-I
330 ..... 286-I
335 ..... 286-I
340 ..... 286-I
345 ..... 286-I
350 ..... 286-I
355 ..... 286-I
360 ..... 286-I
385 ..... 286-I
390 ..... 286-I
500 ..... 287-I
520 ..... 287-I
525 ..... 287-I
530 ..... 287-I, 288-I
535 ..... 287-I, 288-I
700 ..... 287-I
705 ..... 287-I
710 ..... 287-I
715 ..... 287-I, 288-I
720 ..... 287-I, 288-I
750 ..... 289-I
801 ..... 421-II
802 ..... 421-II
806 ..... 421-II
900 ..... 394B-IIs, 291-I
950 Series Screen receivers ..... 424A to 424M-IIs
950 Battery 394B-IIs, 289-I
950-DC 290-I
1090 to 1099 ..... 250-IV
1121 ..... 837-V
1171 ..... 841-V
1172 ..... 841-V
1201 to 1209 ..... 843-V
1231 to 1239 ..... 844-V
1251 to 1259 ..... 845-V
1261 to 1269 ..... 846-V
1271 to 1279 ..... 847-V
1281D to 1289D (Chassis R-128D), Schematic, Parts List 1002-VI
1301 to 1309 (Chassis R-130), Schematic, Socket Voltages, Parts List 1003-VI
1301 to 1309 (Chassis R-130), Chassis Layout, Alignment 1004-VI
1311 to 1319 (Chassis R-131), Schematic, Socket Voltages, Parts List 1005-VI
1341 to 1349 (Chassis R-134), Schematic, Socket Voltages, Parts List 1008-VI
1361 to 1369 (Chassis R-136), Schematic, Socket Voltages; Parts List 1009-VI
1371 to 1379 (Chassis R-137), Schematic (1st Half Diagram), Parts List, ... 1010-VI
1371 to 1379 (Chassis R-137), Schematic (2nd Half), Operating Voltages, Parts List (continued) 1011-VI
1381 to 1389 (Chassis R-138), Schematic, (1st Half), Parts List, Phonograph Connection 1012-VI
1381 to 1389 (Chassis R-138), Schematic, (2nd Half), Operating Voltages Parts List (continued) 1013-VI
1391D to 1399D (Chassis R-139D), Schematic, Parts List 1014-VI
1401 to 1409 (Chassis R-140), Schematic, Parts List, Socket Voltages 1015-VI
1421 to 1429 (Chassis R-142A & R-142AS), Schematic, Parts List, Socket Voltages 1016-VI
1441 to 1449 (Chassis R-144AS), Schematic, Socket Voltages, Parts List 1018-VI
1451 to 1459 (Chassis R-145), Schematic, Socket Voltages, Parts List 1019-VI
1471 to 1479 (Chassis R-147), Schematic, Socket Voltages, Parts List 1020-VI
1601 to 1609 (Chassis R-160—Auto Radio), Schematic, Socket Voltages, Parts List 1021-VI

STORY & CLARK RADIO CORP.

36 ..... 290B-Is
43 ..... 290B-Is
51 ..... 290B-Is

STRATFORD RADIO CO.

38 ..... See Balkeit—Model 38
48 ..... See Balkeit—Model 48
59 ..... See Balkeit—Model 59

STROMBERG-CARLSON TELEPHONE MFG. CO.

D-968 ..... 292-I
Police Radio 659-III, 660-III, 661-III
1A 435-II
1B 298-I
10 ..... 432-II, 433-II, 311-III, 321-III, 335-III
11 ..... 432-II, 433-II, 434-II, 311-III, 321-III, 335-III
12 ..... 300B-Is, 335-III
14 ..... 300A-Is, B-Is, 335-III
16 ..... 430-II, 431-II
19 ..... 429-II, 334-III
20 ..... 429-II, 334-III
22 ..... 428-II, 331-III
25 ..... 427-II, 327-III
26 ..... 427-II, 327-III
27 ..... 434A-IIs, B-IIs
29 ..... 434C-IIs, D-IIs, 310-O-IIs
33 Auto Set 848-V
33A Auto Set 849-V
37 ..... 850-V
38 ..... 655-III, 656-III, 657-III, 658-III
39 ..... 655-III, 656-III, 657-III, 658-III
40 ..... 655-III, 656-III, 657-III, 658-III
41 ..... 655-III, 656-III, 657-III, 658-III
48 ..... 259-IV, 260-IV, 261-IV, 262-IV, 263-IV
49 ..... 259-IV, 260-IV, 261-IV, 262-IV, 263-IV
50 ..... 259-IV, 260-IV, 261-IV, 262-IV, 263-IV
51 ..... 259-IV, 260-IV, 261-IV, 262-IV, 263-IV
52 ..... 851-V
54 ..... 851-V
55 Tel-lek-tor-et 852-V
56 Tel-lek-tor-et 852-V
58—Schematic, Socket Voltages 1022-VI
60 ..... 853-V
61 (AC Set), Schematic, Socket Voltages 1023-VI
61 (AC-DC), Schematic, Socket Voltages 1024-VI
62—Schematic, Socket Voltages, Trimmers 1025-VI
63—Schematic, Socket Voltages, Trimmers 1025-VI
64 ..... 854-V
65—Schematic, Socket Voltages 1026-VI
66—Schematic, Socket Voltages 1026-VI
67—Schematic, Socket Voltages 1026-VI
68 All-Wave 855-V
69 All-Wave 856-V
70—Schematic 1027-VI
70—Wiring Diagram 1028-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

STROMBERG-CARLSON (cont'd)

70—Socket Voltages, Trimmers 1029-VI
70—Alignment 1030-VI
70—Service Notes on "Te-lektor" 1031-VI
70—Service Notes on "Te-lektor" (cont'd) 1032-VI
70—Service Notes on "Te-lektor" (cont'd) 1033-VI
70—Service Notes on "Te-lektor" (cont'd) 1034-VI
70—Service Notes on "Te-lektor" (cont'd) 1035-VI
70—Service Notes on "Te-lektor" (cont'd) 1036-VI
70—Service Notes on "Te-lektor" (concluded) 1037-VI
72—Schematic 1027-VI
72—Wiring Diagram 1028-VI
72—Socket Voltages 1029-VI
72—Alignment 1030-VI
72—Service Notes on "Te-lektor" 1031-VI
72—Service Notes on "Te-lektor" (cont'd) 1032-VI
72—Service Notes on "Te-lektor" (cont'd) 1033-VI
72—Service Notes on "Te-lektor" (cont'd) 1034-VI
72—Service Notes on "Te-lektor" (cont'd) 1035-VI
72—Service Notes on "Te-lektor" (cont'd) 1036-VI
72—Service Notes on "Te-lektor" (concluded) 1037-VI
74—Schematic 1027-VI
74—Wiring Diagram 1028-VI
74—Socket Voltages 1029-VI
74—Alignment 1030-VI
74—Service Notes on "Te-lektor" 1031-VI
74—Service Notes on "Te-lektor" (cont'd) 1032-VI
74—Service Notes on "Te-lektor" (cont'd) 1033-VI
74—Service Notes on "Te-lektor" (cont'd) 1034-VI
74—Service Notes on "Te-lektor" (cont'd) 1035-VI
74—Service Notes on "Te-lektor" (cont'd) 1036-VI
74—Service Notes on "Te-lektor" (concluded) 1037-VI
80—Schematic, Socket Voltages, Trimmers 1038-VI
82—Schematic, Socket Voltages, Trimmers 1039-VI
83—Schematic, Socket Voltages, Trimmers 1040-VI
84—Schematic, Socket Voltages, Trimmers 1041-VI
115—Schematic, Socket Voltages, Trimmers 1042-VI
125—Schematic, Parts List 1043-VI
125—Wiring Diagram 1044-VI
125—Alignment, Socket Voltages, Trimmers 1045-VI
130 Series—Schematic, Parts List 1046-VI
130 Series—Chassis Layout, Socket Voltages, Trimmers 1047-VI
130 Series—Wiring Diagram 1048-VI
130 Series—Alignment, Socket Voltages 1049-VI
403 ..... 296-I
403A 298-I
403AA 296-I
403B 296-I
404RA 296-I
404RAC 296-I
501 ..... 299-I, 334-III
502 ..... 299-I, 334-III
523-DC 292-I, 298-III
524-DC 292-I
601 ..... 297-I, 334-III
602 ..... 297-I, 334-III
633 ..... 300-I, 334-III
634 ..... 300-I, 334-III
635 ..... 292-I, 296-III, 298-III, 300-III, 334-III
635-AC 310-III
635-DC 297-I
636 ..... 292-I, 296-III, 300-III, 334-III
638A 300A-Is
638B 300A-Is
638-DC 294-I
641 ..... 293-I, 304-III, 325-III, 334-III
642 ..... 293-I, 304-III, 321-III, 325-III, 334-III
642-AC 311-III
645 ..... 425-II, 426-II
652 ..... 294-I, 325-III, 334-III
654 ..... 294-I, 314-III, 321-III, 335-III
734 ..... 298-III
734B 300-I
744B 299-I
846 ..... 295-I, 304-III, 311-III, 334-III

STUDEBAKER LABORATORIES

31 ..... 436-II
42 ..... 439-II

SUPREME INSTRUMENTS CORP.

AAA-1 ..... 447-II
Ohmmeter 449-II
Tube Checker 449A-IIs
70 Oscillator 449-II
85 Tube Tester 857-V
90 Tester 448-II
333 Set Analyzer 858-V

T

TRANSITONE AUTOMOBILE RADIO CORP.

See Philco Radio & Television Corp.

L. TATRO PRODUCTS CORP.

AK-54 ..... 861-V
AM-54 ..... 861-V
K-54 ..... 862-V
L-54 ..... 863-V
L-74 ..... 864-V
M-54 ..... 862-V
N-54 ..... 863-V
NH-44 ..... 862-V
N-74 ..... 864-V
P-54 ..... 865-V
Governor 864-V
Lieut. Governor 864-V
Mayor 861-V
President 860-V
Recorder 865-V
Senator 861-V
084 ..... 859-V
094 ..... 860-V

TELEPHONE MAINTENANCE CO.

Telmaco P-1 ..... 358-I

TEMPLE CORPORATION

8-60 ..... 301-I, 340-III
8-61 ..... 302-I
8-80 ..... 301-I, 340-III
8-81 ..... 302-I
8-90 ..... 301-I, 340-III
8-91 ..... 302-I

THORDARSON ELECTRIC MFG. CO.

Class B Amplifier 264-IV, 265-IV, 266-IV, 267-IV

TRANSFORMER CORP. OF AMERICA

TC-1—Schematic, Socket Voltages 1050-VI
TC-2—Schematic, Socket Voltages 1050-VI
TC-6—Schematic, Alignment 1051-VI
TC-10—Schematic, Alignment, Socket Voltages 1052-VI
TC-20—Schematic, Socket Voltages, Alignment 1053-VI
TC-21—Schematic, Socket Voltages, Alignment 1053-VI
TC-22—Schematic 1054-VI
TC-23—Schematic 1054-VI
TC-24—Schematic 1054-VI
TC-26—Schematic 1054-VI
TC-27—Schematic 1054-VI
TC-28—Schematic, Alignment, Socket Voltages 1055-VI
TC-29—Schematic, Alignment, Socket Voltages 1055-VI
TC-31—Alignment, Schematic, Parts List 1056-VI
TC-35LW—Schematic 1057-VI
TC-36—Schematic, Alignment 1058-VI
TC-36A—Schematic 1059-VI
TC-36LW—Schematic 1059-VI
TC-37—Schematic, Alignment 1060-VI
TC-37A—Schematic 1061-VI
TC-37LW—Schematic 1061-VI
TC-38—Schematic, Alignment 1062-VI
TC-39—Schematic, Alignment 1063-VI
TC-39A—Schematic 1054-VI
TC-39LW—Schematic 1054-VI
TC-42—Schematic, Alignment 1064-VI
TC-43—Schematic, Alignment 1064-VI
TC-44—Schematic, Alignment 1064-VI
TC-53A—Schematic 1065-VI
TC-60—Schematic, Alignment 1066-VI
TC-65—Schematic, Alignment 1067-VI
TC-66—Schematic 1068-VI
TC-75—Schematic 1069-VI
TC-76—Schematic 1069-VI
25-51 ..... 328-I
25-53 ..... 328-I
25-55 ..... 328-I
25-90 ..... 328A-Is
25-91 ..... 328A-Is
25-94 ..... 458-II, 459-II
25-160 ..... 870-V
25-240 ..... 871-V
25-280 ..... 872-V
40 ..... 456-II, 457-II, 463-II, 329-III
51 ..... 328-I
53 ..... 328-I
55 ..... 328-I
60 ..... 355-I
61 ..... 460-II, 462-II
70 ..... 460-II, 461-II, 462-II
80 ..... 465-II
88 ..... 466-II
84 ..... 662-III, 663-III, 664-III
85 ..... 662-III, 663-III, 664-III
90 ..... 464-II, 328A-Is
91 ..... 328A-Is
91A 328A-Is
92 ..... 467-II
94 ..... 458-II, 459-II
100 ..... 665-III, 666-III, 667-III
120 ..... 668-III
160AVC 182J-IIs
160-AC 870-V
200 Series Short Wave 468A to 468G-IIs
220 ..... 468H to 468P-IIs
240-AC 871-V
260 ..... 669-III, 670-III, 672-III
280 ..... 674-III
280-AC 872-V
300 ..... 268-IV, 269-IV
320 ..... 270-IV
340 ..... 271-IV, 272-IV
360 ..... 273-IV
400 AC-DC 866-V
422 AC-DC 867-V
423 AC-DC 867-V
470 ..... 868-V
480 ..... 869-V

TRAV-LER MFG. CO.

AC Power Pack 332-I
DC Power Pack 332-II
K 452-II
SG-AVC Super 455-II
SG-AC 451-II
SG-DC 455-II
Trav-lette 454-II
6 ..... 322-I
7 ..... 332-I
8 Super 453-II

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TRIPLET ELECTRICAL INSTRUMENT CO.

1125 Tester 873-V
1150 Oscillator 873-V

TROY RADIO MFG. CO.

TR-4—Schematic 1070-VI
TR-4CH—Schematic 1070-VI
TR-68—Auto Radio—Schematic 1071-VI
53 (Chassis 53CH), Schematic 1070-VI
53C (Chassis 53CH), Schematic 1070-VI
75—AC-DC (Chassis 175), Schematic 1070-VI
75C—AC-DC (Chassis 175), Schematic 1070-VI
75 (Battery Set), (Chassis 75B), Schematic 1071-VI
75C (Battery Set), (Chassis 75B), Schematic 1071-VI
75C—AC-DC (Chassis TR-75CH) 1071-VI
75PC—AC (Chassis TR-75CH) 1071-VI
75—AC (Chassis TR-75CH), Schematic 1071-VI
77 (Chassis 77), Schematic 1071-VI
77C (Chassis 77), Schematic 1071-VI
153 (Chassis TR-153), Schematic 1070-VI
153C (Chassis TR-153), Schematic 1070-VI

U

UNITED AIR CLEANER CO.
See Sentinal Radio Corp.

UNITED AMERICAN BOSCH CORP.

Also see American Bosch Magneto Corp.

BAN Edition 2 ..... 90-I
BAN Editions 3 & 4 ..... 90-I
BAN Editions 5 & 6 ..... 90-I
J 333-III
RS 501 ..... 889-V
RS 502 ..... 889-V
T 891-V
"Vibro-Power" 512, 4HHH-IIs
04—Schematic, Socket Voltages, Chassis Layout, Alignment 1072-VI
05—Schematic, Socket Voltages 1073-VI
4 ..... 274-IV, 276-IV
5-AC 90D-Is
10 ..... 274-IV, 275-IV, 276-IV
16 Amborola 86-I, 307-III, 333-III
17 ..... 307-III, 333-III
18 ..... 304-III, 309-III
20-AC 141-II
27 Amboroda Battery 98-I
28 ..... 298-III, 300-III, 303-III, 304-III, 306-III, 309-III, 315-III, 323-III, 343-III
28-AC 89-I
29 ..... 298-III, 300-III, 303-III, 304-III, 309-III, 315-III, 323-III
31 ..... 277-IV, 278-IV
35 Royal Cruiser 87-I
36 ..... 279-IV
36A 874-V
36B 874-V
38-AC 25 Cycles 89-I
40 ..... 281-IV, 282-IV
46-AC 88-I
46 Little Six Battery 86-I
48-AC 60 Cycles 90-I, 298-III
48-DC 298-III
48 ..... 304-III, 307-III, 309-III, 315-III, 320-III, 333-III
49 ..... 304-III
49-AC 25 Cycles 90-I
54-DC 91-I
56 ..... 875-V
57 Battery 86-I
58-AC 90A-Is, 315-III, 320-III
60-AC 90B-Is 90C-II, 90E-II, 315-III, 320-III
61-AC 90E-Is
62-DC 90F-Is
63-DC 90G-Is
66-AC 88-I
66 Battery 88-I
73-AC 140-II
74-AC 140-II
76 Battery 88-I
76L Battery 88-I
80 Auto Receiver 91-I, 141-II, 142-II
84 Auto Receiver 91-I, 141-II, 142-II
87 Battery 86-I
91 ..... 283-IV, 284-IV
96-AC 88-I
96-DC 89-I
100 ..... 285-IV
107-AC 88-I
108 Police Car Radio 876-V
113 Police Car Radio 877-V
113X Police Car Radio 878-V
116-AC 88-I
123 Police Car Radio 877-V
123X Police Car Radio 878-V
126-AC 88-I
136-AC 88-I
140A Car Set 879-V
146-AC 88-I
150 ..... 286-IV
160 Car Set 880-V
166-AC 88-I
176-AC 88-I
200 ..... 287-IV, 288-IV
201 ..... 287-IV, 288-IV
205 ..... 289-IV, 290-IV
226 ..... 881-V
236 ..... 291-IV, 292-IV
237 ..... 291-IV, 292-IV
242 ..... 293-IV, 294-IV
243 ..... 293-IV, 294-IV
250 ..... 295-IV, 296-IV
251 ..... 295-IV, 296-IV
260 ..... 297-IV, 298-IV
261 ..... 297-IV, 298-IV
305A 299-IV, 300-IV
305A Edition 2 ..... 882-V
310A 883-V
312 ..... 301-IV, 302-IV
313 ..... 301-IV, 302-IV
350 ..... 884-V
355 ..... 885-V
360 ..... 886-V
370 ..... 887-V
402 (Editions 1, 2 & 3), Schematic, Chassis Layout, Socket Voltages 1074-VI
420—Schematic, Parts List, Socket Voltages, Chassis Layout 1075-VI
430—Schematic, Socket Voltages 1076-VI
430—Alignment, Parts List 1077-VI
440—Schematic, Socket Voltage, Chassis Layout, Parts List 1078-VI
450—Schematic, Socket Voltages, Parts List 1079-VI
460—Schematic, Parts List 1080-VI
460—Alignment 1081-VI
460—Alignment (cont'd.) Socket Voltages, Under Chassis Layout 1082-VI
460 (Edition 2), Schematic, Socket Voltages 1083-VI
460 (Edition 2), Alignment 1084-VI
460 (Edition 2), Alignment, Under Chassis Layout, Parts List (cont'd) 1085-VI
470—Schematic, Socket Voltages 1086-VI
470—Alignment 1087-VI
470—Under Chassis Layout, Alignment (cont'd.) Parts List 1085-VI
500 Series 888-V
501 ..... 889-V
502 ..... 889-V
503 ..... 890-V
505—Schematic, Socket Voltages 1089-VI
505—Alignment, Chassis Layout 1090-VI
505—Under Chassis Layout, Parts List 1091-VI
510—Schematic, Socket Voltages 1092-VI
510—Alignment, Chassis Layout 1093-VI
510—Under Chassis Layout, Parts List 1094-VI
510E—Schematic, Socket Voltages 1092-VI
510E—Alignment, Chassis Layout 1093-VI
510E—Under Chassis Layout, Parts List 1094-VI
524A—(Editions, 1, 2, 2D, 2G), Car Radio—Schematic, Socket Voltages 1095-VI
524A (Editions 1, 2, 2D, 2G), Car Radio—Alignment, Parts List 1096-VI
536—Car Radio—Schematic, Socket Voltages 1097-VI
536—Car Radio—Service Data, Alignment, Chassis Layout 1098-VI
536—Car Radio—Under Chassis Layout, Parts List 1099-VI
565W—Schematic, Socket Voltages 1100-VI
565W—Alignment, Chassis Layout, Under Chassis Layout, Parts List 1101-VI
565K—Schematic, Socket Voltages 1100-VI
565K—Alignment, Chassis Layout, Under Chassis Layout, Parts List 1101-VI
575F—Schematic, Socket Voltages 1102-VI
575F—Parts List 1103-VI
575Q—Schematic, Socket Voltages 1102-VI
575Q—Parts List 1103-VI
585Y—Schematic, Socket Voltages 1104-VI
585Y—Parts List 1103-VI
585Z—Schematic, Socket Voltages 1104-VI
585Z—Parts List 1103-VI
595M—Schematic, Socket Voltages 1105-VI
595M—Alignment, Under Chassis Layout 1106-VI
595M—Chassis Layout, Under Chassis Layout, Parts List 1107-VI
595P—Schematic, Socket Voltages 1105-VI
595P—Alignment, Under Chassis Layout 1106-VI
595P—Chassis Layout, Under Chassis Layout, Parts List 1107-VI
634A—Car Radio—Schematic, Socket Voltages 1108-VI
634A—Car Radio—Parts List 1109-VI
636—Car Radio—Schematic, Socket Voltages 1110-VI
636—Car Radio—Parts List 1109-VI
637—Car Radio—Schematic, Socket Voltages 1110-VI
637—Car Radio—Parts List 1109-VI
736-A2—Car Radio—Schematic, Socket Voltages 1111-VI
736-A2—Car Radio—Alignment, Parts List 1112-VI
737-A2—Car Radio—Schematic, Socket Voltages 1111-VI
737-A2—Car Radio—Alignment, Parts List, ... 1112-VI
738-A2—Car Radio—Schematic, Socket Voltages 1111-VI
738-A2—Car Radio—Alignment, Parts List 1112-VI
825 Power Pack 89-I

UNITED MOTORS SERVICE CORP.

A1 Delco 903-V
A3 Delco 904-V
B1 Delco 903-V
B3 Delco 904-V
BOP-4036 ..... 905-V
2003 ..... 892-V
2010 ..... 892-V
2035 ..... 893-V
3026 ..... 894-V
4037 ..... 895-V
4038 ..... 896-V
4048 ..... 897-V
4049-32V. DC 898-V
4050-32V. DC 898-V
4051-32V. DC 899-V
4052 AC-DC 900-V
4053 ..... 901-V
4053A 901-V
36441 Auto Set (Chevrolet) 902-V

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UNITED REPRODUCERS CORP.

(See also Gray Electric Co.)

K-70 ..... 303-I, 343-III
Courier 325-III
Kilectron 305-III, 309-III
20 Electrostatic 304-I
45 Arborphone 490-II
65 Electrostatic 489-II
65 Chassis 303-I
868 ..... 491-II
880 ..... 491-II
890 ..... 491-II

U. S. ELECTRIC WORKS

M Genemotor 492-II
T Genemotor 492-II
U Genemotor 492-II

U. S. RADIO & TELEVISION CORP.

3 ..... 488-II
5-A 303-IV, 304-IV, 305-IV, 306-IV
6 Tube Battery 487-IV
7 ..... 488A, B-IIs
7-D 307-IV, 308-IV
8 ..... 483-II, 484-II
9 ..... 309-IV, 310-IV, 311-IV
10 ..... 481-II, 482-II
12 ..... 312-IV, 313-IV
19 ..... 309-IV, 310-IV, 311-IV
20 ..... 478-II
24 ..... 314-IV, 315-IV, 316-IV, 317-IV
25 ..... 318-IV, 319-IV, 320-IV
26 ..... 479-II
26-P 480-II, 329-III
27 ..... 469-II, 470-II, 475-II
27-P Motor Board 468-II
28 ..... 906-V
28-A 906-V
29 ..... 906-V
30 ..... 307-I
31 ..... 471 to 474-II
32 ..... 477-II
33-110V. DC 907-V
36 ..... 96B-Is
37 ..... 473-II
41 ..... 306-I
42 ..... 306-I
43 ..... 306-I
44 ..... 306-I
46 ..... 307-I
46A 307-I
47 ..... 307-I
47A 307-I
48 ..... 305-I
48A 305-I
49 ..... 908-V
55 ..... 908-V
69 ..... 321-IV, 322-IV, 323-IV
80 ..... 486-II, 305-I, 295-III
90 ..... 476-II
99 ..... 434F-IIs
99X 434F-IIs
120 ..... 312-IV, 313-IV
300 ..... 324-IV, 325-IV
400 ..... 314-IV, 315-IV, 316-IV, 317-IV
500 ..... 318-IV, 319-IV, 320-IV
502 ..... 303-IV, 304-IV, 305-IV, 306-IV
507 ..... 326-IV, 327-IV
700 ..... 307-IV, 308-IV
900 ..... 309-IV, 310-IV, 311-IV
902 ..... 309-IV, 310-IV, 311-IV
906 ..... 321-IV, 322-IV, 323-IV
1006 Class B 909-V
1007 Class B 909-V
1009 ..... 910-V
1200 ..... 312-IV, 313-IV
3040 ..... 326-IV, 327-IV
3056 ..... 326-IV, 327-IV
3070 ..... 910-V

UTAH PRODUCTS CO.

400A Series 911-V
400B Tuner Series 912-V
400B Amplifier Series 913-V

W

WEBSTER ELECTRIC CO.

B-37-50 ..... 350B-Is
35TA 396-II
6005 ..... 350B-Is
6009 ..... 350B-Is
6013 ..... 496-II
6025-JD 350A-Is
6030-JE 350B-Is

WELLS GARDNER & CO.

See also Gulbransen Co. and Montgomery-Ward & Co.

C, AC-9 ..... 503-II, 504-II
ODM Series—Schematic 1113-VI
ODM Series—Service Data, Socket Voltages, Chassis Layout, Trimmers 1114-VI
00A 914-V
00B 915-V
0C 916-V
02A 917-V
02AA 917-V
05A 328-V
05AA 918-V
05BA 919-V
06A 920-V
06W 921-V
07A Series 922-V
022 ..... 329-IV
052 ..... 330-IV
062 ..... 510A-IIs
073 ..... 923-V
092 ..... 331-IV
2B Series 924-V
2CM Series—Schematic 1115-VI
5 Tube DC 509-II, 510-II
5B Series 925-V
5D Series—Schematic, Socket Voltages, Chassis Layout, Trimmers 1116-VI
5G Series—Schematic 1117-VI
5G Series—Alignment, Socket Voltages, Battery Connections 1118-VI
6B Series—Schematic, Chassis Layout, Service Data 1119-VI
6D Series,—Schematic 1120-VI
6D Series—Service Data, Chassis Layout, Socket Voltages 1121-VI
6F Series—Schematic (R. F. Section) 1122-VI
6F Series—Schematic (A. F. Section) 1123-VI
6F Series—Parts List 1124-VI
6F Series—Service Data, Socket Voltages 1125-VI
6N Series—Schematic 1126-VI
6N Series—Service Data, Chassis Layout, Socket Voltages 1127-VI
6R Series—Schematic 1128-VI
6S Series—Schematic 1129-VI
6U Series 926-V
7C Series 927-V
7E Series—Schematic 1130-VI
7E Series—Service Data, Chassis Layout, Socket Voltages 1131-VI
7GM Series—Schematic 1132-VI
7GM Series—Service Data, Chassis Layout, Socket Voltages 1133-VI
7H Series—Schematic 1134-VI
7J Series—Schematic 1135-VI
7J Series—Service Data, Socket Voltages, Chassis Layout, Phonograph Connections 1136-VI
7K Series—Schematic 1137-VI
7K Series—Service Data, Socket Voltages Chassis Layout 1138-VI
8T-AC 497-II
9B Series 928-V
9 in Line 197-I
9C Series—Schematic 1139-VI
9C Series—Service Data, Socket Voltages, Chassis Layout 1140-VI
10 ..... 501-II, 502-II
20 ..... 332-IV, 333-IV
40 ..... 334-IV, 335-IV
40-A 334-IV, 335-IV
50 ..... 336-IV, 337-IV
60 ..... 505-II, 506-II, 507-II
63 ..... 505-II, 506-II, 507-II
70 Series 929-V
80 ..... 508-II
80-A 498-II, 499-II, 500-II
92 ..... 338-IV
93 ..... 338-IV
332 ..... 339-IV
352 ..... 340-IV
502 ..... 341-IV
572 ..... 342-IV
872 ..... 343-IV

WESTINGHOUSE ELECTRIC & MFG. CO.

WR-4 ..... 511-II, 512-II, 513-II
WR-5 ..... 266A-Is
WR-6 ..... 266D-Is
WR-6-R ..... 526 to 529-II
WR-7 ..... 266B-Is
WR-7-R ..... 526 to 529-II
WR-8 ..... 515-II, 517-II, 266H-Is
WR-8-R 514-II, 518-II 519-II, 266H-Is
WR-10 ..... 521-II, 522-II, 523-II, 266G-Is
WR-10-A 520-II
WR-14 ..... 525-II
WR-15 ..... 524-II
WR-20 ..... 932-V
WR-21—Schematic 1141-VI
WR-21—Alignment, Service Data 1142-VI
WR-22 ..... 933-V
WR-23 ..... 934-V
WR-24 ..... 934-V
WR-25 Auto Set 935-V
WR-28—Schematic, Socket Voltages, Parts List 1143-VI
WR-29—Schematic, Socket Voltages, Parts List 1143-VI
WR-30—Schematic, Socket Voltages 1144-VI
WR-100—Schematic, Socket Voltages, Parts List 1145-VI
WR-101—Schematic, Parts List 1146-VI
WR-203—Schematic, Parts List 1147-VI
WR-204—Schematic, Socket Voltages 1148-VI
WR-204—Alignment, Service Notes 1149-VI
WR-204—Chassis Layout, Under Chassis Layout, Parts List 1150-VI
WR-205—Schematic, Socket Voltages 1151-VI
WR-205—Alignment 1152-VI
WR-205—Chassis Layout, Under Chassis Layout, Parts List 1153-VI
WR-208—Schematic, Parts List, Socket Voltages 1154-VI
WR-303—Schematic, Parts List 1147-VI
WR-304—Schematic, Socket Voltages 1148-VI
WR-304—Alignment, Service Notes 1149-VI
WR-304—Chassis Layout, Under Chassis Layout, Parts List 1150-VI
WR-305—Schematic, Socket Voltages 1151-VI
WR-305—Alignment 1152-VI
WR-305—Chassis Layout, Under Chassis Layout, Parts List 1153-VI
WR-306—Schematic, Socket Voltages 1155-VI
WR-306—Alignment, Parts List 1156-VI
WR-306—Chassis Layout, Under Chassis Layout, Parts List (concluded) 1157-VI
WR-500—Auto Set—Schematic, Socket Voltages 1158-VI
WR-500—Car Set—Alignment. Chassis Layout, Service Data, Parts List 1159-VI
WR-502—Auto Radio—Schematic, Socket Voltages 1160-VI
WR-503—Auto Set—Schematic, Socket Voltages 1161-VI

WESTON ELECTRICAL INSTRUMENT CORP.

See also Jewell Inst. Co.

Adapters for Weston and Jewell Analyzers 232J-IIs 232K-IIs, 232L-IIs
Test Panel 449B-IIs
209 Tube Checker 936-V

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WESTON INST. (cont'd) (cont'd)

214 Tube Checker (Jewell) 937-V
444 Set Analyzer (Jewell) 938-V
533 Tube Checker (Jewell) 939-V
534 Tube Checker (Jewell) 940-V
538 Tube Checker (Jewell) 941-V
560 Oscillator (Jewell) 942-V
565 Test Set 943-V
566 (Type 3) Set Tester 944-V
660 (Type 3) Set Analyzer 945-V

WHOLESALE RADIO SERVICE CO., Inc.

VA 344-IV
Mighty Atom 535-II
10 531-II, 532-II
20 533-II, 534-II
40, 40A 534A, B, C, D-IIs

WEXTARK RADIO STORES

Knight 8-9 324B-Is
Knight 6 Tube DC 301-III

WILCO RADIO CO.

See Brunswick Radio Corp.

WILCOX-GAY CORP.

2T5 947-V
2U7 947-V
2VA7 947-V
2VB7 947-V
3D5 948-V
3F7 949-V
3J5 950-V
3K5 950-V
3KD5 950-V
3P6 951-V
3PA6 951-V
3PB8 952-V
3R6 953-V
3PB8 952-V
3R6 953-V
3S5 954-V
3SA5 954-V
3T6 955-V
3TA6 955-V
3TB8 956-V
4B6 957-V

WILCOX LABORATORIES Inc.

6 530-II

WILLARD STORAGE BATTERY CO.

"A" Units:
3262 304A-Is
3280 304A-Is
3290 304A-Is
3390 304A-Is
"B" Units:
3095 304A-Is
3310 304A-Is
4095 304A-Is
4310 304A-Is
"A-B" Units:
3301 304B-Is
4301 304B-Is
6301 304B-Is

RUDOLPH WURLITZER MFG. CO.

See also All-American Mohawk Corp.

A-60 960-V
B 536-II
B-6 961-V
B-80 345-IV
B-1930-31 346-IV
C-4 962-V
DC-7 347-IV
DC-65 348-IV
M-4 962-V
P-5 963-V
S-40 964-V
S-50 349-IV
S-63 350-IV
SA-5 965-V
SA-6 966-V
SA-65 351-V
SA-90 352-IV
SA-91 353-IV
SA-91A 967-V
SA-120 968-V
SA-133 969-V
SA-130 354-IV
SU-5 970-V
SW-80 355-IV
SW-88 971-V
U-50 356-IV
U-500 357-IV
450 958-V
460 959-V

Z

ZANEY GILL CO.

Vitatone Model 34 495B-IIs

ZENITH RADIO CORPORATION

A, B, C, D 576K-IIs
AH-CH-RH-No. 3A 688-III, 690-III, 324-III
BH-LHB 576N-IIs
ZE-3 Power Supply 312-I
ZE-4 312-I
ZE-5 Power Unit 309-I
ZE-6 Filter Unit 578-II
ZE-7 Power Supply 568-II
ZE-8 Filter Unit 566-II
ZE-8P Filter Unit 566-II
ZE-9 Power Supply 568-II
ZE-10 Power Supply 309-I
ZE-11 Power Supply 314-I
ZE-13 Power Supply 314-I
ZE-14 Power Supply 314-I
ZE-15 Power Supply 314-I
ZE-17 Power Supply 317-I
ZE-18 Power Supply 317-I
ZE-19 Power Unit 564-II
ZE-20 Audio Unit 564-II
ZE-50 Power Unit 576-II
Model VII 566-II
Record Changer 578-II
Zenette 5 Tube 574-II
Zenette 6 Tube 574-II 632-III, 633-III
4B-106 (Chassis 5406) Schematic, Socket Voltages 1162-VI
4B-131 (Chassis 5406) Schematic, Socket Voltages 1162-VI
4B-132 (Chassis 5406) Schematic, Socket Voltages 1162-VI
4P-26 (Chassis 5401) Schematic, Alignment, Socket Voltages, Chassis Layout 1163-VI
4P-51 (Chassis 5401) Schematic, Alignment, Socket Voltages, Chassis Layout 1163-VI
4-R 309-I
4T-26 (Chassis 5401) Alignment, Schematic, Socket Voltages, Chassis Layout 1163-VI
4T-26 (Chassis 5403) Schematic, Alignment, Socket Voltages, Chassis Layout 1164-VI
4T-51 (Chassis 5401) Schematic, Alignment, Socket Voltages, Chassis Layout 1163-VI
4T-51 Revised (Chassis 5403) Schematic, Alignment, Socket Voltages, Chassis Layout 1164-VI
4V-31 (Chassis 5405) Schematic, Alignment, Socket Voltages, Chassis Layout 1165-VI
4V-59 (Chassis 5405) Schematic, Alignment, Socket Voltages, Chassis Layout 1165-VI
5M-90 (Chassis 5510) Auto Set, Schematic 1166-VI
5S-29 (Chassis 5513-5513A) Schematic, Chassis Layout 1167-VI
5S-56 (Chassis 5513-5513A) Schematic, Chassis. Layout 1167-VI
5S-119 (Chassis 5516) Schematic, Socket Voltages 1168-VI
5S-126 (Chassis 5516) Schematic, Socket Voltages 1168-VI
5S-127 (Chassis 5516) Schematic, Socket Voltages 1168-VI
5S-150 (Chassis 5516) Schematic, Socket Voltages 1168-VI
5S-151 (Chassis 5516) Schematic, Socket Voltages 1168-VI
5S-161 (Chassis 5516) Schematic, Socket Voltages 1168-VI
6B-107 (Chassis 5635) Schematic, Socket Voltages 1169-VI
6B-129 (Chassis 5635) Schematic, Socket Voltages 1169-VI
6B-164 (Chassis 5635) Schematic, Socket Voltages 1169-VI
6D-116 (Chassis 5633) Schematic, Socket Voltages 1170-VI
6D-117 (Chassis 5633) Schematic, Socket Voltages 1170-VI
6D-118 (Chassis 5633) Schematic, Socket Voltages 1170-VI
6-EP 570-II
6M-90D (Chassis 5630) Auto Set—Schematic 1171-VI
6M-90D—Alignment, Socket Voltages 1173-VI
6M-90S—Schematic 1171-VI
6M-90S—Alignment, Socket Voltages 1173-VI
6M-91D (Chassis 5631) Auto Set—Schematic 1172-VI
6M-91D—Alignment, Socket Voltages 1173-VI
6M-91S (Chassis 5631) Auto Set—Schematic 1172-VI
6M-91S—Alignment, Socket Voltages 1173-VI
6M-92 (Chassis 5632) Auto Set—Schematic 1174-VI
6M-92—Alignment, Socket Voltages 1173-VI
6S-27 (Chassis 5619) Schematic, Alignment, Socket Voltages Chassis Layout 1175-VI
6S-52 (Chassis 5619) Schematic, Alignment, Socket Voltages, Chassis Layout 1175-VI
6S-128 (Chassis 5634) Schematic, Socket Voltages 1176-VI
6S-137 (Chassis 5634) Schematic, Socket Voltages 1176-VI
6S-147 (Chassis 5634) Schematic, Socket Voltages 1176-VI
6S-152 (Chassis 5634) Schematic, Socket Voltages 1176-VI
6S-157 (Chassis 5634) Schematic, Socket Voltages 1176-VI
6V-27 (Chassis 5621) Schematic, Alignment, Socket Voltages, Chassis Layout 1177-VI
6V-62 (Chassis 5621) Schematic, Alignment, Socket Voltages, Chassis Layout 1177-VI
7 Auto Set 972-V
7D-119 (Chassis 5707) Schematic 1179-VI
7D-126 (Chassis 5707) Schematic 1179-VI
7D-127 (Chassis 5707) Schematic 1179-VI
7D-138 (Chassis 5707) Schematic 1179-VI
7D-148 (Chassis 5707) Schematic 1179-VI
7D-151 (Chassis 5707) Schematic 1179-VI
7D-162 (Chassis 5707) Schematic 1179-VI
7D-167 (Chassis 5707) Schematic 1179-VI
7M-91D (Chassis 5706) Auto Set—Schematic 1180-VI
7M-91D—Alignment, Socket Voltages 1173-VI
7M-91S (Chassis 5706) Auto Set—Schematic 1180-VI
7M-91S—Alignment, Socket Voltages 1173-VI
7S-28 (Chassis 5704) Schematic, Alignment, Socket Voltages, Chassis Layout 1178-VI
7S-30 (Chassis 5704) Schematic, Alignment, Socket Voltages, Chassis Layout 1178-VI

PLEASE NOTE: To differentiate between the various volumes, a Roman numeral follows the page number of each set listed. Thus the numeral I refers to the 1931 issue, II refers to the 1932 issue, etc. The small "s" following some of the Roman numerals specifies that the particular page is one of the supplements of the 1931 or 1932 Manuals. Plain numbers shown on pages are complete diagrams. Underscored page numbers represent other additional servicing data. For instance, Atwater Kent Mfg. Co. . . . Model 35 . . . 99-I is main diagram in Vol. I; 342-III which is underscored is additional data in Volume III.

ZENITH RADIO (cont'd)

7S-53 (Chassis 5704) Schematic, Alignment, Socket Voltages, Chassis Layout....1178-VI
8S-129 (Chassis 5801) Schematic....1181-VI
8S-154 (Chassis 5801) Schematic....1181-VI
9S-30 (Chassis 5903) Schematic, Chassis Layout....1182-VI
9S-54 (Chassis 5903) Schematic, Chassis Layout....1182-VI
9S-55 (Chassis 5903) Schematic, Chassis Layout....1182-VI
10....572-II
10-AC....313-III, 315-III, 316-III
11....572-II, 308-I, 315-III, 316-III
11E....308-I, 295-III, 317-III
12....572-II, 308-I, 315-III, 316-III
12L-57 (Chassis 1202-1202A) Schematic....1183-VI
12L-57 (Chassis 1202-1202A) Socket Voltages, Chassis Layout....1184-VI
12L-57 (Chassis 1202-1202A) Service Data, Alignment....1185-VI
12L-58 (Chassis 1202-1202A) Schematic....1183-VI
12L-58 (Chassis 1202-1202A) Socket Voltages, Chassis Layout....1184-VI
12L-58 (Chassis 1202-1202A) Service Data, Alignment....1185-VI
14....308-I
14E....308-I
15....318-I
15E....318-I, 295-III, 304-III
15EP....318-I
16....318-I
16E....318-I, 304-III, 347-III
16EP....318-I, 304-III
18....295-III
27....311-I
30....295-III
31 Battery....311-I
32 Battery....311-I
33....312-I
33X....310-I
34....312-I
34P....310-I
35....312-I
35A....312-I
35P....313-I
35PX....316-I
37A....313-I
39....315-I
39A....315-I, 304-III
40A....315-I
41....319-I, 295-III
42....318-I, 300-III, 306-III, 307-III, 313-III
50....295-III, 300-III, 302-III, 303-III, 304-III, 305-III, 308-III, 323-III
52....320-I, 300-III, 310-III, 329-III
53....320-I
54....320-I
55....320-I
60....317-I
61....317-I
62....317-I
64....317-I
67....317-I
70....321-I
71....321-I
72....321-I
73....321-I
77....321-I
80....576-II, 320-A, B-Is
91....676-III, 678-III, 680-III, 682-III, 684-III, 686-III, 576A to I-IIs
92....676-III, 678-III, 680-III, 682-III, 684-III, 686-III, 576A to I-IIs
102....572-II
103, No. 5A....576Q-IIs 576R-IIs, 576S-IIs, 576T-IIs
112....572-II
122....572-II
210....576O, P-IIs
215....358-IV, 359-IV, 360-IV
216....358-IV, 359-IV, 360-IV
220....358-IV, 359-IV, 360-IV
225....358-IV, 359-IV, 360-IV
230....361-IV, 362-IV, 363-IV
240....361-IV, 362-IV, 363-IV
244....361-IV, 362-IV, 363-IV
245....361-IV, 362-IV, 363-IV
250....364-IV, 365-IV, 366-IV
260....364-IV, 365-IV, 366-IV
272....364-IV, 365-IV, 366-IV
333....316-I
342....312-I
342P....310-I
352....312-I
352A....312-I
352AP....313-I
352APX....316-I
352P....313-I
352PX....316-I
353A....316-I
362....312-I
362X....310-I
392....315-I
392A....315-I
410....367-IV, 368-IV, 369-IV, 370-IV
411....367-IV, 368-IV, 369-IV, 370-IV
412....319-I
420....367-IV
420....367-IV, 368-IV, 369-IV, 370-IV
422....318-I
430....371-IV
440....371-IV
460....372-IV, 373-IV
462....973-V
474....979-V
475....974-V
476....980-V
476A....980-V
476B....981-V
500....374-IV, 375-IV, 376-IV
501....374-IV, 375-IV, 376-IV
503....374-IV, 375-IV, 376-IV
514....374-IV, 375-IV, 376-IV
515....374-IV, 375-IV, 376-IV
516....374-IV, 375-IV, 376-IV
522....320-I
532....320-I
542....320-I
563 DC....975-V
600....374-IV, 375-IV, 376-IV
602....317-I
604....374-IV, 375-IV, 376-IV
606....374-IV, 375-IV, 376-IV
610....374-IV, 375-IV, 376-IV
612....317-I
616....374-IV, 375-IV, 376-IV
618....374-IV, 375-IV, 376-IV
622....317-I
642....317-I
650-HD....976-V
651-HE....976-V
660-TD....976-V
661-TE....976-V
663 (Chassis 5510), Auto Set—Schematic....1186-VI
664 (Chassis 5510), Auto Set—Schematic....1186-VI
2009-C....576M-IIs
2022 (LH, WH, MH)....576J-IIs
2032....980-V
2036....361-IV, 362-IV
2037....374-IV, 375-IV, 376-IV
2042A & B....378-IV, 379-IV
2044....358-IV, 359-IV, 360-IV
2046....380-IV, 382-IV, 384-IV
2052....978-V
2052-A....978-V
2052-B....978-V
2052-C....978-V
2053-B....979-V
2054....974-V
2054-B....974-V
2056....983-V
2056-1....983-V
2057....976-V
2059....981-V
5701....982-V
5702....982-V
5703....982-V
672....317-I
701 AC-DC....977-V
705....978-V
706....978-V
707....978-V
710....377-IV
711....978-V
712....978-V
715....979-V
722....321-I
732....321-I
750....978-V
755....979-V
756....979-V
760....974-V
765....974-V
767....974-V
770....980-V
770-B....981-V
775....980-V
775-B....981-V
780....980-V
825....982-V
827....982-V
829....982-V
870....982-V
2009-C-P (LP)....576L-IIs

"WHAT'S WRONG WITH MY RADIO SET?"

When your customers ask you this question, show them the following chart—which lists the major sources of trouble in faulty radio receivers. Space limitations preclude listing all the detailed causes (short- and open-circuits, off-value components, etc.) of the various troubles here enumerated, which the Service Man must check before he is in position to quote an approximate charge for repairs.

ANTENNA, GROUND, AND LIGHTNING ARRESTER
- NO SHORT-WAVE RECEPTION
- INTERMITTENT RECEPTION
- POOR RECEPTION
- LACK OF VOLUME
- EXCESSIVE NOISE
- FADING

TUBES
- NO RECEPTION
- DISTORTION
- HUM
- OFF-CALIBRATION OF DIAL
- LACK OF SENSITIVITY
- LOSS OF SELECTIVITY
- MICROPHONICS
- INTERMITTENT RECEPTION
- FADING
- POOR A.V.C. ACTION
- NOISY RECEPTION
- CIRCUIT OSCILLATION

REPRODUCER
- DISTORTION
- TINNY SOUNDS
- SCRATCHING AND GRATING
- EXCESSIVE HUM
- INTERMITTENT RECEPTION
- NO RECEPTION
- LOW VOLUME

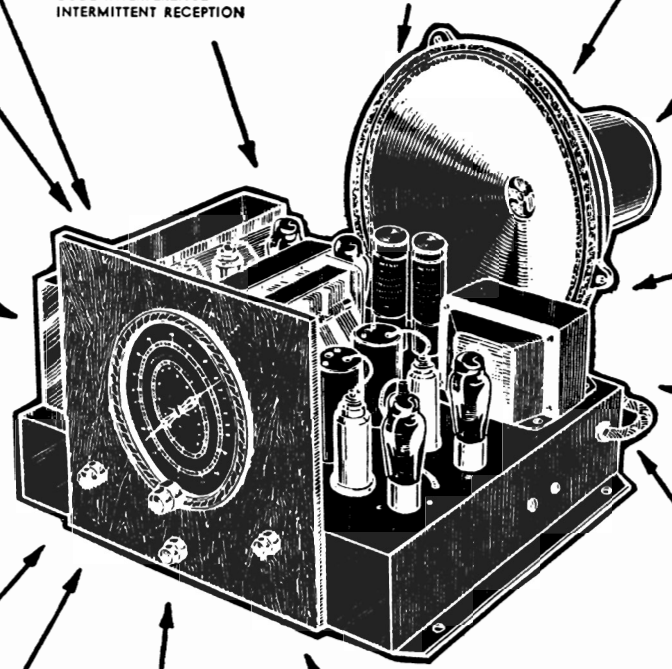
BYPASS CONDENSERS
- CIRCUIT OSCILLATION
- POOR TONE QUALITY
- CROSS-TALK
- INTERMITTENT RECEPTION
- POOR A.V.C. ACTION
- FADING
- LOSS OF VOLUME
- HUM
- EXCESSIVE HISS
- NOISY RECEPTION
- OFF-CALIBRATION OF DIAL
- NO RECEPTION
- SHORT-WAVE DEAD SPOTS

R.F. AND I.F. COILS
- INTERMITTENT RECEPTION
- OFF-CALIBRATION OF DIAL
- POOR SELECTIVITY
- SPOTTY SELECTIVITY
- LACK OF SENSITIVITY
- SPOTTY SENSITIVITY
- POOR FIDELITY
- NO RECEPTION
- FADING
- CROSS-TALK
- CIRCUIT OSCILLATION

I.F. WAVETRAP
- CODE INTERFERENCE
- INTERMITTENT RECEPTION

WIRING OF SET
- NOISY RECEPTION
- EXCESSIVE HUM
- CIRCUIT OSCILLATION
- LACK OF SHORT-WAVE RECEPTION
- NO RECEPTION
- CROSS-TALK

OSCILLATOR SECTION
- LACK OF SENSITIVITY
- EXCESSIVE HISS
- DISTORTION
- ERRATIC OPERATION
- DEAD SPOTS ON SHORT WAVES
- FREQUENCY INSTABILITY
- INTERMITTENT OPERATION



TUNING CONDENSERS
- NOISY RECEPTION
- DEAD SPOTS
- INTERMITTENT RECEPTION
- MICROPHONIC HOWLS
- OFF-CALIBRATION OF DIAL
- FADING

POWER TRANSFORMER
- NO RECEPTION
- INTERMITTENT RECEPTION
- EXCESSIVE NOISE
- EXCESSIVE HUM
- SHORT TUBE LIFE

SHIELDING OF SET AND COMPONENTS
- CIRCUIT OSCILLATION
- MICROPHONICS
- NOISY RECEPTION
- LACK OF SENSITIVITY
- CROSS-TALK
- FADING
- INTERMITTENT RECEPTION

RADIO CABINET
- RESONANCE
- TINNY SOUNDS
- RUMBLES

LINE CORD AND PLUG
- INTERMITTENT RECEPTION
- NO RECEPTION
- NOISY RECEPTION

ALIGNMENT OF STAGES
- LACK OF SENSITIVITY
- SPOTTY SENSITIVITY
- POOR TONE QUALITY
- CIRCUIT OSCILLATION
- CODE INTERFERENCE
- OFF-CALIBRATION OF DIAL
- POOR SELECTIVITY
- SPOTTY SELECTIVITY

WAVE-CHANGE SWITCH
- LOSS OF VOLUME ON SHORT WAVES
- INTERMITTENT OPERATION
- NO RECEPTION
- NOISY RECEPTION
- SHORT-WAVE DEAD SPOTS
- FADING
- LOSS OF VOLUME
- A.V.C. NOT FUNCTIONING

VOLUME AND TONE CONTROLS
- NOISY RECEPTION
- NO CONTROL OF VOLUME
- SUDDEN CHANGE IN VOLUME
- NO CONTROL OF TONE
- SUDDEN CHANGE IN TONE
- INTERMITTENT RECEPTION
- NO RECEPTION
- LOSS OF SENSITIVITY
- CIRCUIT OSCILLATION

HOUSE WIRING
- INTERMITTENT RECEPTION
- NO RECEPTION
- NOISY RECEPTION

A.F. TRANSFORMERS
- NOISY RECEPTION
- NO RECEPTION
- REDUCED VOLUME
- INTERMITTENT RECEPTION
- POOR TONE QUALITY

RESISTORS
- INTERMITTENT RECEPTION
- DISTORTION
- POOR A.V.C. ACTION
- FADING
- CIRCUIT OSCILLATION
- NO RECEPTION
- LOW VOLUME
- SHORT TUBE LIFE

PIPES IN HOUSE
- INTERMITTENT RECEPTION
- NOISY RECEPTION

FILTER CONDENSERS
- EXCESSIVE HUM
- NO RECEPTION
- LOW VOLUME
- INTERMITTENT RECEPTION
- CIRCUIT OSCILLATION

LOCAL MACHINERY AND APPLIANCES
- NOISY RECEPTION
- CLICKS
- SUDDEN CHANGE IN VOLUME

ATMOSPHERIC CONDITIONS
- FADING
- NOISY RECEPTION
- DISTORTION
- LACK OF SHORT-WAVE RECEPTION
- CROSS-TALK

(Original compilation courtesy Radio Today; modifications by Radio-Craft.)

RCA ALL-METAL RADIO TUBE CHARACTERISTICS CHART

TYPE	NAME	BASE	SOCKET CONNECTIONS	DIMENSIONS MAXIMUM OVERALL LENGTH X DIAMETER	CATHODE TYPE	RATING FILAMENT OR HEATER VOLTS	RATING FILAMENT OR HEATER AMPERES	RATING PLATE MAX. VOLTS	RATING SCREEN MAX. VOLTS	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID VOLTS	SCREEN VOLTS	SCREEN MILLIAMP.	PLATE MILLIAMP.	A-C PLATE RESISTANCE OHMS	MUTUAL CONDUCTANCE MICROMHOS	VOLTAGE AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS
6A8	PENTAGRID CONVERTER	SMALL OCTAL 8-PIN	FIG. 8A	3½" x 1 5/16"	HEATER	6.3	0.3	250	100	CONVERTER	250	(−3.0 min.)	100	3.2	3.3	Anode Grid (#2): Supply, 250 max. volts; Current, 4.0 ma. Oscillator-Grid (#1) Resistor, 50000 ohms. Conversion conductance, 500 micromhos.				
6C5	DETECTOR AMPLIFIER TRIODE	SMALL OCTAL 8-PIN	FIG. 8Q	2½" x 1 5/16"	HEATER	6.3	0.3	250	—	CLASS A AMPLIFIER	250	−8.0	—	—	8.0	10000	2000	20	—	—
										BIAS DETECTOR	250	(−17.0 approx.)	—	—	Plate current to be adjusted to 0.2 milliampere with no signal.					
6F5	HIGH-MU TRIODE	SMALL OCTAL 8-PIN	FIG. 8M	3½" x 1 5/16"	HEATER	6.3	0.3	250	—	CLASS A AMPLIFIER	250	−2.0	—	—	0.9	66000	1500	100	—	—
6F6	POWER AMPLIFIER PENTODE	SMALL OCTAL 7-PIN	FIG. 7S	3½" x 1 5/16"	HEATER	6.3	0.7	315	315	CLASS A AMPLIFIER	250	−16.5	250	6.5	34.0	80000	2500	200	7000	3.0
								375	250	PUSH-PULL CLASS AB1 AMPLIFIER	375	−26.0	250	—	Power output value is for 2 tubes at indicated plate-to-plate load.				10000	19.0
6J7	TRIPLE-GRID DETECTOR AMPLIFIER	SMALL OCTAL 7-PIN	FIG. 7R	3½" x 1 5/16"	HEATER	6.3	0.3	250	125	SCREEN-GRID R-F AMPLIFIER	250	−3.0	100	0.5	2.0	exceeds 1.5 meg.	1225	exceeds 1500	—	—
										BIAS DETECTOR	250	−4.3	100	Cathode current 0.43 ma.	—	Plate coupling resistor 500000 ohms. **Grid coupling resistor 250000 ohms.				
6K7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	SMALL OCTAL 7-PIN	FIG. 7R	3½" x 1 5/16"	HEATER	6.3	0.3	250	125	SCREEN-GRID R-F AMPLIFIER	250	(−3.0 min.)	125	2.6	10.5	600000	1650	990	—	—
										MIXER IN SUPERHETERODYNE	250	−10.0	100	—	—	Oscillator peak volts = 7.0				
6L6	BEAM POWER AMPLIFIER	SMALL OCTAL 7-PIN	FIG. 7A	4 5/16" x 1 1/8"	HEATER	6.3	0.9	375	250	SINGLE-TUBE CLASS A1 AMPLIFIER	300	−12.5	200	2.5	48.0	—	—	—	4500	6.5
								400	300	PUSH-PULL CLASS AB1 AMPLIFIER	400	−25	300	—	Power output value is for 2 tubes at indicated plate-to-plate load.				6600	34.0
								400	300	PUSH-PULL CLASS AB1 AMPLIFIER	400	−25	300	—	Power output value is for 2 tubes at indicated plate-to-plate load.				3800	60.0
6L7	PENTAGRID MIXER & AMPLIFIER	SMALL OCTAL 7-PIN	FIG. 7T	3½" x 1 5/16"	HEATER	6.3	0.3	250	150	MIXER IN SUPERHETERODYNE	250	−3.0	100	6.2	2.4	Oscillator Grid (#3) bias, −10 volts. Grid #3 peak swing, 12 volts min. Conversion conductance, 350 micromhos.					
										CLASS A AMPLIFIER	250	−3.0	(100 max.)	5.5	5.3	800000	1100	880	—	—
6N7	TWIN-TRIODE AMPLIFIER	SMALL OCTAL 8-PIN	FIG. 8B	3½" x 1 5/16"	HEATER	6.3	0.8	300	—	CLASS B AMPLIFIER	250 300	0 0	—	—	Power output value is for one tube at stated load, plate-to-plate				8000 10000	8.0 10.0
6Q7	DUPLEX-DIODE HIGH-MU TRIODE	SMALL OCTAL 7-PIN	FIG. 7V	3½" x 1 5/16"	HEATER	6.3	0.3	250	—	TRIODE UNIT AS CLASS A AMPLIFIER	250	−2.2	—	—	0.5	—	Gain per stage = 43			
6R7	DUPLEX-DIODE TRIODE	SMALL OCTAL 7-PIN	FIG. 7V	3½" x 1 5/16"	HEATER	6.3	0.3	250	—	TRIODE UNIT AS CLASS A AMPLIFIER	250	−9	—	—	9.5	8500	1900	16	10000	0.28
25A6	POWER AMPLIFIER PENTODE	SMALL OCTAL 7-PIN	FIG. 7S	3½" x 1 5/16"	HEATER	25.0	0.3	180	135	CLASS A AMPLIFIER	95 180	−15 −20	95 135	4.0 7.5	20.0 38.0	45000 40000	2000 2500	90 100	4500 5000	0.9 2.75

*Grids #3 and #5 are screen. Grid #4 is signal-input control grid.
★For Grid-leak Detection—plate volts 45-100.
ΔGrids #2 and #4 are screen. Grid #1 is signal-input control grid.

◀Grid #3 connected to grid #1.
%Applied through 20000-ohm voltage-dropping resistor.
■Applied through 200000-ohm plate-coupling resistor.

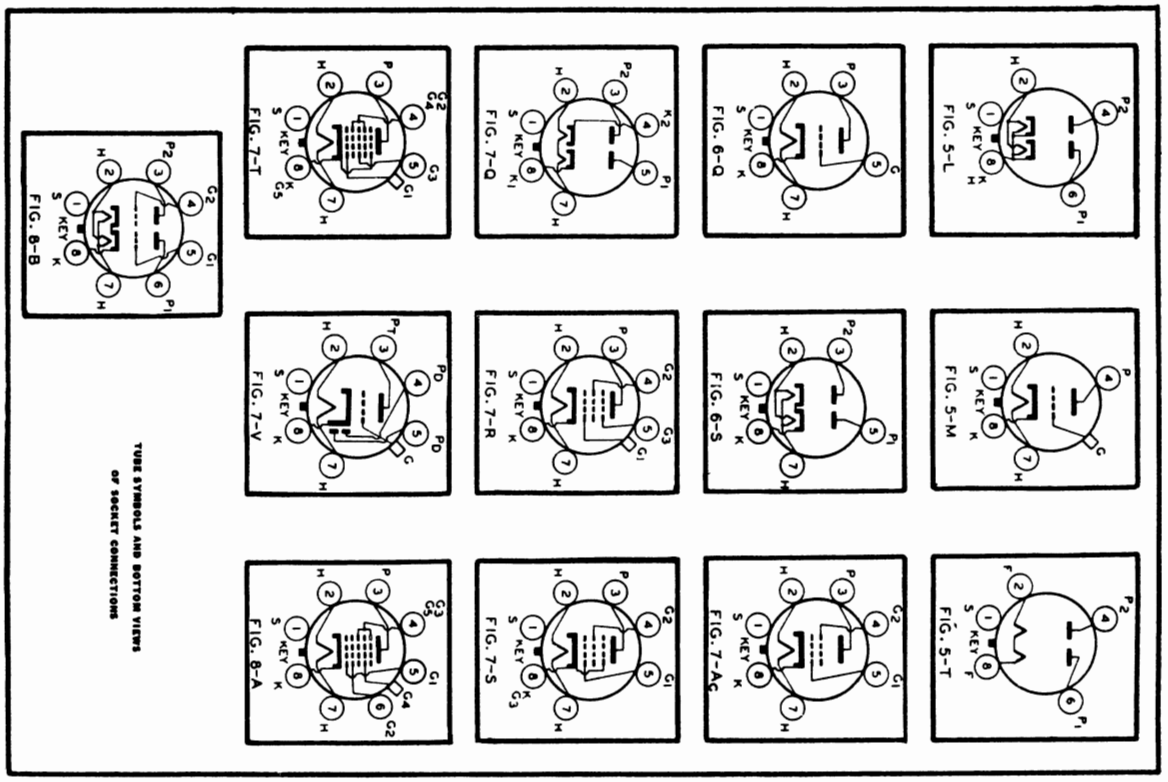
**For grid of following tube.
■Either A.C. or D.C. may be used on heater.

5W4	FULL-WAVE RECTIFIER	SMALL OCTAL 8-PIN	FIG. 8T	3½" x 1 5/16"	FILAMENT	5.0	1.5	—	—	FULL-WAVE RECTIFIER	Maximum A-C Voltage per Plate Maximum D-C Output Current	350 Volts, RMS 110 Milliamperes
5Z4	FULL-WAVE RECTIFIER	SMALL OCTAL 8-PIN	FIG. 8L	3½" x 1 5/16"	HEATER	5.0	2.0	—	—	FULL-WAVE RECTIFIER	Maximum A-C Voltage per Plate Maximum D-C Output Current	400 Volts, RMS 125 Milliamperes
6H6	TWIN DIODE	SMALL OCTAL 7-PIN	FIG. 7Q	1½" x 1 5/16"	HEATER	6.3	0.3	—	—	TWIN-DIODE DETECTOR RECTIFIER	Maximum A-C Voltage per Plate Maximum D-C Output Current	100 Volts, RMS 4 Milliamperes
6X5	FULL-WAVE RECTIFIER	SMALL OCTAL 8-PIN	FIG. 8S	3½" x 1 5/16"	HEATER	6.3	0.6	—	—	FULL-WAVE RECTIFIER	Maximum A-C Voltage per Plate Maximum D-C Output Current	350 Volts, RMS 75 Milliamperes
25Z6	RECTIFIER-DOUBLER	SMALL OCTAL 7-PIN	FIG. 7Q	3½" x 1 5/16"	HEATER	25.0	0.3	—	-	VOLTAGE DOUBLER	Maximum A-C Voltage per Plate Maximum D-C Output Current	125 Volts, RMS 100 Milliamperes
										HALF-WAVE RECTIFIER	Maximum A-C Voltage per Plate* Maximum D-C Output Current per Plate	250 Volts, RMS 85 Milliamperes

*Plate voltages greater than 125 volts RMS require 100-ohm series-plate resistor

All-metal tube types and bottom views of their prongs.

TUBE SYMBOLS AND BOTTOM VIEWS OF SOCKET CONNECTIONS



NOTE: See back of book for complete tube chart

QUESTION COUPONS

OFFICIAL RADIO SERVICE MANUAL 25
Question Coupon
NAME
ADDRESS
THIS COUPON IS GOOD FOR ONE QUESTION.

OFFICIAL RADIO SERVICE MANUAL 24
Question Coupon
NAME
ADDRESS
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OFFICIAL RADIO SERVICE MANUAL 23
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OFFICIAL RADIO SERVICE MANUAL 22
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OFFICIAL RADIO SERVICE MANUAL 5
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OFFICIAL RADIO SERVICE MANUAL 4
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OFFICIAL RADIO SERVICE MANUAL 3
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OFFICIAL RADIO SERVICE MANUAL 2
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OFFICIAL RADIO SERVICE MANUAL 1
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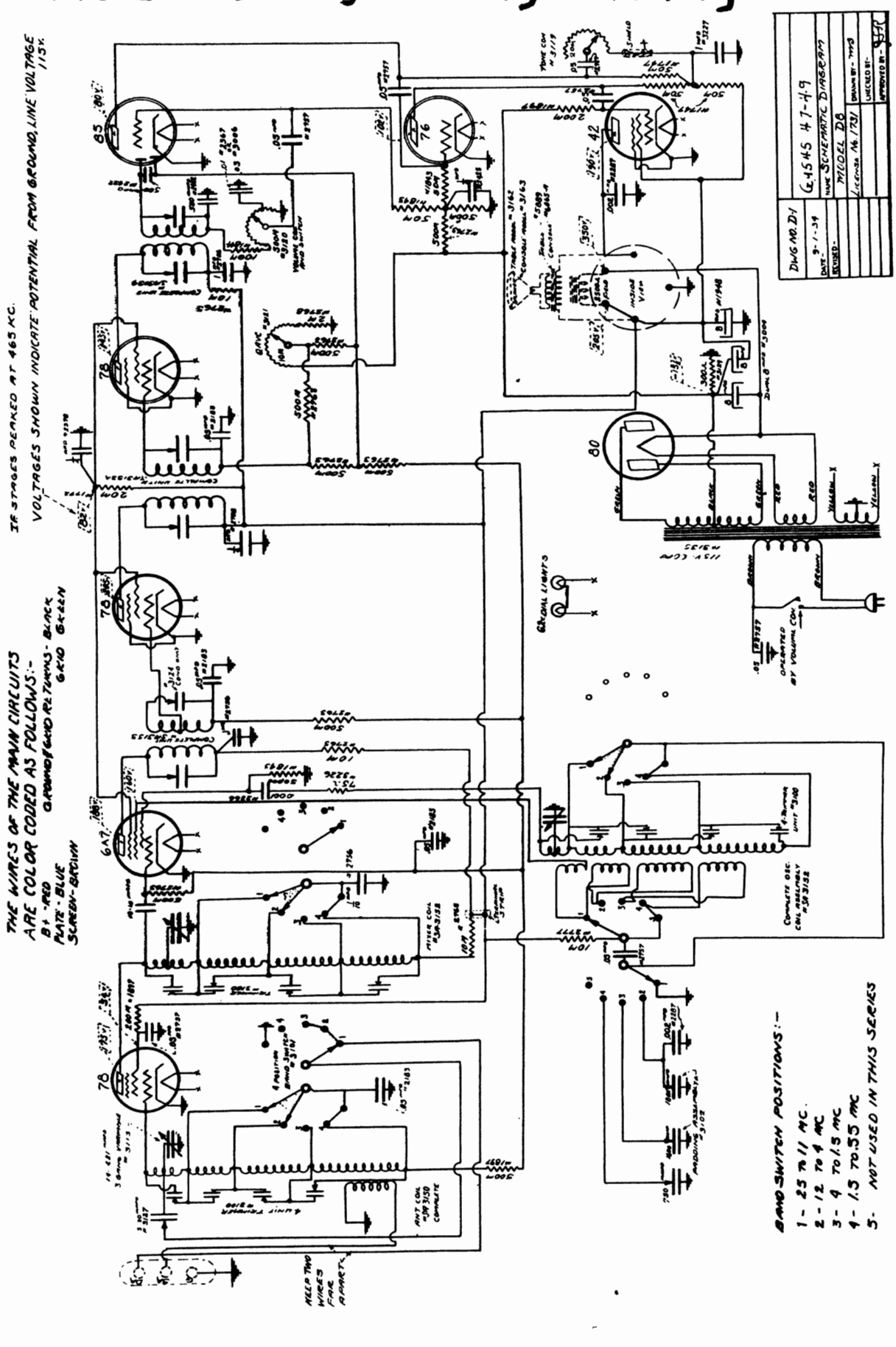
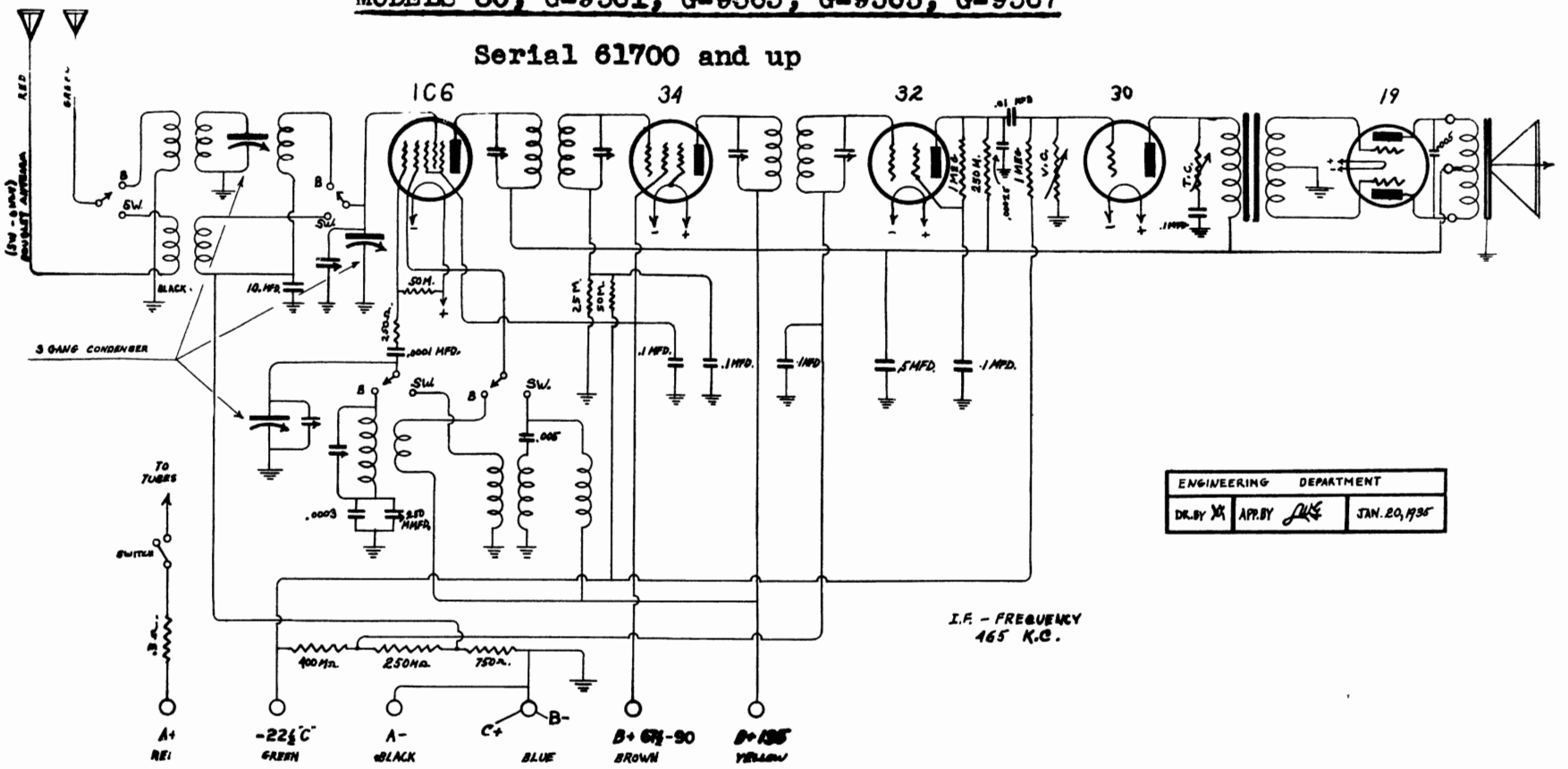
ALLIED RADIO CORP.

Models D-8, G-9547, G-9549, G-9545



MODELS 80, G-9561, G-9563, G-9565, G-9567

Serial 61700 and up



ENGINEERING DEPARTMENT		
DR. BY	APP. BY	JAN. 20, 1935

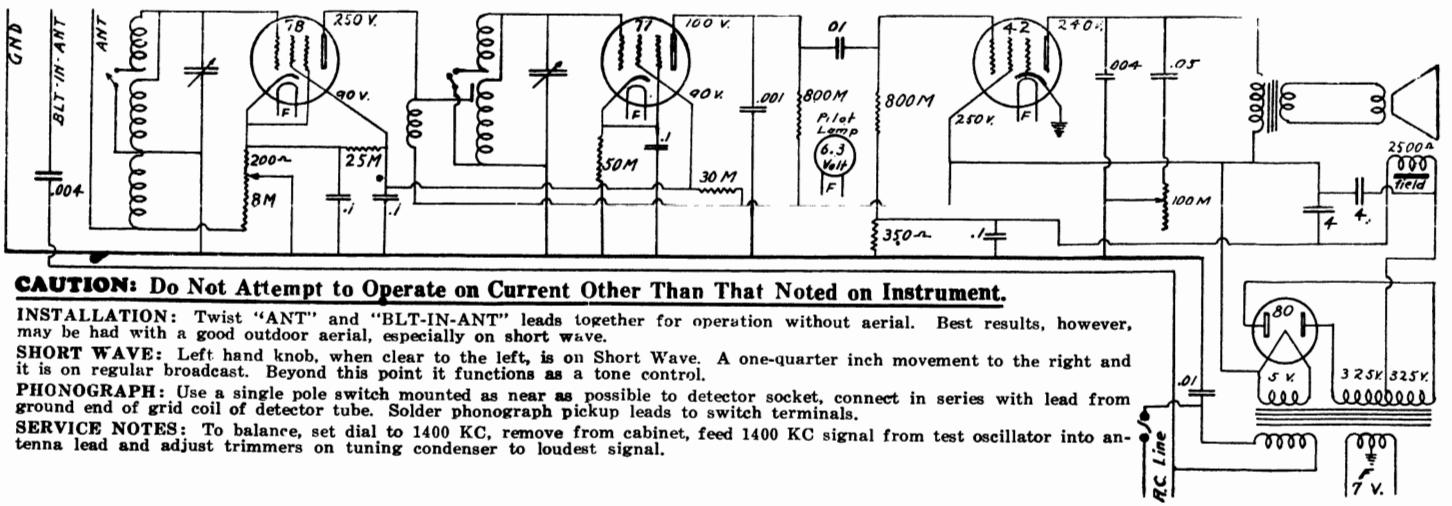
ALLIED RADIO CORP.

MODELS R, G-9551

5-TUBE DUAL-WAVE

RECEIVER

Serial 320001 up



CAUTION: Do Not Attempt to Operate on Current Other Than That Noted on Instrument.

INSTALLATION: Twist "ANT" and "BLT-IN-ANT" leads together for operation without aerial. Best results, however, may be had with a good outdoor aerial, especially on short wave.

SHORT WAVE: Left hand knob, when clear to the left, is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.

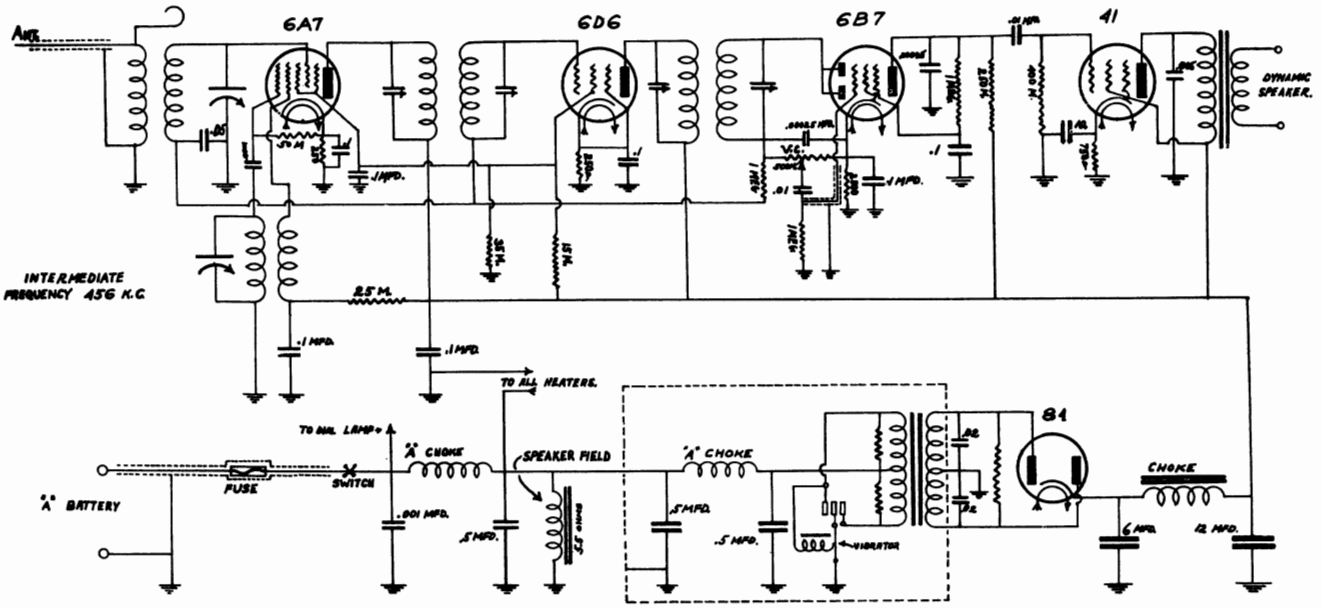
PHONOGRAPH: Use a single pole switch mounted as near as possible to detector socket, connect in series with lead from ground end of grid coil of detector tube. Solder phonograph pickup leads to switch terminals.

SERVICE NOTES: To balance, set dial to 1400 KC, remove from cabinet, feed 1400 KC signal from test oscillator into antenna lead and adjust trimmers on tuning condenser to loudest signal.

ALLIED RADIO CORP.

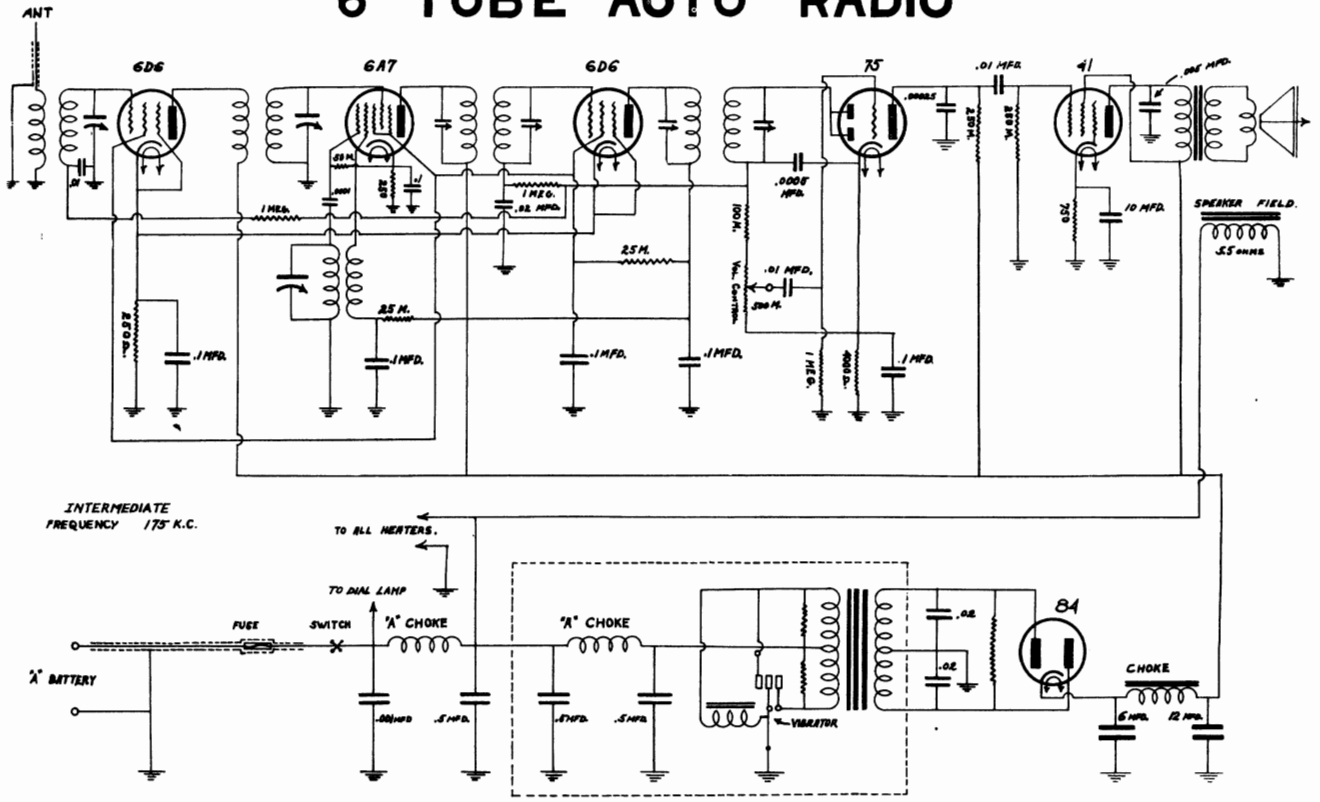
Models 101, G-9515, G-9881, H-9811

5 TUBE AUTO RADIO



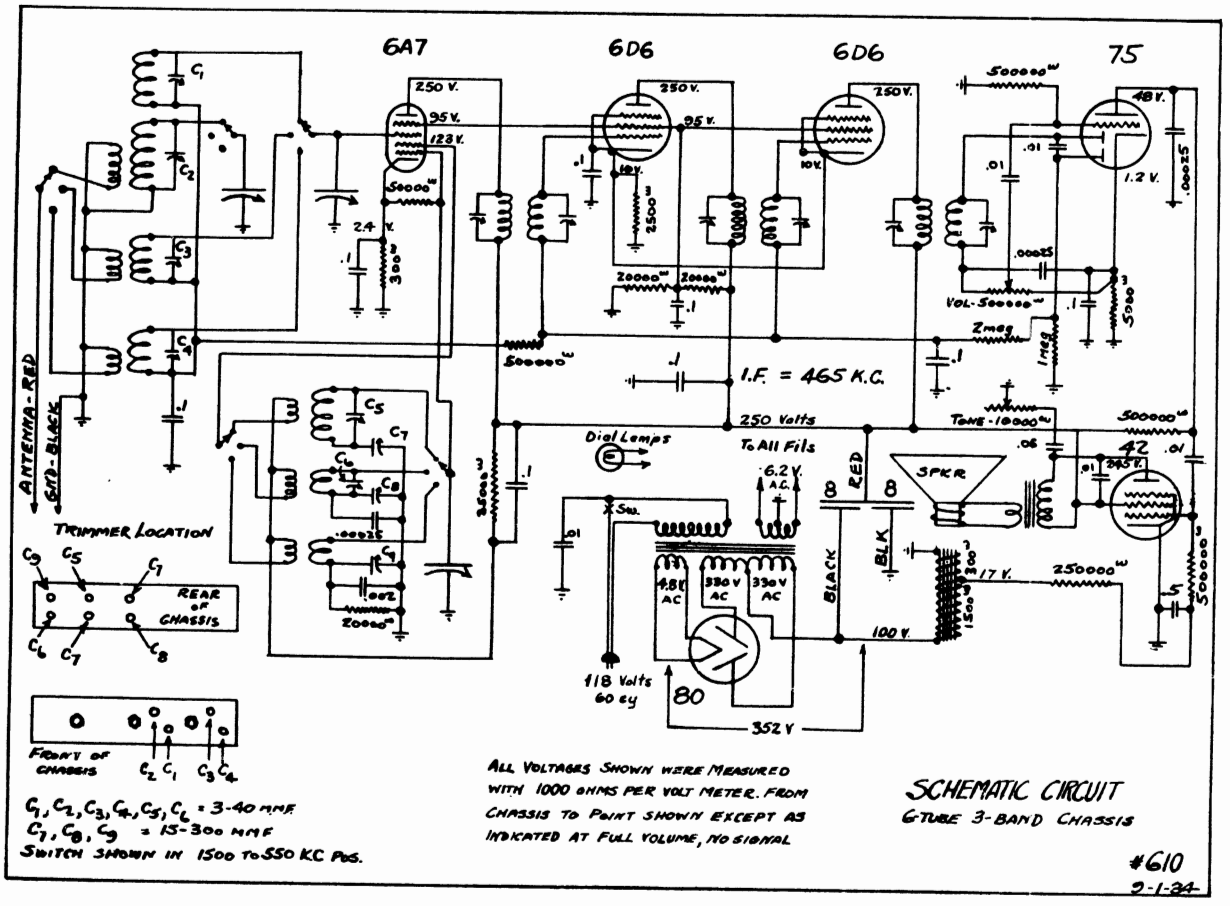
Models 102, G-9517, G-9882, H-9812

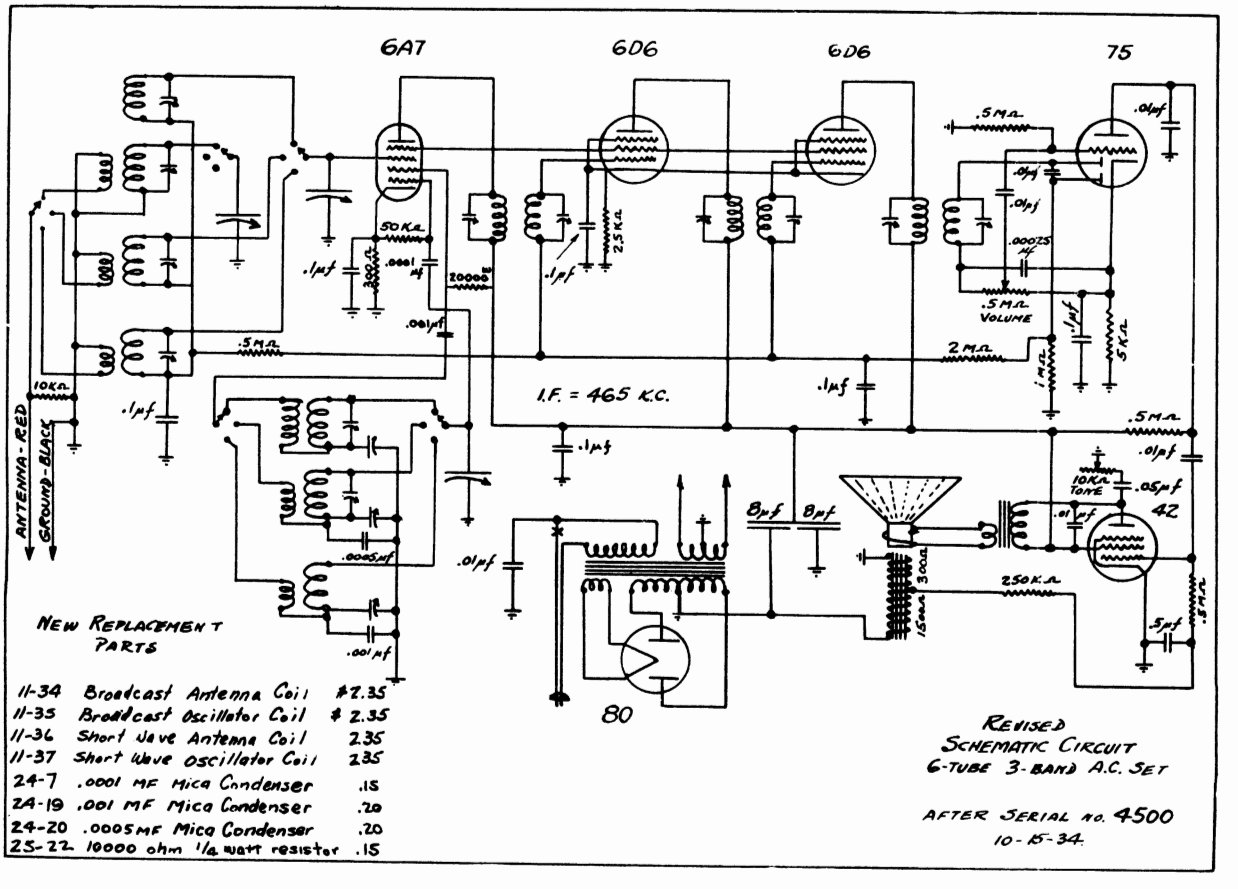
6 TUBE AUTO RADIO



ALLIED RADIO CORP.

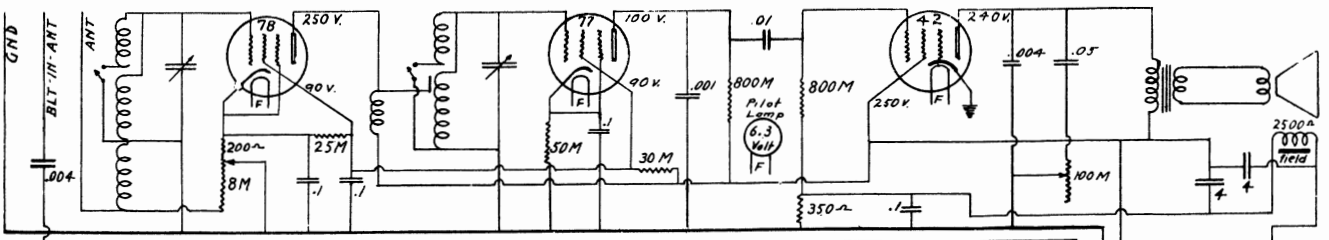
Models 633, G-9533





ALLIED RADIO CORP.

MODEL F-9521 and F-9523



CAUTION: Do Not Attempt to Operate on Current Other Than That Noted on Instrument.

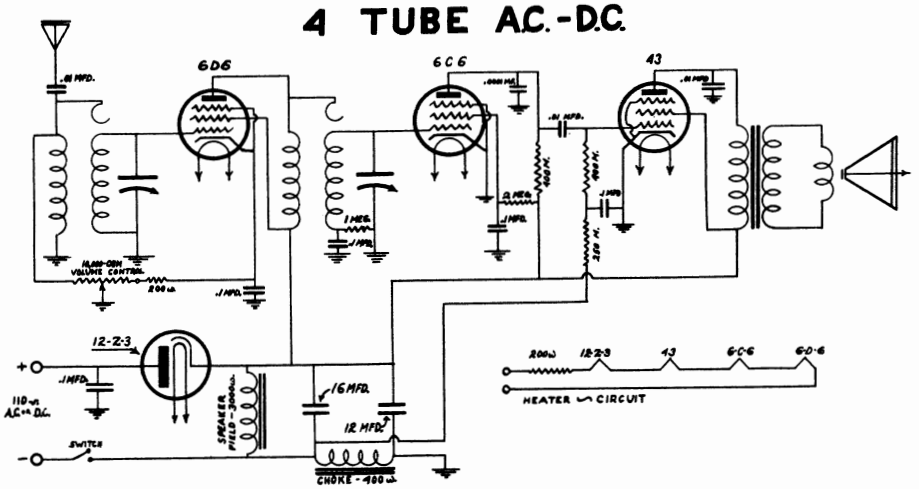
INSTALLATION: Twist "ANT" and "BLT-IN-ANT" leads together for operation without aerial. Best results, however, may be had with a good outdoor aerial, especially on short wave.

SHORT WAVE: Left hand knob, when clear to the left, is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.

PHONOGRAPH: Use a single pole switch mounted as near as possible to detector socket, connect in series with lead from ground end of grid coil of detector tube. Solder phonograph pickup leads to switch terminals.

SERVICE NOTES: To balance, set dial to 1400 KC, remove from cabinet, feed 1400 KC signal from test oscillator into antenna lead and adjust trimmers on tuning condenser to loudest signal.

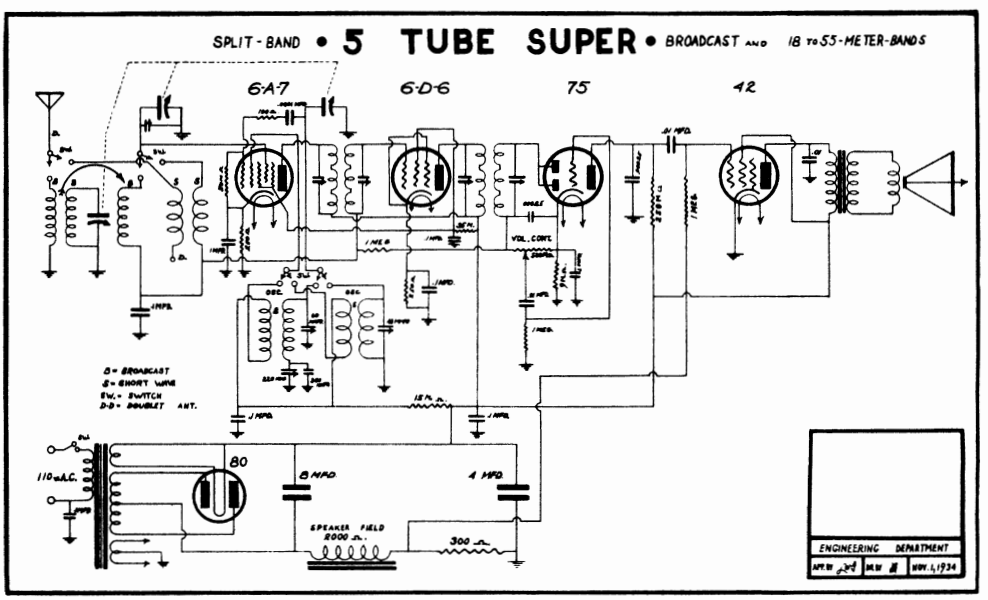
4 TUBE AC.-D.C.



Models G-9503 H-9803

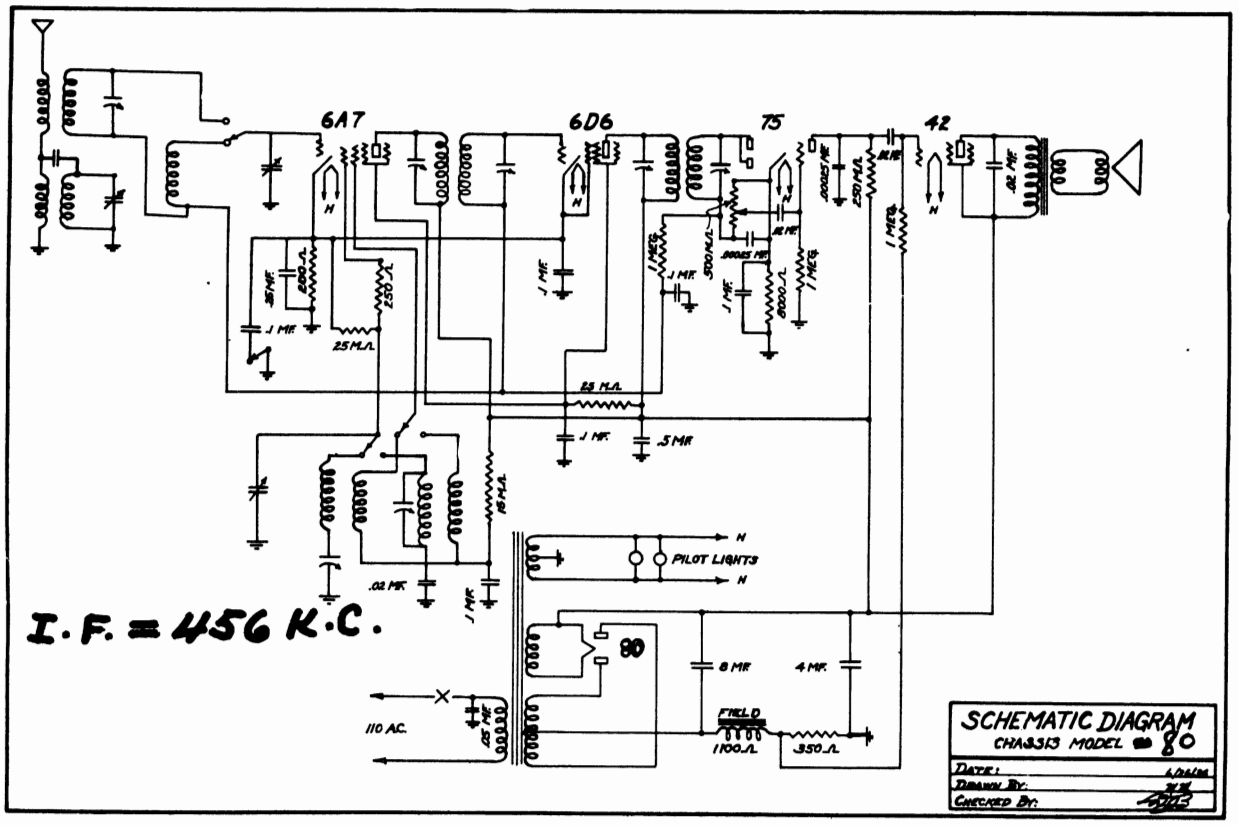
Models G-9511 G-9513

I. F. Peak 465 K.C.

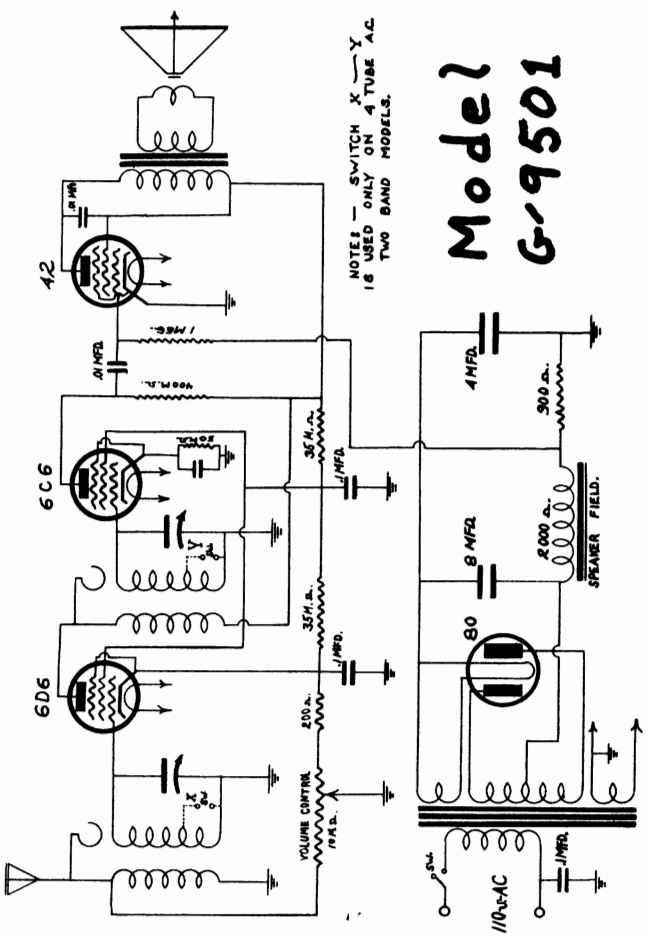


ALLIED RADIO CORP.

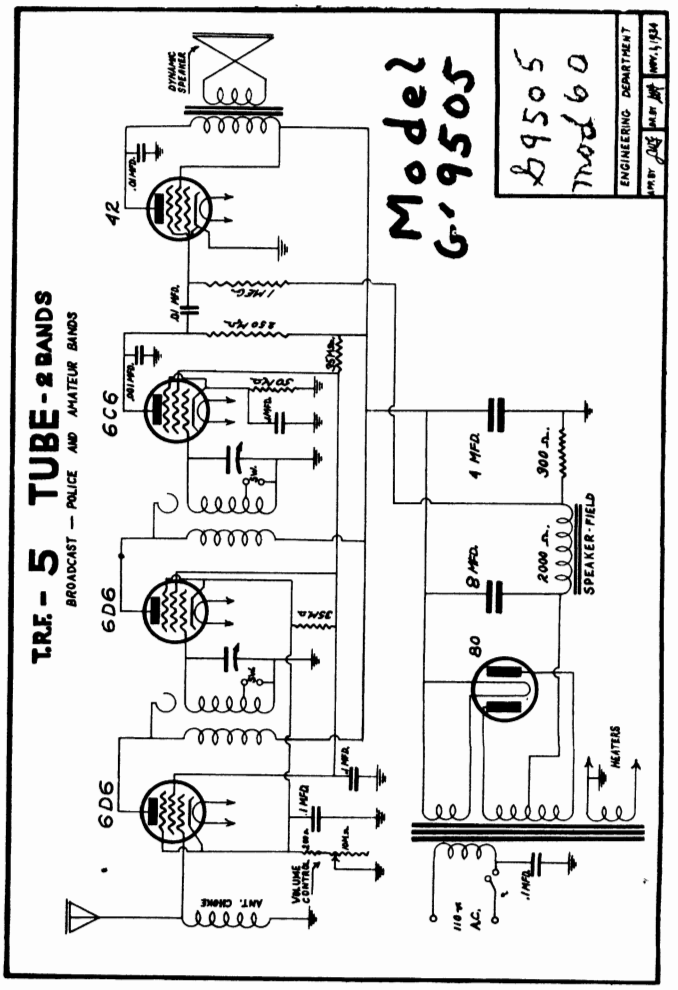
Model G-9521



Model G-9501

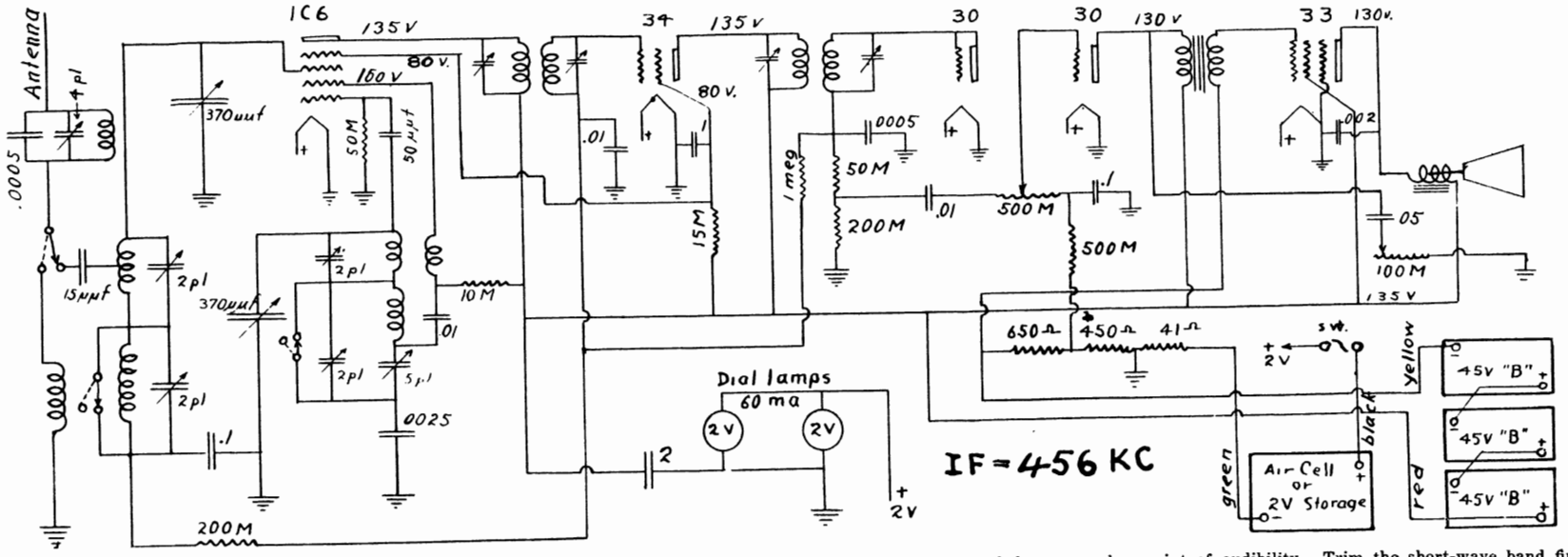


Model G-9505



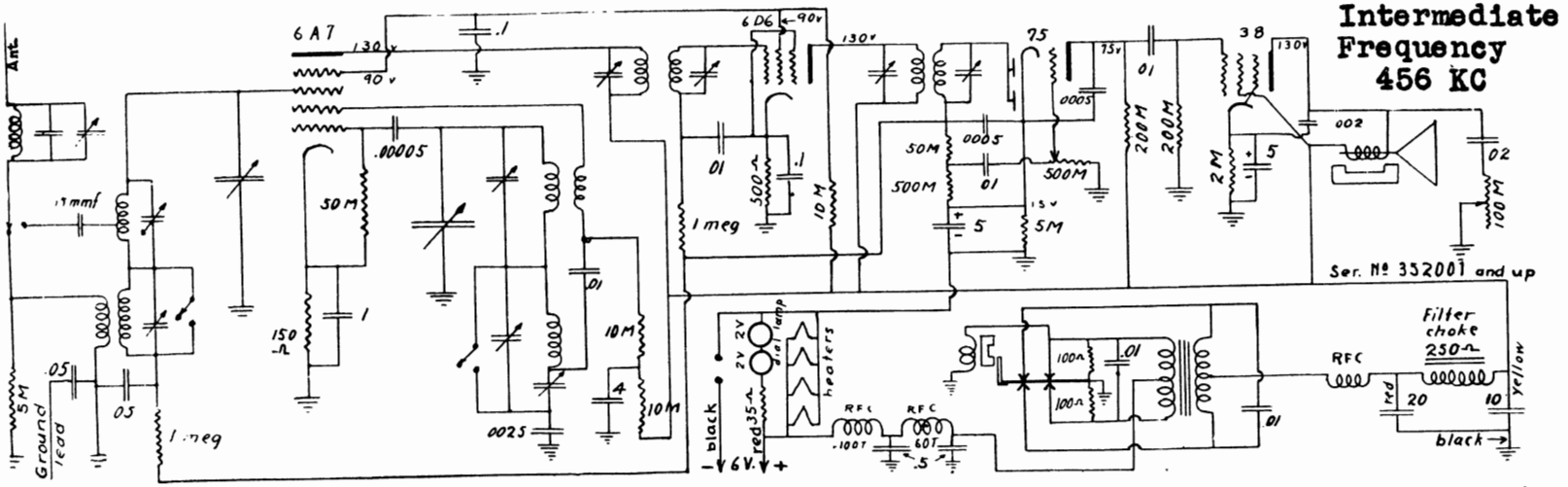
B9505
Mod 60

MODELS PA, G-9561, G-9563, G-9565, G-9567



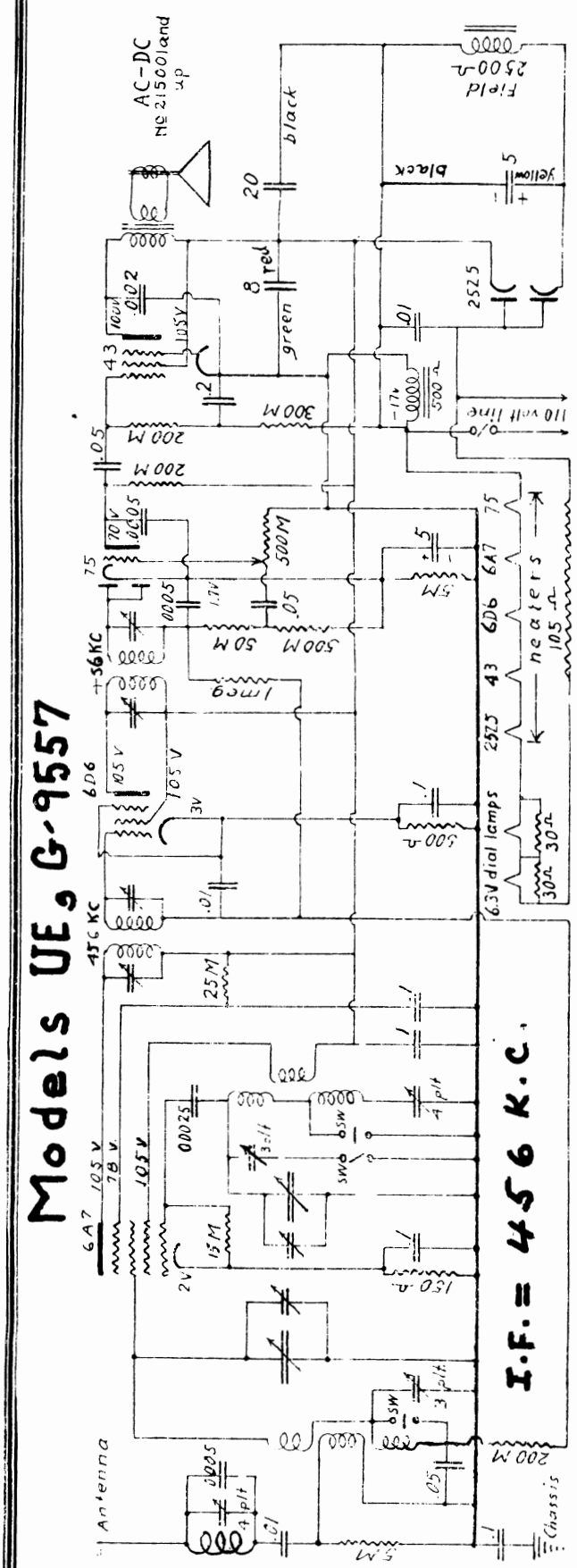
The intermediate stages are carefully phased to 456 KC at the factory. Should rephasing be necessary attach the output lead from a 456 KC test oscillator to the grid cap of the 1C6 tube, keep the signal to a very low audible value and carefully adjust the screws in the top of each of the two tall cans to loudest volume. If an output meter is available it should be used across the two black leads at the speaker transformer. An oscillator covering a frequency from 550 KC to 16 MC should be used to rephase the R. F. and the oscillator output is attached to the aerial lead of the set. At all times keep the oscillator signal turned down to a low point of audibility. Trim the short-wave band first, then the broadcast band, setting the dial pointer to a frequency near the high frequency end of the scale in each case. The short-wave oscillator trimmer is located directly across the large (oscillator) coil looking at the under side of the set and the R. F. short-wave trimmer at the right hand end of this coil. The broadcast band is next trimmed at the high frequency end of the broadcast scale, applying a signal from the oscillator corresponding to the dial setting and adjust the porcelain base trimmer at center of chassis until the signal is heard at the correct location on dial.

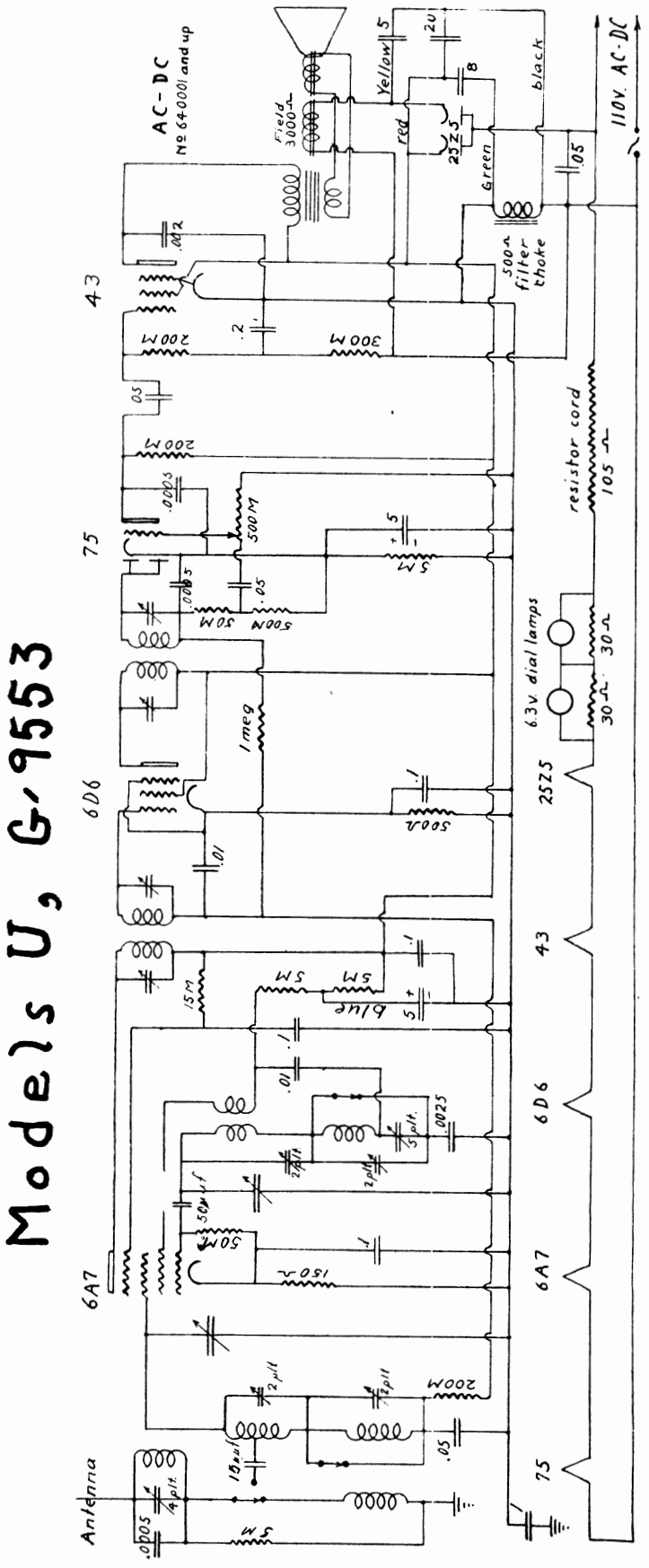
MODELS PB, G-9571, G-9573



ALLIED RADIO CORP.

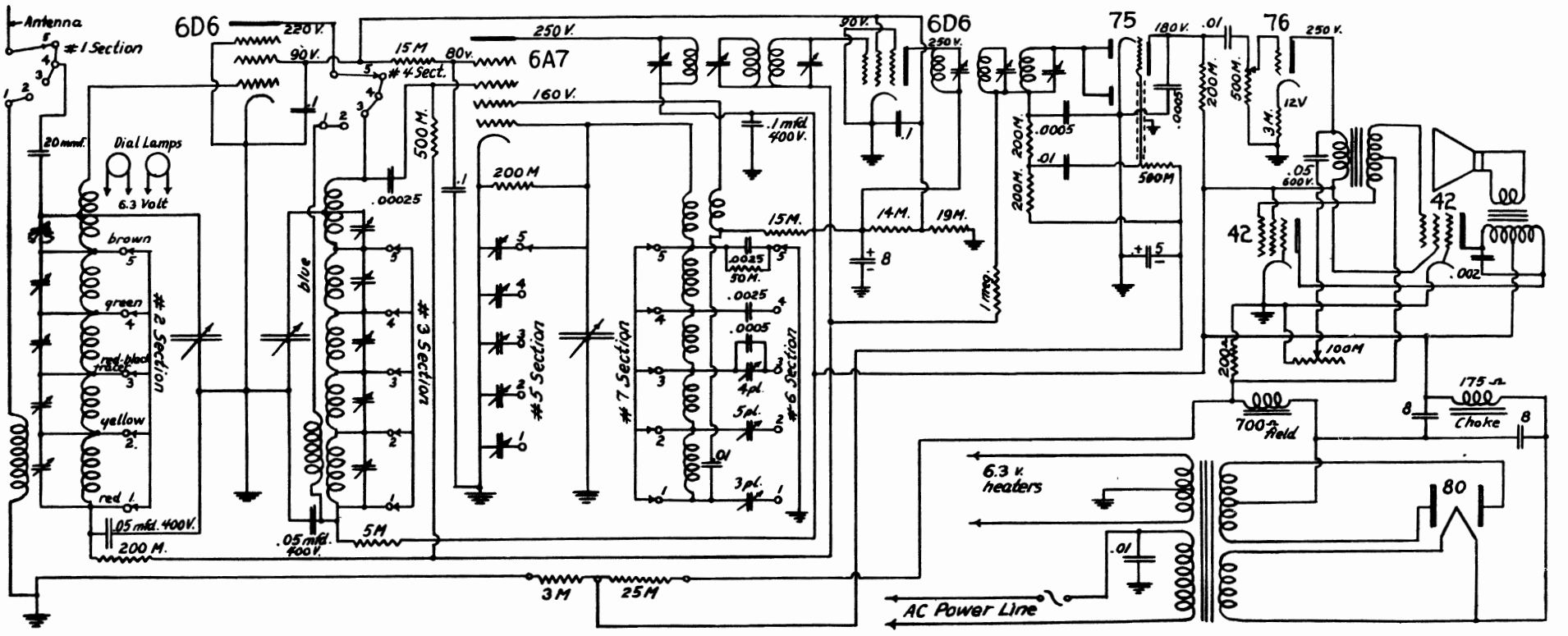
ALLIED RADIO CORP.





MODELS W, G-9575, G-9595, G-9601, G-9605

Intermediate Frequency - 456 KC



ALLIED RADIO CORP.

OPERATING INSTRUCTIONS

ALL WAVE 8-TUBE SUPERHETERODYNE

CAUTION: Do not attempt to operate on current other than that noted on the instrument.

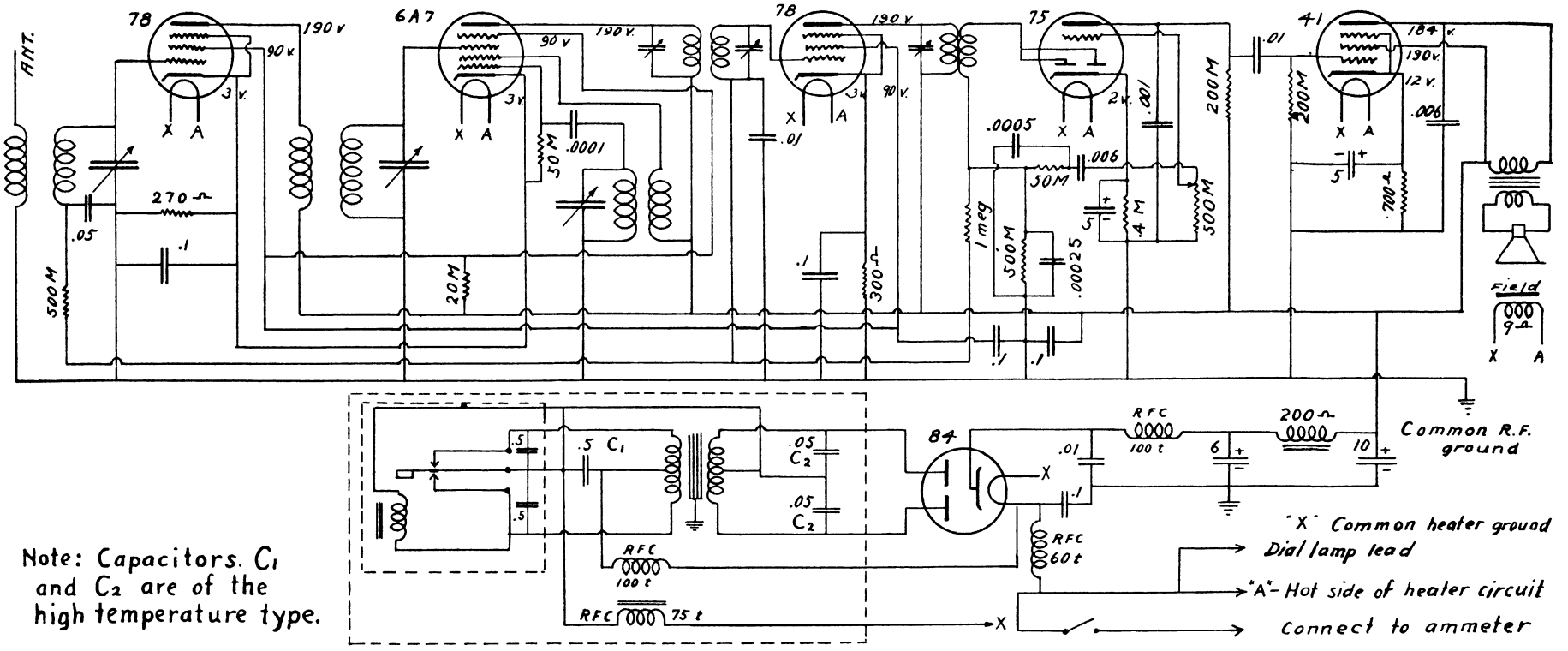
INSTALLATION: A good aerial, 25 to 50 feet long, well away from surrounding metal structures and power lines, is essential for best results. Any of the new ALL-WAVE Antennas is recommended for best performance. Power noise interferes especially with short-wave reception. If the set is located where power noise is prevalent, it may be necessary to install an aerial high above the street and use a "transposition" lead-in to the set. A good ground connection (water pipe or equivalent) will also contribute to quieter reception.

SERVICE NOTES: If the radio fails to operate when unpacked, or stops working after a few days, proceed as follows: (1) Have the tubes checked. (2) Remove the chassis from the cabinet and check for loose connections. Do not return the receiver unless you have made the above tests. This set was shipped, carefully inspected.

The intermediate stages are carefully phased to 456 KC. Should rephasing be necessary, attach the output lead from a 456 KC test oscillator to the grid cap of the 6A7 tube; keep the signal to a very low audible value and carefully adjust the three trimmer screws, two in the top and one in the bottom of each of the two tall cans, to loudest volume. If an output meter is available, it should be used across the two outside black leads at the speaker transformer. An all-wave oscillator having a range from 150 KC to 20 MC will be necessary to rephase the frequency bands. The oscillator output is attached to the aerial lead of the set and the oscillator output kept always at a low audible level. The R.F. coil trimmers are reached through a series of five (5) holes in the side of the R.F. shield cans and correspond to frequency band Nos. 1, 2, 3, 4, and 5, from top down. The oscillator parallel trimmers are seen on the under side of the set when the front of it is raised and are located along side the band switch, #1 being the one nearest the back of chassis and #5 nearest the front. The dual porcelain trimmers at back of chassis are series padders, the left hand for band #2 and the right band one for band #1. The series padder for band #3 is the single trimmer at the center of the chassis. Each band is trimmed first at the minimum end of its range, band #5 being first, #4 second, then #3, etc. Bands 3, 2, and 1 are also tracked near their maximum ranges, or with the tuning condenser turned well in, by adjusting that series padder belonging to the particular band being used, location of which is given above.

NOTE: Should it be necessary to write us for parts or information, always give the serial number of the set as stamped on the back of the chassis.

AUTO RADIO MODELS T, G-9599



Note: Capacitors. C_1 and C_2 are of the high temperature type.

BALANCING I.F. COILS. These are peaked to 175 K.C. and are trimmed through the top of the tall cans by means of a small screwdriver and a 5-16" socket wrench. Chassis must first be removed from cabinet and signal from a test oscillator fed into grid cap of the 6A7 tube.

BALANCING R.F. COILS. Tuning control must be attached to condenser shaft with pointer set to 530 when tuning condenser is turned to maximum. Tune in a signal at its proper dial setting near 1400 and adjust first and second trimmers on variable from front of chassis for loudest signal. If signal does not come at proper setting adjust rear trimmer to shift signal to its proper point on dial and readjust first and second trimmers. After reinstalling set in in car slightly readjust first trimmer through hole in top of cabinet.

Ignition Noise. Fouled plugs or plugs with improperly adjusted gaps will affect the operation of the set. Burned or improperly adjusted breaker points will also impair the performance. In some cases a .5 mfd. or 1 mfd. condenser connected from ammeter to car frame will be required. Also, in some installations using a roof antenna, a .5 mfd. condenser connected from car frame to dome lamp lead at point where it leaves bulkhead will be required. It is usually necessary to connect a .5 mfd. condenser from primary of ignition coil to ground and from relay switch on generator to ground. Ground all of the control rods going to the instrument board of the car by soldering to each rod a length of copper braid and connecting same to the motor head. Isolate the battery lead to the ignition coil by running same through a grounded shield. In some cases it may be necessary to solder a short piece of copper braid from the shaft of the tuning condenser of set to the common ground point on the chassis just below the shaft.

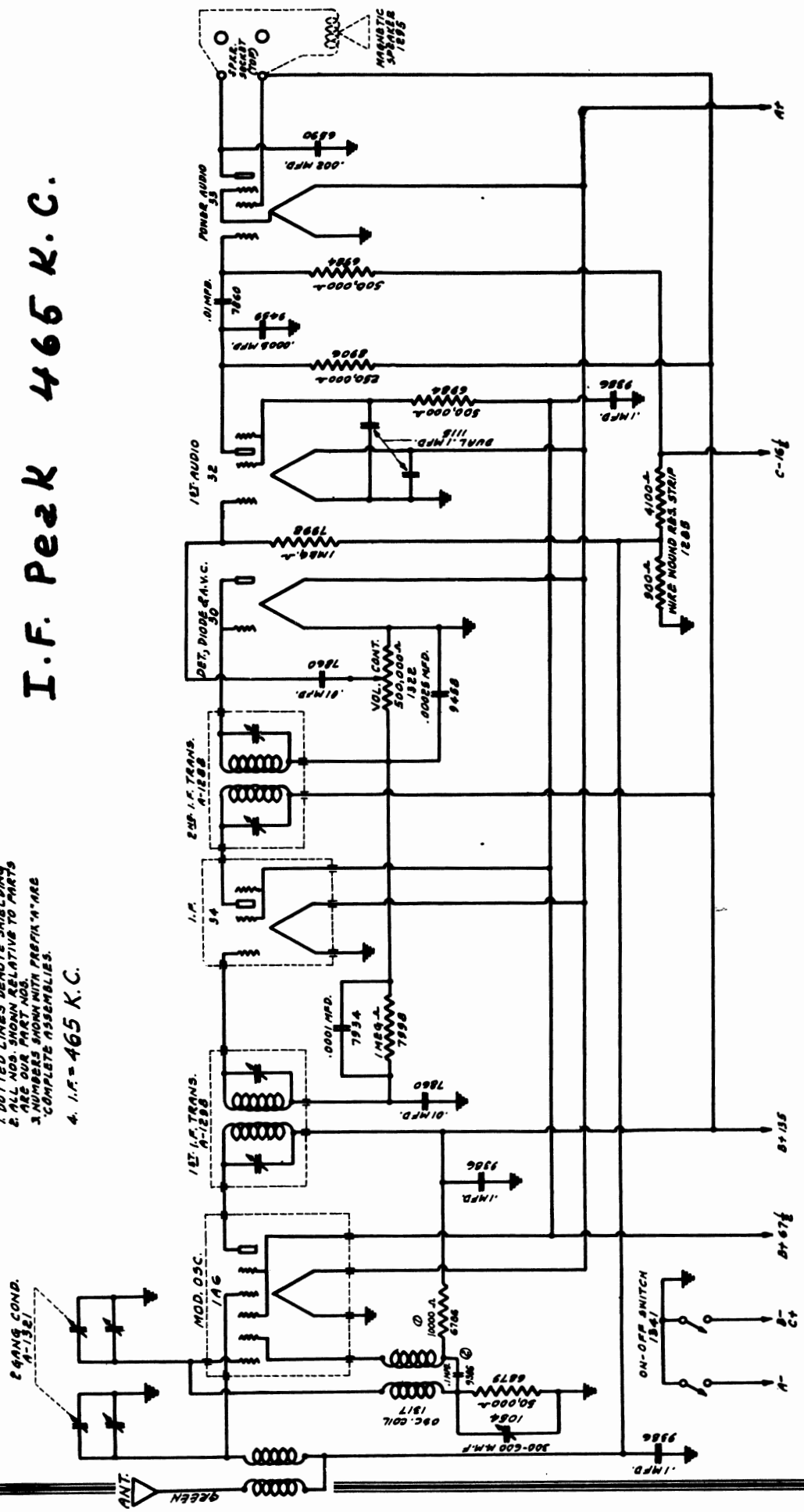
"B" Power Supply should require little or no attention. A full wave vibrator in connection with the primary of a transformer and the 6-volt storage battery furnishes the means of obtaining the proper "B" voltage. With the power turned on a slight buzz should be heard which indicates proper operation of vibrator. Failure to observe this buzz will denote a faulty condition, in which case the complete set should be taken to the dealer for inspection.

ALLIED RADIO CORP.

Models G-9611, G-9613, G-9886 G-9887, G-9898

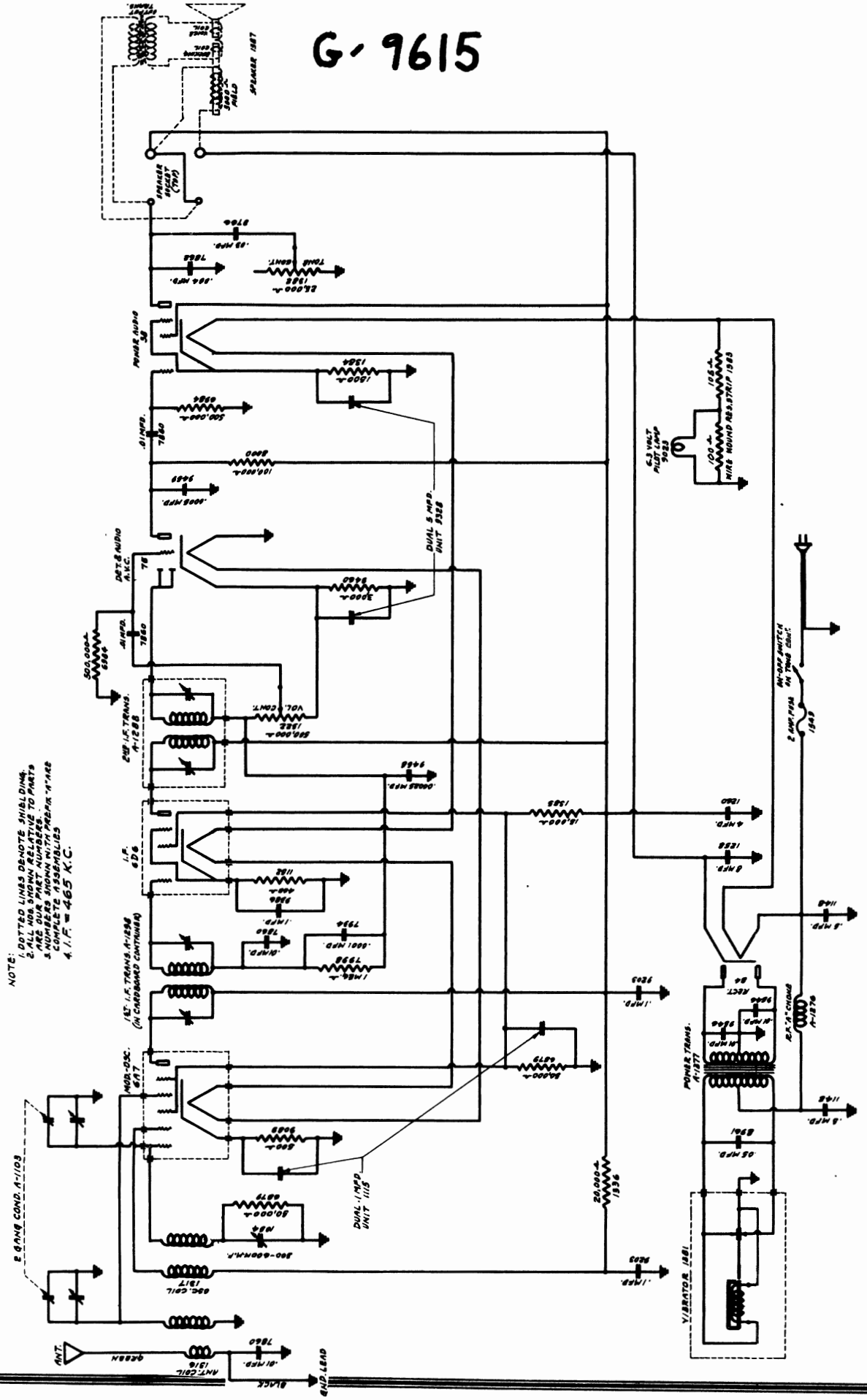
I.F. Peak 465 K.C.

NOTE:
1. DOTTED LINES DENOTE SHIELDING.
2. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NOS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
4. I.F. = 465 K.C.



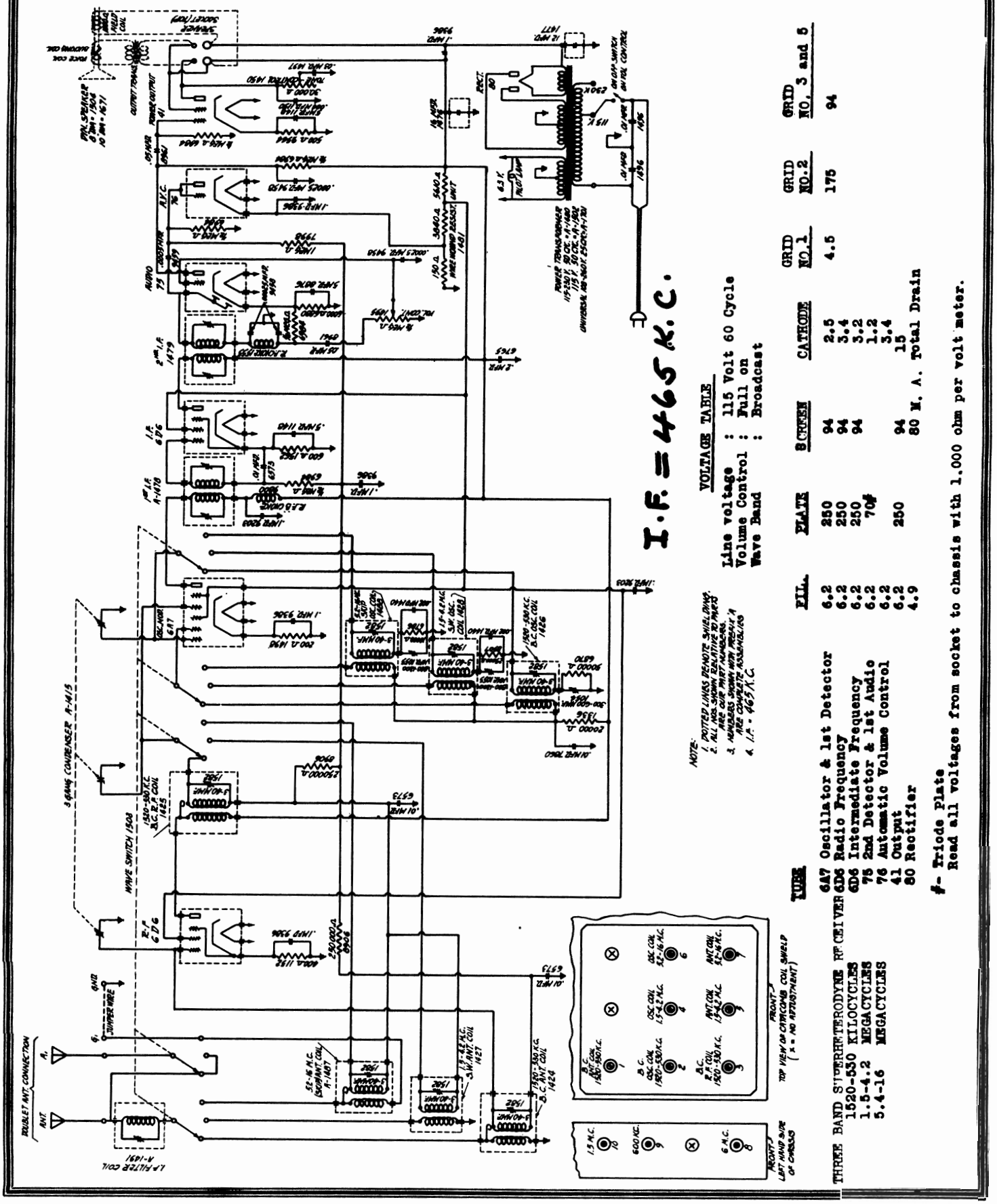
ALLIED RADIO CORP.

G-9615



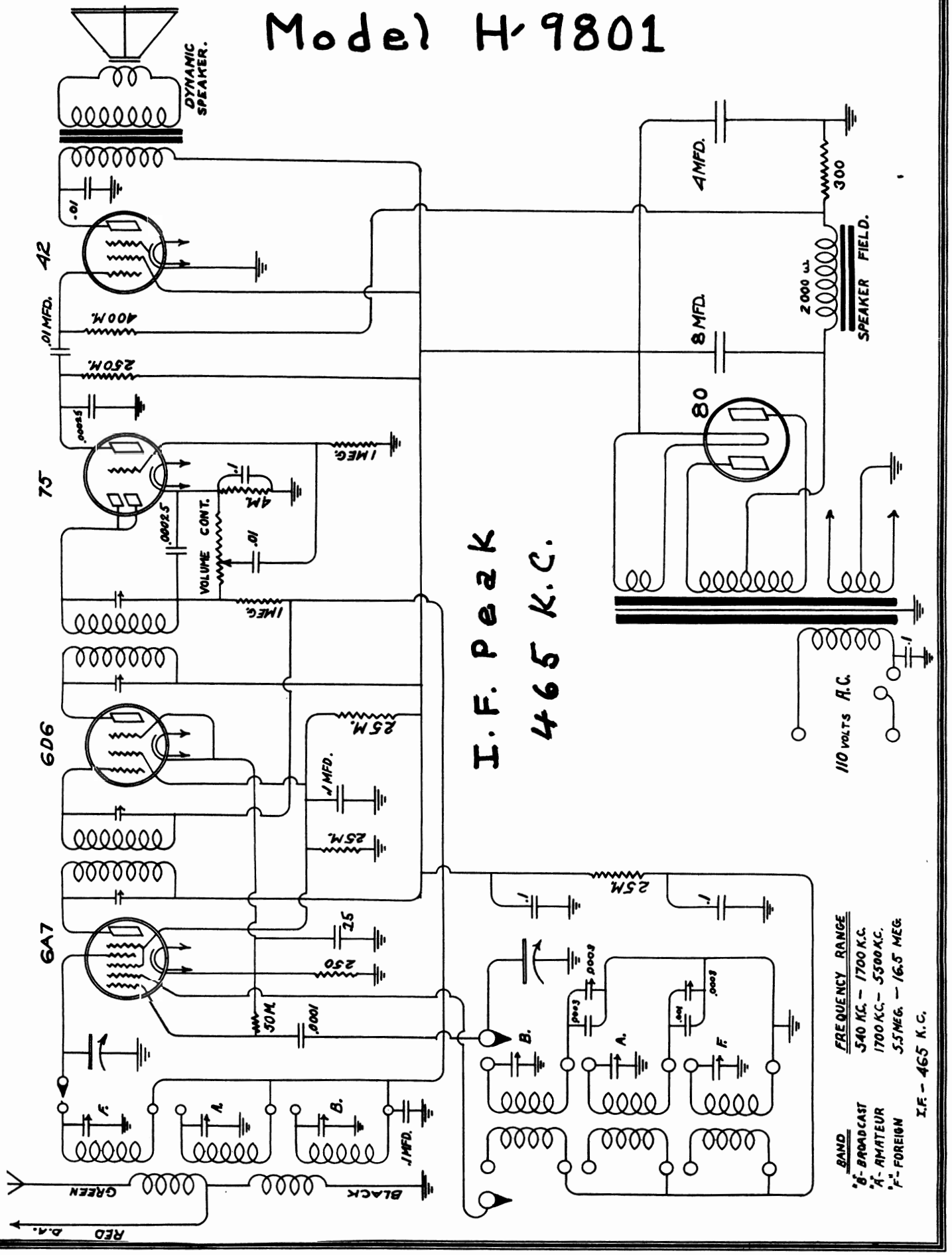
ALLIED RADIO CORP.

Models G-9643, G-9645



ALLIED RADIO CORP.

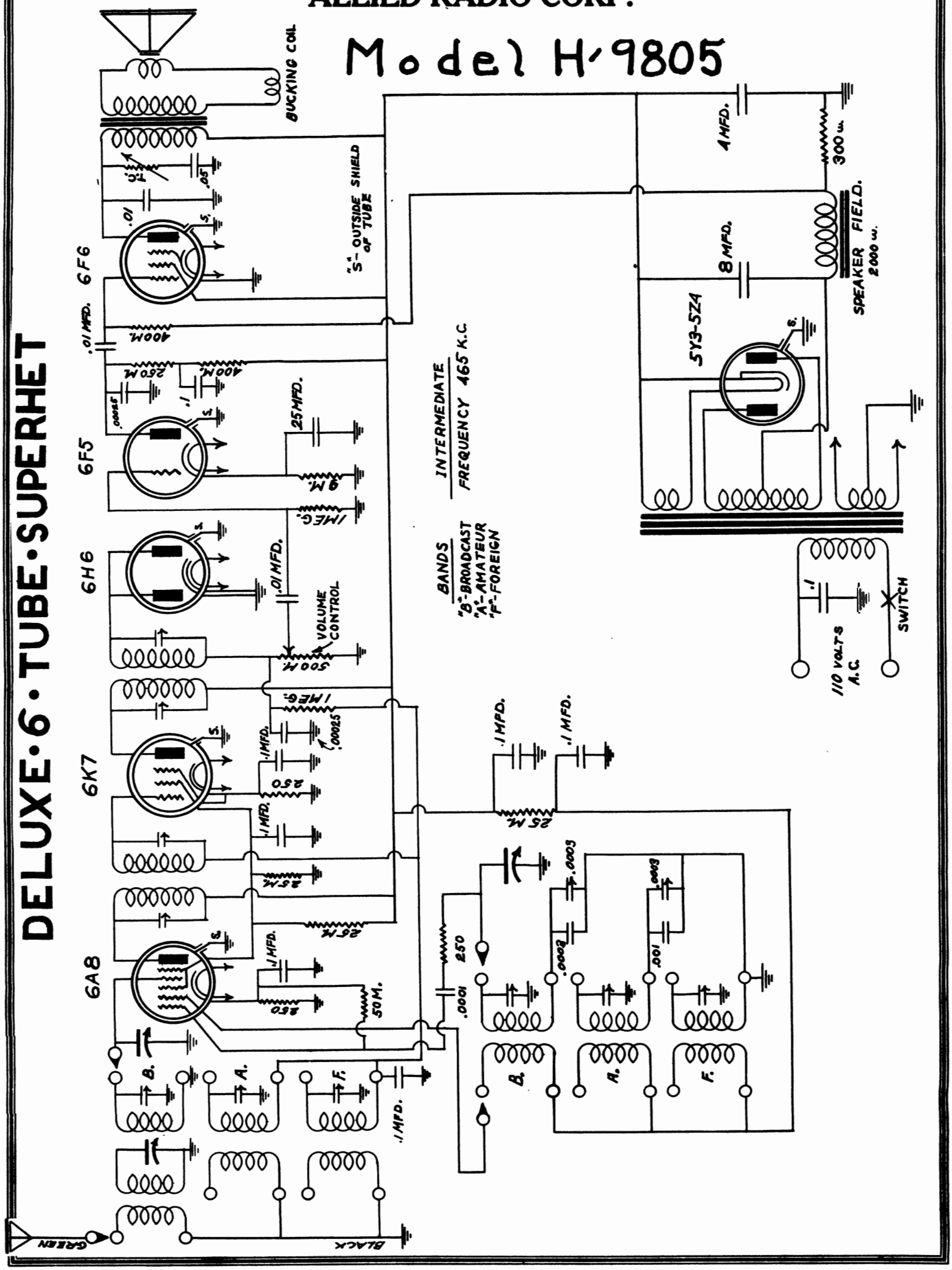
Model H-9801



ALLIED RADIO CORP.

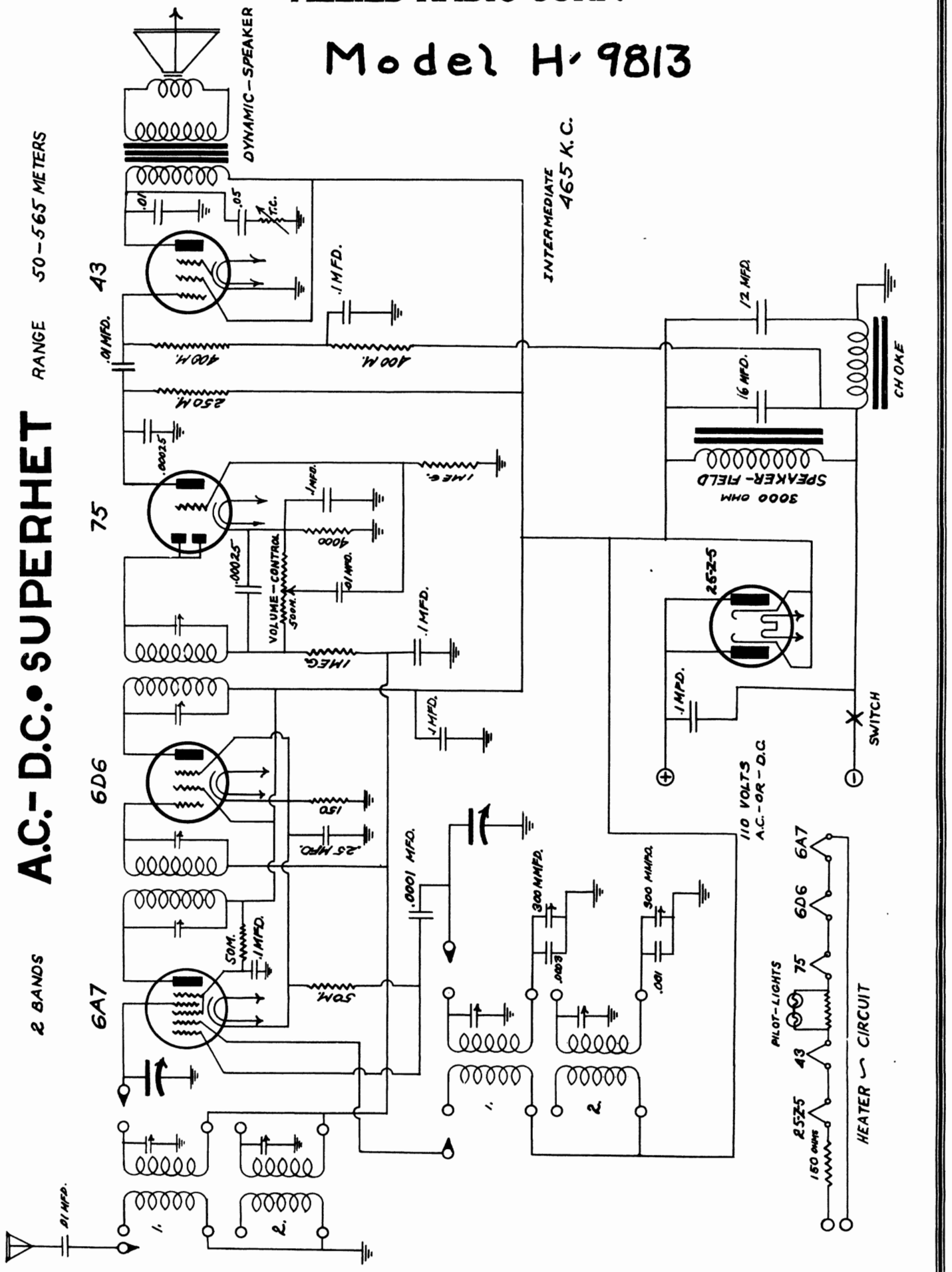
Model H-9805

DELUXE·6·TUBE·SUPERHET



ALLIED RADIO CORP.

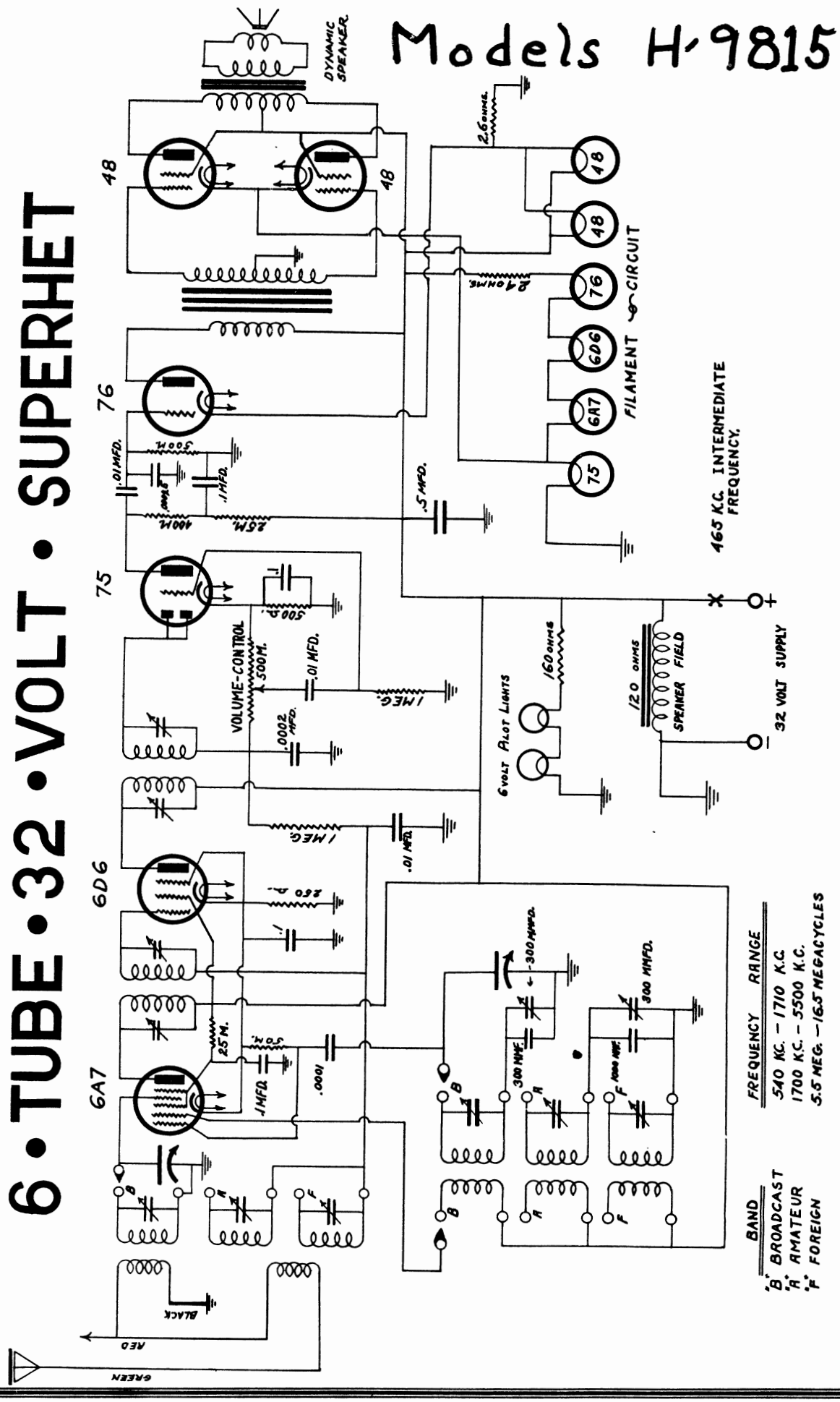
Model H-9813



ALLIED RADIO CORP.

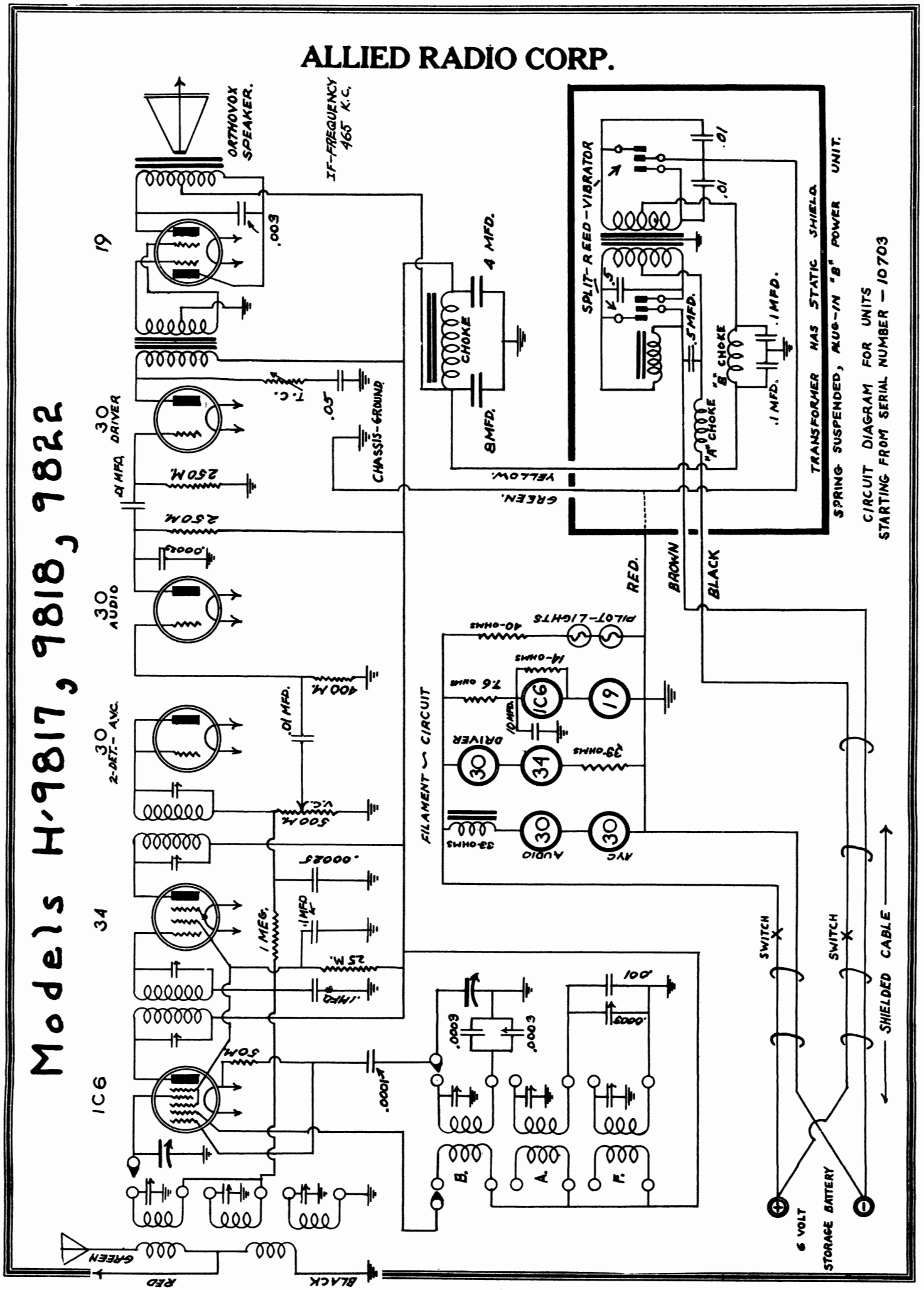
Models H-9815

6 • TUBE • 32 • VOLT • SUPERHET



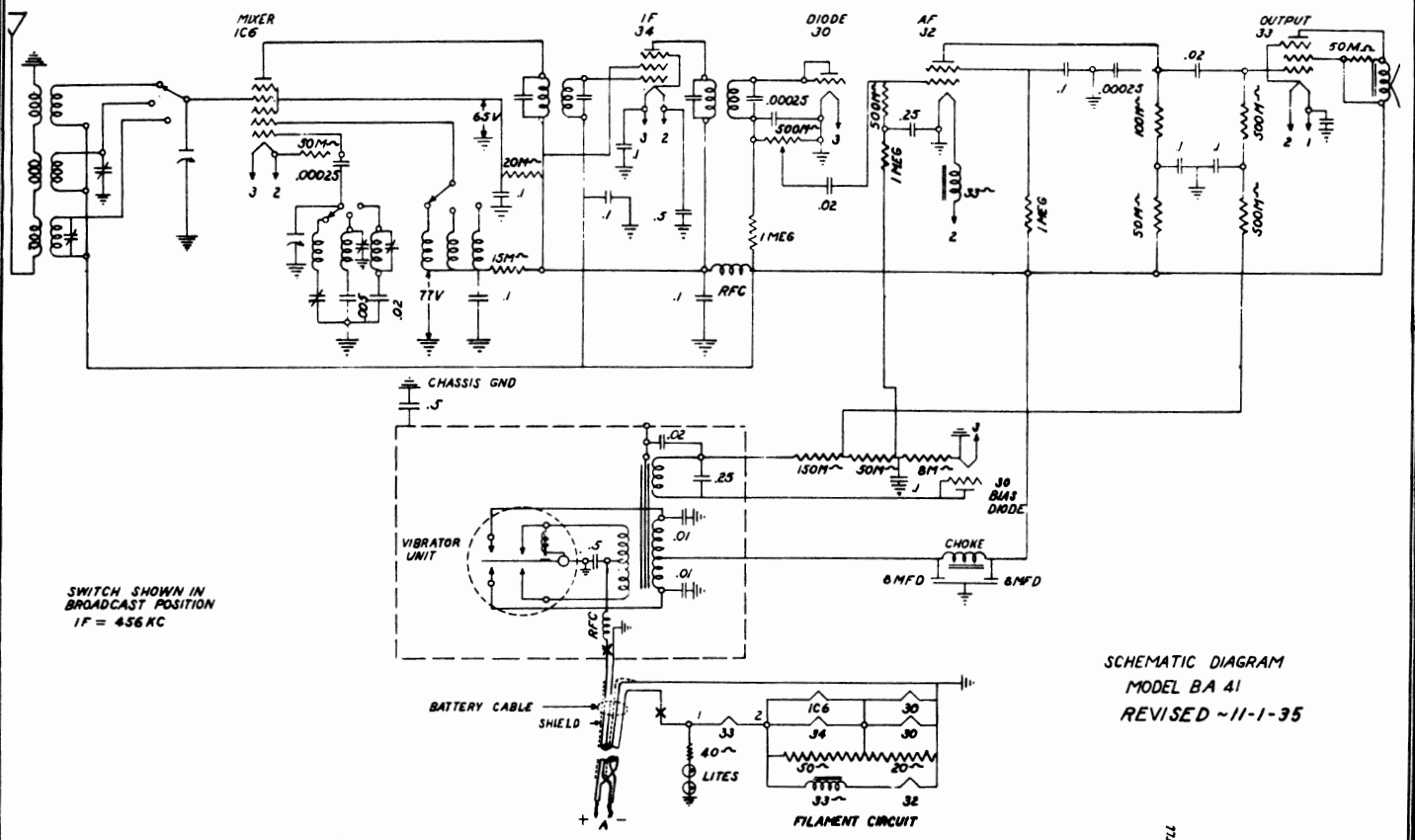
BAND	FREQUENCY RANGE
'B' BROADCAST	540 KC. – 1710 K.C.
'A' AMATEUR	1700 K.C. – 5500 K.C.
'F' FOREIGN	5.5 MEG. – 16.5 MEGACYCLES

ALLIED RADIO CORP.

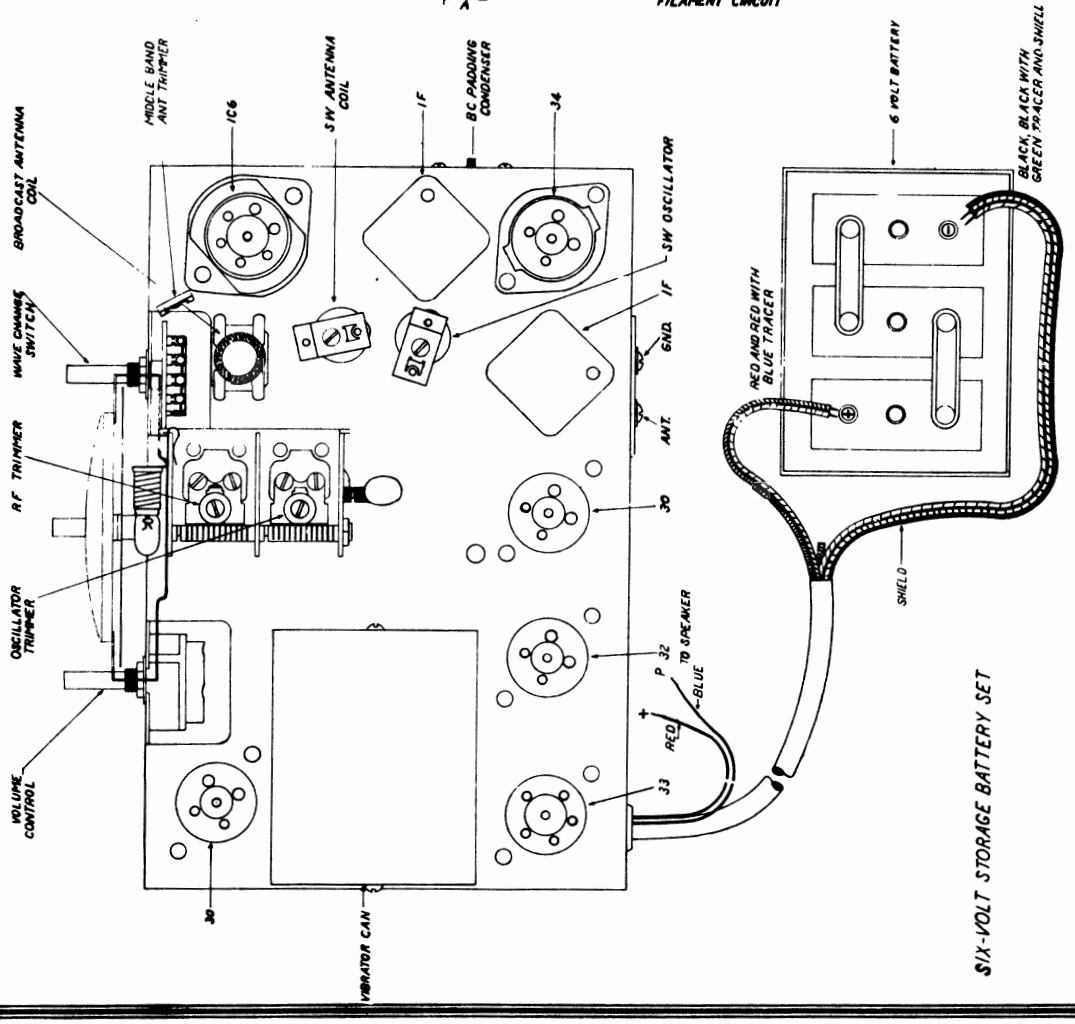


ALLIED RADIO CORP.

Models H9850-52-53-54-55-56-58



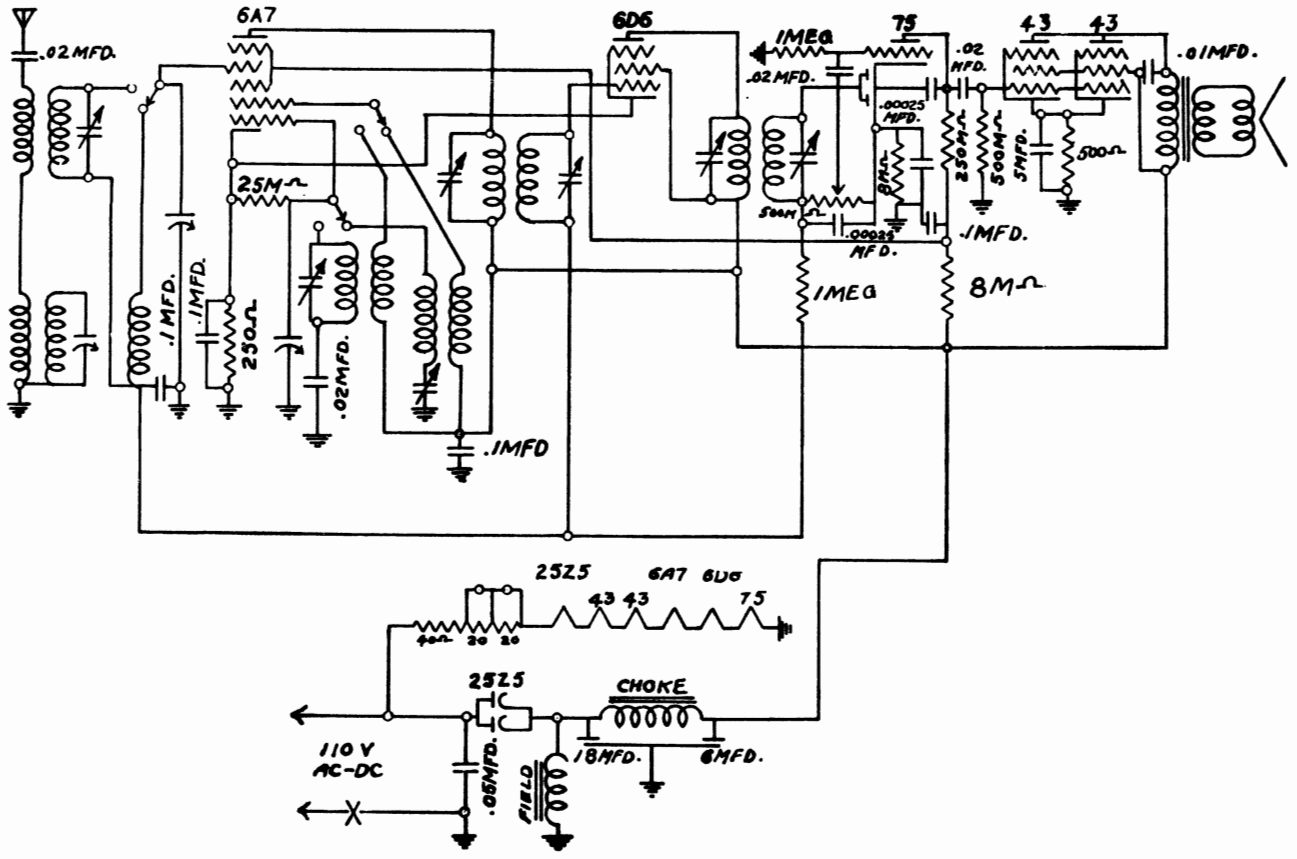
SCHEMATIC DIAGRAM
MODEL BA 41
REVISED ~11-1-35



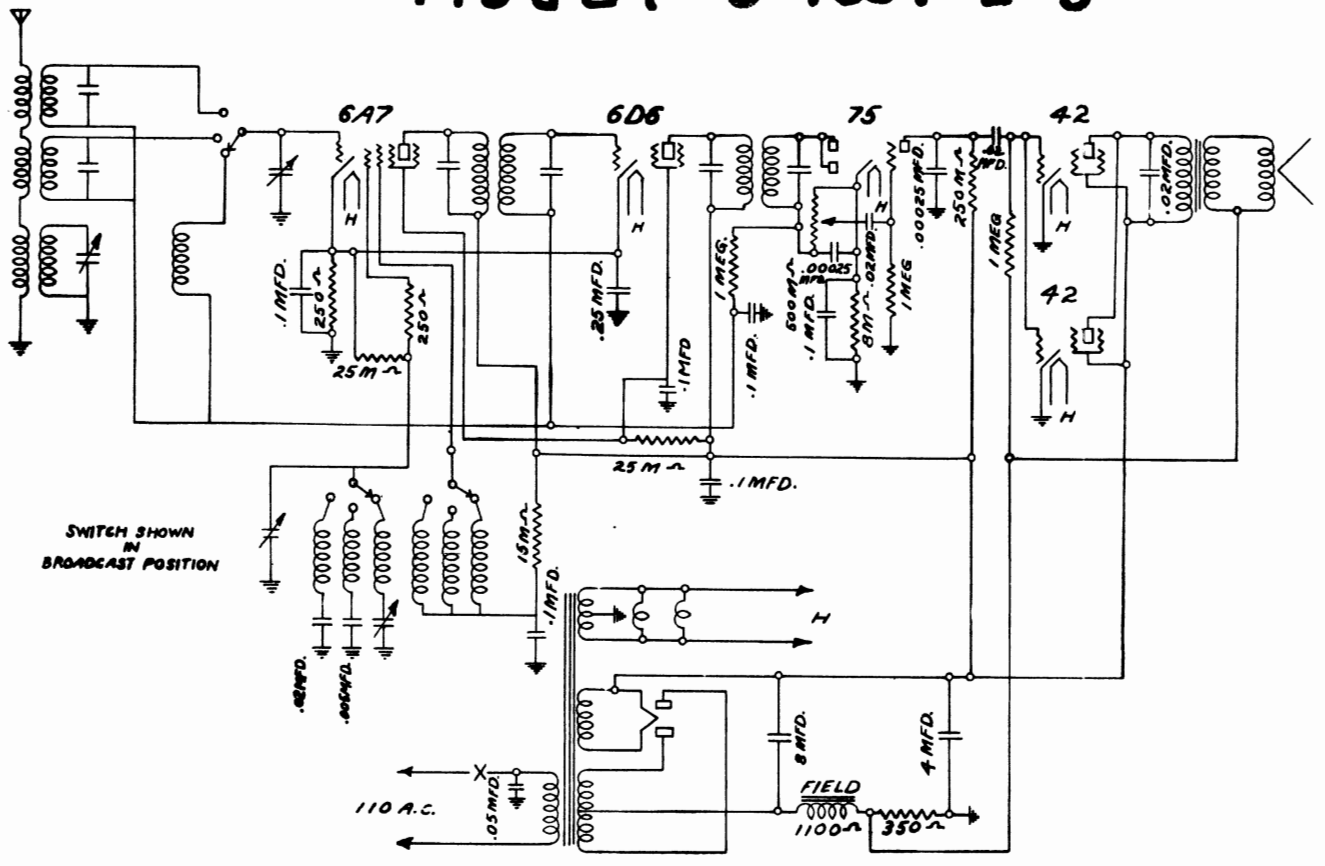
SIX-VOLT STORAGE BATTERY SET

ALLIED RADIO CORP.

Model G/9855

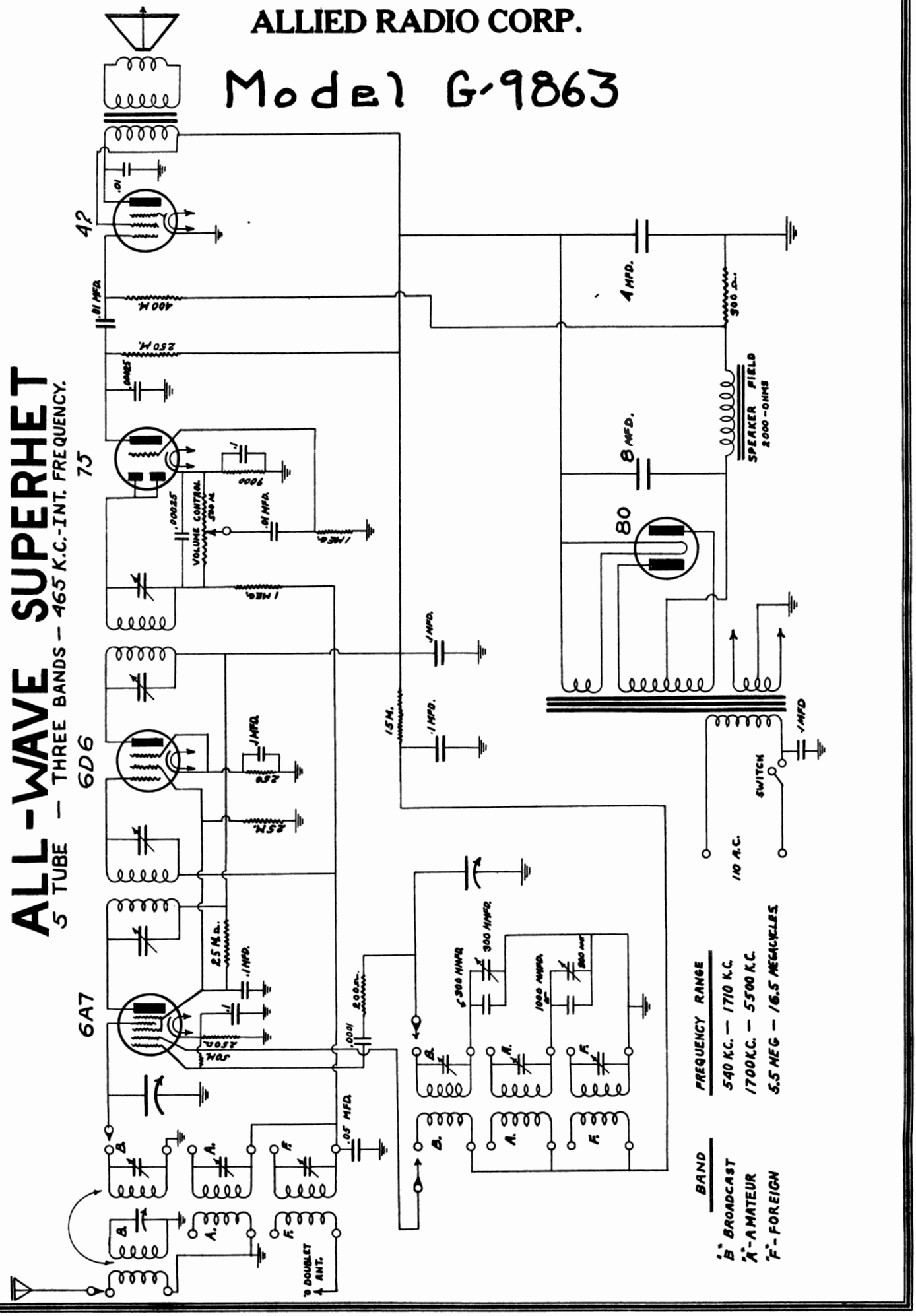


Model G/9851-2-8



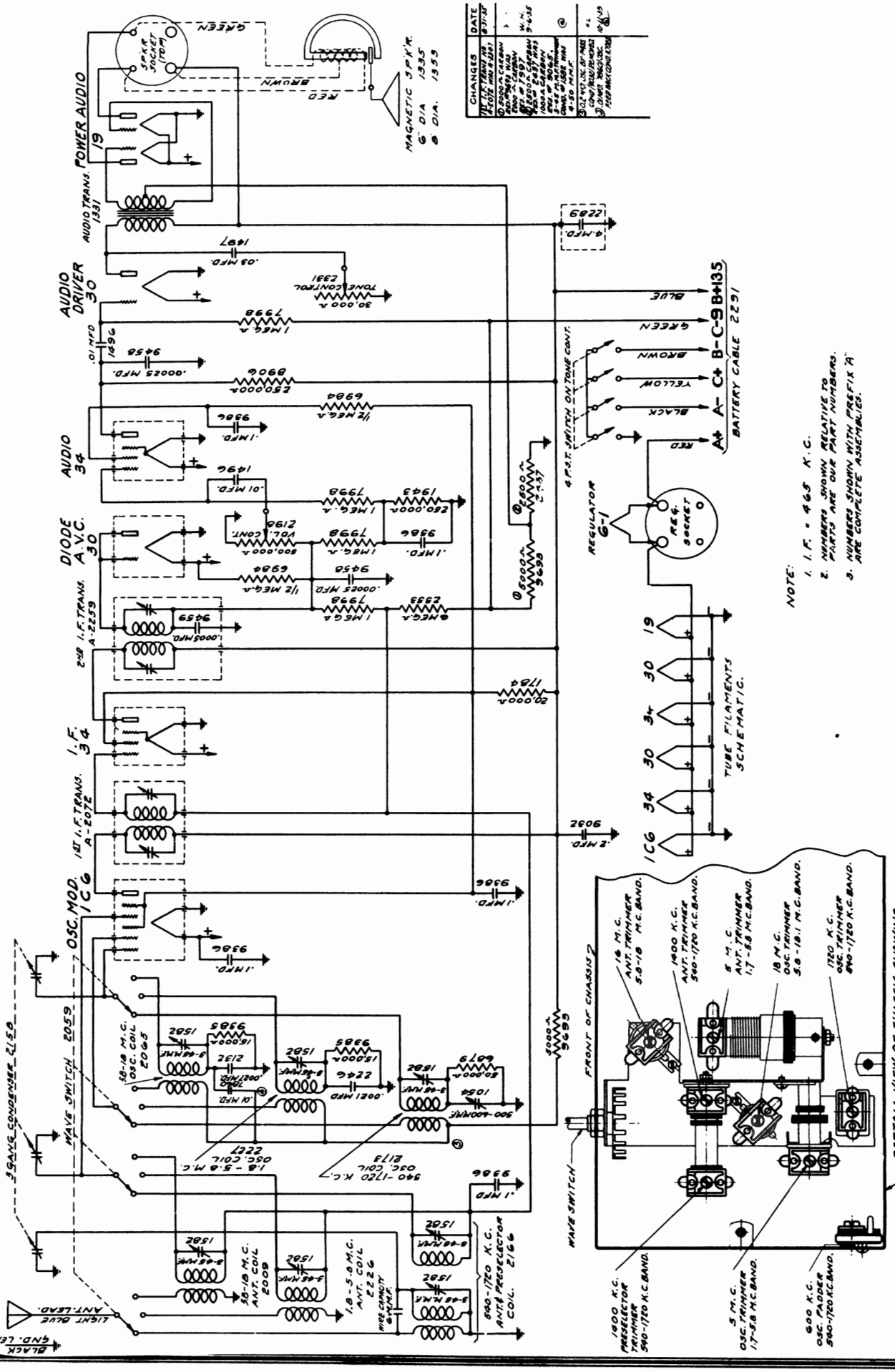
ALLIED RADIO CORP.

Model G-9863



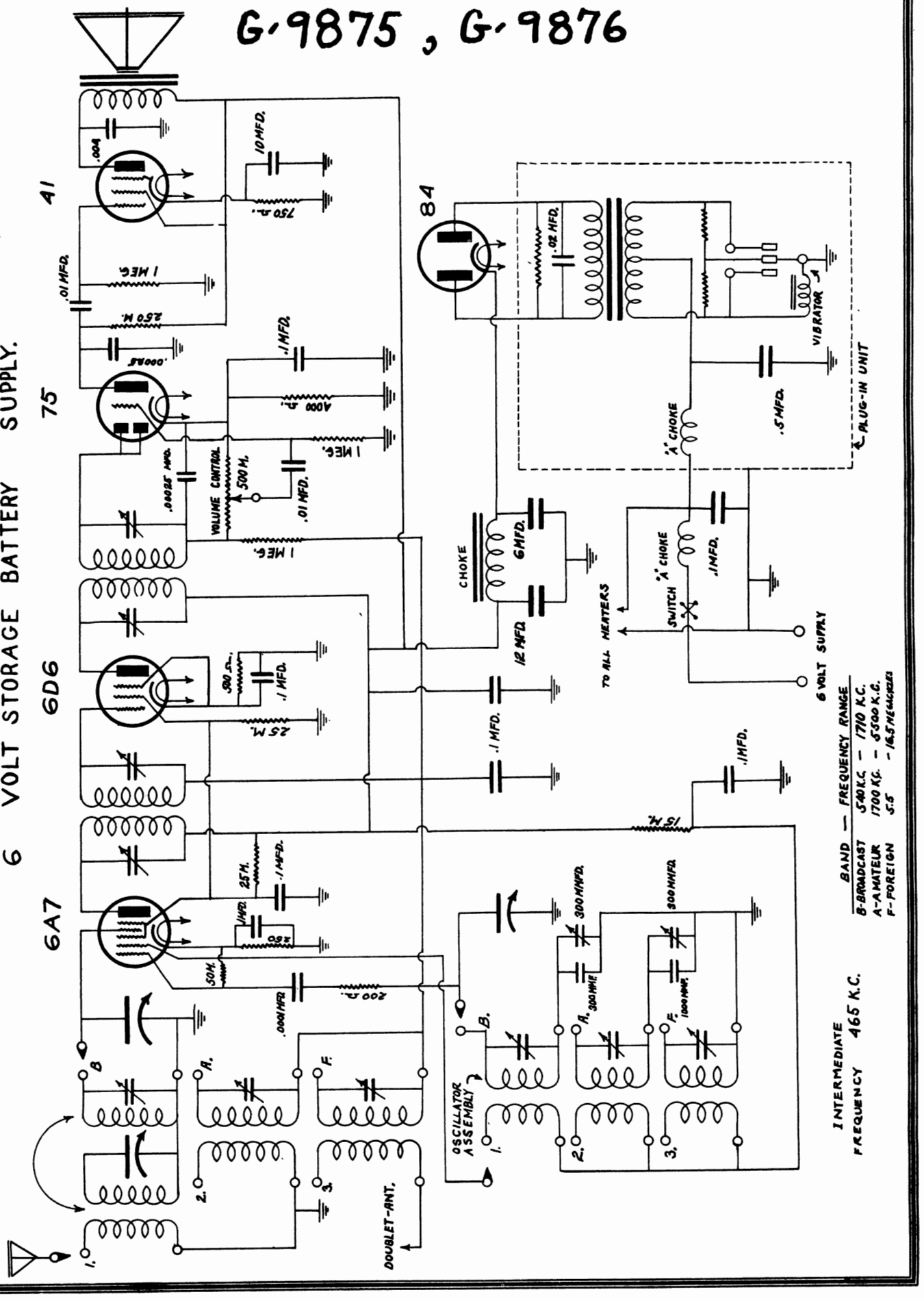
ALLIED RADIO CORP.

Models H-9872, H-9873, H-9874, H-9875, H-9876



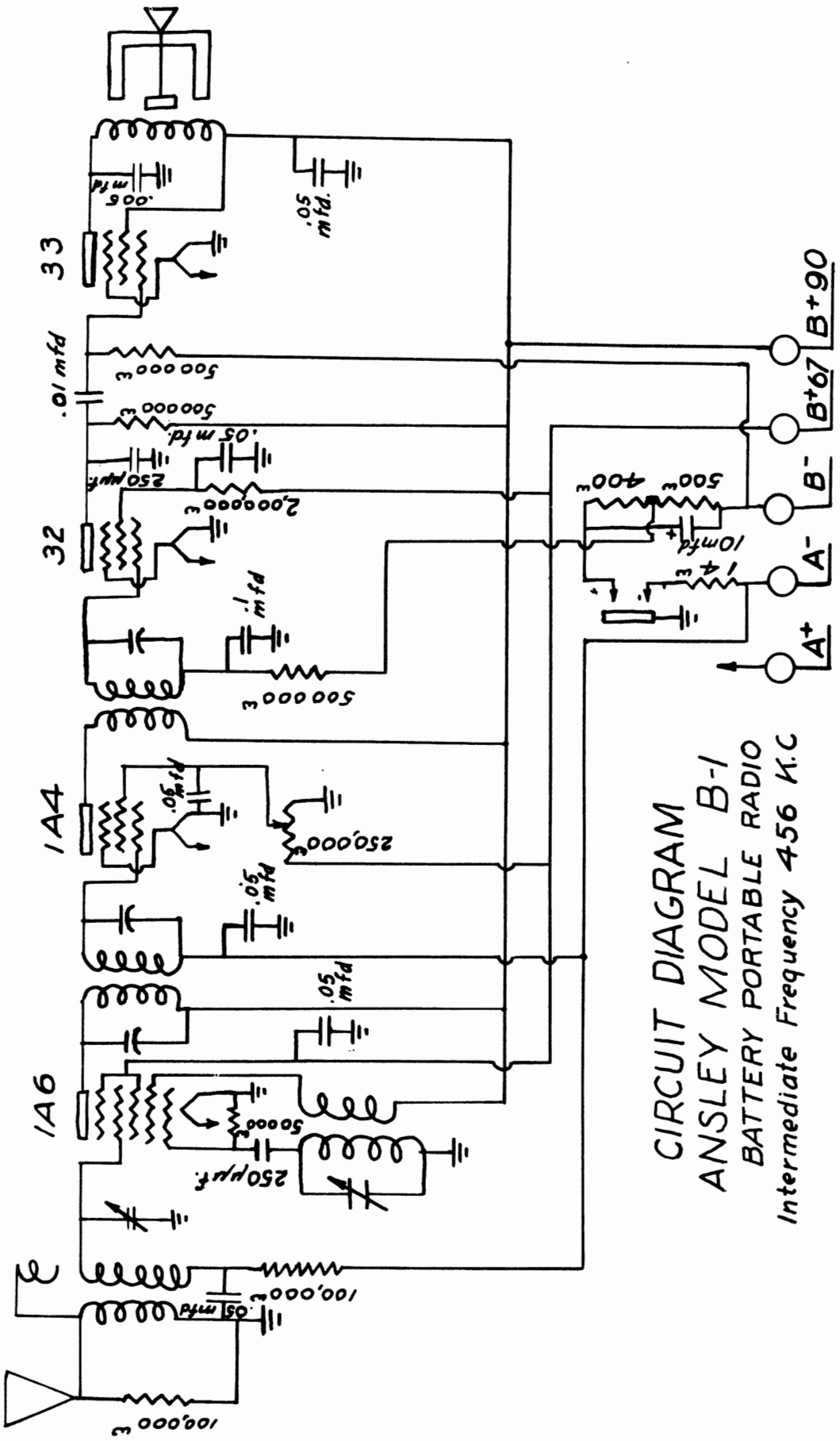
ALLIED RADIO CORP.

G-9875 , G-9876



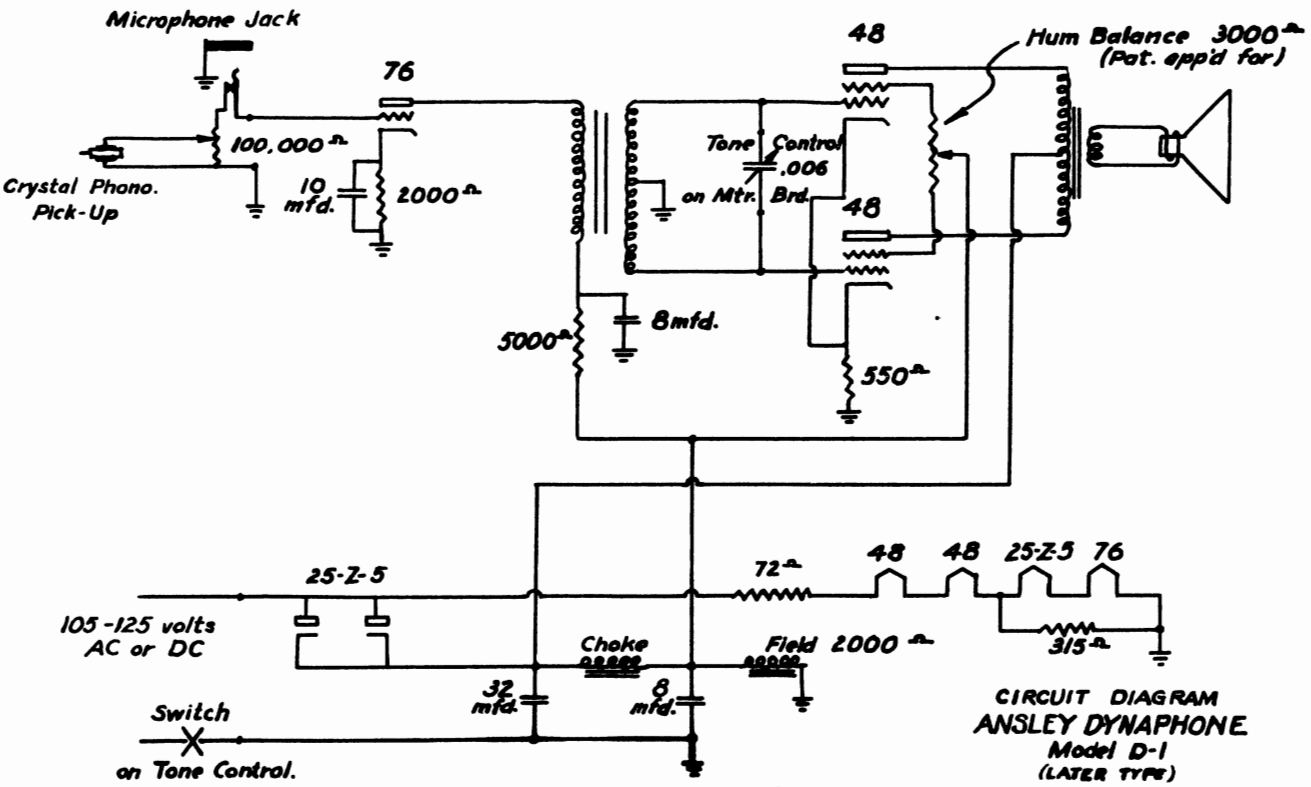
ANSLEY RADIO CORP.

BATTERY PORTABLE MODEL B-1



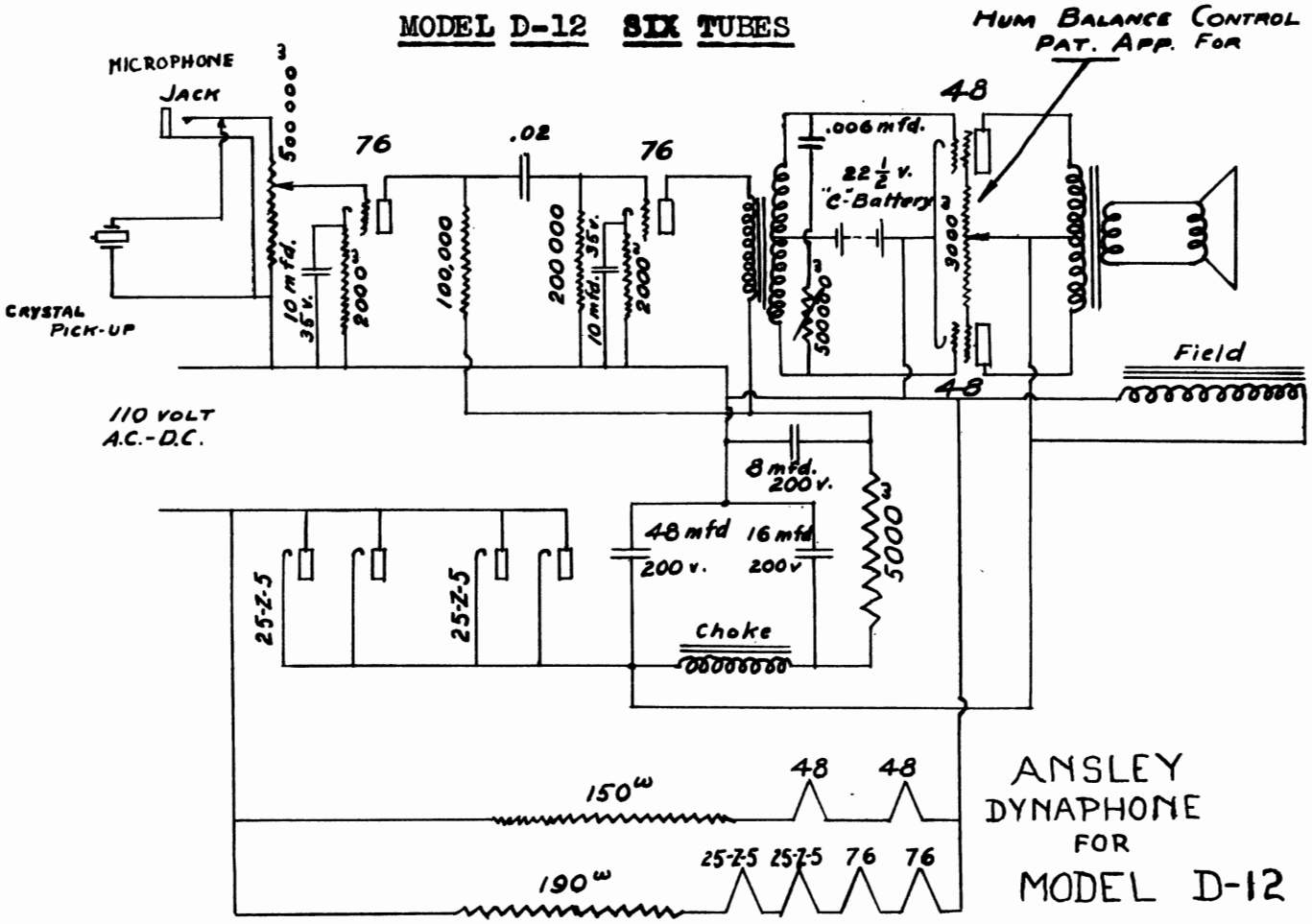
ANSLEY RADIO CORP.

MODEL D-1 FOUR TUBES



CIRCUIT DIAGRAM
ANSLEY DYNAPHONE
Model D-1
(LATER TYPE)

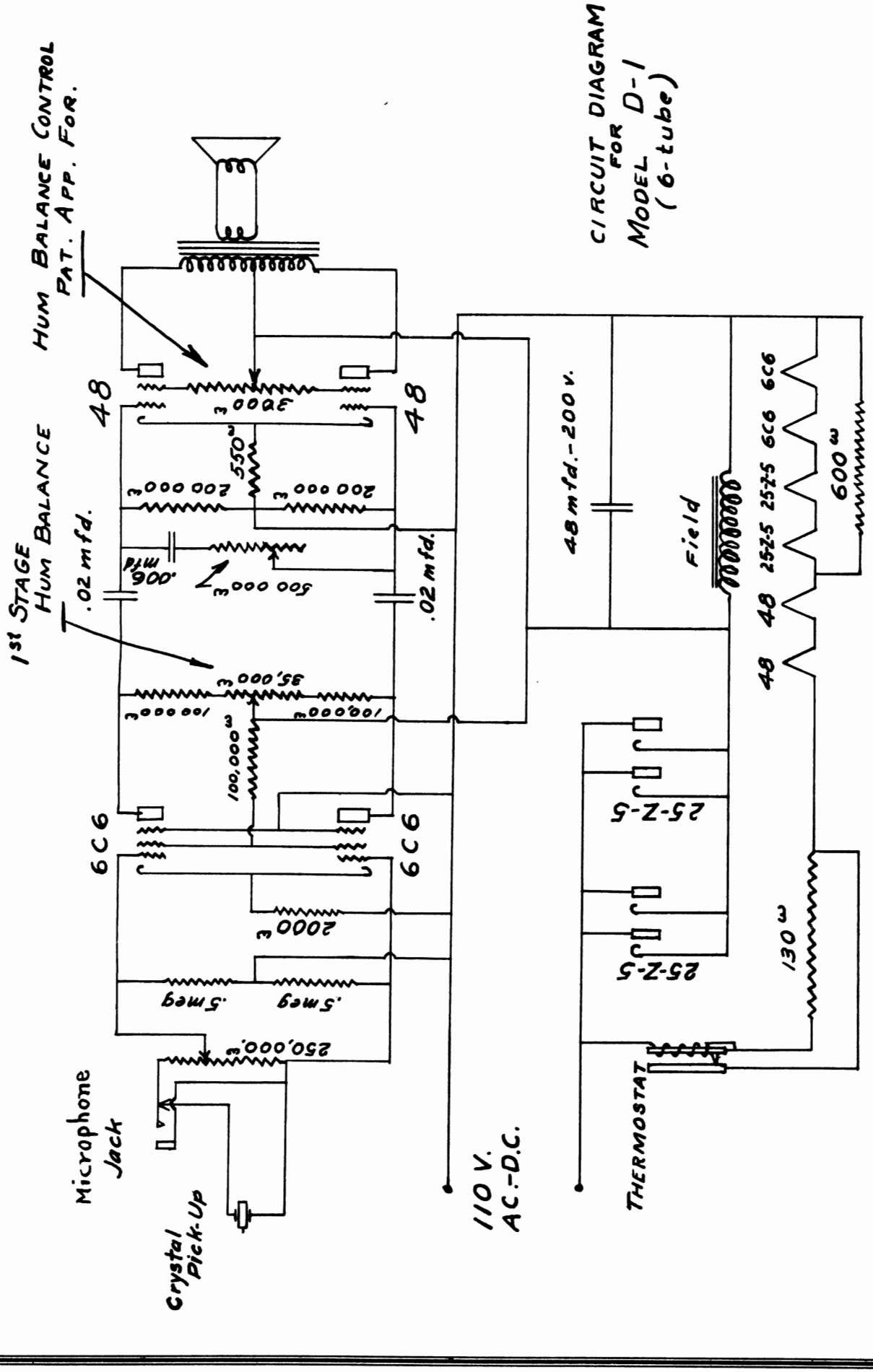
MODEL D-12 SIX TUBES



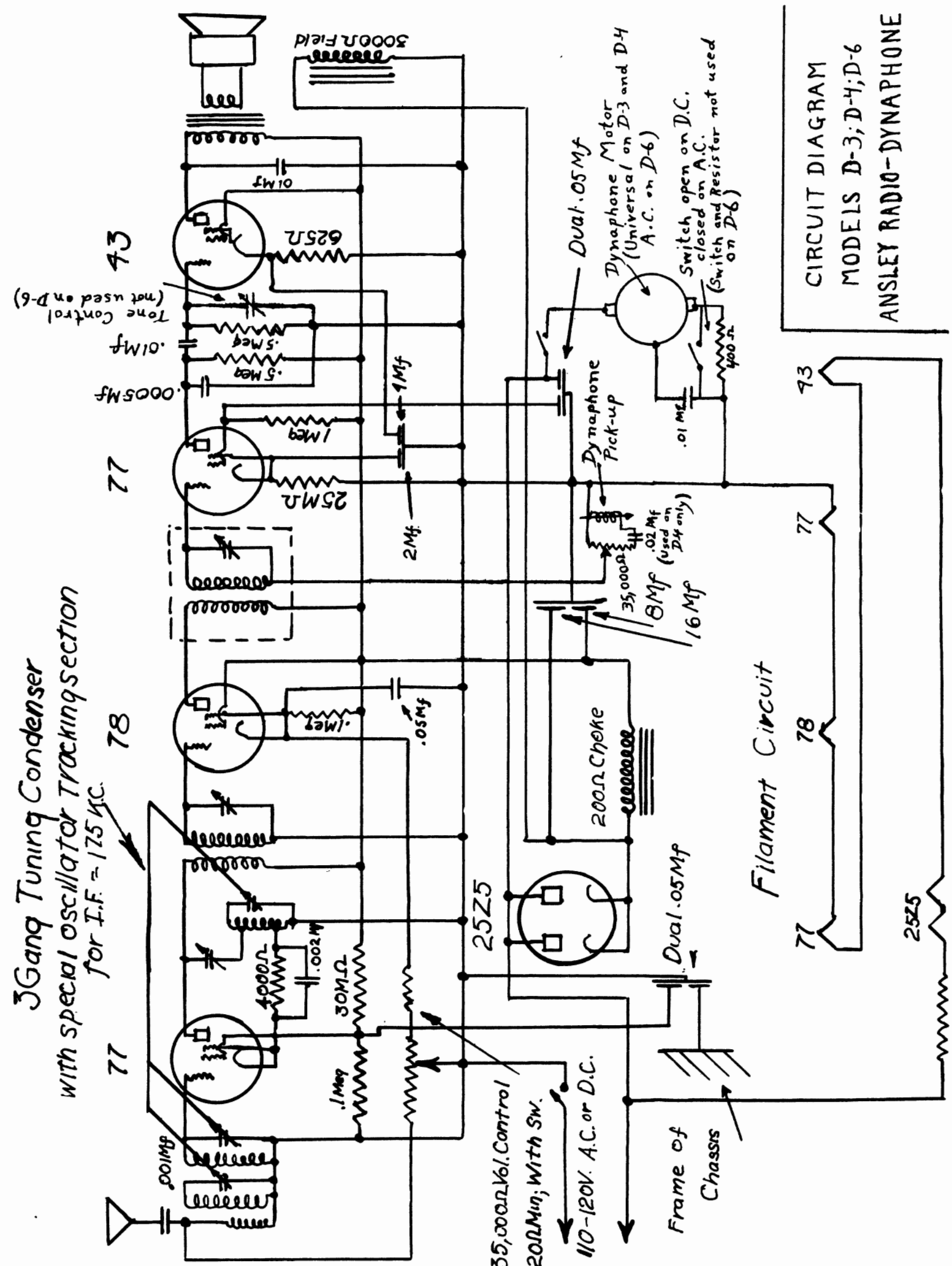
ANSLEY
DYNAPHONE
FOR
MODEL D-12

ANSLEY RADIO CORP.

MODEL D-1 SIX TUBES



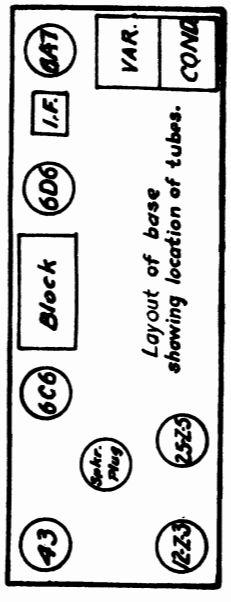
ANSLEY RADIO CORP.

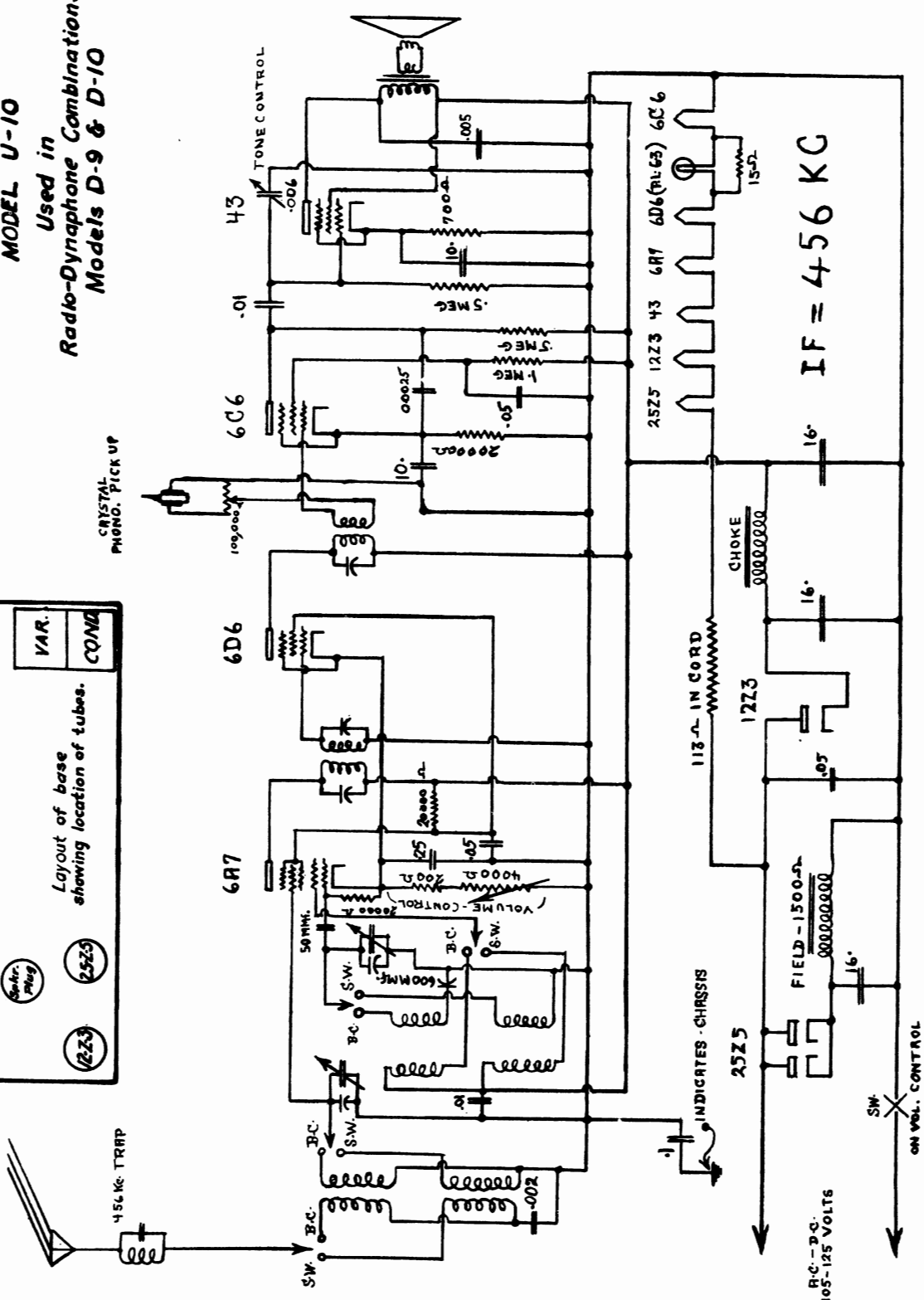


ANSLEY RADIO CORP.

CIRCUIT DIAGRAM
ANSLEY UNIVERSAL RADIO
MODEL U-10
Used in
Radio-Dynaphone Combinations
Models D-9 & D-10

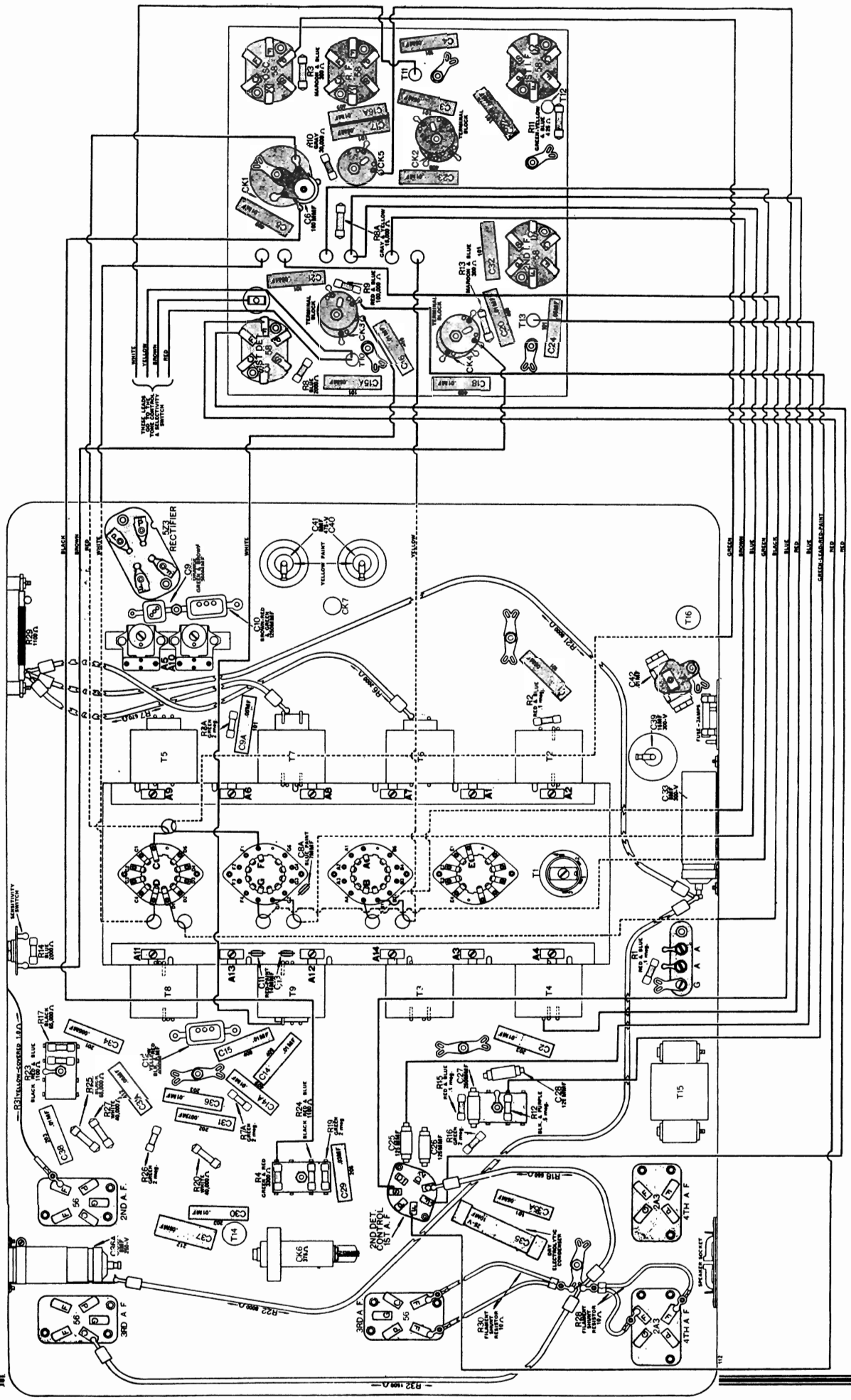
MODEL U-10 SIX TUBES





ATWATER KENT MFG. CO.

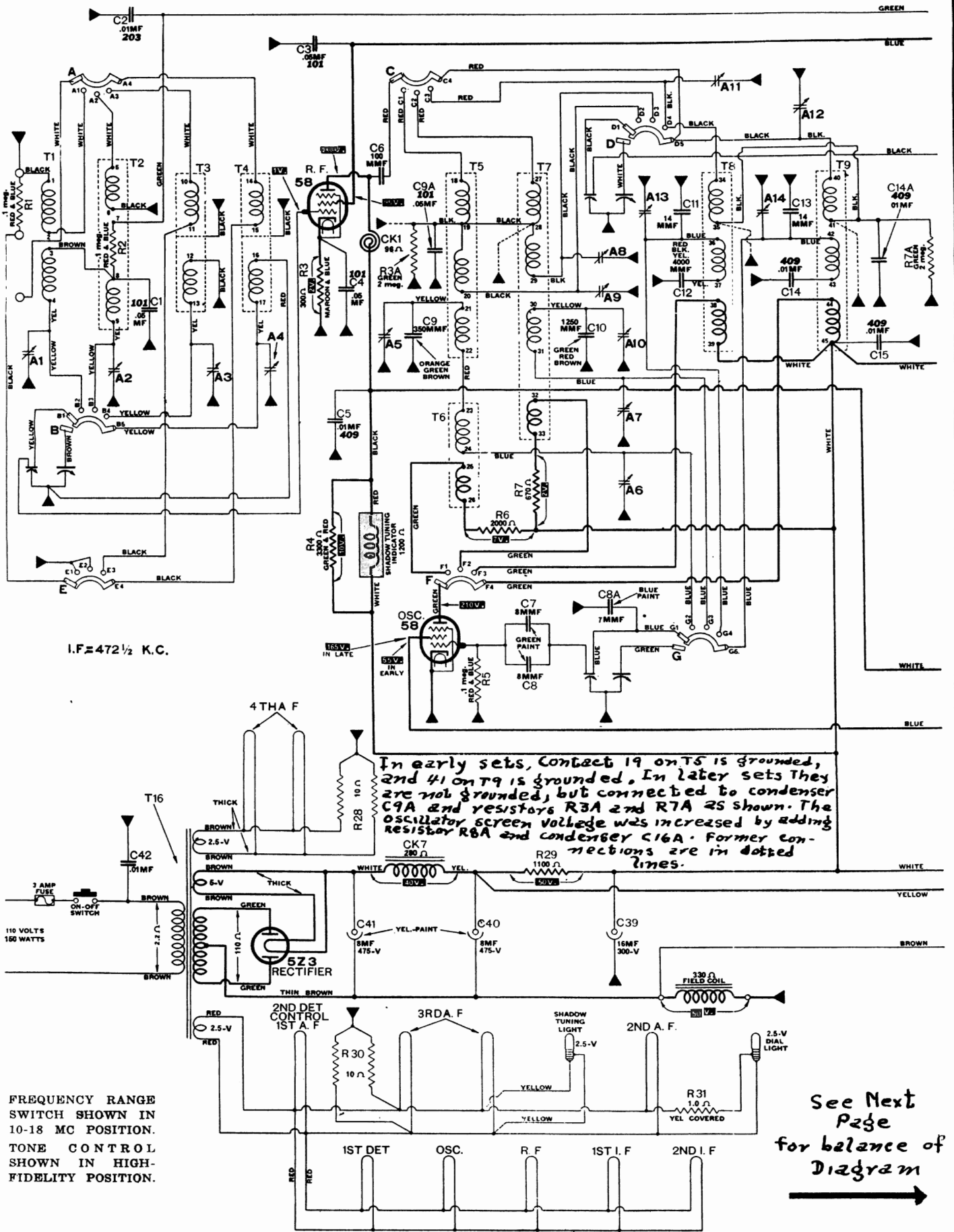
MODEL 112



THIS CHART SHOWS ALL CONNECTIONS BETWEEN UPPER UNIT AND LOWER BASE

ATWATER KENT MFG. CO.

MODEL 112



FREQUENCY RANGE SWITCH SHOWN IN 10-18 MC POSITION.

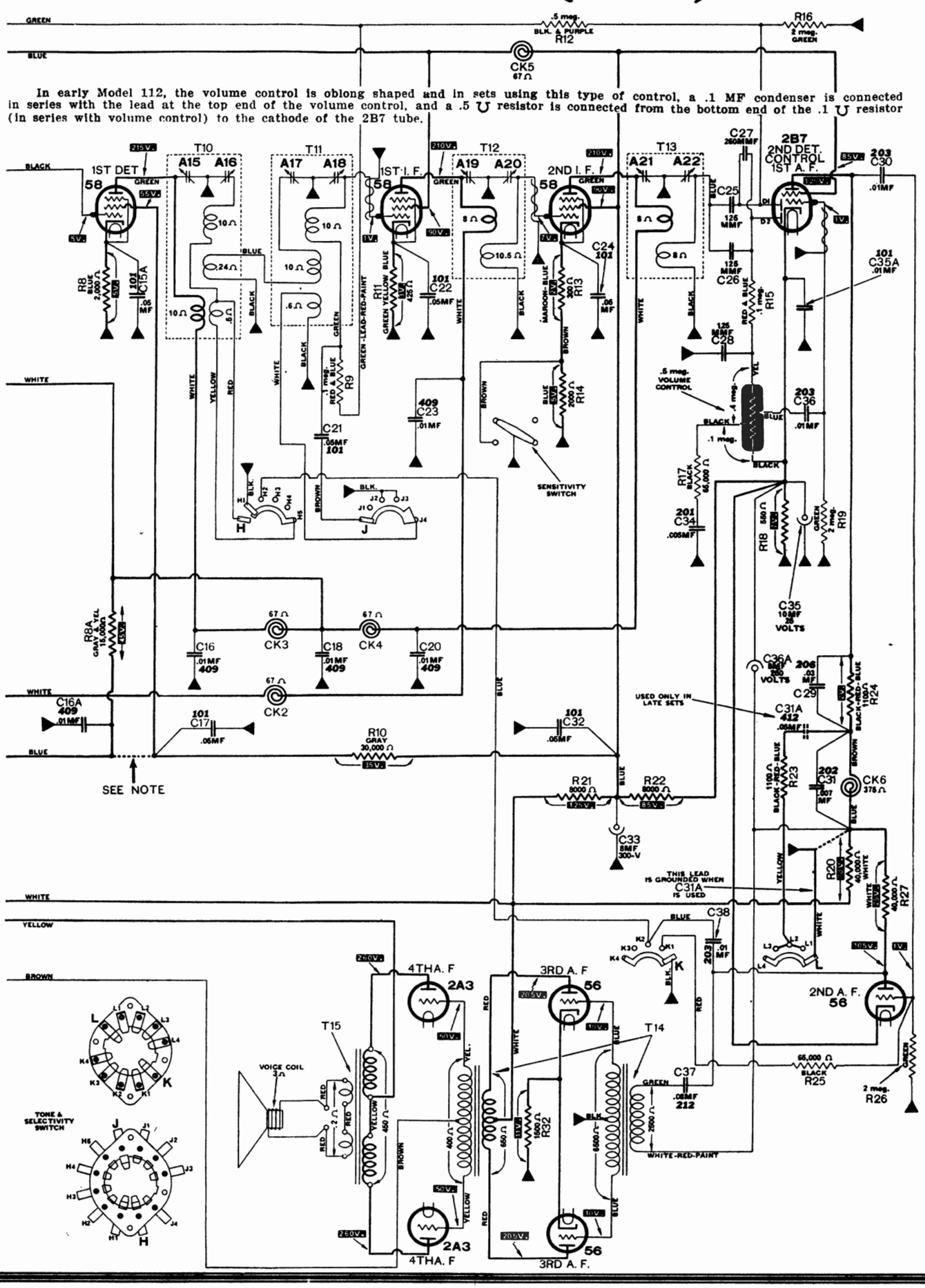
TONE CONTROL SHOWN IN HIGH-FIDELITY POSITION.

See Next Page for balance of Diagram →

ATWATER KENT MFG. CO.

MODEL 112 (CONTINUED)

In early Model 112, the volume control is oblong shaped and in sets using this type of control, a .1 MF condenser is connected in series with the lead at the top end of the volume control, and a .5 Ω resistor is connected from the bottom end of the .1 Ω resistor (in series with volume control) to the cathode of the 2B7 tube.



ATWATER KENT MFG. CO.

MODEL 112 — ADJUSTING TRIMMER CONDENSERS

EQUIPMENT

1. OSCILLATOR. The oscillator should extend from the lowest I. F. frequency (125 KC in Atwater Kent sets) to at least 18 MC. The oscillator should have a good attenuator and should be well shielded. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers on some models, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025MFD fixed condenser in series with the oscillator pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume. This is necessary to minimize the effect of the automatic-volume-control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. BALANCING UNIT. Build two of the Type "A" balancing units and one of the I. F. coupling units shown below. These are required for correct adjustment of Atwater Kent super-heterodynes. The Type "B" balancing unit, also described, is used on earlier models of Atwater Kent sets.

(These Atwater Kent units may be purchased from your distributor.)

To use the I. F. coupling unit, place it on the grid cap of the 1st-detector tube as shown, and clip the lead (that ordinarily goes to the 1st-detector grid cap) to the left-hand end of the 10,000 Ω resistor as shown.

4. Use a non-metallic screw driver for adjustment of the trimmers.

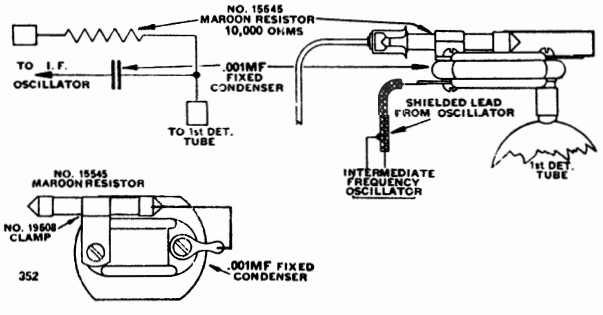


Fig. 1. I. F. Coupling unit, part No. 42590.

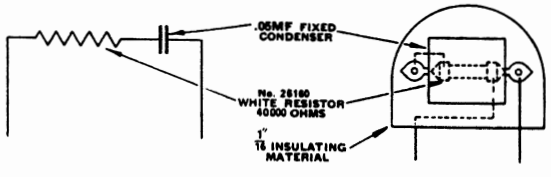


Fig. 2. Balancing unit "A," part No. 42610.

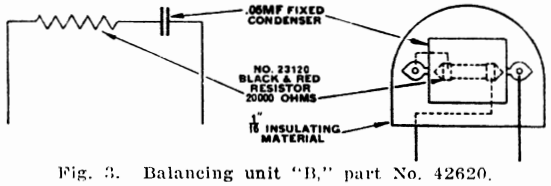


Fig. 3. Balancing unit "B," part No. 42620.

GENERAL NOTES

1. Do not make any trimmer adjustments and do not disturb the dial gear or the dial indicator adjustments unless absolutely necessary.

2. With all-wave sets, it is very desirable to use a test oscillator that extends to 18 MC (18,000 KC). If you attempt to use harmonics of a broadcast oscillator, you are likely to use the wrong harmonic and set the trimmers incorrectly.

3. When using a test oscillator, you will experience "double-spot" or image reception, particularly on the highest frequency range of the set. The double-spot point is twice the I. F. frequency below the correct point. For instance, if a set has an I. F. frequency of 472½ kilocycles, and you are tuning in an 18 MC signal, the double-spot or image will be twice 472½ or 945 KC (.94 MC) below 18. In such a case you will hear the signal at 18 MC and also at 17.06 MC. In properly aligned sets of six tubes or more, the image should be weaker than the desired signal.

4. Because of the facts mentioned in paragraphs 2 and 3 above, it is very desirable, wherever possible, first to check the short-wave dial calibration and determine how far, and in what direction, the readings are "off." This should be done on actual reception of short-wave stations of known frequency. This pre-checking will assist you in selecting the correct harmonic (in case you are using a broadcast oscillator), and it will also minimize possibility of confusing the correct signal and the image signal.

5. On oscillator trimmers there may be two different settings at which the signal is received. Always use the *first* of these two positions as you screw the trimmer in from a loose or minimum-capacity position. THIS IS IMPORTANT.

6. On sets with a combined oscillator and 1st-detector tube, tune the set to a quiet point near 1000 KC while adjusting the I. F. trimmers.

OSCILLATOR GOVERNS DIAL ACCURACY

It is essential to understand definitely that in a super-heterodyne the dial calibration depends on the oscillator circuit of the set, providing that the I. F. trimmers are correctly aligned. The pre-selector (R. F. and 1st-detector) trimmers do not affect the dial calibration but simply affect sensitivity.

If the dial calibration of one or more of the frequency ranges of the set is "off," check the oscillator trimmer, the oscillator tracking condenser and tracking trimmer, and the oscillator transformer for the particular range or ranges in question.

The oscillator **trimmer** is used to adjust the **high-frequency** end of the particular range.

The oscillator **tracking condenser** adjusts the **low-frequency** end of the particular range

In Atwater Kent sets the fixed tracking condenser on the broadcast range (and in some models also on the police range) is shunted with an adjustable tracking trimmer condenser. The adjustable tracking trimmer condenser is not used on the high-frequency ranges.

The adjustment of the trimmers for the high-frequency and low-frequency end of a particular range is slightly interlocking. For example, assume that the broadcast range of a set is off calibration. First turn the tuning knob so the dial pointer is at 1500 KC and, using a 1500 KC signal, peak the broadcast oscillator trimmer. Then turn the set to 560 KC and, using a 560 KC signal, peak the oscillator broadcast tracking trimmer for maximum output. This adjustment will have slightly affected the previous adjustment at 1500 KC so it will be necessary to repeat the adjustment at 1500 KC and also possibly at 560 KC.

If adjustment of the oscillator trimmer and the oscillator tracking trimmer does not correct the dial readings, it may be necessary to replace the fixed oscillator tracking condenser or the oscillator transformer for that particular range.

Naturally, the I. F. trimmers should be checked, and adjusted if necessary, before any attempt is made to align the R. F. or oscillator trimmers.

GENERAL PROCEDURE

First check the I. F. trimmers. If reception is satisfactory and the dial calibration is correct on the broadcast range, it is safe to assume that the I. F. trimmers are correctly adjusted.

If the dial calibration is "off" (or the set is weak) on only one range, adjust the trimmers for that range only. If this does not correct the trouble, inspect the resistors, condensers, transformers, and switch contacts associated with that particular range.

In checking a set, do not disturb the position of the wiring any more than necessary.

ATWATER KENT MFG. CO.

MODEL 112

ADJUSTING TRIMMER CONDENSERS (Contd.)

I. F. TRIMMERS

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. **Put tone control in 2nd-position from right.**

Put balancing unit A (shown in Fig. 2) across trimmer A21 and peak A22.

Put unit A across A22 and peak A21.

Put unit A across A19 and peak A20.

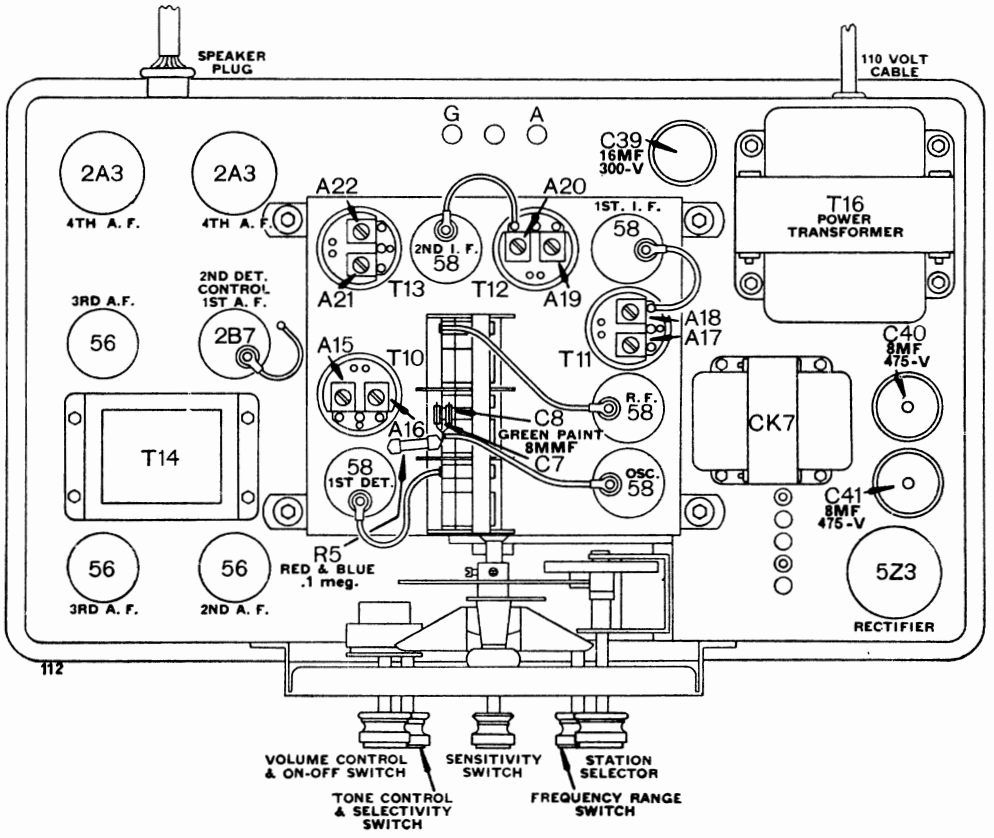
Put unit A across A20 and peak A19.

Put one unit A across A17 and another unit A across A15; peak A18 and A16.

Put one unit A across A18 and another unit A across A16; peak A17 and A15.

In case of instability while adjusting A21 and A22, place an extra balancing unit A across A18.

Remove the I. F. coupling unit and the balancing units and seal the trimmer screws.



R. F. TRIMMERS

Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

10 to 18 MC range. Tune oscillator exactly to 18 MC and turn tuning knob of set so indicator is at 18 MC mark. Adjust trimmers A14, A4 and A12 for peak output.

4 to 10 MC range. Tune oscillator exactly to 10 MC and turn set to 10 MC mark on the 4 to 10 MC range. Peak trimmers A13, A3 and A11.

1.5 to 4 MC range. Tune oscillator to 4 MC and turn set to the 4 MC mark on the 1.5 to 4 MC scale. Peak trimmers A7, A2 and A8. Tune oscillator to 1.5 MC and, with set at 1.5, peak A10. Repeat adjustments on A7 and A10 if necessary.

Broadcast range. Tune oscillator and set to 1500 KC. Peak trimmers A6, A1 and A9. Tune oscillator to 560 KC and turn set to the 560 KC mark. Peak A5. Repeat adjustments on A6 at 1500 and A5 at 560 if necessary.

TUNING MECHANISM

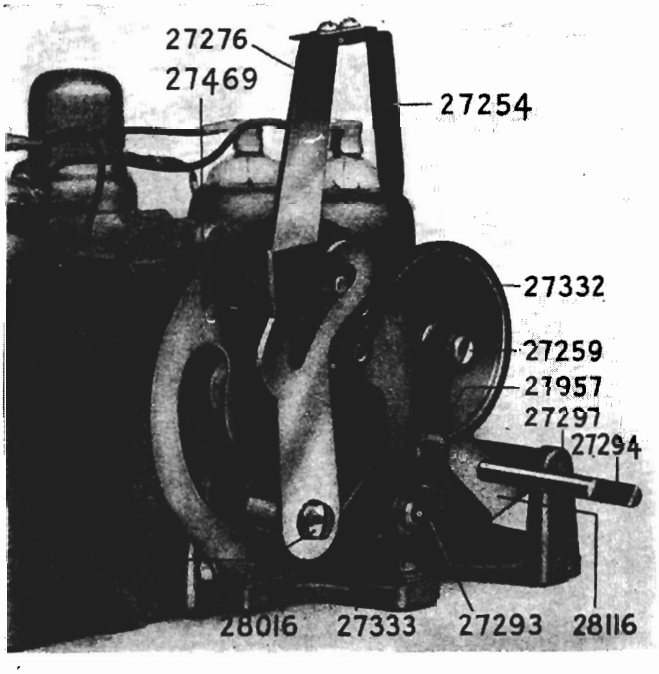


Illustration of parts in dual-speed compensated tuning mechanism in Models 112, 318, 447 and 559.

TRIMMERS ON MODELS 112 AND 559

	10-18 MC Range	4-10 MC Range	1.5-4 MC Range	540-1600 KC Range
R. F.	A4	A3	A2	A1
1st-Detector	A12	A11	A8	A9
Oscillator	A14	A13	A7	A6
Tracking	None	None	A10	A5

The I. F. trimmers are A15 to A22, inclusive.

PARTS LIST FOR MODEL 112

27287		Var. cond. assem.
25601		Rubber grommet
27301		Washer
22649		Screw
27286		Range switch
27272		Crank arm
35380		Reflector assem.
28379		Front panel assem.
27554		Escutcheon
27674		Vol. control, .5 U
27314		Vol. cont. mtg. bracket
27587		Tone cont. switch
27317		Mtg. bracket for above
38740		Sensitivity switch assem.
27628		Shaft and blade for above
27472		Antenna jumper
25913		R. F. coil shield
25056		I. F. T. shield
26255		I. F. T. shield insul.
25058		I. F. T. shield cover without hole
25059		I. F. T. shield cover with hole
25906		Filter choke cover
25758		Power trans. cover
15331		Audio trans. lid
23774		Fuse (3 amp.)
27057		Bottom cover
22683		Tube shield
23743		Aux. tube shield
27334		Tone cont. cond. clamp
27249		Mica for trimmers on strips
17109		Screw for above
17064		Insul. washer for above
27072		Station directory, F-1131
27545		Inst. folder, F-1143
27864		Shipping container
27728		Knob, vol. control and tuning
27494		Knob, tone control
27358		Knob, range switch
26571		Knob, silencing
28115		Spring (large knob)
28114		Spring (small knob)

TRANSFORMERS

T1	38310	No. 1 R. F. T., broadcast
T2	38340	No. 1 H. F., 1st range
T3	38360	No. 1 H. F., 2nd range
T4	38380	No. 1 H. F., 3rd range
T5	38320	No. 2 R. F. T., broadcast
T6	38330	Oscillator T., broadcast
T7	38350	No. 2 H. F., 1st range
T8	38370	No. 2 H. F., 2nd range
T9	38390	No. 2 H. F., 3rd range
T10	27448	No. 1 I. F. T.
T11	27449	No. 2 I. F. T.
T12	27451	No. 3 I. F. T.
T13	27452	No. 4 I. F. T.
T14	39730	Audio trans.
T15	39740	Output trans.
T16	26257	Power trans.

CHOKES

CK1	17015	R. F. plate choke
CK2	19210	R. F. plate circuit choke
CK3	19210	1st det. plate circuit choke
CK4	19210	2nd I. F. plate circuit choke
CK5	19210	R. F. 1st I. F. screen choke
CK6	28372	1st A. F. plate choke
CK7	25894	Audio filter choke

TRIMMERS

38770		Single trimmer
32880		Double I. F. trimmer

CONDENSERS*

C1	31160	.05 MF (101)
C2	27630	.01 MF (203)
C3	31160	.05 MF (101)
C4	31160	.05 MF (101)
C5	32810	.01 MF (409)
C6	22220	100 MMF (mica), 450-V.
C7	25661	8 MMF (green), 500-V.
C8	25661	8 MMF (green), 500-V.
C8A	36220	7 MMF (blue)
C9	27391	350 MMF (orange, green and brown)
C9A	31160	.05 MF (101)
C10	27389	1250 MMF (brown, red and green)
C11	34470	14 MMF (red on T8)
C12	27392	4000 MMF (yellow, black and red)
C13	34470	14 MMF (red on T9)
C14	32810	.01 MF (409)
C14A	32810	.01 MF (409)
C15	32810	.01 MF (409)
C15A	31160	.05 MF (101)
C16	32810	.01 MF (409)
C16A	32810	.01 MF (409)
C17	31160	.05 MF (101)
C18	32810	.01 MF (409)
C20	32810	.01 MF (409)
C21	31160	.05 MF (101)
C22	31160	.05 MF (101)
C23	32810	.01 MF (409)
C24	31160	.05 MF (101)
C25	39340	125 MMF (mica)
C26	39340	125 MMF (mica)
C27	33670	250 MMF (mica), 500-V.
C28	39340	125 MMF (mica)
C29	29530	.03 MF (206)
C30	27630	.01 MF (203)
C31	36670	.007 MF (202)
C31A	36490	.05 MF (412)
C32	31160	.05 MF (101)
C33	25384	8 MF, 300-V.
C34	28040	.005 MF (201)
C35	25379	10 MF, 25-V.
C35A	31160	.01 MF (101)
C36	27630	.01 MF (203)
C36A	25385	8 MF, 250-V.
C37	35420	.08 MF (212)
C38	27630	.01 MF (203)
C39	27583	16 MF, 300-V.
C40	28031	8 MF, 475-V.
C41	28031	8 MF, 475-V.
C42	23250	.01 MF, 450-V.

PARTS FOR TUNING MECHANISM

(See illustration on page 6)

27469	Dial gear
27276	Pointer arm
27254	Dial pointer
27332	Counter shaft gear (lge.)
27333	Idler gear (sml.)
27259	Gear screw
27957	Broadcast pinion gear
28116	Gear frame
27351	Screw (5/32" dia.)
27294	Tuning shaft
28016	Tuning bracket
27293	Detention spring
27298	Shaft spacer
27297	Bracket holding pin

RESISTORS

R1	30340	Red-blue, .1 U, 1/3-W.
R2	30340	Red-blue, .1 U, 1/3-W.
R3	37530	Maroon-blue, 300 Ω, ½-W.
R3A	30370	Green, 2 U, 1/3-W.
R4	30380	Green-red, 3300 Ω, 1/3-W.
R5	20980	Red-blue, .1 U, ½-W.
R6	33230	Flexible, 2000 Ω
R7	33210	Flexible, 670 Ω
R7A	30370	Green, 2 U, 1/3-W.
R8	33250	Blue, 2000 Ω, 1/3-W.
R8A	20960	Gray-yellow, 15,000 Ω, ½-W.
R9	30340	Red-blue, .1 U, 1/3-W.
R10	31840	Gray, 30,000 Ω, 1/3-W.
R11	37540	Green-yellow-blue, 425 Ω, ½-W.
R12	30350	Black-purple, .5 U, 1/3-W.
R13	37530	Maroon-blue, 300 Ω, ½-W.
R14	33250	Blue, 2000 Ω, 1/3-W.
R15	30340	Red-blue, .1 U, 1/3-W.
R16	30370	Green, 2 U, 1/3-W.
R17	31980	Black, 65,000 Ω, 1/3-W.
R18	23780	Flexible, 550 Ω
R19	30370	Green, 2 U, 1/3-W.
R20	26160	White, 40,000 Ω, ½-W.
R21	24340	Flexible, 8000 Ω
R22	24340	Flexible, 8000 Ω
R23	31480	Black-red-blue, 1100 Ω, 1/3-W.
R24	31480	Black-red-blue, 1100 Ω, 1/3-W.
R25	21040	Black, 65,000 Ω, ½-W.
R26	30370	Green, 2 U, 1/3-W.
R27	26160	White, 40,000 Ω, ½-W.
R28	17077	Flexible, 10 Ω
R29	19180	Iron core, 1100 Ω
R30	17077	Flexible, 10 Ω
R31	16081	Flexible, .6 Ω
R32	20380	Flexible, 1500 Ω

SOCKETS

22734		5 prong (56)
22735		4 prong (2A3)
26111		7 prong
24494		6 prong (58)
22733		6 prong (2a5-55)
22689		4 prong (rect.)
21336		4 prong (speaker)
18449		Fuse

112 SPEAKER No. 36700

26243		Diaphragm
23668		Cable and plug
35080		Field coil (325 Ω)
15079		Speaker plug

CABINET PARTS

25925		Wing nut
21142		Washer
25742		Clamp (large)
25746		Clamp bolt

* Voltages for condensers are determined by the first numeral of the code number on the condenser.
Example: 101=100 volts, 202=200 volts, 403=450 volts.

Ω=ohms. U=megohms.

PARTS LIST FOR MODEL 511
Tune♦O♦Matic

28913		Front panel assem.
27923		Escutcheon
25689		Shadow tuning meter
27675		Range switch
22678		R. F. coil shield
23774		Fuse (3 amp.)
22683		Tube shield
23743		Aux. tube shield
27289		Tone control switch
27829		Base cover
25906		Filter choke cover
25758		Power T. cover
27732		Vol. control .5 meg.
27682		Var. cond. assem.
27828		On-off switch
28556		Wrench
28296		Dealer inst. folder F 1207
28297		Customer inst. folder F 1208
28572		Shipping container (wood)
29013		Shipping container (chassis)
26569		Knob, vol. cont. and tuning
27495		Knob, tone and silencing
26571		Knob, range switch

TRANSFORMERS

T1	40560	No. 1 R. F. T.
T2	40570	No. 2 R. F. T.
T3	40580	No. 3 R. F. T.
T4	40590	Oscillator T.
T5	28172	No. 1 I. F. T.
T6	28173	No. 2 I. F. T.
T7	28174	No. 3 I. F. T.
T8	28175	No. 4 I. F. T.
T9	40760	Audio T.
T10	40770	Output T.
T11	26257	Power T.

RESISTORS

R1	30340	Red, blue, .1 U, ⅓ W.
R2	37530	Maroon, blue, 300 Ω, ½ W.
R3	37530	Maroon, blue, 300 Ω, ½ W.
R4	31980	Black, 65,000 Ω, ⅓ W.
R5	30340	Red, blue, .1 U, ⅓ W.
R6	20950	Maroon, 10,000 Ω, ½ W.
R7	36430	Blue, yellow, 5000 Ω, ⅓ W.
R8	30340	Red, blue, .1 U, ⅓ W.
R9	37540	Blue, yellow, green, 425 Ω, ½ W.
R10	24340	Flexible, 8000 Ω.
R11	24340	Flexible, 8000 Ω.
R12	30350	Black, purple, .5 U, ⅓ W.
R13	31480	Blue, red, black, 1100 Ω ⅓ W.
R14	39130	Green, gray, red, 2500 Ω, ⅓ W.
R15	31980	Black, 65,000 Ω, ⅓ W.
R16	30340	Red, blue, .1 U, ⅓ W.
R17	39790	Blue, green, red, 500 Ω, ⅓ W.
R18	30370	Green, 2 U, ⅓ W.
R19	26160	White, 40,000 Ω, ½ W.
R21	39790	Blue, green, red, 500 Ω.
R22	30370	Green, 2 U, ⅓ W.
R23	30370	Green, 2 U, ⅓ W.
R24	16081	Flexible, .6 Ω.
R25	26160	White, 40,000 Ω, ½ W.
R26	20380	Flexible, 1500 Ω.
R27	17077	Flexible, 10 Ω.
R28	19180	Iron core, 1100 Ω.
R29	17077	Flexible, 10 Ω.
R30	31860	Flexible, 1.0 Ω.

CONDENSERS*

C1	31160	.05 MF (101)
C2	31530	.1 MF (102)
C3	31160	.05 MF (101)
C4	26820	.05 MF (208)
C5	35840	50 MMF, 500-V.
C6	31530	.1 MF (102)
C7	27391	350 MMF (orange, green, brown)
C8	27598	3700 MMF (orange, violet, red)
C9	26820	.05 MF (208)
C10	31160	.05 MF (101)
C11	31160	.05 MF (101)
C12	26820	.05 MF (208)
C13	31530	.1 MF (102)
C14	31530	.1 MF (102)
C15	29530	.03 MF (206)
C16	26820	.05 MF (208)
C17	26820	.05 MF (208)
C18	39340	125 MMF
C19	39340	125 MMF
C20	39340	125 MMF
C21	28130	500 MMF (402)
C22	29890	.005 MF (408)
C23	27630	.01 MF (203)
C24	25385	8 MF, 250-V.
C28	25379	10 MF, 25-V.
C29	27630	.01 MF (203)
C30	39650	.004, .001 MF (419)
C31	35420	.08 MF (212)
C32	23250	.01 MF, line cond., 450-V.
C33	22538	8 MF, 475-V.
C34	22538	8 MF, 475-V.
C35	27911	16 MF, 300-V.
C36	25384	8 MF, 300-V.

*Voltages for condensers are determined by the first numeral of the code number which is found on the condenser.
Example: 101 = 100 volts, 202 = 200 volts, 403 = 450 volts.

CHOKES

CK1	19210	1st det. filter
CK2	19210	Screen
CK3	25894	Filter choke

TRIMMERS

39430		Double R. F. trimmer
38770		Tracking trimmer (A8)
32880		Double I. F. trimmer

SOCKETS

24492		4-prong (2A3)
24493		5-prong
22689		4-prong (rect.)
21336		4-prong (spkr.)
26111		7-prong
24494		6-prong
18449		Fuse

40870 CLOCK ASSEMBLY

The only parts sold separately are those listed below.

28317		Spool assembly
27697		Cord assembly
27818		Cord check
28373		Cord and plug assem.
27811		Time adj. knob
27797		Crystal
27798		Retaining ring
28911		Shipping container

TUNE-O-MATIC PARTS

28237		Disc and bushing assem.
27735		Gear friction disc fibre
27737		Gear friction spring
28236		Cam
27741		Disc spacer
28238		Station selector disc
27742		Disc spacer spring
28229		Collar
27736		Worm gear
27744		Worm shaft support
27753		Bearing (left hand)
27752		Bearing (right hand)
27526		Ball bearing
28233		Small wheel
28232		Large wheel
28231		Shaft and worm
27784		Locknut
27783		Thrust screw
40860		Solenoid coil
27352		Rubber pad for above
28301		Contact fingers
28234		Knob gear
27836		Knob shaft
22717		Dial pointer arm
28235		Dial gear
27646		Gear stop
22649		Pointer arm screw
22651		Pointer arm washer
25857		Bracket
28302		Reversal switch
27758		Spring
28405		Disc cover
28433		Motor assem.
27774		Plunger
27767		Felt washer for the above
27775		Plunger hanger wire
28371		Switch shield

REMOTE CONTROL, No. 41940

28494		Control switch
42450		Resistor, 150 Ω
28816		Dial assem.
28299		Lamp, 6-8-v., frosted
24278		Knob
25865		Escutcheon
28753		Base cover
28655		Cable and plug assem. (15-wire)
28648		Cable (11-wire)
28926		Base assem.
28925		Box
28469		Cable clamp
28657		Wood screw
28219		Spring in lamp socket
28218		Washer in lamp socket
28815		Socket assembly
28658		Inst. sheet, F-1214
28659		Shipping container

MODEL 511 SPEAKER

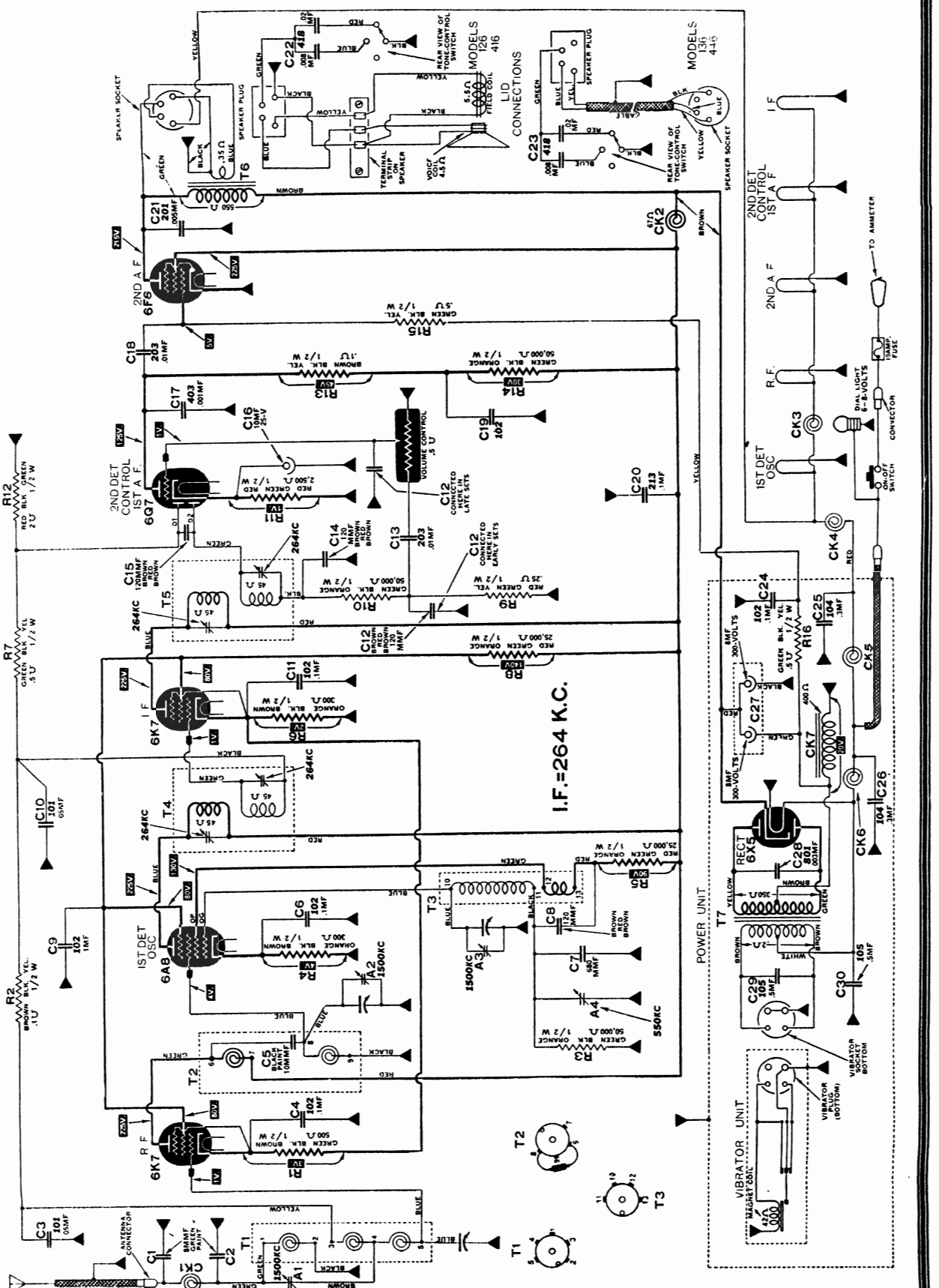
26243		Diaphragm
23668		Cable and plug assem.
35080		Field coil (325Ω)
15079		Plug (only)

Ω=ohms. U=megohms.

ATWATER KENT MFG. CO.

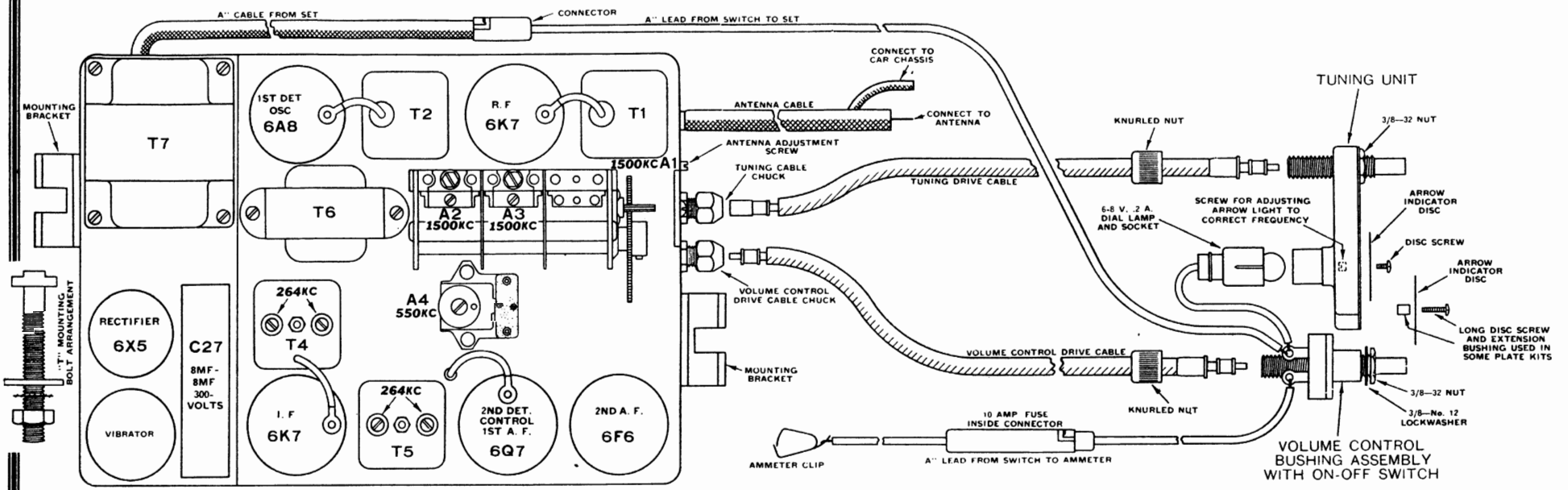
DIAGRAM OF MODELS 126, 136, 416 and 446

Models 126 and 136 Have Glass Tubes with Suffix "G" Added to Type Numbers



MODELS 126, 136, 416, 446 and 556

IMPORTANT: Models 126, 136 and 556 Have Glass Tubes, with Suffix "G" Added to Type Numbers



TRIMMER CONDENSERS

Trimmers are precisely adjusted at the factory, and readjustment is never required except in the normal course of servicing. The following technical data is therefore intended only for the use of radio service experts who have the equipment and experience for this work.

GENERAL

When adjusting trimmers, keep the radio volume control and tone control turned full clockwise.

Use an Atwater Kent No. 42590 I.F. coupling unit to couple the signal generator while aligning I.F. trimmers. The coupling unit may be purchased through any Atwater Kent distributor.

In order to keep below the AVC level, it is necessary to use the weakest possible output from signal generator that will give a reading on a sensitive output meter.

I.F. TRIMMERS

Turn variable condenser full out of mesh.

Connect signal generator (264 KC) to cap of I.F. tube by means of No. 42590 coupling unit. Peak two trimmers on top of T5.

Connect signal generator to cap of 1st-detector tube and peak two trimmers on top of T4.

DIAL ADJUSTMENT

With variable condenser fully meshed, the arrow indicator should be adjusted (by means of screw in center of dial lamp opening at rear of tuning unit) to the mark beyond the 550 KC end of dial.

R.F. TRIMMERS

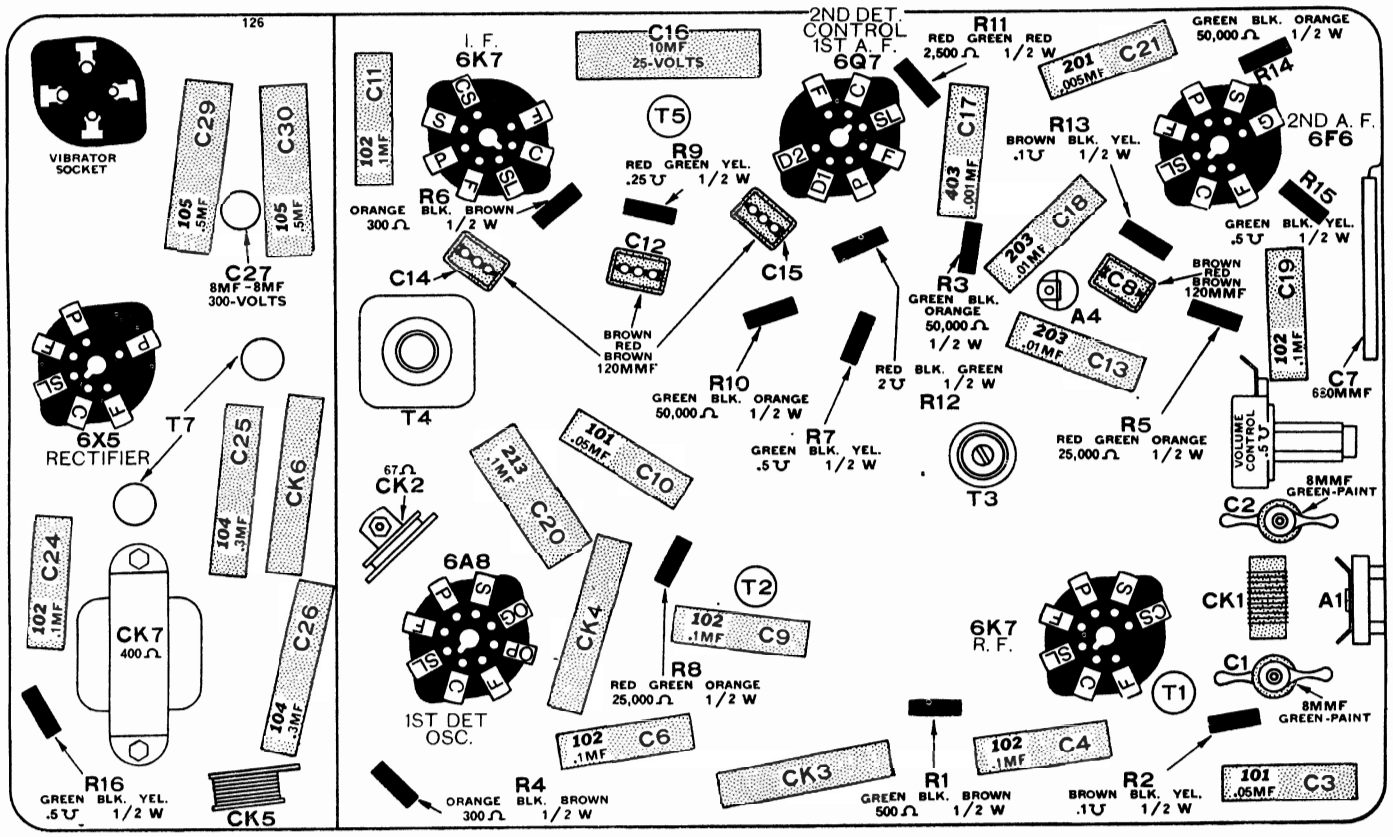
Connect signal generator (1500 KC) to antenna and chassis, using a 200 MMF fixed condenser in series with the antenna lead. With dial at 1500 KC, peak A3 (oscillator), A2 (1st-detector) and A1 (antenna). Use first peak as A3 is screwed in from a loose position.

With signal generator at 550 KC, peak tracking condenser A4 while rocking tuning control slightly around the 550 KC mark.

Repeat adjustments at 1500 and 550 KC if necessary.

ATWATER KENT MFG. CO.

CHART, MODELS 126, 136, 416 and 446



Model 556 is simliar except for differences in the power unit and 2nd-A.F. bias circuit.

PARTS LIST MODELS 126, 136, 416, 446 and 556

32104	Set container with volume control chuck	T4	50030
29298	Station selector chuck	T5	50050
26035	Inner plate	T6	32148
29226	Chuck nut	T7	32134
32106	Ground clip (edge of set)		
32319	Bottom lid	T7	26291
32128	Snap buttons (2 used)		
32108	Snap buttons (8 used)	A1	32121
32142	T head mounting bolt		29119
32204	Mounting washer		
24465	Lockwasher		
32171	Mounting nut		
32217	Cable and socket from chassis to lid		
49990	Var. condenser assembly		
32097	Var. cond. mounting clips		
32187	No. 1 I.F.T. shield		
32189	No. 2 I.F.T. shield		
32219	Oscillator trans. shield		
32218	R.F.T. shield		
32211	Clips on R.F., I.F. shields		
32109	Clips on Osc. shield		
32102	VOL. CONTROL .5 MEG.		
45370	TONE CONTROL SWITCH		
32182	Tone control nut		
32168	Tube shield (half)		
32169	Holding ring for the above		
32266	Tube shield clip on base		

SOCKETS

30058	Universal 8 prong		
32114	Vibrator socket		
29057	Speaker socket		

TRANSFORMERS

T1	50060	No. 1 R.F. Trans.	
T2	50070	No. 2 R.F. Trans.	
T3	50080	Oscillator Trans.	

POWER UNIT

		29687	120 MMF
C16	25379	10 MF, 25 V	
C18A	25379	10MF, 25 V (556)	
C27	32136	8-8 MF 300 V (126, 136, 416, 446)	
C27	32273	8-8 MF 300 V (556)	
C28	50210	.003 MF 800 V (801)	
50170		Power unit complete with tube (126, 136, 416, 446)	
50240		Power unit complete with tube (556)	
32209		Base and socket assembly	
26046		Power trans. brackets	
32138		VIBRATOR	
32095		Container less covers	
32268		Top cover	
32096		Bottom cover	

REMOTE CONTROL UNIT

32122		Tuning unit*
32222		Switch and bracket assem. complete with leads
32221		Switch and bracket assem. less leads
32172		Arrow indicator disc
30091		Crystal
30092		Dial plate
30093		Disc screw 7/32"
32223		Disc screw 3/8"
30099		Disc screw 3/4"
30101		Disc bushing 3/16"
30094		Disc bushing 33/64"
32225		Sheath-clamping nut
32123		Tuning flexible drive assem.
32151		Volume control flexible drive assembly

*Parts of tuning unit assembly are not sold separately.

CHOKES

CK1	50270	Antenna choke
CK2	19210	"B" Choke
CK3	36630	"A" choke
CK4	36630	"A" choke
CK5	50160	"A" choke
CK6	36630	"A" choke
CK7	32135	Iron core filter choke

CONDENSERS

Tubular condensers with letter "F" before code number are smaller than the standard Atwater Kent tubular condensers, but otherwise identical in voltage rating and capacity. The standard condensers may be used in place of the "F" type.

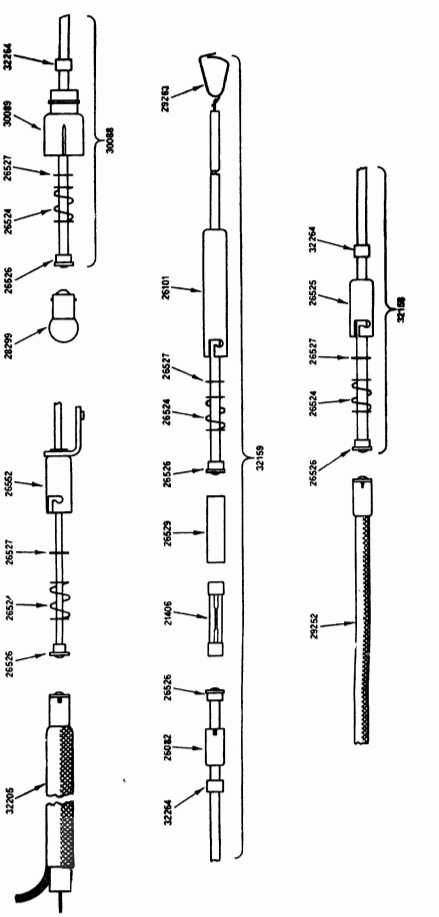
C1	25661	8 MMF (green paint)
C2	25661	8 MMF (green paint)
C5	34460	10 MMF (in T2)
C7	31180	680 MMF

SPEAKER PARTS	126, 416, 556	S6	S8	HF
Speaker, complete	32137	56800	56600	56900
Speaker, less housing or cable		32147		32131*
Cone head		30096	26822	Cable & plug, No. 32276
Field coil		30097	30097	Plug, No. 29056
Copper ring		30098	30710	Tip contact, No. 24082
Speaker housing		32271	30087	
Terminal strip		32286	32286	
Plug (4 prongs)		32112	32112	
Wire screen			32274	
Cloth screen		32299	32329	

LID PARTS	126, 416	556	136, 446
Lid only		32283	32105
Cloth screen	32299	32267	
Metal screen		26983	
Grille (chrome)	32143		
Grille gasket (fibre)	32409		
Cable and socket			32285
Socket only			29057
Plug (4 prong)	32112		32112
Chrome strip, long			32206
Chrome strip, short			32207
Chrome strip fastener			32298

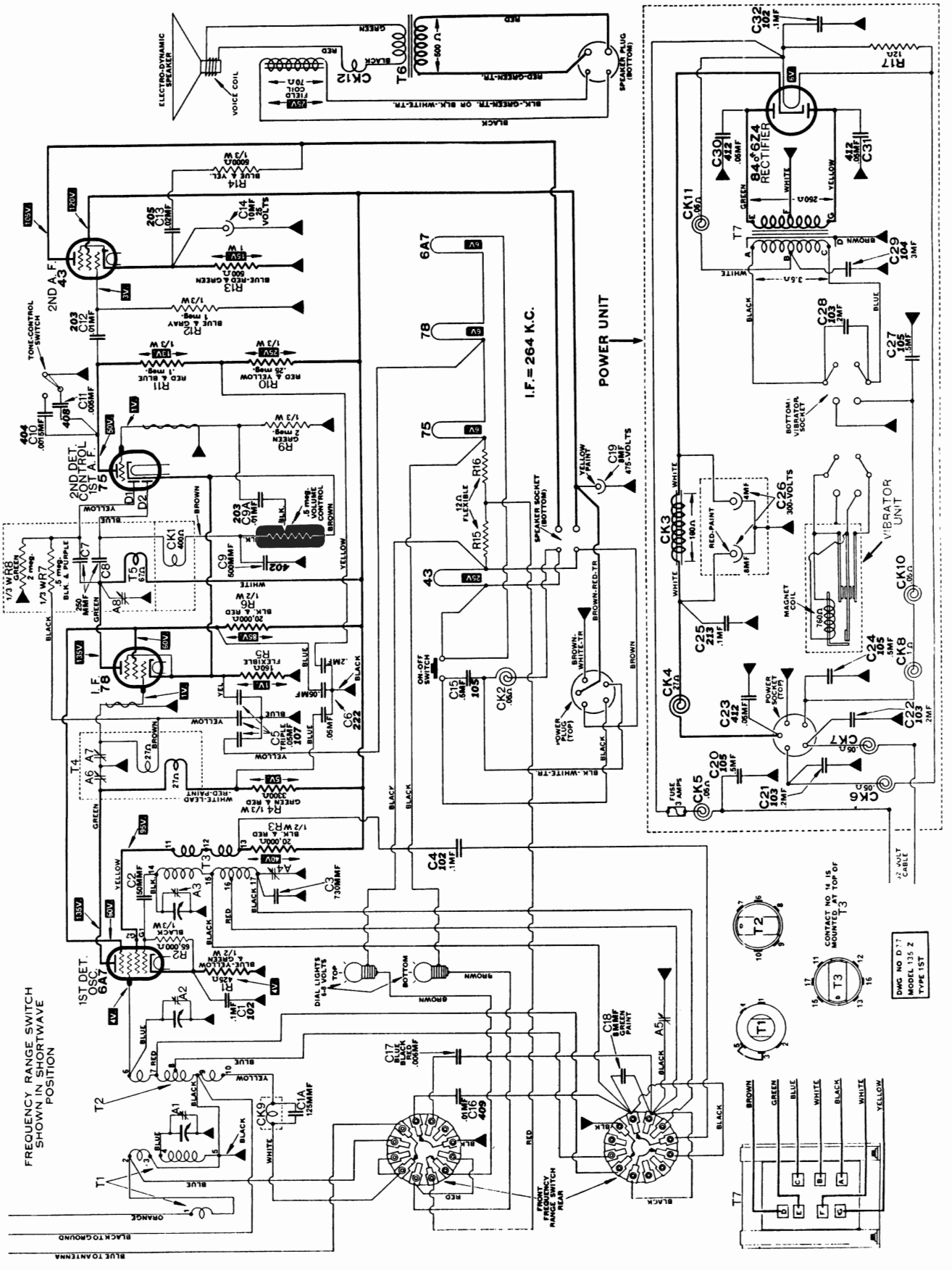
*Parts for HF speaker are not sold separately

Genuine Atwater Kent Service parts are sold only to recognized Radio Service Men by Atwater Kent Radio Distributors.



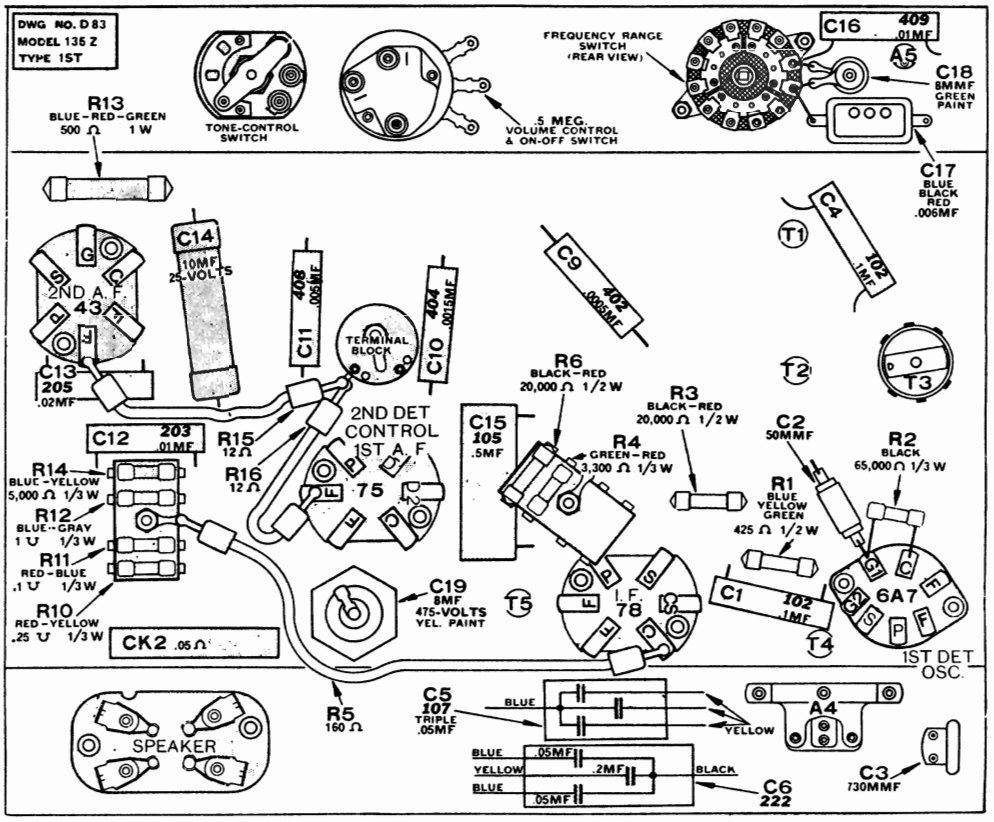
ATWATER KENT MFG. CO.

MODELS 135Z AND 215Z

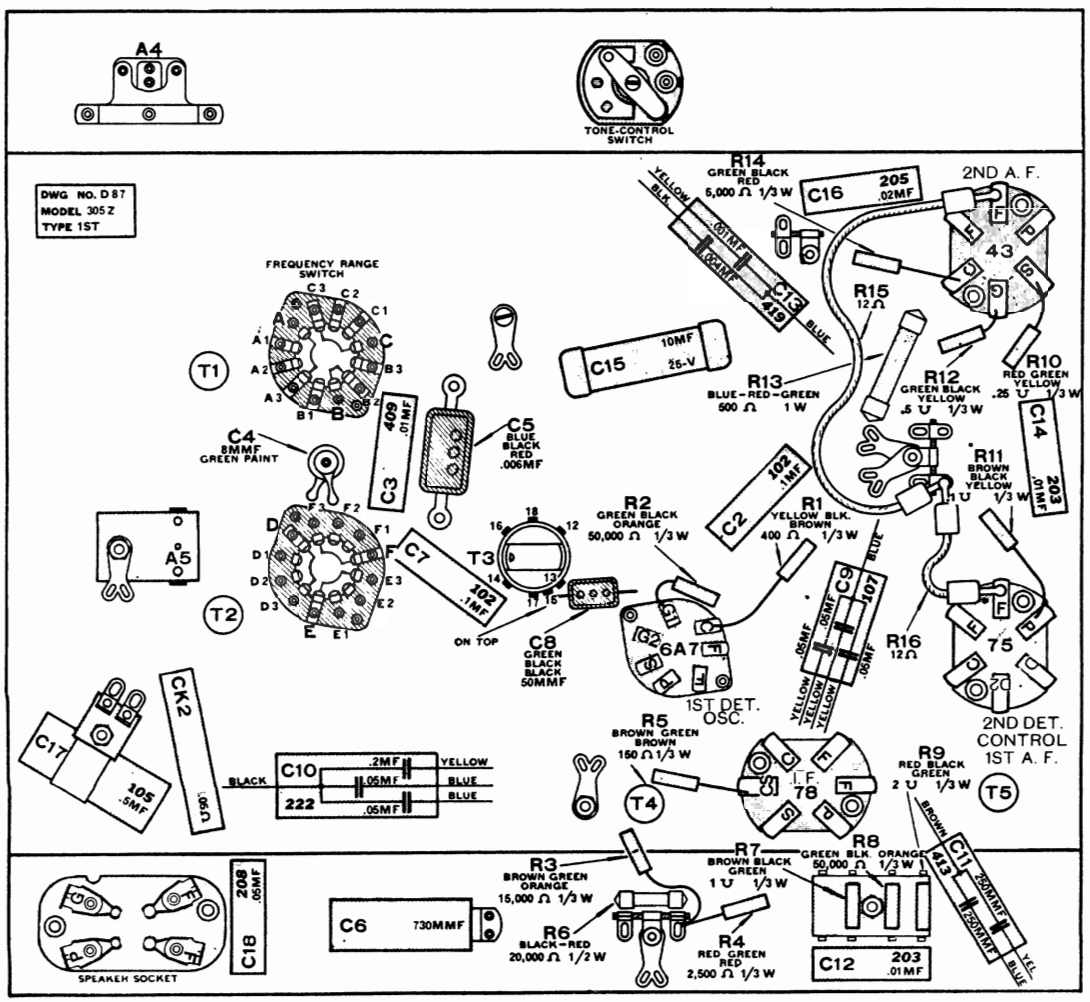


ATWATER KENT MFG. CO.

MODELS 135Z AND 215Z

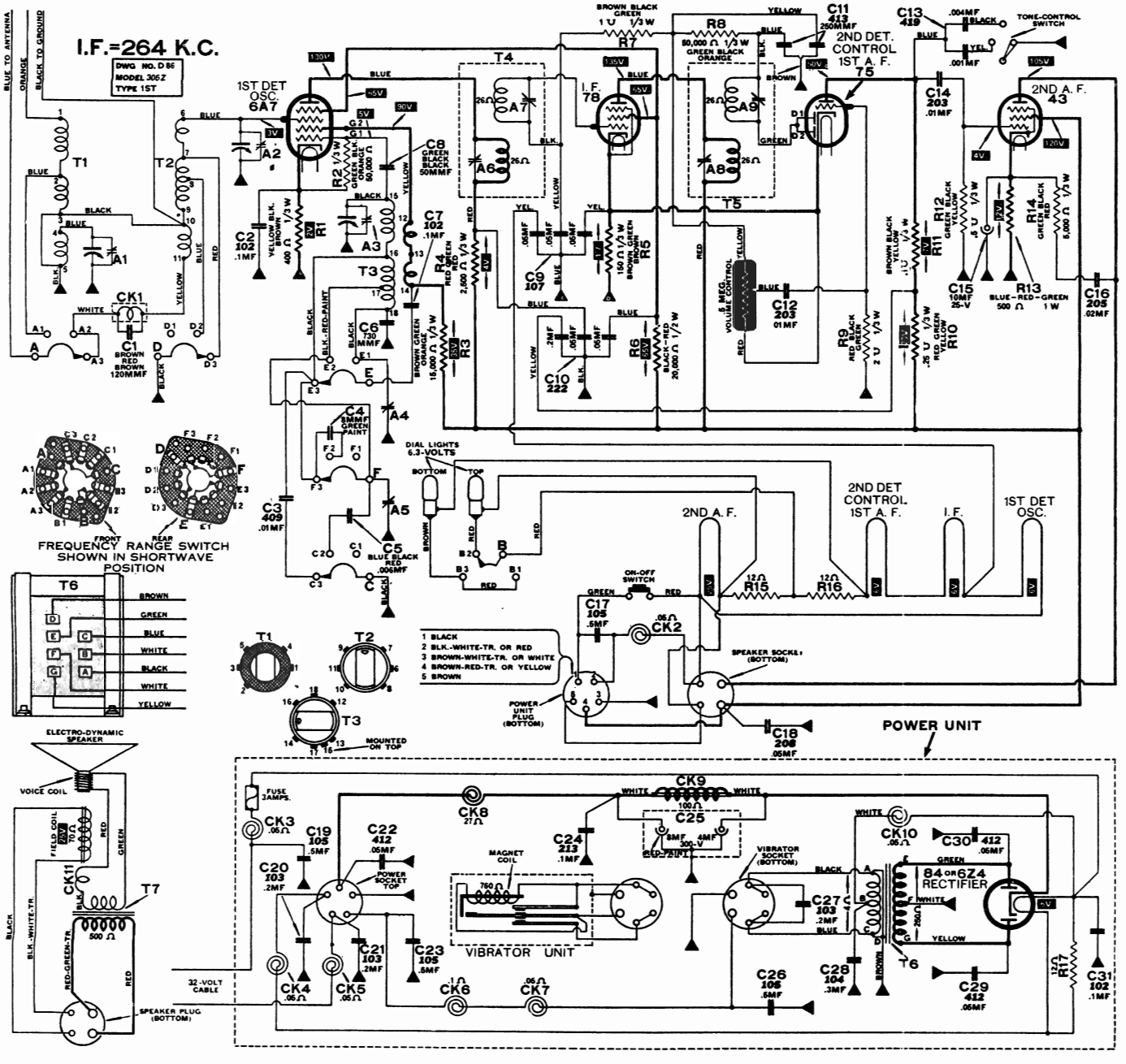


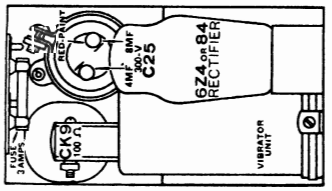
MODELS 305Z AND 565Z

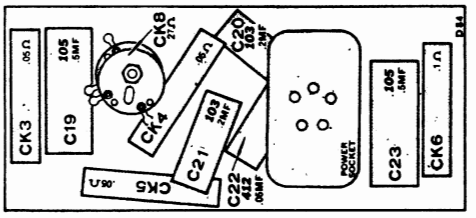


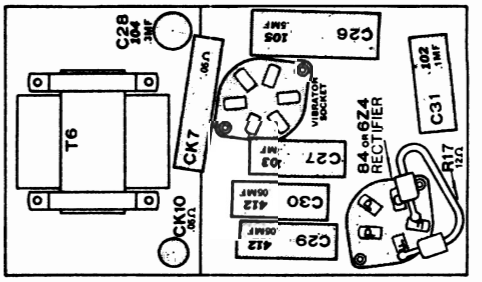
ATWATER KENT MFG. CO.

MODELS 305Z AND 565Z







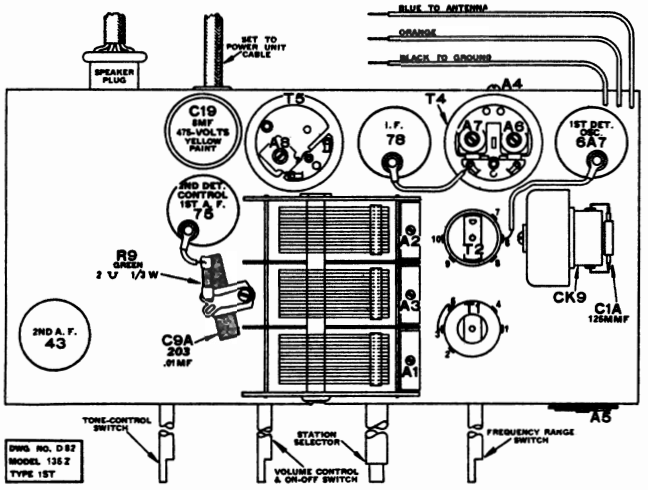


Charts Showing Location of Parts in Power Unit.

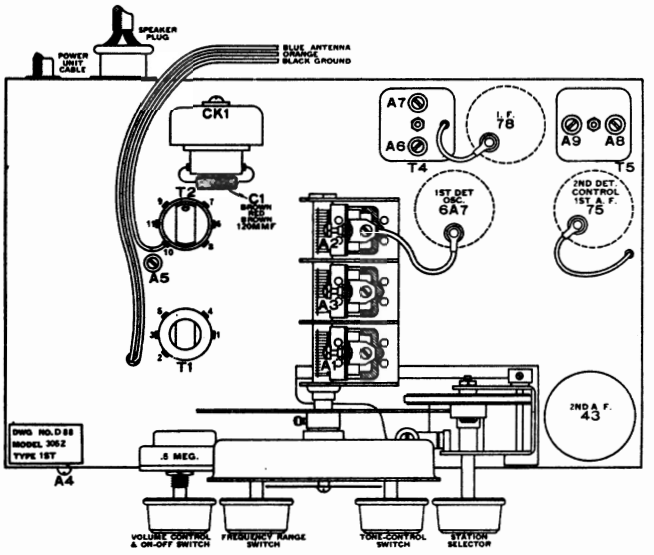
ATWATER KENT MFG. CO.

MODELS 135Z, 215Z, 305Z, AND 565Z

ADJUSTING TRIMMER CONDENSERS



MODELS 135Z AND 215Z



MODELS 305Z AND 565Z

A1—Preselector, 1500 KC.
A2—1st-detector, 1500 KC.
A3—Oscillator, 15 MC.
A4—Tracking, 560 KC.
A5—Oscillator, 1500 KC.
A6—1st-detector plate, 264 KC.
A7—I. F. grid, 264 KC.
A8—I. F. plate, 264 KC.

A1—Preselector, 1500 KC.
A2—1st-detector, 1500 KC.
A3—Oscillator, 15 MC.
A4—Tracking, 560 KC.
A5—Oscillator, 1500 KC.
A6—1st-detector plate, 264 KC.
A7—I. F. grid, 264 KC.
A8—I. F. plate, 264 KC.
A9—2nd-detector, 264 KC.

EQUIPMENT.

1. OSCILLATOR. The oscillator should cover the I. F. and R. F. frequencies. It should be well shielded and have a good attenuator. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025 MFD fixed condenser in series with the pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume, and the tone control at high pitch. This is necessary to minimize the effect of the automatic volume control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. I. F. COUPLING UNIT. Purchase from your distributor one of the special Atwater Kent I. F. coupling units No. 42590. This is placed on the grid cap of the I. F. or the 1st-detector tube, as specified, and the lead that normally connects to the grid cap is attached to the coupling unit.

4. Use a non-metallic screw driver for adjustment of the trimmers.

GENERAL NOTES.

1. Do not tamper with the trimmer adjustments unless the necessity is clearly apparent.

2. On the oscillator trimmer there are two different settings at which the signal will be received. Always use the *first* of these two positions as you screw the trimmer in from a loose or minimum-capacity position. THIS IS IMPORTANT.

3. Check the I. F. trimmers first.

4. In checking the set, do not disturb the position of the wiring any more than necessary.

DIAL CALIBRATION.

The dial calibration depends on the oscillator circuit of the set, providing that the I. F. trimmers are correctly aligned to their specified frequency. The pre-selector (R. F. and 1st-detector) trimmers do not affect the dial calibration, but simply affect sensitivity.

The oscillator trimmer is used to adjust the high-frequency end of the scale.

The oscillator tracking condenser adjusts the low-frequency end of the scale.

If adjustment of the oscillator trimmer and the oscillator tracking trimmer condenser does not correct the dial readings, it may be necessary to replace the fixed oscillator tracking condenser or the oscillator transformer.

Naturally the I. F. trimmers should be checked and adjusted, if necessary, before any attempt is made to align the R. F. or oscillator trimmers.

PROCEDURE

I. F. TRIMMERS.

Connect I. F. test oscillator (264 KC) to I. F. grid by means of regular I. F. coupling unit. Peak A8 (and A9 in 305Z, 565Z). Connect I. F. oscillator to 1st-detector grid and peak A7, A6.

DIAL POINTER ADJUSTMENT.

With rotor of variable condenser fully meshed, dial indicator should be at 538 KC.

R. F. TRIMMERS.

Connect an R. F. oscillator to antenna and ground of set.

Short-wave range. With oscillator and dial at 15 MC, peak A3. Use the first point on the trimmer, as it is screwed in from a loose or minimum-capacity position.

Police range. No trimmers on this range.

Broadcast range. With oscillator and dial at 1500 KC, peak A5, A2 and A1. With oscillator and dial at 560 KC, peak A4.

PARTS LIST

MODELS 305Z AND 565Z

For part numbers of tubular resistors and condensers, refer to lists in previous supplements.

30039	Cabinet with screen
29984	Screen
29759	Escutcheon and crystal
28961	Vol. control, .5 U
42750	Tone control switch assembly
29101	Shaft and blade for above
45130	Range switch
27431	Variable cond. assem.
29583	Dial holder
29582	Dial plate (305Z)
29901	Dial plate (565Z)
45170	Pilot light socket assem.
29848	Lamp, 6.3-V. (bayonet)
28577	Cable and plug assem. (5-prong)
22683	Tube shield
29183	Shield for T4, T5
31151	Base cover (565Z)
24327	Shield for trap choke
28946	Knob without dot
28947	Knob with dot
28063	Spring
29576	Inst. Sheet (F1259)
46920	Shipping Container (305Z)
46940	Shipping container (565Z)

TRIMMERS

A4	39630	(Front of chassis)
A5	28843	(Top of chassis)
A6, 7	29119	Double I. F. (on T4)
A8, 9	29119	Double I. F. (on T5)

RESISTORS

R15, 16, 17	41840	12 Ω, flexible

TRANSFORMERS

T1	43060	No. 1 R. F. T.
T2	44970	No. 2 R. F. T.
T3	43080	Osc. trans.
T4	45420	No. 1 I. F. T.
T5	45150	No. 2 I. F. T.
T6	41820	Power T.
T7	21672	Output T.

CONDENSERS

C1	41650	120 MMF, 500-V., on wave trap
C4	25661	8 MMF, 500-V.
C5	25035	6000 MMF, 450-V.
C6	45080	730 MMF, 100-V.
C8	29603	50 MMF, 450-V.
C15	25379	10 MF, 25-V. (electrolytic)
C25	26995	8 MF, 4 MF, 300-V.

CHOKES

CK1	41020	Wave trap assembly
CK6	41780	Double layer choke
CK8	36620	R. F. +B filter choke
CK9	27011	A. F. +B filter choke (iron core)

Chokes not listed above are No. 36630.

SOCKETS

21336	4-prong speaker socket
24494	6-prong tube socket on chassis
26111	7-prong tube socket
21337	5-prong cable socket on power unit
26985	5-prong tube socket on power unit
26986	6-prong vibrator socket

POWER UNIT

(Models 135Z, 215Z, 305Z, 565Z)

41910	Power unit complete with vibrator and 84 tube
28845	Power unit less 84 tube
28452	Power unit container
26094	Power unit lid
28915	Side cover
28449	Vibrator
27038	Vibrator cover tube
23774	Fuse, 3 amps.
18449	Fuse socket

Condensers, chokes, etc., in the power unit are listed separately for the different models.

135Z, 305Z SPEAKER No. 42700

19465	Diaphragm
35310	Field coil, 70 Ω
21672	Output transformer
23657	Small choke
19487	Cable and plug assembly

215Z, 565Z SPEAKER No. 42800

20737	Diaphragm
35310	Field coil, 70 Ω
21672	Output transformer
25525	Small choke
19789	Cable and plug assembly

Illustration of Dual-Speed Tuning Mechanism in Models 305Z, 565Z, etc.

PARTS FOR TUNING MECHANISM

28944	Condenser mounting bracket (rear)
28934	Tuning gear bracket
28995	Gear stop stud
28956	Tuning gear
27947	Dial pointer holder
27696	Screw for the above
29759	Escutcheon and crystal assem.
27522	Dial pointer
27535	Dial pointer screw
28116	Gear frame
27332	Large gear (rubber tired)
27333	Small gear (rubber tired)
28959	Tuning shaft
27957	Broadcast pinion gear
27297	Pin
27293	Detention spring

PARTS LIST

MODELS 305Z AND 565Z

For part numbers of tubular resistors and condensers, refer to lists in previous supplements.

30039	Cabinet with screen
29984	Screen
29759	Escutcheon and crystal
28961	Vol. control, .5 U
42750	Tone control switch assembly
29101	Shaft and blade for above
45130	Range switch
27431	Variable cond. assem.
29583	Dial holder
29582	Dial plate (305Z)
29901	Dial plate (565Z)
45170	Pilot light socket assem.
29848	Lamp, 6.3-V. (bayonet)
28577	Cable and plug assem. (5-prong)
22683	Tube shield
29183	Shield for T4, T5
31151	Base cover (565Z)
24327	Shield for trap choke
28946	Knob without dot
28947	Knob with dot
28063	Spring
29576	Inst. Sheet (F1259)
46920	Shipping Container (305Z)
46940	Shipping container (565Z)

TRIMMERS

A4	39630	(Front of chassis)
A5	28843	(Top of chassis)
A6, 7	29119	Double I. F. (on T4)
A8, 9	29119	Double I. F. (on T5)

RESISTORS

R15, 16, 17	41840	12 Ω, flexible

TRANSFORMERS

T1	43060	No. 1 R. F. T.
T2	44970	No. 2 R. F. T.
T3	43080	Osc. trans.
T4	45420	No. 1 I. F. T.
T5	45150	No. 2 I. F. T.
T6	41820	Power T.
T7	21672	Output T.

CONDENSERS

C1	41650	120 MMF, 500-V., on wave trap
C4	25661	8 MMF, 500-V.
C5	25035	6000 MMF, 450-V.
C6	45080	730 MMF, 100-V.
C8	29603	50 MMF, 450-V.
C15	25379	10 MF, 25-V. (electrolytic)
C25	26995	8 MF, 4 MF, 300-V.

CHOKES

CK1	41020	Wave trap assembly
CK6	41780	Double layer choke
CK8	36620	R. F. +B filter choke
CK9	27011	A. F. +B filter choke (iron core)

Chokes not listed above are No. 36630.

SOCKETS

21336	4-prong speaker socket
24494	6-prong tube socket on chassis
26111	7-prong tube socket
21337	5-prong cable socket on power unit
26985	5-prong tube socket on power unit
26986	6-prong vibrator socket

POWER UNIT

(Models 135Z, 215Z, 305Z, 565Z)

41910	Power unit complete with vibrator and 84 tube
28845	Power unit less 84 tube
28452	Power unit container
26094	Power unit lid
28915	Side cover
28449	Vibrator
27038	Vibrator cover tube
23774	Fuse, 3 amps.
18449	Fuse socket

Condensers, chokes, etc., in the power unit are listed separately for the different models.

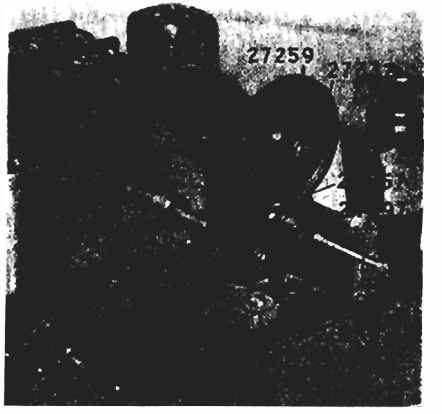
135Z, 305Z SPEAKER No. 42700

19465	Diaphragm
35310	Field coil, 70 Ω
21672	Output transformer
23657	Small choke
19487	Cable and plug assembly

215Z, 565Z SPEAKER No. 42800

20737	Diaphragm
35310	Field coil, 70 Ω
21672	Output transformer
25525	Small choke
19789	Cable and plug assembly

Illustration of Dual-Speed Tuning Mechanism in Models 305Z, 565Z, etc.



PARTS FOR TUNING MECHANISM

28944	Condenser mounting bracket (rear)
28934	Tuning gear bracket
28995	Gear stop stud
28956	Tuning gear
27947	Dial pointer holder
27696	Screw for the above
29759	Escutcheon and crystal assem.
27522	Dial pointer
27535	Dial pointer screw
28116	Gear frame
27332	Large gear (rubber tired)
27333	Small gear (rubber tired)
28959	Tuning shaft
27957	Broadcast pinion gear
27297	Pin
27293	Detention spring

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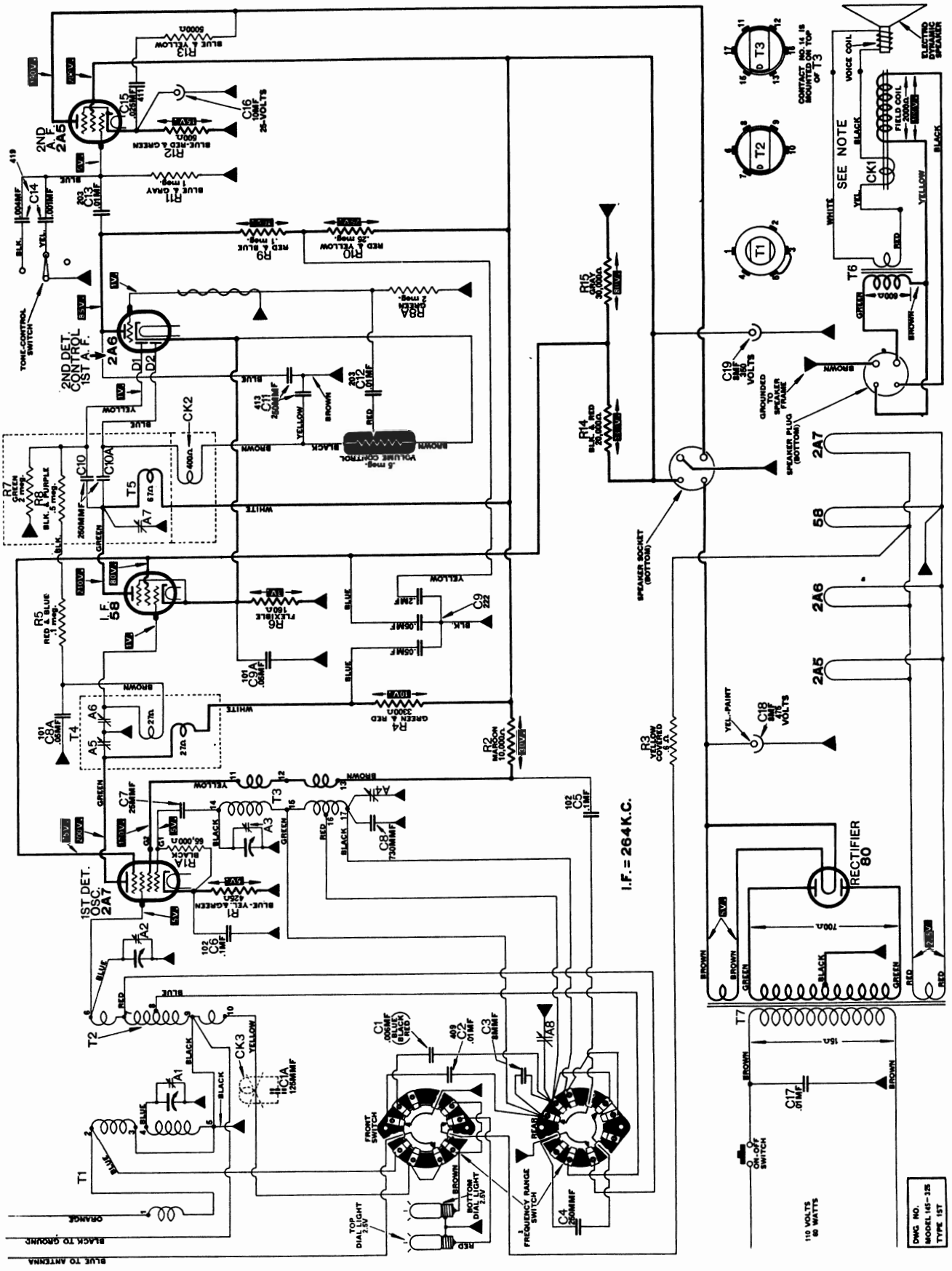
MODELS 145 AND 325

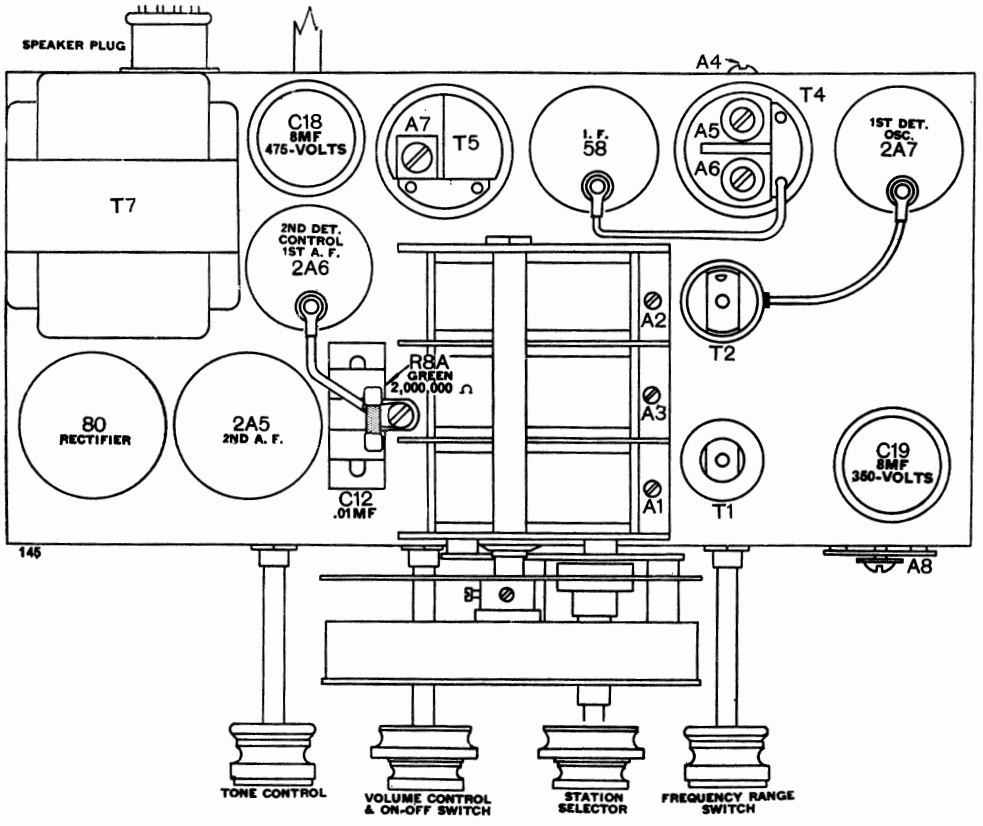


In Model 325 the field coil is 1200 Ω and the voltages throughout are slightly higher than shown in diagram. In later sets C4 is not used, the diode circuit is changed and there are some minor changes in the frequency-switch circuit.

ATWATER KENT MFG. CO.

MODELS 145 AND 325

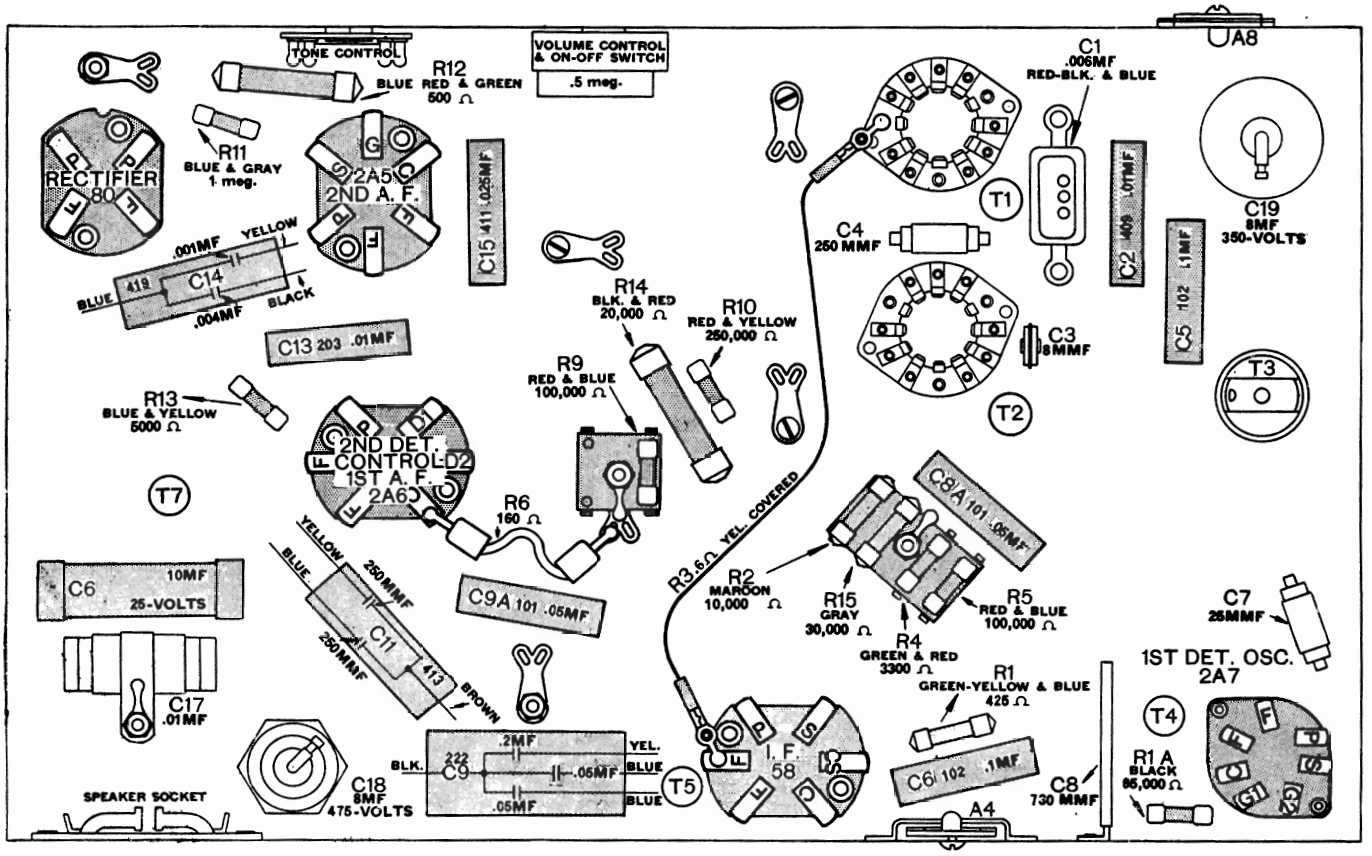
(I. F. = 264 KC.)



R. F. TRIMMERS ON MODELS 145 AND 325

	Short-Wave Range	Police Range	Broadcast Range
Antenna	None	None	A1
Detector	None	None	A2
Oscillator	A3	None	A8
Tracking	None	None	A4

The I. F. trimmers are A5, A6 and A7.



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SERVICE DATA

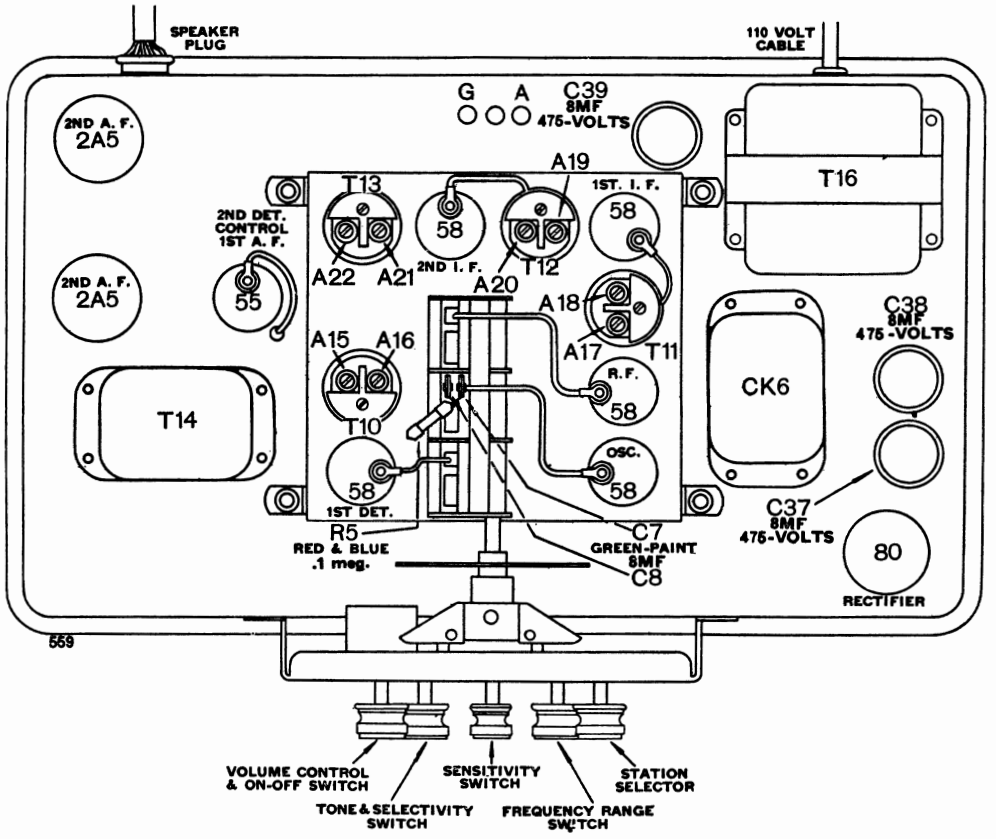
MODELS 145, 206, 325, 376, 559, 825, AND 944

ADJUSTING TRIMMER CONDENSERS

TOP VIEW MODEL 559

The location of trimmers on Model 112 is the same on Model 559.

Refer below for names of trimmers on these models.



R. F. TRIMMERS ON MODELS 112 AND 559

	10-18 MC Range	4-10 MC Range	1.5-4 MC Range	540-1600 KC Range
R. F.	A4	A3	A2	A1
1st-Detector	A12	A11	A8	A9
Oscillator	A14	A13	A7	A6
Tracking	None	None	A10	A5

The I. F. trimmers are A15 to A22, inclusive.

EQUIPMENT. (All sets listed above)

1. OSCILLATOR. The oscillator should extend from the lowest I. F. frequency (125 KC in Atwater Kent sets) to at least 18 MC. The oscillator should have a good attenuator and should be well shielded. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers on some models, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025MFD fixed condenser in series with the oscillator pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume. This is necessary to minimize the effect of the automatic-volume-control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. BALANCING UNIT. Build two of the Type "A" balancing units and one of the I. F. coupling units shown on right. These are required for correct adjustment of Atwater Kent super-heterodynes. The Type "B" balancing unit, also described, is used on earlier models of Atwater Kent sets.

4. Use a non-metallic screw driver for adjustment of the trimmers.

(Continued on next page)

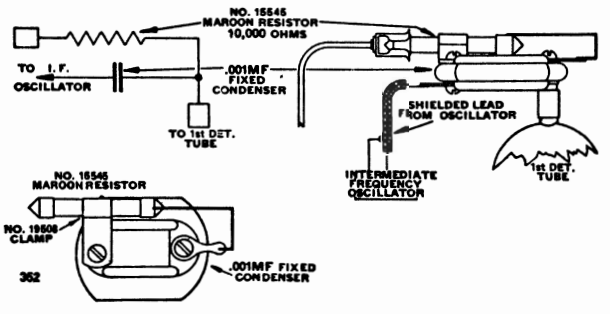


Fig. 1. I. F. Coupling unit.

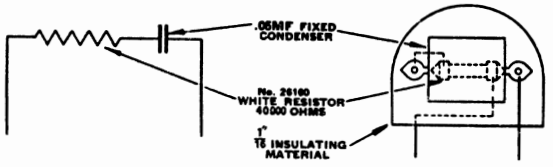


Fig. 2. Balancing unit "A."

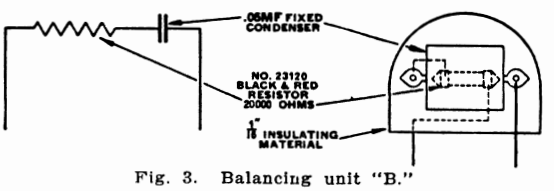


Fig. 3. Balancing unit "B."

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ADJUSTING TRIMMER CONDENSERS (Contd.)

GENERAL NOTES.

1. Do not make any trimmer adjustments and do not disturb the dial gear or the dial indicator adjustments unless absolutely necessary.

2. With all-wave sets, it is very desirable to use a test oscillator that extends to 18 MC (18,000 KC). If you attempt to use harmonics of a broadcast oscillator, you are likely to use the wrong harmonic and set the trimmers incorrectly.

3. When using a test oscillator, you will experience "double-spot" or image reception, particularly on the highest frequency range of the set. The double-spot point is twice the I. F. frequency below the correct point. For instance, if a set has an I. F. frequency of 472½ kilocycles, and you are tuning in an 18 MC signal, the double-spot or image will be twice 472½ or 945 KC (.94 MC) below 18. In such a case you will hear the signal at 18 MC and also at 17.06 MC. In properly aligned sets of six tubes or more. the image should be weaker than the desired signal.

4. Because of the facts mentioned in paragraphs 2 and 3 above, it is very desirable, wherever possible, first to check the short-wave dial calibration and determine how far, and in what direction, the readings are "off." This should be done on actual reception of short-wave stations of known frequency. This pre-checking will assist you in selecting the correct harmonic (in case you are using a broadcast oscillator), and it will also minimize possibility of confusing the correct signal and the image signal.

5. On oscillator trimmers there may be two different settings at which the signal is received. Always use the *first* of these two positions as you screw the trimmer in from a loose or minimum-capacity position. THIS IS IMPORTANT.

6. On sets with a combined oscillator and 1st-detector tube, tune the set to a quiet point near 1,000 KC while adjusting the I. F. trimmers.

OSCILLATOR GOVERNS DIAL ACCURACY.

It is essential to understand definitely that in a super-heterodyne the dial calibration depends on the oscillator circuit of the set, providing that the I. F. trimmers are correctly aligned. The pre-selector (R. F. and 1st-detector) trimmers do not affect the dial calibration but simply affect sensitivity.

If the dial calibration of one or more of the frequency ranges of the set is "off", check the oscillator trimmer, the oscillator tracking condenser and tracking trimmer, and the oscillator transformer for the particular range or ranges in question.

The oscillator **trimmer** is used to adjust the **high-frequency** end of the particular range.

The oscillator **tracking condenser** adjusts the **low-frequency** end of the particular range.

In Atwater Kent sets the fixed tracking condenser on the broadcast range (and in some models also on the police range) is shunted with an adjustable tracking trimmer condenser. The adjustable tracking trimmer condenser is not used on the high-frequency ranges.

The adjustment of the trimmers for the high-frequency and low-frequency end of a particular range is slightly interlocking. For example, assume that the broadcast range of a set is off calibration. First turn the tuning knob so the dial pointer is at 1500 KC and, using a 1500 KC signal, peak the broadcast oscillator trimmer. Then turn the set to 560 KC and, using a 560 KC signal, peak the oscillator broadcast tracking trimmer for maximum output. This adjustment will have slightly affected the previous adjustment at 1500 KC so it will be necessary to repeat the adjustment at 1500 KC and also possibly at 560 KC.

If adjustment of the oscillator trimmer and the oscillator tracking trimmer does not correct the dial readings, it may be necessary to replace the fixed oscillator tracking condenser or the oscillator transformer for that particular range.

Naturally, the I. F. trimmers should be checked, and adjusted if necessary, before any attempt is made to align the R. F. or oscillator trimmers.

GENERAL PROCEDURE.

First check the I. F. trimmers. If reception is satisfactory and the dial calibration is correct on the broadcast range, it is safe to assume that the I. F. trimmers are correctly adjusted.

If the dial calibration is "off" (or the set is weak) on only one range, adjust the trimmers for that range only. If this does not correct the trouble, inspect the resistors, condensers, transformers, and switch contacts associated with that particular range.

In checking a set, do not disturb the position of the wiring any more than necessary.

MODELS 112 AND 559

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. **Put tone control in 2nd-position from right.**

Put balancing unit A (shown in Fig. 2) across trimmer A21 and peak A22.

Put unit A across A22 and peak A21.

Put unit A across A19 and peak A20.

Put unit A across A20 and peak A19.

Put one unit A across A17 and another unit A across A15; peak A18 and A16.

Put one unit A across A18 and another unit A across A16; peak A17 and A15.

In case of instability while adjusting A21 and A22, place an extra balancing unit A across A18.

Remove the I. F. coupling unit and the balancing units and seal the trimmer screws.

R. F. TRIMMERS.

Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

10 to 18 MC range. Tune oscillator exactly to 18 MC and turn tuning knob of set so indicator is at 18 MC mark. Adjust trimmers A14, A4 and A12 for peak output.

4 to 10 MC range. Tune oscillator exactly to 10 MC and turn set to 10 MC mark on the 4 to 10 MC range. Peak trimmers A13, A3 and A11.

1.5 to 4 MC range. Tune oscillator to 4 MC and turn set to the 4 MC mark on the 1.5 to 4 MC scale. Peak trimmers A7, A2 and A8. Tune oscillator to 1.5 MC and, with set at 1.5, peak A10. Repeat adjustments on A7 and A10 if necessary.

Broadcast range. Tune oscillator and set to 1500 KC. Peak trimmers A6, A1 and A9. Tune oscillator to 560 KC and turn set to the 560 KC mark. Peak A5. Repeat adjustments on A6 at 1500 and A5 at 560 if necessary.

MODELS 145 AND 325

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 264 KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. Turn the set to a quiet point near 1000 KC.

Peak trimmer A7, A6 and A5. Remove the I. F. coupling unit and seal the trimmer screws.

ATWATER KENT MFG. CO.

ADJUSTING TRIMMER CONDENSERS (Contd.)

DIAL POINTER ADJUSTMENT.

With the variable condenser all the way in, the dial pointer should be set at 535 KC.

R. F. TRIMMERS.

Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal. Loosen the trimmer screws.

Short-wave range. Oscillator at 15 MC, and set turned to 15 MC mark, peak trimmer A3.

Police range. There are no trimmer adjustments for this range.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, peak trimmers A8, A2 and A1. Tune oscillator and set to 560 KC. Peak A4. Repeat adjustments on A8 at 1500 KC and A4 at 560 KC if necessary.

MODELS 206 AND 376 (1st type)

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the oscillator to 472½ KC. Use the weakest possible signal that will give a reading on the output meter with the radio volume control on full.

Turn the set to a quiet point near 1000 KC.

Peak trimmers A8, A7 and A6 for maximum output. Remove the I. F. coupling unit and seal the I. F. trimmers.

DIAL POINTER ADJUSTMENT.

With the variable condenser rotor completely meshed, the dial pointer should be set at 535 KC.

R. F. TRIMMERS.

Connect a suitable R. F. oscillator to the antenna and ground terminals of set.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, adjust trimmers A9, A2 and A3. Tune oscillator and set to 560. Peak A5. Repeat adjustments on A9 at 1500 KC and A5 at 560 KC if necessary.

Police range. There are no trimmer adjustments for this range.

Short-wave range. With oscillator at 15 MC and set turned to 15 MC, peak trimmers A10, A1 and A4.

MODELS 318 AND 447

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full.

Put balancing unit A (shown in Fig. 2) across trimmer A19 and peak A20.

Put unit A across A20 and peak A 19.

Put unit A across A17 and peak A18.

Put unit A across A18 and peak A17.

Put unit A across A15 and peak A16.

Put unit A across A16 and peak A15.

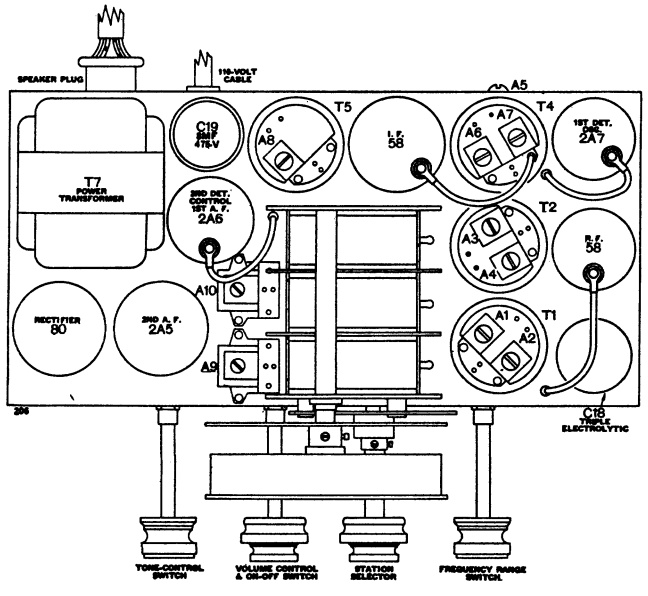
Remove the I. F. coupling unit and balancing unit and seal the I. F. trimmers.

R. F. TRIMMERS.

Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal that will give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

12 to 22.5 MC range. Oscillator at 18 MC, dial pointer at 18 MC, peak trimmers A13, A4 and A8.

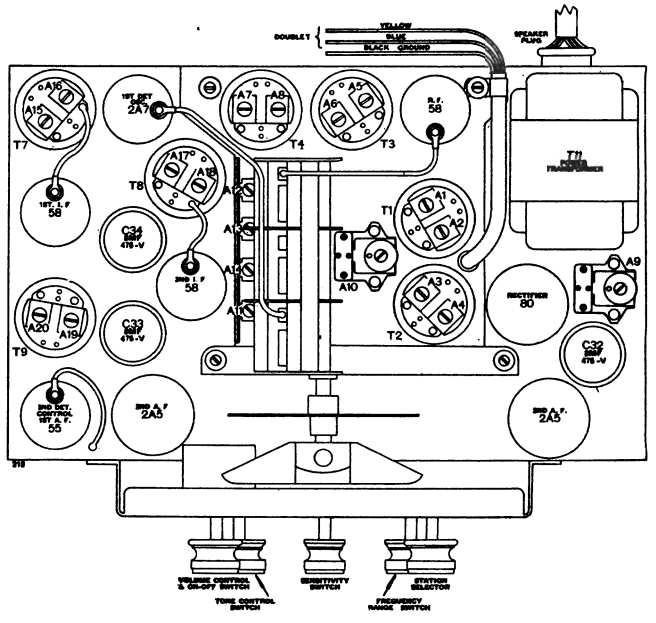
4.6 to 12.2 MC range. Oscillator at 12 MC, dial pointer at 12 MC, peak trimmers A14, A2 and A6 for maximum output.



R. F. TRIMMERS ON MODELS 206 AND 376

	Short-Wave Range	Police Range	Broadcast Range
R. F.	A1	None	A2
1st-Detector	A4	None	A3
Oscillator	A10	None	A9
Tracking	None	None	A5

The I. F. trimmers are A6, A7 and A8.



R. F. TRIMMERS ON MODELS 318 AND 447

	12-22.5 MC Range	4.6-12.2 MC Range	1.6-4.6 MC Range	540-1600 KC Range
R. F.	A4	A2	A3	A1
1st-Detector	A8	A6	A7	A5
Oscillator	A13	A14	A12	A11
Tracking	None	None	A10	A9

The I. F. trimmers are A15 to A20, inclusive.

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ADJUSTING TRIMMER CONDENSERS (Contd.)

1.6 to 4.6 MC range. Oscillator at 4 MC and dial pointer at 4 MC, peak trimmers A12, A3 and A7. Tune oscillator to 1.7 MC, and with dial pointer at 1.7, peak A10. Repeat adjustments on A12 at 4 MC and A10 at 1.7 MC if necessary.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, peak trimmers A11, A1 and A5. Tune oscillator to 560 KC, turn dial pointer to 560 KC mark, and peak A9. Repeat adjustments on A11 at 1500 KC and A9 at 560 KC if necessary.

MODEL 944

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 450 KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter, with the condenser A5 turned well out in counter-clockwise direction (when facing rear of chassis). Peak the I. F. trimmers A3 and A4 for maximum output. Now turn the regenerative control condenser "in" (clockwise from rear of chassis) until a "squeal" or audio howl indicating oscillation of the I. F. stage, then back off about one-quarter turn, or until the audio howl stops. The adjustments of the I. F. trimmers should again be checked for peak—*i. e.*, the peaking procedure and adjustment of the regenerative condenser should be repeated until maximum output is obtained.

R. F. TRIMMERS.

Check the dial setting by turning the gang condenser to maximum position and observing, by means of steel scale held vertically over the condenser shaft axis, whether the 540 KC mark on the dial is perpendicular to a line along the top of the condenser frame in back of the dial. Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws. Tune the oscillator to 1500 KC and turn the tuning knob of the set to a dial mark half way between 140 and 150 and perpendicular to a line along the top of the condenser frame. (Determined as explained in setting dial at 540 KC.) Peak the trimmers A1 and A2 for maximum output. Retune oscillator and set to 1100 KC and check regenerative condenser A5 adjustment for maximum sensitivity—*i. e.*, one-quarter turn below audio howl. If oscillation occurs at any other point on the dial after the above adjustments, it will be necessary to again turn back a fraction of a turn on the condenser A5.

Note.—1st-detector grid clip must be inside of shield can when adjusting the R. F. trimmers.

PARTS LIST

MODEL 145

28839		Cabinet less screen
27906		Screen
27945		Escutcheon and crystal assem.
27388		Crystal
27431		Var. cond. assem.
27692		Tuning gear
27574		Dial plate holder
27947		Dial pointer holder
27522		Dial pointer
27535		Pointer screw
27523		Dial plate
24323		Power trans. cover
25056		I. F. T. shield
27485		Range switch
19566		110 V. cable
40090		Pilot light assem.
28827		Dial lamp socket
26526		Ferrule and bushing
26524		Spring
22683		Tube shield
28281		Front and back plate assem.
28594		Tuning shaft assem.
22657		Dial rubber and bushing
25058		I. F. T. shield cover
25059		I. F. T. shield cover (hole)
27676		Pilot lamp, 2.5 V. (frosted)
27425		Vol. control, .5 U
39620		Tone control switch assem.
28192		Shaft and blade for above
27562		Inst. sheet, F-1149
27867		Shipping container

TRANSFORMERS

T1	39820	No. 1 R. F. T.
T2	39830	No. 2 R. F. T.

MODEL 145 (Contd.)

T3	39840	Oscillator T.
T4	27789	No. 1 I. F. T.
T5	27791	No. 2 I. F. T.
T6	28621	Output T.
T7	25191	Power T.

RESISTORS

(For tubular resistors see page 19.)

R6	28950	Flexible, 160 Ω

CONDENSERS

(For tubular condensers see page 18.)

C1	25035	.006 MF, blue, blk. and red
C3	27650	8 MMF
C4	33670	250 MMF, 500-V., mica
C7	33930	25 MMF
C8	39660	730 MMF
C10	33670	250 MMF, 500-V., mica
C10A	33670	250 MMF, 500-V., mica
C18	22538	8 MF, 475 V.
C19	27585	8 MF, 350 V.

TRIMMERS

A4	39630	Rear
A5,6	32880	T4
A7	36570	T5
A8	38890	Front

CHOKES

CK1	28623	On speaker
CK2	40140	R. F. choke

MODEL 145 (Contd.)

SOCKETS

24494		6 prong
24492		4 prong
21336		Speaker
26111		7 prong

MODEL 145 SPEAKER

42100		Complete speaker
28619		Diaphragm assem.
28621		Output trans. (T6)
28622		Field coil
28623		Choke coil (CK1)

MODEL 325

(For parts not listed below refer to Model 145.)

27985		Bottom plate
27946		Escutcheon and crystal assem.
28535		Dial plate
40140		R. F. choke (CK2)
27865		Shipping container

MODEL 325 SPEAKER 41800

27661		Cone housing
25525		Choke (CK1)
21260		Field coil
20737		Diaphragm
20657		Cable and plug assem.
18582		Plug only
19469		Segment

Ω=ohms. U=megohms.

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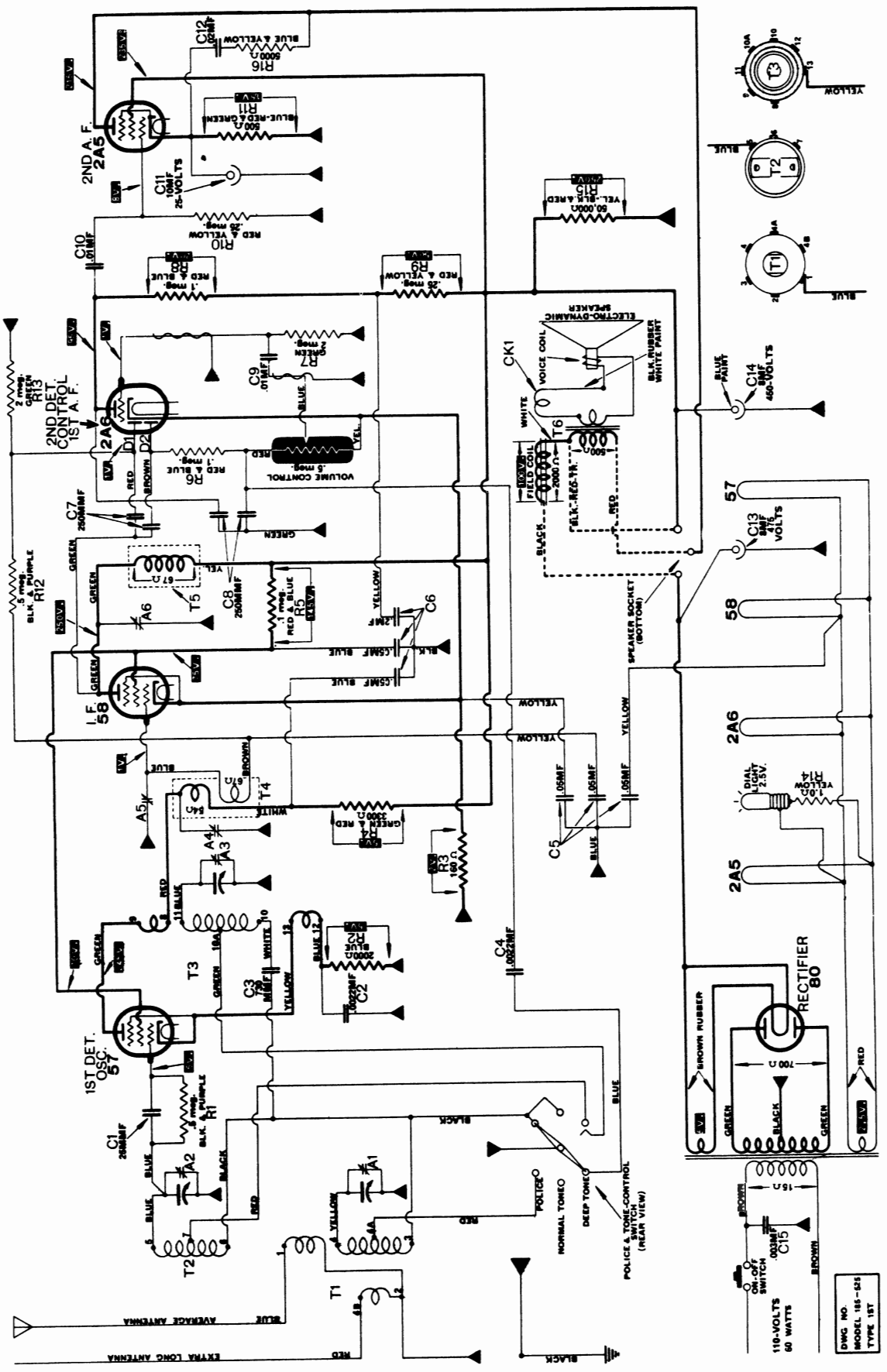
MODELS 165 (2nd TYPE), 185 AND 525



I. F.=264 KILOCYCLES

The power transformer is listed as T7 in the parts list. Voltage measurements above were made with a line voltage of 110 V.

ATWATER KENT MFG. CO.

2nd TYPE MODEL 165

Part No.	Name of Part
25309	Cabinet complete
24293	Volume control, .5 U
25022	Variable condenser
25312	Police and tone control switch complete
25311	Switch base complete
25226	Switch shaft and blade
24278	Knob volume and tuning
25145	Knob—tone
15404	Dial lamp, 2.5-V.

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	33820	No. 1 R. F. T.
T2	32440	No. 2 R. F. T.
T3	32450	Osc. T.
T4	32620	No. 1 I. F. T.
T5	32630	No. 2 I. F. T.
T6	21672	Output T.
T7	25191	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30350	Bl'k-purple, .5 U, 1/3-W.
R2	33250	Blue, 2000 Ω, 1/3-W.
R3	28950	Flexible, 160 Ω
R4	30380	Red-green, 3300 Ω, 1/3-W.
R5	20980	Red-blue, .1 U, ½-W.
R6	30340	Red-blue, .1 U, 1/3-W.
R7	30370	Green, 2 U, 1/3-W.
R8	30340	Red-blue, .1 U, 1/3-W.
R9	31970	Red-yel., .25 U, 1/3-W.
R10	31970	Red-yel., .25 U, 1/3-W.
R11	32010	Blue-red-green, 500 Ω, 1-W.
R12	30350	Bl'k-purple, .5 U, 1/3-W.
R13	30370	Green, 2 U, 1/3-W.
R14	31860	Flexible, ½ Ω
R15	34340	Yel.-bl'k-red, 50,000 Ω, 1½-W.
R16	36430	Yel.-blue, 5000 Ω, 1/3-W.

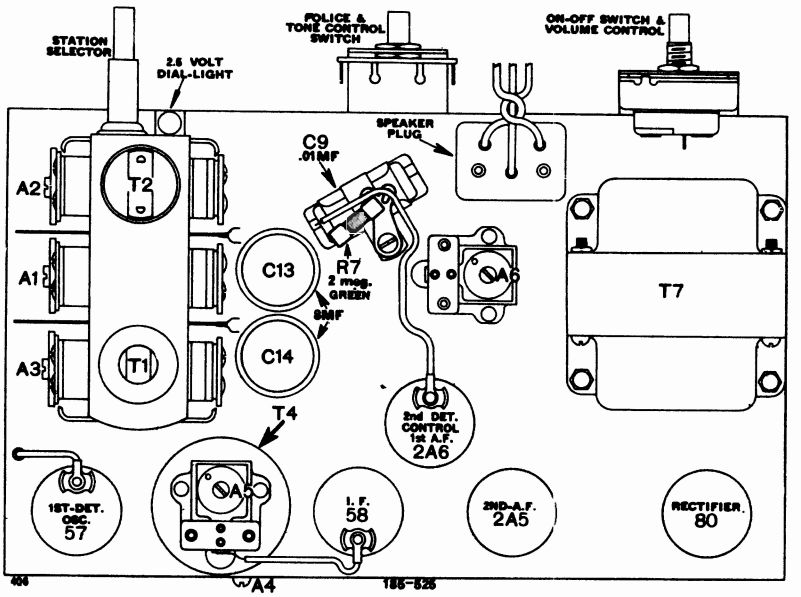
CONDENSERS

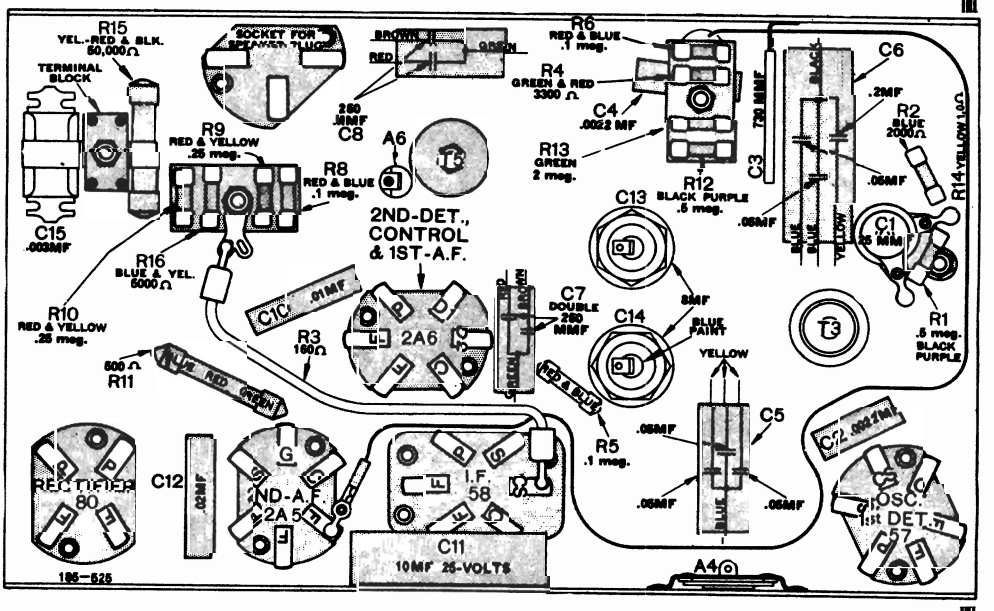
Code No.	Part No.	Name of Part
C1	33650	25 MMF, 500-V.
C2	33660	.0022 MF, 450-V., IND.
C3	25638	730 MMF, 100-V.
C4	33660	.0022 MF, 450-V., IND.
C5	32410	.05, .05 and .05 MF, 100-V., IND.
C6	32390	.05, .05 and .2 MF, 200-V., IND.
C7	33630	250 MMF (double), 450-V., IND.
C8	33630	250 MMF (double), 450-V., IND.
C9	23250	.01 MF, 450-V.
C10	27630	.01 MF, 200-V., IND.
C11	25379	10 MF, dry electrolytic, 25-V.
C12	33660	.02 MF, 200-V., IND.
C13	25168	8 MF, 475-V., electrolytic
C14	26381	8 MF, 450-V., electrolytic (blue)
C15	32740	.003 MF, 500-V.

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4	24495	Single I. F.

MODELS 165 (2nd TYPE), 185 AND 525





A5	24554	Single I. F. (includes I. F. shield)
A6	33080	Single I. F.

SOCKETS

Part No.	Name of Part
25196	Speaker
24492	Rectifier
24494	Small 6 prong (3 used)
22733	Large 6 prong (1 used)

MISCELLANEOUS

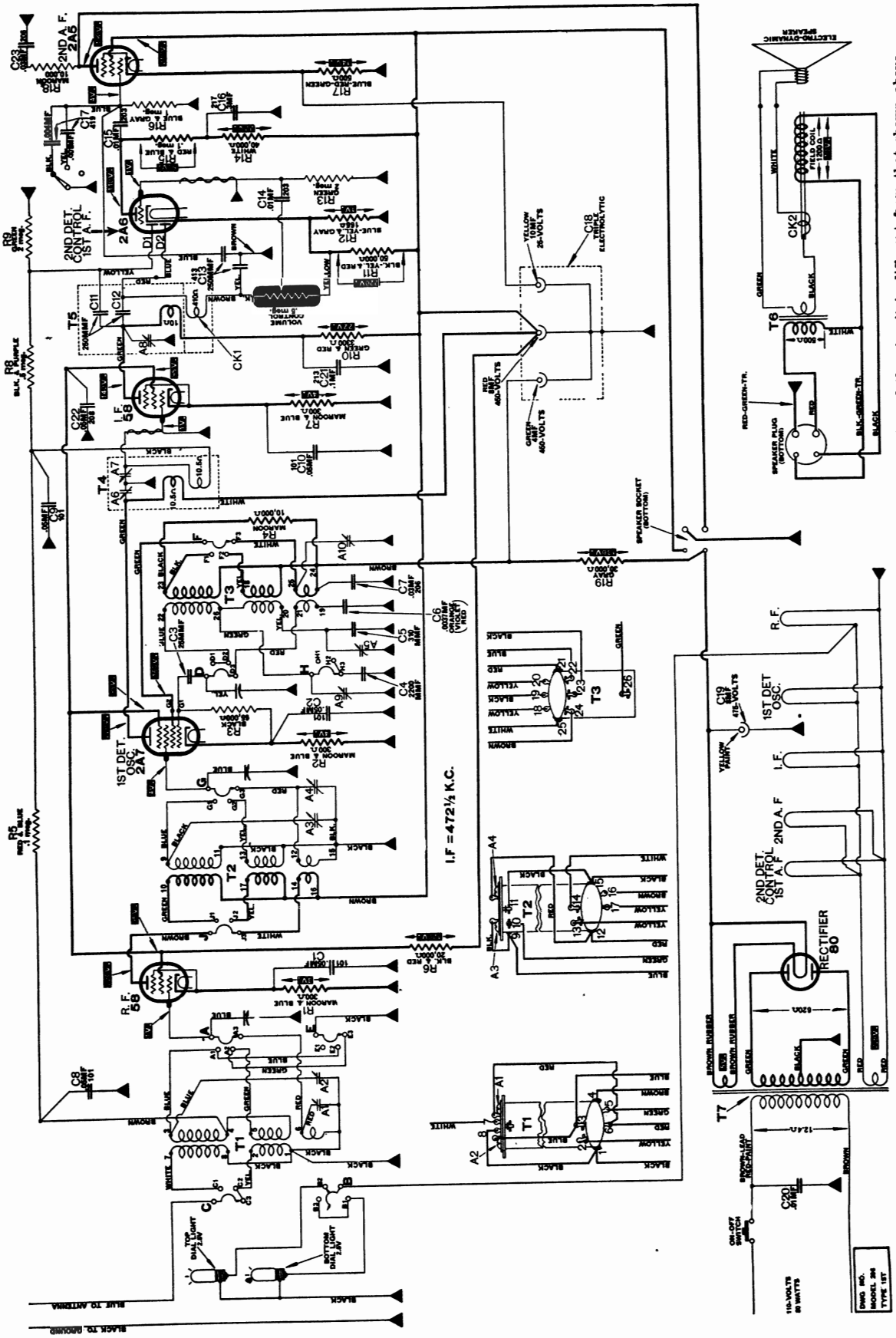
Part No.	Name of Part
25194	Cloth screen
25213	Cabinet feet
24323	Power T. cover (2 used)
24554	I. F. shield and trimmer, A5
19566	110-V. cable and plug
24549	Dial assembly
25745	Name decalcomania
25965	Tone decalcomania
26706	Vernier shaft
26707	Vernier cap
26708	Ball bearing
26709	Trimmer screw
26711	Trimmer washer
27133	Trimmer mica
22683	Tube shield
26671	Instruction and log card, F1109
25189	Shipping container

165-185 SPEAKER No. 34100

Part No.	Name of Part
18870	Field coil (2000 Ω)
21672	Output T.—(T6)
21161	Diaphragm
25179	Cable and plug
25308	Speaker plug (3 prong)
23657	Choke (CK1)

ATWATER KENT MFG. CO.

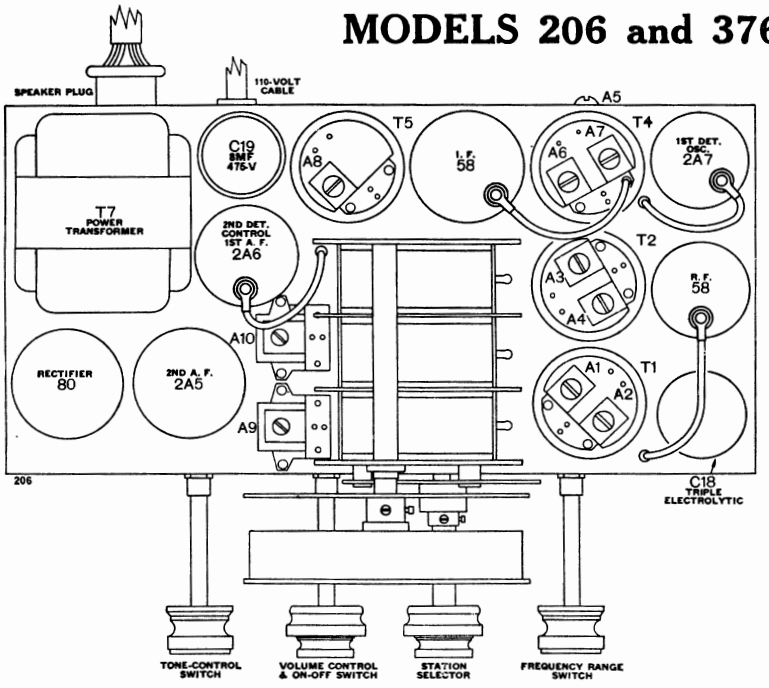
MODELS 206 AND 376 (1st TYPE)



The 1st type of Models 206 and 376 have cylindrical I. F. transformer shields. The 2nd type has square I. F. shields and the circuit is different from that shown above.

ATWATER KENT MFG. CO.

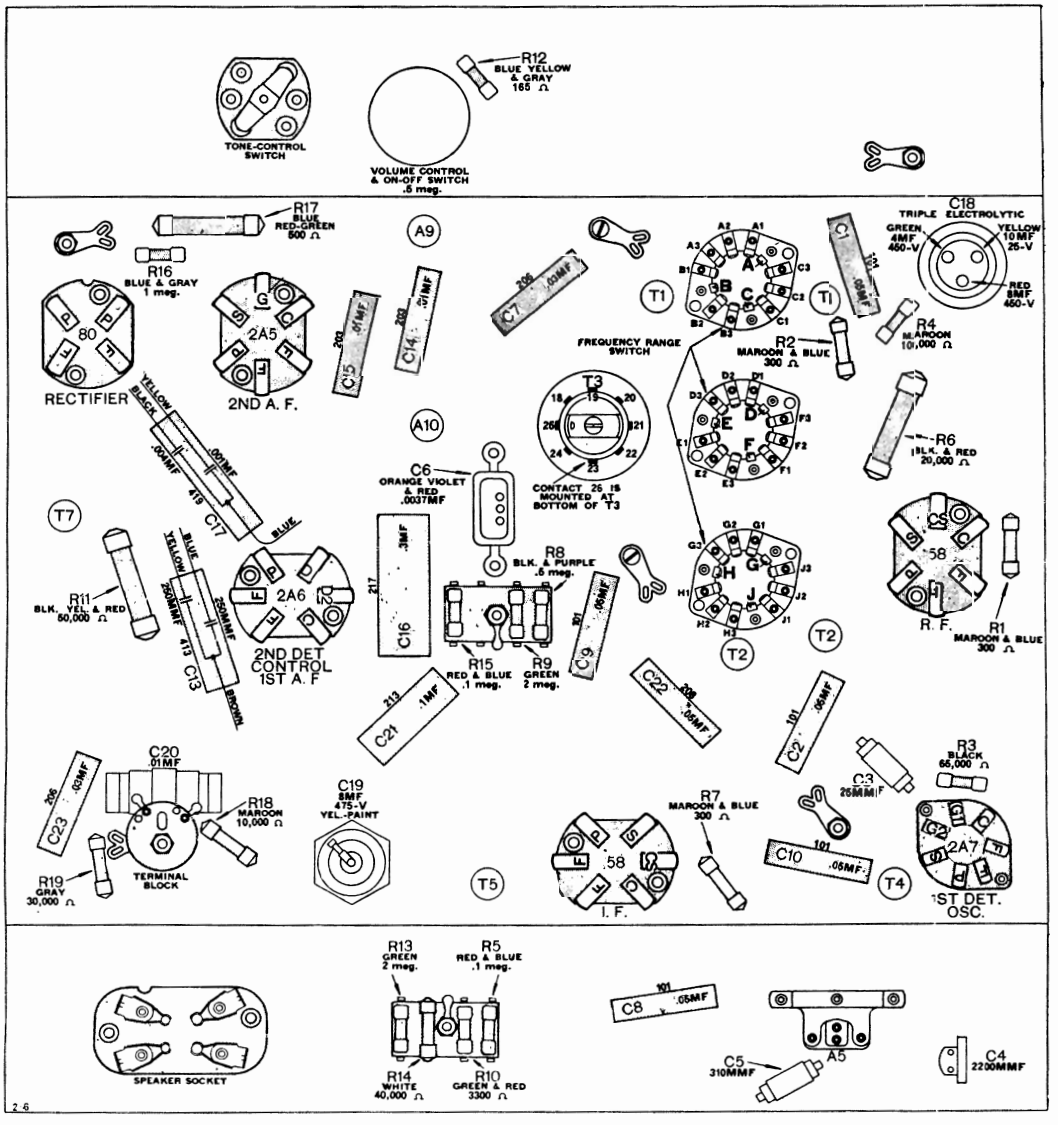
MODELS 206 and 376 (1st TYPE)



R. F. TRIMMERS ON MODELS 206 AND 376

	Short-Wave Range	Police Range	Broadcast Range
R. F.	A1	None	A2
1st-Detector	A4	None	A3
Oscillator	A10	None	A9
Tracking	None	None	A5

The I. F. trimmers are A6, A7 and A8.



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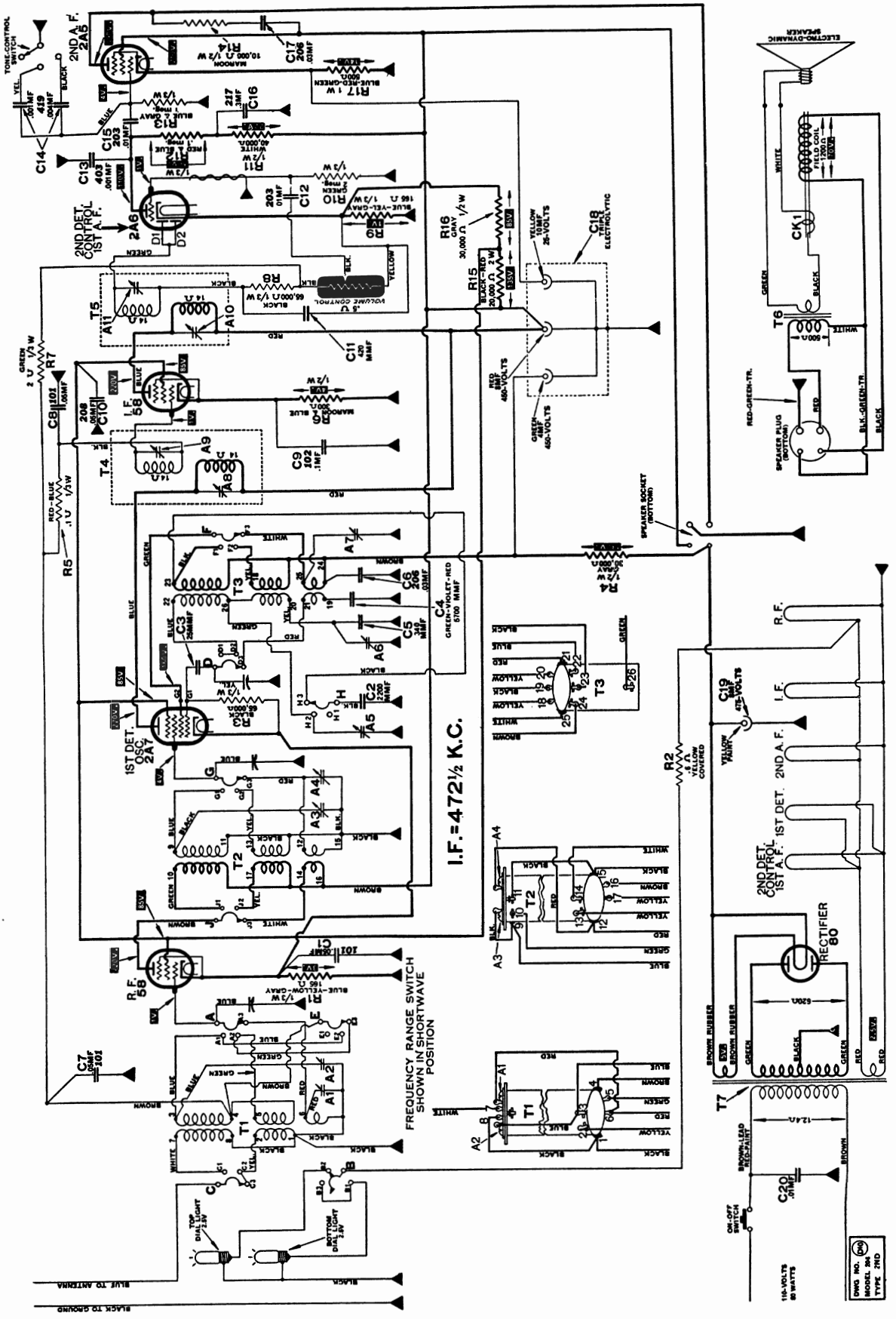
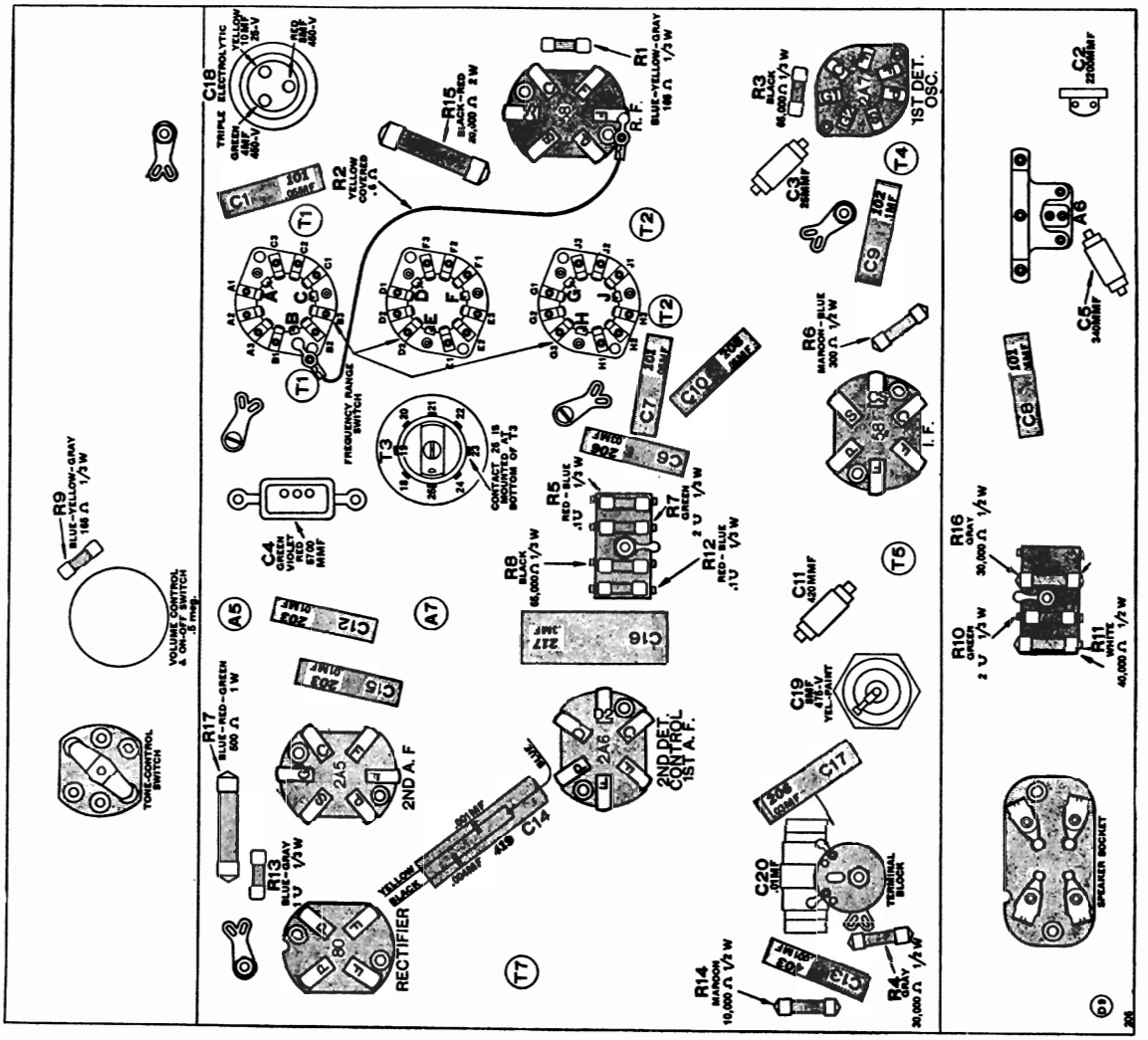
MODELS 206 AND 376 (2nd TYPE)



ATWATER KENT MFG. CO.

MODELS 206 AND 376 (2nd TYPE)



ADJUSTING TRIMMERS, MODELS 206 AND 376 (2nd Type)

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the oscillator to 472½ KC. Use the weakest possible signal that will give a reading on the output meter with the radio volume control on full.

Peak trimmers A11, A10, A9 and A8 for maximum output. Remove the I. F. coupling unit and seal the I. F. trimmers.

DIAL POINTER ADJUSTMENT.

With the variable condenser rotor completely meshed, the dial pointer should be set at 535 KC.

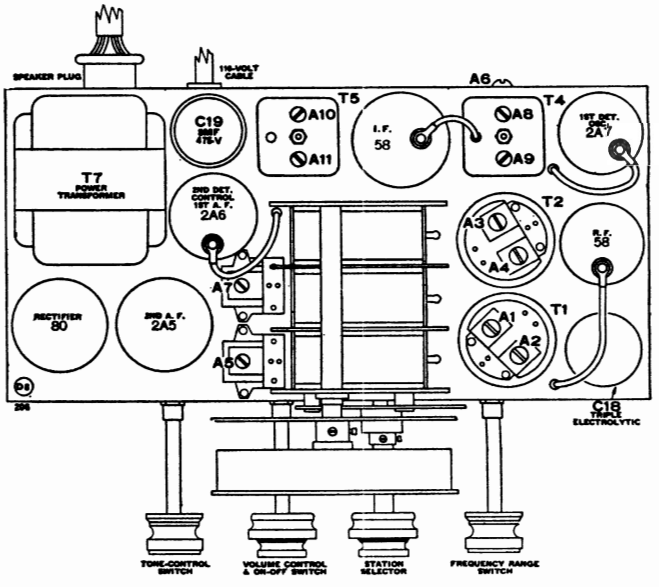
R. F. TRIMMERS.

Connect a suitable R. F. oscillator to the antenna and ground terminals of set.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, adjust trimmers A5, A2 and A3. Tune oscillator and set to 560. Peak A6. Repeat adjustments on A5 at 1500 KC and A6 at 560 KC if necessary.

Police range. There are no trimmer adjustments for this range.

Short-wave range. With oscillator at 15 MC and set turned to 15 MC, peak trimmers A7, A1 and A4.



R. F. TRIMMERS ON MODELS 206 AND 376.

	Short-Wave Range	Police Range	Broadcast Range
R. F.	A1	None	A2
1st-Detector	A4	None	A3
Oscillator	A7	None	A5
Tracking	None	None	A6

The I. F. trimmers are A8, A9, A10 and A11

MODEL 206

28834		Cabinet less screen
27908		Screen
27944		Escutcheon and crystal assem.
27388		Crystal
27432		Var. cond. assem.
27692		Tuning gear
27514		Spacer
27959		Screw
28281		Front and back plate assem.
28594		Tuning shaft assem.
22657		Dial rubber
27574		Dial plate holder
27947		Dial pointer holder
27522		Dial pointer
27685		Dial plate
25377		Bushing under var. cond. assem.
28422		Plate under var. cond. assem.
24323		Power trans. cover
25056		I. F. T. shield (early)
27781		Osc. trans. shield
27543		R. F. T. shield
27887		R. F. T. shield insulator
40090		Pilot light assem.
27676		Pilot lamp, 2.5-V. (frosted)
27602		Range switch
25058		I. F. T. shield cover without hole
25059		I. F. T. shield cover with hole
25601		Rubber grommet
39620		Tone control switch assem.
28192		Shaft and blade for above
27425		Vol. control, .5 U
27559		Inst. folder, F-1146
27862		Shipping container

TRANSFORMERS

T1	40880	No. 1 R. F. T.
T2	41160	No. 2 R. F. T.
T3	41170	Oscillator T.
T4	*28161	No. 1 I. F. T. (EARLY)
T5	*28162	No. 2 I. F. T. (EARLY)
T6	21672	Output trans.
T7	28084	Power trans.

* Early style with cylindrical shield. In later sets No. 1 I. F. T. complete with trimmers and shield is No. 28527, No. 2 I. F. T. is No. 28528.

CONDENSERS

C3	33930	25 MMF, 500-V.
C4	40380	2200 MMF
C5	40390	360 MMF
C6	*27598	3700 MMF
C11	33670	250 MMF, 500-V.
C12	33670	250 MMF, 500-V.
C18	27592	4-8-10 MF
C19	22538	8 MF, 475-V. (yel. paint)
C20	23250	.01 MF, line cond.

* In late sets C6 is No. 27599, 5700 MMF, green, violet and red.

TRIMMERS

A1-2	39430	On T1
A3-4	39430	On T2
A5	38890	Rear of chassis on bottom

MODEL 206 (Contd.)

A6-7	32880	On T4
A8	40610	On T5
A9	40450	Next to A10
A10	39630	Front of chassis alongside of var. cond.

CHOKES

CK1	28163	On No. 2 I. F. T.
CK2	25525	On speaker

206 SPEAKER No. 41900

25525		Choke (CK2)
28345		Cable and plug
15079		Plug
21672		Output trans. (T6)
19465		Diaphragm
21260		Field coil (1200 Ω)

MODEL 376

For parts not listed below refer to Model 206.

28517		Base plate
28531		Escutcheon and crystal
27559		Inst. sheet, F-1146
28756		Shipping container

376 SPEAKER No. 41800

25525		Choke (CK2)
21260		Field coil (1200 Ω)
20737		Diaphragm
20657		Cable and plug
18582		Plug
19469		Segment

MODEL 559

27287		Var. cond. assem.
25601		Rubber grommet
27301		Washer
22649		Screw
27286		Range switch
27272		Crank arm
35380		Reflector assem.
27958		Front panel assem.
27321		Vol. control, .5 U
27314		Vol. cont. mtg. bracket
25558		Vol. cont. cover
27289		Tone cont. switch
27317		Mtg. bracket for above
38740		Sensitivity switch assem.
27628		Shaft and blade for above
27472		Antenna jumper
25913		R. F. coil shield
25056		I. F. T. shield
26255		I. F. T. shield insul.
25058		I. F. T. shield cover without hole
25059		I. F. T. shield cover with hole
18534		Fuse
27057		Bottom cover
22683		Tube shield
23743		Aux. tube shield
27334		Tone cont. cond. clamp
27249		Mica for trimmers on strips
17109		Screw for above
17064		Insul. washer for above
27072		Station directory, F-1131
27545		Inst. folder, F-1143
27683		Shipping container

MODEL 559 (Contd.)

PARTS FOR TUNING ARRANGEMENT

27469		Dial gear
27276		Pointer arm
27254		Dial pointer
27332		Counter shaft gear (lge.)
27333		Idler gear (sml.)
27259		Gear screw
27957		Broadcast pinion gear
28116		Gear frame
27351		Screw (5/32" dia.)
27294		Tuning shaft
28016		Tuning bracket
27293		Detention spring
27298		Shaft spacer
27297		Bracket holding pin

TRANSFORMERS

T1	38310	No. 1 R. F. T., broadcast
T2	38340	No. 1 H. F., 1st range
T3	38360	No. 1 H. F., 2nd range
T4	38380	No. 1 H. F., 3rd range
T5	38320	No. 2 R. F. T., broadcast
T6	38330	Oscillator T., broadcast
T7	38350	No. 2 H. F., 1st range
T8	38370	No. 2 H. F., 2nd range
T9	38390	No. 2 H. F., 3rd range
T10	27448	No. 1 I. F. T.
T11	27449	No. 2 I. F. T.
T12	27451	No. 3 I. F. T.
T13	27452	No. 4 I. F. T.
T14	38610	A. F. input trans.
T15	21370	A. F. output trans.
T16	26395	Power trans.

RESISTORS

R6	33230	Flexible, 2000 Ω
R7	33210	Flexible, 670 Ω
R17	33210	Flexible, 670 Ω
R21	24340	Flexible, 8000 Ω
R22	24340	Flexible, 8000 Ω
R24	25950	Flexible, 200 Ω
R26	17077	Flexible, 10 Ω
R27	31860	Dial light res., 1.0 Ω

CONDENSERS

C6	22220	100 MMF, 450-V.
C7	25661	8 MMF, 500-V.
C8	25661	8 MMF, 500-V.
C9	27391	350 MMF (orange, green and brown)
C10	27389	1250 MMF (green, red and brown)
C11	34470	14 MMF, 500-V. (red paint)
C12	27392	4000 MMF (red, blk. and yel.)
C13	34470	14 MMF, 500-V. (red paint)
C25	39340	125 MMF
C26	39340	125 MMF
C27	35290	125 MMF
C36	23250	.01 MF, line cond., 450-V.
C37	22538	8 MF, 475-V.
C38	22538	8 MF, 475-V.
C39	22538	8 MF, 475-V.

Ω=ohms. U=megohms.

PARTS LIST

MODEL 559 (Contd.)

CHOKES

CK1	17015	R. F. plate choke
CK2	19210	R. F. plate circuit choke
CK3	19210	1st det. plate circuit choke
CK4	19210	2nd I. F. plate circuit choke
CK5	19210	R. F. 1st I. F. screen choke
CK6	36180	B filter choke

TRIMMERS

38770	Single trimmer
32880	Double I. F. trimmer

SOCKETS

24494	6 prong (58)
22733	6 prong (2a5-55)
22689	4 prong
21337	5 prong
18449	Fuse

559 SPEAKER No. 36500

34630	Field coil (625 Ω)
20737	Diaphragm
20657	Cable and plug assem.
21370	Output trans.

MODEL 825

27731		Volume control, .5 U
28796		Cabinet complete
27902		Cloth screen
25865		Escutcheon window
27983		Escutcheon name plate
26283		Dial plate
24892		A. C.-D. C. switch
41050		Range switch
28805		Shaft and blade
41040		Tone control switch
28797		Shaft and blade
27593		Variable condenser

TRANSFORMERS

T1	35450	No. 1 R. F. T.
T2	35460	No. 2 R. F. T.
T3	35470	Oscillator T.
T4	26326	No. 1 I. F. T.
T5	35910	No. 2 I. F. T.
T6	26501	Output A. F. T.

RESISTORS

R2	31830	Flexible, 250 Ω
R8	19820	Flexible, 48 Ω
R14	35820	Flexible, 12 Ω
R15	31690	Iron core, 145 Ω

CONDENSERS

C1	35590	500 MMF, 450-V., mica
C2	33670	250 MMF, 500-V., mica

MODEL 825 (Contd.)

C3	35840	50 MMF, 500-V., mica
C4	35990	830 MMF, 100-V., mica
C9	23250	.01 MF, 450-V., paper
C14	26158	Triple dry electrolytic 14, 8 and 8 MF

TRIMMER CONDENSERS

A4, 5	35650	Double I. F. trimmer
A6	35610	Single I. F. trimmer

SOCKETS

26111	Socket (7 prong)
24494	Socket (6 prong)
24493	Socket (5 prong)

MISCELLANEOUS PARTS

26706		Vernier shaft
26707		Vernier cap
26708		Ball bearing
26709		Trimmer screw
26711		Trimmer washer
27133		Trimmer mica
26323		T4 shield
21878		Shield disc
24327		T5 shield
26137		T5 shield insulator
24727		Antenna lead and card
26284		Dial light socket
16099		Dial lamp, 6-V.
26451		Tube shield
26014		Top shield
26324		Base cover
26017		Back plate
27563		Instruction and log card, F1150
27866		Shipping container

SPEAKER

26159	Speaker complete
25603	Diaphragm assembly
26501	Output transformer
26502	Field coil
26503	Choke coil (CK1)

MODEL 944

28773		Cabinet, less screen
27892		Screen
25213		Foot
27487		Escutcheon name plate
27936		Dial window
27935		Dial assembly
27433		Var. cond. assem.
28089		Vernier cap
28091		Ball bearing
28092		Cap spring
28093		Spring retaining screw
28094		Tuning shaft

MODEL 944 (Contd.)

28095		Trimmer mica
25199		Pilot light socket and resistor
15404		Pilot lamp, 2.5 V.
24323		Power T. cover
28282		Side mounting angle plate
26312		C11 shield
27567		Vol. control, 20,000 Ω
27095		R. F. shield
27597		I. F. coil shield
27724		I. F. coil shield insulator
27631		Tall tube shield
26451		Short tube shield
25059		I. F. T. cover with hole
25029		Four (4) contact terminal block
28075		Eight (8) contact terminal block
27564		Instruction folder, F-1151
27861		Shipping container

TRANSFORMERS

T1	38990	No. 1 R. F. T.
T2	39010	Oscillator
T3	27486	No. 1 I. F. T.
T4	21672	Output T.
T5	25191	Power T.

RESISTORS

R11	20050	Flexible, 355 Ω
R12	31860	Flexible, 1.0 Ω

CONDENSERS

C3	33670	250 MMF, 500-V., mica
C4	35290	125 MMF
C11	22538	8 MF, yel. paint, 475-V.
C12	27584	4 MF, 350-V.
C14	23250	.01 MF, line cond.

TRIMMERS

A3	38660	I. F. plate trimmer
A4	36570	2nd detector trimmer
A5	39090	Rear of set

CHOKE

CK1	23657 On speaker

SOCKETS

24494	6 prong (1st det. and A. F.)
22733	6 prong (2nd det.)
24492	4 prong
25196	Speaker

944 SPEAKER No. 34100

18870		Field coil, 2,000 Ω
21672		Output trans. (T4)
21161		Diaphragm
25179		Cable and plug
25308		Plug (3 prong)
23657		Choke

Ω=ohms. U=megohms.

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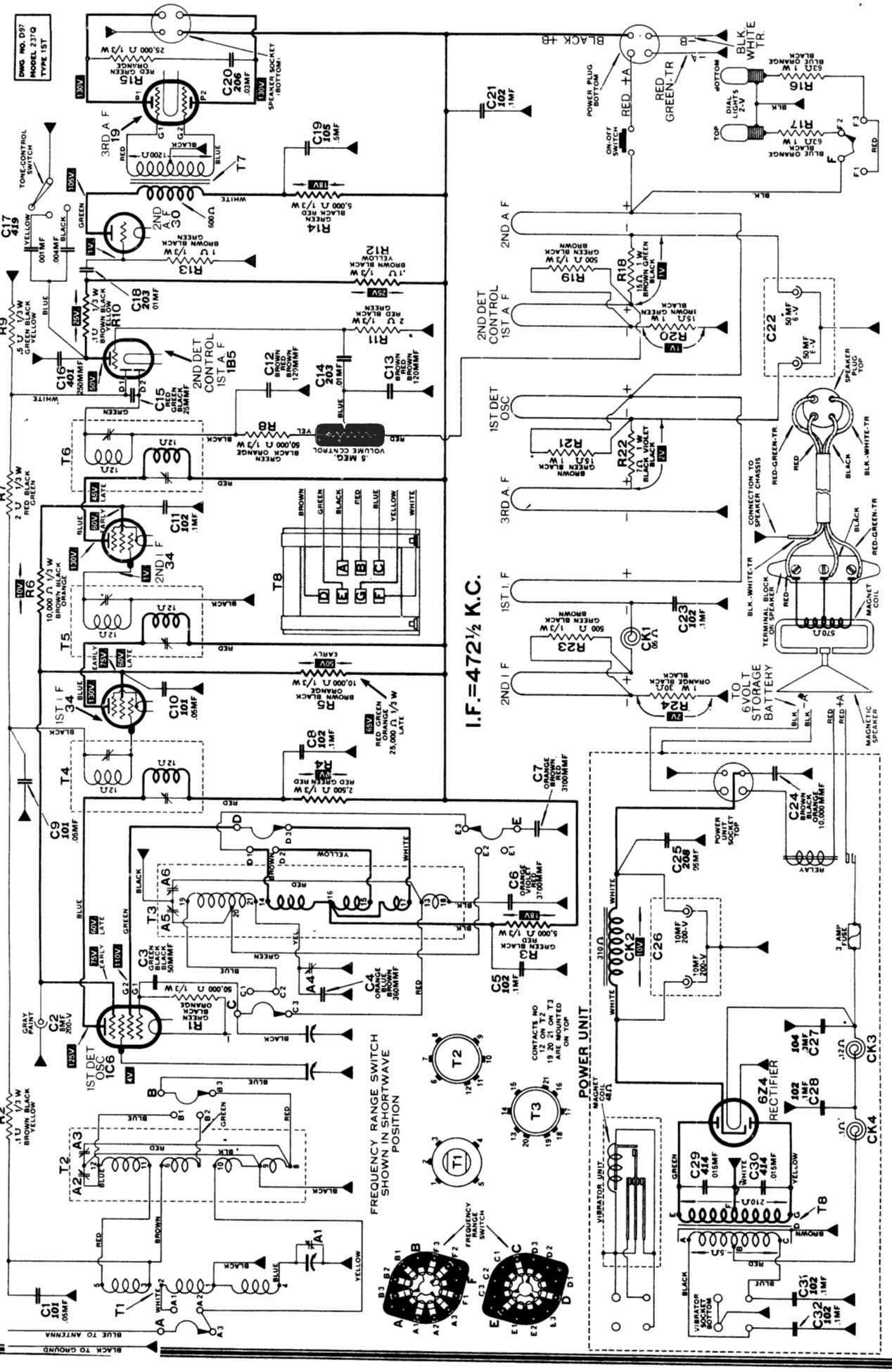
MODELS 237Q AND 467Q



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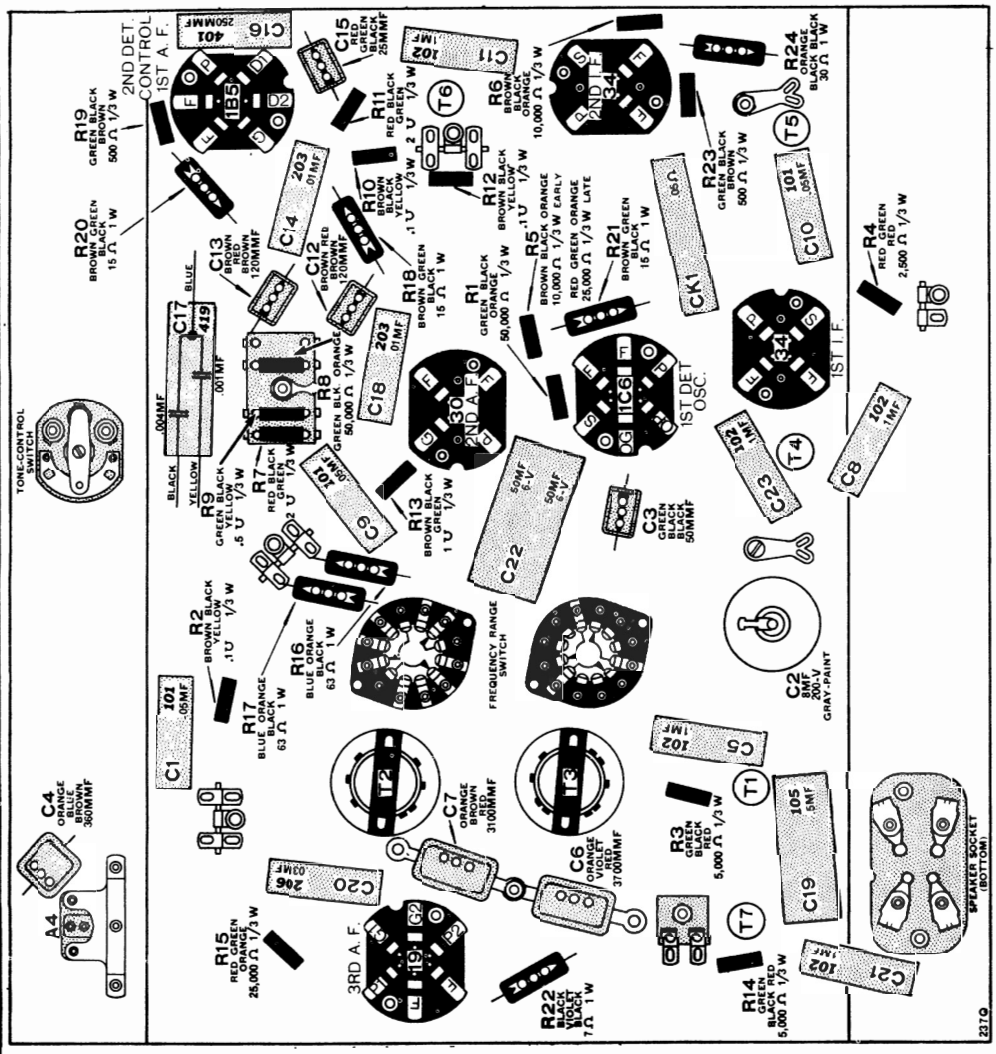
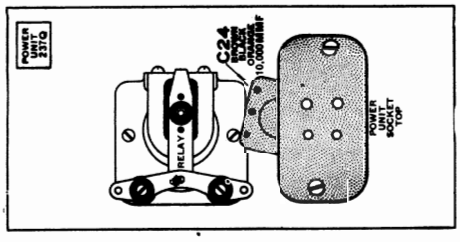
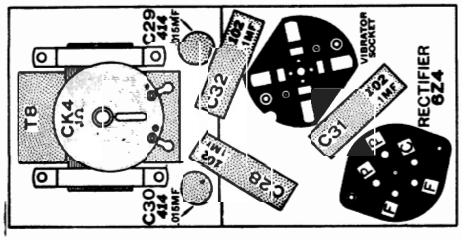
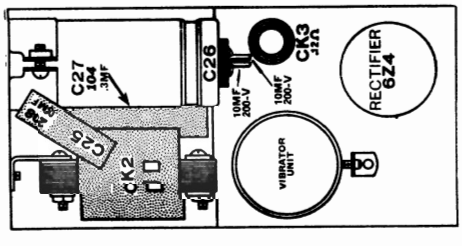
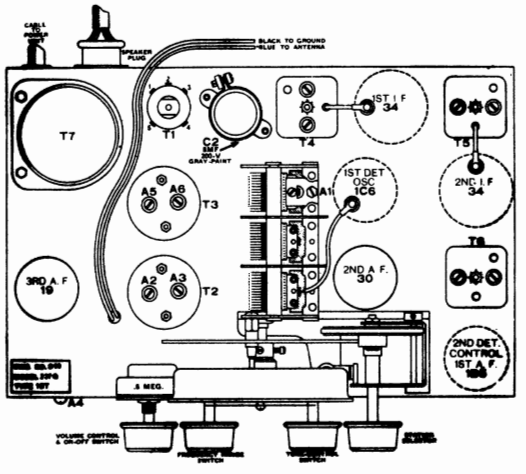
MODELS 237Q AND 467Q











A1—Pre-selector, 1500 KC.
A2—1st-detector, 1500 KC.
A3—1st-detector, 18 MC.
A4—Oscillator tracking, 560 KC.
A5—Broadcast oscillator, 1500 KC.
A6—Short-wave oscillator, 18 MC.
There are six I. F. trimmers, two on top of each I. F. transformer (T4, 5 and 6). These are peaked 472½ KC.

Parts

30046		Cabinet with screen (237Q)
29983		Gasket and screen (237Q only)
29759		Escutcheon and crystal
28961		Volume control, .5 U
42750		Tone control switch assembly
29101		Shaft and blade for above
28986		Range switch
31349		Variable condenser assembly
40090		Dial light socket assembly
26721		Dial light, 2-V., 60 MA
31354		Dial plate (237Q)
31355		Dial plate (467Q)
31606		Dial plate holder
22683		Tube shield (1C6, 1B5)
15213		Tube shield (34)
29547		Coil shield (T2, 3)
29619		I. F. T. shield (T4, 5, 6)
31553		Cable and plug (chassis to power unit)
31634		Cable plug only
29874		Instruction sheet, F-1276
48790		Shipping container (237Q)
48810		Shipping container (467Q)
31006		Base cover (467Q only)

TRANSFORMERS

T1	47460	Broadcast pre-selector
T2	47470	1st-detector transformer
T3	47480	Oscillator transformer
T4	48610	No. 1 I. F. T.
T5	48620	No. 2 I. F. T.
T6	48630	No. 3 I. F. T.
T7	47840	Audio input transformer
T8	48480	Power transformer (S-375)

ELECTROLYTICS

C2	29529	8 MF, 200-V.
C22	31551	50 and 50 MF, 6-V.
C26	31552	10 and 10 MF, 200-V.

RESISTORS

R16	31546	63 Ω, blue-orange-black
R17	31546	63 Ω, blue-orange-black
R18	31547	15 Ω, brown-green-black
R20	31547	15 Ω, brown-green-black
R21	31547	15 Ω, brown-green-black
R22	31545	7 Ω, black-violet-black
R24	31548	30 Ω, orange-black-black

TRIMMERS

44570	Double R. F. trimmer
29823	Double I. F. trimmer
39630	Broadcast tracking trimmer (A4)

SOCKETS

26985	6Z4 socket
24492	Vibrator socket
21336	Power supply socket
24492	4-prong tube socket
24494	6-prong tube socket (1C6, 1B5)
21336	Speaker socket
18449	Fuse socket

CHOKES

CK1	36630	Filament choke
CK2	31587	R. F. choke
CK3	36610	R. F. choke
CK4	31573	A. F. choke

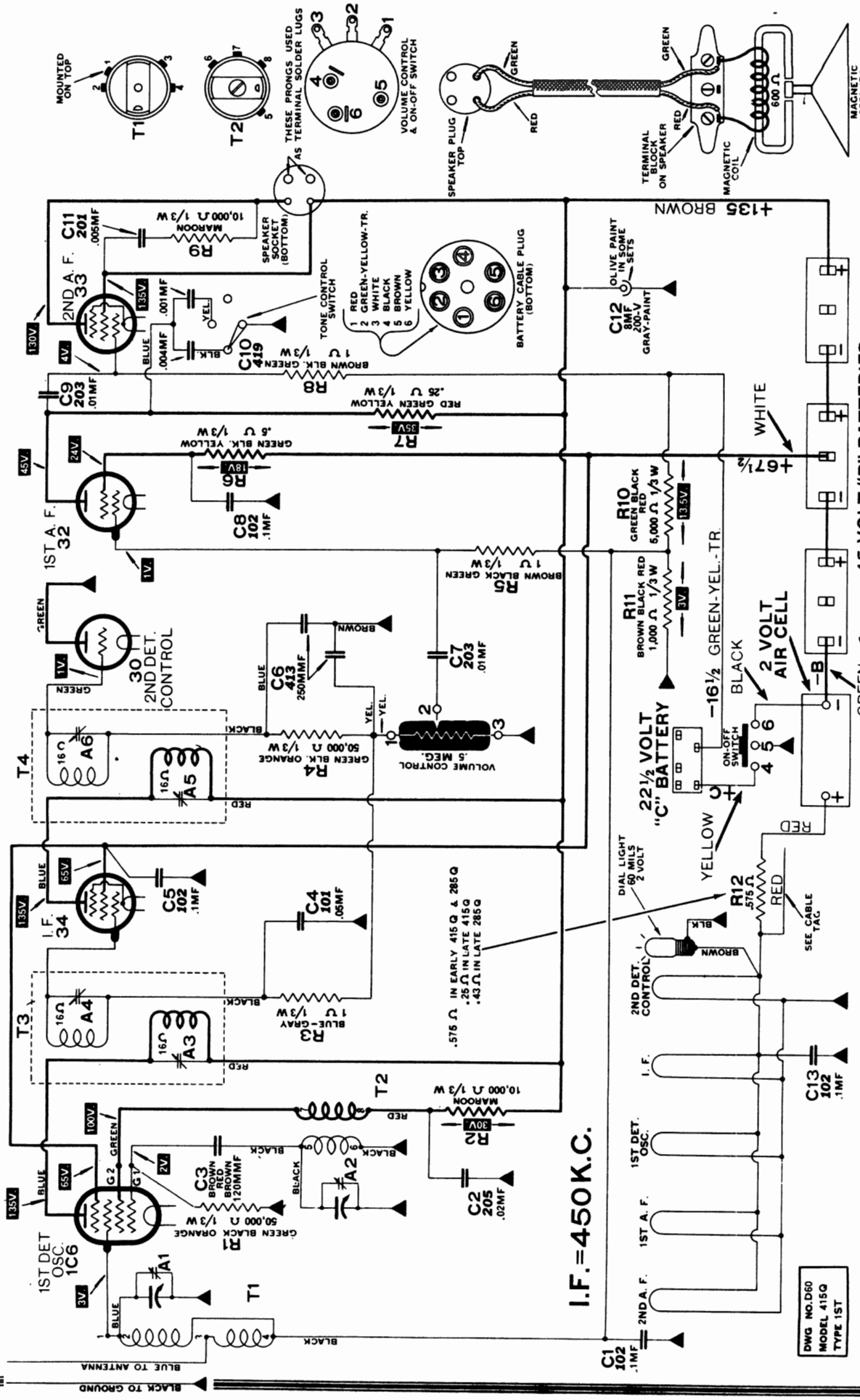
POWER UNIT

48590	Power unit complete with tube
31568	Power unit container
26094	Power unit container lid
31495	Power unit auxiliary container
48290	Relay assembly
31554	Vibrator
31565	"A" terminal clip

See Models 657Q, 747Q for Alignment Data

ATWATER KENT MFG. CO.

MODELS 285Q AND 415Q



"B" voltage was 135 V. for above measurements.

ATWATER KENT MFG. CO.

MODELS 285Q AND 415Q

I. F. TRIMMERS

Connect signal generator (450 KC) to cap of I. F. tube by means of No. 42590 coupling unit. Peak two trimmers on top of T4 (A5 and A6).

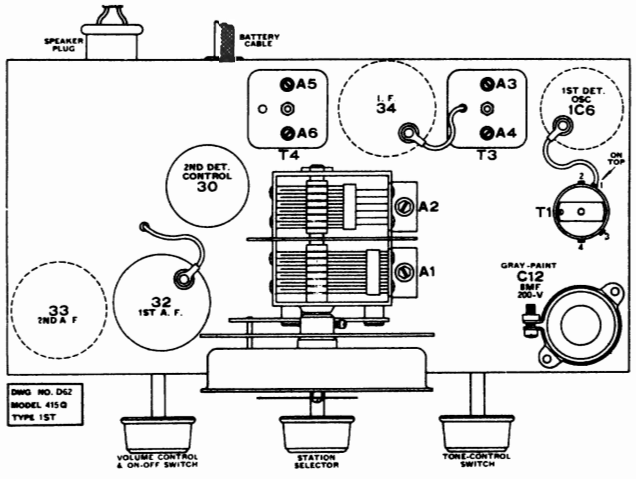
Connect coupling unit to cap of 1st-detector tube and peak two trimmers on top of T3 (A3 and A4).

DIAL POINTER ADJUSTMENT

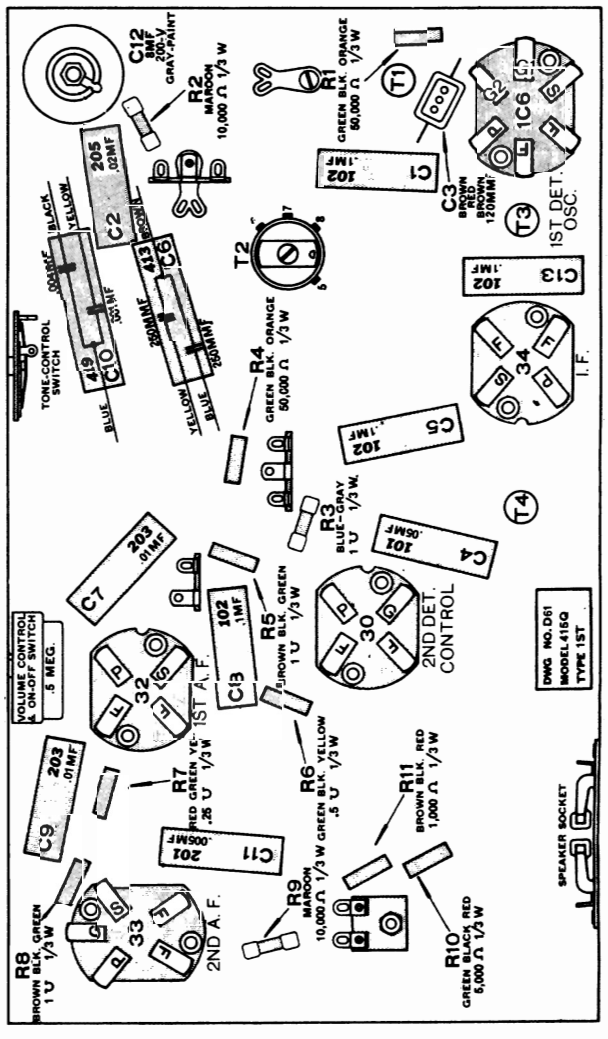
With rotor of variable condenser fully meshed, dial indicator should be at 545 KC.

R. F. TRIMMERS

Connect signal generator (1500 KC) to antenna and ground of set, using a 250 MMF condenser in series with the antenna lead. With dial at 1500 KC, peak A1 and A2. On late sets, A1 is not used. A2 is the oscillator trimmer.



A1—1st-detector, 1500 KC. (Not used on late sets.)
A2—Oscillator, 1500 KC.
There are four I. F. trimmers, A3, A4, A5, and A6. These are peaked at 450 KC.



PARTS LIST

30044		Cabinet with screen (415Q)
29451		Screen (415Q)
29783		Escutcheon and crystal assem.
29531		Vol. control, .5 U
44430		Tone control switch assem.
30045		Shaft and blade for the above
29427		Var. cond. assem.
29441		Dial holder
29456		Dial plate (415Q)
29977		Dial plate (285Q)
29417		Drive shaft
30042		Plate assembly for shaft
17961		Dial rubber and bushing
27692		Tuning gear
29054		Male plug assem.
29055		Female plug assem.
31168		Battery cable set-end (415Q)
31487		Battery cable and plug, battery end (285Q)
31219		Battery cable and plug, battery end (415Q)
29472		Battery cable tag, F-1253
28827		Pilot light socket assem.
26721		Pilot lamp, 2-V., .06 amp.
22683		Tube shield (1st det.)
28614		Tube shield (2nd A. F.)
29282		Tube shield (I. F.)
29468		Inst. sheet, F-1250
45030		Shipping container

TRANSFORMERS

T1	44780	No. 1 R. F. T.
T2	44790	Oscillator T.
T3	44880	No. 1 I. F. T.
T4	44890	No. 2 I. F. T.

RESISTORS

R12	47120	.25 Ω, flexible (415Q)
R12	47210	.43 Ω, flexible (285Q)
	40340	1.03 Ω, 3-V. dry battery resistor

CONDENSERS

C3	29532	120 MMF, 450-V.
C12	29529	8 MF, 200-V.

TRIMMERS

A3, 4	29119	Double trimmer on T3
A5, 6	29119	Double trimmer on T4

SOCKETS

24494	6-prong (1C6)
21336	4-prong (speaker)
24493	5-prong (33)
24492	4-prong (32, 30)

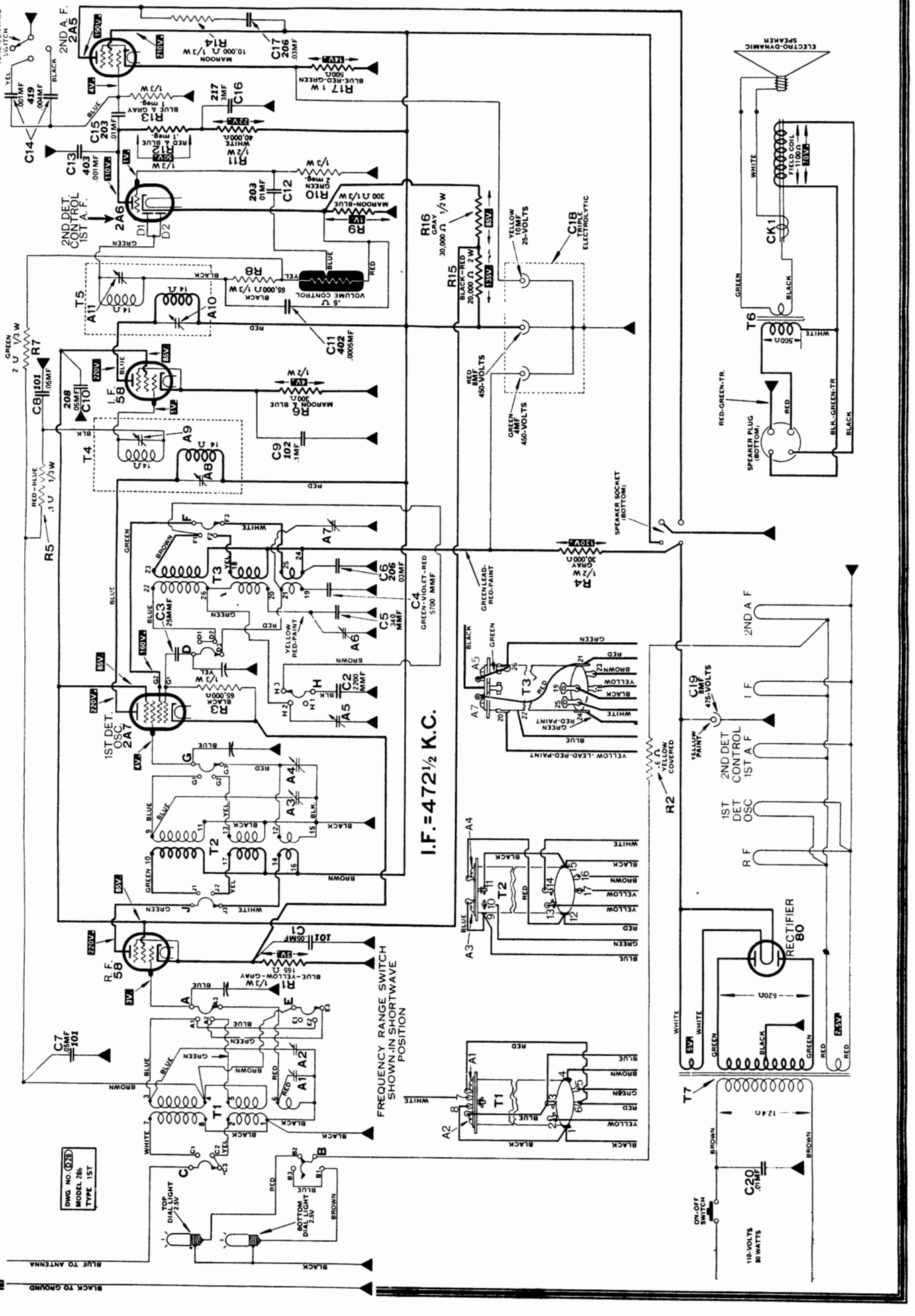
285Q SPEAKER No. 49900
415Q SPEAKER No. 48500

29076*	Speaker unit
29077	Drive rod
31207	Cable and plug assem.
29075	Diaphragm

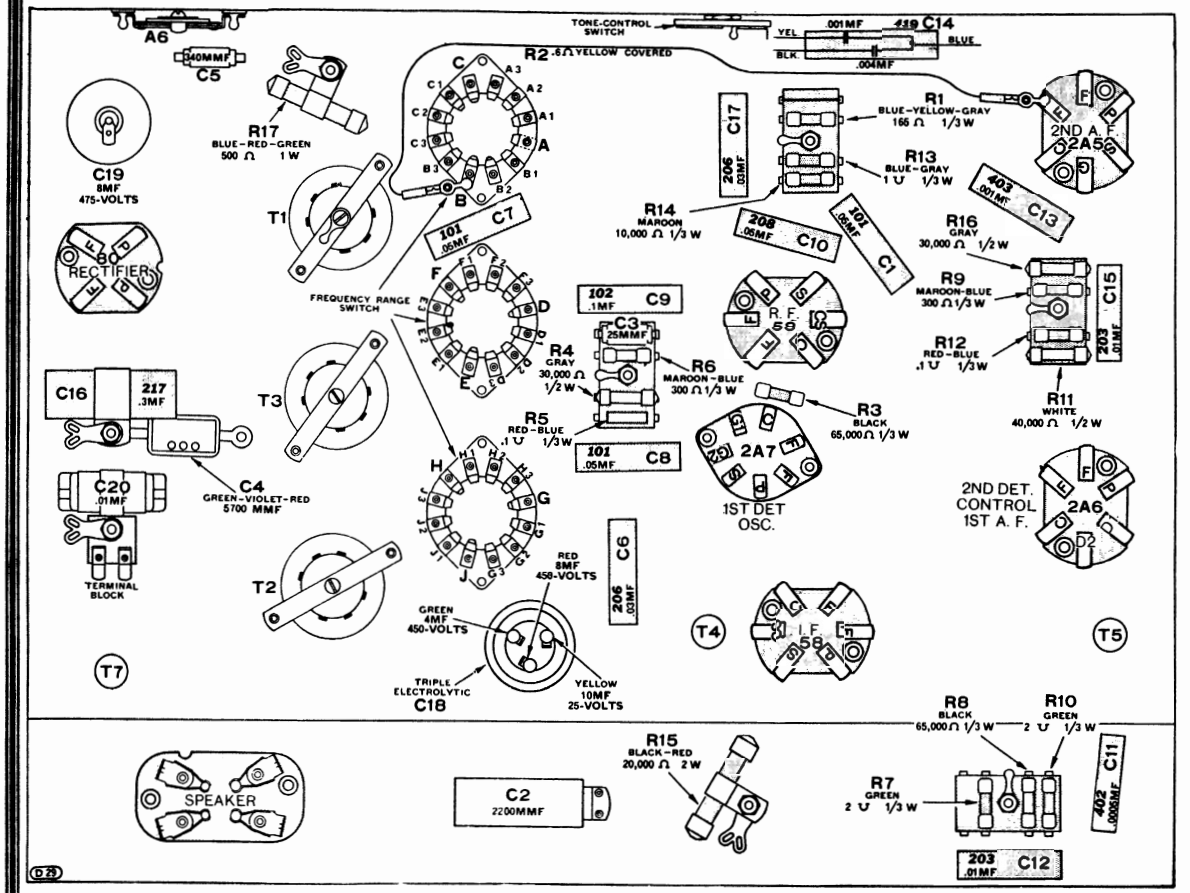
* Parts for this unit are not sold separately.

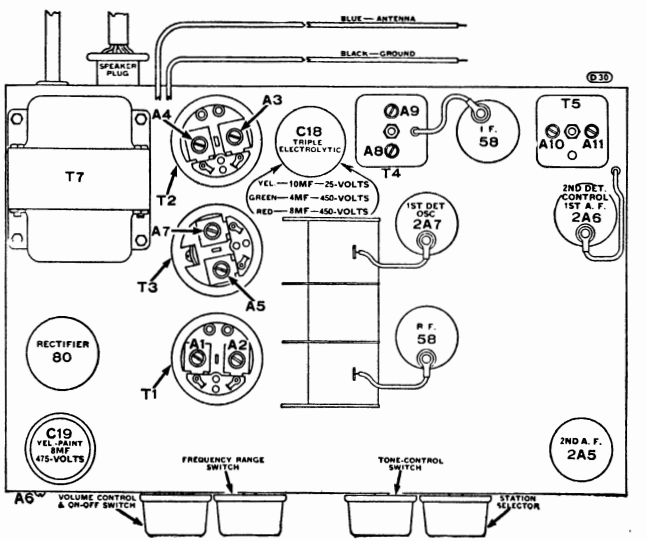
ATWATER KENT MFG. CO.

MODELS 286 AND 356



MODELS 286 AND 356





A1—R. F., 15 MC.
A2—R. F., 1500 KC.
A3—1st-detector, 1500 KC.
A4—1st-detector, 15 MC.
A5—Oscillator, 1500 KC.
A6—Oscillator, 560 KC.
A7—Oscillator, 15 MC.
A8—1st-detector plate, 472½ KC.
A9—I. F. grid, 472½ KC.
A10—I. F. plate, 472½ KC.
A11—2nd-detector, 472½ KC.

I. F. TRIMMERS.

Connect test oscillator (472½ KC) to I. F. tube by means of regular I. F. coupling unit. Peak A10, A11. Connect oscillator to 1st-detector tube and peak A8, A9.

DIAL POINTER ADJUSTMENT.

With rotor of variable condenser fully meshed, dial indicator should be at 535 KC.

R. F. TRIMMERS.

Connect an R. F. oscillator to antenna and ground of set.

Short-wave range. With oscillator and dial at 15 MC, peak A7, A4, A1.

Police range. No trimmers on this range.

Broadcast range. With oscillator and dial at 1500 KC, peak A5, A3, A2. With oscillator and dial at 560 KC, peak A6.

PARTS LIST

29404		Cabinet with screen (356)
29127		Screen (356)
28531		Escutcheon and crystal
28954		Range switch
28961		Vol. control
42750		Tone control switch assem.
29101		Shaft and blade for the above
28946		Knob without dot (tuning and range)
28947		Knob with dot (volume and tone)
27432		Var. condenser
28968		Dial holder
28542		I. F. T. shield
27933		T1, T2 shield
27932		T3 shield
40090		Dial light socket assem.
27676		Dial lamp, 2.5-V (frosted)
22683		Tube shield
25058		R. F. T. shield cover
15213		Tube shield (R. F.)
29038		Shipping container (286)
29135		Shipping container (356)
29017		Instruction sheet, F-1217

TRANSFORMERS

T1	42560	No. 1 R. F. T.
T2	42570	No. 2 R. F. T.
T3	42580	Osc. trans.
T4	28527	No. 1 I. F. T. (includes trimmers)
T5	28528	No. 2 I. F. T. (includes trimmers)
T6	21672	Output trans.
T7	28084	Power trans.

RESISTORS

R2	16081	.6 Ω dial light resis.

CONDENSERS

C2	40380	2200 MMF, 100-V.
C3	33930	25 MMF, 500-V.
C4	27599	5700 MMF, 450-V.
C5	41580	340 MMF, 500-V.
C18	27592	Triple elec., 4 MF, 8 MF, 450-V., 10 MF, 25-V.
C19	28031	8 MF, 475-V.
C20	23250	.01 MF, 450-V., line cond.

TRIMMERS

A1, 2	39430	On T1
A3, 4	39430	On T2
A5, 7	39430	On T3
A6	39630	Front of chassis (560 KC)

SOCKETS

24492	4 prong
24494	6 prong
28111	7 prong
21336	Speaker

475 and 286 SPEAKER No. 41800

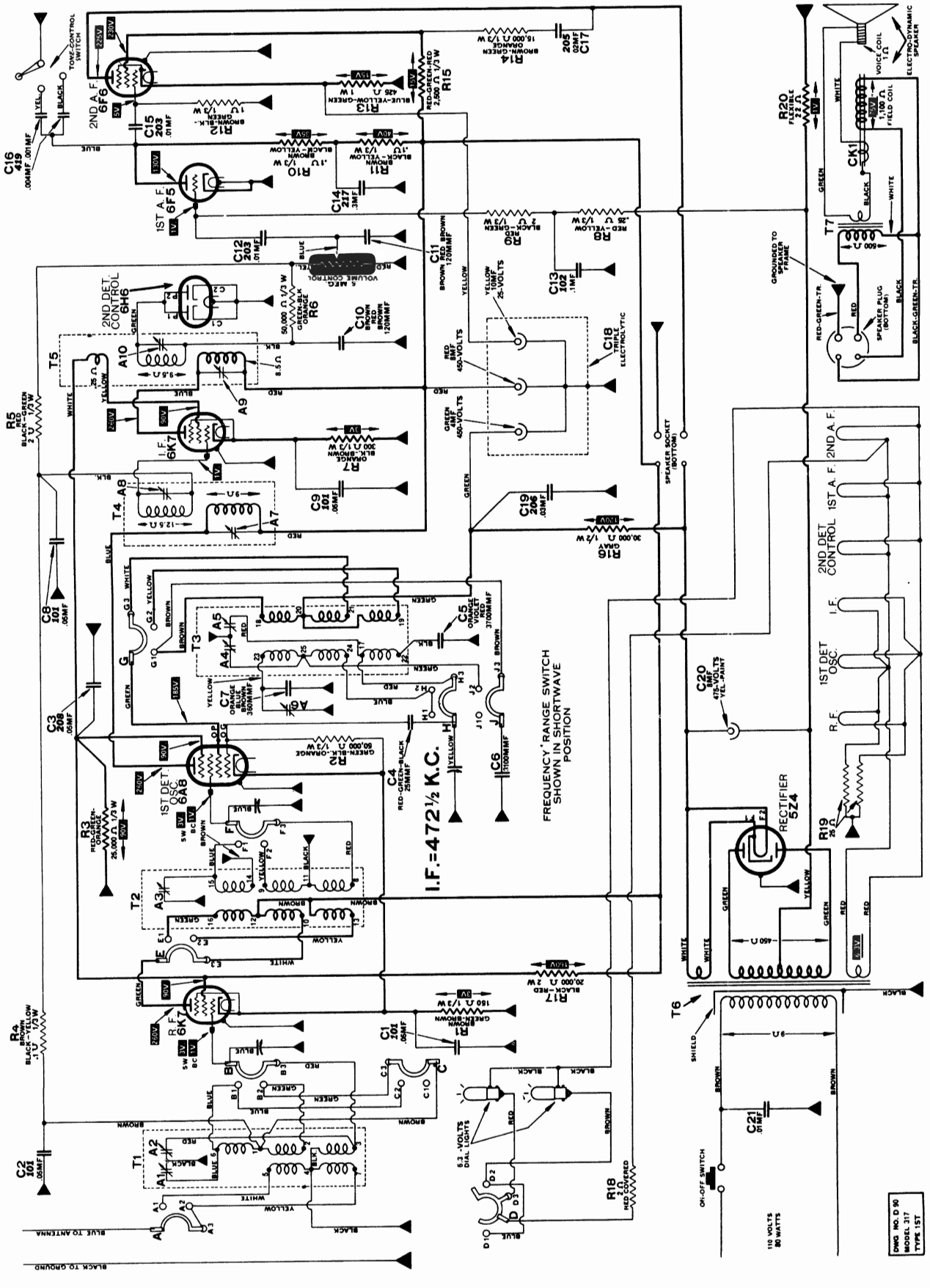
25525	Small choke
21260	Field coil (1100 Ω)
21672	Output transformer
20737	Diaphragm
27611	Cable and plug
15079	Plug

735 and 356 SPEAKER No. 41900

25525	Small choke
21260	Field coil (1100 Ω)
21672	Output transformer
19465	Diaphragm
28345	Cable and plug
15079	Plug

ATWATER KENT MFG. CO.

MODELS 317 AND 337 (Early Type)



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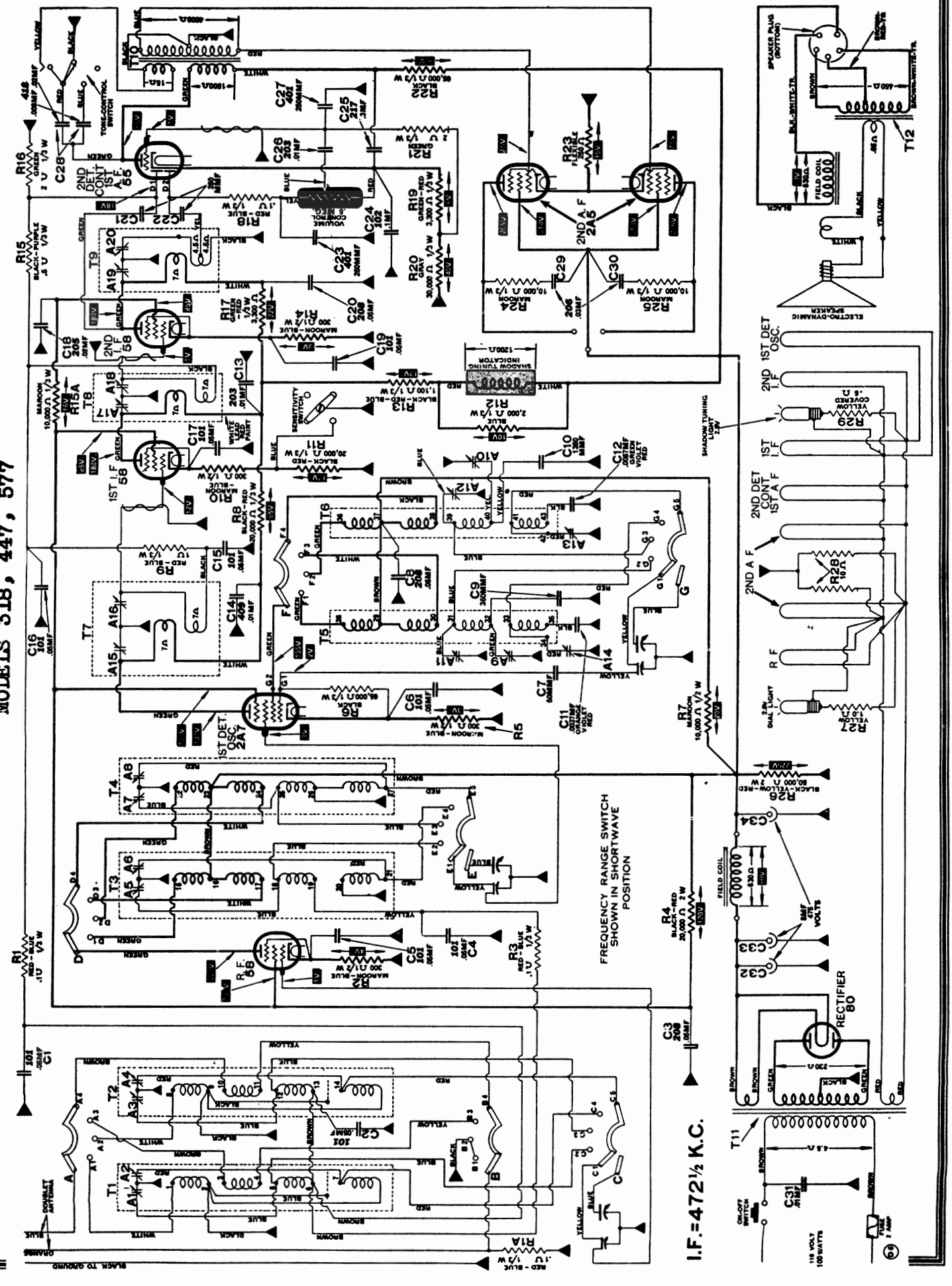


ATWATER KENT MFG. CO.

ADJUSTING TRIMMERS, MODELS 318, 447 AND 577

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full.

Put balancing unit A (shown in Fig. 2) across trimmer A19 and peak A20.

Put unit A across A20 and peak A 19.

Put unit A across A17 and peak A18.

Put unit A across A18 and peak A17.

Put unit A across A15 and peak A16.

Put unit A across A16 and peak A15.

Remove the I. F. coupling unit and balancing unit and seal the I. F. trimmers.

R. F. TRIMMERS.

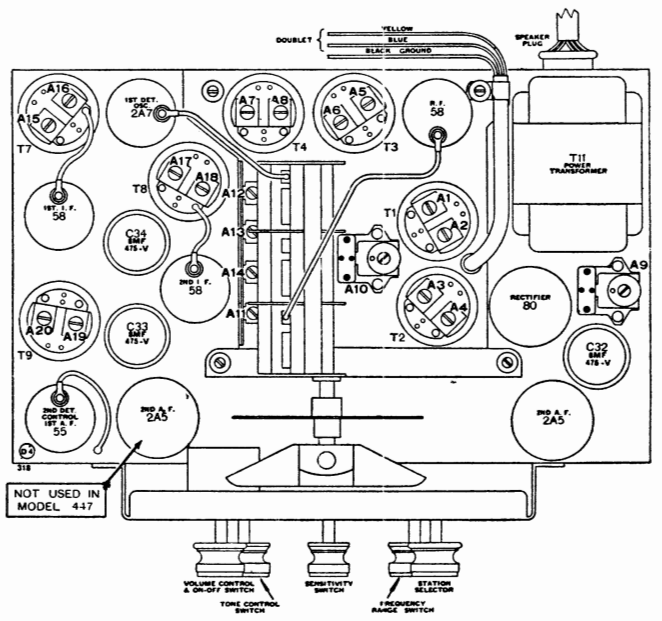
Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal that will give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

12 to 22.5 MC range. Oscillator at 18 MC, dial pointer at 18 MC, peak trimmers A13, A4 and A8.

4.6 to 12.2 MC range. Oscillator at 12 MC, dial pointer at 12 MC, peak trimmers A14, A2 and A6 for maximum output.

1.6 to 4.6 MC range. Oscillator at 4 MC and dial pointer at 4 MC, peak trimmers A12, A3 and A7. Tune oscillator to 1.7 MC, and with dial pointer at 1.7, peak A10. Repeat adjustments on A12 at 4 MC and A10 at 1.7 MC if necessary.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, peak trimmers A11, A1 and A5. Tune oscillator to 560 KC, turn dial pointer to 560 KC mark, and peak A9. Repeat adjustments on A11 at 1500 KC and A9 at 560 KC if necessary.

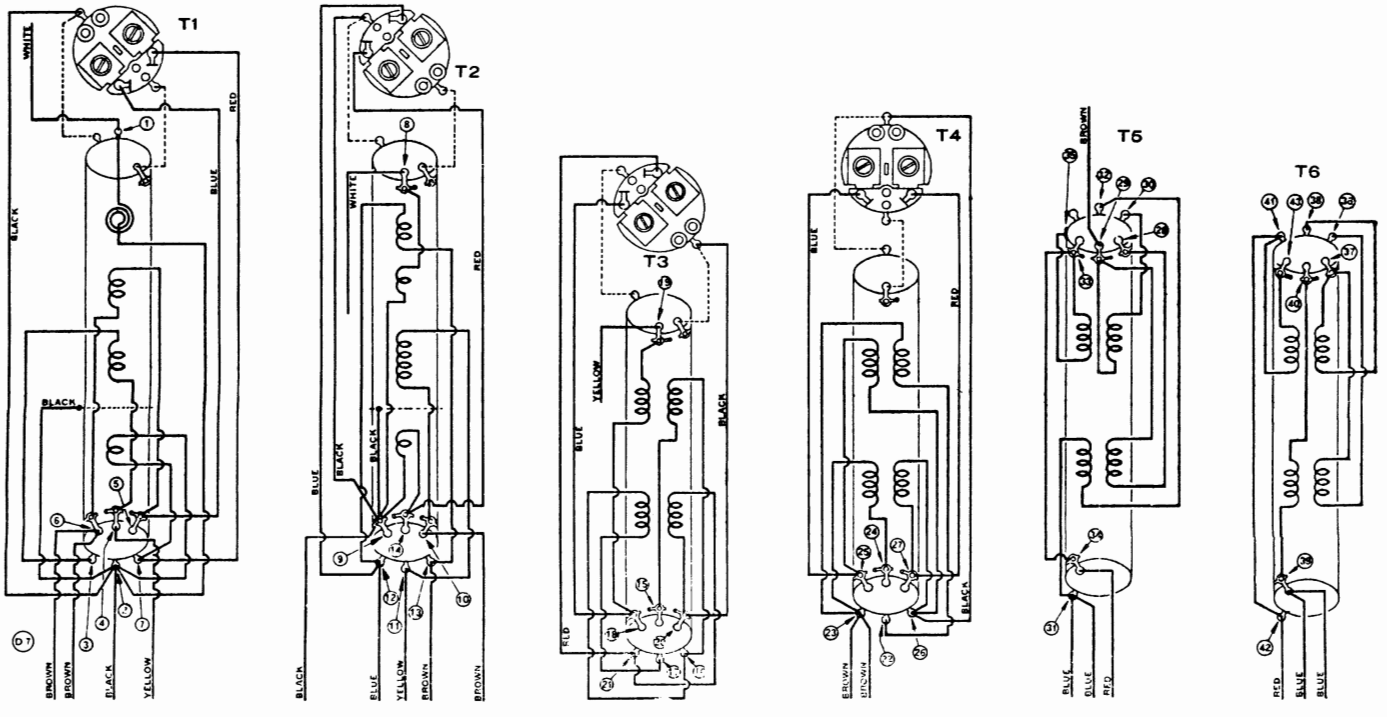


R. F. TRIMMERS ON MODELS 318, 447 AND 577.

	12-22.5 MC Range	4.6-12.2 MC Range	1.6-4.6 MC Range	540-1600 KC Range
R. F.	A4	A2	A3	A1
1st-Detector	A8	A6	A7	A5
Oscillator	A13	A14	A12	A11
Tracking	None	None	A10	A9

The I. F. trimmers are A15 to A20, inclusive.

R. F. TRANSFORMERS IN MODELS 318, 447 AND 577



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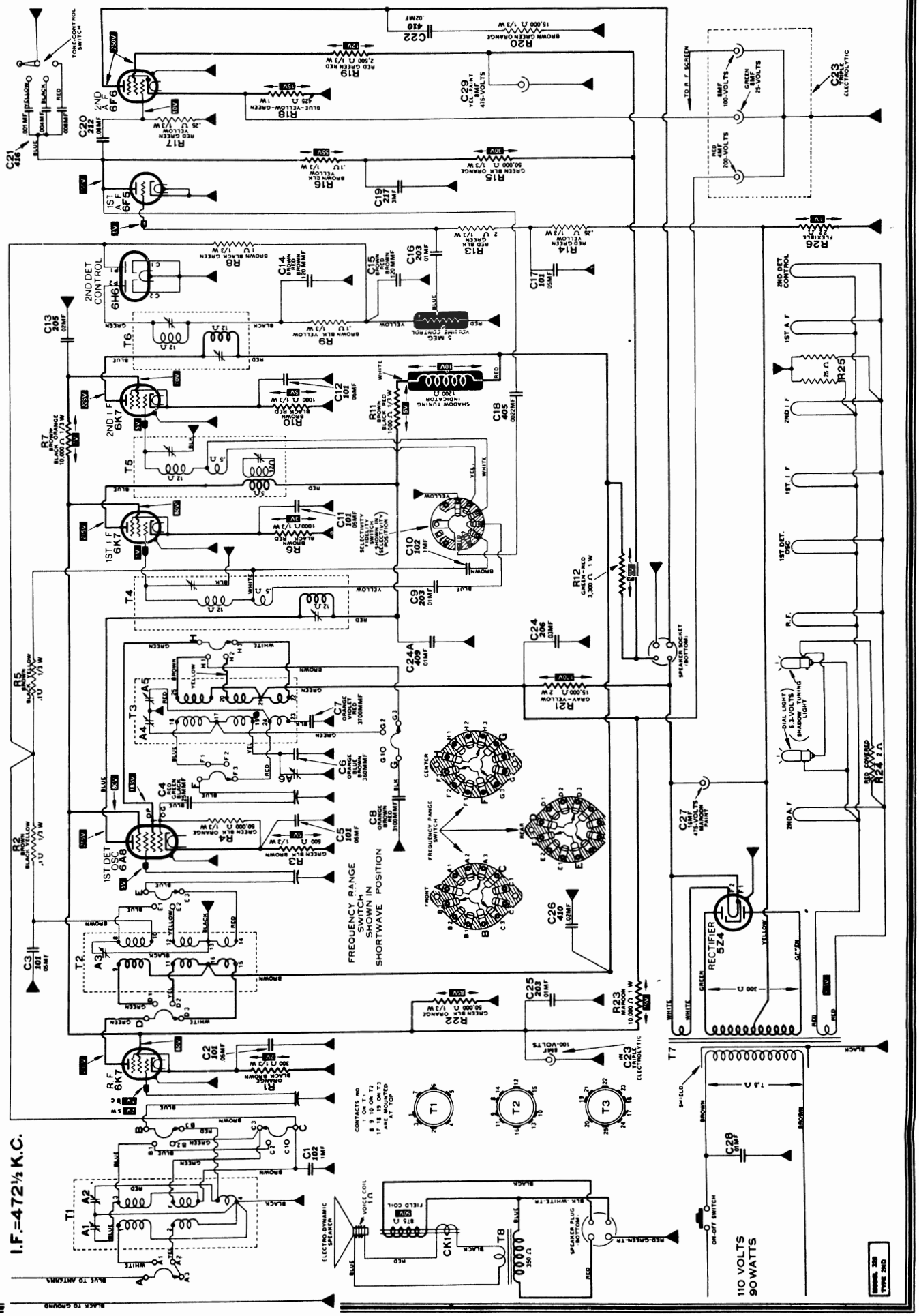
MODEL 328, 2ND TYPE, ABOVE SERIAL No. 6438750



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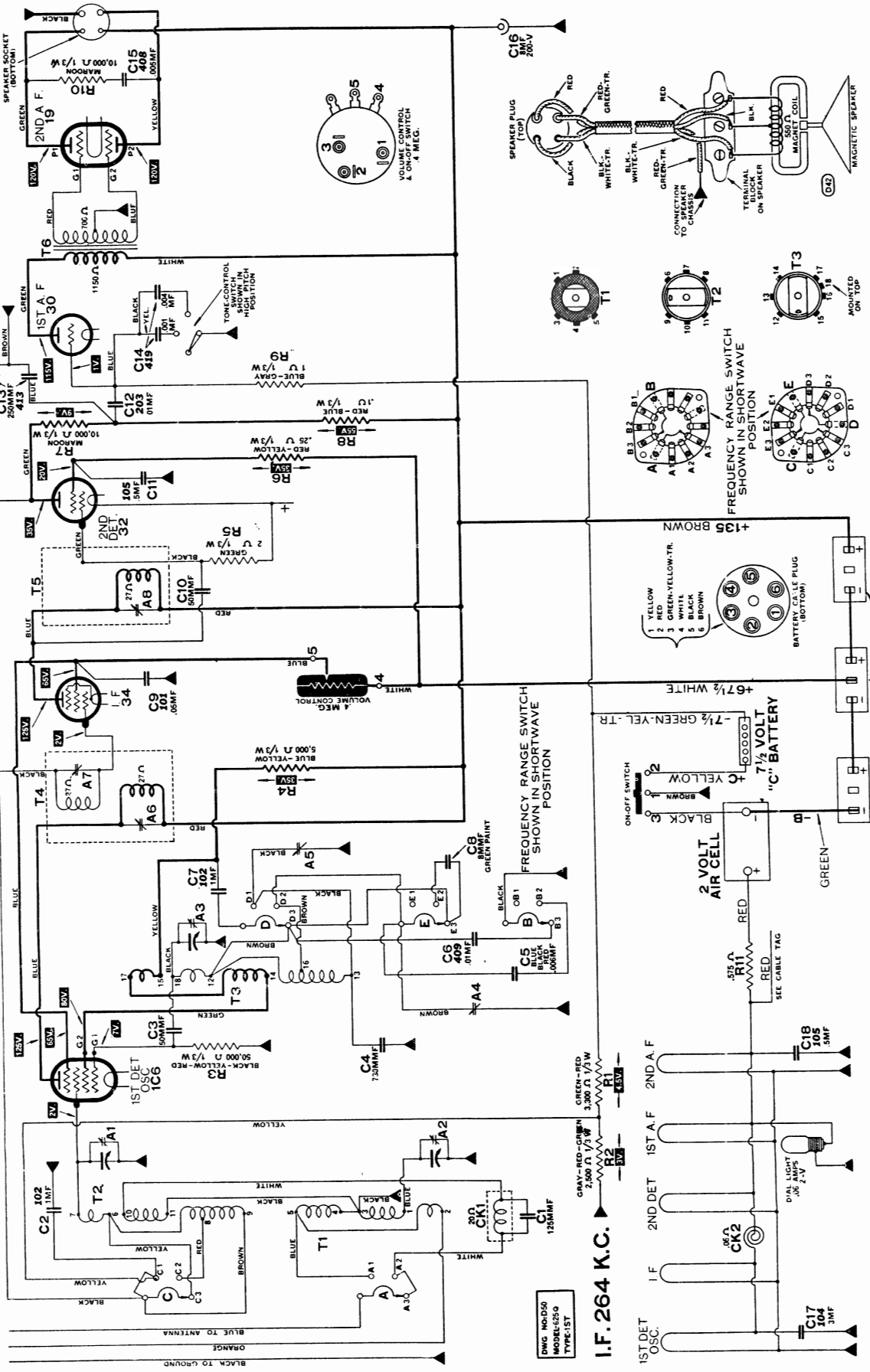
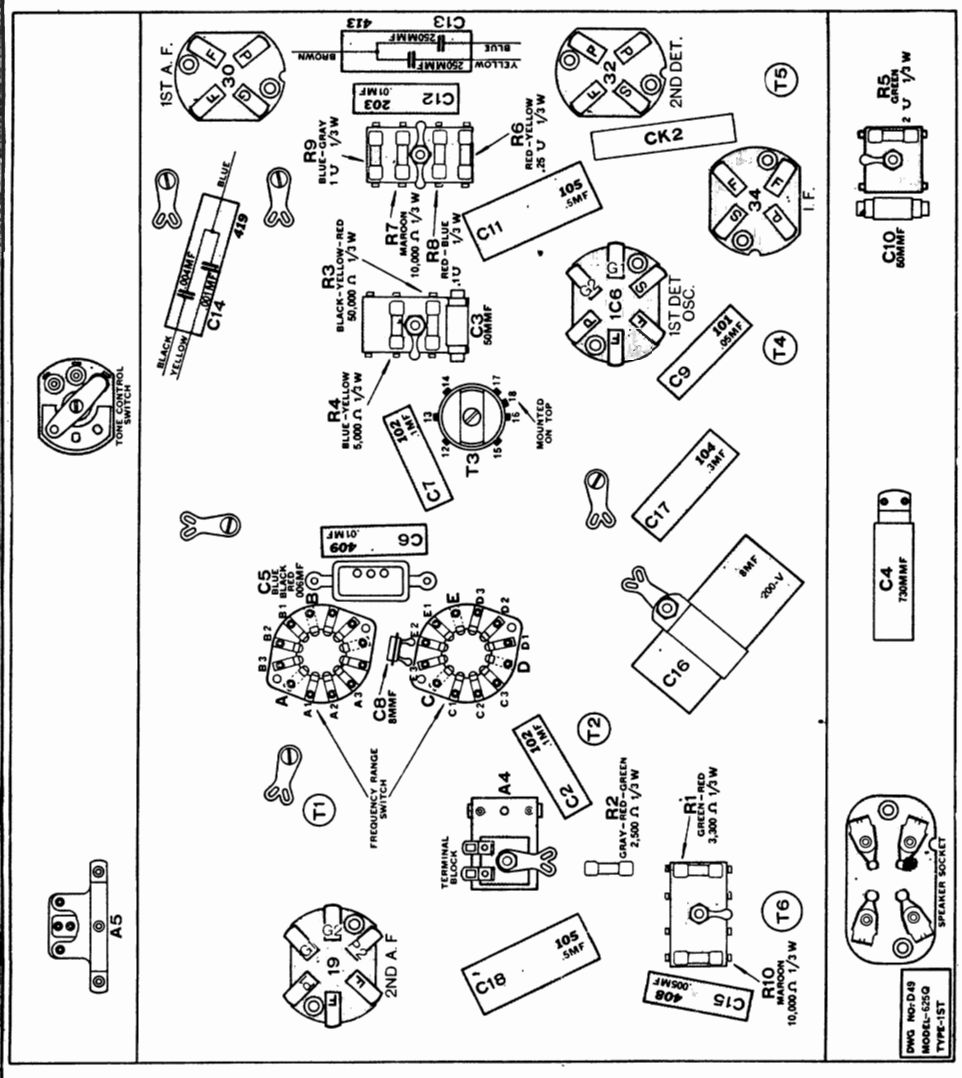
MODELS 385Q AND 625Q

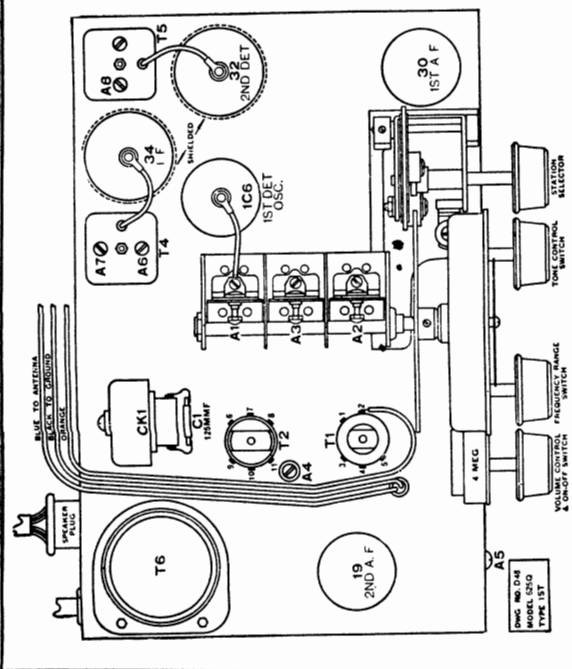


Condenser C7 in oscillator plate circuit is .1 MF. In late sets, C9 (I. F. and 1st-detector screen bypass) is .2 MF (103).

ATWATER KENT MFG. CO.

MODELS 385Q AND 625Q





TRIMMERS

A1—1st-detector, 1500 KC.
A2—Pre-selector, 1500 KC.
A3—Oscillator, 15 MC.
A4—Oscillator, 1500 KC.
A5—Oscillator, 560 KC.
A6—1st-detector plate, 264 KC.
A7—I. F. grid, 264 KC.
A8—I. F. plate, 264 KC.

Intermediate Frequency 246 K.C.

Parts List

28986		Range switch
42750		Tone control switch assembly
29101		Shaft and blade for above
29251		Volume control, .4 U
40090		Dial light socket assembly
26721		Lamp, 2-V., .06 amp.
27431		Variable cond. assem.
29262		Dial holder
28531		Escutcheon and crystal assem.
29228		Dial plate (625Q)
29229		Dial plate (385Q)
29282		Tube shield (paper)
29183		I. F. T. shield
24327		Wave trap shield
29236		Instruction sheet, F-1238
29038		Shipping container (385Q)
29135		Shipping container (625Q)
30032		Cabinet with screen (625Q)
29127		Screen
28993		Base cover
41020		Wave trap assem. (264 KC)

CABLES

29331		Male cable and plug assembly (625Q)
29673		Female cable and socket assem. (385Q and 625Q)
30036		Male cable and plug assem. (385Q)
29055		Battery socket assembly
29054		Battery plug assembly
29227		Battery cable tag, F-1234

TRANSFORMERS

T1	43060	Antenna trans.
T2	44040	1st-det. trans.
T3	44050	Osc. trans.
T4	44070	No. 1 I. F. transformer
T5	44170	No. 2 I. F. transformer
T6	44240	Audio transformer

RESISTORS

R11	40330	.575 Ω (on cable)
	44230	1.03 Ω (in envelope)

CONDENSERS

C1	41650	125 MMF, 500-V.
C3	35840	50 MMF, 500-V.
C4	43970	730 MMF, 100-V.
C5	25035	.006 MF, 450-V., blue, blk., red
C8	25661	8 MMF, 500-V.
C10	35840	50 MMF, 500-V.
C16	22472	8 MF, 200-V., dry electro.

TRIMMERS

A4	28843	Osc. BC trimmer
A5	39630	Osc. track cond.
A6, 7	29119	On No. 1 I. F. T.
A8	29119	On T5, No. 2 I. F. T.

CHOKES

CK2	44160	Filament choke

SOCKETS

24492		4 prong
24494		6 prong
21336		Speaker

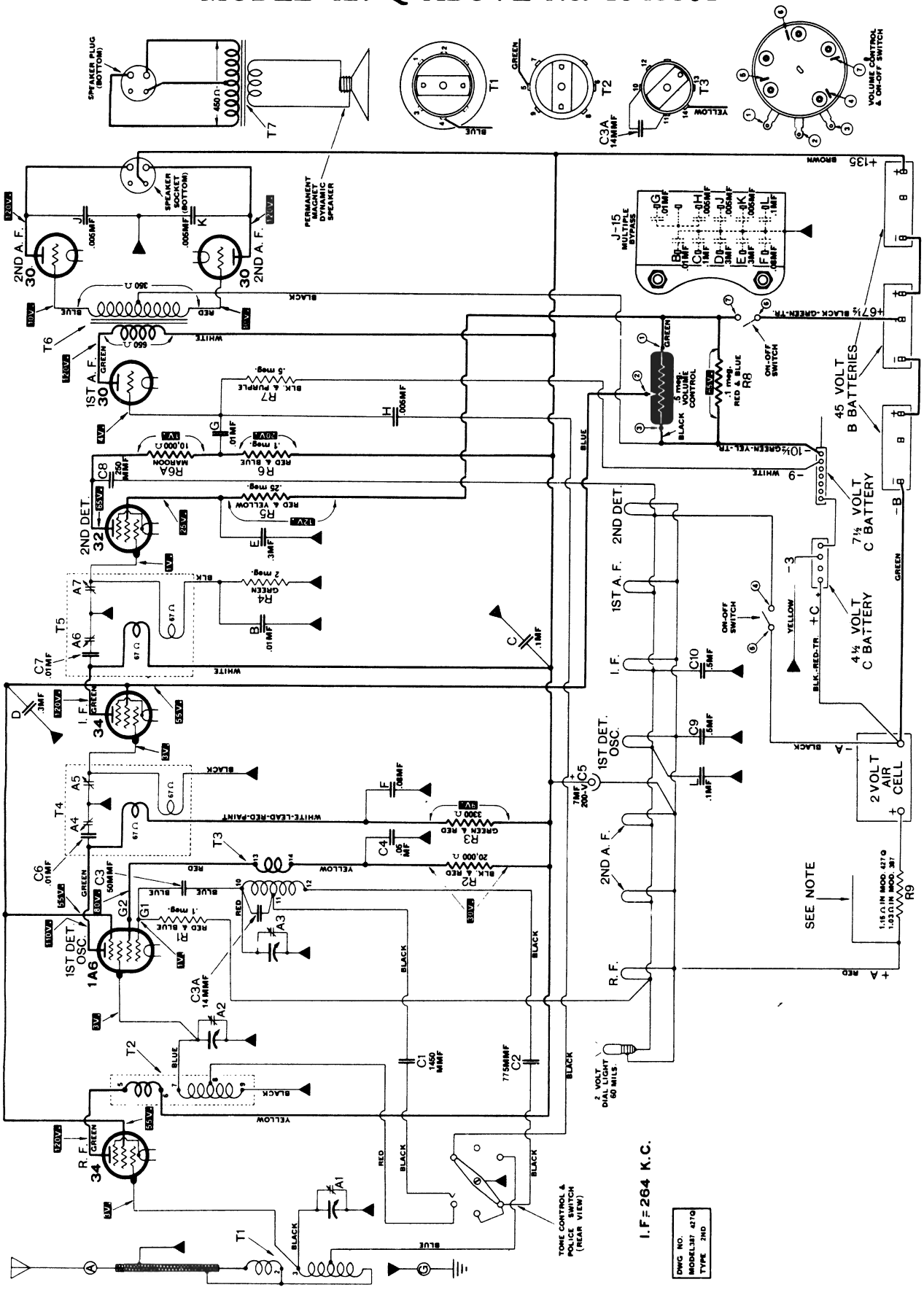
385Q SPEAKER No. 46800
625Q SPEAKER No. 46700

28974		Cone housing (625Q)
28979		Cone housing (385Q)
19469		Segment
29074		Cable and plug assembly
29075		Diaphragm assembly
29076*		Sound unit complete
29077		Drive rod
17868		Drive rod nut

* Parts for this unit are not sold separately.

ATWATER KENT MFG. CO.

MODEL 387 ABOVE No. 7873966
MODEL 427-Q ABOVE No. 1948501



Total "B" voltage at time measurements were made equaled 120 volts. Tube voltages are taken from —F of each tube. Resistor R9 is used with 2-volt air cell, but is not used with 2-volt storage cell. An extra resistor of the same value as R9 is used with a 3-volt dry-cell "A" battery, and is connected in series with R9.

ATWATER KENT MFG. CO.

MODEL 387 ABOVE No. 7873966

MODEL 427-Q ABOVE No. 1948501

2nd TYPE 387

(Above Serial No. 7873966)

2nd TYPE 427-Q

(Above Serial No. 1948501)

(For parts not listed below refer to 1st Type 387 and 427-Q)

Part No.	Name of Part
27054	Dial assembly
26721	Dial lamp (2-V., 60 MILS.)
37830	Tone control switch complete

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	37920	No. 1 R. F. T.
T2	37930	No. 2 R. F. T.
T3	37940	Oscillator T.
T4	26068	No. 1 I. F. T.
T5	26068	No. 2 I. F. T.
T6	35030	Input T.
T7	23701	Output T.

TRIMMERS

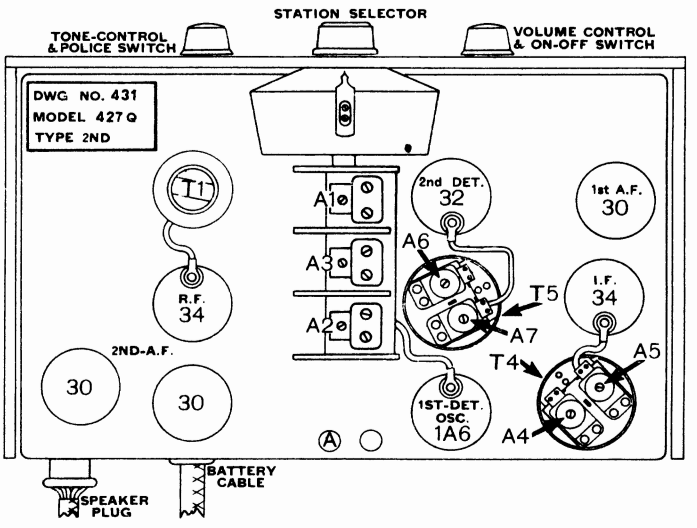
Code No.	Part No.	Name of Part
A4, 5	30110	Double I. F. trimmer
A6, 7	30110	Double I. F. trimmer

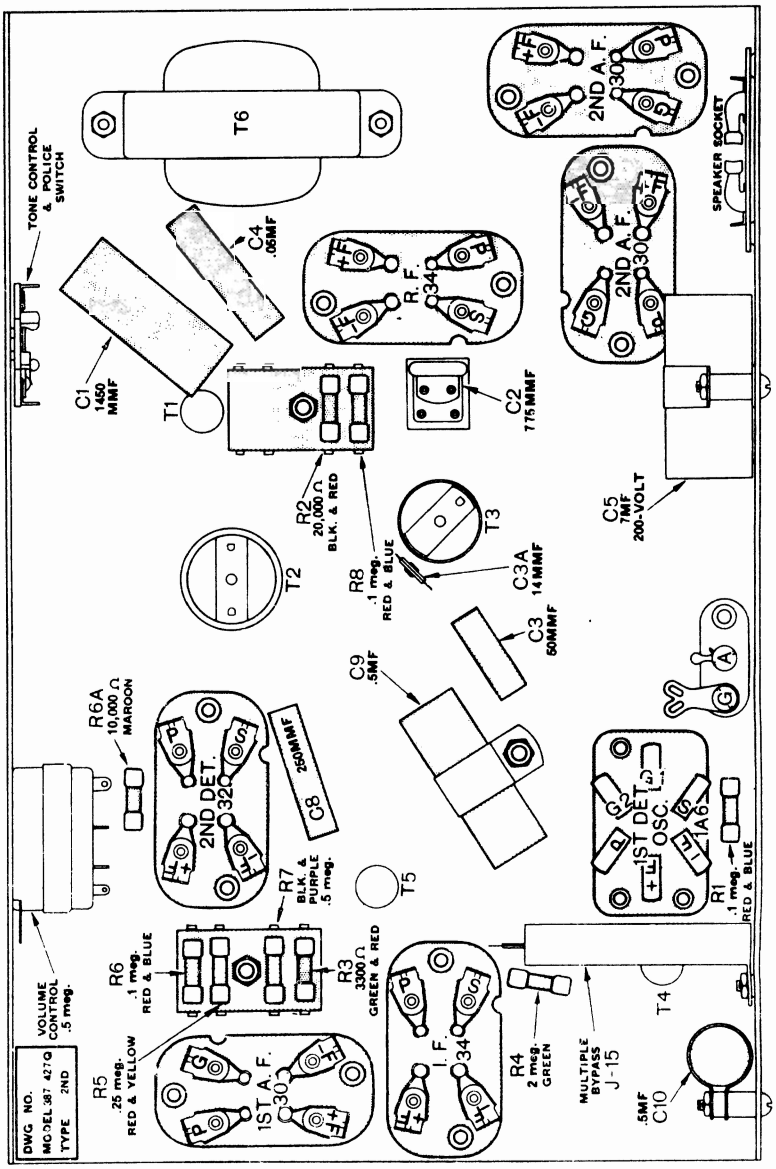
CONDENSERS

Code No.	Part No.	Name of Part
C1	37840	1450 MMF, 100-V.
C2	30580	775 MMF, 100-V.
C3	35840	50 MMF, 500-V.
C3A	36280	14 MMF, 500-V.
C4	26820	.05 MF. 200-V., NI
C5	22472	7 MF, 200-V., dry electrolytic
C6	27630	.01, 200-V.
C7	27630	.01, 200-V.
C8	33620	250 MMF, 450-V., NI
C9	31510	.5 MF, 100-V., NI
C10	31510	.5 MF, 100-V., NI
	34010	Multiple by-pass (J15)

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 ℧, 1/3-W.
R2	30390	Bl'k-red, 20,000 Ω, 1/3-W.
R3	30380	Red-green, 3300 Ω, 1/3-W.
R4	30370	Green, 2 ℧, 1/3-W.
R5	31970	Red-yel., .25 ℧, 1/3-W.
R6	30340	Red-blue, .1 ℧, 1/3-W.
R6A	30320	Maroon, 10,000 Ω, 1/3-W.
R7	30350	Bl'k-purple, .5 ℧, 1/3-W.
R8	30340	Red-blue, .1 ℧, 1/3-W.
R9	36250*	Wire wound, 1.15 Ω in 427-Q
R9	36240†	Wire wound, 1.03 Ω in 387

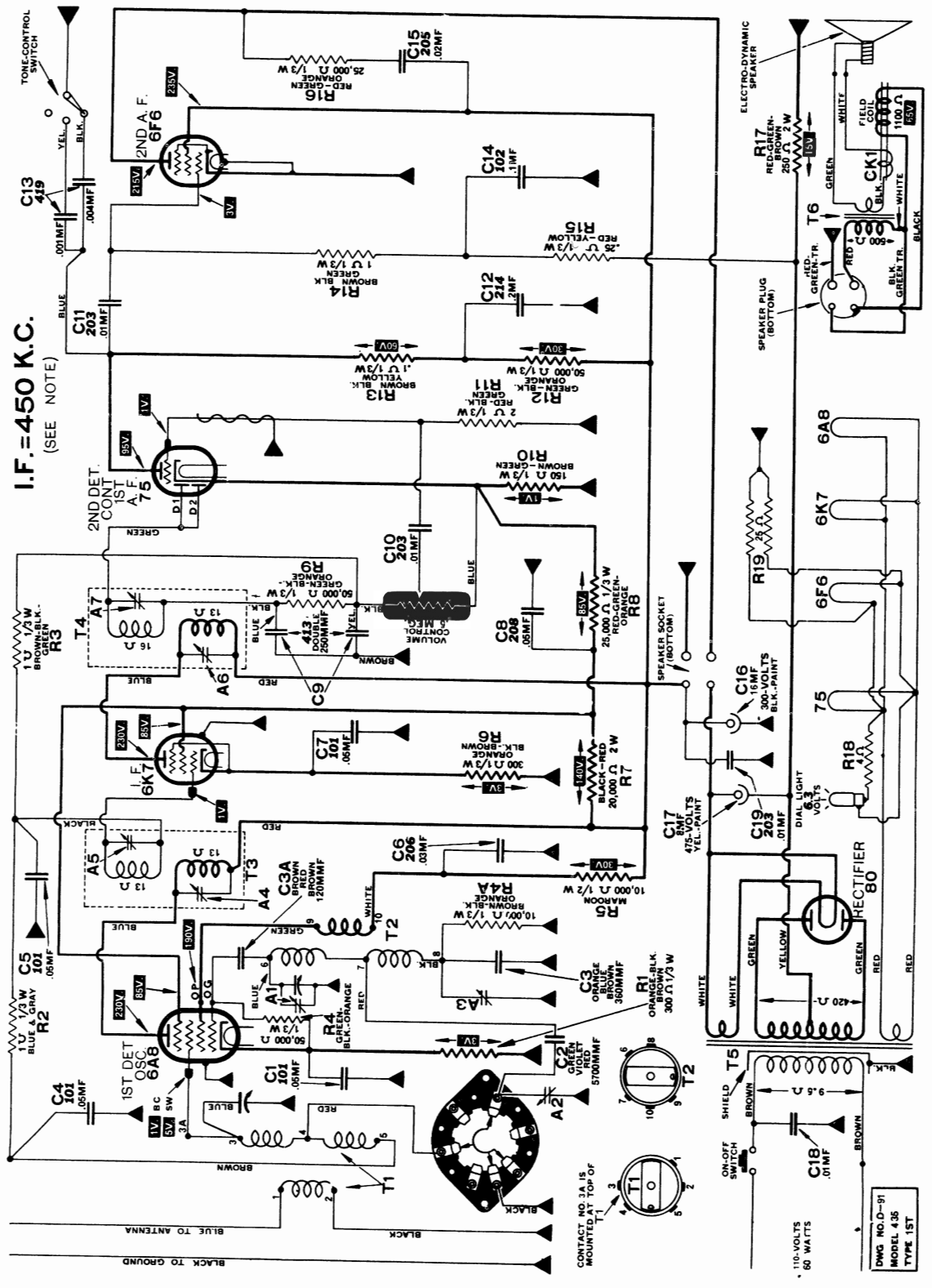




This late type of Models 387 and 427-Q differs from the early type by having a police-switch circuit which permits tuning in both police bands.

ATWATER KENT MFG. CO.

MODEL 435 DIAGRAM (Early Type)

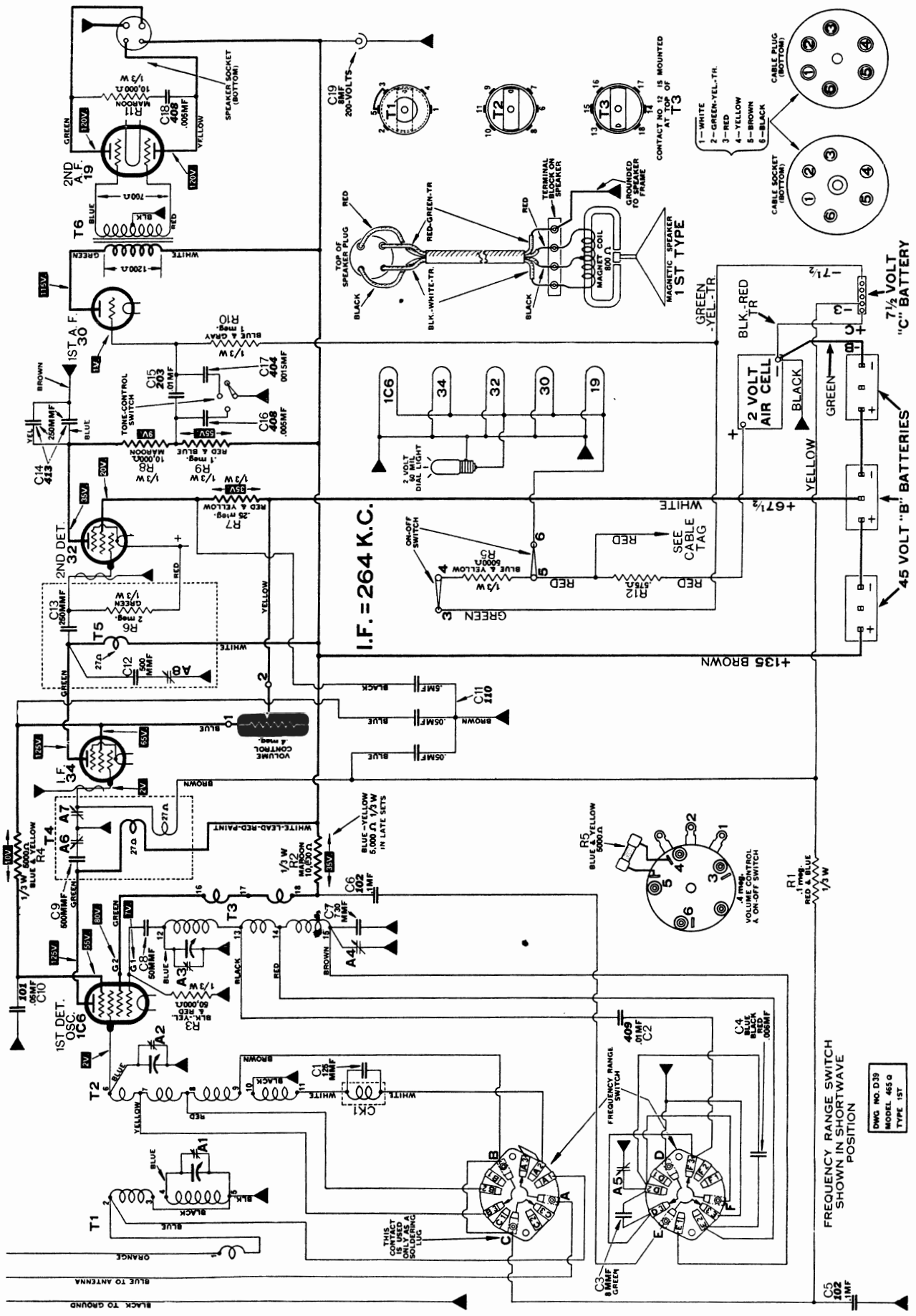


The frequency-range switch is shown in the short-wave position.

The I. F. in some Model 435 sets is 472½ KC and a label to this effect is attached to the rear of the chassis. The I. F. transformers and trimmers, etc., are exactly the same for either 450 or 472½ KC.

ATWATER KENT MFG. CO.

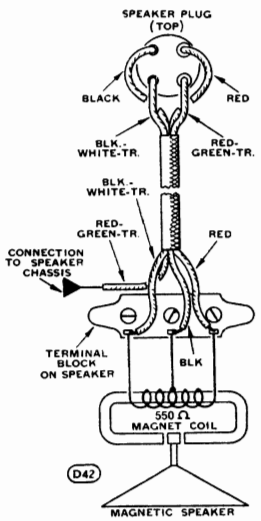
MODELS 465Q and 655Q



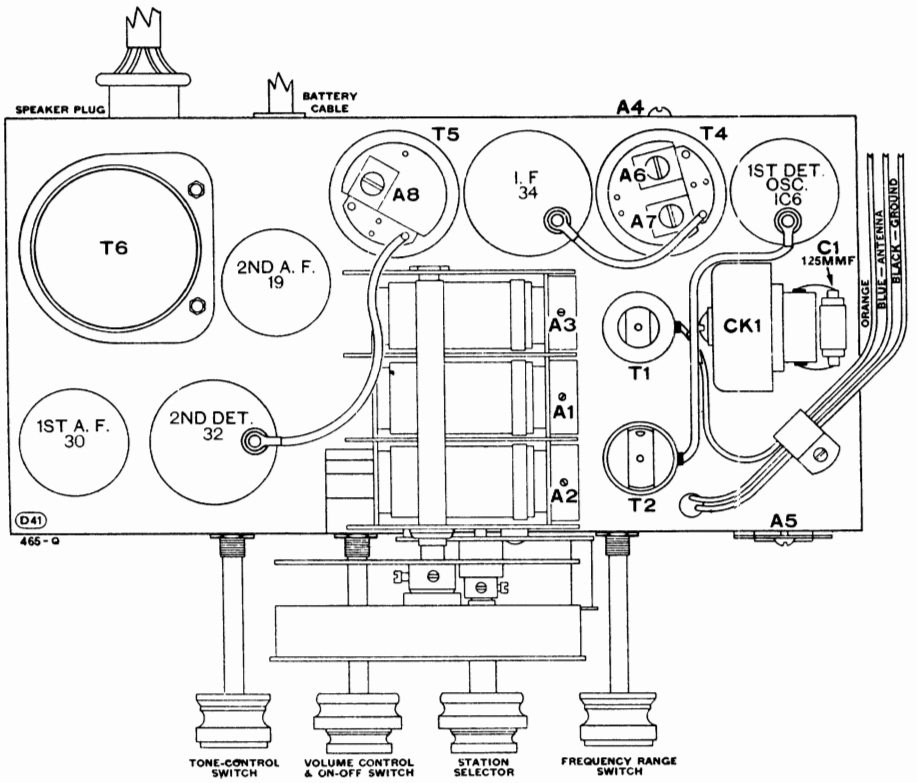
A choke, No. 36630, not shown above, is used in the filament circuit of some Model 465Q and 655Q sets. Connections of the 2nd type speaker are shown on page 2.

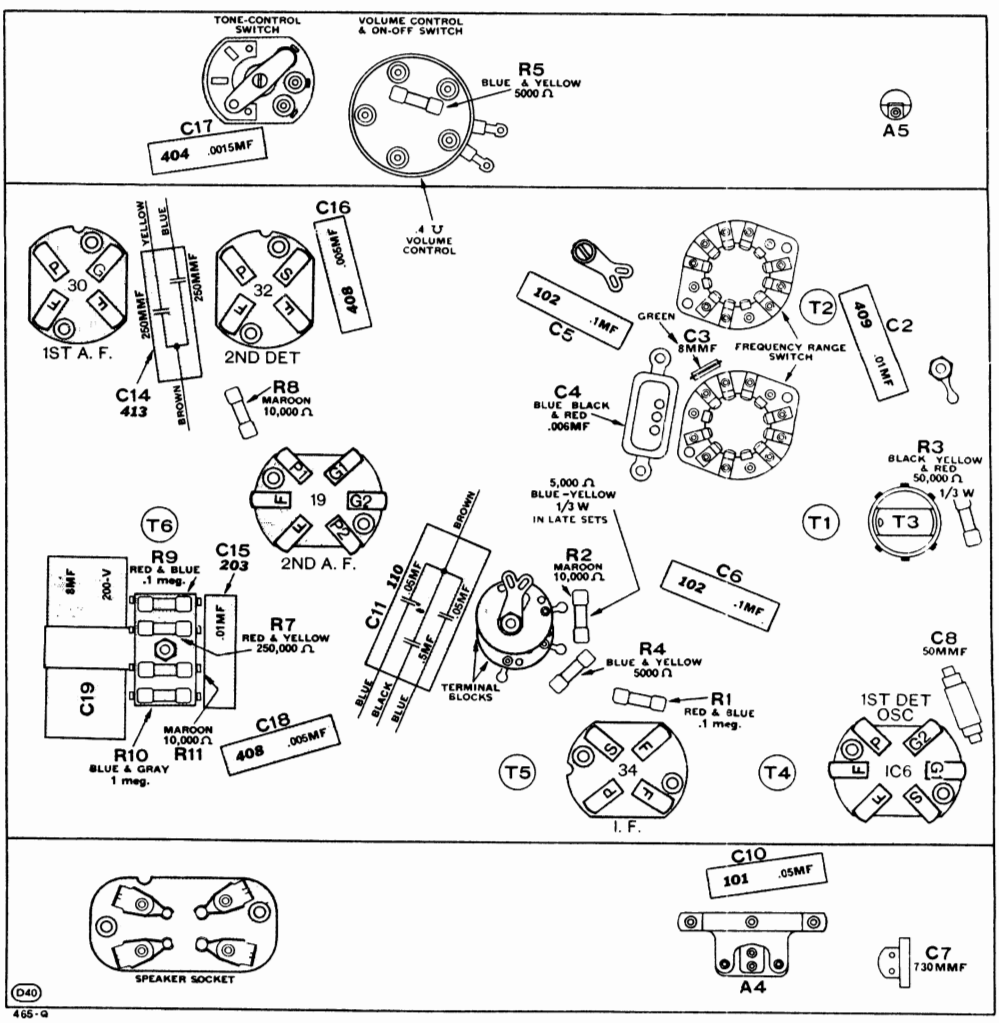
ATWATER KENT MFG. CO.

MODELS 465Q and 655Q



2ND TYPE





TRIMMERS ON MODELS 465Q and 655Q

(See page 1 for trimmer adjustment data.)

I. F. TRIMMERS

I. F. (264 KC).....A6, A7, A8

5.3 to 16 MC RANGE

Oscillator (15MC).....A3

1.6 to 4.8 MC RANGE

There are no trimmer adjustments for this range.

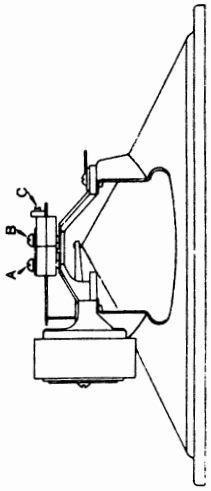
540 to 1600 KC RANGE

Antenna (1500 KC).....A1
1st-Det. (1500 KC).....A2
Oscillator (1500 KC).....A5
Tracking (560 KC).....A4

ATWATER KENT MFG. CO.

MODELS 465Q, 655Q, 768Q and 978Q

SPEAKER ADJUSTMENT

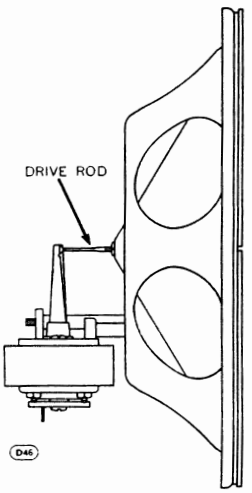


1st TYPE

1st Type: When adjustment is required, place set and speaker in operation and tune in a signal. Loosen screw A and tighten B, or vice versa, in order to center the armature in the magnet gap. If the armature is not correctly centered, it may strike against one pole of the magnet and cause chattering. If the speaker overloads or chatters only on a very strong signal, turn screw C anti-clockwise. This tightens the armature movement. In general it is not advisable to disturb the adjustment of screw C.

2nd Type: There are no centering adjustments on the 2nd type speaker used in late models 465Q and 655Q. If the unit becomes open or requires adjustment, it is necessary to replace the complete sound unit.

The diaphragm is clamped to the drive rod between two nuts. When installing a new diaphragm or unit, turn the rear nut back on the drive rod, fasten the diaphragm or unit to cone housing, and turn rear nut forward until it touches apex of diaphragm. Put the front nut on drive rod and tighten securely.



2nd TYPE

SYNCHRONIZING TRIMMER CONDENSERS

(Refer to January, 1935 Supplement for General Data)

MODELS 465Q and 655Q

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the standard I. F. coupling unit described in January, 1935, supplement. Adjust the I. F. oscillator to 264KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. Turn the set to a quiet point near 1000 KC.

Peak trimmers A6, A7, and A8. Remove the I. F. coupling unit and seal the I. F. trimmers.

DIAL POINTER ADJUSTMENT.

With the variable condenser all the way in, the dial pointer should be set at 535 KC.

R. F. TRIMMERS.

Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal. Loosen the trimmer screws.

Short-wave range. Oscillator at 15 MC, and set turned to 15 MC mark, peak trimmer A3.

Police range. There are no trimmer adjustments for this range.

Broadcast range. Oscillator at 1500 KC, and dial pointer at 1500 KC mark, peak trimmers A5, A2 and A1. Tune oscillator and set to 560 KC. Peak A4. Repeat adjustments on A5 at 1500 KC and A4 at 560 KC if necessary.

MODELS 768Q and 978Q

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the standard I. F. coupling unit described in the January, 1935, supplement. Adjust the test oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest oscillator signal that will give a reading on the output meter with the radio volume control on full.

Peak A16. Then peak A15, 14, 13, and 12, using a 40000-ohm balancing unit alternately in the usual manner. Remove the coupling unit and seal the I. F. trimmers.

DIAL POINTER ADJUSTMENT.

This procedure is the same as for Models 447 and 318 as described in the January, 1935, supplement.

R. F. TRIMMERS.

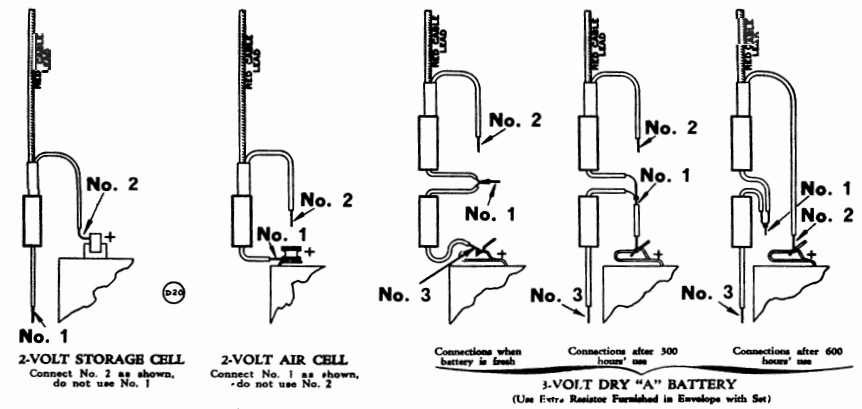
12 to 22.5 MC range. Oscillator at 18 MC, dial pointer at 18 MC, peak trimmers A11, and A5.

4.6 to 12.2 MC range. Oscillator and pointer at 12 MC, peak trimmers A8, and A3.

1.6 to 4.6 MC range. Oscillator and pointer at 4 MC, peak trimmers A10, and A4.

Tune oscillator to 1.7 with pointer at 1.7, peak A9.

Broadcast range. Oscillator at 1500 KC, and pointer at 1500 KC, peak A7, A1, and A2. With oscillator and dial pointer at 560, peak A6.



2-VOLT STORAGE CELL
Connect No. 2 as shown, do not use No. 1

2-VOLT AIR CELL
Connect No. 1 as shown, do not use No. 2

Connections when battery is fresh | Connections after 300 hours' use | Connections after 600 hours' use

3-VOLT DRY "A" BATTERY
(Use Extra Resistor Furnished in Envelope with Set)

MODELS 768Q and 978Q

CONNECTIONS FOR DIFFERENT TYPES OF "A" BATTERIES

PARTS LIST FOR MODEL 768Q, 978Q

28629		Cabinet with screen
27904		Screen
27292		Var. cond. assem.
27922		Range switch assem.
28253		Battery cable and plug (male)
28254		Battery cable and socket
29056		Battery plug assem. (male)
29057		Battery socket assem.
27254		Dial pointer
27869		Dial and frame assembly
27262		Dial frame only
27511		Dial plate
27962		Escutcheon
28896		Front panel assembly
26721		Dial lamp (2-V., 60 mils.)
27965		Vol. control .5 U
28907		Tone control switch assem.
28908		Shaft and blade for the above
38740		Sensitivity switch assem.
27628		Shaft and blade for the above
28946		Knob (tuning and range)
28947		Knob (vol. and tone)
26571		Knob (sensitivity)
27695		Battery cable tag F1155
27951		Inst. sheet F1158
27993		Shipping container

TRANSFORMERS

T1	41080	BC antenna trans.
T2	41090	BC and 4-12 det. trans.
T3	41120	1.6-4.5, 12-22 det. trans.
T4	41110	BC and 4-12 osc. trans.
T5	41130	1.6-4.5, 12-22 osc. trans.
T6	28166	No. 1 I. F. T.
T7	28167	No. 2 I. F. T.
T8	28168	No. 3 I. F. T.
T9	40710	Audio input trans.

RESISTORS

R1	30340	.1 U, red, blue, ⅓ watt
R2	31970	.25 U, red, yellow, ⅓ watt
R3	15545	10,000 Ω, maroon, 1 watt
R4	36430	5000 Ω, blue, yel., ⅓ w.
R5	36430	5000 Ω, blue, yel., ⅓ w.
R6	30380	3300 Ω, green, red, ⅓ w.
R7	30350	.5 U, black, purple, ⅓ w.
R8	30370	2 U, green, ⅓ watt
R9	30360	1 U, blue, gray, ⅓ watt
R10	30340	.1 U, red, blue, ⅓ watt
R11	30340	.1 U, red, blue, ⅓ watt
R12	30390	20,000 Ω, black, red, ⅓ w.
R13	37530	300 Ω, maroon, blue, ¼ watt
R14	37540	425 Ω, blue, yel., green, ¼ w.
R15	39790	500 Ω, blue, red, green, ⅓ watt
R15A	30320	10,000 Ω, maroon, ⅓ watt
R16	30360	1 U, blue, gray, ⅓ watt
R17	30350	.5 U, black, purple, ⅓ watt
R18	31970	.25 U, red, yellow, ⅓ watt
R19	40330	.575 Ω, wire wound
—	40350	1.03 Ω, wire wound (for use with 3-V. "A" battery)

CHOKES

CK1	23530	Filament choke
CK2	27792	2nd det. plate choke

SHIELDS

27932	Shield for T1, 3
27933	Shield for T2
25056	Shield for T6, 7, 8
27335	Shield for T4, 5
22683	Tube shield (30-1C6)
15213	Tube shield (32-34)
25059	I. F. T. shield cover (with hole)
25058	I. F. T. shield cover (without hole)

CONDENSERS

C1	31160	.05 MF, 100-V. (101)
C2	31160	.05 MF, 100-V. (101)
C3	35840	50 MMF, mica, 500-V.
C4	28118	360 MMF, mica, 100-V.
C5	27598	.0037 MF, orange, violet, red
C6	39290	1350 MMF, mica, 100-V.
C7*	27599	.0057 MF, green, violet, red
C8	36510	500 MMF, mica, 500-V.
C9	31160	.05 MF, 100-V. (101)
C10	26820	.05 MF, 200-V. (208)
C10A	26820	.05 MF, 200-V. (208)
C11	36510	500 MMF, mica, 500-V.
C12	36510	500 MMF, mica, 500-V.
C13	35290	125 MMF, mica, 500-V.
C14	35290	125 MMF, mica, 500-V.
C15	26820	.05 MF, 200-V. (208)
C16	26820	.05 MF, 200-V. (208)
C17	27630	.01 MF, 200-V. (203)
C18	31510	.5 MF, 100-V. (105)
C19	32390	.05, .05, .2 MF, 200-V. (222)
C20	27630	.01 MF, 200-V. (203)
C21	33620	250 MMF, 400-V. (401)
C22	38260	.001, .004, .008 MF, 400-V. (416)
C23	29530	.03 MF, 200-V. (206)
C24	22472	8 MF, 200-V. dry electrolytic
C25	31150	.3 MF, 100-V. (104)

*In some sets C7 is .005 MF (No. 25035), blue, black, red. Either the .0057 or the .006 may be used for replacement.

TRIMMERS

A1	38180	Single trimmer on T1.
A2, 3	39430	Double trimmer on T2
A4, 5	39430	Double trimmer on T3
A6	39420	560 KC tracking
A9	39420	1.6 MC tracking
A12, 13	32880	Double trimmer on T6
A14, 15	32880	Double trimmer on T7
A16	40610	Single trimmer on T8.
	39140	Strip of four trimmers

SOCKETS

24492	4 prong	
24494	6 prong	
21336	Speaker	

PARTS FOR TUNING MECHANISM

27469	Dial gear
27276	Pointer arm
27254	Dial pointer
27332	Counter shaft gear (large)
27333	Idler gear (small)
27259	Gear screw
27957	Broadcast pinion gear
28116	Gear frame
27351	Screw (5/32" dia.)
27294	Tuning shaft
28016	Tuning bracket
27293	Detention spring
27298	Shaft spacer
27297	Bracket holding pin

768-Q SPEAKER No. 43100

978-Q SPEAKER No. 43200

28348		Cable and plug assembly
27128		Magnet
27129		Magnet clamping plate
8188		8/32 hex. nut
9898		No. 6 lock washer
23318		No. 2 washer
27138		Clamping block top
27139		Clamping block bottom
27141		Adjusting screw, 6/32
27142		Cover plate
27143		Mounting bracket
27145		Conehead assembly
28976		Coil
27147		Armature
27211		Mount. brackets, pair (978-Q)
27148		Spring
27149		Terminal

MODEL 978-Q

For parts not listed below refer to Model 768-Q.

28897	Front panel assem.
27963	Escutcheon
27832	Base cover
28256	Battery cable and plug (male)
28254	Battery cable and socket (female)

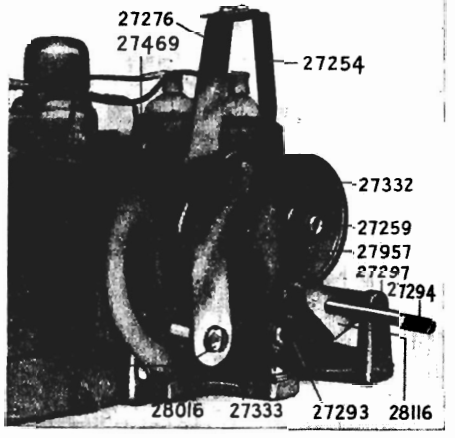


Illustration of parts in dual-speed compensated tuning mechanism in Models 768Q, 978Q, etc.

Ω = ohms. U = megohms.

PARTS LIST FOR MODEL 465Q, 655Q

28832		Cabinet with screen
28518		Baffle board with screen
28531		Esc. and crystal assem.
27431		Var. cond. assembly
27692		Tuning gear
28281		Front and back plate assem.
28594		Tuning shaft assem.
22657		Dial rubber
28356		Dial plate holder
27523		Dial plate
27947		Dial pointer holder
27522		Dial pointer
27535		Dial pointer screw
22683		Tube shield (1C6)
15213		Tube shield (32)
44180		Range switch
27495		Knob (tone control)
27496		Knob (vol. control)
26569		Knob (range)
27498		Knob (tuning, large)
24278		Knob (tuning, small)
28827		Lamp socket
26526		Ferrule and bushing
26524		Spring
26721		Pilot lamp (2-V., 60 mils.)
25056		No. 1 I. F. T. shield
28239		No. 2 I. F. T. shield
27966		Vol. control, .4 U
29003		Battery cable and plug assem. (male)
29004		Battery cable and socket assem. (female)
29055		Battery socket assembly
29054		Battery plug assembly
15739		Battery cable clamp
26688		Battery cable tag F-1116
39620		Tone control switch assem.
28192		Shaft and blade for the above
20093		Mtg. nut for vol. control and tone control
28663		Shipping container
27953		Instruction folder F-1160

TRANSFORMERS

T1	41250	No. 1 R. F. T.
T2	41260	No. 2 R. F. T.
T3	41270	Oscillator trans.
T4	28164	No. 1 I. F. T.
T5	28165	No. 2 I. F. T.
T6	40660	Audio input trans.

WAVE TRAP

41020	Trap assembly (264KC)
28458	Choke only (CK1)
41650	125 MMF, 500-V. condenser (C1)
24327	Shield

RESISTORS

R1	30340	.1 U, ⅓ watt, red, blue
R2*	30320	10,000 Ω, ⅓ watt, maroon
R3	30330	50,000 Ω, ⅓ watt, black, yellow, red
R4	36430	5000 Ω, ⅓ watt, blue, yellow
R5	36430	5000 Ω, ⅓ watt, blue, yellow
R6	30370	2 U, ⅓ watt, green
R7	31970	.25 U, ⅓ watt, red, yellow
R8	30320	10,000 Ω, ⅓ watt, maroon
R9	30340	.1 U, ⅓ watt, red, blue
R10	30360	1 U, ⅓ watt, blue, gray
R11	30320	10,000 Ω, ⅓ watt, maroon
R12	40330	.575 Ω, wire wound
—	40340	1.03 Ω, wire wound (for use with 3-V. "A" battery)

*If set fails to operate over entire dial, with partially used "B" batteries, change R2 to 5000 ohms (No. 36430, blue and yellow).

CONDENSERS

C1	41650	125 MMF, mica
C2	32810	.01 MF, 400-V. (409)
C3	28341	8 MMF, 500-V., mica
C4	25035	.006 MF, blue, black, red, mica
C5	31530	.1 MF, 100-V. (102)
C6	31530	.1 MF, 100-V. (102)
C7	39660	730 MMF, 100-V., mica
C8	35840	50 MMF, 500-V, mica
C9	36510	500 MMF, 500-V., mica
C10	31160	.05 MF, 100-V. (101)
C11	31920	.05, .05, and .5, 100-V (110)
C12	36510	500 MMF, 500-V., mica
C13	33670	250 MMF, 500-V., mica
C14	33630	250 and 250 MMF, 400-V. (413)
C15	27630	.01 MF, 200-V (203)
C16	29890	.005 MF, 400-V. (408)
C17	36650	.0015 MF, 400-V. (404)
C18	29890	.005 MF, 400-V. (408)
C19	22472	8 MF, 200-V., electrolytic

TRIMMERS

A4	39630	Rear of chassis
A5	38890	Front of chassis
A6, 7	32880	On T4 (double)
A8	40610	On T5 (single)

CHOKES

CK1	28458	264KC trap choke
CK2	36630	Filament choke

SOCKETS

21336	4 prong (speaker)	
24492	4 prong	
24494	6 prong	

465-Q SPEAKER No. 42900 (1st type)

655-Q SPEAKER No. 45900 (1st type)

28348		Cable and plug assembly
27128		Magnet
27129		Magnet clamping plate
8188		8/32 hex. nut
9898		No. 6 lock washer
23318		No. 2 washer
27138		Clamping block top
27139		Clamping block bottom
27141		Adjusting screw, 6/32
27142		Cover plate
27143		Mounting bracket
27144		Sound unit assembly, less magnets
27145		Conehead assembly
27146		Coil
27147		Armature
27211		Mount. brackets, pair (655-Q)
27148		Spring
27149		Terminal

465-Q SPEAKER No. 46700 (2d type)

655-Q SPEAKER No. 46800 (2d type)

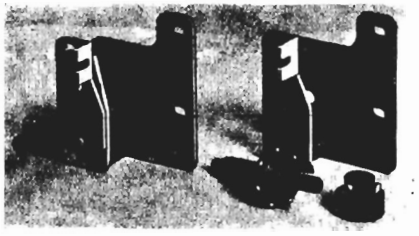
28974		Cone housing (465-Q)
28979		Cone housing (655-Q)
19469		Segment
29074		Cable and plug assembly
29075		Diaphragm assembly
29076*		Sound unit complete
29077		Drive rod
17868		Drive rod nut

*Parts for this unit are not sold separately.

MODEL 655-Q

For parts not listed below refer to Model 465-Q.

27985	Base plate
28661	Shipping container
29011	Cable and plug assem. (male)
29012	Cable and socket assem. (female)



EARLY TYPE LATE TYPE

Ω = ohms. U = megohms.

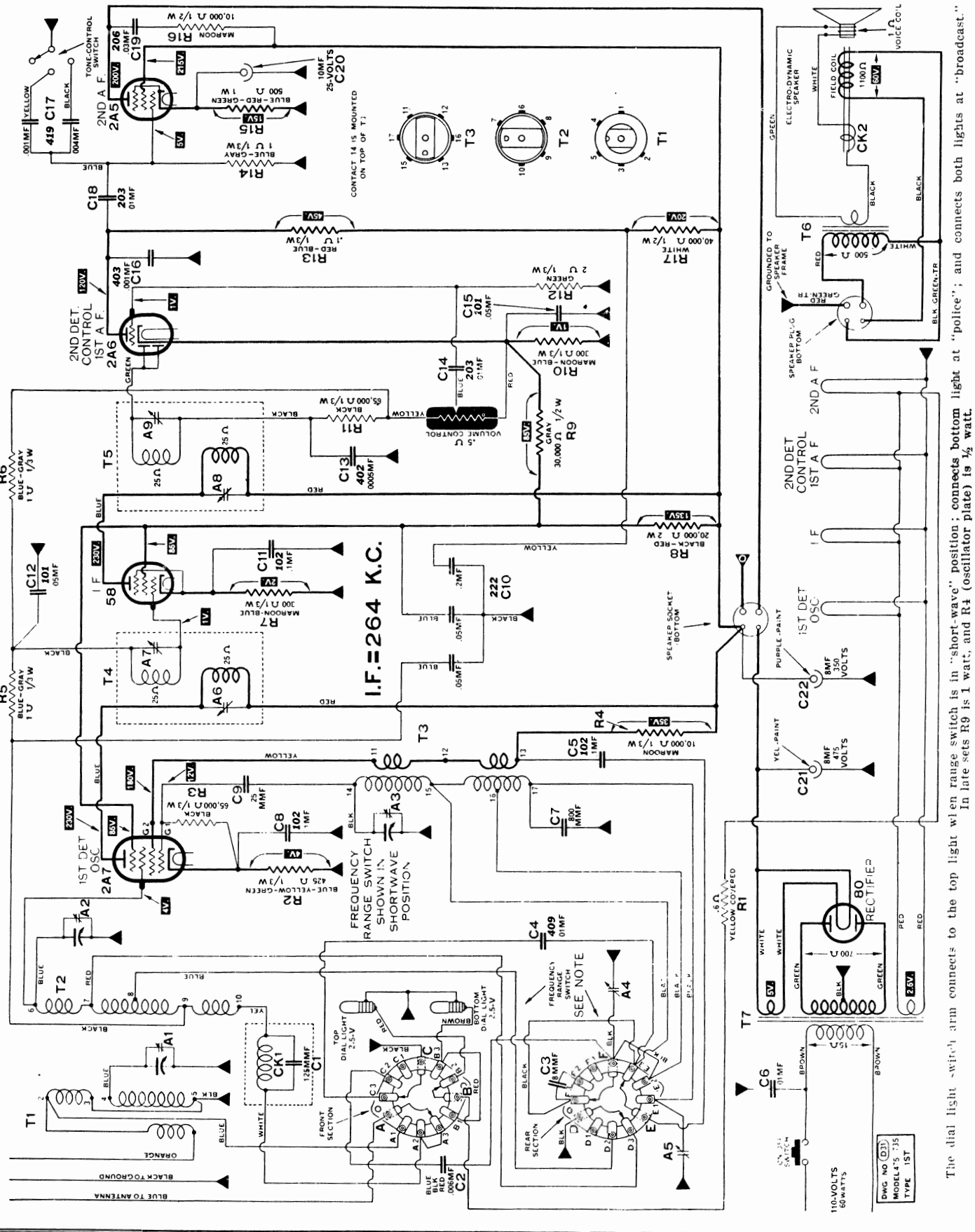
*Illustration of Early and Late Type Vernier Drive Arrangements used in Models 465Q, 655Q, etc.

The early type is superseded by the late type and parts for the early type are NOT furnished. When any part of the early type drive requires replacement, it is necessary to install the complete new type assembly, which consists of two parts: No. 28281, front-and-back-plate assembly; and No. 28594, tuning shaft assembly.

The dial rubber and bushing, No. 22657, is the same in both types.

ATWATER KENT MFG. CO.

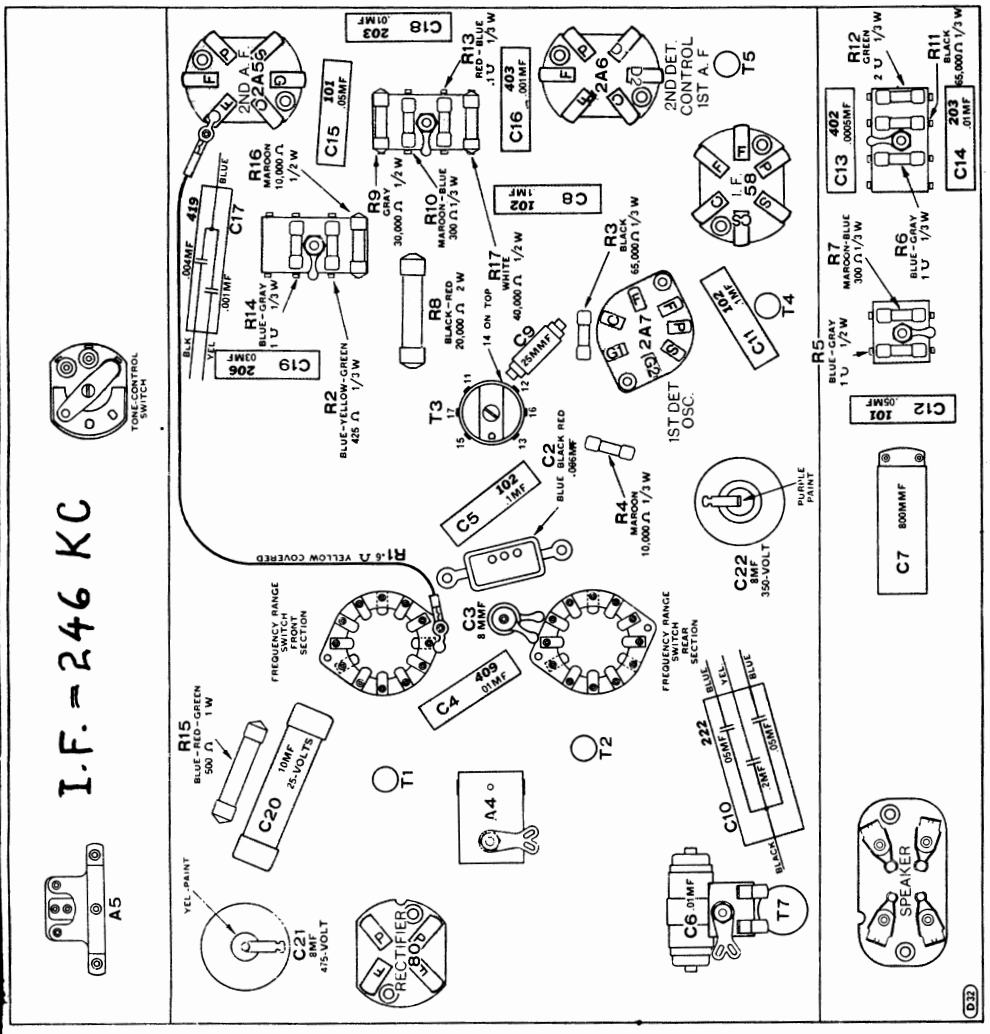
MODELS 475 AND 735



The dial light switch arm connects to the top light when range switch is in "short-wave" position; connects bottom light at "police"; and connects both lights at "broadcast."
In late sets R9 is 1 watt, and R4 (oscillator plate) is ½ watt.

ATWATER KENT MFG. CO.

MODELS 475 AND 735



29403	Cabinet with screen (735)	
29143	Screen (735)	
28531	Escutcheon and crystal assem.	
27431	Variable condenser	
42750	Tone control switch assem.	
29101	Shaft and blade for the above	
28961	Volume control, .5 U	
28986	Range switch	
28946	Knob without dot	
28947	Knob with dot	
28968	Dial holder	
29121	Dial plate (735)	
28989	Dial plate (475)	
29183	I. F. T. shield	
41020	Wave trap assem. (264 KC)	
40090	Dial light socket assem.	
27676	Dial lamp, 2.5-V. (frosted)	
22683	Tube shield	
28993	Base cover (475)	
29133	Instruction sheet, F-1217	
29184	Shipping container (735)	
29038	Shipping container (475)	

TRANSFORMERS

T1	43060	No. 1 R. F. T.
T2	43070	No. 2 R. F. T.
T3	43080	Osc. trans.
T4	43290	No. 1 I. F. T.
T5	43310	No. 2 I. F. T.
T6	21672	Output trans. (on speaker)
T7	25191	Power trans.

RESISTORS

R1	16081	.6 Ω dial light

CONDENSERS

C1	41650	125 MMF, 500-V.
C2	25035	.006 MF, 450-V.
C3	25661	8 MMF, 500-V.
C7	42830	800 MMF, 100-V.
C9	33930	25 MMF, 500-V.
C20	25379	10 MF, 25-V.
C21	28031	8 MF, 475-V.
C22	27585	8 MF, 350-V.

TRIMMERS

A4	28843	Osc. trimmer
A5	39630	On front of chassis
A6, 7	29119	On T4
A8, 9	29119	On T5

CHOKES

CK2	25525	On speaker

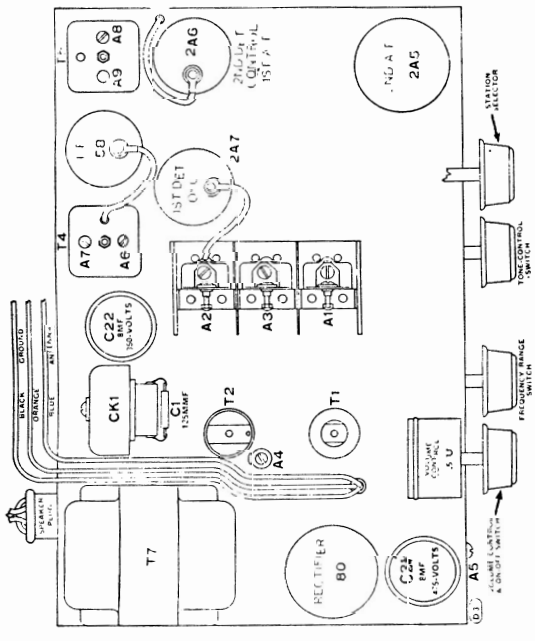
SOCKETS

24492	4 prong
24494	6 prong
26111	7 prong
21336	Speaker

PARTS FOR TUNING MECHANISM

(Used in all sets in this supplement)

28944	Condenser mounting bracket (rear)
28934	Tuning gear bracket
28995	Gear stop stud
28956	Tuning gear
27947	Dial pointer holder
27696	Screw for the above
28531	Escutcheon and crystal assem.
27522	Dial pointer
27535	Dial pointer screw
28116	Gear frame
27332	Large gear (rubber tired)
27333	Small gear (rubber tired)
28959	Tuning shaft
27957	Broadcast pinion gear
27297	Pin
27293	Detention spring



I. F. TRIMMERS.

Connect I. F. test oscillator (264 KC) to I. F. tube by means of regular I. F. coupling unit. Peak A9, A8. Connect I. F. oscillator to 1st-detector tube and peak A7, A6.

DIAL POINTER ADJUSTMENT.

With rotor of variable condenser fully meshed, dial indicator should be at 535 KC.

R. F. TRIMMERS.

Connect an R. F. oscillator to antenna and ground of set.

Short-wave range. With oscillator and dial at 15 MC, peak A3. Use the first point on the trimmer, as it is screwed in from a loose or minimum-capacity position.

Police range. No trimmers on this range.

Broadcast range. With oscillator and dial at 1500 KC, peak A4, A2 and A1. With oscillator and dial at 560 KC, peak A5.

TRIMMERS

A1—1st-detector, 1500 KC.
A2—1st-detector, 1500 KC.
A3—Oscillator, 15 MC.
A4—Oscillator, 1500 KC.
A5—Oscillator, 560 KC.
A6—1st-detector plate, 264 KC.
A7—I. F. grid, 264 KC.
A8—I. F. plate, 264 KC.
A9—2nd-detector. 264 KC.

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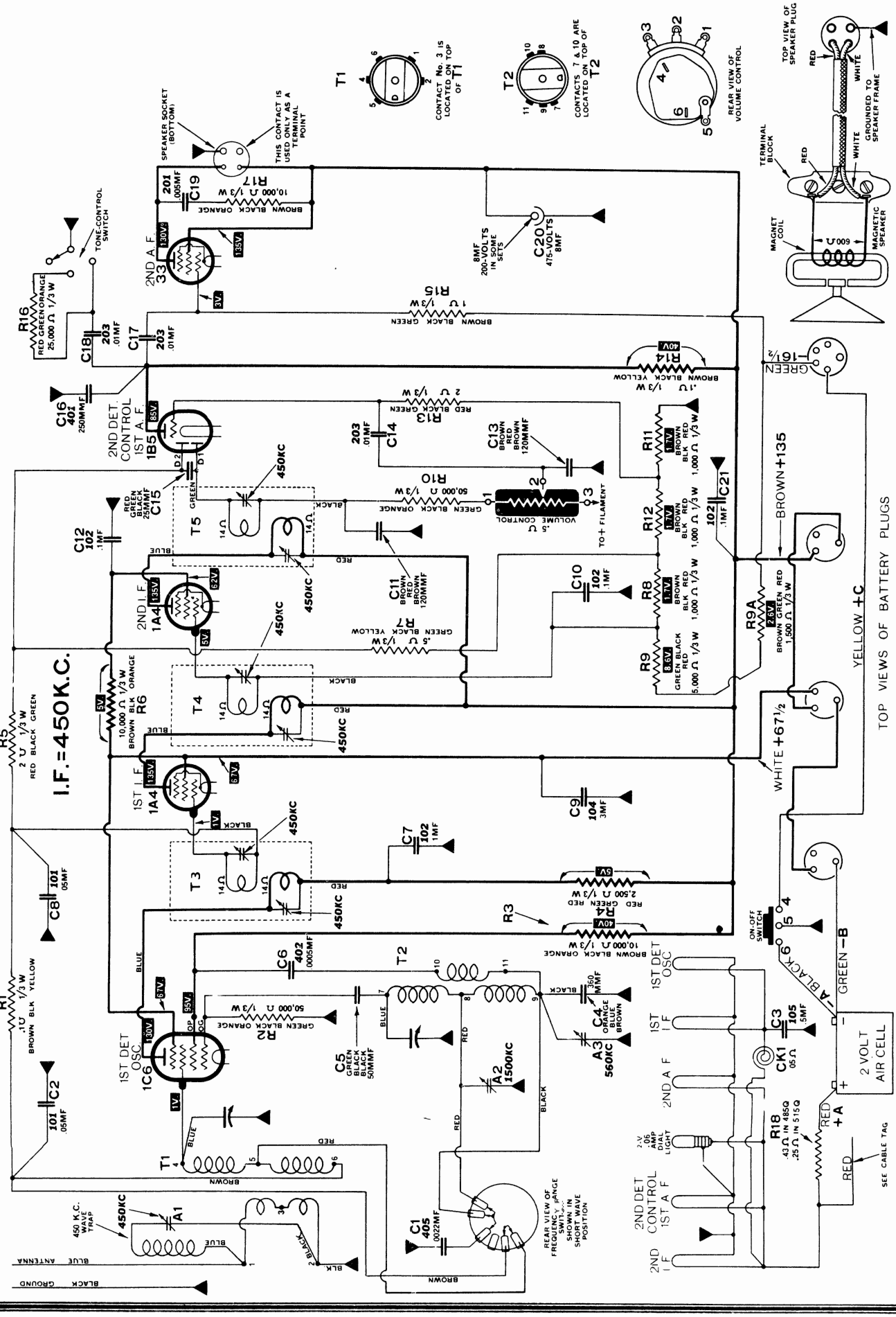
MODELS 485Q AND 515Q



The I. F. is 472½ KC in some of these sets as specified on label at rear of chassis. The I. F. transformers, trimmers, etc., are exactly the same for 450 or 472½ KC "B" voltage was 135 V. for above measurements.

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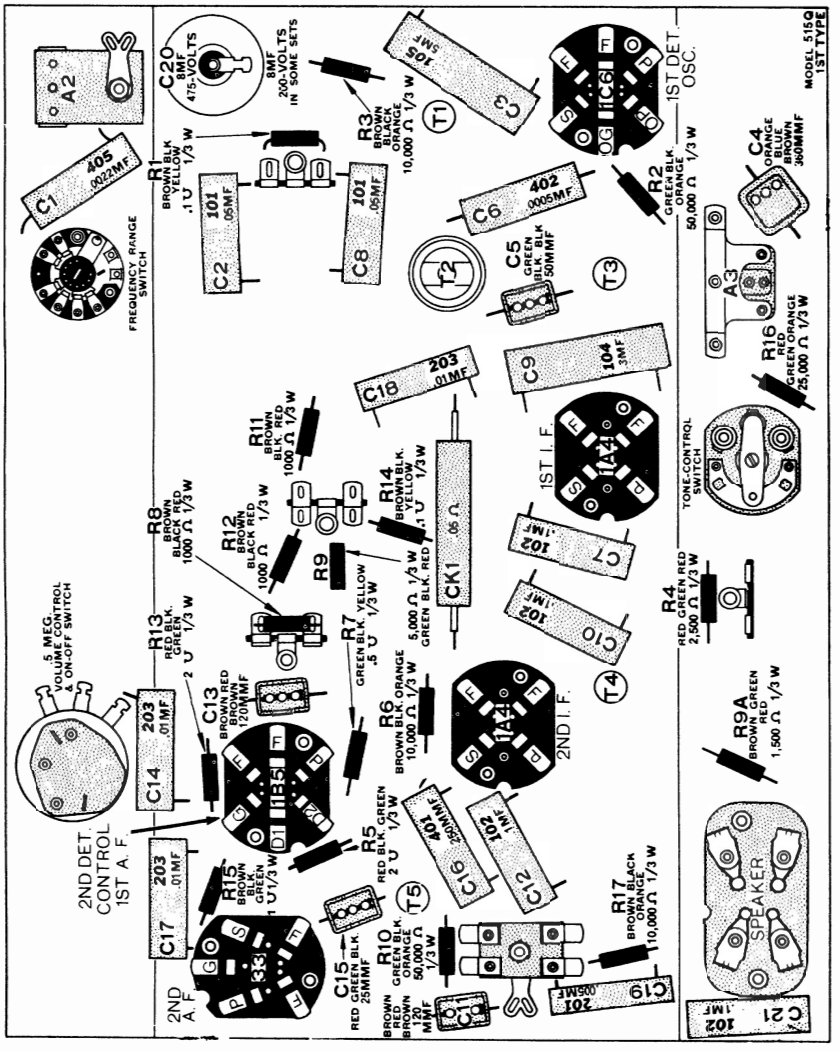
MODELS 485Q, 515Q



I. F. TRIMMERS

Connect signal generator (450 KC) to 2nd-I. F. grid cap by means of No. 42590 coupling unit. Peak two trimmers on top of T5 (3rd I. F. transformer).

Connect signal generator to cap of 1st-I. F. tube and peak two trimmers on top of T4 (2nd I. F. transformer).

Connect signal generator to cap of 1st-detector tube and peak two trimmers on top of T3 (1st I. F. transformer).

DIAL POINTER ADJUSTMENT

With the variable condenser fully meshed, the arrow-indicator disc should be set at 540 KC.

R. F. TRIMMERS

In location where severe electrical interference is present, it is necessary, when aligning R. F. trimmers, to connect a 40,000-ohm resistor in series with a .02 M. F. condenser from the grid cap of the 1st-I. F. tube to chassis. This reduces the I. F. sensitivity and permits use of a stronger output from the signal generator to over-ride the local noise level without bringing the AVC into action.

Short-wave Range

No trimmers on this range.

Broadcast Range

Connect signal generator to antenna and ground of set, using a 250 MMF condenser in series with the antenna lead. With signal generator and dial at 1500 KC, peak the broadcast oscillator trimmer A2. Use the first peak as A2 is screwed in from a loose position. Tune generator to 560 KC and peak broadcast tracking trimmer A3 while rocking variable condenser one division around the 560 KC mark. Repeat adjustments at 1500 and at 560 KC if necessary.

I. F. Trap

Feed 450 KC signal into antenna and ground of set, using a .00025 MFD condenser in series with the antenna lead. Adjust A1 trap trimmer for minimum response.

I. F. is 472½ KC in Some of These Models

In some Models 485Q and 515Q sets, the I. F. is 472½ KC as indicated by label on rear of chassis. With these models, all adjustments mentioned above for 450 KC should be made at 472½ KC.

PARTS LIST

30084		Cabinet with screen (515Q)
31622		Gasket and screen assem. (515Q)
29759		Escutcheon and crystal
31768		Var. condenser
29531		Vol. control, .5 U
45370		Tone control switch
31851		Range switch
31865		Battery cable (515Q)
31866		Battery cable (485Q)
31401		Tube shield (halves) (1A4)
31402		Tube shield cap
31993		Centering plate (485Q)
31994		Screw for the above
29619		I. F. T. shield
31857		Battery cable tag, F-1326
22683		Tube shield (1C6)
31859		"C" battery plug, 5-prong
31858		"B" battery plug, 3-prong
31853		Inst. sheet, F-1322
49470		Shipping container (515Q)
49460		Shipping container (485Q)

TUNING PARTS

29417	Shaft
30042	Plate assembly
17961	Dial rubber
27692	Tuning gear
31927	Indicator disc with bushing
31875	Dial and holder assem.
31818	Dial holder
31871	Dial spacer (red rubber, 4 used)
31839	Dial gasket
31814	Dial only
31819	Light shield ring
31864	Reflector only
31822	Snap eyelets
49520	Pilot light socket assem.
26721	Pilot lamp, 2-V., 60 mils.

KNOBS

28946	Knob (without dot)
28947	Knob (with dot)
32036	Knob (yel., red, dot)
28063	Knob spring

TRANSFORMERS

T1	49530	No. 1 R. F. transformer
T2	49570	Oscillator transformer
T3	49540	No. 1 I. F. transformer
T4	49550	No. 2 I. F. transformer
T5	48630	No. 3 I. F. transformer
	49330	Wave trap assem.

RESISTORS

R17	47120	.25 Ω (515Q)
R17	47210	.43 Ω (485Q)
	40340	1.03 Ω, wire wound, for use with a 3-V. "A" battery

CONDENSERS

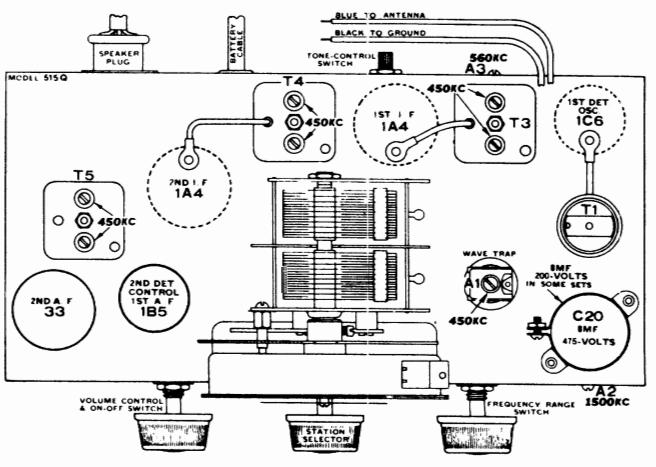
C4	29589	360 MMF
C5	29603	50 MMF
C11, 13	29687	120 MMF
C15	29606	25 MMF
C20	29529	8 MF, 200-V. (C20 is 8 MF, 475-V., No. 28031 in some sets.)

CHOKES

CK1	36630	48-turn choke

TRIMMERS

A1	31845	On wave trap
A2	28843	Front of chassis
A3	39630	Rear of chassis
	29823	On T3, T4, T5



A1—Trap trimmer, 450 KC.
A2—Broadcast oscillator, 1500 KC.
A3—Broadcast tracking, 560 KC.
There are six I. F. trimmers, two on top of each I. F. transformer (T3, 4 and 5). These are peaked at 450 KC.

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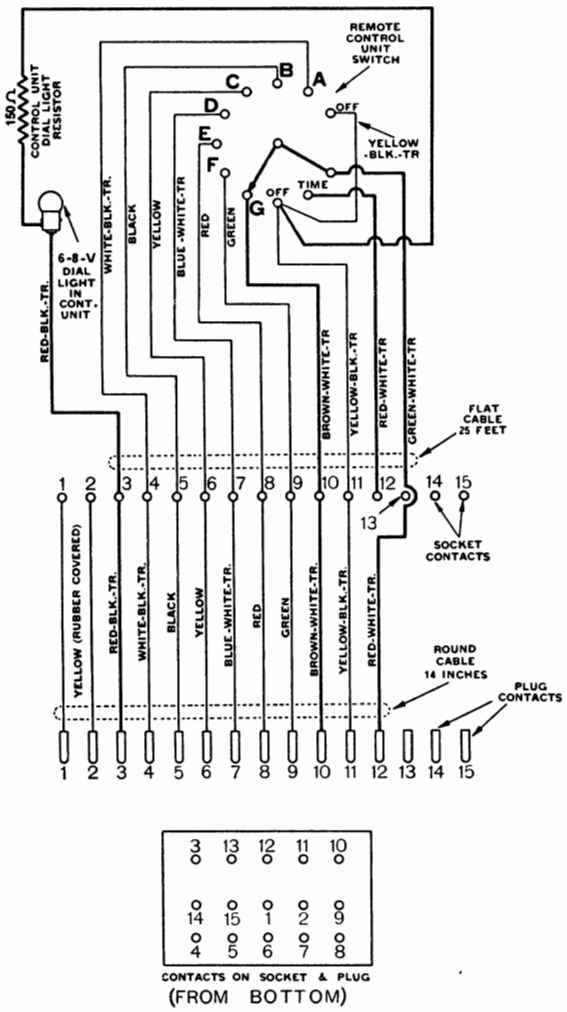
CIRCUIT OF AUTOMATIC TUNING MECHANISM, CLOCK ASSEMBLY, AND REMOTE CONTROL UNIT.

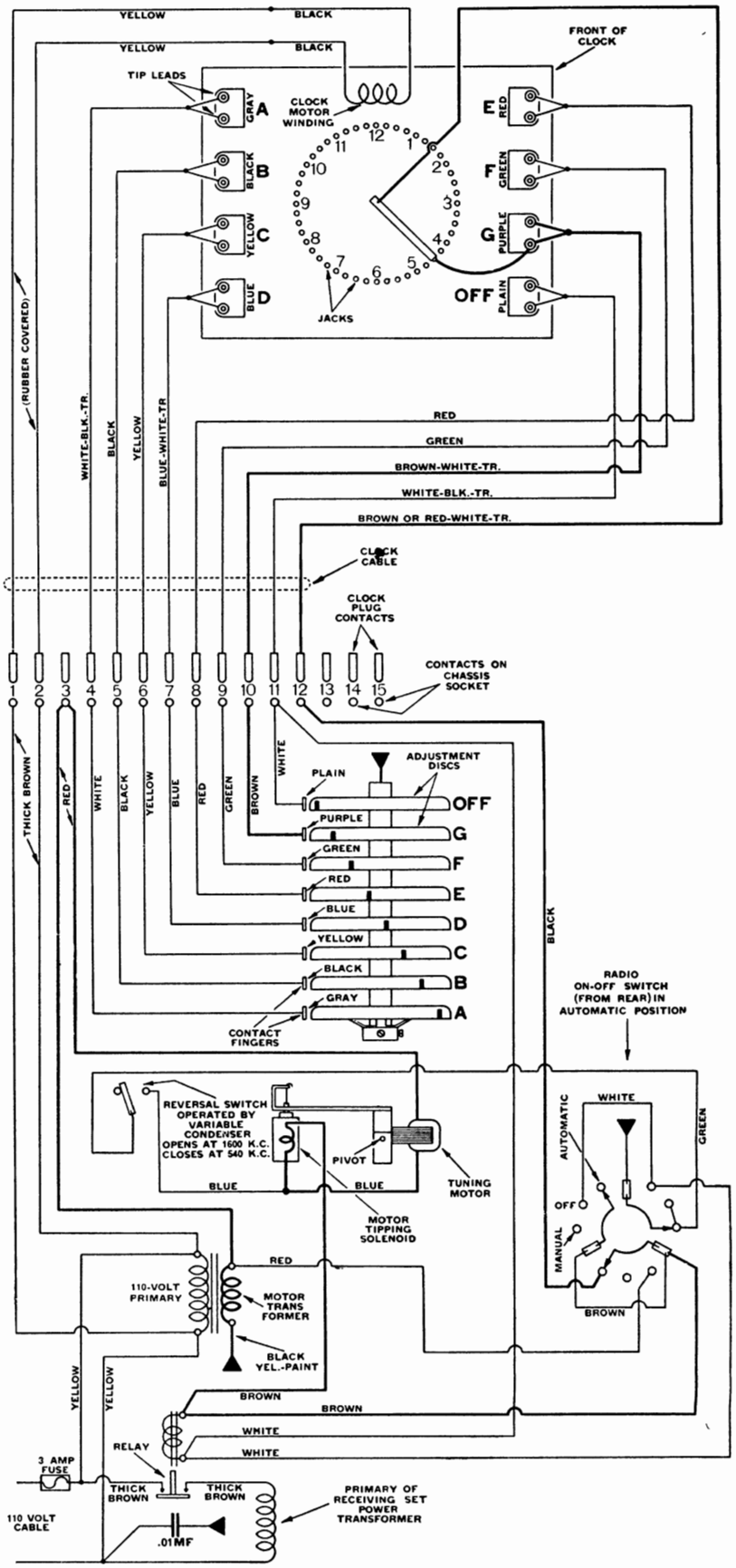
MODEL 511
Tune•O•Matic



CONTACTS ON SOCKET & PLUG
(FROM BOTTOM)

When using Model 511 without remote control, the cable from the clock assembly is plugged into the chassis socket.

The remote control is added to Model 511 by removing the clock assembly plug from the chassis socket and inserting it in the socket which is attached to the remote control. The plug of the remote control is inserted in the socket on the chassis.



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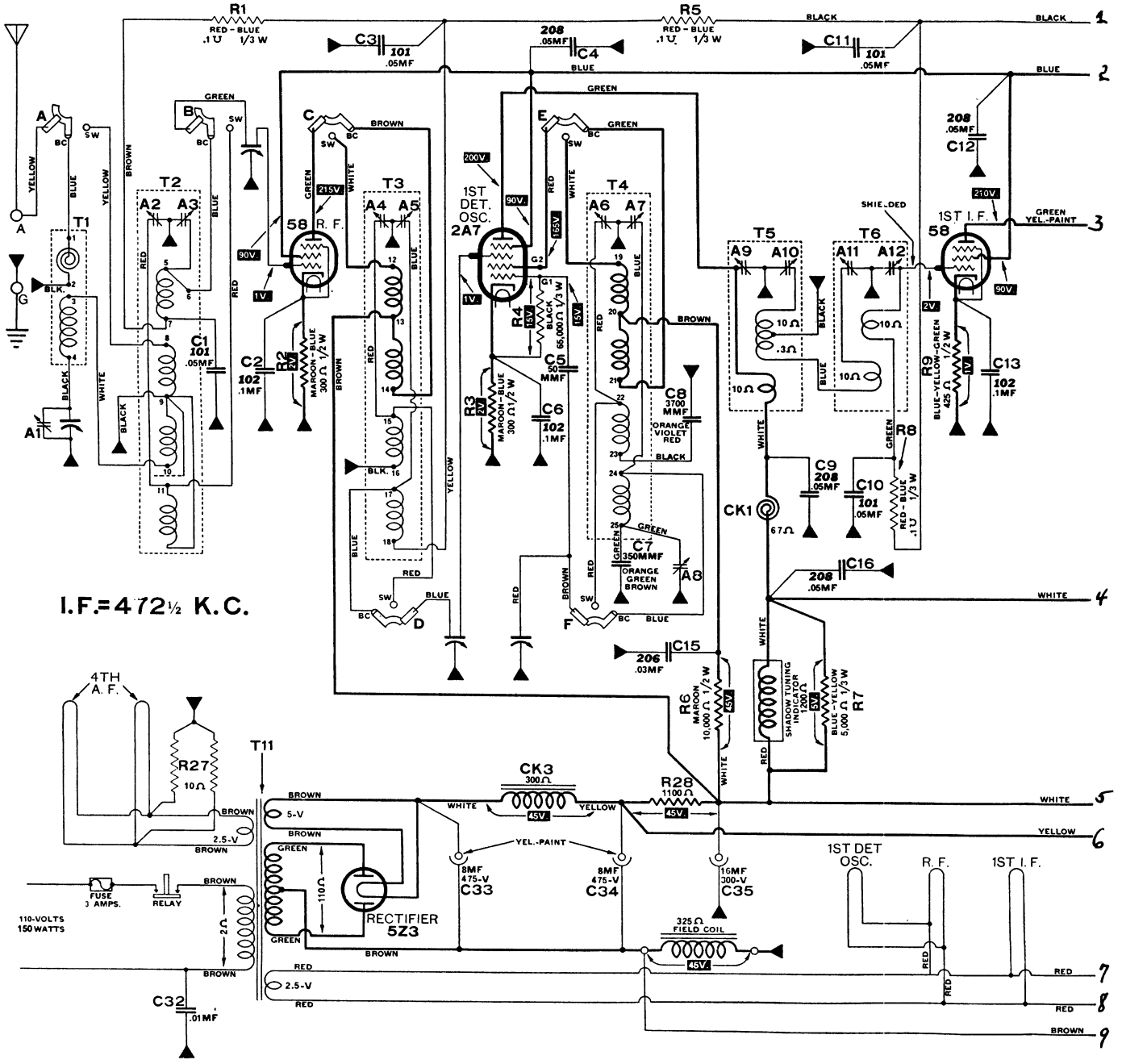
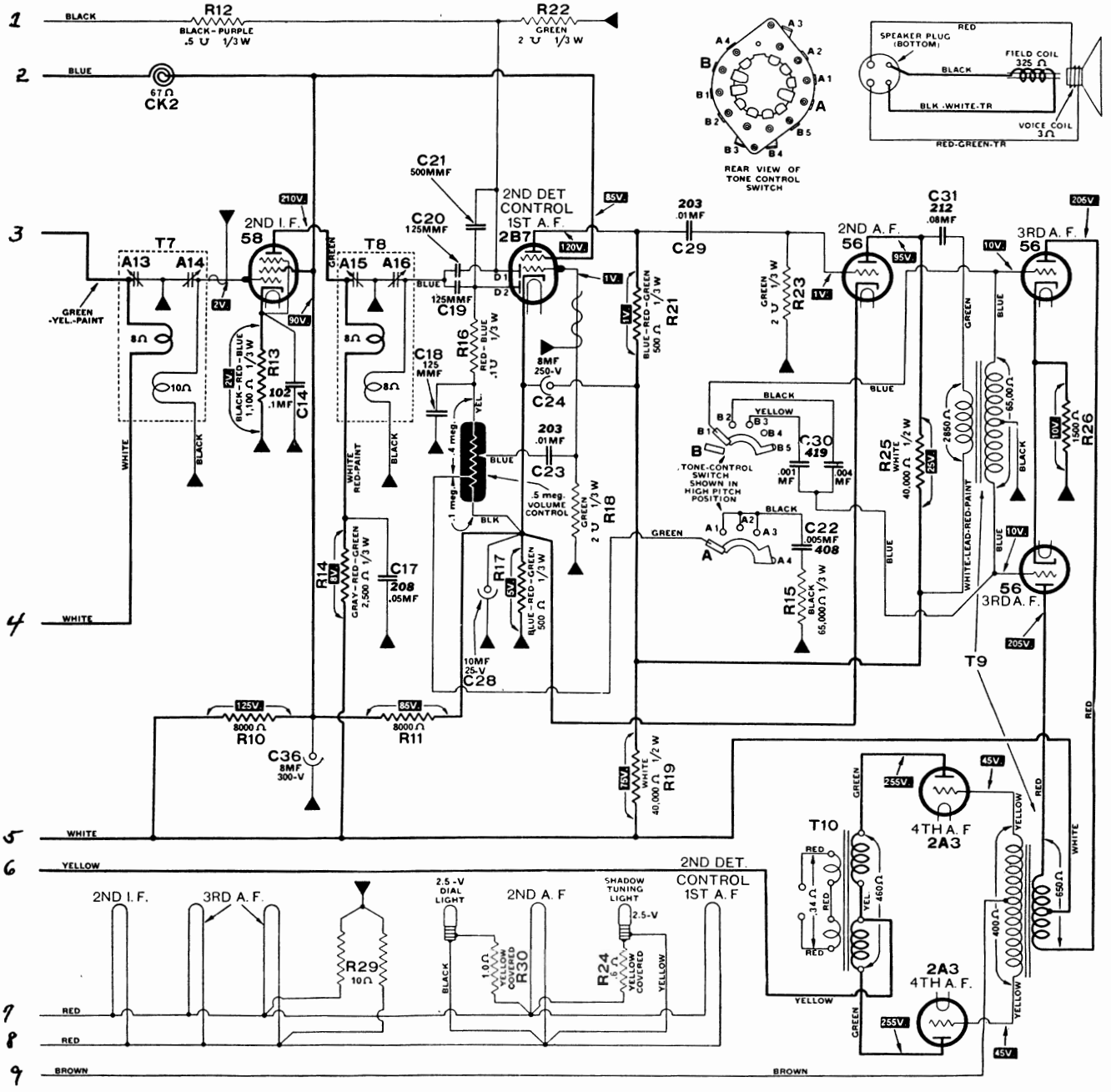
MODEL 511 Tune ♦ O ♦ Matic



Model 511 has two frequency ranges: the broadcast range (BC) covers 540 to 1600 kilocycles, and the short-wave range (SW) covers 5500 to 15500 kilocycles.

ATWATER KENT MFG. CO.

MODEL 511 Tune ♦ O ♦ Matic



Only the late type audio circuit is shown above. In early sets, the plate circuit of the 2B7 is similar to that used in Model 112.

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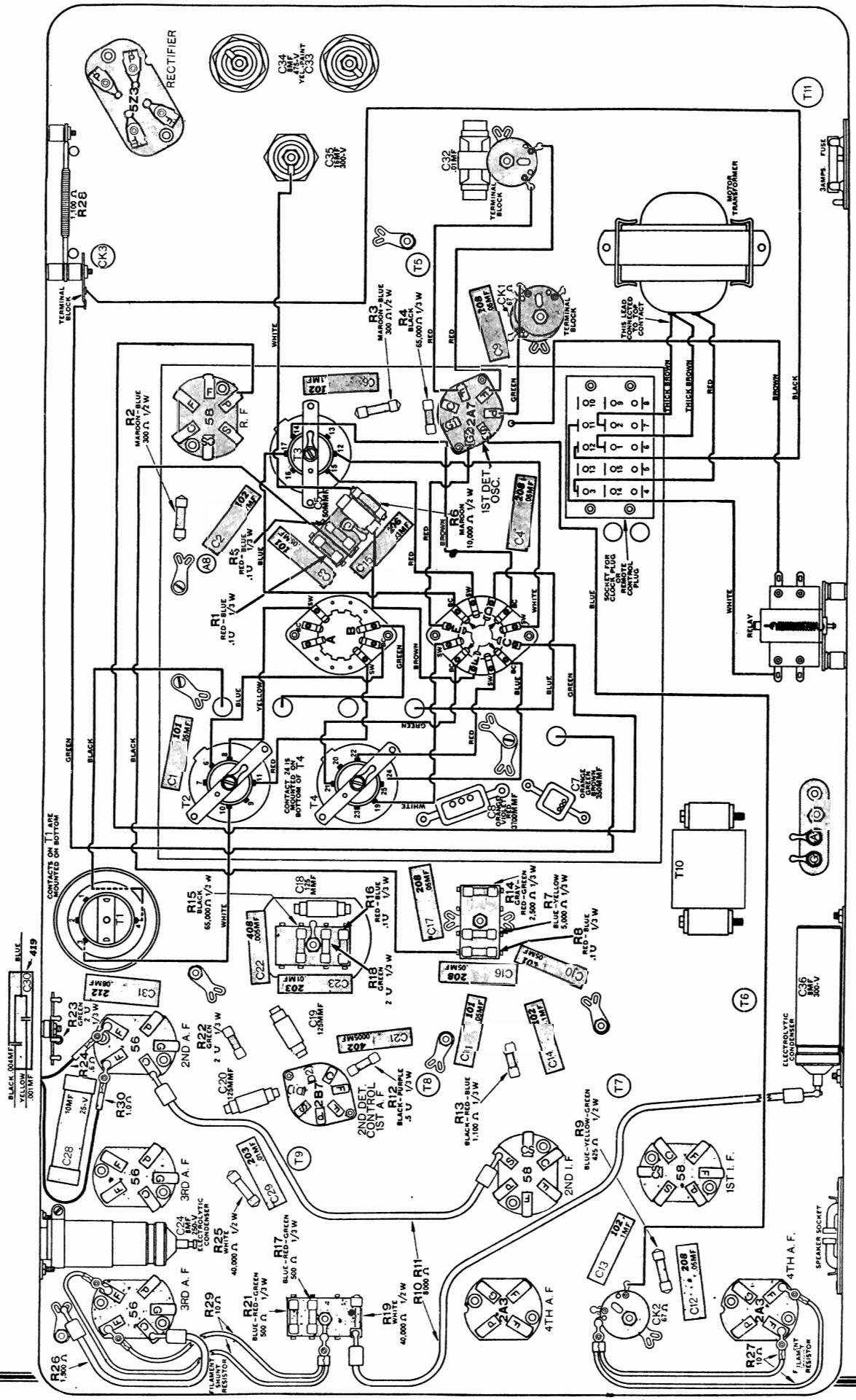
BOTTOM VIEW MODEL 511 (Late Type)



This illustration shows the connections from the top base to the main chassis assembly.

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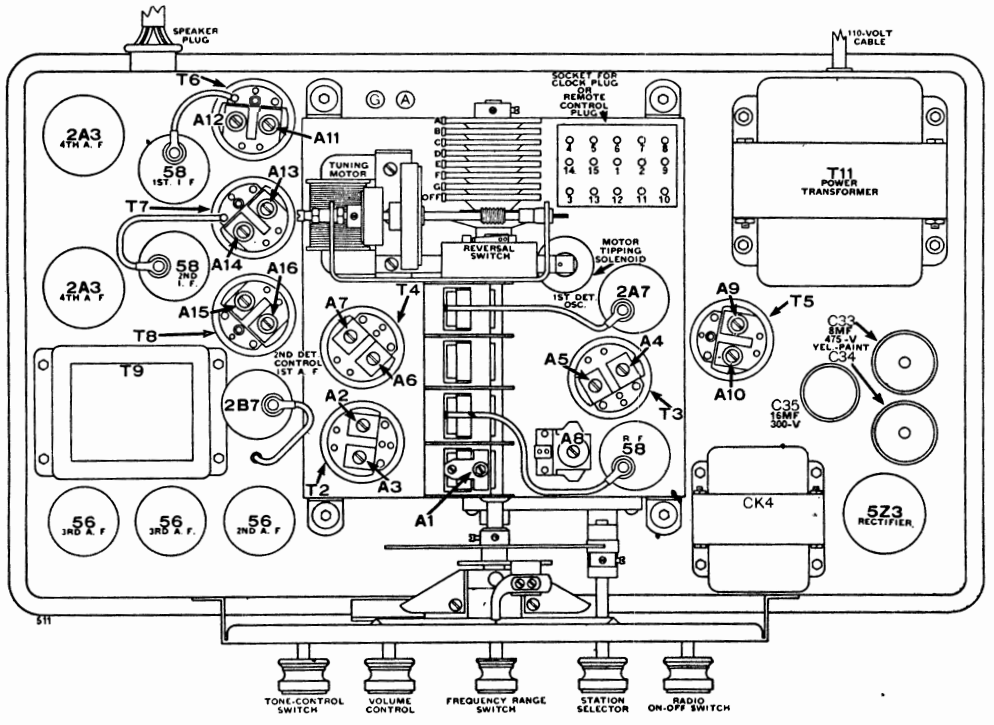
MODEL 511 Tune ♦ O ♦ Matic

ADJUSTING TRIMMER CONDENSERS



TOP VIEW MODEL 511

	5.4 to 15.5 M.C.	540 to 1600 K.C.
R. F.	A2	A1 & A3
1st-Detector ...	A4	A5
Oscillator	A6	A7
Tracking	None	A8

I. F. Trimmers are A9 to A16 inclusive

DIAL POINTER ADJUSTMENT

If the dial gear and indicator have not been tampered with, leave them alone; but if they have been changed in any way, reset as follows:

1. Loosen the two set screws which hold pointer gear on condenser shaft.
2. Turn condenser to minimum.
3. See illustration at bottom of page 13. Place straight-edge gauge in vertical position with the long flat face against the front mounting plate of the variable condenser as shown. Turn the condenser until the front edge of the rotor spacing bar just touches the straight edge. Hold the condenser in this position and move the pointer arm so the pointer is at 1575 KC, after which tighten the set screws to hold the dial gear securely.
4. Loosen the screws which hold the pointer to the pointer arm, and adjust the pointer so that when the condenser is completely meshed, the pointer is at 530 KC.

Recheck at 1575 KC and repeat proceedure 3 and 4 if necessary.

EQUIPMENT

1. OSCILLATOR. The oscillator should extend from the lowest I. F. frequency (125 KC in Atwater Kent sets) to at least 18 MC. The oscillator should have a good attenuator and should be well shielded. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers on some models, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025MFD fixed condenser in series with the oscillator pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume. This is necessary to minimize the effect of the automatic-volume-control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. BALANCING UNIT. Build or purchase from your distributor two of the Type "A" balancing units and one of the I. F. coupling units shown on right. These are required for correct adjustment of Atwater Kent super-heterodynes. The coupling unit is placed on the grid cap of the 1st-detector tube, and the lead that normally connects to the grid cap is attached to the end of the maroon resistor as shown.

4. Use a non-metallic screw driver for adjustment of the trimmers.

I. F. TRIMMERS

Connect an IF test oscillator to the 1st-detector tube by means of the IF coupling unit shown in FIG. 1. Adjust the IF oscillator to 472½ K.C. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control full on. Put tone control in 2nd position from right.

Put unit A on A15 and peak A16.
Put unit A on A16 and peak A15.
Put unit A on A13 and peak A14.
Put unit A on A14 and peak A13.
Put one unit A on A11 and one on A 9. Peak A12 and A10.
Put one unit A on A12 and one on A10. Peak A11 and A 9.

In case of instability while adjusting A15 and A16, place an extra balancing unit A across A12.

Remove the I. F. coupling unit and the balancing units and seal the trimmers.

R. F. TRIMMERS

Connect an RF oscillator to the antenna and ground terminals of the set. Use the weakest possible oscillator signal to give a reading on the output meter. Loosen the trimmer screws for the range or ranges that are to be re-adjusted.

5.4 to 15.5 MC range. Tune test oscillator to 15 MC. Turn oscillator trimmer A6 "in", stopping at the peak of position where the signal is first heard as the trimmer is turned in. Then tune the set to 14.06 MC and note whether the oscillator signal is present at this frequency and considerably weaker than at 15 MC. If so, the oscillator trimmer adjustment is correct and the R.F. trimmers A2 and A4 should be peaked at 15 MC.

Broadcast range. Tune test oscillator and set to 1500 KC. Turn trimmer A7 "in" until oscillator signal is heard and peaked. Peak R.F. trimmers A1, A3, and A5. Tune test oscillator and set to 560KC. Peak A8. Go back and forth between A7 at 1500 and A8 at 560 until both of these frequencies come in at the correct points on the dial.

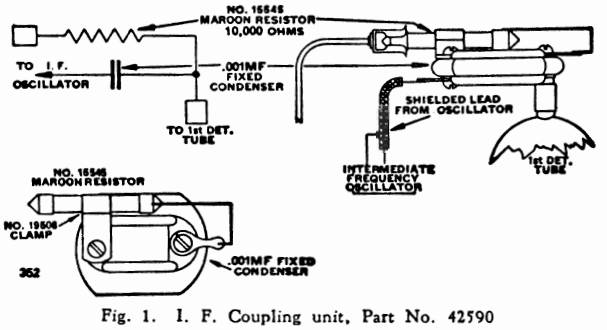


Fig. 1. I. F. Coupling unit, Part No. 42590

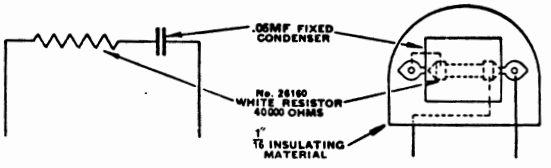


Fig. 2. Balancing unit "A," Part No. 42610

MODEL 511 Tune•O•Matic

SERVICING THE Tune•O•Matic MECHANISM

In addition to the simplicity of design and operation of the TUNE-O-MATIC, the rugged construction and positive adjustments are such that, under normal conditions of operation, it WILL NOT be necessary for the Service Man to make ANY mechanical adjustments on this mechanism, other than that of setting the station selector discs.

However should the initial adjustments of any part of the mechanism become changed at any time, it will cause the mechanism to function unsatisfactorily and corrective adjustments will be necessary. Several of the probable sources of trouble in this respect have been tabulated below, with a brief statement of the adjustments required. For additional details in regard to the latter, reference should be made to the respective sections under ADJUSTMENTS.

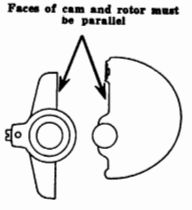
TROUBLE OBSERVED	ADJUSTMENT REQUIRED
1. Reversal switch control cam does not operate reversing switch.	1. Loosen reversal switch mounting screws and move bakelite switch base to the right or left as required. (See Adjustments—Sec. A.)
2. Motor does not drive mechanism through complete operating cycle.	2. Check bearing adjustments. Check large and small pulley adjustments. Check for continuous contact between selector disc and contact finger in question.
3. Mechanism runs continuously.	3. Reversal switch does not trip or does not make contact after it does trip. (See also, instructions—clock assembly adjustments.)
4. Difficulty in manual tuning.	4. Loosen setscrew of reversal switch control cam on condenser shaft and relieve pressure of clutch-spring on clutch-disc gear sufficiently to allow tuning knob to turn easily during manual operation, but not enough to cause it to slip during automatic operation.

MECHANICAL NOISE DURING OPERATION OF MECHANISM

CAUSED BY	REMEDY
1. Dry worm and gear.	1. Use graphite sparingly.
2. "Squeak" in motor bearings.	2. ONE DROP of 3 in 1 oil.
3. Improper mesh of worm and gear.	3. See that gear is centered in worm, and meshes about half the depth of the teeth.
4. Worm shaft loose in bearings.	4. See Adjustments Sec. B.
5. Solenoid plunger hangar wire does not hold plunger snugly.	5. Pinch ends of hangar wire with pliers.
6. Solenoid plunger and mounting arm vibrate.	6. Set spacing between plunger and top of solenoid to ½" by adjustment of large pulley.
7. Felt washer omitted between top of plunger and plunger mounting arm.	7. Replace with Part No. 27767.
8. Pointer control gear teeth in contact with metal of pointer control pinion instead of bakelite section.	8. Adjust pointer control gear on condenser shaft.
9. Noise from selector disc dust cover.	9. Tighten mounting screws and make sure that cover does not contact clutch-disc gear.

ADJUSTMENTS

SEC. A. Failure of reversal switch control cam to operate reversal switch in either maximum positions may be corrected by adjusting solenoid switch position as previously mentioned. If further adjustment is necessary it should be made as follows: Checking the reversal switch by manual operation of the large pointer control gear—in position of minimum capacity of the gang condenser, the pointer control gear is adjusted on the condenser shaft so that the stop arm attached to the gear makes contact with the pointer control pinion gear. Take notice, however, that the reverse switch is tripped to the OFF position by reversal switch control cam, when the stop is within approximately ⅛" of the pointer control pinion gear. In the position of maximum capacity of the gang condenser, it may be necessary to move the reversal switch control cam slightly in a clockwise direction (when facing the rear of the mechanism) on the condenser shaft, in order that the reversal switch will be tripped to the ON position when the gang condenser is within 1/16" of complete mesh. It should be noted that when the proper adjustment has been made, the contact faces of the reversal switch cam are parallel to the flat edge of the condenser rotors.



SEC. B. Improper adjustment of large and small pulleys. The large pulley is adjusted first, so that when it makes contact with the lower portion of the motor driving-nib, the space between the solenoid plunger and the top of the solenoid is approximately one-half inch. The small pulley is then adjusted so that there is about 1/32" space between large pulley and motor driving-nib when the driving-nib is in contact with the small pulley. This adjustment should place the small pulley in a position of positive contact with the motor driving-nib when the solenoid is not energized. If it does not, the mechanism will fail to return from the position of maximum mesh of the gang condenser.

Improper adjustment of worm shaft bearings will cause heating and partial or complete "freezing" of the shaft and bearing. To adjust the worm gear drive shaft bearings, the bearing adjusting screw is turned clockwise until a slight movement of the small pulley is observed, indicating contact of the shaft and the bearing. The adjusting screw is then given ¼ additional turn in the same direction and the lock nut tightened.

RELAY

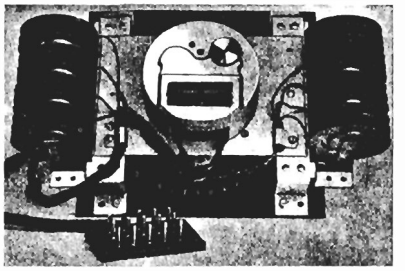
No trouble should be experienced with the OFF and ON relay used in conjunction with the TUNE-O-MATIC mechanism. Any tendency for contacts to stick may be removed by the use of emery cloth. In cases where buzzing of the relay occurs, it should be noted whether the armature seats properly.

STATION SELECTOR DISCS

Tension collar at rear of station discs may be loosened if station selector discs are difficult to set. However sufficient pressure should be retained to keep the discs in the position which they have been set, while the mechanism is in operation.

SERVICING TUNE-O-MATIC CLOCK ASSEMBLY

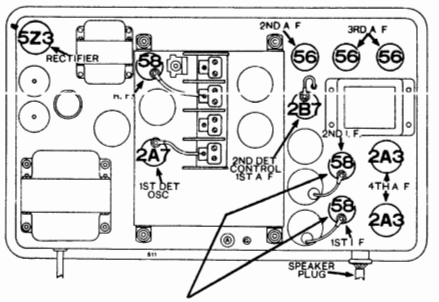
The TUNE-O-MATIC clock assembly is illustrated at right. No attempt should be made to make adjustments on any part of the clock assembly unit other than pointed out below. Where major adjustments are required, the complete unit must be removed from the cabinet and returned to the distributor.



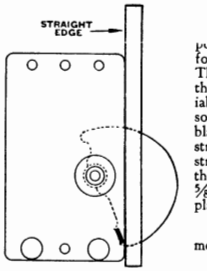
In cases where the contact arm, on the rear of the jack panel, jumps a noticeable period of time before or after the MINUTE hand reaches each successive 15 minute mark on the clock face, it will be necessary to set both the hour hand and the minute hand on 12, when the contact arm is on the 12 o'clock jack. To make this adjustment the clock crystal should be carefully removed, by releasing the crystal retaining spring (use narrow blade screwdriver), to allow access to the clock hands. Turn the knurled clock-hand adjusting knob on the rear of the clock until the hand is almost at 12, then allow the clock to run on its own power. The instant the contact arm jumps to the 12 o'clock jack see that both the hour and the minute hand are within the black mark at 12. Both hands are held on their respective shafts by friction only, and therefore may be moved in either direction manually to the 12 o'clock position. After the hands have been adjusted as indicated above, the relation of the minute hand and the time the contact arm jumps to the succeeding positions may be checked at other points on the clock face in a like manner, and if found satisfactory, the clock crystal should be replaced and the retaining spring adjusted.

For any adjustments ot the clock assembly unit relative to the clock mechanism, sluggish break and make action of the jack contact arm from one position to the next, etc., will require that the complete clock assembly be returned to the distributor.

It may be well to note that if any selector cord tip, after being released from a time selector jack, should become lodged against a selector cord tip of another station, the TUNE-O-MATIC mechanism will operate continuously until the cord tip is dislodged from its contact with the cord tip in the jack. The same action will occur if the contact arm should lodge on two jack contacts.



SPECIAL ALUMINUM SHIELDS ARE PLACED OVER THESE TWO TUBES
Top View, Model 511

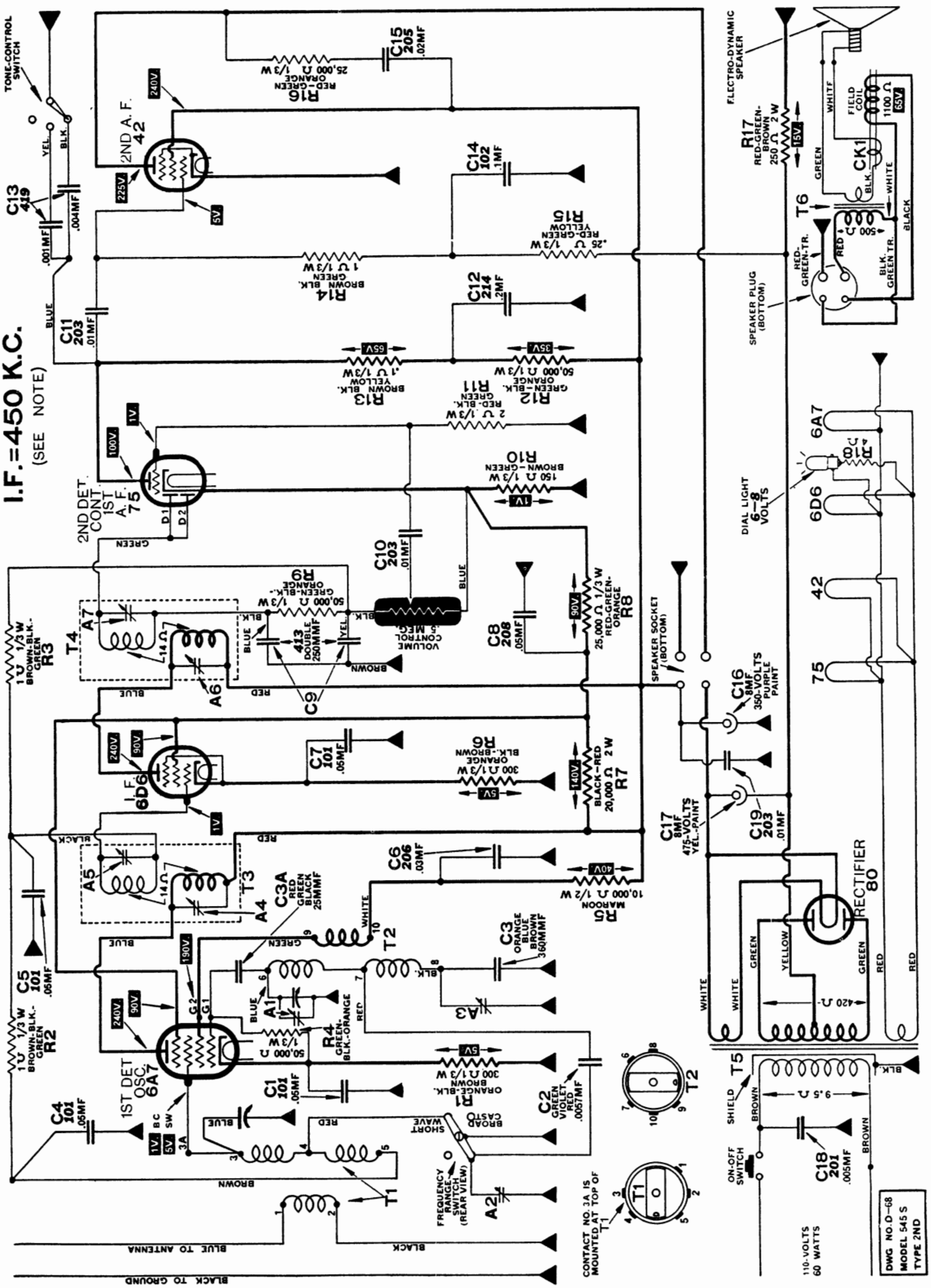


This illustration shows the correct position of the variable condenser rotor for a dial-pointer setting of 1575 KC. The straight-edge is held firmly against the front mounting plate of the variable condenser and the rotor is turned so the spacing bar (shown as a small black oblong) is just touching the straight edge. The straight edge is a strip of bakelite or hard rubber ¼" thick, ⅜" wide, and 6" long. The ⅜" side is held against the mounting plate.

See section on "Dial Pointer Adjustment" on page 11.

ATWATER KENT MFG. CO.

MODEL 545



The I. F. in some Model 545 sets is 472½ KC and a label to this effect is attached to the rear of the chassis. The I. F. transformers and trimmers, etc., are exactly the same for either 450 or 472½ KC.

CHANGES. Early Model 545 has 2.5-volt tubes and the circuit is similar to that shown above. Late sets have .01 MF line bypass; electrolytic C16 is 300-V, 16 MF; a filament-shunt resistor of 25-ohms (tapped at 12.5) is added and the filament circuit is not grounded except through this resistor; dial light in late srts is 6.3 volts.

ATWATER KENT MFG. CO.

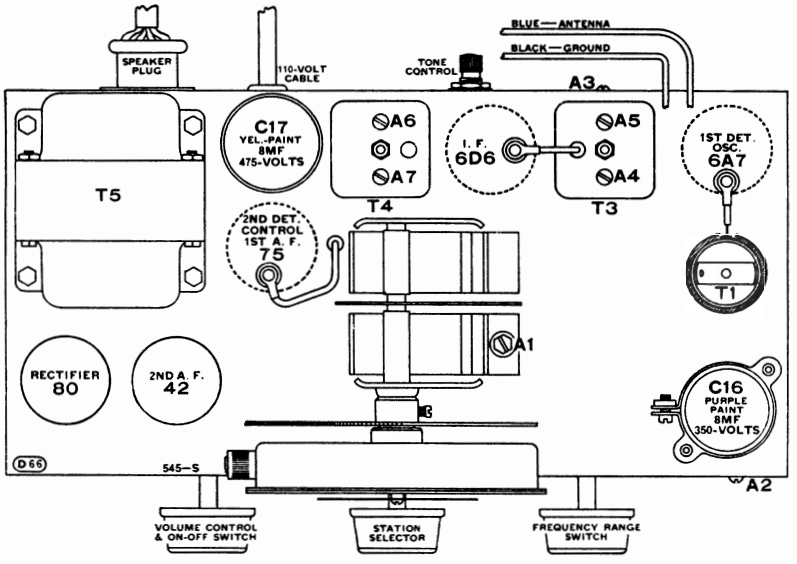
MODEL 545

ADJUSTING TRIMMERS

I. F. Connect I. F. test oscillator (450* KC) to I. F. tube by means of regular I. F. coupling unit. Peak A7 and A6. Connect coupling unit to 1st-detector and peak A5 and A4.

DIAL. With rotor of variable condenser fully meshed, dial indicator should be at 540 KC.

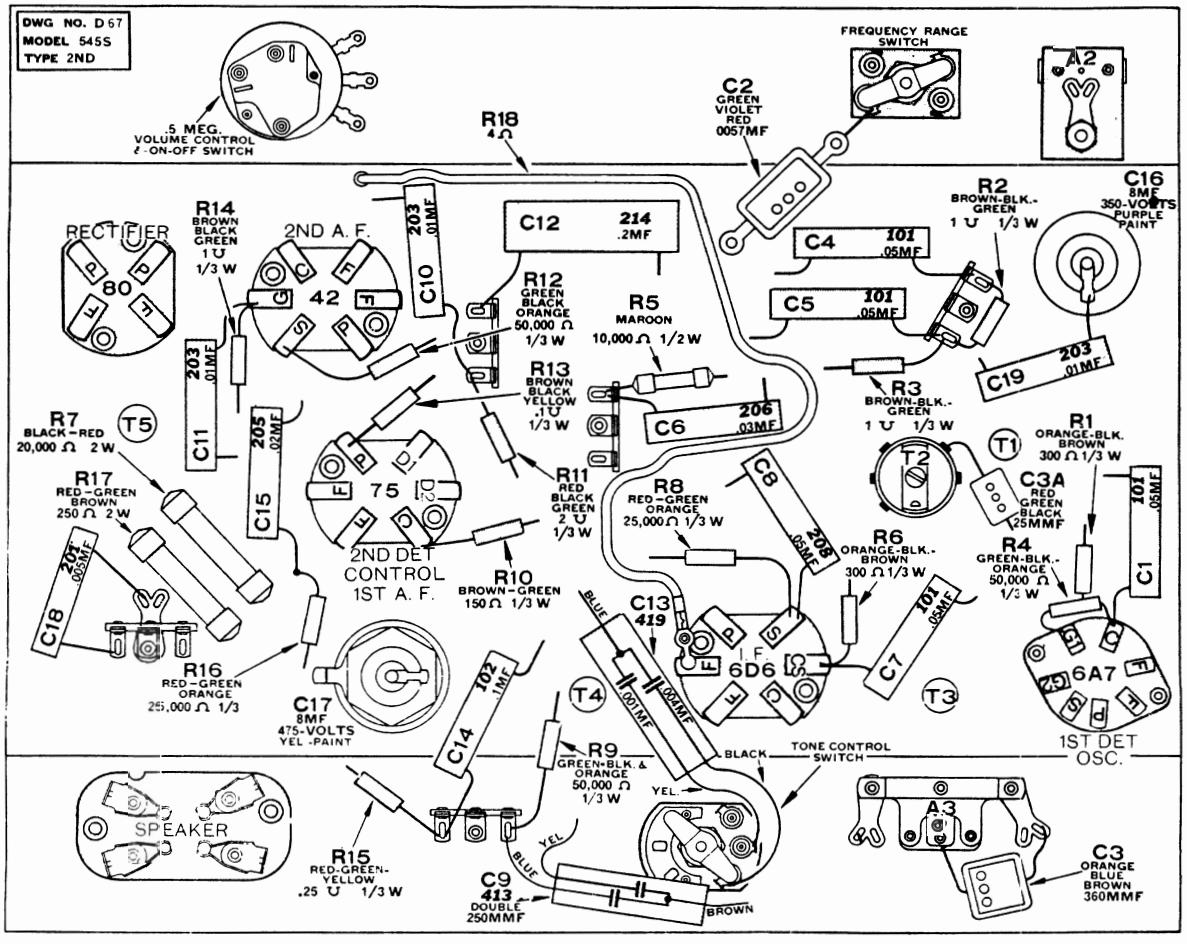
R. F. Connect a 6 MC oscillator to antenna and ground. Peak A1. With oscillator and dial at 1700 KC, peak A2. With oscillator and dial at 540 KC, peak A3.



	Short-Wave Range	Broadcast Range
1st Detector		.....
Oscillator	A1	A2
Tracking		A3

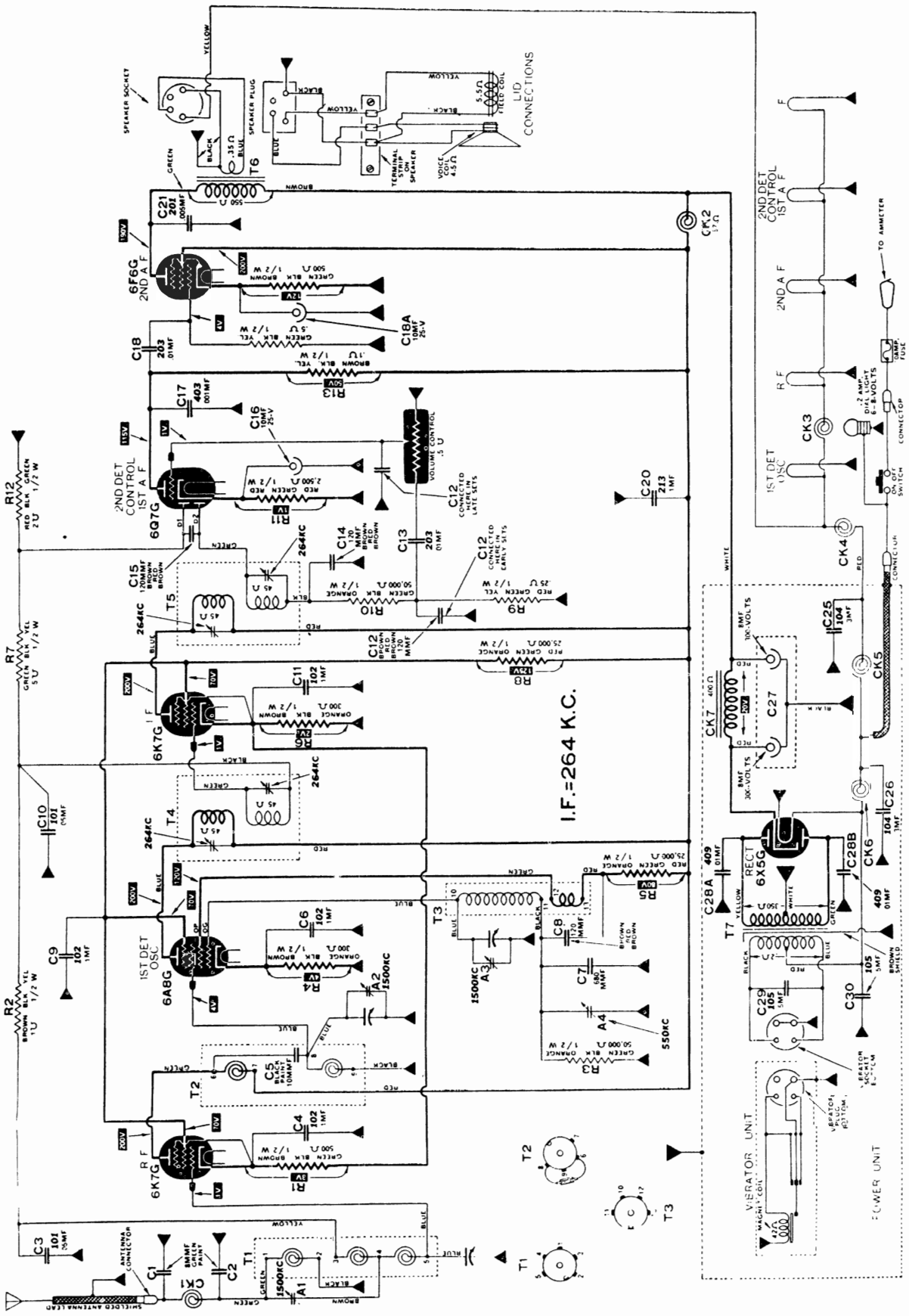
The I. F. trimmers are A4 to A7, inclusive.

*In some Model 545 sets, the I. F. is 472½ KC and a label to this effect is attached to rear of chassis.



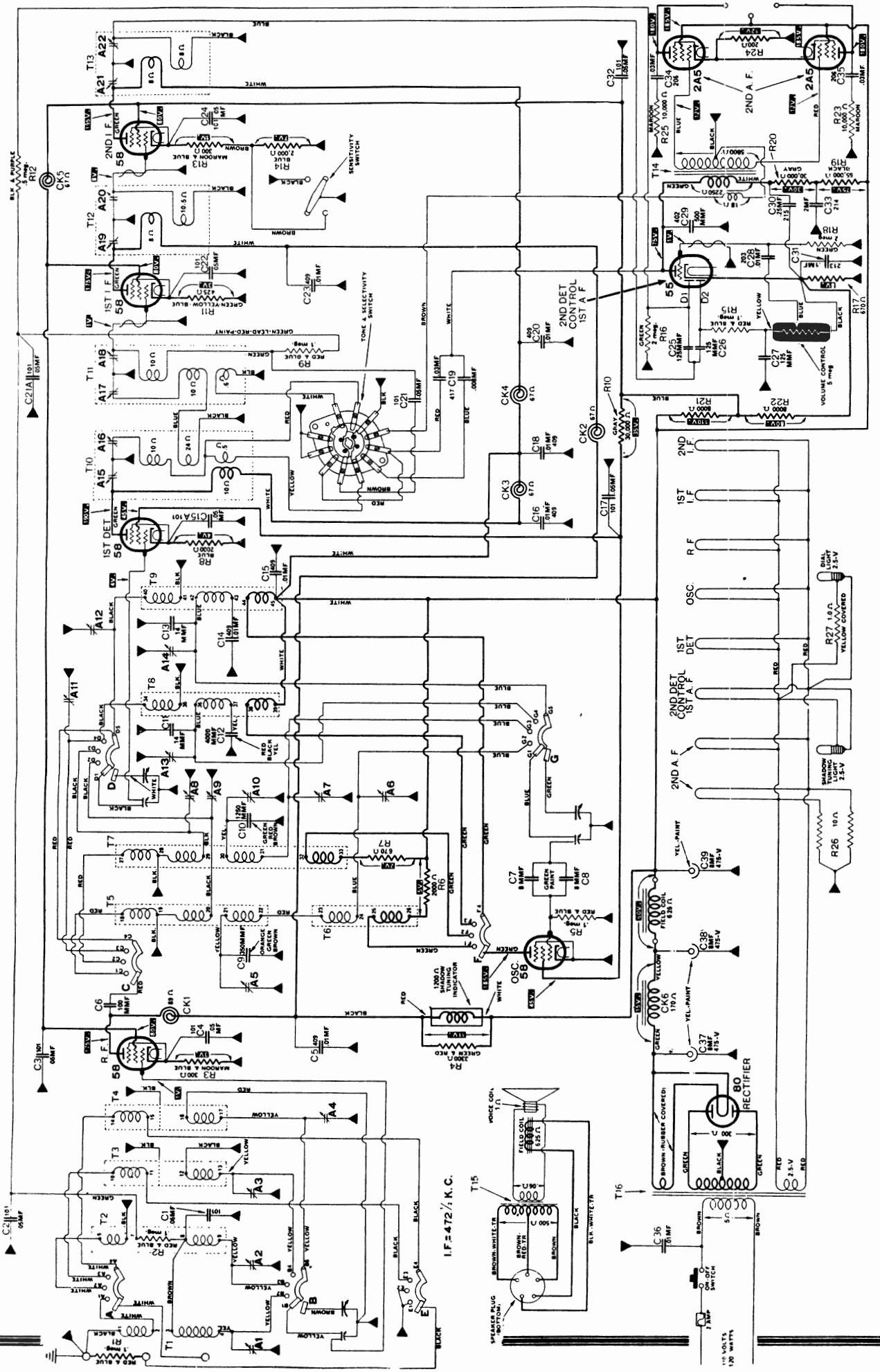
ATWATER KENT MFG. CO.

DIAGRAM OF MODEL 556



ATWATER KENT MFG. CO.

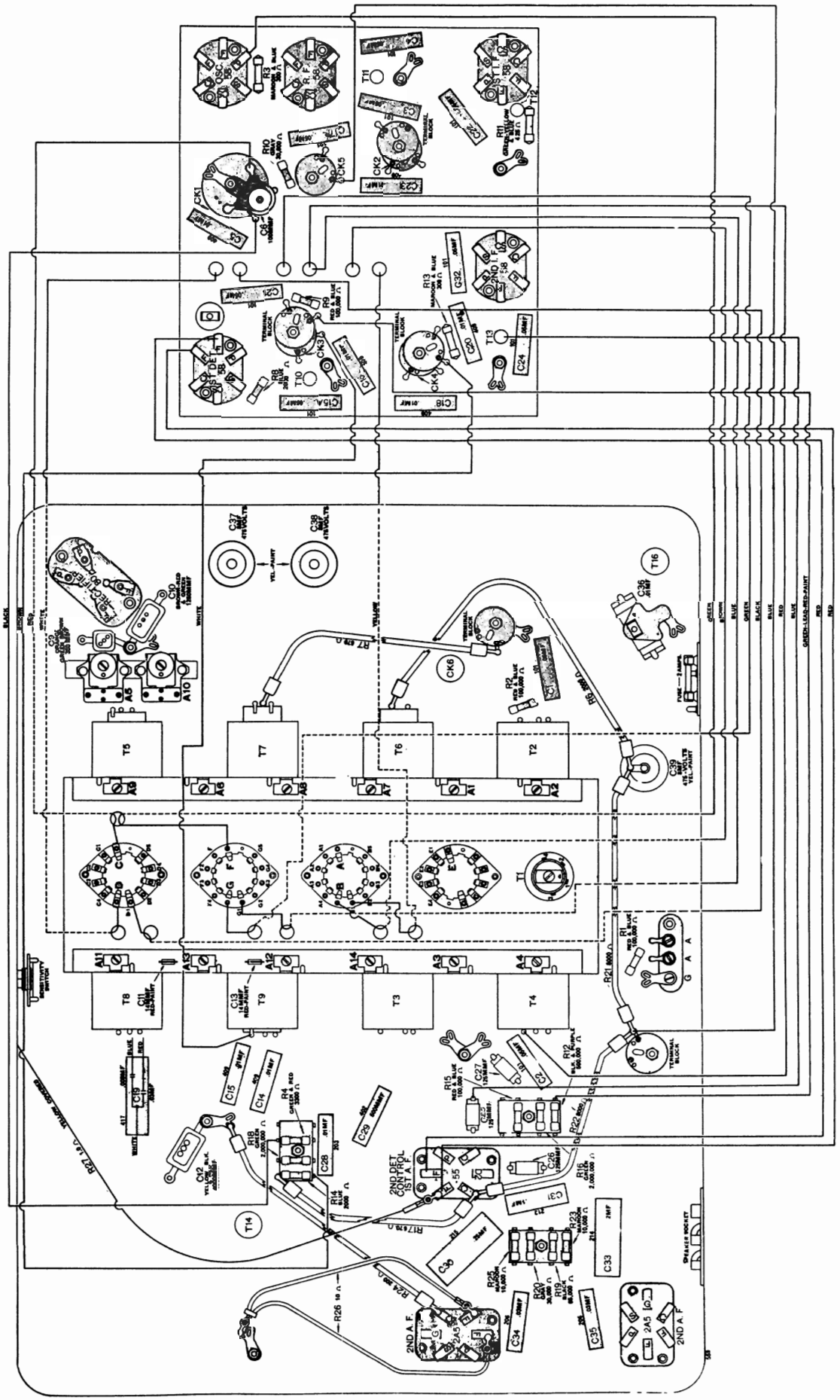
MODEL 559



Voltage measurements were made with sensitivity switch at "local." The R. F. and I. F. circuit of Model 112 is the same as Model 559.

ATWATER KENT MFG. CO.

MODEL 559
(I. F. = 472½ KC.)
(For top view, see page 12)



This view shows the connections between the top unit and the main base.

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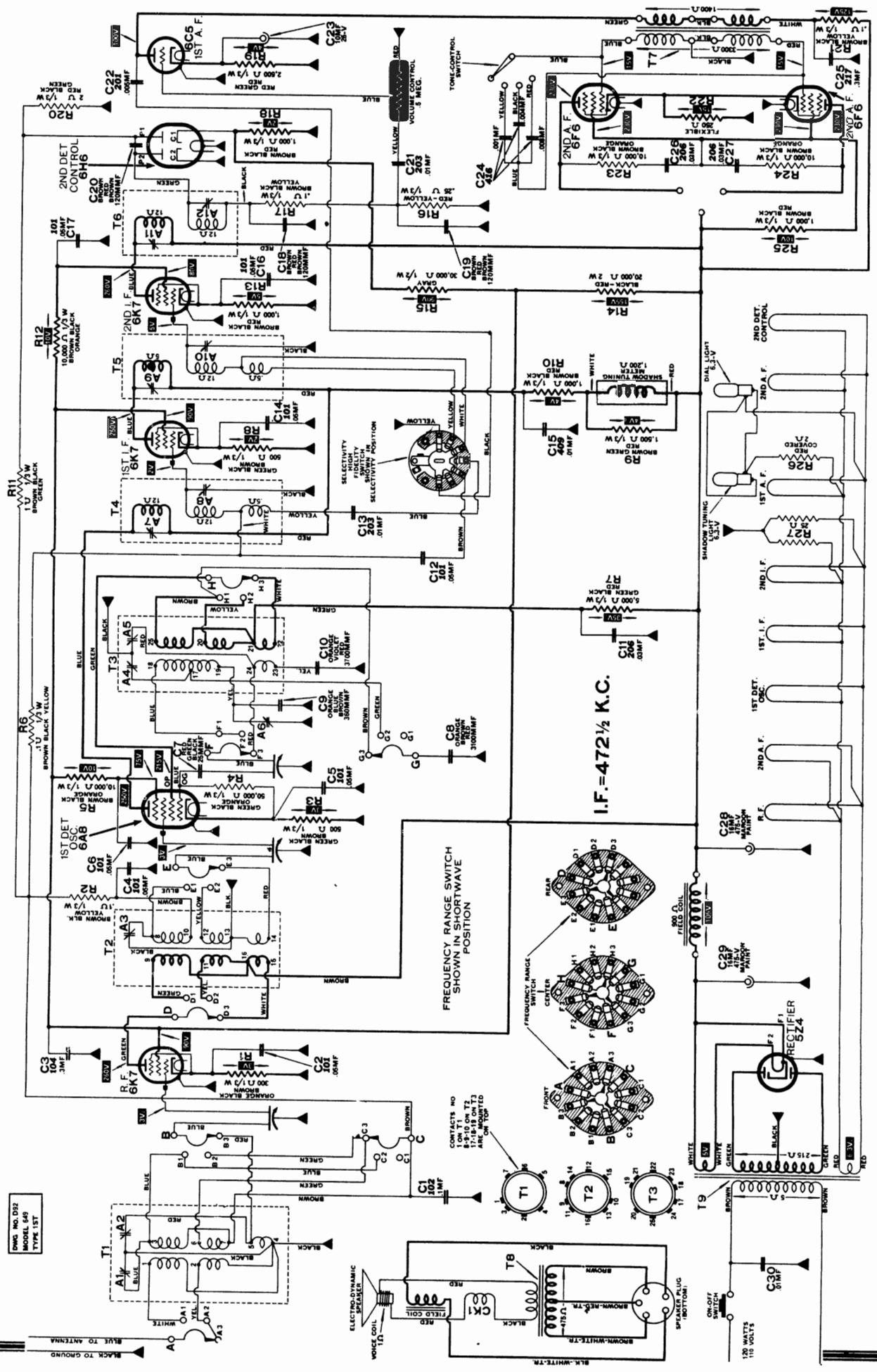
MODEL 649 (Early Type)



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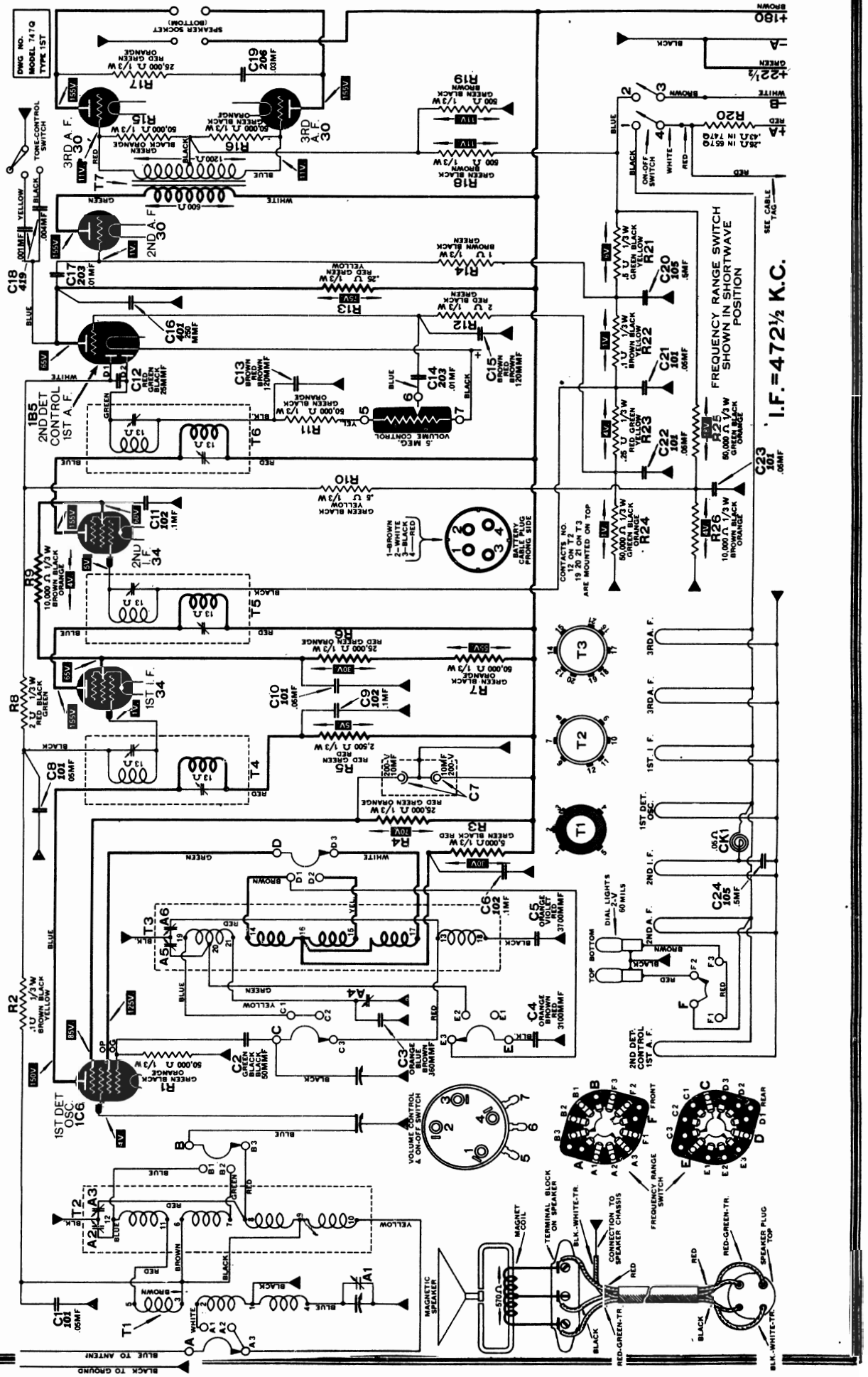
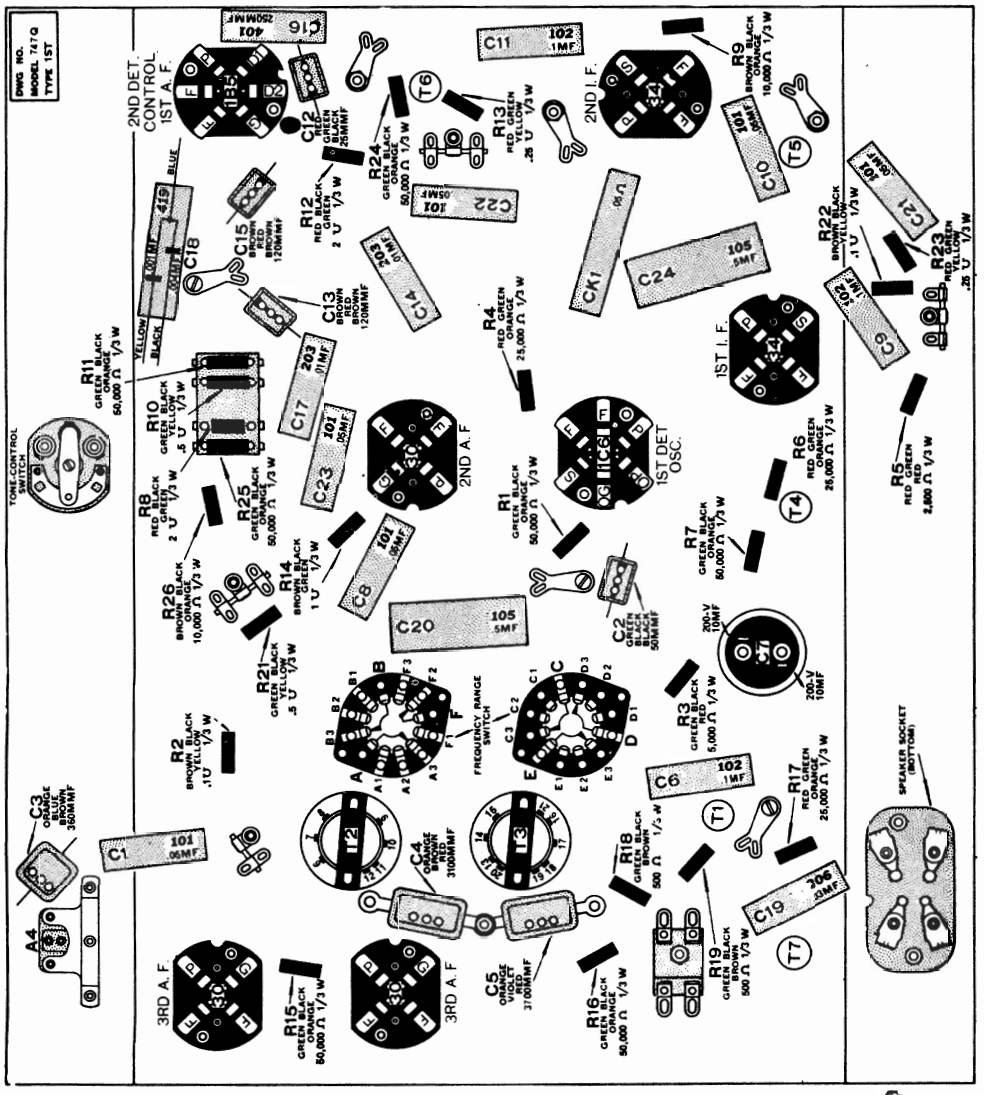
MODELS 657Q AND 747Q



ATWATER KENT MFG. CO.

MODELS 657Q AND 747Q



I. F. TRIMMERS

Connect signal generator (472½ KC) to 2nd-I. F. grid cap by means of No. 42590 coupling unit. Peak two trimmers on top of T6 (3rd I. F. transformer).

Connect signal generator to cap of 1st-I. F. tube and peak two trimmers on top of T5 (2nd I. F. transformer).

Connect signal generator to cap of 1st-detector tube and peak two trimmers on top of T4 (1st I. F. transformer).

DIAL POINTER ADJUSTMENT

With the variable condenser fully meshed, the dial pointer should be set at 535 KC.

R. F. TRIMMERS

In location where severe electrical interference is present, it is necessary, when aligning R. F. trimmers, to connect a 40,000-ohm resistor in series with a .02 M. F. condenser from the grid cap of the 1st-I. F. tube to chassis. This reduces the I. F. sensitivity and permits use of a stronger output from the signal generator to over-ride the local noise level without bringing the AVC into action.

Short-wave Range

Connect a 400-ohm resistor in series with the generator pick-up lead at the antenna terminal of set. With signal generator and dial at 18 MC peak the short-wave oscillator trimmer A6, using the first peak as this trimmer is screwed down from a loose position.

Check to determine that A6 has been adjusted to the correct point by tuning in the double spot at 17.05 MC. The signal generator should be left at 18 MC while making this check.

Retune the set to 18 MC and while slowly rocking the variable condenser, peak the short-wave detector trimmer A3. A better method of setting A3 is to connect a 400 MMF vernier-type variable condenser across the oscillator section of the gang condenser (*after* setting A6) and increase the capacity of this extra condenser until the 18 MC signal is again heard. Then peak A3. This method avoids interlocking between the detector tuned circuit and the oscillator tuned circuit.

Police Range

No trimmers on this range.

Broadcast Range

Connect signal generator to antenna and ground of set, using a 250 MMF condenser in series with the antenna lead. With signal generator and dial at 1500 KC, peak the broadcast trimmers A5, A2 and A1 (oscillator, detector, and antenna). Use the first peak as A5 is screwed in from a loose position. Tune generator to 560 KC and peak broadcast tracking trimmer A4 while rocking variable condenser one division around the 560 KC mark. Repeat adjustments at 1500 and at 560 KC if necessary.

PARTS LIST

30046		Cabinet with screen (657Q only)
29983		Gasket and screen (657Q only)
29759		Escutcheon and crystal assem.
31734		Volume control, .5 U
42750		Tone control switch assembly
29101		Shaft and blade for above
28986		Range switch
31349		Variable condenser assembly
40090		Dial light socket assembly
26721		Dial light, 2-V., 60 MA
31713		Dial plate (657Q only)
31714		Dial plate (747Q only)
31606		Dial plate holder
22683		Tube shield (1B5, 1C6)
15213		Tube shield (34)
29547		Coil shield (T2, 3)
29619		I. F. T. shield (T4, 5, 6)
49240		Shipping container (657Q)
49250		Shipping container (747Q)
31703		Instruction sheet, F-1312
27695		Battery cable tag, F-1155
31006		Base plate (747Q)

TRANSFORMERS

T1	47460	Broadcast pre-selector
T2	49210	1st detector
T3	47480	Oscillator
T4	48610	No. 1 I. F. T.
T5	48620	No. 2 I. F. T.
T6	48630	No. 3 I. F. T.
T7	47840	Audio input trans.

TRIMMERS

44570		Double R. F. trimmer
29823		Double I. F. trimmer
39630		Broadcast tracking trimmer (A4)

ELECTROLYTICS

31552		10 MF and 10 MF, 200-V.

CHOKES

CK1	36630	Filament choke

BATTERY CABLES

31759		Cable and plug (set end), 747Q
31761		Cable and socket (bat. end), 747Q
31756		Cable and plug (set end), 657Q
31757		Cable and socket (bat. end), 657Q
29056		Battery-cable plug only
29057		Battery-cable socket only

RESISTORS

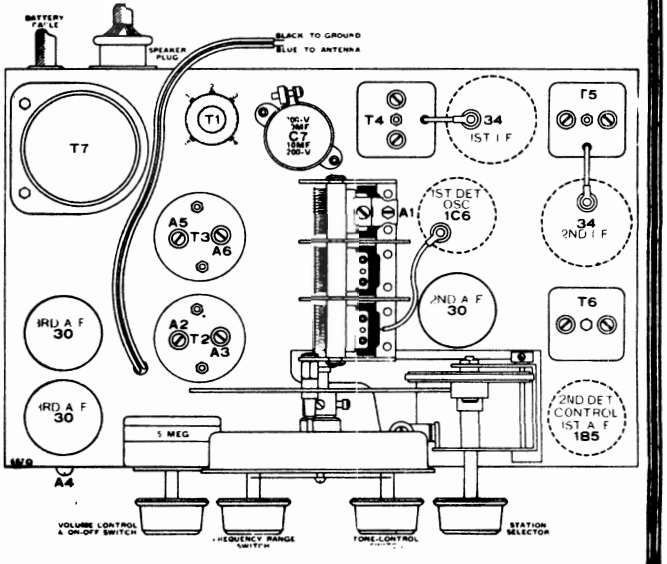
R26	47120	.25 Ω (in 657Q)
R26	47210	.43 Ω (in 747Q)
	40340	Dry cell battery resistor, 1.03 Ω

SOCKETS

24492		4-prong socket
24494		6-prong socket (1C6, 1B5)
21336		Speaker socket

SPEAKERS

Refer to list under Models 237Q and 467Q.

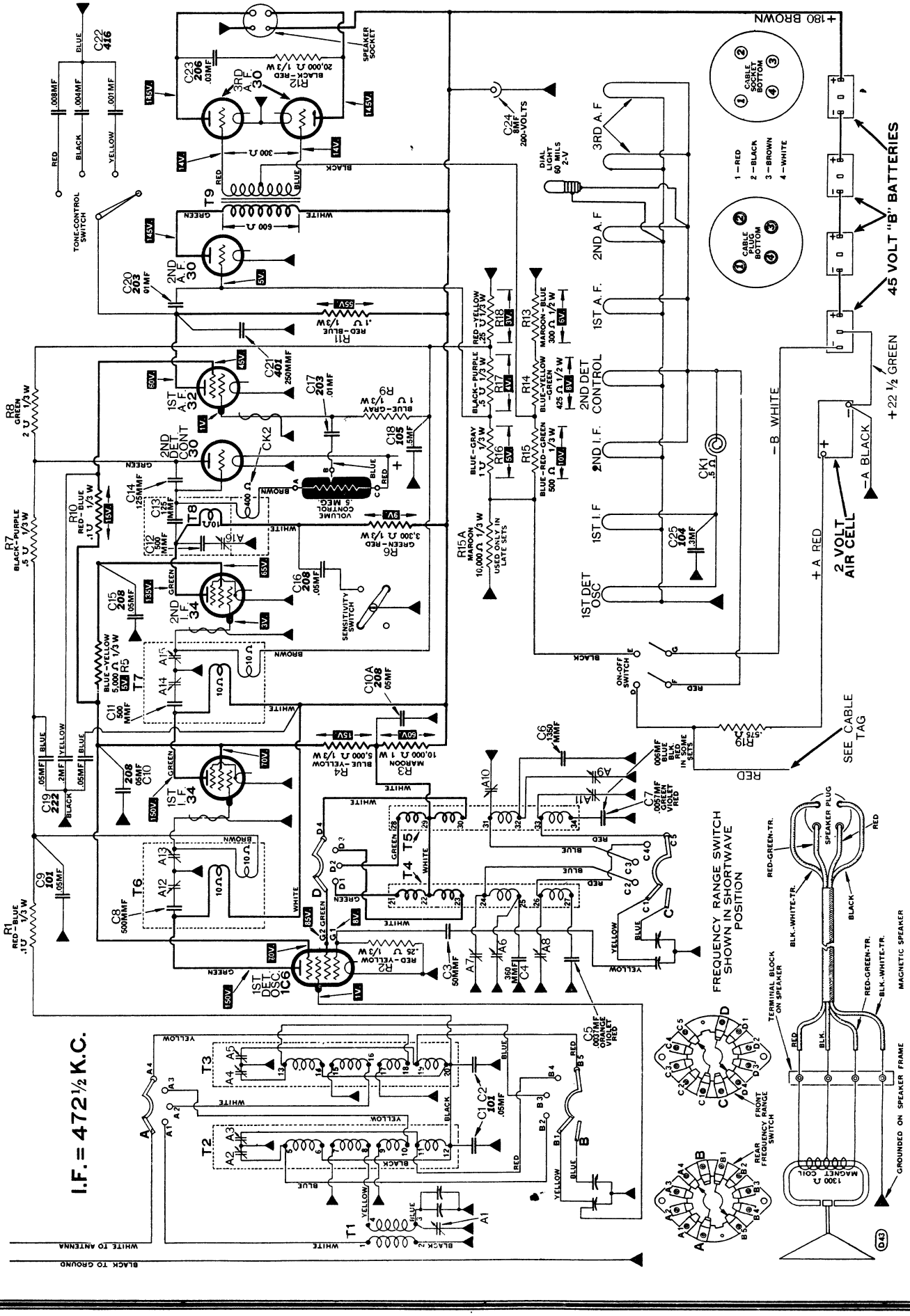


A1—Pre-selector, 1500 KC.
A2—1st-detector, 1500 KC.
A3—1st-detector, 18 MC.
A4—Oscillator tracking, 560 KC.
A5—Broadcast oscillator, 1500 KC.
A6—Short-wave oscillator, 18 MC.

There are six I. F. trimmers, two on top of each I. F. transformer (T4, 5 and 6). These are peaked 472½ KC.

ATWATER KENT MFG. CO.

MODELS 768Q and 978Q

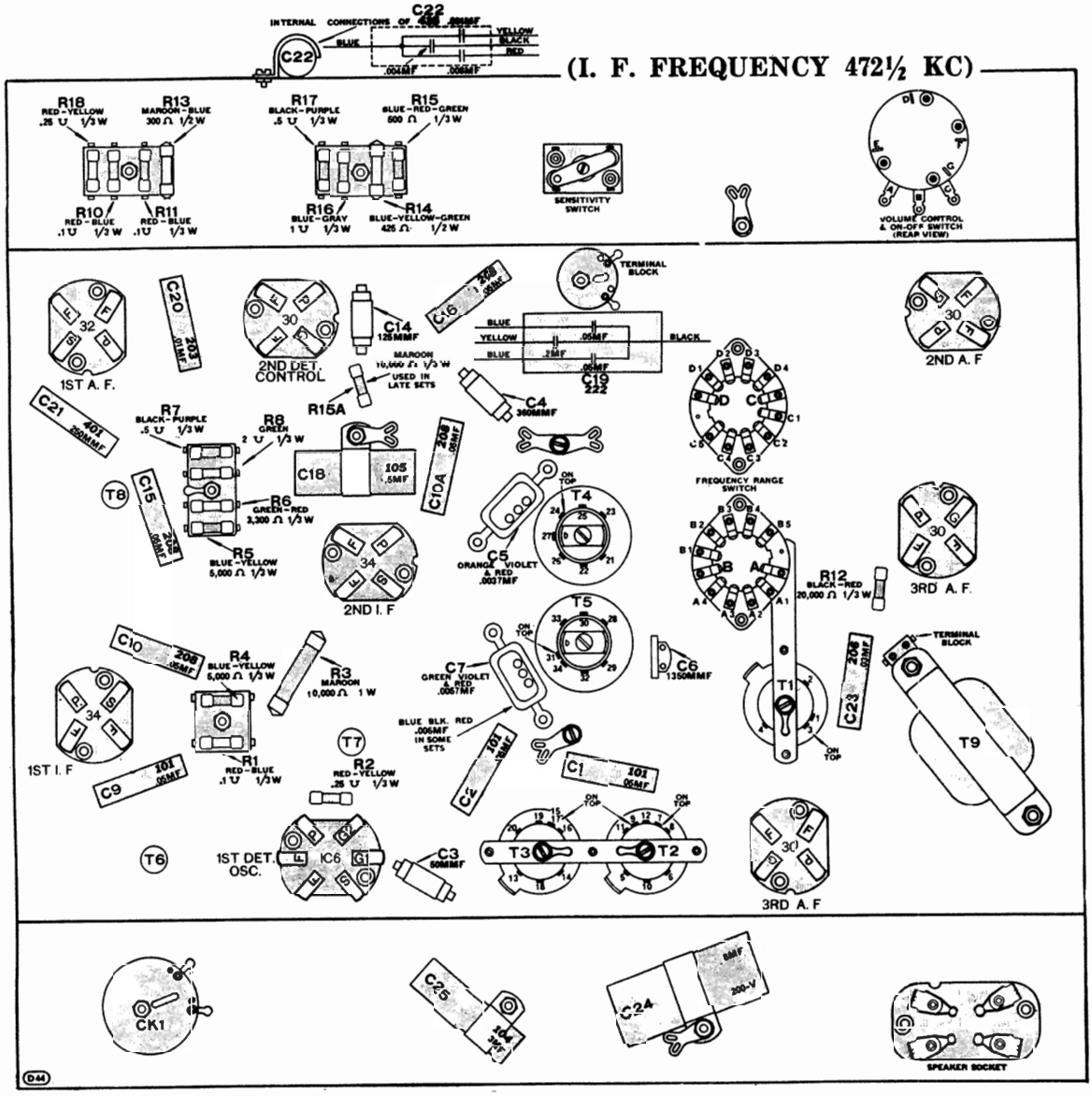


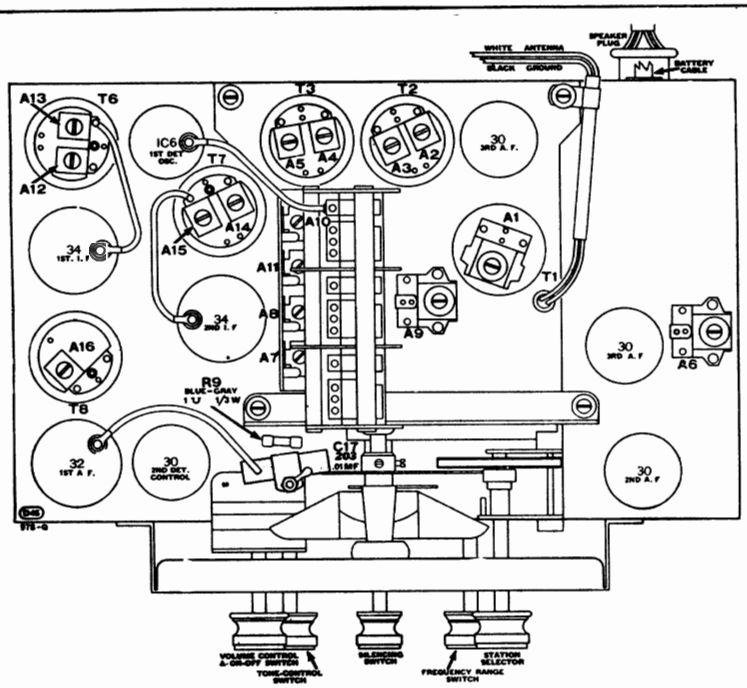
An extra tracking condenser (No. 25837, 1100 MMF, brown-brown-red) is connected across C5 in some models.

ATWATER KENT MFG. CO.

MODELS 768Q and 978Q

(I. F. FREQUENCY 472½ KC)





TRIMMERS ON MODELS 768Q and 978Q

I. F. TRIMMERS

I. F. (472½ KC)....A12 to A16

12 to 22.5 MC RANGE

1st-Det. (18 MC).....A5
Oscillator (18 MC).....A11

4.6 to 12.2 MC RANGE

1st-Det. (12 MC).....A3
Oscillator (12 MC).....A8

1.6 to 4.6 MC RANGE

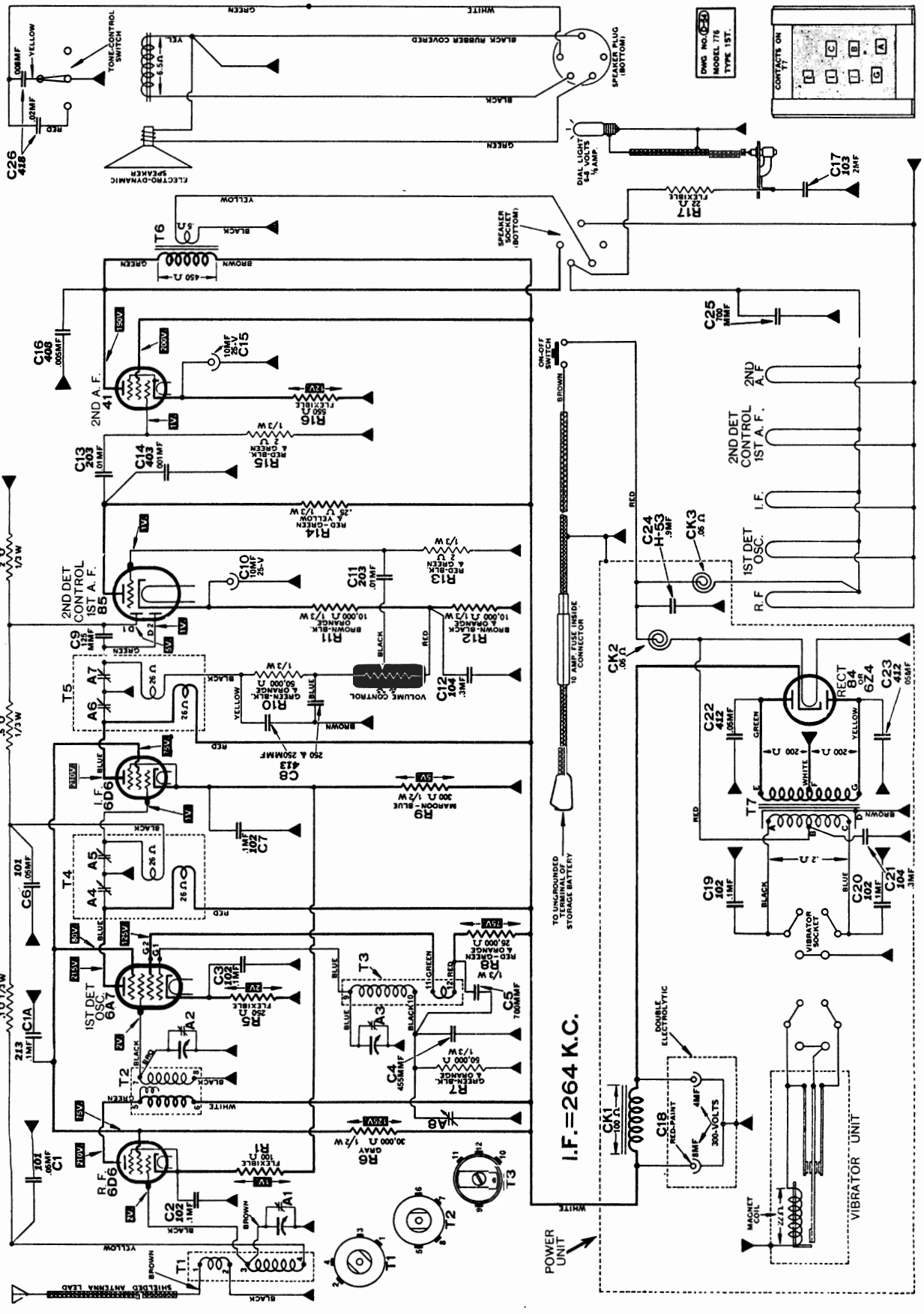
1st-Det. (4 MC).....A4
Oscillator (4 MC).....A10
Tracking (1.7 MC).....A9

540 to 1600 KC RANGE

Antenna (1500 KC).....A1
1st-Det. (1500 KC).....A2
Oscillator (1500 KC).....A7
Tracking (560 KC).....A6

ATWATER KENT MFG. CO.

MODEL 776 MOTOR CAR RADIO



In early sets R11 is 5,000 ohms with a drop of 4 volts and R12 is 15,000 ohms with a drop of 10 volts. In late sets these two resistors are each 10,000 ohms and there is approximately 6 volts across each. (At the same time this change was made, the 1st-A. F. plate resistor, R14 was changed from .1 meg. to .25 meg. With the .1 meg. resistor, the drop across it is 55 volts, and the plate voltage is 125. With the .25 meg. resistor, the plate voltage is lower. All voltages are measured with the 250-volt scale of a 1,000-ohm-per-volt voltmeter.)

The voltage across R11 regulates the "squelch" or minimum-signal level at which the 2nd-detector begins to function. The combined voltage across R11 and R12 acts as the bias on the AVC and the 1st-A. F. grid.

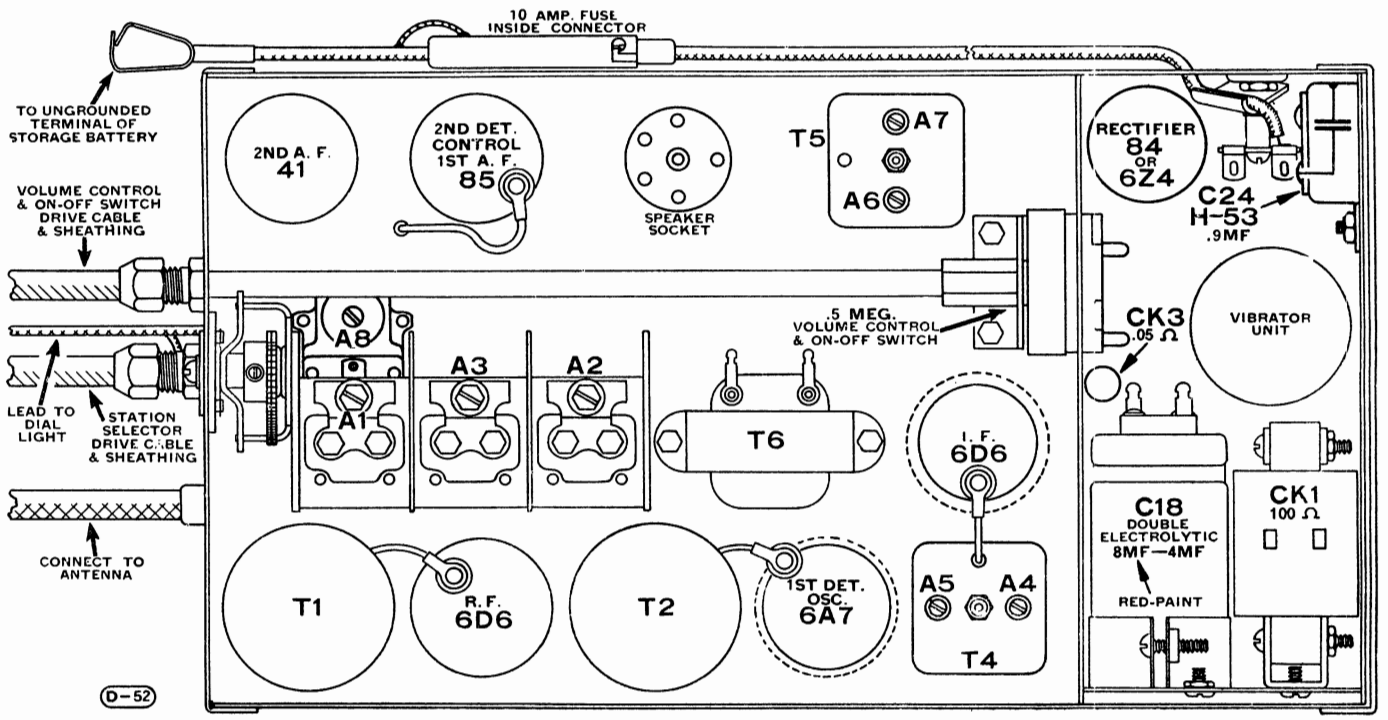
Early Model 776 sets do not have tone control, and the "A" filter circuit is slightly different from that shown.

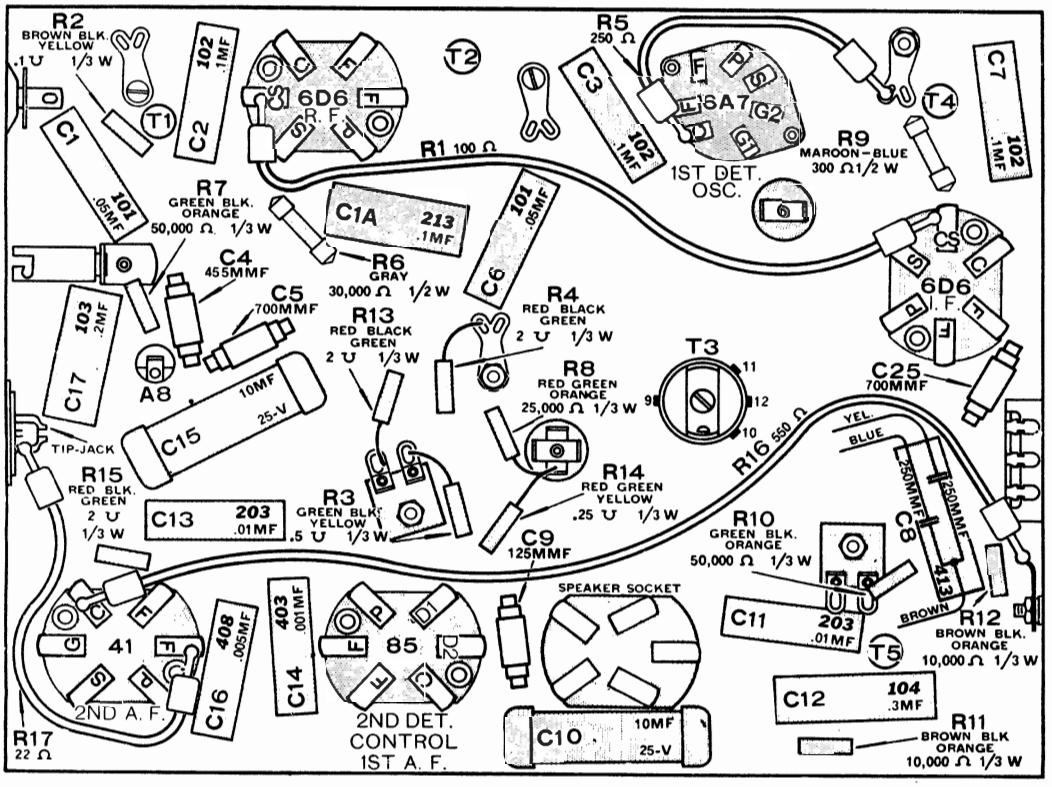
C17 in the lower right-hand part of the diagram is .2 MF.

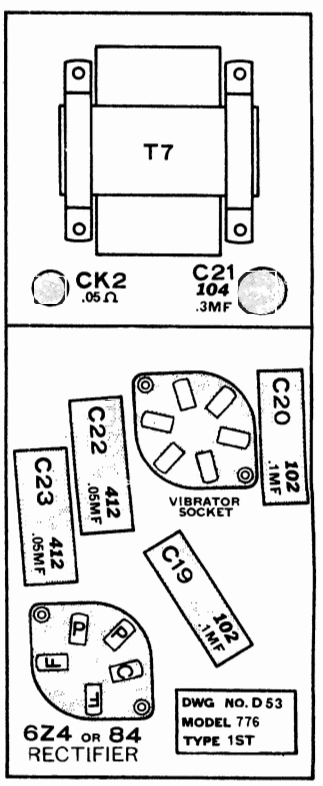
ATWATER KENT MFG. CO.

MODEL 776

TOP VIEW AND CHART







ATWATER KENT MFG. CO.

MODEL 776 MOTOR CAR RADIO

ADJUSTING TRIMMER CONDENSERS

EQUIPMENT.

1. OSCILLATOR. The oscillator should cover the I. F. and R. F. frequencies. It should be well shielded and have a good attenuator. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025 MFD fixed condenser in series with the pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume, and the tone control at high pitch. This is necessary to minimize the effect of the automatic volume control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. I. F. COUPLING UNIT. Purchase from your distributor one of the special Atwater Kent I. F. coupling units No. 42590. This is placed on the grid cap of the I. F. or the 1st-detector tube, as specified, and the lead that normally connects to the grid cap is attached to the coupling unit.

4. Use a non-metallic screw driver for adjustment of the trimmers.

GENERAL NOTES.

1. Do not tamper with the trimmer adjustments unless the necessity is clearly apparent.

2. On the oscillator trimmer there are two different settings at which the signal will be received. Always use the *first* of these two positions as you screw the trimmer in from a loose or minimum-capacity position. THIS IS IMPORTANT.

3. Check the I. F. trimmers first.

4. In checking the set, do not disturb the position of the wiring any more than necessary.

DIAL CALIBRATION.

The dial calibration depends on the oscillator circuit of the set, providing that the I. F. trimmers are correctly aligned to their specified frequency. The pre-selector (R. F. and 1st-detector) trimmers do not affect the dial calibration, but simply affect sensitivity.

The oscillator trimmer is used to adjust the high-frequency end of the scale.

The oscillator tracking condenser adjusts the low-frequency end of the scale.

If adjustment of the oscillator trimmer and the oscillator tracking trimmer condenser does not correct the dial readings, it may be necessary to replace the fixed oscillator tracking condenser or the oscillator transformer.

Naturally the I. F. trimmers should be checked and adjusted, if necessary, before any attempt is made to align the R. F. or oscillator trimmers.

PROCEDURE

(For location of trimmers, refer to upper illustration on page 2.)

I. F. TRIMMERS.

Connect I. F. test oscillator (264 KC) to I. F. tube by means of the regular I. F. coupling unit. Peak A6, A7. Connect I. F. oscillator to 1st-detector tube and peak A4, A5.

DIAL POINTER ADJUSTMENT.

Connect oscillator (560 KC) to antenna and ground and peak A8 while rocking the variable condenser for maximum sensitivity. Then adjust dial pointer to 560 KC mark by turning the adjustment nut at rear of control unit.

R. F. TRIMMERS.

Connect R. F. oscillator to antenna and ground of set.

With oscillator and dial at 1500 KC, peak A3, A2, A1. Check frequency alignment at 560 KC.

PARTS LIST FOR MODEL 776

For part numbers of tubular resistors and condensers, refer to lists in previous supplements.

29296	Cabinet body, complete, less lid
29297	Inner plate with spring
29298	Tuning cable chuck and plate less nut
29225	Vol. control chuck less nut
29226	Chuck nut
26523	Rubber gasket
26128	Thumbscrew (specify gold finish)
29233	Instruction folder, F-1235
21143	Plug suppressor
21144	Distributor suppressor
23260	1 MF, 200-V. condenser (K 1)
38270	Filter cond., .5 MF (224)
26098	Antenna cable
26099	Battery cable
26611	Shipping container
26462	Variable condenser
29286	Shield for T3
27095	Shield for T1 and T2
29183	I. F. T. shield
26505	Volume control .5 U
26033	Volume control mounting bracket
29224	Volume control hex. nut
29232	Volume control shaft-tube support
29279	Volume control shaft tube
44340	Tone control switch assembly
30037	Tone control shaft and blade
26451	Tube shield (cardboard)
29094	Terminal card

SOCKETS

24493	5-prong socket
24494	6-prong socket (85, 41)
27023	6-prong socket (6D6)
26111	7-prong socket
26572	Tip jack

TRANSFORMERS

T1	38010	No. 1 R. F. T.
T2	43840	No. 2 R. F. T.
T3	43860	Osc. trans.
T4	43640	No. 1 I. F. T.
T5	43650	No. 2 I. F. T.
T6	26982	Output T.
T7	26291	Power T.

RESISTORS

R1	20040	100 Ω, flexible
R5	31830	250 Ω, flexible
R16	23780	550 Ω, flexible
R17	16840	22 Ω, flexible

CONDENSERS

C4	43910	455 MMF, 500-V.
C5	36510	700 MMF, 500-V.
C9	35290	125 MMF, 500-V.
C10, 15	25379	10 MF, 25-V. (electrolytic)
C18	26995	8 MF-4 MF, 300-V. (electrolytic)
C24	45530	.9 MF (H53)
C25	36510	700 MMF, 500-V.

TRIMMERS

A4, 5	29119	On T4
A6	29119	On T5
A7	39420	Under var. cond.

POWER UNIT

43940	Power unit complete with tube
29289	Power unit container
27005	Vibrator
27038	Vibrator cover tube
26985	5-prong socket (rectifier)
26986	6-prong socket (vibrator)
27011	Filter choke (iron core)
36630	Choke (48-turn)
29264	Clamp for 48-turn choke
29094	Terminal card
29252	"A" lead from power unit
26291	Power transformer
26995	Electrolytic cond., 4 and 8 MF, 300-V.

SPEAKER

26851	Speaker less cable
29293	Lid with metal screen
26448	Plug only
19508	Cond. clamp
26826	Cone head assem.
26827	Field coil (6.5 Ω)

CONTROL UNIT

(The key numbers refer to illustration on facing page.)

1	30001	Case
2	30003	Bezel
3	30016	Dial plate
4	30002	Crystal
5	29341	Remote control complete with mounting parts less cables
6	30011	Key knob (volume)
7	30008	Tuning knob
8	30009	Tuning knob set screw
9	30023	Case mounting screw
10	30017	Pointer shaft
11	30007	Drive-shaft retaining screw
12	30038	Key retaining spring
13	30022	Post mounting screw
14	27118	6-8-volt dial light (green)
15	30013	Dial light socket and lead less lamp
16	30005	Drive shaft (gear)
17	30004	Dial pointer
18	30021	Lock washer
19	30006	Drive-shaft washer
20	29338	Strap and bushing
21	30015	Pointer gear
22	30014	Pointer pinion gear
23	26894	"U" washer, blued
24	30012	"U" washer, flat
25	29254	Vol. control cable assem.
26	29339	Steering post mtg. bracket
27	26105	Tuning cable assem.
	30019	Sheath-clamping screw

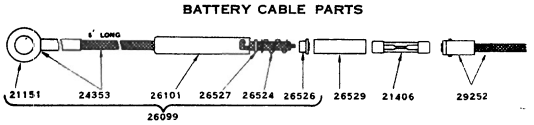
Ω = ohms. U = megohms.

Part Number	Description
26943	Universal mounting bracket for control unit in Models 666, 816, 926, 936, for mounting control head at lower edge of instrument panel.

The mounting plates and bracket listed below are for Model 776 control unit

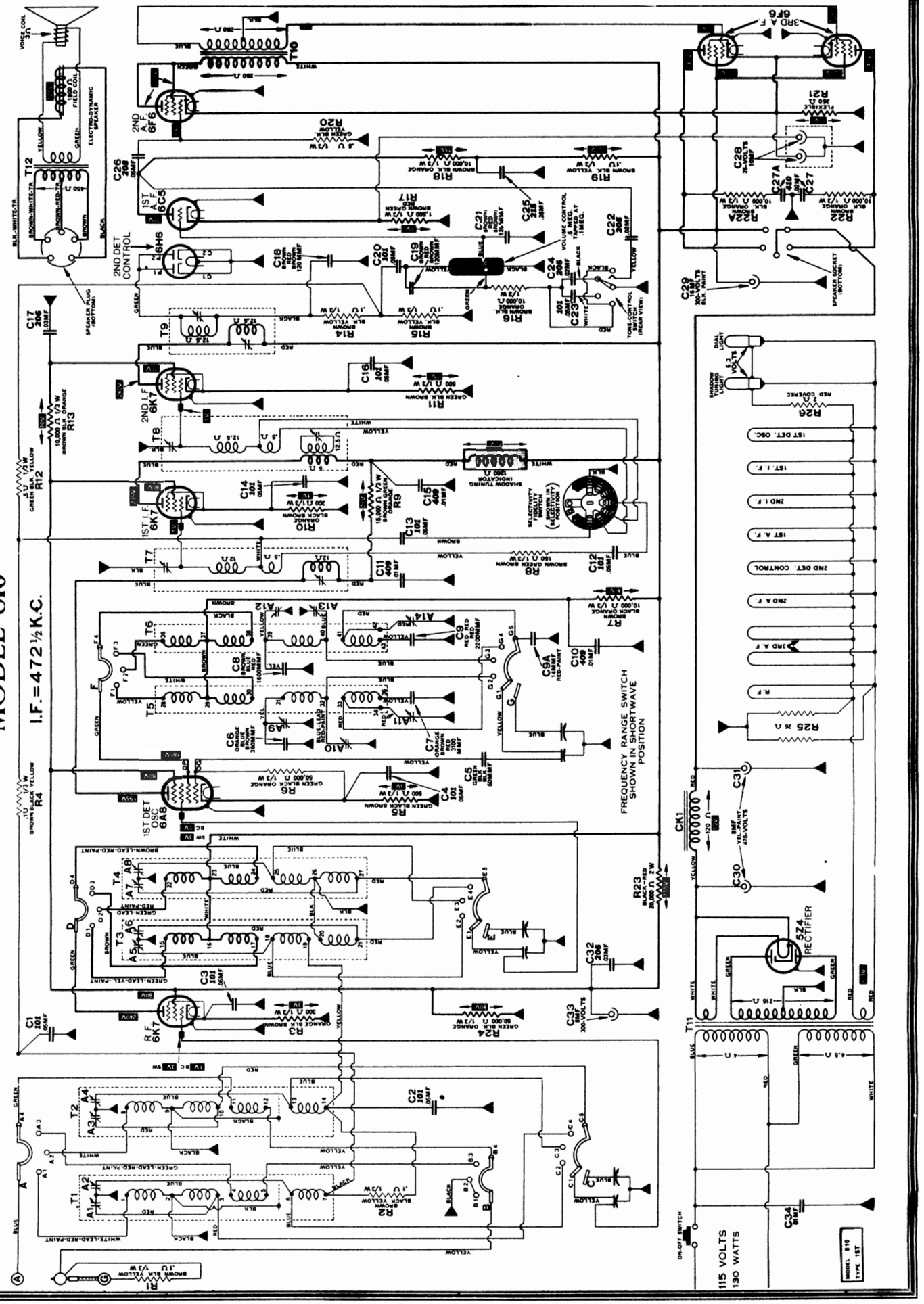
30025	1934 Ford ..... Dash finish.
30029	Universal mounting bracket for flush mounting of control head at lower edge of instrument panel. This type mounting may be used on all General Motors and other cars for which there are no mounting plates available. Also for cars which do not have the cut-out space in instrument panel.
29592	1935 Chrysler Air Stream ..... Vertical wood-grain finish.
30027	1935 Plymouth, Dodge, DeSoto ..... Horizontal wood-grain finish.
29591	1935 Ford ..... Taupe finish.
30028	1935 Hudson and Terraplane ..... Dash finish.
30026	1934 Chrysler, Plymouth, Dodge ..... Black finish.

BATTERY CABLE PARTS



ANTENNA CABLE PARTS

ATWATER KENT MFG. CO.



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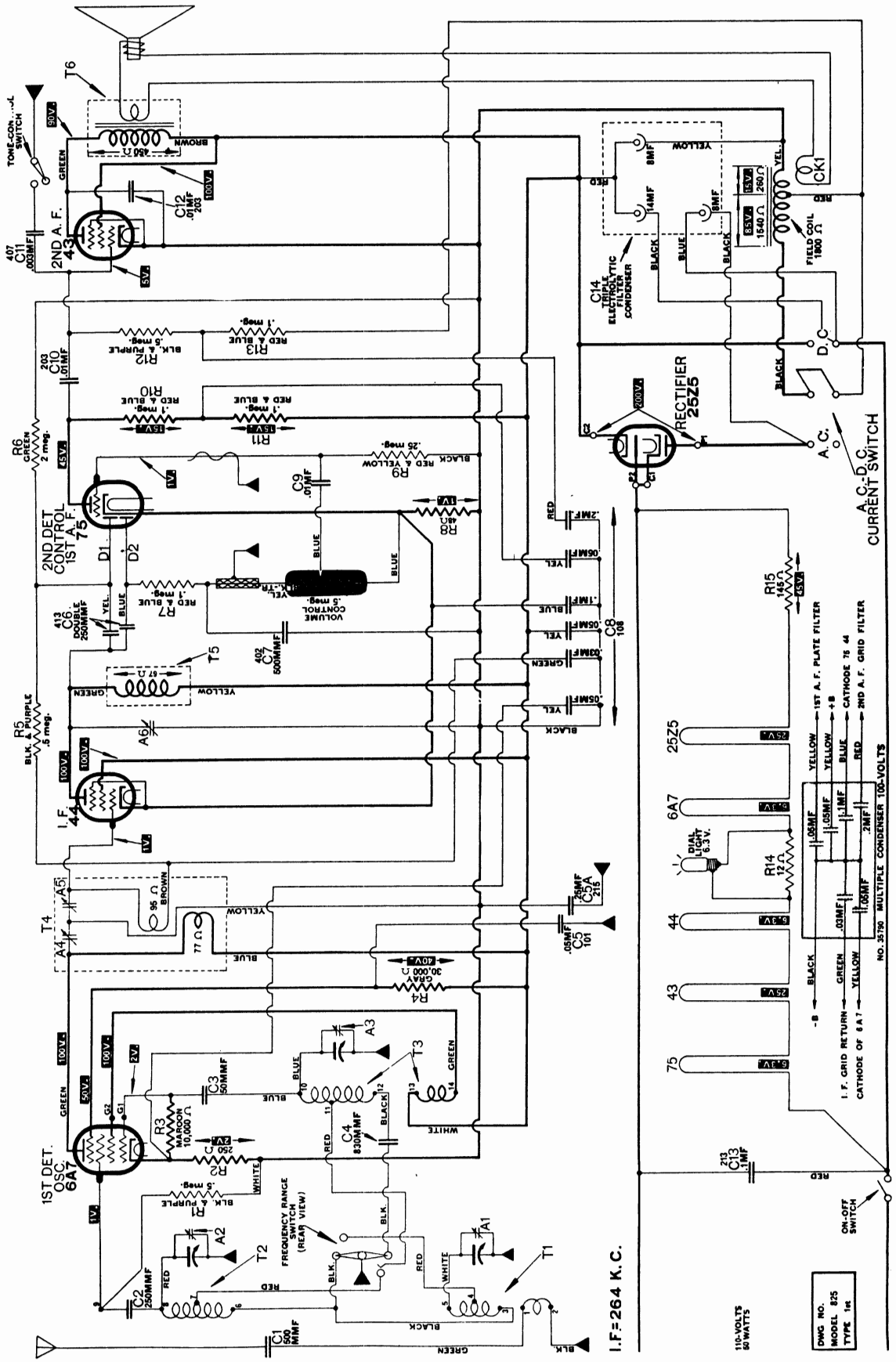
MODEL 825 (A. C.—D. C.)



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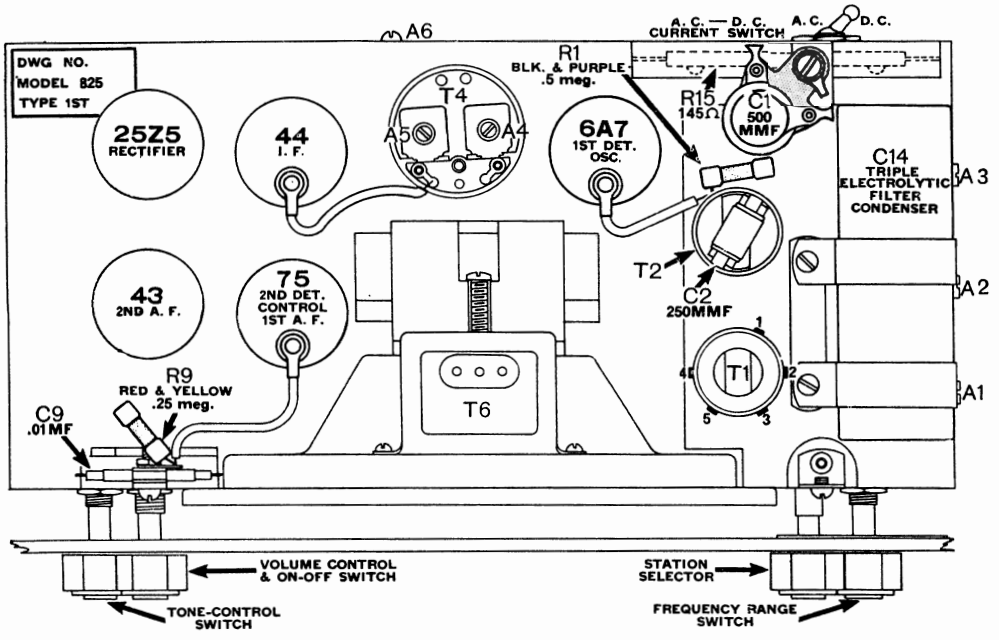
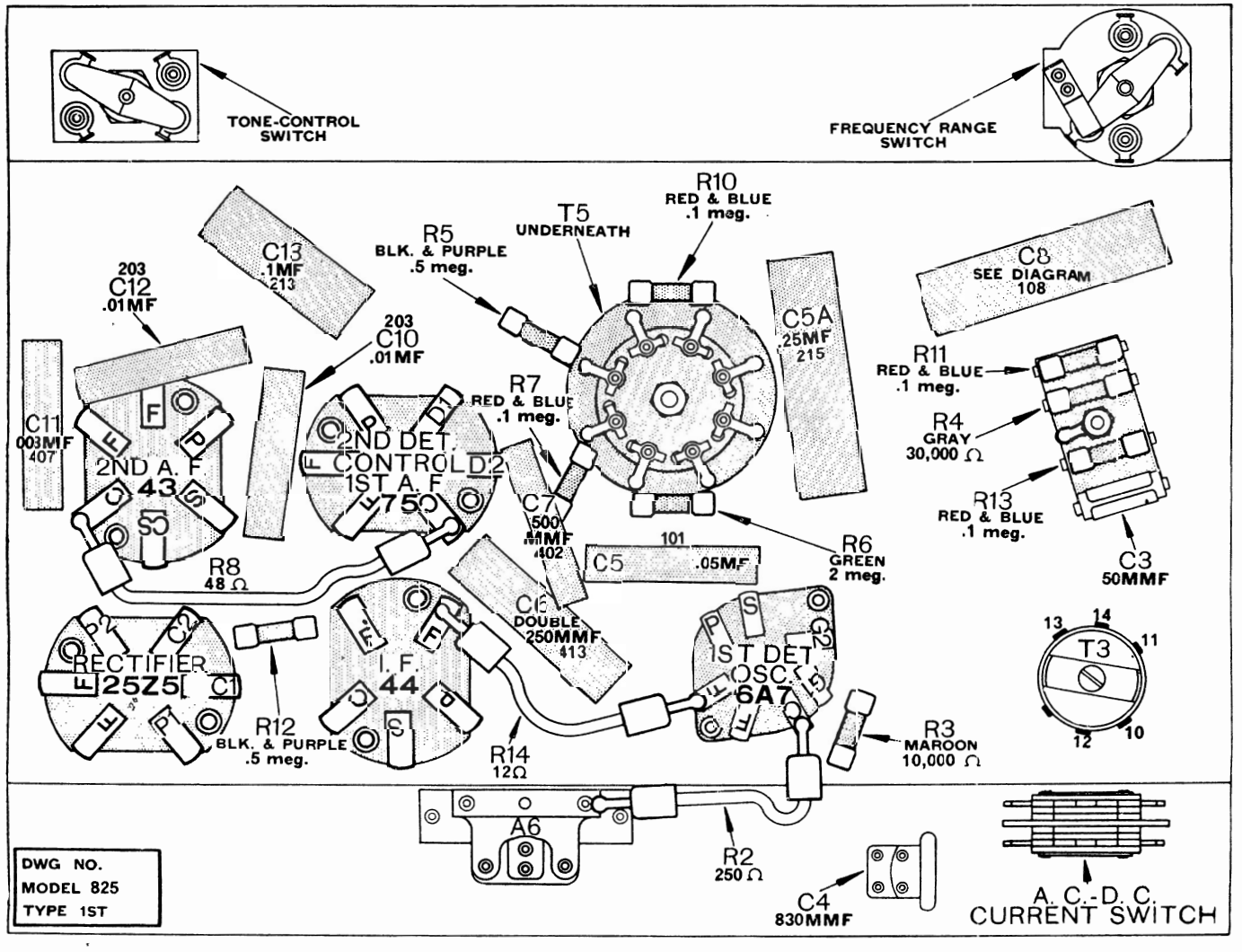
MODEL 825 (A. C.—D. C.)

(I. F. = 264 KC.)



Trimmers A1, A2 and A3 are adjusted at 1500 KC.

A4, A5 and A6 are adjusted at 264 KC.



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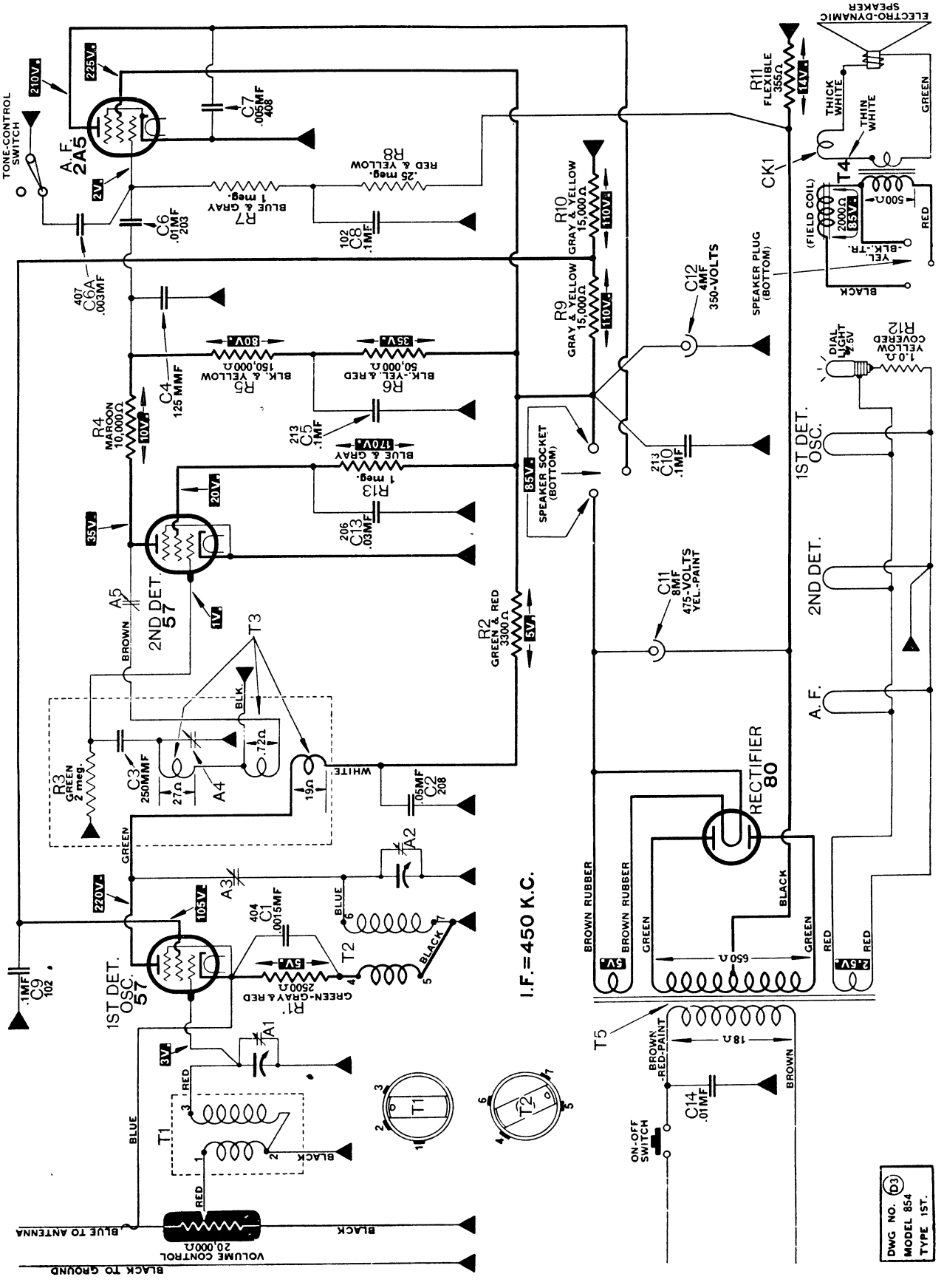
MODEL 854

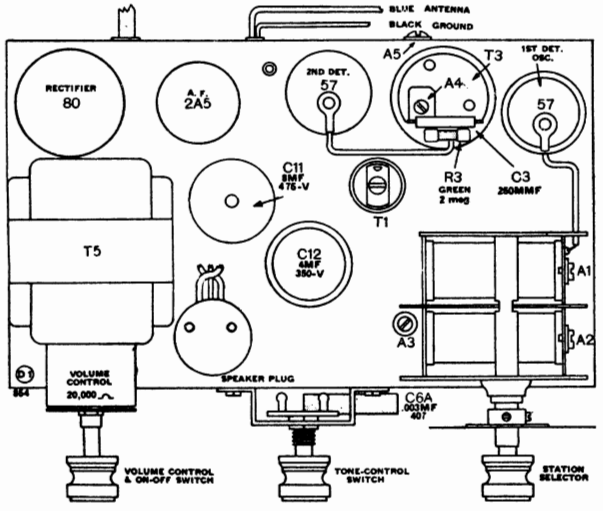


ATWATER KENT MFG. CO.

ADJUSTING TRIMMERS, MODEL 854

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 450 KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter, with the condenser A5 turned well out in counter-clockwise direction (when facing rear of chassis). Peak the I. F. trimmers A3 and A4 for maximum output. Now turn the regenerative control condenser "in" (clockwise from rear of chassis) until a "squeal" or audio howl indicating oscillation of the I. F. stage, then back off about one-quarter turn, or until the audio howl stops. The adjustments of the I. F. trimmers should again be checked for peak—*i. e.*, the peaking procedure and adjustment of the regenerative condenser should be repeated until maximum output is obtained.



R. F. TRIMMERS.

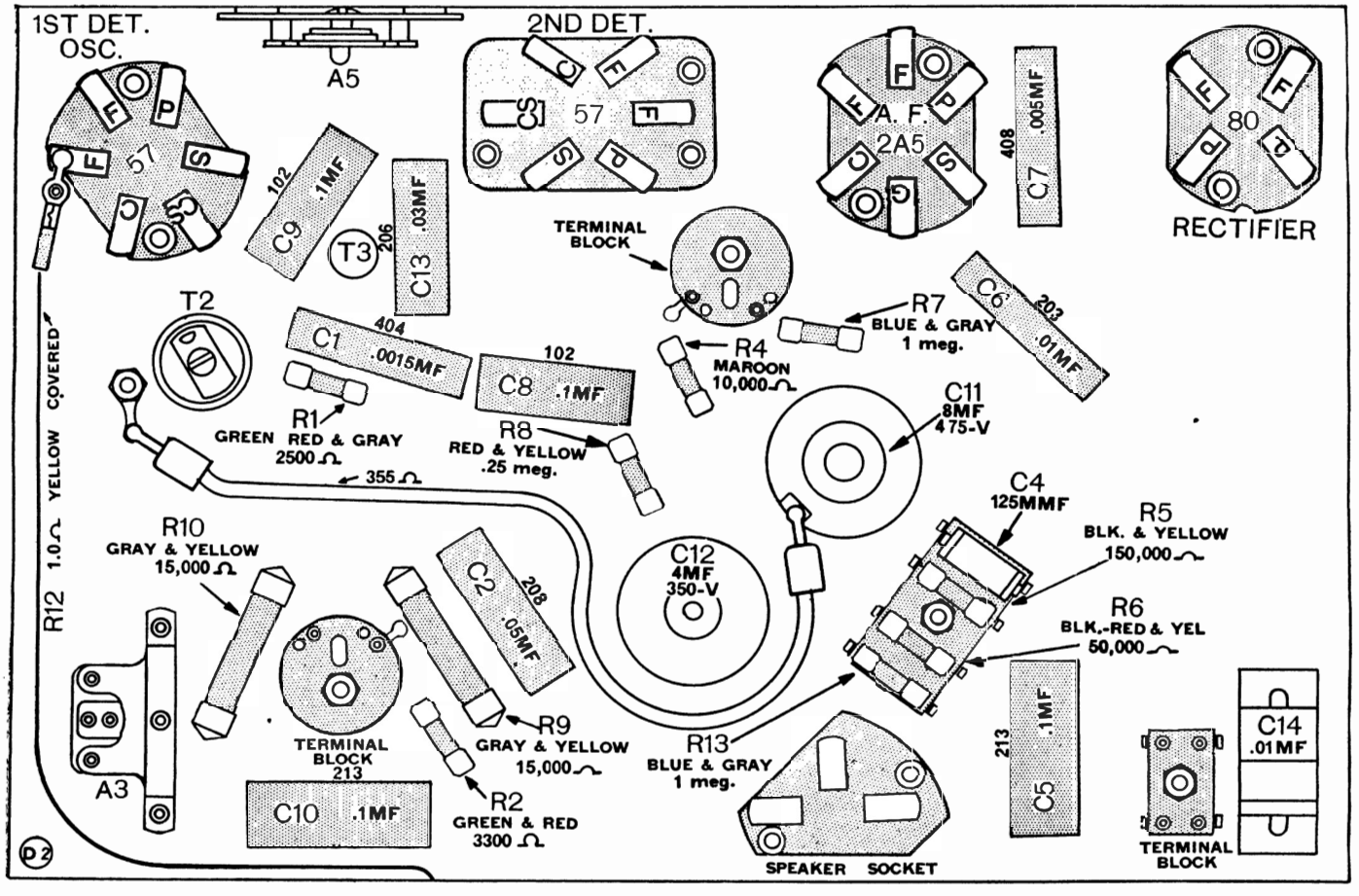
Check the dial setting by turning the gang condenser to maximum position and observing, by means of steel scale held vertically over the condenser shaft axis, whether the 540 KC mark on the dial is perpendicular to a line along the top of the condenser frame in back of the dial, as shown in illustration. Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws. Tune the oscillator to 1500 KC and turn the tuning knob of the set to a dial mark half way between 140 and 150 and perpendicular to a line along the top of the condenser frame. (Determined as explained in setting dial at 540 KC.) Peak the trimmers A1 and A2 for maximum output. Retune oscillator and set to 1100 KC and check regenerative condenser A5 adjustment for maximum sensitivity—*i. e.*, one-quarter turn below audio howl. If oscillation occurs at any other point on the dial after the above adjustments, it will be necessary to again turn back a fraction of a turn on the condenser A5.

Note.—1st-detector grid clip must be inside of shield can when adjusting the R. F. trimmers.

Trimmers A1 and A2 are adjusted at 1500 KC.

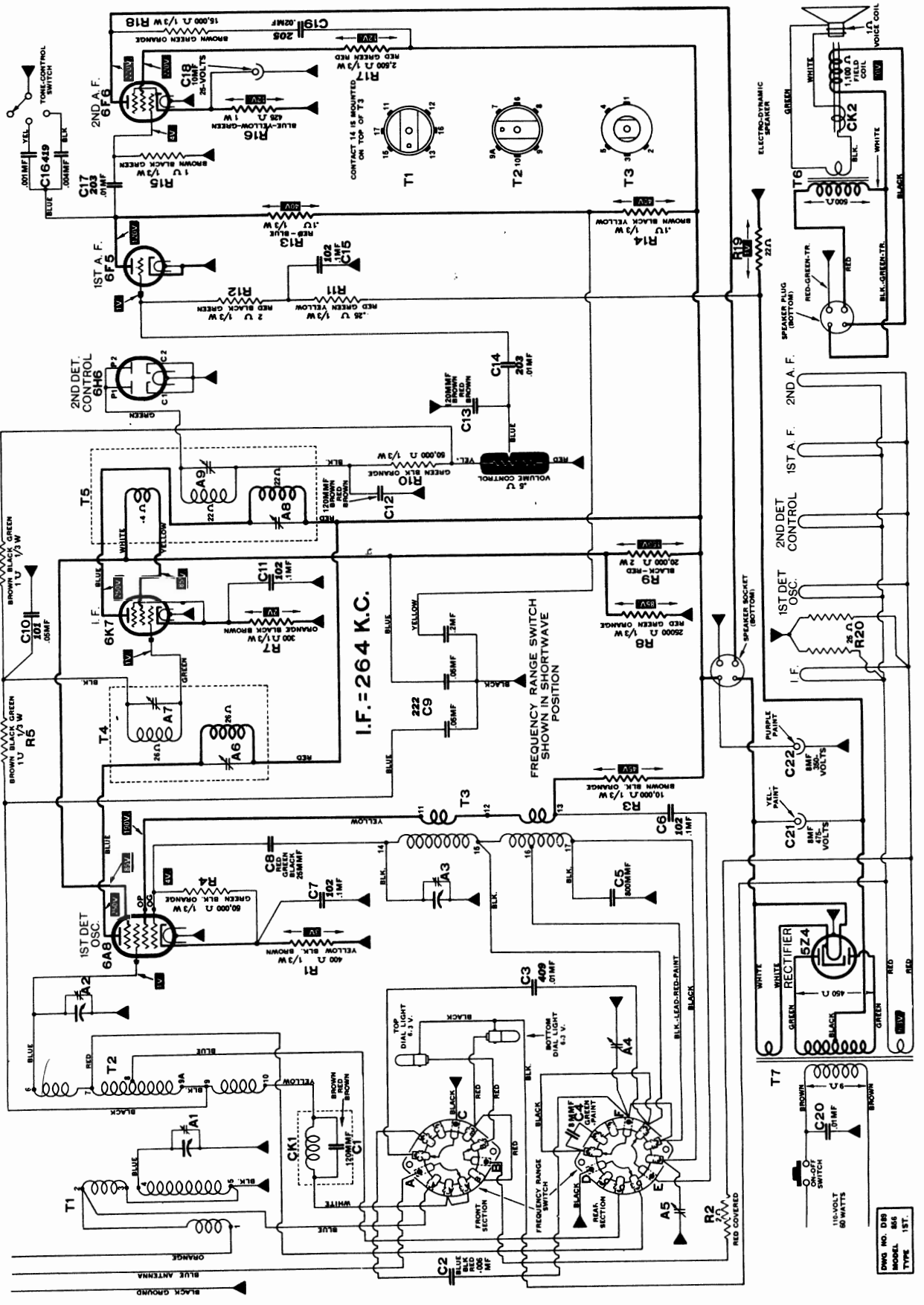
Trimmers A3 and A4 are adjusted at 450 KC.

Trimmer A5 controls sensitivity, and is adjusted in accordance with instructions at about 1100 KC.



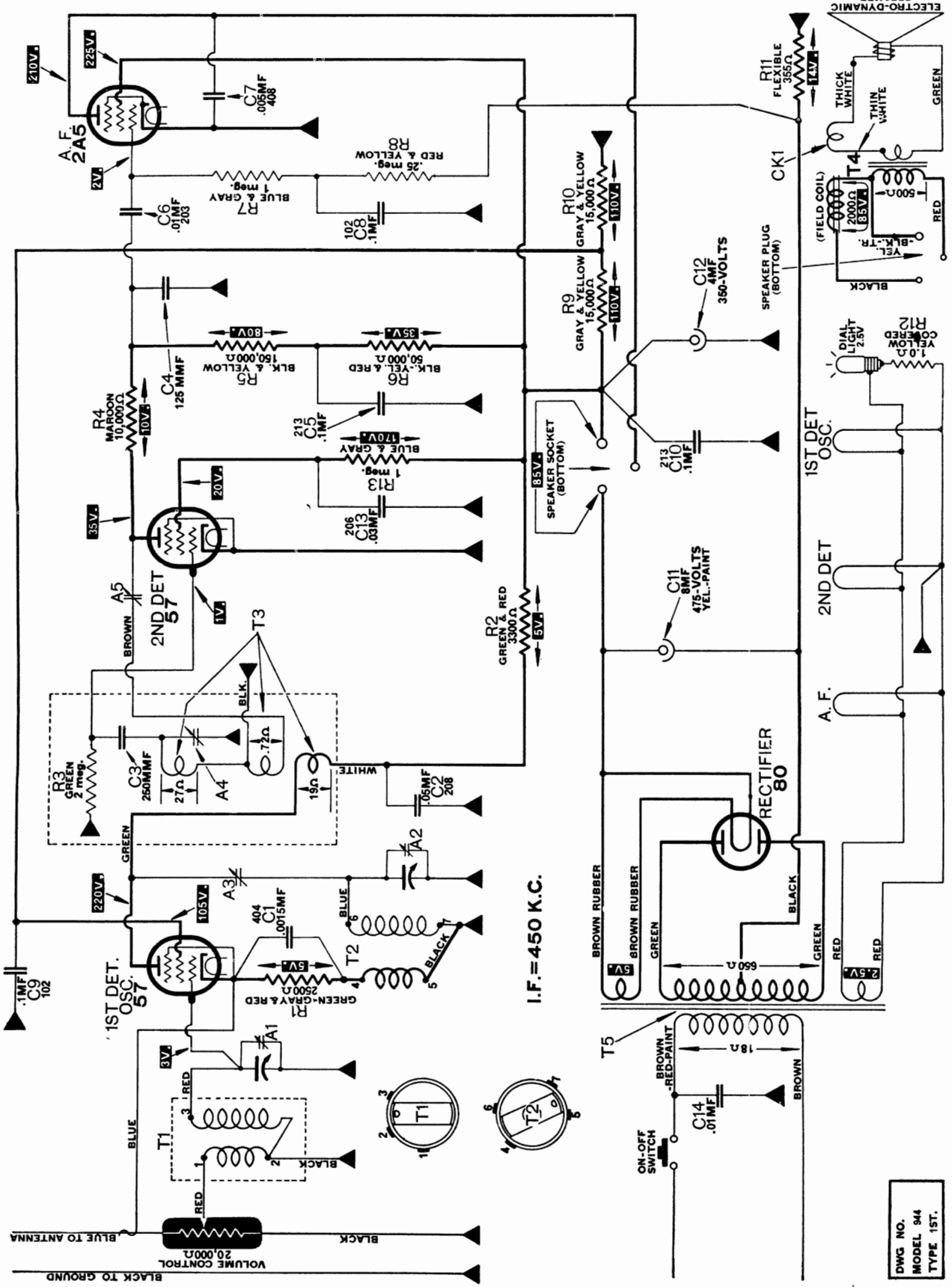
ATWATER KENT MFG. CO.

MODELS 856 AND 976 (Early Type)



ATWATER KENT MFG. CO.

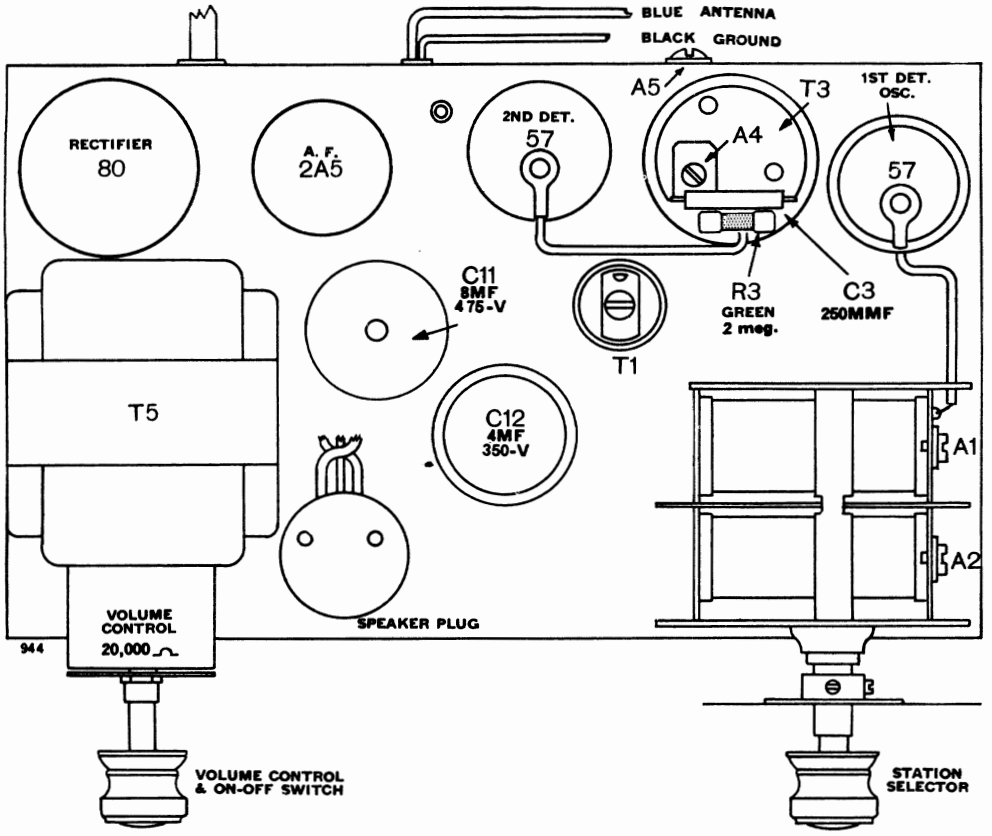
MODEL 944



ATWATER KENT MFG. CO.

MODEL 944

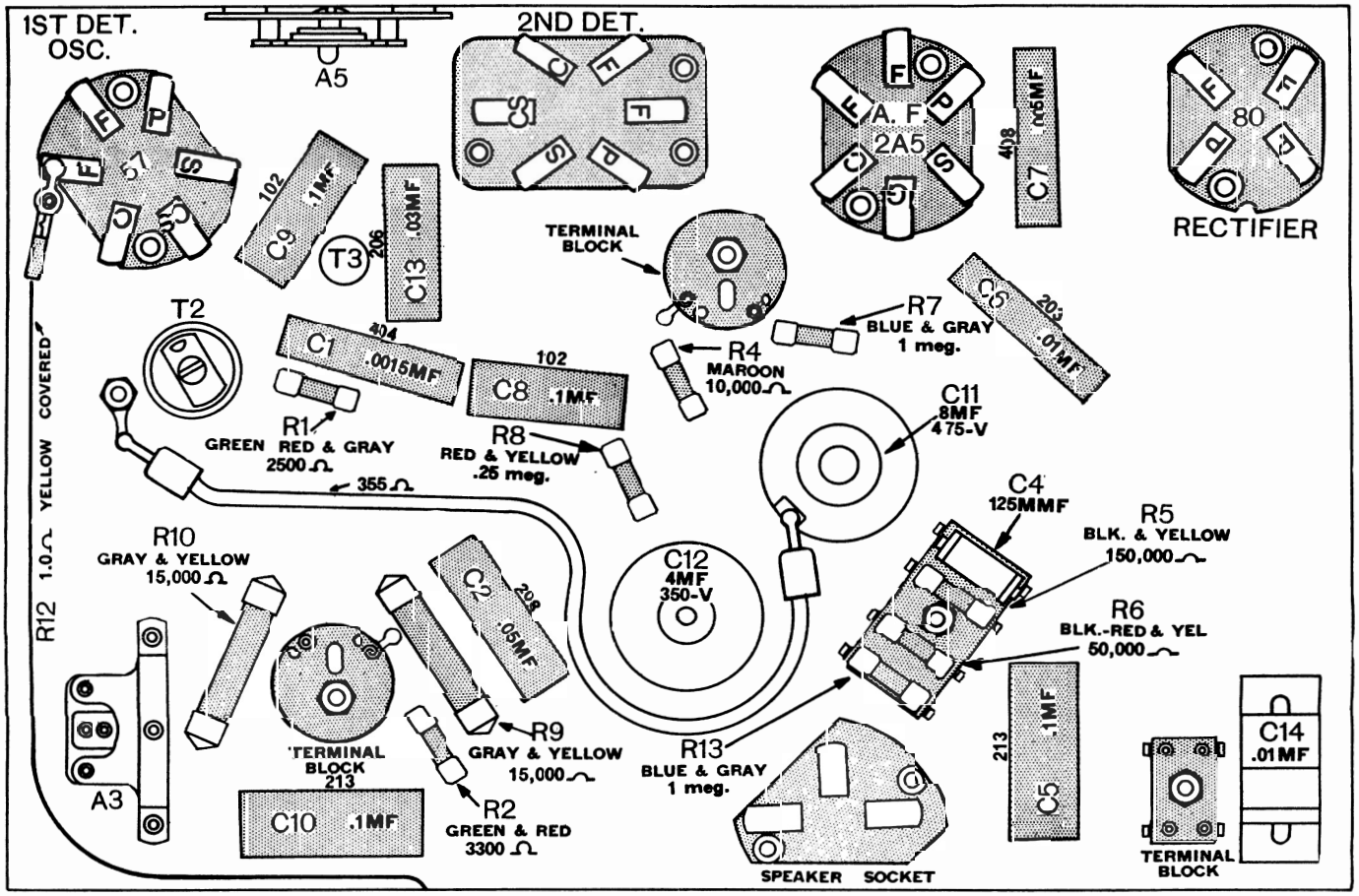
(I. F. = 450 KC.)



Trimmers A1 and A2 are adjusted at 1500 KC.

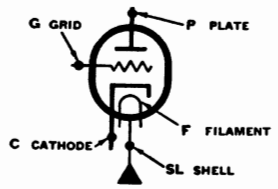
Trimmers A3 and A4 are adjusted at 450 KC.

Trimmer A5 controls sensitivity, and is adjusted in accordance with instructions at about 1100 KC.

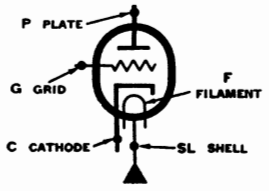


ATWATER KENT MFG. CO.

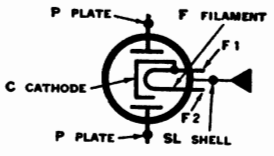
SYMBOLS AND SOCKETS FOR NEW METAL TUBES



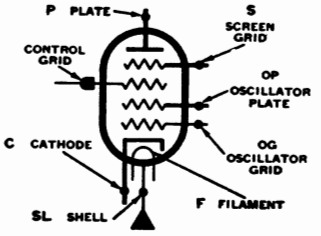
6C5
DETECTOR AMPLIFIER TRIODE



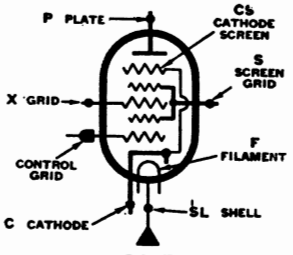
6D5
POWER AMPLIFIER TRIODE



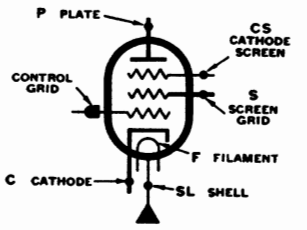
5Z4
FULL-WAVE RECTIFIER



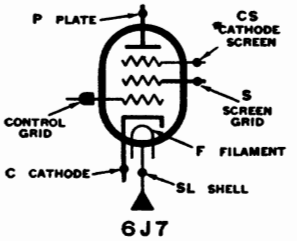
6A8
PENTAGRID CONVERTER



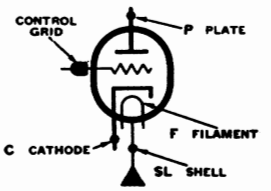
6L7
PENTAGRID MIXER AMPLIFIER



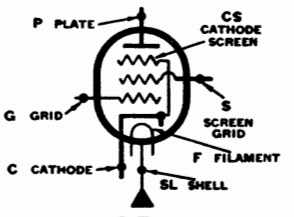
6K7
TRIPLE-GRID
SUPER-CONTROL AMPLIFIER



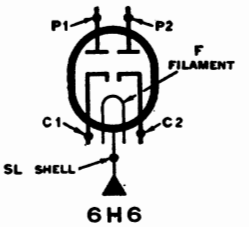
6J7
TRIPLE-GRID
DETECTOR AMPLIFIER



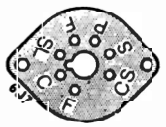
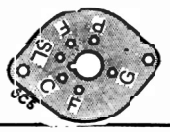
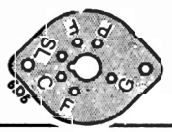
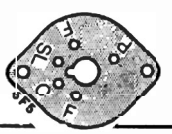
6F5
HIGH-MU TRIODE

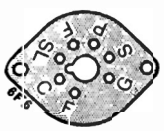
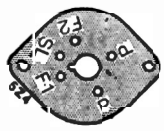


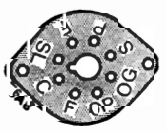
6F6
POWER-AMPLIFIER
PENTODE



6H6
TWIN DIODE



INTERMEDIATE FREQUENCIES OF ATWATER KENT SUPERHETERODYNE RECEIVERS

Model	IF KC
H	130
80	130
80-F	130
82	130
82-F	130
82-D	130
82-Q	130
83	130
83-F	130
84	130
84-F	130
84-D	130
84-Q	130
85	130
85-F	130
85-Q	130
86	130
86-F	130
87	130
87-D	130
89	130
89-F	130
89-P	130
90	130
90-F	130
91	260
91-B	260
91-C	260
92	130
92-F	130
93	1000
94	130

Model	IF KC
94-F	130
96	130
96-F	130
99	130
99-F	130
99-P	130
112	472½
135-Z	264
145	264
155	262½
*165	262½
**165	264
165-Q	264
185	264
185-A	264
188	130
188-F	130
206	472½
206-D	472½
215-Z	264
217	264
217-D	264
228	130
228-F	130
228-D	130
228-Q	130
246	262½
260	130
260-F	130
266	262½
275	264
286	472½

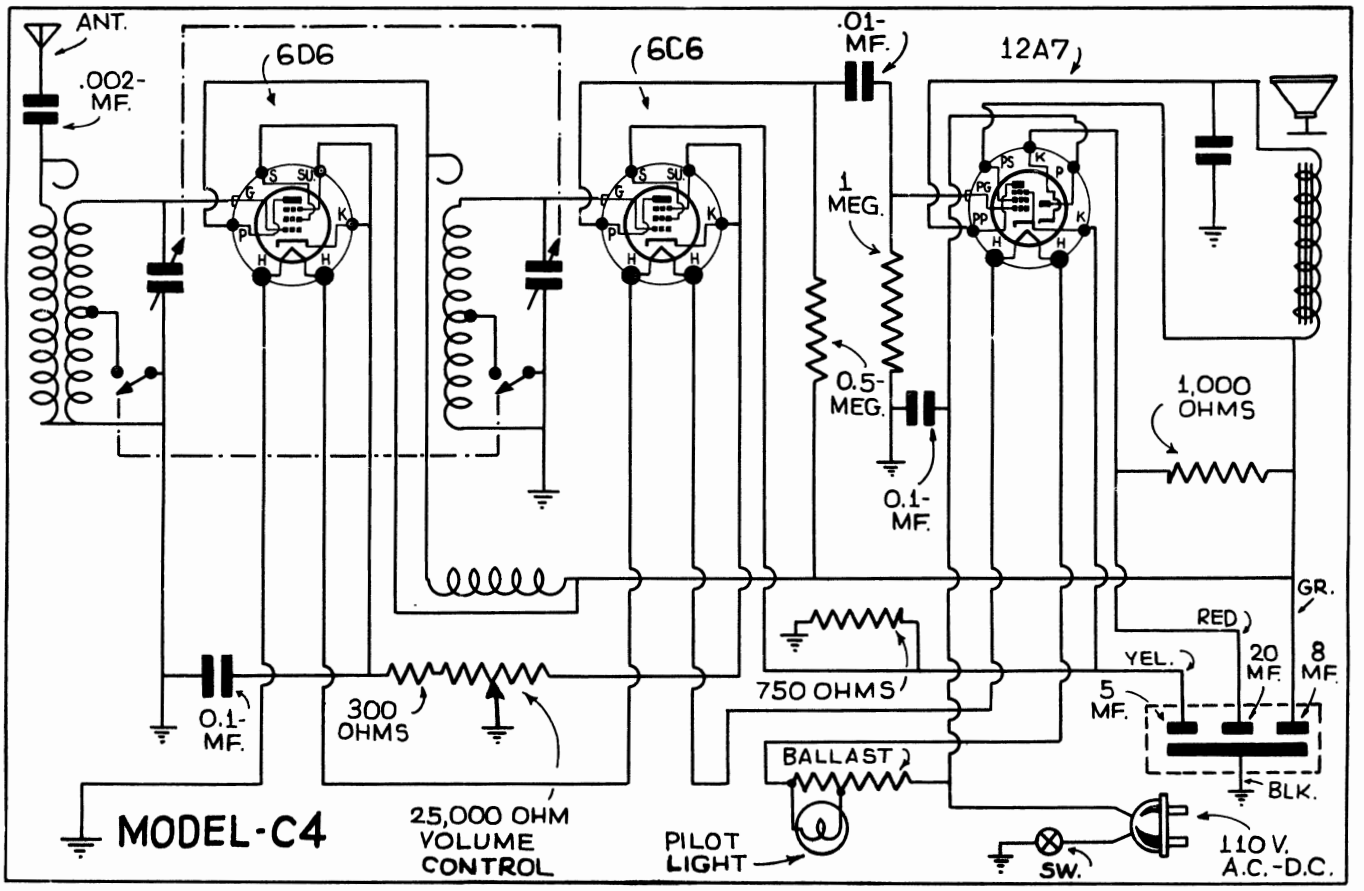
Model	IF KC
310	130
318	472½
325	264
356	472½
376	472½
376-D	472½
385-Q	264
387	264
424	264
425	264
427	264
427-D	264
427-Q	264
447	472½
448	130
465-Q	264
469	130
469-F	130
469-D	130
469-Q	130
475	264
480	472½
487	472½
509	472½
510	130
511	472½
525	264
525-Q	264
534	450
555	262½
558	130
558-D	130

Model	IF KC
558-Q	130
559	472½
567	130
567-F	130
577	472½
612	130
625-Q	264
627	130
636	262½
655-Q	264
665	264
666	264
667	264
667-D	264
708	472½
711	472½
735	264
756	262½
756-B	262½
768-Q	472½
776	264
788	472½
808	472½
808-A	472½
812	130
816	264
825	264
854	450
926	264
936	264
944	450
978-Q	472½

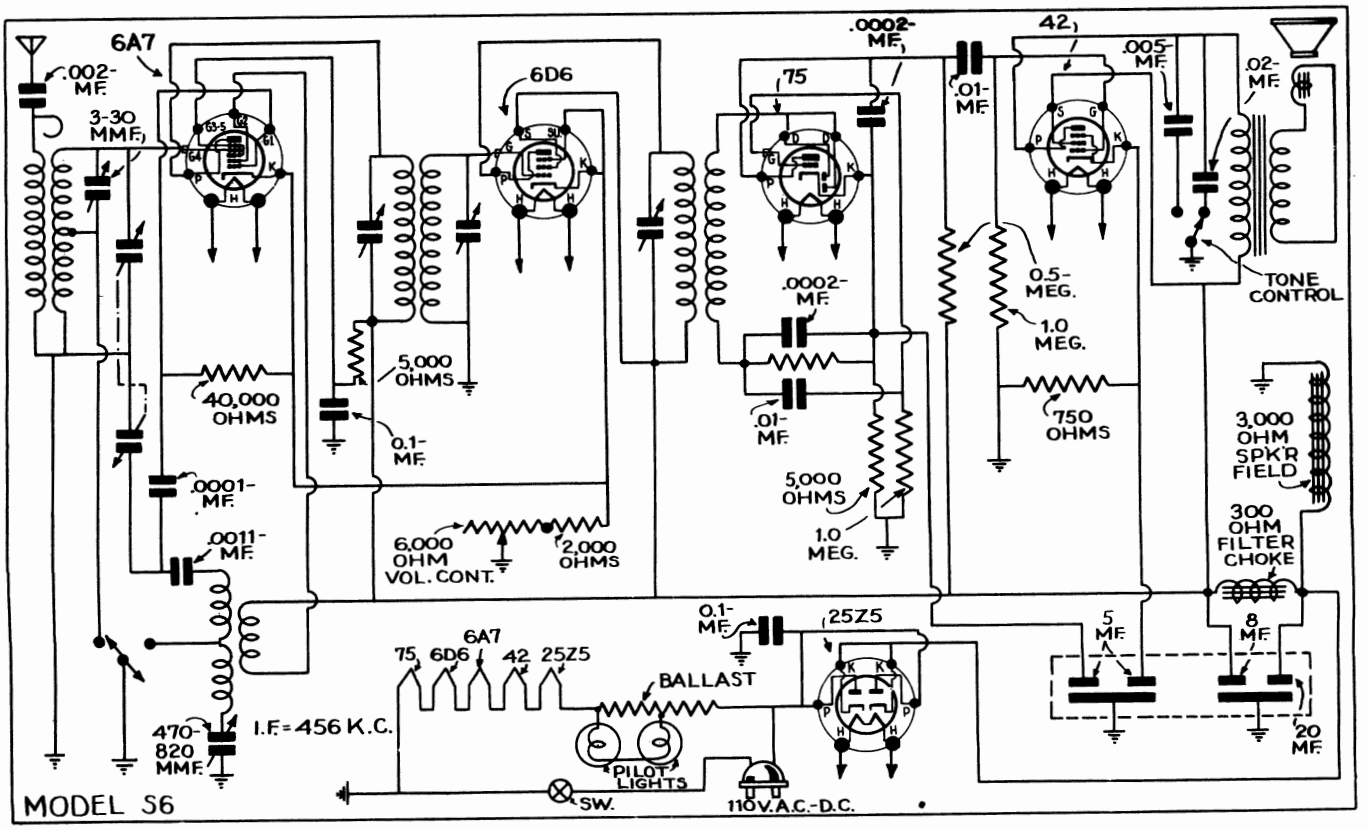
* Early. ** Late.

AUTOMATIC RADIO MFG. CO., Inc.

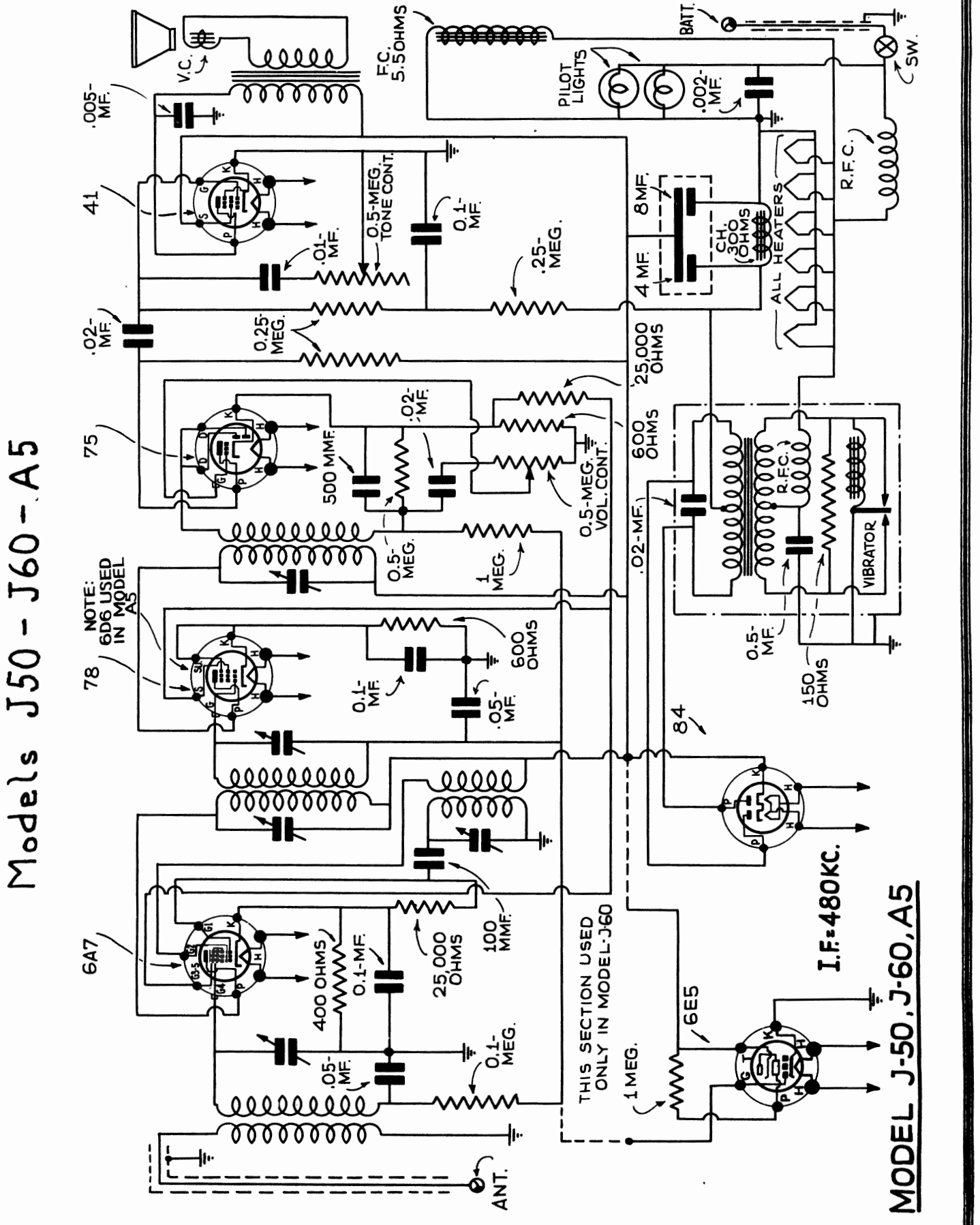
Model C4



Model S6



AUTOMATIC RADIO MFG. CO., Inc.



AUTOMATIC RADIO MFG. CO., Inc.

Model J-80 Auto Radio

ALIGNMENT PROCEDURE

I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 input and connect an output meter to the speaker output. Using a weak signal tune the two I. F. condensers on the composite coil and the two I. F. condensers on the output I. F. coil for maximum response.

Connect the signal generator set at 1400kc to the antenna lead using a dummy antenna of 150 mmf Tune the set by means of the dial to 1400kc position. Adjust oscillator trimmer for this frequency. Then trim RF stage and antenna stage for maximum response. Repeating the alignment may result in improved sensitivity.

HINTS ON MOTOR NOISE

This receiver incorporates the latest advances in the radio art relative to "Suppressorless" operation. In general, the use of the generator condenser and distributor suppressor supplied with the receiver are sufficient to eliminate or reduce the motor noise to a satisfactory level in the average car. However, there may be "stubborn" cases requiring further attention. In general, ignition noise may be caused by "antenna pick-up" or chassis pick-up". To check for chassis pick-up, disconnect antenna from set, shield exposed piece of antenna wire (i.e. tape bare end and push back under shield) if noise ceases, the ignition noise is being picked up by the antenna. If the noise continues, it is due to chassis pick-up. This will respond to conventional treatment i.e. separation of low tension and high tension leads, bonding, ammeter-by-pass, etc. Antenna pick-up may be caused generally by insufficient shielding on antenna lead-in, poor grounding of shield, dome light interference, etc., poor grounding of engine, frame rods, body, etc.

When the motor is running the entire electrical system of the automobile including the ignition system and the generator may cause interference.

Ignition interference which comes from the ignition coil, distributor, spark plugs, and from all the wires connecting these may be recognized by a steady tick-tick-tick. This source of interference may be eliminated entirely or reduced to where it is not noticeable on reception by the placing of suppressors on each of the spark plugs and one on the center lead of the distributor—the one running from the distributor to the coil.

Interference caused by the generator is due to the commutator ripple and may be recognized by the high-pitched hum or buzz which increases as the motor is raced. This may be suppressed by the use of a condenser connected from the cutout terminal, which is mounted on top of the generator, to the frame of the generator.

In the majority of cases, the accomplishment of the above will suppress the interference caused by the motor, so that stations may be received clearly while car is in motion. However, in rare cases, where due to poor connections in the ignition system, faulty spark plugs or distributor or other such causes, interference is noticed, it will be necessary to trace the disturbance and filter properly. Should this occasion arise, the following suggestions are offered.

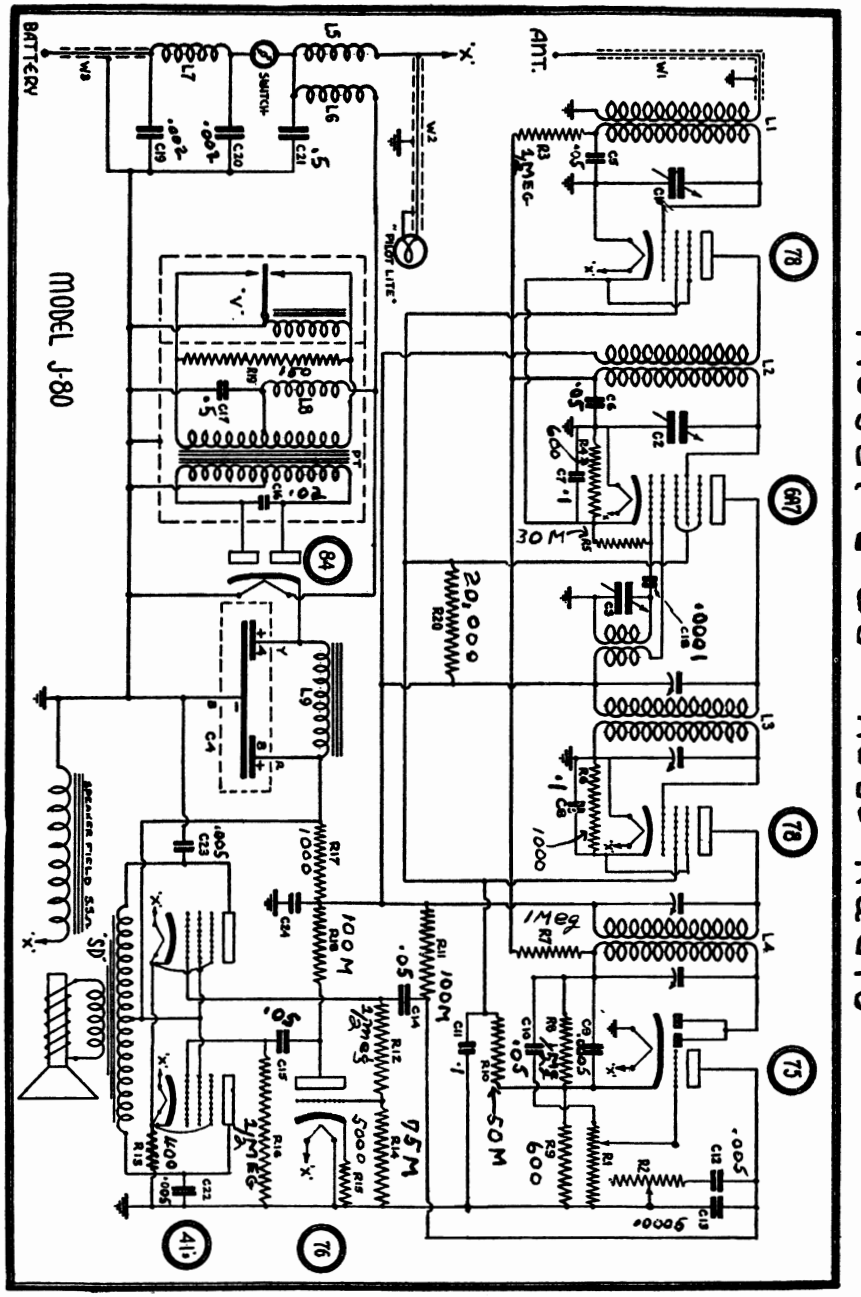
1. Clean and adjust points on spark plugs so that gap is approximately the same as when they were new (.025" to 0.30").
2. Clean and adjust points on the distributor.
3. Try the placing of a condenser from the breaker terminal of the distributor to ground.
4. Try placing of condenser from either low tension side of ignition to ground.
5. Try placing of condenser from terminal on ignition switch to ground.
6. Try grounding the shielded cable in various places.
7. If the ignition coil is mounted on the dash near the radio receiver, try mounting the coil on the motor block so that the high tension lead may be shortened.
8. Remove the antenna lead from the receiver. If the interference decreases greatly, or is eliminated entirely, it is possible that the antenna is picking up the interference. This may be overcome by shielding the antenna lead-in up to where it connects to the antenna and then grounding the shielding.

Dome lights in closed cars are a frequent source of trouble. Try condenser from either side of switch to ground.

Noises are sometimes developed in body and chassis, due to metal parts rubbing together. This can be located by allowing machine to coast with motor shut off. Tightening body bolts and bonding metal parts which are not well grounded will eliminate this type of noise.

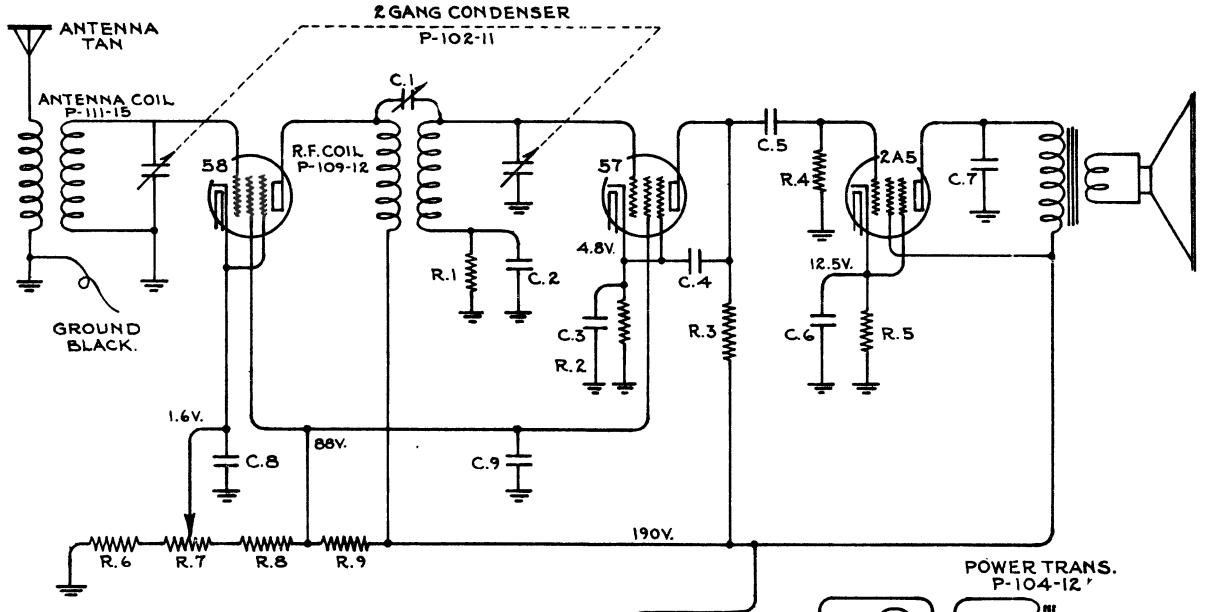
Brake static developed in the brakes may be located in the above manner and eliminated by having the brakes cleaned and adjusted. Also control rods or cables should make good contact to car chassis.

If interference from vibrator is encountered, it can be eliminated by proper ground connections on set. Shielding of antenna lead-in with low capacity shield and proper bonding of "A" cable.



BELMONT RADIO CORP.

MODEL 401



Nº	VALUE	Nº	VALUE
C.1:-	2-20 $\mu\mu f$ P-124-12	R.1:-	2 MEG. 1/5W.
C.2:-	.05 X 200V.	R.2:-	25M 1/5W.
C.3:-	.25 X 200V.	R.3:-	750M 1/5W.
C.4:-	.0005 MICA	R.4:-	500M 1/5W.
C.5:-	.01 X 400V.	R.5:-	500 1/2W.
C.6:-	4.0 MFD. X 20V.	R.6:-	100 1/5W.
C.7:-	.01 X 400V.	R.7:-	10M VOL. CONTROL P-101-17
C.8:-	.05 X 200V.	R.8:-	10M 1/5W.
C.9:-	.25 X 200V.	R.9:-	19M 1W.
C.10:-	4.0 MFD. X 200V.		
C.11:-	5.0 MFD. X 250V.		
C.12:-	.006 X 600V.		

NOTE:- CONDENSERS C.2, C.8 ARE DUAL TYPE.
CONDENSERS C.3, C.9, ARE DUAL TYPE.
CONDENSERS C.6, C.10, C.11 IN ONE UNIT P-119-10
RESISTOR R.6 IN VOL. CONTROL P-101-17

NOTE:- NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL.

MODEL 401

SERVICE MANUAL FOUR TUBE A.C. - T.R.F. RECEIVER

105-125 Volts, 60 Cycle Alternating Current - 40 Watts

FOR VOLTAGES IN EXCESS OF 125, A SPECIAL TRANSFORMER IS REQUIRED, ALSO FOR 25 CYCLES, A UNIVERSAL TRANSFORMER IS NOT AVAILABLE FOR THIS MODEL.

540 - 1720 Kilocycles.

The tube complement of this chassis is as follows:

1 Type 58 - remote cut-off pentode as R.F. amplifier.
1 Type 57 - pentode as a detector.
1 Type 2A5 - pentode output tube.
1 Type 80 - high vacuum rectifier.

SERVICE NOTES

Should it ever become necessary or desirable to realign this receiver the proper procedure is as follows:

Before attempting any adjustment, the set must be disconnected from the power supply, the tubes should be checked, aerial inspected and connections cleaned if necessary. To remove chassis from cabinet, pull off volume, selector and switch knobs and remove the three bolts which fasten chassis to cabinet.

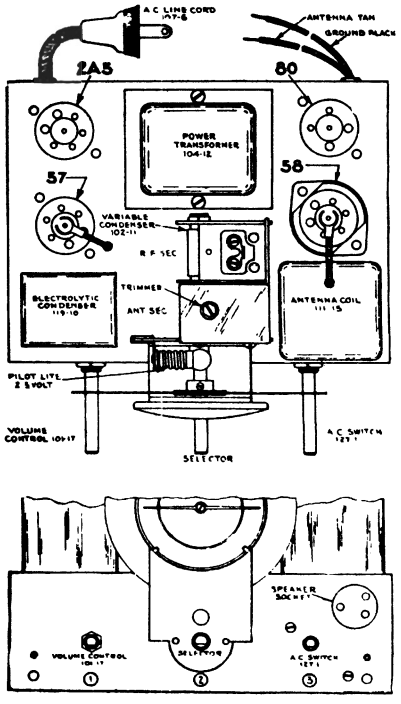
ALIGNMENT:

1. With an external oscillator set at 1720 Kilocycles connected to the grid of the type 58 R.F. tube (cap at top of tube) and with the variable condenser at its minimum capacity position, plates entirely out of mesh, adjust trimmer on R.F. coil (accessible from the under side of the chassis) to resonance. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter to the plate and screen terminals of the type 2A5 output tube.
2. Re-set external oscillator to 1400 Kilocycles and connect in series with a 50 mmfd. condenser, to the tan antenna lead and black ground lead and adjust the antenna trimmer (front section of variable condenser - see illustration) to resonance. When making this adjustment, rock the condenser back and forth with the selector knob while adjusting the trimmer until maximum output is obtained.
3. Bend plates of antenna, front section of condenser, to resonance with external oscillator set at 1200, 1000, 800, 600 Kilocycles. Output should be fairly uniform over the entire band, dropping off slightly at the higher frequencies.

NOTES:

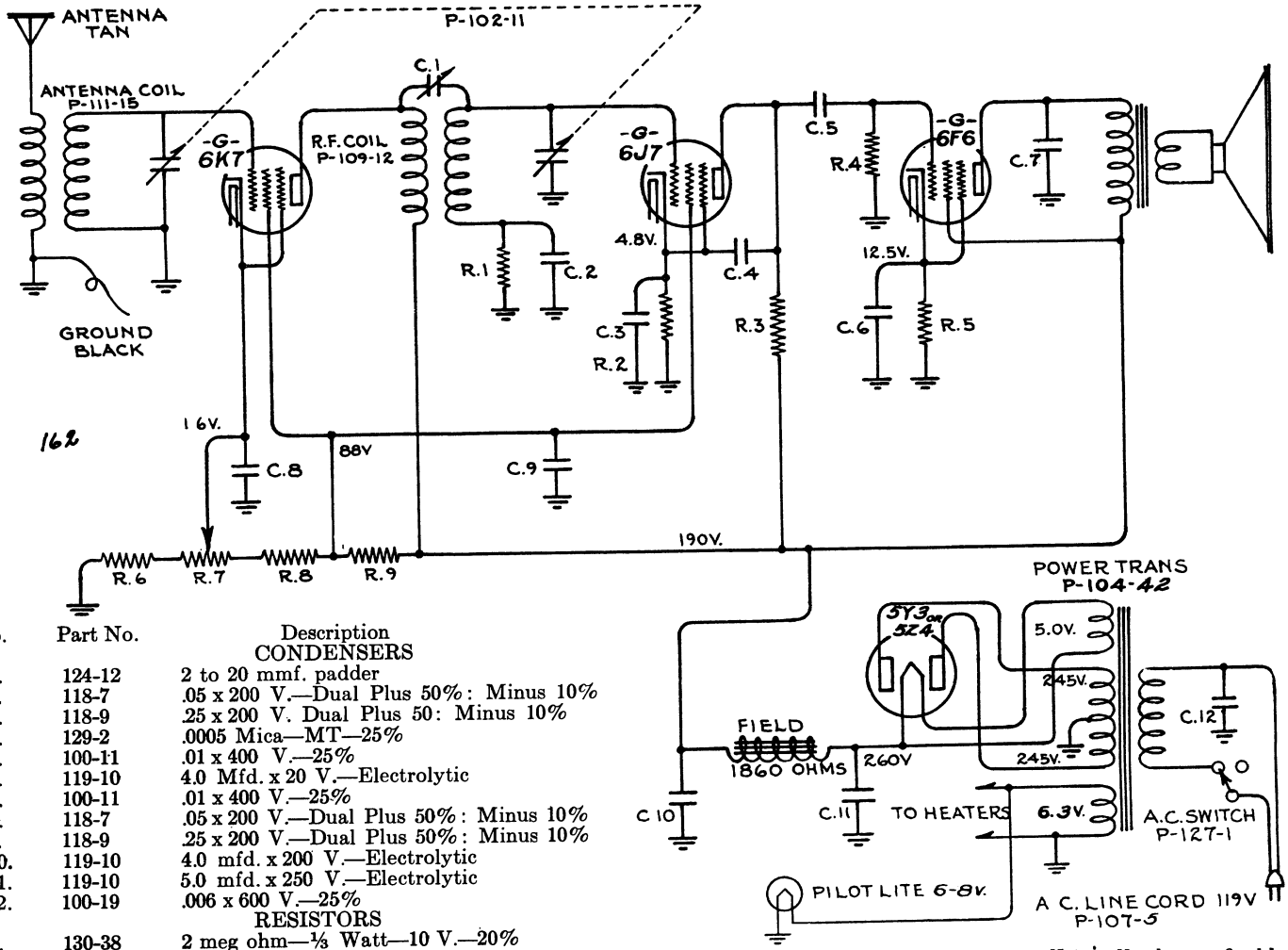
The pilot light used is a 2.5 volt, type T-11-G3½. It can be replaced without removing the chassis from the cabinet, by removing the clip which fastens the assembly to the gang condenser (see illustration).

Voltages from chassis ground to different points are indicated on the schematic circuit diagram and should be measured with a voltmeter having a resistance of 1000 ohms per volt.



BELMONT RADIO CORP.

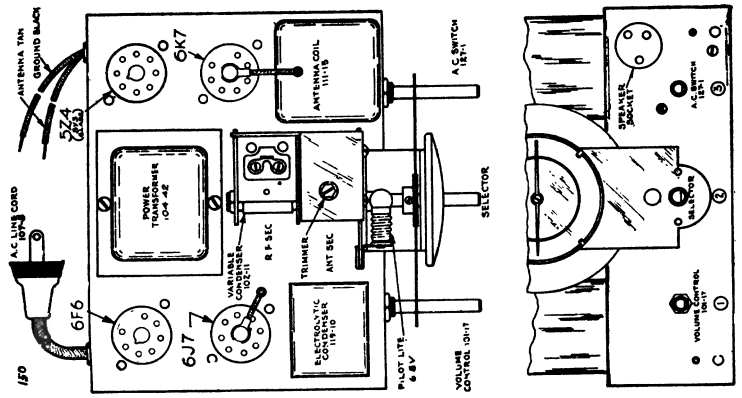
MODEL 401 - Series B



No.	Part No.	Description
		CONDENSERS
C1.	124-12	2 to 20 mmf. padder
C2.	118-7	.05 x 200 V.—Dual Plus 50%: Minus 10%
C3.	118-9	.25 x 200 V. Dual Plus 50: Minus 10%
C4.	129-2	.0005 Mica—MT—25%
C5.	100-11	.01 x 400 V.—25%
C6.	119-10	4.0 Mfd. x 20 V.—Electrolytic
C7.	100-11	.01 x 400 V.—25%
C8.	118-7	.05 x 200 V.—Dual Plus 50%: Minus 10%
C9.	118-9	.25 x 200 V.—Dual Plus 50%: Minus 10%
C10.	119-10	4.0 mfd. x 200 V.—Electrolytic
C11.	119-10	5.0 mfd. x 250 V.—Electrolytic
C12.	100-19	.006 x 600 V.—25%
		RESISTORS
R1.	130-38	2 meg ohm—⅓ Watt—10 V.—20%
R2.	130-1	25M ohm—⅓ Watt—10 V.—20%
R3.	130-37	750M ohm—⅓ Watt—100 V.—20%
R4.	130-3	500M ohm—⅓ Watt—100 V.—20%
R5.	130-70	500 ohm—⅓ Watt— 10 V.—10%
R6.	101-17	100 ohm—⅓ Watt—in Vol. Control
R7.	101-17	10M ohm—Volume control
R8.	130-36	10M ohm—⅓ Watt—50 V.—20%
R9.	130-34	19M ohm— 1 Watt—100 V.—20%

Note: Condensers C.2, C. 8 are dual type.
Condensers C.3, C.9, are dual type.
Condensers C.6, C.10, C.11 in one unit P-119-10.
Resistor R.6 in vol. control P-101-17.

Note:—Numbers prefixed by letter "P" are part numbers. Voltages taken from points indicated to chassis ground. Volume control on full.



All voltages are to be measured with 119 volts on the primary of the power transformer.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone

ALIGNING INSTRUCTIONS

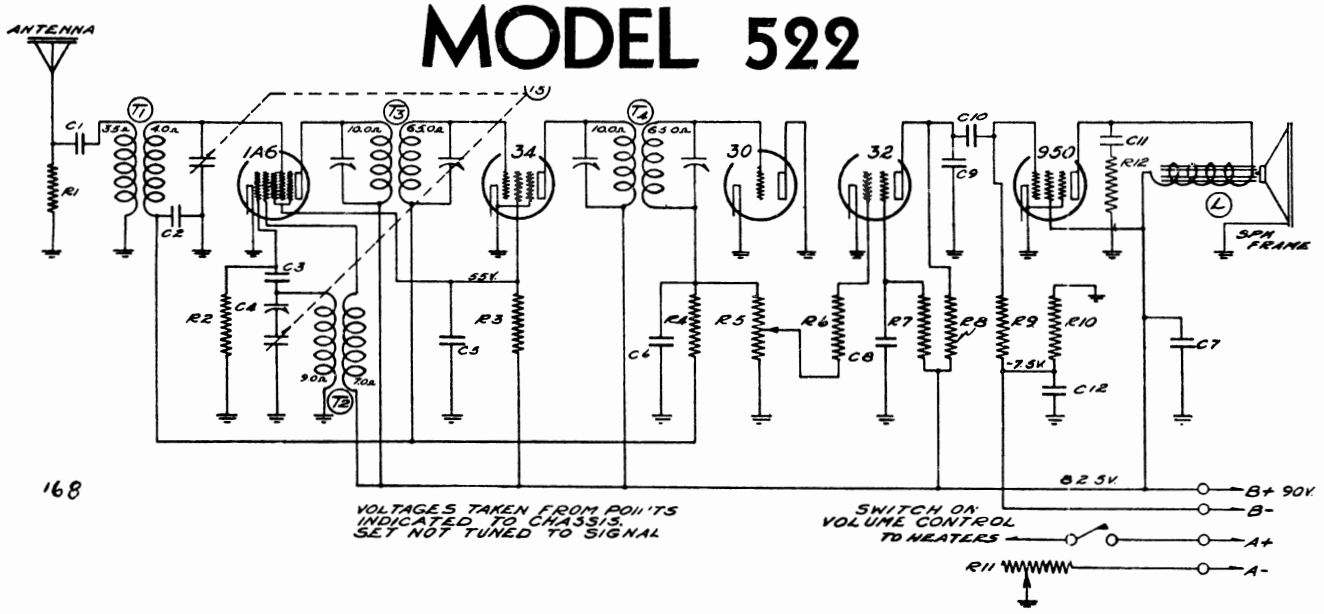
1. With an external oscillator set at 1720 kilocycles connected to the grid of the type 6K7 R. F. tube (cap at top of tube) and with the variable condenser at its minimum capacity position, plates entirely out of mesh, adjust trimmer on R. F. coil (accessible from the under side of the chassis) to resonance.

2. Re-set external oscillator to 1400 kilocycles and connect in series with a 50 mmfd. condenser, to the tan antenna lead and black ground lead and adjust the antenna trimmer (front section of variable condenser—see illustration) to resonance. When making this adjustment, rock the condenser back and forth with the selector knob while adjusting the trimmer until maximum output is obtained.

3. Bend plates of antenna, front section of condenser, to resonance with external oscillator set at 1200, 1000, 800, 600 kilocycles. Output should be fairly uniform over the entire band, dropping off slightly at the higher frequencies.

BELMONT RADIO CORP.

MODEL 522



No.	Part No.	Description
		RESISTORS
R1	130-17	10M Ohm-⅛ Watt - 20% - 20 Volt - Carbon
R2	130-52	50M Ohm-⅛ Watt - 20% - 10 Volt - Carbon
R3	130-17	10M Ohm-⅛ Watt - 20% - 20 Volt - Carbon
R4	130-38	2 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
R5	101-43	1 Meg Ohm Volume Control and Switch
R6	130-52	50M Ohm - ⅛ Watt - 20% 10 Volt - Carbon
R7	130-19	1 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
R8	130-9	200M Ohm - ⅛ Watt - 20% - 20 Volt - Carbon
R9	130-19	1 Meg Ohm - ⅛ Watt - 20% 100 Volt - Carbon
R10	130-93	450 Ohm - ⅛ Watt - 10% 10 Volt - Carbon
R11	101-44	4.75 Ohms - Rheostat
R12	130-52	50M Ohm - ⅛ Watt - 20% 10 Volt - Carbon
		CONDENSERS
C1	100-11	.01 x 400 Volt - 25%
C2	100-22	.05 x 200 Volt - 25%
C3	129-12	.00025 Mica - MT - 20%
C4	124-14	Series Pad
C5	100-9	.05 x 200 Volt - 25%
C6	129-5	.0001 Mica - MT - 20%
C7	100-6	.25 x 200 Volt
C8	100-9	.05 x 200 Volt - 25%
C9	129-2	.0005 Mica - MT - 20%
C10	100-11	.01 x 400 Volt - 25%
C11	100-11	.01 x 400 Volt - 25%
C12	119-22	10.0 Mfd. x 25 Volts - Working Voltage
		PARTS
T1	111-46	Antenna Coil
T2	110-36	Oscillator Coil
T3	108-67	Input I.F. Coil 465 K.C.
T4	108-68	Output I.F. Coil 465 K.C.
T5	102-29	Two Gang Condenser
L	114-19	Six Inch Magnetic Speaker

SERVICE DATA FOR PROFESSIONAL SERVICE MEN

DESCRIPTION

TUBES:

The tube complement of this chassis is as follows:

1 Type 1A6—first detector oscillator.
1 Type 34—I.F. amplifier. 465 K. C.
1 Type 30—second detector. A. V. C.
1 Type 32—audio.
1 Type 950—output.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram, are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

ALIGNING INSTRUCTIONS

CAUTION: No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as run down batteries, defective tubes, poor installations, open or grounded antenna systems, defective condensers and resistors.

In order to properly align this chassis, an oscillator (generator) is necessary.

All adjustments should be made with a non-metallic screw driver.

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-67 and 108-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 950 output tube. Maximum deflection of the volt meter indicates resonance.

Use only enough signal to get a readily readable output.

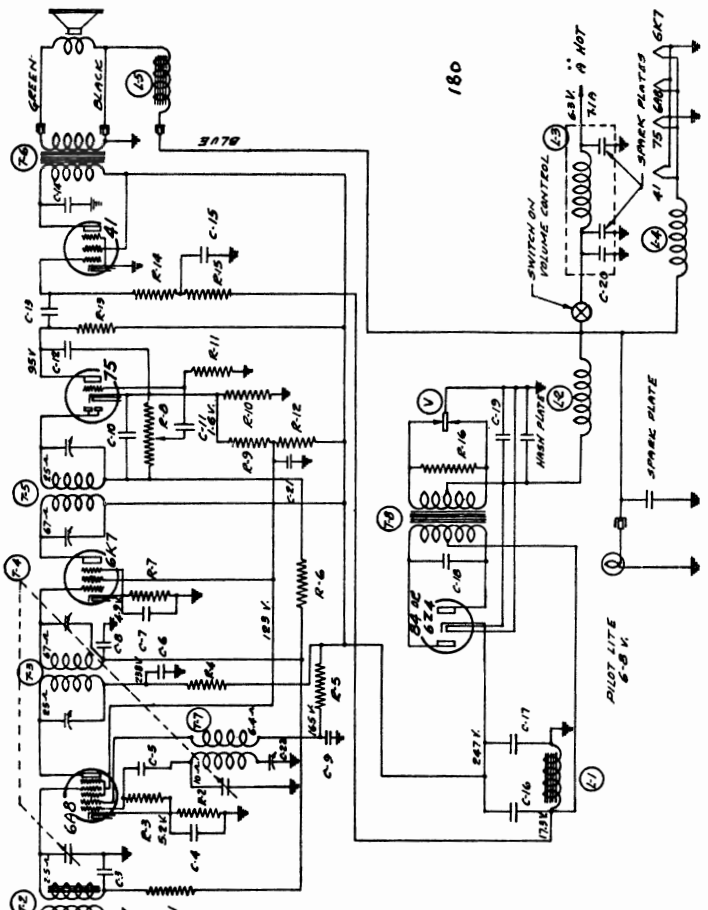
A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

1. Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.
   (a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.
   (b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.
   (c) Re-set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.
   (d) Check for sensitivity at 1400, 1000, 600 K.C. DO NOT BEND PLATES.

BELMONT RADIO CORP.

MODEL 566



	RESISTORS		CONDENSERS		
R1	130-20	100M Ohm—½ Watt—20% 50 Volt—Carbon	C1	129-3	.00002 Mica—"0"—20%
R2	130-79	400 Ohm—½ Watt—10% 10 Volt—Carbon	C2	129-49	.00009 Mica—"0"—5%
R3	130-94	50M Ohm—½ Watt—10% 10 Volt—Carbon—Ins.	C3	100-9	.05x200 Volt
R4	130-23	2M Ohm—½ Watt—20% 10 Volt—Carbon	C4	100-6	.25x200 Volt
R5	130-42	20M Ohm—½ Watt—20% 100 Volt—Carbon—Ins.	C5	129-21	.0002 Mica—"MT"—"0"—20%
R6	130-68	1 Meg Ohm—½ Watt—10% 20 Volt—Carbon	C6	100-1	.1 x400 Volt 50%—10%
R7	130-79	400 Ohm—½ Watt—10% 10 Volt—Carbon	C7	100-33	.1 x200 Volt 50%—10%
R8	101-41	500M Ohm—Volume Control and Switch	C8	100-9	.05x200 Volt 25%—25%
R9	130-106	50M Ohm—½ Watt—10% 100 Volt—Carbon—Ins.	C9	100-1-B	.1 x400 Volt 50%—10%
R10	130-101	600 Ohm—½ Watt—10% 10 Volt—Carbon—Ins.	C10	129-12	.00025 Mica—"MT"—"0"—20%
R11	130-68	1 Meg Ohm—½ Watt—10% 20 Volt—Carbon	C11	100-9	.05 x200 Volt 25%—25%
R12	130-95	12M Ohm—½ Watt—10% 100 Volt—Carbon	C12	129-5	.0001 Mica—"MT"—"0"—20%
R13	130-3	500M Ohm—½ Watt—20% 100 Volt—Carbon	C13	116-15	.05 x400 Volt
R14	130-5	300M Ohm—½ Watt—20% 10 Volt—Carbon	C14	116-15	.007x800 Volt
R15	130-45	250M Ohm—½ Watt—20% 20 Volt—Carbon—Ins.	C15	100-33	.1x200 Volt 50%—10%
R16	130-84	200 Ohm—½ Watt—20% 10 Volt—Carbon—Ins.	C16	119-20	8.0 Mfd. Electrolytic Condenser—350 Working Volts
			C17	119-20	4.0 Mfd. Electrolytic Condenser—350 Working Volts
			C18	100-36	.01x1400 Volt—10%
			C19	100-35	.5 x 200 Volt 50%—10%
			C20	100-35	.5 x 200 Volt 50%—10%
			C21	100-33	.1 x 200 Volt 50%—10%
			C22	124-17	Single Padder J-4-S

NOTE: C-13 and C-14 in one unit—part number 116-15.

ALIGNING INSTRUCTIONS:

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 41 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 tube.
2. Adjust trimmer condensers of output I.F. transformer (No. 108-70) to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer (No. 108-69) to resonance with oscillator, again going over trimmers of output I.F. transformer (No. 108-70). See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

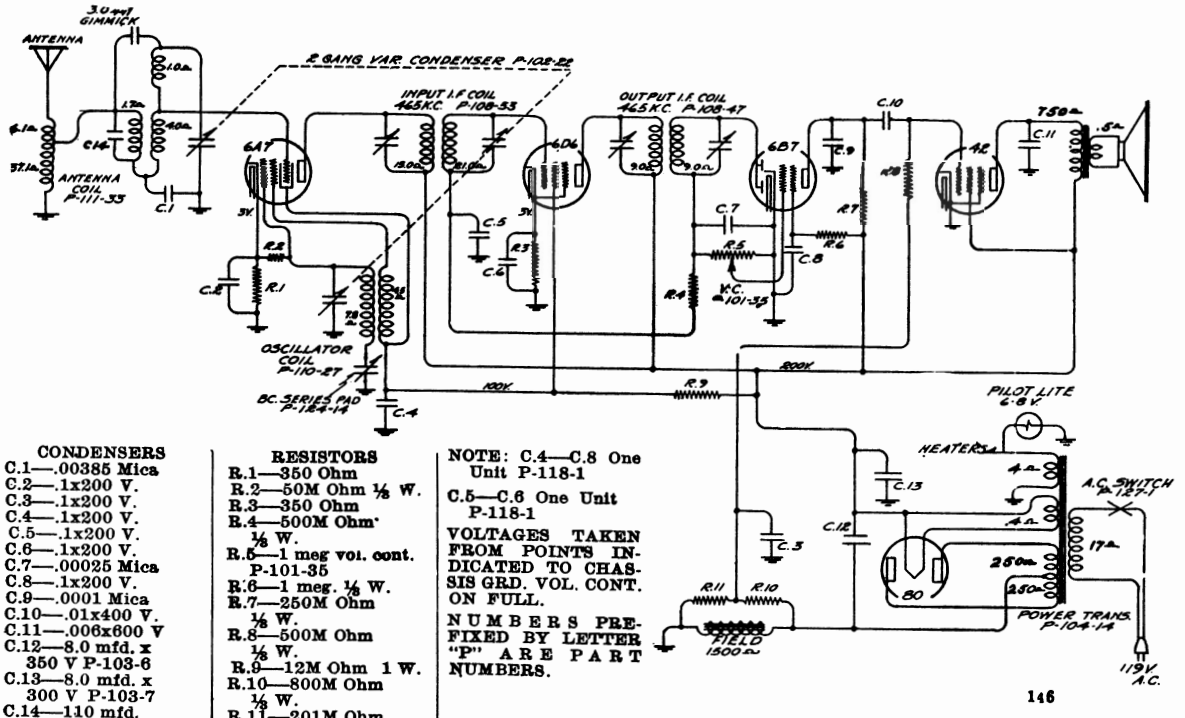
BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of the receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is rear section of gang—see top view.)
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust antenna trimmer to resonance—see top view.
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad, rocking gang condenser to and fro, at the same time adjusting series pad for maximum gain.

   This adjustment is accessible from the top of chassis—see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. UNDER NO CIRCUMSTANCES BEND PLATES OF VARIABLE CONDENSER SECTIONS TO CORRECT TRACKING.

BELMONT RADIO CORP.
Model 578—Series A

MODEL 578—5G133670A—5K173250A



146

CONDENSERS

C.1—.00385 Mica
C.2—.1x200 V.
C.3—.1x200 V.
C.4—.1x200 V.
C.5—.1x200 V.
C.6—.1x200 V.
C.7—.00025 Mica
C.8—.1x200 V.
C.9—.0001 Mica
C.10—.01x400 V.
C.11—.006x600 V
C.12—8.0 mfd. x 350 V P-103-6
C.13—8.0 mfd. x 300 V P-103-7
C.14—110 mfd. Either external Mica Cond. or cap. winding in coil.

RESISTORS

R.1—350 Ohm
R.2—50M Ohm ⅛ W.
R.3—350 Ohm
R.4—500M Ohm ⅛ W.
R.5—1 meg vol. cont. P-101-35
R.6—1 meg. ⅛ W.
R.7—250M Ohm ⅛ W.
R.8—500M Ohm ⅛ W.
R.9—12M Ohm 1 W.
R.10—800M Ohm ⅛ W.
R.11—201M Ohm ⅛ W.

NOTE: C.4—C.8 One Unit P-118-1

C.5—C.6 One Unit P-118-1

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GRD. VOL. CONT. ON FULL.

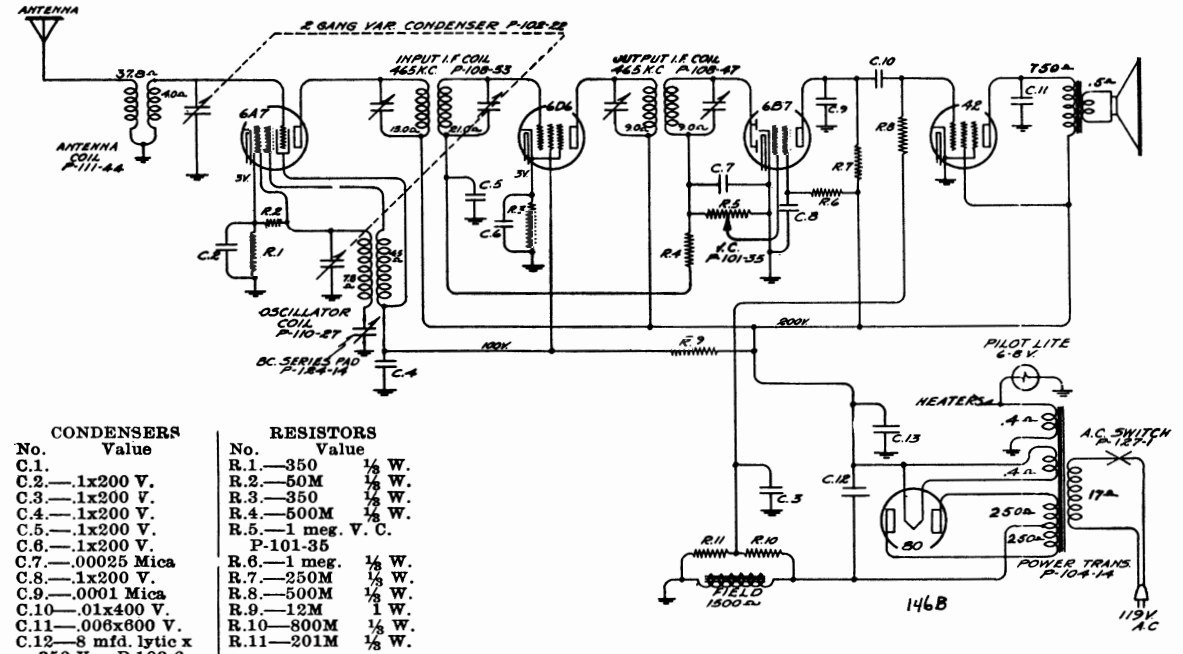
NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.

I. F. FREQUENCY: 465 K.C.

Beginning with 5K173250A, Antenna Coil No. 111-44 replaced No. 111-33, and capacities C1—.00385 mfd. and C14—.00011 mfd. were eliminated. Note: On early models C14 was a capacity winding on the primary of the No. 111-33 Antenna Coil.

See revised diagram below.

MODEL 578—SERIES A 5K173250A and up



146B

CONDENSERS

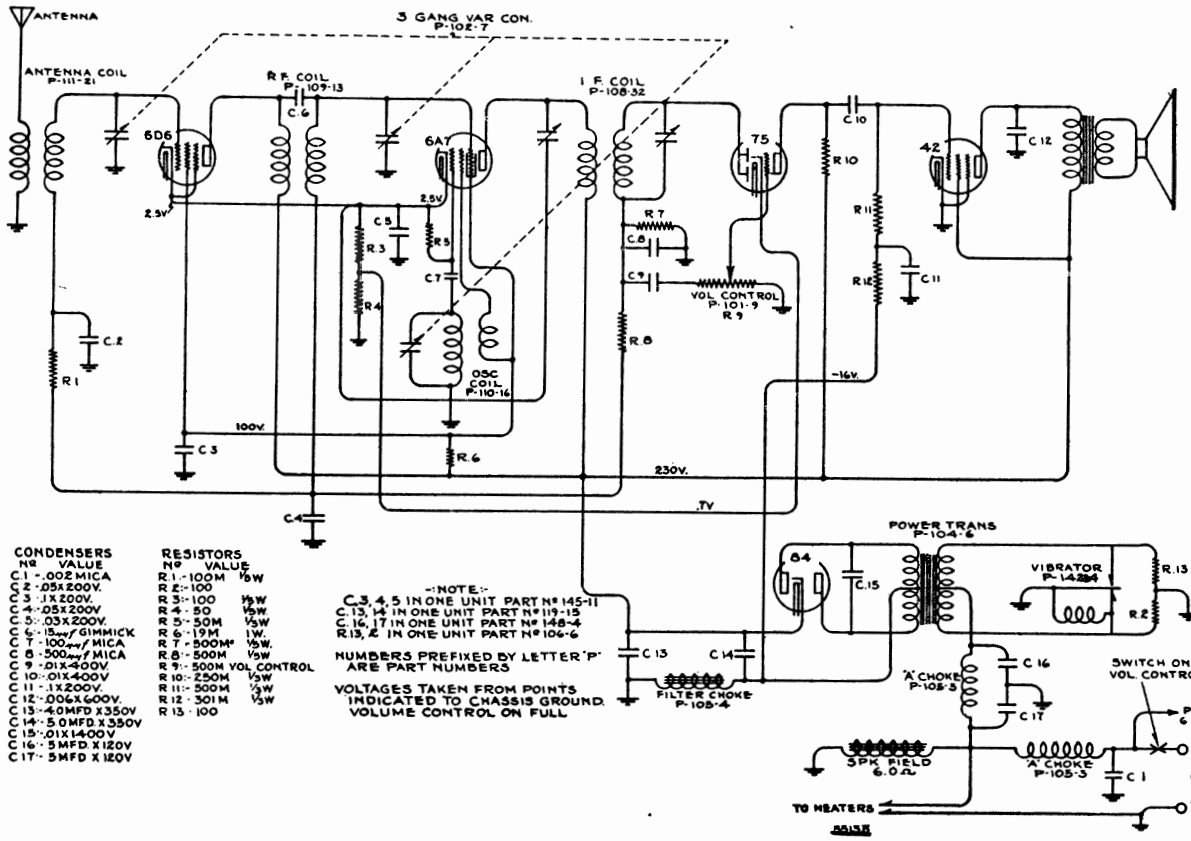
No.	Value
C.1.	
C.2.	—.1x200 V.
C.3.	—.1x200 V.
C.4.	—.1x200 V.
C.5.	—.1x200 V.
C.6.	—.1x200 V.
C.7.	—.00025 Mica
C.8.	—.1x200 V.
C.9.	—.0001 Mica
C.10	—.01x400 V.
C.11	—.006x600 V.
C.12	—8 mfd. lytic x 350 V.—P-103-6
C.13	—8 mfd. lytic x 300 V.—P-103-7

RESISTORS

No.	Value
R.1.	—350 ⅛ W.
R.2.	—50M ⅛ W.
R.3.	—350 ⅛ W.
R.4.	—500M ⅛ W.
R.5.	—1 meg. V. C. P-101-35
R.6.	—1 meg. ⅛ W.
R.7.	—250M ⅛ W.
R.8.	—500M ⅛ W.
R.9.	—12M 1 W.
R.10	—800M ⅛ W.
R.11	—201M ⅛ W.

BELMONT RADIO CORP.

MODEL 580

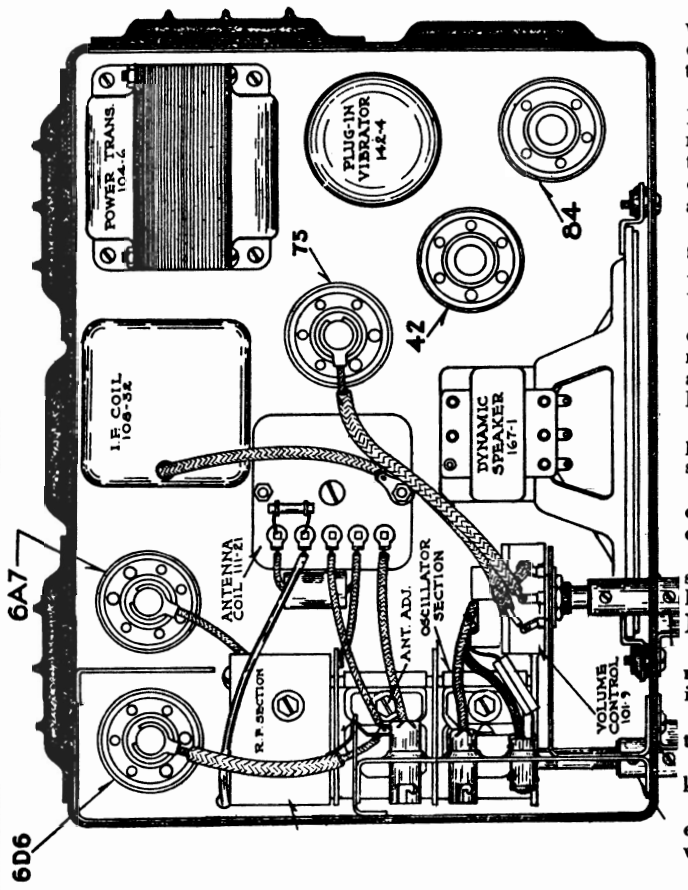


CONDENSERS		RESISTORS	
Nº	VALUE	Nº	VALUE
C 1	.002 MICA	R 1	100M 1/2W
C 2	.05 X 200V.	R 2	100
C 3	.1 X 200V.	R 3	100 1/2W
C 4	.05 X 200V	R 4	50 1/2W
C 5	.03 X 200V.	R 5	50M 1/2W
C 6	.15 mmf GIMMICK	R 6	1.9M 1W.
C 7	100 mmf MICA	R 7	500M 1/2W.
C 8	500 mmf MICA	R 8	500M 1/2W
C 9	.01 X 400V.	R 9	500M VOL CONTROL
C 10	.01 X 400V	R 10	250M 1/2W
C 11	.1 X 200V.	R 11	500M 1/2W
C 12	.006 X 600V.	R 12	301M 1/2W
C 13	40 MFD X 350V	R 13	100
C 14	50 MFD X 350V		
C 15	.01 X 1400V		
C 16	5 MFD X 120V		
C 17	5 MFD X 120V		

NOTE:-
C.3, 4, 5 IN ONE UNIT PART Nº 145-11
C. 13, 14 IN ONE UNIT PART Nº 119-15
C. 16, 17 IN ONE UNIT PART Nº 148-4
R 13, C IN ONE UNIT PART Nº 106-6

NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL



I. F. ALIGNMENT:

1. With variable condenser at its maximum capacity position and with volume control full on, connect in series with a .1 mfd. condenser, an oscillator set at 175 kilocycles to the grid cap of the 6A7 tube.

2. Adjust trimming condensers of I. F. transformer, part number 108-32 (two adjustments) to resonance, as indicated on an output meter connected across the primary terminals of the speaker input transformer or between the plate and screen terminals of the type 42 output tube. The connection to the tube can be made by means of an adapter. Maximum deflection of the meter indicates resonance.

Note: I. F. transformer adjustments are accessible from the bottom of the chassis—the bottom cover must be removed.

R. F. ALIGNMENT:

1. Attach oscillator connected in series with a 200 mmfd. condenser to the antenna lead and with the variable condenser at its minimum capacity position (extreme right of its rotation) and with an oscillator set at 1550 kilocycles, adjust condenser trimmer of oscillator section (Front shaft end) to resonance.

2. Re-set oscillator to 1400 kilocycles, rotate variable condenser to pick up signal, adjust antenna (center section) and R. F. (rear section) trimmers to resonance.

3. Check alignment at 1400-1000-600-530 kilocycles by setting oscillator to these frequencies and picking up signal by rotating condenser.

4. Bend slotted plates of antenna and R. F. sections only if necessary. UNDER NO CIRCUMSTANCES BEND PLATES OF OSCILLATOR SECTION.

NOTES:

Voltages from chassis to different points are indicated on schematic circuit diagram, and should be measured with a voltmeter having a resistance of 1000 ohms per volt.

Failure to operate, noisy or weak reception, may be due to defective tubes or poor contact between cap on top of tube and grid clip.

Tubes may be checked by replacing with another tube which is known to be good.

If fuse blows out frequently, and insulating sleeve has been properly placed over fuse, the trouble probably is in the vibrator and vibrator should be replaced.

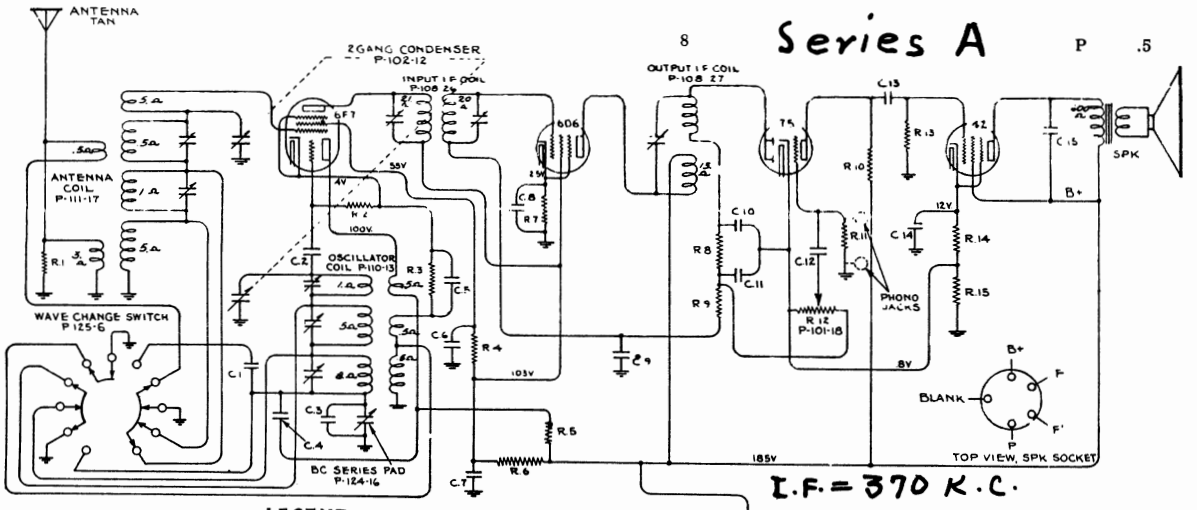
NEVER ATTEMPT TO ADJUST VIBRATOR POINTS.

Case rattles may be due to one or more of the following:

Loose screws in top or bottom covers. Loose elements in tubes.

BELMONT RADIO CORP.

MODEL 585 (SERIES A - B - C)



LEGEND

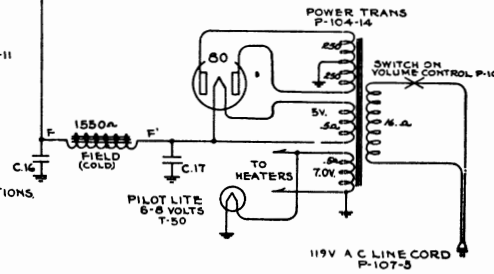
CONDENSERS		RESISTORS	
Nº	VALUE	Nº	VALUE
C.1:-	2870 μμf MICA	R.1:-	800Ω ½W.
C.2:-	100 " "	R.2:-	50MΩ "
C.3:-	475 "	R.3:-	700Ω "
C.4:-	.1 X 200V	R.4:-	100MΩ "
C.5:-	.1 X 200V.	R.5:-	20MΩ ½W.
C.6:-	.1 X 200V	R.6:-	19MΩ ½W.
C.7:-	.1 X 200V	R.7:-	200Ω "
C.8:-	.1 X 200V	R.8:-	50MΩ ⅓W
C.9:-	.1 X 200V.	R.9:-	1MEG "
C.10:-	500 μμf MICA	R.10:-	250MΩ "
C.11:-	500 μμf MICA	R.11:-	2MEG. "
C.12:-	.05 X 200V	R.12:-	500MΩ VOL. CONTROL
C.13:-	.01 X 400V	R.13:-	500MΩ ⅓W
C.14:-	4.0 MFD. X 25V.	R.14:-	500Ω "
C.15:-	.015 X 400V.	R.15:-	35Ω "
C.16:-	3.0 MFD X 250V		
C.17:-	4.0 MFD X 300V		

NOTE
C.7, C.9 ARE IN ONE UNIT P-118-1
C.14, C.16, C.17, ONE UNIT LYTIC P-119-11
R.7, R.14, R.15, ONE UNIT P-106-18

NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.

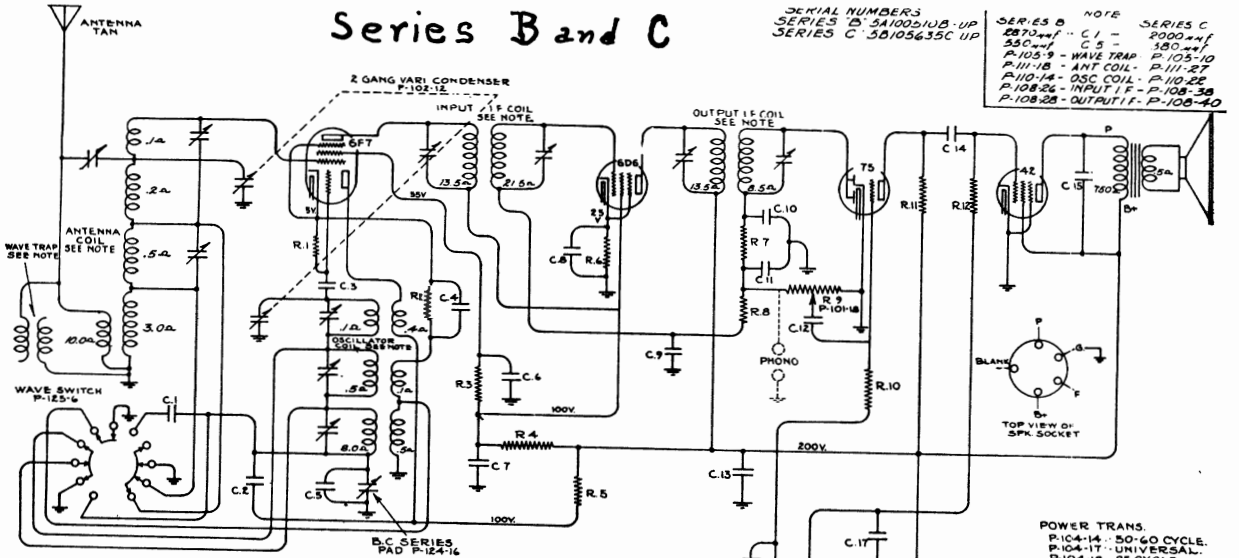
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND, VOLUME CONTROL ON FULL

WAVE CHANGE SWITCH P-125-6 - 3 POSITIONS, ROTATING CLKWISE:
1ST POSITION - BC. 1720-540 KC
2ND " - MW. 7.6 - 2.3 MC
3RD " - SW. 23.0 - 7.5 MC
SWITCH SHOWN AT SW. POSITION



TUNING RANGE—SERIES A:
Standard Broadcast Band
540 - 1720 Kilocycles
Intermediate Band
2.3 - 7.6 Megacycles
Short Wave Band
7.5 - 23.0 Megacycles

TUNING RANGE—SERIES B & C:
Standard Broadcast Band
530 - 1720 Kilocycles
Intermediate Band
2.35 - 7.7 Megacycles
Short Wave Band
7.6 - 19.0 Megacycles



CONDENSERS

Nº	VALUE
C.1:-	SEE NOTE
C.2:-	.1 X 200V
C.3:-	100 μμf MICA
C.4:-	.1 X 200V
C.5:-	SEE NOTE
C.6:-	.1 X 200V
C.7:-	.1 X 200V
C.8:-	.1 X 200V
C.9:-	.1 X 200V
C.10:-	100 μμf MICA
C.11:-	100 μμf MICA
C.12:-	.05 X 200V
C.13:-	8.0 MFD. 1-500V P-103-7
C.14:-	.01 X 400V
C.15:-	.015 X 600V
C.16:-	.1 X 200V
C.17:-	.1 X 200V
C.18:-	8.0 MFD. X 350V. P-103-6

RESISTORS

Nº	VALUE
R.1:-	50MΩ ⅓W
R.2:-	700 "
R.3:-	100M "
R.4:-	25M ½W.
R.5:-	20M "
R.6:-	250 ⅓W
R.7:-	50M "
R.8:-	500M "
R.9:-	500M VOL CONT'L
R.10:-	1 MEG. ⅓W
R.11:-	250M "
R.12:-	" "
R.13:-	15M "
R.14:-	180M "
R.15:-	800M "

C.6, C.8 IN DUAL UNIT P-118-1
C.7, C.9 - " " "
C.16, C.17 - " " "

NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL

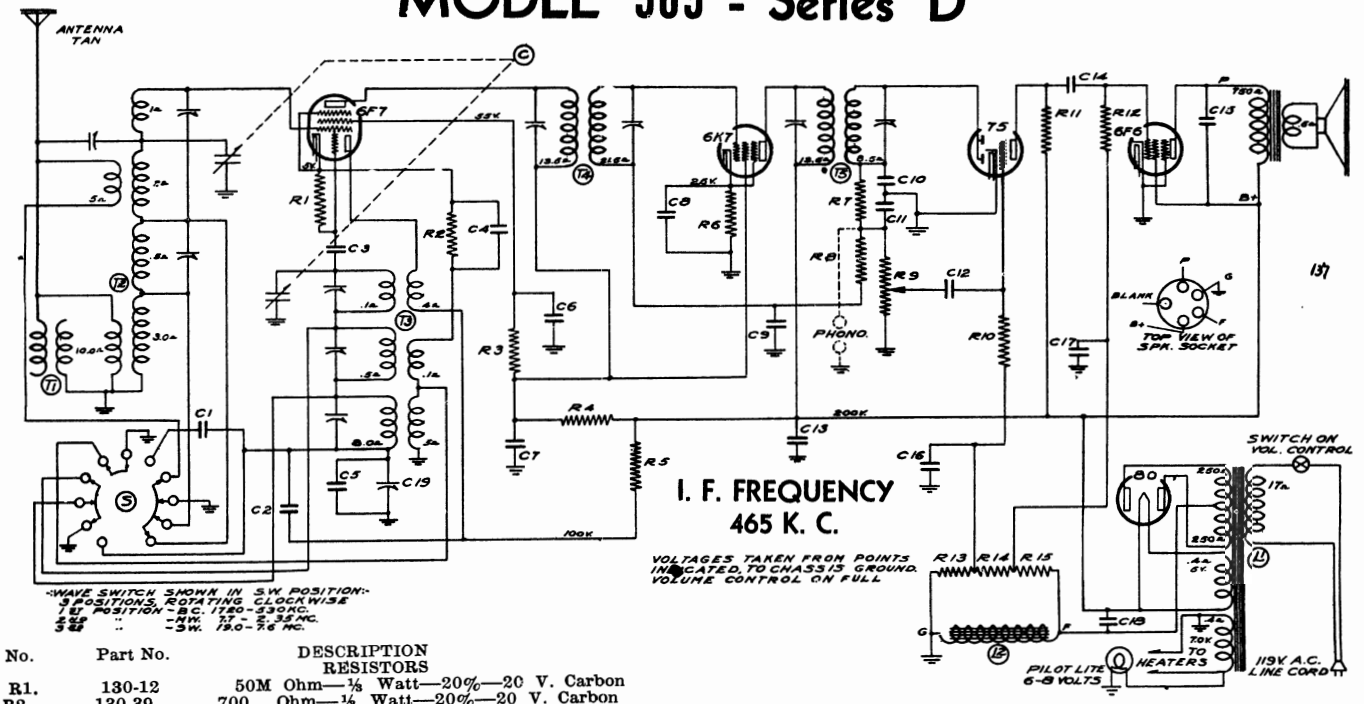
WAVE SWITCH P-125-6, 3 POSITIONS ROTATING CLKWISE:
1ST POSITION - BC. 1720-530 KC
2ND " - MW. 7.7 - 2.35 MC
3RD " - SW. 19.0 - 7.6 MC
SWITCH SHOWN AT SW. POSITION

C.15 - .015 x 600V

I.F. = 465 K.C.

BELMONT RADIO CORP.

MODEL 585 - Series D



No.	Part No.	DESCRIPTION
		RESISTORS
R1.	130-12	50M Ohm—⅛ Watt—20%—20 V. Carbon
R2.	130-39	700 Ohm—⅛ Watt—20%—20 V. Carbon
R3.	130-20	100M Ohm—⅛ Watt—20%—50 V. Carbon
R4.	130-44	25M Ohm—⅛ Watt—20%—150 V. Carbon
R5.	130-42	20M Ohm—⅛ Watt—20%—100 V. Carbon
R6.	130-32	250 Ohm—⅛ Watt—20%—10 V. Wire Wound
R7.	130-12	50M Ohm—⅛ Watt—20%—20 V. Carbon
R8.	130-3	500M Ohm—⅛ Watt—20%—100 V. Carbon
R9.	101-18	500M Ohm Volume Control
R10.	130-19	1 meg Ohm—⅛ Watt—20%—100 V. Carbon
R11.	130-11	250M Ohm—⅛ Watt—10%—100 V. Carbon
R12.	130-11	250M Ohm—⅛ Watt—10%—100 V. Carbon
R13.	130-48	15M Ohm—⅛ Watt—10%—20 V. Carbon
R14.	130-47	180M Ohm—⅛ Watt—10%—100 V. Carbon
R15.	130-46	800M Ohm—⅛ Watt—10%—100 V. Carbon
		CONDENSERS
C1.	129-23	.002 Mica—MW—5%
C2.	100-20	.1 x 120 V.—25%
C3.	129-5	.0001 Mica—MT—20%
C4.	100-20	.1 x 200 V.—25%
C5.	129-24	.00038—MT—5%
C6.	118-1	.1x 200 V.—Dual Plus 50%; Minus 10%
C7.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C8.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C9.	118-1	.1 x 200 V.—Dual Plus 50%; Minus 10%
C10.	129-51	.000125—Mica MT—20%
C11.	129-51	.000125—Mica MT—20%
C12.	100-22	.05 x 200 V.—25%
C13.	103-7	.8 mfd. x 300 V. Electrolytic
C14.	100-11	.01 x 400 V.—25%
C15.	100-19	.006 x 600 V.—25%
C16.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C17.	118-1	.1 x 200 V.—Dual Plus 50%: Minus 10%
C18.	103-6	.8 mfd. x 350 V. Electrolytic
C19.	124-5	B. C. Series Pad J-3-S.
		MISCELLANEOUS
T1.	105-10	Antenna Choke Coil
T2.	111-27	Antenna Coil
T3.	110-22	Oscillator Coil
T4.	108-38A	Input I.F. Transformer
T5.	108-40	Output I.F. Transformer
C	102-12	Two Gang Variable Cond.
S	125-6	Wave Change Switch
L1.	104-14A	Power Transformer 50/60 Cycle
L1.	104-18	Power Transformer 25 Cycle
L2.	114-11	Speaker—Field Resistance 1550 Ohms
L1.	104-17	Power Trans. Universal 50/60 Cycle
L1.	104-41	Power Trans. Universal 25 Cycle.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

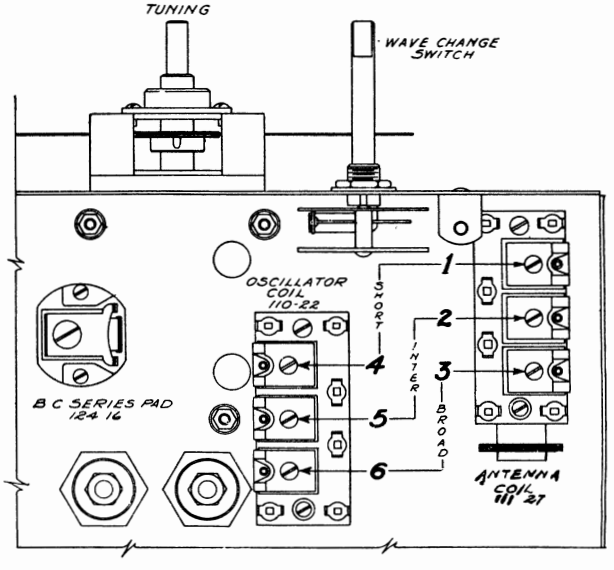
Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Aligning I. F. Transformers

1. With volume control full on, the extreme right of its rotation, and with wave changing switch in the broadcast position, extreme left of its rotation, and with variable condenser at its minimum capacity position, plates entirely out of mesh, adjust the I.F. transformers (two adjustments at the top of parts number 108-38 and 108-40—see top view).
   (a) Connect external oscillator which has been adjusted to 465 kilocycles in series with I.F. dummy antenna, to the control grid cap of the type 6K7 tube and chassis ground. Adjust output I.F. transformer, part number 108-40, to resonance.
   (b) Move generator output clip from grid of 6K7 to grid cap of type 6F7 tube and align input I.F. transformer, part number 108-38.
   (c) With generator connected to grid of type 6F7 tube, readjust output I.F. transformer, part number 108-40, to resonance.

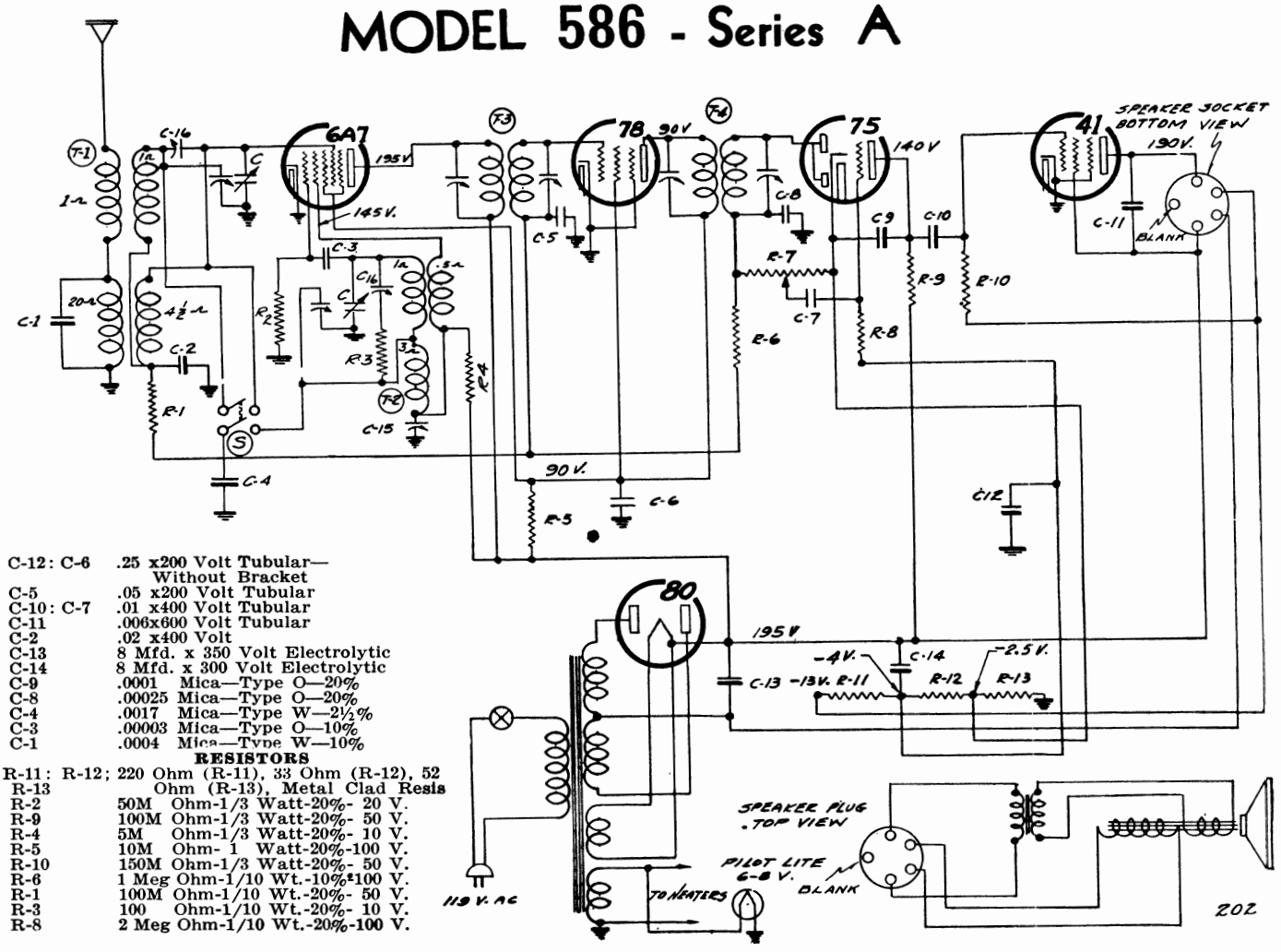
BOTTOM VIEW OF CHASSIS



Type 6F7—triode pentode as oscillator and first detector.
Type 6K7—remote cut-off pentode as I.F. amplifier.
Type 75—duplex diode triode as diode detector, A.V.C. and A.F.
Type 6F6—pentode output tube.
Type 80—high vacuum rectifier.

BELMONT RADIO CORP.

MODEL 586 - Series A



C-12: C-6	.25 x200 Volt Tubular—Without Bracket
C-5	.05 x200 Volt Tubular
C-10: C-7	.01 x400 Volt Tubular
C-11	.006x600 Volt Tubular
C-2	.02 x400 Volt
C-13	8 Mfd. x 350 Volt Electrolytic
C-14	8 Mfd. x 300 Volt Electrolytic
C-9	.0001 Mica—Type O—20%
C-8	.00025 Mica—Type O—20%
C-4	.0017 Mica—Type W—2½%
C-3	.00003 Mica—Type O—10%
C-1	.0004 Mica—Type W—10%

RESISTORS

R-11: R-12; R-13	220 Ohm (R-11), 33 Ohm (R-12), 52 Ohm (R-13), Metal Clad Resis
R-2	50M Ohm-1/3 Watt-20%- 20 V.
R-9	100M Ohm-1/3 Watt-20%- 50 V.
R-4	5M Ohm-1/3 Watt-20%- 10 V.
R-5	10M Ohm- 1 Watt-20%-100 V.
R-10	150M Ohm-1/3 Watt-20%- 50 V.
R-6	1 Meg Ohm-1/10 Wt.-10%-100 V.
R-1	100M Ohm-1/10 Wt.-20%- 50 V.
R-3	100 Ohm-1/10 Wt.-20%- 10 V.
R-8	2 Meg Ohm-1/10 Wt.-20%-100 V.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-76 Output I.F. Transformer
Part No. 108-75 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 78 tube, and adjust the output I.F. transformer (No. 108-76) to resonance.

   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 78 to grid cap to 6A7 and adjust input I.F. transformer (No. 108-75) to resonance.

   (c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-76) if necessary.

BROADCAST AND SHORT WAVE BAND ALIGNMENT

Broadcast Band:—535 to 1720 Kilocycles.
Short Wave Band:—2280 to 6600 Kilocycles.

Important:—These adjustments must be made in the following order:

SHORT WAVE OSCILLATOR ADJUSTMENT:

1. With band switch in the short wave band position, extreme right of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with the external oscillator connected in series with "Dummy 1" to grid cap of the 6A7 tube, make the following adjustment:

   (a) Set external oscillator to 6.6 megacycles and adjust short wave oscillator trimmer to resonance. This adjustment is marked "S.W. Osc."

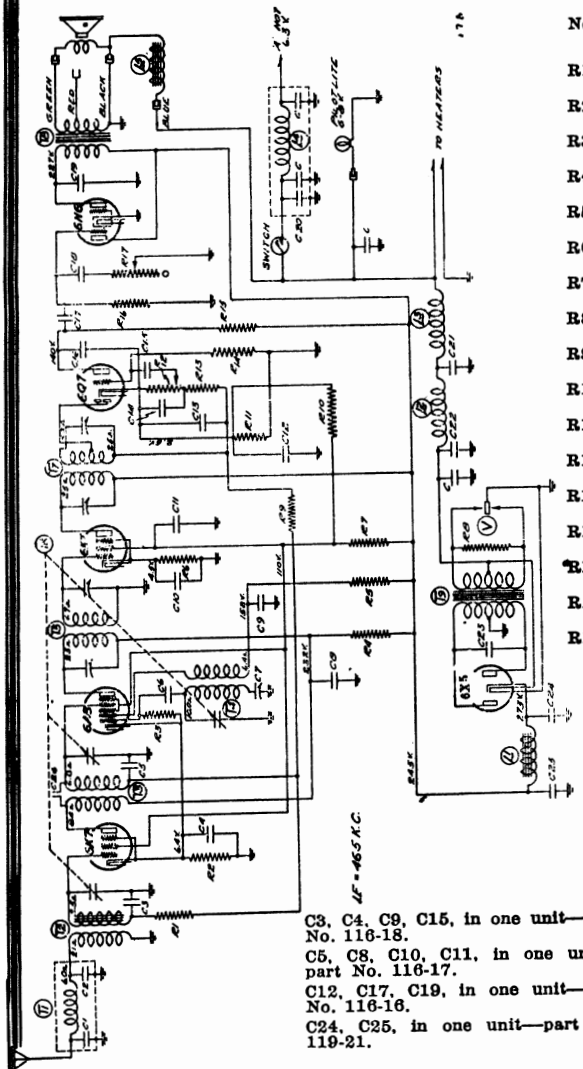
NOTE: Make certain that the fundamental 6.6 megacycles signal has been tuned in and not the image frequency, noting that the image appears when the tuning knob is moved to approximately 5.7 megacycles.

BROADCAST BAND OSCILLATOR ADJUSTMENT:

1. With band switch in the broadcast position, extreme left of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 1" to grid cap of the 6A7 tube, make the following adjustment:

   (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. This adjustment is the trimmer mounted on the front section of the variable gang condenser.

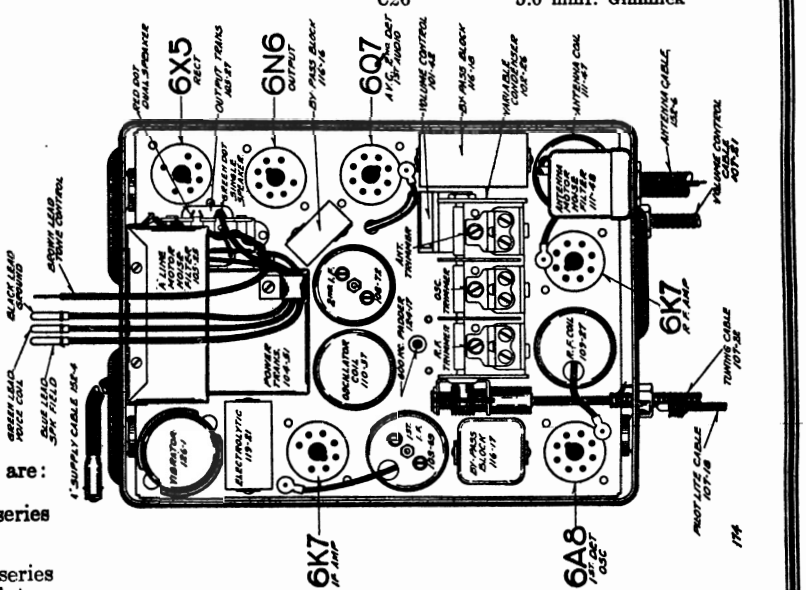
BELMONT RADIO CORP.
MODEL 666



C3, C4, C9, C15, in one unit—part No. 116-18.
C5, C8, C10, C11, in one unit—part No. 116-17.
C12, C17, C19, in one unit—part No. 116-16.
C24, C25, in one unit—part No. 119-21.

No.	Part No.	Description
		RESISTORS
R1	130-20	100M Ohm - ½ Watt - 20% - 50 Volt - Carbon
R2	130-99	300 Ohm - ½ Watt - 20% - 10 Volt - Carbon
R3	130-94	50M Ohm - ½ Watt - 10% - 10 Volt - Carbon
R4	130-98	1500 Ohm - ½ Watt - 20% - 25 Volt - Carbon
R5	130-42	20M Ohm - ½ Watt - 20% - 100 Volt - Carbon
R6	130-70	500 Ohm - ½ Watt - 10% - 10 Volt - Carbon
R7	130-95	12M Ohm - 1.2 Watt - 10% - 100 Volt - Carbon
R8	130-97	200 Ohm - ½ Watt - 10% - 10 Volt - Carbon
R9	130-3	500M Ohm - ½ Watt - 20% - 100 Volt - Carbon
R10	130-108	40M Ohm - ½ Watt - 10% - 100 Volt - Carbon
R11	130-107	800 Ohm - ½ Watt - 10% - 10 Volt - Carbon
R12	101-42	50M Ohm - Volume Control and Switch
R13	130-22	5M Ohm - ½ Watt - 20% -10 Volt - Carbon
R14	130-68	1 Meg Ohm - ½ Watt - 10% - 20 Volt - Carbon
R15	130-9	200M Ohm - ½ Watt - 20% - 20 Volt - Carbon
R16	130-3	500M Ohm - ½ Watt - 20% - 100 Volt - Carbon
R17	101-45	1 Meg Ohm - Tone Control

		CONDENSERS
C		Spark Plate
C1	129-3	.00002 Mica - "O" - 20%
C2	129-49	.00009 Mica - "O" - 5%
C3	116-18	.05 x 200 Volt
C4	116-18	.25 x 200 Volt
C5	116-17	.05 x 200 Volt
C6	129-21	.0002 Mica - MT - "O" 20%
C7	124-17	Single Padder J-4-S
C8	116-17	.1 x 400 Volt
C9	116-18	.1 x 400 Volt
C10	116-17	.1 x 200 Volt
C11	116-17	.1 x 200 Volt
C12	116-16	.05 x 200 Volt
C13	129-5	.0001 Mica - MT - "O" 20%
C14	129-2	.0005 Mica - MT - "O" 20%
C15	116-18	.02 x 200 Volt
C16	129-5	.0001 Mica - MT - "O" 20%
C17	116-16	.05 x 400 Volt
C18	100-37	.003 x 600 Volt - 10%
C19	116-16	.01 x 800 Volt
C20	100-35	.5 x 200 Volt - 50% - 10%
C21	100-35	.5 x 200 Volt - 50% - 10%
C22	100-35	.5 x 200 Volt - 50% - 10%
C23	100-36	.01 x 1400 Volt - 10%
C24	119-21	8.0 mfd. Lytic Cond. 350 Working Volts
C25	119-21	4.0 mfd. Lytic Cond. 350 Working Volts
C26		5.0 mmf. Jimmick



DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

I.F. ALIGNMENT

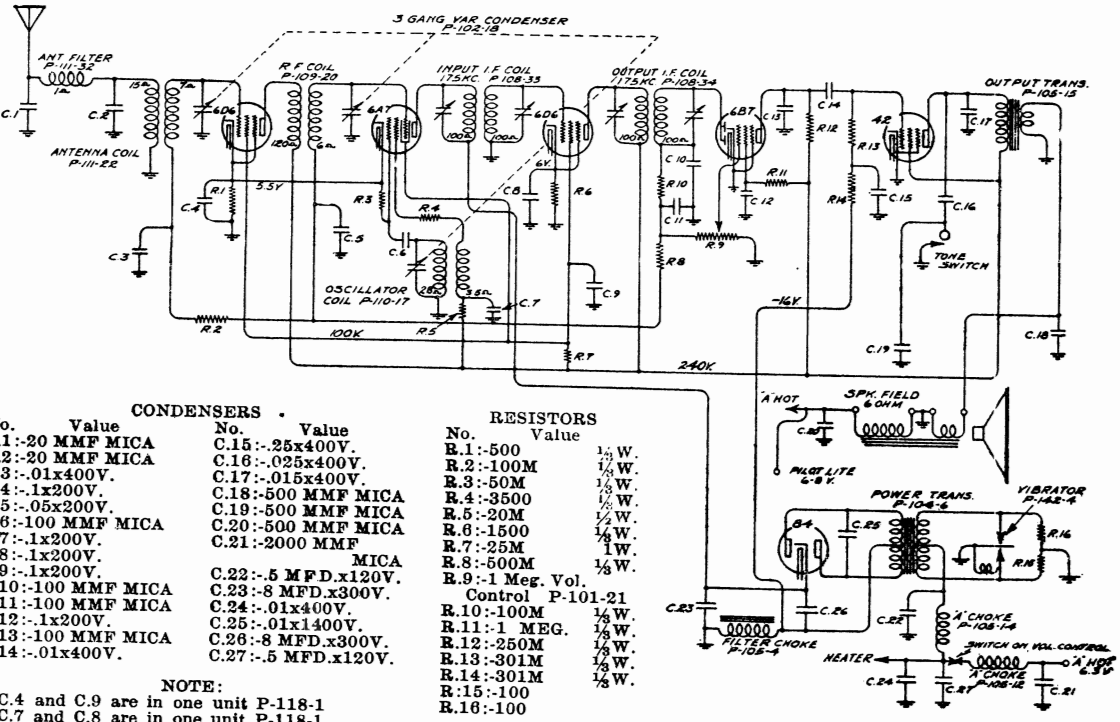
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-72 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-69 to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 KC. Adjust series pad rocking gang condenser to and fro at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis (see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

BELMONT RADIO CORP.

MODEL 680



CONDENSERS

No.	Value	No.	Value
C.1	:-20 MMF MICA	C.15	:-.25x400V.
C.2	:-20 MMF MICA	C.16	:-.025x400V.
C.3	:-.01x400V.	C.17	:-.015x400V.
C.4	:-.1x200V.	C.18	:-500 MMF MICA
C.5	:-.05x200V.	C.19	:-500 MMF MICA
C.6	:-100 MMF MICA	C.20	:-500 MMF MICA
C.7	:-.1x200V.	C.21	:-2000 MMF MICA
C.8	:-.1x200V.	C.22	:-.5 MFD.x120V.
C.9	:-.1x200V.	C.23	:-8 MFD.x300V.
C.10	:-100 MMF MICA	C.24	:-.01x400V.
C.11	:-100 MMF MICA	C.25	:-.01x1400V.
C.12	:-.1x200V.	C.26	:-8 MFD.x300V.
C.13	:-100 MMF MICA	C.27	:-.5 MFD.x120V.
C.14	:-.01x400V.		

RESISTORS

No.	Value	
R.1	:-500	1/3 W.
R.2	:-100M	1/4 W.
R.3	:-50M	1/8 W.
R.4	:-3500	1/8 W.
R.5	:-20M	1/2 W.
R.6	:-1500	1/3 W.
R.7	:-25M	1W.
R.8	:-500M	1/3 W.
R.9	:-1 Meg. Vol. Control P-101-21	
R.10	:-100M	1/3 W.
R.11	:-1 MEG.	1/3 W.
R.12	:-250M	1/3 W.
R.13	:-301M	1/3 W.
R.14	:-301M	1/3 W.
R.15	:-100	
R.16	:-100	

NOTE:
C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.26 and C.23 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

Serial No. 60001 and up.

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:
"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.
"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

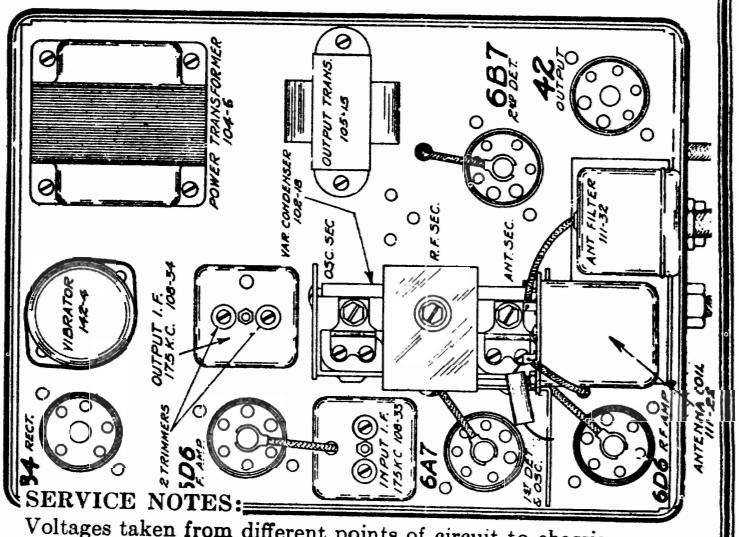
I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view)
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.

   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.



SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver.

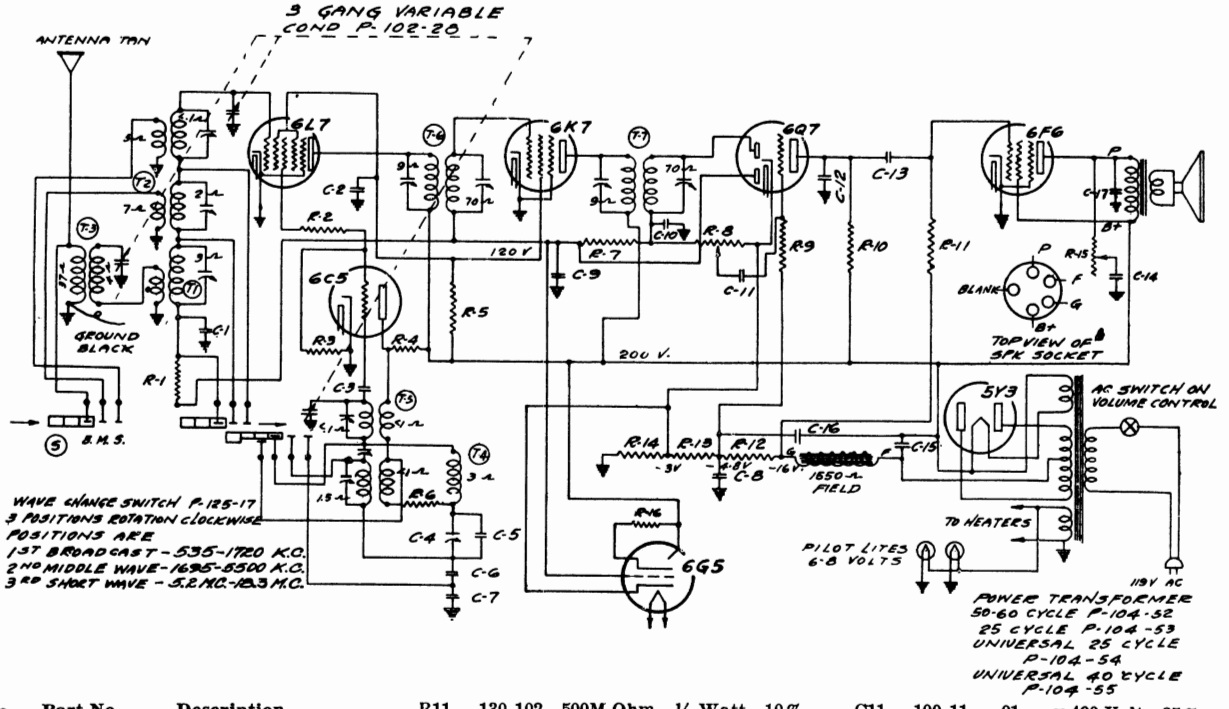
Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

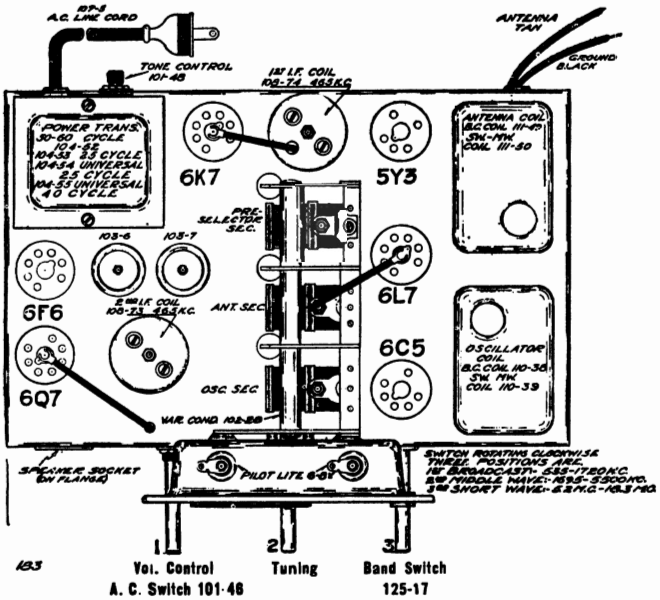
BELMONT RADIO CORP.

MODEL 686 SERIES A, B AND MODEL 786 SERIES A

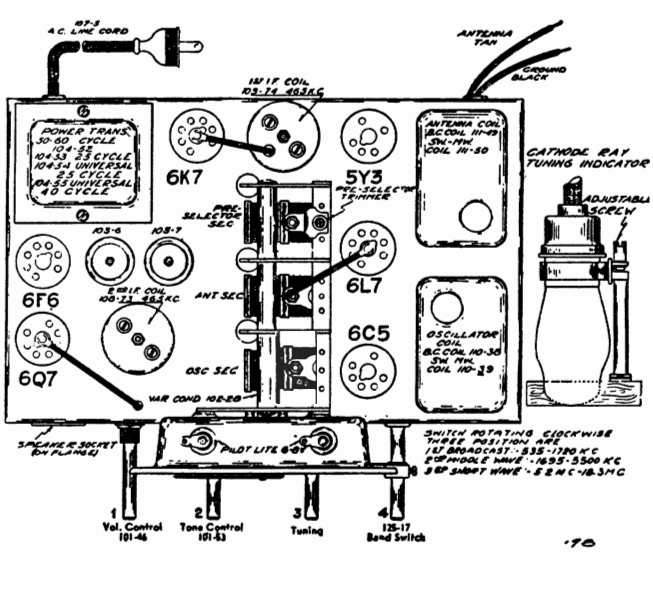


No.	Part No.	Description
		RESISTORS
R1	130-20	100M Ohm—⅛ Watt—20%—50 Volt—Carbon
R2	130-105	150 Ohm—⅛ Watt—20%—10 Volt—Carbon
R3	130-12	50M Ohm—⅛ Watt—20%—10 Volt—Carbon
R4	130-104	9M Ohm—1 Watt—20%—100 Volt—Carbon
R5	130-104	9M Ohm—1 Watt—20%—100 Volt—Carbon
R6	130-27	50 Ohm—⅛ Watt—20%—3 Volt—Carbon
R7	130-19	1 Meg Ohm—⅛ Watt—20%—100 Volt—Carbon
R8	101-46	1 Meg Ohm—Volume Control
R9	130-4	3 Meg Ohm—⅛ Watt—20%—100 Volt—Carbon
R10	130-103	100M Ohm—⅛ Watt—20%—50 Volt—Carbon
R11	130-102	500M Ohm—⅛ Watt—10%—50 Volt—Carbon
R12, R13, R14	106-26	220 Ohm, 32 Ohm, 52 Ohm
R15	101-53	50M Ohm—Tone Control
R16	130-110	1 Meg Ohm—1/10 Watt—10%—100 Volt—Carbon
		CONDENSERS
C1	100-22	.05 x 200 Volt—25%
C2	100-20	.1 x 200 Volt—25%
C3	129-39	.00005 Mica (MT—0)—20%
C4	124-28	Series Pad (80—225)
C5	129-56	.00055 Mica (MT—0)—10%
C6	129-55	.0034 Mica (MW—W)—2½%
C7	129-54	.003 Mica (MW—W)—2½%
C8	100-20	.1 x 200 Volt—25%
C9	100-22	.05 x 200 Volt—25%
C10	129-12	.00025 Mica (MT—0)—20%
C11	100-11	.01 x 400 Volt—25%
C12	129-2	.0005 Mica (MT—0)—20%
C13	100-11	.01 x 400 Volt—25%
C14	100-27	.025 x 600 Volt—25%
C15	103-6	8 Mfd. x 350 Volt Electrolytic
C16	103-7	8 Mfd. x 300 Volt Electrolytic
C17	100-25	.002 x 600 Volt—20%
		PARTS
T1	111-49	Broadcast Antenna Coil
T2	111-50	S.W.—M.W. Antenna Coil
T3	111-51	B.C.—Pre-Selector Coil Assem.
T4	110-38	B.C. Oscillator Coil
T5	110-39	S.W.—M.W. Oscillator Coil
T6	108-74	Input I.F.—465 K.C.
T7	108-73	Output I.F.—465 K.C.
S	125-17	Band Switch

I. F. FREQUENCY
465 K. C.

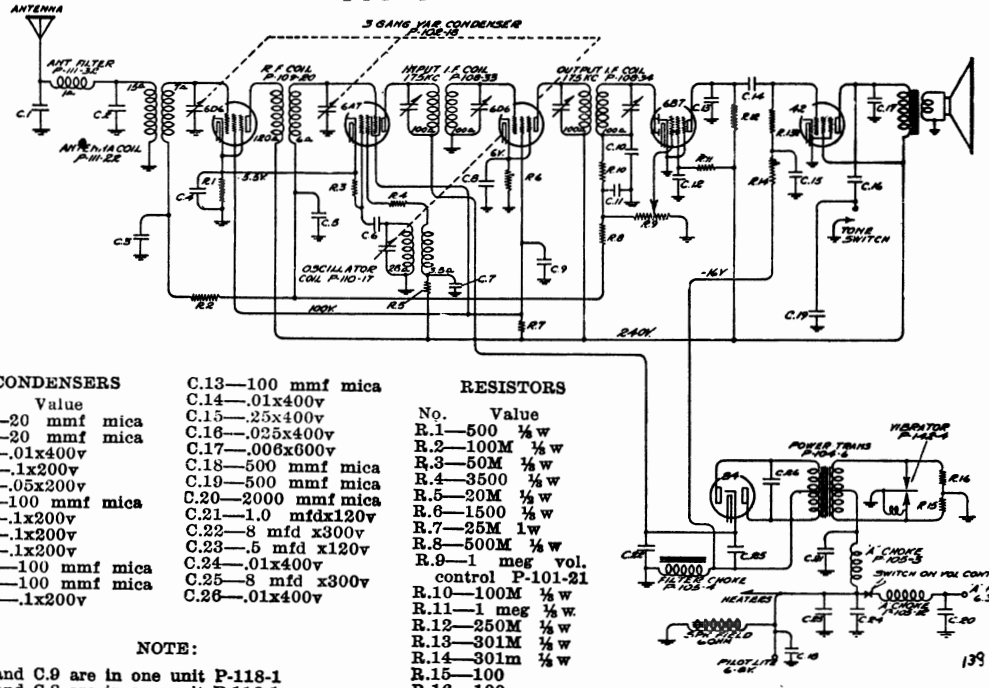


MODEL 686 SERIES A



MODELS 686 SERIES B AND 786 SERIES A

BELMONT RADIO CORP.
MODEL 690



CONDENSERS

No.	Value
C.1	20 mmf mica
C.2	20 mmf mica
C.3	.01x400v
C.4	.1x200v
C.5	.05x200v
C.6	100 mmf mica
C.7	.1x200v
C.8	.1x200v
C.9	.1x200v
C.10	100 mmf mica
C.11	100 mmf mica
C.12	.1x200v
C.13	100 mmf mica
C.14	.01x400v
C.15	.25x400v
C.16	.025x400v
C.17	.006x600v
C.18	500 mmf mica
C.19	500 mmf mica
C.20	2000 mmf mica
C.21	1.0 mfdx120v
C.22	8 mfd x300v
C.23	.5 mfd x120v
C.24	.01x400v
C.25	8 mfd x300v
C.26	.01x400v

RESISTORS

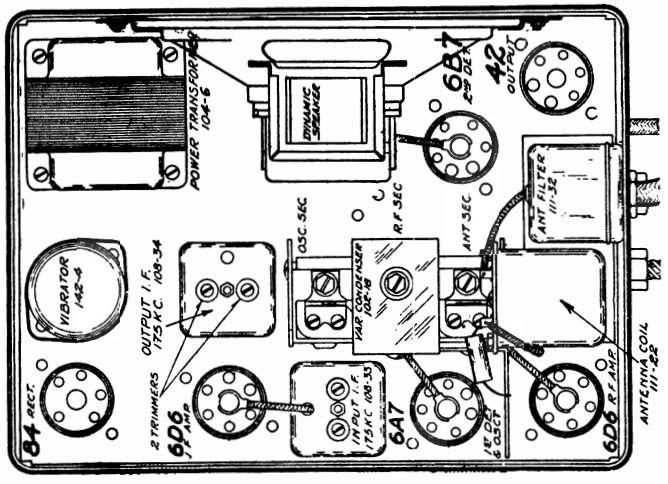
No.	Value
R.1	500 ½ w
R.2	100M ½ w
R.3	50M ½ w
R.4	3500 ½ w
R.5	20M ½ w
R.6	1500 ½ w
R.7	25M 1w
R.8	500M ½ w
R.9	1 meg vol. control P-101-21
R.10	100M ½ w
R.11	1 meg ½ w.
R.12	250M ½ w
R.13	301M ½ w
R.14	301m ½ w
R.15	100
R.16	100

NOTE:

C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.22 and C.25 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.

Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

Serial No. 40001 up.



DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:
"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.
"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.

(a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

SERVICE NOTES:

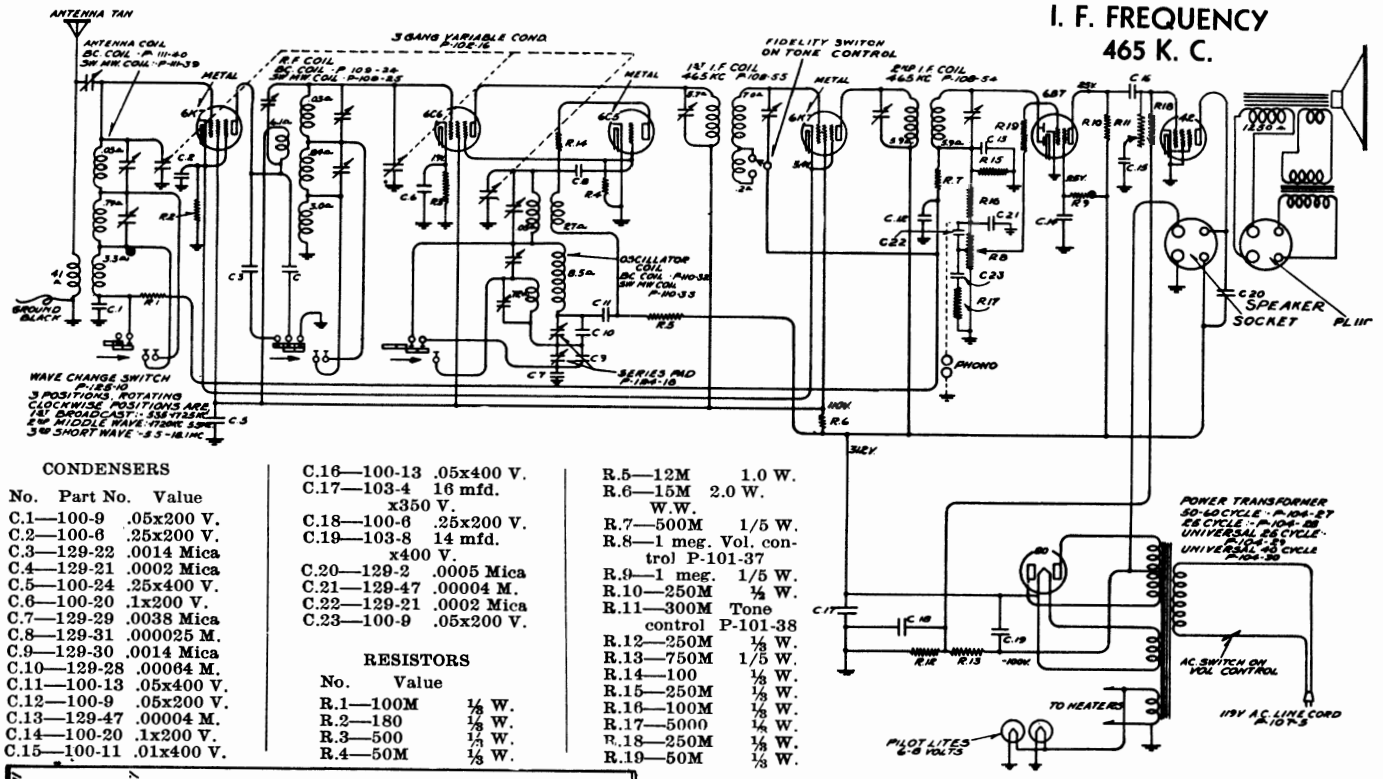
Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.
All voltages are to be measured with 6.3 volts input to receiver.
Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.
Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

BELMONT RADIO CORP.

MODEL 770—SERIES A

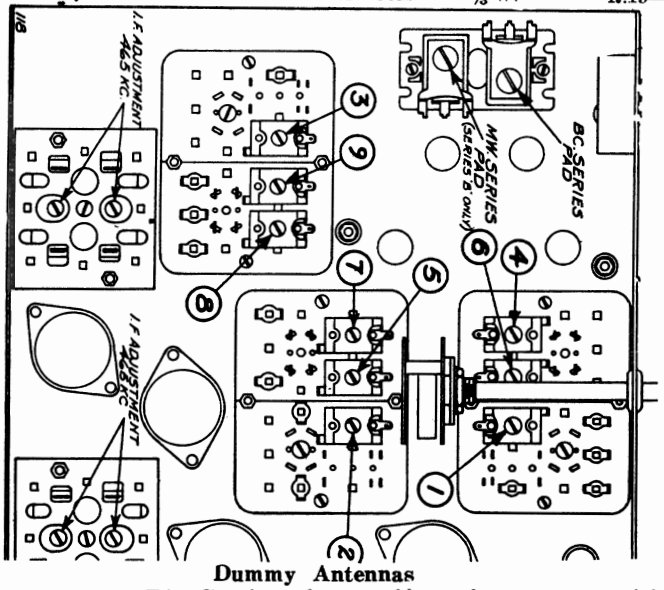


CONDENSERS

No.	Part No.	Value
C.1	100-9	.05x200 V.
C.2	100-6	.25x200 V.
C.3	129-22	.0014 Mica
C.4	129-21	.0002 Mica
C.5	100-24	.25x400 V.
C.6	100-20	.1x200 V.
C.7	129-29	.0038 Mica
C.8	129-31	.000025 M.
C.9	129-30	.0014 Mica
C.10	129-28	.00064 M.
C.11	100-13	.05x400 V.
C.12	100-9	.05x200 V.
C.13	129-47	.00004 M.
C.14	100-20	.1x200 V.
C.15	100-11	.01x400 V.
C.16	100-13	.05x400 V.
C.17	103-4	16 mfd. x350 V.
C.18	100-6	.25x200 V.
C.19	103-8	14 mfd. x400 V.
C.20	129-2	.0005 Mica
C.21	129-47	.00004 M.
C.22	129-21	.0002 Mica
C.23	100-9	.05x200 V.

RESISTORS

No.	Value	
R.1	100M	⅛ W.
R.2	180	⅛ W.
R.3	500	⅛ W.
R.4	50M	⅛ W.
R.5	12M	1.0 W.
R.6	15M	2.0 W. W.W.
R.7	500M	1/5 W.
R.8	1 meg. Vol. control P-101-37	
R.9	1 meg.	1/5 W.
R.10	250M	½ W.
R.11	300M Tone control P-101-38	
R.12	250M	⅛ W.
R.13	750M	1/5 W.
R.14	100	⅛ W.
R.15	250M	⅛ W.
R.16	100M	⅛ W.
R.17	5000	⅛ W.
R.18	250M	⅛ W.
R.19	50M	⅛ W.



Dummy Antennas

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

BROADCAST BAND ALIGNMENT:

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
   (a) Adjust broadcast series pad to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the electrolytic condenser. See top view.
   (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

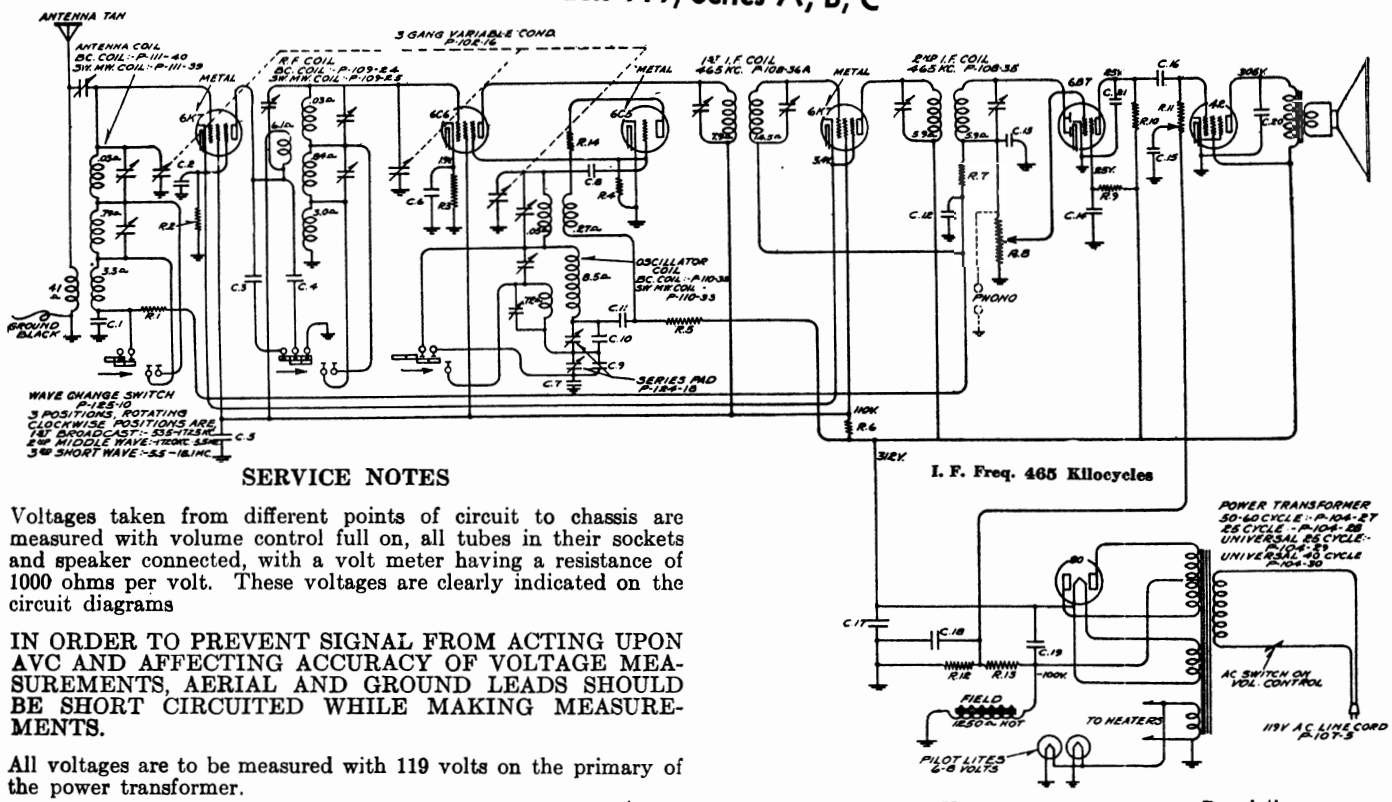
1. With wave changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 8), short wave R.F. (adjustment number 7) and short wave antenna (adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate wave position, center of its rotation, and with external oscillator set at 1800 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Rotate variable condenser to approximately 1800 K.C., tune in oscillator signal and adjust M.W. series pad (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
   (b) Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 5), intermediate wave antenna (adjustment number 4) and intermediate wave oscillator (adjustment number 9) to resonance.
   (c) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

BELMONT RADIO CORP.

Models 777, Series A, B, C



SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams

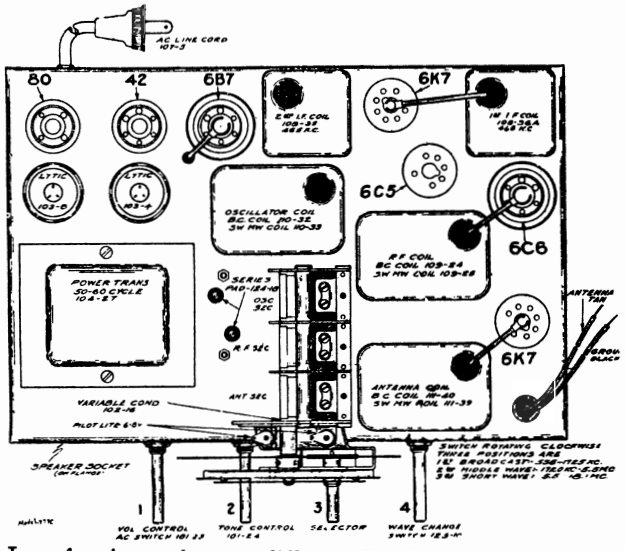
IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.



In a few isolated cases, difficulty has been experienced with intermittent hum. This hum usually appears only after the receiver has been allowed to operate for some time and temporarily disappears upon snapping the line switch off and on. This difficulty is generally due to the opening up of the common lead of the dual condenser (.1—.25—220 V.—part No. 118—12), at the point of attachment of the lead to the condenser foil.

This condenser is indicated as C-18 and C-14 on the circuit diagram, C-14 being the .1 mfd. x 200 V. screen bypass of the 6B7, while C-18 is a .25 mfd. x 200 V. unit acting as a hum filter for the bias voltage of the type 42 tube. Examination of the circuit will show that when this occurs, the entire hum voltage

No.	Part No.	Description
		RESISTORS
R1.	130—20	100M Ohms—⅓ Watt—20%—50 V.
R2.	130—53	180 Ohms—⅓ Watt—10%—10 V.
R3.	130—54	500 Ohms—⅓ Watt—20%—10 V.
R4.	130—52	50M Ohms—⅓ Watt—20%—10 V.
R5.	130—49	12M Ohms—1 Watt—20%—150 V.
R6.	130—61	15M Ohms—2 Watt—20%—180 V.
R7.	130—3	500M Ohms—⅓ Watt—20%—100 V.
R8.	101—23	1 meg ohm—Volume Control
R9.	130—19	1 meg ohm—⅓ Watt—20%—100 V.
R10.	130—62	250M Ohms—⅓ Watt—20%—50 V.
R11.	101—24	300M Ohms—Tone Control
R12.	130—11	250M Ohms—⅓ Watt—20%—50 V.
R13.	130—37	750M Ohms—⅓ Watt—20%—50 V.
R14.	130—60	100 Ohms—⅓ Watt—20%—10 V.
		CONDENSERS
C1.	100—9	.05 x 200 V.—25%
C2.	100—6	.25 x 200 V.—25%
C3.	129—30	.0014 Mica—MW.—20%
C4.	129—21	.0002 Mica—MT—20%
C5.	100—24	.25 x 400 V.—25%
C6.	100—20	.1 x 200 V.—25%
C7.	129—29	.0038 Mica—MW—2½%
C8.	129—31	.000025 Mica—MT—15%
C9.	129—25	.0012 Mica—MW.—5%
C10.	129—28	.00064 Mica—MT—5%
C11.	100—13	.05 x 400 V.—25%
C12.	100—13	.05 x 400 V.—25%
C13.	129—32	.00003 Mica—MT—30%
C14.	118—12	.1 x 200 V.—25%
C15.	100—11	.01 x 400 V.—25%
C16.	100—13	.05 x 400 V.—25%
C17.	103—4	16 mfd. x 350 V. Electrolytic
C18.	118—12	.25 x 200 V.—20%
C19.	103—8	14 mfd. x 400 V.
C20.	100—19	.006 x 600 V.—25%
C21.	129—5	.0001 Mica—MT—20%

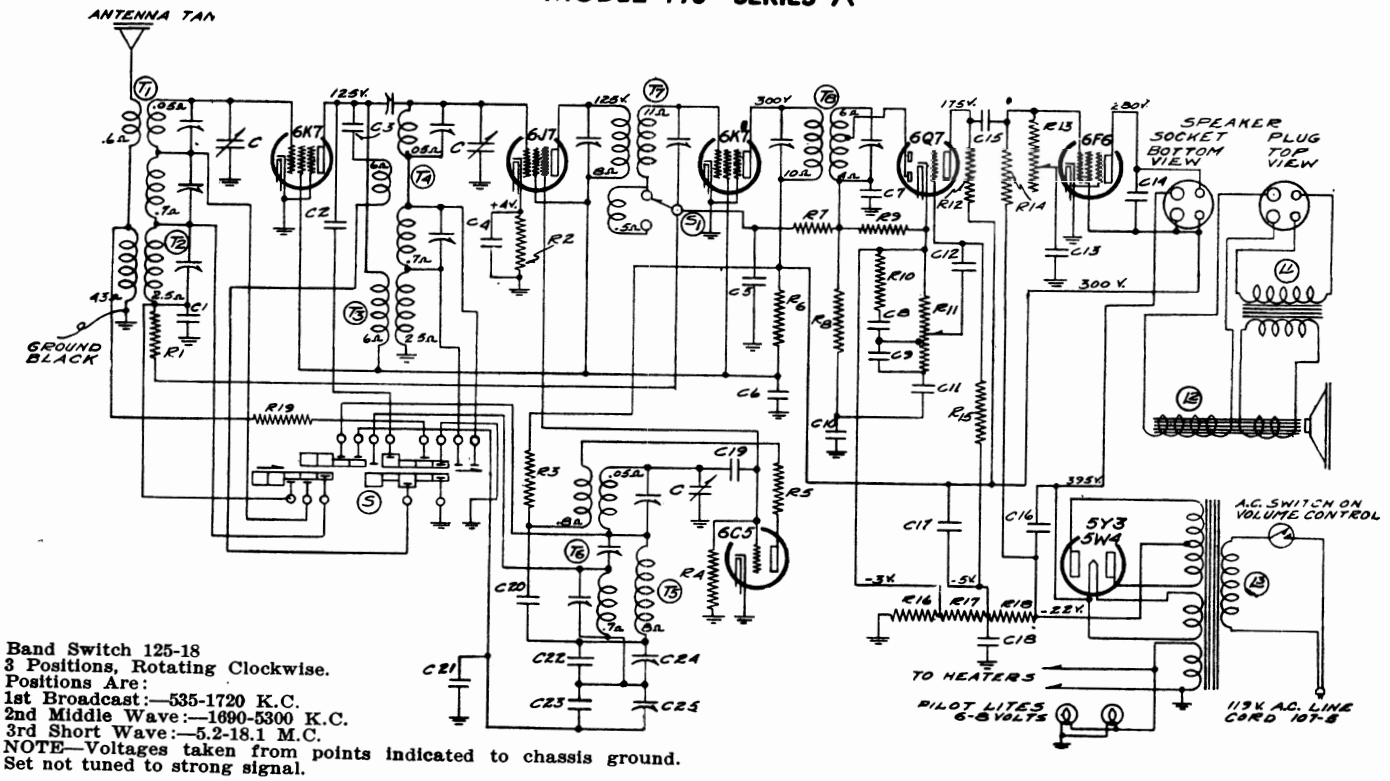
SCINTILLATION NOISE DURING WARM-UP OF TUBES

MODEL 777 SERIES B-C AND MODEL 770 SERIES A

When a model 777 or model 770 receiver is first turned on, a frying noise will generally be noted. This noise continues until the tubes warm-up and the receiver begins to draw current. It is created by scintillation of the electrolytic filter condensers. During the time the tubes are warming up, they draw no current from the rectifier causing the voltage across the first condenser to exceed the scintillating voltage of the electrolytic condenser. The condensers used however are of the regulating type and are purposely designed in such a manner that during the heating period of the tubes, the condensers draw considerable leakage current, thereby loading the rectifier and preventing excessive voltage on other circuit components. The condensers are designed to withstand this temporary overload without detrimental effect on the life of the electrolytic or the receiver. DO NOT THEREFORE REPLACE CONDENSERS BECAUSE OF THIS SCINTILLATION NOISE. RATHER CONSIDER IT AS A SIGN OF NORMAL OPERATION.

BELMONT RADIO CORP.

MODEL 778—SERIES A



Band Switch 125-18
3 Positions, Rotating Clockwise.
Positions Are:
1st Broadcast:—535-1720 K.C.
2nd Middle Wave:—1690-5300 K.C.
3rd Short Wave:—5.2-18.1 M.C.
NOTE—Voltages taken from points indicated to chassis ground.
Set not tuned to strong signal.

RESISTORS

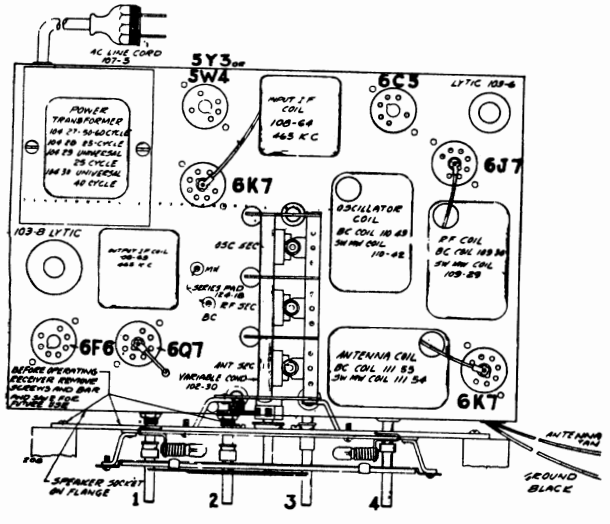
No.	Part No.	Description
R1	130-20	100M ohms—1/3 Watt—20%—50 Volt—Carbon
R2	130-43	2500 ohms—1/3 Watt—20%—20 Volt—Carbon
R3	130-77	10M ohms—1 Watt—20%—100 Volt—Carbon
R4	130-12	50M ohms—1/3 Watt—20%—20 Volt—Carbon
R5	130-60	100 ohms—1/3 Watt—20%—10 Volt—Carbon
R6	130-88	10M ohms—2 Watt—20%—Wire Wound
R7	130-3	500M ohms—1/3 Watt—20%—100 Volt—Carbon
R8	130-20	100M ohms—1/3 Watt—20%—50 Volt—Carbon
R9	130-11	250M ohms—1/3 Watt—20%—50 Volt—Carbon
R10	130-22	5000 ohms—1/3 Watt—20%—10 Volt—Carbon
R11	101-47	1 meg ohm—(Volume Control with A.C. Switch)
R12	130-20	100M ohms—1/3 Watt—20%—50 Volt—Carbon
R13	101-38	100M ohms—(Tone Control with Fidelity Switch)
R14	130-3	500M ohms—1/3 Watt—20%—100 Volt—Carbon
R15	130-38	2 meg ohm—1/3 Watt—20%—100 Volt—Carbon
R16	106-27	38 ohms—10% Muter Resistor
R17	106-27	28 ohms—10% Muter Resistor
R18	106-27	220 ohms—10% Muter Resistor
R19	130-27	50 ohms—1/3 Watt—20%—Carbon
		Note: R16, R17, R18 in one unit—part No. 106-27

CONDENSERS

C	102-30	One Section of three gang variable condenser.
C1	100-9	.05—200 Volt—25%
C2	129-59	.0003 Mica—MT—0—5%
C3	129-39	.00005 Mica—MT—0—20%
C4	100-9	.05—200 Volt—25%
C5	100-9	.05—200 volt—25%
C6	100-24B	.25—400 Volt—20%
C7	129-5	.0001 Mica—MT—0—20%
C8	100-9	.05—200 Volt—25%
C9	129-2	.0005 Mica—MT—0—20%
C10	129-60	.00015 Mica—MT—0—20%
C11	100-9	.05—200 Volt—25%
C12	100-11	.01—400 Volt—25%
C13	100-26	.02—400 Volt—25%
C14	100-32	.0005—1000 Volt—20%
C15	100-11	.01—400 Volt—25%
C16	103-8	14 mfd.—400 Volt Electrolytic
C17	103-6	8 mfd.—350 Volt Electrolytic
C18	100-6B	.25—200 Volt—20%
C19	129-31	.000025 Mica—MT—0—15%
C20	100-13	.05—400 Volt—25%
C21	129-54	.003 Mica—MW—W—2½%
C22	129-57	.0005 Mica—MT—0—5%
C23	129-58	.0021 Mica—MW—W—5%
C24	124-18	Padder, 175 mmf. working capacity.
C25	124-18	Padder, 300 mmf. working capacity.
		Note: C24, C25 in one unit—part No. 124-18.

PARTS

T1	111-54	M.W. and S.W. Antenna Coil Assem.
T2	111-55	Broadcast Ant. Coil Assem.
T3	109-30	Broadcast R.F. Coil Assem.
T4	109-29	M.W. and S.W. R.F. Coil Assem.
T5	110-43	Broadcast Osc. Coil Assem.
T6	110-42	M.W. and S.W. Osc. Coil Assem.
T7	108-64	Input I.F. Coil—465 Kc.
T8	108-63	Output I.F. Coil—465 Kc.
L1		Output Trans. (on speaker).
L2	114-36	8" Speaker (Field Resistance 1250 Ohms)
L3	104-27	Power Transformer (50-60 Cycle)
S	125-18	Band Switch
S1	101-38	Fidelity Switch on Tone Control



Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

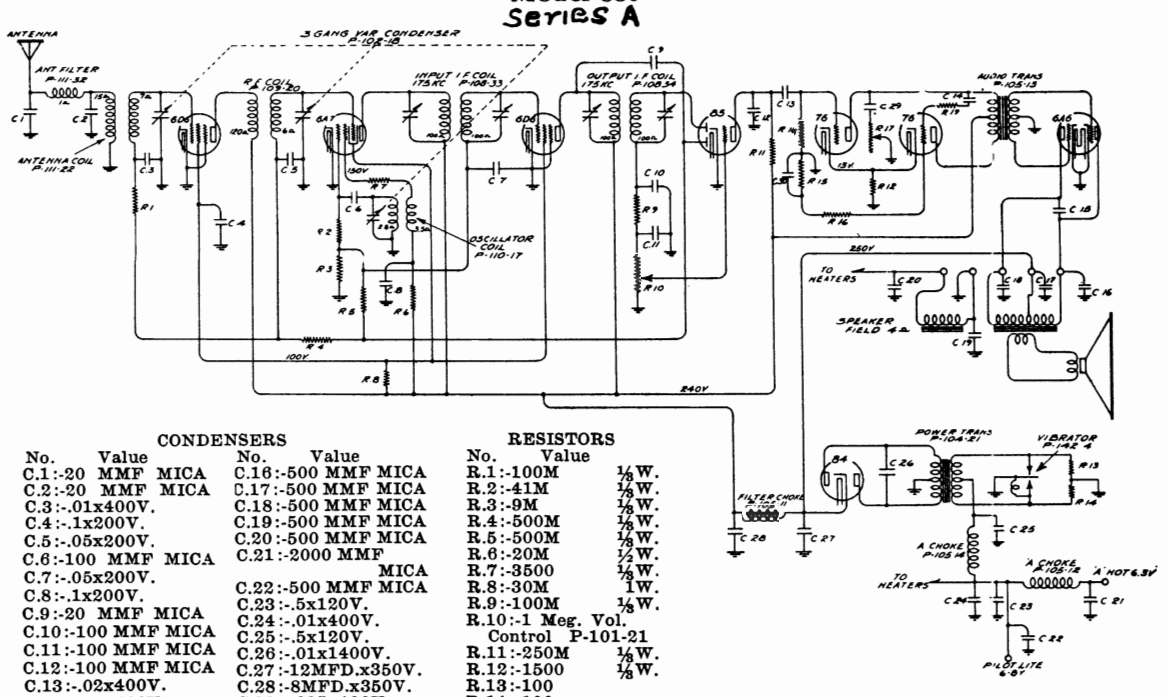
Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

BELMONT RADIO CORP.

Model 880
Series A



CONDENSERS

No.	Value	No.	Value
C.1	-20 MMF MICA	C.16	-500 MMF MICA
C.2	-20 MMF MICA	C.17	-500 MMF MICA
C.3	-.01x400V.	C.18	-500 MMF MICA
C.4	-.1x200V.	C.19	-500 MMF MICA
C.5	-.05x200V.	C.20	-500 MMF MICA
C.6	-100 MMF MICA	C.21	-2000 MMF MICA
C.7	-.05x200V.	C.22	-500 MMF MICA
C.8	-.1x200V.	C.23	-.5x120V.
C.9	-20 MMF MICA	C.24	-.01x400V.
C.10	-100 MMF MICA	C.25	-.5x120V.
C.11	-100 MMF MICA	C.26	-.01x1400V.
C.12	-100 MMF MICA	C.27	-12MFD.x350V.
C.13	-.02x400V.	C.28	-8MFD.x350V.
C.14	-.02x400V.	C.29	-.025x400V.
C.15	-.006x600V.	C.30	-.01x400V.

NOTE:
C.4 and C.8 are in one unit P-118-1
C.27 and C.28 are in one unit P-119-16
R.13 and R.14 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

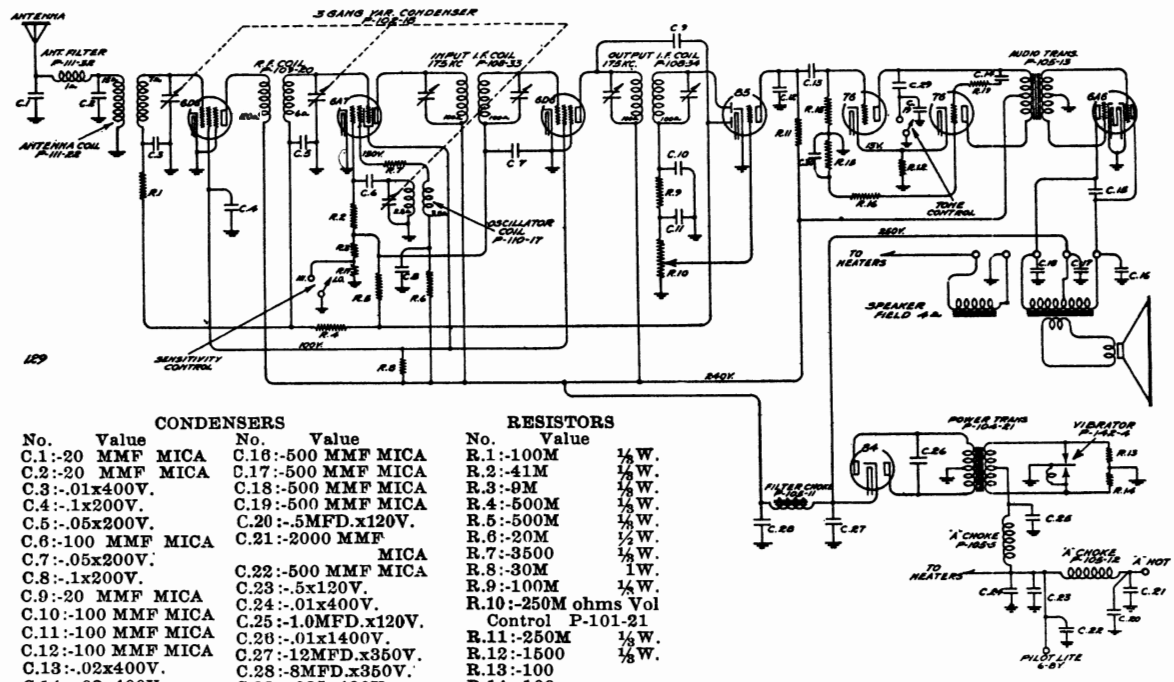
RESISTORS

No.	Value	
R.1	-100M	1/8 W.
R.2	-41M	1/8 W.
R.3	-9M	1/8 W.
R.4	-500M	1/8 W.
R.5	-500M	1/8 W.
R.6	-20M	1/2 W.
R.7	-3500	1/8 W.
R.8	-30M	1W.
R.9	-100M	1/8 W.
R.10	-1 Meg. Vol. Control P-101-21	
R.11	-250M	1/8 W.
R.12	-1500	1/8 W.
R.13	-100	
R.14	-100	
R.15	-75M	1/8 W.
R.16	-90M	1/8 W.
R.17	-Switch	
R.18	-500M	1/8 W.
R.19	-1 Meg.	1/8 W.

Serial No. 80001 and up.

I.F. = 175 K.C.

Model 880 Series B



CONDENSERS

No.	Value	No.	Value
C.1	-20 MMF MICA	C.16	-500 MMF MICA
C.2	-20 MMF MICA	C.17	-500 MMF MICA
C.3	-.01x400V.	C.18	-500 MMF MICA
C.4	-.1x200V.	C.19	-500 MMF MICA
C.5	-.05x200V.	C.20	-.5MFD.x120V.
C.6	-100 MMF MICA	C.21	-2000 MMF MICA
C.7	-.05x200V.	C.22	-500 MMF MICA
C.8	-.1x200V.	C.23	-.5x120V.
C.9	-20 MMF MICA	C.24	-.01x400V.
C.10	-100 MMF MICA	C.25	-1.0MFD.x120V.
C.11	-100 MMF MICA	C.26	-.01x1400V.
C.12	-100 MMF MICA	C.27	-12MFD.x350V.
C.13	-.02x400V.	C.28	-8MFD.x350V.
C.14	-.02x400V.	C.29	-.025x400V.
C.15	-.006x600V.	C.30	-.01x400V.

NOTE:
C.4 and C.8 are in one unit P-118-1
C.27 and C.28 are in one unit P-119-16
R.13 and R.14 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

RESISTORS

No.	Value	
R.1	-100M	1/8 W.
R.2	-41M	1/8 W.
R.3	-9M	1/8 W.
R.4	-500M	1/8 W.
R.5	-500M	1/8 W.
R.6	-20M	1/2 W.
R.7	-3500	1/8 W.
R.8	-30M	1W.
R.9	-100M	1/8 W.
R.10	-250M ohms Vol Control P-101-21	
R.11	-250M	1/8 W.
R.12	-1500	1/8 W.
R.13	-100	
R.14	-100	
R.15	-75M	1/8 W.
R.16	-90M	1/8 W.
R.17	-4M	1/2 W.
R.18	-500M	1/8 W.
R.19	-1 Meg.	1/8 W.

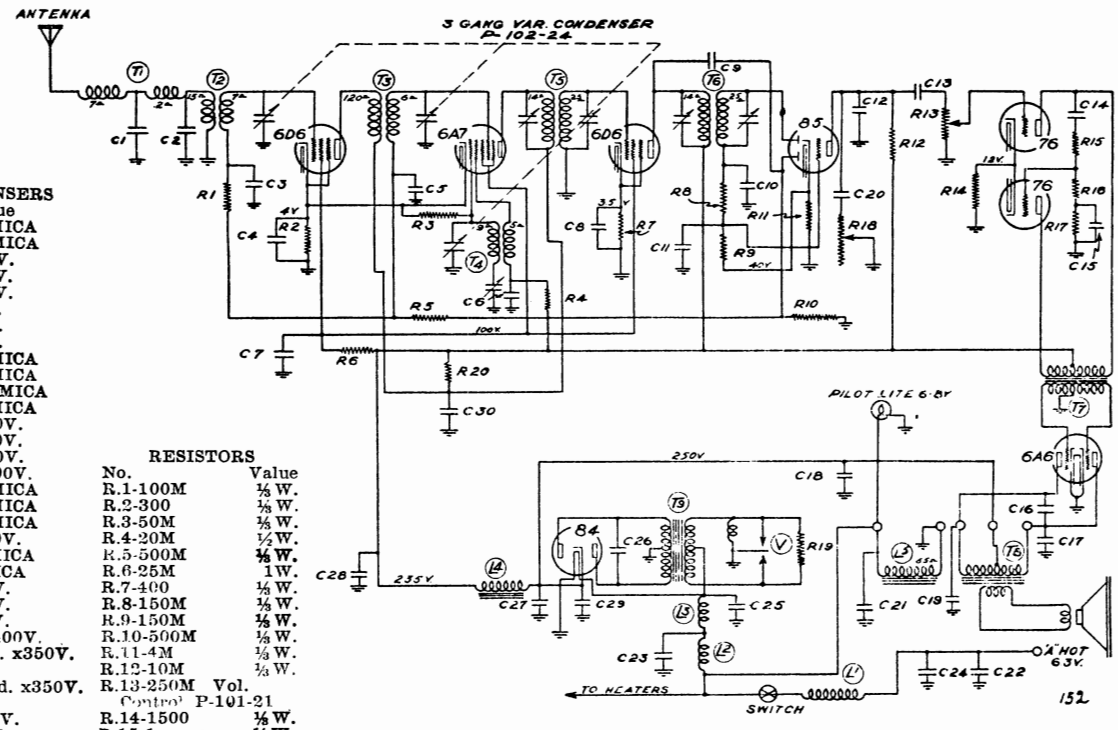
Series A 80001 up

Series B 81002 up

I.F. = 175 K.C.

BELMONT RADIO CORP.

Model 880 Series C



CONDENSERS

No.	Value
C.1-.00009 MICA	
C.2-.00002 MICA	
C.3-.01x400V.	
C.4-.25x200V.	
C.5-.05x200V.	
C.6-.1x200V.	
C.7-.1x200V.	
C.8-.1x200V.	
C.9-.00002 MICA	
C.10-.0001 MICA	
C.11-.00005 MICA	
C.12-.0001 MICA	
C.13-.02x400V.	
C.14-.02x400V.	
C.15-.01x400V.	
C.16-.006x600V.	
C.17-.0005 MICA	
C.18-.0005 MICA	
C.19-.0005 MICA	
C.20-.05x400V.	
C.21-.0005 MICA	
C.22-.002 MICA	
C.23-.5x120V.	
C.24-.5x120V.	
C.25-.5x120V.	
C.26-.015x1400V.	
C.27-8.0 mfd. x350V. P-119-16	
C.28-12.0 mfd. x350V. P-119-16	
C.29-.01x400V.	
C.30-.1x400V.	
117-2 Dash Mounting Bracket	
117-1 Bracket Steering Column	
Dash Mounting Assembly	

RESISTORS

No.	Value
R.1-100M	⅛ W.
R.2-300	⅛ W.
R.3-50M	⅛ W.
R.4-20M	½ W.
R.5-500M	⅛ W.
R.6-25M	1W.
R.7-400	⅛ W.
R.8-150M	⅛ W.
R.9-150M	⅛ W.
R.10-500M	⅛ W.
R.11-4M	⅛ W.
R.12-10M	⅛ W.
R.13-250M Vol. Control P-101-21	
R.14-1500	⅛ W.
R.15-1 meg	⅛ W.
R.16-91M	⅛ W.
R.17-75M	⅛ W.
R.18-100M Tone Control P-101-39	
R.19-200	⅛ W.
R.20-1500	⅛ W.

PARTS

No.	Part No.
T1-Antenna Filter	P-111-43
T2-Antenna Coil	P-111-42
T3-R.F. Coil	P-109-20
T4-Oscillator Coil	P-110-34
T5-Input I.F. Coil	P-108-56
T6-Output I.F. Coil	P-108-57
T7-Audio Trans.	P-105-13
T8-Output Trans.	
T9-Power Trans.	P-104-21
L1-"A" Choke	P-105-18
L2-"A" Choke	P-105-18
L3-"A" Choke	P-105-19
L4-Filter Choke	P-105-11
L5-Speaker Field	
V-Vibrator	142-4

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

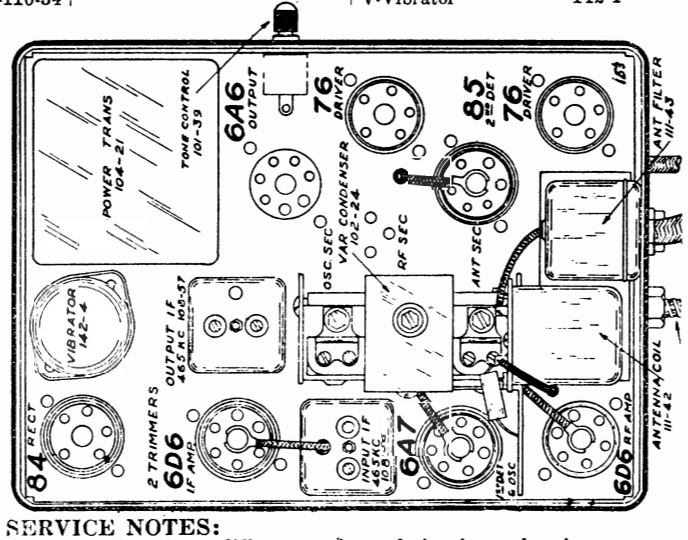
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 6A6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-56) and output (108-57) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with **broadcast dummy, to the antenna lead of receiver.**
2. **Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).**
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
4. Re-set external oscillator to 600 K.C. and adjust series pad to resonance, rotate condenser and move dial pointer to 600 K.C. by gently rocking condenser to and fro. Pick up oscillator signal while adjusting series pad to resonance. This adjustment is accessible from the bottom of the chassis.
   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.



SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

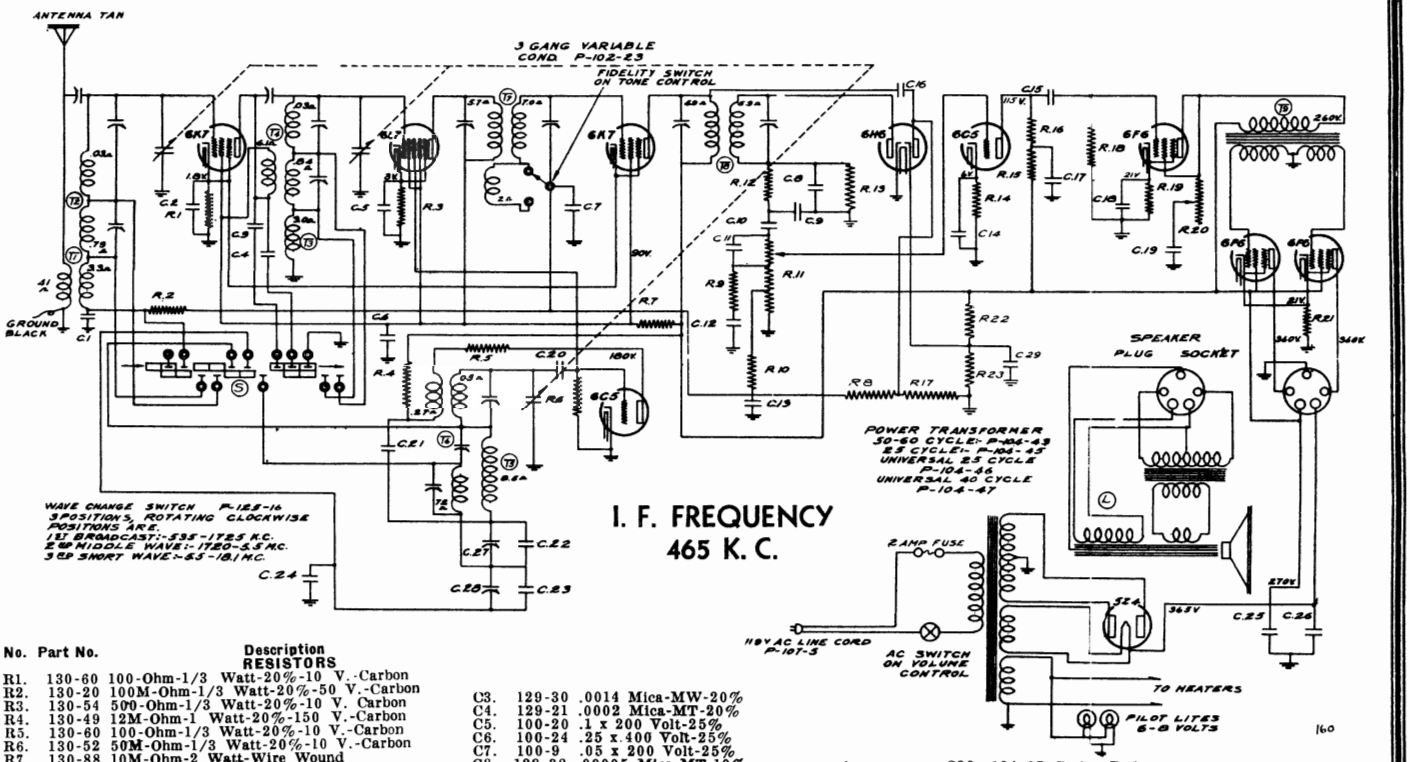
All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

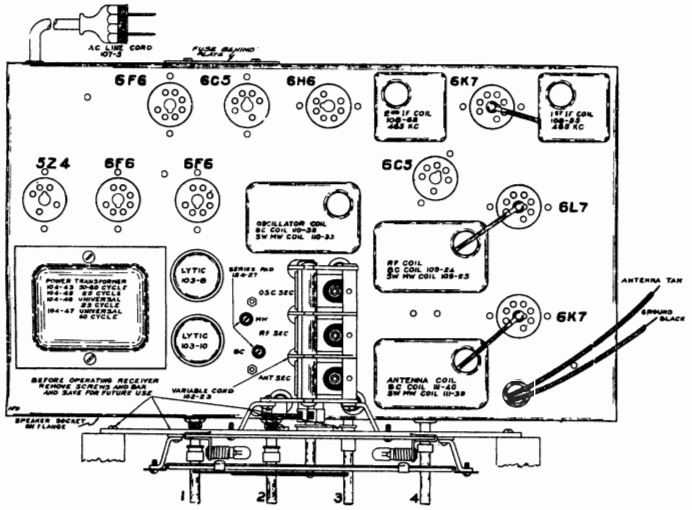
BELMONT RADIO CORP.

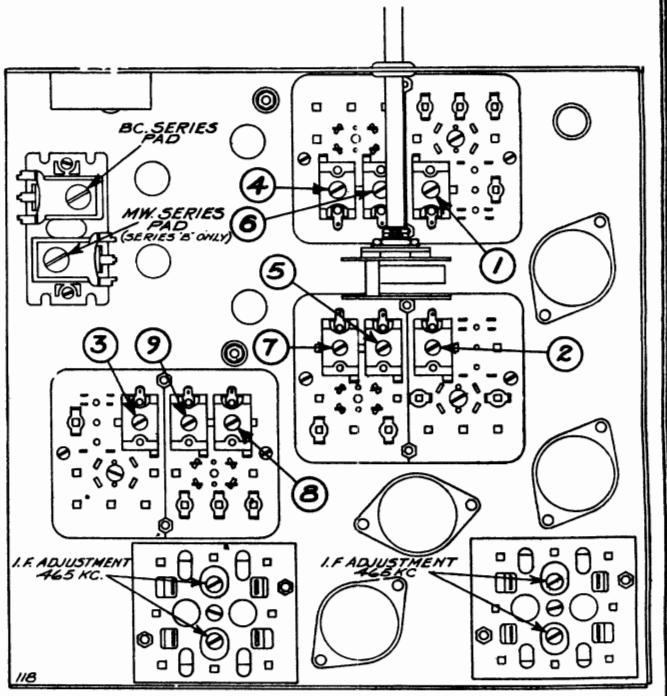
MODEL 1070—SERIES A



No.	Part No.	Description
		RESISTORS
R1.	130-60	100-Ohm-1/3 Watt-20%-10 V.-Carbon
R2.	130-20	100M-Ohm-1/3 Watt-20%-50 V.-Carbon
R3.	130-54	500-Ohm-1/3 Watt-20%-10 V. Carbon
R4.	130-49	12M-Ohm-1 Watt-20%-150 V.-Carbon
R5.	130-60	100-Ohm-1/3 Watt-20%-10 V.-Carbon
R6.	130-52	50M-Ohm-1/3 Watt-20%-10 V.-Carbon
R7.	130-88	10M-Ohm-2 Watt-Wire Wound
R8.	130-3	500M-Ohm-1/3 Watt-20%-100 V.-Carb.
R9.	130-22	5M-Ohm-1/3 Watt-20%-10 V.-Carbon
R10.	130-85	3M-Ohm-1/3 Watt-20%-10 V.-Carbon
R11.	101-36	1 Meg-Ohm-Volume Control
R12.	130-20	100M-Ohm-1/3 Watt-20%-50 V.-Carbon
R13.	130-11	250M-Ohm-1/3 Watt-20%-50 V.-Carbon
R14.	130-36	10M-Ohm-1/3 Watt-20%-50 V.-Carbon
R15.	130-20	100M-Ohm-1/3 Watt-20%-50 V.-Carbon
R16.	130-20	100M-Ohm-1/3 Watt-20%-50 V.-Carbon
R17.	130-3	500M-Ohm-1/3 Watt-20%-100 V.-Carb.
R18.	130-3	500M-Ohm-1/3 Watt-20%-100 V.-Carb.
R19.	106-25	1000-Ohm-1/3 Watt-Muter
R20.	101-40	5000-Ohm Tone Control
R21.	106-25	370-Ohm-1/3 Watt Muter
R22.	130-9	200M-Ohm-1/3 Watt-20%-20 V. Carbon
R23.	130-21	20M-Ohm-1/3 Watt-20%-20 V. Carbon
		CONDENSERS
C1.	100-9	.05 x 200 Volt-25%
C2.	100-6	.25 x 200 Volt-20%
C3.	129-30	.0014 Mica-MW-20%
C4.	129-21	.0002 Mica-MT-20%
C5.	100-20	.1 x 200 Volt-25%
C6.	100-24	.25 x 400 Volt-25%
C7.	100-9	.05 x 200 Volt-25%
C8.	129-38	.00005 Mica-MT-10%
C9.	129-38	.00005 Mica-MT-10%
C10.	100-9	.05 x 200 Volt-25%
C11.	129-2	.0005 Mica-MT-20%
C12.	100-22	.05 x 200 Volt-25%
C13.	100-22	.05 x 200 Volt-25%
C14.	119-19	20 mfd. x 25 Volts
C15.	100-13	.05 x 400 Volt-25%
C16.	129-3	.00002 Mica-20%
C17.	100-1	.1 x 400 Volts-Plus 50%; Minus 10%
C18.	119-19	20 mfd. x 25 Volts
C19.	100-24	.25 x 400 Volts-25%
C20.	129-52	.000018 Mica-MT-10%
C21.	100-13	.05 x 400 Volts-25%
C22.	129-28	.00064 Mica-MT-5%
C23.	129-22	.0014 Mica-MW-5%
C24.	129-29	.0038 Mica-MW-2 1/2%
C25.	103-8	14 mfd. x 400 V.
C26.	103-10	30 mfd. x 450 V.
C27.	124-27	Series Pad.
C28.	124-27	Series Pad.
C29.	100-7	.005 x 600 V.-25%
		PARTS
T1.	111-40	Broadcast Antenna Coil
T2.	111-39	Short Wave, Middle Wave Antenna Coil
T3.	109-24	Broadcast R.F. Coil
T4.	109-25	Short Wave, Middle Wave, R.F. Coil
T5.	110-32	Broadcast Oscillator Coil
T6.	110-33	Short Wave, Middle Wave Oscillator Coil
T7.	108-55	Input I.F. Coil 465 Kc.
T8.	108-62	Output I.F. Coil 465 Kc.
T9.	105-17	Audio Transformer
L	114-29	Speaker (Field Resistance 1550 Ohms)
S	125-16	Wave Change Switch
	104-43	50-60 Cycle Power Transformer
	104-45	25 Cycle Power Transformer
	104-46	25 Cycle Universal Power Transformer
	104-47	40 Cycle Universal Power Transformer

TOP VIEW—MODEL 1070—SERIES A





BELMONT RADIO CORP.

MODEL 1070 - Series A

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagrams of series A.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

This chassis is protected against damage from faulty tubes or abnormal line conditions by a fuse in the primary circuit.

If when set is turned on pilot lights do not light, look for a blown fuse.

This fuse is made accessible for replacement by removing fuse cover located on back flange of chassis, replace only with a 2 ampere fuse. If replacement fuse blows out, check tubes, (particularly 5Z4 rectifier) circuit, repair or replace defective tubes or parts.

NEVER ATTEMPT TO REPLACE FUSE WITHOUT FIRST DISCONNECTING POWER.

NEVER REPLACE WITH FUSE OTHER THAN 2 AMPERE RATING.

NOTE: Chassis with serial numbers from 5K194500 to 5K195497 have the fuse mounted on the under-side of the chassis, it is necessary to remove the chassis from the cabinet to replace the fuse.

ALIGNING INSTRUCTIONS

Dummy Antennas

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

CAUTION:

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-62 Output I.F. Transformer
Part No. 108-55 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view).

1. With volume control full on, (the extreme right of its rotation), the wave changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer to resonance.
   (c) With oscillator still connected to 6L7, re-adjust output I.F. transformer.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
   (a) Adjust broadcast series pad to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the electrolytic condenser. See top view.
   (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

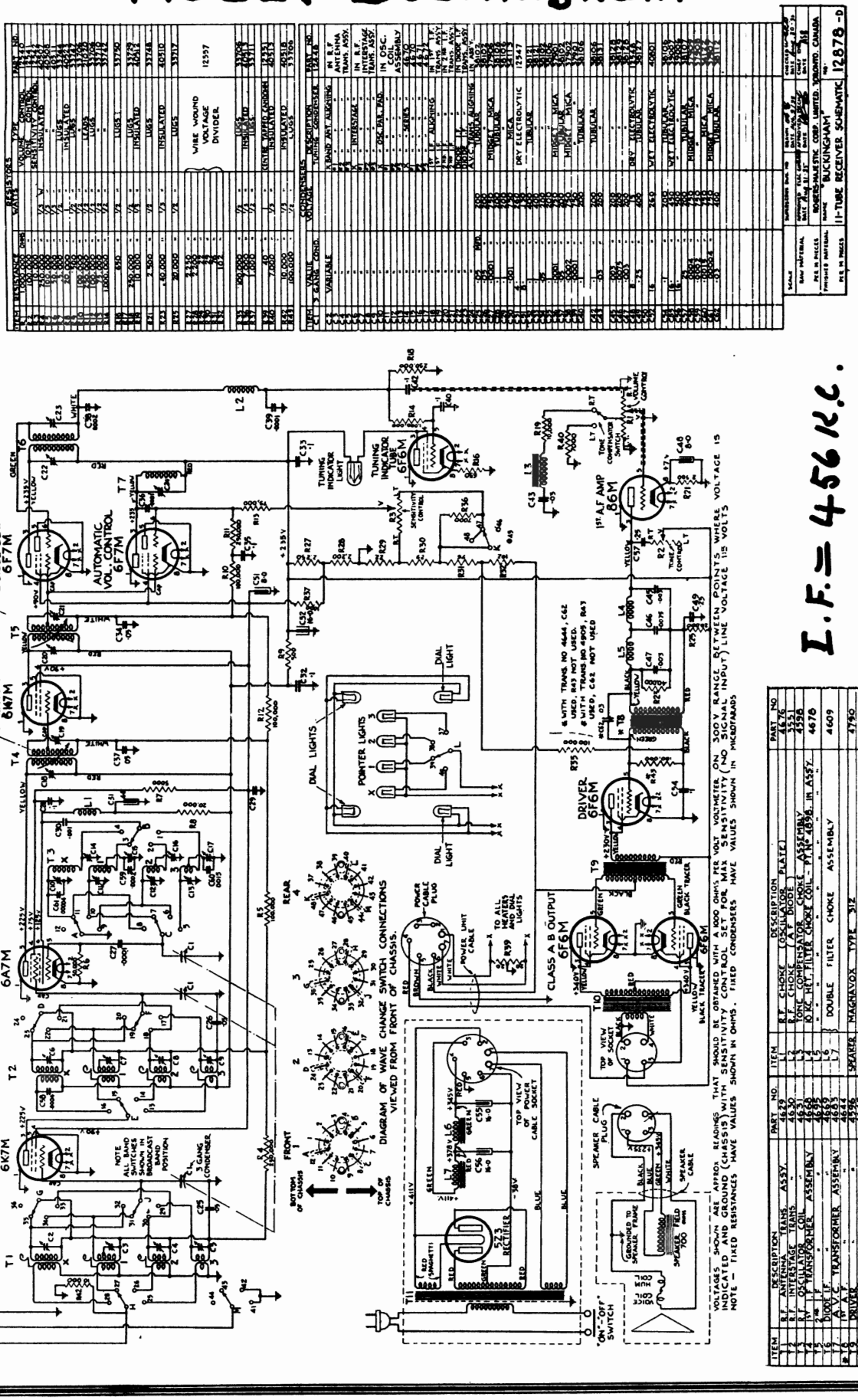
1. With wave changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 8), short wave R.F. (adjustment number 7) and short wave antenna (adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate wave position, center of its rotation, and with external oscillator set at 1800 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Rotate variable condenser to approximately 1800 K.C., tune in oscillator signal and adjust M.W. series pad (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
   (b) Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 5), intermediate wave antenna (adjustment number 4) and intermediate wave oscillator (adjustment number 9) to resonance.
   (c) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

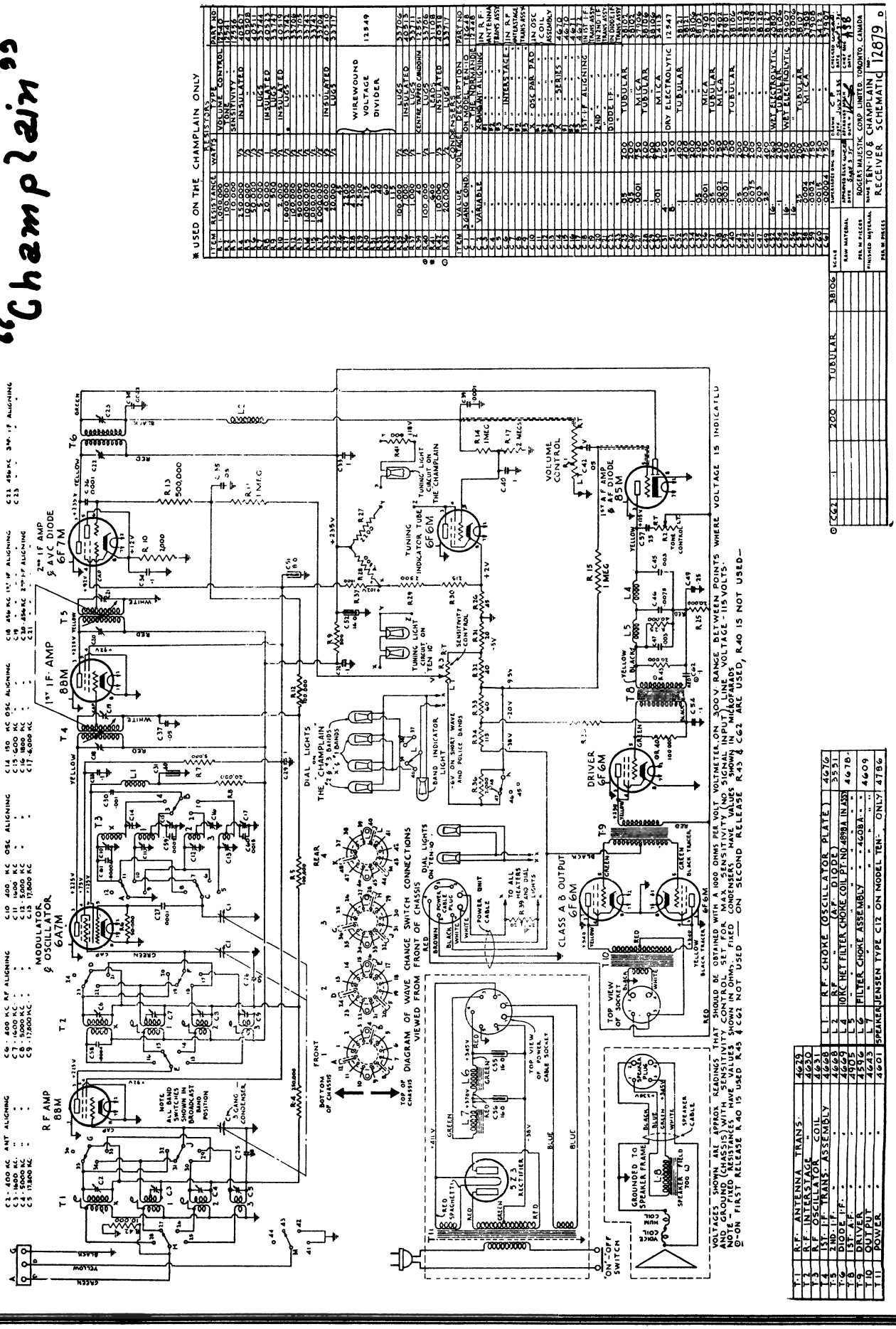
CANADIAN RADIO CORP.

Model "Buckingham"



CANADIAN RADIO CORP.

Model "Champlain"



T1	R.F. ANTENNA TRANS.	4629
T2	R.F. INTERSTAGE "	4630
T3	R.F. OSCILLATOR COIL	4631
T4	1ST I.F. TRANS. ASSEMBLY	4668
T5	2ND I.F. " "	4668
T6	DIODE I.F. " "	4669
T8	DRIVER " "	4905
T10	OUTPUT " "	4546
T11	POWER " "	4601
L1	R.F. CHOKE (OSCILLATOR PLATE)	4676
L2	R.F. " (A.F. DIODE)	5551
L4	10 KC NET FILTER CHOKE COIL PT. NO. 4898A IN ASSY	4678
L5	FILTER CHOKE ASSEMBLY " " 4608A " "	4609
L6	" " " " " 4608B " "	4786
SPEAKER	JENSEN TYPE C12 ON MODEL TEN — ONLY	

* USED ON THE CHAMPLAIN ONLY

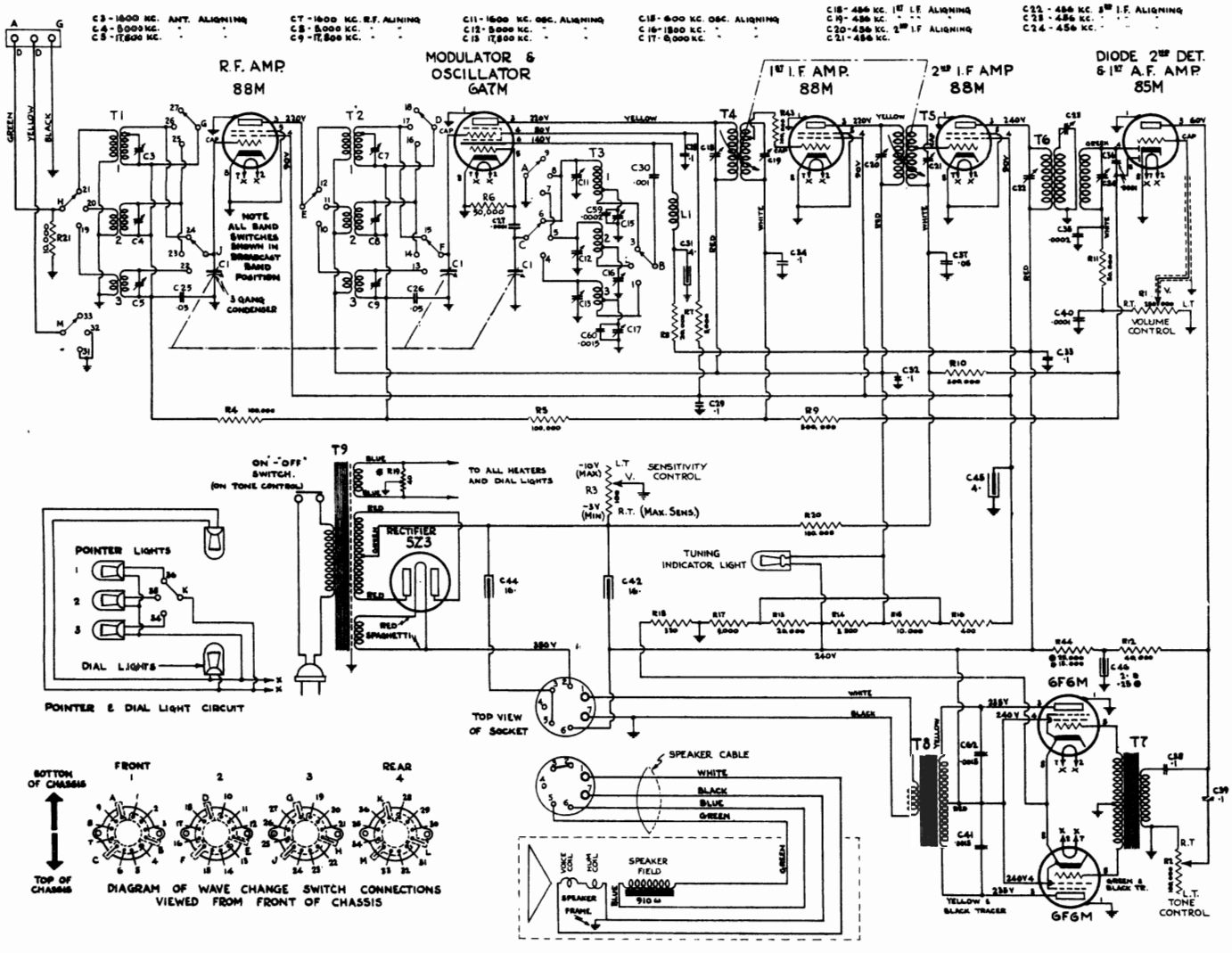
ITEM	RESISTANCE	WATTS	RESISTOR TYPE	PART NO
R.1	1,000,000		VOLUME CONTROL	12540
R.2	100,000		TONE "	12541
R.3	250,000		SENSITIVITY "	12542
R.4	250,000	½	INSULATED	46258
R.5	100,000	½	"	46258
R.6	3,000	½	LUGS	33744
R.7	5,000	½	INSULATED	40319
R.8	10,000	½	"	40319
R.9	2,000	½	LUGS	33744
R.10	1,000,000	½	INSULATED	40319
R.11	1,000,000	½	LUGS	33744
R.12	500,000	½	"	33743
R.13	500,000	½	"	33743
R.14	1,000,000	½	"	33743
R.15	2,000,000	½	"	33744
R.16	40,000	½	INSULATED	40320
R.17	2,000,000	½	LUGS	33717
R.18	2,500	1	WIREWOUND VOLTAGE DIVIDER	12549
R.19	115			
R.20	40			
R.21	60			
R.22	100,000	½	LUGS	33706
R.23	1,000	½	INSULATED	40315
R.24	40	½	CENTRE TAPPED CARDWIN	12551
R.25	100,000	½	LUGS	33706
R.26	40,000	½	INSULATED	40320
R.27	10,000	½	"	40318
R.28	20,000	½	"	40318
R.29	40,000	½	"	40320
R.30	10,000	½	"	40318
R.31	20,000	½	"	40319
R.32	40,000	½	"	40320
R.33	60			
R.34	100,000	½	LUGS	33706
R.35	1,000	½	INSULATED	40315
R.36	40	½	CENTRE TAPPED CARDWIN	12551
R.37	100,000	½	LUGS	33706
R.38	40,000	½	INSULATED	40320
R.39	10,000	½	"	40318
R.40	20,000	½	"	40319
R.41	40,000	½	"	40320
R.42	10,000	½	"	40318
R.43	20,000	½	"	40319
R.44	40,000	½	"	40320
R.45	60			

ITEM	VALUE	VOLTAGE	DESCRIPTION	PART NO
C.1	3 GANG COND.		ON MODEL TEN 10	12548
C.2	"		3 GANG ANT ALIGNING	12547
C.3	VARIABLE		" "	ANTENNA TRANS ASSY
C.4	"		" "	IN R.F.
C.5	"		" "	INTERSTAGE " IN R.F.
C.6	"		" "	INTERSTAGE " IN R.F.
C.7	"		" "	TRANS ASSY
C.8	"		" "	OSC PAR. PAD IN OSC
C.9	"		" "	COIL ASSEMBLY
C.10	"		" "	" "
C.11	"		" "	" "
C.12	"		" "	SERIES " 4670
C.13	"		" "	" " 4670
C.14	"		" "	" " 4671
C.15	"		" "	" " 4671
C.16	"		" "	IN 1ST I.F. TRANS ASSY
C.17	"		" "	IN 1ST I.F. TRANS ASSY
C.18	"		2ND "	IN 2ND I.F. TRANS ASSY
C.19	"		DIODE I.F. "	TRANS ASSY
C.20	"		" "	TRANS ASSY
C.21	"		" "	TRANS ASSY
C.22	.1	200	TUBULAR	38121
C.23	.1	400	"	38104
C.24	.1	200	"	38104
C.25	.0001	750	MICA	37901
C.26	.0001	750	MICA	37901
C.27	.0001	750	TUBULAR	38101
C.28	.0001	750	TUBULAR	38101
C.29	.0001	750	TUBULAR	38106
C.30	.0001	750	TUBULAR	38106
C.31	.05	400	"	38118
C.32	.05	400	"	38118
C.33	.003	400	"	38118
C.34	.0015	200	"	38113
C.35	.003	200	"	38113
C.36	.25	400	WET ELECTROLYTIC	38113
C.37	.05	400	" "	38100
C.38	16	200	WET ELECTROLYTIC	39007
C.39	16	450	" "	39007
C.40	16	200	TUBULAR	39006
C.41	16	450	"	39006
C.42	.0002	750	MICA	37901
C.43	.0002	750	"	37901
C.44	.0015	750	TUBULAR	37908
C.45	.003	750	"	37909
C.46	.003	200	"	38118
C.47	.003	200	"	38118
C.48	.1	200	"	38121
C.49	.25	400	WET ELECTROLYTIC	39007
C.50	.1	200	" "	39007
C.51	.1	200	TUBULAR	38121
C.52	.1	200	"	38121
C.53	.1	200	"	38121
C.54	.1	200	"	38121
C.55	.1	200	"	38121
C.56	.1	200	"	38121
C.57	.1	200	"	38121
C.58	.1	200	"	38121
C.59	.1	200	"	38121
C.60	.1	200	"	38121
C.61	.1	200	"	38121
C.62	.1	200	TUBULAR	38106

RAW MATERIAL	SPECIFICATION NO.	DRAWING NO.	CHART NO.	438
PER M PIECES	ROGERS MAJESTIC CORP. LIMITED, TORONTO, CANADA			
FINISHED MATERIAL	MODEL TEN-10 & CHAMPLAIN			
PER M PIECES	RECEIVER SCHEMATIC			12879 D

CANADIAN RADIO CORP.

Model "Countess" Chassis 83



VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER ON 300V RANGE BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS) WITH SENSITIVITY CONTROL SET FOR MAX. SENSITIVITY (& NO SIGNAL INPUT) LINE VOLTAGE - 115 VOLTS.
NOTE —: FIXED RESISTANCES HAVE VALUES SHOWN IN OHMS. - FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS
NOTE —: D.C. VOLTAGES ON 60 ~ CHASSIS WILL BE APPROX. 8% HIGHER THAN THOSE SHOWN.

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO
C1	3 GANG COND.		ON MODEL 83A-83B	
C3	VARIABLE		#1 BAND ANT. ALIGNING	IN R.F.
C4	"		#2 " " "	TRANS.
C5	"		#3 " " "	ASSEM.
C7	"		#1 - INTERSTAGE "	INTERSTAGE
C8	"		#2 " " "	TRANS.
C9	"		#3 " " "	ASSEM.
C11	"		#1 - OSC. PLATE GRID	IN OSC.
C12	"		#2 " " " "	COIL ASSEM.
C13	"		#3 " " " "	
C15	"		#1 " " SERIES "	4670
C16	"		#2 " " " "	4671
C17	"		#3 " " " "	4672
C18	"		1ST I.F ALIGNING	IN 1ST I.F.
C19	"		" " "	TRANS. ASSY
C20	"		2ND I.F. ALIGNING	IN 2ND I.F
C21	"		" " "	TRANS. ASSY
C22	"		DIODE " "	IN DIODE I.F.
C23	"		" " "	TRANS. ASSEM.
C24	"		" " "	12424
C25	.05	200	TUBULAR	38102
C26	.05	200	"	38102
C27	.0001	750	MICA	37902
C28	.1	200	TUBULAR	38104
C29	.1	200	"	38104
C30	.001	750	MICA	54113
C31	4	350 DC	DRY ELECTROLYTIC	13084 *
C45	4	350 "	" "	
C46	2	400 "	" "	13085 *
C46	.25	400 "	TUBULAR	38107 ●
C31	4	350 "	DRY ELECTROLYTIC	13084 ●
C45	4	250 "	" "	
C32	.1	400	TUBULAR	38121
C38	.1	400	"	38121
C34	.1	200	"	38106
C35	.0002	750	MICA	37902
C36	.0001	750	"	37901
C37	.05	200	TUBULAR	38102
C38	.1	400	"	38121
C39	.1	400	"	38121
C40	.0001	750	MICA	37901
C41	.0015	500	OIL IMP TUBULAR	11977-A
C42	16	250	WET ELEC. REG. TYPE	40801
C44	16	475	WET ELECTROLYTIC	39011
C59	.0002	750	MICA	37902
C60	.0015	750	"	54122
C62	.0015	500	OIL IMP. TUBULAR	11977-A

ITEM	RESISTANCE	WATTS	TYPE	PART NO
R1	250,000 OHMS		VOLUME CONTROL	12121-A
R2	100,000 "		TONE "	12841-A
R3	100 "		SENSITIVITY "	12777-A
R4	100,000 "		INSULATED	40808 &
R5	100,000 "	1/2 W	"	40808
R6	50,000 "	1/2 "	"	40811
R7	5,000 "	1/4 "	LUGS	33744
R8	20,000 "	1 "	INSULATED	40823
R9	500,000 "	1/2 "	LUGS	33709
R10	500,000 "	1/2 "	"	33709
R11	50,000 "	1/3 "	INSULATED	40811
R12	40,000 "	1 "	LUGS	33803
R13	20,000 "	1 "		
R14	3,500 "	11 "	WIRE WOUND VOLTAGE DIVIDER	12776-A
R15	10,000 "	2 "		
R16	400 "	.4 "		
R17	9,000 "	1.2 "		
R18	330 "	1.5 "		
R19	40 "	1 "	C.T. CANDOHM	12561-A *
R20	100,000 "	1/2 "	LUGS	33709
R21	10,000 "	1/2 "	INSULATED	40818
R43	100,000 "	1/2 "	"	40808
R44	25,000 "	1/2 "	"	40804 ●
R44	15,000 "	1/2 "	"	40827 *

ITEM	NAME	NO.
T1	R.F. ANTENNA TRANS.	5039
T2	R.F. INTERSTAGE TRANS.	5040
T3	R.F. OSCILLATOR COIL	5041
T4	1ST I.F. TRANS. ASSEMBLY	5035
T5	2ND I.F. " "	44868
T6	DIODE I.F. " "	5007
T7	INPUT " "	4818
T8	OUTPUT " "	5160
T9	POWER " "	4774
	" " "	5081

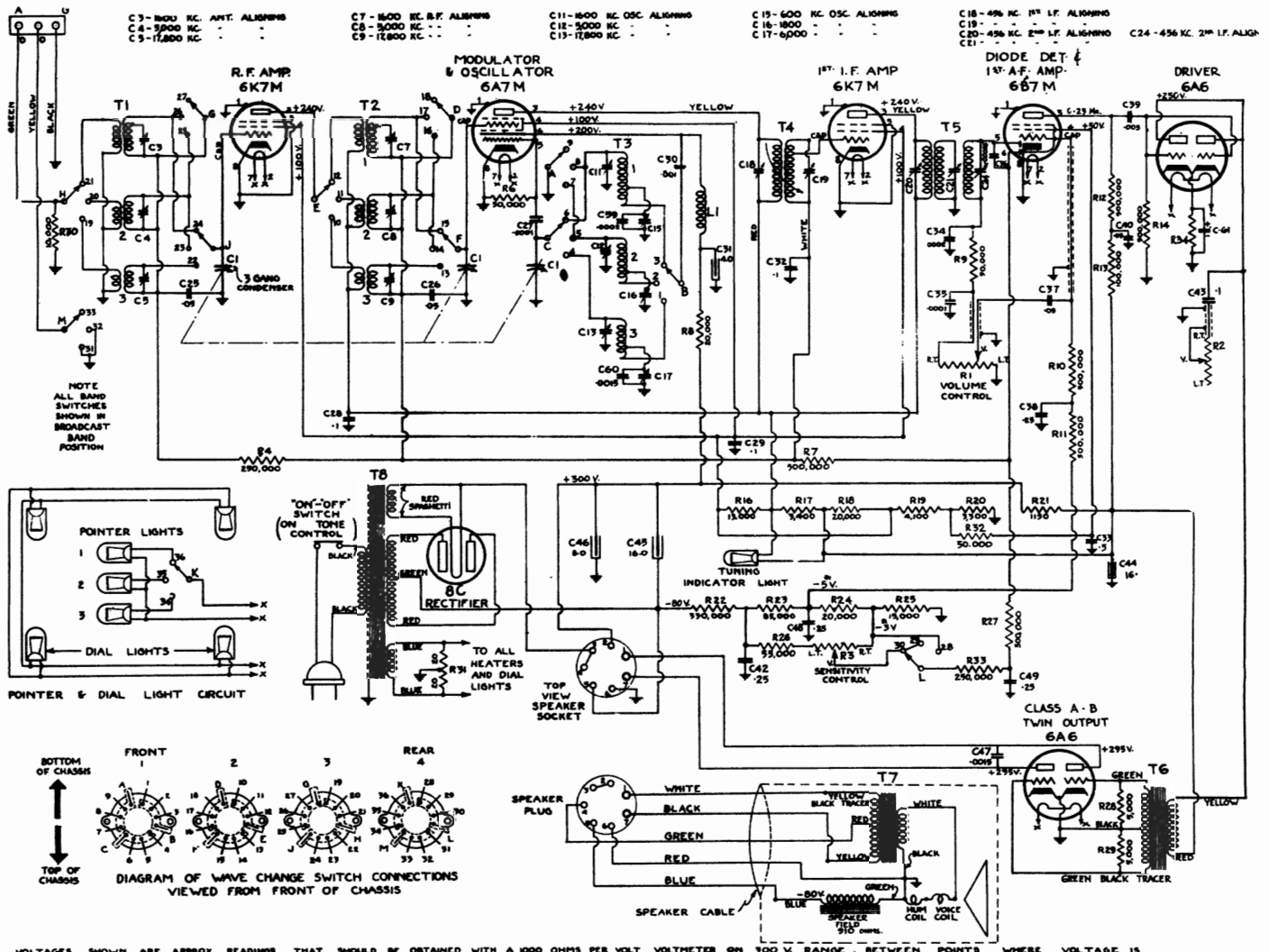
* 25 CYCLE ONLY
⊙ 60 " "

ITEM	NAME	NO.
L1	R.F. CHOKE (OSCILLATOR PLATE)	4676
SPEAKER	MAGNAVOX TYPE 102	5148

I.F. = 456 K.C.

CANADIAN RADIO CORP.

Model "Empress" Chassis 72
" "Duchess" " 76



VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER ON 500 V. RANGE, BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS) WITH SENSITIVITY CONTROL SET FOR MAX. SENSITIVITY (NO SIGNAL INPUT), LINE VOLTAGE 115 VOLTS.
NOTE - FIXED RESISTORS HAVE VALUES SHOWN IN OHMS. FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS.
VOLTAGES MARKED # CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.

I.F. = 456 K.C.

PRINT NUMBER	L'TR.	CHANGE	BY	DATE	CHECK
2725	A	R31 - C.T. CANDOHM REMOVED	AB	26/1/37	
2734	B	5000 ω RES. ADDED	"	27/1/37	
2738	C	R31 - C.T. CANDOHM ADDED	"	29/1/37	
2738	D	.25 MFD. 200V. COND. ADDED	"	"	
2738	E	VOL. CONT. WAS 12810	"	"	
2738	F	TONE CONT. WAS 12760	"	"	
2739	G	RECTIFIER WAS 523	"	30/1/37	
2755	H	ADDED R39 & C49	"	2/2/37	
2767	J	C32 WAS .02 MFD.	"	10/2/37	
2768	K	REMOVE 5000 Ω RES. ADDED BY (G)	"	11/2/37	
2796	L	ANT. TRANS. ASSY. WAS 4840	"	"	
2796	M	INTER. " " 4841	"	"	
2796	N	OSC. COIL " " 4842	"	"	
	O	R.F. CHOKE (OSC. PLATE) WAS 8981	JFR	3/3/37	
	P	R19 & C41 REMOVED	CP	7/3/37	
	Q	R32 & C61 ADDED	CP	7/3/37	
3111	R	ALTERNATIVE VOLUME CONTROL CIRCUIT ADDED	CP	8/7/37	

TO 50M OHMS (R9)
C-35
C-62
R55
C-37
R1
TO CAP OF 6B7M
ALTERNATIVE VOLUME CONTROL CIRCUIT

ITEM	CAPACITY	CONDENSERS VOLTAGE	DESCRIPTION	PART NO.
C1	3 GANG COND. VARIABLE		TUNING COND. #1 BAND ANT. ALIGNING	12445-C
C2	"		" " "	IN R.F. ANTENNA TRANS. ASSY.
C3	"		" " "	
C4	"		" " "	
C5	"		" " "	
C6	"		R.F. INTERSTAGE	IN R.F. INTERSTAGE TRANS. ASSY
C7	"		" " "	
C8	"		" " "	
C9	"		" " "	
C10	"		OSC. PAR. PAD	IN OSC. COIL ASSEMBLY
C11	"		" " "	
C12	"		" " "	
C13	"		" " "	
C14	"		" " "	
C15	"		" " "	
C16	"		" " "	
C17	"		" " "	
C18	"		1ST I.F. ALIGNING	IN 1ST I.F. TRANS. ASSY
C19	"		1ST I.F. "	IN 1ST I.F. TRANS. ASSY
C20	"		2ND I.F. "	IN 2ND I.F. TRANS. ASSY
C21	"		2ND I.F. "	IN 2ND I.F. TRANS. ASSY
C22	.02 MFD.	200 V.	TUBULAR	38107
C23	"	200 V.	"	38107
C24	.0001	750 V.	MICA	37006
C25	.05	400 V.	TUBULAR	38107
C26	"	400 V.	"	38107
C27	.001	750 V.	MICA	37006
C28	.1	PEAK 410 V.	DOUBLE DRY ELECTROLYTIC	39001
C29	.1	400 V.	TUBULAR	38107
C30	.001	750 V.	MICA	37006
C31	.0001	750 V.	"	37006
C32	.0001	750 V.	"	37006
C33	.5	400 V.	TUBULAR	38107
C34	.0001	750 V.	MICA	37006
C35	.0001	750 V.	"	37006
C36	.05	400 V.	TUBULAR	38107
C37	.05	400 V.	"	38107
C38	.05	400 V.	"	38107
C39	.005	400 V.	"	38107
C40	.05	400 V.	"	38107
C41	.25	200 V.	"	38107
C42	.25	200 V.	"	38107
C43	1	PEAK 410 V.	WET ELECTROLYTIC	39002
C44	16	450 V.	" "	39003
C45	16.0	450 V.	" "	39003
C46	8.0	450 V.	" "	39004
C47	.0015	750 V.	MICA	37006
C48	.0015	750 V.	TUBULAR OIL IMPREG. TUBULAR	38107
C49	.25	200 V.	"	38107
C50	.0003	750 V.	MICA	37006
C51	.0015	750 V.	"	37006
C52	8	450 V.	DRY ELECTROLYTIC	39004
C53	8	450 V.	TUBULAR	38107

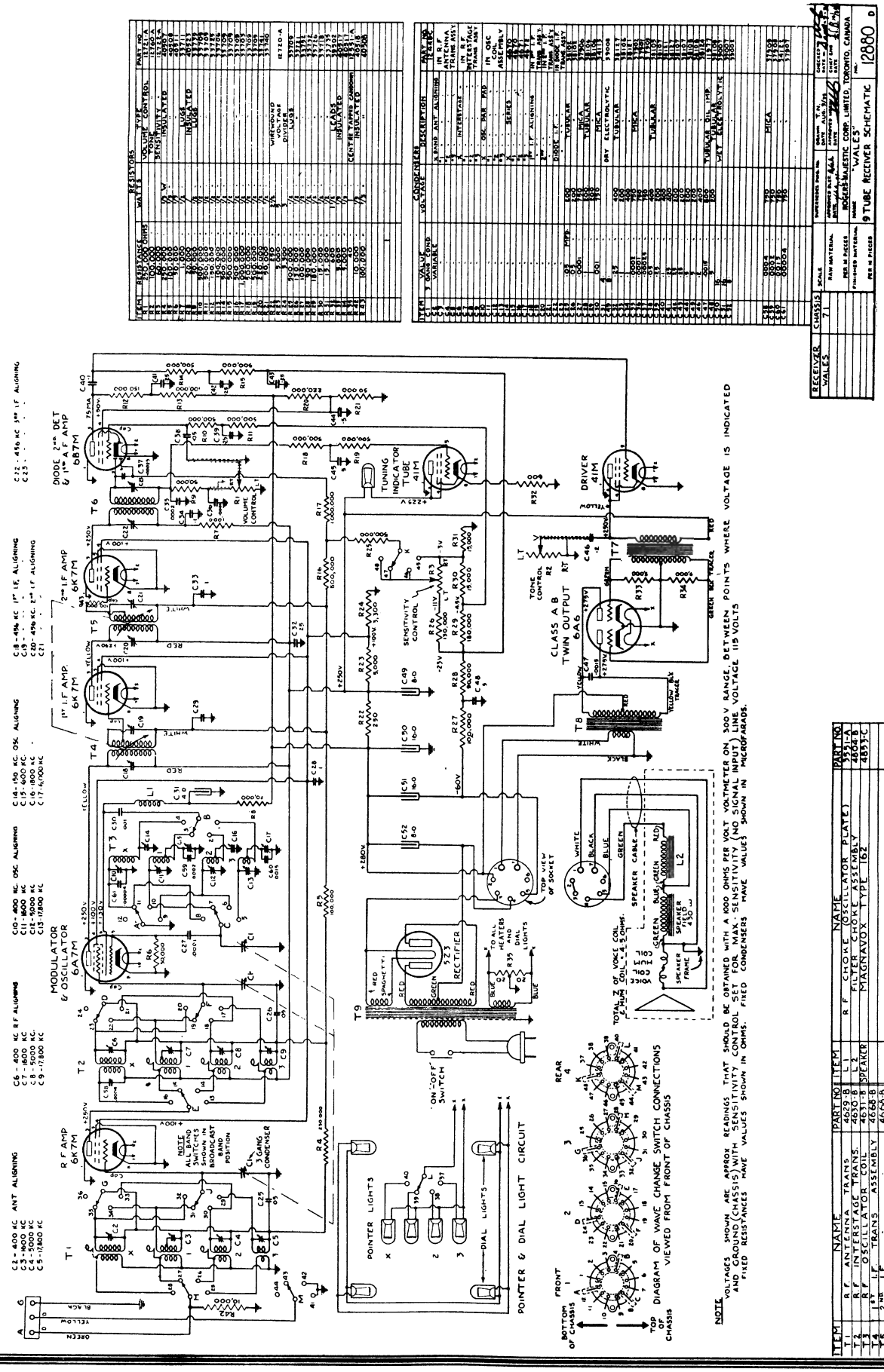
ITEM	NAME	PART NO.
T1	R.F. ANTENNA TRANSFORMER	5039
T2	R.F. INTERSTAGE "	5040
T3	R.F. OSCILLATOR COIL	5041
T4	1ST I.F. TRANSFORMER ASSEMBLY	4648
T5	2ND I.F. " "	5007
T6	DRIVER " "	4950
T7	OUTPUT " "	4642
T8	POWER " "	4774

ITEM	NAME	PART NO.
L1	R.F. CHOKE (OSCILLATOR PLATE)	4676-A
SPEAKER	MAGNAVOX TYPE 160	4859

ITEM	RESISTANCE	OHMS	WATTS	TYPE	PART NO.
R1	1,000,000			VOLUME CONTROL	12803-A
R2	500,000			TONE CONTROL & SWITCH	12803-A
R3	2,500,000			SENSITIVITY CONTROL	12803-A
R4	250,000		1/2 W	INSULATED	40507
R5	50,000		1/2		
R6	500,000		1/2	LUGS	40811
R7	500,000		1/2		40811
R8	20,000		1/2	INSULATED	40495
R9	50,000		1/2		40495
R10	500,000		1/2	LUGS	40811
R11	500,000		1/2		40811
R12	500,000		1/2		40811
R13	500,000		1/2		40811
R14	500,000		1/2		40811
R15	13,000	(MAX)	1/2		
R16	15,000		1/2		
R17	9,400		1/2	WIRE WOUND VOLTAGE DIVIDER	12808-A
R18	20,000		1/2		
R19	4,100		1/2		
R20	5,100		1/2		
R21	1150		1/2		
R22	330,000		1/2	LUGS	40811
R23	85,000		1/2		40811
R24	20,000		1/2		40811
R25	15,000		1/2		40811
R26	55,000		1/2		40811
R27	300,000		1/2		40811
R28	5,000		1/2		40811
R29	5,000		1/2		40811
R30	10,000		1/2		40811
R31	50		1/2	INSULATED	40818
R32	50,000		1/2	CENTRE TAPPED CANDOHM INSULATED	12451-A
R33	250,000		1/2	LUGS	40811
R34	1,000		1/2	LEADS	40170
R35	500,000		1/2	LUGS	40811

CANADIAN RADIO CORP.

Model "Wales" Chassis 71

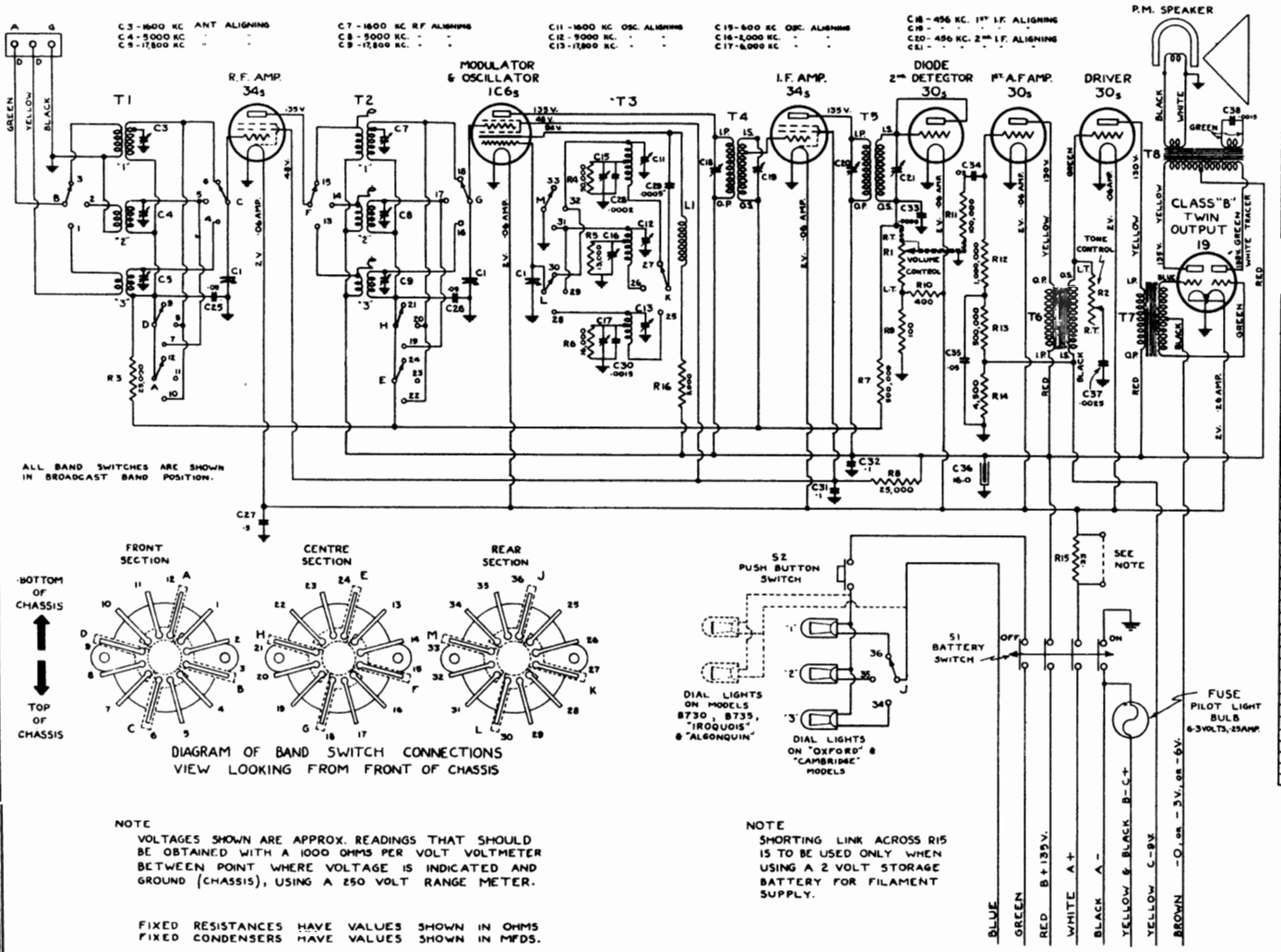


ITEM	NAME	PART NO
T1	R F ANTENNA TRANS.	4629-B
T2	R F INTERSTAGE TRANS.	4630-B
T3	R F OSCILLATOR COILS	4631-B
T4	1ST I F TRANS ASSEMBLY	4668-B
T5	2ND I F "	4665-B
T6	DIODE I F "	4669-B
T7	DRIVER "	4776-B
T8	OUTPUT "	4770-B
T9	POWER "	4774-C

ITEM	NAME	PART NO
L1	R F CHOKE OSCILLATOR PLATE	7951-A
L2	FIELD COIL ASSEMBLY	4859-C
	MAGNAVOX TYPE 162	

CANADIAN RADIO CORP.

Model 7-Tube Battery Set



ITEM	RESISTANCE	WATTS	TYPE	PART NO.
R1	250,000 OHMS		VOL. CONTROL	12611-A
R2	1,500,000 "		TONE "	12612-A
R3	25,000 "	1/2 W	INSULATED	40504
R4	50,000 "	1/2		40511
R5	13,000 "	1/2		40515
R6	16,000 "	1/2		40516
R7	500,000 "	1/2	LUGS	33709
R8	25,000 "	1/2		33701
R9	100 "	1/4	LEADS	32629
R10	400 "	1/4		32630
R11	100,000 "	1/2	LUGS	33706
R12	1,000,000 "	1/2		33703
R13	500,000 "	1/2		33709
R14	4,500 "	1/2		33751
R15	33 "		CANDOHM	38205
R16	5,000 "	1/2	INSULATED	40517

ITEM	CAPACITY	RATED WORKING VOLTAGE	TYPE	PART NO.
C1	3 GANG COND.		VARIABLE	12448-C
C3	1600 KC. ANT. ALIGNING		-	IN R.F.
C4	5000 " "		-	ANTENNA
C5	17,800 " "		-	TRANS. ASS'Y.
C7	1600 KC. R.F.		-	IN R.F.
C8	5,000 " "		-	INTERSTAGE
C9	17,800 " "		-	TRANS. ASS'Y.
C11	1600 KC. OSC.		-	IN OSC.
C12	5,000 " "		-	COIL
C13	17,800 " "		-	ASSEMBLY
C15	600 " "		-	4670
C16	2000 " "		-	4671
C17	6,000 " "		-	4672
C18	456 KC 1ST I.F.		-	IN 1ST I.F.
C19	" " "		-	TRANS. ASS'Y.
C20	456 KC. 2ND I.F.		-	IN 2ND I.F.
C21	" " "		-	TRANS. ASS'Y.
C25	.05 MFD.	200 V.	TUBULAR	38102
C26	.05	200 V.	"	38102
C27	.5	200 V.	"	38108
C28	.0002	750 V.	MICA	37908
C29	.0005	750 V.	"	34105
C30	.0015	750 V.	"	34122
C31	.1	200 V.	TUBULAR	38106
C32	.1	200 V.	"	38106
C33	.0005	750 V.	MICA	34110
C34	.02	400 V.	TUBULAR	38104
C35	.05	200 V.	"	38102
C36	16-0	150 V.	WET ELEC.	11511
C37	.0025	750 V.	MICA	34109
C38	.0015	750 V.	"	34108

SCALE	SUPERVISED BY	DRAWN	CHECKED
RAW MATERIAL	APPROVED BY	APPROVED BY	APPROVED BY
PER M PIECES	DATE	DATE JULY 15/35	DATE
FINISHED MATERIAL	NAME	ROGERS-MAJESTIC CORP. LIMITED, TORONTO, CANADA	
PER M PIECES		7 TUBE BATTERY RECEIVER SCHEMATIC	NO. 12884

NOTE
VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER BETWEEN POINT WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS), USING A 250 VOLT RANGE METER.

FIXED RESISTANCES HAVE VALUES SHOWN IN OHMS
FIXED CONDENSERS HAVE VALUES SHOWN IN MFDS.

NOTE
SHORTING LINK ACROSS R15 IS TO BE USED ONLY WHEN USING A 2 VOLT STORAGE BATTERY FOR FILAMENT SUPPLY.

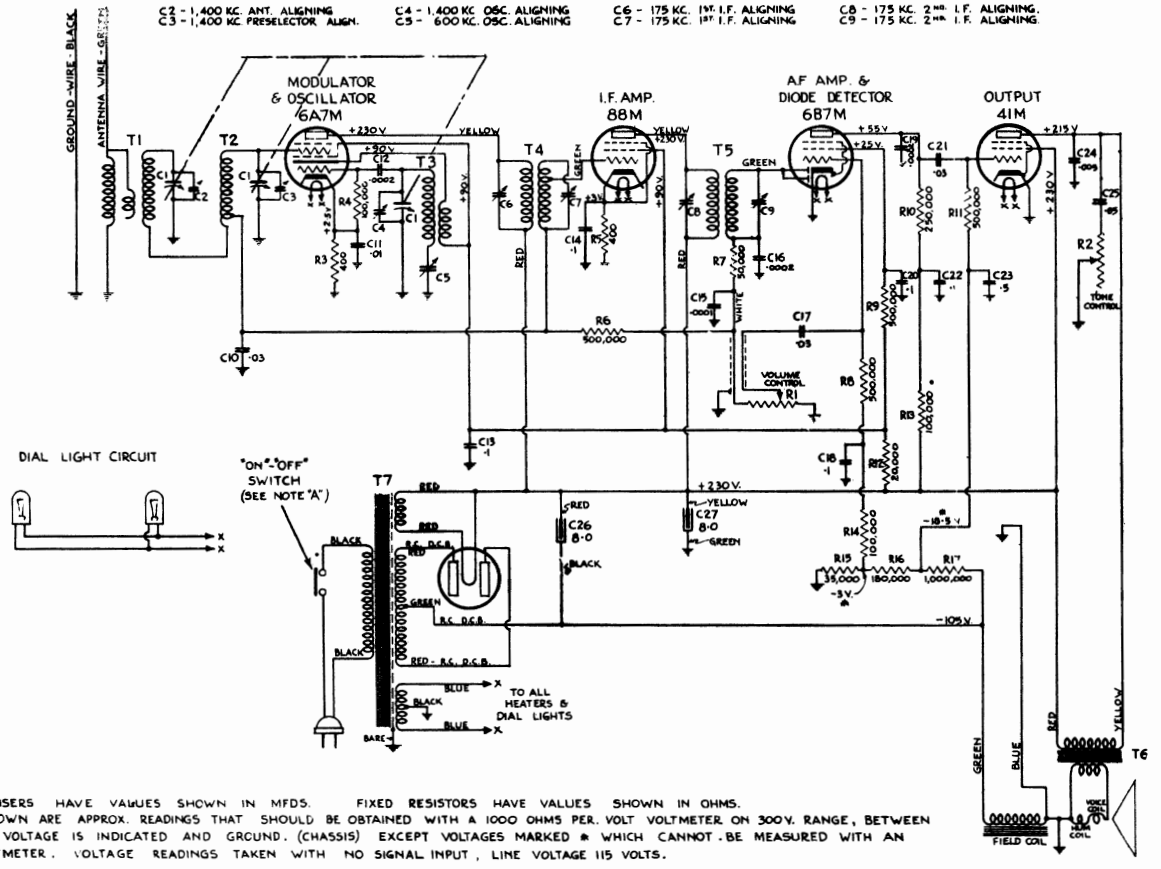
I.F. = 456 K.C.

ITEM	DESCRIPTION	PART NO.
T1	ANTENNA TRANS. ASSEMBLY	5052
T2	R.F. INTERSTAGE	5053
T3	OSCILLATOR COIL	5054
T4	1ST I.F. TRANSFORMER	4741
T5	2ND	4743
T6	INPUT TRANSFORMER	4713
T7	DRIVER	4715
T8	OUTPUT	4717
L1	R.F. CHOKE	4676

ITEM	DESCRIPTION	PART NO.
S1	4 POLE BATTERY SWITCH	12613-A
S2	PUSH BUTTON DIAL LIGHT SWITCH	4802-A
SPEAKER	ON CONSOLE MODELS "CAMBRIDGE", 8735 & "ALGONQUIN" - 10 P.M. 252	4809-A
SPEAKER	ON MANTEL MODELS "OXFORD" 8730 & "IROQUOIS" - 8" P.M. 254.	4792-A

CANADIAN RADIO CORP.

Models Ten-45 Chassis 29
Ten-51 31
"Madelaine" 59
"Earl" 81



NOTE:-
FIXED CONDENSERS HAVE VALUES SHOWN IN MFDS. FIXED RESISTORS HAVE VALUES SHOWN IN OHMS.
VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER. VOLT VOLTMETER ON 300V. RANGE, BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND. (CHASSIS) EXCEPT VOLTAGES MARKED * WHICH CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER. VOLTAGE READINGS TAKEN WITH NO SIGNAL INPUT, LINE VOLTAGE 115 VOLTS.

ITEMS MARKED X ARE USED ON MODEL TEN-45 ONLY
" " ⊛ " " " TEN-51 "
" " □ " " " "MADELAINE" MODEL "
" " ○ " " " "EARL" " "

RESISTORS

ITEM	RESISTANCE	OHMS	WATTS	TYPE	PART NO.
R1	250,000	"		VOLUME CONTROL	4985
R2	250,000	"		VOL. CONTROL & SWITCH	2953
R3	50,000	"		TONE CONTROL & SWITCH	11712
R4	50,000	"		TONE CONTROL	12955
R5	400	"	1/4	LEADS	32600
R6	100,000	"	1/4	"	32602
R7	400	"	1/4	"	32600
R8	500,000	"	1/2	"	32603
R9	500,000	"	1/2	"	32701
R10	250,000	"	1/2	LUGS	38109
R11	500,000	"	1/2	"	33103
R12	250,000	"	1/2	"	33104
R13	250,000	"	1/2	"	33102
R14	100,000	"	1/2	"	33104
R15	35,000	"	1	LEADS	31107
R16	1,800,000	"	1/2	INSULATED	40526
R17	1,000,000	"	1/2	LUGS	33705
				LEADS	31034
				LUGS	33726
				"	33742

CONDENSER

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO.
C1	3 GANG COND.		TUNING CONDENSER	7956
C1	" " "		" "	14257
C1	" " "		" "	11978
C2	VARIABLE		ANTENNA ALIGNING	
C3	"		PRESELECTOR "	ON GANG
C4	"		OSCILLATOR PAR. PAD.	CONDENSER
C5	"		" SERIES "	4671
C6	"		1ST I.F. ALIGNING	IN 1ST I.F.
C7	"		1ST I.F. "	TRANS. ASSY
C8	"		2ND I.F. "	IN 2ND I.F.
C9	"		2ND I.F. "	TRANS. ASSY
C10	.03 MFD	200 V.	TUBULAR	36105
C11	.01 "	400 V.	"	36107
C12	.0002 "	750 V.	MICA	37502
C13	" "	400 V.	TUBULAR	36106
C14	" "	400 V.	"	36106
C15	.0001 "	750 V.	MICA	37501
C16	.0002 "	750 V.	"	37502
C17	.03 "	200 V.	TUBULAR	36105
C18	" "	200 V.	"	36105
C19	.0002 "	750 V.	MICA	37502
C20	.1 "	200 V.	TUBULAR	36106
C21	.03 "	200 V.	"	36105
C22	" "	400 V.	"	36112
C23	.5 "	200 V.	"	36121
C24	" "	200 V.	"	36108
C25	.005 "	600 V.	"	36110
C26	.05 "	600 V.	"	36111
C27	8-0 "	PEAK 900 V.	DOUBLE DRY ELECTROLYTIC COND.	11838
	8-0 "	PEAK 900 V.		

I.F. = 175 K.C.

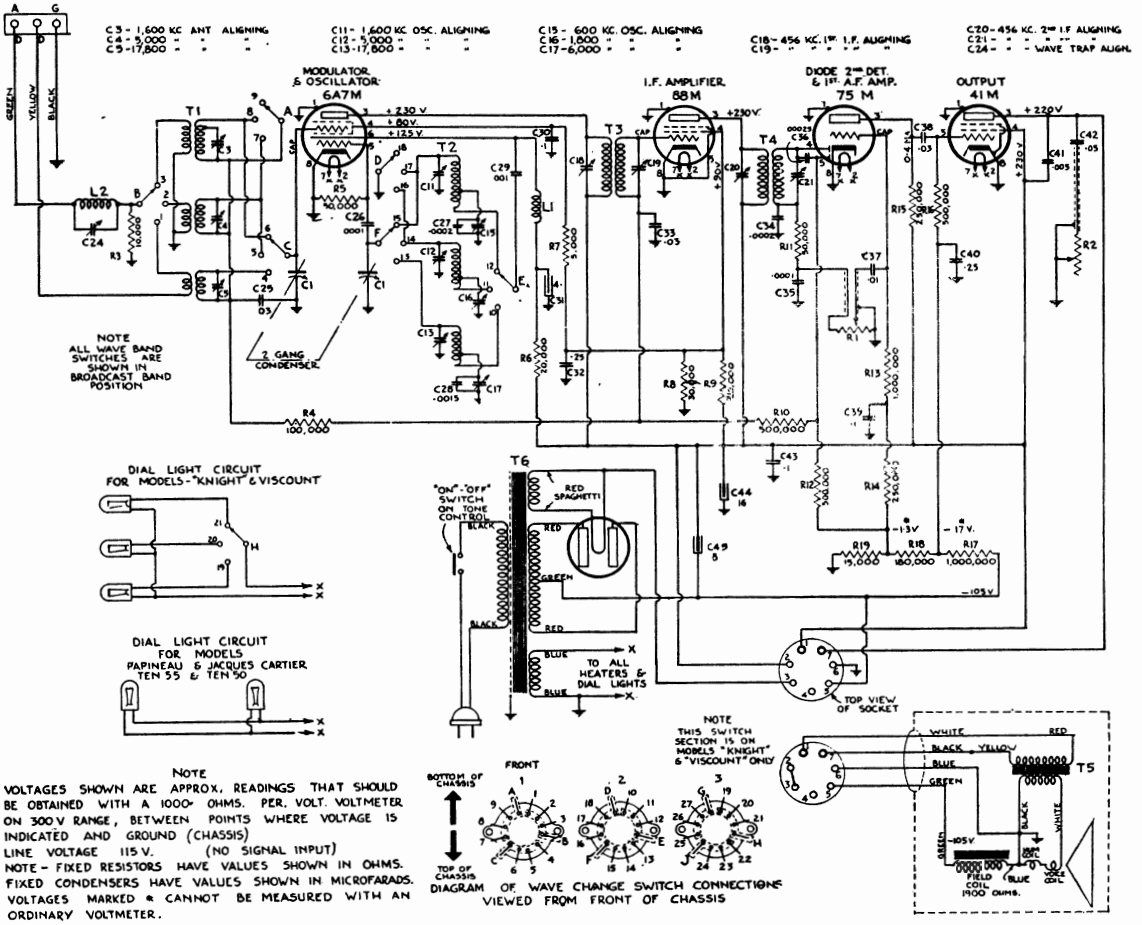
NOTE "A"
"ON"-"OFF" SWITCH IS LOCATED ON VOLUME CONTROL ON MODEL TEN-45 TEN-51 & MADELAINE.
"ON"-OFF SWITCH IS LOCATED ON TONE CONTROL ON "EARL" MODEL.

ITEM	NAME	PART NO.
T1	R.F. ANTENNA TRANSFORMER	4170
T2	R.F. PRESELECTOR "	4172
T3	R.F. OSCILLATOR COIL	4961
T4	1ST I.F. TRANSFORMER ASSY.	4174
T5	2ND I.F. TRANSFORMER ASSY.	4176
○ T6	OUTPUT TRANS. ASSY. FOR K6 "EARL"	4979
⊛ T6	" " " " (" TEN-51	5026
× T6	" " " " (" D15 "TEN-45	4251
□ T6	" " " " (" F6R) "MADELAINE"	5022
T7	POWER TRANS ASSY.	4963

ITEM	NAME	PART NO.
SPEAKER	FOR "EARL" MODEL - TYPE K6	4972
"	" "MADELAINE" MODEL - TYPE F6R	4973
"	" TEN-45 " - " D15	4980
"	" TEN-51 " - " K6	5023

CANADIAN RADIO CORP.

Models Ten-55 Chassis 28
Ten-50 "
Papineau 58
Jeaves Cartier "
Knight 79
Viscount "



NOTE
VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000- OHMS. PER. VOLT. VOLTMETER ON 300 V RANGE, BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS)
LINE VOLTAGE 115 V. (NO SIGNAL INPUT)
NOTE - FIXED RESISTORS HAVE VALUES SHOWN IN OHMS. FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS. VOLTAGES MARKED * CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.

I. F. = 456 K. C.

RESISTORS

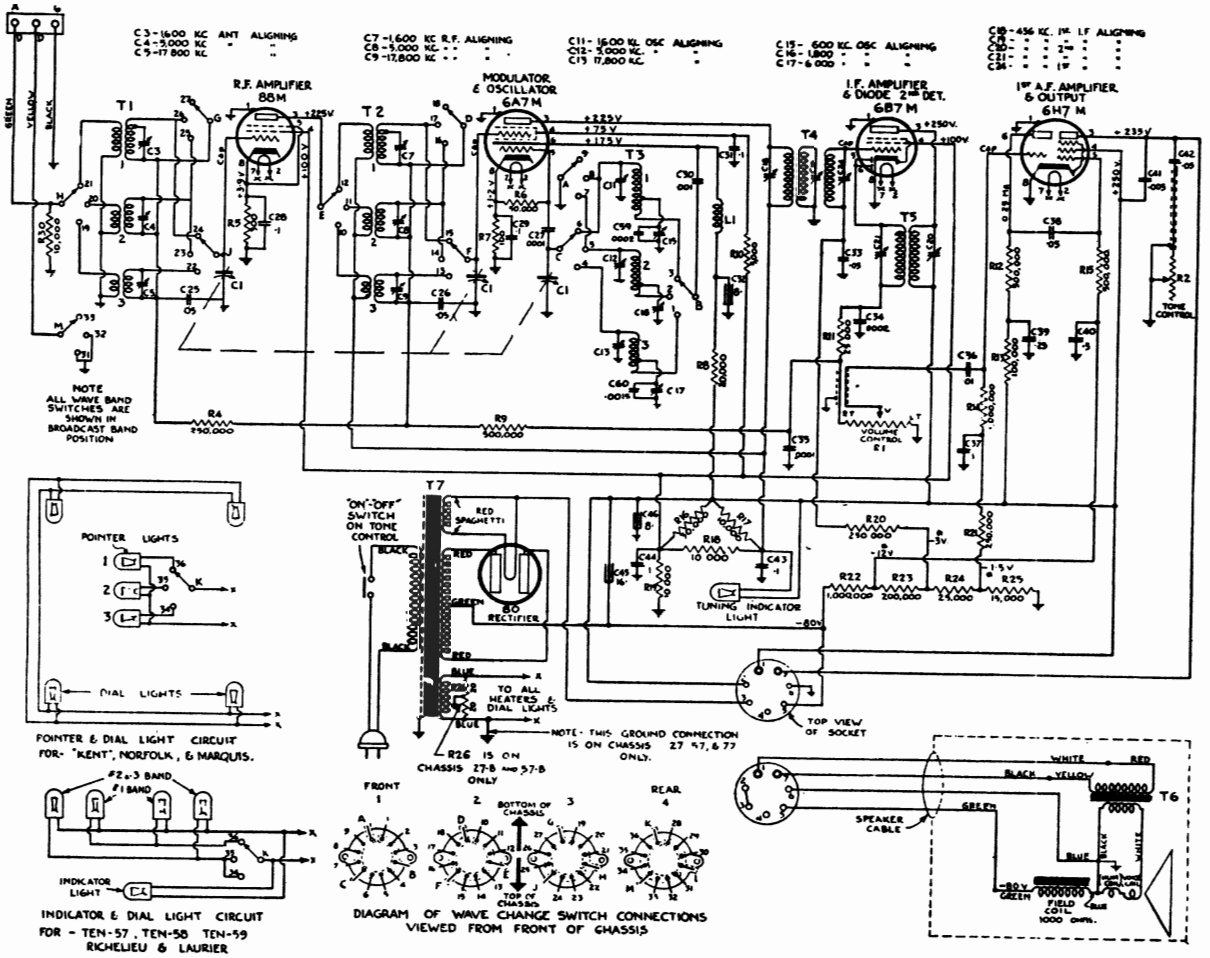
CONDENSERS

ITEM	DESCRIPTION	PART NO
L2	R.F. CHOKE (OSCILLATOR PLATE)	4676
	WAVE TRAP ASSEMBLY	4903
SPEAKER	JENSEN TYPE P&R (ON MODELS TEN-50 PAPINEAU & KNIGHT ONLY)	4933
SPEAKER	JENSEN TYPE D15 (ON MODELS TEN-55 JACQUES CARTIER & VISCOUNT)	4932

ITEM	DESCRIPTION	PART NO
T1	ANTENNA TRANSFORMER	9039
T2	R.F. OSCILLATOR TRANSFORMER	5041
T3	1ST I.F. TRANSFORMER ASSEMBLY	4687
T4	2ND I.F. TRANSFORMER ASSEMBLY	4689
T5	OUTPUT TRANS ASSY (FOR 10" SPEAKER)	4721
T5	OUTPUT " " (FOR 15" ")	5022
T6	POWER " "	4945

CANADIAN RADIO CORP.

Models Ten-57 Chassis 27
Ten-58 "
Ten-59 "
Richelieu 57
Laurier "
Kent 77
Marquis "



VOLTAGES SHOWN ARE APPROX READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER ON 300 V RANGE, BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS) LINE VOLTAGE 115 V (NO SIGNAL INPUT)
NOTE - FIXED RESISTORS HAVE VALUES SHOWN IN OHMS. FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS
VOLTAGES MARKED * CANNOT BE, MEASURED WITH AN ORDINARY VOLTMETER.

I.F. = 456 K.C.

NOTE - ITEMS MARKED ▫ ARE USED ON RECEIVERS FOR OPERATION ON 25 TO 60 CYCLES CHASSIS TYPE - 27, 57, & 77
ITEMS MARKED ■ ARE USED ON RECEIVERS FOR OPERATION ON 60 CYCLES ONLY, CHASSIS TYPE-27-B, 57-B & 77-B

RESISTORS

ITEM	RESISTANCE		WATTS	TYPE	PART NO
R1	500,000	OHMS		VOLUME CONTROL TONE CONTROL & SWITCH	7053-A
R2	30,000	-			2855-A
R3					
R4	250,000	-	1/3 W	INSULATED	40507
R5	2,000	-	1/3 -	"	40509
R6	30,000	-	1/3 -	"	40511
R7	1,000	-	1/3 -	"	40501
R8	60,000	-	1/3 -	"	40513
R9	500,000	-	1/3 -	"	40515
R10	4,000	-	1/2 -	LUGS	35744
R11	45,000	-	1/2 -	INSULATED	40502
R12	400,000	-	1/2 -	LUGS	35709
R13	100,000	-	1/2 -	"	35705
R14	1,000,000	-	1/2 -	"	35706
R15	800,000	-	1/2 -	"	35755
R16	50,000	-	1/2 -	"	35708
R17	10,000	-	1/2 -	"	35707
R18	10,000	-	1/2 -	"	35707
R19	10,000	-	1/2 -	"	35707
R20	240,000	-	1/2 -	"	35729
R21	240,000	-	1/2 -	LUGS	35769
R22	1,000,000	-	1/2 -	"	35757
R23	200,000	-	1/2 -	"	35728
R24	25,000	-	1/2 -	"	35753
R25	15,000	-	1/2 -	LEADS *	35754
▫ R26	40	-	1	CENTER TAPPED CARBOHM	12537
R30	10,000	-	1/3 -	INSULATED	40518

ITEM	NAME	PART NO
T1	R.F. ANTENNA TRANSFORMER	5039
T2	R.F. INTERSTAGE "	5040
T3	R.F. OSCILLATOR COIL	5041
T4	1ST I.F. TRANSFORMER ASSEMBLY	5008
T5	2ND I.F. " "	4669
T6	OUTPUT " "	4253
▫ T7	POWER " "	4885
■ T7	" " ASSY. 60 CYCLE ONLY	5079

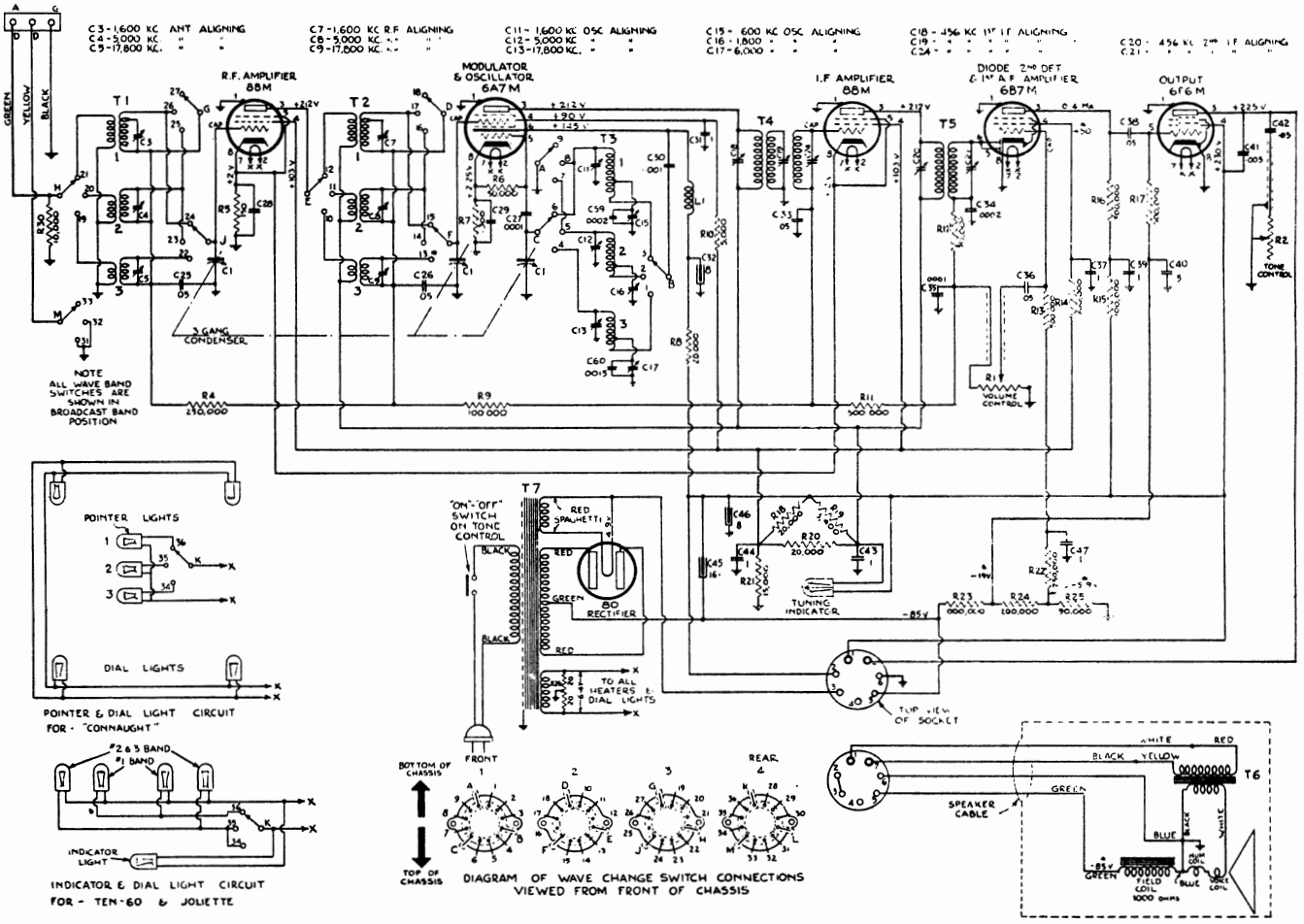
ITEM	NAME		PART NO
L1	R.F. CHOKE	(OSCILLATOR PLATE)	3551-A
SPEAKER	MAGNAVOX	TYPE 160 [WITH OUTPUT TRANSFORMER]	4667

CONDENSERS

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO
C1	3 GANG COND. VARIABLE		MAIN TUNING COND.	12618-C
C2			▫ BAND ANT. ALIGNING	IN R.F.
C3			■ " "	ANTENNA TRANS. ASSY
C4			▫ - -	IN R.F.
C5			■ R.F. INTERSTAGE	INTERSTAGE TRANS. ASSY.
C6			▫ - -	IN R.F.
C7			■ " "	INTERSTAGE TRANS. ASSY.
C8			▫ OSC. PAR. PAD.	IN OSC. COIL ASSEMBLY
C9			■ " "	
C10			▫ - - SERIES	4670
C11			■ " "	4671
C12			▫ - -	4672
C13			■ " "	4673
C14			1ST I.F. ALIGNING	IN 1ST I.F. TRANS ASSY
C15			1ST I.F. -	IN 1ST I.F. TRANS ASSY
C16			2ND I.F. -	IN 2ND I.F. TRANS ASSY
C17			2ND I.F. -	12206-A
C18	.05 MFD	400 V	TUBULAR	38104
C19	.05 "	400 V	"	38104
C20	.0001 "	750 V	MICA	37908
C21	.01 "	400 V	TUBULAR	38108
C22	.0001 "	750 V	MICA	37908
C23	.01 "	400 V	TUBULAR	38101
C24	.05 "	400 V	"	38104
C25	.05 "	400 V	"	38104
C26	.05 "	400 V	"	38104
C27	.0001 "	750 V	MICA	37908
C28	.05 "	400 V	TUBULAR	38104
C29	.05 "	400 V	"	38104
C30	.01 "	400 V	"	38101
C31	.05 "	400 V	"	38104
C32	.05 "	400 V	"	38104
C33	.05 "	400 V	"	38104
C34	.0001 "	750 V	MICA	37908
C35	.0001 "	750 V	"	37908
C36	.05 "	400 V	TUBULAR	38104
C37	1 "	400 V	"	38111
C38	.05 "	400 V	"	38104
C39	.05 "	400 V	"	38104
C40	3 "	400 V	"	38111
C41	.005 "	400 V	"	38106
C42	.05 "	400 V	"	38104
C43	1 "	400 V	"	38111
C44	.05 "	400 V	"	38104
C45	.05 "	400 V	"	38104
C46	.05 "	400 V	"	38104
C47	.05 "	400 V	"	38104
C48	.05 "	400 V	"	38104
C49	.05 "	400 V	"	38104
C50	.05 "	400 V	"	38104
C51	.05 "	400 V	"	38104
C52	.05 "	400 V	"	38104
C53	.05 "	400 V	"	38104
C54	.05 "	400 V	"	38104
C55	.05 "	400 V	"	38104
C56	.05 "	400 V	"	38104
C57	.05 "	400 V	"	38104
C58	.05 "	400 V	"	38104
C59	.05 "	400 V	"	38104
C60	.0015 "	400 V	"	38102
C61	.005 "	400 V	"	38106
C62	.05 "	400 V	"	38104
C63	.05 "	400 V	"	38104
C64	.05 "	400 V	"	38104

CANADIAN RADIO CORP.

Models Ten-60 Chassis 26
Jolliette 53
Connought 80



VOLTAGES SHOWN ARE APPROX READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER ON 300 V RANGE, BETWEEN POINTS WHERE VOLTAGE IS INDICATED AND GROUND (CHASSIS) LINE VOLTAGE 115 V (NO SIGNAL INPUT) VOLTAGES MARKED * CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.
NOTE - FIXED RESISTORS HAVE VALUES SHOWN IN OHMS FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS

I.F. = 456 K.C.

CONDENSERS

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO
C1	3 GANG COND VARIABLE		TUNING COND. #1 BAND ANT ALIGNING	12448 IN R.F.
C2	"	"	" ANTENNA	TRANS ASSY
C3	"	"	" R.F. INTERSTAGE	IN R.F. INTERSTAGE TRANS ASSY
C4	"	"	" OSC PAR PAD	IN OSC COIL ASSEMBLY
C5	"	"	" SERIES	2677
C6	"	"	"	2677
C7	"	"	"	2677
C8	"	"	" ALIGNING	IN 1ST I.F. TRANS ASSY
C9	"	"	1ST I.F. "	IN 2ND I.F. TRANS ASSY
C10	"	"	2ND I.F. "	IN 2ND I.F. TRANS ASSY
C11	"	"	1ST I.F. "	IN 1ST I.F. TRANS ASSY
C12	.05 MFD	400 V	TUBULAR	38105
C13	.05 "	400 V	"	38105
C14	.0001 "	400 V	MICA	37108
C15	" "	400 V	TUBULAR	38105
C16	.001 "	400 V	MICA	37108
C17	" "	400 V	TUBULAR	38105
C18	8 "	PEAK 600 V	DOUBLE DRY ELECTROLYTIC	39003
C19	.05 "	400 V	TUBULAR	38105
C20	.0002 "	400 V	MICA	37108
C21	.0001 "	400 V	"	37108
C22	.05 "	400 V	TUBULAR	38105
C23	" "	400 V	"	38105
C24	.05 "	400 V	"	38105
C25	" "	400 V	"	38105
C26	.05 "	400 V	"	38105
C27	.0002 "	400 V	MICA	37108
C28	.0001 "	400 V	"	37108
C29	.05 "	400 V	TUBULAR	38105
C30	.001 "	400 V	MICA	37108
C31	.05 "	400 V	TUBULAR	38105
C32	.05 "	400 V	"	38105
C33	.05 "	400 V	"	38105
C34	.0002 "	400 V	MICA	37108
C35	.0001 "	400 V	"	37108
C36	.05 "	400 V	TUBULAR	38105
C37	.1 "	400 V	"	38111
C38	.05 "	400 V	"	38105
C39	.0001 "	400 V	MICA	37108
C40	.5 "	400 V	"	38107
C41	.005 "	400 V	"	38106
C42	.05 "	400 V	TUBULAR	38105
C43	16 "	PEAK 500 V	WET ELECTROLYTIC	39005
C44	1 "	200 V	TUBULAR	38108
C45	16 "	PEAK 500 V	WET ELECTROLYTIC	39005
C46	.0002 "	750 V	MICA	37108
C47	.0015 "	750 V	"	34122

ITEM	NAME	PART NO
T1	R.F. ANTENNA TRANSFORMER	5039
T2	R.F. INTERSTAGE "	5040
T3	R.F. OSCILLATOR COIL	5041
T4	1ST I.F. TRANSFORMER ASSEMBLY	5008
T5	2ND I.F. " "	4669
T6	OUTPUT " "	4251
T7	POWER " "	4885

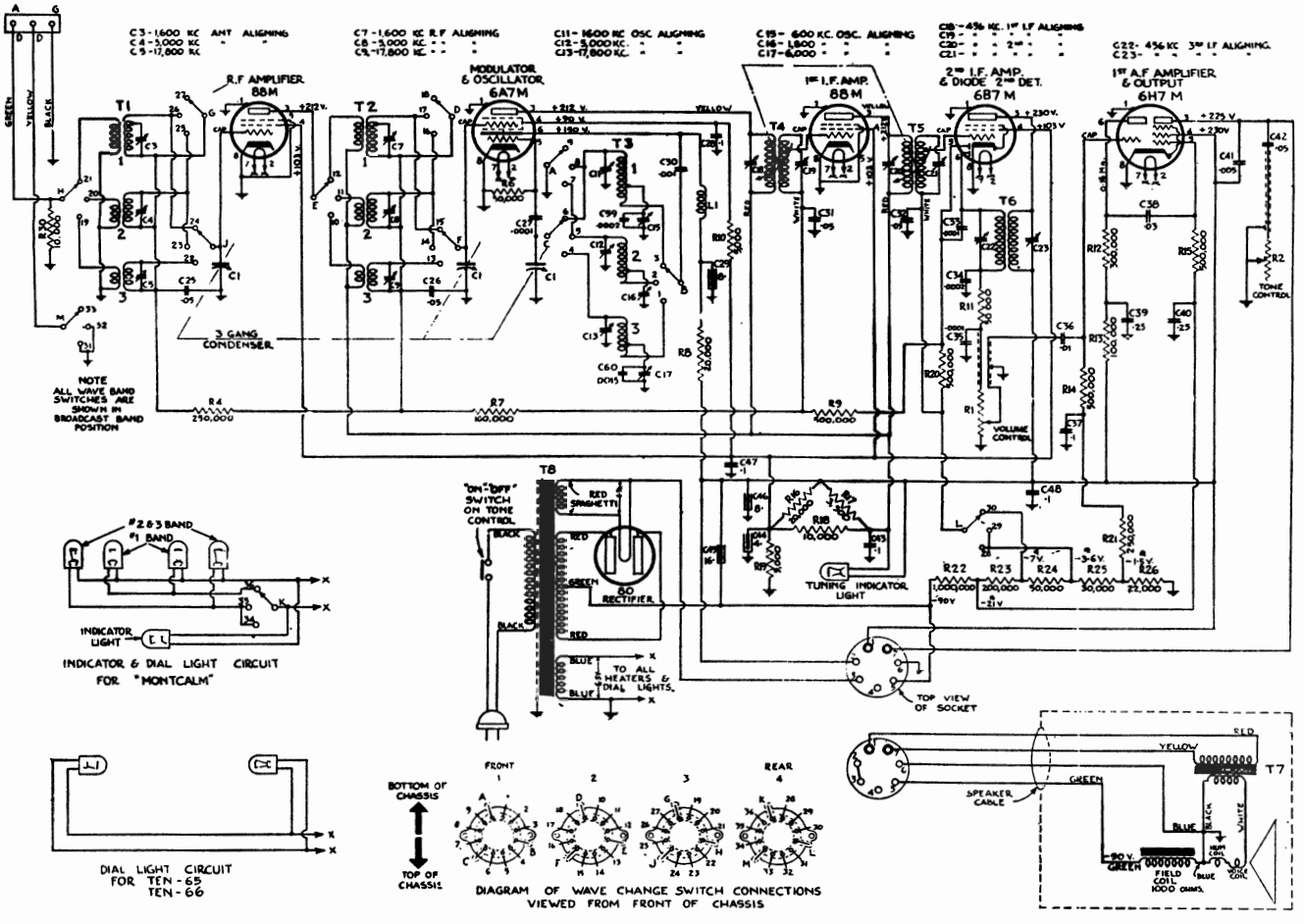
ITEM	NAME	PART NO
L1	R.F. CHOKE (OSCILLATOR PLATE)	3551 A
SPEAKER	JENSEN - D15 (WITH OUTPUT TRANS)	4868

RESISTORS

ITEM	RESISTANCE OHMS	WATTS	TYPE	PART NO
R1	250,000		VOLUME CONTROL TONE CONTROL & SWITCH	7874 2853
R2	50,000			
R3	250,000	1/3 W	INSULATED	40307
R4	250,000	1/3 "	"	40410
R5	50,000	1/3 "	"	40511
R6	20,000	1/3 "	"	40293
R7	100,000	1/3 "	"	40305
R8	1,000	1/3 "	"	40508
R9	100,000	1/2 "	LUGS INSULATED	33704
R10	500,000	1/2 "	"	40410
R11	500,000	1/2 "	"	2681
R12	250,000	1/2 "	LUGS	33703
R13	100,000	1/2 "	"	33705
R14	100,000	1/2 "	"	33705
R15	500,000	1/2 "	"	33707
R16	250,000	1/2 "	"	33705
R17	1 MEG	1/2 "	"	33709
R18	10,000	1/2 "	"	33703
R19	250,000	1/2 "	"	33705
R20	1,500,000	1/2 "	"	33711
R21	500,000	1/2 "	"	33707
R22	50,000	1/2 "	"	33703
R23	10,000	1/3 "	CENTER TAPPED CARBOHM INSULATED	33717 40518
R24	100,000			
R25	90,000			

CANADIAN RADIO CORP.

Models Ten'65 Chassis 24
Ten'66 "
Montcalm 54



VOLTAGES SHOWN ARE APPROX. READINGS THAT SHOULD BE OBTAINED WITH A 1000 OHMS PER VOLT VOLTMETER ON 300 V. RANGE BETWEEN POINTS INDICATED AND GROUND (CHASSIS). LINE VOLTAGE 115 V. (NO SIGNAL INPUT) VOLTAGES MARKED * CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.
NOTE - FIXED RESISTORS HAVE VALUES SHOWN IN OHMS FIXED CONDENSERS HAVE VALUES SHOWN IN MICROFARADS.

I.F. = 456 K.C.

CONDENSERS

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO
C1	3 GANG COND.	(RATED 25 D.C.)	TUNING COND.	12648
C2	3 GANG COND.	" 52 "	TUNING COND.	12438
C3	VARIABLE		#1 BAND ANT. ALIGNING	IN R.F.
C4	"	"	#2 " " "	ANTENNA
C5	"	"	#3 " " "	TRANS ASSY.
C6	"	"	#1 R.F. INTERSTAGE	IN R.F.
C7	"	"	#2 " " "	INTERSTAGE
C8	"	"	#3 " " "	TRANS ASSY.
C9	"	"	#1 OSC. PAR. PAD.	IN OSC.
C10	"	"	#2 " " "	COIL
C11	"	"	#3 " " "	ASSEMBLY
C12	"	"	#1 " SERIES "	48570
C13	"	"	#2 " " "	48571
C14	"	"	#3 " " "	48572
C15	"	"	1ST I.F. ALIGNING	IN 1ST I.F.
C16	"	"	2ND I.F. "	TRANS ASSY
C17	"	"	3RD I.F. "	IN 2ND I.F.
C18	"	"	1ST I.F. "	TRANS ASSY
C19	"	"	2ND I.F. "	IN 3RD I.F.
C20	"	"	3RD I.F. "	TRANS ASSY
C21	.05 MFD.	200 V	TUBULAR	38107
C22	" "	400 V	"	38108
C23	.0001 "	1500 V	MICA	37906
C24	" "	1500 V	"	37908
C25	.05 "	400 V	TUBULAR	38108
C26	8 "	450 V	DOUBLE DRY ELECTROLYTIC	39005
C27	8 "	450 V	" " "	"
C28	.0001 "	1500 V	MICA	37906
C29	.05 "	400 V	TUBULAR	38108
C30	.05 "	400 V	"	"
C31	.0002 "	1500 V	MICA	37907
C32	.0001 "	1500 V	"	37906
C33	.01 "	400 V	TUBULAR	38107
C34	.01 "	400 V	"	"
C35	.03 "	400 V	"	38109
C36	.01 "	400 V	"	38107
C37	.25 "	400 V	"	38110
C38	.05 "	400 V	"	38108
C39	.25 "	400 V	"	38110
C40	.25 "	400 V	"	"
C41	.005 "	400 V	"	38111
C42	.05 "	400 V	"	38108
C43	4 "	450 V	DRY ELECTROLYTIC	12748
C44	16 "	450 V	WET "	39006
C45	.1 "	400 V	TUBULAR	38112
C46	"	400 V	"	38121
C47	.0002 "	750 V	MICA	37908
C48	.0015 "	750 V	"	38122

ITEM	NAME	PART NO.
T1	R.F. ANTENNA TRANSFORMER	5039
T2	R.F. INTERSTAGE "	5040
T3	R.F. OSCILLATOR COIL	5041
T4	1ST I.F. TRANSFORMER ASSEMBLY	4668
T5	2ND I.F. " "	4890
T6	3RD I.F. " "	4669
T7	OUTPUT " "	4255
T8	POWER " "	4865

ITEM	NAME	PART NO.
L1	R.F. CHOKE (OSCILLATOR PLATE)	3531-A
SPEAKER	MAGNAVOX TYPE 160 (WITH OUTPUT TRANSFORMER)	4867

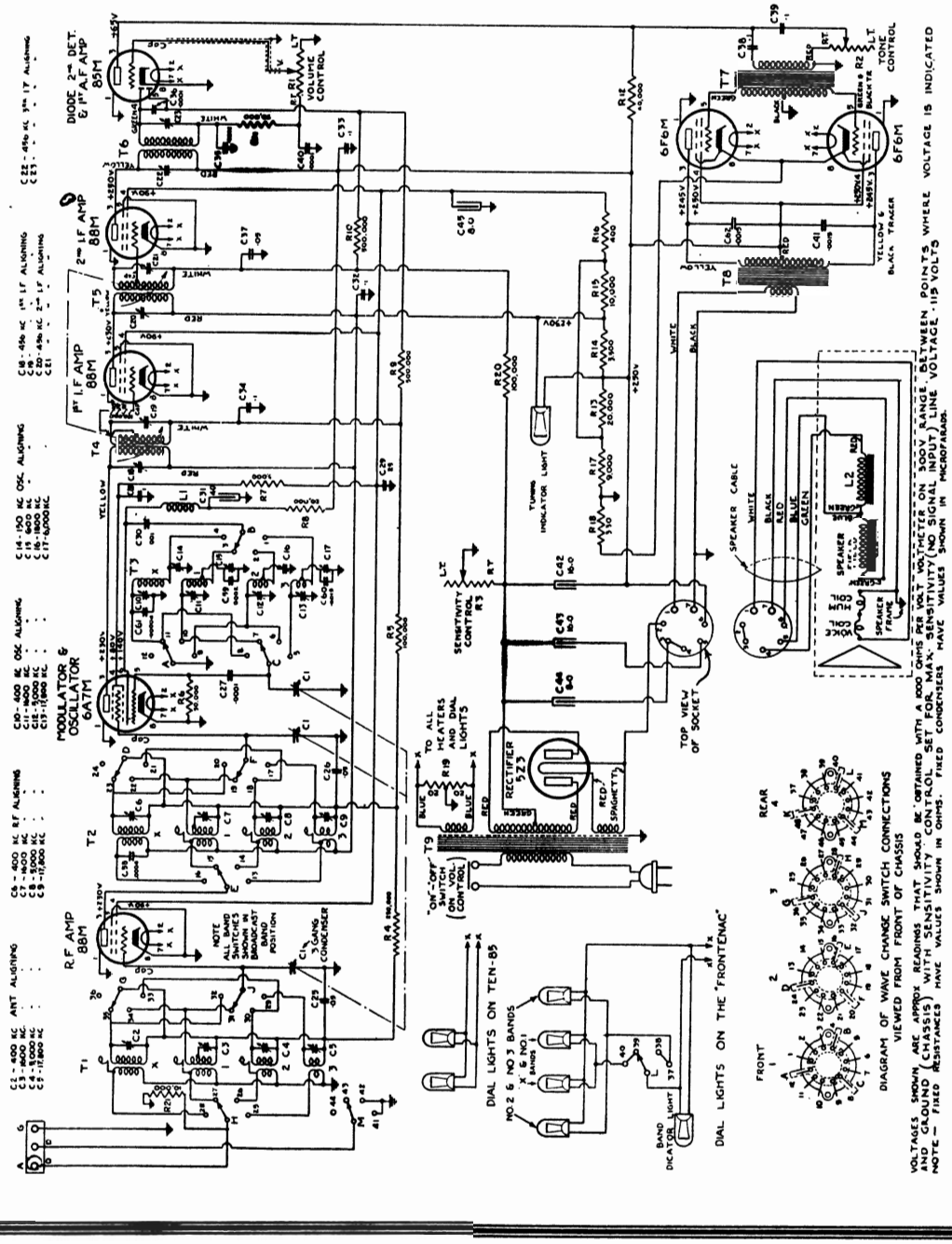
RESISTORS

ITEM	RESISTANCE	WATTS	TYPE	PART NO.
R1	500,000 OHMS		VOLUME CONTROL	12689-A
R2	100,000 "		TONE CONTROL & SWITCH	12689-A
R4	250,000 "	1/2 W	INSULATED	40507
R5	10,000 "	1/2 "	"	40211
R6	100,000 "	1/2 "	"	40305
R7	100,000 "	1/2 "	"	40305
R8	900,000 "	1/2 "	"	40323
R9	400,000 "	1/2 "	"	40313
R10	" "	1/2 "	LEADS	42242
R11	1,000,000 "	1/2 "	INSULATED	40311
R12	1,000,000 "	1/2 "	LEADS	38504
R13	500,000 "	1/2 "	"	38110
R14	500,000 "	1/2 "	"	38110
R15	50,000 "	1/2 "	"	38503
R16	50,000 "	1/2 "	"	38503
R17	10,000 "	MAX. 1.8 "	"	"
R18	10,000 "	" "	WIRE WOUND VOLTAGE DIVIDER	12891-A
R19	10,000 "	" "	LEADS	38504
R20	500,000 "	1/2 "	"	38505
R21	1,000,000 "	1/2 "	"	38507
R22	200,000 "	1/2 "	INSULATED	40322
R23	200,000 "	1/2 "	"	40322
R24	100,000 "	1/2 "	LEADS	38504
R25	50,000 "	1/2 "	"	38503
R26	22,000 "	1/2 "	"	38502
R30	10,000 "	1/2 "	INSULATED	40518

CANADIAN RADIO CORP.

Model Ten-85 Chassis 23

Model "Frontenac" Chassis 52



ITEM	NAME	NO.
T1	R.F. ANTENNA TRANS.	4629
T2	R.F. INTERSTAGE TRANS.	4630
T3	R.F. OSCILLATOR COIL	4631
T4	1st I.F. TRANS ASSEMBLY	4998
T5	2nd I.F. " "	4668
T6	DIODE 1st " "	4669
T7	INPUT " "	4818
T8	OUTPUT " "	4816
T9	POWER " "	4774

ITEM	NAME	NO.
L1	R.F. CHOKE (OSCILLATOR PLATE)	4676
L2	FILTER CHOKE	4804
SPEAKER	MAGNAVOX TYPE 150	4858

ITEM	RESISTANCE	WATTS	TYPE	PART NO.
R1	290,000 OHMS		VOLUME CONTROL	12721-A
R2	100,000 "		TONE "	12341-A
R3	100 "		SENSITIVITY "	12777-A
R4	2,500,000 "	1/2 W.	INSULATED	40507
R5	100,000 "	1/2 "	"	40508
R6	50,000 "	1/2 "	"	40514
R7	9,000 "	1/4 "	LUGS	33764
R8	20,000 "	1 "	INSULATED	40823
R9	200,000 "	1/4 "	LUGS	33709
R10	500,000 "	1/4 "	"	33709
R11	40,000 "	1/2 "	INSULATED	40511
R12	20,000 "	1 "	LUGS	33803
R13	3,500 "	1 "		
R14	3,500 "	2 "	WIRE WOUND VOLTAGE DIVIDER	12776-A
R15	10,000 "	4 "		
R16	400 "	12 "		
R17	9000 "	15 "		
R18	410 "	15 "	C.T. CANDOHM	12581-A
R19	100,000 "	1/4 "	LUGS	33709
R20	10,000 "	1/4 "	INSULATED	40518
R21	100,000 "	1/2 "	"	40508
R22				
R23				

ITEM	CAPACITY	VOLTAGE	DESCRIPTION	PART NO.
C1	3 GANG COND.		ON TWO TEN-85	12648-C
C2	VARIABLE		ON TEN-85 FRONTENAC	12648-A
C3	"		X BAND ANT. ALIGNING	12648-E
C4	"		*1 " " "	ANTENNA TRANS. ASSY
C5	"		*2 " " "	
C6	"		*3 " " "	
C7	"		*1 - INTERSTAGE -	IN R.F. INTERSTAGE TRANS ASSY
C8	"		*2 " " "	
C9	"		*3 " " "	
C10	"		X - OSC. PAR. PAD.	IN OSC. COIL ASSY.
C11	"		*1 " " "	
C12	"		*2 " " "	
C13	"		*3 " " "	
C14	"		*1 - SERIES "	4670
C15	"		*2 " "	4670
C16	"		*3 " "	4672
C17	"		1st I.F. ALIGNING	IN 1st I.F. TRANS. ASSY
C18	"		2nd I.F. ALIGNING	IN 2nd I.F. TRANS. ASSY
C19	"		DIODE	IN 1st I.F. TRANS. ASSY
C20	"		"	
C21	"		"	
C22	"		"	
C23	"		"	
C24	.05	200	TUBULAR	38102
C25	.05	200	"	38102
C26	.0001	750	MICA	37906
C27	.0001	750	TUBULAR	38109
C28	.25	200	"	38107
C29	.001	750	MICA	34113
C30	.001	750	"	
C31	4	250	DRY ELECTROLYTIC	12547-A
C32	.1	400	TUBULAR	38121
C33	.1	400	"	38121
C34	.1	400	"	38121
C35	.0002	200	"	38106
C36	.0001	750	MICA	37902
C37	.05	200	TUBULAR	38101
C38	.1	200	"	38107
C39	.1	400	"	38121
C40	.0001	750	MICA	37901
C41	.0015	750	"	34128
C42	16.	450	OIL IMP. TUBULAR	11977-A
C43	16.	450	WET ELEC. REG TYPE	40801
C44	8.	525	WET ELECTROLYTIC	39001
C45			"	39002
C46				
C47				
C48				
C49				
C50				
C51				
C52				
C53				
C54				
C55				
C56	.0004	750	MICA	37909
C57	.0012	750	"	37908
C60	.0012	750	"	34128
C61	.00004	750	"	37907
C62	.0015	800	OIL IMP. TUBULAR	11977-A

THIS SCHEMATIC APPLIES TO

MODEL	CHASSIS
TEN-85	23
"FRONTENAC"	52

SCALE
PARTS MATERIAL PER 25 PIECES
FINISHED MATERIAL PER 25 PIECES

SUPERSEDES Type No. DATED JUNE 4-37
SUPERSEDED BY DATED JUNE 4-37

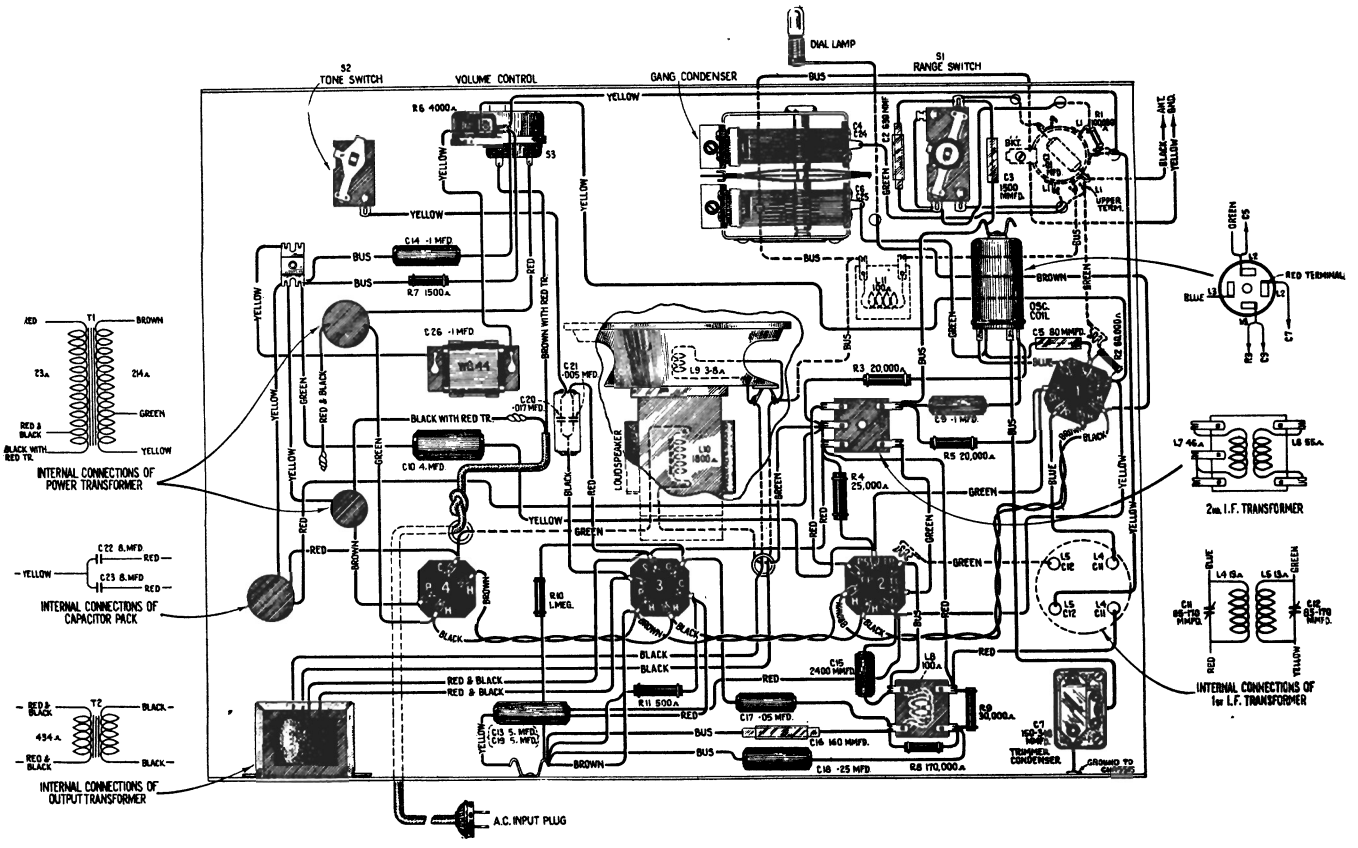
CANADIAN RADIO CORP. LIMITED
ROGERS-MAJESTIC CORP. LIMITED, TORONTO, CANADA

NOTE TEN-85 & "FRONTENAC" RECEIVER SCHEMATIC

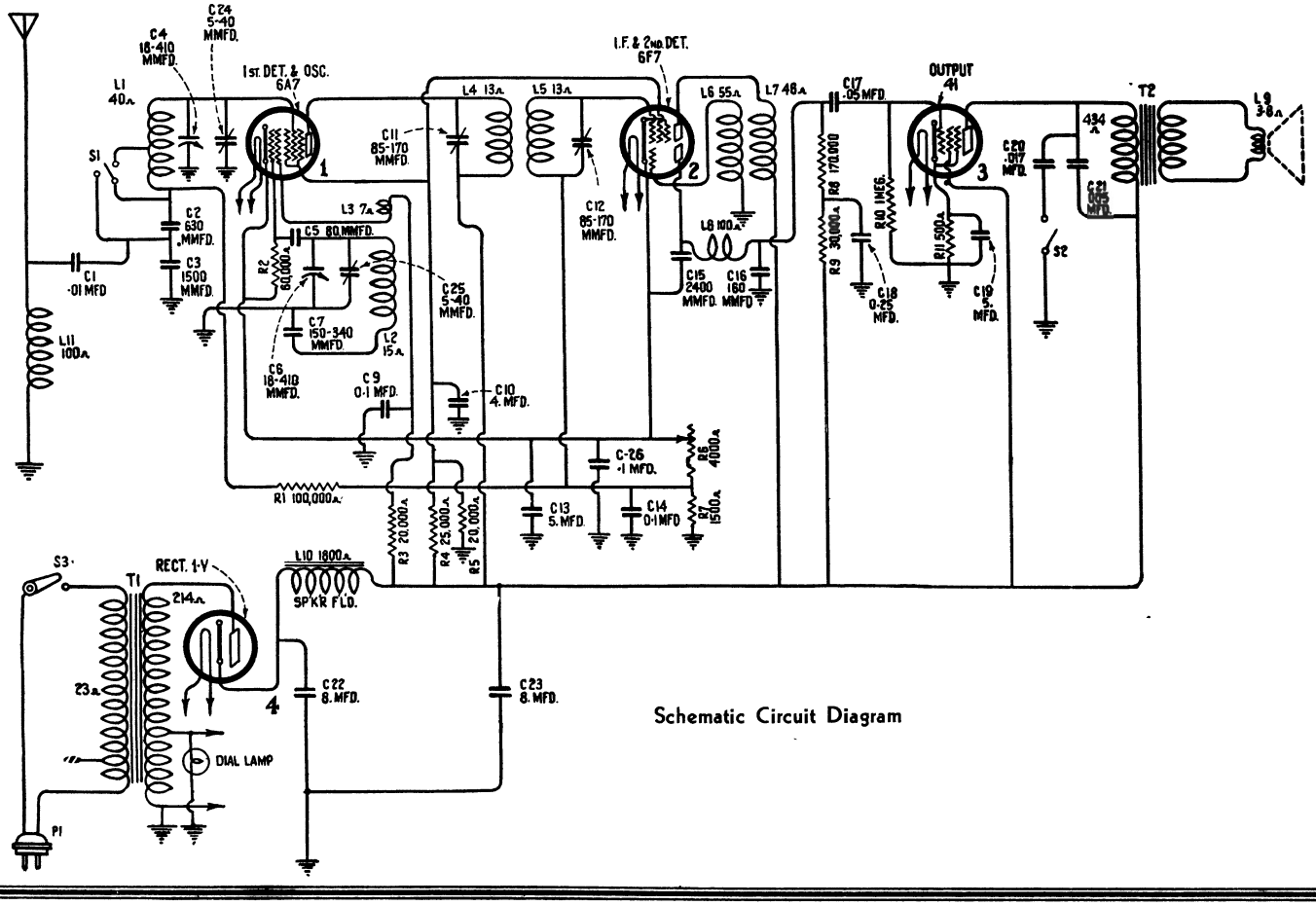
12801 D

CANADIAN WESTINGHOUSE CO., Ltd.

Model 44



Wiring Diagram



Schematic Circuit Diagram

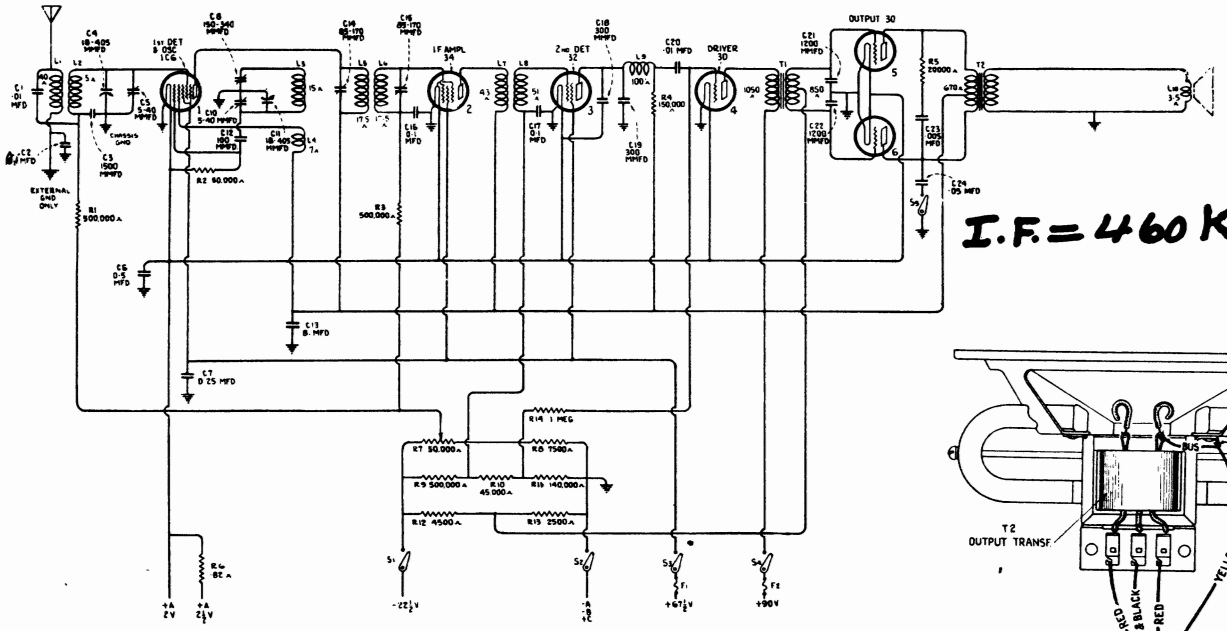
CANADIAN WESTINGHOUSE CO., Ltd.

Models B64 and B634

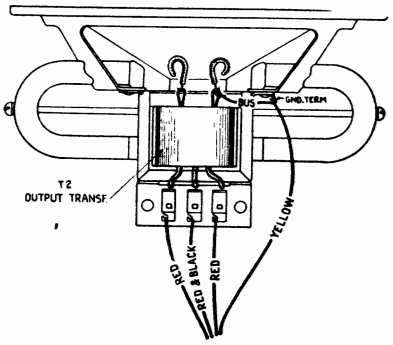
All voltages are taken with respect to filament. (Pin 4 or Pin 6). All voltages are actual operating values. Measured values will depend on meter resistance. Antenna and Ground Shorted. Pins are numbered according to new R.M.A. standards

SOCKET READINGS
New Batteries -- Volume Control at Maximum

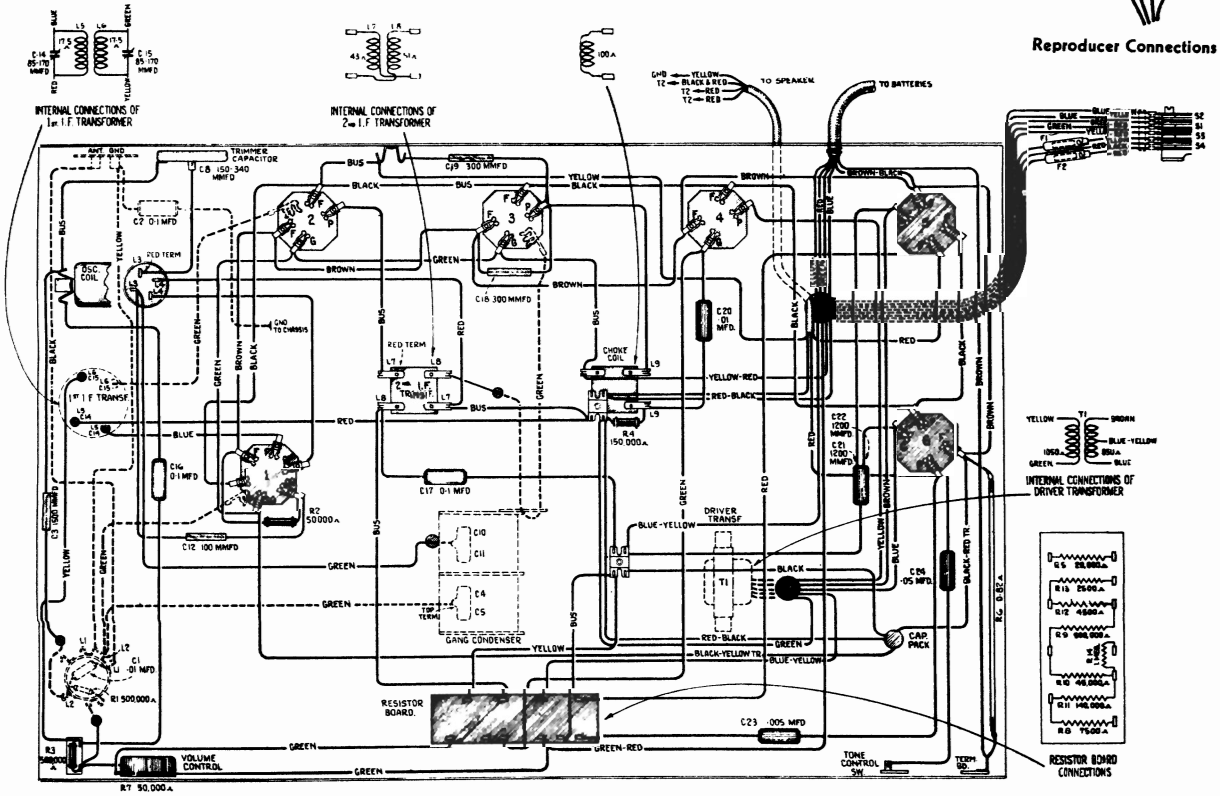
	Cap	Pin 2		Pin 3		Pin 4		Pin 5		Filament
	Volts	Volts	M.A.	Volts	M.A.	Volts	M.A.	Volts	M.A.	Volts
1. W-1C6—First Detector Oscillator	—6.5 Det. Grid.	90 Det. Plate	1.3	90 Osc. Plate	2.5	0 Osc. Grid.	0	64 Screen	1.5	2.0
2. W-34—I.F. Amplifier	—6.5 C. Grid.	90 Plate	1.5	64 Screen	1.0	— Filament	—	—	—	2.0
3. W-32—2nd Detector	—5.8 C. Grid.	67 Plate	0.2	64 Grid	1.0	— Filament	—	—	—	2.0
4. W-30—Driver	.....	90 Plate	2.5	—3.7 Grid	.....	... Filament	...	....	....	2.0
5 or 6 W-30—Power Amplifier	.....	90 Plate	1.0	—8.5 Grid	....	... Filament	...	....	....	2.0



Schematic Circuit



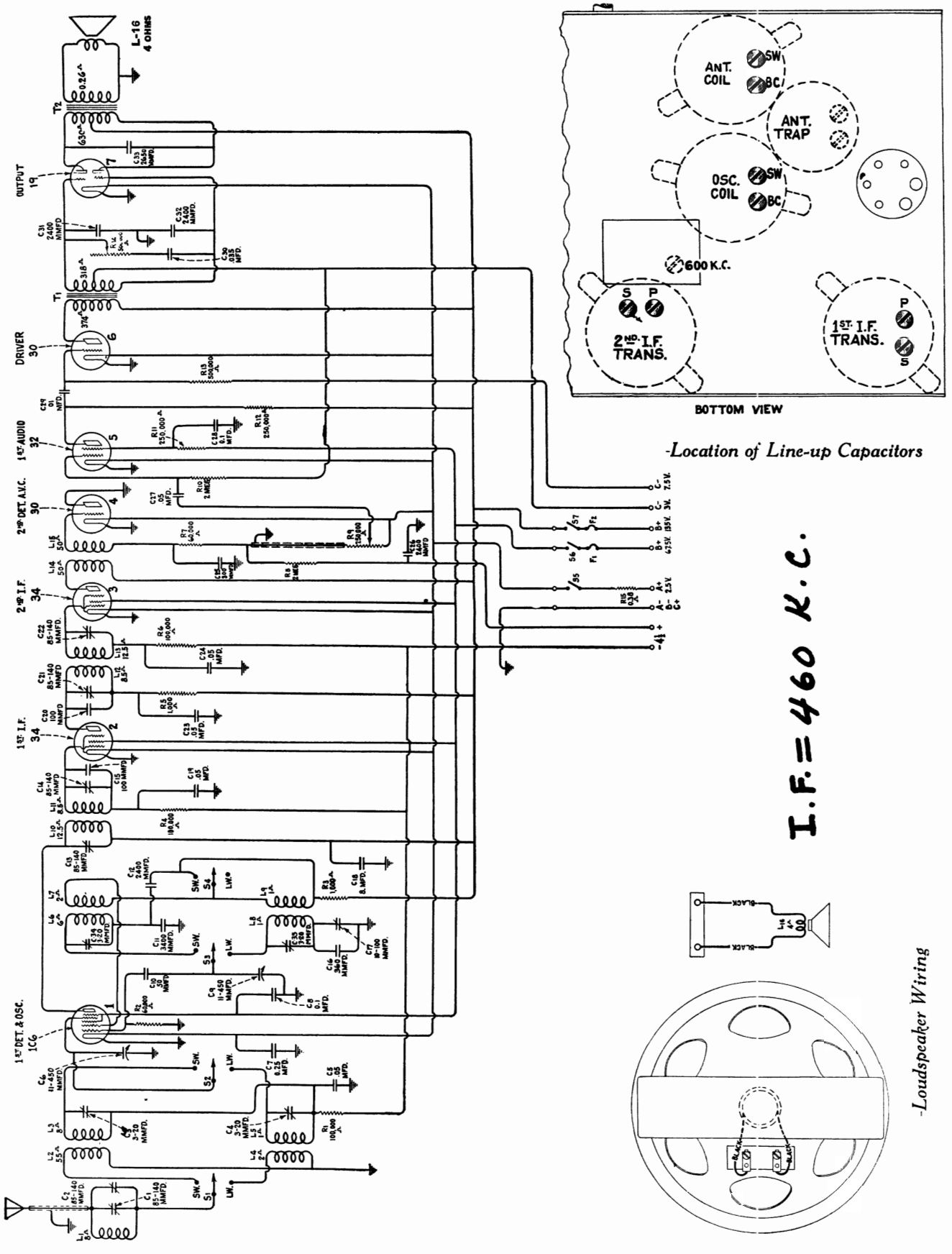
Reproducer Connections



Wiring Diagram

CANADIAN WESTINGHOUSE CO., Ltd.

Model B-74

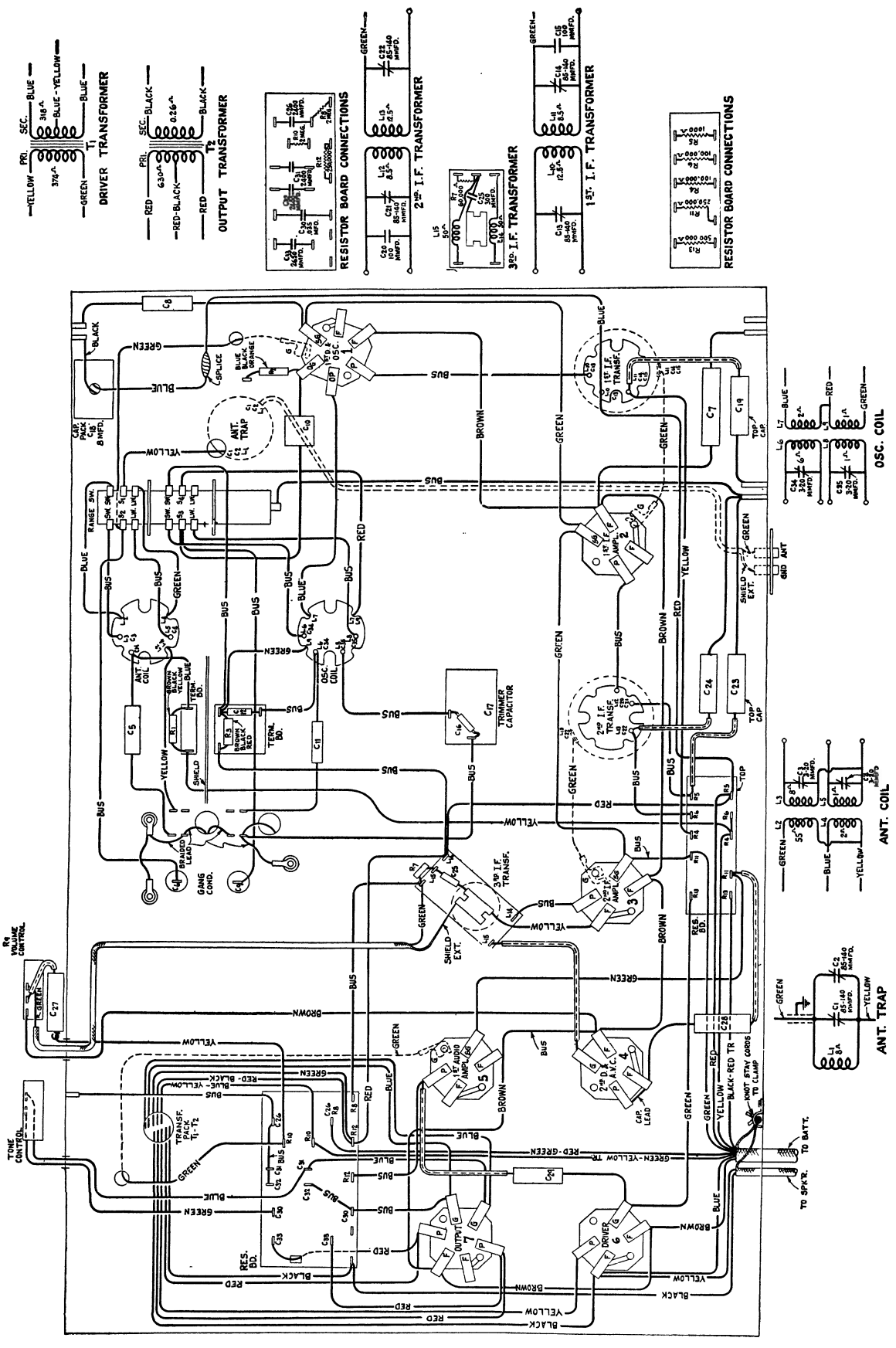


-Location of Line-up Capacitors

-Loudspeaker Wiring

CANADIAN WESTINGHOUSE CO., Ltd.

Model B-74



Tuning Ranges.....540 K. C.–1720 K. C.—5400 K. C.–18,000 K. C.
Maximum Undistorted Output.....1.2 Watts
Maximum Output.....2.2 Watts
Line-up Frequencies.....460 K. C., 600 K. C., 1720 K. C. and 18,000 K. C.

CANADIAN WESTINGHOUSE CO., Ltd.

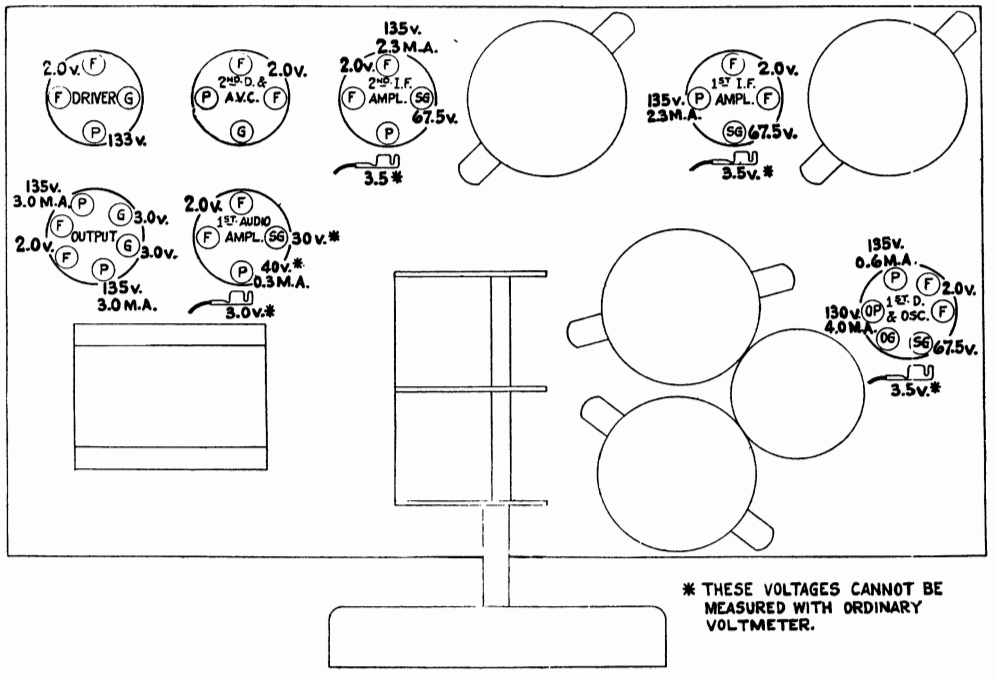
Model B-74

RADIOTRON SOCKET VOLTAGES

Volume Control at Maximum—No Signal—135 Volt "B" Battery—4.5 and 7.5-Volt Bias Batteries

Radiotron No.		Control Grid to Ground	Screen Grid to Ground	Plate to Ground	Plate, M. A.	Filament Volts
W-1A6	1st Detector	3.5*	67.5	135	0.6	2.0
	Oscillator	—	—	130	4.0	
W-34—I. F.		3.5*	67.5	135	2.3	2.0
W-34—I. F.		3.5*	67.5	135	2.3	2.0
W-30—Detector AVC		—	—	—	—	2.0
W-32—Audio		3 0*	30*	40*	0.3	2.0
W-30—Driver		7 5*	—	133	4.0	2.0
W-19—Power		3.0	—	135	3.0	2.0

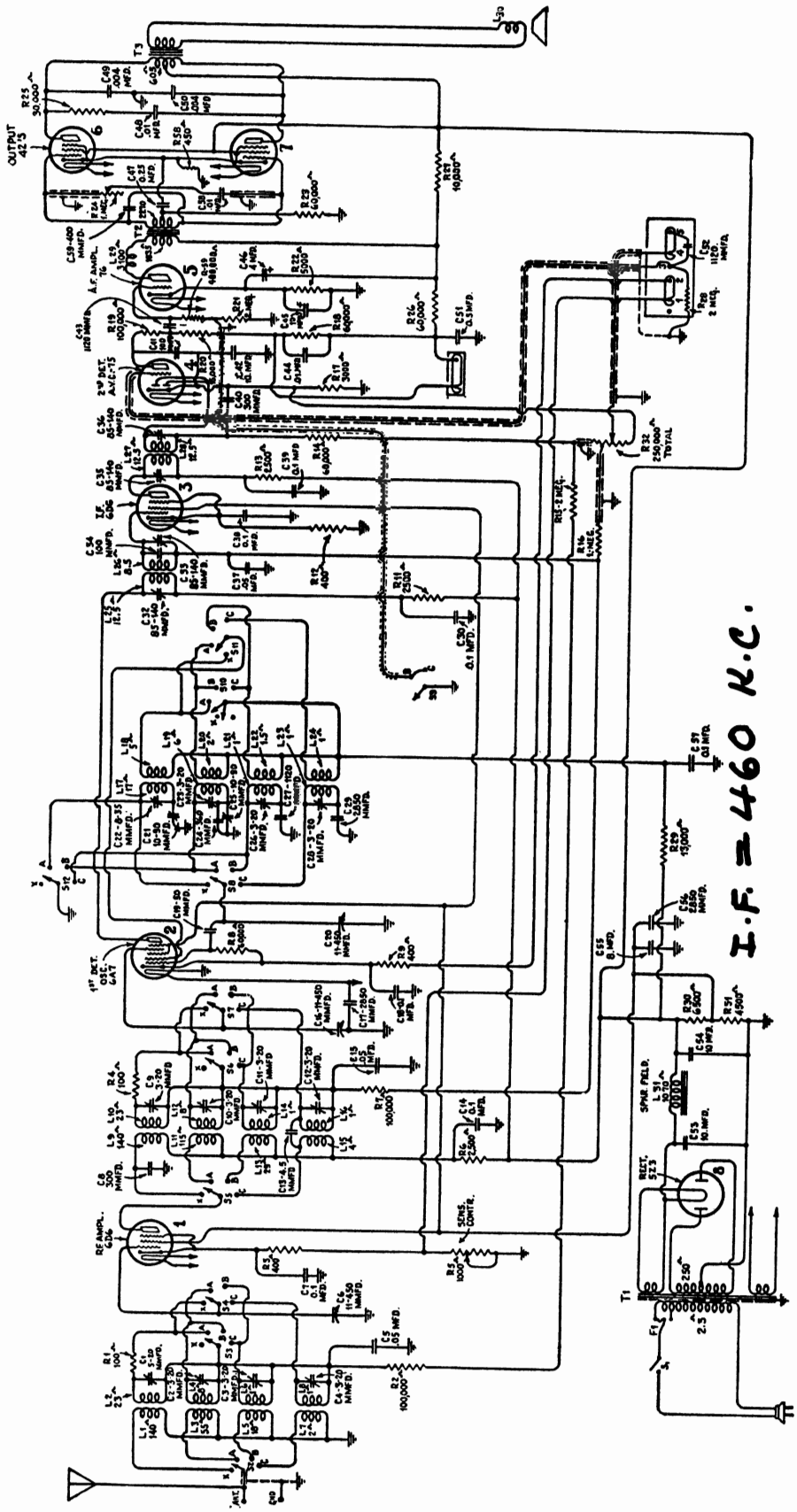
*These voltages cannot be measured with ordinary voltmeter.

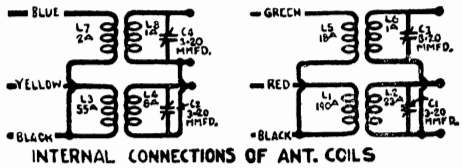


-Radiotron Socket Voltages

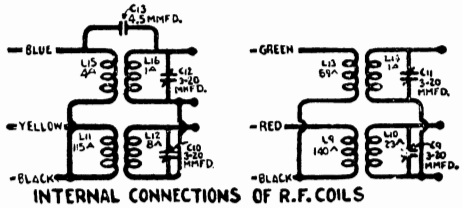
CANADIAN WESTINGHOUSE CO., Ltd.

Model 84

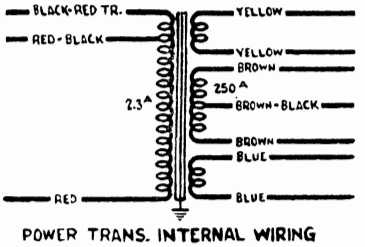




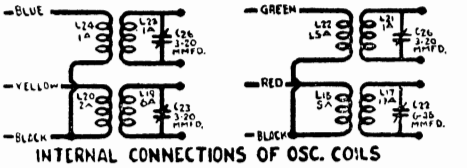
INTERNAL CONNECTIONS OF ANT. COILS



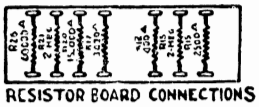
INTERNAL CONNECTIONS OF R.F. COILS



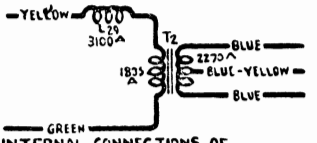
POWER TRANS. INTERNAL WIRING



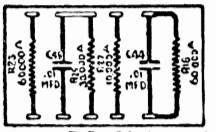
INTERNAL CONNECTIONS OF OSC. COILS



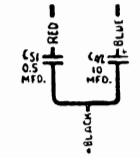
RESISTOR BOARD CONNECTIONS



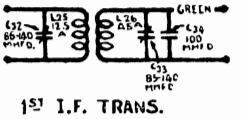
INTERNAL CONNECTIONS OF INTERSTAGE TRANS.



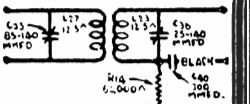
RESISTOR BOARD CONNECTIONS



INTERNAL CONNECTIONS OF CAP. PACK



1ST I.F. TRANS.



2ND I.F. TRANS.

CANADIAN WESTINGHOUSE CO., Ltd.

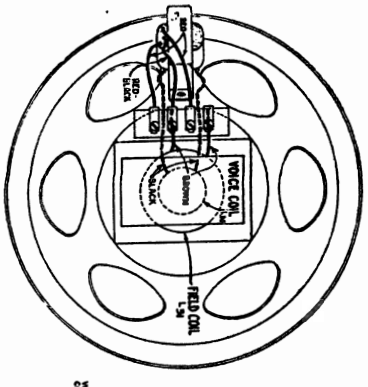
Model 84

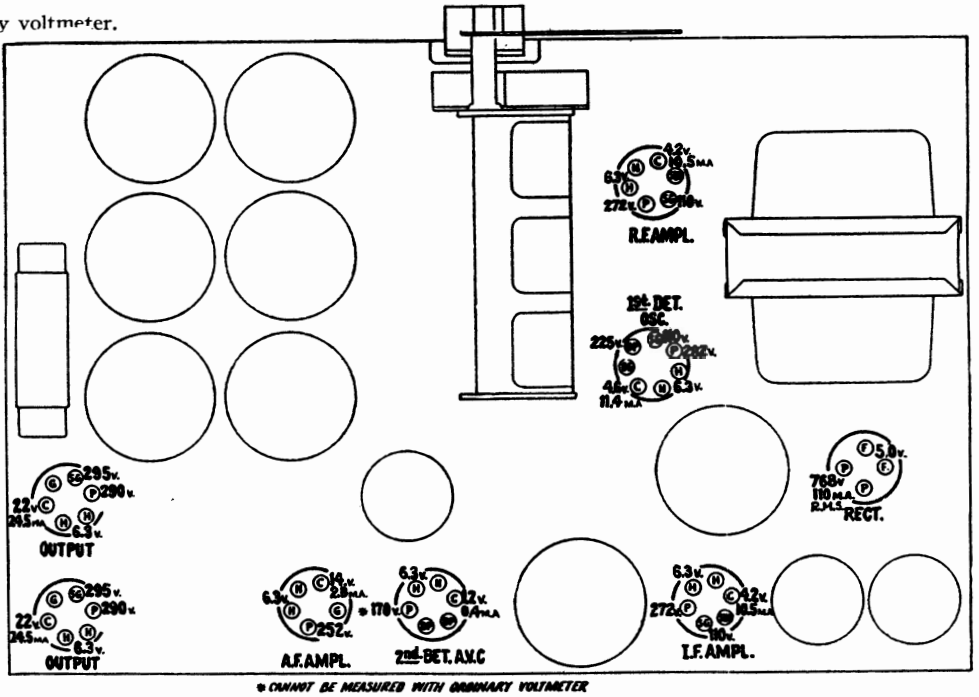
RADIOTRON SOCKET VOLTAGES

120-Volt A. C. Line—Maximum Volume and Sensitivity—No Signal

Radiotron No.		Cathode to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Plate to Ground Volts, D.C.	Cathode Current, M.A.	Heater Volts A.C.
W-6D6 R.F.		4.2	110	272	10.05	6.3
W-6A7	Oscillator	—	—	225	11.4	6.3
	1st Detector	4.6	110	282		
W-6D6 I.F.		4.2	110	272	10.5	6.3
W-75 2nd Det.		1.2	—	170*	0.4	6.3
W-76 A.F.		14.0	—	252	2.8	6.3
W-42 Power		22.0	295	290	24.5	6.3
W-42 Power		22.0	295	290	24.5	6.3
W-5Z3 Rectifier		—	—	768/384 R.M.S.	110.0	5.0

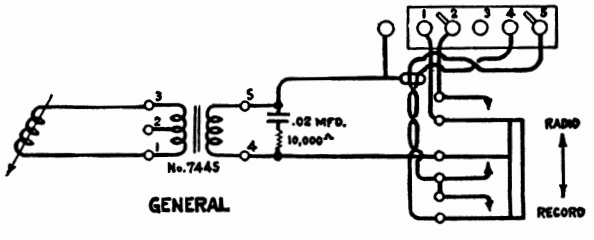
*Cannot be measured with ordinary voltmeter.

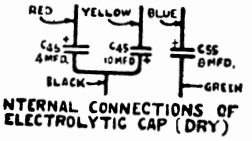




* CANNOT BE MEASURED WITH ORDINARY VOLTMETER

ALL VOLTAGES ARE TO GROUND





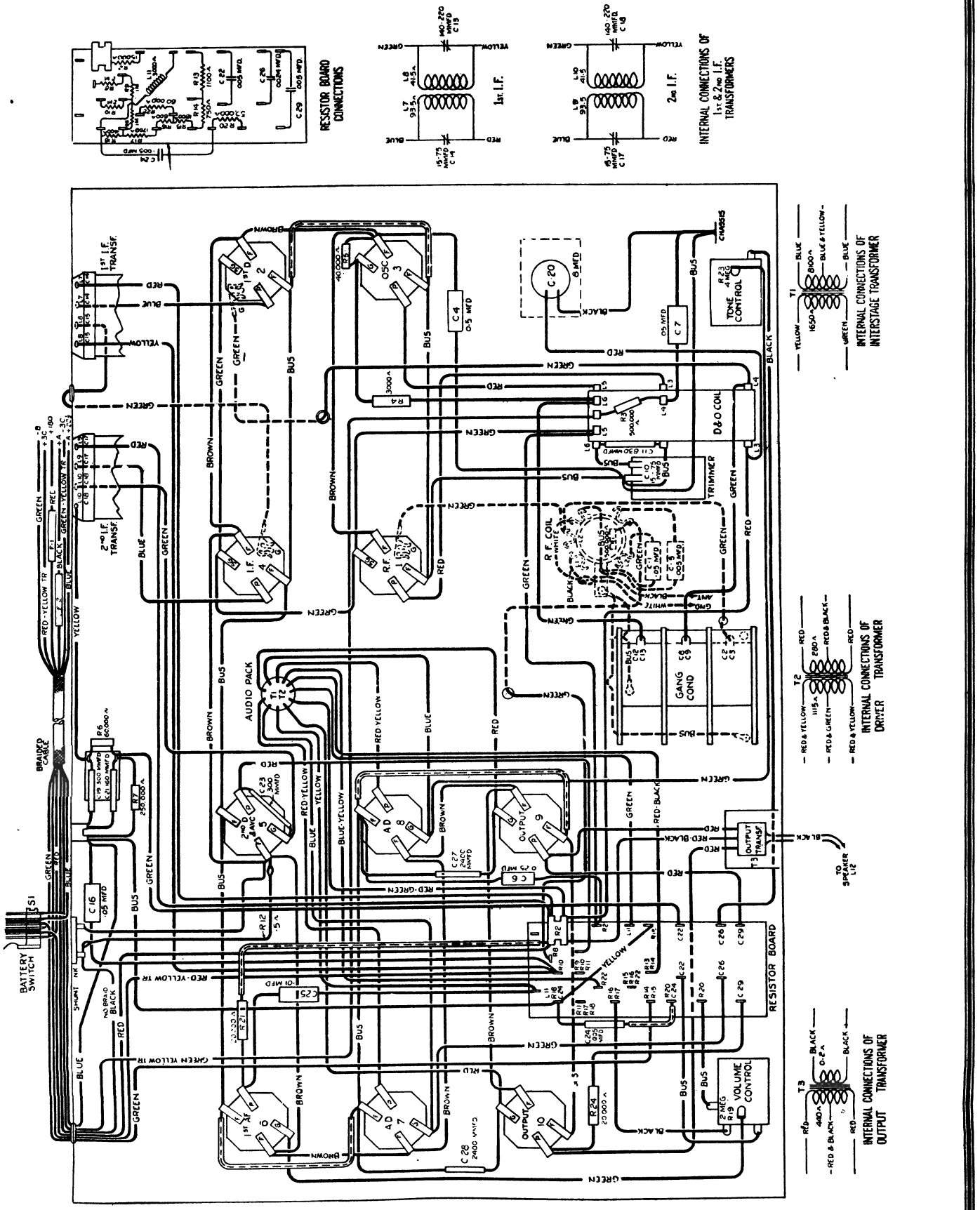
INTERNAL CONNECTIONS OF ELECTROLYTIC CAP (DRY)

Magnetic Pickup Connections

Place Range Switch in A or X position during record reproduction

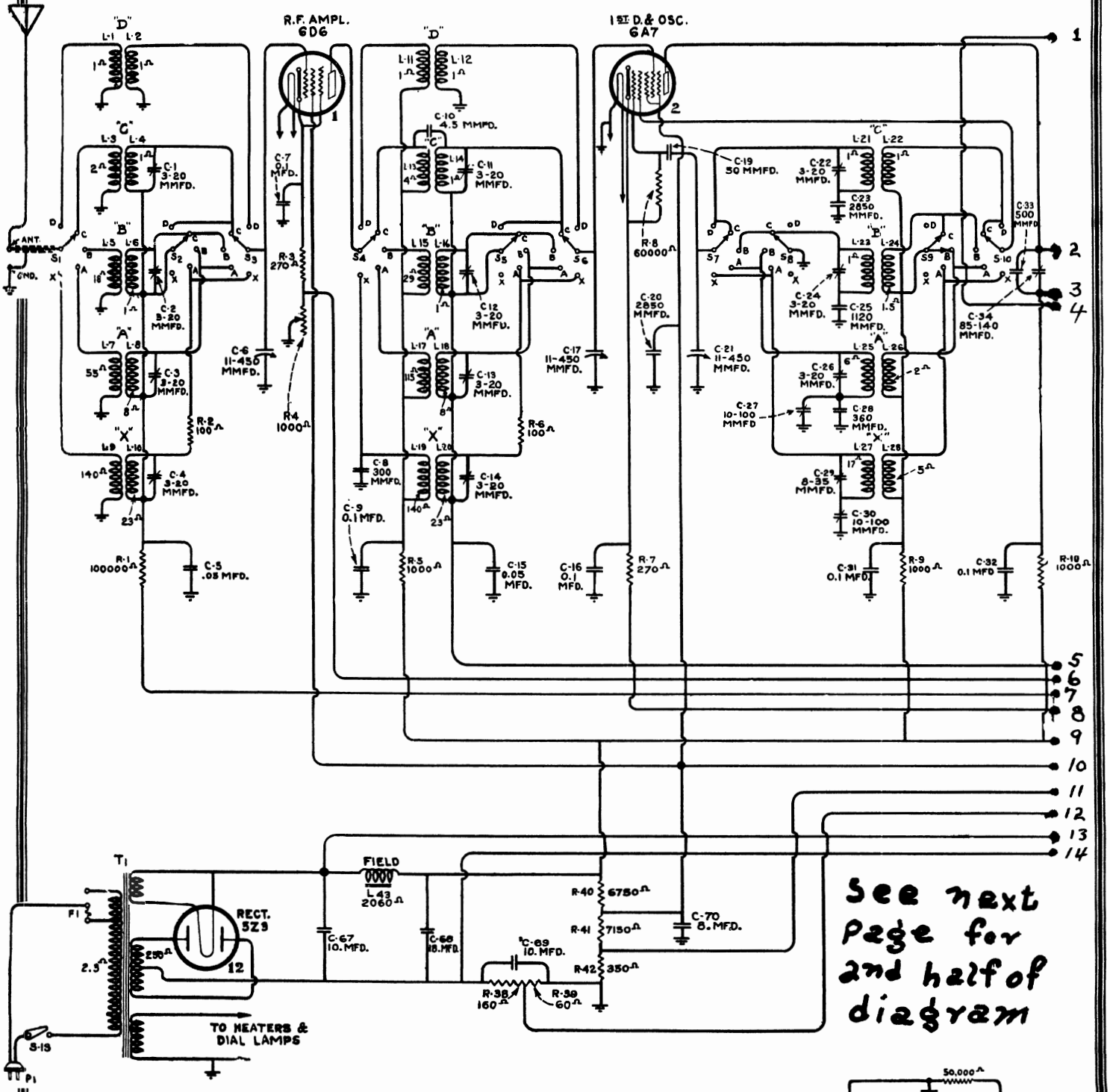
CANADIAN WESTINGHOUSE CO., Ltd.

Model B-103

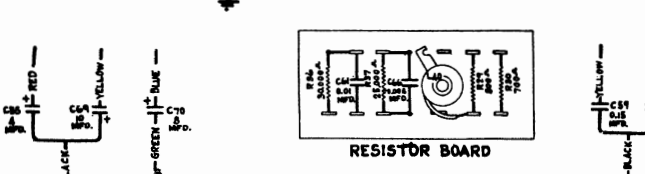


CANADIAN WESTINGHOUSE CO., Ltd.

Model 124

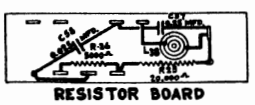


See next page for 2nd half of diagram

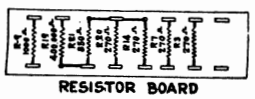


ELECTROLYTIC CAP (DRY)

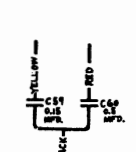
RESISTOR BOARD



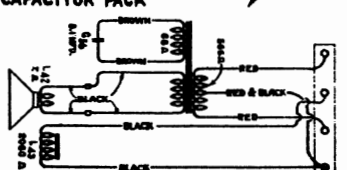
RESISTOR BOARD

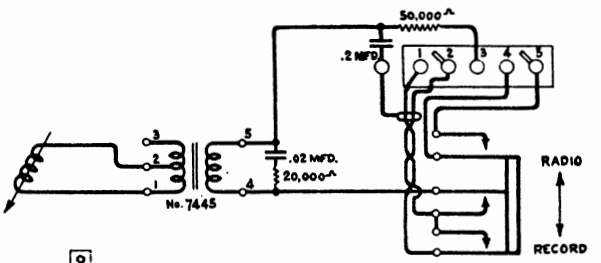


RESISTOR BOARD



CAPACITOR PACK

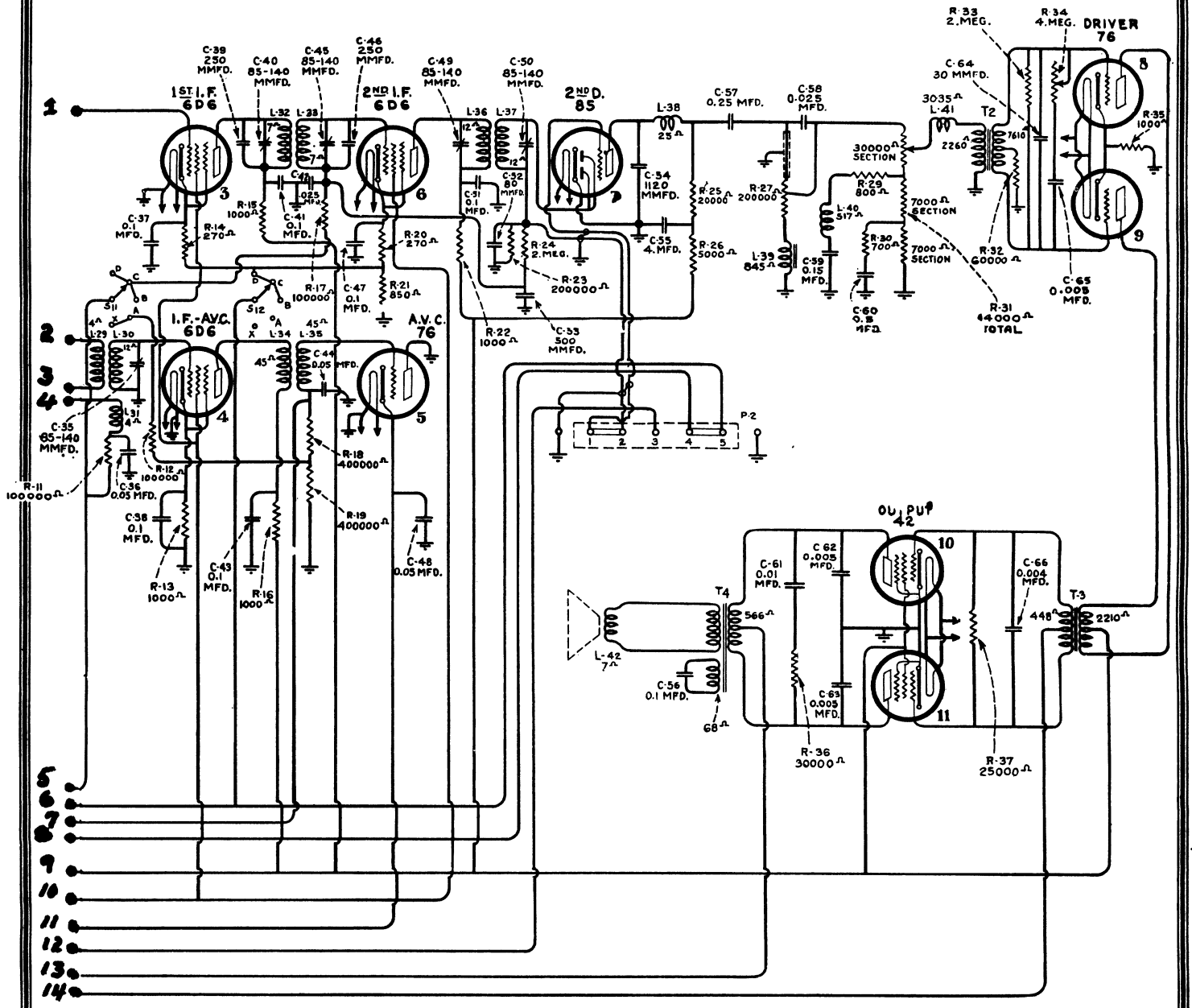


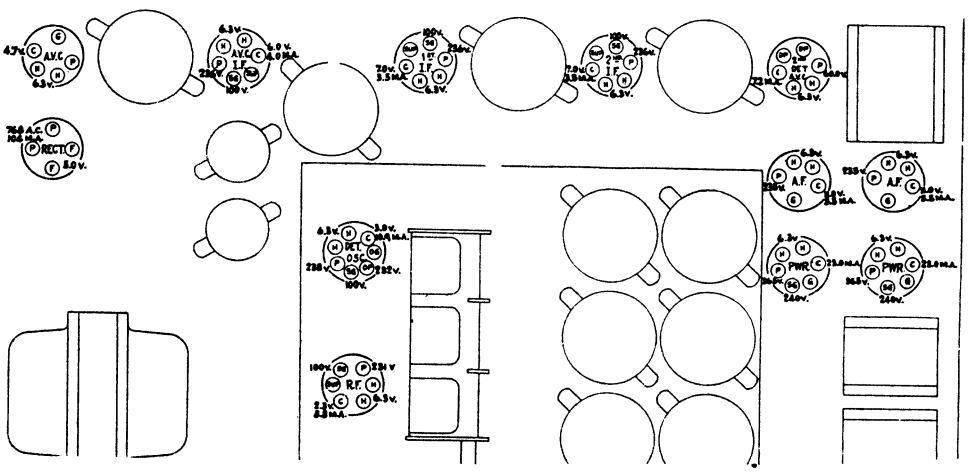


Magnetic Pickup Connections

CANADIAN WESTINGHOUSE CO., Ltd.

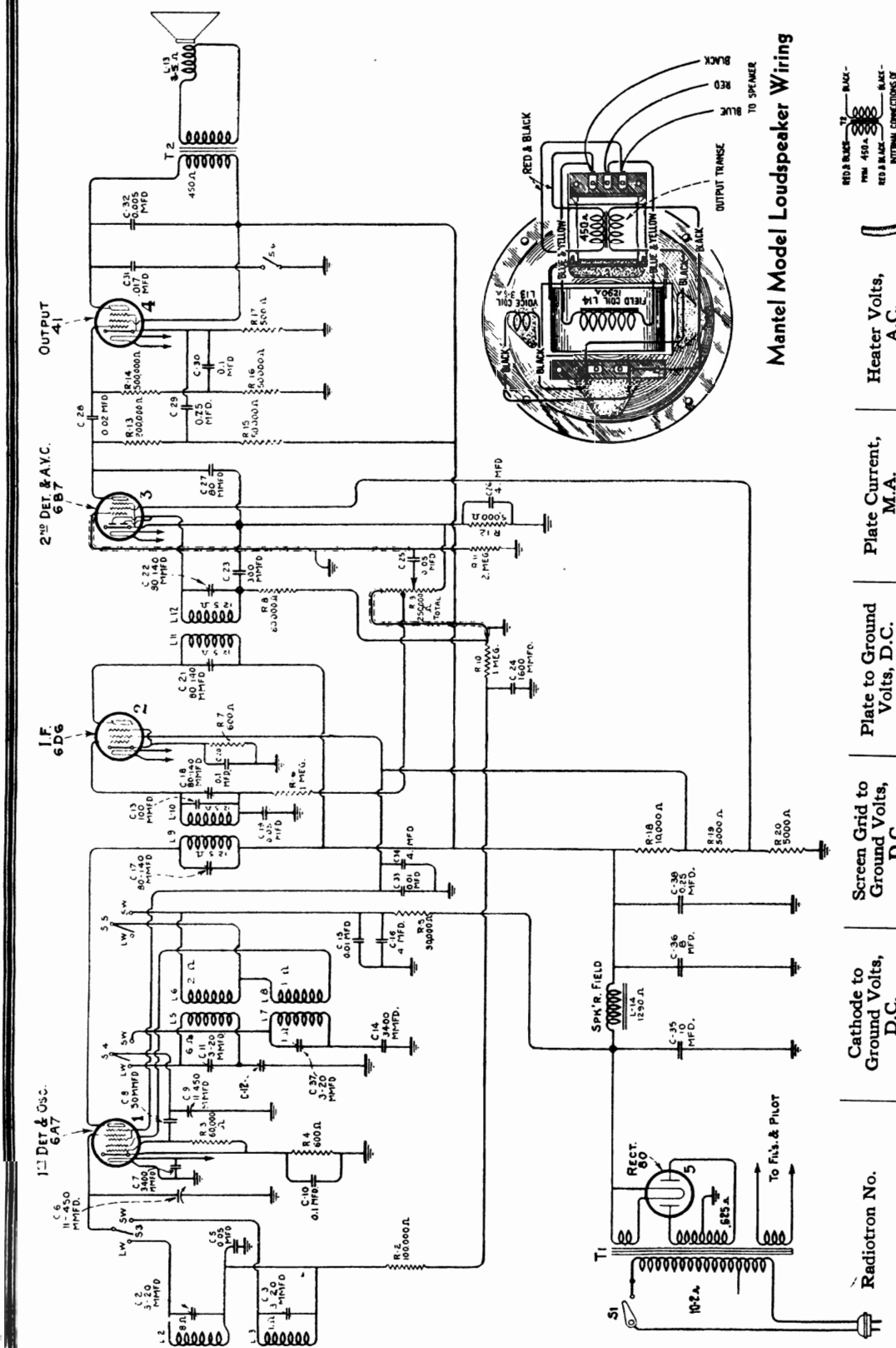
Model 124



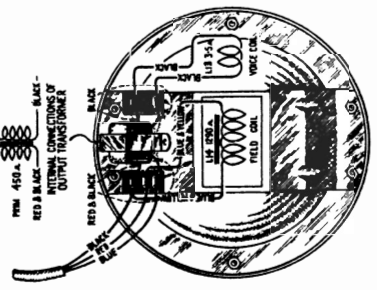


CANADIAN WESTINGHOUSE CO., Ltd.

Models 155A-155X



Mantel Model Loudspeaker Wiring



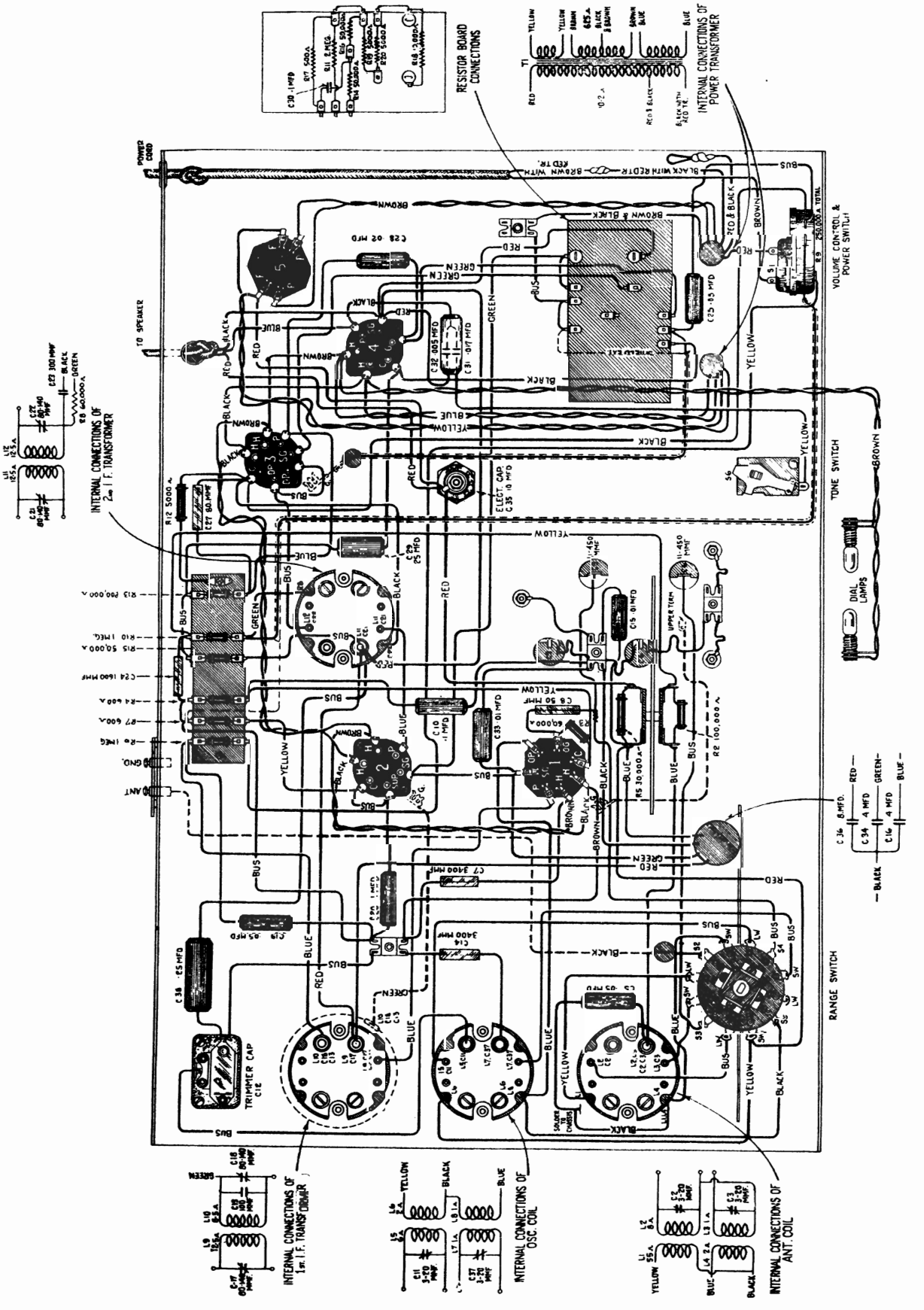
Console Model Loudspeaker

Radiotron No.		Cathode to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Plate to Ground Volts, D.C.	Plate Current, M.A.	Heater Volts, A.C.
†W-6A7	Detector	6.0	105	265	3.5	6.3
	Oscillator		—	220	4.5	
W-6D6 I.F.		6.0	105	265	9.0	6.3
W-6B7 2nd Det. AVC		4.0	50*	90*	0.7	6.3
W-41 Power		16.5	265	245	30.0	6.3
W-80 Rectifier		—	—	800 (Plate to Plate)	64.0	5.0

*Voltage calculated from 265V+B.

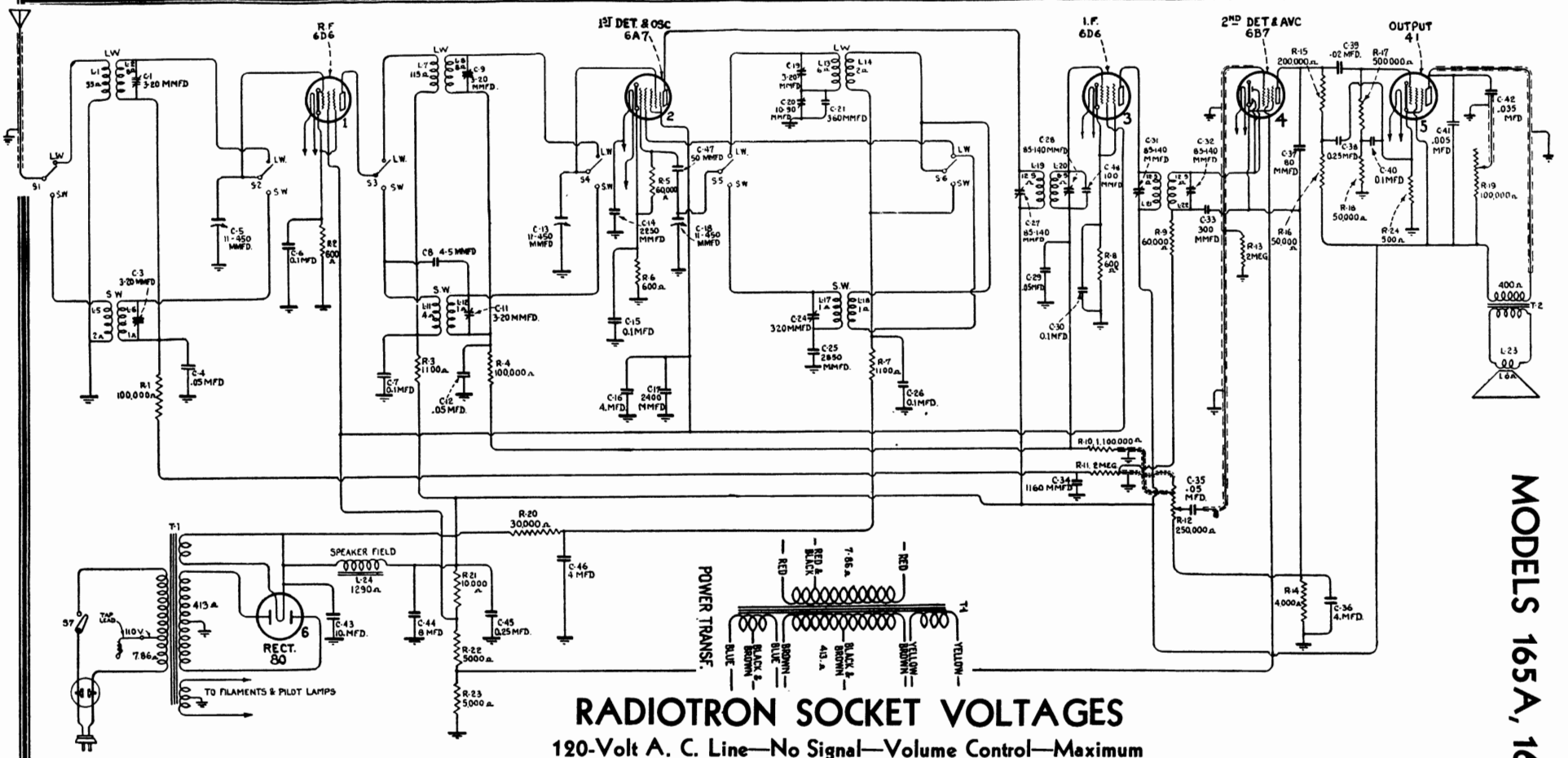
CANADIAN WESTINGHOUSE CO., Ltd.

Models 155A - 155X



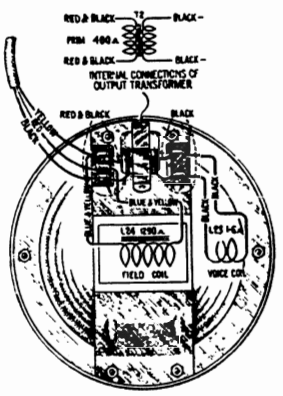
CANADIAN WESTINGHOUSE CO., Ltd.

MODELS 165A, 165X and 165Y



RADIOTRON SOCKET VOLTAGES

120-Volt A. C. Line—No Signal—Volume Control—Maximum



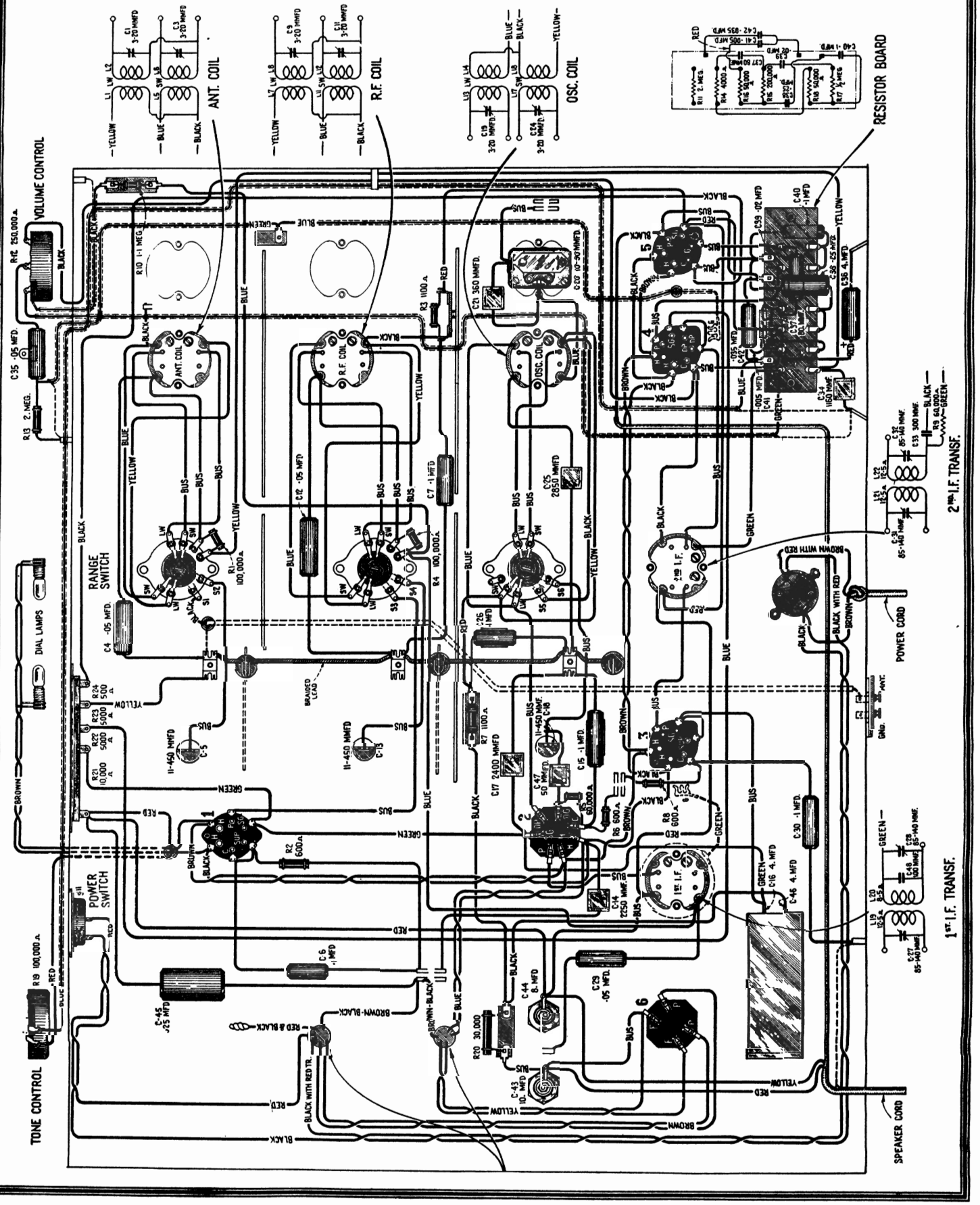
W165X and W165Y

Radiotron Number		Cathode to Ground Volts, D.C.	Screen Grid to Ground, Volts, D.C.	Plate to Ground, Volts, D.C.	Plate Current M.A.	Heater Volts, A.C.
W-6D6—R.F.		6.0	95	265	9.0	6.3
W-6A7	Det.	6.0	95	265	2.5	6.3
	Osc.	.....	.....	220	4.5	
W-6D6—I.F.		6.0	95	265	9.0	6.3
W-6B7—2nd Detector		3.0	50	90*	0.7	6.3
W-42—Power		18	265	245	30.0	6.3
W-80—Rectifier		.....	.....	785 (RMS)	70.0	5.0

*Voltage calculated from 265 V. + B.

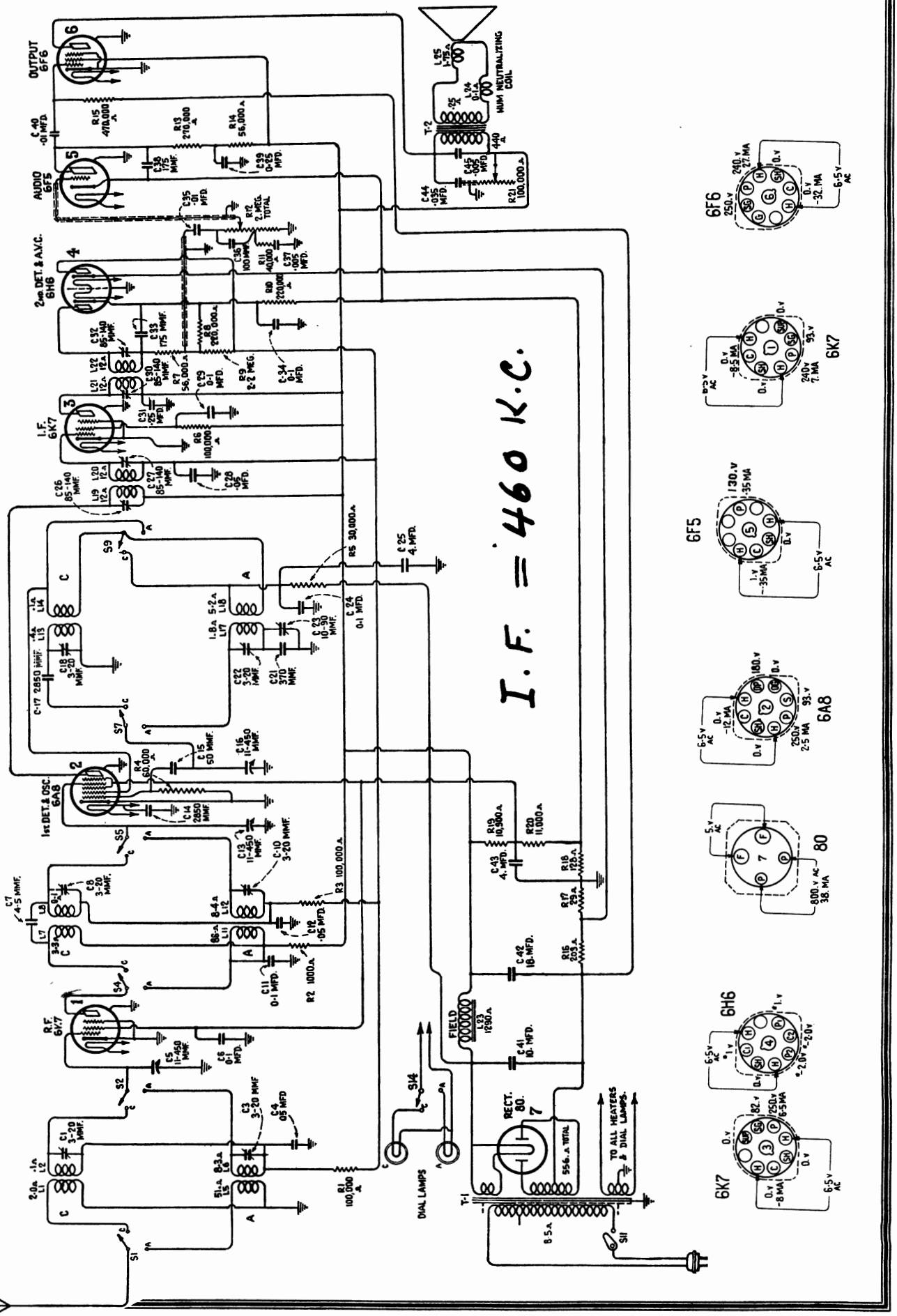
CANADIAN WESTINGHOUSE CO., Ltd.

MODELS W165A, W165X and W165Y



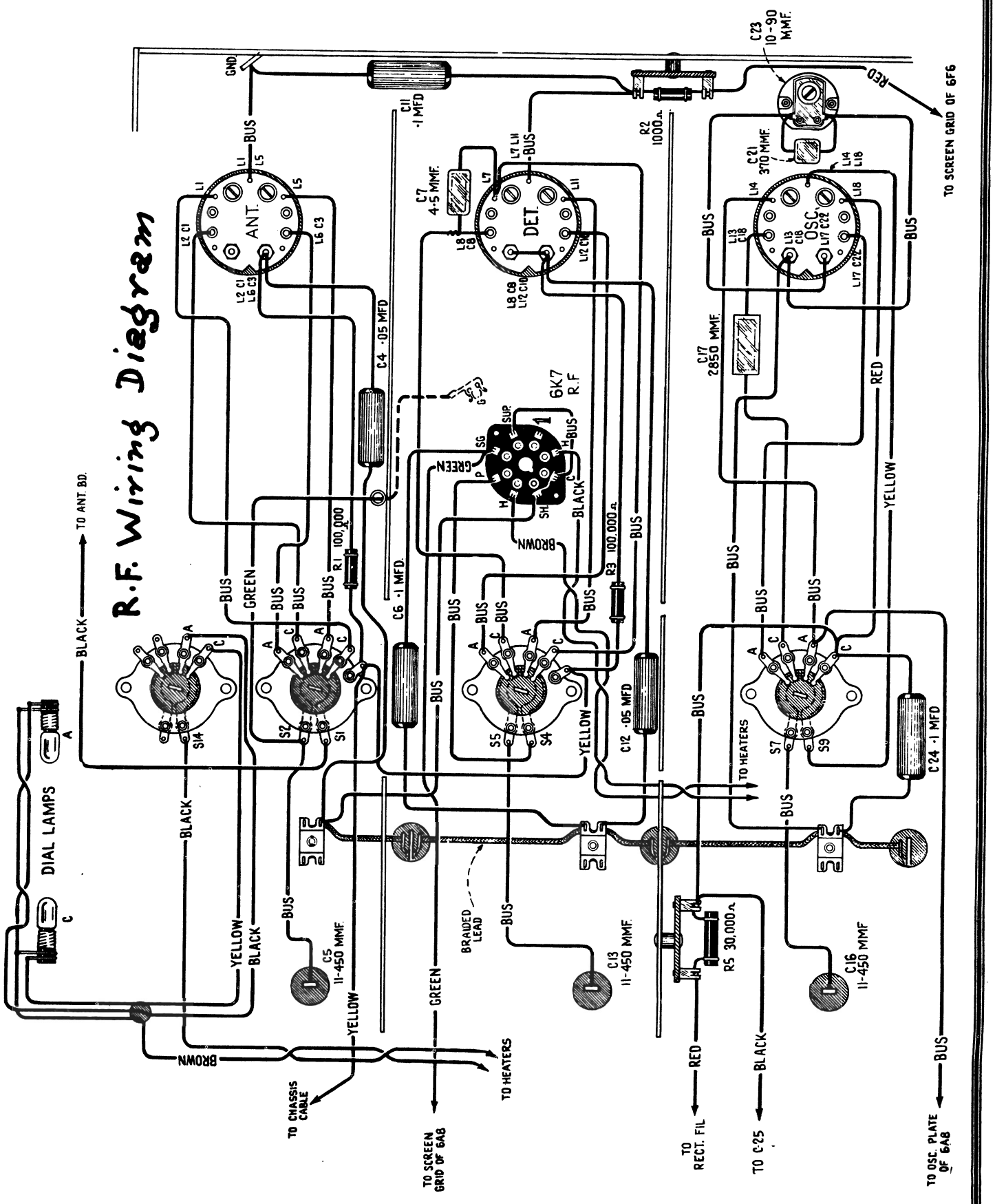
CANADIAN WESTINGHOUSE CO., Ltd.

W175A, X and Y



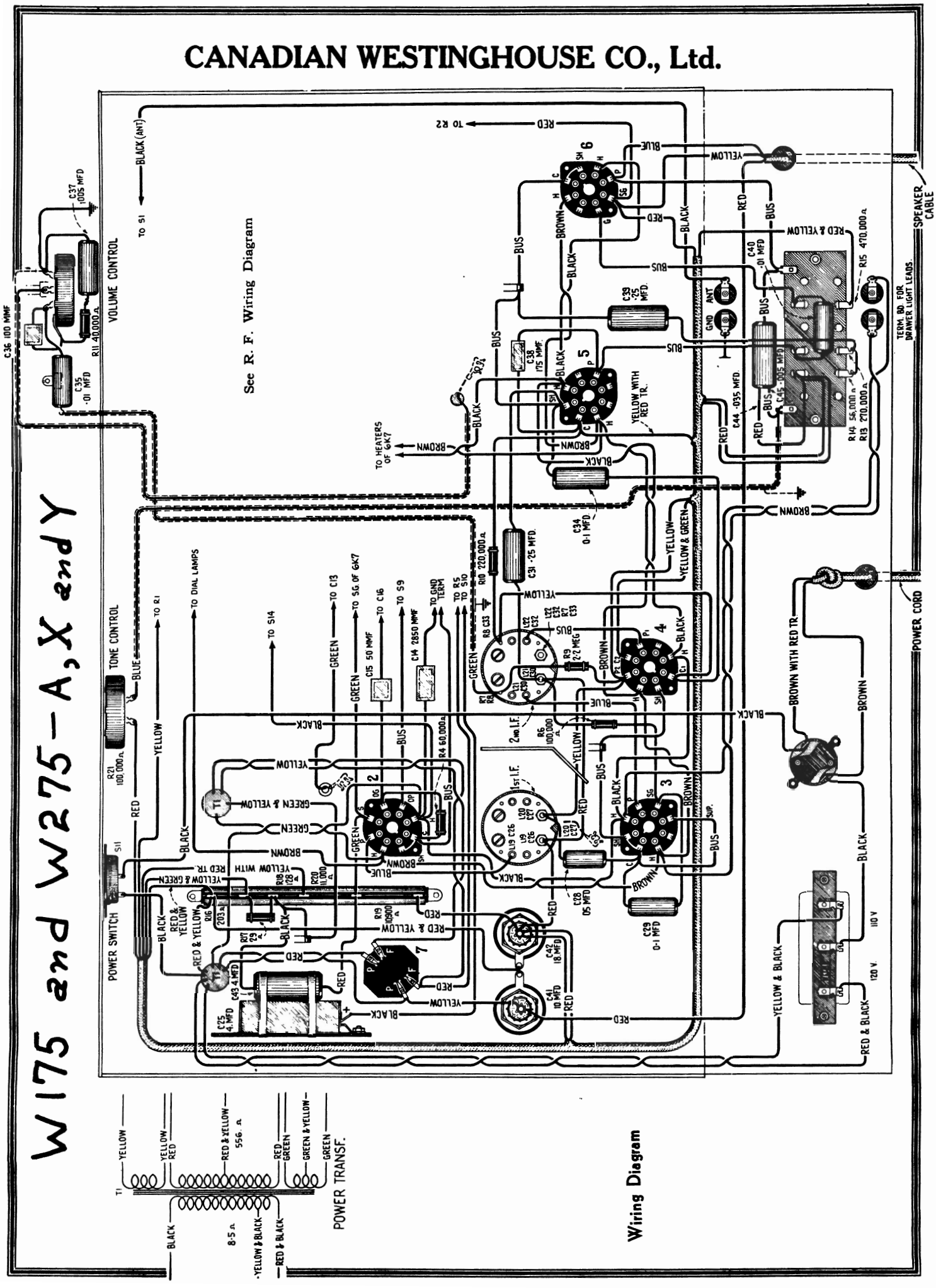
CANADIAN WESTINGHOUSE CO., Ltd.

W175A, 175X and 175Y



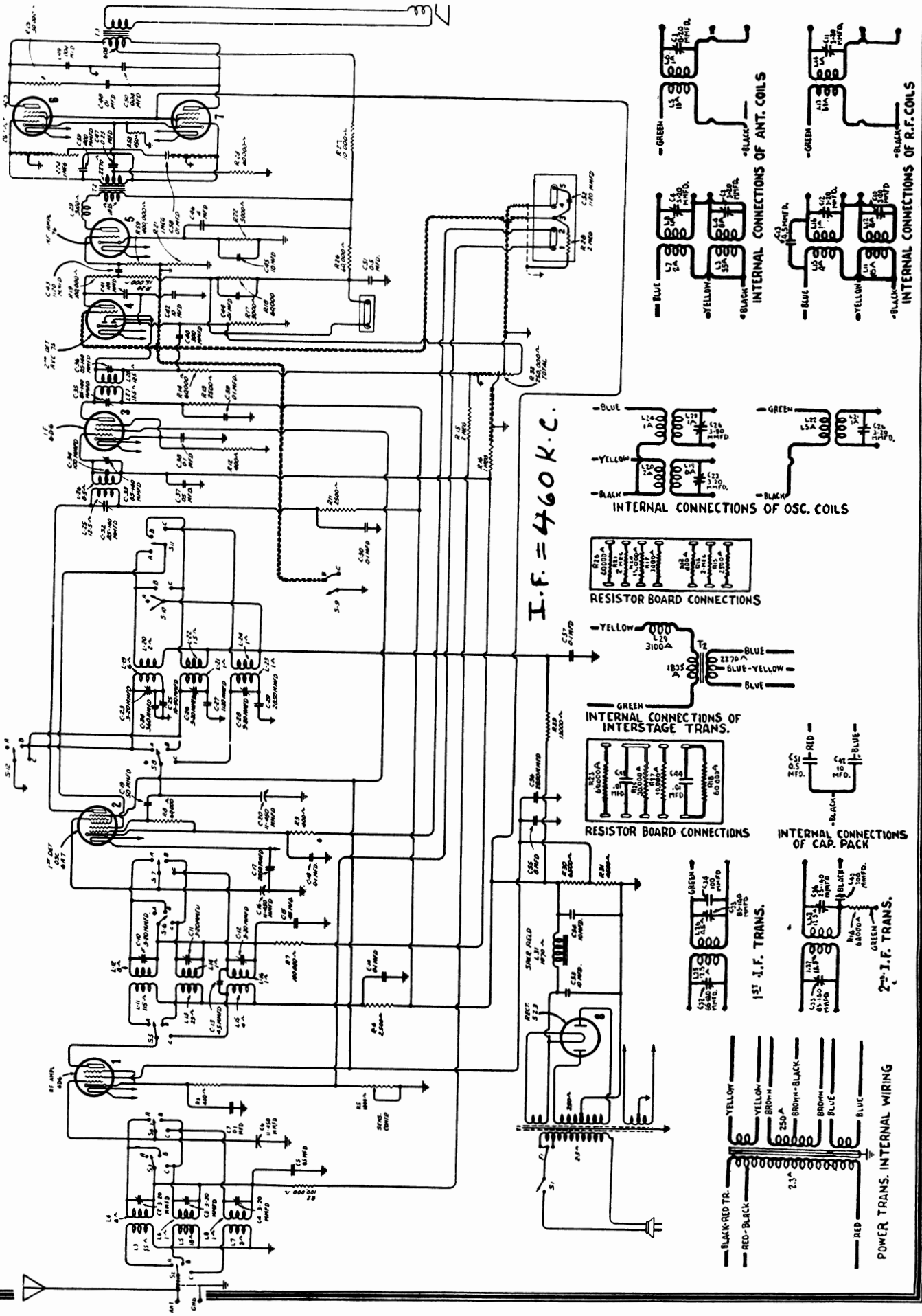
CANADIAN WESTINGHOUSE CO., Ltd.

W175 and W275 - A, X and Y



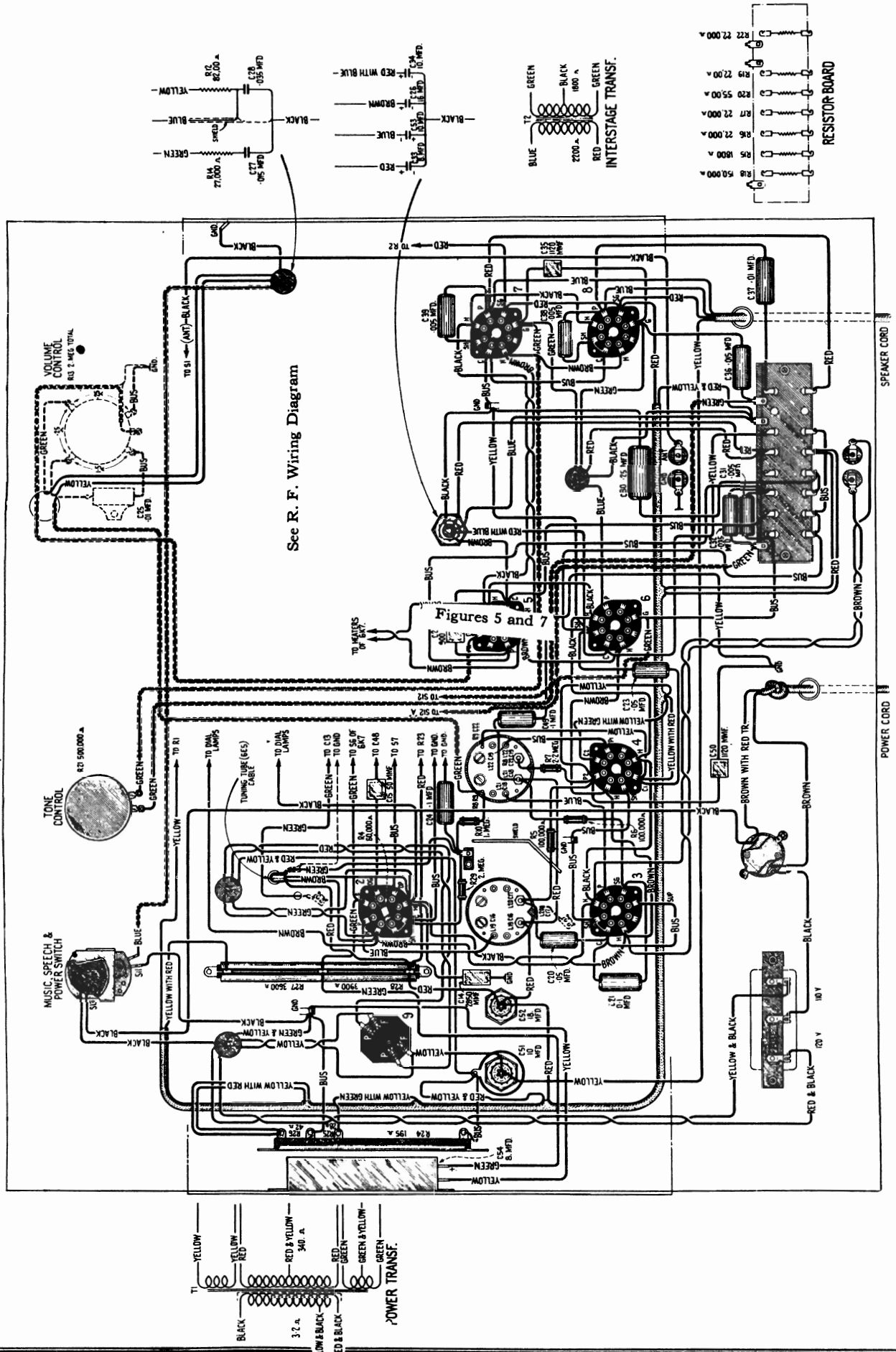
CANADIAN WESTINGHOUSE CO., Ltd.

MODEL 185X



CANADIAN WESTINGHOUSE CO., Ltd.

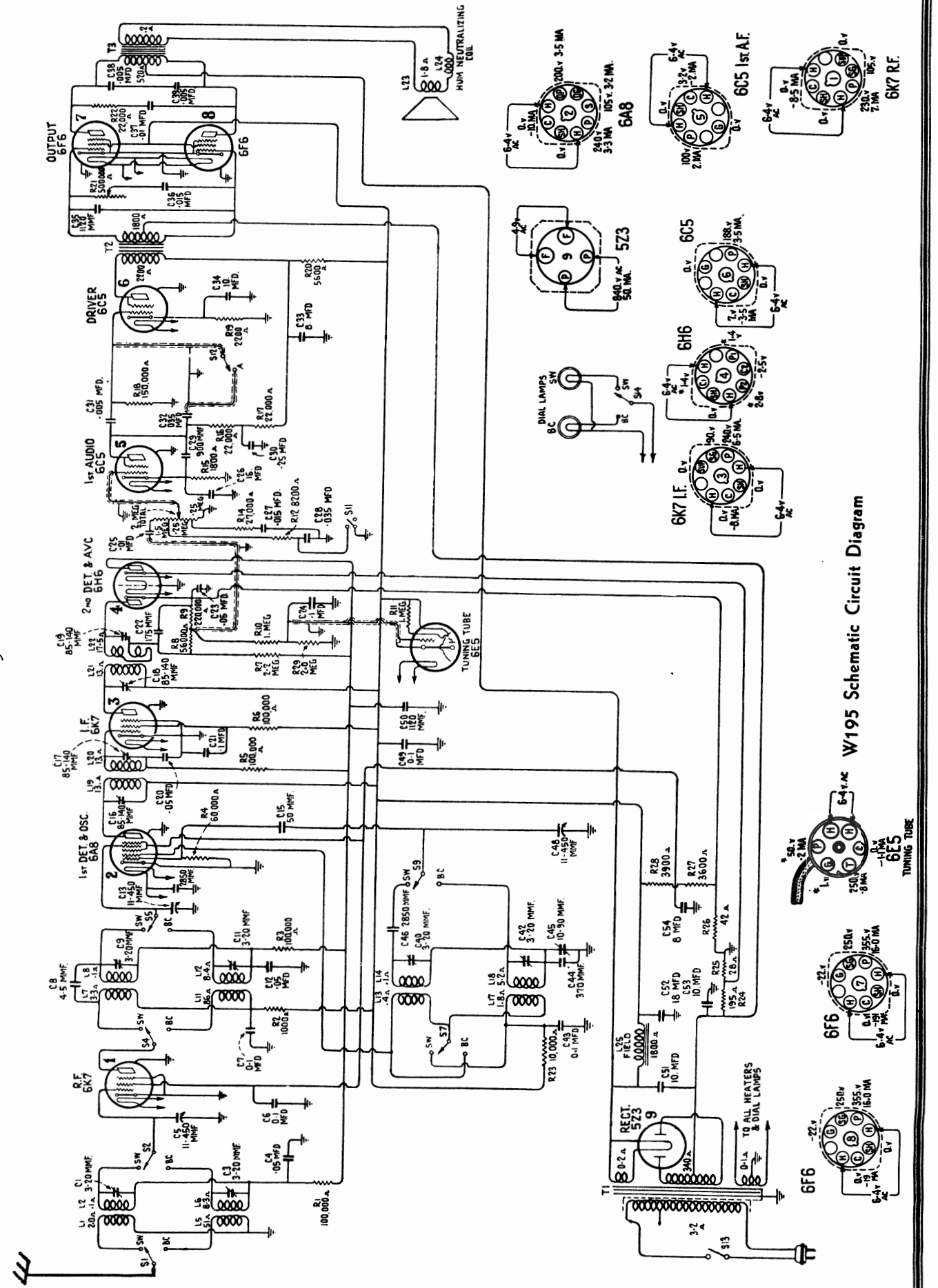
Models 195X-Y and 295X-Y



W195 and W295 Wiring Diagram

CANADIAN WESTINGHOUSE CO., Ltd.

W195X, and Y



CANADIAN WESTINGHOUSE CO., Ltd.

Models 254A-254X

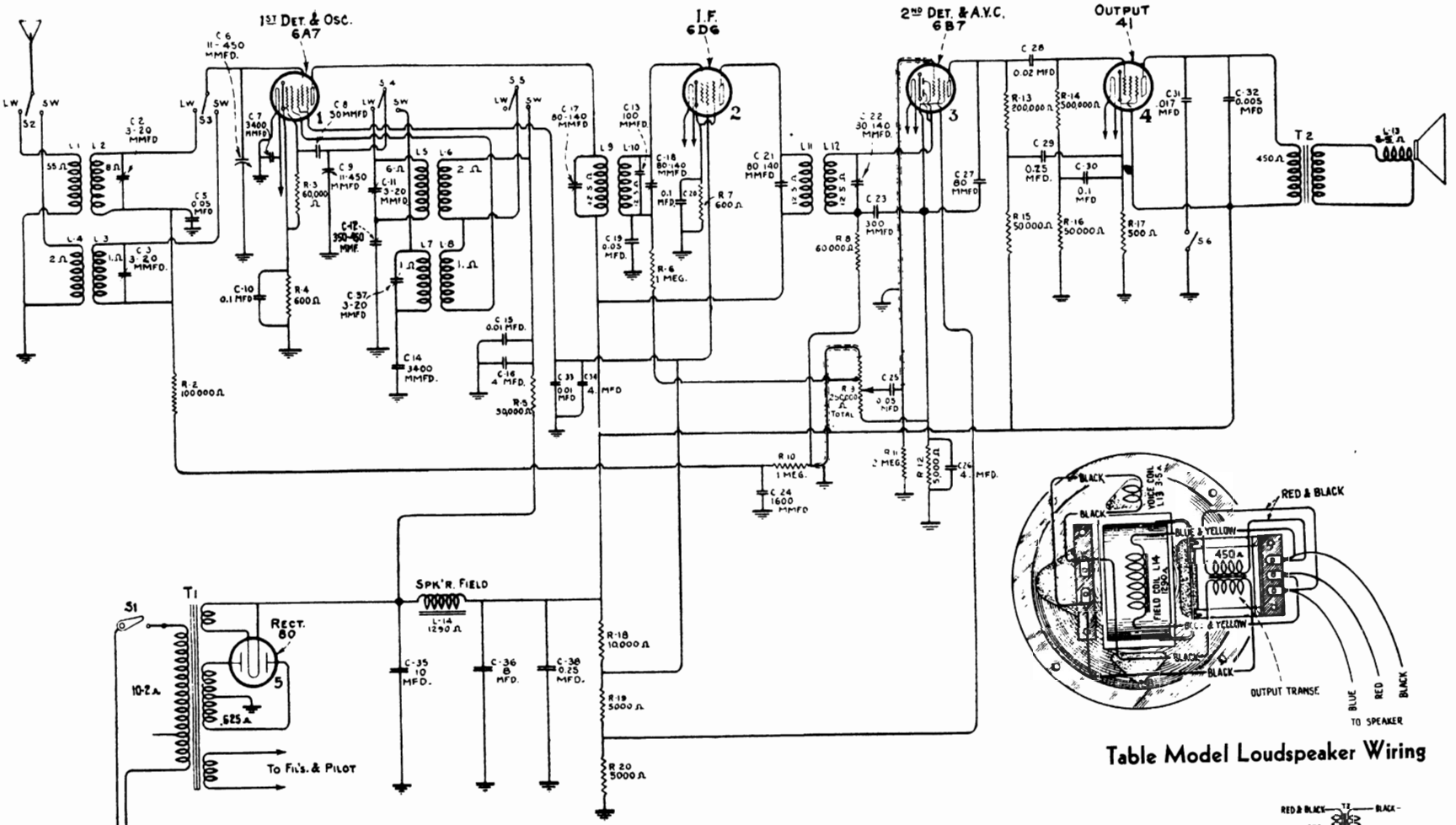
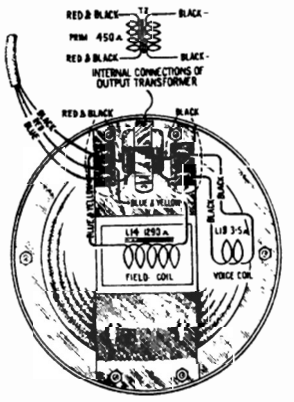


Table Model Loudspeaker Wiring

Radiotron No.		Cathode to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Plate to Ground Volts, D.C.	Plate Current, M.A.	Heater Volts A.C.
W-6A7	Detector	6.0	105	265	3.5	6.3
	Oscillator		—	220	4.5	
W-6D6 I.F.		6.0	105	265	9.0	6.3
W-6B7 2nd Det. AVC		3.0	50*	90*	0.7	6.3
W-41 Power		16.5	265	245	30.0	6.3
W-80 Rectifier		—	—	690 (Plate to Plate)	64.0	5.0

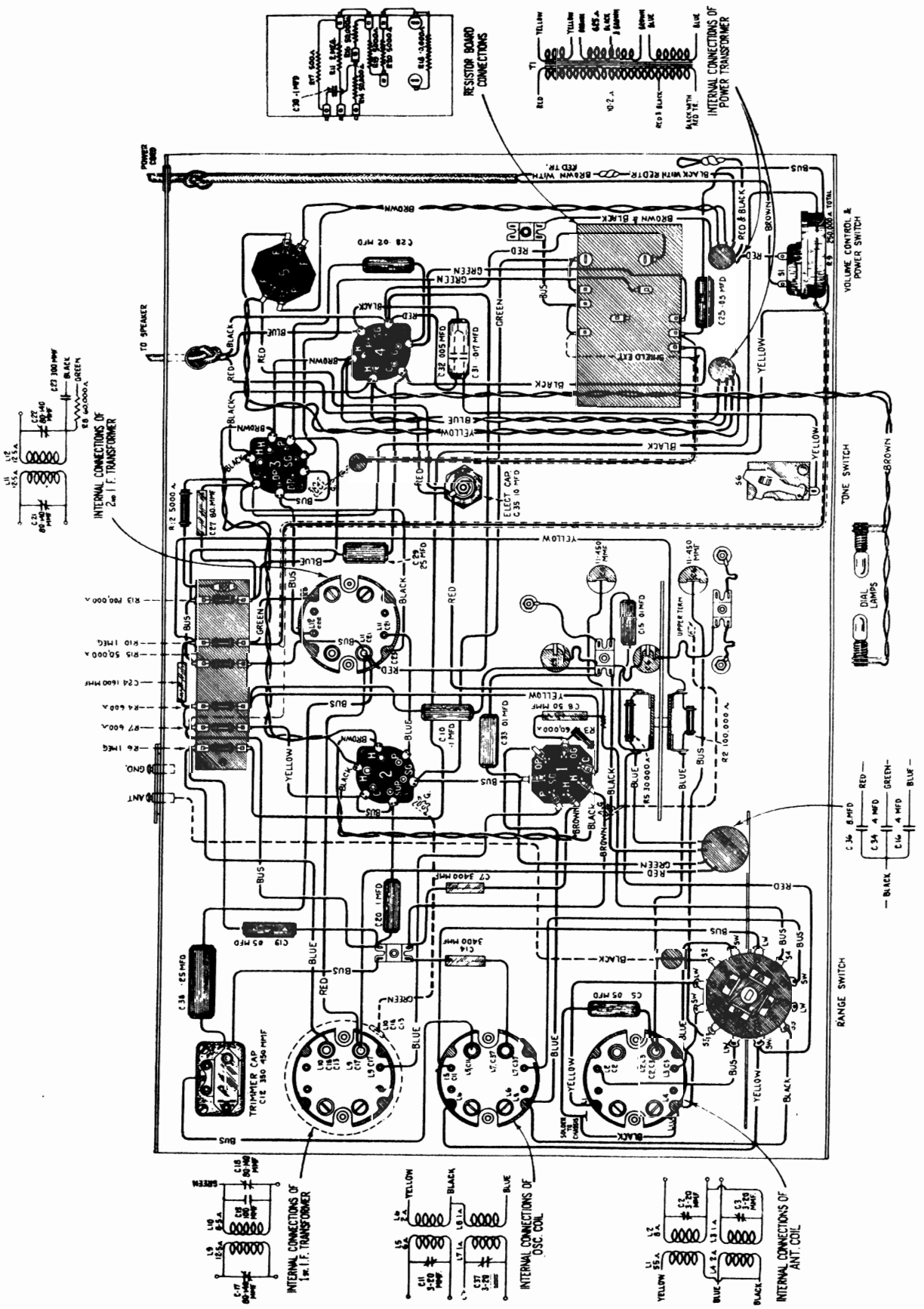
*Voltage calculated from 265V+B.



Console Model Loudspeaker

CANADIAN WESTINGHOUSE CO., Ltd.

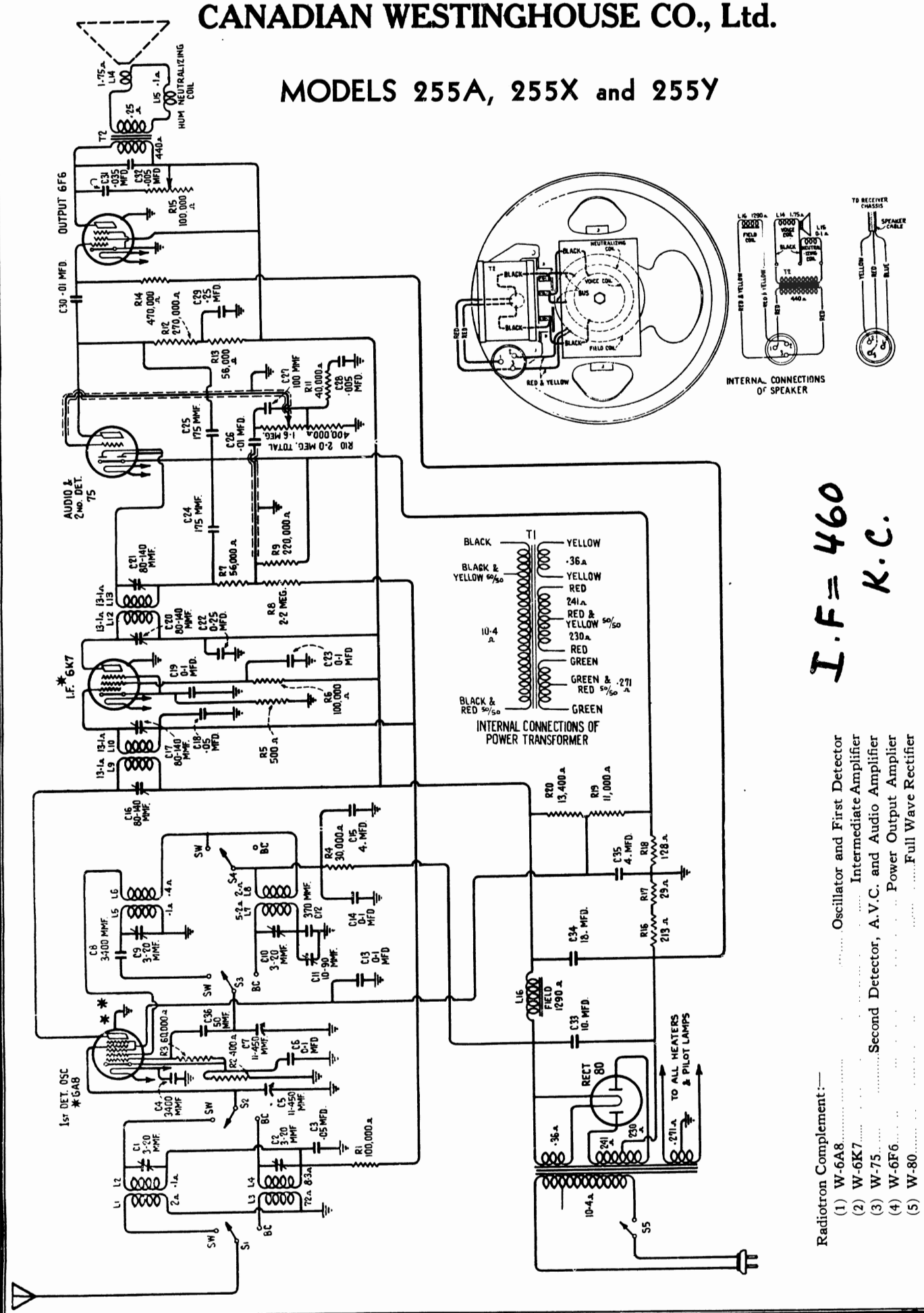
Models 254A – 254X



Wiring Diagram

CANADIAN WESTINGHOUSE CO., Ltd.

MODELS 255A, 255X and 255Y

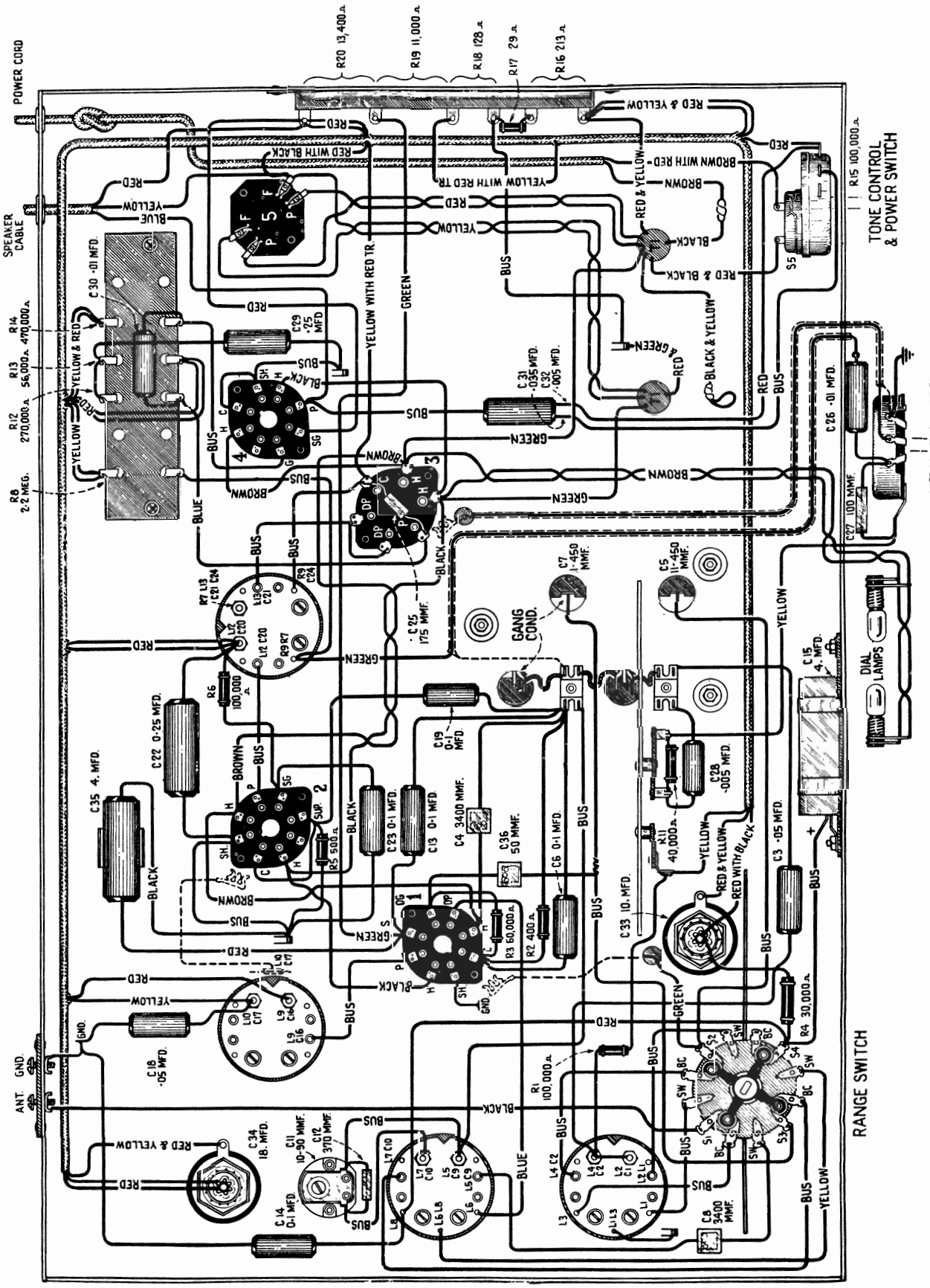


Radiotron Complement:—

(1) W-6A8 ..... Oscillator and First Detector
(2) W-6K7 ..... Intermediate Amplifier
(3) W-75 ..... Second Detector, A.V.C. and Audio Amplifier
(4) W-6F6 ..... Power Output Amplier
(5) W-80 ..... Full Wave Rectifier

CANADIAN WESTINGHOUSE CO., Ltd.

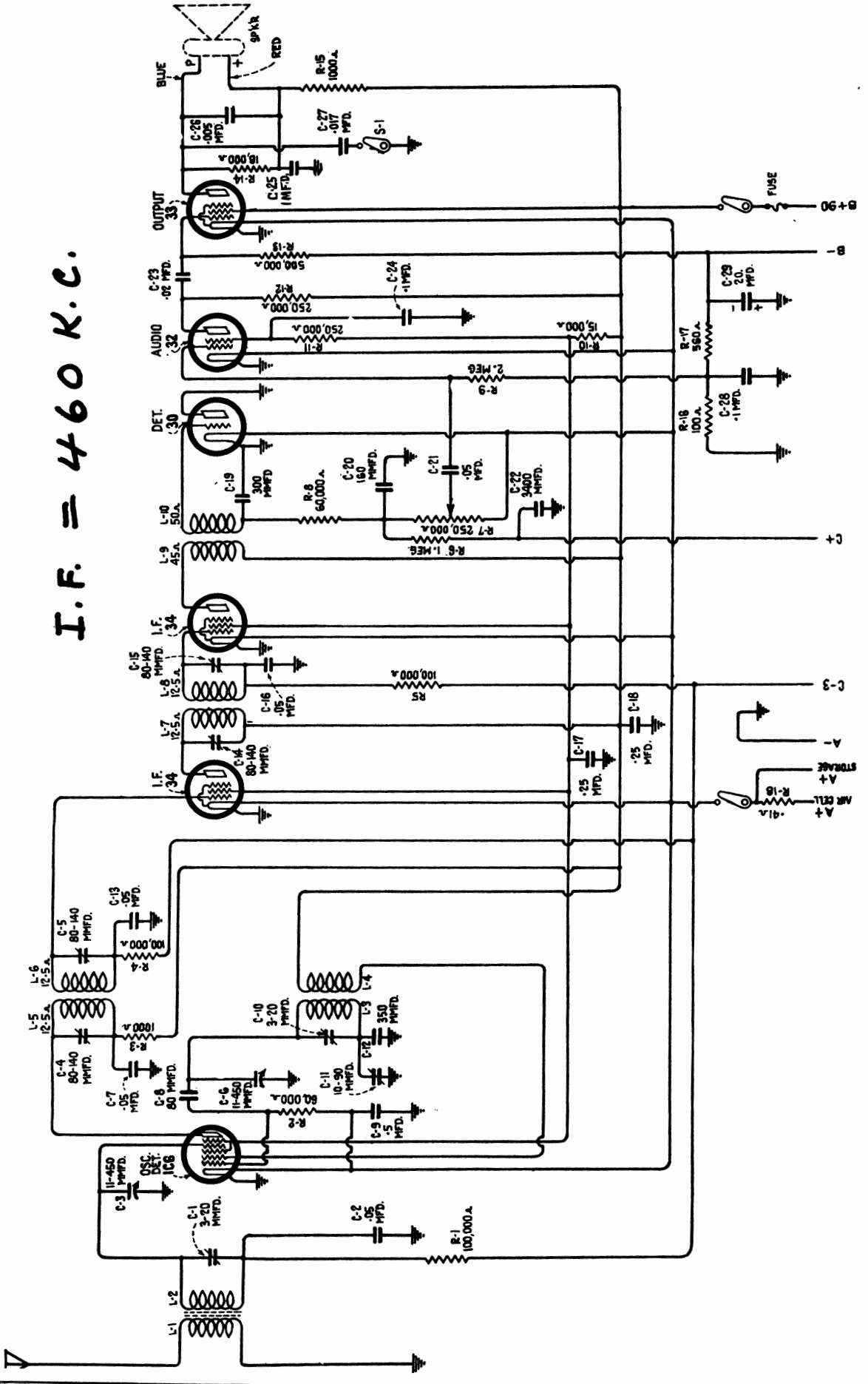
MODELS W255A, W255X and W255Y



CANADIAN WESTINGHOUSE CO., Ltd.

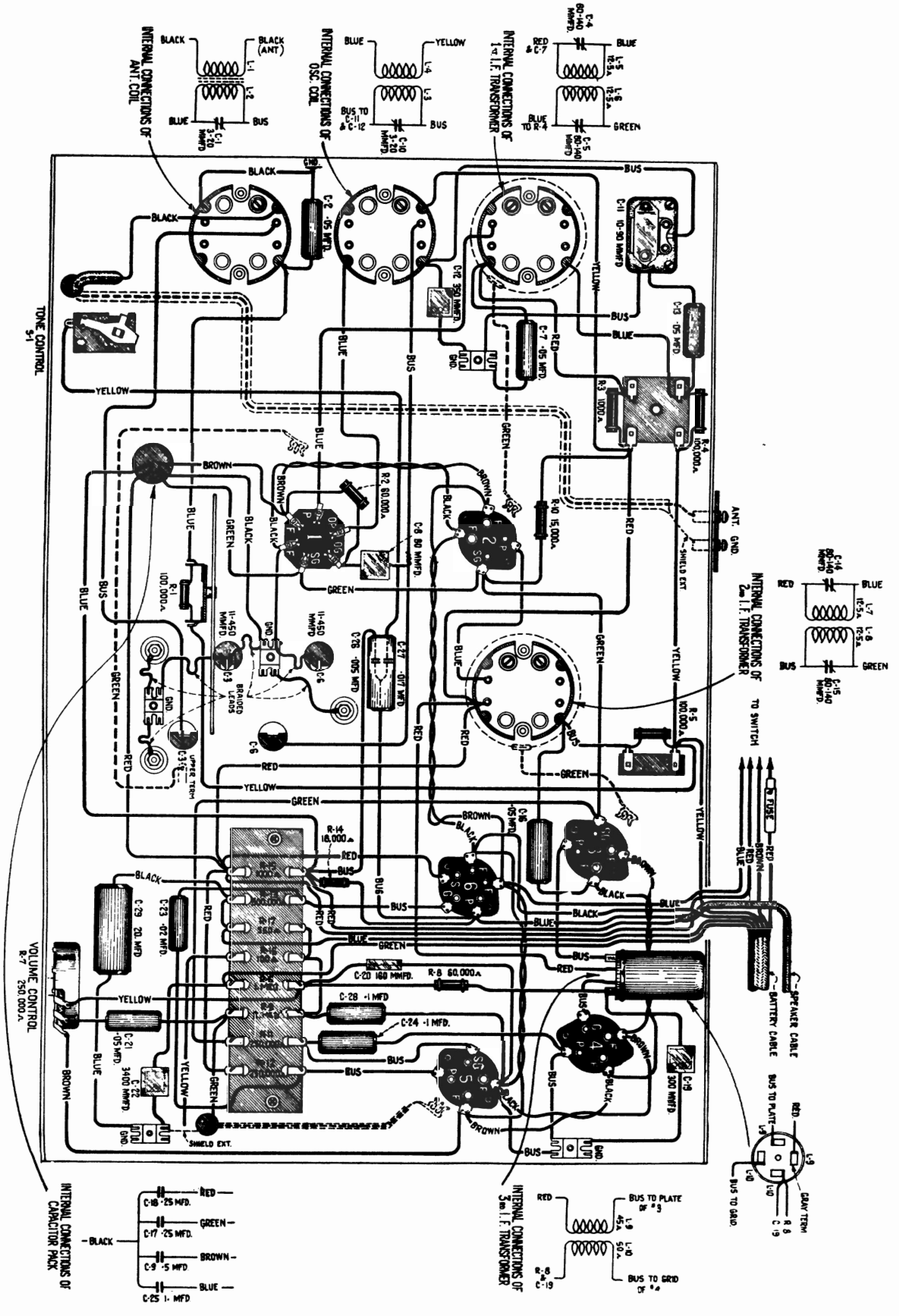
Model B-265A

I.F. = 460 K.C.



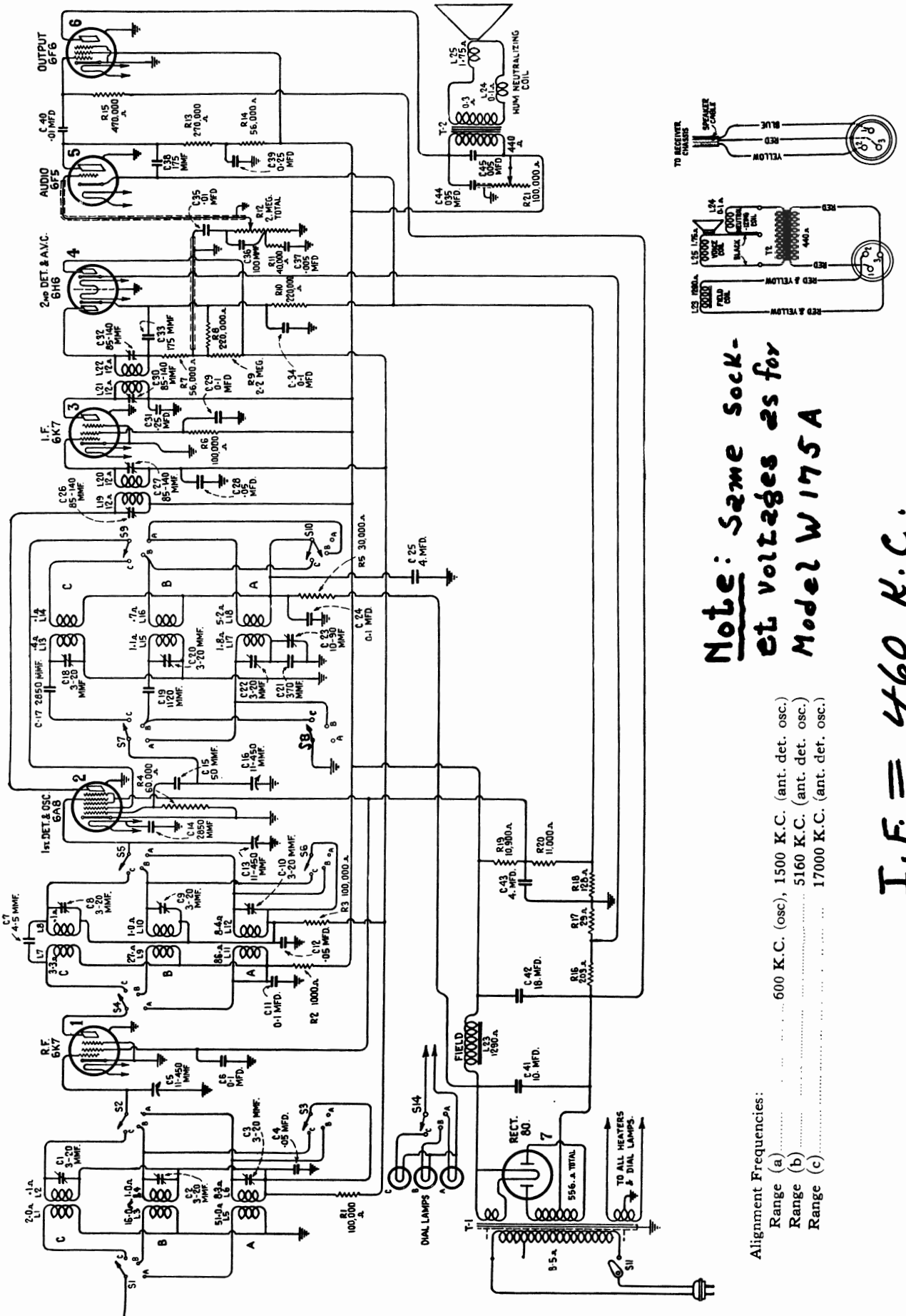
CANADIAN WESTINGHOUSE CO., Ltd.

Model B-265A



CANADIAN WESTINGHOUSE CO., Ltd.

W275A, X and Y



Note: Same Socket voltages as for Model W175A

I.F. = 460 K.C.

Alignment Frequencies:

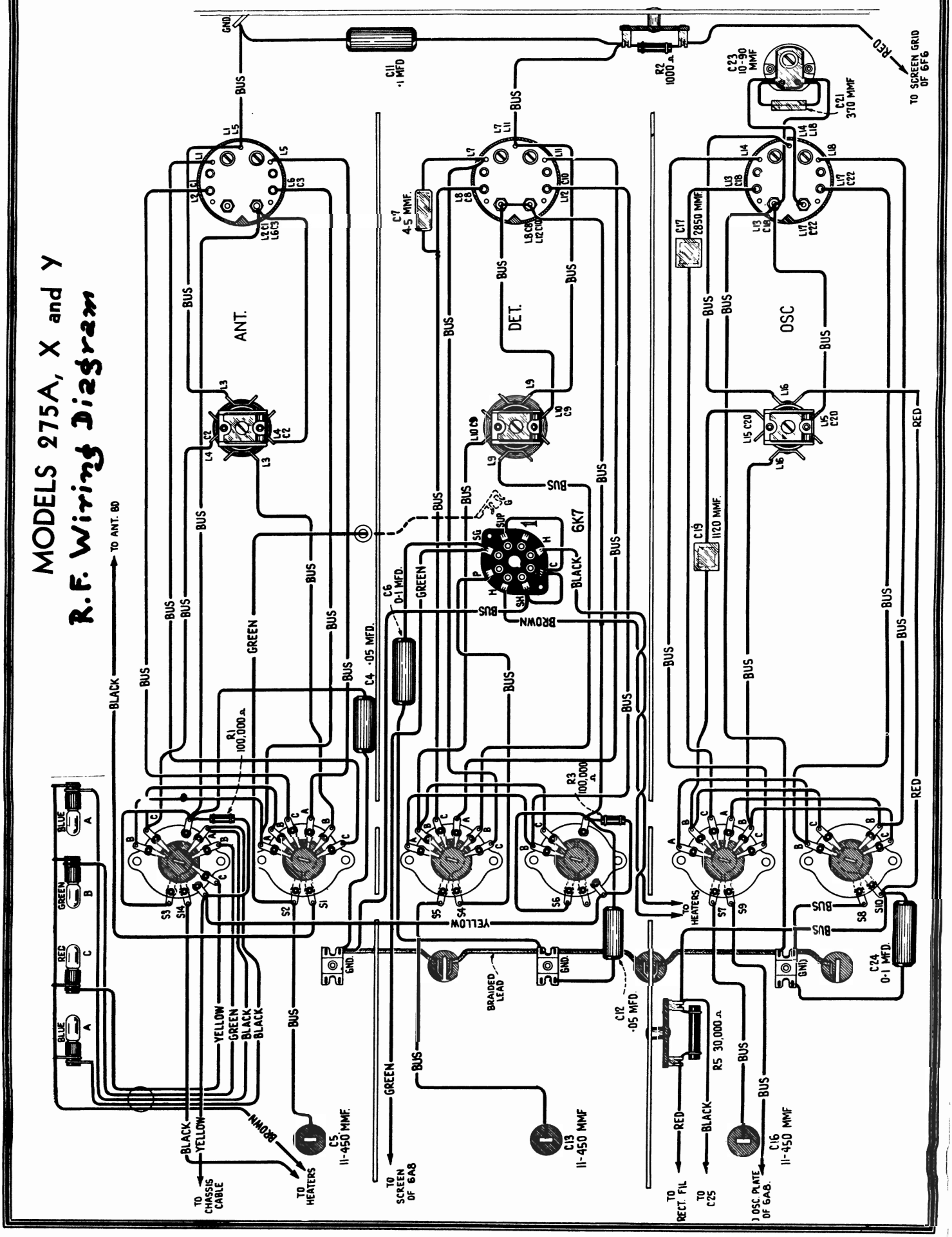
Range (a) ..... 600 K.C. (osc), 1500 K.C. (ant. det. osc.)

Range (b) ..... 5160 K.C. (ant. det. osc.)

Range (c) ..... 17000 K.C. (ant. det. osc.)

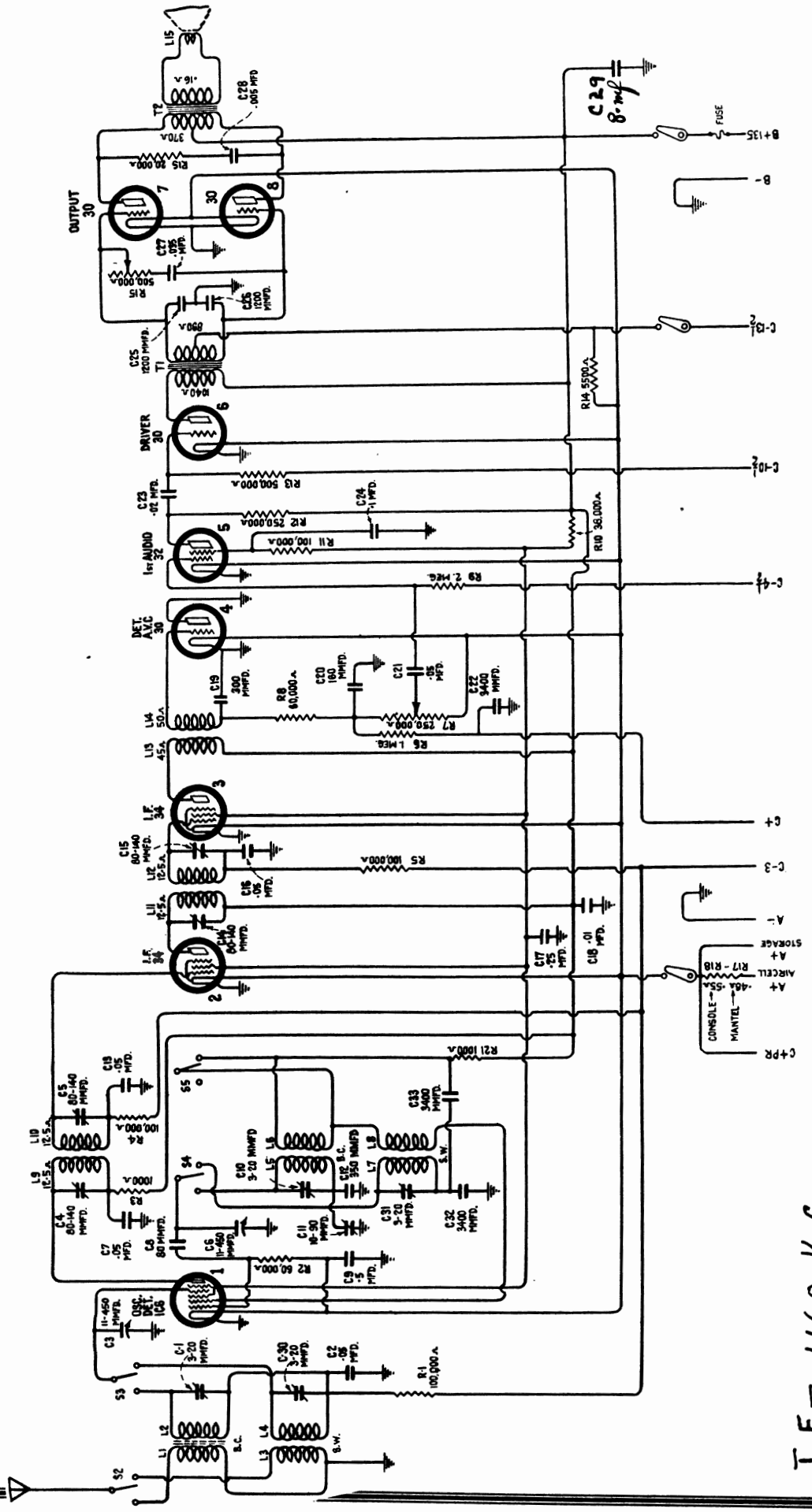
CANADIAN WESTINGHOUSE CO., Ltd.

MODELS 275A, X and Y
R.F. Wiring Diagram



CANADIAN WESTINGHOUSE CO., Ltd.

MODELS B285A and B285X



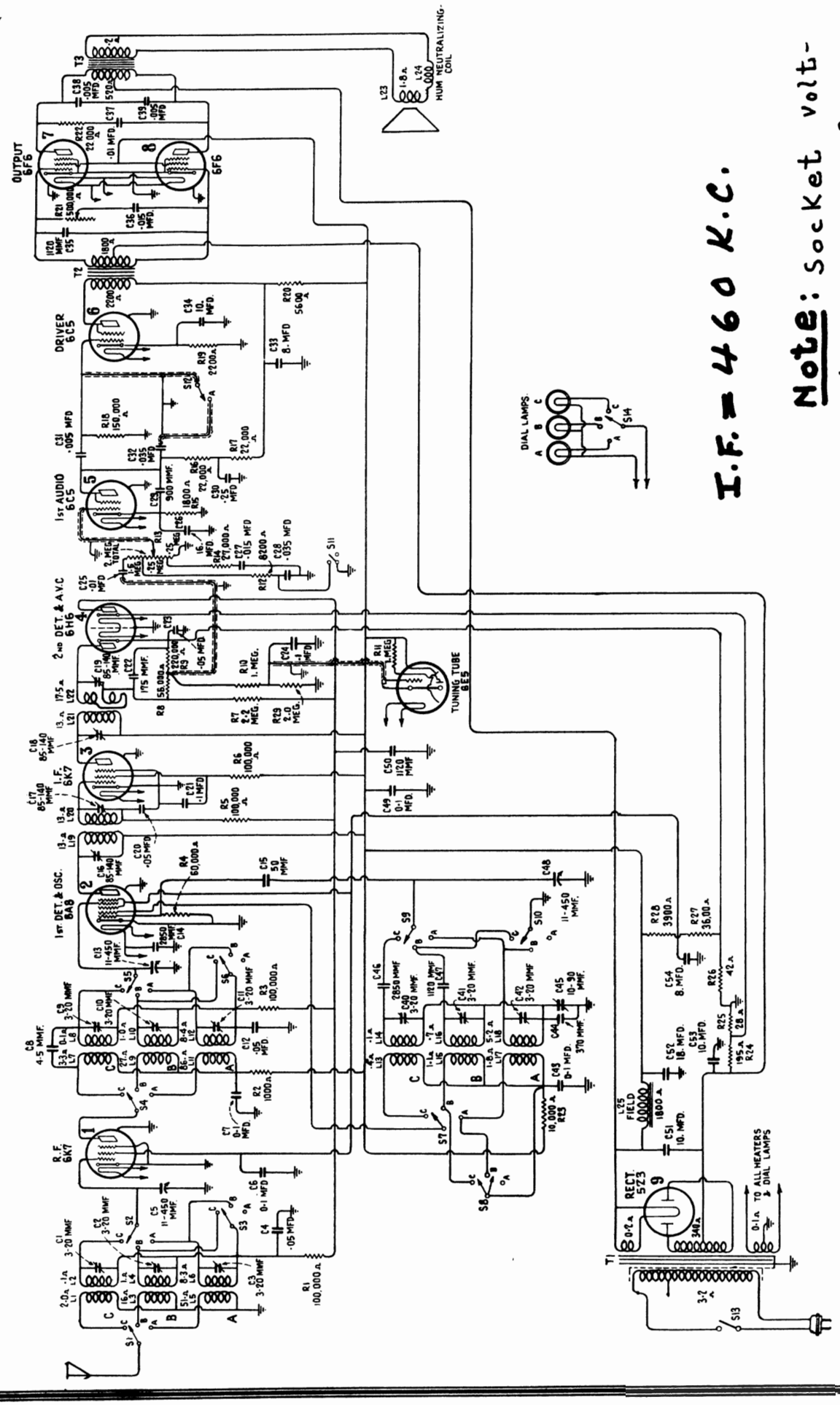
NOTE---COLOR CODE

B+	— Red	C—4½	— Green with Yellow strand
A—, B—	— Black	C+P R	— Brown
B—13½	— Black with Red strand	C+	— Green
C—10½	— Green and Red	C—3	— Yellow
		A+	— Brown

I.F. = 460 K.C.

CANADIAN WESTINGHOUSE CO., Ltd.

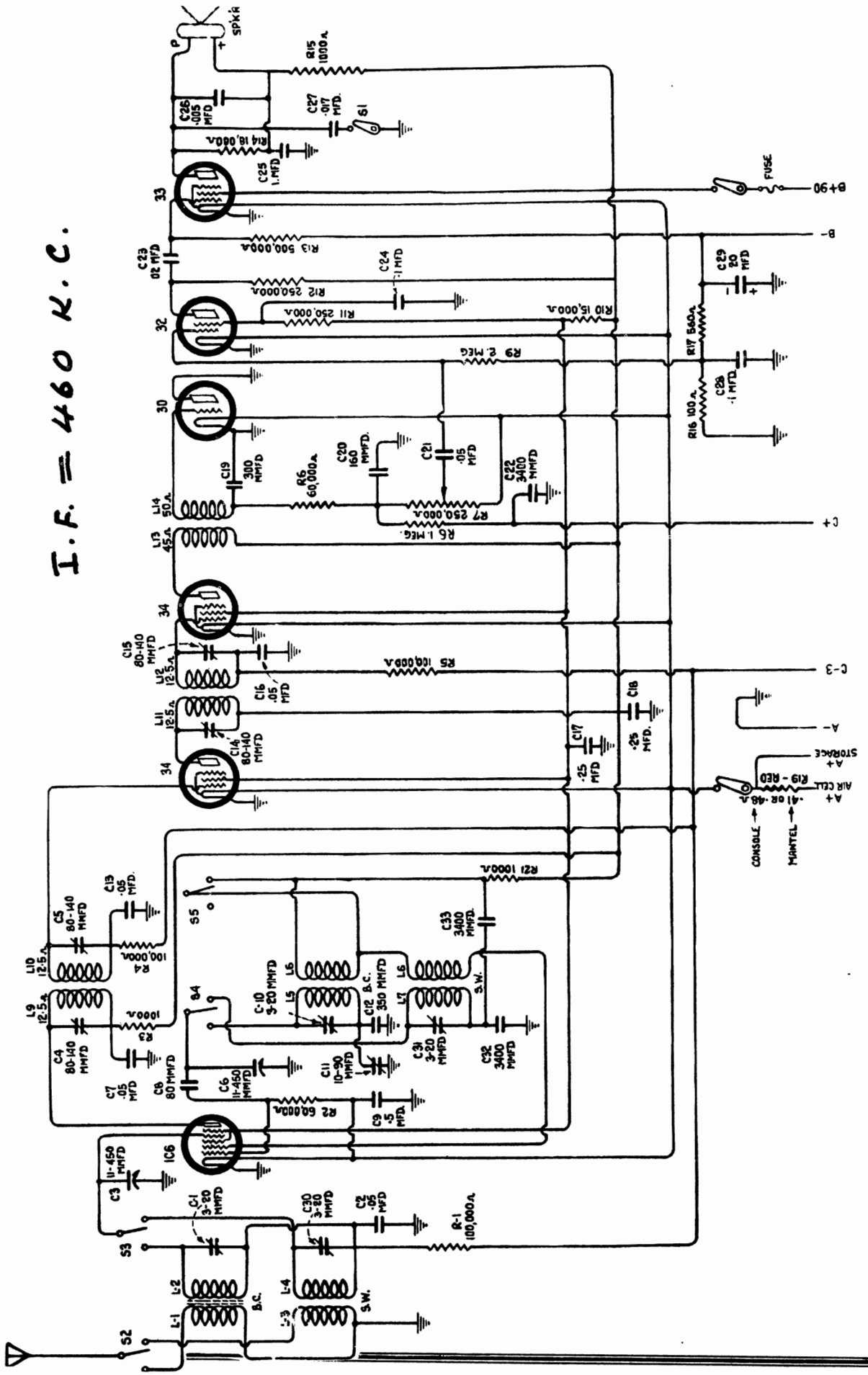
W295X, and Y



CANADIAN WESTINGHOUSE CO., Ltd.

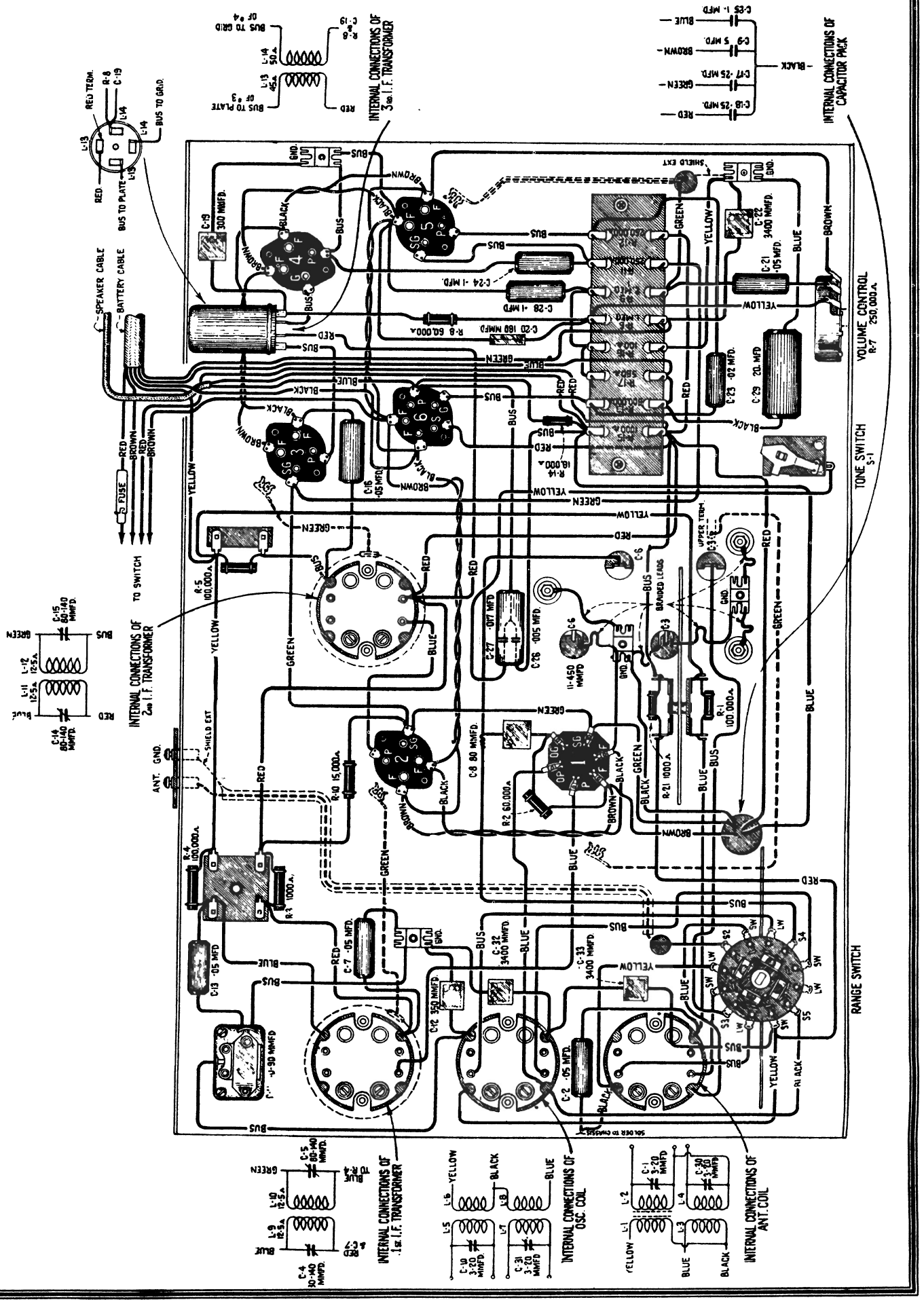
Models B-365A—B-365X

I.F. = 460 K.C.



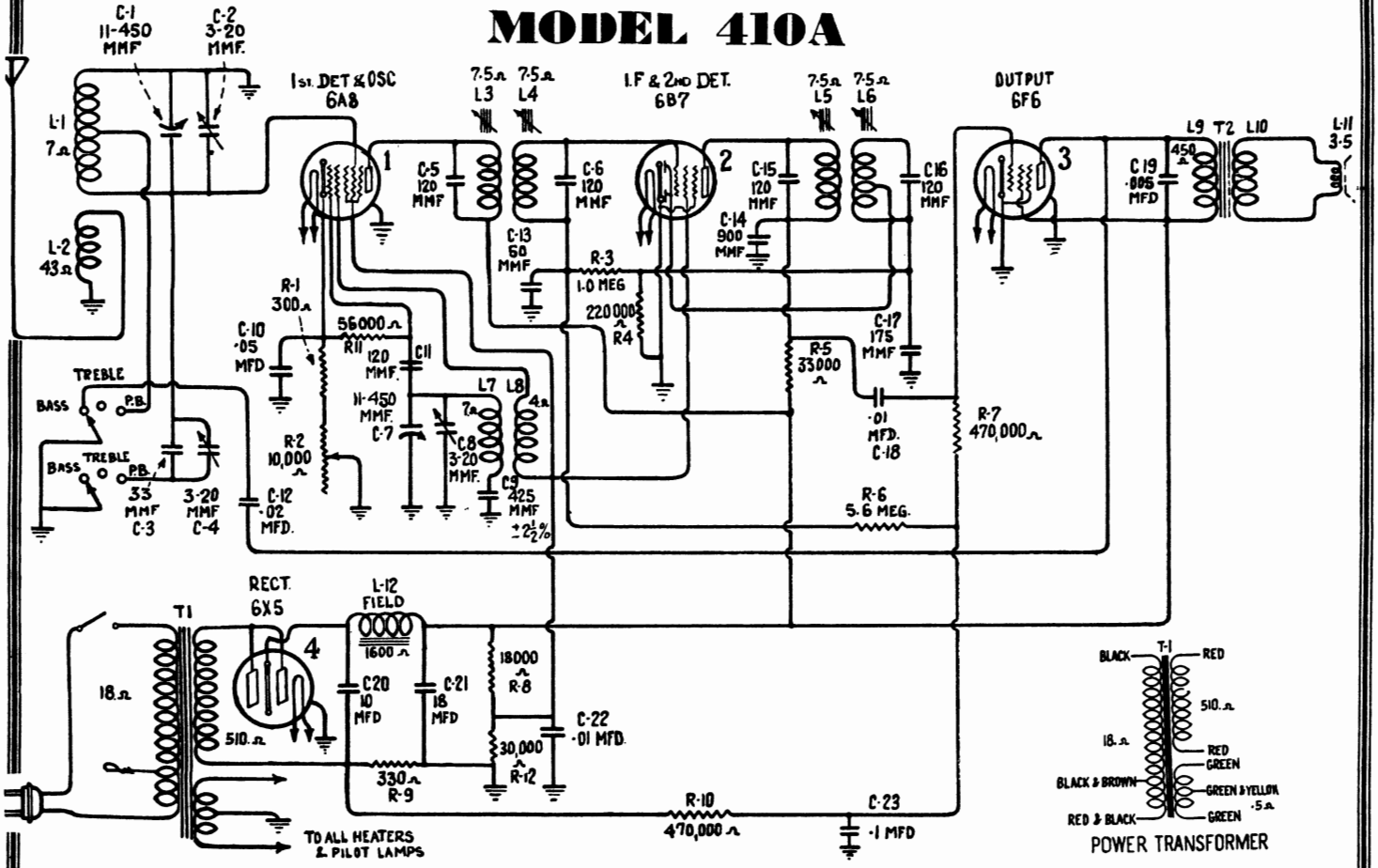
CANADIAN WESTINGHOUSE CO., Ltd.

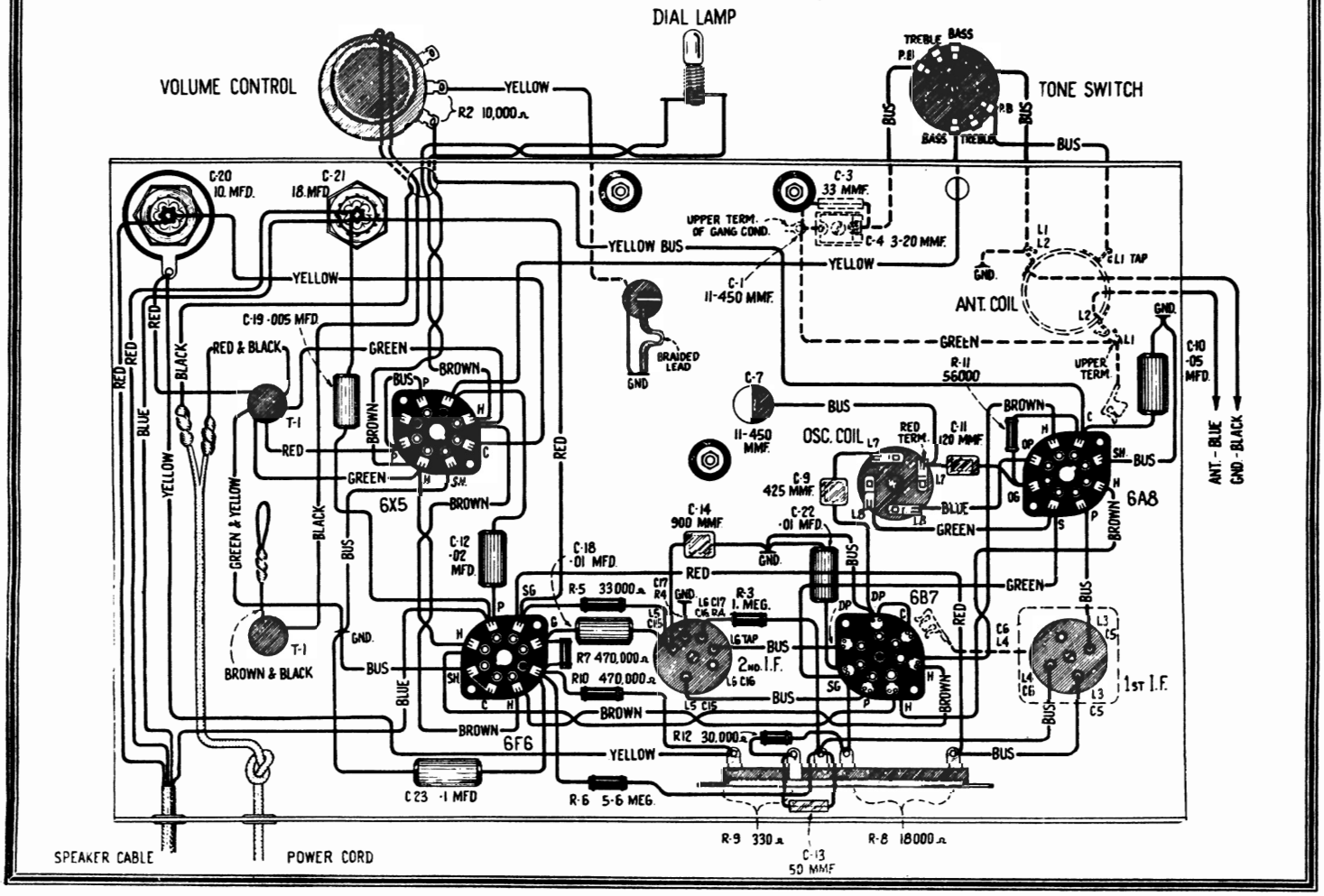
MODELS B 365A AND B 365X



CANADIAN WESTINGHOUSE CO., Ltd.

MODEL 410A





CANADIAN WESTINGHOUSE CO., Ltd.

MODEL 410A

SERVICE DATA

Voltage rating ..... 105-125 Volts
Power frequency rating ..... 25 to 60 Cycles
Power consumption ..... 45 Watts
Number and types of radiotrons ..... 1, W-6X5; 1, W-6F6; 1, W-6A8; 1, W-6B7 Total 4
Undistorted output ..... 1.5 Watt
Frequency range ..... 530 K.C. to 1720 K.C.
Also ..... 2200 K.C. to 2500 K.C.

This receiver is a four tube superheterodyne incorporating such features as wide broadcast range, two police ranges, dynamic speaker, two position tone control, illuminated dial and the inherent sensitivity, selectivity and tone quality of the superheterodyne circuit using the new metal radiotrons.

The following description of the circuit includes several new design features which are incorporated in this receiver.

The first tube is used as a combined first detector and oscillator, (Radiotron W-6A8). Separate tuned circuits are provided for each function. The detector coil is tapped so that the tuning range may be extended in the police band position by shorting out a portion of the coil. The oscillator coil is not tapped. The higher police frequency range is covered by operating the first detector at 460 K.C. higher frequency than the oscillator instead of 460 K.C. lower as on the standard range.

The next tube is used as a combined I.F. amplifier, second detector and first A.F. amplifier. This radiotron W-6B7 is used as follows:

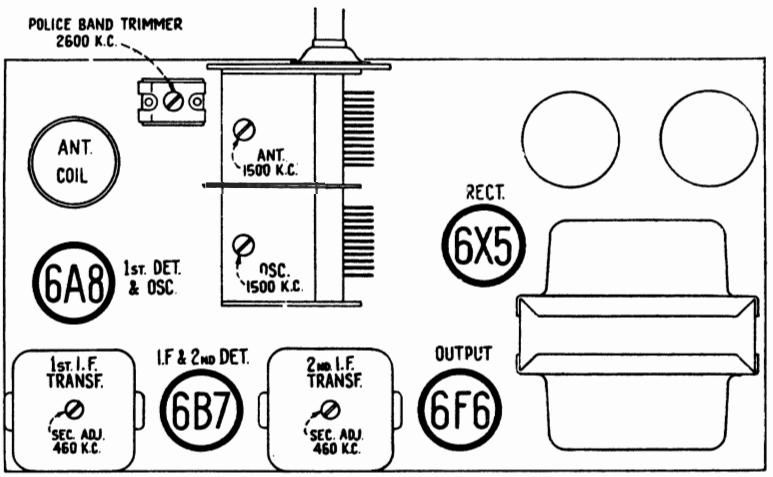
First—the output of the first I.F. transformer is applied to the control grid direct and to the cathode of the radiotron through condenser C-13. The plate, screen and suppressor then function in the normal manner to amplify the I.F. signal. The output from the plate is fed to the second I.F. transformer and from a tap on the secondary of this second I.F. transformer, the I.F. signal is applied to the diode portion of the W-6B7 tube and the diode load resistor R-4. The rectified signal appearing across R-4 is fed back to the control grid of the W-6B7 in a reflex manner. The W-6B7 then functions as a screen grid audio amplifier and the amplified audio frequency voltage appears across the plate load resistor R-5, which is coupled to the output radiotron by condenser C-18,. The I.F. transformers, two in number, are tuned to 460 K.C. These transformers are tuned by fixed primary and secondary condensers and adjusted by movement of the iron core. The use of iron core I.F. transformers results in considerably improved sensitivity, selectivity and stability of adjustment.

The output stage is a single pentode W-6F6.

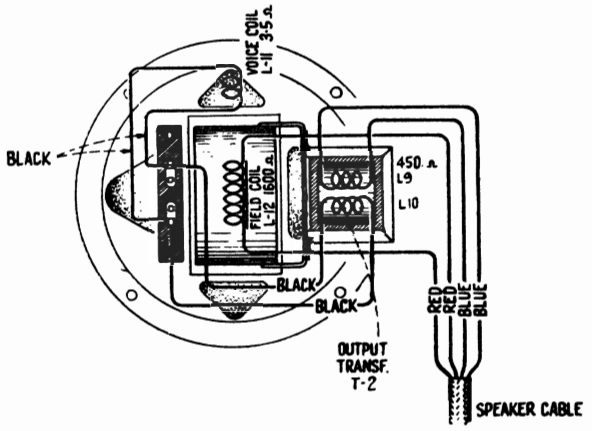
The rectifier is a new metal Radiotron W-6X5, and is used in a half wave rectifying circuit.

The line up adjustment is made in the usual way to the adjustment screws shown in the trimmer location diagram. When making adjustment the test oscillator frequency, receiver dial setting and switch position should correspond to the indicated line up frequency. When making I.F. adjustment the oscillator should be connected to the W-6A8 control grid and ground with the antenna and ground wires shorted.

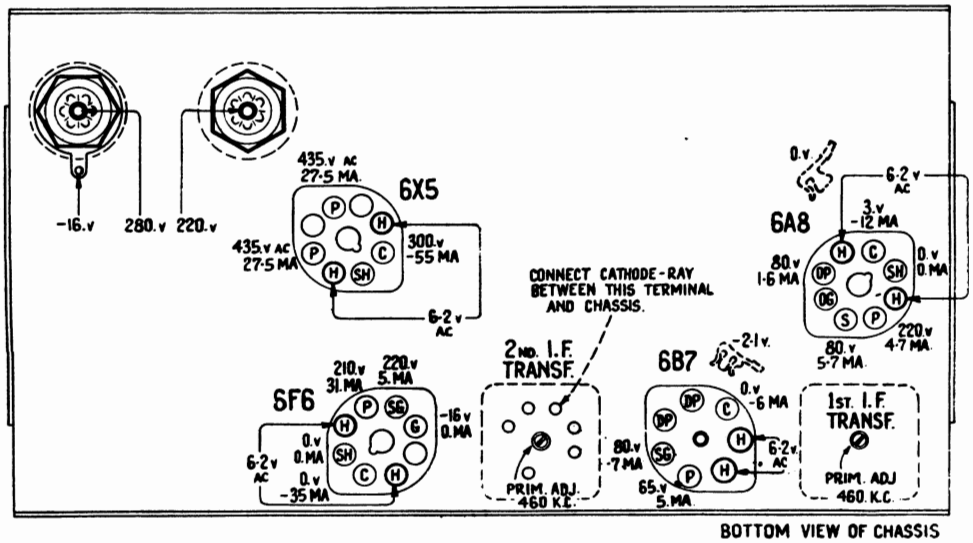
This receiver is capable of 10 K.C. separation of broadcast stations when properly adjusted.



TRIMMER LOCATIONS (also see below)



REPRODUCER CONNECTIONS



BOTTOM VIEW OF CHASSIS

CANADIAN WESTINGHOUSE CO., Ltd.

MODELS 465A and 465X

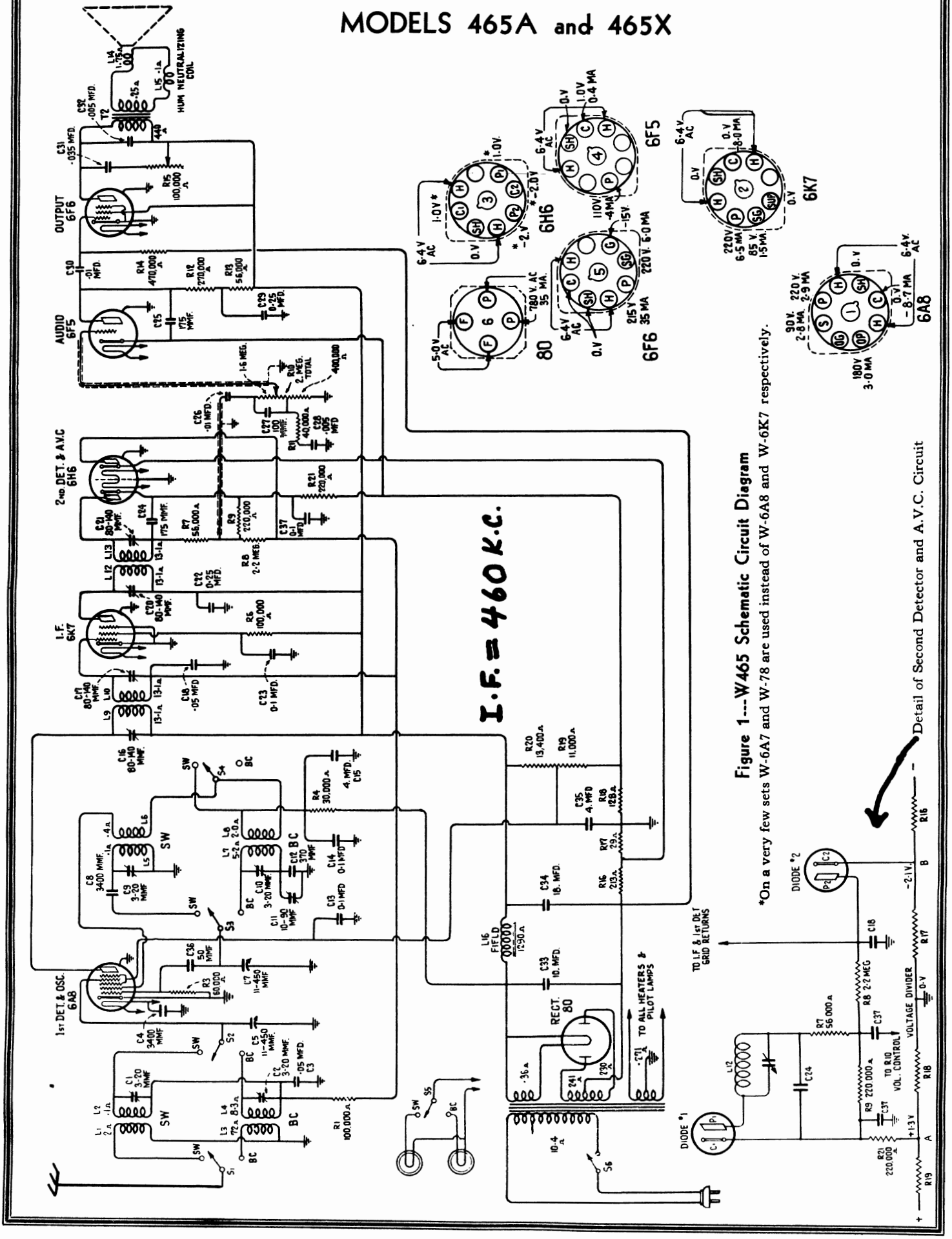
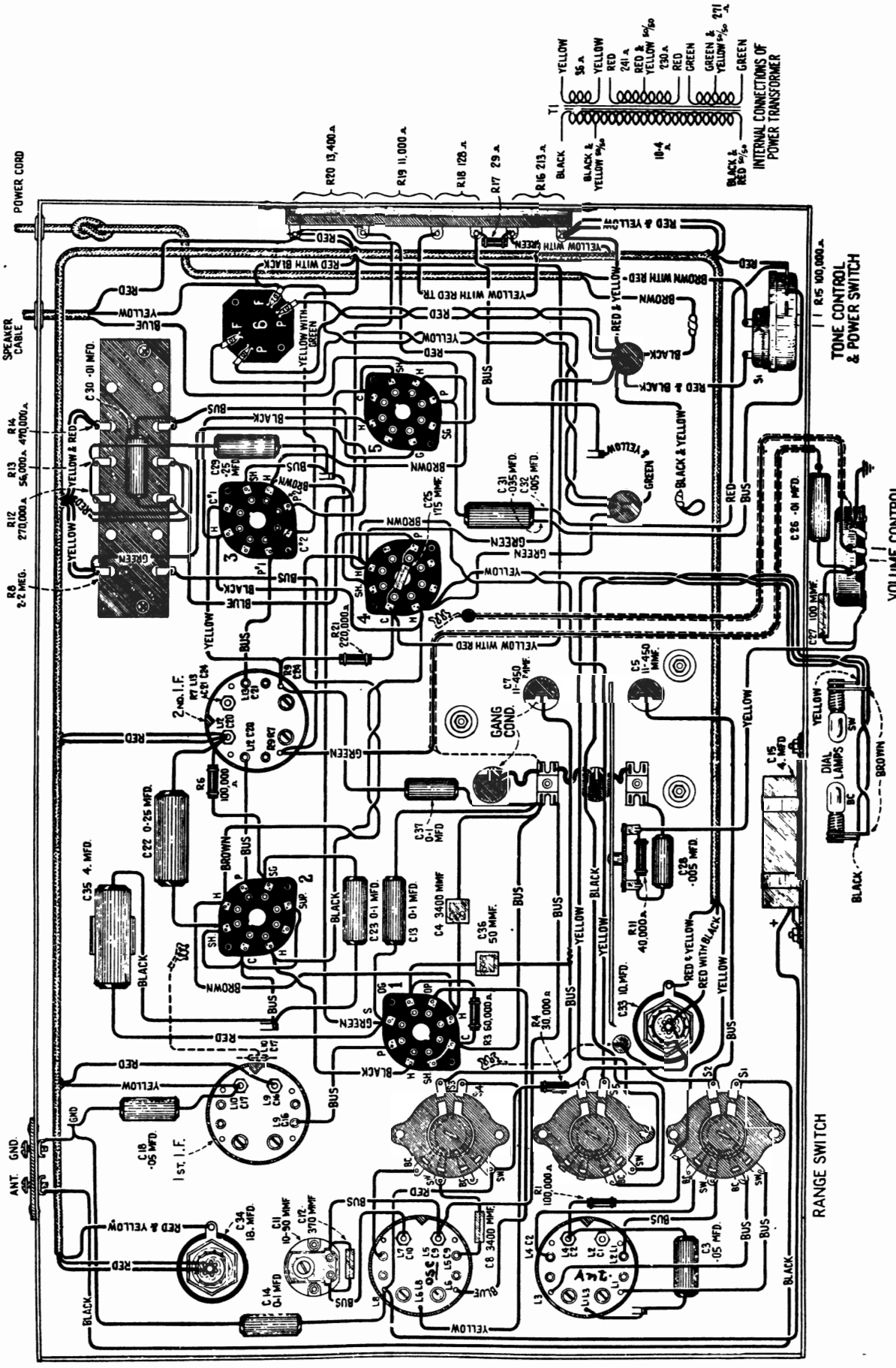


Figure 1---W465 Schematic Circuit Diagram

*On a very few sets W-6A7 and W-78 are used instead of W-6A8 and W-6K7 respectively.

CANADIAN WESTINGHOUSE CO., Ltd.

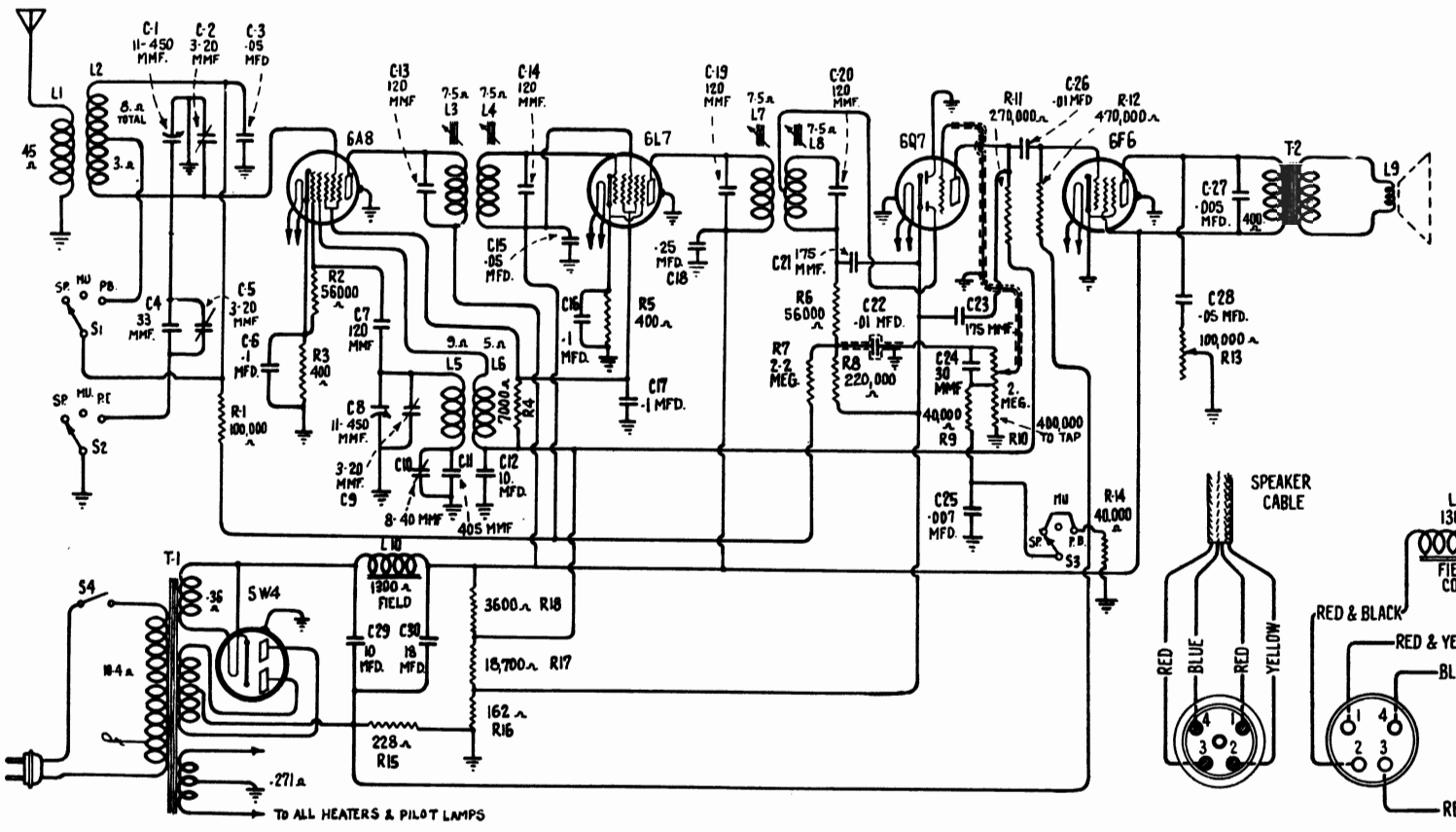
MODELS 465A and 465X



W465 Wiring Diagram

See note under Schematic Circuit Diagram

MODELS 511A and 511X



Schematic Circuit Diagram

Reproducer Wiring Diagram

CIRCUIT ARRANGEMENT

The first detector and oscillator functions are accomplished in a single tube, a W-6A8. The input of this tube is coupled to the antenna through a tuned transformer. The two-section gang condenser, which tunes the antenna transformer secondary and the heterodyne oscillator coil, has adjustable trimmers for obtaining exact alignment. The antenna secondary coil is tapped so that the Power Range, and Music-Speech Switch changes the range of tuning by short circuiting part of the coil. The oscillator coil is not tapped. In the police band position the heterodyne oscillator operates at a frequency 460 kc. lower than the dial setting.

Radiotron Complement:

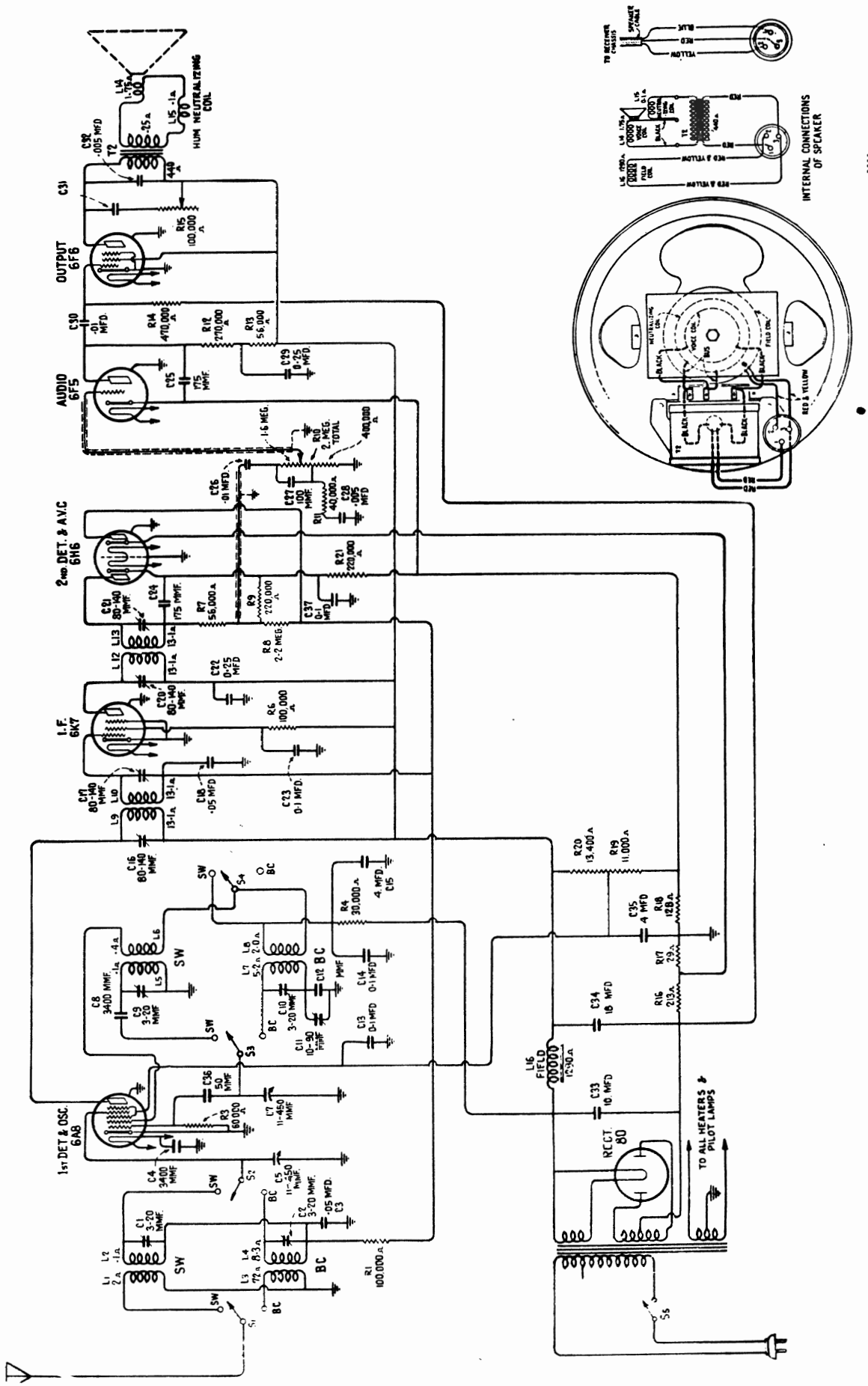
(1) W-6A8 ..... First Det.—Oscillator
(2) W-6L7 ..... Intermediate Amplifier
(3) W-6Q7 ..... Second Det.—A.V.C. and 1st A.F. Stage
(4) W-6F6 ..... Power Output
(5) W-5W4 ..... Full-wave Rectifier

CANADIAN WESTINGHOUSE CO., Ltd.

CANADIAN WESTINGHOUSE CO., Ltd.

MODEL W565X

Six-Tube, Two Range, A. C., Superheterodyne Receiver



CANADIAN WESTINGHOUSE CO., Ltd.

LINE UP PROCEDURE

Properly aligned, this receiver performs outstandingly; improperly aligned, there may be a tendency towards low sensitivity and distorted quality of reproduction. Inasmuch as the line-up procedure is more or less involved, it is ir portant that these instructions be carefully followed.

Equipment—

To align this receiver, proper test equipment must be used. Such consists of a modulated R.F. oscillator having proper frequency range, an output indicator, an alignment tool and a tuning wand. These parts, are available from the manufacturer of this receiver for use by service men to duplicate the original factory adjustments.

Checking with Tuning Wand—

Before making any oscillator or first detector adjustments, the accuracy of the existing adjustments may be checked with a tuning wand (Stock No. 6679). This wand consists of a bakelite rod having a brass cylinder at one end and a special finely divided iron insert at the other end. Inserting the cylinder into the center of a coil lowers its inductance, while inserting the iron end increases its inductance. From this, it is seen that unless the trimmer for a particular coil is properly aligned, the wand may increase the output of the receiver. A perfect adjustment is evidenced by a lowering of output when either end of the wand is inserted into a coil.

The shield over each R.F. coil assembly has a hole at its top for entrance of the tuning wand. An example of the proper manner of using the tuning wand would be to assume the external oscillator were set at 1,500, the signal tuned in, and the output indicator connected across the voice coil of the loudspeaker. Then the tuning wand should be inserted, first one end and then the other end, into the top of the three transformers at the left of the R.F. assembly, facing the front of the chassis. A perfect adjustment of the trimmer would be evidenced by a reduction in output when each end of the wand is inserted into each of the three transformers. If one end—for example, the iron end—when inserted in one coil caused an increase in output, then that circuit is high. An increase in the trimmer capacitance would be the proper remedy.

I. F. TUNING CAPACITOR ADJUSTMENTS

Although this receiver has one I.F. stage, there are two transformers, each having two adjustable capacitors requiring adjustments. The transformers are all peaked, being tuned to 460 K.C.

A detailed procedure for making this adjustment follows:

(a) Connect the output of an external oscillator operating at 460 K.C. between the first detector grid and ground. Connect the output indicator across the voice coil of the loudspeaker.

(b) Place the receiver in operation and adjust the station selector until a point is reached where no signals are heard and turn the volume control to its maximum position. Reduce the oscillator output until a slight indication is obtained in the receiver output indicator.

(c) Refer to Figure 4. Adjust the trimmers of the I.F. transformers until maximum output is obtained. Go over the adjustments a second time.

This completes the I.F. adjustments. It is good practice to follow the I.F. adjustments with the R.F. and oscillator adjustments due to interlocking which always occurs between the two.

R. F. ADJUSTMENTS

Three oscillator and first detector adjustments are required in range "BC". Two are required in range "SW".

To properly align the two ranges, each must be aligned individually in the order given. The preliminary set-up requires that the external oscillator be connected between the antenna and ground terminals of the receiver and the output indicator be connected across the voice coil of the loudspeaker. The volume control must be at its maximum position and the output of the oscillator must be at the minimum value possible to get an output indication under these conditions. In the high frequency bands, it may be necessary to disconnect the oscillator from the receiver and place it at a distance in order to get a sufficiently low input to the receiver.

The dial pointer must be properly set before starting actual adjustments. This is done by turning the variable capacitor until it is at its maximum capacity position. One end of the pointer should point exactly at the horizontal line at the low frequency end of band "BC", while the other end should point to within $\frac{1}{64}$-inch of the horizontal line at the high frequency end of band "BC"

Figure 4 shows the location of the trimmers for each band. Care must be exercised to only adjust the trimmers in the band under test.

RANGE "BC"—

(a) Set the tuning range switch at "BC".

(b) Tune the external oscillator to 1,500 K.C., set the pointer at 1,500 K.C. and adjust the oscillator, detector and antenna trimmers for maximum output.

(c) Shift the external oscillator frequency to 600 K.C. Tune in the 600 K.C. signal, irrespective of scale calibration, and adjust the series trimmer for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 1,500 K.C. as described in (b).

RANGE "SW"—

(a) Set the tuning range switch at "SW".

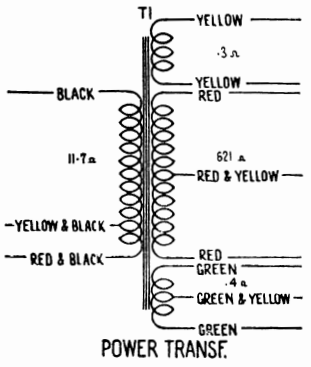
(b) Tune the external oscillator to 17,000 K.C., and set the pointer at 17M. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.

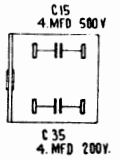
(c) Check for the image signal, which will be received at approximately 16,080 on the dial, if (b) has been properly done. It may be necessary to increase the external oscillator output for this check.

(d) Retune the receiver to the oscillator, leaving the oscillator set at 17,000 K.C. Adjust the antenna and detector short wave trimmers for maximum output.

No further adjustments are necessary.

MODEL W565X





Condensers Used

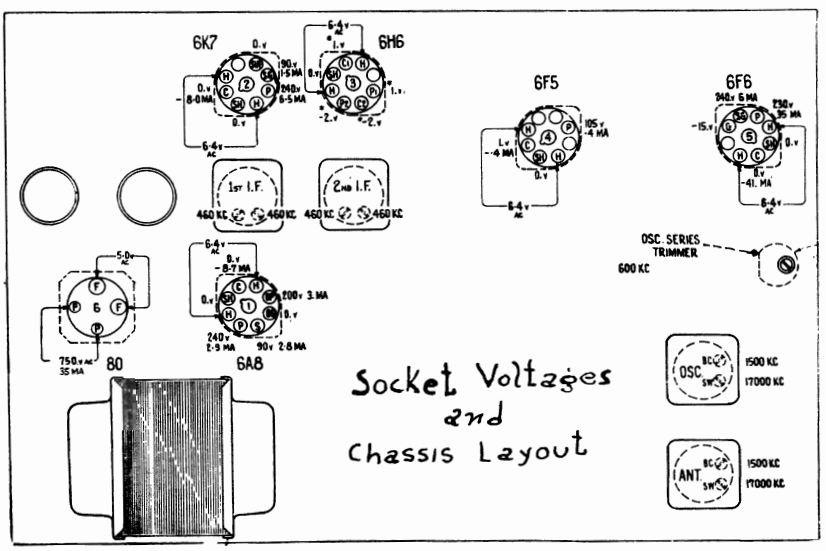
0.005 mfd. 400 V. (C28)
0.005 mfd. 800 V. (C32)
0.01 mfd. 400 V. (C26, C30)
0.05 mfd. 400 V. (C3, C18, C31)
0.1 mfd. 400 V. (C13, C14, C23, C37)
0.25 mfd. 400 V. (C22, C29)
4.0 mfd. electrolytic 200 V. (C35)

MOULDED CAPACITORS

50 mmfd. (C36)
100 mmfd. (C27)
175 mmfd. (C24, C25)
390 mmfd. (C12)
3,400 mmfd. (C4, C8)

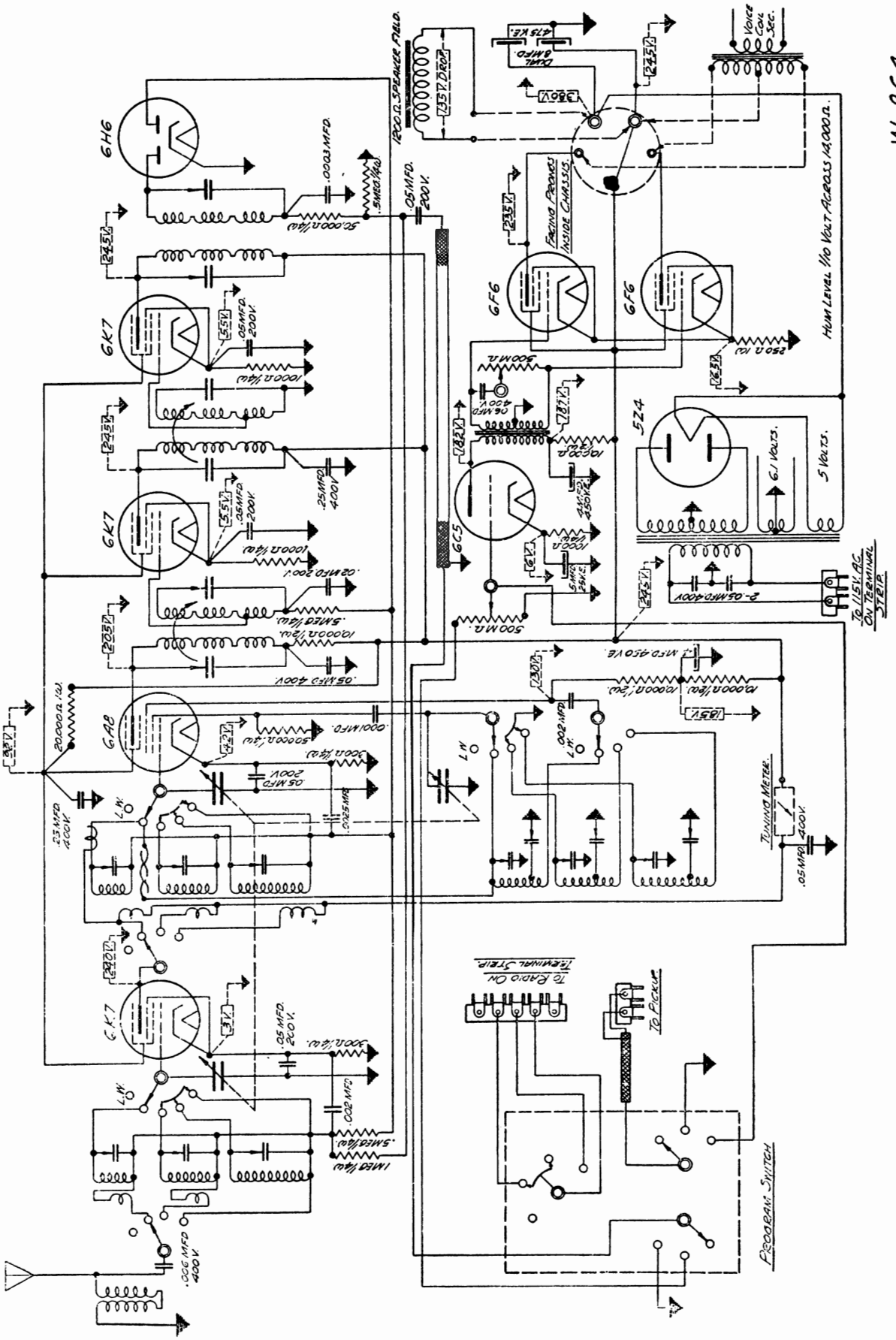
SOCKET METER READINGS

The meter readings given in the diagram Figure 4, are taken with the antenna and ground binding posts short circuited and with 120 volts line. All readings are actual operating conditions and in some cases it will be necessary to allow for meter resistance. All D.C. voltage readings are taken with respect to the chassis frame. All readings are given for normal operation. If readings are taken with a set analyser, circuits that are not intended to oscillate, may oscillate, thus increasing plate or screen voltages and decreasing plate or screen current. The set analyser cable may also cause the oscillator radiotron to cease oscillating, thus increasing current and decreasing voltage.



CAPEHART CORP.

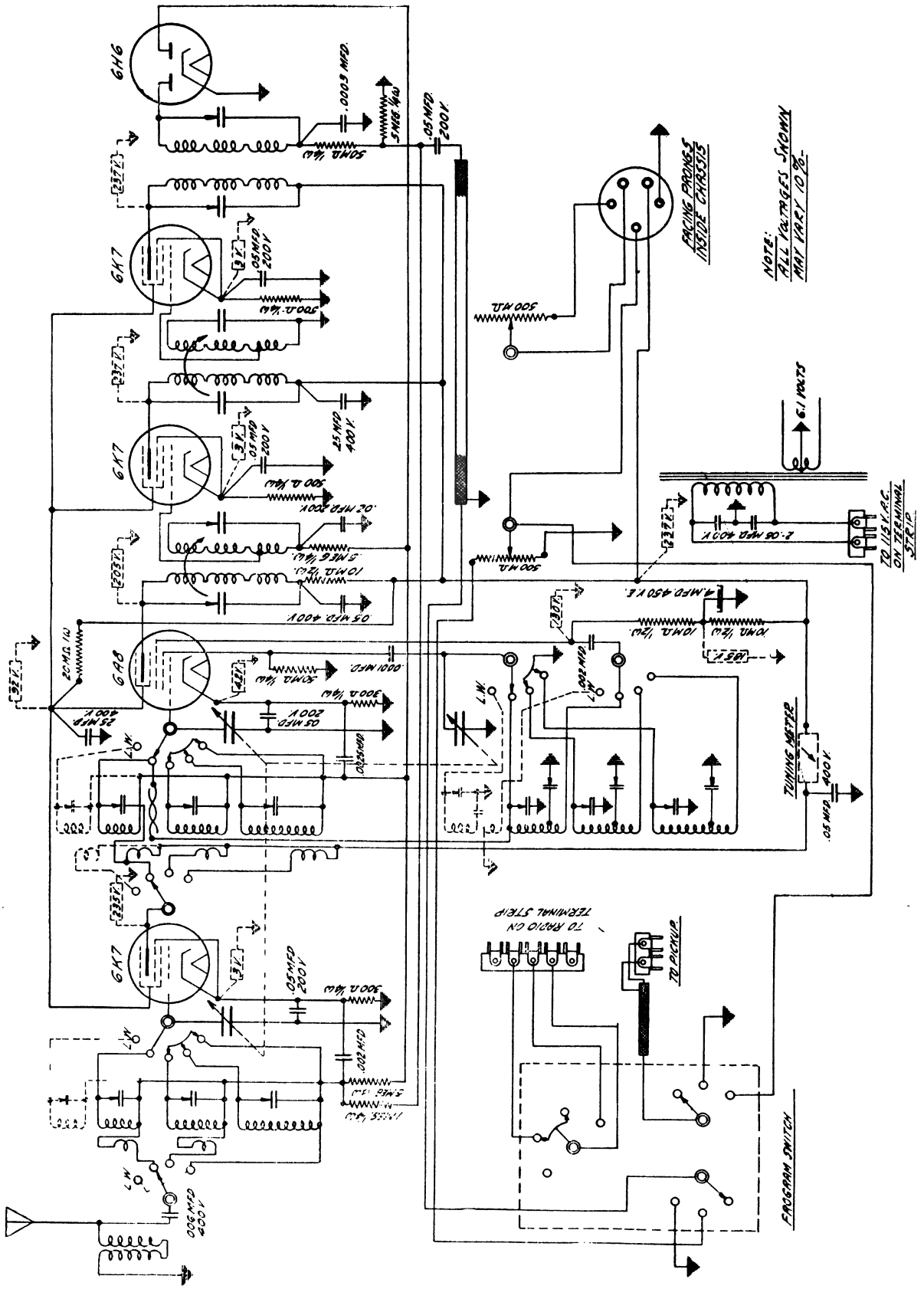
Radio Diagram for Model 202 — W864



• Schematic No. 1 Radio Diagram For Capehart 202 Model •

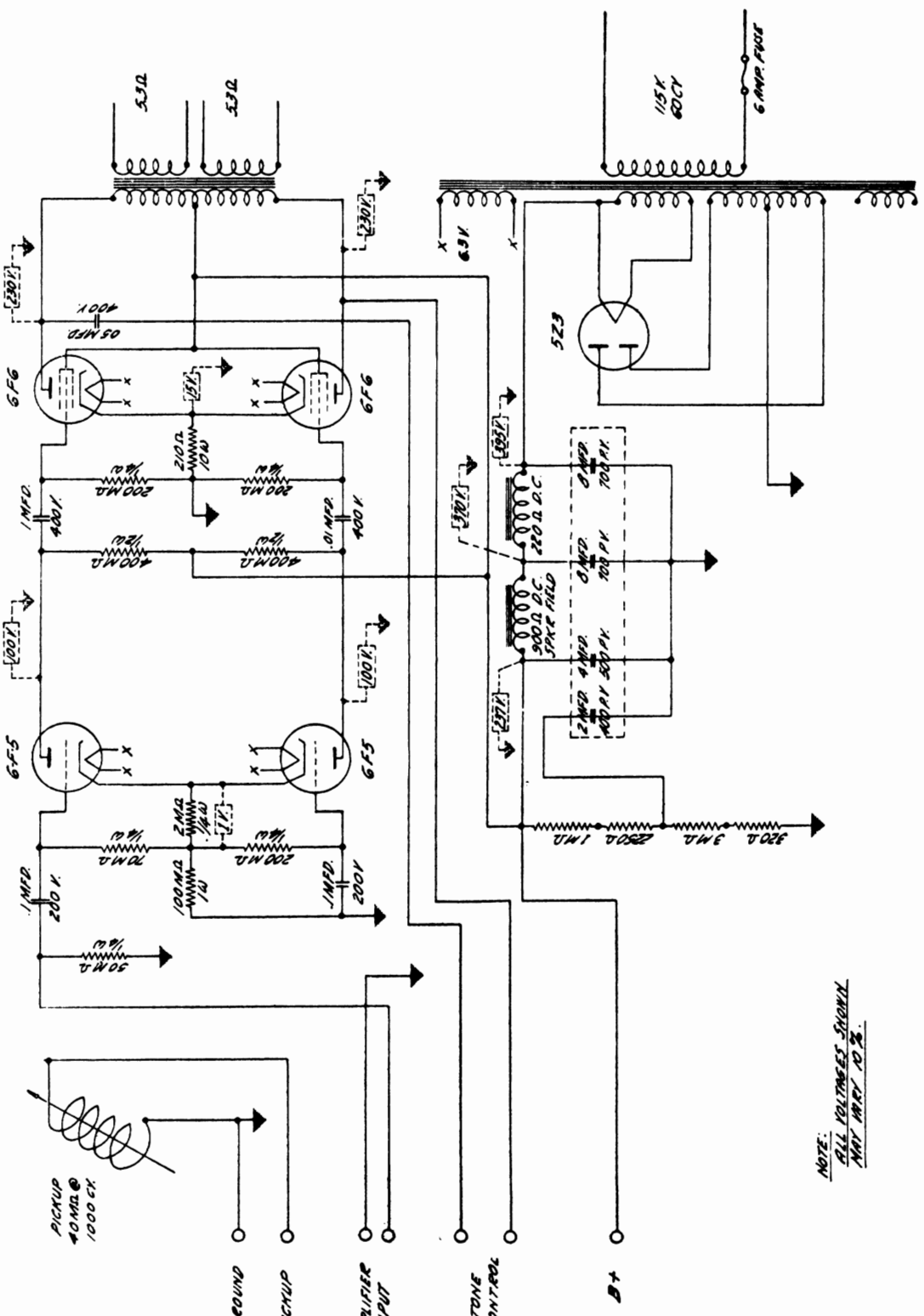
CAPEHART CORP.

~SCHEMATIC RADIO DIAGRAM FOR CAPEHART 203 MODEL~ [W869]


6H6
6N7
6N7
6N7
6H8
6N7
6N7
6N7

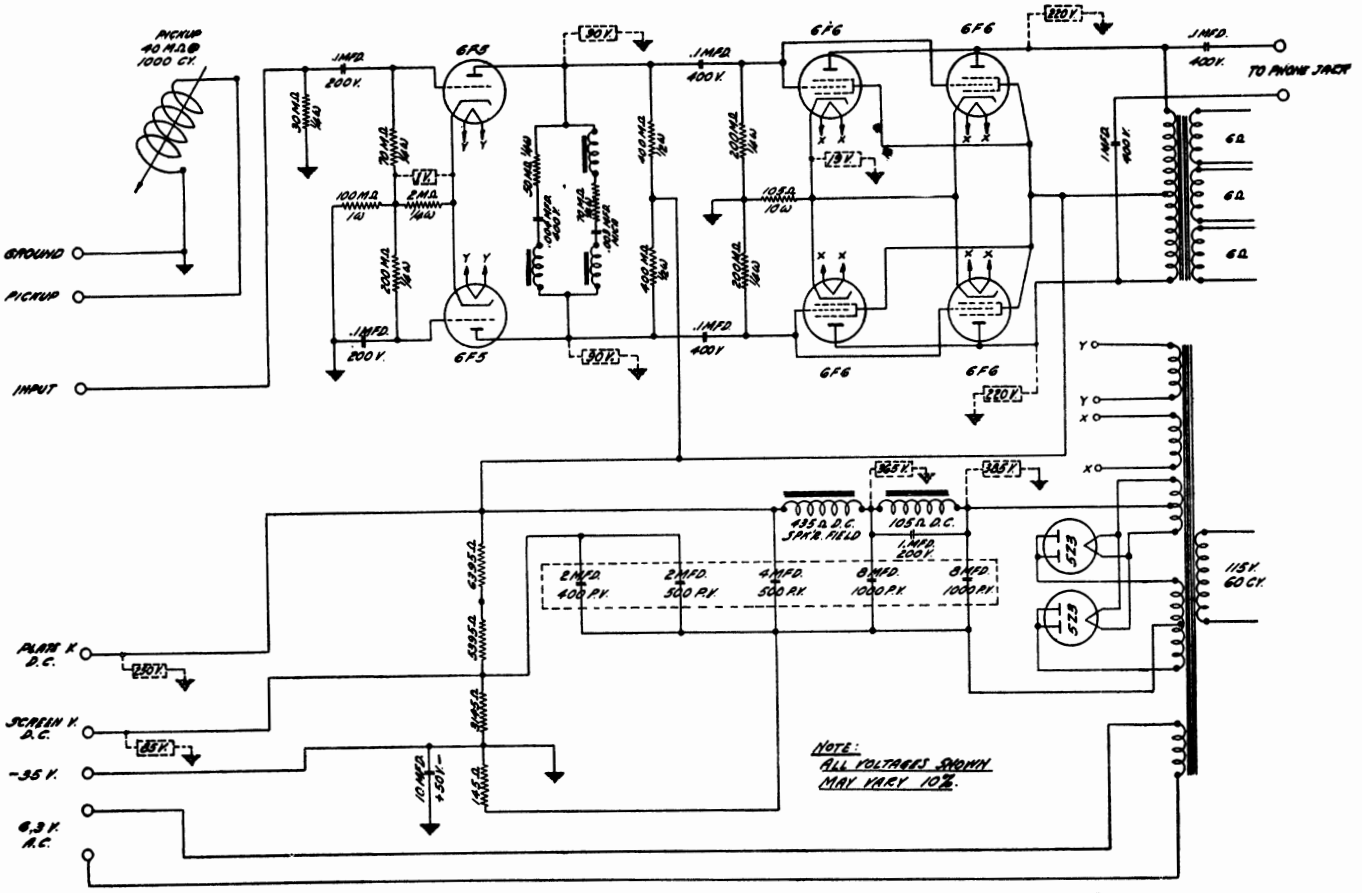
CAPEHART CORP.

SCHEMATIC · CAPEHART · AMPLIFIER · 203 · MODEL [W 870]

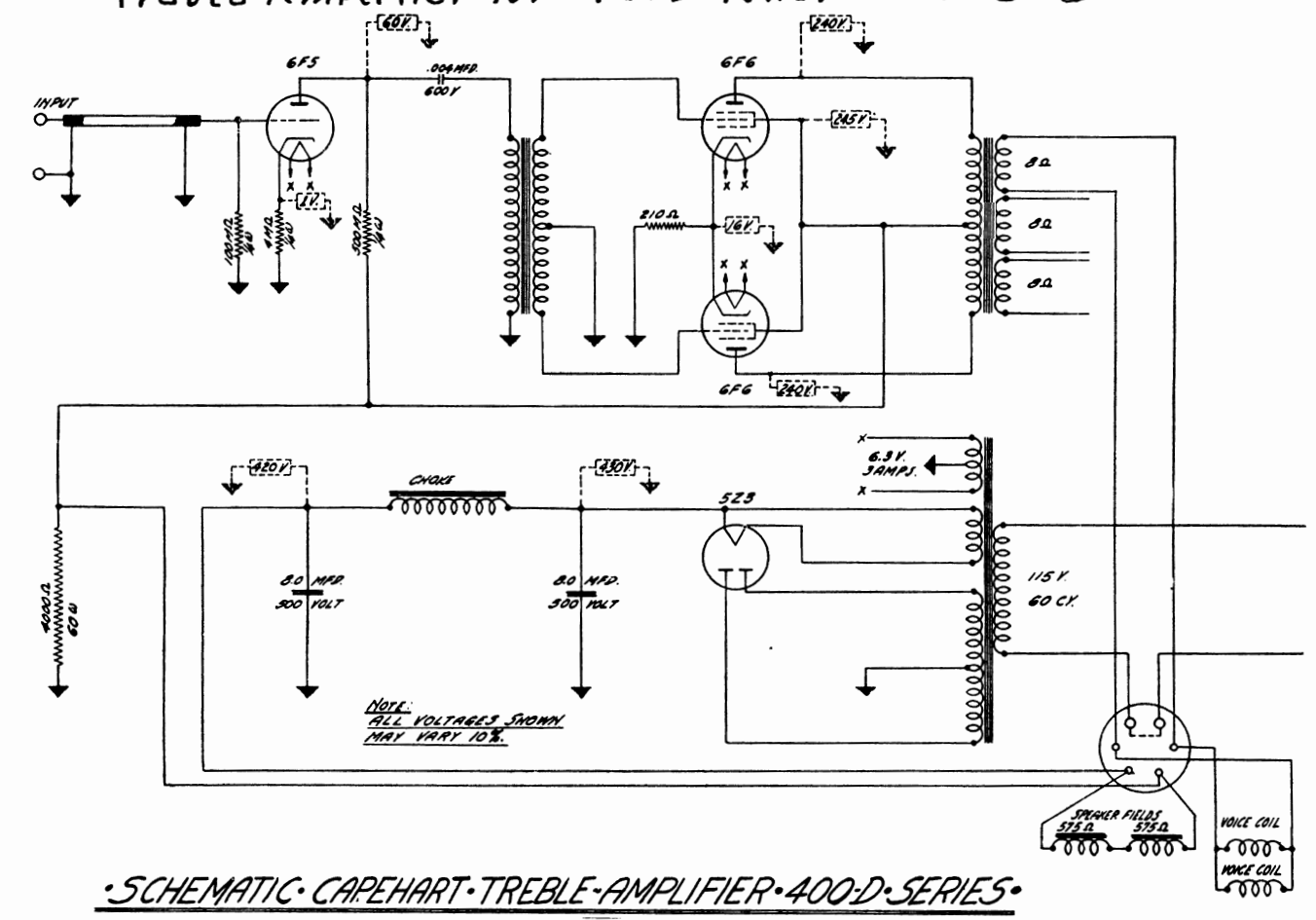


CAPEHART CORP.

Bass Amplifier for 400D Tuner — W867



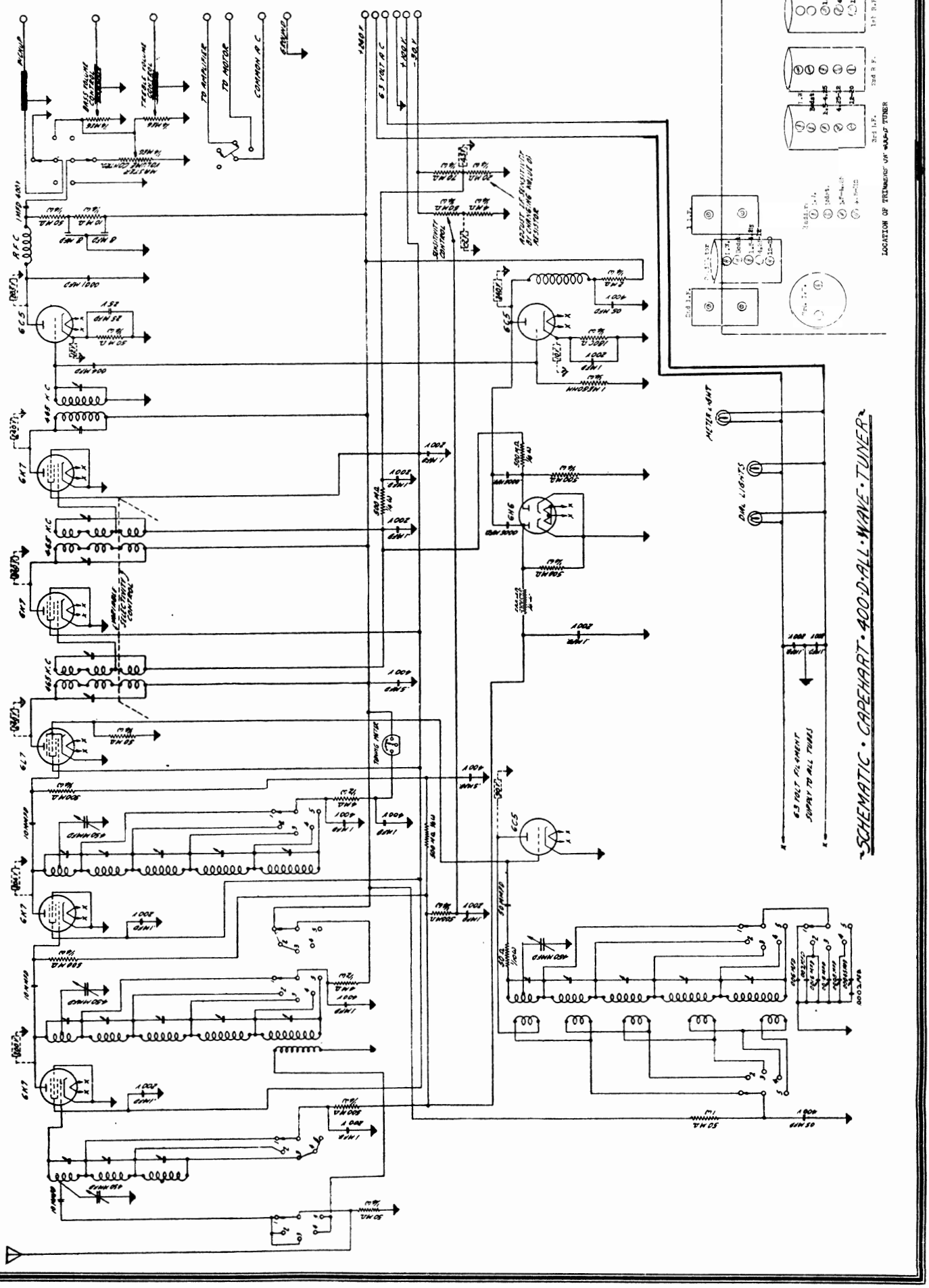
Treble Amplifier for 400D Tuner — W868



•SCHEMATIC• CAPEHART •TREBLE-AMPLIFIER• 400-D• SERIES•

CAPEHART CORP

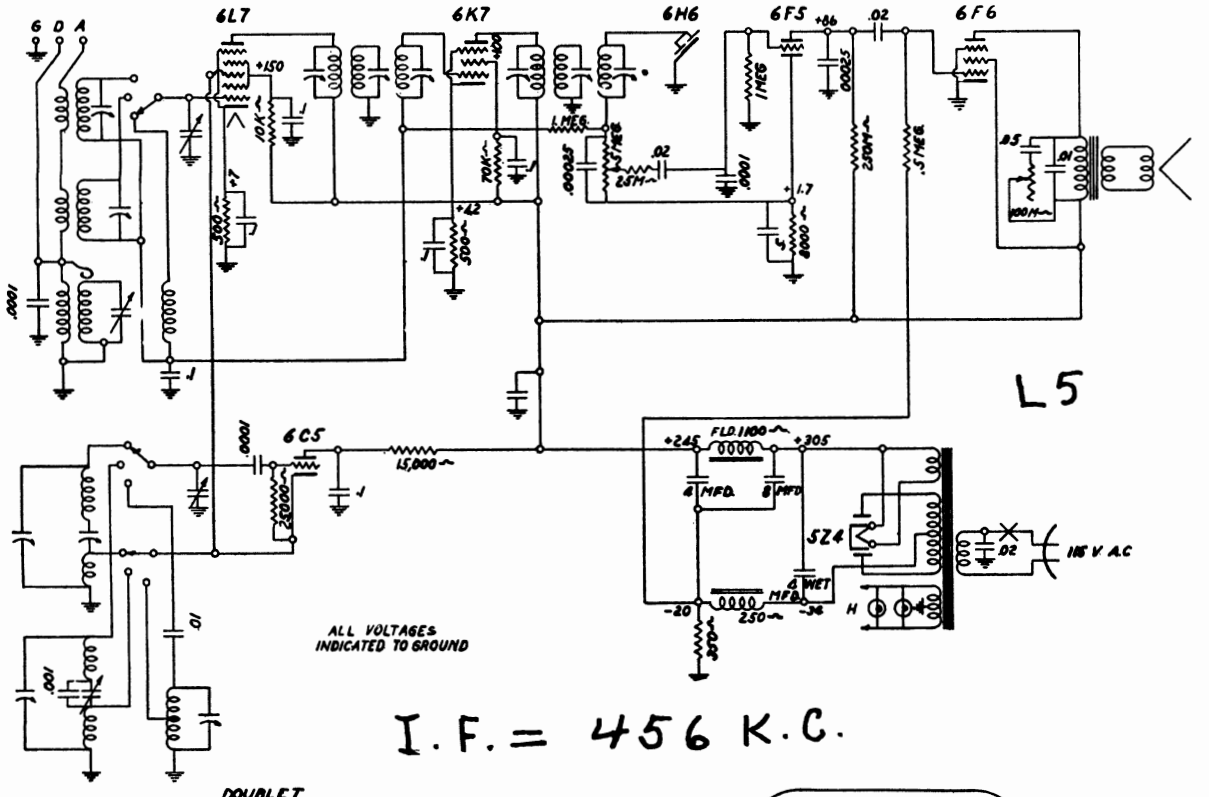
Model 400-D All-Wave Tuner W-877

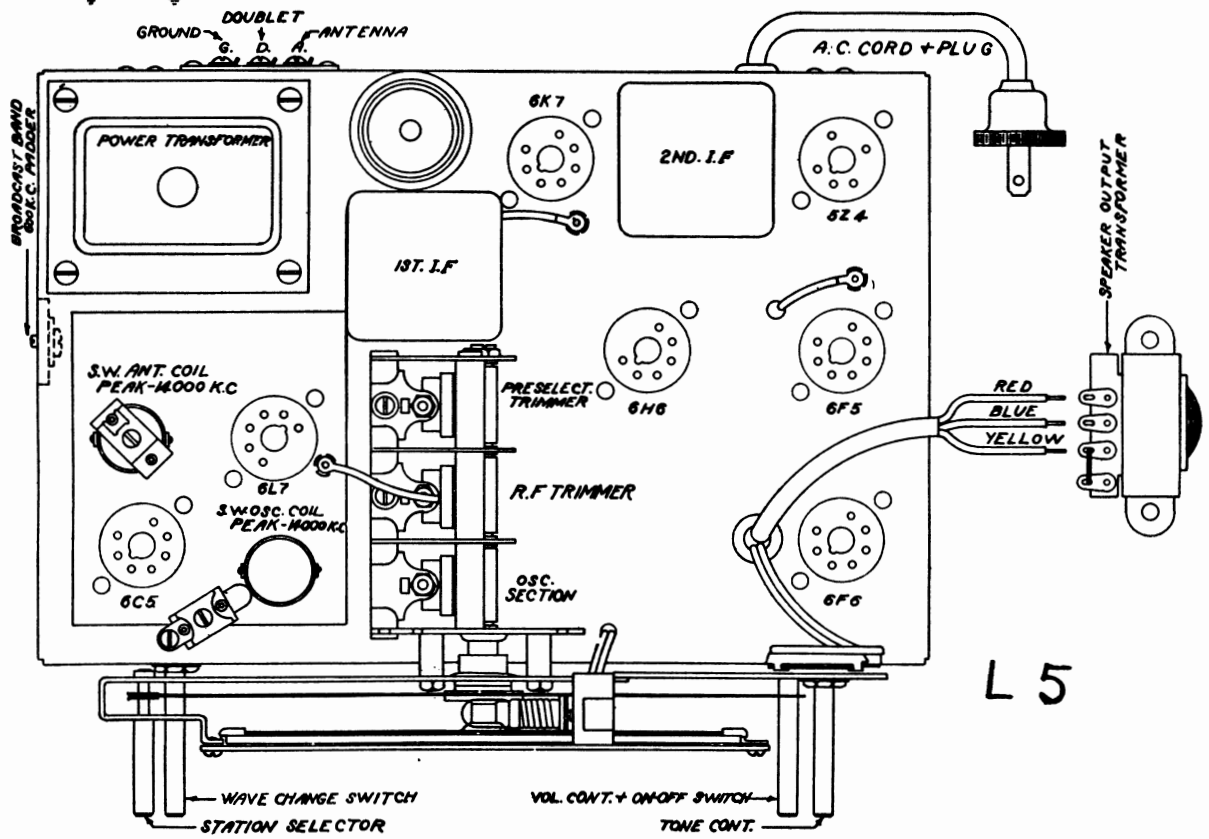


CONTINENTAL RADIO & TELEVISION

Seven Tube A. C. All Wave Superheterodyne

L5 Chassis

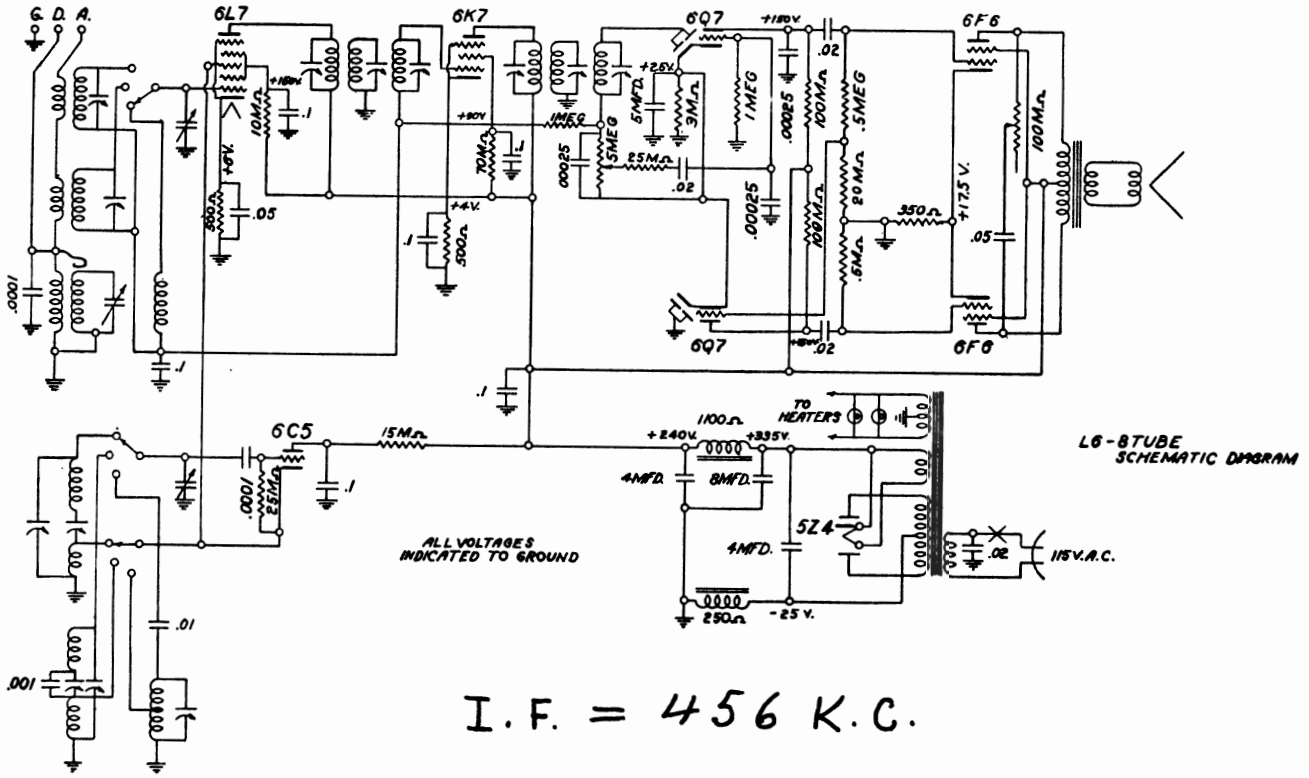




This receiver is designed to operate over three tuning ranges: the broadcast range which extends from 540 to 1700 Kilocycles (KC) (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5000 Kilocycles (KC) (52 to 175 Meters) and the International Short Wave Band which extends from 5800 to 15,200 Kilocycles (KC) (18.5 to 52 meters). This latter range is the one which includes the four internationally assigned bands —the 19, 25, 31 and 49 meter bands.

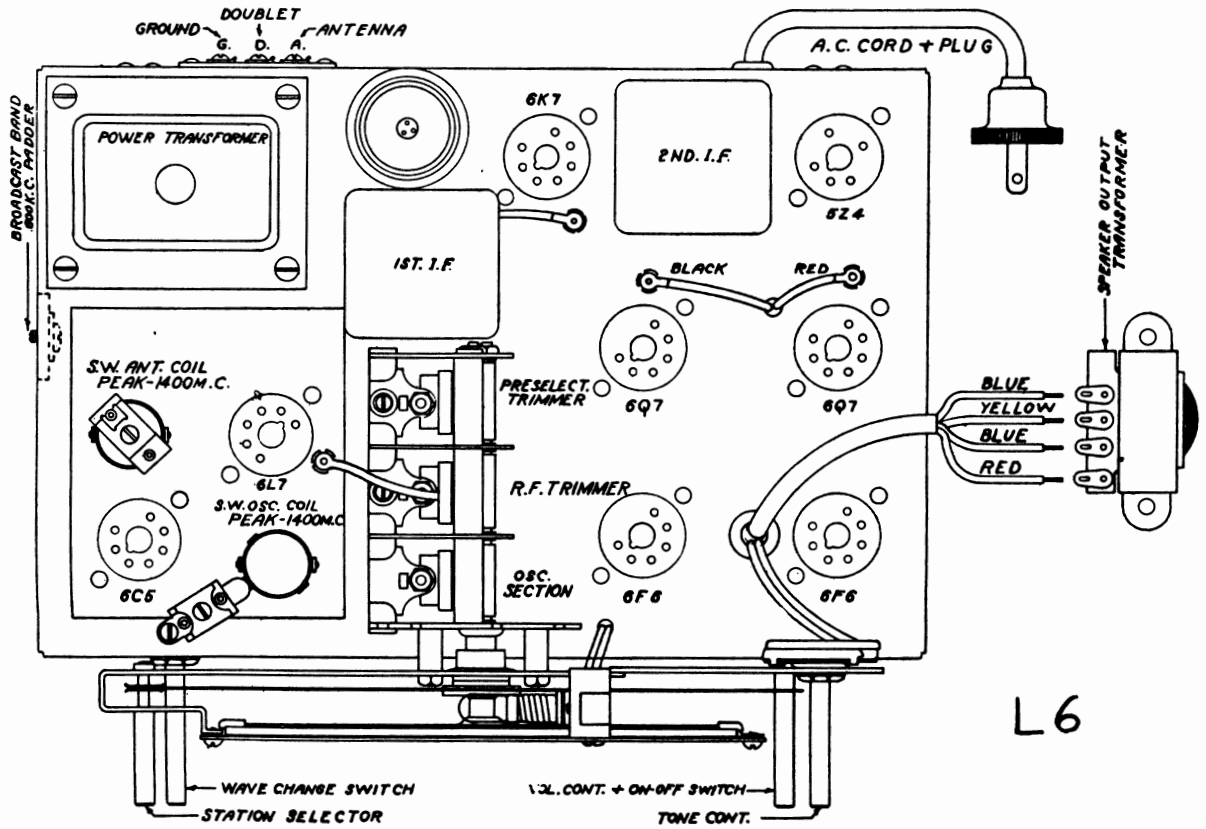
CONTINENTAL RADIO & TELEVISION

Model L6 — Eight Tube A.C. Superheterodyne



I. F. = 456 K. C.

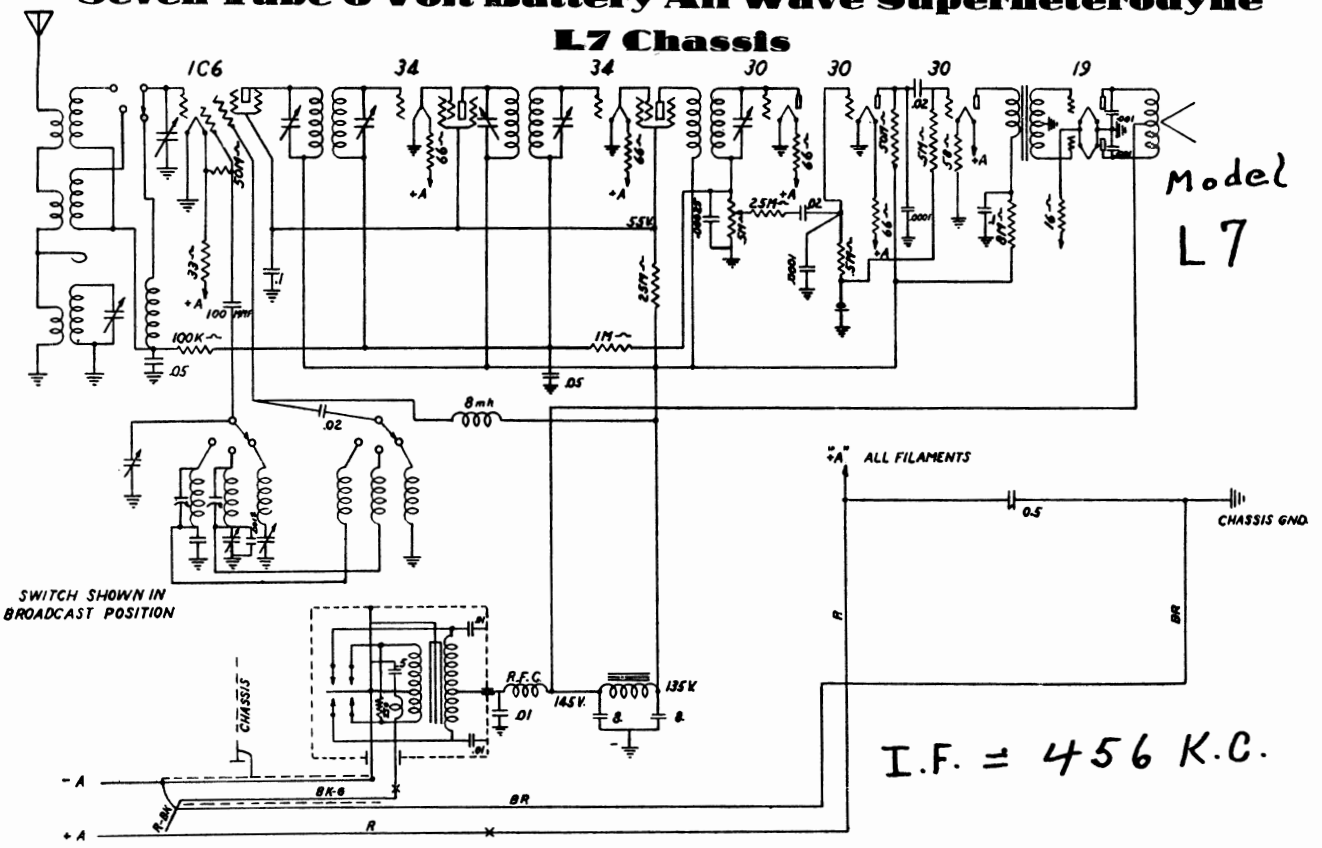
This receiver is designed to operate over three tuning ranges. The broadcast range which extends from 540 to 1700 Kilocycles (KC) (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5000 Kilocycles (KC) (52 to 175 Meters) and the International Short Wave Band which extends from 5800 to 15,200 Kilocycles (KC) (18.5 to 52 meters). This short wave range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.



CONTINENTAL RADIO & TELEVISION

Seven Tube 6 Volt Battery All Wave Superheterodyne

L7 Chassis



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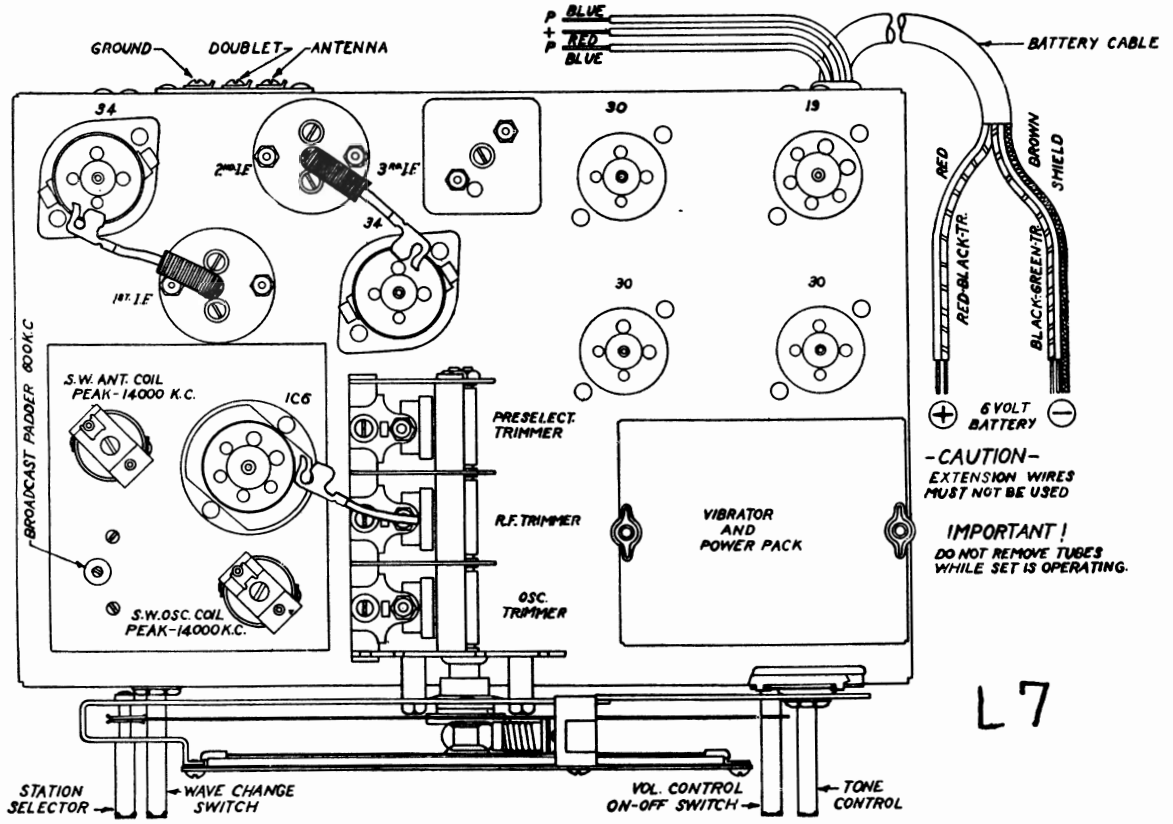
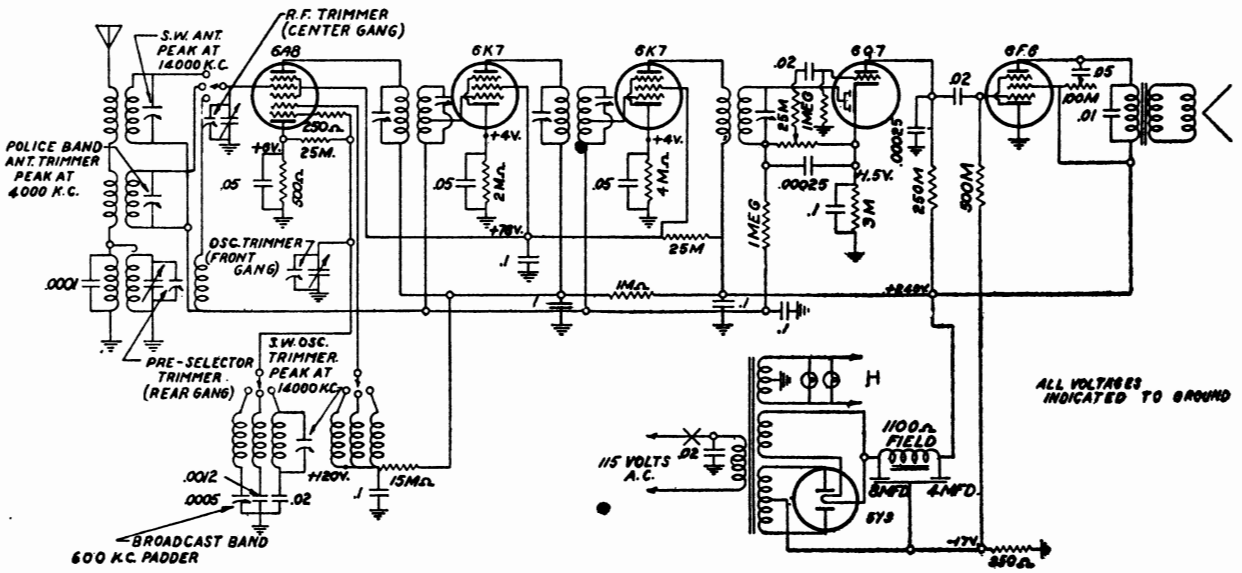


CONTINENTAL RADIO & TELEVISION

Model M1

Six Tube A. C. All Wave Superheterodyne



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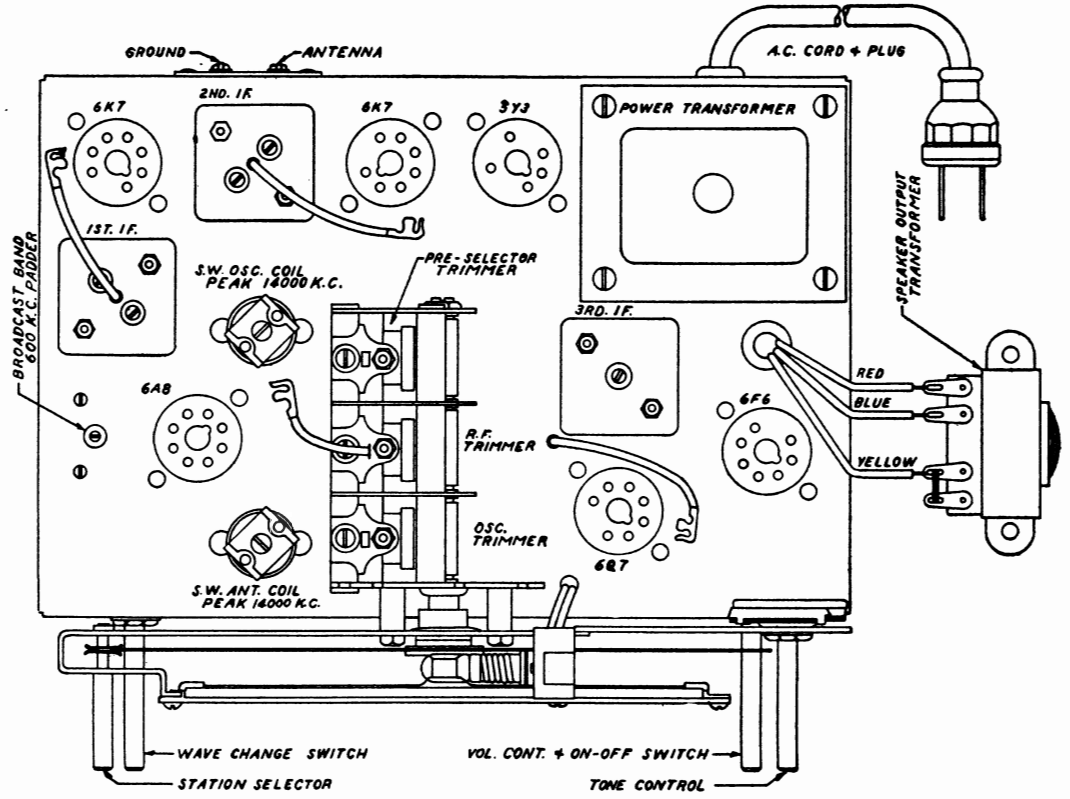
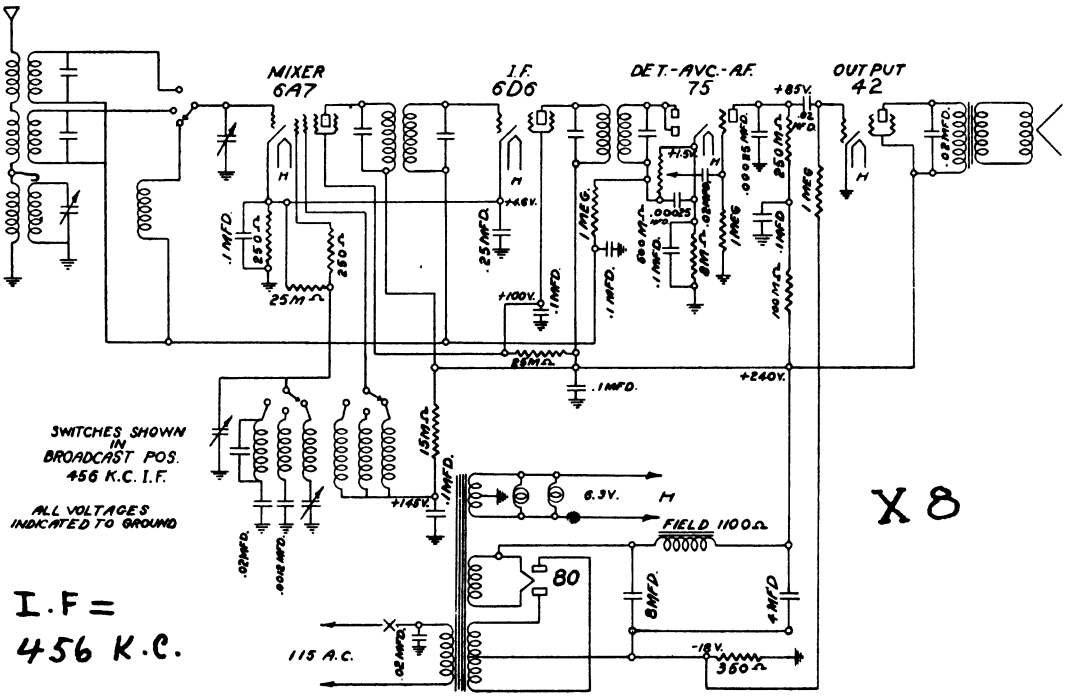
I. F. = 456 K.C.



CONTINENTAL RADIO & TELEVISION

Model X8

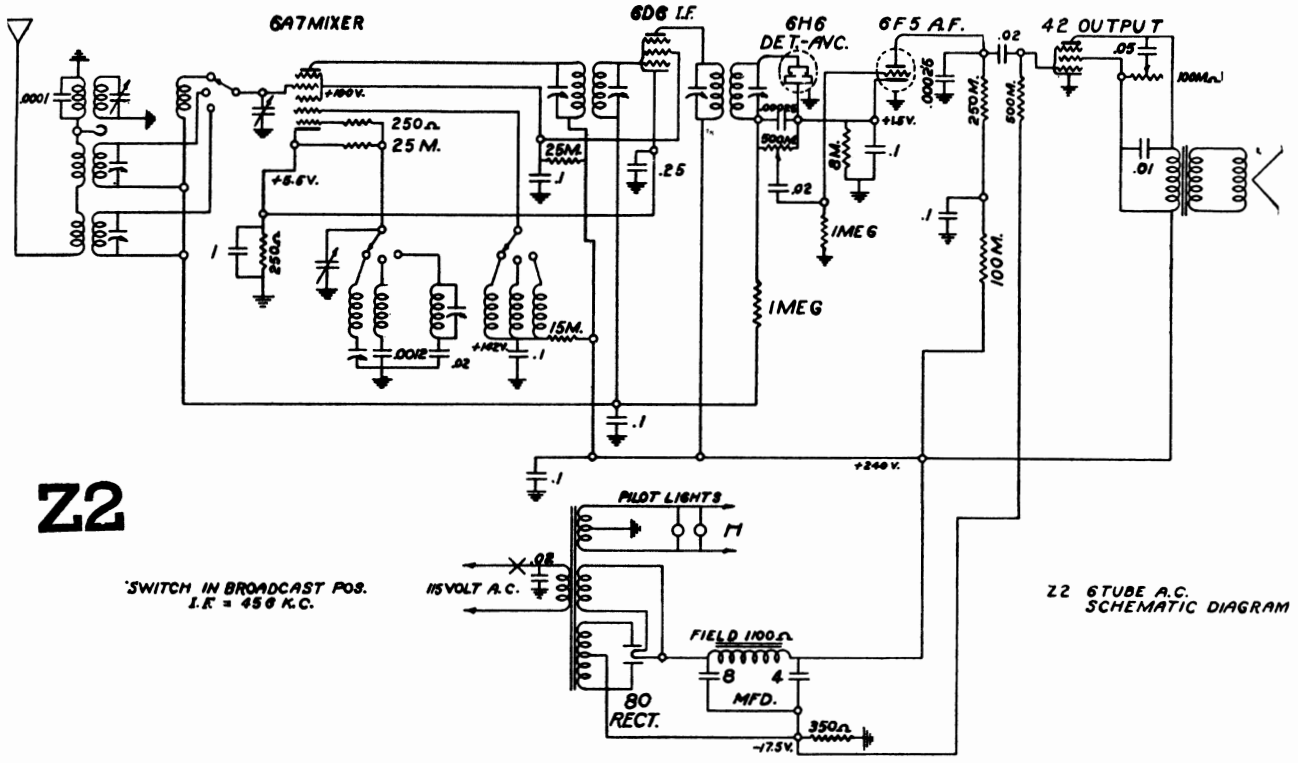
Five Tube A.C. All Wave Superheterodyne


MIXER 6A7
I.F. 6D6
DET.-AVC.-A.F. 75
OUTPUT 42
+85V.
+46V.
+100V.
.1MFD.
25MFD.
25M Ω
250Ω
250Ω
.1MEG.
.00025MFD.
250M Ω
.02MFD.
.1MEG.
.1MFD.
.1MEG.
.1MFD.
.1MEG.
.1

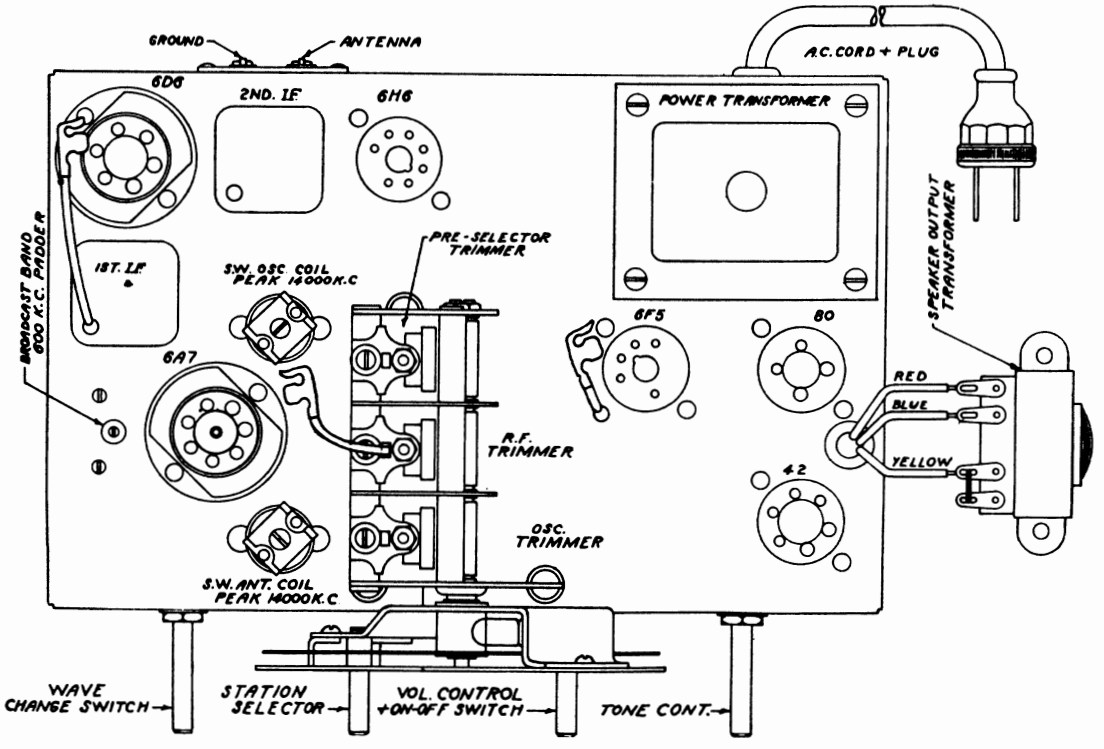
CONTINENTAL RADIO & TELEVISION

Six Tube A.C. All Wave Superheterodyne

Z2 Chassis



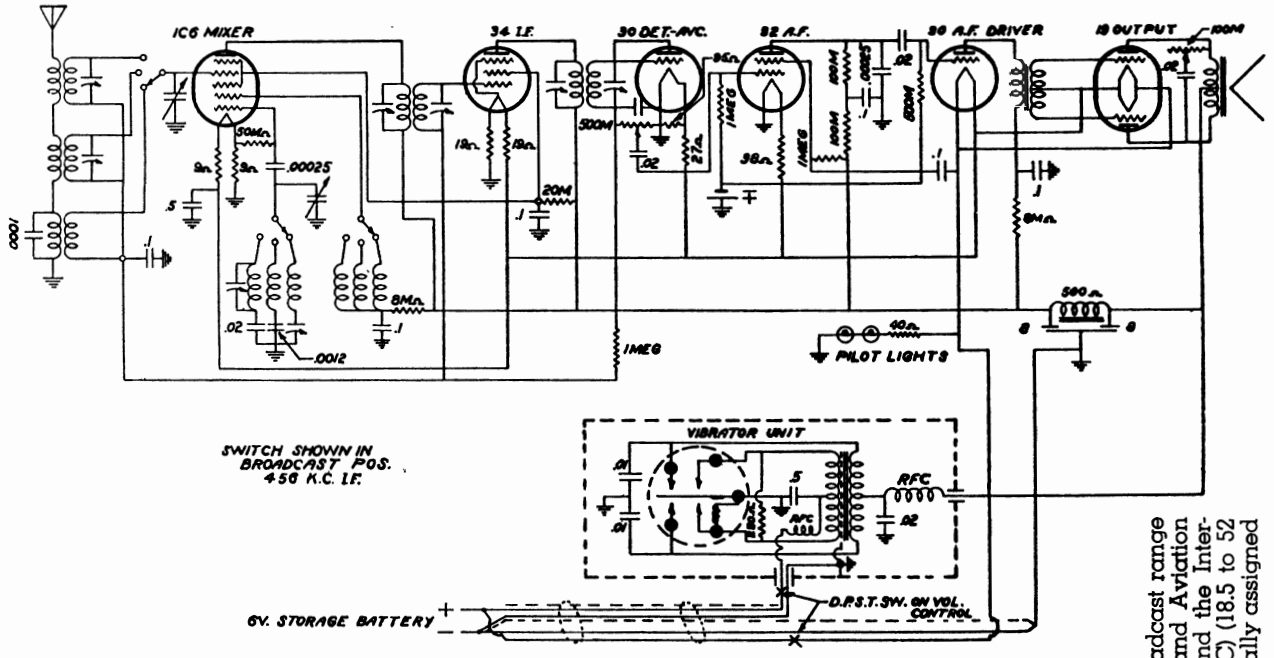
This receiver is designed to operate over three tuning ranges. The broadcast range which extends from 540 to 1700 Kilocycles (KC) (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5000 Kilocycles (KC) (52 to 175 Meters) and the International Short Wave Band which extends from 5800 to 15,200 Kilocycles (KC) (18.5 to 52 meters). This short wave range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

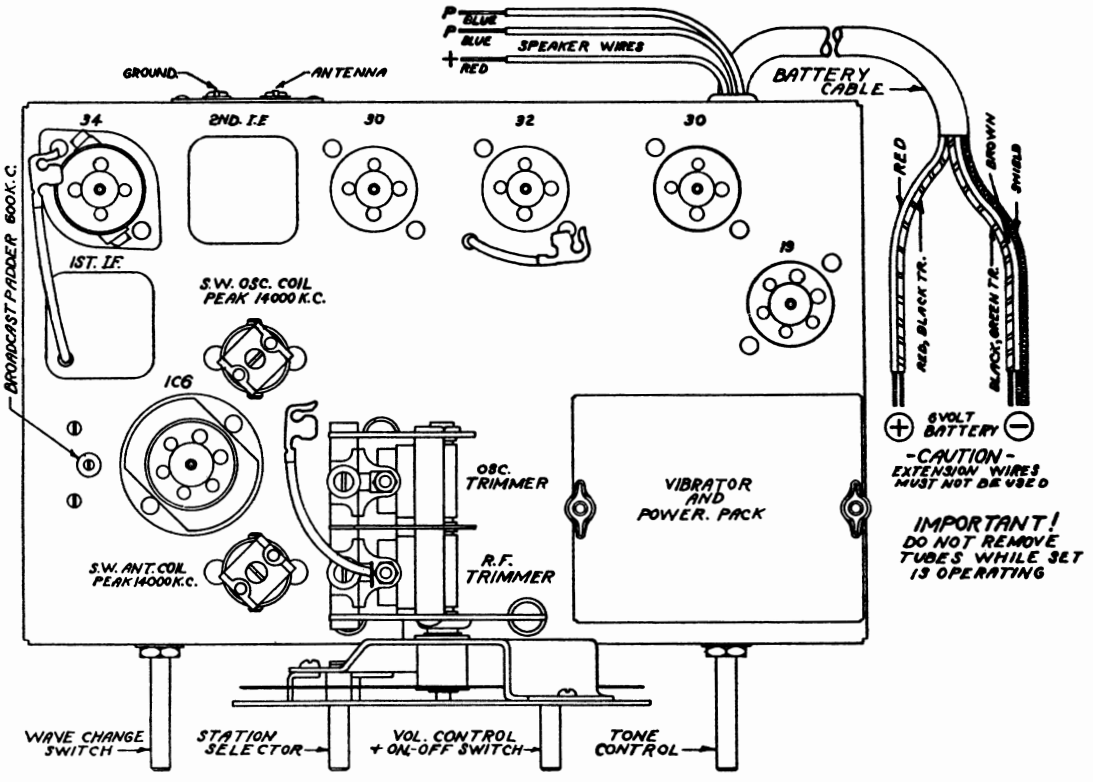


CONTINENTAL RADIO & TELEVISION

Six Tube 6 Volt Battery Superheterodyne

Z4 Chassis Revised





This receiver is designed to operate over three tuning ranges. The broadcast range which extends from 540 to 1700 Kilocycles (KC) (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5000 Kilocycles (KC) (52 to 175 Meters) and the International Short Wave Band which extends from 5800 to 15,200 Kilocycles (KC) (18.5 to 52 meters). This short wave range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

REASONS FOR UNSATISFACTORY OPERATION

FAILURE TO OPERATE

1. Check connections from battery cable to storage battery. If connections are reversed, set will not operate. Proper instructions for connecting the battery are given on the first page.
2. Check all tubes. Have them tested by meter equipped to test the type of tubes used in this receiver.
3. Check tube shields for good ground connections. Check grid caps for good connection. See that grid caps and tube shields are not shorted to each other (touching).
4. Reversed connections on Antenna and ground terminals. Try both ways for best results.
5. Oscillator tube (1C6) not oscillating.
6. Vibrator unit not securely in socket.

HUM

A minimum amount of hum, equivalent to A.C. receivers, may be present. Excessive hum may be traced to the following causes:

1. Omitting the use of a ground or a poor ground connection.
2. Vibrator unit not securely fitted in socket.
3. Antenna picking up interference from high tension power lines.
4. Weak or rundown battery. Battery with defective cell.
5. Poor battery connections.
6. Extending or lengthening battery leads cause an enormous increase in "hum." The battery cable attached to the receiver is of special design and its ends **must** be connected directly to the battery terminals. **(See battery connection data on first page.)**

CROSLEY RADIO CORP.

MODEL 2-C-1

Specifications

Model 2-C-1 is a two tube tuned radio frequency receiver designed for operation from AC or DC 110 Volt electric circuit.

Tubes And Voltage Limits

The following are the tubes and voltages meas-

Circuit

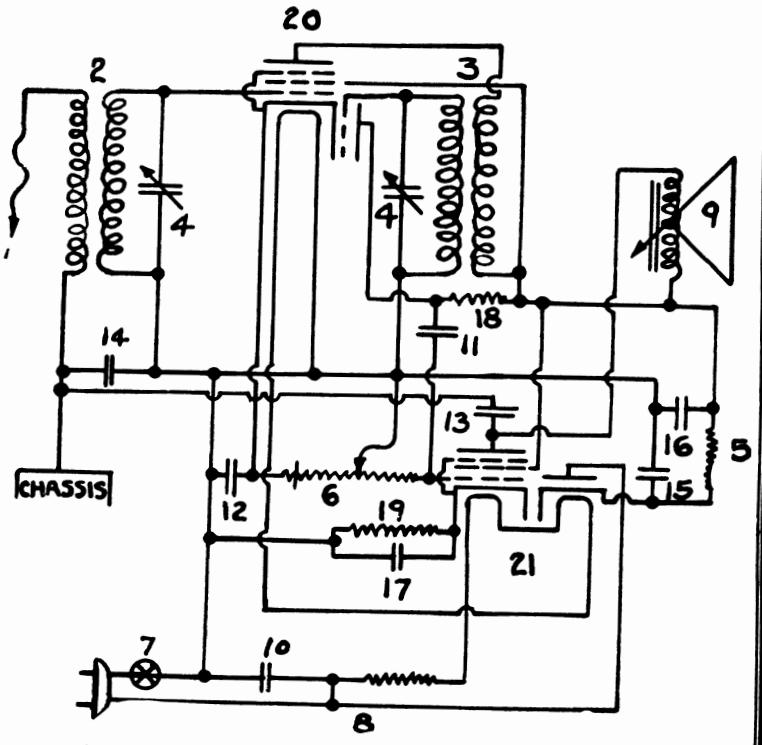
Referring to diagram.

The signal enters through antenna and is stepped up by antenna transformer (2) the secondary of which is tuned to the desired signal by one section of the variable condenser (4). This signal activates the pentode section of the 6-F-7 tube. The amplified signal is again stepped up in the R. F. Transformer (3) whose secondary is tuned by the other section of the variable condenser, and this amplified signal is fed into the triode section of the 6-F-7 tube which is operating as a detector. The gain in both sections of this tube is controlled by the volume control (6) which also acts as a grid resistor for the pentode section of the output tube 12-A-7. Resistor (18) serves as the plate resistor for the detector. The signal is coupled to the output pentode through coupling condenser (11) is amplified and then activates the speaker motor. This motor is mechanically connected to the front of the cabinet which serves as the speaker diaphram.

Condenser (12) is the 6-F-7 cathode bypass and condenser (14) is the bypass between chassis and negative line.

The 12-A-7 bias resistor (19) and bypass condenser (17) are combined with condensers (15) and (16) as part of the filter circuit. Resistor (5) is also part of this filter which serves to smooth the B supply from the rectifier section of 12-A-7 tube.

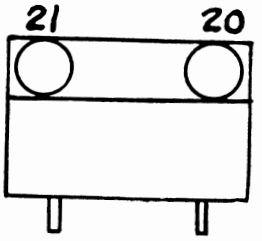
Condenser (10) is the hum modulation suppressor condenser and resistor (8) is a series filament



resistor contained in the power supply cable.

Speaker

The front of cabinet is the speaker diaphram. If chassis is to be removed from cabinet the speaker drive rod is unsoldered from speaker motor as explained on instruction card. Do not use glue to fasten front in cabinet. This front is held in place with Hydrolene.



Tube	Position And Use	Plate	Scr. Grid	Control Grid	Cathode	PL	GL	KL	Filament
6-F-7	R. F. and Regen. Det.	125	125	0	5-30	30	0	—	6.5
12-A-7	A. F. and Rect.	115	125	0	10	117.5	—	135	12.5

VOLTAGE LIMITS ARE PLUS OR MINUS 10% OF VALUES GIVEN

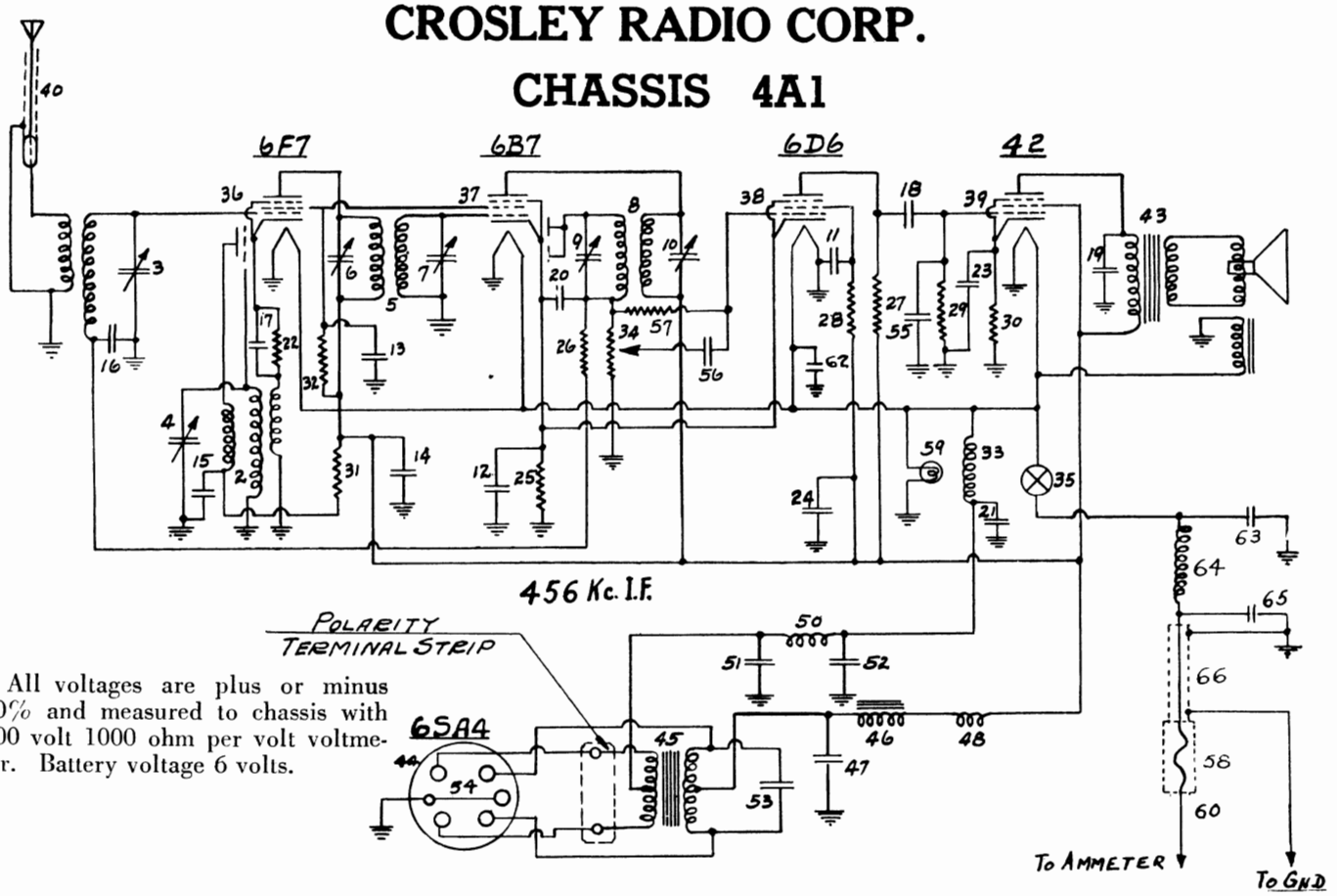
PARTS LIST—MODEL 2-C-1

* Figures in 2nd last column refer to parts shown in diagram.

Qty.	Part No.	Description	* Item	List Each
1	G33-32000	Antenna Trans.	2	.55
1	G21-32001	R. F. Trans.	3	.60
1	G8-33001	Variable Condenser	4	2.25
1	W34698B	Volume Control & Switch	6-7	1.00
1	G49-28807	6F7 Socket	20	.10
1	G77-28807	12A7 Socket	21	.10
1	G7-34400	Tube Connector Assem.		.05
1	G8-34400	Tube Connector Assem.		.05
1	B34702B	Resistance Cable and Plug (325 Ohms)	8	.70
1	223M-B	Speaker Unit	9	2.33
1	W34710	Speaker Bracket		.05
		FILTER & BY-PASS CONDENSERS		
1	W34711	.02 Mfd. 110 V.	10	.15
1	W34713	.006 Mfd. 160 V.	11	.15
1	W34712	.25 Mfd. 160 V.	12	.20
1	W34714	.008-.05 Mfd. 160 V.-160 V.	13-14	.20
1	W34704A	16.-16.-8. Mfd. 100 V.-100 V.-20 V.	15 16-17	2.00
		RESISTORS		
2	W22514	750 Ohm Flex.	5-19	.15
1	21454	1 Megohm	18	.15
1	4AC	Cabinet (Ship Design)		.67
	4AE	Cabinet (Artists Pictures)		.67
1	G1-34822	4AC Cabinet Front		.30
	G2-34822	4AE Cabinet Front		.30
1	B34719	Cabinet Back		.05
1	L-34885	Speaker Pin Assem.		.05
2	W2244B	Knobs		.10

CROSLEY RADIO CORP.

CHASSIS 4A1



All voltages are plus or minus 10% and measured to chassis with 500 volt 1000 ohm per volt voltmeter. Battery voltage 6 volts.

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Eposc	Esup
6F7	Osc. Mod.	6.0	230	0	8	100	60	—
6B7	I.F. and Diode	6.0	230	0	3	100	—	—
6D6	A.F.	6.0	60	0	3	25	—	3
42	Output	6.0	220	0	16	230	—	—

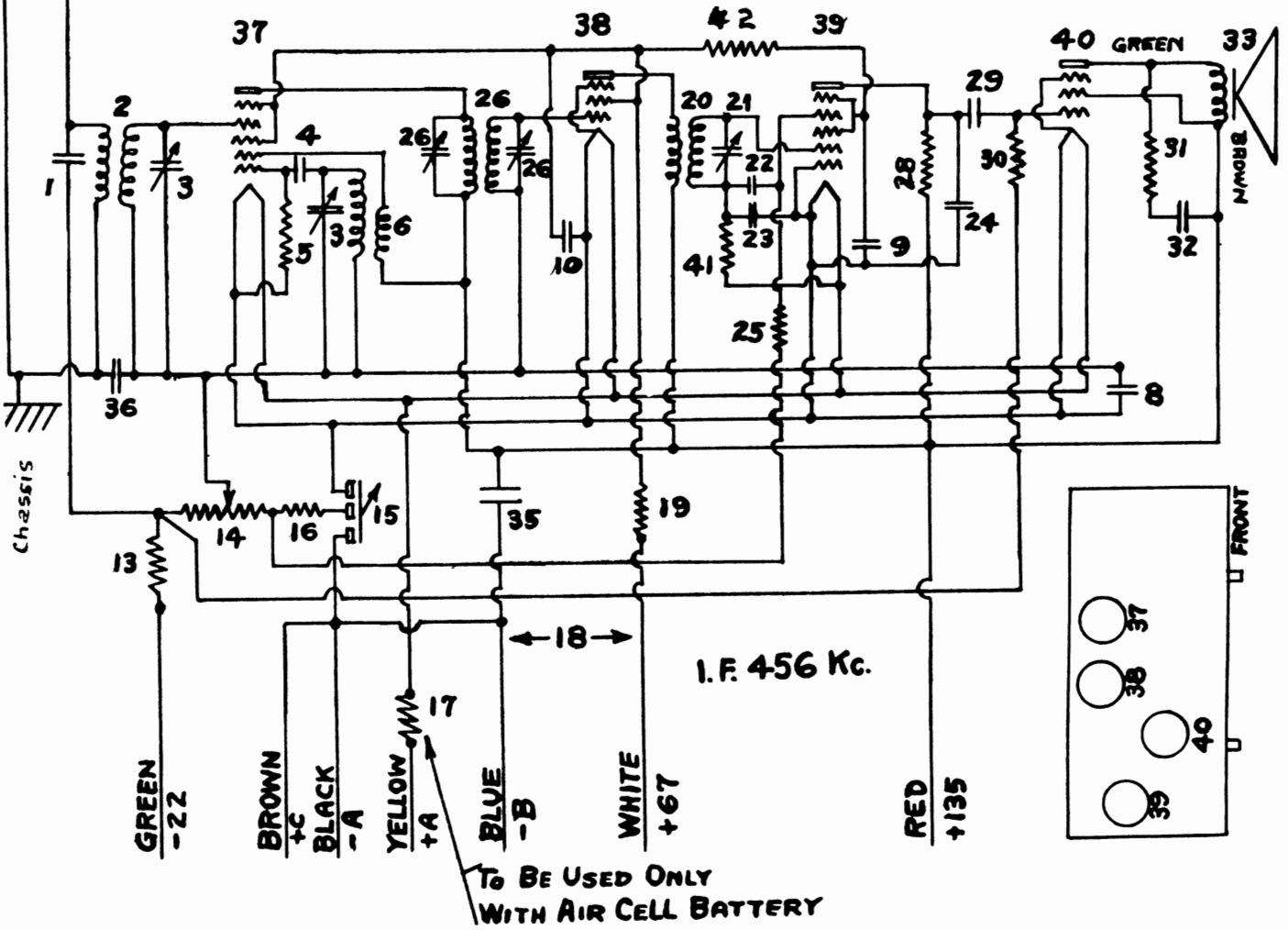
*** Figures in 2nd last column refer to parts shown in wiring diagram of Model 4A1**

Qty.	Part No.	Description	* Item	List Each
1	G9-32000	Antenna Coil	1	.60
1	G8-32002	Osc. Coil		.45
1	W32728	Washer (Ant. Coil Shield Base)		.05
1	W30802	Coil Shield (Ant.)		.15
1	W30026	Retaining Ring (Ant.)		.05
1	W25200	Coil Socket (Osc.)		.05
1	W25025A	Coil Shield (Osc.)		.10
1	W26891	Insulating Washer (Osc.)		.05
1	W21541B	Retaining Ring (Osc.)		.05
1	L32698	Variable tuning Cond. Gang	3-4	5.50
1	G7-32004	Ist I. F. Trans. Coil and Tuning Condensers	5-6-7	1.85
1	G8-32004	2nd I. F. Trans. Coil and Tuning Condensers	8-9-10	1.75
1	W32712B	Level Control and Power Switch	34-35	1.10
1	W32739A	Level Control Bracket		.10
1	G49-27975	6F7 Socket	36	.10
1	G48-27975	6B7 Socket	37	.10
1	G75-27975	6D6 Socket	38	.10
1	G25-27975	42 Socket	39	.10
1	G81-27975	6SA4 Socket	54	.10
1	LB32037	6SA4 Synerotube	44	5.00
2	W27981A	Tube Shield Base		.05
2	W30964	Tube Shield (6B7 & 6F7)	36-37	.10
1	G1-32769	Power Transformer	45	2.75
1	G11-24028	"B" Filter Choke	46	1.10
1	G1-32755	R. F. "B" Choke	48	.15
1	G6-28067	R. F. "A" Choke	50	.30
1	G4-28067	"A" Choke	33	.35
1	B32783	Antenna Lead	40	.45
1	G1-25891	Antenna Wire		.90
1	G5-31701	"A" Cable Assem.	60	.25
1	G7-31701	"A" Lead Assem. & Choke Assem.	61	1.40
1	W32757	12 Amp. Fuse	58	.10
		BY-PASS & FILTER CONDENSERS		
1	W32711A	0.1-0.1-0.05-0.05 Mfd. 200 Volt	11-12	
3	W32780A	0.05 Mfd. 400 Volt	13-14 15-18 56	1.00 .15
1	W32779A	0.02 Mfd. 200 Volt	16	.15

Qty.	Part No.	Description	* Item	List Each
2	W32781A	0.1 Mfd. 200 Volt	17-62	.15
1	W32782A	0.01 Mfd. 400 Volt	19	.15
3	W32741	0.0005 Mfd. (Mica)	20-21 55	.15
2	W30366	0.5 Mfd. 160 Volt	51-52	.50
1	W32762	0.005 Mfd. 1000 Volt	53	.65
1	W30419A	8.-8. Mfd. 25 Volt-250 Volt	23-24	1.80
1	W32759	8. Mfd. 300 Volt	47	1.50
		RESISTORS		
1	W21452	1100 Ohms	22	.15
1	W28589	350 Ohms	25	.10
2	21454	1 Megohm	26-57	.15
1	21875	100000 Ohms	27	.15
2	23785	500000 Ohms	28-29	.15
1	W25521	450 Ohms	30	.15
2	32331	55000 Ohms (½ Watt)	31-32	.15
		CASE		
1	L32730	Case		1.70
1	B32714A	Bottom Cover		.25
1	B32720B	Top Cover		.25
1	W32717A	Control Window		.10
1	B32718A	Control Window Cover		.30
1	W32724	Knob		.10
1	W32725A	Knob (Key)		.20
1	W32723A	Mounting Bracket (Front)		.10
1	C32742	Mounting Bracket (Rear or Bulkhead)		.05
1	W32787A	3" Mounting Bolt		Doz. Ea. .10 .05
1	W32788	7/16 Washer		.15 .05
1	W32789	7/16 x 14 Thr. Nut		.15 .05
5	W32734	5/16 x 24 Hex. Hd. Mtg. Bolt		.10 .05
5	W24235	5/16 Shakeproof Washer		.10 .05
1	W6849	5/16 Washer (Black Oxide)		.10 .05
4	W6133	5/16 x ¾ Washer		.15 .05
1	W12131	7/16 Std. Lockwasher		.15 .05
1	W33436	¼-20 x ¾ Rd. Hd. Screw		.15 .05
	W31625A	Distributor Suppressor		.40
	W33165	Spark Plug Suppressor		.40
	W29754B	.5 Mfd. Cond. (Eliminator)		.45
1	33-B	Speaker	43	4.00

CROSLEY RADIO CORP.

Wiring Diagram For Model 4B1



Parts List Model 4B1

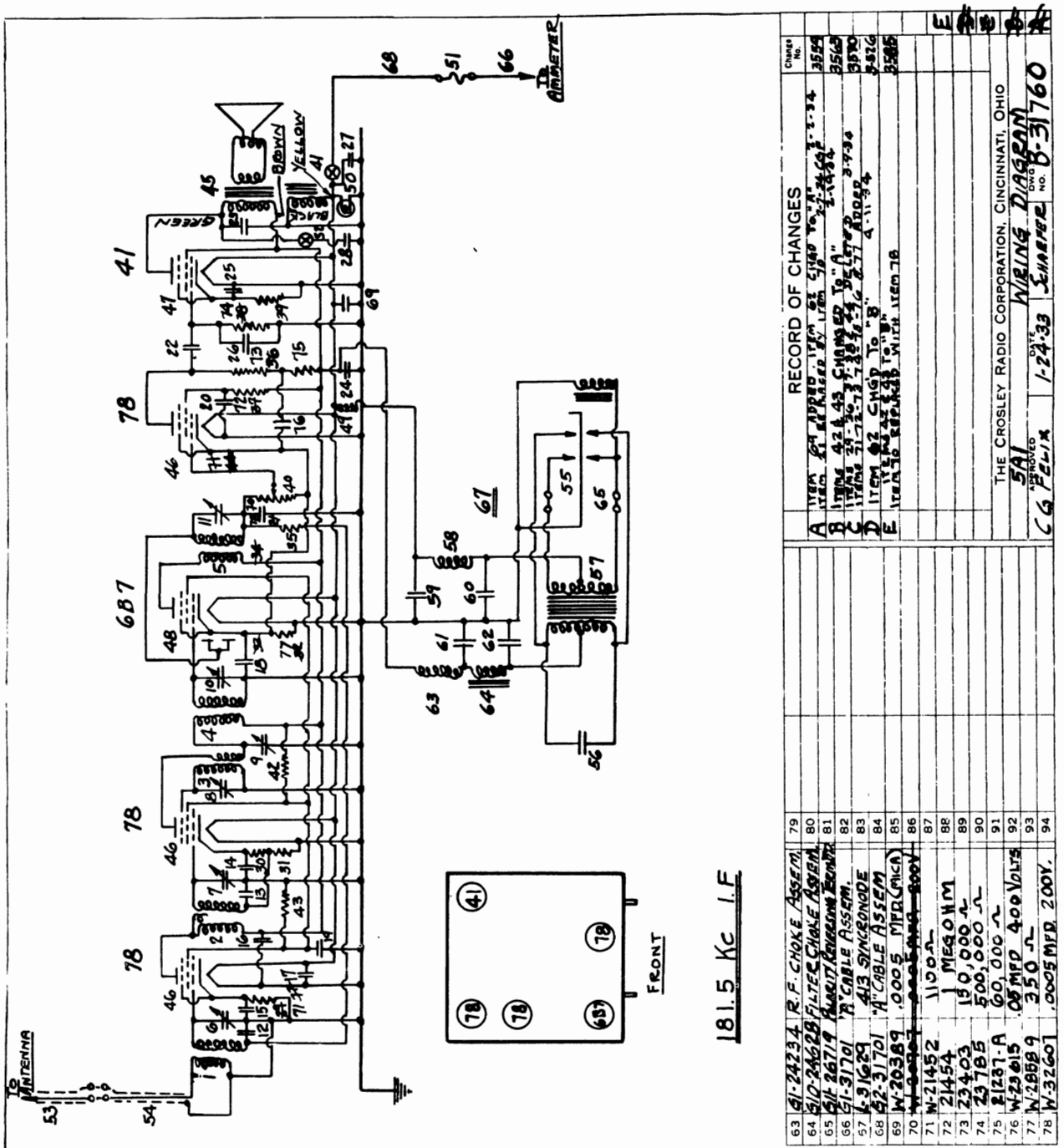
Figures in first column correspond to figures in diagram

1	W	—28621	0.02 Mfd. 200 Volt
2	G27	—32000	Antenna Coil
3	G6	—33001	Variable Cond.
4	W	—5382	0.00025 Mfd.
5		21875	100,000 Ohms
6	G9	—32002	Oscillator Coil
7			
8	W	—28622	0.1 Mfd. 200 Volt
9			0.1 Mfd. 200 Volt
10	W	—30321-A	1.0 Mfd. 160 Volt
11			
12			
13		27121	5,000 Ohms
14	W	—33922-A	Volume Control
15			3 P. S. T. Switch
16	W	—23013	2,000 Ohms
17	G5	—23300	0.6 Ohm
18	G2	—29237	Cable & Marker Assem.
19	W	—21452	1,100 Ohms
20	G13	—32004	2nd I. F. Trans.
21	G5	—33005	I. F. Trimmer Cond.
22	W	—28621	0.02 Mfd. 200 Volt
23	W	—25572	0.0005 Mfd. 400 Volt
24			0.0005 Mfd. 400 Volt
25		—26577	3 Meg.
26	G9	—32004	1st I. F. Trans.
27			
28		21455	300,000 Ohms
29	W	—28621	0.02 Mfd. 200 Volt
30		21454	1 Meg.
31		24814	7,000 Ohms
32	W	—28619	0.006 Mfd. 200 Volt
33		21M	Speaker
34			
35	W	—29910-A	0.25 Mfd. 200 Volt
36	W	—28621	0.02 Mfd. 200 Volt
37	G55	—27975	1A6 Socket
38	G31	—27975	34 Socket
39	G4	—33070	1A6 Socket
40	G36	—27975	33 Socket
41		23785	500,000 Ohms
42		24990	25,000 Ohms

CROSLEY RADIO CORP.

5A1

WIRING DIAGRAM FOR CROSLEY MODEL 5A1



1	GR-24935	ANTENNA COIL	
2	G7-28968	R.F. COIL	
3	G25-24916	OSCILLATOR COIL	
4	G1-25444	1ST I.F. COIL	
5	G1-25445	2ND I.F. COIL	
6			
7	L-29783	ANT. TUNING COND.	
8		R.F. TUNING COND.	
9	G2-25948	OSC. TUNING COND.	
10	W-25008-A	I.F. PRI. TUNING COND.	
11	G2-25948	I.F. SEC. TUNING COND.	
12	W-27203	DIODE TRANSTUN. COND.	
13	W-27203	0-02 MFD. 200V.	
14	W-27203	0-02 MFD. 200V.	
15	W-27203	0-02 MFD. 200V.	
16	W-23615	0-05 MFD. 400V.	
17	W-24049-A	0-1 MFD. 200V.	
18	W-24049-A	0-1 MFD. 200V.	
19	W-25438	0-1 MFD. 200V.	
20		0-1 MFD. 200V.	
21	~~W-23611~~	~~0-02 MFD. 400V.~~	
22	W-23142	0-02 MFD. 400V.	
23	W-23191-A	0-01 MFD. 400V.	
24		8 MFD. 250V.	
25	W-30419-A	8 MFD. 25V.	
26	W-20389	.00005 (MICA)	
27	W-20389	.00005 (MICA)	
28	W-23191-A	0-01 MFD. 400V.	
29	~~W-21454~~	~~1 MEG~~	
30	W-30127	450 Ω	
31	W-27066	6400 Ω	
32	W-25937	275 Ω	
33	W-25357	75 Ω	
34	21454	1-MEG	
35	21454	1-MEG	
36	~~41455~~	~~1500 Ω~~	
37	~~41448~~	~~500 Ω~~	
38	~~41448~~	~~300 Ω~~	
39	W-23907	750 Ω	
40	W-30436	LEVEL CONTROL	
41		S.P.S.T. SWITCH	
42	W-26525	(15000 Ω	
43		(25000 Ω	
44	~~W-22614~~	~~250 Ω~~	
45		3 & 3-3 SPEAKER	
46	539-28807	78 SOCKET	
47	528-28807	41 SOCKET	
48	548-28807	6B7 SOCKET	
49	G4-28067	"A" CHOKE	
50	W-40998	6V. DIAL LIGHT	
51	W-31105	10 AMP "A" FUSE	
52	W-26156-A	S.P.S.T. SWITCH	
53	D-31296-A	ANTENNA LEAD	
54	W-31702	ANTENNA LEAD GROMMET	
55	L-29160	VIBRATOR ASSEM.	
56	W-31632	0-01 MFD. 1000 V.	
57	G1-31618	POWER TRANS.	
58	G2-28067	"A" CHOKE	
59	W-30366	0-5 MFD. 160 V.	
60	W-30368	0-5 MFD. 160 V.	
61	W-23142	0-02 MFD. 400 V.	
62	W-31631B	12 MFD. 300 V.	
63	G1-24434	R.F. CHOKE ASSEM.	
64	G10-24628	FILTER CHOKE ASSEM.	
65	G4-26719	OUTPUT TRANSF. ASSEM.	
66	G1-31701	"B" CABLE ASSEM.	
67	W-31629	4/3 SYNCHRONODE	
68	G2-31701	"A" CABLE ASSEM	
69	W-20389	.0005 MFD (MICA)	
70	~~W-20389~~	~~.00005 MFD (MICA)~~	
71	W-21452	1100 Ω	
72	21454	1 MEGOHM	
73	23403	150,000 Ω	
74	23185	500,000 Ω	
75	21287-A	60,000 Ω	
76	W-29615	.05 MFD 400 VOLTS	
77	W-18689	350 Ω	
78	W-32601	.0005 MFD. 2000 V.	
79			
80			
81			
82			
83			
84			
85			
86			
87			
88			
89			
90			
91			
92			
93			
94			

RECORD OF CHANGES

		Change No.
A	ITEM 24 ADDED, ITEM 61 CHGD TO "A"	3554
B	ITEM 43 CHANGED TO "A"	3563
C	ITEM 31 CHGD TO "B"	3570
D	ITEM 62 CHGD TO "B"	3576
E	ITEM 78 ADDED, ITEM 78 CHGD TO "B"	3585

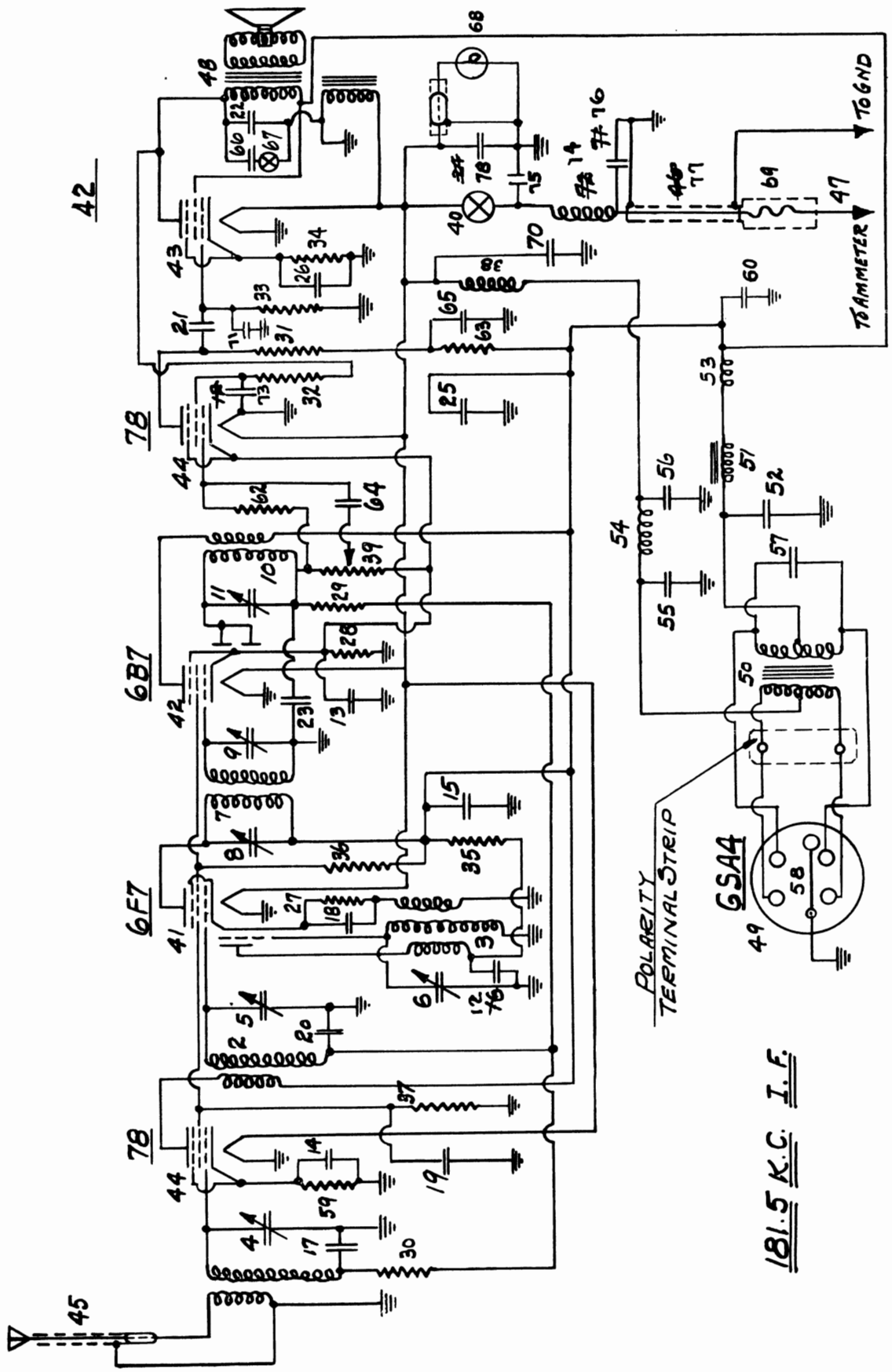
THE CROSLEY RADIO CORPORATION, CINCINNATI, OHIO

5A1 WIRING DIAGRAM

APPROVED C.G. Felix | DATE 1-24-33 | ENGRG. DWG. NO. 8-31760

CROSLEY RADIO CORP.

5A3



CIRCUIT DIAGRAM—MODEL 5A3 —ROAM 10

CROSLEY RADIO CORP.

MODEL 5A3—ROAMIO

TUBE VOLTAGES—MODEL 5A3

Type	Where Used	Ef	Ep	Eg	Ec	Esg	Eosc	E Sup-G
78	R. A. Amp	6.0	230	0–30	5.0	100	—	5.0
6F7	Osc.-Mod.	6.0	230	0–30	8.0	100	55	—
6B7	I. F. Amp. Diode Det. A. V. C.	6.0	230	0	3.0	100	—	—
78	Audio Amp.	6.0	60	0–30	3.0	25	—	3.0
42	Output	6.0	220	0	16.0	230	—	—

VOLTAGES MEASURED TO CHASSIS WITH A 500 VOLT 1000 OHMS PER VOLT VOLTMETER. 6 VOLT BATTERY USED.

VOLTAGE LIMITS PLUS OR MINUS 10%.

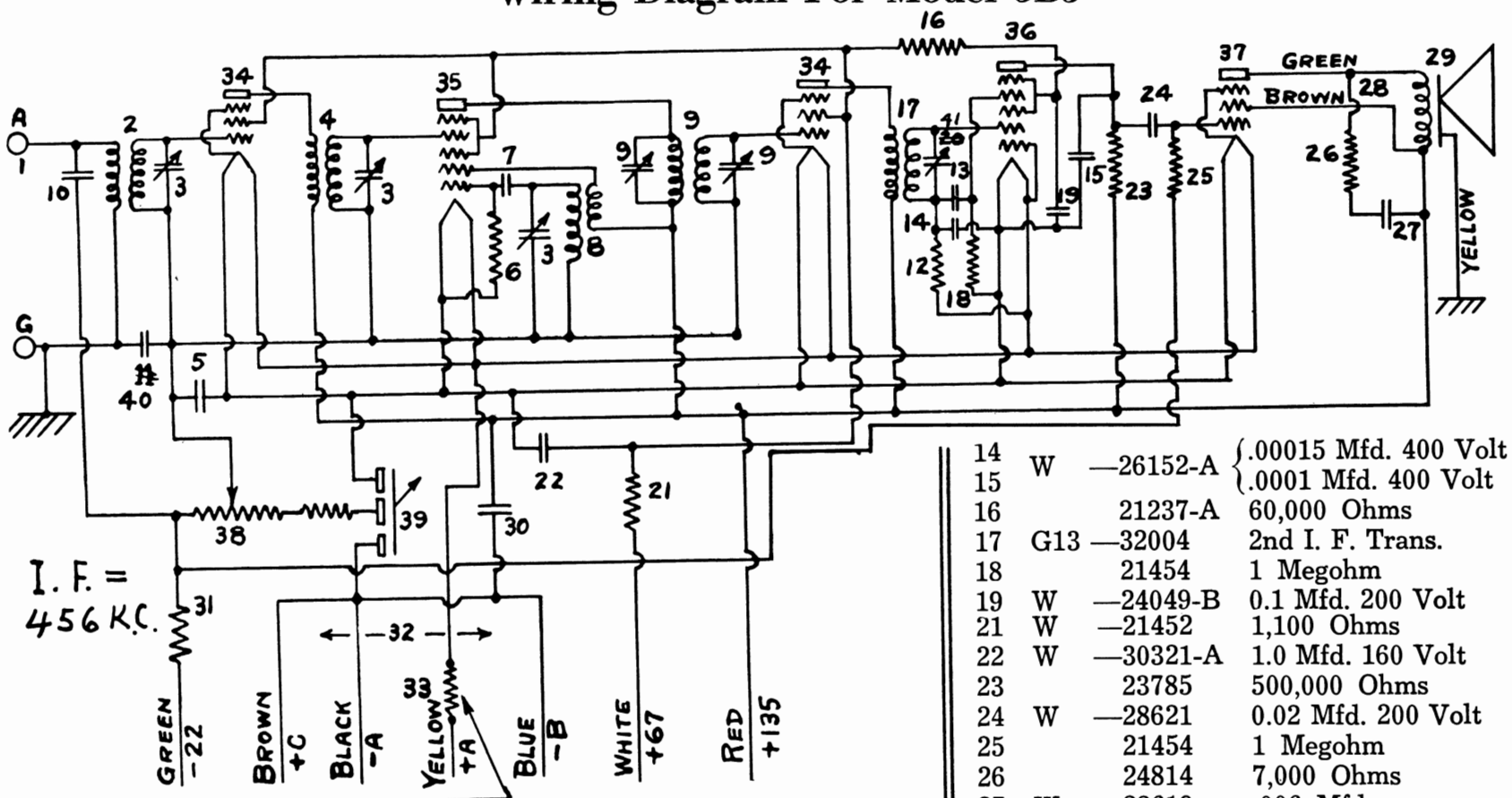
PARTS LIST—MODEL 5A3

Figures in first column refer to parts shown in diagrams.

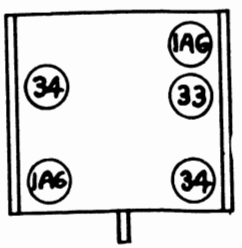
Item No.	Part No.	Description
1	G19—32000	Antenna Coil
	W —30802A	Coil Shield
	W —30026A	Retaining Shield
2	G11—32001	R. F. Coil
	W —30802A	Coil Shield
	W —30877	Insulating Washer
	W —30026A	Retaining Ring
3	G14—32002	Osc. Coil
	W —25025B	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
4		
5	G2 —33002	Tuning Cond. Gang
6		
7		1st. I. F. Trans.
8	G6 —32003	1st. I. F. Prim. Tuning Cond.
9		1st. I. F. Sec. Tuning Cond.
10		2nd. I. F. Trans.
11	G7 —32003	2nd. I. F. Sec. Tuning Cond.
12		0.05 Mfd. 400 Volt
13		0.1 Mfd. 200 Volt 4 Section Condenser
14	W —32711A	0.1 Mfd. 200 Volt
15		0.05 Mfd. 400 Volt
16	Deleted	
17	W —32779B	0.02 Mfd. 200 Volt Condenser
18	W —32781B	0.1 Mfd. 200 Volt Condenser
19	W —32780B	0.05 Mfd. 400 Volt Condenser
20	W —32779B	0.02 Mfd. 200 Volt Condenser
21	W —32780B	0.05 Mfd. 400 Volt Condenser
22	W —23635	0.006 Mfd. 400 Volt Condenser
23	W —32741A	0.0005 Mfd. (Mica) Condenser
24	Deleted See 78	
25	W —32802	8. Mfd. 300 Volt Condenser
26		8. Mfd. 20 Volt Condenser
27	W —21452	1,100 Ohms Resistor
28	W —28589	350 Ohms Resistor
29	—21454	1 Megohm ⅓ Watt Resistor
30	—21875	100,000 Ohms Resistor
31	—23403	150,000 Ohms Resistor
32	—21454	1 Megohm Resistor
33	—23875	500,000 Ohm Resistor
34	W —25521	450 Ohm Resistor
35	—32331	55,000 Ohm ½ Watt Resistor
36	W —26525B	15,000 Ohm Resistor
37		25,000 Ohm Resistor
38	G4 —28067	R F. "A" Choke
39	W —30436A	Level Control
40		Switch
41	G49—27975	6-F-7 Socket
42	G48—27975	6-B-7 Socket
	W —27981A	Tube Shield Base
	W —30964	Tube Shield
43	G25—27975	42 Socket
44	G39—27975	78 Socket
45	L —35108	Antenna Body and Sleeve Assem.
	G1 —32750	Antenna Lead Assem.
46	Deleted See 77	
47	G5 —31701	"A" Cable Assem.

Item No.	Part No.	Description
	W —31102	Fuse Carrier
48	—33B	Speaker
49	LB —32037	6 SA 4 Syncrotube
50	G1 —32769	Power Transformer
51	G11—24628	"B" Filter Choke
52	W —32759	8. Mfd. 300 Volt Condenser
53	G1 —32755	R. F. "B" Choke
54	G6 —28067	R. F. "A" Choke
55	W —30366	0.5 Mfd. 160 Volt Condenser
56	W —30366	0.5 Mfd. 160 Volt Condenser
57	W —32762	0.005 Mfd. 1,000 Volt Condenser
58	G81—27975	6 SA 4 Socket
59	W —21452	1,100 Ohm Resistor
60	W —30741	0.00025 Mfd. (Mica) Condenser
61		
62	W —21454	1 Megohm Resistor
63	W —21237A	60,000 Ohm ¼ Watt Resistor
64	W —32780B	0.05 Mfd. 400 Volt Condenser
65	W —32780B	0.05 7Mfd. 400 Volt Condenser
66	W —32782B	0.01 Mfd. 400 Volt Condenser
67	W —26156A	S. P. S. T. Switch (Tone Control)
68		Dial Light
69	W —32757	12 Amp. Fuse
70	W —32741A	0.0005 Mfd. (Mica) Condenser
71	W —32741A	0,0005 Mfd. (Mica) Condenser
72	Deleted See 74	
73	W —24784	0.25 Mfd. 200 Volt Condenser
74		"A" Choke
75	G8 —31701	.00025 Mfd. Condenser
76		.00025 Mfd. Condenser
77		"A" Lead
78	W —30741	.00025 Mfd. (Mica) Condenser
	B —32783	Anetnna Cable
	W —29754C	0.5 Mfd. Condenser (Eliminator)
	L —32810	Remote Control Assembly Complete
	B —30372B	Housing
	G2 —31538	Cover Assm.
	W —30370	Dial Glass only
	B —32812	Dial
	W —30371A	Dial Hand
	G1 —30295	Gear Assm.
	G5 —23472	Knob (Tuning)
	G1 —28036	Knob (Key)
	G7 —25868	Drive Shaft 15" (V. C.)
	G21—25868	Drive Shaft 15" (Tuner)
	G8 —25868	Drive Shaft 30" (V. C.)
	G20—25868	Drive Shaft 30" (Tuner)
	W —26315	4-40 x ⅛ Dog Pt. S. P. Set Screw (4 used)
	W —28029B	Steering Column Bracket
	G1 —28035	Strap Assm.
	R —186	8-32 x ¾ R. H. Machine Screw (black) (1 used)
	W —20802	No. 10 Shakeproof Washer (black) (4 used)
	R —181	No. 10 x ⅛ R.H. Machine Screw (black) (3 used)
	C —141	8-32 x 1⅛ Fr. Hd. Machine Screw (2 used)
	W —31539	No. 2-56 x ⅛ R.H. Machine Screw (1 used)
	G17—26317	Dial Light Bracket Assem.
	G8 —32750	Dial Light Lead Assem.

Wiring Diagram For Model 5B3



USED ONLY WITH AIR CELL BATTERY



Parts List Model 5B3

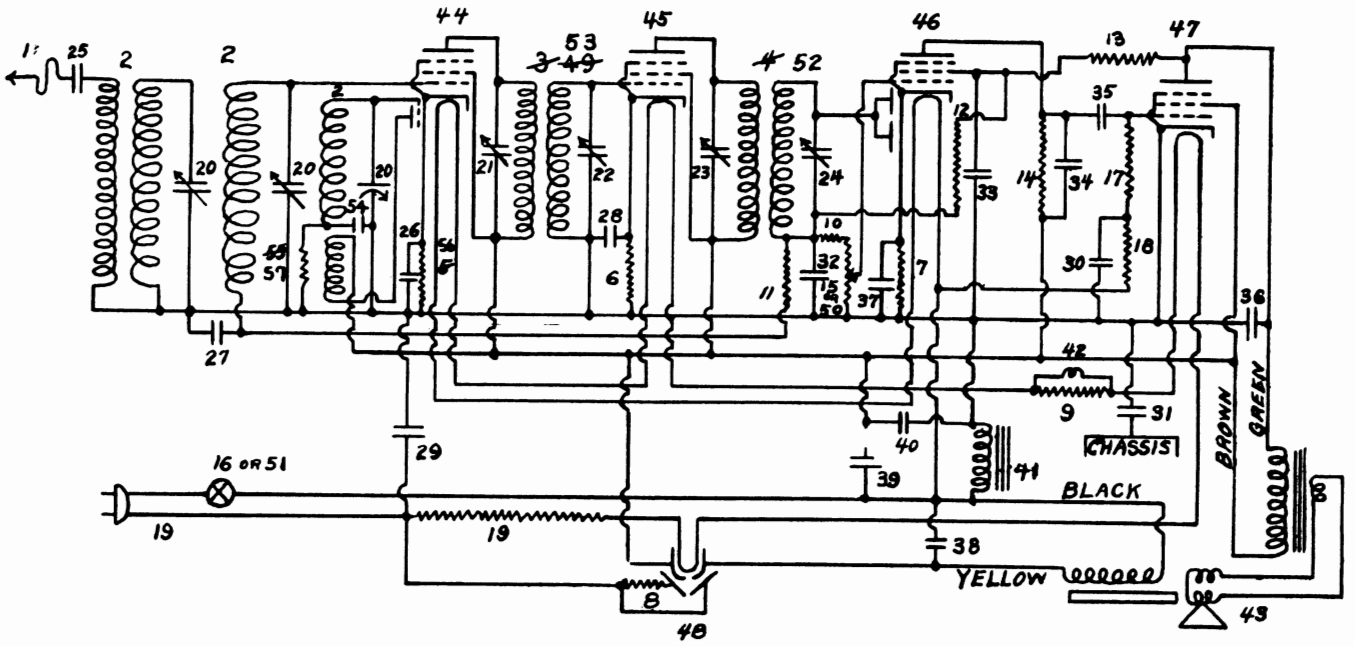
Figures in first column correspond to figures in diagram

1	G10	—26719	Ant. Gnd. Term.
2	G10	—32000	Antenna Coil
3	G4	—33002	Tuning Condenser
4	G17	—32001	R. F. Transformer
5	W	—24049-B	0.1 Mfd. 200 Volt
6		21875	100,000 Ohms
7	G1	—34004	.025 Mfd. (Mica)
8	G9	—32002	Oscillator Coil
9	G9	—32004	1st I. F. Trans.
10	W	—28621	.02 Mfd. 200 Volt
12		23785	500,000 Ohms
13	W	—28621	.02 Mfd. 200 Volt
14	W	—26152-A	.00015 Mfd. 400 Volt
15			.0001 Mfd. 400 Volt
16		21237-A	60,000 Ohms
17	G13	—32004	2nd I. F. Trans.
18		21454	1 Megohm
19	W	—24049-B	0.1 Mfd. 200 Volt
21	W	—21452	1,100 Ohms
22	W	—30321-A	1.0 Mfd. 160 Volt
23		23785	500,000 Ohms
24	W	—28621	0.02 Mfd. 200 Volt
25		21454	1 Megohm
26		24814	7,000 Ohms
27	W	—28619	.006 Mfd.
28	W	—27933	Speaker Cable
29		30418	336-3B Speaker
30	W	—29910-A	0.25 Mfd. 200 Volt
31		27121	5,000 Ohms
32	G2	—29237	Battery Cable
33	G2	—23300	Air Cell Resistor .53 Ohms
34	G31	—27975	34 Socket
35	G55	—27975	1A6 Socket
36	G4	—33070	1A6 Flex. Socket
37	G36	—27975	33 Socket
38	W	—32649	Volume Cont. 10,000 Ohms
39			Switch 3. P. S. T.
40	W	—24049-B	O.1 Mfd. 200 Volt
41	G8	—33005	I. F. Tuning Cond.

CROSLEY RADIO CORP.

CROSLEY RADIO CORP.

CHASSIS 5C2



Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Ep-osc
6F7	Osc-Mod.	6.5	100	0	5	100	—	100
78	I. F.	6.5	100	0	3	100	3	—
6B7	Diode-AF	6.5	15	0	1	15	—	—
43	Output	27	96	-20	0	100	—	—
25Z5	Rectifier	27	—	—	100	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured to –B at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter.

Power demand 50 watts, 110 volts, 60 cycles. Voltages on other frequencies and DC will vary slightly from the above table.

I.F. = 181.5 K.C.

PARTS LIST—MODEL 5C2

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5C2

Qty.	Part No.	Description	* Item	List Each
1	G1-32000	Antenna Coil	2	1.10
1	G2-32003	1st I. F. Trans. Coil	53	.70
1	G1-32003	Diode Feeding Trans.	52	.80
2	W25200A	Coil Socket		.05
2	W25024A	Coil Shield		.10
2	W21541B	Retainer Ring		.05
2	W26891	Insulating Washer		.05
1	G5-33002	Variable Tuning Condenser Gang	62	3.75
1	W31812	Dial Pointer		.05
1	G2-27817	Dial Light Bracket Assm.		.15
1	G3-33006	1st I. F. Prim. & Sec. Trimmer Cond.	58-59	.30
1	G4-33006	2nd I. F. Prim. & Sec. Trimmer Cond.	60-61	.50
1	W32242	Vol. Control & Line Switch	50-51	1.00
or	W31204	Vol. Control & Line Switch	16-15	1.00
1	G49-27975	6F7 Socket	44	.10
1	G39-27975	78 Socket	45	.10
1	G48-27975	6B7 Socket	46	.10
1	G30-27975	43 Socket	47	.10
1	G51-27975	25Z5 Socket	48	.10
2	W32360	Tube Shield Base		.05
2	W31212	Tube Shield (Half)		.05
2	W31213	Tube Shield (Slotted Half)		.05
2	W31210	Tube Shield Ring		.05
1	B30957B	Resistor Cable & Plug (120 Ohms)	19	.70
1	W31765	Antenna	1	.20
1	G2-28859	Filter Choke	41	1.25
		FILTER & BY-PASS CONDENSERS		
1	W31992	10.-8.-25.-16. Mfd. 25 V.-125 V.-125 V.-100 V.	37-38 39-40	3.50
1	W30325	0.003 Mfd. 200 V.	25	.20
1	W25516	0.25-0.25 Mfd. 200 V.-200 V.	30-31	.40
1	W27668	0.0001 Mfd.	32	.15
1	W30322A	0.00017-0.006 Mfd. 200 V.-200 V.	34-35	.30

Qty.	Part No.	Description	* Item	List Each
1	W30323	0.01 Mfd. 200 V.	36	.15
1	W28621	0.02 Mfd. 200 V.	63	.15
1	W28623	0.02-0.02 Mfd. 200 V.-200 V.	64-65	.25
1	W29271A	0.02-0.02 Mfd. 400 V.-400 V.	66-67	.25
1	W29910A	0.25 Mfd. 200 V.	68	.20
		RESISTORS		
1	W28589	350 Ohms	6	.10
1	W27503	1400 Ohms	7	.10
1	W24537	60 Ohms	8	.10
1	W30539	26.7 Ohms	9	.20
1	21237A	60000 Ohms	10	.15
1	21454	1 Megohm	11	.15
1	26578	5 Megohm	12	.15
2	23785	500000 Ohms	13-17	.15
1	23403	150000 Ohms	14	.15
1	21455	300000 Ohms	18	.15
1	W22514	750 Ohms	56	.15
1	24990	25000 Ohms	57	.20
		CABINET AND SPEAKER		
	4D	Cabinet Assembly		5.47
1	W33139	Dial Plate		.15
1	W33140	Vol. Control Plate		.15
1	W28723	Bull's Eye		.05
1	W29023	Bezel		.05
1	W33164	Grille Cloth		.10
1	B33167A	Baffle		.10
1	W33168	Back Cover		.50
1	W33143	Knob		.10
1	W33144	Knob		.10
1	G5-31692	Speaker & Plate Assm.		4.50
1	G1-29529	Cone & Voice Coil		2.00
1	G6-29535	Transformer		1.10
1	W31214	Field Coil		1.25
4	W28742	Speaker Mounting Screws (Chrome)		.05

CROSLEY RADIO CORP.

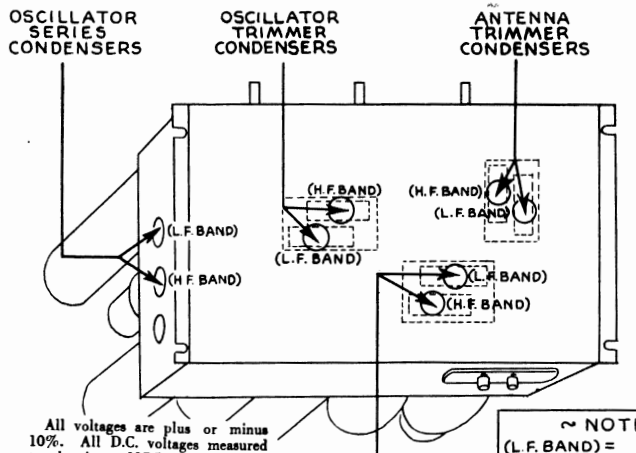
CHASSIS 5H1

PARTS LIST—MODEL 5H1

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5H1

Part No.	Description	* Item
G3-32000	Antenna Coil (Low Freq.)	1
G1-32002	Antenna Coil (High Freq.)	73
G2-32001	R. F. Coil (L. F.)	3
G1-32001	R. F. Coil (H. F.)	4
G2-32002	Osc. Coil (L. F.)	5
G1-32002	Osc. Coil (H. F.)	6
G9-32004	1st I. F. Trans. and Trimmer Condensers	7-8
		9
G10-32004	2nd I. F. Trans. and Trimmer Condensers	10-11
		12
G10-33009	L. F. & H. F. Ant. Trimmer Condensers	14-15
G9-33009	L. F. & H. F. R. F. Trimmer Cond.	16-17
G8-33009	L. F. Osc. Trimmer Cond.	18
G2-33007	L. F. & H. F. Osc. Series Trimmer Cond.	22-23
G7-33002	Variable Tuning Condenser Gang	74
G20-25050	Dial Assm.	
W25200	Coil Shield Socket	
W30802	Coil Shield	
W25025A	Coil Shield	
W25024A	Coil Shield	
W26891	Insulating Washer (L. F. and R. F. & Osc. Coils)	1-3
		5
W21541B	Retaining Ring	1-3-5
W30020	Retaining Ring	2-4-6
G13-27812	Dial Light Bracket Assm.	
W25594B	Tone Control & Line Switch	43-44
W25666B	Level Control (Volume)	70
B32285	6 Pole D. T. Switch	21
B30375A	Cord & Plug	66
G16-26719	Ant.-Gnd. Terminal	75
G49-27456	6F7 Socket	60
G47-27456	6A7 Socket	61
G48-27456	6B7 Socket	62
G25-27456	42 Socket	63
G6-27456	80 Socket	64
W26010	Tube Shield Base	
W27328A	Tube Shield (6F7, 6A7, 6B7)	

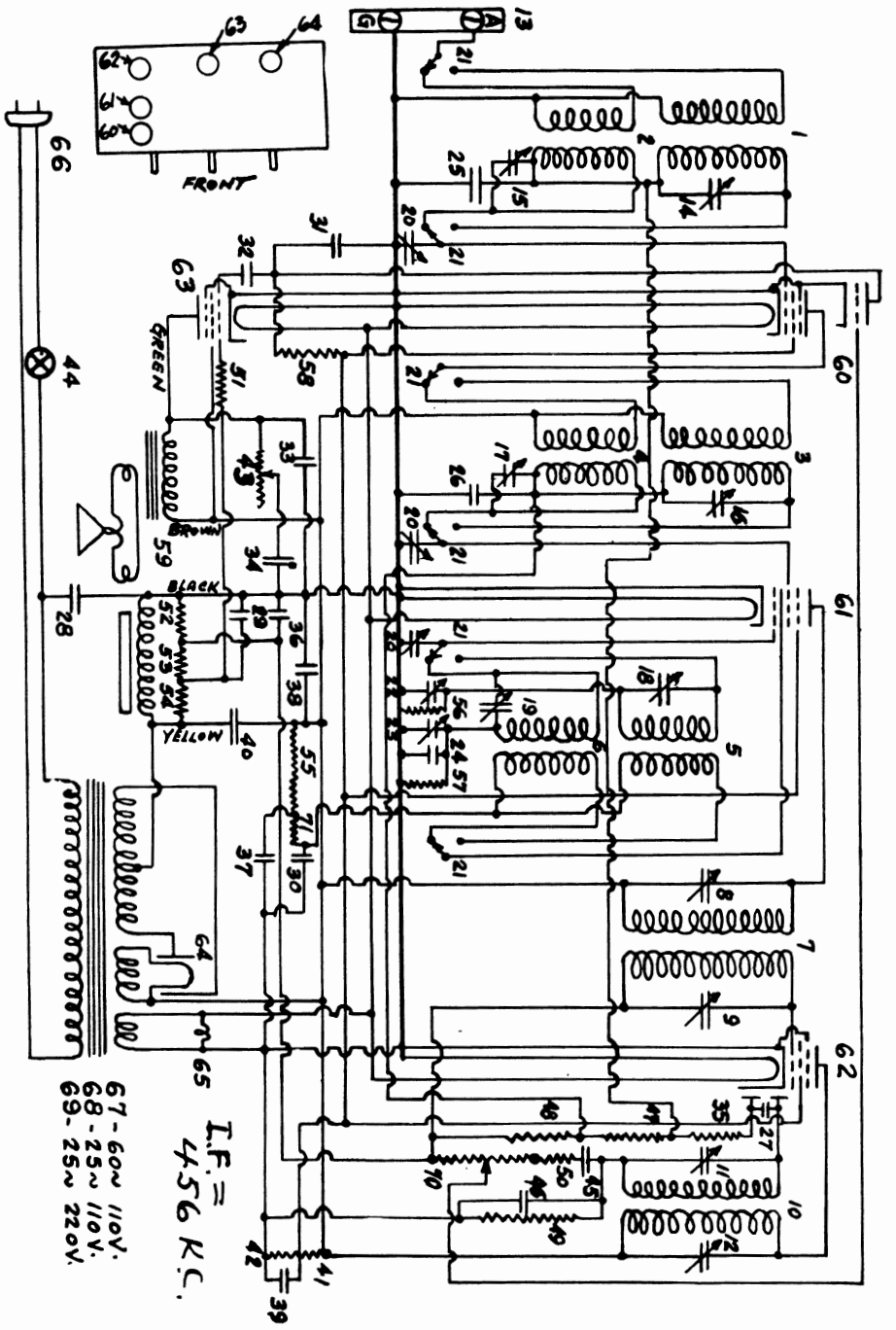
Part No.	Description	* Item
G6-30745	Power Trans. 60 cy. 110 V.	67
G7-30745	Power Trans. 25 cy. 110 V.	68
G-830745	Power Trans. 25 cy. 220 V.	69
	FILTER & BY-PASS CONDENSERS	
W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V.	37-38
		39
W26194B	12. Mfd. 475 V.	40
W30321A	1. Mfd. 160 V.	29
W32304	0.0014 Mfd. 300 V.	24
W32380	0.05 Mfd. 200 V.	25
W32379	0.02 Mfd. 200 V.	26
W27540	0.0005 Mfd. 400 V.	27
W30805	0.01 Mfd. 400 V.	28
W32378	0.01 Mfd. 400 V.	30
W25537A	0.001-0.03 Mfd. 400 V.-400 V.	31-32
W25517	0.008-0.05 Mfd. 400 V.-400 V.	33-34
W24784	0.25 Mfd. 200 V.	36
W30322	0.006-0.00017 Mfd. 200 V.-200 V.	45-46
	RESISTORS	
26577	3 Megohm	35-48
21454	1 Megohm	47-49
W31883	8500-25000 Ohm	41-42
23785	500000 Ohm	50-51
		54
21875	100000 Ohm	53
21876	10000 Ohm	55
21237A	60000 Ohm	56
21453	40000 Ohm	57
23403	150000 Ohm	58
24814	7000 Ohm	71
24990	25000 Ohm	72
W31007A	Speaker Cord (4 Wire)	
W32352	Knob	
W32353	Knob	
W31463	Escutcheon	
S-27	Escutcheon Screws (.10 doz.)	



All voltages are plus or minus 10%. All D.C. voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 50 watts, 110 volts, 60 cycles.

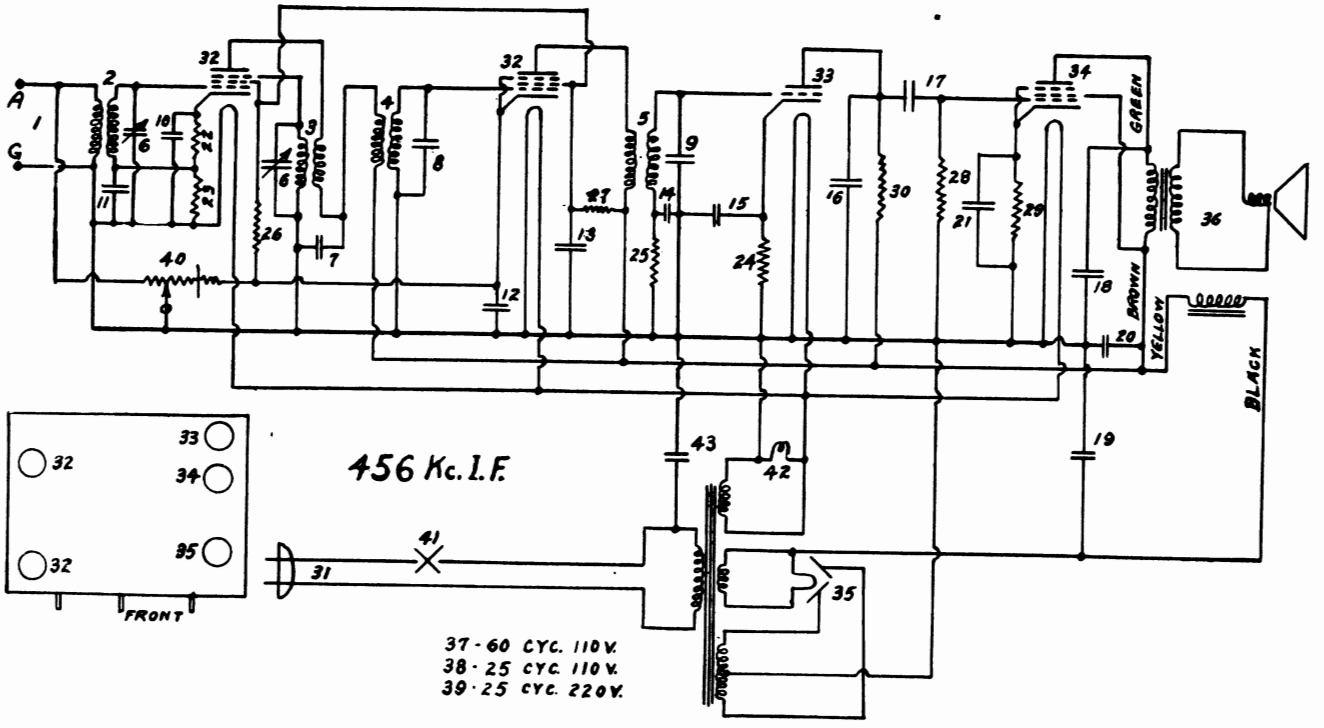
~ NOTE ~
(L.F. BAND) = LOW FREQUENCY BAND
(H.F. BAND) = HIGH FREQUENCY BAND

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Epl	Egl
6F7	R.F.-A.F.	6.5	250	—3.5	0	125	—	35	—3.5
6A7	Osc.-Mod.	6.5	250	—3.5	0	125	—	190	—15.0
6B7	I.F.-Diode	6.5	250	—3.5	0	125	—		
42	Output	6.5	230	—18	0	250			
80	Rectifier	5 1							



CROSLEY RADIO CORP.

CHASSIS 5M3



Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup
6D6	Osc-Mod.	6.3	235	29	32	120	0
6D6	I. F.	6.3	235	0	3	120	3
76	Detector	6.3	80	0	10	—	—
42	Output	6.3	225	0	18	235	—
80	Rectifier	4.9	—	—	310	—	—

All voltages are measured to chassis voltages and are plus or minus 10%. All DC are voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 50 watts, 110 volts, 60 cycles.

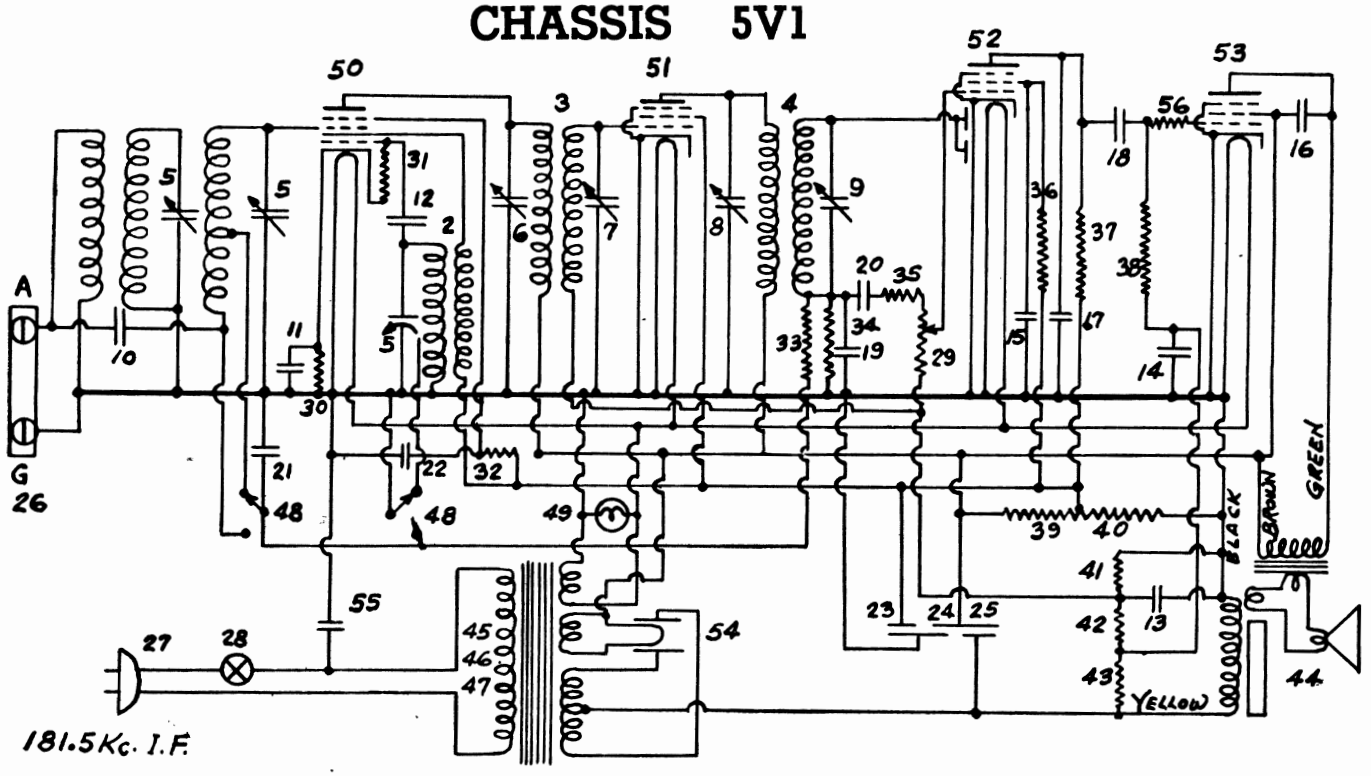
PARTS LIST—MODEL 5M3

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5M3

Qty.	Part No.	Description	* Item	List Each
1	G7-32000	Antenna Coil	2	.35
1	G6-32002	Osc. Coil	3	.40
1	G3-32004	1st I. F. Trans. Coil	4	.55
1	G4-32004	2nd I. F. Trans. Coil	5	.55
4	W25200	Coil Socket		.05
2	W25024A	Coil Shield		.10
2	W25025A	Coil Shield		.10
4	W26891	Insulating Washer		.05
4	W21541B	Retaining Ring		.05
1	G3-33001	Tuning Condenser Gang	44	2.25
1	G19-25050	Dial Assem.		.35
1	G12-27812	Dial Light Brkt Assm.		.20
1	G2-25948	1st I. F. Primary Tuning Cond.	7	.30
1	W27548	1st I. F. Sec. Tuning Cond. Adj. Blade	8	.05
1	W25008A	2nd I. F. Sec. Tuning Cond. Adj. Blade	9	.05
2	W31472	First Blade		.05
2	W25584	Mica Insulator		.05
2	W26069B	Adjusting Nut		.05
2	W25446	Bakelite Washer		.05
2	W24865	Metal Washer		.05
2	W25450B	Insulating Washer		.05
2	W25007B	Insulating Washer		.05
2	O-4	Flat Washer		.05
2	M-20	Rivet (.120x7/32) Tubular		.05
2	R80	4-36x¾ Rd. Hd. Mach. Screw		.05
1	W26573B	Vol. Control & Line Switch	40-41	1.10
2	G75-27456	6D6 Socket	32	.10
1	G80-27456	76 Socket	33	.10
1	G25-27456	42 Socket	34	.10
1	G6-27456	80 Socket	35	.10
2	W26010	Tube Shield Base (6D6)		.10
2	B26009C	Tube Shield		.05
1	B21491C	Cable & Plug	31	.50
1	G5-28500	Power Trans. 60 cy. 110 V.	37	3.00
	G6-28500	Power Trans. 25 cy. 110 V.	38	4.00
	G7-28500	Power Trans. 25 cy. 220 V.	39	4.00
1	LW-20264	Ant.-Gnd. Terminal	1	.15
		FILTER & BY-PASS CONDENSERS		
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V.	16-17	.30
1	W23191A	0.01 Mfd. 400 V.	18	.25
1	W30805	0.01 Mfd. 400 V.	43	.20
1	W28622	0.1-0.1 Mfd. 200 V.-200 V.	45-46	.25
2	W28623	0.02-0.02 Mfd. 200 V.-200 V.	47-48	.25
1	W29150B	8.-6.-12. Mfd. 450 V.-450 V.-25 V.	49-50 19-20 21	2.60
		RESISTORS		
1	W25937	275 Ohm	22	.15
1	31094	4500 Ohm	23	.15
1	21237A	60000 Ohm	24	.15
1	21454	1 Megohm	25	.15
1	W27120	25000-8500 Ohm	26-27	.40
1	23785	500000 Ohm	28	.15
1	W23907	750 Ohm	29	.20
1	21455	300000 Ohm	30	.15
2	W32352	Knob		.10

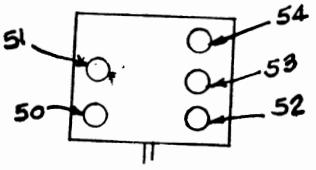
CROSLEY RADIO CORP.

CHASSIS 5V1



Type	Where Used	Ef	Ep	Eg	Ek	Esup	Eg-osc	Ep-osc
6A7	Osc-Mod.	6.5	240	0	3	0	-15	125
6D6	I. F.	6.5	240	-3.5	0	0	—	—
6B7	Diode-AF	6.5	30	-3.5	0	—	—	—
42	Output	6.5	230	-18	0	—	—	—
80	Rectifier	5.1	—	—	240	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured to chassis at 117.5 line with 1000 ohms per volt 250-volt voltmeter. Power demand is 50 watts at 110 volts 60 cycles.



PARTS LIST—MODEL 5V1

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5V1

Qty.	Part No.	Description	* Item	List Each
1	G18-32000	Preselector Coil	1	1.10
1	G15-32002	Osc. Coil	70	.65
1	G2-32003	1st I. F. Trans. Coil	3	.70
1	G1-32003	2nd I. F. Trans. Coil	4	.80
1	G4-33005	1st I. F. Primary Trimmer Cond.	65	.30
1	W-27548	1st I. F. Sec. Trimmer Cond. Adj. Blade	7	.05
1	W-31472	1st I. F. Sec. Trimmer Cond. Fixed Blade		.05
1	W25584	Mica Insulator		.05
1	W26069B	Adjusting Nut		.05
1	W25446	Bakelite Washer		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.05
1	W25007B	Insulating Washer		.05
1	O-4	Flat Washer		.05
1	M-20	Tubular Rivet .120x7/32		.05
1	R-80	4-36x¾ Rd. Hd. Mach. Screw		.05
2	G3-33005	2nd I. F. Prim. & Sec. Trimmer Cond.	66-67	.30
2	G9-33002	Variable Tuning Condenser Gang	57	3.50
1	G7-32086	Dial Drive Assembly		1.00
1	W32441A	Level Control & Line Switch	28-29	1.00
1	B21491C	Cord & Plug	27	.50
1	W32442A	D. P. D. T. Switch	48	.45
1	LW20264	Ant.-Gnd. Terminal	26	.15
1	G47-27456	6A7 Socket	50	.10
1	G75-27456	6D6 Socket	51	.10
1	G47-27456	6B7 Socket	52	.10
1	G25-27456	42 Socket	53	.10
1	G6-27456	80 Socket	54	.10
1	G6-30745	Power Transformer 60 cy. 110 V.	45	3.75
1	G7-30745	Power Transformer 25 cy. 110 V.	46	5.25
1	G8-30745	Power Transformer 25 cy. 220 V.	47	5.25
		FILTER & BY-PASS CONDENSERS		
1	B30059C	8.-8.-8 Mfd. 250 V. 450 V.	23-24	
		450 V.	25	3.00
2	W30321A	1. Mfd. 160 V.	14-68	.55
1	W27668	0.0001 Mfd.	10	.15
1	W26571	0.0005 Mfd. 400 V.	12	.15
1	W30323	0.01 Mfd. 200 V	16	.15
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V.	17-18	.30
1	W30322A	0.00017-0.006 Mfd. 200 V.		
		200 V.	19-20	.30
1	W30805	0.01 Mfd. 400 V.	55	.20
2	W28621	0.02 Mfd. 200 V.	60-61	.15
1	W29271A	0.02-0.02 Mfd. 400 V. 400 V.	63-64	.25
		RESISTORS		
1	W25937	275 Ohms	30	.15
1	21237A	60000 Ohms	31	.15
1	21876	10000 Ohms	32	.15
1	26577	3 Megohm	33	.15
4	23785	500000 Ohms	34-36	
			38-43	.15
2	21455	300000 Ohms	35-56	.15
2	21875	100000 Ohms	37-42	.15
1	W31883	8500-25000 Ohms	39-40	.55
1	24990	25000 Ohms	41	.20
1	W23013	2000 Ohms	69	.15
3	W32352	Knobs		.10

PARTS LIST—MODEL 5V2

Figures in first column refer to parts shown in diagrams

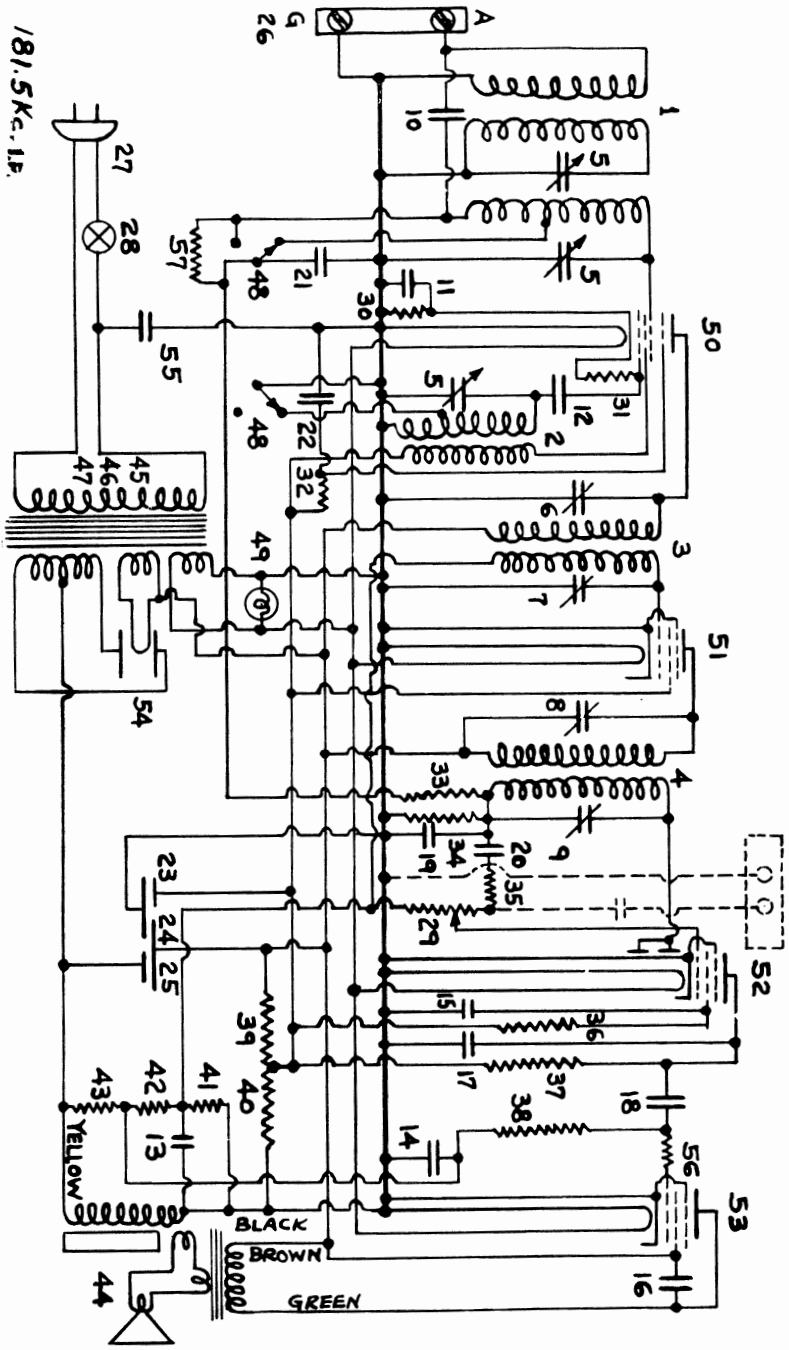
Item No.	Part No.	Description
1	G24—32000	Preselecter Coil
2	G15—32002	Oscillator Coil
	W —25025B	Coil Shield 1"
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21451C	Retaining Ring
3	G2 —32003	1st. I. F. Transformer
	W —25024B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21451C	Retaining Ring
4	G1 —32003	2nd. I. F. Transformer
	W —25024B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21451C	Retaining Ring
5	G21—33002	Tuning Condenser Gang
	G21—25050	Dial Assembly
	G8 —32075	Drive Wheel Assembly
6	G4 —33005	1st. I. F. Primary Trimmer Condenser
7	W —25008A	1st. I. F. Secondary Trimmer Condenser Adj. Blade only
8	G3 —33005	2nd. I. F. Primary Trimmer Cond.
9	G3 —33005	2nd. I. F. Secondary Trimmer Cond.
10	W —27668	0.0001 Mfd. Condenser
11	W —28621	0.02 Mfd. 200 Volt Condenser
12	W —26571	0.0005 Mfd. 400 Volt Condenser
13	W —30321A	1.0 Mfd. 160 Volt Condenser
14	W —30321A	1.0 Mfd. 160 Volt Condenser
15	W —28621	0.02 Mfd. 200 Volt Condenser
16	W —30323	0.01 Mfd. 200 Volt Condenser
17	W —25537A	0.001 Mfd. 400 Volt Condenser
18		0.03 Mfd. 400 Volt Condenser
19	W —30322A	0.00017 Mfd. 200 Volt Condenser
20		0.006 Mfd. 200 Volt Condenser
21	W —29271A	0.02 Mfd. 400 Volt Condenser
22		0.02 Mfd. 400 Volt Condenser
23	B —30059C	8.0 Mfd. 250 Volt (Yellow) Cond.
24		8.0 Mfd. 450 Volt (Red) Condenser
25		8.0 Mfd. 450 Volt (+Red, —No Code) Condenser
26	G10—26719	Ant.-Gnd. Terminal
27	B —33906A	A. C. Cord and Plug
28	W —33556	A. C. Switch
29		Level Control
30	W —25937	275 Ohm Resistor
31	—21237A	60,000 Ohm Resistor
32	—21876	10,000 Ohm Resistor
33	—26577	3 Megohm Resistor
34	—23785	500,000 Ohm Resistor
35	—21455	300,000 Ohm Resistor
36	—23785	500,000 Ohm Resistor
37	—21875	100,000 Ohm Resistor
38	—23785	500,000 Ohm Resistor
39	W —31883	8,500 Ohm Resistor
40		25,000 Ohm Resistor
41	—24990	25,000 Ohm Resistor
42	—21875	100,000 Ohm Resistor
43	—23785	500,000 Ohm Resistor
44	—418C	Speaker
	W —31007A	Speaker Cable
45	G6 —30745	Power Transformer, 110 Volt, 60 Cy.
46	G7 —30745	Power Transformer, 110 Volt, 25 Cy.
47	G8 —30745	Power Transformer, 220 Volt, 25 Cy.
48	W —33557	D. P. D. T. Switch
49	G14—27812	Dial Light Bracket Assembly
50	G47—27456	6-A-7 Socket
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
51	G75—27456	6-D-6 Socket
	W —27981A	Tube Shield Base
	B —26009D	Tube Shield
52	G48—27456	6-B-7 Socket
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
53	G25—27456	—42 Socket
54	G6 —27456	—80 Socket
55	W —30805	0.01 Mfd. 400 Volt Condenser
56	—21455	300,000 Ohm Resistor
57	W —23013	2,000 Ohm Resistor
	W —32352	Knob (Black)
	W —31585B	Knob (Brown)
	W —31463	Escutcheon

TUBE VOLTAGES—MODEL 5V2

Type	Where Used	Ef	Ep	Eg	Esg	Ek	Esup	Eg-osc	Ep-osc
6A7	Osc-Mod.	6.5	240	0	90	3	0	-15	125
6D6	I. F.	6.5	240	-3.5	125	0	0	—	—
6B7	Diode-AF	6.5	30	-3.5	40	0	—	—	—
42	Output	6.5	230	-18	240	0	—	—	—
80	Rectifier	5.1	—	—	—	240	—	—	—

ALL VOLTAGES ARE PLUS OR MINUS 10%. ALL DC VOLTAGES ARE MEASURED TO CHASSIS AT 117.5 LINE WITH 1000 OHMS PER VOLT 250-VOLT VOLTMETER. POWER DEMAND IS 50 WATTS AT 110 VOLTS 60 CYCLES.

ALIGNMENT AND SERVICING PROCEDURE SAME AS ON MODEL 5V1.

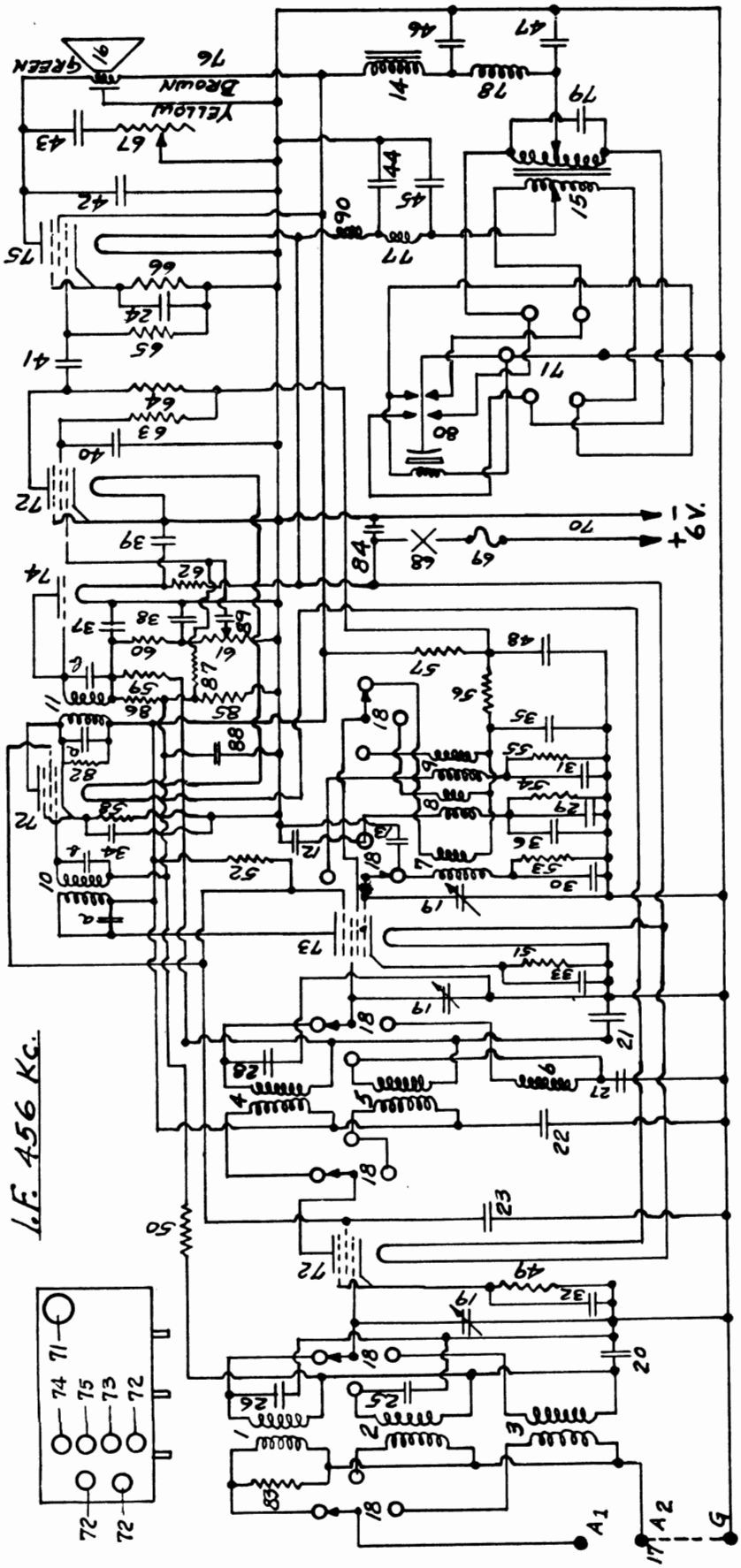


CROSLEY RADIO CORP.

CIRCUIT DIAGRAM OF MODEL 5V2

CROSLEY RADIO CORP.

CIRCUIT DIAGRAM OF MODEL 6B1



PARTS LIST—MODEL 6B1

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1	G20—32000	Low Freq. Ant. Coil
	G5 —31267	Coil Shield Assm.
	W —30026A	Retaining Ring
2	G28—32000	High Freq. Ant. Coil
	G4 —31267	Coil Shield Assem.
	W —30026A	Retaining Ring
3	G31—32000	Police Band Ant. Coil
	G6 —31267	Coil Shield Assm.
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
4	G2 —32001	L. F. R. F. Coil
	W —25024B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
5	G18—32001	H. F. R. F. Coil
	W —30802A	Coil Shield
	W —25200	Coil Socket
	W —30026A	Retaining Ring
6	G19—32001	Pol. Band R. F. Sec. Coil
7	G2 —32002	L. F. Osc. Coil
	G6 —31267	Coil Shield Assm.
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
8	G1 —32002	H. F. Osc. Coil
	W —30802A	Coil Shield
	W —25200	Coil Socket
	W —30026A	Retaining Ring
9	G24—32002	Pol. Band Osc. Coil
	G6 —31267	Coil Shield Assm.
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
10	G34—32004	1st I. F. Trans. Assm.
11	G35—32004	2nd I. F. Trans. Assm.
12, 13	G14—33009	H. F. Osc. Trimmer; I. F. Osc. Trimmer
44	W —33299	0.5 Mfd. 160 Volt Condenser
45	W —33299	0.5 Mfd. 160 Volt Condenser
46	W —34898	8. Mfd. 300 Volt Condenser
47	W —33301	0.25 Mfd. 300 Volt Condenser
48	W —34899	8. Mfd. 250 Volt Condenser
49	W —30127	450 Ohm Flex. Resistor
50	—23785	500,000 Ohm Resistor
51	W —28589	350 Ohm Flex. Resistor
52	—23616	15,000 Ohm Resistor
53	—21237A	60,000 Ohm Resistor
54	—21453	10,000 Ohm Resistor
55	—33390	30,000 Ohm Resistor
56	—31094	4,500 Ohm Resistor
57	—31094	4,500 Ohm Reisitor
58	W —29585	600 Ohm Flex. Resistor
59	—26577	3 Megohm Resistor
60	—21455	300,000 Ohm Resistor
61	W —32062	Level Control
62	W —24537	60 Ohm Flex. Resistor
63	—21454	1 Megohm Resistor
64	—23403	150,000 Ohm Resistor
65	—21454	1 Megohm Resistor
66	W —21452	1,100 Ohm Flex. Resistor
67, 68	W —32063	Tone Control; S. P. S. T. Line Switch
69	W — 7983A	3 Amp. Fuse
	G2 —33339	Fuse Panel Assm.
	W —33310A	Fuse Panel Cover
	W —34223	Insulator
	W — 4072	Thumb Screw
70	B —34902	Battery Cable
71	G1 —33314	Syncrotube Socket
	W —33313B	Rubber Cushion
	See 80	
	W —33312	Rubber Sleeve
	B —33349A	Syncrotube Cover
14	G12—28069	L. F. Choke
15	G3 —31618	Power Transformer
	W —33592A	Transformer Spring
16	—426PT	Speaker
17	G24—26719	Ant. Gnd. Terminal
18	B —34443B	6 P. 3 T. Switch
	W —32162C	Shield (metal)
19	C —33075B	Tuning Condenser Gang
	G25—32086	Dial Assembly
	W —34657A	Dial Hand only
	W —34655B	Dial Pointer only
	W —34603	Dial Cap Nut
20	W —32379	0.02 Mfd. 200 Volt Condenser
21	W —32379	0.02 Mfd. 200 Volt Condenser
22, 23, 24	W —34896	12. Mfd. 250 Volt Condenser; 8. Mfd. 250 Volt Condenser; 8. Mfd. 25 Volt Condenser
25, 26	G1 —33008	H. F. Ant. Trimmer Condenser; L. F. Ant. Trimmer Condenser
27, 28	G9 —33009	H. F. R. F. Trimmer Condenser; L. F. R. F. Trimmer Condenser
29, 30	G7 —33006	H. F. Osc. Series Trimmer Condenser; L. F. Osc. Series Trimmer Condenser
31	G6 —34000	1350 Mmf. Condenser
32	W —28621	0.02 Mfd. 200 Volt Condenser
33	W —28621	0.02 Mfd. 200 Volt Condenser
34	W —28621	0.02 Mfd. 200 Volt Condenser
35	W —32378	0.01 Mfd. 400 Volt Condenser
36	G11—34000	1400 Mmf. Condenser
37, 38	W —26152A	0.00015 Mfd. 400 Volt Condenser; 0.0001 Mfd. 400 Volt Condenser
39	W —34897	100 Mmf. 2 Volt Condenser
40	W —28621	0.02 Mfd. 200 Volt Condenser
41	W —28621	0.02 Mfd. 200 Volt Condenser
42, 43	W —31052	0.004 Mfd. 400 Volt Condenser; 0.05 Mfd. 400 Volt Condenser
72	G88—28807	Socket (15)
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
73	G47—28807	Socket (6A7)
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
74	G9 —28807	Socket (30)
75	G15—28807	Socket (38)
76	W —35111	Speaker Cable, 3 wire
77	G6 —28067	Syncronode "A" Choke
78	G1 —21234	Syncronode R. F. "B" Choke
79	W —32762	0.005 Mfd. 1,000 Volt Condenser
	B —33317C	Syncronde Cover
80	L —33345	Syncrotube (6 SA4)
81	See 84	
82	—23785	500,000 Ohm Resistor
83	—31094	4,500 Ohm Resistor
84	G4 —34005	0.002 Mfd. Condenser
85	—26577	3 Megohm Resistor
86	—26578	5 Megohm Resistor
87	—26577	3 Megohm Resistor
88	W —28621	0.02 Mfd. 200 Volt Condenser
89	W —28621	0.02 Mfd. 200 Volt Condenser
90	G2 —32977	R. F. Choke
	C —33347A	Bottom
	W —35060	Band Change Plate
	W —31585B	Knob—Plain
	W —33995A	Knob—Vernier
	W — 7600	Knob Set Screw
	W —33994A	Knob—Tuning
	W — 7908	Knob Set Screw
	W —34678B	Knob—Band Change
	W —33708	Escutcheon and Lens
	W —34307	Lens only

CROSLEY RADIO CORP.

MODEL 6B1

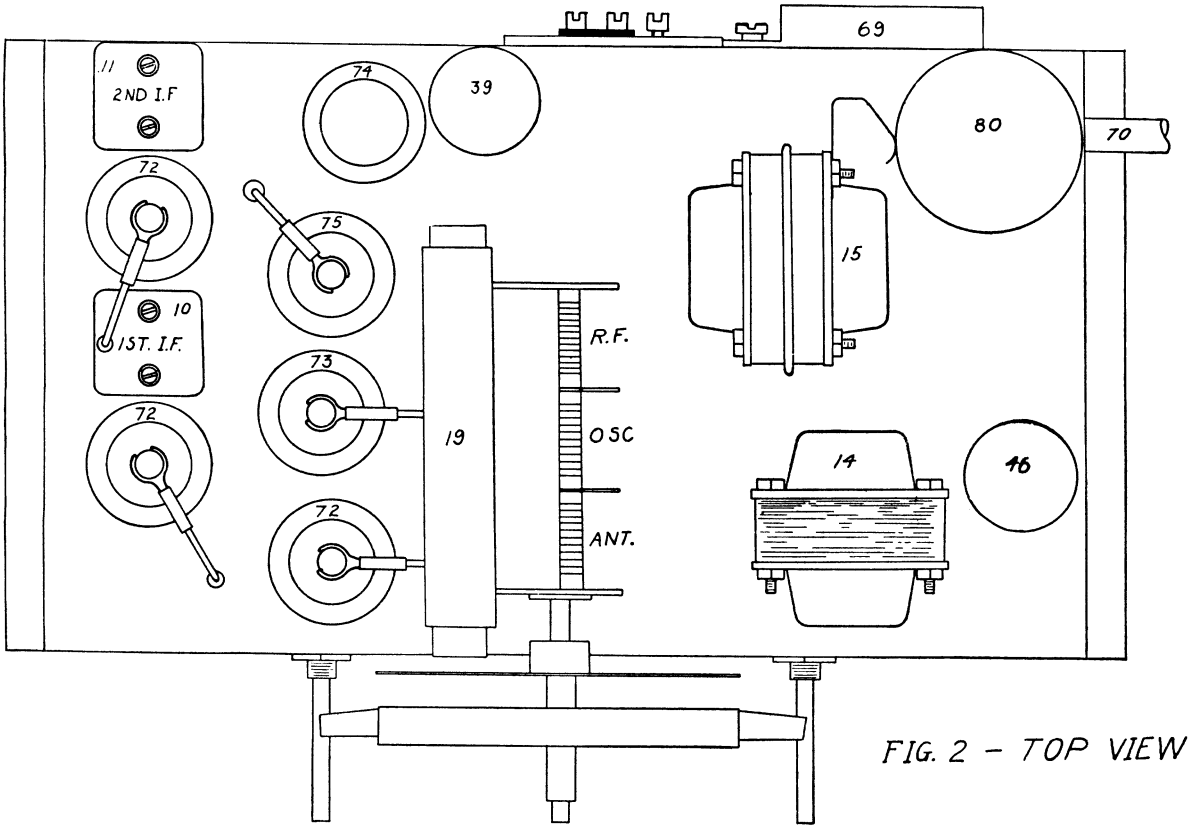


FIG. 2 - TOP VIEW

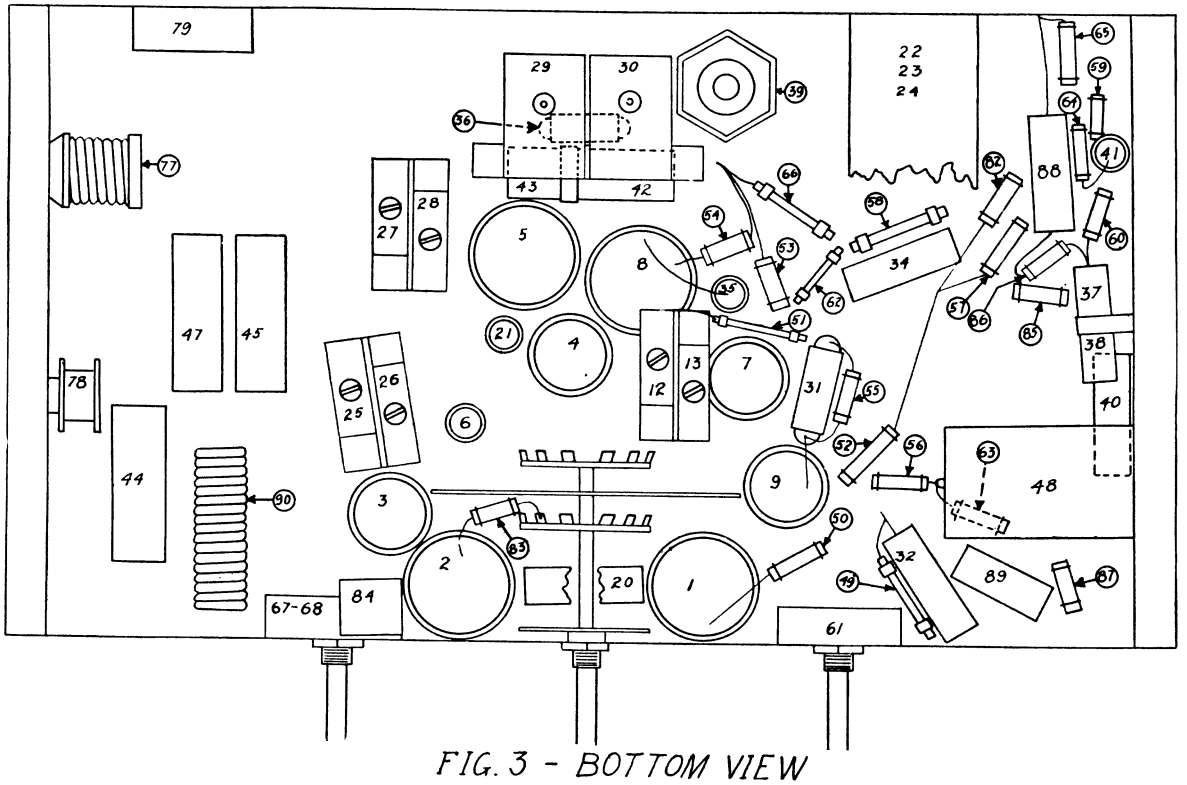


FIG. 3 - BOTTOM VIEW

Ant. Parallel Trimmer Condenser, Band No. 1—Item No. 26.

Ant. Parallel Trimmer Condenser, Band No. 2—Item No. 25.

R.F. Parallel Trimmer Condenser, Band No. 1—Item No. 28.

R.F. Parallel Trimmer Condenser, Band No. 2—Item No. 27.

Osc. Parallel Trimmer Condenser, Band No. 1—Item No. 13.

Osc. Parallel Trimmer Condenser, Band No. 2—Item No. 12.

Osc. Series Trimmer Condenser, Band No. 1—Item No. 30.

Osc. Series Trimmer Condenser, Band No. 2—Item No. 29.

MODEL 6B1—BATTERY SIX

SPECIFICATIONS

The Crosley Model 6B1 is a six tube superheterodyne receiver designed for operation on a six volt storage battery. It tunes in three steps covering the following frequencies:

Band No. 1—540-1725 Kilocycles.

Band No. 2—5600-15300 Kilocycles.

Band No. 3—1700-5500 Kilocycles.

Band No. 1 is calibrated on the dial in Myriacycles (10 Kc.) and Bands No. 2 and 3 are calibrated in Megacycles (1000 Kc.). It employs A. V. C., continuously variable tone control, class "A" pentode audio amplification and a band spread pointer, 36-1 ratio.

TUBES AND VOLTAGE LIMITS

The following are the tubes used and the voltages measured from the tube contacts to the chassis with a 250,000 ohm, 250 volt voltmeter with the receiver in full operating condition but with no signal to the antenna and using a six volt storage battery. A low range voltmeter should be used in measuring the filament voltages. Voltage limits are plus or minus 10% of the values given.

TUBE VOLTAGES—MODEL 6B1

Type	Where Used	Ef	Epl	Ep2	Esg	Eg2	Ek
15	R. F. Amp.	1.98	175		80		2.5
6A7	Osc.-Mod.	5.95	175	145	80	6 to 12	4.0
15	I. F. Amp.	1.98	175		80		2.5
30	Det. & A. V. C.	2.0	0				
15	A. F. Amp.	1.98	90		50 V. C. Full		V. C. Full 0
38	Output	5.95	158		175		18

ALL VOLTAGES GIVEN ARE PLUS OR MINUS 10% AND ARE MEASURED WITH A 250 VOLT (1000 OHMS PER VOLT) VOLTMETER WITH A 6 VOLT BATTERY. A LOW RANGE VOLTMETER USED FOR MEASURING FILAMENTS.

POWER DEMAND APPROXIMATELY 12 WATTS. "A" BATTERY DRAIN AT 6 VOLTS APPROXIMATELY 2 AMP.

CIRCUIT DESCRIPTION

The circuit consists of one stage of R.F. amplification, an oscillator-modulator, one stage of I.F. amplification, diode detector, automatic volume control, two stages of audio amplification and power supply. The R. F. stage employs a Type 15 tube, the oscillator-modulator stage uses a Type 6A7 tube and the I.F. amplifier also uses a Type 15 tube. A Type 30 tube is used as a diode detector and to supply A. V. C. voltage to the control grids of the R.F., oscillator-modulator, I.F. and first A.F. tubes. The first A.F. amplifier employs a Type 15 tube which is resistance coupled to the Type 38 power output pentode tube. A permanent magnet, moving coil type speaker is used and is coupled to the plate of the Type 38 tube through an output transformer which is located on the speaker. A 6SA4 Syncrotube, self-rectifying type vibrator, is used to furnish the "B" power supply.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and should need no readjustment unless some coil or condenser has been replaced. Do not change the setting of any trimmer condenser unless it is definitely known that the adjustment is necessary. If re-alignment is found necessary, the circuits can be properly adjusted only with the use of a modulated test oscillator and an output meter.

CONNECTING OUTPUT METER

The output meter may be connected to the output circuit by connecting one terminal to the plate of the 38 power output tube and the other terminal to the screen grid of the same tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first prong to the left of the filament prongs and the screen grid prong will be the second prong to the left of the filament prongs. Be sure that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

PEAKING I.F. STAGES AT 456 KC.

I. Connect the ground lead of the test oscillator to the chassis frame. Connect a .1 mfd., or larger, condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. The .1 mfd. condenser is necessary to prevent a short circuit which would remove the bias voltage.

II. Set the test oscillator to 456 kilocycles.

III. Turn the volume control of the receiver on full. Rotate the station selector until the condenser plates are completely meshed and set the band change switch to Band No. 2. Turn the tone control all the way to the left. Be sure the bottom plate of the chassis is securely fastened in place.

IV. (a) Peak both tuning condensers located on top of the 2nd I.F. transformer shown in Fig. 2.

NOTE: Be sure to use the lowest test oscillator output that will give a reasonable scale deflection on the output meter. 20-30 volts output should be sufficient for satisfactory alignment.

(b) Peak both tuning condensers located on top of the 1st I.F. transformer shown in Fig. 2.

V Repeat operation (IV) to insure accurate adjustment of the I.F. tuning condensers.

PEAKING R.F. CIRCUITS

I. Connecting Test Oscillator To The Receiver:
It is necessary to connect a DUMMY ANTENNA in series with the test oscillator and the antenna terminal of the receiver. On Bands No. 1 and No. 3 this consists of a .0002 mfd. *mica* condenser. On Band No. 2 it consists of a *carbon* resistor of approximately 400 ohms. With the tuning condenser plates completely meshed make certain that the dial pointer is exactly horizontal. If not, loosen the nut and set the pointer horizontal and tighten the nut again. The setting of the band spread pointer is not important.

II. To Peak Band No. 1:

NOTE: Be sure to use the lowest test oscillator output that will give a reasonable scale deflection on the output meter. 20-30 volts output should be sufficient for satisfactory alignment.

(a) Set the band change switch to Band No. 1.

(b) Set the test oscillator to 1400 kilocycles. Rotate the station selector until the dial pointer points to 140 on the dial. Then adjust the oscillator parallel trimmer condenser, Fig. 3, for Band No. 1 for maximum reading on the output meter.

(c) With the same dial setting peak the Ant. and R.F. parallel trimmer condensers for Band No. 1.

(d) Set the test oscillator to 600 kilocycles.

(e) Tune in the 600 kilocycle signal with the station selector, in the region of 60 on the dial, for maximum reading on the output meter.

(f) Close the oscillator series trimmer condenser for Band No. 1, Fig. 3, ⅛ turn and re-tune the stamately 14 on the dial in addition to 15 on the dial the oscillator parallel trimmer condenser has been aligned on the correct frequency.

(h) Reduce the output of the test oscillator to the previous output and retune the station selector to the 15 megacycle signal at 15 on the dial.

(i) Close the R.F. parallel trimmer condenser for Band No. 2.

(j) Open the R.F. parallel trimmer condenser for Band No. 2 not more than ⅛ turn and re-tune the station selector to the 15 megacycle signal for maximum output.

(k) Repeat operation (j) as many times as necessary to obtain the highest reading on the output meter on the first peak from the closed position.

(l) Close the Ant. parallel trimmer condenser for Band No. 2.

(m) Open the Ant. parallel trimmer condenser for Band No. 2 not more than ⅛ turn and re-tune the station selector to the 15 megacycle signal for maximum output.

(n) Repeat operation (m) as many times as necessary to obtain the highest reading on the output meter on the first peak from the closed position.

tion selector to the 600 kilocycle signal for maximum reading on the output meter.

(g) Repeat operation (f) as many times as necessary to obtain the highest reading on the output meter. However, if the meter reads lower after operation (f) open the oscillator series trimmer condenser ⅛ turn and re-tune the station selector to the 600 kilocycle signal, noting the reading on the output meter as above, and repeat as many times as necessary to obtain the highest meter reading. Do not re-set the parallel trimmer condensers at this frequency.

(h) Repeat operations (b) and (c) for more accurate adjustments.

III. To Peak Band No. 2:

(a) Be sure to change the DUMMY ANTENNA as described in (I) under Peaking R.F. Circuits.

(b) Close the oscillator parallel trimmer condenser for Band No. 2 and then open it 2 turns.

(c) Close the R.F. parallel trimmer condenser for Band No. 2 and then open it ⅛ turn.

(d) Close the Ant. parallel trimmer condenser for Band No. 2 and then open it ¼ turn.

(e) Set the test oscillator to 15 megacycles.

(f) Rotate the station selector until the dial pointer points to 15 on the dial (Band No. 2).

(g) Peak the oscillator parallel trimmer condenser for Band No. 2 on the first signal heard when closing this condenser.

NOTE: To check on the adjustment of the oscillator parallel trimmer condenser.

(1) Increase the output of the test oscillator not more than ten times.

(2) Try to tune in the 15 megacycle signal with the station selector at approximately 14 on the dial.

(3) If the 15 megacycle signal is heard at approxi-

(o) Set the test oscillator to 6 megacycles.

(p) Tune in the 6 megacycle signal with the station selector in the region of 6 on the dial (Band No. 2) for maximum reading on the output meter.

(q) Close the oscillator series trimmer condenser for Band No. 2, Fig. 3, ⅛ turn and re-tune the station selector to the 6 megacycle signal for maximum reading on the output meter.

(r) Repeat operation (q) as many times as necessary to obtain the highest reading on the output meter. However, if the meter reads lower after operation (q) open the oscillator series trimmer condenser ⅛ turn and re-tune the station selector to the 6 megacycle signal, noting the reading on the output meter as above, and repeat as many times as necessary to obtain the highest meter reading. Do not re-set the parallel trimmer condenser at this frequency.

(s) Repeat operations (i), (j) and (k) above in the order given.

(t) Repeat operations (l), (m) and (n) above in the order given.

IV. The circuits of Band No. 3 cannot be aligned as there are no trimmer condensers provided for this band.

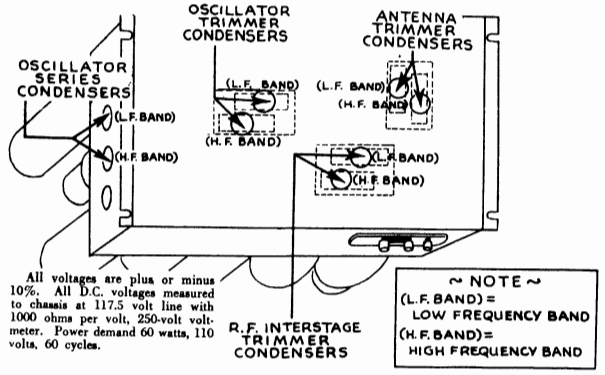
PARTS LIST

* Figures in 2nd last column refer to parts shown in wiring diagram

Part No.	Description	* Item
G3-32000	Antenna Coil (Low Freq.)	2
G1-32002	Antenna Coil (High Freq.)	3
G2-32001	R. F. Trans. Coil (L. F.)	4
G1-32001	R. F. Trans. Coil (H. F.)	5
G2-32002	Oscillator Coil (L. F.)	6
G1-32002	Osc. Coil (H. F.)	7
G9-32004	1st I. F. Trans. (With Trimmers	8-18 19
G10-32004	2nd I. F. Trans. (With Trimmers	9-20 21
W25200	Coil Shield Socket	
W30802	Coil Shield	
W25025A	Coil Shield	
W25025A	Coil Shield	
W26891	Insulating Washer L. F. Ant.-R. F. and Osc.	2-4-6
W21541B	Retaining Ring	2-4-6
W30026	Retaining Ring	3-5-7
G1-33008	L. F. & H. F. Antenna Trimmer Cond.	11-12
G1-33008	L. F. & H. F. R. F. Trimmer Cond.	13-14
G15-33009	L. F. & H. F. Osc. Trimmer Condenser	15-75
G2-33007	L. F. & H. F. Osc. Series Trimmer Cond.	16-17
G19-33002	Variable Tuning Condenser Gang	10
G5-32086	Dial Drive Assm.	
W32208A	Dial Hand	
W32293	Dial Hand Nut	
G75-27456	6D6 Socket	61
G47-27456	6A7 Socket	62
G48-27456	6B7 Socket	63
G80-27456	76 Socket	64
G25-27456	42 Socket	65
G6-27456	80 Socket	66
W26010	Tube Shield Base	
W27328A	Tube Shield (6A7, 6B7)	
B26009C	Tube Shield (6D6)	
G6-30745	Power Transformer 60 cy. 110 V.	71
G7-30745	Power Transformer 25 cy. 110 V.	72
G8-30745	Power Transformer 25 cy. 220 V.	73
B32285	Band Change Switch	74

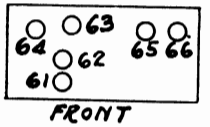
Part No.	Description	* Item
B30375A	Cable & Plug	67
W28552	Level Control (Volume) (3 Megohms)	58
G4-27134	Dial Light Brkt Assm.	
W25594B	Tone Control (80000 Ohm) & Line Switch	59-60-1
G16-26719	Ant.-Gnd. Terminal	
	FILTER & BY-PASS CONDENSERS	
W29097C	8.-8.-8. Mfd. 450 V.-450 V 250 V.	37-38 39
W26194B	12. Mfd. 475 V.	36
W30321	1. Mfd. 160 V.	32
W32379	0.02 Mfd. 200 V.	22-23 25
W32304	0.0014 Mfd.	24
W30322A	0.00017-0.006 Mfd. 200 V.-200 V.	26-27
W25537A	0.001-0.03 Mfd. 400 V.-400 V.	28-29
W30805	0.01 Mfd. 400 V.	30
W32378	0.01 Mfd. 400 V.	31
W24784	0.25 Mfd. 200 V.	33
W25517	0.008-0.05 Mfd. 400 V.-400 V.	34-35
W27540	0.0005 Mfd. 400 V.	40
	RESISTORS	
W28589	350 Ohms (Flexible)	41
21453	40000 Ohms	42
23785	500000 Ohms	43-48 50-53
26577	3 Megohms	44-46
W27504	100 Ohms (Flexible)	45
21454	1 Megohm	47
23403	150000 Ohms	49
21876	10000 Ohms	51
24814	7000 Ohms	52
33474	120000 Ohms	54
W31883	8500-25000 Ohms	56-57
W32352	Knob	
W32353	Knob	
W31007A	Speaker Cord (4 Lead)	
W32219A	Dial Glass	
W32220A	Dial Glass Retainer	
B32190C	Escutcheon	
W33106A	Escutcheon Gasket	
D28	Escutcheon Screws (.10 doz)	

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Epl	Egl
6D6	R.F.	6.5	250	0	-3.0	125	—	—	—
6A7	Osc.-Mod.	6.5	250	0	-4.0	125	—	150	-15.0
6B7	I.F.-Diode	6.5	250	0	-3.0	125	—	—	—
76	A.F.	6.5	35	0	-3.0	—	—	—	—
42	Output	6.5	230	-18	0	250	—	—	—
80	Rectifier	5.1							



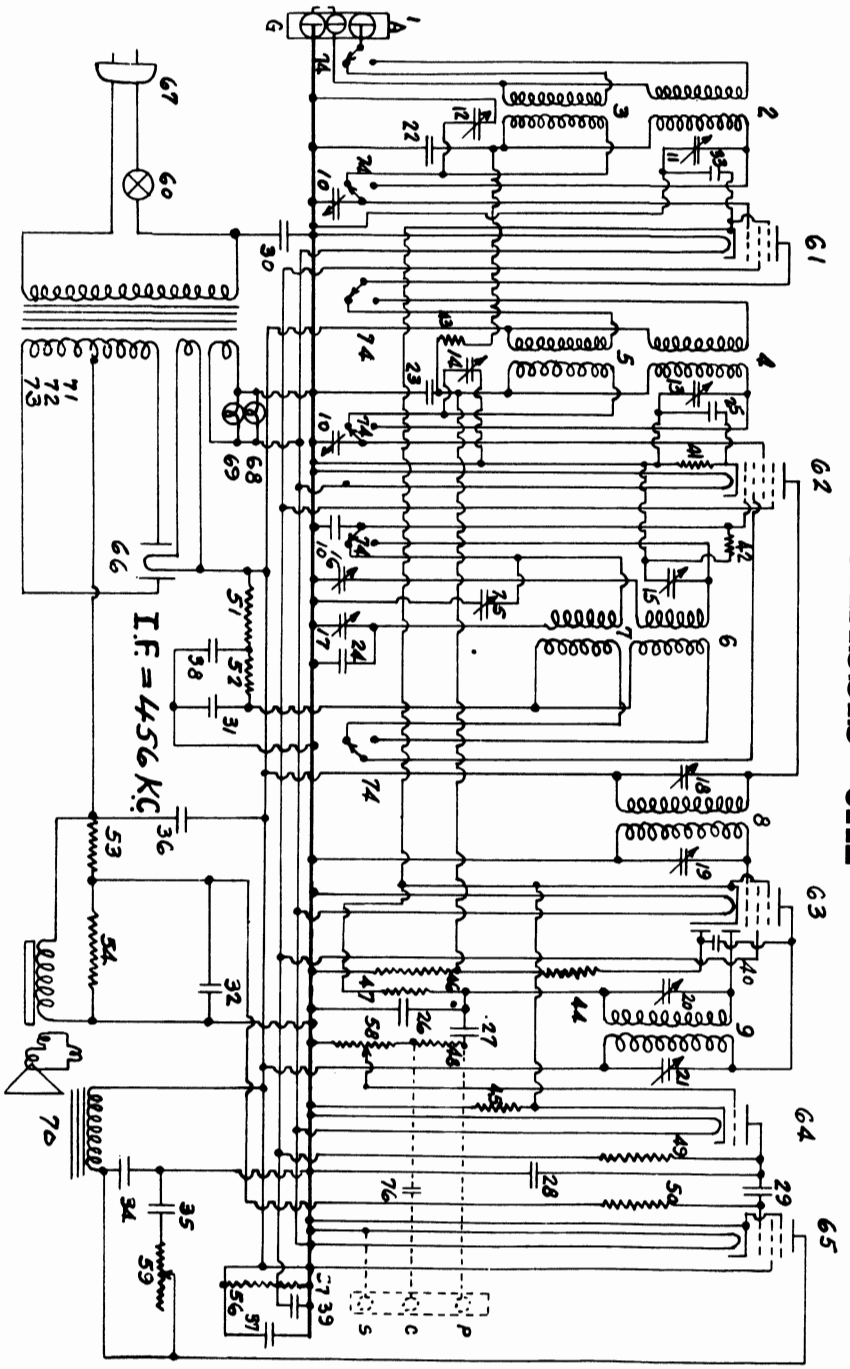
All voltages are plus or minus 10%. All D.C. voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 60 watts, 110 volts, 60 cycles.

~ NOTE ~
(L.F. BAND) = LOW FREQUENCY BAND
(H.F. BAND) = HIGH FREQUENCY BAND



Broadcast Band
535 to 1750 K.C

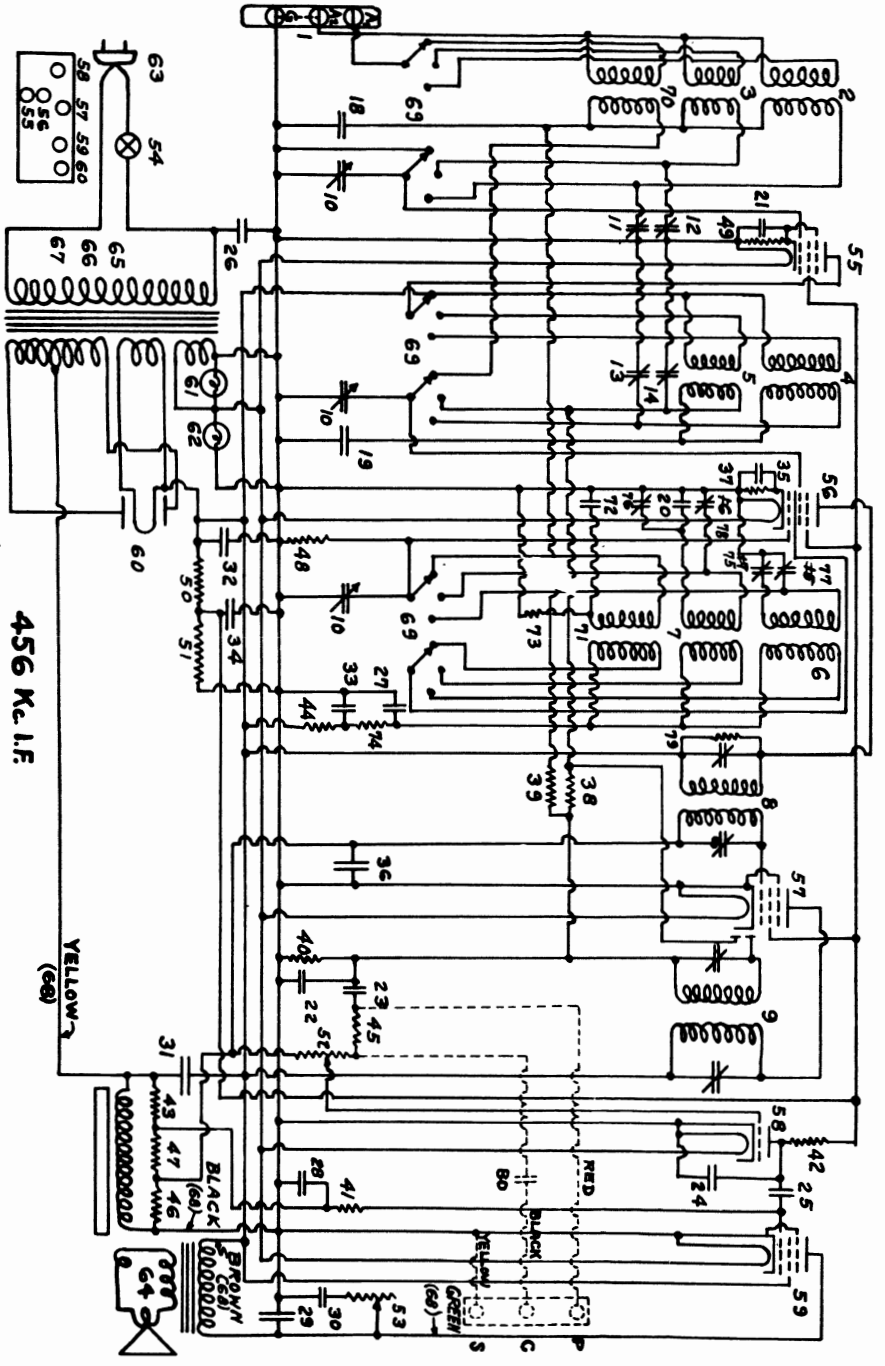
Police Band
5700 to 15500
K.C.



Parts List Model 6H3

Figures in first column correspond to figures in diagram

1	G16	—26719	Ant. Gnd. Term.
2	G3	—32000	L. F. Ant. Coil
3	G1	—32002	H. F. Ant. Coil
4	G2	—32001	L. F. R. F. Coil
5	G1	—32001	H. F. R. F. Coil
6	G2	—32002	L. F. Osc. Coil
7	G1	—32002	H. F. Ocs. Coil
8	G18	—32004	1st I. F. Trans.
9	G19	—32004	Diode Trans.
19	G19	—33002	Variable Cond.
11	G1	—33008	L. F. Ant. Trimmer
12			H. F. Ant. Trimmer
13	G1	—33008	L. F. R. F. Trimmer
14			H. F. R. F. Trimmer
15			
16			
17			
18	W	—32379	0.02 Mfd. 200 Volt
19	W	—32379	0.02 Mfd. 200 Volt
20	W	—32304	1400 Mmfd. H. F.
21	W	—32379	0.02 Mfd. 200 Volt
22	W	—30322-A	.00017 Mfd. 200 Volt
23			.006 Mfd. 200 Volt
24	W	—25537-A	.001 Mfd. 400 Volt
25			.03 Mfd. 400 Volt
26	W	—30805	0.01 Mfd. 400 Volt
27	W	—32378	0.01 Mfd. 400 Volt
28	W	—30321-A	1.0 Mfd. 160 Volt
29	W	—25517-A	.008 Mfd. 400 Volt
30			0.05 Mfd. 400 Volt
31	W	—26194-B	12 Mfd. 475 Volt
32			8 Mfd. 450 Volt (Red)
33	W	—29097-D	8 Mfd. 450 Volt (Green)
34			8 Mfd. .250 V. (No Code)
35	W	—32379	0.02 Mfd. 200 Volt
36	W	—29910-A	0.25 Mfd. 200 Volt
37	W	—28589	350 Ohms
38		26577	3-Megohm
39		26577	3-Megohm
40		21454	1-Megohm
41		23785	500,000 Ohms
42		23403	150,000 Ohms
43		23785	500,000 Ohms
44		21876	10,000 Ohms
45		23785	500,000 Ohms
46		22831	15,000 Ohms
47		21875	100,000 Ohms
48		21453	40,000 Ohms
49	W	—21964	165 Ohms
50	W	—31883	8,500 Ohms
51			25,000 Ohms
52	W	—28552	Level Control
53	W	—25594-B	Tone Control
54			S. P. S. T. Line Switch
55	G75	—27456	6D6 Socket
56	G47	—27456	6A7 Socket
57	G48	—27456	6B7 Socket
58	G80	—27456	76 Socket
59	G25	—27456	42 Socket
60	G6	—27456	80 Socket
61	W	—4099-A	6 V. Dial Light
62	W	—4099-A	6 V. Dial Light
63	B	—33905	Cable & Plug
64		318-B	Speaker
65	G6	—30745	Power Trans. 60 Cy.
66	G7	—30745	Power Trans. 25 Cy. 110 Volt
67	G8	—30745	Power Trans, 25 Cy. 220 Volt
68	W	—31007-A	Speaker Cord
69	B	—34427-A	Band Change Switch
70	G31	—32000	3rd Ant. Coil
71	G24	—32002	3rd Osc. Coil
72	G7	—34000	1450 Mmfd.
73	W	—24990	25,000 Ohms
74		22831	15,000 Ohms
75	G2	—33007	L. F. Osc. Series Cord
76			H .F. Osc. Series Cord
77	G9	—33009	L. F. Osc. Trimmer
78			H. F. Osc. Trimmer
79		23785	500,000 Ohms
80	W	—23191-A	.01 Mfd. 400 V. (For. Only)

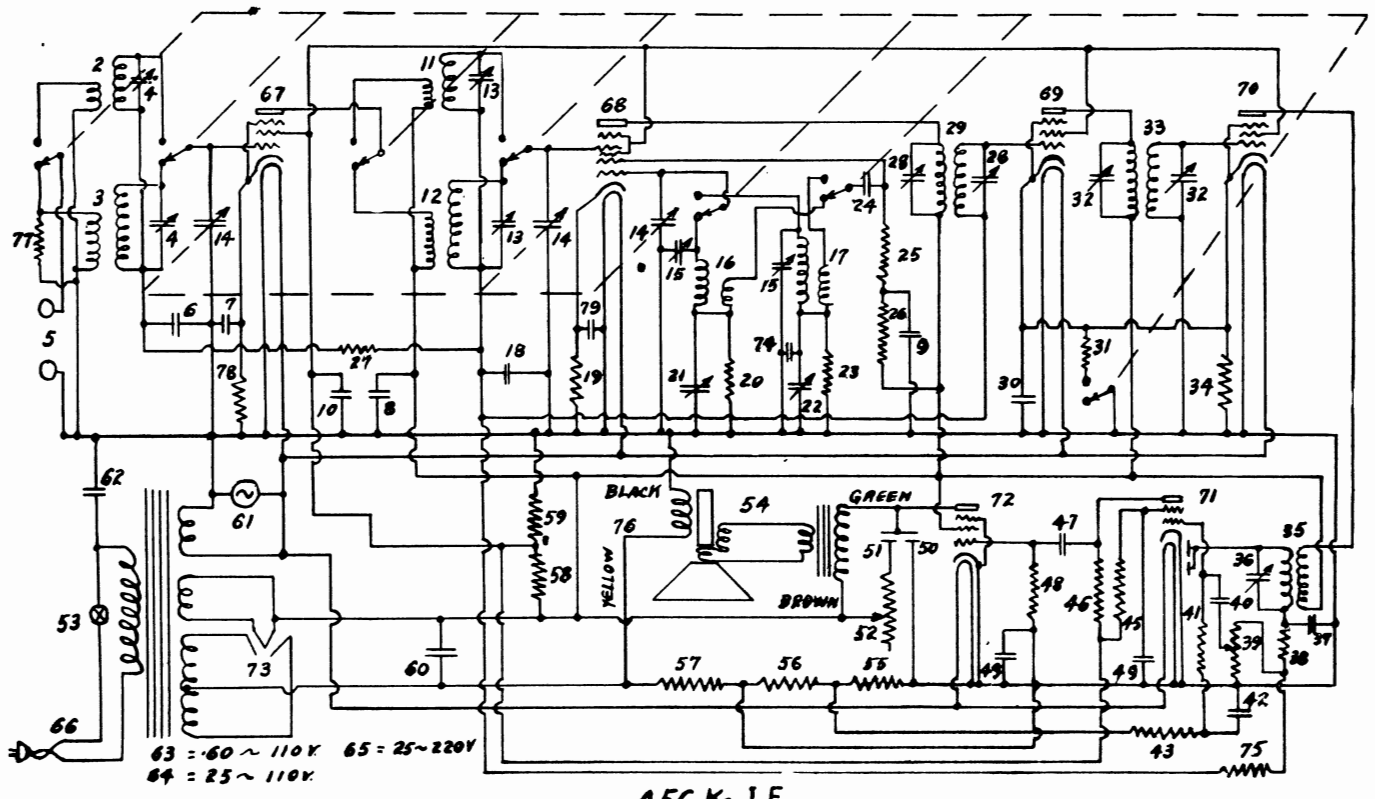


CROSLEY RADIO CORP.

Wiring Diagram For Model 6H3

CROSLEY RADIO CORP.

CHASSIS 7H2

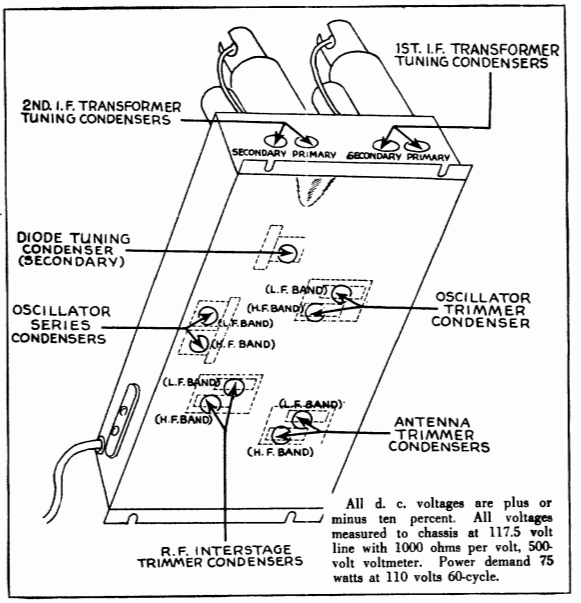


456 Kc. I.F.

PARTS LIST—MODEL 7H2

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 7H2

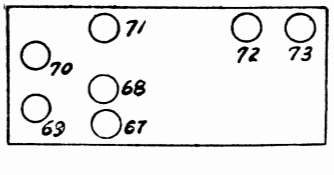
Part No.	Description	* Item
G1-32002	Antenna Coil (H. F.)	81
G3-32000	Antenna Coil (L. F.)	3
G1-32001	R. F. Coil (H. F.)	11
G2-32001	R. F. Coil (L. F.)	12
G2-32002	Osc. Coil (L. F.)	16
G1-32002	Osc. Coil (H. F.)	17
G1-32004	1st I. F. Trans.	29
G1-32004	2nd I. F. Trans.	33
G2-32004	3rd I. F. Trans. (Diode)	35
W31386	Coil Shield Bracket	
W25200	Coil Socket	
W30802	Coil Shield	
W25025A	Coil Shield	
W25024A	Coil Shield	
G1-24064	Coil Shield	29-33
		35
W26801	Insulating Washer	3-12
W21541B	Retaining Ring	16
W30026	Retaining Ring	81-11
		17
G1-33008	Ant. Tuning Condenser	86
G1-33008	R. F. Tuning Condenser	87
G2-33009	Osc. Tuning Condenser	80
G7-33006	I. F. Condenser	88-89
G6-33006	1st & 2nd I. F. Condensers	90-91
G2-33006	3rd I. F. Condenser	92
G13-33002	Variable Tuning Condenser Gang	82
G1-32086	Dial Drive Assm.	
G4-27134	Dial Light Bracket Assm.	61
W32128A	Light Diffuser Retainer	
W32244	Light Diffuser	
B32147A	7 Pole D. T. Switch	1
W32062	Level (Volume) Control (1 Meg.)	39
W32063	Tone Control & Switch	52-53
G16-26719	Ant.-Gnd. Terminal	93
G5-30745	Power Trans. 60 cy. 110 V.	63
G36-25669	Power Trans. 25 cy. 110-220 V.	64-65
		66
	FILTER & BY-PASS CONDENSERS	
W26194B	12. Mfd. 475 V. Condenser	60
W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V. Condenser	8-9
W32380	0.05 Mfd. 200 V. Condenser	10
W25435	0.003 Mfd. 400 V.	18
W24049	0.1 Mfd. 200 V.	24
		30-42
W27932	0.0001 Mfd. 200 V.	44
W27216	0.05 Mfd. 200 V.	37
W30321	1.0 Mfd. 160 V.	47
W31032	0.004-0.05 Mfd. 400 V.-400 V.	49
W30805	0.01 Mfd. 400 V.	50-51
W32304	0.0014 Mfd.	62
W28621	0.02 Mfd. 200 V.	74
W28619	0.006 Mfd. 200 V.	83-85
W32379	0.02 Mfd. 200 V.	84
		6
	RESISTORS	
W25937	275 Ohm	19-78
W21237A	60000 Ohm	20
W21433	40000 Ohm	23
W21876	10000 Ohm	25-26
W21455	300000 Ohm	27
W22514	750 Ohm	31-34
W23403	150000 Ohm	38-56
W21454	1 Megohm	41-43
		57
W23785	500000 Ohm	45-48
W21875	100000 Ohm	46
W22831	15000 Ohm	55
W31361	7000-11000 Ohms	58-59
W26577	3 Megohm	75
W31094	4500 Ohm	77
W31007A	Speaker Cord (4 Lead)	76
W32252	Knob	



All d. c. voltages are plus or minus ten percent. All voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 500-volt voltmeter. Power demand 75 watts at 110 volts 60-cycle.

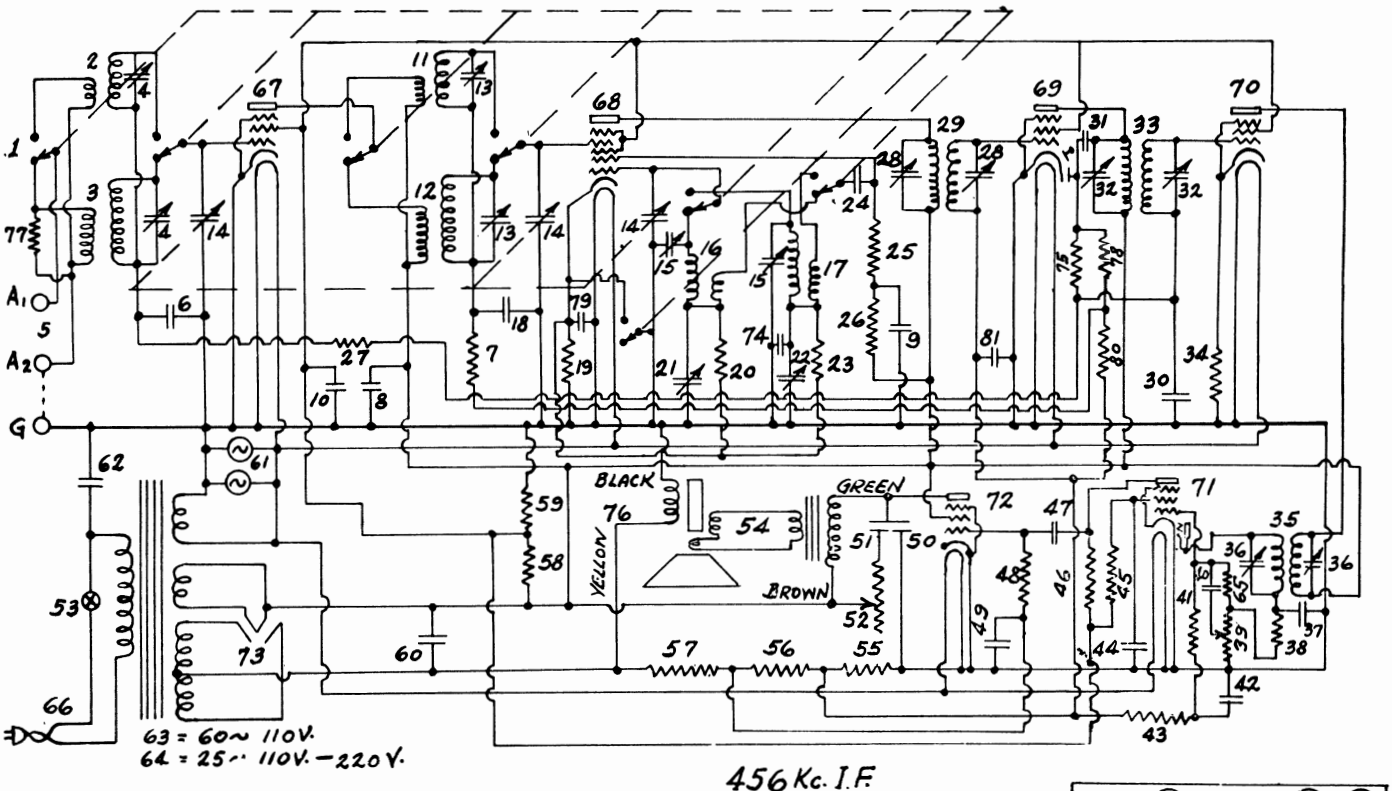
Type	Where Used	Ef	Ep	Eg	Ek	Esg	Ep-osc.
58	RF	2.5	225	0	3	100	
2A7	Osc. Mod.	2.5	225	0	3	100	150
58	1st IF	2.5	225	0	4.5	100	
58	2nd IF	2.5	225	0	4.5	100	
2B7	Diode AF	2.5	50	0.5	0	22	
2A5	Output	2.5	215	2.0	0	225	
80	Rectifier	4.9	—	—	225	—	

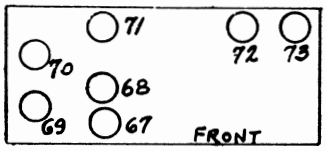
Voltage Across Speaker Field, — 120.



CROSLEY RADIO CORP.

CHASSIS 7H3





PARTS LIST—MODEL 7H3

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 7H3

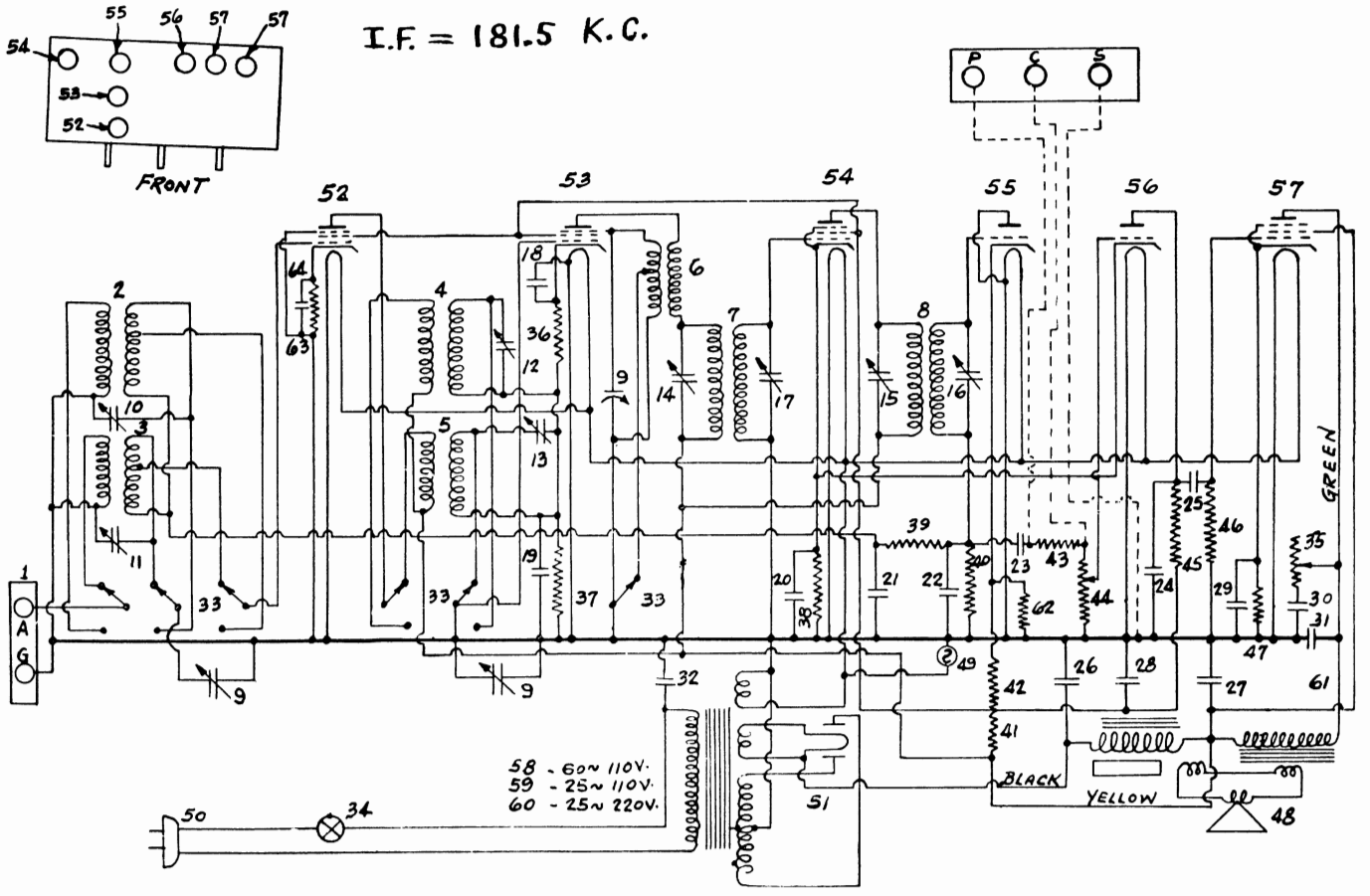
Part No.	Description	Item
G1-32002	Antenna Coil (H. F.)	2
G3-32000	Antenna Coil (L. F.)	3
G1-32001	R. F. Coil (H. F.)	11
G2-32001	R. F. Coil (L. F.)	12
G2-32002	Osc. Coil (L. F.)	16
G1-32002	Osc. Coil (H. F.)	17
G1-32004	1st I. F. Trans.	29
G1-32004	2nd I. F. Trans.	33
G6-32004	3rd I. F. Trans. (Diode) & Trimmer Condensers	35-36
W31386	Coil Shield Bracket	
W25200	Coil Sockets	
W30802	Coil Shield	
W25025A	Coil Shield	
W25024A	Coil Shield	
G1-24064	Coil Shield	29-33
W26891	Insulating Washer	
W21541B	Retaining Ring	3-12-16
W30026	Retaining Ring	11-2-17
G1-33008	Ant. Trimmer Condenser	4
G1-33008	R. F. Trimmer Condenser	13
G14-33009	Osc. Trimmer Condenser	15
G12-33006	L. F. & H. F. Osc. Trimmer Cond. (Series)	21-22
G6-33006	1st I. F. Trimmer Cond.	28
G6-33006	2nd I. F. Trimmer Cond.	32
G18-33002	Variable Tuning Condenser Gang	14
G1-32086	Dial Drive Assm.	
G4-27134	Dial Light Brkt Assm.	61
W32128A	Light Diffuser	
W32244	Light Diffuser Retainer	
G75-27975	6D6 Socket (R. F. & 2nd I. F.)	67-70
G47-27975	6A7 Socket (Osc.)	68
G48-27975	6B7 Socket (I. F. & Diode)	69
G49-27975	6F7 Socket (Diode & 1st A. F.	71
G25-27975	42 Socket (Output)	72
G6-27975	80 Socket (Rectifier)	73
W27981	Tube Shield Base	
W28632	Tube Shield (6A7-6B7-6F7)	
B26009	Tube Shield (6D6 Tube)	
G9-30745	Power Transformer 60 cy. 110 V.	63
G39-25669	Power Transformer 25 cy. 110-220 V.	64
B32147A	7 P. D. T. Switch	1
G16-26719	Ant.-Gnd. Terminal	5
W32062	Level Control (Volume) 1 Megohm	39
W32063	Tone Control & Line Switch	52-53
B21491A	Cord & Plug	66
	FILTER & BY-PASS CONDENSERS	
W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V.	8-9
W26194B	12. Mfd. 475 V.	10
W30321	1. Mfd. 160 V.	60
W32379	0.02 Mfd. 200 V.	49
W32380	0.05 Mfd. 200 V.	6
W25435	0.003 Mfd. 400 V.	18
W27216	0.05 Mfd. 200 V.	24
W31937	0.0001 Mfd.	30-47
W27932	0.0001 Mfd. 200 V.	31
W28619	0.006 Mfd. 200 V.	37
W24049	0.1 Mfd. 200 V.	40
W31052	0.004-0.05 Mfd. 400 V.-400 V.	42-44
W30805	0.01 Mfd. 400 V.	50-51
W32304	0.0014 Mfd.	62
	RESISTORS	74
26577	3 Megohm	7-41-75
W27503	1400 Ohm	19
21237A	60000 Ohm	20
21453	40000 Ohm	23
21876	10000 Ohm	25-26
21455	300000 Ohm	27
W25937	275 Ohm	34
23403	150000 Ohm	38
21454	1 Megohm	43-57
		78
23785	500000 Ohm	45-48
21875	100000 Ohms	46
33390	30000 Ohms	55
23403	150000 Ohms	56
W31361	7000-11000 Ohms	58-59
26578	5 Megohm	65
31094	4500 Ohms	77
W31007A	Speaker Cord	76
W32127A	Dial Glass	
W32126A	Dial Glass Retainer	
B32125B	Escutcheon	
W32352	Knob	
G1-32067	Crank Assm.	
B32172	Tube & Cond. Shield	
W23880A	Thumb Screw	
C32149	Bottom	

Type	Where Used	Ei	Ep	Eq	Ek	Esg	Ep-Osc
6D6	R.F.	6.5	225	—	0	100	—
6A7	Osc.-Mod.	6.5	225	—	(10LF) (0HF)	100	150
6B7	1st I.F. & A.V.C. Diode	6.5	225	0.3	0	100	—
6D6	2nd I.F.	6.5	225	—	2.0	100	—
6F7	Diode & I.F.	6.5	30	-5	0	22	—
42	Output	6.5	215	2.0	0	225	—
80	Rectifier	4.9	—	—	225	—	—

105 volts across speaker field.

CROSLEY RADIO CORP.

CHASSIS 7V2



PARTS LIST—MODEL 7V2

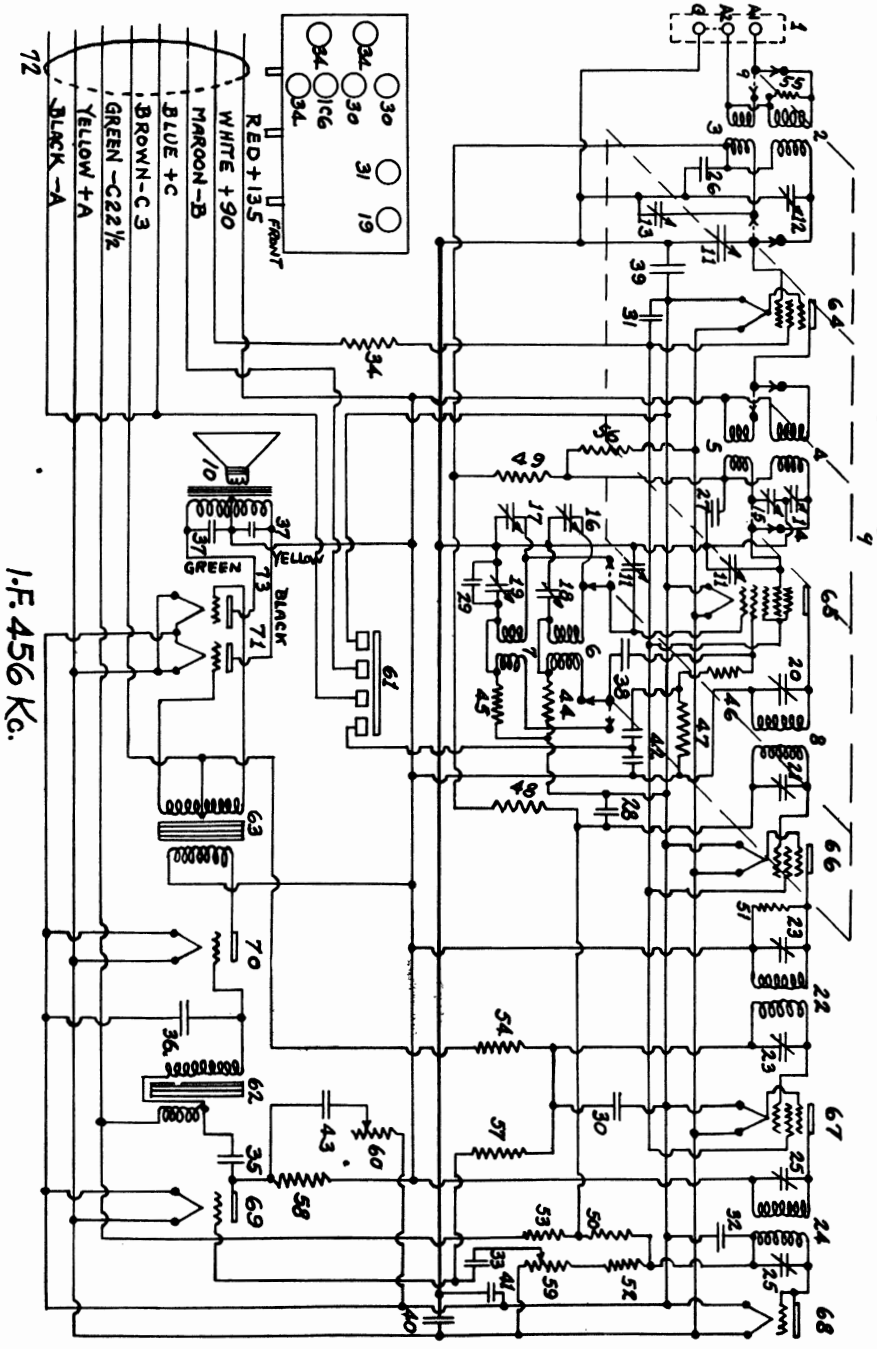
*** Figures in 2nd last column refer to parts shown in wiring diagram of Model 7V2**

Qty.	Part No.	Description	* Item	List Each
1	G15-32000	Ant. Transformer Coil L. F. (Short Wave)	2	.60
1	G16-32000	Ant. Transformer Coil H. F. (Broadcast)	3	.45
1	G9-32001	R. F. Transformer Coil L. F.	4	.50
1	G8-32001	R. F. Transformer Coil H. F.	5	.50
1	G11-32002	Osc. Transformer Coil	6	.70
1	G5-32003	1st I. F. Transformer Coil	7	.70
1	G1-32003	2nd I. F. Transformer Coil	8	.80
7	W25200	Coil Socket		.05
5	W25024A	Coil Shield (Large)		.10
2	W25025A	Coil Shield (Small)		.10
7	W26891	Insulating Washer		.05
7	W21541B	Retaining Ring		.05
1	G1-29699	L. F. & H. F. Ant. Trimmer Cond.	10-11	.20
1	G1-29699	L. F. & H. F. R. F. Trimmer Cond.	12-13	.20
1	G1-33007	1st & 2nd I. F. Primary and 2nd I. F. Secondary Trimmer Cond.	14-15	.70
1	W25008A	1st I. F. Sec. Trimmer Cond. Adj. Blade	16	.05
1	W32291B	Dial Support Brkt.	17	.05
1	G6-32086	Dial Drive Assm.		1.20
1	W32208A	Dial Hand		.05
1	G14-33002	Variable Tuning Condenser Gang	65	3.75
1	W25666B	Level Control (Volume)	44	.90
1	W25594B	Tone Control & Line Switch	34-35	1.10
2	G4-27134	Light Bracket Assm.	49	.20
1	B30569D	6 Pole D. T. Switch	33	1.90
3	G24-27456	58 Socket	52-53	
			54	.10
2	G18-27456	56 Socket	55-56	.10
1	G43-27456	2A5 Socket	57	.10
1	G6-27456	80 Socket	51	.10
3	W26010	Tube Shield Base (58 Tube)		.05
3	B26009C	Tube Shield		.10
1	G17-23559	Power Transformer 110 Volt 60 cy.	58	3.25
1	G18-23559	Power Transformer 110 Volt 25 cy.	59	4.75
1	G19-23559	Power Transformer 220 Volt 25 cy.	60	4.75
1	B-21491C	A. C. Cord & Plug	50	.50
1	LW-20264	Ant.-Gnd. Terminal	1	.15
		FILTER & BY-PASS CONDENSERS		
1	W29150B	12.-6.-8. Mfd. 25 V.-450 V.-450 V. Cond.	27-28	
			29	2.60
1	W26194B	12. Mfd. 475 Volt Cond.	26	1.25
1	W24049B	0.1 Mfd. 200 Volt Cond.	20	.15
1	W23142	0.02 Mfd. 400 Volt Cond.	21	.20
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V. Cond.	24-25	.30
1	W25517A	0.05-0.008 Mfd. 400 V.-400 V. Cond.	30-31	.30
1	W30805	0.01 Mfd. 400 Volt Cond.	32	.20
1	W29266B	0.00017-0.03 Mfd. 400 V.-400 V. Cond.	66-67	.25
1	W28621	0.02 Mfd. 200 Volt Cond.	68	.15
1	W28623	0.02-0.02 Mfd. 200 V.-200 V. Cond.	69-70	.25
		RESISTORS		
3	W25937	275 Ohm	36-38	
			63	.15
1	31094	4500 Ohm	37	.15
1	26577	3 Megohm	39	.15
1	21454	1 Megohm	40	.15
1	W28471	8500-25000 Ohm	41-42	.45
2	23785	500000 Ohm	43-46	.15
1	23403	150000 Ohm	45	.15
1	W25521	450 Ohm	47	.15
1	W30127	450 Ohm	62	.15
1	W31009A	Speaker Cable	61	.15
1	W32353	Knob (Large)		.10
3	W32352	Knob (Small)		.10
1	B21335	Tube & Condenser Shield		.20

PARTS LIST—MODEL 8B3

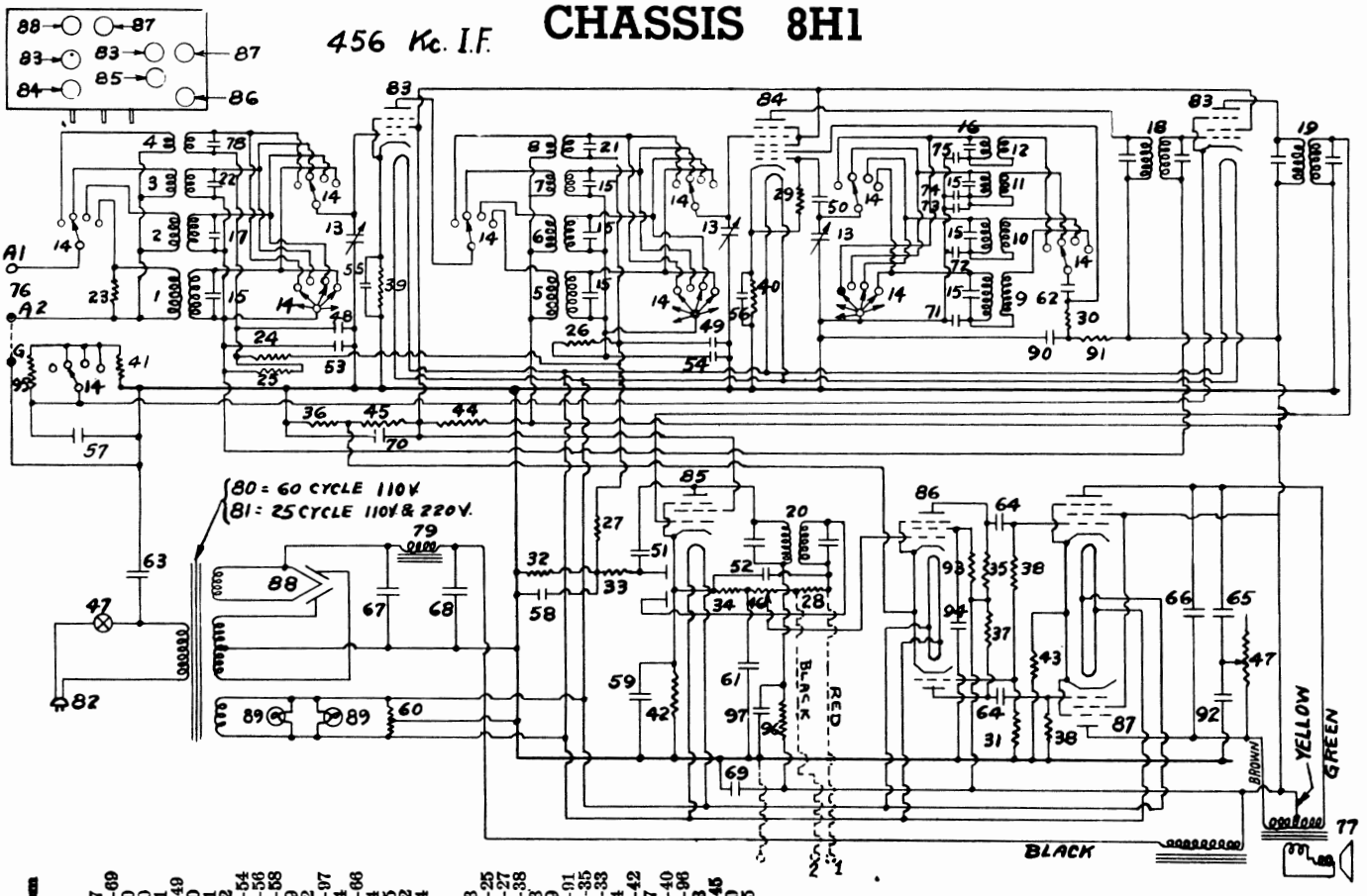
Figures in first column correspond to figures in diagram

	Part Number	Description
1	G16—26719	Ant.-Gnd. Term.
2	G3 —32000	L. F. Ant. Trans.
3	G28—32000	H. F. Ant. Trans.
4	G2 —32001	L. F. R. F. Trans.
5	G18—32001	H. F. R. F. Trans.
6	G2 —32002	L. F. Osc. Trans.
7	G21—32002	H. F. Osc. Trans.
8	G1 —32004	1st I. F. Trans.
9	B —34094	Band Change Switch
10	—42PM	Speaker
11	G25—33002	Variable Cond.
12	G1 —33008	L. F. Ant. Trim. Cond.
13		H. F. Ant. Trim. Cond.
14	G9 —33009	L. F. R. F. Trim. Cond.
15		H. F. R. F. Trim. Cond.
16	G18—33009	L. F. Osc. Trim. Cond.
17		H. F. Osc. Trim. Cond.
18	G20—33006	L. F. Osc. Series T. C.
19		H. F. Osc. Series T. C.
20	G6 —33006	1st I. F. Pri. T. C.
21		1st I. F. Sec. T. C.
22	G21—32004	2nd I. F. Trans.
23		Trimmer Cond.
24	G22—32004	3rd I. F. Trans.
25		Trimmer Cond.
26	W —32379	.02 Mfd. 200 Volt
27	W —32379	.02 Mfd. 200 Volt
28	W —27216	.05 Mfd. 200 Volt
29	G3 —34000	2200 Mmfd.
30	W —27216	.05 Mfd. 200 Volt
31	W —28869	2.0 Mfd. 200 Volt
32	W —27932	.0001 Mfd. 200 Volt
33	W —27216	.05 Mfd. 200 Volt
34	24814	7000 Ohms
35	W —29910-A	.25 Mfd. 200 Volt
36	G1 —34004	.00025 Mica
37	W —31158	Dual .006 Mfd. 400 V.
38	W —25435	.003 Mfd. 400 Volt
39	W —24049-B	.1 Mfd. 200 Volt
40	W —29910-A	.25 Mfd. 200 Volt
41	W —30321-A	1.0 Mfd. 160 Volt
42	W —33990	Dual 8 Mfd. Elect.
43	W —27216	.05 Mfd. 200 Volt
44	21875	100,000 Ohms
45	21875	100,000 Ohms
46	21876	10,000 Ohms
47	27121	5,000 Ohms
48	21455	300,000 Ohms
49	21455	300,000 Ohms
50	26577	3 Meg.
51	21455	300,000 Ohms
52	23403	150,000 Ohms
53	33490	10 Meg.
54	21455	300,000 Ohms
55	31094	4,500 Ohms
56	26578	5 Meg.
57	21454	1 Meg.
48	22196	20,000 Ohms
59 W	—34095	Level Control
60 W	—33993-A	Tone Control
		On-Off Switch
62 G1	—34189	1st Audio Trans.
63 G2	—34189	2nd Audio Trans.
64 G31	—27975	34 Socket
65 G84	—33070	1C6 Socket
66 G31	—27975	34 Socket
67 G31	—27975	34 Socket
68 G9	—33070	30 Socket
69 G9	—27975	30 Socket
70 G14	—27975	31 Socket
71 G44	—27975	19 Socket
72 G3	—29237	Cable & Marker Assm.
73 W	—31009-A	Speaker Cable
	27307	Spkr. Cone & V. C. As.
	29200	Spkr. Transformer
G17	—32086	Dial Assem.
W	—32208	Dial Hand
	B-76	Dial Hand Screw
W	—33528	Escutcheon & Window
W	—33984	Escutcheon Gasket
	D-28	Escutcheon Screws
W	33994	Tuning Knob
W	33995	Vernier Knob
W	31585	V. C. & T. C. Knob
W	33991	Band Change Knob
G6	—23300	"A" Batt. Resistor



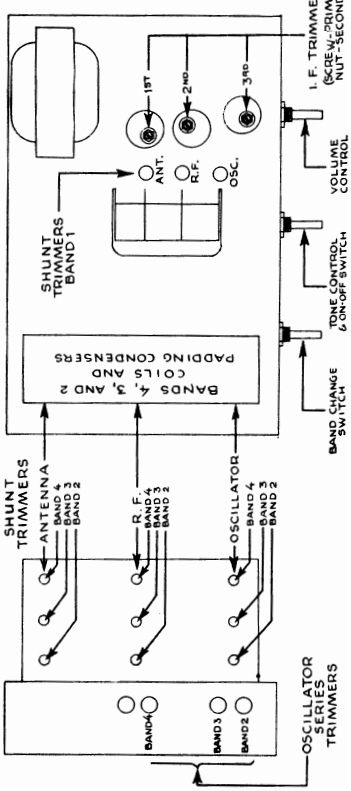
CROSLEY RADIO CORP.

CHASSIS 8H1



*Figures in 2nd last column refer to parts shown in wiring diagram of Model 8H1

Part No.	Description	* Item
G8-32000	Antenna Coil (Broadcast)	1
G4-32000	Ant. Coil (1500-4000 Kc.)	2
G5-32000	Ant. Coil (4000-10000 Kc.)	3
G6-32000	Ant. Coil (10000-24000 Kc.)	4
G2-32001	Inter. Coil (Broadcast)	5
G8-32001	Inter. Coil (1500-4000 Kc.)	6
G3-32001	Inter. Coil (4000-10000 Kc.)	7
G4-32001	Inter. Coil 10000-24000 Kc.)	8
G2-32002	Osc. Coil (Broadcast)	9
G3-32002	Osc. Coil (1500-4000 Kc.)	10
G4-32002	Osc. Coil (4000-10000 Kc.)	11
G5-32002	Osc. Coil (10000-24000 Kc.)	12
W25200	Coil Socket	
W30802	Coil Shield	1 to 12 Coils
G1-32261	Coil Shield Shelf	1 to 12 Coils
C-32729A	Coil Shelf Cover	
G12-32004	1st Tuned I. F. Trans.	18
G5-32004	2nd Tuned I. F. Trans.	19
G6-32004	3rd Tuned I. F. Trans.	20
G7-33009	Parallel Padding Condenser	15
G6-33009	Parallel Padding Condenser	17
G17-33009	Parallel Padding Condenser	100
G2-33008	Parallel Padding Condenser	99
G11-33009	Parallel Padding Condenser	21
G6-33009	Parallel Padding Condenser	16
G2-33006	Padding Condenser	72-73
G14-33006	Padding Condenser	98
B32190B	Band Change Switch	14
G18-32002	Tuning Condenser Gang	13
G15-32096	Dial Drive Assem.	
W32188B	Dial Hand	
B76	4/36x¼ Bind. Mach. Sc.	
G4-27134	Light Bracket Assem.	89
W32128A	Light Diffuser	
W32244	Diffuser Retainer	
W33378	Level Control (Volume)	46
W32063	Tone Control & Line Switch	47
G37-25669	Power Trans. 60 Cy. 110 V.	80
G38-25669	Power Trans. 25 Cy. 110-120 Volt	81
G1-24628	Filter Choke	79
	FILTER & BY-PASS CONDENSERS	
W26194B	12 Mfd. 475 Volt	67
W29097C	8.-8.-8. Mfd. 450-450-250 Volts	68-69
W32258	8 Mfd. 300 Volts	70
W30321	1. Mfd. 160 Volts	90
W32278	0.001 Mfd.	61
W30741	0.00025 Mfd.	48-49
W32226	0.0005 Mfd.	50
W31937	0.0001 Mfd	51
W32379	0.02 Mfd. 200 Volt	52
W28621	0.02 Mfd. 200 Volt	53-54
		55-56
		57-58
W23635	0.006 Mfd.	59
W23191A	0.01 Mfd. 400 Volt	62
W23015	0.05 Mfd. 400 Volt	63-97
W31052	0.05-0.004 Mfd. 400-400 Volt	64
W32279	0.00085 Mfd.	65-66
W32232A	0.000781 Mfd.	74
W30270	0.001 Mfd.	75
W23112	0.02 Mfd. 400 Volt	92
		94
	RESISTORS	
31094	4500 Ohms	23
21495	300000 Ohms	24-25
		26-27
23785	500000 Ohms	28-38
		93
21875	100000 Ohms	29
24814	7000 Ohms	30-91
21237A	60000 Ohms	31-35
26577	3 Megohms	32-33
21876	10000 Ohms	34
W30127	450 Ohms (Flexible)	36-42
23403	150000 Ohms	37
W25937	275 Ohms (Flex.)	39-40
W22514	750 Ohms (Flex.)	41-96
W22873	220 Ohms	43
W32301	10000-15000 Ohms	44-45
W32337	10-10 Ohms	60
22831	15000 Ohms	95

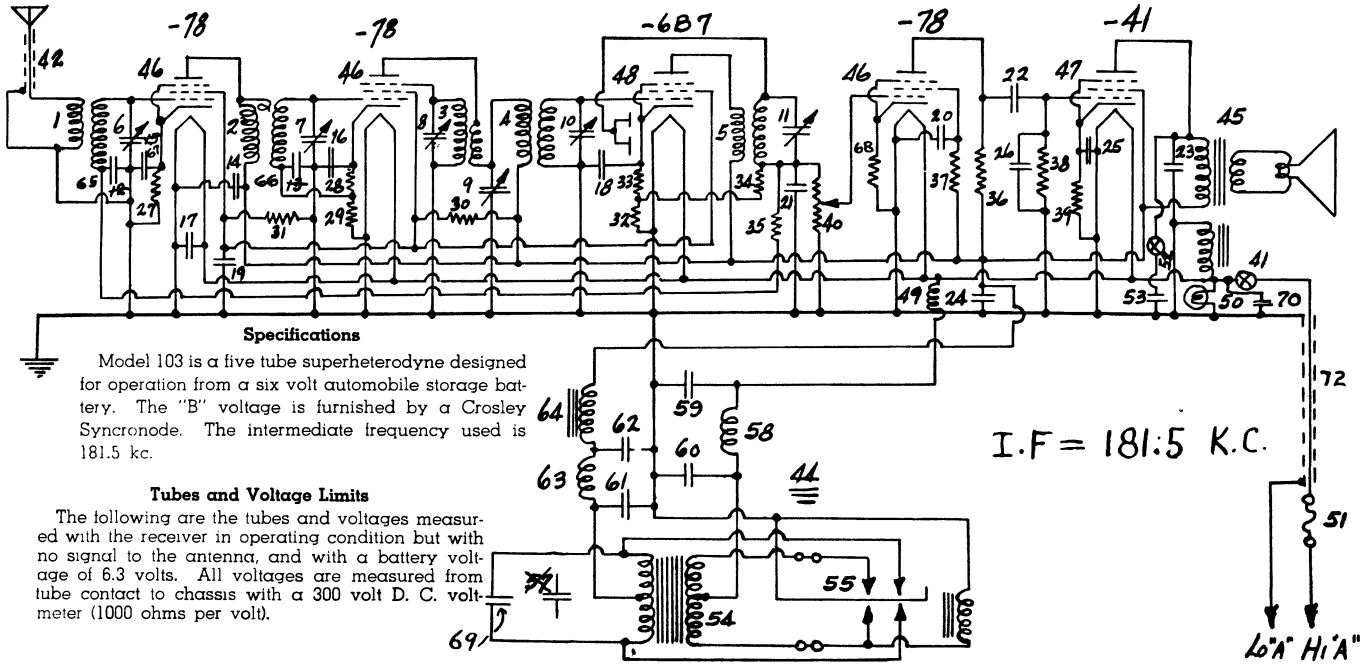


Type	Where Used	Ef	Ep	Eg	Ek SW.BC	Esg	Epx	Egx
6D6	R.F.	6.3	250	0	3	100	—	—
6A7	Osc.-Mod.	6.3	250	0	3	100	220	0 to −10
6D6	1st I. F.	6.3	250	0	7-21	100	—	—
6B7	2nd I. F. and Diode	6.3	250	0	3	100	—	—
6F7	A.F. and Phase Inv.	6.3	140	0	4	35	70	0
42	Output	6.3	240	0	16	250	—	—
80	Rectifier	5.0	—	—	350	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured with 117.5 volts AC line and with a 500-volt 1000-ohms-per-volt DC voltmeter. Power demand is 100 watts.

CROSLEY RADIO CORP.

Model 103



Specifications

Model 103 is a five tube superheterodyne designed for operation from a six volt automobile storage battery. The "B" voltage is furnished by a Crosley Syncronode. The intermediate frequency used is 181.5 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured with the receiver in operating condition but with no signal to the antenna, and with a battery voltage of 6.3 volts. All voltages are measured from tube contact to chassis with a 300 volt D. C. voltmeter (1000 ohms per volt).

Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid	Filament
78	R. F. Amplifier	210	100	2	2	6.3
78	Oscillator Modulator	210	100	28	0	6.3
6B7	I. F. Amplifier and Diode Detector	210	100	2.5		6.3
78	Audio Amplifier	50	20	2.0	2	6.3
41	Output	195	210	16.0		6.3

Voltage limits are plus or minus 15% of values given.

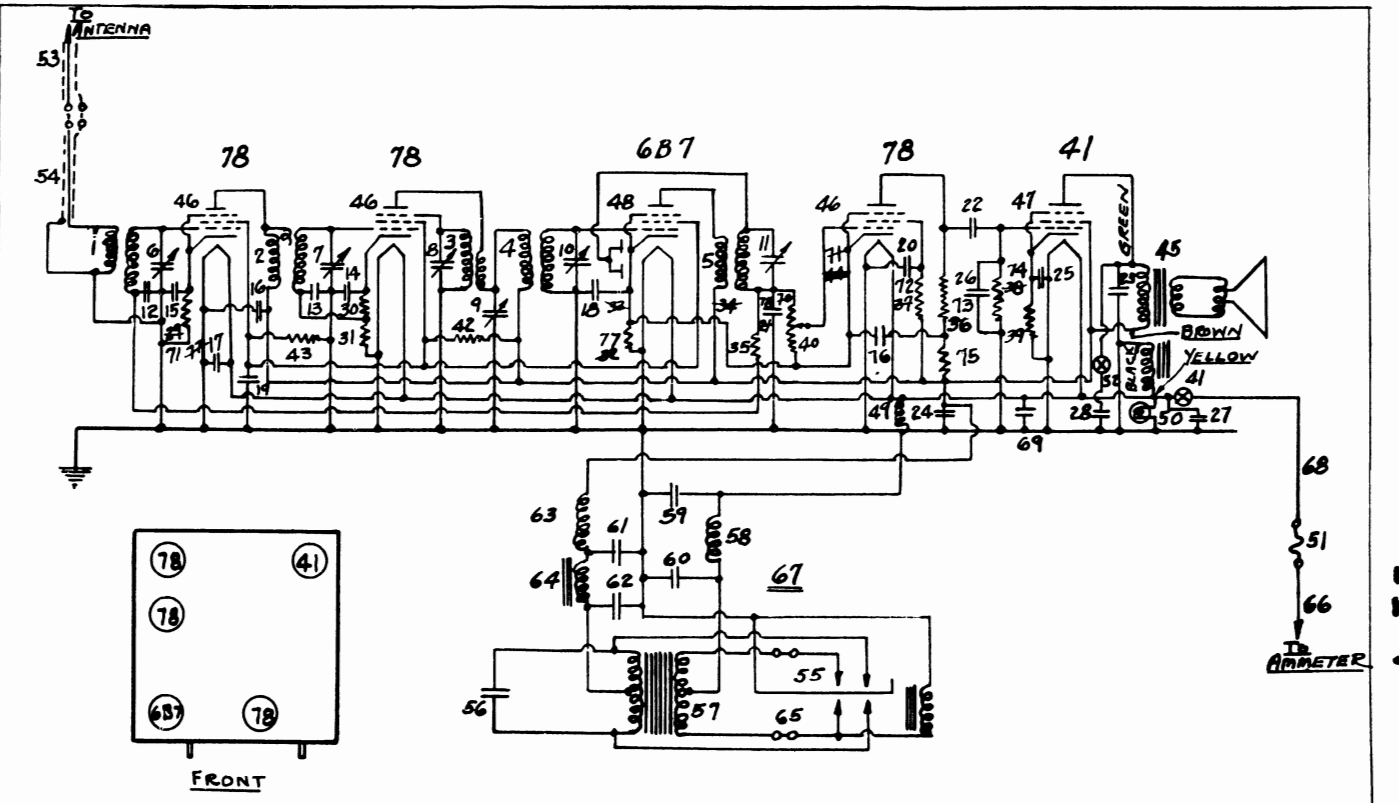
PARTS LIST—MODEL 103

Qty.	Part No.	Description	Item	List Each
		RECEIVER CHASSIS		
1	G48-28807	Seven Prong Socket 6B7	48	.10
1	G22-28807	Six Prong Socket 41	47	.10
3	G39-28807	Six Prong Socket 78	46	.10
1	W-27981	Tube Shield Base		.05
1	W-27328	Tube Shield		.10
1	G21-24995	Antenna Coil	1	.40
1	G25-24996	Oscillator Coil	3	.40
1	G7-25968	Radio Frequency Coil	2	.50
1	G1-25444	I. F. Transformer (1st)	4	.75
1	G3-25445	I. F. Transformer (2nd)	5	.75
4	W-25200	Coil Socket		.05
3	W-25024	Coil Shield (Large)		.10
1	W-25025	Coil Shield (Small)		.10
1	G1-29551	Coil Shield Assembly		.15
1	W-29263	Coil Bracket		.05
5	W-24360	Insulating Washer		.05
5	W-21541B	Coil Retaining Ring		.05
1	L-29783	Variable Condenser Gang	6, 7, 8	3.25
1	G1-29302	Coupling Assembly		.40
1	W-30436	Volume Control & Switch	40, 41	1.10
2	G2-25948	I. F. Trimmer Condenser	9, 11	.30
1	W-25008	I. F. Condenser Blade	10	.05
1	W-25584	Mica		.05
1	R-80	Screw		.05
1	W-26069B	Adjusting Nut		.05
1	W-24865	Washer		.05
1	W-25450B	Insulating Washer		.05
1	W-25007B	Insulating Washer		.05
1	W-25446	Bakelite Washer		.05
1	O-4	Flat Washer		.05
1	M-20	Rivet		.05
1	G4-28067	"A" Choke	49	.35
2	21454	Resistor 1 megohm	34, 35	.15
1	23785	Resistor 500,000 ohm	37	.15
1	21875	Resistor 100,000 ohm	36	.15
2	22514	Resistor 750 ohm	39, 68	.15
1	W-30127	Resistor 450 ohm	28	.15
1	W-21237	Resistor 60,000 ohm	31	.15
1	W-25357	Resistor 75 ohm	33	.10
1	W-21455	Resistor 300,000 ohm	38	.15
1	31094	Resistor 4,500 ohm	71	.15
2	W-21964	Resistor 165 ohm	27, 32	.15
1	23616	Resistor 15,000 ohm	30	.15
1	W-26571	Condenser .005 Mfd	21	.15
1	W-23142	Condenser .02 Mfd	22	.20
1	W-30419	Condenser 8-8 Mfd	24, 25	1.40
1	W-23035	Condenser .06 Mfd	23	.20
2	W-20389	Condenser .00005 Mfd	26, 70	.25
1	W-23615	Condenser .05 Mfd	14	.15
1	W-25438	Condenser .1-.1 Mfd	19, 20	.25
2	W-24049A	Condenser .1 Mfd	17, 18	.15
4	W-27203	Condenser .02 Mfd	16, 65 66, 67	.15
		MODEL 400 SYNCRONODE	44	
1	L-30424	Cover		.50
1	C-30455	Chassis		.50
1	L-29160	Vibrator Assembly	55	4.50
1	G2-28067	"A" Choke Assembly	58	.35
1	G7-28065	Power Transformer	54	2.25
1	G1-24234	R. F. Choke Assembly	63	.15
1	G7-28069	Filter Choke	64	1.45
1	W-29808	Condenser 12 Mfd	62	1.35

Qty.	Part No.	Description	Item	List Each
		MODEL 400 SYNCRONODE		
1	W-30367	Condenser .25 Mfd	60	.30
1	W-30366	Condenser .5 Mfd	59	.50
1	W-23142	Condenser .02 Mfd. (400 v.)	61	.20
1	W-30984	Condenser .02 Mfd. (800 v.)	69	.30
4	W-29314	Rubber Sleeve (to Mount Sync.)		.05
1	W-20264	Terminal Board		.15
		MODEL 353-3C SPEAKER	45	
1	G2-29529	Cone Assembly		2.50
1	W-29777	Field Coil		1.00
1	G4-24628	Transformer Assembly		1.40
		MISCELLANEOUS		
1	L-30452	Receiver Case		.65
1	C-30450	Cover		.25
1	C-30451	Bottom		.25
1	L-28034	Remote Control		4.11
1	W-28102A	Clamp Spring		.15
8	W-20070	Suppressor (Spark Plug)		.50
1	W-20071	Suppressor (Dist. Head)		.50
3	W-29754	Elim. Condenser		.45
1	W-25784	Tennaflex		1.50
1	W-29323	Mounting Bolt		.10
1	W-29324	Mounting Washer		.05
1	7961	Mntg. Shakeproof Washer		.05
1	W-29325	Mounting Nut		.05
2	W-30739	No. 8x½ P. K. Screw (Top & Bottom)		.05
4	W-30739	No. 8x½ P. K. Screw (Chassis to case)		.05
30	W-31050	No. 8x¼ P. K. Screw (Case)		.05
4	W-31070	6-32x½ Screw (Speaker)		.05
4	W-24074	Elastic Stop Nut (Speaker)		.05
4	O-6	Flat Washer (Speaker)		.05
3	W-20800	Shakeproof Washer (Spr.)		.05
1	W-4562	Solder Lug (Speaker)		.05
1	G1-25891	Antenna Wire		.75
1	W-28010	Antenna Wire Shield	42	.25
1	W-31100	"A" Cable & Fuse Assem.	72	.55
1	W-31102	Fuse Carrier only		.10
1	W-20106	Fuse Carrier Cap		.05
1	W-20110	Spring		.06
2	W-20107	Washer		.05
1	W-31103	10 Ampere Fuse		.10
66"	W-31101	Wire		.03 Ft.
1	W-31076	Lug		.05
1	W-26156A	Switch	52	.30
1	W-23191	Condenser .01 Mfd	53	.25
1	W-29298	Grill Cloth		.15
1	B-29309	Mounting Plate		.20
		REMOTE CONTROL		
1	G8-25868	Drive Shaft Assem. (V. C.)		1.65
1	G9-25868	Drive Shaft Assem. (Dial)		1.55
1	G1-28035	Strap Assembly		.15
1	W-28029B	Column Bracket		.20
1	G4-26317	Bracket Assem.		.30
1	W-29316A	Gear Dial		.30
1	W-4907	Spring Washer		.05
1	G5-23472	Knob		.10
1	G1-28036	Key Knob		.20
1	B-26307D	Housing		.50
1	W-28025C	Cover		.30

WIRING DIAGRAM FOR CROSLEY MODEL 119

1	G26-24995	ANTENNA COIL
2	G7-26968	R.F. COIL
3	G25-24996	OSCILLATOR COIL
4	G1-25444	1ST I.F. COIL
5	G3-25445	2ND I.F. COIL
6	L-29783	ANT. TUNING COND.
7		R.F. TUNING COND.
8		OSC. TUNING COND.
9	G2-25948	I.F. PRI. TUNING COND.
10	W-25008-A	I.F. SEC. TUNING COND.
11	G2-25948	DIODE TRANS. TUN. COND.
12	W-27203	0.02 MFD. 200V
13	W-27203	0.02 MFD. 200V
14	W-27203	0.02 MFD 200V
15	W-27203	0.02 MFD. 200V
16	W-23615	0.05 MFD. 400V
17	W-24049-A	0.1 MFD 200V
18	W-24049-A	0.1 MFD. 200V
19	W-25438	0.1 MFD. 200V
20		0.1 MFD. 200V
21	~~W-26571~~	~~.00005 MFD. 500V~~
22	W-23142	0.02 MFD. 400V
23	W-23191-A	0.01 MFD. 400V
24	W-30419-A	8 MFD. 250V
25		8 MFD. 25V
26	W-20389	.00005 (MICA)
27	W-20389	.00005 (MICA)
28	W-23191-A	0.01 MFD. 400V
29	~~W-31704~~	~~168 Ω~~
30	W-30127	450 Ω
31	W-27086	6400 Ω
32	W-25937	275 Ω
33	W-28357	75 Ω
34	21454	1-MEG
35	21454	1-MEG
36	~~21475~~	~~100,000 Ω~~
37	~~23786~~	~~500,000 Ω~~
38	~~21458~~	~~300,000 Ω~~
39	W-23907	750 Ω
40	W-30436	LEVEL CONTROL
41		S.P.S.T. SWITCH
42		
43	W-26525-B	15000 Ω
44		25000 Ω
45	~~W-22514~~	~~750 Ω~~
46	539-28807	353-3 SPEAKER
47	G28-28807	78 SOCKET
48	G48-28807	41 SOCKET
49	G4-28067	6B7 SOCKET
50	W-4099-A	"A" CHOKE
51	W-31103	6V. DIAL LIGHT
52	W-26156-A	10 AMP "A" FUSE
53	B-31296-A	S.P.S.T. SWITCH
54	W-31702	ANTENNA LEAD
55	L-29160	ANTENNA LEAD CONNECTOR
56	W-31632	VIBRATOR ASSEM.
57	G1-31618	0.01 MFD. 1000 V.
58	G2-28067	POWER TRANS.
59	W-30366	"A" CHOKE
60	W-30368	0.5 MFD 160 V.
61	W-23142	0.5 MFD. 160 V.
62	W-31631-B	0.02 MFD. 400 V.
		12 MFD. 300 V.



181.5 Kc I.F

63	G1-24234	R.F. CHOKE ASSEM.	79
64	G10-24628	FILTER CHOKE ASSEM.	80
65	G11-26719	POLARITY REVERSING TERMINAL	81
66	G1-31701	"A" CABLE ASSEM.	82
67	L-31629	413 SYNCRONODE	83
68	G2-31701	"A" CABLE ASSEM	84
69	W-20389	.0005 MFD (MICA)	85
70	~~W-20707~~	~~.0005 MFD. 500V~~	86
71	W-21452	1100 Ω	87
72	21454	1 MEGOHM	88
73	23403	150,000 Ω	89
74	23785	500,000 Ω	90
75	R1237-A	60,000 Ω	91
76	W-23015	.05 MFD 400 VOLTS	92
77	W-28589	350 Ω	93
78	W-32607	.0005 MFD. 200V.	94

RECORD OF CHANGES

		Change No.
A	ITEM 69 ADDED ITEM 61 CHGD TO "A" 2-2-34 ITEM 21 BE PLACED BY ITEM 70 2-7-34 CGF 2-14-34	3554
B	ITEMS 42 & 43 CHANGED TO "A"	3563
C	ITEMS 29-30-31-32-34 DELETED 3-9-34 ITEMS 71-72-73-74-76-76 & 77 ADDED	3570
D	ITEM #2 CHG'D TO "B" 4-11-34	3576
E	ITEMS 42 & 43 TO "B" ITEM 70 REPLACED WITH ITEM 78	3585

THE CROSLEY RADIO CORPORATION, CINCINNATI, OHIO

5A1 WIRING DIAGRAM

APPROVED C G FELIX DATE 1-24-33 DRAWN SCHAEFER DWG NO B-31760

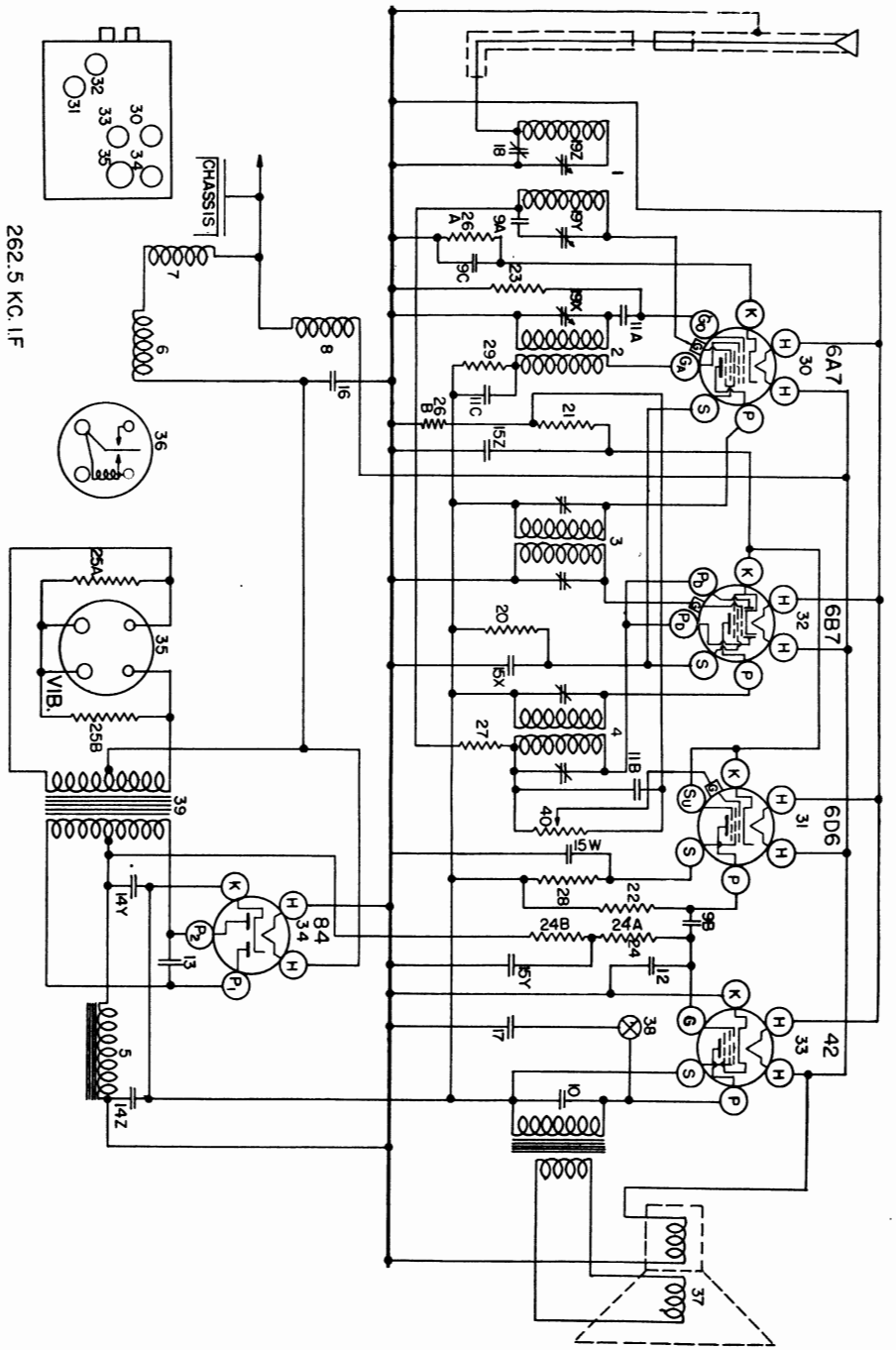
E D C B A

CROSLEY RADIO CORP.

119

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL A156



PARTS LIST—MODEL A-156

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G1 —38274	Pre-selector Coil Assm. Complete
	G41—32000	Pre-selector Coil only
	W —38276B	Shield
	W —38277	Wood Coil Spacer (2)
	W —35400A	Rubber Band
2	G27—32002	Osc. Coil only
	W —26891	Insulating Washer
	W —21541A	Retaining Ring
	W —25025B	Shield
	W —25200	Coil Socket
3	G13—32005	1st I. F. Assm.
4	G14—32005	2nd I. F. Assm.
5	G25—24628	Filter Choke
6	G10—28067	R. F. Choke
7	G4 —32977	Motor Noise Choke
8	G3 —32977	Motor Noise Choke
9A	W —28621	Condenser 0.02 Mfd. 200 V.
9B	W —28621	Condenser 0.02 Mfd. 200 V.
9C	W —28621	Condenser 0.02 Mfd. 200 V.
9D	W —28621	Condenser 0.02 Mfd. 200 V.
10	W —23635	Condenser 0.006 Mfd. 400 V.
11A	G1 —34002	Condenser 0.00025 Mfd.
11B	G1 —34002	Condenser 0.00025 Mfd.
11C	G1 —34002	Condenser 0.00025 Mfd.
12	G3 —34002	Condenser 0.0005 Mfd.
13	W —32762	Condenser 0.005 Mfd. 1000 Volt
14Z, 14Y	W —37020	Condenser 4.0 Mfd. / Condenser 5.0 Mfd.
15Z, 15Y, 15X, 15W	W —37021	Condenser 0.1 Mfd. 160 V. / Condenser 0.1 Mfd. 160 V. / Condenser 0.05 Mfd. 160 V. / Condenser 0.05 Mfd. 160 V.
16	W —37061	Condenser 0.50 Mfd. 160 V.
17	W —37047	Condenser 0.015 Mfd. 400 V.
18	W —32926A	Condenser Ant. Series Trimmer
19Z, 19Y, 19X	G41—33002	3 Section Tuning Condenser Gang
	W —38204B	Gear Assm.
	G1 —38227	Pinion & Coupling Link Assm.
20	—32331	Resistor 55,000 Ohms ½ W.
21	W —25937	Resistor 275 Ohm (½ W. Flex.)
22	—35929	Resistor 150,000 Ohms ¼ W.
23	—21237A	Resistor 60,000 Ohms ¼ W.
24A	—35601	Resistor 300,000 Ohm ¼ W.
24B	—35601	Resistor 300,000 Ohm ¼ W.
25A	—27504	Resistor 100 Ohm ½ W.
25B	—27504	Resistor 100 Ohm ½ W.
26A	—22514	Resistor 750 Ohm ½ W. Flex.
26B	—22514	Resistor 750 Ohm ½ W. Flex.
27	—34883	Resistor 2.0 Megohm ¼ W.
28	—35602	Resistor 1.0 Megohm ¼ W.

Item No.	Part No.	Description
29	W —22196	Resistor 20,000 Ohms ¼ W.
30	G47—28807	Socket 6A7
31	G75—28807	Socket 6D6
32	G48—28807	Socket 6B7
33	G25—28807	Socket 42
34	G45—28807	Socket 84
35	G1 —28807	Socket VIB
	W —31212	Tube Shield (Half)
	W —31210	Shield Ring
	W —24394A	Shield Base
36	G6 —38000	Vibrator (D. A. Corp. No. 5040000)
	G2 —38281	Vibrator Partition Assm.
37	33—BL—M	Speaker
38	W —35741	Tone Control Switch
39	G6 —32769	Power Transformer
40	W —37256	Volume Control 1. Megohm
	W —38257C	Cover Bracket
	C —37159	Case
	C —38220A	Top Cover
	C —38224A	Bottom Cover
	W —37057	Emblem
	W —32947	Hole Plug
	*G1 —38390	V. Remote Control Complete
	* —38384	V. Remote Control Head Assm.
	—38377	Dial Glass
	* —37707	Pointer
	*W —38393	Dial Face
	*G10—23472	Knob (2)
	—38389	Dial Light Socket Assm.
	—38443	On-Off Switch
	—38448	Switch Cover
	G5 —38390	V. Remote Control Complete
	—38544	V. Remote Control Head Assm.
	—38377	Dial Glass
	—37708	Pointer Assm.
	—38441	Dial Face Glass
	G9 —23472	Knobs (2)
	—38389	Dial Light Socket Assm.
	—38443	On-Off Switch
	—38448	Switch Cover
	G2 —38310	Control Cable Assm. (Cond. Dr.)
	G3 —38310	Control Cable Asm. (Level Con.)
	—32783A	Ant. Lead
	G14—32750	"A" Lead with Fuse Assm.
	G15—32750	"A" Lead to Set
	W —31103	Fuse 10 Amp.
	W —32956A	Mounting Stud (2)
	—6213	Mounting Nut (2)
	W —32957	Mounting Lock Washer (2)
	W —38336	Steering Column Brkt. Assm.
	W —31625A	Suppressor, Distributor
	W —29754A	Condenser 0.5 Mfd. (Elim) (2)

*Used on sets with serial numbers 1,064,155 to 1,065,154 inclusive.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	P2	S	G	K	Su	Ga	Go
6A7	Osc.-Mod.	6.0	230	—	100	0	6.0	—	220	0 to –30
6B7	I-F, Diode Det. & AVC	6.0	230	—	100	0	2.0	—	—	—
6D6	1st A-F Amp.	6.0	55	—	20	0	2.0	—	—	—
42	Output	6.0	220	—	230	–7*	0	—	—	—
84	Rectifier	6.0	230	230	—	—	—	—	—	—

Power Output Approximately 3 Watts.
Battery Drain Approximately 6.3 Amperes at 6 volts.
* True Bias Reading Approximately —15 Volts Measured Across Filter Choke.

PARTS LIST—MODEL A-166

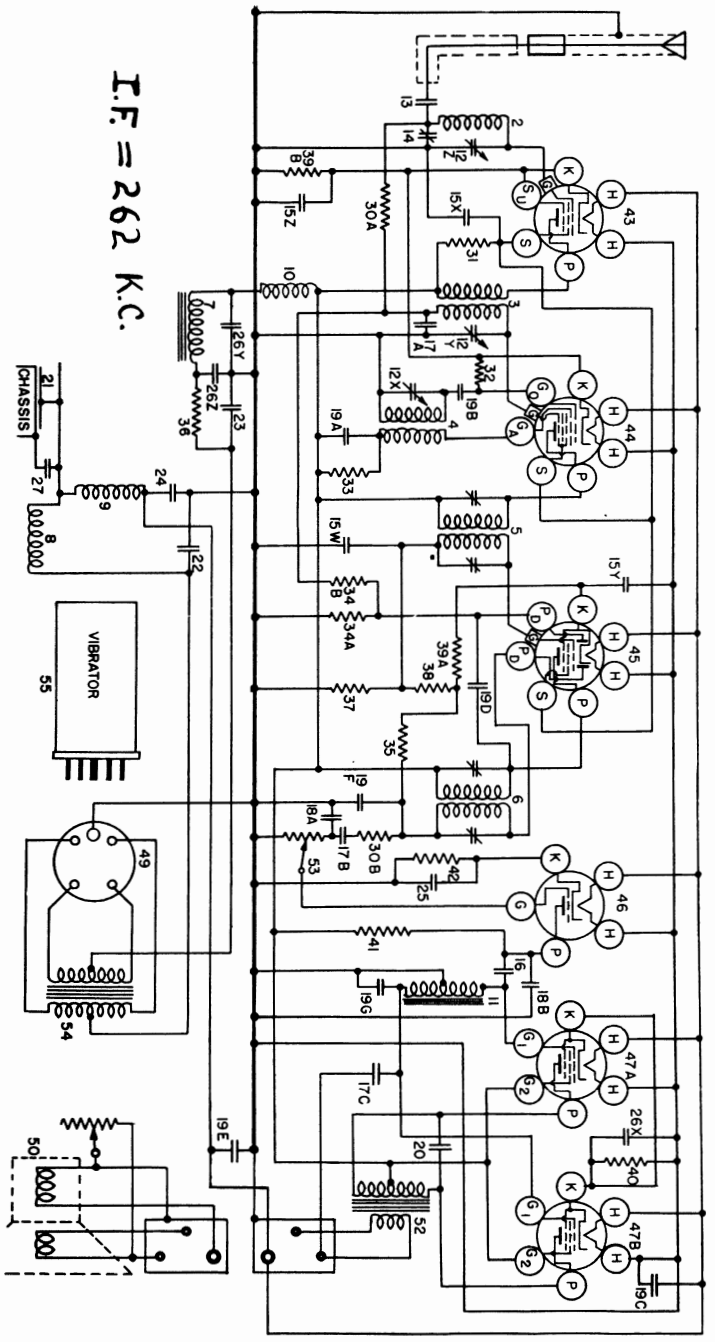
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1		
2	G83—32000	Ant. Coil
	W —38420	Ant. Coil Shield
	W —32913	Wood Coil Spacer
3	G22—32001	R. F. Coil
	W —32897	R. F. Coil Shield
	W —32912	Wood Coil Spacer
4	G27—32002	Osc. Coil
	W —25025B	Osc. Coil Shield
	W —25200A	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
5	G16—32005	1st I. F. Coil Assm.
6	G15—32005	2nd I. F. Coil Assem.
7	G31—24628	Coil, "B" Filter Choke
8	G15—28067	Coil, "A" Filter Choke
9	G6 —32997	Coil, Motor Noise Filter Choke
10	G5 —32997	Coil, Motor Noise "B" Choke
11	G11—29535	Coil, A. F. Grid Coupling Choke
12Z, 12Y, 12X	G44—33002	3 Section Tuning Cond. Gang
13	W —38367	Condenser, 0.02 Mfd. 200 V.
14	W —38350	Condenser, Ant. Series Trimmer
15Z		Condenser, 0.05 Mfd. 400 V.
15Y, 15X	W —38419	Condenser, 0.1 Mfd. 400 V. / Condenser, 0.05 Mfd. 400 V.
15W		Condenser, 0.1 Mfd. 400 V.
16	W —22688	Condenser, 0.1 Mfd. 400 V.
17A	W —32779	Condenser, 0.02 Mfd. 200 V.
17B	W —32779	Condenser, 0.02 Mfd. 200 V.
17C	W —32779	Condenser, 0.02 Mfd. 200 V.
18A	G2 —34002	Condenser, 0.0001 Mfd. (Mica)
18B	G2 —34002	Condenser, 0.0001 Mfd. (Mica)
19A To 19 G	G1 —34002	Condenser, 0.00025 Mfd. (Mica) / Condenser, 0.00025 Mfd. (Mica) / Condenser, 0.00025 Mfd. (Mica)
20	W —25435	Condenser, 0.003 Mfd. 400 V.
21	W —32904	Condenser, 20 Mmf.
22	W —38433	Condenser, 0.5 Mfd. 160 V.
23	W —38431	Condenser, 0.15 Mfd. 400 V.
24	W —37190	Condenser, 0.02 Mfd. 160 V.
25	W —38430	Condenser, 4. Mfd.
26Z, 26Y, 26X	W —38427	Condenser, 8. Mfd. 350 V. / Condenser, 8. Mfd. 350 V. / Condenser, 12. Mfd. 25 V.
27	—29910A	Condenser, 0.25 Mfd. 200 V.
28	W —35784A	Condenser, 0.5 Mfd. 160 V.
30A	—35600	Resistor, 100,000 Ohm, ¼ W.
30B	—35600	Resistor, 100,000 Ohm, ¼ W.
31	—36952	Resistor, 30,000 Ohm, 1 W. Insul.
32	—35928	Resistor, 60,000 Ohm, ¼ W. Insul.
33	—36760	Resistor, 20,000 Ohm, ¼ W. Insul.
34A	—35602	Resistor, 1 Megohm, ¼ W., Insulated Type
34B	—35602	Resistor, 1 Megohm, ¼ W., Insulated Type
35	—35601	Resistor, 300,000 Ohm, ¼ W., Insulated Type
36	W —32961	Resistor, 100 Ohm, 3 W., Flex.
37	W —21452	Resistor, 1100 Ohm, ¾ W., Flex.
38	W —28589	Resistor, 350 Ohm, ½ W., Flex.
39A	W —30127	Resistor, 450 Ohm, ½ W., Flex.
39B	W —30127	Resistor, 450 Ohm, ½ W., Flex.
40	W —26049	Resistor, 450 Ohm, 3 W., Flex.
41	—36761	Resistor, 40,000 Ohm, ¼ W.
42	—38428	Resistor, 4,500 Ohm, ¼ W.
43	G75—28807	Socket 6D6
44	G47—28807	Socket 6A7
45	G48—28807	Socket 6B7
46	G80—28807	Socket 76
47A	G22—28807	Socket 41
47B	G22—28807	Socket 41
	W —31212	Tube Shield–small half (Plain)
	W —31213	Tube Shield–small half (Cut Out)
	W —34174	Tube Shield–large half (Plain)
	W —34175	Tube Shield–large half (Cut Out)
	W —31210	Shield Ring
	W —32360A	Tube Shield Base
48	W —32895	Speaker Socket
49	W —32965A	Vib. Socket
	W —38413	Vib. Ground Clip
50	424—G1	Speaker
51	W —35181A	Suppressor 20,000 Ohm
52	G28—24628	Transformer, Output
53	—38425	Volume Control, 1 Megohm
54	G8 —32769	Power Transformer
55	G7 —38000	Vibrator, (D. A. Corp. No. 5041245)
	C —38407	Case
	C —38408	Case Top Cover
	C —38409A	Case Bottom Cover
	W —32947	Trimmer Hole Plug
	W —38412A	Oval Head Cover Nut
	W —32921	Cover Tie Bolt
MG8	—38410	Syncronode Partition Assem.
	W —32956	Mounting Stud
	W —38455	Case Spacer
	W —32957	Lock Washer
	—6213	Hex. Nut
	—38472	Remote Control Head Assm.
G4	—38310	Control Cable to Var. Cond.
G5	—38310	Control Cable to Vol. Cont.
G13	—32750	"A" Lead to Set.
G14	—32750	"A" Lead, Fused
G9	—23472	Knob (2)
	W —38325A	Under Instr. Panel Mtg. Kit
	W —38336A	Steering Column Mtg. Kit.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	K	Ga	Go
6D6	R-F Amplifier	6.0	220	100	0	5.7	—	—
6A7	Osc.-Mod.	6.0	220	100	0	5.7	130	-5 to -10
6B7	I-F Amp. & Diode Detector	6.0	220	100	0	6.8	—	—
76	Ist A-F Amp.	6.0	130	—	0	8.0	—	—
41	(2) Output	6.0	210	—	0	18.0	—	—

POWER OUTPUT APPROXIMATELY 3 WATTS.
BATTERY DRAIN APPROXIMATELY 6.2 AMPERES AT 6 VOLTS.

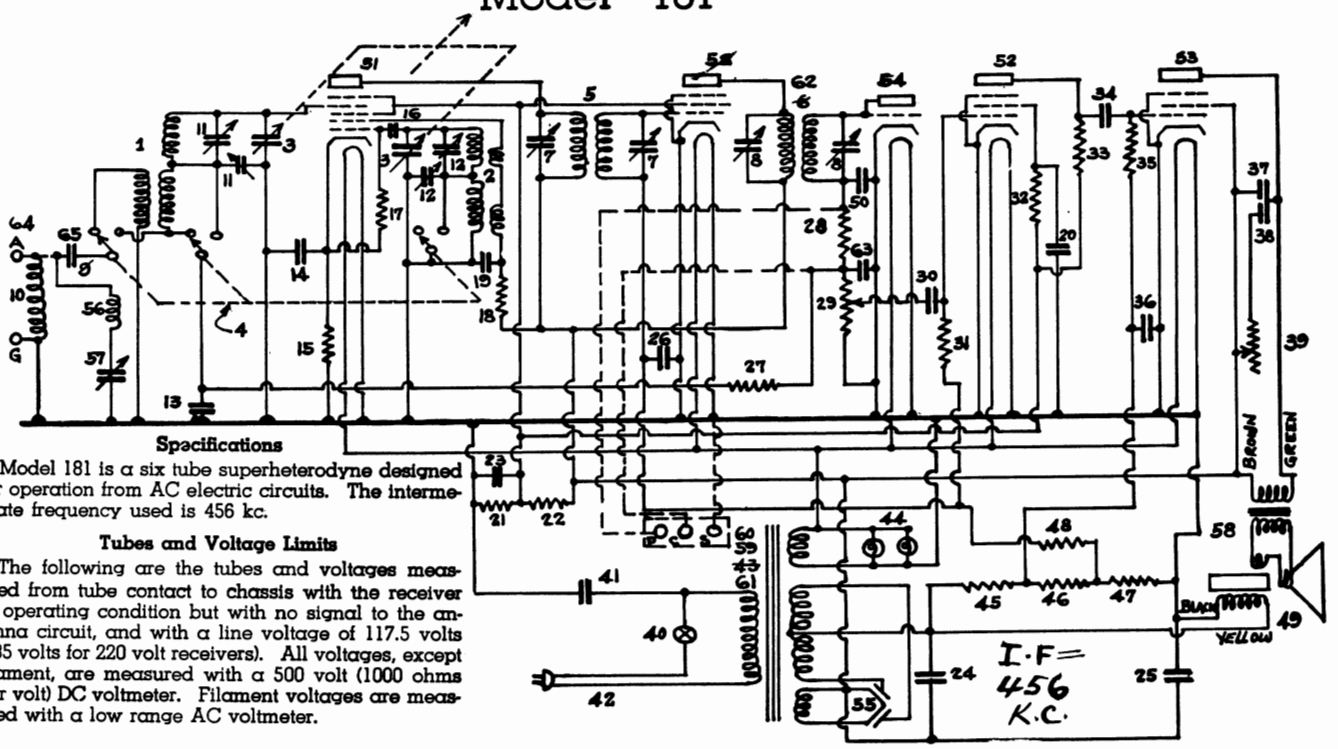


CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL A-166

CROSLEY RADIO CORP.

Model 181



Specifications

Model 181 is a six tube superheterodyne designed for operation from AC electric circuits. The intermediate frequency used is 456 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured from tube contact to chassis with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 volts for 220 volt receivers). All voltages, except filament, are measured with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

Tube	Position and Use	Plate	Voltages Screen Grid	Cathode	Supp. Grid	Filament
2A7	Oscillator	165		-9.5		2.45
	Modulator	240	110	2.5		2.45
58	IF Amplifier	236	110	0		2.45
56	Diode Detector and AVC					2.45
58	AF Amplifier	52	27	0		2.45
2A5	Output	222	240	0		2.45
80	Rectifier	330				4.8

Chassis to B- 93 volts.
Bias voltages are obtained by a resistor divider shunting the speaker field which is in B- circuit, from rectifier to chassis.
IF Amplifier bias (Grid to B-) 28 volts.
AF Amplifier bias (Grid to B-) 12 volts.
Output bias (Grid to B-) 18 volts.

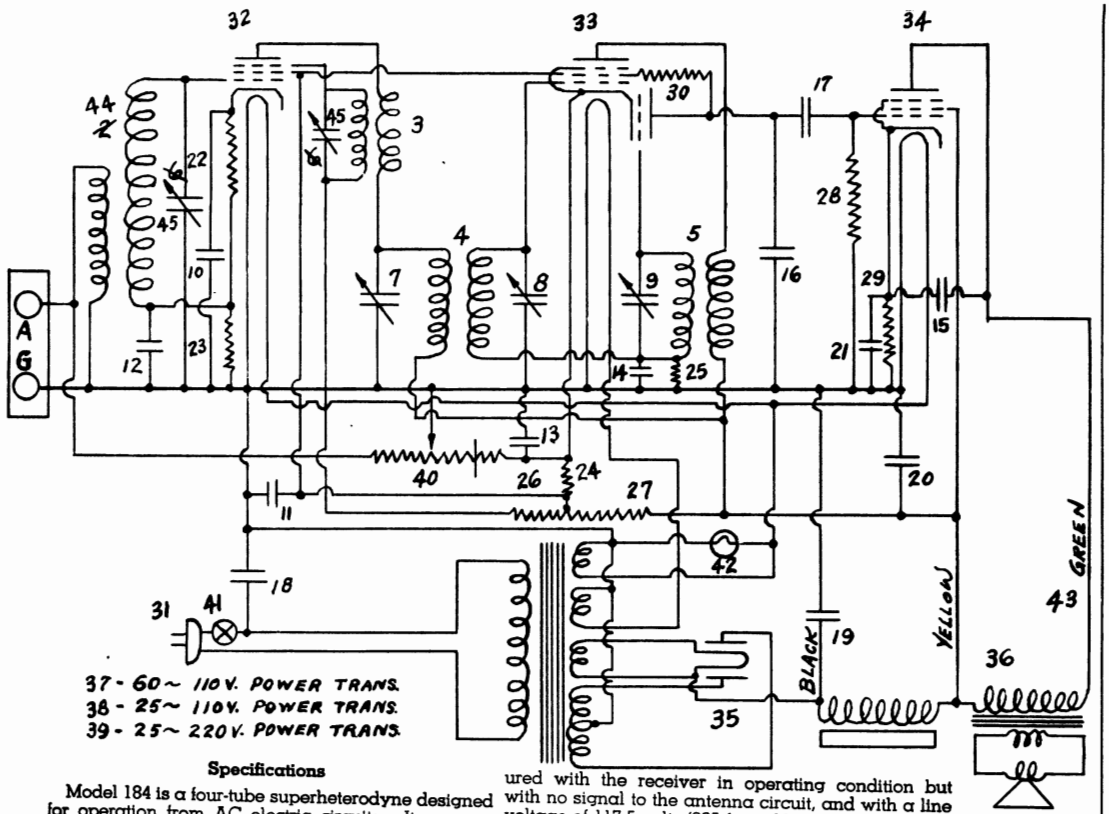
PARTS LIST—MODEL 181

* Figures in 2nd last column refer to parts shown in diagram

Qty.	Part No.	Description	* Item	List Each
1	G23-24995	Antenna Coil	1	.60
1	G28-24996	Oscillator Coil	2	.65
2	G7-29699	Ant. and Oscillator Coil, Trimmer Condenser	11, 12	.30
1	G2-30795	First I. F. Transformer	5	.55
1	G2-30795	Second I. F. Transformer	62	.55
2	W30027	Coil Shield		.15
2	W30802	Coil Shield		.15
4	W25200	Coil Socket		.05
4	W30026	Retainer Ring		.05
2	W30845	Insulating Washer		.05
2	W30877	Insulating Washer		.05
1	W30744A	No. 3 P. D. T. Change Sw.	4	.85
1	B30769A	Variable Tuning Condenser Assm	3	2.35
1	G4-27812	Dial Light Socket		.20
1	G9-25050	Dial Assembly		.30
1	G1-30070	V. C. Dial Assembly		.30
2	G14-25948	I. F. Condenser	7, 8	.30
1	W25008	Condenser Blade	57	.05
1	R80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.05
1	W25007	Insulating Washer		.05
1	W25446	Bakelite Washer		.05
1	O-4	Flat Washer		.05
1	M-20	Rivet		.05
1	G1-26719	A. G. Terminal	10	.15
2	G5-24234	R. F. Choke Assm	56, 64	.45
1	G56-27975	2A7 Socket	51	.10
2	G24-27975	58 Socket	52	.10
1	G43-27975	2A5 Socket	53	.10
1	G18-27975	56 Socket	54	.10
1	G6-27975	80 Socket	55	.10
4	W27981	Tube Shield Base		.05
1	W26231B	Tube Shield		.10
1	W27328A	Tube Shield		.10
2	B26009C	Tube Shield		.10
1	B30875	AC Cord and Plug	42	.45
1	W30836	Tone Control and Switch	39, 40	1.10
1	W30610C	Level Control (volume)	29	.70
2	W31225	Knobs (large)		.10
2	W31224	Knobs (small)		.10
2	W30463	Escutcheons		.25
6	S-27	Escutcheon Screws		.05
1	W31007	4 Lead Speaker Cord	58	.15
		POWER TRANSFORMERS		
1	G4-30745	Power Trans. 110 V. 60 Cy.	61	3.50
1	G2-30745	Power Trans. 110 V. 25 Cy.	59	4.75
1	G3-30745	Power Trans. 220 V	60	4.75
		FILTER & BY PASS CONDENSERS		
1	W30325	0.003 Mfd. 200 Volt	9	.20
1	W27204	.02-.02 Mfd. 200 Volt	13, 14	.25
1	W30741	.00025 Mfd. 1000 Volt	16	.15
1	W25474	.1-.1 Mfd. 400 Volt	19, 20	.40
1	W30059A	8.-8.-8. Mfd. 250 V.-450 V.-450 V.	23, 24, 25	3.60
1	W24049	.1 Mfd. 200 Volt	26	.15
2	W27203	.02 Mfd. 200 Volt	30, 34	.15
1	W30321	1. Mfd. 160 Volt	36	.55
1	W25517	.008-.05 Mfd. 400 Volt	37, 38	.30
1	W30805	.01 Mfd. 400 Volt	41	.20
2	W27932	.0001 Mfd. 200 Volt	50, 63	.15
1	W26571	.05 Mfd. 200 Volt	65	.15
		RESISTORS		
1	W25937	275 Ohms	15	.12
3	W21875	100000 Ohms	17, 33, 46	.15
1	W5370A	20000 Ohms	18	.24
1	W25970	15000-10000 Ohms	21, 22	.40
1	W26577	3 Megohm	27	.15
1	W21237A	60000 Ohms	28	.15
1	W21454	1 Megohm	31	.15
4	W23785	500000 Ohms	32, 35, 45, 48	.15
1	W22196	20000 Ohms	47	.15

CROSLEY RADIO CORP.

Model 184



Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid.	Filament
58	Oscillator-modulator	165	82	22	0	2.5
6F7	I. F. & Detector	165	82	2	0	2.5
2A5	Output	158	165	10		2.5
80	Rectifier	295				4.9

Voltage limits are plus or minus 10% of values given.

Specifications

Model 184 is a four-tube superheterodyne designed for operation from AC electric circuits. It uses an intermediate frequency of 456 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 for a 220 volt receiver). All voltages, except filament, are measured from tube contact to chassis with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

PARTS LIST—MODEL 184

* Figures in 2nd last column refer to parts shown in diagram

Qty.	Part No.	Description	*	List Price
1	W20264	Ant.-Grd. Terminal	1	.15
1	G28-24995	Antenna Coil	44	.65
1	G12-24996	Oscillator Coil	3	.40
1	G7-25444	1st I. F. Transformer	4	.60
1	G9-25445	2nd I. F. Transformer	5	.50
1	W25024	Coil Shield (Large)		.10
3	W25025	Coil Shield (Small)		.10
4	W25200	Coil Socket		.05
4	W26891	Insulating Washer		.05
4	W21541B	Coil Retaining Ring		.05
1	B31784	Variable Condenser Gang		2.75
1	G15-25050	Dial Assem.		.40
1	G2-25948	1st I. F. Prim. Trim. Cond.	7	.30
1	G10-25948	2nd I. F. Prim. Trim. Cond.	9	.15
1	W27548	1st I. F. Sec. Trim. Cond. (Adjustable Blade Only)	8	.05
1	W25584	Mica		.05
1	R80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.05
1	W25007B	Insulating Washer		.05
1	W25446	Bakelite Washer (Large)		.05
1	O4	Washer		.05
1	M20	Rivet		.05
1	G24-27456	Socket -58	32	.10
1	G49-27456	Socket 6-F-7	33	.10
1	G43-27456	Socket 2-A-5	34	.10
1	G6-27456	Socket -80	35	.10
2	W26010	Tube Shield Base		.05

Qty.	Part No.	Description	*	List Price
1	W27328A	Tube Shield (6F7)		.10
1	B26009C	Tube Shield (58)		.10
1	B21491B	A. C. Cable & Plug	31	.25
1	W31009	Speaker Cable	43	.25
1	W26573B	Volume Control & Switch	40-41	1.00
1	G1-23472	Knobs		.10
1	G1-28500	Power Trans. 110 V. 60 Cy.	37	2.25
	G2-28500	Power Trans. 110 V. 25 Cy.	38	3.00
	G3-28500	Power Transformer 220 V.	39	3.25
		FILTER & BY PASS CONDENSERS		
1	W27204	.02-.02 Mfd. 200 V. Cond.	12-13	.25
1	W24049A	.1 Mfd. 200 V. Condenser	14	.15
1	W23191A	.01 Mfd. 400 V. Condenser	15	.25
1	W25537A	.001-.03 Mfd. 400 V. Cond.	16-17	.30
1	W29592A	.003 Mfd. 400 V. Condenser	18	.20
2	W27203	.02 Mfd. 200 V. Condenser	10-11	.15
1	W29150A	7.-6.-8. Mfd. 450-400-25 V. Filter Condenser	21	2.90
		RESISTORS		
1	W25937	275 Ohm Resistor	22	.15
1	W31094	4500 Ohm Resistor	23	.15
1	W24990	25000 Ohm Resistor	24	.20
1	W21454	1 Megohm	25	.15
1	W28471	25000-8500 Ohm Resistor	26-27	.45
1	W23785	500000 Ohm Resistor	28-30	.15
1	W25521	450 Ohm Resistor	29	.15

SPEAKER PARTS * 36

	Magnavox 324-2M Spec. 1300	Jensen 342-2J Spec. 2617		
1	28761	29434	Cone & Voice Coil Assem.	2.00
1	28763	29436	Field Coil	1.10
1	28764	29437	Transformer	1.25

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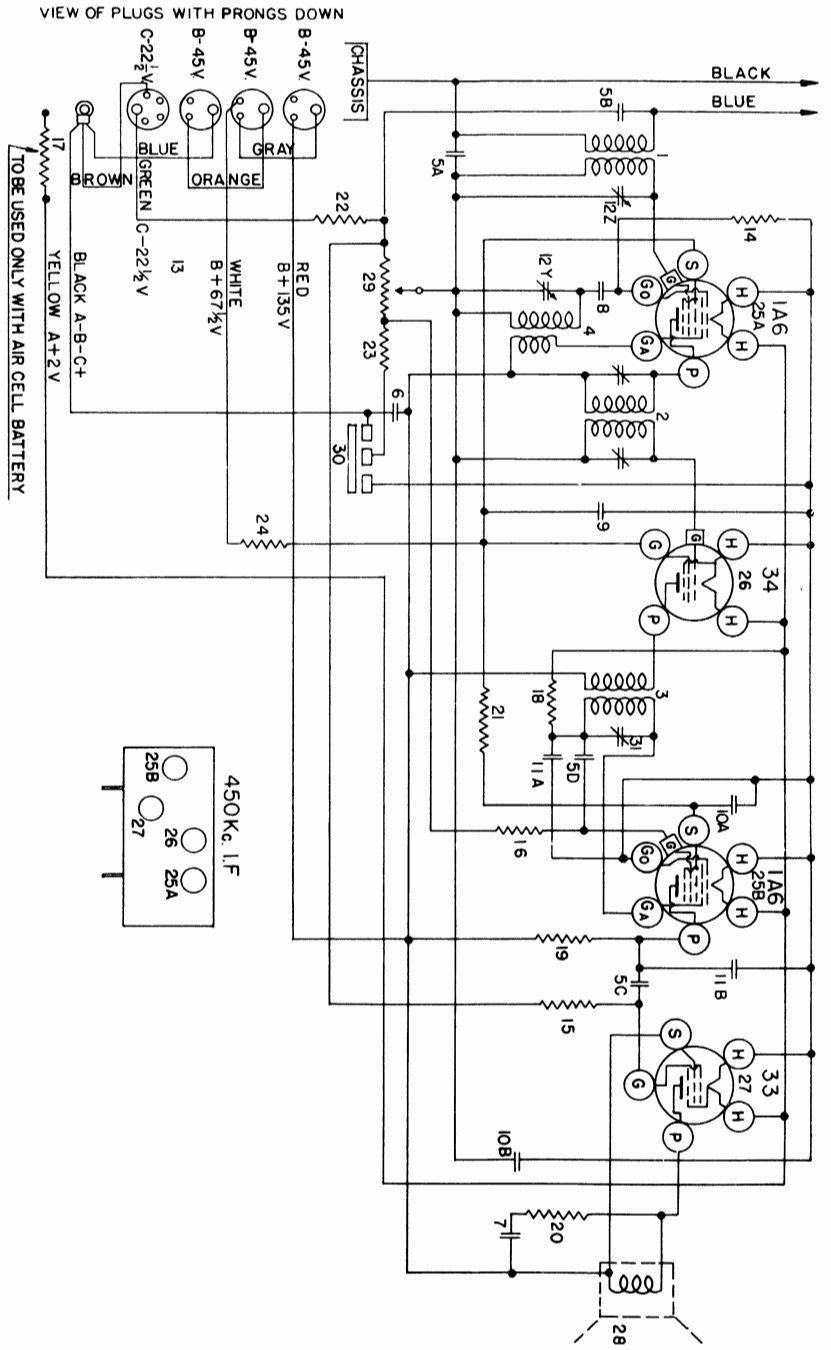
WIRING DIAGRAM—MODEL 415

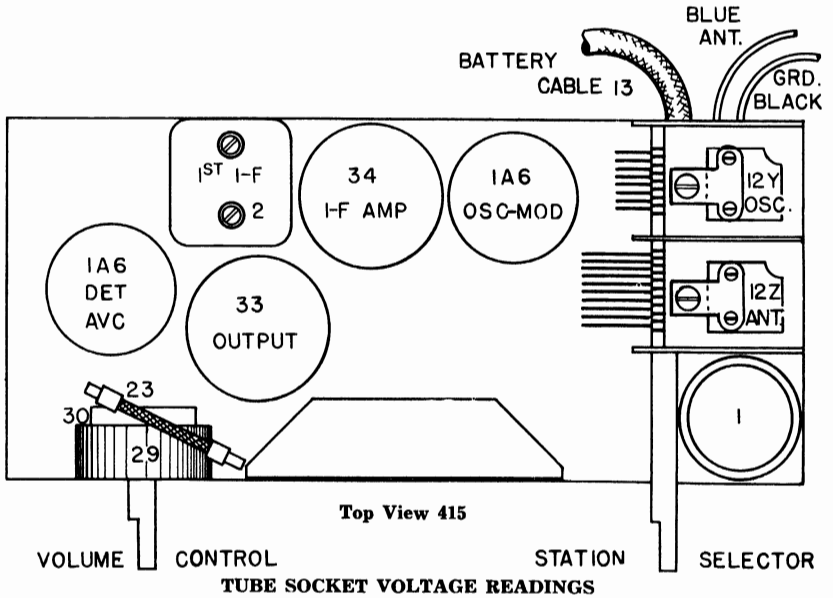


PARTS LIST—MODEL 415

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G27—32000	Ant Coil
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
2	G9 —32004	1st I-F Coil—only
	W —25025B	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200A	Coil Socket
3	G13—32004	2nd I-F Coil Asem.
4	G9 —32002	Osc. Coil
	W —25025B	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200A	Coil Socket
5A	W —28621	Condenser 0.02 Mfd. 200 V.
5B	W —28621	Condenser 0.02 Mfd. 200 V.
5C	W —28621	Condenser 0.02 Mfd. 200 V.
5D	W —28621	Condenser 0.02 Mfd. 200 V.
6	W —29910A	Condenser 0.25 Mfd. 200 V.
7	W —28619	Condenser 0.006 Mfd. 200 V.
8	W —5382	Condenser 0.00025 Mfd.
9	W —30321A	Condenser 1.0 Mfd. 160 V.
10A	W —28622	Condenser 0.1 Mfd. 200 V.
10B	W —28622	Condenser 0.1 Mfd. 200 V.
11A	W —25572	Condenser 0.0005 Mfd. 400 V.
11B	W —25572	Condenser 0.0005 Mfd. 400 V.
12Z, 12Y	G6 —33001	2 Section Tuning Condenser Gang

Item No.	Part No.	Description
13	C —36726C	Battery Cable Assem.
14	—21875	Resistor 100,000 Ohm ¼ W.
15	—21454	Resistor 1.0 Megohm ¼ W.
16	—26577	Resistor 3.0 Megohm ¼ W.
17	G5 —23300	Resistof 0.6 Ohm
18	—23785	Resistor 500,000 Ohm ¼ W.
19	—21455	Resistor 300,000 Ohm ¼ W.
20	—24814	Resistor 7,000 Ohm ¼ W.
21	—24990	Resistor 25,000 Ohm ¼ W.
22	—27121	Resistor 5.000 Ohm ¼ W.
23	W —23013	Resistor 2,000 Ohm ½ W. Flex.
24	W —21452	Resistor 1,100 Ohm ½ W. Flex.
25A	G55—27975	Socket 1A6
	W —33072	Socket Cushion
25B	G55—33070	Socket 1A6
26	G31—27975	Socket 34
27	G36—27975	Socket 33
28	—21M	Speaker
29, W 33922A		Volume Control
30		On-Off Switch
31	G5 —33005	Condenser 1st I-F Trimmer
	D —33938	Cabinet
	W —31140	Escutcheon (V. C.)
	W —34050	Escutcheon (Dial)
	W —28760B	Escutcheon Pin (6)
	W —33939	Knob (2)



Top View 415

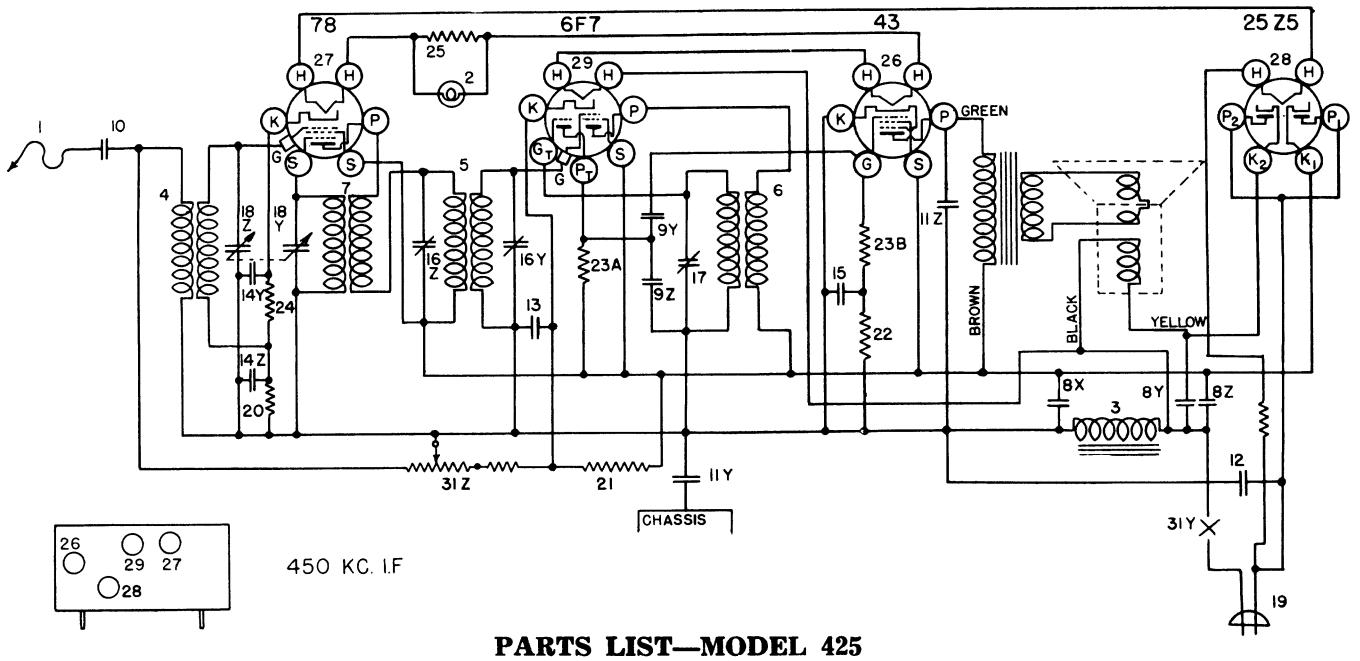
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G
1A6	Oscillator-Modulator	2.0	135	63	0
34	I-F Amplifier	2.0	135	63	0
1A6	Detector & A-F Amp.	2.0	40	25	0
33	Output	2.0	130	135	0

"A" Battery Drain Approximately .44 Ampere.
"B" Battery Drain Approximately 20 Mils.
Power Output Approximately .7 Watt.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 425



PARTS LIST—MODEL 425

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —29784-3	Antenna Roll
2	G2 —27812	Dial Light Socket Assem.
3	G1 —28859	Choke Assembly (filter)
4	G75—32000	Antenna Coil
5	G3 —32004	First I. F. Coil Only
	W —25024B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541	Retaining Ring
6	G11—32004	Second I. F. Coil Only
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541	Retaining Ring
7	G6 —32002	Oscillating Coil Only
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541	Retaining Ring
8Z, 8Y, 8X	W —29804A	Condenser 16 Mfd. 125 V. Condenser 8 Mfd. 125 V. Condenser 25 Mfd. 100 V.
9Z, 9Y	W —30322A	Condenser 0.00017 Mfd. 200 V. Condenser 0.006 Mfd. 200V.
10	W —30325	Condenser 0.003 Mfd. 200 V.
11Z, 11Y	W —29265	Condenser 0.008 Mfd. 200 V. Condenser 0.05 Mfd. 200 V.
12	W —30488	Condenser 0.02 Mfd. 400 V.
13	W —28621	Condenser 0.02 Mfd. 200V.
14Z, 14Y	W —28623	Condenser 0.02 Mfd. 200V. Condenser 0.02 Mfd. 200V.
15	W —29910A	Condenser 0.25 Mfd. 200 V.

Item No.	Part No.	Description
16Z, 16Y	G11—33006	2 Section 1st I. F. Trimmer
17	G5 —33005	1 Section 2nd I. F. Trimmer
18Z, 18Y	G16—33001	2 Section Tuning Condenser Gang
	W —36786A	Gang Insulator Cover
19	B —35350	Power Cord and Plug
20	—31093	Resistor 2700 Ohm ¼ W.
21	—24990	Resistor 25,000 Ohm ¼ W.
22	—21455	Resistor 300,000 Ohm ¼ W.
23A	—23785	Resistor 500,000 Ohm ¼ W.
23B	—23785	Resistor 500,000 Ohm ¼ W.
24	W —28589	Resistor 350 Ohm ½ W Flex.
25	W —30539	Resistor 26.7 Ohm 3. W Flex.
26	G30—28807	Socket 43
27	G39—28807	Socket 78
28	G51—28807	Socket 25Z5
29	G49—28807	Socket 6F7
30	—214BL9	Speaker
31Z, 31Y	—36793	Volume Control On-Off Switch
	D —36919A	Cabinet -5H
	W —36920A	Dial Plate
	W —36921A	V. C. Plate
	W —28760	Plate Pins (6)
	W —36922	Pointer (2)
	W —35252A	Knob (2)
	W —28723A	Bulls Eye
	W —29023	Bulls Eye Bezel
	W —33924	Chassis Foot (2) Spreader
	B —36806C	Mounting Plate (Back)

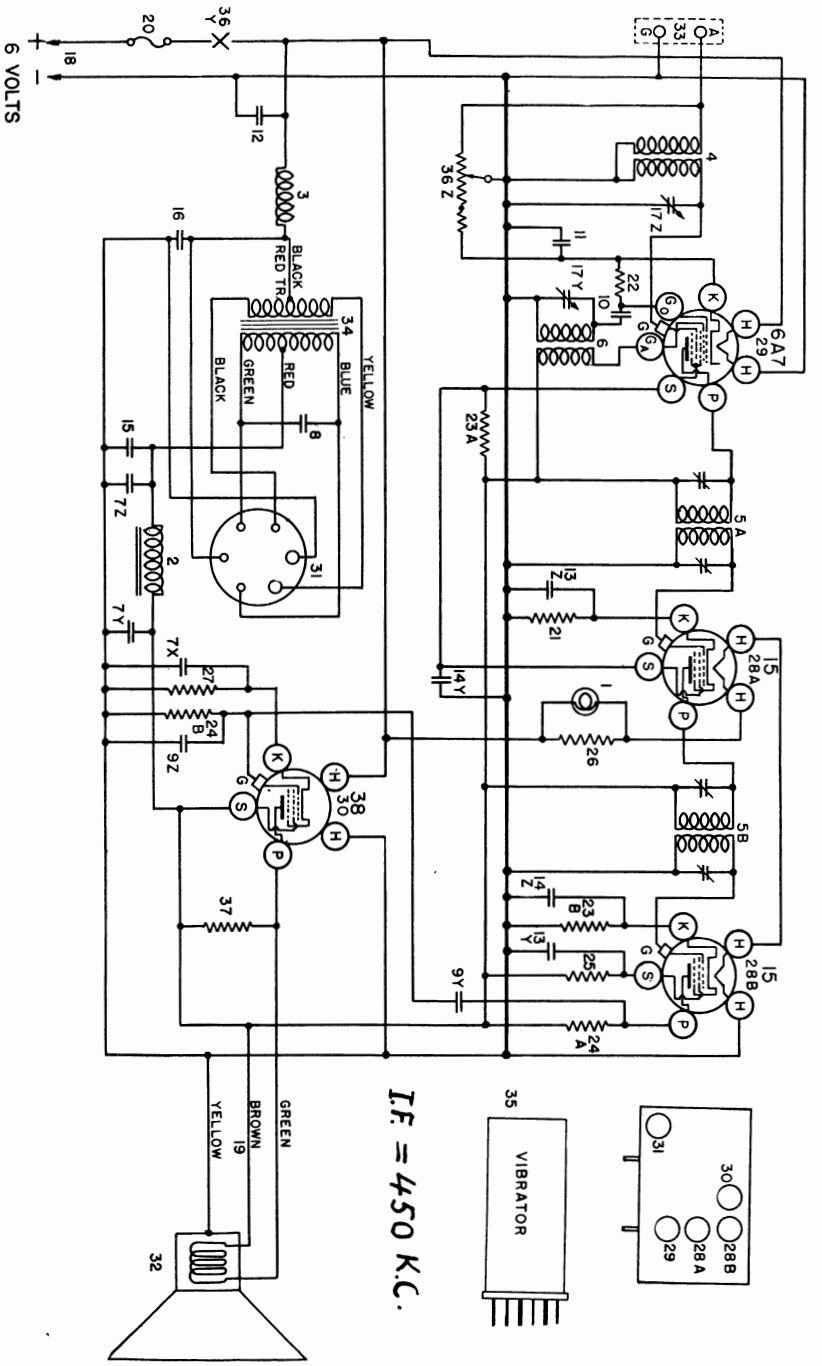
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	G	Pt	Gt
78	Osc.-Mod.	6.5	105	105	17	20	—	—
6F7	I-F Amp. & Det.	6.5	105	105	0	3	35	0
43	Output	26.0	105	105	-20	0	—	—
25Z5	Rectifier	26.5	117.5	—	—	—	—	—

Power Demand Approximately 60 Watts on 117.5 V.-A.C. Power Supply.
Power Output Approximately .9 Watt.
Voltage Reading Approximately 10% lower on 120 V., D.C.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 435



PARTS LIST—MODEL 435

Figures in first column refer to parts in Diagrams.

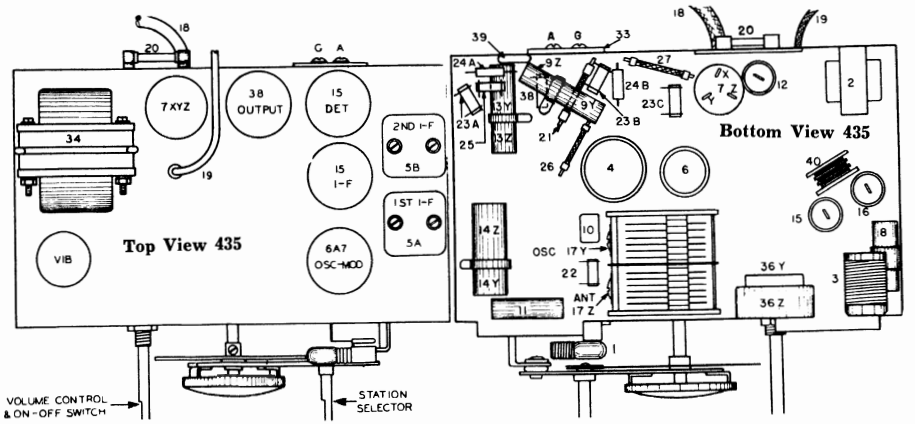
Item No.	Part No.	Description
1	G6 —27134	Dial Light Brkt. Assm.
2	G10—29535	Filter Choke 2.4 H.
3	G13—28067	"A" Filter Choke
4	G55—32000	Ant. Coil (only)
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
5A	G70—32004	1st I. F. Coil Assm.
5B	G70—32004	2nd I. F. Coil Assm.
6	G9 —32002	Osc. Coil (only)
	W —25025B	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200	Coil Socket
7Z, 7Y, 7X	W —34896	Condenser 12.0 Mfd. 250 V. Condenser 8.0 Mfd. 250 V. Condenser 8.0 Mfd. 25 V.
8	W —37214	Condenser 0.001 Mfd. 1,000 V.
9Z, 9Y	W —30322A	Condenser 0.00017 Mfd. 200 V. Condenser 0.006 Mfd. 200 V.
10	G1 —34002	Condenser 0.00025 Mfd. (Mica)
11	W —28621	Condenser 0.02 Mfd. 200 V.
12	W —37190	Condenser 0.02 Mfd. 160 V.
13Z, 13Y	W —28623	Condenser 0.02 Mfd. 200 V. Condenser 0.02 Mfd. 200 V.
14Z, 14Y	W —28622	Condenser 0.1 Mfd. 200 V. Condenser 0.1 Mfd. 200 V.
15	W —37173	Condenser 0.25 Mfd. 300 V.
16	W —37174	Condenser 0.5 Mfd. 160 V.
17Z, 17Y	G14—33001	2 Section Tuning Cond. Gang.
	—36147B	Dial Drive Unit Assm.
	MG16—35757	Drive Mounting Brkt.
	W —36150A	Dial Face only
	—37158	Dial Glass
	—37156	Pointer
	—37157	Pointer Screw
18	B —34902	Battery Cable
	—34903	Battery Clip +
	—34904	Battery Clip —

Item No.	Part No.	Description
19	W —35111	Speaker Cable
20	G2 —33339	Fuse Panel
21	W —22514	Resistor 750 Ohm ½ W., Flex
22	—21453	Resistor 40,000 Ohm ¼ W.
23A	—21237A	Resistor 60,000 Ohm ¼ W.
23B	—21237A	Resistor 60,000 Ohm ¼ W.
23C	—21237A	Resistor 60,000 Ohm ¼ W.
24A	—35602	Resistor 1.0 Megohm ¼ W.
24B	—35602	Resistor 1.0 Megohm ¼ W.
25	—33490	Resistor 10.0 Megohm ¼ W.
26	W —37189	Resistor 12.75 Ohm ½ W., Flex.
27	W —21452	Resistor 1100. Ohm ¾ W., Flex.
28A	G88—28807	Socket 15
28B	G88—28807	Socket 15
29	G47—28807	Socket 6A7
30	G15—28807	Socket 38
31	G92—28807	Socket Vib.
	W —35772	Tube Shield (Half) (6)
	W —35773	Tube Shield Cap (3)
	W —35774	Shield Base (3)
32	33—MS—3U	Speaker
33	G1 —26719	Terminal Board Ant. & Grd.
34	G4 —31618	Power Transformer
35	W —37216	Vibrator
	W —37195	Vibrator Shield
	W —37217	Vibrator Side Packing
	W —37218	Vibrator Top Packing
	W —26973B	Shield Base
36Z, 36Y	—37187	Volume Control On-Off Switch
37	—21453	Resistor 40,000 Ohm ¼ W.
38	—35600	Resistor 100,000 Ohm ¼ W.
39	G2 —34002	Condenser 0.0001 Mfd.
40	G1 —24234	R. F. Choke
	B —37172A	Syncronode Cover
	B —35917	Escutcheon
	D —28	Escutcheon Screws (3)
	W —31585B	Knob (2)
	W —7983A	Fuse, 3 Amp.

TUBE SOCKET VOLTAGE READINGS

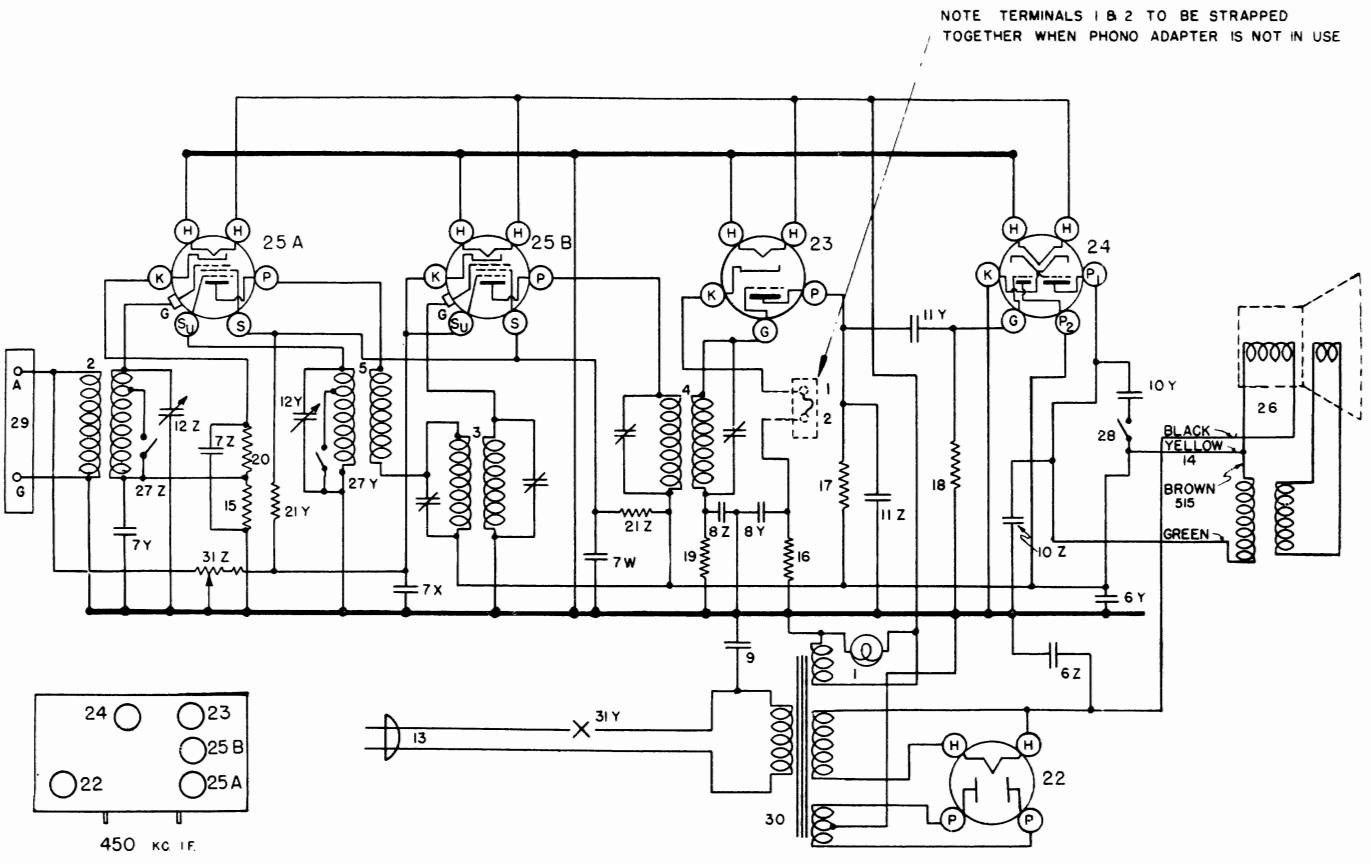
Tube	Where Used	S	G	S	G	K	Ga	Go
6A7	Osc.-Mod.	6.3	185	70	0	2.5	185	–10 to –20
15	I-F Amplifier	2.1	185	70	0	2.5	—	—
15	Detector	2.1	20	4	0	4.5	—	—
38	Output	6.3	170	185	0	11.0	—	—

POWER OUTPUT APPROXIMATELY 1 WATT.
"A" BATTERY DRAIN APPROXIMATELY 1.95 AMPERES AT 6 VOLTS.



CROSLEY RADIO CORP.

WIRING DIAGRAM OF MODELS 515 AND 5515



PARTS LIST—MODELS 515 AND 5515

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1	G4 —27134	Dial Light Socket Assembly.
2	G42—32000	Coil Ant.
3	G48—32004	1st. I. F. Trans.
4	G49—32004	2nd. I. F. Trans.
5	G47—32002	Osc. Coil.
6Z, 6Y	W —36719	Condenser, 8 Mfd., 450 Volts. / Condenser, 6 Mfd., 450 Volt.
7Z, 7Y, 7X, 7W	W —28623	Condenser, 0.02 Mfd. 200 Volt. / Condenser, 0.02 Mfd. 200 Volt. / Condenser, 0.02 Mfd. 200 Volt. / Condenser, 0.02 Mfd. 200 Volt.
8Z, 8Y	W —28622	Condenser, 0.1 Mfd. 200 Volt. / Condenser, 0.1 Mfd. 200 Volt.
9	W —30805	Condenser, 0.01 Mfd. 400 Volt.
10Z, 10Y	W —35011	Condenser, 0.006 Mfd. 400 Volt. / Condenser, 0.03 Mfd. 400 Volt.
11Z, 11Y	W —25537A	Condenser, 0.001 Mfd. 400 Volt. / Condenser, 0.03 Mfd. 400 Volt.
12Z, 12Y	G14—33001	Variable Tuning Condenser Gang.
	—36148	Dial Assembly complete.
13	B —33906A	Cord—Power Supply.
14	G3 —35696	Speaker Cable (5515 only).
15	—31091	Resistor, 4,500 Ohms.
16	—21237A	Resistor, 60,000 Ohms.
17	—21455	Resistor, 300,000 Ohms.
18	—23785	Resistor, 500,000 Ohms.
19	—21454	Resistor, 1 Megohm.
20	W—25937	Resistor, 275 Ohms Flex.
21Z, 21Y	W —35963	Resistor, 8,500 Ohms. / Resistor, 25 000 Ohms.
22	G6 —28807	Socket, 80.
23	G80—28807	Socket, 76.
24	G90—28807	Socket, 6B5.
25A	G75—28807	Socket, 6D6.
25B	G75—28807	Socket, 6D6.
	W —35772	Tube Shield, Half.
	W —35773	Tube Shield Cap.
	W —35774	Tube Shield Base.
26	—219-BL9	Speaker.
27Z, 27Y	W —35753A	Band Change Switch.
28	W —36184A	Tone Control Switch.
29	G1 —26719	Ant. Gnd. Terminal.
30	G5 —28500	Power Transformer, 60 Cy., 110 V.
	G6 —28500	Power Transformer 25 Cy., 110 V.
	G7 —28500	Power Transformer, 25 Cy., 220 V.
31Z, 31Y	—37343	Volume Control. / On-Off Switch.
	B —35917	Escutcheon.
	—37158	Dial Glass.
	—37156	Dial Pointer.
	—37157	Pointer Screw.
	W —31585B	Knob (2) large.
	W —36355	Knob (2) small,—Tone control.
	— 4099	Dial Bulb.
	—37511	Name Plate or Emblem.
	—35253	Spring for 36355—Knob.
	—35863	Grille Cloth.
		New Magna--Ceramic Dial
	—40625	Dial Drive Assembly.
	—40626	Dial face.

MODEL 515 & 5515

SPECIFICATIONS

The Crosley models 515 and 5515 employ the same chassis. The 515 is a table model with speaker attached and the 5515 is a console model with speaker mounted in the cabinet. It is available or adaptable for operation on A-C lines as follows: 110 V.-60 cycles, 110 V.-25 cycles and 220 V.-25 cycles It is a two band receiver tuning from approximately 540 to 1570 kilocycles in the broadcast band and from 1570 to 4000 kilocycles in the police and amateur band.

The tubes used are 6D6 Oscillator-**Modulator**, 6D6 I. F. Amplifier, 76 Detector, 6B5 Output **and type** 80 Rectifier.

SOCKET VOLTAGES

The tube socket voltages are measured from the socket contacts to the chassis with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and no signal input. Readings may vary plus or minus 10% of values given. Filament readings are taken with a low range A. C. voltmeter.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	P2	K
6D6	Osc-Mod	6.3	210	120	0	28	—	31
6D6	I. F. Amp	6.3	210	120	3	0	—	3
76	Detector	6.3	86	—	—	0	—	8.5
6B5	Output	6.3	200	—	—	0	210	0
80	Rectifier	4.9	280	—	—	—	—	—

Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 50 Watts.

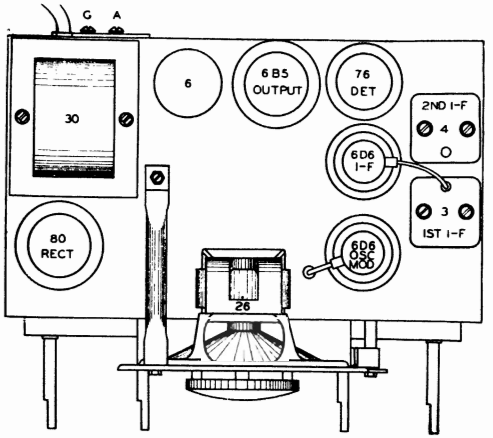


Fig. 2-A. Top View 515

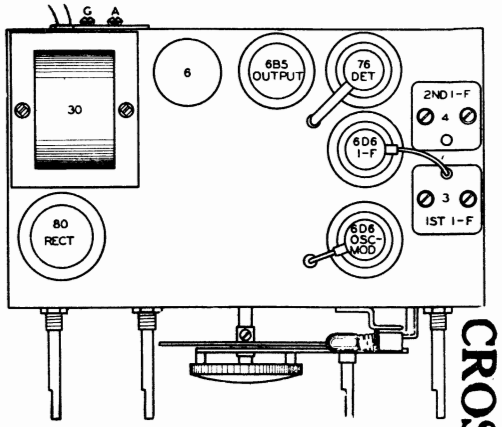


Fig. 2-B. Top View 5515

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can be properly aligned only with the use of a modulated signal generator and an output meter.

Connecting Output Meter.

Connect one terminal of the output meter to P1 and the other terminal to P2 of the 6B5 output tube. Looking at the bottom of the tube with the filament prongs toward you P1 will be the first prong to the left of the filaments and P2 will be next to P1. Be sure the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Peaking I. F. Stages at 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. series condenser to the top cap of the 6D6 Osc.-Mod. tube, leaving the tube's grid clip in place. KEEP THE GENERATOR LEAD AS FAR AS POSSIBLE FROM THE OTHER S. G. TUBES.

(b) Connect the ground lead of the signal generator to the chassis frame or ground terminal of the receiver.

(c) Set the signal generator to 450 kilocycles.

(d) Rotate the receiver tuning condenser until the rotor plates are completely out of mesh.

(e) Turn the band selector switch to the right hand position. (Short Wave Band).

(f) Turn the volume control of the receiver on full.

(g) With the signal generator set to the lowest usable output level adjust the I. F. trimmer condensers located on top of the I. F. transformers, Fig. 2A&B for maximum output.

NOTE: Make the adjustments very carefully, going over them several times to insure that the final setting is at resonant frequency. An insulated screw driver should be used to insure accurate adjustments.

2. Aligning R. F. Circuits.

(a) Turn the band selector switch to the left hand position. (Broadcast Band).

(b) Leave the receiver tuning condenser rotor plates completely out of mesh.

(c) Connect the output lead from the signal generator through a .00025 mfd., series condenser to the antenna terminal of the receiver.

(d) Set the signal generator to approximately 1570 kilocycles.

(e) Adjust the trimmer on the "Osc." section of the tuning condenser gang for maximum output. (Fig. 3).

(f) Set the signal generator to 1400 kilocycles.

(g) Tune in the 1400 kilocycle signal with the station selector for maximum output.

NOTE: Do not disturb the setting of the "Osc." trimmer as this is adjusted at 1570 kilocycles only and any further adjustment at this point would affect both the tuning range of the receiver and the tracking of its circuits.

(h) Adjust the trimmer on the "Ant." section of the tuning condenser gang for maximum output.

NOTE: There are no adjustments on this receiver for the Police Band.

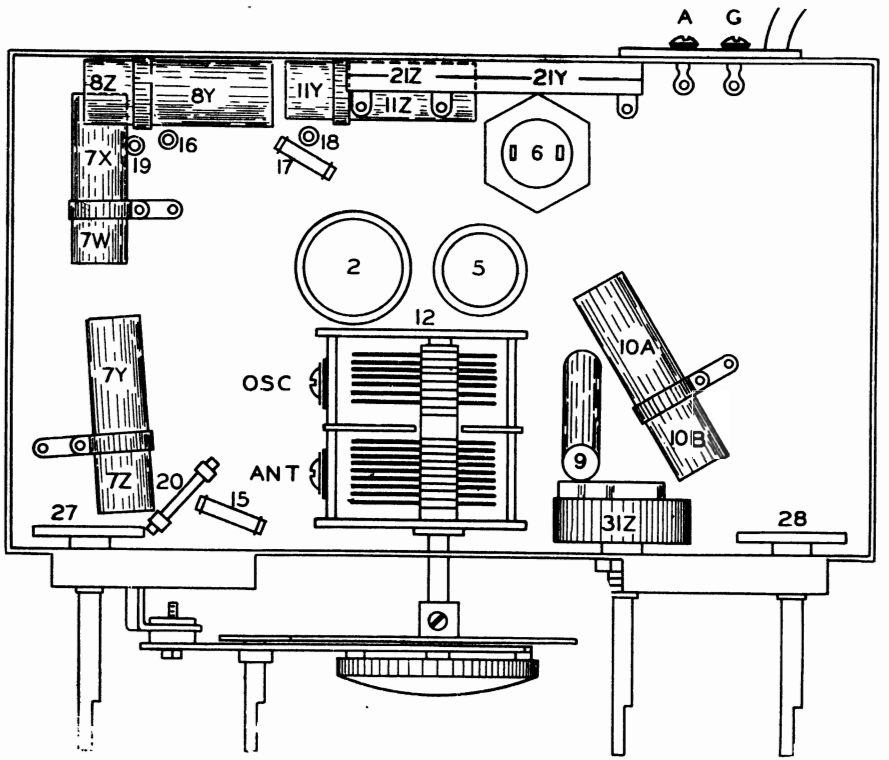


Fig. 3. Bottom View 515 and 5515

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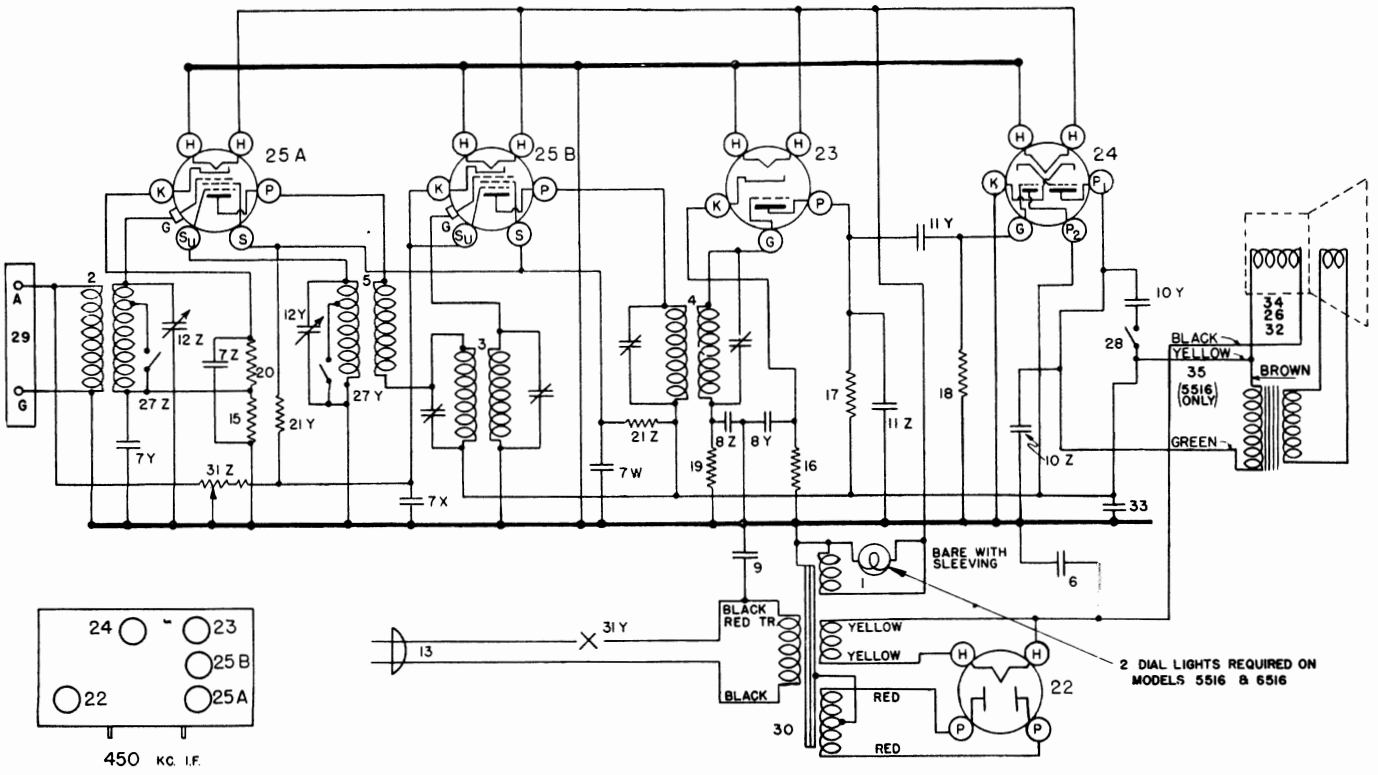
WIRING DIAGRAM OF MODELS 516, 5516 AND 6516



PARTS LIST—MODELS 516, 5516, AND 6516

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Name	Description
1	W —37922	Bulb	Dial Light
	G3 —37965	Socket	Dial Light
2	G42—32000	Coil	Antenna
3	G48—32004	Coil	1st I-F (Complete)
4	G49—32004	Coil	2nd I-F (Complete)
5	G47—32002	Coil	Osc.
6	W —41080	Condenser	12 Mfd. 300V.
7 Z	W —28623	Condenser	.02 Mfd. 200V.
7 Y			.02 Mfd. 200V.
7 X			.02 Mfd. 200V.
7W			.02 Mfd. 200V.
8 Z	W —28622	Condenser	.1 Mfd. 200V.
8 Y	W —30805	Condenser	.1 Mfd. 200V.
9			.01 Mfd. 400V.
10 Z	W —35011	Condenser	.006 Mfd. 400V.
10 Y			.03 Mfd. 400V.
11 Z	W —25537A	Condenser	.001 Mfd. 400V.
11 Y			.03 Mfd. 400V.
12 Z	G14—33001	Condenser	2 section Var. Tuning.
12 Y			
13	B —33906A	Cord & Plug	Power Supply
15	—31094	Resistor	4500 Ohm.
16	—21237A	Resistor	60000 Ohm. ¼ W.
17	—21455	Resistor	300,000 Ohm.
18	—23785	Resistor	500,000 Ohm.
19	—21454	Resistor	1 Megohm
20	W —25937	Resistor	275 Ohm Flex
21 Z	W —35963	Resistor	8500 Ohm } Candohm
21 Y			25000 Ohm }
22	G6 —28807	Socket	Type 80
23	G80—28807	Socket	Type 76
24	G90—28807	Socket	Type 6B5
25A	G75—28807	Socket	Type 6D6
25B	G75—28807	Socket	Type 6D6
26	219BL9	Speaker	Used on 6516 Only
27 Z	W —35753A	Switch	Band Selector
27 Y			
28	W —36184A	Switch	Tone Control

Item No.	Part No.	Name	Description
29	G1 —26719	Terminal Board	Ant. & Grd.
30	G5 —28500	Transformer	Power—110V. 60 Cy.
	G6 —28500	Transformer	Power—110V. 25 Cy.
	G7 —28500	Transformer	Power—220V 25 Cy.
31 Z	—37343		Volume Control
31 Y			On-Off Switch
32	219BJ3	Speaker	Used on 5516 Only
33	W —41081	Condenser	16 Mfd. 250V.
34	241BL9	Speaker	Used on 516 only
35	G3 —35696	Cable	Speaker (5516 only)
	W —31585B	Knob	
	W —36355	Knob	
	W —35772	Shield	Tube (Half)
	W —35773	Cap	Tube Shield
	W —35774	Base	Tube Shield
	C —40822	Dial	Calibrated Glass
	W —40815	Bracket	Dial Glass Mtg. RH
	W —40816	Bracket	Dial Glass Mtg. LH
	W —40804	Cushion	Dial Glass 516
	W —40806	Drive Unit	Dial Only
	MG16—40819	Bracket	Drive Mtg. Assy.
	B —40590	Escutcheon	Dial
	D — 28	Screw	Escutcheon Mtg.
	C —41059	Dial	Calibrated Glass
	W —40797	Bracket	Dial Glass Mtg.
	W —40798	Bracket	Dial Support L. H.
	W —40799	Bracket	Dial Support R. H. 5516
	W —40793	Drive Unit	Dial 6516
	MG16—40765	Bracket	Drive Mtg. Assy. Only
	MG33—40765	Drive Bearing	Assy.
	B —40839	Escutcheon	Ring
	W —28760	Escutcheon	Pin
	B —40818B	Pointer	Disc.
	W —40486	Pointer	Disc. Screw
	B —40802	Bracket	Speaker Mtg. 6516
	W —41001A	Clamp	Speaker Only

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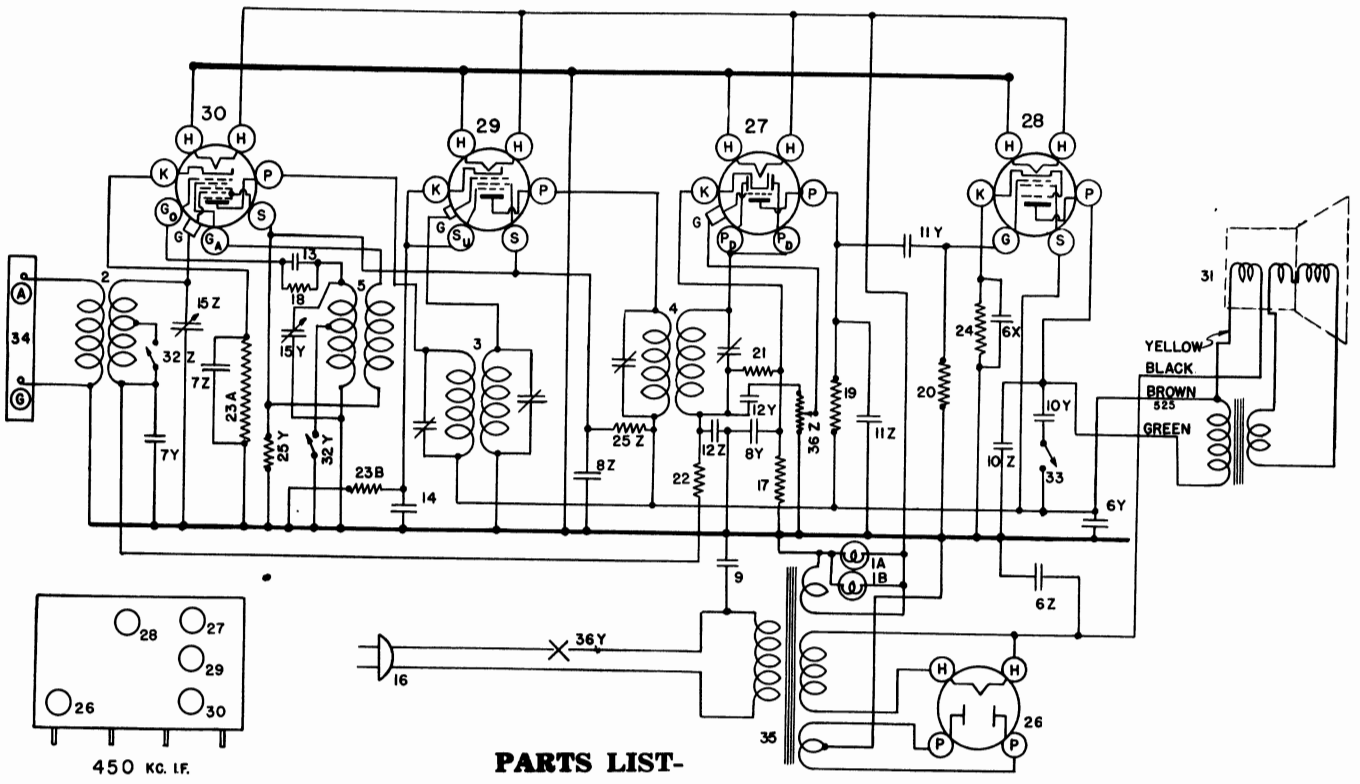
WIRING DIAGRAM -- MODELS 525 and 505



PARTS LIST-

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	G4 —27134	Dial Light Bracket Assembly
1B	G4 —27134	Dial Light Bracket Assembly
2	G42—32000	Coil, Ant. Trans.
	W —30802A	Coil Shield
	W —30026A	Coil Retaining Ring
	W —36178	Coil Insulator
3	G50—32004	Coil, 1st. I. F.
	G3 —31927	Coil Shield
	W —35037A	Coil Insulator
4	G49—32004	Coil, 2nd. I. F.
	G3 —31927	Coil Shield
	W —35037A	Coil Insulator
5	G43—32002	Coil Oscillator
	W —25025B	Coil Shield
	W —21541C	Coil Retaining Ring
	W —26891	Coil Insulator
6Z, 6Y, 6X	W —35750	Condenser, 8 Mfd. 450 Volt / Condenser, 6 Mfd. 450 Volt / Condenser, 12 Mfd. 25 Volt
7Z, 7Y	W —28623	Condenser, .02 Mfd. 200 Volt / Condenser, .02 Mfd. 200 Volt
8Z, 8Y	W —28622	Condenser, 0.1 Mfd. 200 Volt / Condenser, 0.1 Mfd. 200 Volt
9	W —30805	Condenser, .01 Mfd. 400 Volt
10Z, 10Y	W —35011	Condenser, .006 Mfd. 400 Volt / Condenser, .03 Mfd. 400 Volt
11Z, 11Y	W —25537A	Condenser, .001 Mfd. 400 Volt / Condenser, .03 Mfd. 400 Volt
12Z, 12Y	W —30322A	Condenser, .00017 Mfd. / Condenser, .006 Mfd.
13	G1 —34002	Condenser, .00025 Mfd.
14	W —28621	Condenser, .02 Mfd.
15Z, 15Y	—35751A	Condenser, 2 Gang Var. R.F. 360 / Condenser, 2 Gang Var. 450
	—36148	Dial Drive Unit, complete
	—36156	Dial Pointer
	—36157	Dial Pointer Screw
	—36158	Dial Lens
	G16—35757	Dial Drive Mounting Bracket Assem.

Item No.	Part No.	Description
16	B —33906A	Cord, Power Supply
17	—21876	Resistor, 10,000 Ohms
18	—21453	Resistor, 40,000 Ohms
19	—21455	Resistor, 300,000 Ohms
20	—23785	Resistor, 500,000 Ohms
21	—21454	Resistor, 1 Megohm
22	—26577	Resistor, 3 Megohm
23A	—25937	Resistor, 275 Ohms, 1½ Watt Flex.
23B	—25937	Resistor, 275 Ohms, 1½ Watt Flex.
24	W —23907	Resistor, 750 Ohms, 1½ Watt Flex.
25Z, 25Y	W —35963	Resistor, 8,500 Ohms, 3 Watt / Resistor, 25,000 Ohms, 3 Watt
26	G6 —28807	Socket 80
27	G41—28807	Socket 75
	W —35774	Tube Shield Base
	W —35772	Tube Shield Half (2 used)
	W —35773	Tube Shield Cap
28	G22—28807	Socket 41
29	G75—28807	Socket 6D6
	W —35774	Tube Shield Base
	W —35772	Tube Shield half (2 used)
	W —35773	Tube Shield Cap
30	G47—28807	Socket 6A7
	W —35774	Tube Shield Base
	W —35772	Tube Shield half (2 used)
	W —35773	Tube Shield Cap
31	—36278	Speaker, 318 BL9
32Z, 32Y	W —35753A	Switch, Ant. / Switch, Osc.
33	W —36184A	Switch, Tone Control
34	G10—26719	Terminal, Ant. Gnd.
35	G5 —28500	Transformer, Power, 60 Cy., 110 Volt
	G6 —28500	Transformer, Power, 25 Cy., 110 Volt
	G7 —28500	Transformer, Power, 25 Cy., 220 Volt
36Z, 36Y	W —36227	Volume Control, 4,800 Ohm, 160 Ohm fixed. / On-Off Switch
	W —31585B	Knobs
	B —35917	Escutcheon

NOTE:—Part numbers with A. B, etc., following, mean duplicate parts. Part numbers with Z, Y, X, etc., following, mean parts having multiple sections.

MODELS 525 & 505

SPECIFICATIONS

The Crosley models 525 and 505 employ the same chassis. The 525 is a table model with speaker attached and the 505 is a console model with the speaker mounted in the cabinet. It is available or adaptable for operation on A-C lines as follows: 110 V.-60 cycles, 110 V.-25 cycles and 220 V.-25 cycles. It is a two band receiver tuning from approximately 540 to 1570 kilocycles in the broadcast band and from 1570 to 4000 kilocycles in the police and amateur band.

The tubes used are 6A7 Oscillator-Modulator, 6D6 I. F. Ampilfier, 75 Detector, 41 Output and type 80 Rectifier.

SOCKET VOLTAGES

The tube socket voltages are measured from the socket contacts to the chassis with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and no signal input. Readings may vary plus or minus 10% of values given. Filaments are measured with a low range A-C Voltmeter.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	G	K	S	Su	Ga	Go
6A7	Osc-Mod	6.3	215	0	3	105	0	105	-4
6D6	I. F. Amp.	6.3	215	0	3	105	3	—	—
75	Detector & A. F. Amp.	6.3	80	0	.75	—	—	—	—
41	Output	6.3	205	0	16	215	—	—	—
80	Rectifier	4.9	280	—	—	—	—	—	—

Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 60 Watts.

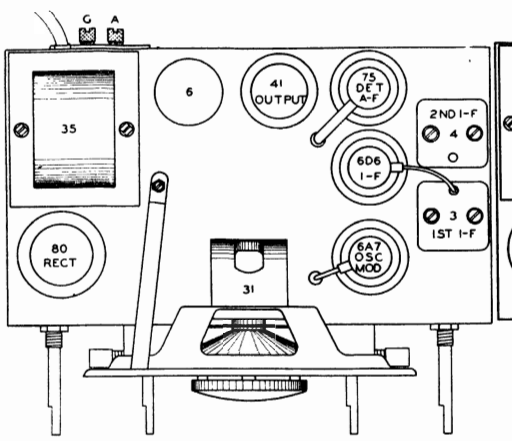


Fig. 2-A. Top View 525

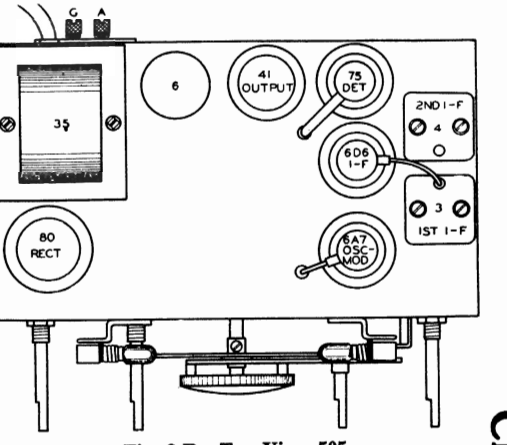


Fig. 2-B. Top View 505

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can be properly aligned only with the use of a modulated signal generator and an output meter.

Connecting Output Meter.

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 41 output tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first to the left of the filament prongs and the screen prong will be next to the plate prong. Be sure the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Peaking I. F. Stages at 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. series condenser to the top cap of the 6A7 Osc-Mod tube, leaving the tube's grid clip in place. KEEP THE GENERATOR OUTPUT LEAD AS FAR AS POSSIBLE FROM THE OTHER S. G. TUBES.

(b) Connect the ground lead of the signal generator to the chassis frame or ground terminal of the receiver.

(c) Set the signal generator to 450 kilocycles.

(d) Rotate the receiver tuning condenser until the rotor plates are completely out of mesh.

(e) Turn the band selector switch to the right hand position. (Short Wave Band).

(f) Turn the volume control of the receiver on full.

(g) With the signal generator set to the lowest usable output level adjust the I. F. trimmer condensers located on top of the I. F. transformers, Fig. 2A&B for maximum output.

NOTE: Make the adjustments very carefully, going over them several times to insure that the final setting is at resonant frequency. An insulated screw driver should be used to insure accurate adjustments.

2. Aligning R. F. Circuits.

(a) Turn the band selector switch to the left hand position. (Broadcast Band).

(b) Leave the receiver tuning condenser rotor plates completely out of mesh.

(c) Connect the output lead from the signal generator through a .00025 mfd., series condenser to the antenna terminal of the receiver.

(d) Set the signal generator to approximately 1570 kilocycles.

(e) Adjust the trimmer on the "Osc." section of the tuning condenser gang for maximum output. (Fig. 3).

(f) Set the signal generator to 1400 kilocycles.

(g) Tune in the 1400 kilocycle signal with the station selector for maximum output.

NOTE: Do not disturb the setting of the "Osc." trimmer as this is adjusted at 1570 kilocycles only and any further adjustment at this point would affect both the tuning range of the receiver and the tracking of its circuits.

(h) Adjust the trimmer on the "Ant." section of the tuning condenser gang for maximum output.

NOTE: There are no adjustments on this receiver for the Police Band.

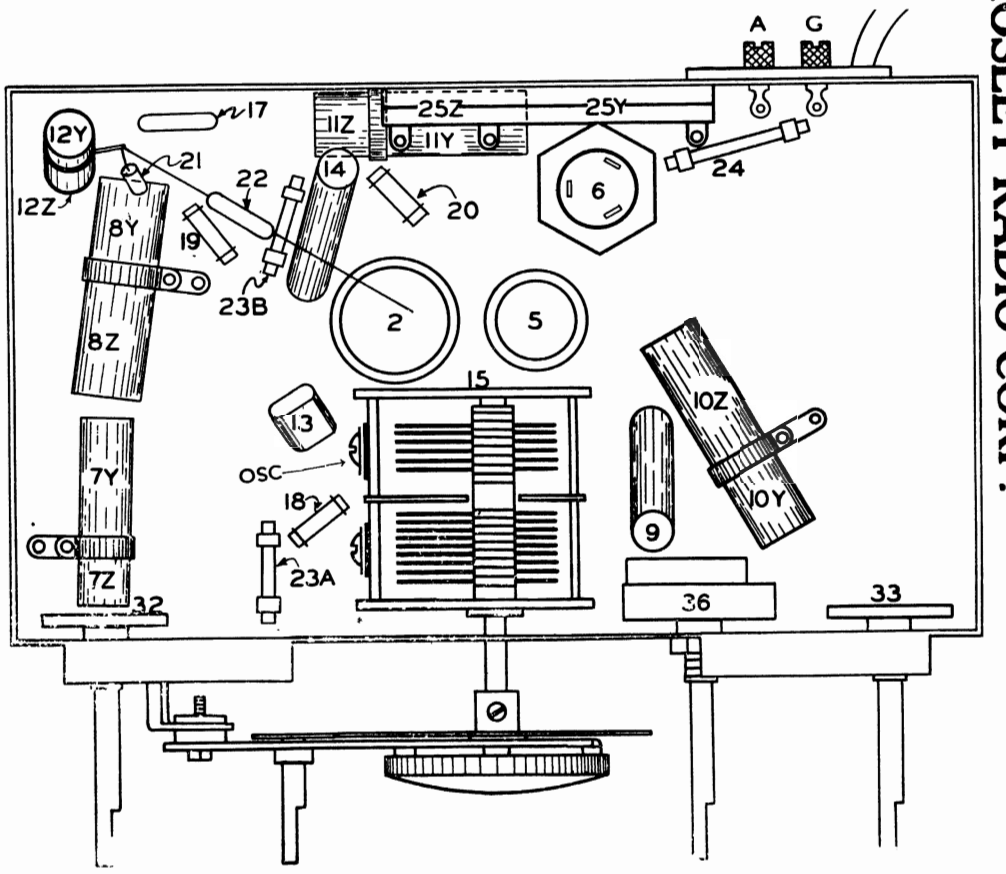


Fig. 3. Bottom View 525 and 505

CROSLEY RADIO CORP.

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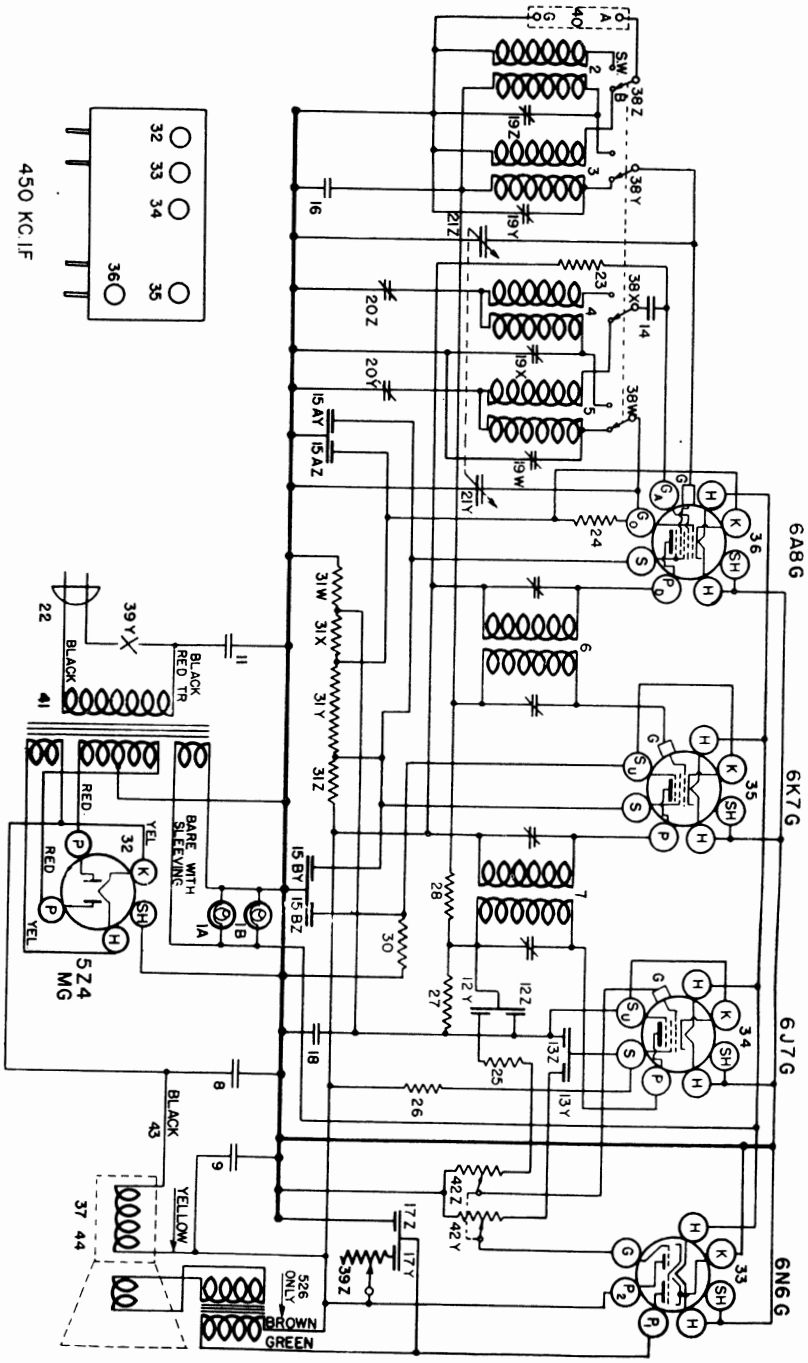
WIRING DIAGRAM—MODELS 526 AND 5526



PARTS LIST—MODELS 526 and 5526

Figures in first column refer to parts in Diagrams.

Item	Part No.	Description
1A	W 37922	Dial Light Bulb
1B	W 37922	Dial Light Bulb
	G3 —37965	Dial Light Socket Assembly
2	G82 —32000	Ant. Coil S. W. B.
3	G81 —32000	Ant. Coil B. C. B
4	G65 —32002	Osc. Coil S. W. B.
5	G66 —32002	Osc. Coil B. C. B.
6	G71 —32001	1st I-F Assembly
7	G72 —32001	2nd I-F Assembly
8	W —36055	Condenser 35 Mfd. 400 V.
9	W —36057	Condenser 40 Mfd. 300 V.
10	None	
11	W —30805	Condenser 0.01 Mfd. 400 V.
12Z	W —30322A	Condenser 0.00017 Mfd. 200 V.
12Y		Condenser 0.006 Mfd. 200 V.
13Z	W 25537A	Condenser 0.001 Mfd. 400 V.
13Y		Condenser 0.03 Mfd. 400 V.
14	W —23191A	Condenser 0.01 Mfd. 400 V.
15AZ	W 28623	Condenser 0.02 Mfd. 200 V.
15AY		Condenser 0.02 Mfd. 200 V.
15BZ	W 28623	Condenser 0.02 Mfd. 200 V.
15BY		Condenser 0.02 Mfd. 200 V.
16	W —27216	Condenser 0.05 Mfd. 200 V.
17Z	W —31052	Condenser 0.004 Mfd. 400 V.
17Y		Condenser 0.05 Mfd. 400 V.
18	W —36541	Condenser 0.02 Mfd. 160 V.
19Z		
19Y	W —37241A	4 Section Trimmer Cond.
19X		
19W		
20Z	G29 —33006	S. W. Osc. Series Trimmer
20Y		B. C. Osc. Series Trimmer
21Z	G17 —33001	Var. Tuning Cond. Gang.
21Y		
	C —40821	Dial Glass
	W —40186	Pointer Disc Mtg. Screw
	B —40818B	Pointer Disc
	MG16 —40765	Drive Mtg. Brkt. Assembly
	W —40804	Dial Glass Cushion
	W —40797	Dial Glass Brkt.
	W —40798	Support Brkt. L. H.
	W —40799	Support Brkt. R. H.
	B —40802	Speaker Mtg. Bracket (526)
	W —40801	Drive Segment
	W —40793	Dial Drive Unit
	MG33 —40765	Drive Bearing Assembly

Item	Part No.	Description
22	B —33906A	Power Cord & Plug
23	— 5370A	Resistor 20,000 Ohm
24	—21237	Resistor 60,000 Ohm
25	—21875	Resistor 100,000 Ohm
26	—21455	Resistor 300,000 Ohm
27	—33344	Resistor 400,000 Ohm
28	—37245	Resistor 1.5 Megohm
29	None	
30	W —28105	Resistor 500 Ohm ½ W. Flex.
31Z		10,000 Ohm
31Y	W —37246A	Candohm 25,000 Ohm
31X		185 Ohm
31W		185 Ohm
32	G154 —36400	Socket 5Z4
33	G165 —36400	Socket 6N6
34	G157 —36400	Socket 6J7
35	G151 —36400	Socket 6K7
36	G156 —36400	Socket 6A8
37	331-BL-9	Speaker (526)
	432-CJ-3	Speaker (5526)
	G3 —35696	Speaker Cable (5526)
	W —41001A	Speaker Clamp
38W		
to	—37247	Band Selector Switch
38Z		
39Z		Tone control
39Y	W —41028	On-Off Switch
40	G1 —26719	Ant & Grd. Terminal Board
41	G12 —28500	Power Trans. 60 Cy. 110 V.
	G13 —28500	Power Trans. 25 Cy. 110 V.
	G14 —28500	Power Trans. 25 Cy. 220 V.
42Z		Volume Control A-F Grid
42Y	—41027	Volume Control Output Grid.
	B —40839	Escutcheon Ring
	W —28760B	Escutcheon Pin
	W —37339	Knob V. C. & Station Select.
	W —37341	Knob T. C. & Band Select.
	W —40911	Shield, Tube
	W —27981A	Base Tube Shield

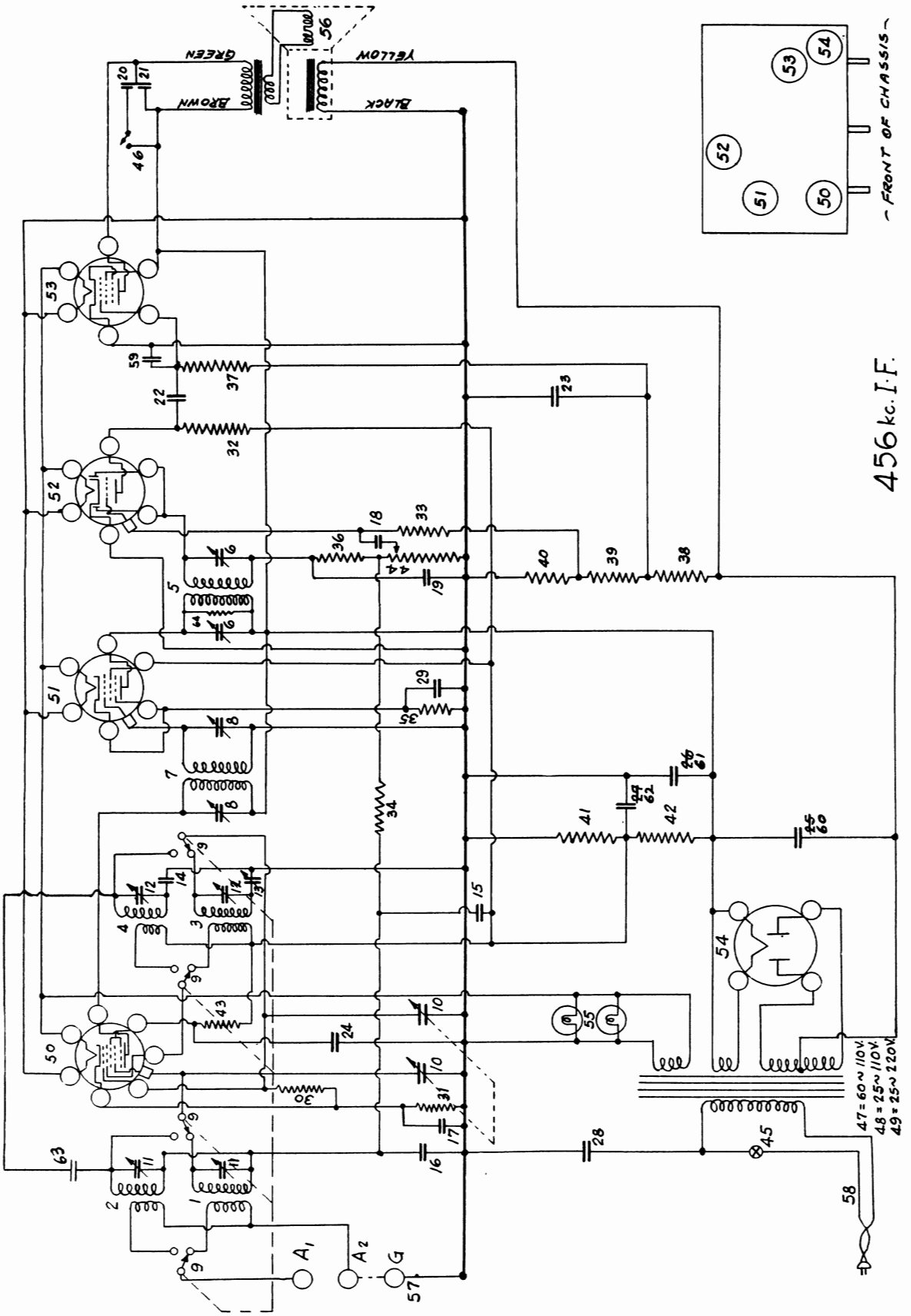
TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	P_2	S	Su	G	K	Ga	Go
6A8-G	Osc.-Mod.	6.7	295	—	135	—	0	7.5	155	-10 to -20
6K7-G	I-F Amplifier	6.7	295	—	135	10	0	10	—	
6J7-G	Det. & A-F Amp.	6.7	1.0	—	65	4	0	4	—	
6N6-G	Output	6.7	285	295	—	—	0	0	—	
5Z4-MG	Rectifier	5.0	—	—	—	—	—	390	—	

Power Output Approximately 3 Watts. Power Consumption Approximately 85 Watts at 117.5 Volts.

CROSLEY RADIO CORP.

534



Wiring Diagram of Model 534

CROSLEY RADIO CORP.

MODEL 534

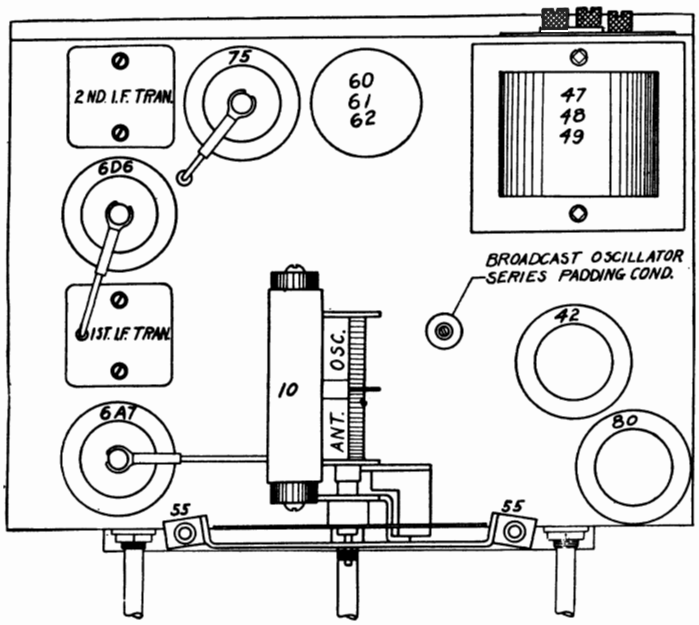


Fig. 2—Top View

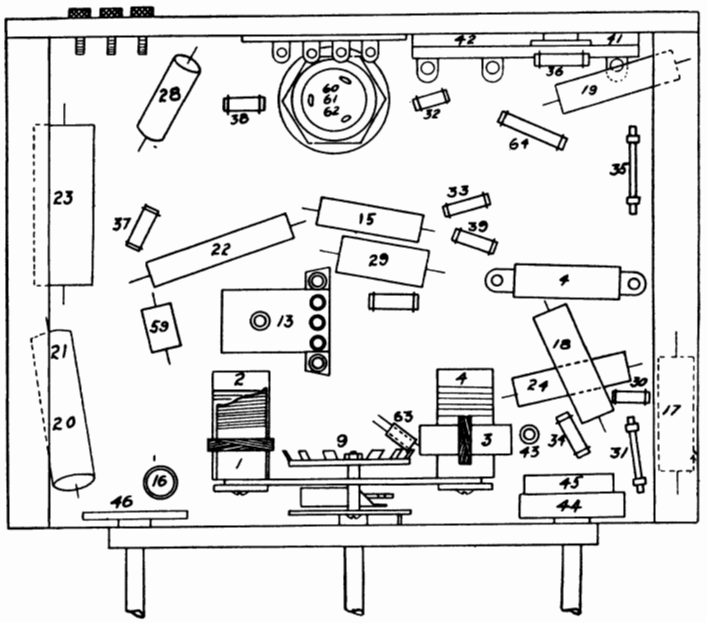


Fig. 4—Bottom View

PARTS LIST—MODEL 534

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1	G39—32000	Low Freq. Ant. Trans.
3	G40—32000	High Freq. Ant. Trans
3	G31—32002	L. F. Osc. Trans.
4	G32—32002	H. F. Osc. Trans
5, 6	G38—32004	2nd I. F. Trans. / I. F. Trimmer Cond.
7, 8	G39—32004	1st I. F. Trans. / I. F. Trimmer Cond
9	B —35031	4 Pole S. T. Sw.
10	B —35025	Variable Cond. Gang
	G26—32086	Dial Drive Assembly
	W —32008A	Dial Hand
	W —32293	Dial Hand Nuts (2)
11	W —35033	Ant. Trimmer Cond.
12	W —35033	Osc. Trimmer Cond.
13	G10—33005	Series Cond.
14	G12—34000	4725 Mmf. Cond.
15	W —32378	0.01 Mfd. 400 V. Cond.
16	W —32380	0.05 Mfd. 200 V. Cond.
17	W —28621	0.02 Mfd. 200 V. Cond.
18	W —28619	0.006 Mfd. 200 V. Cond.
19	W —27932	0.0001 Mfd. 200 V. Cond.
20, 21	W —35011	0.03 Mfd. 400 V. Cond. / 0.006 Mfd. 400 V. Cond.
22	W —27216	0.05 Mfd. 200 V. Cond.
23	W —30321A	1.0 Mfd. 160 V. Cond.
24	W —28621	0.02 Mfd. 200 V. Cond.
25, 26, 27	See 60-61-62	
28	W —30805	0.01 Mfd. 400 V. Cond.
29	W —24049B	0.1 Mfd. 200 V. Cond.
30	—21453	40,000 Ohm Resistor
31	W —25937	275 Ohm Flex. Resistor
32	—21455	300,000 Ohm Resistor
33	—26577	3 Megohm Resistor
34	—26577	3 Megohm Resistor
35	W —25937	275 Ohm Flex. Resistor
36	—21455	300,000 Ohm Resistor
37	—23785	500,000 Ohm Resistor
38	—23785	500,000 Ohm Resistor
39	—34018	200,000 Ohm Resistor
40	—21876	10,000 Ohm Resistor
41	W —31883	25,000 Ohm Resistor
42	W —31883	8,500 Ohm Resistor
43	—23868	6,500 Ohm Resistor
44	W —35013	Level Control 1 Megohm
45	W —35013	Power Switch
46	W —34191	Tone Control Switch
47	G8 —28500	Power Trans. 60 Cy. 110 V.
48	G9 —28500	Power Trans. 25 Cy. 110 V.
49	G10—28500	Power Trans. 25 Cy. 220 V.
50	G47—28807	6A7 Socket
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
51	G75—28807	6D6 Socket
	W —27981A	Tube Shield Base
	B —26009D	Tube Shield
52	G41—28807	-75 Socket
	W —27981A	Tube Shield Base
	W —28632A	Tube Shield
53	G25—28807	-42 Socket
54	G6 —28807	-80 Socket
55	W —4099A	6-8 V. Dial Lamp
	G4 —27134	Light Bracket Assem. (2)
56	—318BL	Speaker
	G5 —31128	Speaker Term. Board
	W —34627	Insulator
	W —34628	Term. Board Cover
57	G16—26719	Ant. Gnd. Terminal
58	B —33905	Power Cable & Plug
59	G1 —34002	0.00025 Mfd. (Mica)
60		8. Mfd. 450 V.)
61	B —30059C	8. Mfd. 450 V.) Condenser
62		8 Mfd. 250 V.)
63	G31—34403	1.0 Mmf.
64	—21454	1 Megohm Resistor
	B —35034	Chassis End (2)
	W —31157B	Knob (1) Station Selector
	W —33991	Knob (1) Band Change
	W —31585B	Knob (2) (Tone Control & Volume Control)
	B —33528A	Escutcheon
	W —33984	Escutcheon Gasket
	W —34306	Escutcheon Lens
	—34976	Grille Cloth

MODEL 534

SPECIFICATIONS

The Crosley Model 534 chassis is a five tube superheterodyne receiver designed for A. C. operation. It employs a tuned antenna circuit which covers from 535 kilocycles to 1730 kilocycles on the broadcast band and from 5.3 megacycles to 15.7 megacycles on the short wave band, automatic volume control, two step tone control and class "A" pentode audio amplification.

TUBES AND VOLTAGE LIMITS

The following are the tubes and voltages measured from the tube contact to chassis with a 500,000 ohm 500 Volt voltmeter with the receiver in operating condition but with no signal to the antenna, and with a line voltage of 117.5 volts. Voltage limits are plus or minus 10% of values given.

TUBE VOLTAGES—MODEL 534

Type	Where Used	Ef	Ep	Esg	Esup	Ek	Eg
6A7	Osc. Mod.	6.3	100	70	2.5	2.5	0
6D6	I. F. Amp.	6.3	205	100	3.0	3.0	0
75	Diode and A. F.	6.3	50	—	0	0	x
42	Output	6.3	195	205	—	0	-8
80	Rect.	4.9	—	—	—	—	—

VOLTAGE ACROSS SPEAKER FIELD 53 VOLTS.
x INDICATES HIGH RESISTANCE IN THE CIRCUIT WHICH PREVENTS ACCURATE MEASUREMENT.
ALL MEASUREMENTS MADE WITH A 1000 OHM PER VOLT VOLTMETER FROM CHASSIS.

(The power consumption at 117.5 volts is approximately 95 watts).

CIRCUIT DESCRIPTION

The circuit consists of a tuned antenna stage, an oscillator-modulator stage, one stage of I.F. amplification, diode detector and A.V.C., A.F. amplifier and power supply. The oscillator-modulator stage uses a Type 647 tube and the I. F. stage uses a Type 6D6 tube. The A.V.C., second detector and first stage of audio amplification are combined in a type 75 tube. The output stage uses a single Type 42 tube and the power supply uses a Type 80 tube.

PEAKING PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and will not need readjustment unless some coil or condenser has been replaced. Do not change the setting of any trimmer condenser unless it is definitely known that the adjustment is necessary. If realignment is found necessary, the circuits can be properly adjusted only with the use of a modulated test oscillator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate of the Type 42 tube and the other terminal to the screen grid of the Type 42 tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first to the left of the filament prongs and the screen grid prong will be next to the plate prong. Be sure that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger) in series with one of the leads.

PEAKING I.F. STAGES AT 456 Kc.

NOTE: Be sure speaker is connected before turning on receiver.

I. Connect the ground lead of the test oscillator to the chassis frame. Connect a .1 mfd., or larger, concondenser in series with the other lead and connect this lead to the grid cap of the Type 6A7 tube, leaving the tube's grid clip in place. The .1 mfd. condenser is necessary to prevent a short circuit which would remove the bias voltage.

II. Set the test oscillator at 456 kilocycles.

III. Turn the volume control of the receiver on full. Turn the tuning condenser until the plates are completely meshed and turn the band selector switch to the right. Turn the tone control to the left.

IV. (a) Peak both I.F. tuning condensers located on top of the 2nd I.F. transformer (Fig. 2). NOTE: Be sure to use the lowest oscillator output that will give a reasonable scale deflection on the output meter. 20 to 60 volts output is satisfactory.

(b) Peak both I.F. tuning condensers located on top of the 1st I.F. transformer (Fig. 2).

V. Repeat operation IV to insure accurate adjustment of the I.F. tuning condensers.

PEAKING R.F. CIRCUITS

Connecting test oscillator to receiver: It is necessary to connect a dummy antenna in series with the test oscillator and the antenna terminal of the receiver. On the Broadcast Band this consists of a .0002 mfd. *mica* condenser and on the Short Wave Band it consists of a *carbon* resistor of approximately 400 ohms. With the tuning condenser plates completely meshed make certain that the dial pointer is exactly horizontal.

I. To Peak The Broadcast Band: See NOTE in IV (a) under peaking I.F. Stages, also Fig. 3 for location of parallel trimmer condensers and Fig. 2 for location of oscillator series trimmer (or padding) condenser.

(a) Set test oscillator at 1400 kilocycles. Tune the station selector until the dial pointer points to 140 on the dial. Then adjust the oscillator parallel trimmer condenser (Broadcast Band) for maximum output.

(b) With the same dial setting peak the antenna parallel trimmer condenser for the Broadcast Band.

(c) Set the test oscillator at 600 kilocycles.

(d) Tune in the 600 kilocycle signal with the station selector in the region of 60 on the dial, for maximum reading on the output meter.

(e) Close the oscillator series padding condenser (Broadcast Band), Fig, 2, ⅛ turn and re-tune the station selector to the 600 kilocycle signal for maximum output, noting the reading on the output meter.

(f) If the meter reads higher after operation (e) repeat the operation again and again until no further improvement in the reading of the output meter can be obtained. If the meter reads lower after operation (e) open the oscillator series trimmer condenser ⅛ turn and re-tune the station selector to the 600 kilocycle signal, noting the reading on the output meter as above and repeat as many times as necessary to obtain the highest meter reading. Do not reset the parallel trimmer condensers at this frequency.

(g) Repeat operations (a) and (b) for more accurate adjustments.

II. To Peak The Short Wave Band:

(a) Be sure to change the dummy antenna as described above.

(b) Close the oscillator parallel trimmer condenser (Short Wave Band) and then open three turns.

(c) Close the antenna parallel trimmer condenser (Short Wave Band) and then open ½ turn.

(d) Tune the station selector to 15 megacycles (15 on the dial).

(f) Peak the oscillator parallel trimmer condenser on the first signal heard when closing the condenser.

NOTE: To check on the adjustment of the oscillator parallel trimmer condenser:

(1) Increase the test oscillator output not more than ten times.

(2) Try to tune in the 15 megacycle signal with the station selector tuned to approximately 14 on the dial.

(3) If the 15 megacycle signal is heard at approximately 14 on the dial in addition to 15 on the dial the oscillator parallel trimmer condenser has been aligned on the correct frequency.

(g) Reduce the output from the test oscillator to the previous output and re-tune the station selector to 15 megacycles at 15 on the dial.

(h) Peak the antenna parallel trimmer condenser for the Short Wave Band for maximum output, then re-tune the station selector again for maximum output.

(i) Repeat the two operations in (h) as many times as necessary to obtain the highest reading on the output meter.

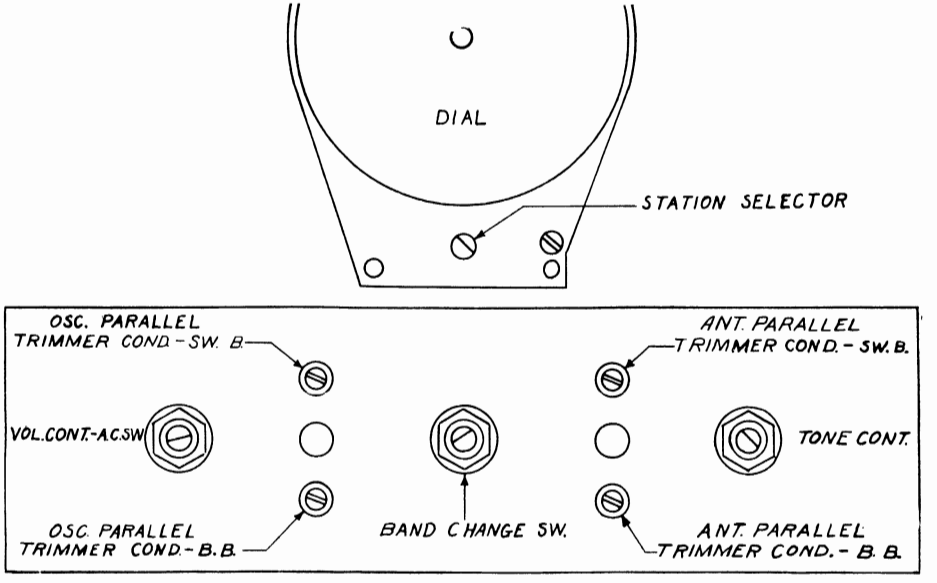
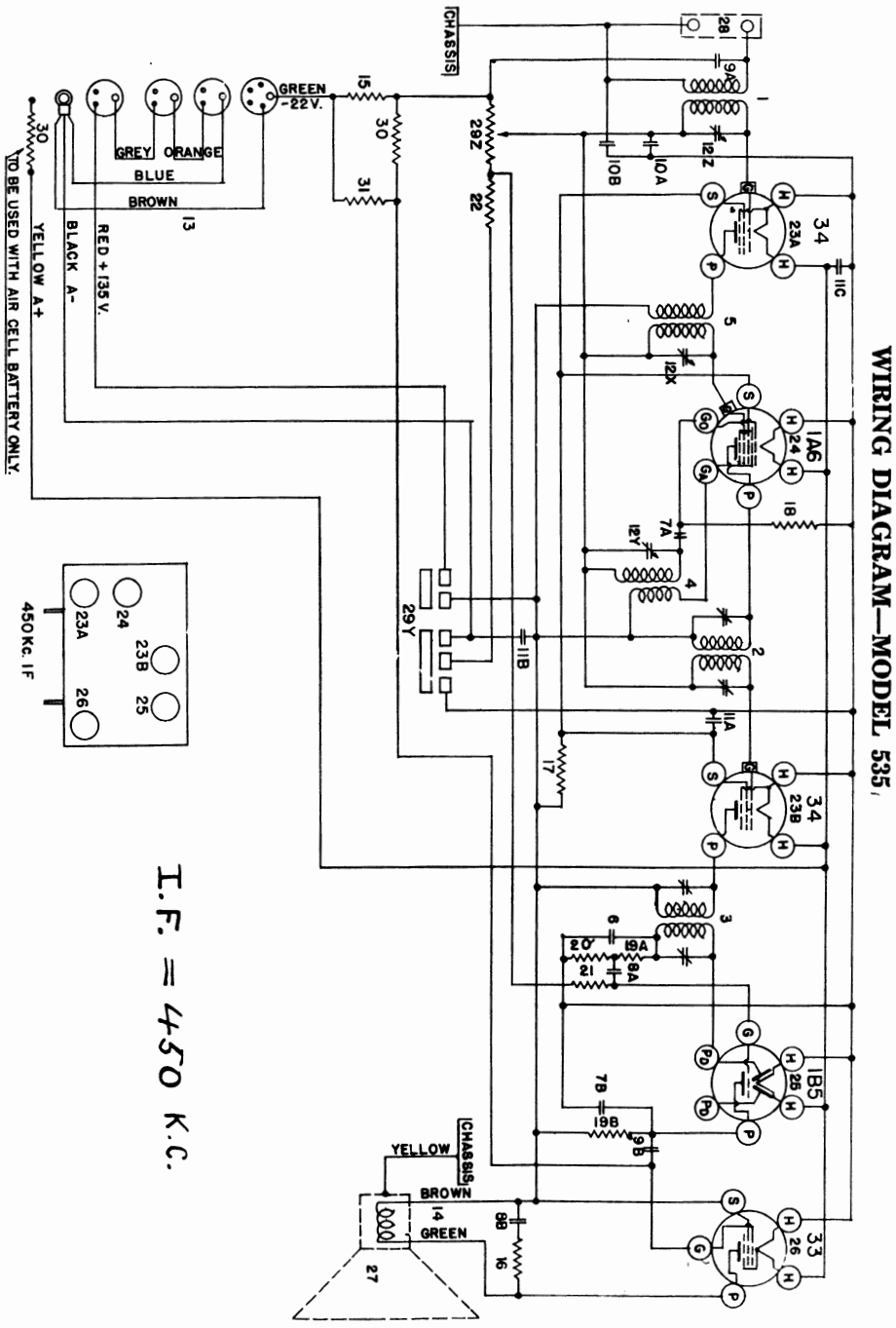


Fig. 3—Front View

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 535

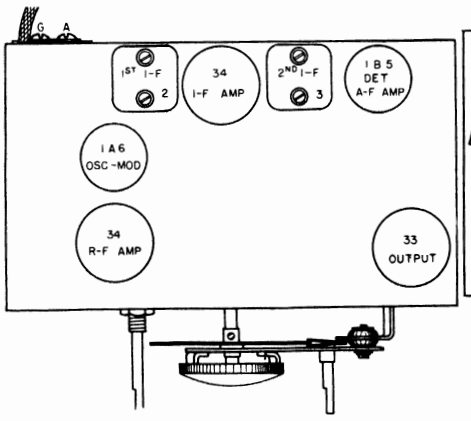


PARTS LIST—MODEL 535

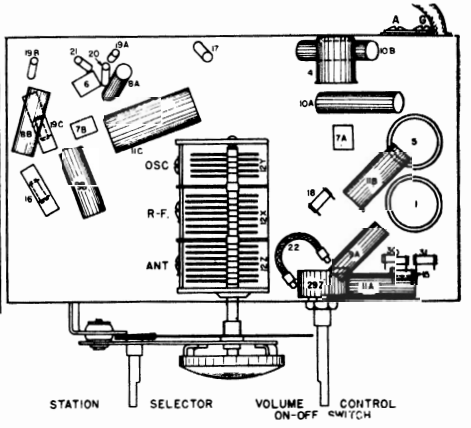
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G55—32000	Antenna Coil (only)
	W —30802A	Coil Shield
	W —30026	Retaining Ring
2	G73—32004	First I. F. Assembly
3	G38—32004	Second I. F. Assembly
4	G67—32002	Oscillator Coil (only)
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
5	G53—32001	R. F. Coil (only)
	W —30802A	Coil Shield
	W —30026	Retaining Ring
6	G2 —34002	Condenser 0.0001 Mfd. Mica
7A	G1 —34002	Condenser 0.00025 Mfd. Mica
7B	G1 —34002	Condenser 0.00025 Mfd. Mica
8A	W —28619	Condenser 0.006 Mfd. 160 Volt
8B	W —28619	Condenser, 0.006 Mfd. 160 Volt
9A	W —28621	Condenser 0.02 Mfd. 200 Volt
9B	W —28621	Condenser 0.02 Mfd. 200 Volt
10A	W —24049B	Condenser 0.1 Mfd. 200 Volt
10B	W —24049B	Condenser 0.1 Mfd. 200 Volt
11A	W —29910A	Condenser 0.25 Mfd. 200 Volt
11B	W —29910A	Condenser 0.25 Mfd. 200 Volt
11C	W —29910A	Condenser 0.25 Mfd. 200 Volt
12Z, 12X, 12Y	G43—33002	Three Section Tuning Con. Gang
	—37147	Dial Drive Unit
	MG16—35757	Drive Mounting Bracket
	W —36150A	Dial Face
	—37158	Dial Glass

Item No.	Part No.	Description
	—37156	Pointer
	—37157	Pointer Screw (1)
C	—37396	Battery Cable
W	—35111	Speaker Cable
15	—27121	Resistor 5000 Ohm ¼ W.
16	—24814	Resistor 7000 Ohm ¼ W.
17	—37377	Resistor 20,000 Ohm 1 W.
18	—34019	Resistor 75,000 Ohm ¼ W.
19A	—21455	Resistor 300,000 Ohm ¼ W.
19B	—21455	Resistor 300,000 Ohm ¼ W.
19C	—21455	Resistor 300,000 Ohm ¼ W.
20	—21454	Resistor 1.0 Megohm ¼ W.
21	—26577	Resistor 3.0 Megohm ¼ W.
22	W —23013	Resistor 20,000 Ohm ½ W. Flex.
23A	G31—28807	Socket 34
23B	G31—28807	Socket 34
24	G55—28807	Socket 1A6
25	G91—28807	Socket 1B5
26	G36—28807	Socket 33
	W —26974	Tube Shield
	W —26973	Shield Base
27	31—MS—3	Speaker
28	G1 —26719	Terminal Board—Ant & Grnd.
29Z, 29X	—37409	Volume Control On-Off Switch
30	—34883	Resistor 2 Megohm ¼ W.
31	—26578	Resistor 5.0 Megohm ¼ W.
B	—35917	Escutcheon
D	—28	Escutcheon Screw (3)
W	—31585B	Knob (2)
G2	—23300	Resistor 0.53 Ohm (For air cell only)



Top View 535



Bottom View 535

TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	S	G	Ga	Go
34	R-F Amplifier	2.0	135	67.5	-2.5	—	—
1A6	Osc.-Mod.	2.0	135	67.5	-2.5	135	-5 to -10
34	I-F Amplifier	2.0	135	67.5	-2.5	—	—
1B5	Diode Detector & A-F Amplifier	2.0	65	—	-0.1	—	—
33	Output	2.0	130	135	-1.0	—	—

"A" BATTERY DRAIN APPROXIMATELY 0.5 AMPERES—"B" BATTERY DRAIN APPROXIMATELY 23 MILS MILS.

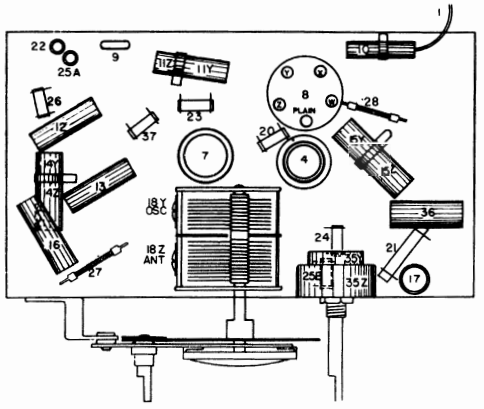
POWER OUTPUT APPROXIMATELY 1 WATT.

PARTS LIST—MODEL 545

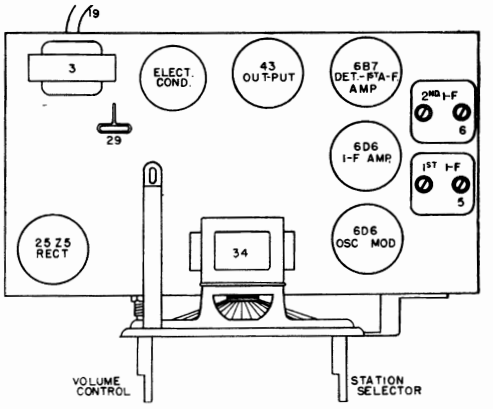
Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	W —29784B	Ant. (Flex Wire)
2	G4 —27134	Dial Light Socket Assm.
3	G3 —28859	Filter Choke
4	G51—32000	Ant. Coil
	W —36457	Ant. Coil Mounting Brkt.
5	G51—32004	1st I. F. Assm.
6	G49—32004	2nd I. F. Assm.
7	G6 —32002	Osc. Coil
	W —25200	Coil Socket
	W —25025B	Coil Shield
	W —26891	Coil Insulator
	W —21541C	Retaining Ring
8Z, 8Y, 8X, 8W	W —31992	Condenser, 25. Mfd. 125 V. Condenser, 8. Mfd. 125 V. Condenser, 16. Mfd. 100 V. Condenser, 10. Mfd. 125 V.
9	G2 —34002	Condenser, 100. Mmfd.
10	W —30325A	Condenser, 0.003 Mfd. 200 V.
11Z, 11Y	W —30322A	Condenser, 0.00017 Mfd. 200 V. Condenser, 0.006 Mfd. 200 V.
12	W —30323	Condenser, 0.01 Mfd. 200 V.
13	W —28621	Condenser, 0.02 Mfd. 200 V.
14Z, 14Y	W —28623	Condenser, 0.02 Mfd. 200 V. Condenser, 0.02 Mfd. 200 V.
15Z, 15Y	W —29271	Condenser, 0.02 Mfd. 400 V. Condenser, 0.02 Mfd. 400 V.
16	W —24049B	Condenser, 0.1 Mfd. 200 V.
17	W —29910A	Condenser, 0.25 Mfd. 200 V.
18Z, 18Y	G14—33001	2 Section Tuning Cond. Gang
	—36147B	Dial Drive Assm.
	MG16—35757	Dial Drive Support Brkt. Assm.

Item No.	Part No.	Description
	W —36150A	Dial Face
	—37158	Dial Glass
	—37156	Pointer
	—37157	Pointer Screw
19	B —33906A	Power Supply Cord & Plug
20	—31093	Resistor, 2700 Ohm ¼ W.
21	—23616	Resistor, 15,000 Ohm 1. W.
22	—21237A	Resistor, 60,000 Ohm ¼ W.
23	—35929	Resistor, 150,000 Ohm ¼ W.
24	—21455	Resistor, 300,000 Ohm ¼ W.
25A	—23785	Resistor, 500,000 Ohm ¼ W.
25B	—23785	Resistor, 500,000 Ohm ¼ W.
26	—33490	Resistor, 10. Megohm ¼ W.
27	W —28589	Resistor, 350 Ohm ½ W. Flex.
28	W —27503	Resistor, 1,400 Ohm ½ W. Flex.
29	W —36114	Resistor, Candohm
30A	G75—28807	Socket, 6D6
30B	G75—28807	Socket, 6D6
31	G51—28807	Socket, 25Z5
32	G30—28807	Socket, 43
33	G48—28807	Socket, 6B7
	W —35772	Tube Shield (Half) (6)
	W —35773	Tube Shield Cap (3)
	W —35774	Tube Shield Base (3)
34	214—BL—9	Speaker
35Z, 35Y	—36265	Volume Control On-Off Switch
36	W —32780A	Condenser, 0.05 Mfd. 400 V.
37	—34883	Resistor, 2 Megohm ¼ W.
	B —35917	Escutcheon
	D —28	Escutcheon Screws (3)
	W —31585B	Knobs (2)



Bottom View 545



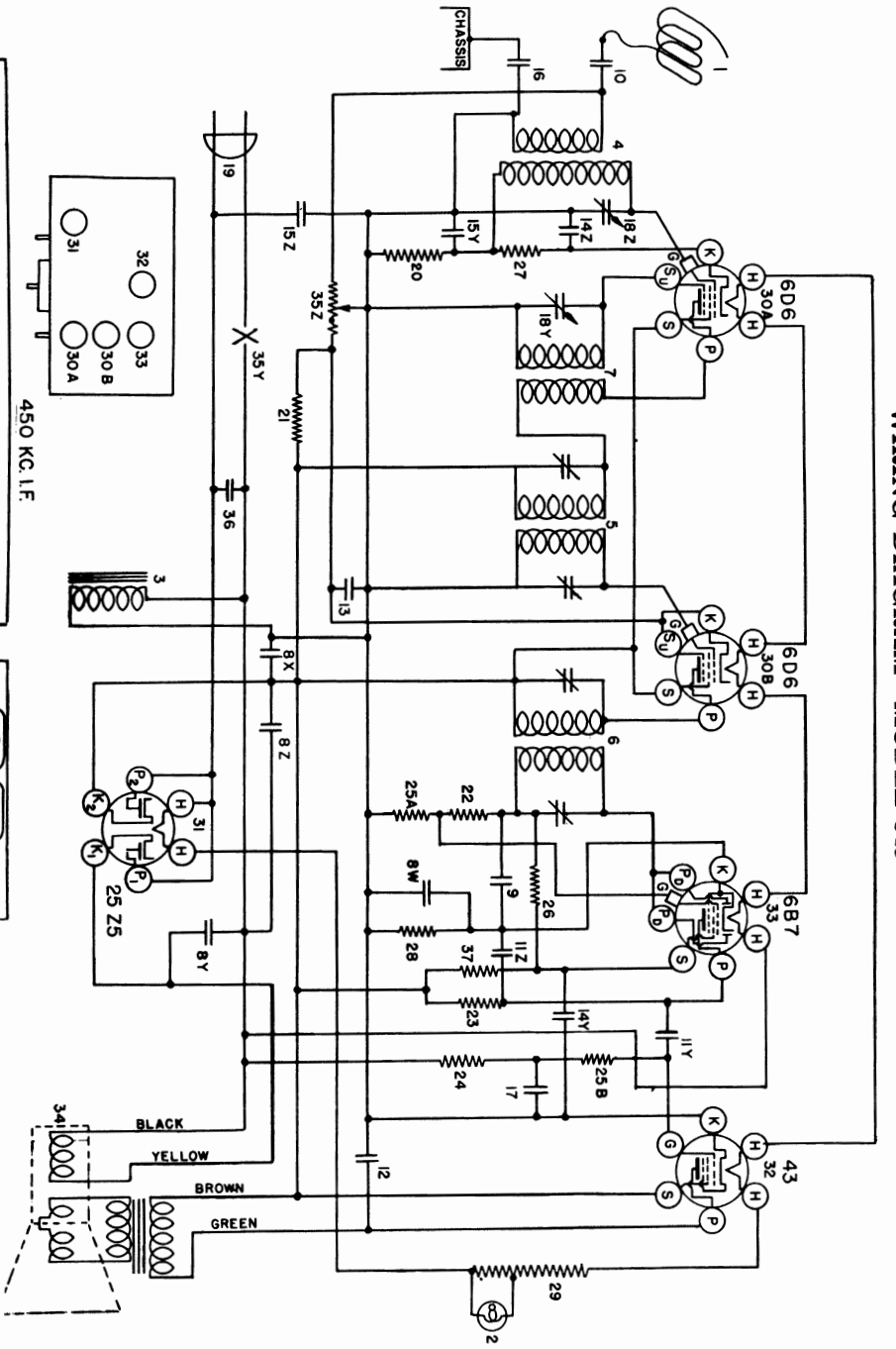
Top View 545

TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	S	Su	G	K
6D6	Osc.-Mod.	6.5	105	105	0	-17	20
6D6	I-F Amplifier	6.5	105	105	3.5	0	3.5
6B7	Diode Detector & A-F Amplifier	6.5	25	20	—	0	1.5
43	Output	25.2	100	105	—	-20	0
25Z5	Rectifier	25.2	117.5 A.C.				

Power Consumption Approximately 55 Watts at 120 Volts.

Voltage Reading Approximately 10% Lower on 120 V., D.C.

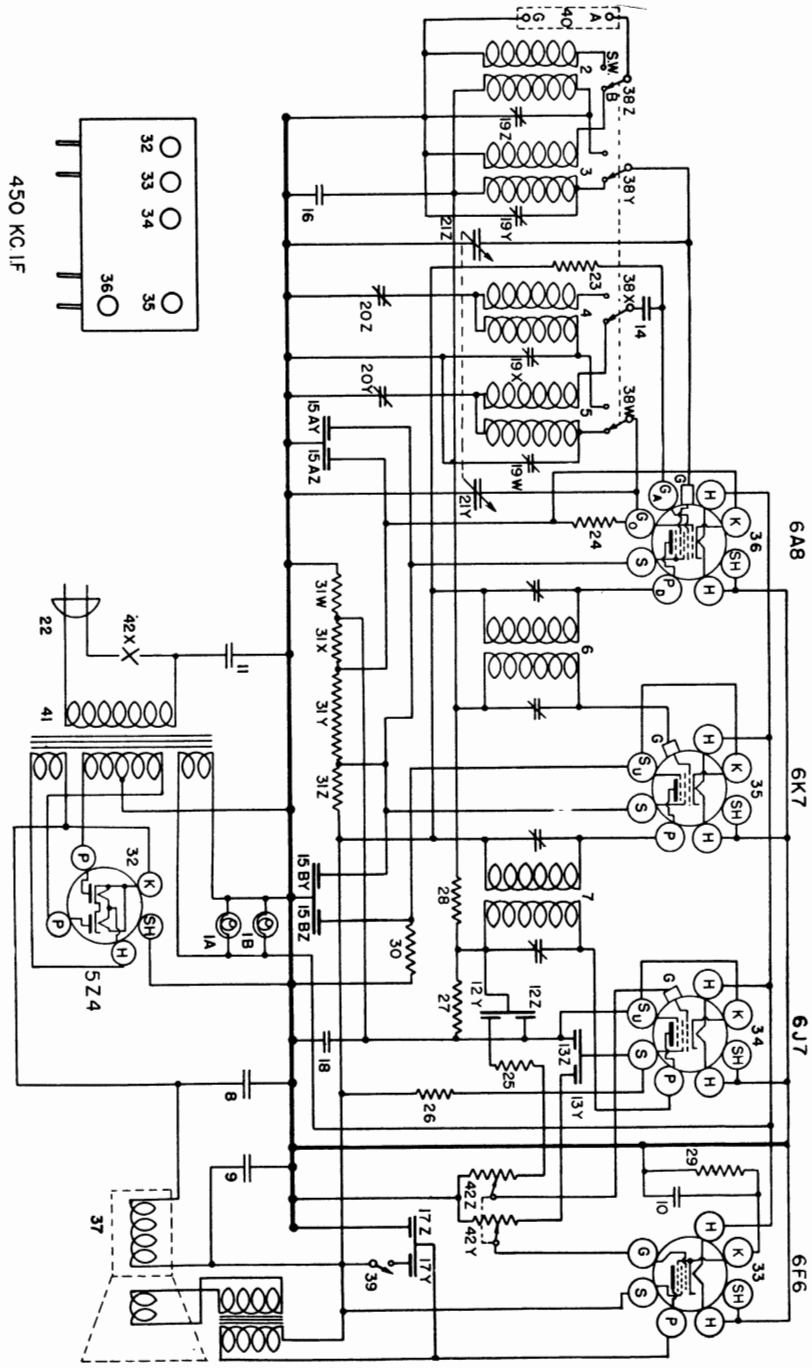


CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 545

CROSLEY RADIO CORP.

WIRING DIAGRAMS—MODELS 555 AND 5555

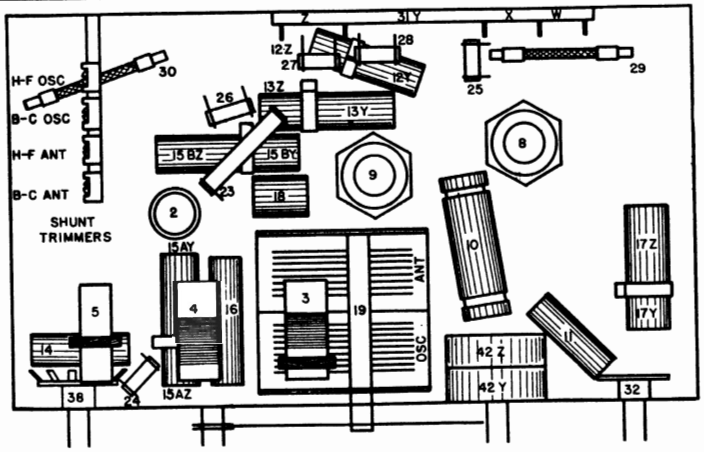


PARTS LIST—MODEL 555

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1A	G6 —27134	Dial Light Assm.
1B	G6 —27134	Dial Light Assm.
2	G82 —32000	Ant. Coil, S. W. B.
3	G81 —32000	Ant. Coil, B. C. B.
4	G65 —32002	Osc. Coil, S. W. B.
5	G66 —32002	Osc. Coil, B. C. B.
6	G71 —32004	1st I. F. Assm.
7	G72 —32004	2nd I. F. Assm.
8	W —36055	Condenser, 35. Mfd. 400 Volt
9	W —36057	Condenser, 40. Mfd. 300 V.
10	W —36931	Condenser, 12 Mfd. 25 V.
11	W —30805	Condenser, 0.01 Mfd. 400 V.
12Z, 12Y	W —30322A	Condenser, 0.00017 Mfd. 200 V.
13Z, 13Y	W —25537A	Condenser, 0.006 Mfd. 200 V.
14	W —23191A	Condenser, 0.001 Mfd. 400 V.
15AZ, 15AY	W —28623	Condenser, 0.03 Mfd. 400 V.
15BZ, 15BY	W —28623	Condenser, 0.02 Mfd. 200 V.
16	W —27216	Condenser, 0.02 Mfd. 200 V.
17Z, 17Y	W —35011	Condenser, 0.05 Mfd. 200 V.
18	W —36541	Condenser, 0.006 Mfd. 400 V.
19Z, 19Y, 19V, 19W	W —37241A	Condenser, 0.03 Mfd. 400 V.
20Z, 20Y	G29 —33006	Condenser, 0.02 Mfd. 160 V.
21Z, 21Y	G17 —33001	4 Section Trimmer Cond.
	—37353C	S. W. Osc. Series Padder
	—37158	B. C. Osc. Series Padder
	—37156	Var. Tuning Cond. Gang
	—37157	Dial Assm. Complete
		Dial Glass
		Dial Pointer
		Pointer Screw

Item No.	Part No.	Description
	—37354	Dial Face only
22	B —33906A	A. C. Cord & Plug
23	—5370A	Resistor, 20,000 Ohm
24	—21237	Resistor, 60,000 Ohm
25	—21875	Resistor, 100,000 Ohm
26	—21455	Resistor, 300,000 Ohm
27	—33344	Resistor, 400,000 Ohm
28	—37245	Resistor, 1.5 Megohm
29	W —25291	Resistor, 500 Ohm 1½ W. (Flex)
30	W —28106	Resistor, 500 Ohm ½ W. (Flex)
31Z, 31Y, 31X, 31W	W —37246A	Resistor, 10,000 Ohm Candohm Resistor, 25,000 Ohm Candohm Resistor, 185. Ohm Candohm Resistor, 185. Ohm Candohm
32	G154—36400	Socket, 5Z4
33	G153—36400	Socket, 6F6
34	G157—36400	Socket, 6J7
35	G151—36400	Socket, 6K7
36	G156—36400	Socket, 6A8
37	331—CL—9	Speaker, (555)
	432—CJ—3M	Speaker, (5555) Console
	G3 —35696	Speaker Cable (5555)
38W To 38Z	—37247	Band Change Switch
39	W —36184A	Tone Control Switch
40	G1 —26719	Ant. & Grd. Terminal
41	G12 —28500	Power Trans. 60 Cy. 110 V.
	G13 —28500	Power Trans. 25 Cy. 110 V.
	G14 —28500	Power Trans. 25 Cy. 220 V.
42Z, 42Y	—37395	Volume Control A. F. Grid Volume Control Output Grid
42X		On-Off Switch
	B —35917	Escutcheon
	D — 28	Escutcheon Screws (3)
	W —31585B	Knob, V. C. & Dial
	W —36355	Knob, T. C. & Band Change



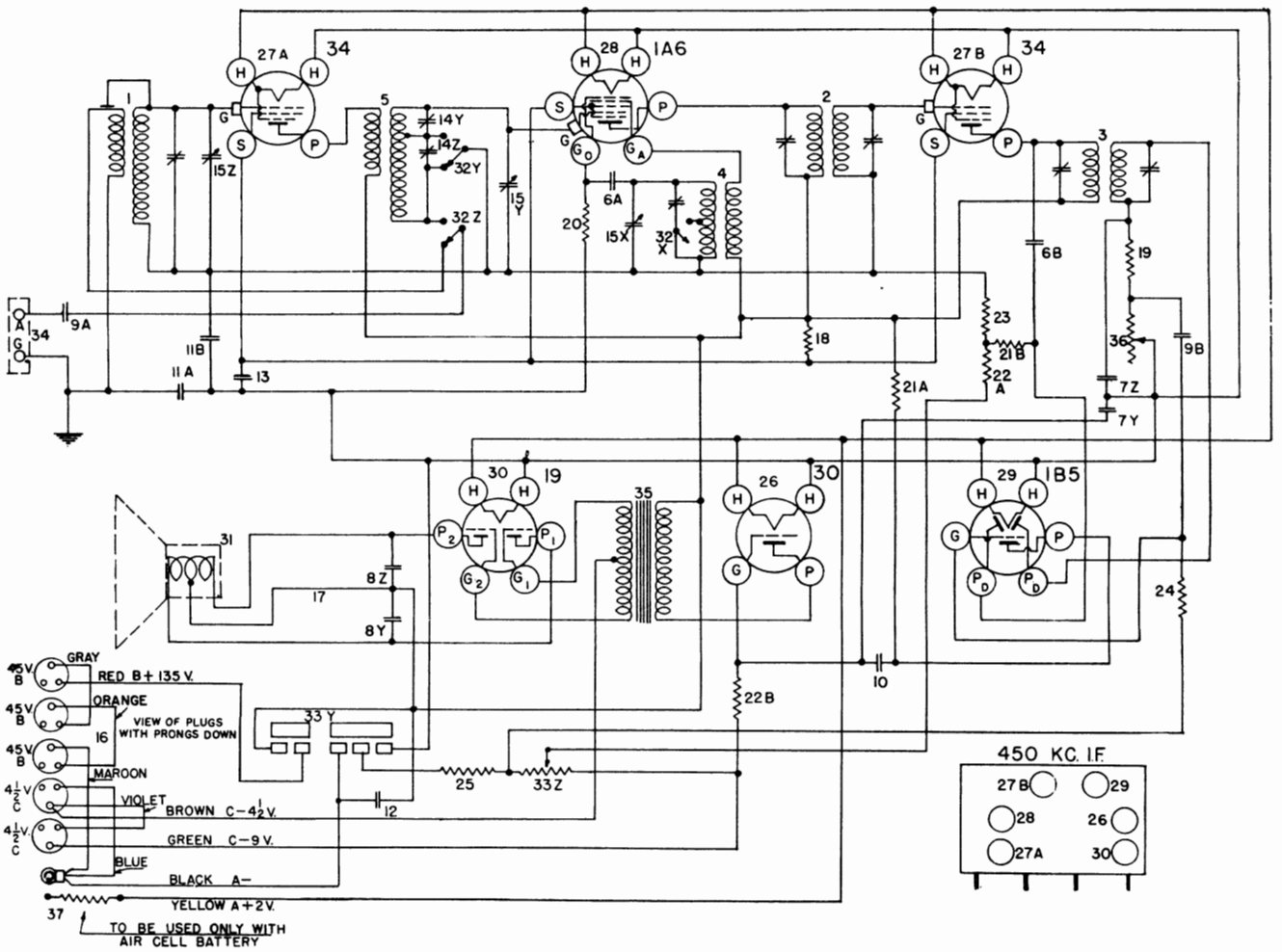
TUBE SOCKET VOLTAGE READINGS

Type	Where Used	H	P	S	Su	G	K	Ga	Go
6A8	Osc.-Mod.	6.7	295	135	—	0	7.5	155	-10 to -20
6K7	I-F Amplifier	6.7	295	135	10	0	10	—	—
6J7	Det. & A-F Amp.	6.7	1.0	65	4	0	4	—	—
6F6	Output	6.7	295	295	—	0	20	—	—
5Z4	Rectifier	5.0	—	—	—	—	390	—	—

Power Output Approximately 3 Watts. Power Consumption Approximately 85 Watts at 117.5 Volts.

CROSLEY RADIO CORP.

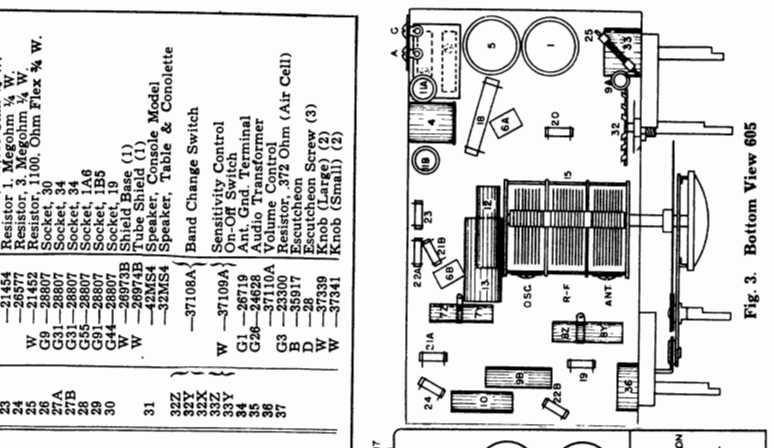
WIRING DIAGRAM—MODEL 605



PARTS LIST—MODEL 605

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G76—32000	Ant. Coil only
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
2	G48—32004	1st I. F. Assm.
3	G69—32004	2nd I. F. Assm.
4	G47—32002	Osc. Coil only
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulator Ring
	W —21541C	Retaining Ring
5	G53—32001	R. F. Coil only
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
6A	G2 —34002	Condenser, 0.0001 Mfd.
6B	G2 —34002	Condenser, 0.0001 Mfd.
7Z		Condenser, 0.00015 Mfd.
7Y	W —28152A	Condenser, 0.006 Mfd. 400 V.
8Z		Condenser, 0.008 Mfd. 400 V.
8Y	W —31158	Condenser, 0.01 Mfd. 200 V.
9A	W —30323	Condenser, 0.01 Mfd. 200 V.
9B	W —30323	Condenser, 0.02 Mfd. 200 V.
10	W —28621	Condenser, 0.1 Mfd. 200 V.
11A	W —24049B	Condenser, 0.1 Mfd. 200 V.
11B	W —24049B	Condenser, 0.25 Mfd. 200 V.
12	W —29910A	Condenser, 1.0 Mfd. 160 V.
13	W —30321A	Condenser, B. C. Trimmer R. F.
14Z	G22—33009	Condenser, H. F. Trimmer R. F.
14Y		
15Y	G42—33002	3 Section Tuning Cond. Gang
15X	—36148B	Dial Drive Assm.
	W —36160D	Dial Drive Mtg. Bracket
	B —36151A	Dial Face
	—37156	Pointer
	—37157	Pointer Screw
	—37158	Dial Glass
	C —31008B	Battery Cable
	W —53703A	Speaker Cable
	—21453	Resistor, 40,000 Ohm 1 W.
	—21237A	Resistor, 60,000 Ohm ¼ W.
	—23403	Resistor, 150,000 Ohm ¼ W.
	—23403	Resistor, 150,000 Ohm ¼ W.
	—23785	Resistor, 500,000 Ohm ¼ W.
	—23785	Resistor, 500,000 Ohm ¼ W.
	—21454	Resistor 1, Megohm ¼ W.
	—26577	Resistor, 3, Megohm ¼ W.
	W —21452	Resistor, 1100, Ohm Flex ¾ W.
	G9 —28807	Socket, 30
	G31—28807	Socket, 34
	G31—28807	Socket, 34
	G85—28807	Socket, 1A6
	G44—28807	Socket, 1B5
	W —26973B	Socket, 19
	W —26974B	Shield Base (1)
	—42MS4	Tube Shield (1)
31	—32MS4	Speaker, Console Model
		Speaker, Table & Conolette
32Z	—37108A	Band Change Switch
32Y		
32X		
33Z	W —37109A	Sensitivity Control
33Y		On-Off Switch
34	G1 —26719	Ant. Gnd. Terminal
35	G26—24628	Audio Transformer
36	—37110A	Volume Control
37	G3 —23300	Resistor, 372 Ohm (Air Cell)
	B —35917	Escutcheon
	D —23339	Escutcheon Screw (3)
	W —37341	Knob (Large) (2)
	W —37341	Knob (Small) (2)



TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	S	G	Ga	Go
34	R-F Amplifier	2.0	135	55	-.5	—	—
1A6	Osc.-Mod.	2.0	135	55	-.5	135	-5 to -10
34	I-F Amplifier	2.0	135	55	-.5	—	—
1B5	Diode Detector and A-F Amplifier	2.0	75	—	-.5	—	—
30	A-F Amplifier	2.0	135	—	-3.0	—	—
19	Double Tri. Output	2.0	135	—	-1.0	—	—

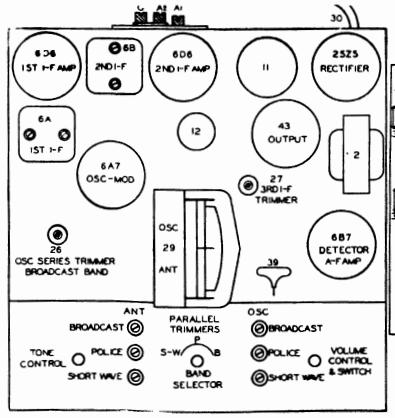
Power Output Approximately 2.5 Watts.
"A" Battery Drain Approximately .56 Amperes at 2 Volts.
"B" Battery Drain 12 to 30 Milliamperes, Depending Upon Setting of Volume and Sensitivity Controls.

PARTS LIST—MODEL 615

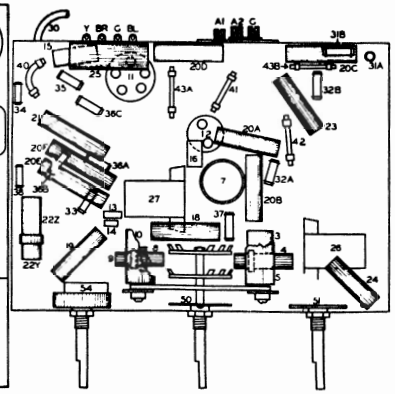
Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	G4 —27134	Dial Light Socket
1B	G4 —27134	Dial Light Socket
2	G3 —28859	Choke, 9 Henry
3	G39—32000	Ant. Coil B. C. Band
4	G43—32000	Ant. Coil P. Band
5	G56—32000	Ant. Coil S. W. Band
6A	G43—34004	1st I. F. Trans.
6B	G44—34004	2nd I. F. Trans.
7	G13—32004	3rd I. F. Trans.
8	G34—32002	Osc. Coil B. C. Band
9	G35—32002	Osc. Coil P. Band
10	G32—32002	Osc. Coil S. W. Band
11Z	W —31992	Condenser, 25 Mfd. 125 Volt
11Y		Condenser, 8 Mfd. 125 Volt
11X		Condenser, 16 Mfd. 100 Volt
11W		Condenser, 10 Mfd. 25 Volt
12	W —35980	Condenser, 5 Mfd. 75 Volt
13	G12—34000	Condenser, 0.004725 Mfd.
14	G7 —34000	Condenser, 0.00145 Mfd.
15	W —30805	Condenser, 0.01 Mfd. 400 Volt
16	G2 —34002	Condenser, 0.0001 Mfd.
17	—	
18	W —32379	Condenser, 0.02 Mfd. 200 Volt
19	W —32378	Condenser, 0.01 Mfd. 400 Volt
20A	W —28621	Condenser, 0.02 Mfd. 200 Volt
20B	W —28621	Condenser, 0.02 Mfd. 200 Volt
20C	W —28621	Condenser, 0.02 Mfd. 200 Volt
20D	W —28621	Condenser, 0.02 Mfd. 200 Volt
20E	W —28621	Condenser, 0.02 Mfd. 200 Volt
20F	W —28621	Condenser, 0.02 Mfd. 200 Volt
21	W —30323	Condenser, 0.01 Mfd. 200 Volt
22Z	W —30322A	Condenser, 0.006 Mfd. 200 Volt
22Y		Condenser, 0.00017 Mfd. 200 Volt
23	W —24049B	Condenser, 0.1 Mfd. 200 Volt
24	W —36072	Condenser, 0.035 Mfd. 200 Volt
25	W —29910A	Condenser, 0.25 Mfd. 200 Volt
26	G10—33005	Trimmer Condenser
27	G11—33005	Trimmer Condenser
28Z	W —35951	3 Gang Trim. Cond. 3-25 Mmf.
28Y		
28X		
28W	W —35951	3 Gang Trim. Cond. 3-25 Mmf.
28V		
28U		
29Z	G13—33001	2 Gang Var. Tuning Condenser
29Y		
	G29—32086	Dial Drive Assembly
	W —37198	Dial Hand
	W —32293	Dial Hand Nut
	C 35946	Dial Indicator

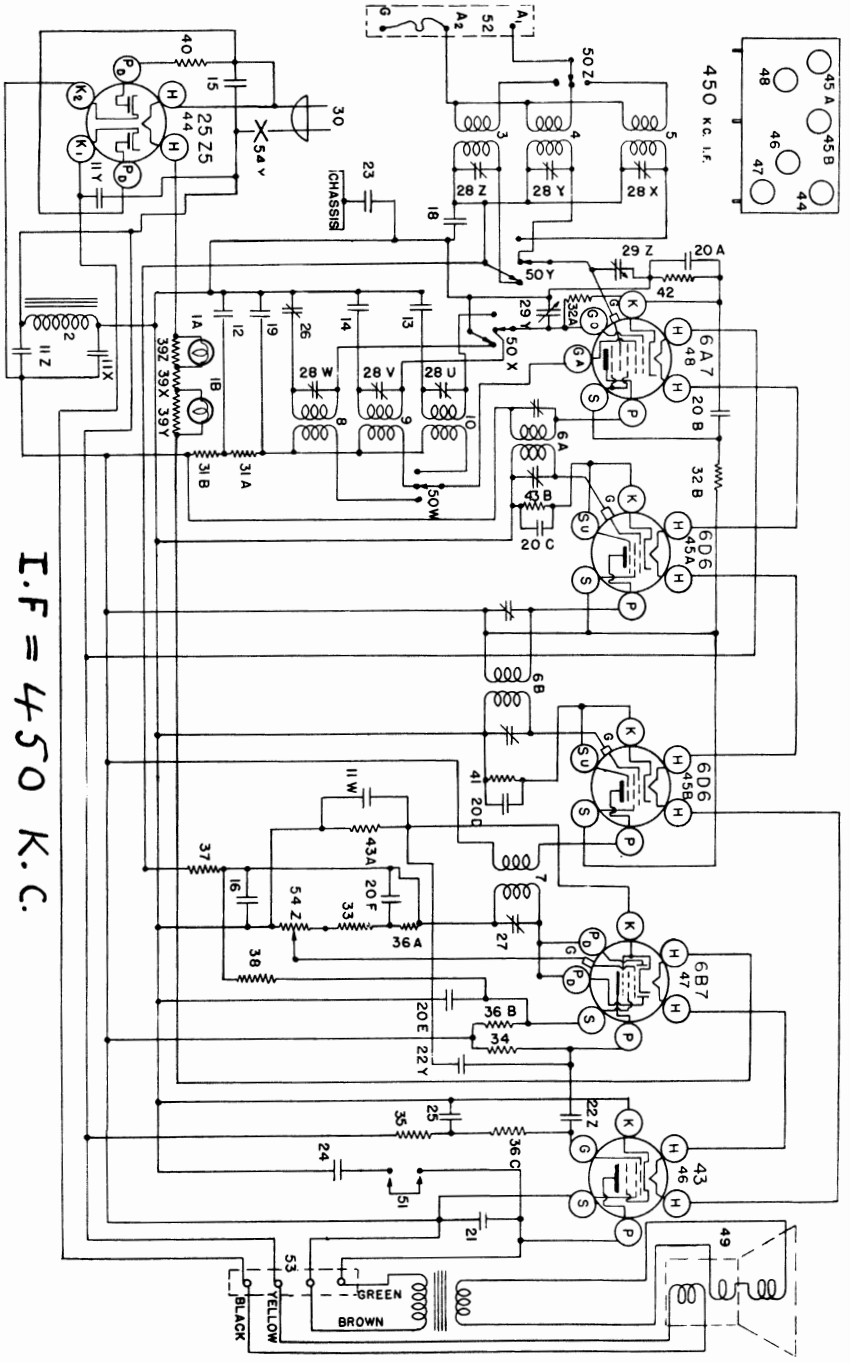
Item No.	Part No.	Description
30	B —33906A	Cable & Plug (Power Supply)
31A	—31094	Resistor, 4.500 Ohms
31B	—31094	Resistor, 4.500 Ohms
32A	—21453	Resistor, 40,000 Ohms
32B	—21453	Resistor, 40,000 Ohms
33	—21237A	Resistor, 60,000 Ohms
34	—23403	Resistor, 150,000 Ohms
35	—21455	Resistor, 300,000 Ohms
36A	—23785	Resistor, 500,000 Ohms
36B	—23785	Resistor, 500,000 Ohms
36C	—23785	Resistor, 500,000 Ohms
37	—21454	Resistor, 1 Megohm
38	—33490	Resistor, 10 Megohm
39Z	W —35979	Resistor, 26.7 Ohms
39Y		Resistor, 26.7 Ohms
39X		Resistor, 80 Ohms
40	W —24537	Resistor, 60 Ohms
41	W —28589	Resistor, 350 Ohms
42	W —22514	Resistor, 750 Ohms
43A	W —27503	Resistor, 1400 Ohms
43B	W —27503	Resistor, 1400 Ohms
44	G51—28807	Socket 25Z5
45A	G75—28807	Socket 6D6
45B	G75—28807	Socket 6D6
46	G30—28807	Socket 43
47	G48—28807	Socket 6B7
48	G47—28807	Socket 6A7
	W —35772	Tube Shield Half
	W —35773	Tube Shield Cap
	W —35774	Tube Shield Base
49	314 BL	Speaker, (Table Model)
	414 CL	Speaker, (Console Model)
50Z To 50W	B —35935	Band Change Switch
51	W —35937	Tone Control Switch
52	G27—26719	Ant. Gnd. Terminal Board
53	G5 —31128	Speaker Terminal Board
54Z	36052	Volume Control, 500,000 Ohms
54Y		On-Off Switch
	W —34628	Speaker Terminal Board Cover
	W —34627	Speak. Term. Bd. Cov. Insulator
	W —37340	Knob (Pointer Notch)
	W —37339	Knob
	W —33528C	Escutcheon
	W —33984	Escutcheon Gasket
	D —28	Escutcheon Screws
	W —36312	Band Change Plate
	W —36309	Band Ch. Indicator (Celluloid)
	W —28760B	Escutcheon Pins



Top View 615



Bottom View 615



CROSLEY RADIO CORP.

MODEL 615

PARTS LIST—MODEL 616

Figures in first column refer to parts in Diagrams.

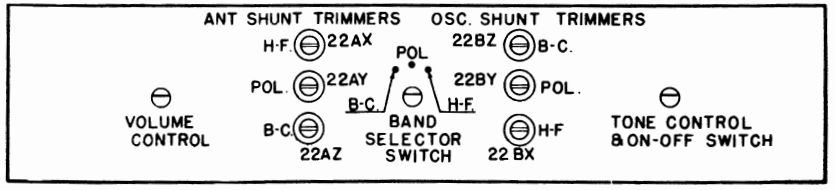
Item	Part No.	Description
1A	W —37922	Bulb Dial Light
1B	W —37922	Bulb Dial Light
	G3 —37965	Dial Light Socket Assembly
2	G104 —32000	Ant. Coil B. C. B.
3	G103 —32000	Ant. Coil Pol. B.
4	G105 —32000	Ant. Coil H. F. B.
5	G99 —32004	1st I-F Assembly
6	G100 —32004	2nd I-F Assembly
7	G91 —32002	Osc. Coil B. C. B.
8	G92 —32002	Osc. Coil Pol. B.
9	G93 —32002	Osc. Coil H. F. B.
10	W —36055	Condenser 35 Mfd. 400 V.
11	W —36057	Condenser 40 Mfd. 300 V.
12	G7 —34007	Condenser 1750Mmfd. Pol. Osc. Series
13	G8 —34007	Condenser 4350Mmfd. H.-F. Osc. Series
14A	G2 —34002	Condenser 0.0001 Mfd.
14B	G2 —34002	Condenser 0.0001 Mfd.
15A	W —35139	Condenser 0.004 Mfd. 400 V.
15B	W —35139	Condenser 0.004 Mfd. 400 V.
16	W —30805	Condenser 0.01 Mfd. 400 V.
17	W —30488	Condenser 0.02 Mfd. 400 V.
18	W —35936	Condenser 0.05 Mfd. 200 V.
19	W —24049B	Condenser 0.1 Mfd. 200 V.
20	W —22688	Condenser 0.1 Mfd. 400 V.
21	—40769	Condenser B-C Osc. Series Trimmer
22AZ to 22AX, 22BZ to 22BX	W —35951	3 Section Ant. Shunt Trimmers
23Z to 23Y	W —35951	3 Section Osc. Shunt Trimmers
23Y	G21 —33001	2 Section Var. Tuning Cond. Gang.
	MG27 —40762	Dial Drive Assembly
	C —40930	Dial Glass
	W —40804	Dial Glass Cushion
24	B —33906A	Power Cord & Plug
25	G3 —35696	Speaker Cable
26	—40757	Resistor 50,000 Ohm, ¼ W.
27	—35930	Resistor 200,000 Ohm, ¼ W.

Item	Part No.	Description
28	—21455	Resistor 300,000 Ohm, ¼ W.
29	—23785	Resistor 500,000 Ohm, ¼ W.
30A	—36688	Resistor 3 Megohm ¼ W.
30B	—36688	Resistor 3 Megohm ¼ W.
31	—36952	Resistor 30,000 Ohm, 1 W.
32	W —21964	Resistor 165 Ohm, ¾ W.
33	W —27503	Resistor 1400 Ohm, ¾ W.
34Z, 34Y	W —32301	Candohm {10,000 Ohm / 15,000 Ohm}
35	G166 —36400	Socket 5Z4
36	G158 —36400	Socket 6F5
37	G155 —36400	Socket 6H6
38	G165 —36400	Socket 6N6
39	G151 —36400	Socket 6K7
40	G156 —36400	Socket 6A8
	W —40911	Tube Shield
	W —27981A	Tube Shield Base
41	—40971	Speaker Spec. 332-BJ-3
42Z to 42W	—40770	Band Selector Switch
43	G27 —26719	Ant & Grd. Terminal Board
44Z, 44Y	—37908	Tone Control (100,000 Ohm) On-Off Switch
45	G12 —28500	Power Transformer 60 Cy. 110 V.
46	G13 —28500	Power Transformer 25 Cy. 110 V.
47	G14 —28500	Power Transformer 25 Cy. 220 V.
48	—37967	Volume Control (1 Meg.)
49	W —29910A	Condenser 0.25 Mfd. 200 V.
50	W —28621	Condenser 0.02 Mfd. 200 V.
51	W —35758	Condenser 0.008 Mfd. 400 V.
52	W —25357	Resistor 75 Ohms, ¾ W.
	B —40839	Escutcheon Ring
	W —28760A	Escutcheon Pin
	W —37339	Knob (3)
	W —40192B	Knob (1)
	W —36117	Rubber Mtg. Foot

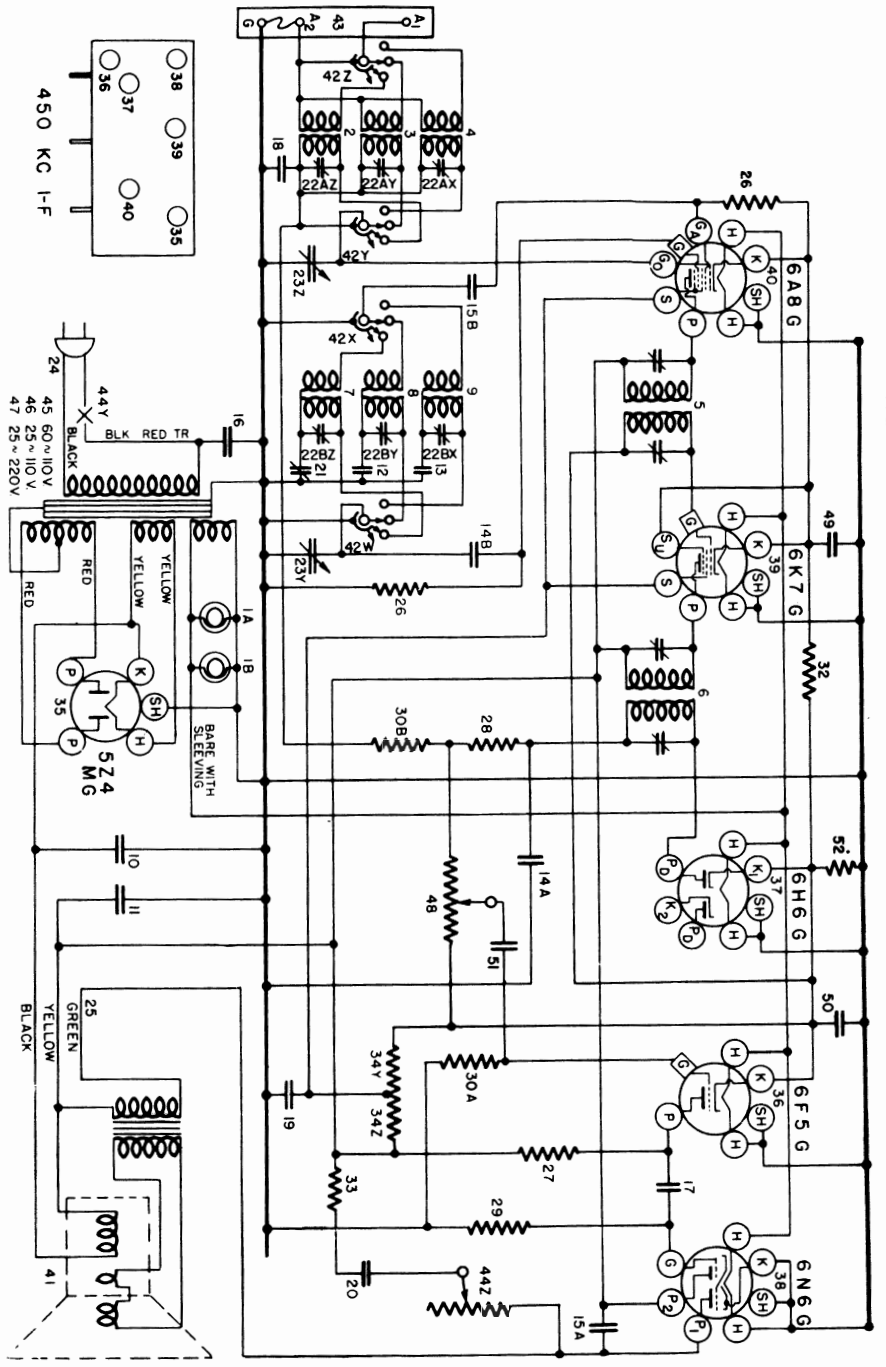
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	P_2	S	Su	G	K	Go	Ga
6A8-G	Osc.-Modulator	6.3	240	—	95	—	0	4.5	-5 to -30	115
6K7-G	I-F Amplifier	6.3	240	—	95	4.5	0	4.5	—	—
6H6-G	Diode Detector	6.3	0	—	—	—	0	—	—	—
6F5-G	A-F Amplifier	6.3	150	—	—	—	0	1.5	—	—
6N6-G	Output	6.3	220	240	—	—	0	0	—	—
5Z4-MG	Rectifier	4.9	310	—	—	—	—	—	—	—

MEASURED ON 117.5 VOLT—60 CYCLE POWER SUPPLY.
POWER CONSUMPTION APPROXIMATELY 80 WATTS.
POWER OUTPUT APPROXIMATELY 4 WATTS.



Front View 616



CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 616

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 626

PARTS LIST—MODEL 626

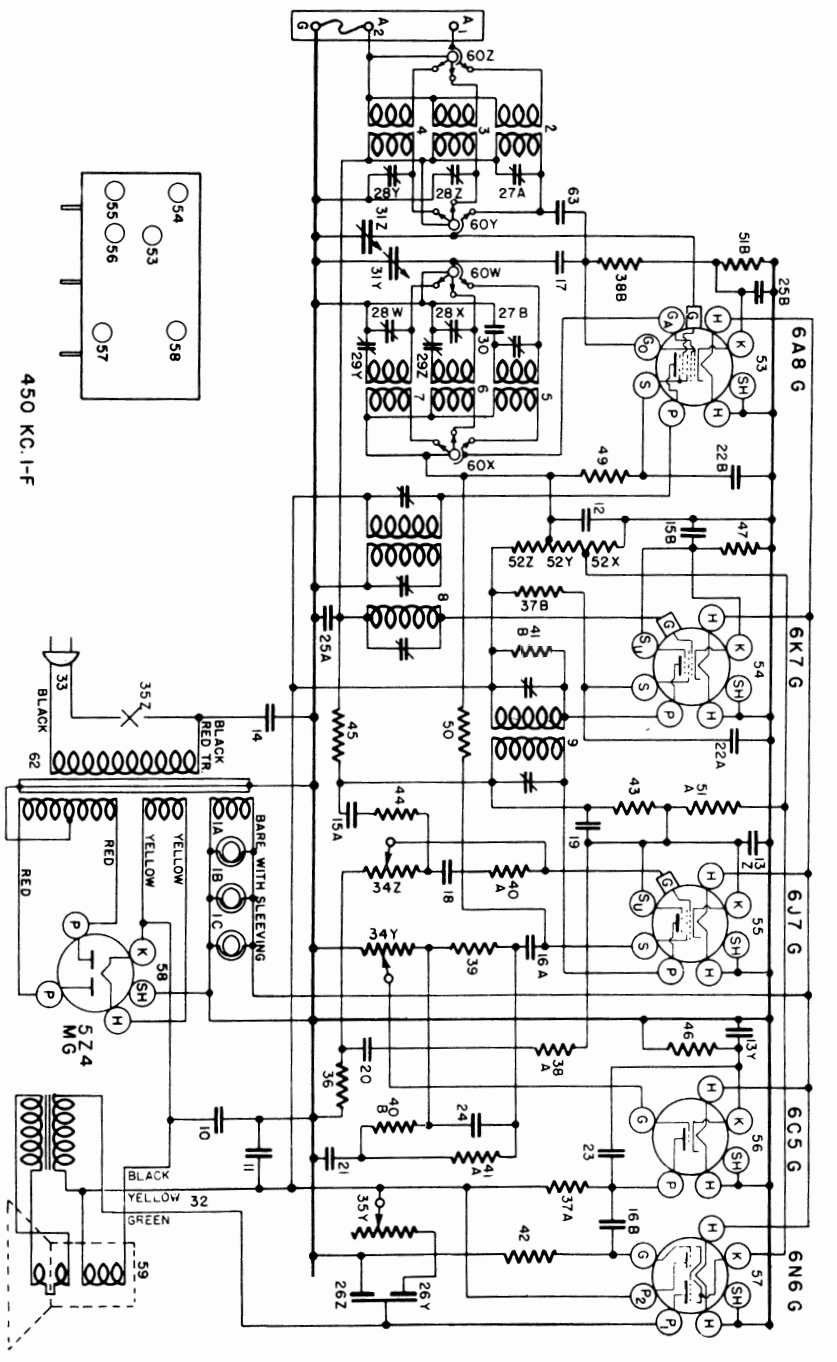
Figures in first column refer to parts in Diagrams.

Item	Part No.	Description
1A	W —37922	Bulb, Dial Light
1B	W —37922	Bulb, Dial Light
1C	W —37922	Bulb, Indicator Light
2	G92 —32000	Coil, Ant. 6000-18000 Kc.
3	G90 —32000	Coil, Ant. 1800-6000 Kc.
4	G91 —32000	Coil, Ant. 540-1800 Kc.
5	G84 —32002	Coil, Osc. 6000-18000 Kc.
6	G83 —32002	Coil, Osc. 1800-6000 Kc.
7	G82 —32002	Coil, Osc. 540-1800 Kc.
8	G101—32004	Coil, 1st I-F Assm.
9	G102—32004	Coil, 2nd I-F Assm.
10	W —36055	Condenser, 35 mfd., 400 V.
11	W —36057	Condenser, 40 mfd., 300 V.
12	W —40325	Condenser, 50 mfd., 150 V.
13Z, 13Y	W —37778	Condenser, 12 mfd., 25 V.
14	W —30805	Condenser, .01 mfd., 400 V.
15A	W —36541	Condenser, .02 mfd., 160 V.
15B	W —36541	Condenser, .02 mfd., 160 V.
16A	W —32780B	Condenser, .05 mfd., 400 V.
16B	W —32780B	Condenser, .05 mfd., 400 V.
17	G1 —34002	Condenser, .00025 mfd., (molded)
18	G6 —34002	Condenser, .000025 mfd., (molded)
19	G2 —34002	Condenser, .0001 mfd., (molded)
20	W —30323	Condenser, .01 mfd., 200 V.
21	W —37988	Condenser, .017 mfd., 200 V.
22A, 22B	W —23142	Condenser, .02 mfd., 400 V.
23	W —27540	Condenser, .02 mfd., 400 V.
24	G5 —34002	Condenser, .0005 mfd., 400 V.
25A	W —35936	Condenser, .00005 mfd., (molded)
25B	W —35936	Condenser, .05 mfd., 200 V.
26Z, 26Y	W —31052	Condenser, .05 mfd., 200 V.
27A	W —37954	Condenser, .004 mfd., 400 V.
27B	W —37954	Condenser, H-F Ant. Shunt Trim.
28Z		Condenser, H-F Ant. Shunt Trim.
28Y		Condenser, Pol. Ant. Shunt Trim.
28X	W —37822A	Condenser, B-C Ant. Shunt Trim.
28W		Condenser, Pol. Osc. Shunt Trim.
29Z		Condenser, B-C Osc. Shunt Trim.
29Y	G31 —33006	Condenser, Pol. Osc. Series Trim.
30	G17 —34000	Condenser, B-C Osc. Series Trim.
31Z		Condenser, .0053 mfd. H-F Osc.
31Y	G19 —33001	Condenser, Var. Tuning Gang
32	G4 —35696	Cable, Speaker
33	B —33906A	Cable & Plug, Power Supply
34Z	—37907	Vol. Cont., 1st A-F Control, 3 Meg.
34Y		2nd A-F Control, 1 Meg.
35Y	—37908	Control, Tone
35Z		Switch, On-Off
36	—21455	Resistor, 300,000 Ohm, ¼W.
37A	— 5469A	Resistor, 100,000 Ohm, 1 W.
37B	— 5469A	Resistor, 100,000 Ohm, 1 W.
38A	—36761	Resistor, 40,000 Ohm, ¼ W., Insul.
38B	—36761	Resistor, 40,000 Ohm, ¼ W., Insul.
39	—21454	Resistor, 1 Megohm, ¼ W.
40A	—34020	Resistor, 250,000 Ohm, ¼ W.
40B	—34020	Resistor, 250,000 Ohm, ¼ W.
41A	—37590	Resistor, 750,000 Ohm, ¼ W.
41B	—37590	Resistor, 750,000 Ohm, ¼ W.
42	—36322	Resistor, 500,000 Ohm, ¼ W.
43	—33344	Resistor, 400,000 Ohm, ¼ W.
44	—23403	Resistor, 150,000 Ohm, ¼ W.
45	—37245	Resistor, 1.5 Megohm, ¼ W.
46	—21876	Resistor, 10,000 Ohm, ¼ W.
47 W	—22514	Resistor, 750 Ohm, ½ W., Flex.
49	—22831	Resistor, 15,000 Ohm, ¼ W.
50	—21875	Resistor, 100,000 Ohm, ¼ W.
51A W	—28106	Resistor, 500 Ohm, ½ W. Flex.
51B W	—28106	Resistor, 500 Ohm, ½ W. Flex.
52Z		Resistor, 10,000 Ohm
52Y	—37829A	Resistor, 25,000 Ohm Candohm
52X		Resistor, 60 Ohm
53	G156—36400	Socket 6A8
54	G151—36400	Socket 6K7
55	G157—36400	Socket 6J7
56	G152—36400	Socket 6C5
57	G165—36400	Socket 6N6
58	G154—36400	Socket 5Z4
59	—37916	Speaker, Spec. 532-CJ-3
60 B	—37906D	Switch, 2 Sec. Band Selector
61 G27	—26719	Terminal Board, Ant. & Grnd.
62 G15	—28500	Transformer, Power 110-60 Cy.
G16	—28500	Transformer, Power 110-25 Cy.
G17	—28500	Transformer, Power 220-25 Cy.
W	—27981A	Base, Tube Shield
	—40531	Belt, Drive
W	—22334	Cable, Indicator Control
	—40537	Coupling, Flexible Drive
MG39	—40906	Dial Assembly, Complete
C	—37894	Escutcheon, Cabinet
C	—40929	Face, Glass Dial
W	—40365	Gasket, Escutcheon Felt
	—40485	Hand, Long
	—41145	Hand, Short
W	—37339	Knob, 3 required
W	—40192B	Knob, 1 required
B	—37898	Lens, Dial
W	—37909	Pulley, Indicator Cable
W	—40911	Shield, Tube
W	—40570	Shield, Dial Light
G3	—37965	Socket, Indicator & Dial Light
B	—37896A	Spring, Escutcheon Retaining
B	—37897	Spring, Dial Lens Retaining
	—40715	Mask Dial

TUBE SOCKET VOLTAGE READINGS

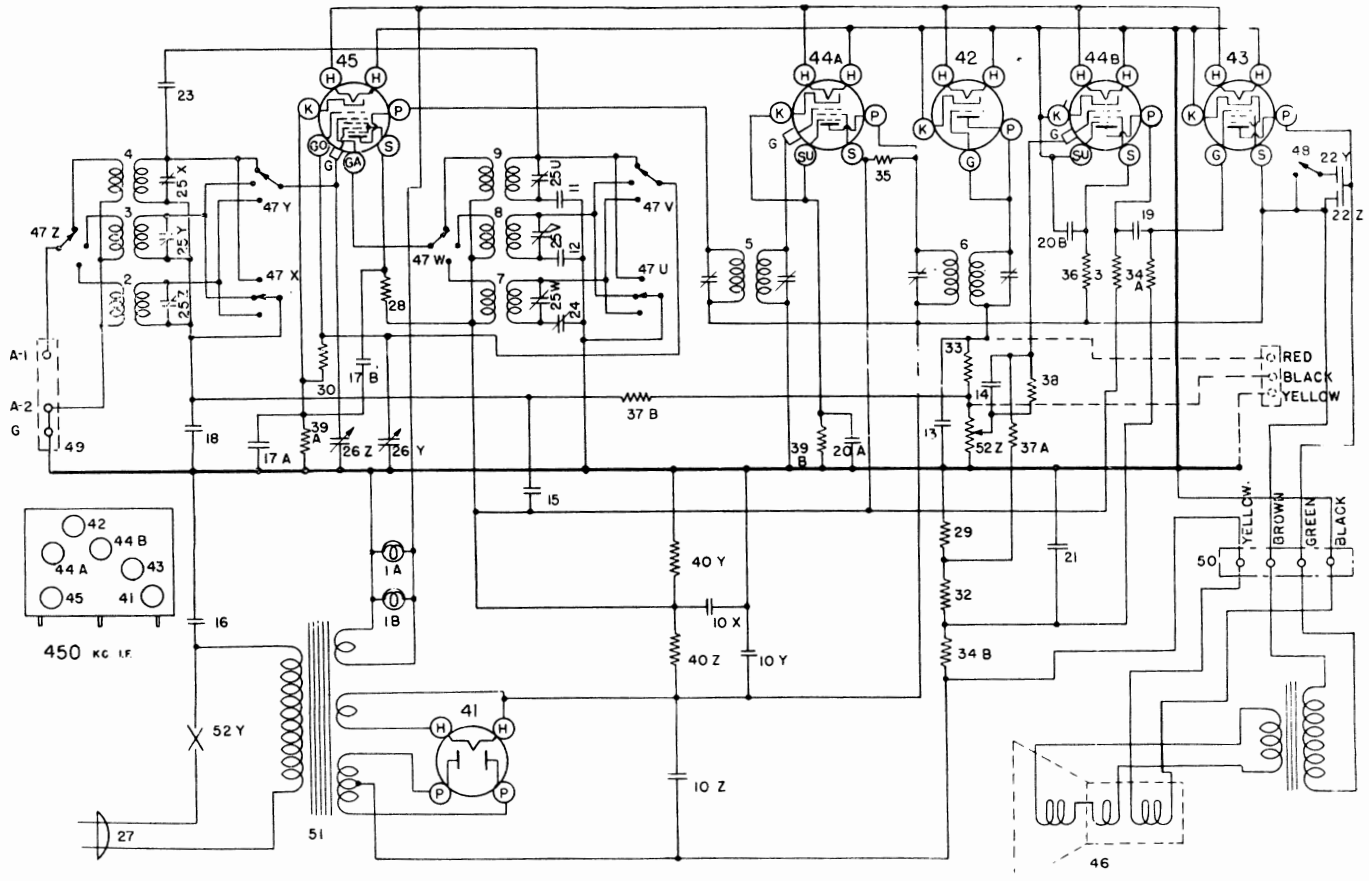
Tube	Function	H	P	P_2	S	Su	G	K	Go	Ga
6A8–G	Osc.-Modulator	6.3	265	—	100	—	0	5.0	0	140
6K7–G	I-F Amplifier	6.3	265	—	120	6.2	0	6.2	—	—
6J7–G	Det. & A-F Amplifier	6.3	0	—	75	2.6	0	2.6	—	—
6C5–G	2nd. A-F Amplifier	6.3	140	—	—	—	0	10.0	—	—
6N6–G	Output	6.3	270	255	—	—	0	2.3	—	—
5Z4–MG	Rectifier	4.9	350	—	—	—	—	—	—	—

MEASURED ON 117.5 VOLT—60 CYCLE POWER SUPPLY.
POWER CONSUMPTION APPROXIMATELY 78 WATTS.
POWER OUTPUT APPROXIMATELY 3 WATTS.



CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 635



PARTS LIST—MODEL 635

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	G4 —27134	Dial Light Bracket Assembly.
1B	G4 —27134	Dial Light Bracket Assembly.
2	G39—32000	Coil, Ant. Trans. 540-1725 Kc.
3	G43—32000	Coil, Ant. Trans. 1.7-5.2 Mc.
4	G40—32000	Coil, Ant. Trans. 5.3-15.5 Mc.
5	G39—32004	Coil, 1st. I. F. Trans.
	G4 —31927	Coil Shield Assembly.
6	G38—32004	Coil 2nd. I. F. Trans.
	G4 —31927	Coil Shield Assembly.
7	G34—32002	Coil, Osc. 540-1725 Kc.
8	G35—32002	Coil, Osc. 1.7-5.2 Mc.
9	G32—32002	Coil, Osc. 5.3-15.5 Mc.
10Z	B —30059-C	Condenser, 8 Mfd. 450 Volts.
10Y		Condenser, 8 Mfd. 450 Volts.
10X		Condenser, 8 Mfd. 250 Volts.
11	G12—34000	Condenser, 4725 Mmf.
12	G7 —34000	Condenser. 1450 Mmf.
13	G2 —34002	Condenser, 0.0001 Mfd. 200 Volt.
14	W —28619	Condenser, 0.006 Mfd. 200 Volt.
15	W —32378	Condenser, 0.01 Mfd. 400 Volt.
16	W —30805	Condenser, 0.01 Mfd. 400 Volt.
17A	W —28621	Condenser, 0.02 Mfd. 200 Volt.
17B	W —28621	Condenser, 0.02 Mfd. 200 Volt.
18	W —32380	Condenser, 0.05 Mfd. 200 Volt.
19	W —27216	Condenser, 0.05 Mfd. 200 Volt.
20A	W —24049B	Condenser, 0.1 Mfd. 200 Volt.
20B	W —24049B	Condenser, 0.1 Mfd. 200 Volt.
21	—30321A	Condenser, 1.0 Mfd. 160 Volt.
22Z	W —35011	Condenser, 0.006 Mfd. 400 Volt.
22Y		Condenser, 0.03 Mfd. 400 Volt.
23	G49—34403	Condenser, 1.0 Mmf.
24	G10—33005	Condenser, Var. 540-1725 Kc.
25Z	W —35951	Trimmer Condenser Assembly.
25Y		
25X		
25W		
25V	W —35951	Trimmer Condenser Assembly.
25U		
26Z	B —35025	Condenser, Variable Tuning Gang.
26Y		
	G29— 32086	Dial Drive Assembly.
27	B —33905	Cord, Power Supply.
28	—35934	Resistor, 6,500 Ohms.
29	—22831	Resistor, 15,000 Ohms.
30	—21454	Resistor, 40,000 Ohms.
31	—21875	Resistor, 100,000 Ohms.
32	—34018	Resistor, 200,000 Ohms.
33	—21455	Resistor, 300,000 Ohms.
34A	—23785	Resistor, 500,000 Ohms.
34B	—23785	Resistor, 500,000 Ohms.
35	—21454	Resistor, 1 Megohm.
36	—34883	Resistor, 2 Megohm.
37A	—26577	Resistor, 3 Megohm.
37B	—26577	Resistor, 3 Megohm.
38	—26578	Resistor, 5 Megohm.
39A	W —25937	Resistor, 275 Ohm, ½ Watt.
39B	W —25937	Resistor, 275 Ohm, ½ Watt.
40Z	W —35963	Resistor, 8,500 Ohm, 3 Watt.
40Y		Resistor, 25,000 Ohm, 3 Watt.
41	G6 —28807	Socket, 80.
42	G80—28807	Socket, 76.
	W —35774	Shield Base.
	W —35772	Shield Half (2 used).
	W —36280	Shield Cap.
43	G25—28807	Socket, 42.
44A	G75—28807	Socket, 6D6.
44B	G75—28807	Socket, 6D6.
	W —35774	Shield Base.
	W —35772	Shield Half (2 used)
	W —35773	Shield Cap.
45	G47—28807	Socket, 6A7.
	W —35774	Shield Base.
	W —35772	Shield Half (2 used).
	W —35773	Shield Cap.
46	—318BL	Speaker.
47	B —35935	Switch, Band Change.
48	W —35937	Switch, Tone Control.
49	G16—26719	Terminal, Ant.-Grd.
50	G5 —31128	Terminal, Speaker.
51	G8 —28500	Transformer, Power, 60 Cy., 110 Volt.
	G9 —28500	Transformer, Power, 25 Cy., 110 Volt.
	G10—28500	Transformer, Power, 25 Cy., 220 Volt.
52Z	—35938	Volume Control, 1 Megohm.
52Y		On-Off Switch.
	W —36492	Knobs.
	W —36831A	Knob (Tail).
	B —36560	Escutcheon.
	W —36563	Glass.
	C —35946	Dial only.
	W —37198	Dial Hand.
	W —32293	Dial Hand Nut.

SERVICE DATA -- MODEL 635

MODEL 635

SPECIFICATIONS

The Crosley Model 635 radio is a six-tube superheterodyne receiver and is available or adaptable for operation on A-C lines as follows: 100 V.-60 cycles, 110 V.-25 cycles and 220 V.-25 cycles. It is a three band receiver tuning from 540 to 1700 kilocycles in the broadcast band, 1700 to 5200 kilocycles in the police and amateur band, and 5400 to 15,300 kilocycles in the high frequency band.

The tubes used are: 6A7 Oscillator-Modulator, 6D6 I. F. Amplifier, 76 Detector and AVC, 6D6 A. F. Amplifier, 42 Output and type 80 Rectifier.

SOCKET VOLTAGES

The tube socket voltages are measured from the socket contacts to the chassis with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with the receiver in operating condition and no signal input. Readings may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	Go	Ga	K
6A7	Osc-Mod	6.3	220	80	—	0	-4 to -10	105	2.5
6D6	I. F. Amplifier	6.3	220	105	3.3	0	—	—	3.3
76	Diode Detector	6.3	—	—	—	—	—	—	0
6D6	A. F. Amplifier	6.3	20	20	0	1.0	—	—	0
42	Output	6.3	210	220	—	8.0	—	—	0
80	Rectifier	4.9	220	—	—	—	—	—	—

Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 60 Watts.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can be properly aligned only with the use of a modulated signal generator and an output meter.

Connecting Output Meter.

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 42 output tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first to the left of the filaments and the screen prong will be next to the plate prong. Be sure the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger —not electrolytic) in series with one of the leads.

1. Peaking I. F. Stages at 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis. KEEP THE GENERATOR OUTPUT LEAD AS FAR AS POSSIBLE FROM THE OTHER S. G. TUBES.

(b) Turn the tuning condenser rotor plates until they are completely meshed.

(c) Turn the band selector switch to the short wave band (extreme left hand position).

(d) Set the signal generator to 450 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I. F. transformer for maximum output.

(f) Adjust both trimmers located on top of the 1st I. F. transformer for maximum output.

(g) Using the lowest signal generator output that will give a reasonable scale deflection on the output meter repeat operations (e) and (f) as many times as necessary to obtain the maximum output.

2. Peaking R. F. Circuits—Broadcast Band (540 to 1700 K. C.)

(a) Connect the output of the signal generator through a .00025 mfd. condenser to the "Ant" terminal of the receiver.

(b) Turn the tuning condenser rotor plates until they are COMPLETELY OUT OF MESH.

(c) Turn the band selector switch to the broadcast band (extreme right hand position).

(d) Set the signal generator at 1720 kilocycles.

(e) Adjust the oscillator parallel trimmer (broadcast band) for maximum output.

(f) Set the signal generator at 1400 kilocycles.

(g) Tune-in the 1400 kilocycles signal with the station selector.

(h) Adjust the antenna parallel trimmer (broadcast band) for maximum output.

(i) Using the lowest signal generator output that will give a reasonable output meter reading, repeat operations (g) and (h) until no further increase in output can be be obtained.

(j) Set the signal generator to 600 kilocycles.

(k) Tune-in the 600 kilocycle signal with the station selector in the region of 60 on the dial, for maximum reading on the output dial.

(l) Adjust the oscillator series trimmer, (Fig. 2) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

(m) Repeat operations (g) and (h) for more accurate adjustments.

3. Peaking R. F. Circuits—Police Band (1700 to 5000 K. C.)

(a) Turn the band selector switch to the police band (middle position).

(b) Set the signal generator to 5000 kilocycles. (5.0 megacycles).

(c) Turn the station selector to 5 on the police band.

(d) Adjust the oscillator parallel trimmer (P. Band) for maximum output.

(e) Adjust the antenna parallel trimmer (P. Band) for maximum output.

4. Peaking R. F. Circuits—Short Wave Band (5.4 to 15 Meg.)

(a) Replace the .00025 mfd. condenser which is being used in series with the output lead of the signal generator with a 400 ohm carbon resistor.

(b) Turn the band selector switch to the short wave band (left hand position).

(c) Set the signal generator to 15 megacycles.

(d) Close the Oscillator parallel trimmer (S-W Band) and then open three turns.

(e) Close the Antenna parallel trimmer (S-W Band) and then open ½ turn.

(f) Turn the station selector to 15 on the dial (S-W Band.)

(g) Peak the oscillator parallel trimmer (S-W Band) on the FIRST signal heard when closing the condenser. In making this adjustment care should be taken not to use too much output from the signal generator to avoid setting the oscillator circuit on the wrong frequency.

NOTE: Check on the adjustment of the S-W Band oscillator parallel trimmer as follows:

1. Increase the signal generator output not more than ten times.

2. Try to tune-in the 15 megacycles signal with the station selector at approximately 14 on the dial.

3. If the 15 megacycle signal can be heard at approximately 14 and 15 both on the dial the oscillator parallel trimmer has been aligned on the correct frequency. It should be noted, however, that the signal tuned in at 15 on the dial should be much stronger than the signal heard at 14. If this condition is not found it will be necessary to repeat operation (g).

(h) Reduce the output of the signal generator to the previous output and retune the station selector to 15 megacycles at 15 on the dial.

(i) Adjust the antenna parallel trimmer (S-W Band) for maximum output, then re-tune the station selector for maximum output.

(j) Repeat the two operations in (i) as many times as necessary to obtain the maximum output.

NOTE: On the band selector switch there is a small eyelet soldered to one of the connecting lugs. This eyelet, item No. 23, is used as a small condenser the capacity of which is formed by inserting an insulated wire into the sleeve of the eyelet. If a new band selector switch is installed care should be taken to see that the "capacity wire" is inserted into the sleeve of the eyelet. This insulated wire should be passed through the eyelet and a slight hook made in the end to prevent it from pulling out. (See Fig. 3)

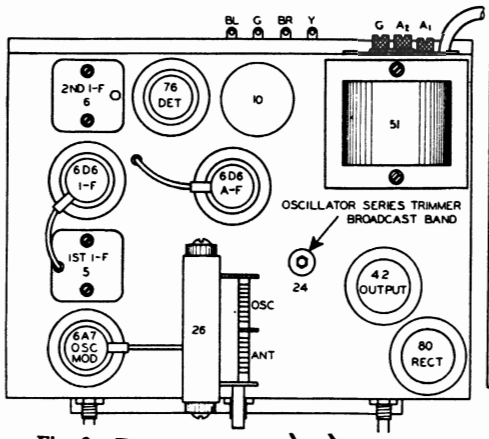


Fig. 2. Top View 635

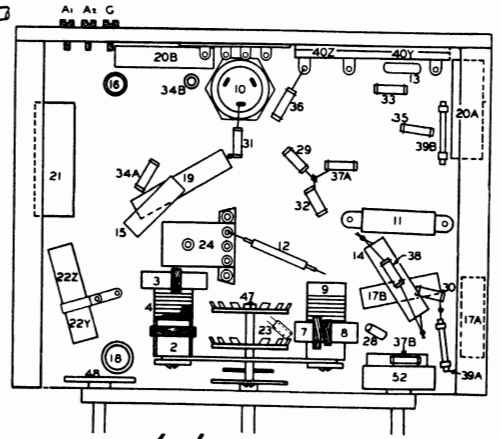
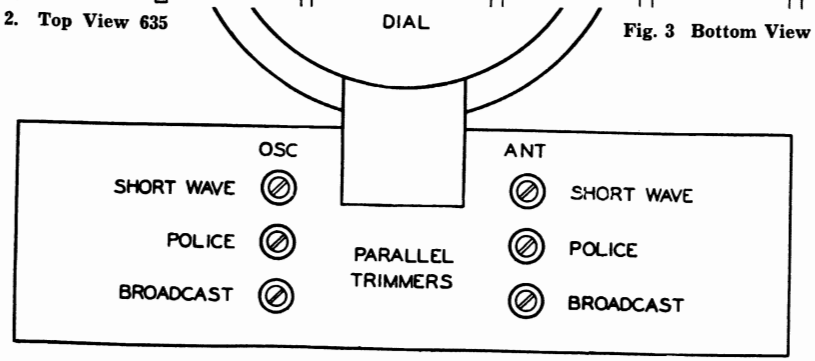


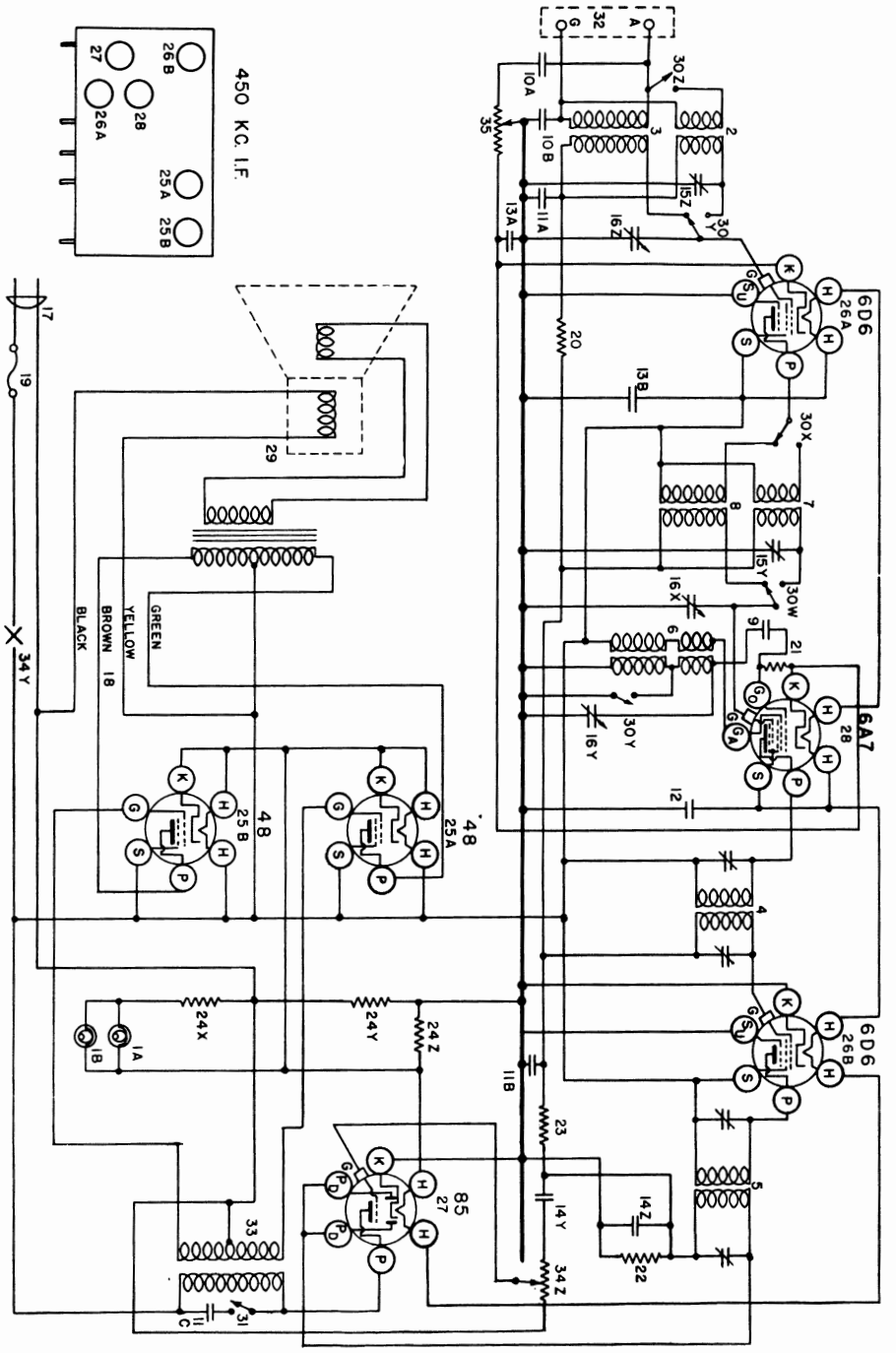
Fig. 3 Bottom View 635



CROSLEY RADIO CORP.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 645

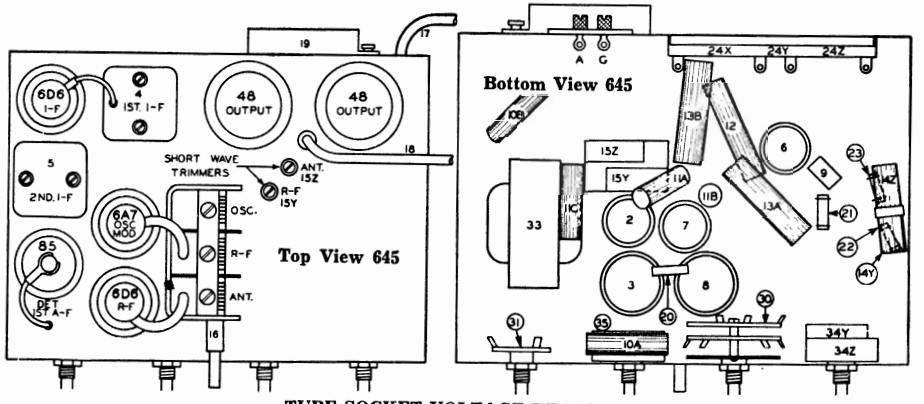


PARTS LIST—MODEL 645

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A, 1B	G4 —27134	Dial Light Bracket Assm.
2	G54—32000	Ant. Coil H-F (only)
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
3	G55—32000	Ant. Coil L-F (only)
	W —30802A	Coil Shield
	W —30026	Retaining Ring
4	G62—32004	1st I. F. Trans. Assm.
5	G63—32004	2nd I. F. Trans. Assm.
6	G43—32002	Osc. Coil H. F. & L. F. (only)
	W —25025B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
7	G32—32001	R. F. Coil H. F. (only)
	W —25024B	Coil Shield
	W —25200	Coil Socket
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
8	G52—32001	R. F. Coil L. F. (only)
	W —30802A	Coil Shield
	W —30877B	Insulating Washer
	W —30026	Retaining Ring
9	G1 —34002	Condenser, 0.00025 mfd.
10A	W —30323	Condenser, 0.01 mfd. 200 V.
10B	W —30323	Condenser, 0.01 mfd. 200 V.
11A	W —28621	Condenser, 0.02 mfd. 200 V.
11B	W —28621	Condenser, 0.02 mfd. 200 V.
11C	W —28621	Condenser, 0.02 mfd. 200 V.
12	W —27216	Condenser, 0.05 mfd. 200 V.
13A	W —24049A	Condenser, 0.1 mfd. 200 V.
13B	W —24049A	Condenser, 0.1 mfd. 200 V.
14Z, 14Y	W —30322A	Condenser, 0.00017 mfd. 200 V.
15Z, 15Y, 16Z, 16Y, 16X	G5 —33008	Condenser, 0.006 mfd. 200 V.
	G39—33002	2 Section R. F. & Ant. H. F. Trim.
		3 Section Gang Condenser

Item No.	Part No.	Description
	MG21—36630	Dial Drive Assm.
	C —36629	Dial Face
	W —37198	Dial Hand
	W —32293	Dial Hand Nut (2)
17	B —34332	Power Supply Cord
18	G2 —35696	Speaker Cable
19	W — 7983A	Fuse, (3 Amp Cart)
	G1 —33339	Fuse, Panel Assm.
	W —33310A	Fuse Cover
	W —34223	Cover Insulator
20	—35600	Resistor, 100,000 Ohms ¼ W.
21	—21453	Resistor, 40,000 Ohms ¼ W.
22	—21454	Resistor, 1 Megohm ¼ W.
23	26577	Resistor, 3 Megohm ¼ W.
24Z		Resistor, 7.3 Ohm 4.25 W.
24Y	W —36704	Resistor, 1.8 Ohm 1.10 W.
24X		Resistor, 7.3 Ohm 0.75 W.
25A	G33—28807	Socket, 48
25B	G33—28807	Socket, 48
26A	G75—28807	Socket, 6D6
26B	G75—28807	Socket, 6D6
27	G27—28807	Socket, 85
28	G47—28807	Socket, 6A7
	W —35772	Tube Shield (half) (6)
	W —35773	Tube Shield Cap (3)
	W —35774	Tube Shield Base (3)
29	328CJ—4M	Speaker. (Table)
	428CJ—4M	Speaker, (Console)
30Z, To 30V	W —36753	Band Change Switch
31	W —36755A	Tone Control Switch
32	G26—26719	Terminal Board Ant. & Grd.
33	MG14—36630	A. F. Transformer
34Z, 34Y	—36686A	Volume Control On-Off Switch
35	—36687	Sensitivity Control
	B —33528C	Escutcheon
	W —33984	Escutcheon Gasket
	D —28	Escutcheon Screws (4)
	W —37339	Knob (3)
	W —37341	Knob (2) Small



TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	Go	Ga	K
6D6	R-F Amp.	6.3	31.5	32	0	0	—	—	0
6A7	Osc.-Mod.	6.3	32.0	20	—	0	2	32	0
6D6	I-F Amp.	6.3	32.0	32	0	0	—	—	0
85	Det. & A-F Amp.	6.3	32.0	—	—	0	—	—	0
48	Output	25.0	31.5	32	—	0	—	—	5.7
48	Output	25.0	31.5	32	—	0	—	—	5.7

Measured on 32 Volt D-C Line.

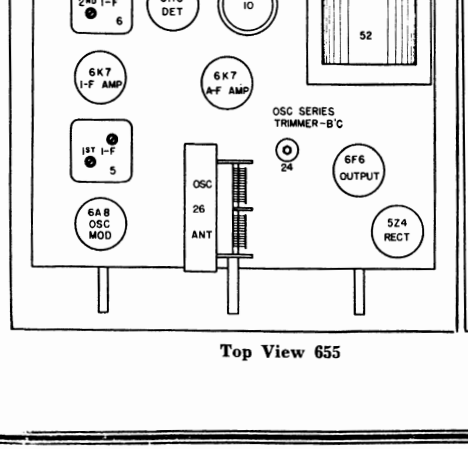
Current Drain Approximately 1.35 Amperes at 32 Volts.

PARTS LIST—MODEL 655

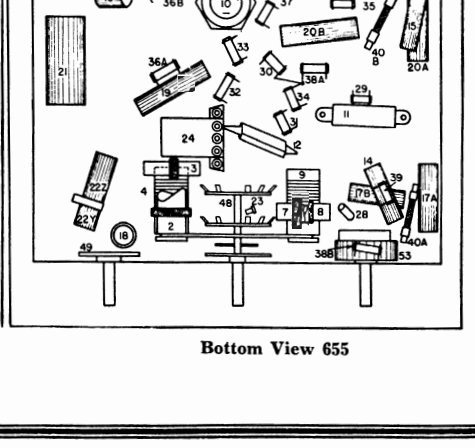
Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	G4 —27134	Dial Light Assm.
1B	G4 —27134	Dial Light Assm.
2	G39 —32000	Ant. Coil only 540-1725 Kc.
3	G43 —32000	Ant. Coil only 1.7-5.2 Mc.
4	G40 —32000	Ant. Coil only 5.3-15.5 Mc.
5	G59 —32004	1st I. F. Trans. Assm.
6	G38 —32004	2nd I. F. Trans. Assm.
7	G34 —32002	Osc. Coil only 540-1725 Kc.
8	G35 —32002	Osc. Coil only 1.7-5.2 Mc.
9	G48 —32002	Osc. Coil only 5.3-15.5 Mc.
10Z, 10Y, 10X	B —30059C	Condenser, 8 mfd. 450 V.
11	G12 —34000	Condenser, 4725 mmf.
12	G7 —34000	Condenser, 1450 mmf.
13	G2 —34002	Condenser, 0.0001 mfd. 200 V.
14	W —28619	Condenser, 0.006 mfd. 200 V.
15	W —32378	Condenser, 0.01 mfd. 400 V.
16	W —30805	Condenser, 0.01 mfd. 400 V.
17A	W —28621	Condenser, 0.02 mfd. 200 V.
17B	W —28621	Condenser, 0.02 mfd. 200 V.
18	W —32380	Condenser, 0.05 mfd. 200 V.
19	W —27216	Condenser, 0.05 mfd. 200 V.
20A	W —24049B	Condenser, 0.1 mfd. 200 V.
20B	W —24049B	Condenser, 0.1 mfd. 200 V.
21	W —30321A	Condenser, 1.0 mfd. 160 V.
22Z, 22Y	W —35011	Condenser, 0.006 mfd. 400 V.
		Condenser, 0.03 mfd. 400 V.
23	G49 —34403	Condenser, 1.0 mmf.
24	G10 —33005	Condenser, B. C. Series Padder
25Z, 25Y, 25X, 25W, 25V, 25U	W —35951	3 Section Ant. Trimmer Cond.
	W —35951	3 Section Osc. Trimmer Cond.
26Z, 26Y	G13 —33001	Var. Tuning Cond. Gang
	G29 —32086	Dial Assm. Complete
	W —37198	Dial Hand
	W —32293	Dial Hand Nut (2)
27	B —33905A	A. C. Cord & Plug
28	—36318	Resistor, 15,000 Ohm (Insul.)
29	—36318	Resistor, 15,000 Ohm (Insul.)
30	—36318	Resistor, 15,000 Ohm (Insul.)

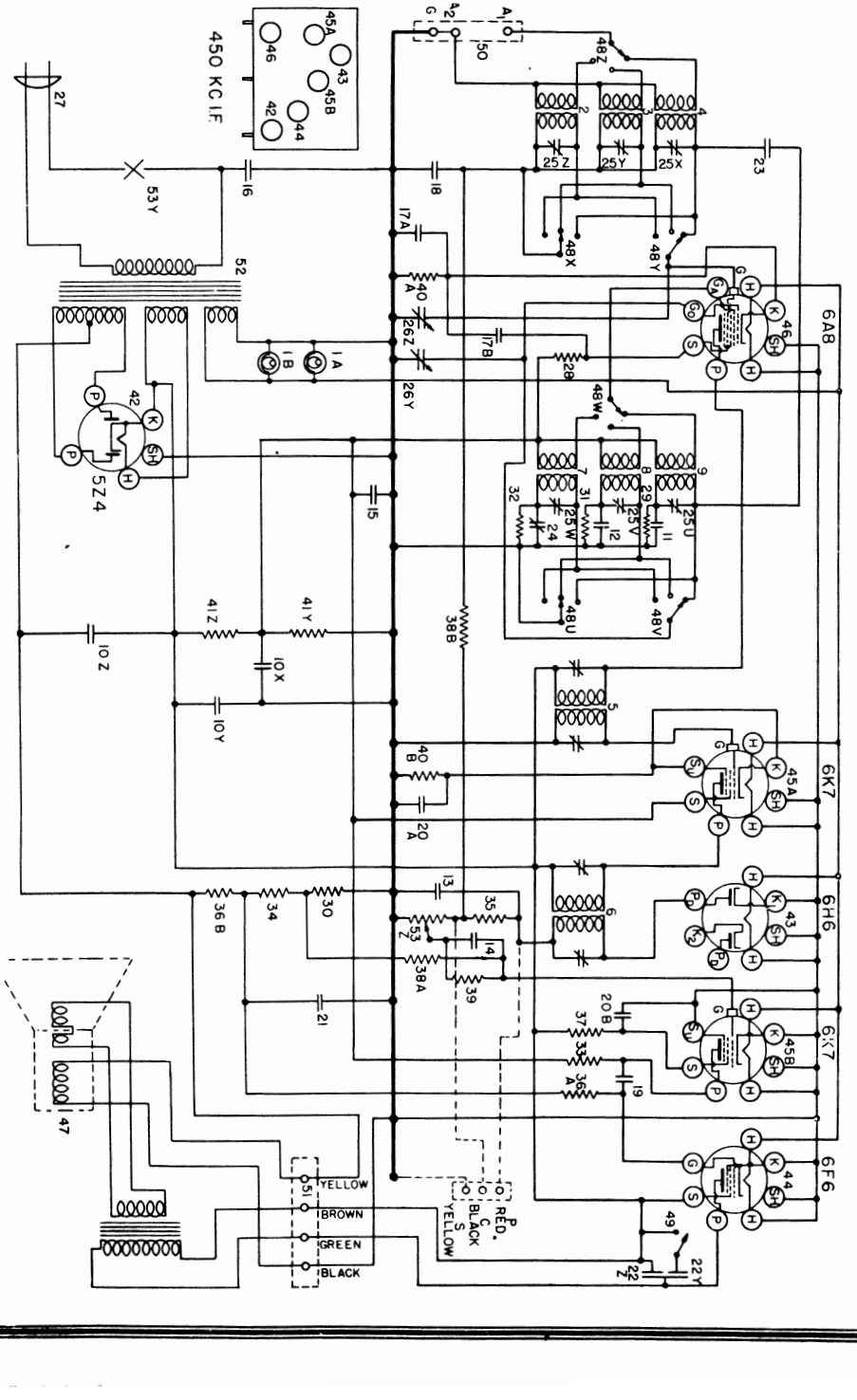
Item No.	Part No.	Description
31	—24990	Resistor, 25,000 Ohm
32	—21453	Resistor, 40,000 Ohm
33	—21875	Resistor, 100,000 Ohm
34	—34018	Resistor, 200,000 Ohm
35	—21455	Resistor, 300,000 Ohm
36A	—23785	Resistor, 500,000 Ohm
36B	—23785	Resistor, 500,000 Ohm
37	—34883	Resistor, 2.0 Megohm
38A	—26577	Resistor, 3.0 Megohm
38B	—26577	Resistor, 3.0 Megohm
39	—26578	Resistor, 5.0 Megohm
40A	—25937	Resistor, 275 Ohms (Flex)
40B	—25937	Resistor, 275 Ohms (Flex)
41Z, 41Y	W —35963	Resistor, 8,500 Ohms
		Resistor, 25,000 Ohms
42	G154—36400	Socket, 5Z4
43	G155—36400	Socket, 6H6
44	G153—36400	Socket, 6F6
45A	G151—36400	Socket, 6K7
45B	G151—36400	Socket, 6K7
46	G156—36400	Socket, 6A8
47	318BL—18M	Speaker, (Table Model)
	418CL—22M	Speaker, (Console Model)
48U To 48Z	B —35935	Band Change Switch
49	W —35937	Switch Tone Control
50	G27 —26713	Terminal Board Ant.—Grd.
51	G5 —31128	Terminal Board Speaker
	W —34628	Term. Board Cover (Speaker)
	W —34627	Term. Board Cover Insulator
52	G8 —28500	Power Trans. 60 Cy. 110 V.
	G9 —28500	Power Trans. 25 Cy. 110 V.
	G10 —28500	Power Trans. 25 Cy. 220 V.
53Z, 53Y	—35938	Volume Control & On-Off Switch
54	G1 —34002	Condenser, 0.00025 mfd.
	B —33528C	Escutcheon
	W —33984	Escutcheon Gasket
	D —28	Escutcheon Screw (4)
	W —36312	Band Change Plate
	W —36309	Band Change Indicator
	W —28760B	Escutcheon Pins
	W —37340	Knob, Band Change
	W —37339	Knob (3)



Top View 655



Bottom View 655



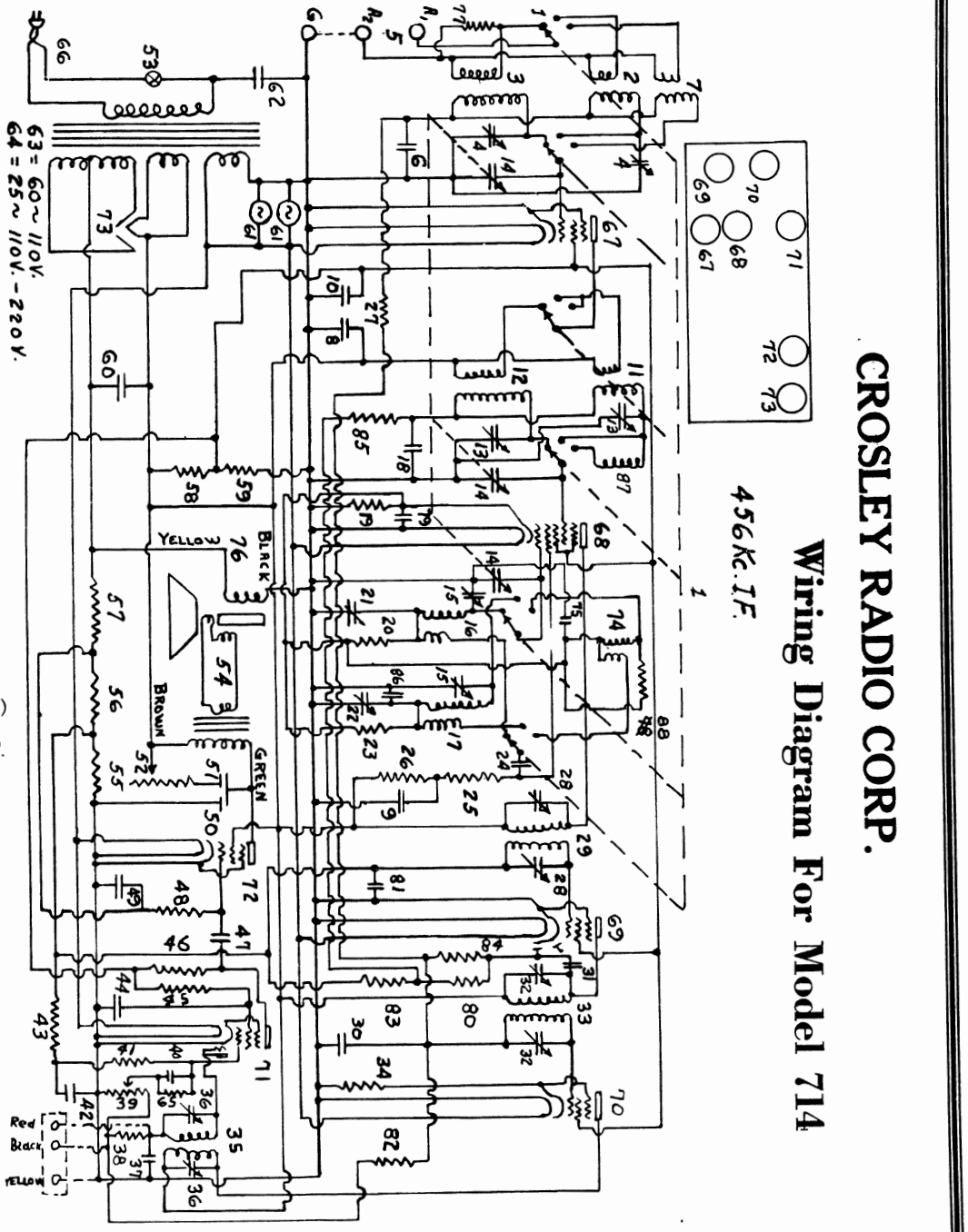
WIRING DIAGRAM—MODEL 655

CROSLEY RADIO CORP.

Parts List Model 714

Figures in first column correspond to figures in diagram

1	B —34443-A	Band Change Switch 6 Pole 3 Throw	
2	G28 —32000	H. F. Ant. Coil	
3	G3 —32000	L. F. Ant. Coil	
4	G1 —33008	Ant. Trimming Cond.	
5	G16 —26719	Ant.-Gnd. Term.	
6	W —32379	.02 Mfd. 200 Volt	
7	G31 —32000	Pol. Ant. Coil	
8		8 Mfd. 450 Volt (Red)	
9	W —29097-D	8 Mfd. 450 Volt (Green)	
10		8 Mfd. 250 Volt (No Code)	
11	G18 —32001	H. F.-R. F. Coil	
12	G2 —32001	L. F.-R. F. Coil	
13	G9 —33009	R. F .Trimmer Cond.	
14	G18 —33002	Variable Condenser	
15	G2 —33009	Osc. Trimming Cond.	
16	G2 —32002	L. F. Osc. Coil	
17	G21 —32002	H. F. Osc. Coil	
18	W —32380	.05 Mfd. 200 Volt	
19	W —21452	1,100 Ohms	
20	21237-A	60,000 Ohms	
21	G12 —33006	Series Cond. L. F.	
22		Series Cond. H. F.	
23	21453	40,000 Ohms	
24	W —25435	.003 Mfd. 400 Volt	
25	21876	10,000 Ohms	
26	21876	10,000 Ohms	
27	21455	300,000 Ohms	
28	G6 —33006	I. F. Tuning Cond. 1st	
29	G1 —32004	1st I. F. Transformer	
30	W —27216	.05 Mfd. 200 Volt	
31	W —31937	.0001 Mfd.	
32	G6 —33006	I. F. Tuning Cond. 2nd	
33	G1 —32004	2nd I. F. Transformer	
34	W —25937	275 Ohms	
35	G26 —32004	3rd I. F. Transformer	
36		3rd I. F. Tuning Cond.	
37	W —27932	.0001 Mfd. 200 Volt	
38	23403	150,000 Ohms	
39	W —32062	Level Control 1 Meg.	
40	W —28619	.006 Mfd. 200 Volt	
41	26577	3 Meg.	
42	W —24049	.1 Mfd. 200 Volt	
43	21454	1 Meg.	
44	W —24049	.1 Mfd. 200 Volt	
45	23785	500,000 Ohms	
46	21875	100,000 Ohms	
47	W —27216	.05 Mfd. 200 Volt	
48	23785	500,000 Ohms	
49	W —30321	1.0 Mfd. 160 Volt	
50	W —31052	.004 Mfd. 400 Volt	
51		.05 Mfd. 400 Volt	
52	W —32063	Tone Control	
53		S. P. S. T. Switch	
54	411C	Speaker	
55	33390	30,000 Ohms	
56	23403	150,000 Ohms	
57	21454	1 Meg.	
58	W —31361	7,000 Ohms	
59		11,000 Ohms	
60	W —26194-B	12 Mfd. 475 Volt	
61	W —4099-A	6-8 V. Dial Light	
62	W —30805	.01 Mfd. 400 Volt	
63	G1 —34432	Power Trans. 60 Cy.	
64	G39 —25669	Power Trans. 25 Cy. 110 V.-220 V.	
65	26578	5 Meg.	
66	B —33906-A	Cord & Plug	
67	G75 —28807	6D6 Socket (R. F. Amp.)	
68	G47 —28807	6A7 Socket (Osc. Mod.)	
69	G48 —28807	6B7 Socket (I. F. & Diode)	
70	G75 —28807	6D6 Socket (2nd I. F.)	
71	G49 —28807	6F7 Socket (Diode & A. F. Amp.)	
72	G25 —28807	42 Socket (Output)	
73	G6 —28807	80 Socket (Rect.)	
74	G24 —32002	Osc .Coil (Pol. Band)	
75	G6 —34000	Series Cond. 1350 Mmf.	
76	W —31007-A	Speaker Cord	
77	31094	4,500 Ohms	
78			
79	W —28621	.02 Mfd. 200 Volt	
80	W —21455	300,000 Ohms	
81	W —28621	.02 Mfd. 200 Volt	
82	26578	5 Meg.	
83	21455	300,000 Ohms	
84	21454	1 Meg.	
85	21454	1 Meg.	
86	G2 —34000	3104 Mmf. Cond.	
87	G19 —32001	Pol. Band R. F. Coil	
88	33390	30,000 Ohms	



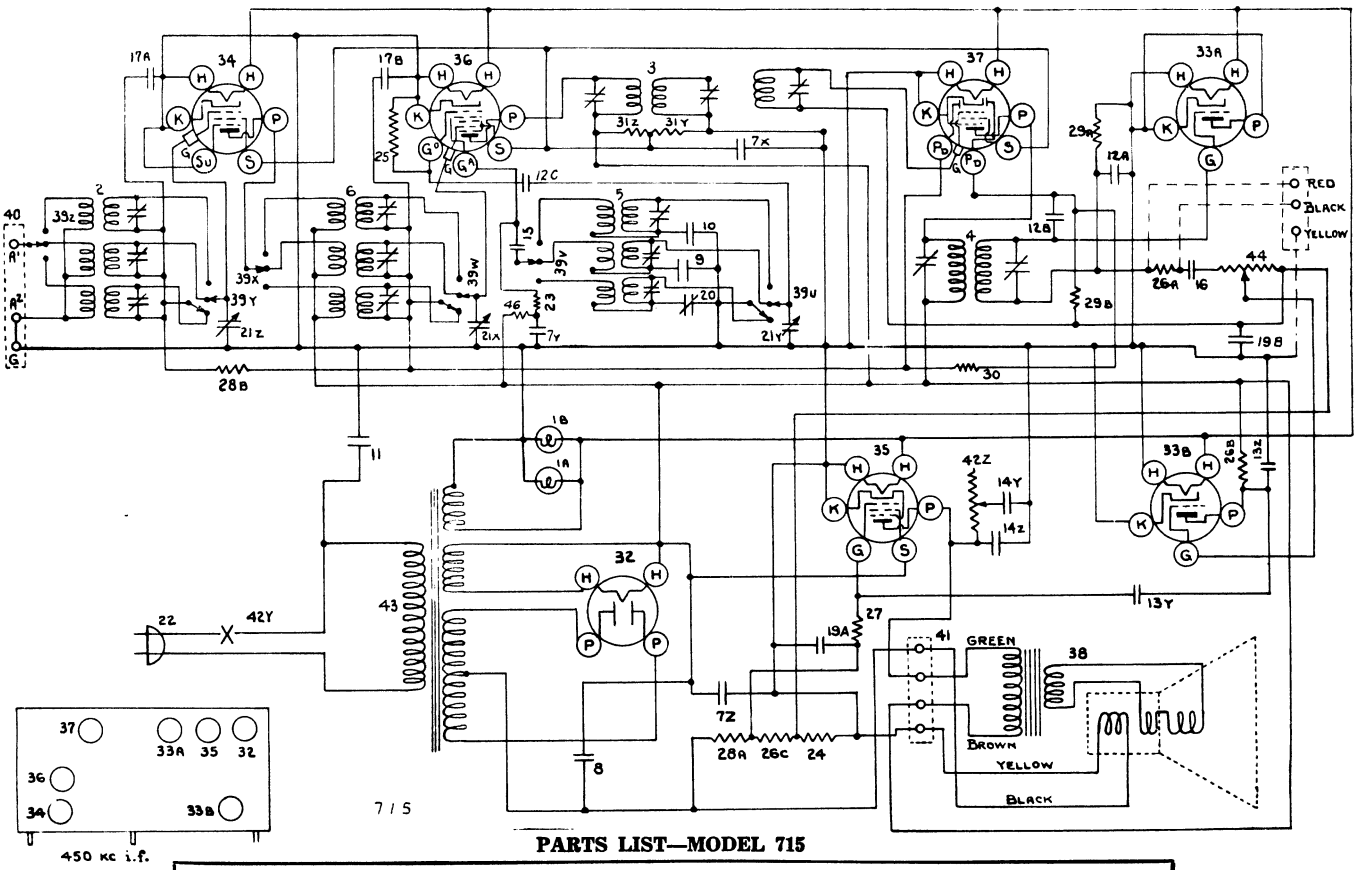
CROSLEY RADIO CORP.

Wiring Diagram For Model 714

456 Kc. I.F.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 715



PARTS LIST—MODEL 715

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	G4 —27134	Dial Light Bracket Assembly.
1B	G4 —27134	Dial Light Bracket Assembly.
2	G50—32000	Ant. Coil Assembly complete.
	G44—32000	Ant. Coil Broadcast Band.
	G45—32000	Ant. Coil Police Band.
	G46—32000	Ant. Coil S. W. Band.
	W —36032	Trimmer Condenser.
	G6 —36031	Support Base Assembly.
	G4 —36031	Coil Shield Assembly.
3	G47—32004	1st. I. F. Trans. Assembly.
4	G46—32004	2nd. I. F. Trans. Assembly.
5	G42—32002	Osc. Coil Assembly complete.
	G36—32002	Osc. Coil B. C. Band.
	G37—32002	Osc. Coil Police Band.
	G38—32002	Osc. Coil S. W. Band.
	W —36032	Trimmer Condenser.
	G7 —36031	Support Base Assembly.
	G5 —36031	Coil Shield Assembly.
6	G29—32001	R. F. Coil Assembly complete.
	G23 32001	R. F. Coil B. C. Band.
	G24—32001	R. F. Coil Police Band.
	G25—32001	R. F. Coil S. W. Band.
	W —36032	Trimmer Condenser.
	G6 —36031	Support Base Assembly.
	G4 —36031	Coil Shield Assembly.
7Z, 7Y, 7X	W —36056	Condenser, 8 Mfd. 450 Volt. / Condenser, 4 Mfd. 350 Volt. / Condenser, 4 Mfd. 250 Volt.
8	W —36055	Condenser, 35 Mfd. 450 Volt.
9	G7 —34000	Condenser, 0.00145 Mfd.
10	G12—34000	Condenser, 0.004725 Mfd.
11	W —30805	Condenser, 0.01 Mfd., 400 Volt.
12A	G2 —34002	Condenser, 100 Mmf.
12B	G2 —34002	Condenser, 100 Mmf.
12C	G2 —34002	Condenser, 100 Mmf.
13Z	W —25537A	Condenser, 0.001 Mfd., 400 Volt..
13Y		Condenser, 0.03 Mfd., 400 Volt.
14Z	W —31052	Condenser, 0.004 Mfd., 400 Volt.
14Y		Condenser, 0.05 Mfd., 400 Volt.
15	W —32378	Condenser, 0.01 Mfd., 400 Volt.
16	W —23191A	Condenser, 0.01 Mfd., 400 Volt.
17A	W —32379	Condenser, 0.02 Mfd., 200 Volt.
17B	W —32379	Condenser, 0.02 Mfd., 200 Volt.
18	See 19B	
19A	W —30321	Condenser, 1.0 Mfd., 160 Volt.
19B	W —30321	Condenser, 1.0 Mfd., 160 Volt.
20	G10—33005	Trimmer Condenser, 5 plate.
21Z, 21Y, 21X	G33—33002	Var. Tuning Condenser, 3 Gang.
	MG21—36045	Dial Drive Assembly.
	W —37198	Dial Pointer only.
	W —32293	Dial Pointer Nut (2 used).
	C —36088	Dial Indicator Plate.
22	B —30375A	Cord and Plug.

Item No.	Part No.	Description
23	—22831	Resistor, 15,000 Ohms.
24	—22196	Resistor, 20,000 Ohms.
25	W —21875	Resistor, 100,000 Ohms.
26A	—23403	Resistor, 150,000 Ohms.
26B	—23403	Resistor, 150,000 Ohms.
26C	—23403	Resistor, 150,000 Ohms.
27	—21455	Resistor, 300,000 Ohms.
28A	—23785	Resistor, 500,000 Ohms.
28B	—23785	Resistor, 500,000 Ohms.
29A	—21454	Resistor, 1 Megohm.
29B	—21454	Resistor, 1 Megohm.
30	—26577	Resistor, 3 Megohm.
31Z, 31Y	W —35963	Resistor, 8,500 Ohm. / Resistor, 25,000 Ohm.
32	G6 —28807	Socket, 80.
33A	G80—28807	Socket, 76.
33B	G80—28807	Socket, 76.
34	G75—28807	Socket, 6D6.
	W —35774	Tube Shield Base.
	W —35772	Tube Shield Half.
	W —35773	Tube Shield Cap.
35	G25—28807	Socket, 42.
36	G47—28807	Socket, 6A7.
	W —35774	Tube Shield Base.
	W —35772	Tube Shield Half.
	W —35773	Tube Shield Cap.
37	G48—28807	Socket, 6B7.
	W —35774	Tube Shield Base.
	W —35772	Tube Shield Half.
	W —35773	Tube Shield Cap.
38	318-BL-18 / 518-CL-22	Speaker.
39	—36058B	Band Change Switch
UtoZ		
40	G27—26719	Ant.-Grd. Terminal.
41	G5 —31128	Speaker Terminal.
	W —34627	Terminal Board Insulator.
	W —34628	Terminal Board Cover.
42Z, 42Y	—36062	Tone Control.
		On-Off Switch.
43	G6 —30745	Power Transformer, 60 Cy., 110 V.
	G7 —30745	Power Transformer, 25 Cy., 110 V.
	G8 —30745	Power Transformer, 25 Cy., 220 V.
44	—36060	Volume Control.
45	See 12C	
46	—21876	Resistor, 10,000 Ohms.
	W —34678B	Knob, Band Change.
	W —31585B	Knob, Controls.
	B —33528C	Escutcheon.
	W —33984	Escutcheon Gasket.
	W —36312	Band Change Switch Plate.
	W —36309	Band Change Indicator, Celluloid.
	W —36313	Tone Control Plate.
	—35922	Grille Cloth, 5N Cabinet.
	—35863	Grille Cloth, 5D Cabinet.

SERVICE DATA -- MODEL 715

MODEL 715

SPECIFICATIONS

The Crosley Model 715 radio is a seven-tube superheterodyne receiver and is available or adaptable for operation on A-C lines as follows: 110 V-60 cycles, 110 V-25 cycles and 220 V-25 cycles. The tubes used are 6D6 R-F Amplifier, 6A7 Oscillator-Modulator, 6B7 I-F Amplifier and AVC, 76 Detector, 76 A-F Amplifier, 42 Output and type 80 Rectifier.

It is a three band receiver and the dial is divided into three sections as follows:

BLACK—540-1625 kilocycles (American Broadcast Band).

GREEN—1625-4700 kilocycles (Police and Amateur Band).

RED—5250-15300 kilocycles (Night High Frequency Band).

The positions on the band selector switch are in the above order, reading from right to left.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500 volt D.C. voltmeter (except filaments) with the receiver in operating condition and no signal input. Readings may vary plus or minus 10% of values given. Filament readings are taken with a low range A.C. voltmeter.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go	Ga
6D6	R-F Amplifier	6.3	315	110	0	-3	0	—	—
6A7	Osc.-Mod.	6.3	315	110	—	-3	0	-5 to -15	185
6B7	I-F Amp. & AVC	6.3	315	110	0	-3	0	—	—
76	Detector	6.3	—	—	—	—	0	—	—
76	A-F Amplifier	6.3	35	—	—	-3	0	—	—
42	Output	6.3	300	245	0	-16	0	—	—
80	Rectifier	5.0	320	—	—	—	—	—	—

Measured on 117.5 Volt Line—60 Cycles A.C. **Power Consumption Approximately 60 Watts**

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can be properly aligned only with the use of a modulated signal generator and an output meter.

Connecting Output Meter.

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 42 output tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first to the left of the filament prongs and the screen prong will be next to the plate prong. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger, not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A7 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis. KEEP THE GENERATOR OUTPUT LEAD AS FAR AS POSSIBLE FROM THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are open. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch all the way to the left.

(d) Set the signal generator to 450 kilocycles.

(e) Close the middle trimmer condenser on the 1st I-F transformer. (Fig. 2)

(f) Adjust the trimmers located on top of the 2nd I-F transformer for maximum output. (Fig. 2)

(g) Adjust the top and bottom trimmers of the 1st I-F transformer for maximum output.

(h) Repeat operations (f) and (g) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

(i) Reduce the output of the signal generator and adjust the middle trimmer on the 1st I-F transformer or maximum output. DO NOT READJUST THE OTHER TRIMMERS.

2. Aligning R-F Amplifier.

(a) When aligning the R-F amplifier the output lead from the signal generator is connected to the "Ant" terminal of the receiver. For the BLACK and GREEN bands a .00025 mfd. condenser must be connected in series with the output lead from the signal generator and for the high frequency band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be shunt aligned and then series aligned (if provision is made for series alignment). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated for each adjustment.

Adjust the "Osc", "R-F" and "Ant" trimmers (Fig. 2) in the order given for maximum output and then check the adjustments in the same order. NOTE: When aligning the Police and High Frequency Band care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is always approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately ten times and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

To align the "series" trimmer set the signal generator to the frequency indicated and then tune-in this signal with the station selector for maximum output. Adjust the "series" trimmer while rocking the tuning condenser back and forth slightly, until no further improvement in output can be obtained.

(b) Signal Input Frequencies.

	Shunt Alignment	Series Alignment
American Broadcast Band (BLACK)	1400 Kc.	600 Kc.
Police and Amateur Band (GREEN)	4000 Kc.	——
Night H-F Band (RED)	10 Megacycles	——

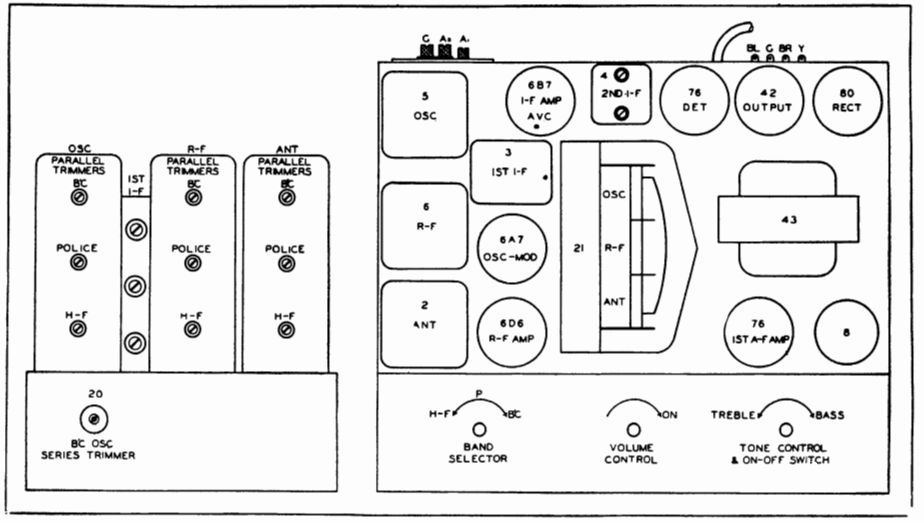


Fig. 2. Side And Top Views 715

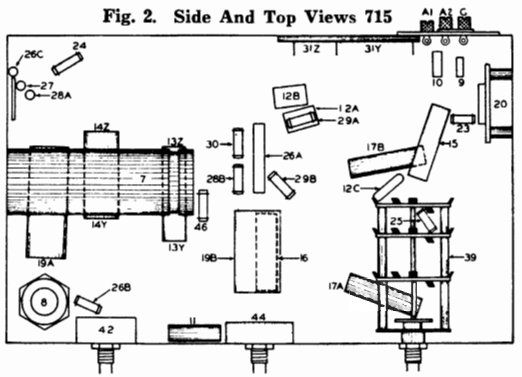
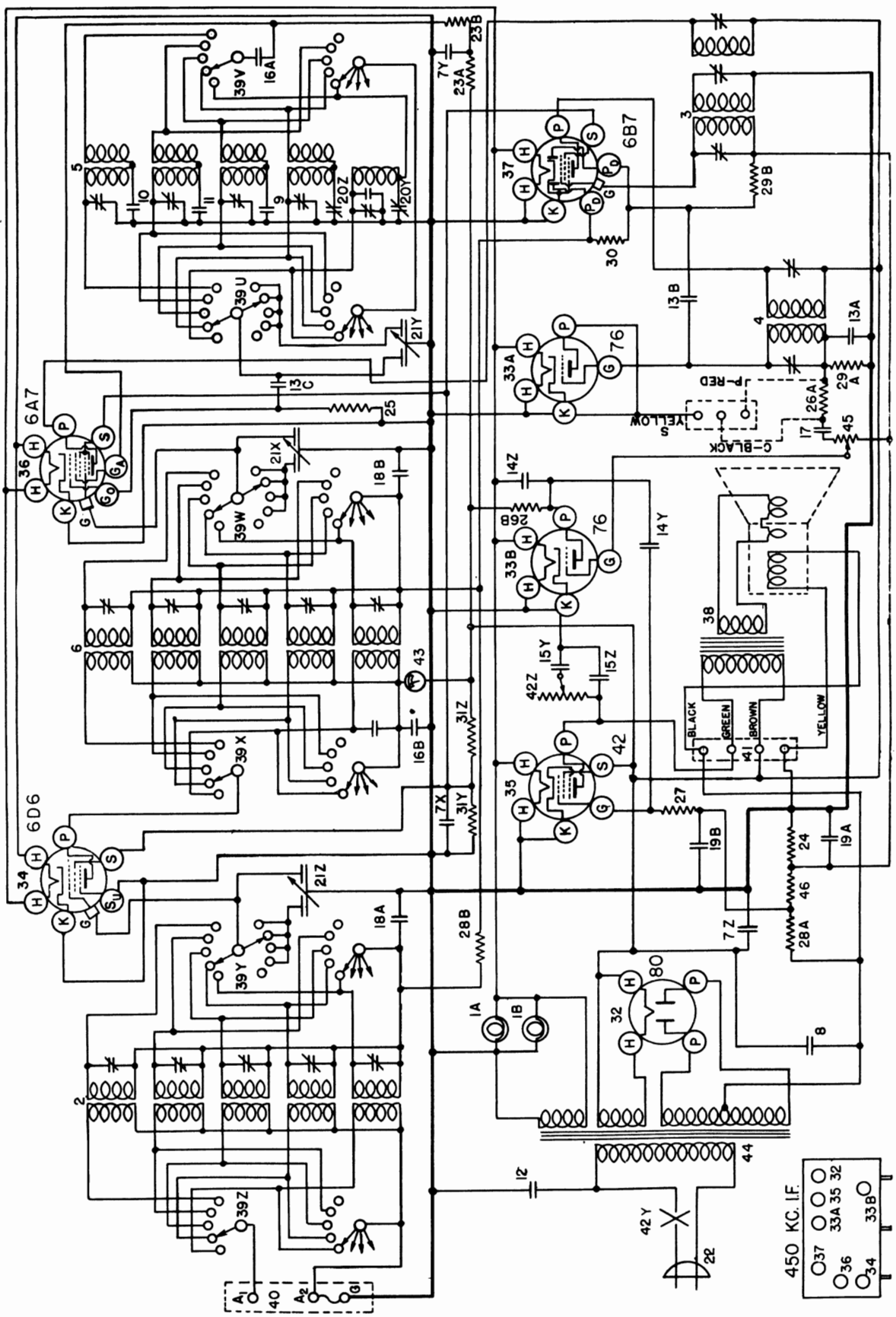
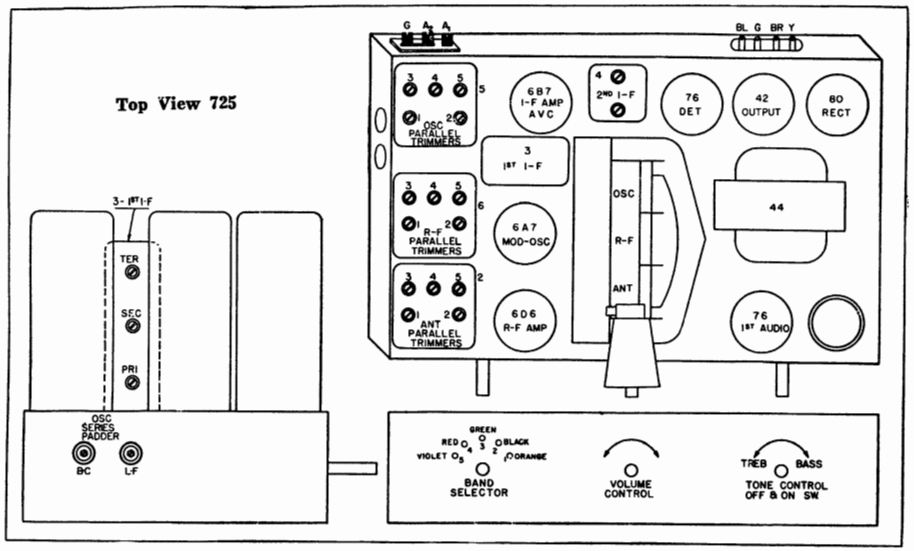


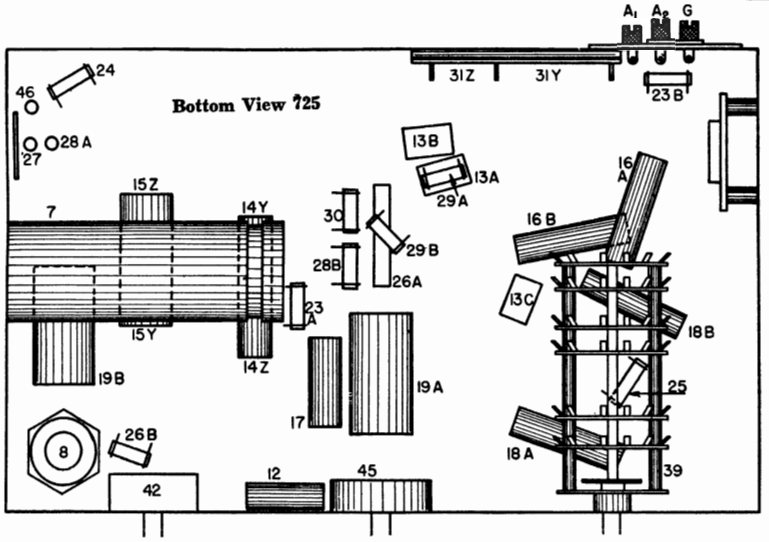
Fig. 3. Botton View 715

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 725







TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	Go	Ga	K
6A8	Osc-Mod	6.3	220	80	—	0	-4 to -10	105	2.5
6K7	I. F. Amplifier	6.3	220	105	3.3	0	—	—	3.3
6H6	Diode Detector	6.3	—	—	—	—	—	—	0
6K7	A. F. Amplifier	6.3	20	20	0	1.0	—	—	0
6F6	Output	6.3	210	220	—	8.0	—	—	0
5Z4	Rectifier	4.9	220	—	—	—	—	—	—

Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 60 Watts.

PARTS LIST—MODEL 725

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A, 1B	—36504	Dial Light Socket Assm.
2	G57—32000	Ant. Coil Assm. Complete
	G48—32000	Ant. Coil only 150-400 Kc.
	G47—32000	Ant. Coil only 540-1500 Kc.
	G49—32000	Ant. Coil only 1500-4000 Kc.
	G53—32000	Ant. Coil only 4-10 Mc.
	G52—32000	Ant. Coil only 10-22 Mc.
	MG9 —36168	Shield
	W —36028	5 Section Trimmer Condenser
	MG19—36168	Coil Support Base
3	G47—32004	1st I. F. Assm.
4	G46—32004	2nd I. F. Assm.
5	G46—32002	Osc. Coil Assm. Complete
	G39—32002	Osc. Coil only 150-400 Kc.
	G40—32002	Osc. Coil only 540-1500 Kc.
	G41—32002	Osc. Coil only 1500-4000 Kc.
	G45—32002	Osc. Coil only 4-10 Mc.
	G44—32002	Osc. Coil only 10-22 Mc.
	G4 —34007	Condenser, 1136 mmf. *
	G6 —34007	Condenser, 1707 mmf. *
	G5 —34007	Condenser, 2757 mmf. *
	G6 —34002	Condenser, 25 mmf.
	MG20—36168	Coil Support Base
	W —36028	5 Section Trimmer Condenser
	MG10—36168	Shield
6	G33—32001	R. F. Coil Assm. Complete
	G27—32001	R. F. Coil only 150-400 Kc.
	G26—32001	R. F. Coil only 540-1500 Kc.
	G28—32001	R. F. Coil only 1500-4000 Kc.
	G31—32001	R. F. Coil only 4-10 Mc.
	G30—32001	R. F. Coil only 10-22 Mc.
	G1 —34002	Condenser, 250 mmf.
	MG9 —36168	Shield
	MG19—36168	Coil Support Base
	W —36028	5 Section Trimmer Condenser
7Z, 7Y, 7X	W —36056	Condenser, 8 mfd. 450 Volt Condenser, 4 mfd. 350 Volt Condenser, 4 mfd. 250 Volt
8	W —36055	Condenser, 35 mfd. 400 Volt
9	G4 —34007	Condenser, 1136 mmf. *
10	G6 —34007	Condenser, 1707 mmf. *
11	G5 —34007	Condenser, 2757 mmf. *
12	W —30805	Condenser, 0.01 mfd. 400 Volt
13A	G2 —34002	Condenser, 100. mmf.
13B	G2 —34002	Condenser, 100. mmf.
13C	G2 —34002	Condenser, 100. mmf.
14Z, 14Y	W —25537A	Condenser, 0.001 mfd. 400 V. Condenser, 0.03 mfd. 400 V.
15Z, 15Y	W —31052	Condenser, 0.004 mfd. 400 V. Condenser, 0.05 mfd. 400 V.
16A	W —32378	Condenser, 0.01 mfd. 400 V.
16B	W —32378	Condenser, 0.01 mfd. 400 V.
17	W —23191A	Condenser, 0.01 mfd. 400 V.
18A	W —32379	Condenser, 0.02 mfd. 200 V.
18B	W —32379	Condenser, 0.02 mfd. 200 V.
19A	W —30321	Condenser, 1.0 mfd. 160 V.
19B	W —30321	Condenser, 1.0 mfd. 160 V.
20Y, 20Z	G15—33006	Condenser, B. C. Series Osc. Condenser, L. F. Series Osc.
21X, 21Y, 21Z	G34—33002	Var. Tuning Cond. Gang
	—37433B	Dial Drive Assm.
	C —37434A	Dial Face only
	—37551	Dial Hand
	—37554	Second Hand
	—37484	Hand Screw
	—37543	Hand Washer
22	B —33905A	A. C. Cord & Plug
23A	—21876	Resistor, 10,000 Ohms
23B	—21876	Resistor, 10,000 Ohms
24	—22196	Resistor, 20,000 Ohms
25	—21875	Resistor, 100,000 Ohms
26A	—23403	Resistor, 150,000 Ohms
26B	—23403	Resistor, 150,000 Ohms
27	—21455	Resistor, 100,000 Ohms
28A	—23785	Resistor, 500,000 Ohms
28B	—23785	Resistor, 500,000 Ohms
29A	—21454	Resistor, 1.0 Megohm
29B	—21454	Resistor, 1.0 Megohm
30	—26577	Resistor, 3.0 Megohm
31Z	W —36442	Resistor, 17,500 Ohms
31Y		Resistor, 15,000 Ohms
32	G6 —28807	Socket, 80
33A	G80—28807	Socket, 76
33B	G80—28807	Socket, 76
34	G75—28807	Socket, 6D6
35	G25—28807	Socket, 42
36	G47—33070	Socket, 6A7
37	G48—28807	Socket, 6B7
	W —35772	Tube Shield Half
	W —35773	Tube Shield Cap
	W —35774	Tube Shield Base
	W —33072	Socket Cushion
38	330CL—22	Speaker, (Table Model)
	630CL—27	Speaker, (Console Model)
39U To 39Z	—36271E	Band Change Switch
40	G27—26719	Terminal Board Ant.-Grd.
41	G5 —31128	Terminal Board Speaker
	W —34628	Terminal Board Cover (Speaker)
	W —34627	Terminal Board Insulator
42Z, 42Y	W —36539A	Tone Control (80,000 Ohms) On & Off Switch
43	W —36500	Tuning Meter
44	G10—30745	Power Trans. 60 Cy., 110 V.
	G11—30745	Power Trans. 25 Cy., 110 V.
	G12—30745	Power Trans. 25 Cy., 220 V.
45	W —36066	Volume Control 1.0 Megohm
46	—34019	Resistor, 75,000 Ohms
	B —36515	Escutcheon
	D —28	Escutcheon Screw (3)
	W —36311	Band Change Escutcheon
	W —36310	Escutcheon Indicator (Celluloid)
	W —28760B	Escutcheon Pin
	W —36518	Knob, Bd. Chg. & Tone Control
	W —36519	Knob, Dial
	W —36520A	Knob, Vernier
	W —36521	Knob, Volume Control

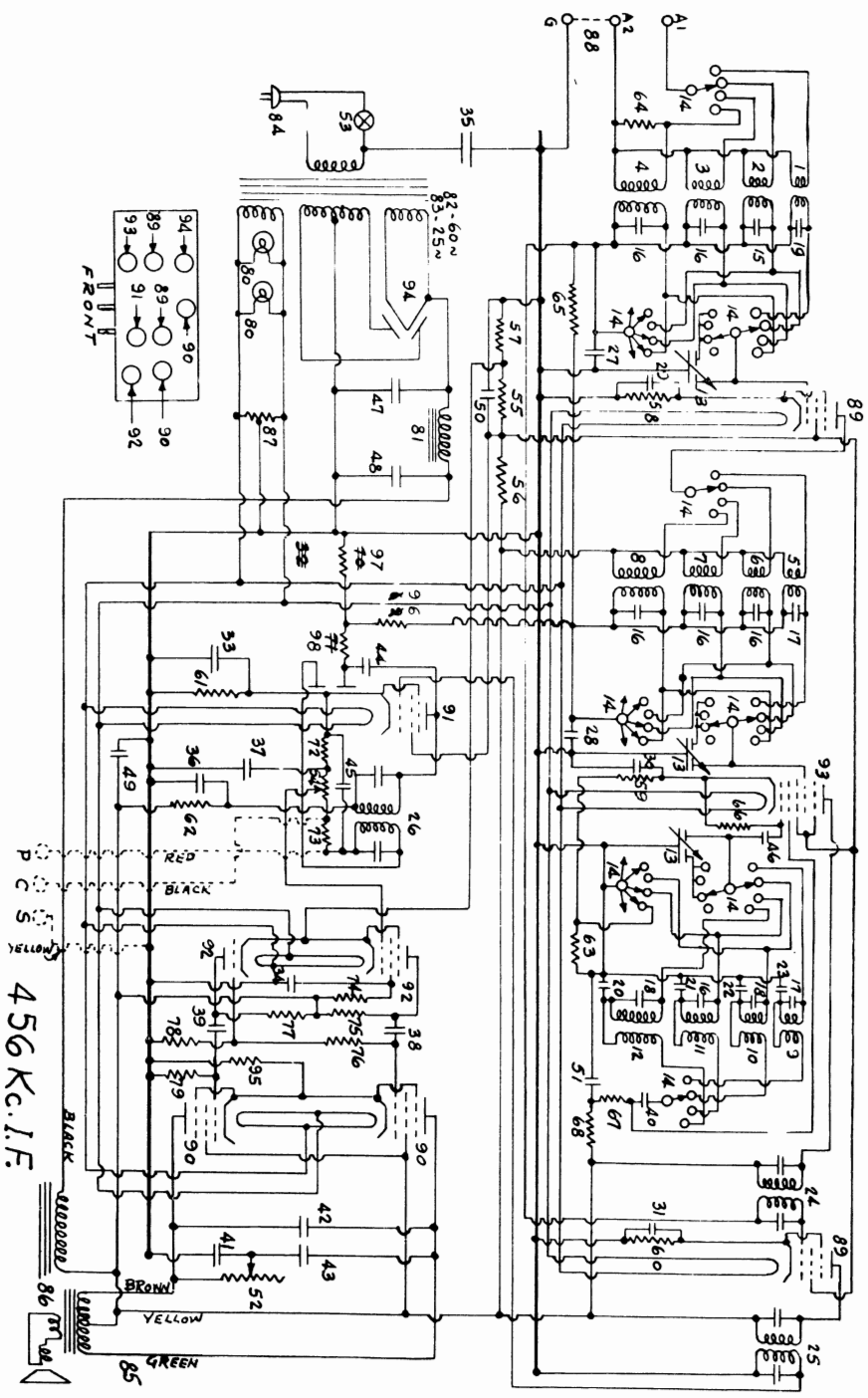
NOTE. * First models had condensers mounted externally but eventually placed in G46—32002 Assm.

CROSLEY RADIO CORP.

Parts List Model 814

Figures in first column correspond to figures in diagram

1	G30 —32000	Ant. Coil (10.0-22.0 Mc)	
2	G29 —32000	Ant. Coil (4.0-10.0 Mc)	
3	G4 —32000	Ant. Coil (1.5-4.0 Mc)	
4	G3 —32000	Ant. Coil (Broadcast)	
5	G16 —32001	Inter. Coil (10.0-22.0 Mc)	
6	G15 —32001	Inter. Coil (4.0-10.0 Mc)	
7	G8 —32001	Inter. Coil (1.5-4.0 Mc)	
8	G2 —32001	Inter. Coil (Broadcast)	
9	G23 —32002	Osc. Coil (10.0-22.0 Mc)	
10	G22 —32002	Osc. Coil (4.0-10.0 Mc)	
11	G3 —32002	Osc. Coil (1.5-4.0 Mc)	
12	G17 —32002	Osc. Coil (Broadcast)	
13	G24 —33002	Variable Condenser	
14	B —34083-A	Band Change Switch	
15	G17 —33009	Padding Condenser	
16	G7 —33009	Padding Condenser	
17	G6 —33009	Padding Condenser	
18	G5 —33009	Padding Condenser	
19	G17 —33006	Padding Condenser	
20	G16 —33006	Trimmer Condenser	
21		Trimmer Condenser	
22	G2 —34000	3104 Mmfd.	
23	G1 —34000	1647 Mmfd.	
24	G25 —32004	1st I. F. Transformer	
25	G23 —32004	2nd I. F. Transformer	
26	G24 —32004	3rd I. F. Transformer	
27	W —32379	0.02 Mfd. 200 Volt	
28	W —32379	0.02 Mfd. 200 Volt	
29	W —28621	0.02 Mfd. 200 Volt	
30	W —28621	0.02 Mfd. 200 Volt	
31	W —28621	0.02 Mfd. 200 Volt	
32			
33	W —28621	0.02 Mfd. 200 Volt	
34	W —23142	0.02 Mfd. 400 Volt	
35	W —30805	0.01 Mfd. 400 Volt	
36	W —23191-A	0.01 Mfd. 400 Volt	
37	W —30321	1.0 Mfd. 160 Volt	
38	W —23615	0.05 Mfd. 400 Volt	
39	W —23615	0.05 Mfd. 400 Volt	
40	W —23635	0.006 Mfd. 400 Volt	
41	W —30270	0.001 Mfd. 400 Volt	
42	W —31052	0.004 Mfd. 400 Volt	
43		0.05 Mfd. 400 Volt	
44	W —32741-A	0.0005 Mfd.	
45	W —31937	0.0001 Mfd.	
46	W —30741	0.00025 Mfd.	
47	W —26194-B	12 Mfd. 475 Volt	
48		8 Mfd. 450 Volt	
49	W —29097-D	8 Mfd. 450 Volt	
50		8 Mfd. 250 Volt	
51	W —32258	8 Mfd. 300 Volt	
52	W —32063	Tone Control	
53		Switch	
54	W —33378	Level Control	
55	W —32301	15,000 Ohms	
56		10,000 Ohms	
57	W —30127	450 Ohms Flex.	
58	W —25937	275 Ohms Flex.	
59	W —27503	1,400 Ohms Flex.	
60	W —27503	1,400 Ohms Flex.	
61	W —30127	450 Ohms Flex.	
62	W —22514	750 Ohms Flex.	
63	W —29585	600 Ohms Flex.	
64	31094	4,500 Ohms	
65	21455	300,000 Ohms	
66	21875	100,000 Ohms	
67	24814	7,000 Ohms	
68	24814	7,000 Ohms	
69			
70			
71			
72	21876	10,000 Ohms	
73	23785	500,000 Ohms	
74	23785	500,000 Ohms	
75	21237-A	60,000 Ohms	
76	23785	500,000 Ohms	
77	23403	150,000 Ohms	
78	21237-A	60,000 Ohms	
79	23785	500,000 Ohms	
80	W —4099-A	6.3 V. Dial Lamp	
81	G1 —24628	Filter Choke	
82	G37 —25669	60 Cy. Power Trans.	
83	G38 —25669	25 Cy. Power Trans.	
84	B —33906-A	Cord & Plug	
85	W —31007-A	Speaker Cable	
86	68C	Speaker	
87	W —32337	10 Ohms-10 Ohms	
88	G14 —26719	Ant.-Gnd. Term.	
89	G75 —27975	6D6 Socket	
90	G25 —27975	42 Socket	
91	G48 —27975	6B7 Socket	
92	G49 —27975	6F7 Socket	
93	G2 —33070	6A7 Socket	
94	G6 —27975	80 Socket	
95	W —22873	220 Ohms	
96	26577	3 Megohm	
97	23785	500,000 Ohms	
98	23785	500,000 Ohms	

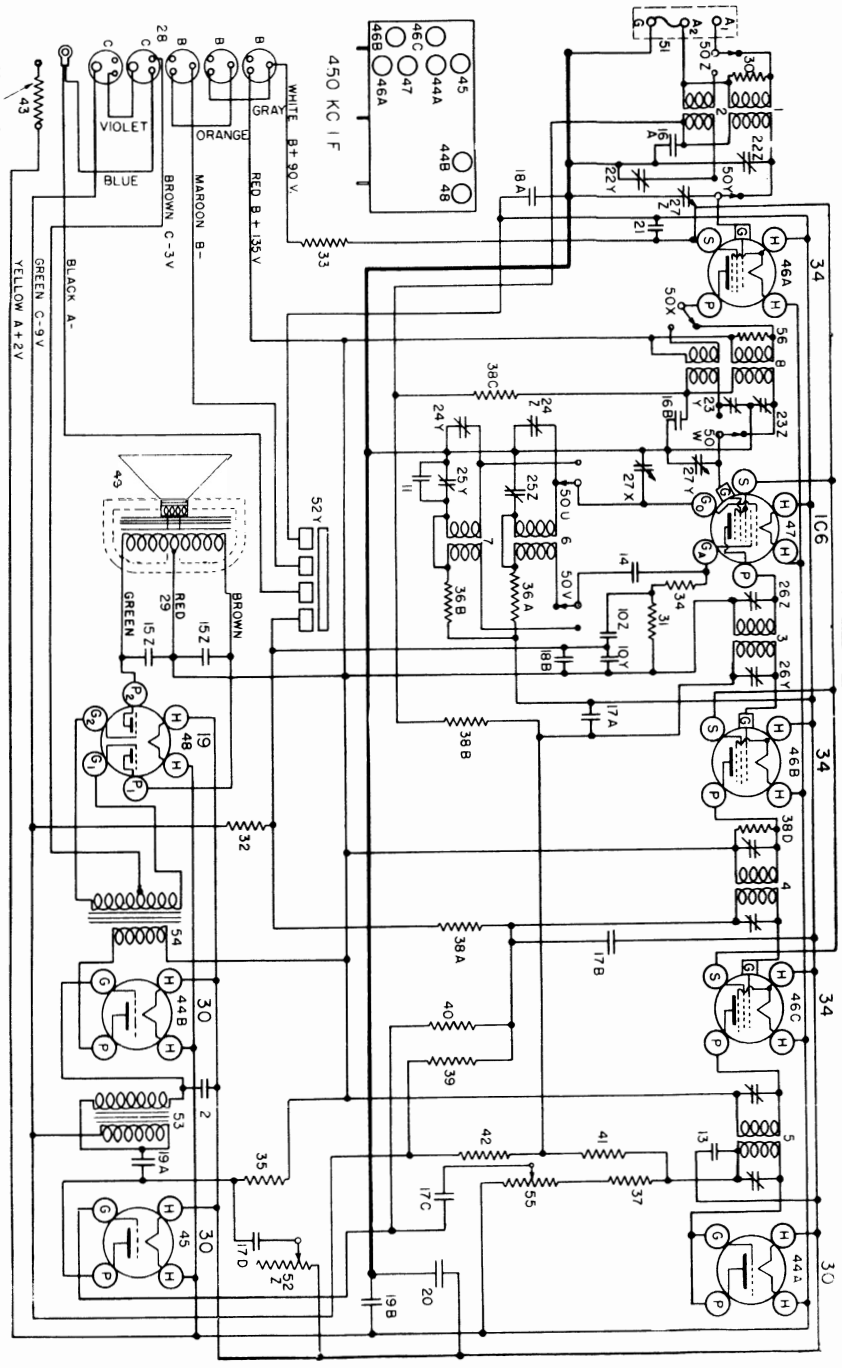


CROSLEY RADIO CORP.

Wiring Diagram For Model 814

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 815



PARTS LIST—MODEL 815

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1	G3 —32000	Ant. Coil 540-1720 Kc.
	W —25025A	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200	Coil Socket
2	G28—32000	Ant. Coil, 5.7-15.5 Mc.
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
	W —33438	Centering Washer
3	G1 —32004	1st I. F. Coil (only)
	G1 —24064	Shield
	W —26891	Insulating Washer
4	G21—32004	2nd I. F. Assm.
5	G22—32004	3rd I. F. Assm.
6	G2 —32002	Osc. Coil, 540-1720 Kc.
	W —25025A	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200	Coil Socket
7	G21—32002	Osc. Coil, 5.7-15.5 Mc.
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
	W —33438	Centering Washer
8	G2 —32001	R. F. Coil, 540-1720
	W —25024B	Coil Shield
	W —26891	Insulating Washer
	W —21541C	Retaining Ring
	W —25200	Coil Socket
9	G18—32001	R. F. Coil, 5.7-15.5 Mc.
	W —30802A	Coil Shield
	W —30026A	Retaining Ring
	W —33438	Centering Washer
10Z, 10Y	W —33990	Condenser, 8. Mfd., 200 V.
11	G3 —34000	Condenser, 2200 Mmfd., 300 V.
12	G1 —34002	Condenser, 0.00025 Mfd., 200 V.
13	W —27932	Condenser, 0.0001 Mfd., 200 V.
14	W —25435	Condenser, 0.003 Mfd., 400 V.
15Z, 15Y	W —31158	Condenser, 0.006 Mfd., 400 V.
16A	W —32379	Condenser, 0.02 Mfd., 200 V.
16B	W —32379	Condenser, 0.02 Mfd., 200 V.
17A	W —27216	Condenser, 0.05 Mfd., 200 V.
17B	W —27216	Condenser, 0.05 Mfd., 200 V.
17C	W —27216	Condenser, 0.05 Mfd., 200 V.
17D	W —27216	Condenser, 0.05 Mfd., 200 V.
18A	W —24049B	Condenser, 0.1 Mfd., 200 V.
18B	W —24049B	Condenser, 0.1 Mfd., 200 V.
19A	W —29910A	Condenser, 0.25 Mfd., 200 V.
19B	W —29910A	Condenser, 0.25 Mfd., 200 V.
20	W —30321A	Condenser, 1.0 Mfd., 160 V.
21	W —28869	Condenser, 2.0 Mfd., 200 V.
22Z, 22Y	G1 —33008	2 Section Ant. Trimmer
23Z, 23Y	G9 —33009	2 Section R. F. Trimmer
24Z, 24Y	G18—33009	2 Section Osc. Trimmer
25Z, 25Y	G20—33006	2 Section Osc. Series Trimmer

Item No.	Part No.	Description
26Z, 26Y	G6 —33006	2 Section 1st I. F. Trimmer
27Z, 27Y, 27X	G33—33002	3 Section Tuning Condenser Gang
	MG26—36493	Dial Drive Complete
	C —35113	Dial Face
	W —37198	Dial Pointer
	W —32293	Pointer Nut (2)
28	C —36517C	Battery Cable
	W —28164	Cable Clamp
29	W —31008	Speaker Cable
30	—31094	Resistor, 4,500 Ohm, ½ W.
31	—27121	Resistor, 5,000 Ohm, ½ W.
32	—23868	Resistor, 6,500 Ohm, ½ W.
33	—24814	Resistor, 7,000 Ohm, ½ W.
34	—21876	Resistor, 10,000 Ohm, ¼ W.
35	—22196	Resistor, 20,000 Ohm, ¼ W.
36A	—21875	Resistor, 100,000 Ohm, ¼ W.
36B	—21875	Resistor, 100,000 Ohm, ¼ W.
37	—23403	Resistor, 150,000 Ohm, ½ W.
38A	—21455	Resistor, 300,000 Ohm, ¼ W.
38B	—21455	Resistor, 300,000 Ohm, ¼ W.
38C	—21455	Resistor, 300,000 Ohm, ¼ W.
38D	—21455	Resistor, 300,000 Ohm, ¼ W.
39	—23785	Resistor, 500,000 Ohm, ¼ W.
40	—24154	Resistor, 1.0 Megohm, ¼ W.
41	—29577	Resistor, 3.0 Megohm, ¼ W.
42	—29578	Resistor, 5.0 Megohm, ¼ W.
43	G4 —23300	Resistor, 0.26 Megohm (Wire Wound)
44A	G9 —28807	Socket 30
44B	G9 —28807	Socket 30
45	G9 —33070	Socket 30
46A	G31—28807	Socket 34
46B	G31—28807	Socket 34
46C	G31—28807	Socket 34
47	G84—33070	Socket 1C6
48	G44—28807	Socket 19
	W —33072	Socket Cushion (2)
	W —27981A	Tube Shield Base (1)
	W —26231	Tube Shield (1)
49	42—PS—3	Speaker
50Z, To 50U	—36456	Band Change Switch
51	G27—26719	Ant. Terminal Board
52Z, 52Y	—36458	Tone Control On-Off Switch
53	MG40—36493	1st Audio Transformer
54	MG41—36493	2nd Audio Transformer
55	—32062	Volume Control (1 Meg.)
56	—22531	Resistor, 15,000 Ohm, ¼ W.
	B —33528	Escutcheon
	W —33984	Escutcheon Gasket
	D —28	Escutcheon Screw (4)
	W —33991	Knob (1)
	W —31585B	Knob (3)

TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	S	G	Ga	Go
34	R. F. Amplifier	2.0	135	67.5	—	—	—
1C6	Osc.-Mod.	2.0	135	67.5	—	85	−5 to −10
34	1st I-F Amplifier	2.0	135	67.5	−3	—	—
34	2nd I-F Amplifier	2.0	135	67.5	−3	—	—
30	Diode Detector	2.0	—	—	—	—	—
30	A-F Amplifier	2.0	70	—	−3	—	—
30	A-F Driver	2.0	135	—	−9	—	—
19	Double Triode Output	2.0	135	—	−1.5	—	—

POWER OUTPUT APPROXIMATELY 2.5 WATTS.
"A" BATTERY DRAIN APPROXIMATELY .74 AMPERES AT 2 VOLTS.
"B" BATTERY DRAIN 20 TO 35 MILLIAMPERES—DEPENDING UPON VOLUME CONTROL ADJUSTMENT

PARTS LIST—MODEL 855

Figures in first column refer to parts shown in **diagrams.**

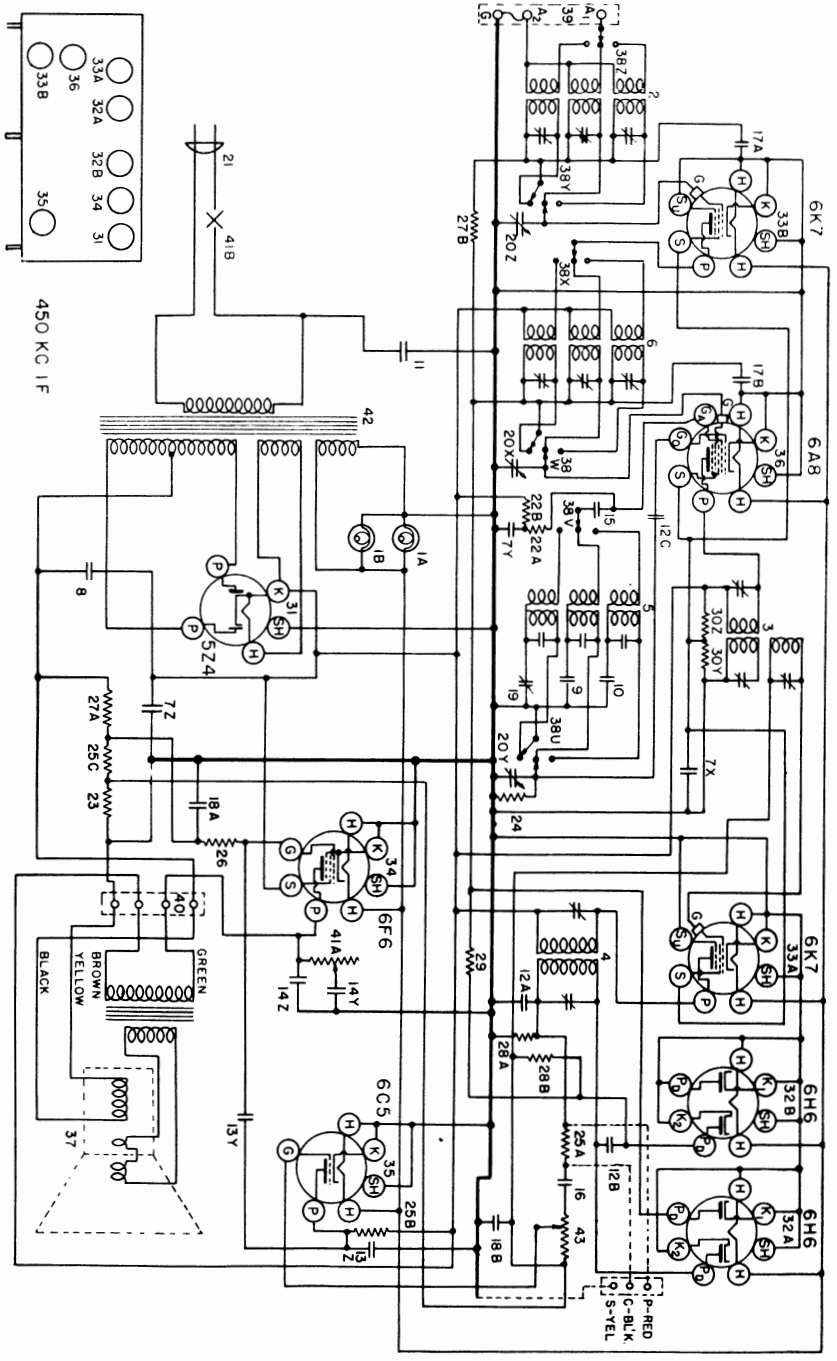
Item No.	Part No.	Description
1A	G4 —27134	Dial Light Socket Assm.
1B	G4 —27134	Dial Light Socket Assm.
2	G74 —32000	Ant. Coil, Assm. Complete
	G46 —32000	Ant. Coil, S. W. Band
	G73 —32000	Ant. Coil, Police Band
	G44 —32000	Ant. Coil, Broadcast Band
	G6 —36031	Coil Support Base
	W —36032	Trimmer Condenser Assm.
	G4 —36031	Coil Shield
3	G64 —32004	1st I. F. Trans.
4	G65 —32004	2nd I. F. Trans.
5	G42 —32002	Osc. Coil Assm. Complete
	G38 —32002	Osc. Coil, S. W. Band
	G36 —32002	Osc. Coil, B. C. Band
	G37 —32002	Osc. Coil, P. Band
	G7 —36031	Coil Support Base
	W —36032	Trimmer Condenser Assm.
	G5 —36031	Coil Shield
6	G51 —32001	R. F. Coil Assm. Complete
	G45 —32001	R. F. Coil, S. W. Band
	G46 —32001	R. F. Coil, P. Band
	G54 —32001	R. F. Coil, B. C. Band
	G6 —36031	Coil Support Base
	W —36032	Trimmer Condenser Assm.
	G4 —36031	Coil Shield
7Z	W —36056	8 mfd. 450 V.
7Y		Condenser, 4 mfd. 350 V.
7X		4 mfd. 250 V.
8	W —36055	Condenser, 35 mfd. 400 V.
9	G7 —34000	Condenser, .00145 mfd.
10	G12 —34000	Condenser, .004725 mfd.
11	W —30805	Condenser, .01 mfd. 400 V.
12A	G2 —34002	Condenser, 100 mmf.
12B	G2 —34002	Condenser, 100 mmf.
12C	G2 —34002	Condenser, 100 mmf.
13Z	W —25537A	Condenser, 0.001 mfd. 400 V.
13Y		Condenser, 0.03 mfd. 400 V.
14Z	W —31052	Condenser, 0.004 mfd. 400 V.
14Y		Condenser, 0.05 mfd. 400 V.
15	W —32378	Condenser, 0.01 mfd. 400 V.
16	W —23191A	Condenser, 0.01 mfd. 400 V.
17A	W —32379	Condenser, 0.02 mfd. 200 V.
17B	W —32379	Condenser, 0.02 mfd. 200 V.
18A	W —30321A	Condenser, 1.0 mfd. 160 V.
18B	W —30321A	Condenser, 1.0 mfd. 160 V.
19	G10 —33005	Condenser, Trim. (Osc. B. C. Bd)
20Z	G33 —33002	Var. Tuning Condenser Gang
20Y		
20X		
	MG21—36045	Dial Drive Assm.
	C —36088	Dial
	W —37198	Dial Hand
	W —32293	Dial Hand Nut

Item No.	Part No.	Description
21	B —33905A	Cord & Plug
22A	—21876	Resistor, 10,000 Ohms
22B	—21876	Resistor, 10,000 Ohms
23	—22196	Resistor, 20,000 Ohms
24	—21875	Resistor, 100,000 Ohms
25A	—23403	Resistor, 150,000 Ohms
25B	—23403	Resistor, 150,000 Ohms
25C	—23403	Resistor, 150,000 Ohms
26	—21455	Resistor, 300,000 Ohms
27A	—23785	Resistor, 500,000 Ohms
27B	—23785	Resistor, 500,000 Ohms
28A	—21454	Resistor, 1 Megohm
28B	—21454	Resistor, 1 Megohm
29	—26577	Resistor, 3 Megohm
30Z	W —35963	Resistor, 8,500 Ohms
30Y		Resistor, 25,000 Ohms
31	G154—36400	Socket, 5Z4
32A	G155—36800	Socket, 6H6
32B	G155—36400	Socket, 6H6
33A	G151—36800	Socket, 6K7
33B	G151—36400	Socket, 6K7
34	G153—36400	Socket, 6F6
35	G152—36400	Socket, 6C5
36	MG45—36791	Socket, 6A8 (Cushion)
	G156—36800	Socket only
	W —33072	Socket Cushion only
	W —36828	Socket Plate only
37	318BL—18	Speaker, (Table Model)
	518CL—22M	Speaker, (Console Model)
38Z		
To	—36058B	Band Change Switch
38U		
39	G27 —26719	Ant. Grd. Terminal
40	G5 —31128	Speaker Terminal
	W —34627	Speaker Term. Cover Insulator
	W —34628	Speaker Terminal Cover
	G28 —26719	Phono. Pickup Terminal Board (25 cy sets)
41A	—36062	Tone Control
41B		On-Off Switch
42	G6 —30745	Power Trans. 110 V. 60 Cy.
	G7 —30745	Power Trans. 110 V. 25 Cy.
	G8 —30745	Power Trans. 220 V. 25 Cy.
43	—36060	Volume Control, 1 Megohm
	W —37340	Knob (Pointer Notch)
	W —37339	Knob
	W —36518	Knob (Tail)
	W —36521	Knob (2)
	B —33528C	Escutcheon
	W —33984	Escutcheon Gasket
	W —36309	Escutcheon Indicator
	W —36312	Band Change Plate
	W —36313	Tone Control Plate

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go	Ga
6K7	R-F Amplifier	6.3	245	110	0	–3	0	—	—
6A8	Osc.-Mod.	6.3	245	110	—	–3	0	–5 to –15	175
6K7	I-F Amplifier	6.3	245	110	0	–3	0	—	—
6H6	Detector	6.3	—	—	—	—	0	—	—
6H6	AVC	6.3	—	—	—	—	0	—	—
6C5	A-F Amplifier	6.3	35	—	—	–3	0	—	—
6F6	Output	6.3	235	245	—	–16	0	—	—
5Z4	Rectifier	5.0	250	—	—	—	—	—	—

Power Consumption Approximately 60 Watts. **Measured** on 117.5 Volt Line—60 Cycles A. C.

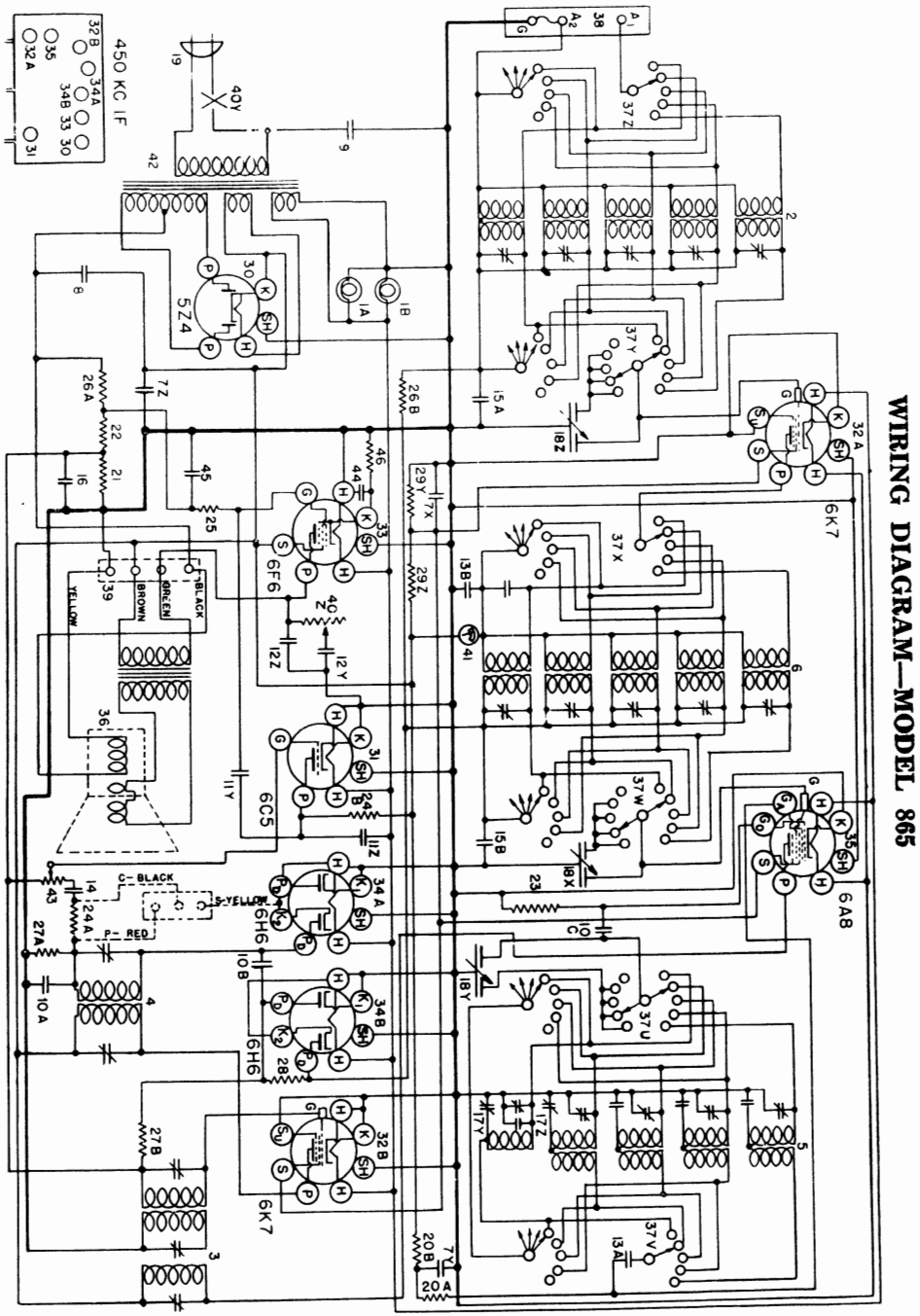


CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 855

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 865



PARTS LIST—MODEL 865

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1A, 1B	—36504	Dial Light Socket Assm.
2	G72 —32000	Ant. Coil Assm. Complete.
	G48 —32000	Ant. Coil only, 150-400 Kc.
	G70 —32000	Ant. Coil only, 540-1500 Kc.
	G49 —32000	Ant. Coil only, 1500-4000 Kc.
	G71 —32000	Ant. Coil only, 4-10 Mc.
	G52 —32000	Ant. Coil only, 10-22 Mc.
	W —36028	5 Section Trimmer Condenser
	MG19—36168	Coil Support Base
	MG9 —36168	Coil Shield
3	G64 —32004	1st I. F. Transformer Assm.
4	G65 —32004	2nd I. F. Transformer Assm.
5	G46 —32002	Osc. Coil Assm. Complete
	G39 —32002	Osc. Coil only, 150-400 Kc.
	G40 —32002	Osc. Coil only, 540-1500 Kc.
	G41 —32002	Osc. Coil only, 1500-4000 Kc.
	G45 —32002	Osc. Coil only, 4-10 Mc.
	G44 —32002	Osc. Coil only, 10-22 Mc.
	W —36028	5 Section Trimmer Condenser
	MG20—36168	Coil Support Base
	MG10—36168	Shield
	G4 —34007	Condenser, 1136 Mmf.
	G6 —34007	Condenser, 1707 Mmf.
	G5 —34007	Condenser, 2757 Mmf.
	G6 —34002	Condenser, 25 Mmf.
6	G49 —32001	R. F. Coil Assm. Complete
	G27 —32001	R. F. Coil only, 150-400 Kc.
	G47 —32001	R. F. Coil only, 540-1500 Kc.
	G28 —32001	R. F. Coil only, 1500-4000 Kc.
	G48 —32001	R. F. Coil only, 4-10 Mc.
	G30 —32001	R. F. Coil only, 10-22 Mc.
	W —36028	5 Section Trimmer Condenser
	MG19—36168	Coil Support Base
	MG9 —36168	Shield
7Z, 7Y, 7X	W —36056	Condenser, 8 Mfd., 450 Volts Condenser, 4 Mfd., 350 V. Condenser, 4 Mfd., 250 V.
8	W —36055	Condenser, 35 Mfd., 400 V.
9	W —30805	Condenser, 0.01 Mfd., 400 V.
10A, 10B, 10C	G2 —34002	Condenser, 100 Mmf. Condenser, 100 Mmf. Condenser, 100 Mmf.
11Z, 11Y, 12Y, 12 Z	W —25537A W —31052	Condenser, 0.001 Mfd., 400 V. Condenser, 0.03 Mfd., 400 V. Condenser, 0.004 Mfd. Condenser, 0.05 Mfd.
13A	W —32378	Condenser, 0.01 Mfd., 400 V.
13B	W —32378	Condenser, 0.01 Mfd., 400 V.
14	W —23191A	Condenser, 0.01 Mfd., 400 V.
15A	W —32379	Condenser, 0.02 Mfd., 200 V.
15B	W —32379	Condenser, 0.02 Mfd., 200 V.
16	W —30321A	Condenser, 1.0 Mfd., 160 V.
17Z, 17Y	G15 —33006	Condenser, B. C. Band Osc. Series Condenser, L. F. Band Osc. Series
18Z, 18Y, 18X	G34 —33002	3 Section Tuning Cond. Gang
	—36499	Dial Drive Assm.

Item No.	Part No.	Description
	—36528	Dial Face only.
	—37551	Dial Hand only
	—37553	Second Hand only
	—37484	Dial Hand Screw
	—37543	Dial Hand Washer
19	B —33905A	A. C. Cord & Plug
20A	—21876	Resistor, 10,000 Ohms
20B	—21876	Resistor, 10,000 Ohms
21	—22196	Resistor, 20,000 Ohms
22	—34019	Resistor, 75,000 Ohms
23	—21875	Resistor, 100,000 Ohms
24A	—23403	Resistor, 150,000 Ohms
24B	—23403	Resistor, 150,000 Ohms
25	—21455	Resistor, 300,000 Ohms
26A	—23785	Resistor, 500,000 Ohms
26B	—23785	Resistor, 500,000 Ohms
27A	—21454	Resistor, 1.0 Megohm
27B	—21454	Resistor, 1.0 Megohm
28	—26577	Resistor, 3.0 Megohm
29Z, 29Y	W —36442	Resistor, 17,500 Ohms Resistor, 15,000 Ohms
30	G154—36400	Socket, 5Z4
31	G152—36400	Socket, 6C5
32A	G151—36400	Socket, 6K7
32B	G151—36400	Socket, 6K7
33	G153—36400	Socket, 6F6
34A	G155—36400	Socket, 6H6
34B	G155—36400	Socket, 6H6
35	G156—36400	Socket, 6A8
36	330—CL—22	Speaker, (Table Model)
	630—CL—27	Speaker, (Console Model)
37U To 37Z	—36271E	Band Change Switch
38	G16 —26719	Ant. Terminal Board
39	G5 —31128	Speaker Terminal Board
	W —34628	Speaker Terminal Cover
	W —34627	Speaker Term. Cover Insulator
40A, 40B	W —36539A	Tone Control On & Off Switch
41	W —36500	Tuning Meter Complete
42	G10 —30745	Power Transformer, 60 Cy., 110 V.
	G11 —30745	Power Transformer, 25 Cy., 110 V.
	G12 —30745	Power Transformer, 25 Cy., 220 V.
43	—36066	Volume Control
44	W —36931	Condenser, 17 Mfd., 25 Volt
45	W —29910A	Condenser, 0.25 Mfd., 200 Volt
46	W —25291	Resistor, 500 Ohm (Flex)
	B —36515	Escutcheon & Lens Assm.
	D —28	Escutcheon Screws (3)
	W —36313	Tone Control Plate
	W —36311	Band Change Plate
	W —36310	Band Chge. Ind., (Celluloid)
	W —28760B	Escutcheon Pins
	W —36519	Knob, Tuning
	W —36520	Knob, Vernier
	W —36521	Knob, Vol. Control
	W —36518	Knob, Band Chge. & Tone Con.

TUBE SOCKET VOLTAGE READINGS

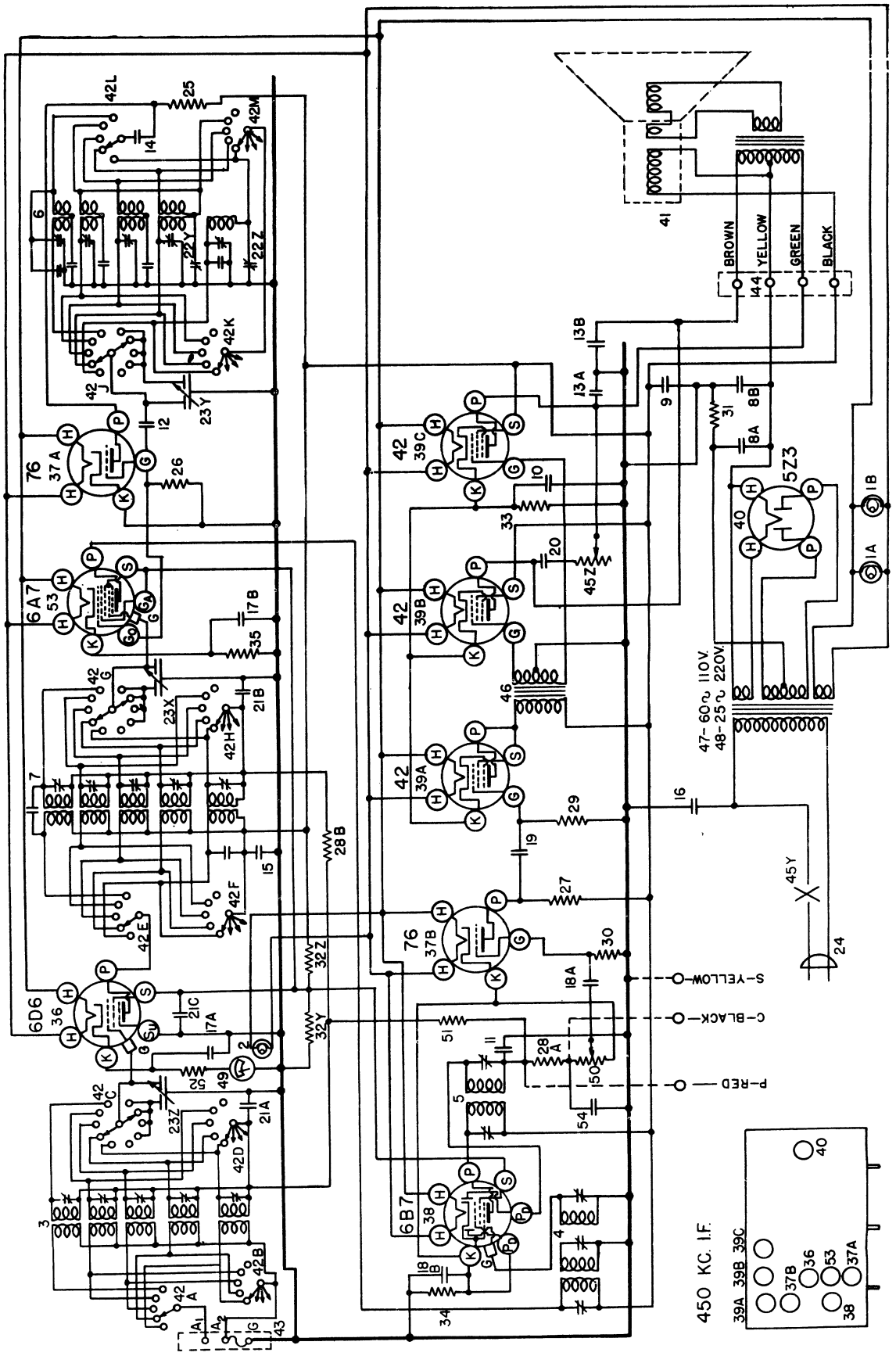
Tube	Function	H	P	S	Su	G	K	Go	Ga
6K7	R-F Amplifier	6.3	245	110	0	-3	0	—	—
6A8	Osc.-Mod.	6.3	245	110	—	-3	0	-5 to -15	175
6K7	I-F Amplifier	6.3	245	110	0	-3	0	—	—
6H6	Detector	6.3	—	—	—	—	0	—	—
6H6	AVC	6.3	—	—	—	—	0	—	—
6C5	A-F Amplifier	6.3	35	—	—	-3	0	—	—
6F6	Output	6.3	235	245	—	-16	0	—	—
5Z4	Rectifier	5.0	250	—	—	—	—	—	—

Measured on 117.5 Volt Line—60 Cycles A.C. Power Consumption Approximately 60 Watts.
Power Output Approximately 5 Watts.

CROSLEY RADIO CORP.

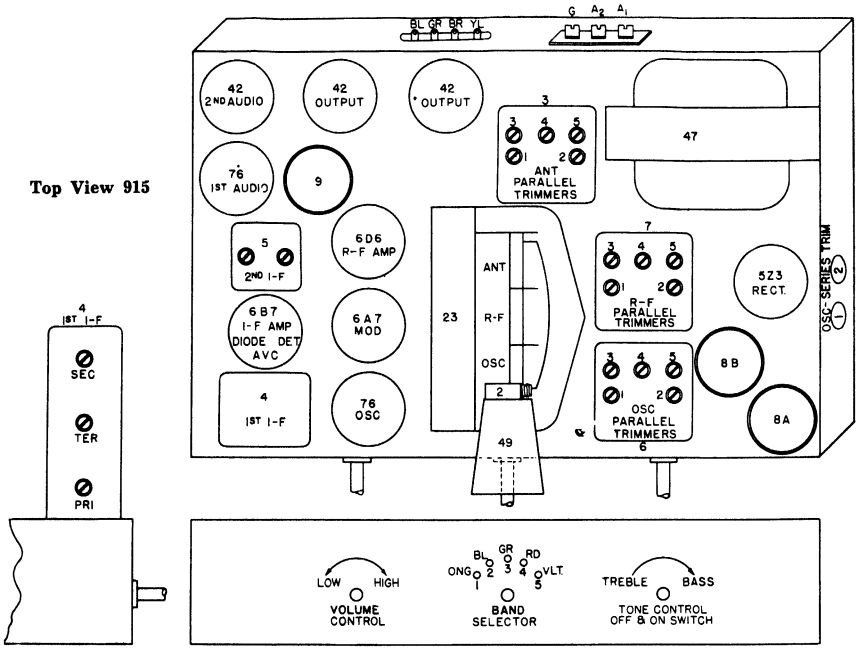
915

WIRING DIAGRAM—MODEL 915



MODEL 915

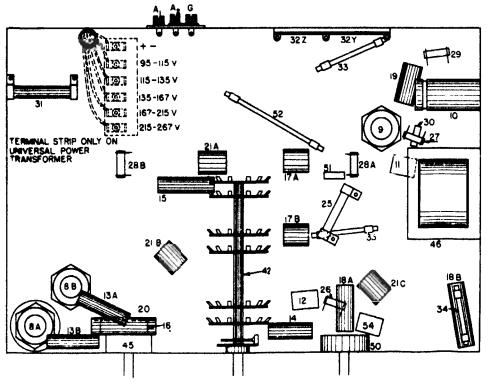
Top View 915



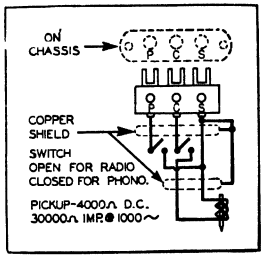
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go	Ga
6D6	R-F Amplifier	6.2	238	102	7	0	7	—	—
6A7	Modulator	6.2	238	102	—	0	6	−1 to −30	102
76	Oscillator	6.2	74	—	—	−24	0	—	—
6B7	I-F Amp. & Det.	6.2	238	102	—	0	3	—	—
76	1st. A-F Amp.	6.2	46	—	—	0	3	—	—
42	2nd. A-F Amp.	6.2	208	208	—	0	18	—	—
42	Output	6.2	335	238	—	0	18	—	—
42	Output	6.2	335	238	—	0	18	—	—
5Z3	Rectifier	4.9	345	—	—	—	—	—	—

Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 122 Watts.



Bottom View 915



Phono Connections

PARTS LIST—MODEL 915

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1A	—36504	Dial Light Socket Assm.
1B	—36504	Dial Light Socket Assm.
2	—36557	Tuning Meter Bulb
3	G63—32000	Ant. Coil Assm. Complete
	G64—32000	Ant. Coil only, 150-400 Kc.
	G68—32000	Ant. Coil only, 540-1500 Kc.
	G65—32000	Ant. Coil only, 1500-4000 Kc.
	G67—32000	Ant. Coil only, 4-10 Mc.
	G66—32000	Ant. Coil only, 10-22 Mc.
	MG26—36542	Coil Support Base
	W —36028	5 Section Trimmer Cond. Assm.
	MG9 —36168	Shield
4	G57—32004	1st I. F. Trans. Assm.
5	G58—32004	2nd I. F. Trans. Assm.
6	G54—32002	Osc. Coil Assm. Complete
	G55—32002	Osc. Coil only, 150-400 Kc.
	G56—32002	Osc. Coil only, 540-1500 Kc.
	G57—32002	Osc. Coil only, 1500-4000 Kc.
	G59—32002	Osc. Coil only, 4-10 Mc.
	G58—32002	Osc. Coil only, 10-22 Mc.
	MG26—36542	Coil Support Base
	W —36028	5 Section Trimmer Cond. Assm.
	G7 —34007	Condenser, 1750 mmf.
	G8 —34007	Condenser, 4350 mmf. (2)
	G6 —34002	Condenser, 25 mmf. (2)
	MG9 —36168	Shield.
7	G39—32001	R. F. Coil Assm. Complete
	G40—32001	R. F. Coil only, 150-400 Kc.
	G44—32001	R. F. Coil only, 540-1500 Kc.
	G41—32001	R. F. Coil only, 1500-4000 Kc.
	G43—32001	R. F. Coil only, 4-10 Mc.
	G42—32001	R. F. Coil only, 10-22 Mc.
	MG27—36542	Coil Support Base
	W —36028	5 Section Trimmer Cond. Assm.
	MG9 —36168	Shield
	G6 —34002	Condenser 25 mmf.
	G1 —34002	Condenser, 250 mmf.
8A	W —36055	Condenser, 35 mfd. 400 Volts
8B	W —36055	Condenser, 35 mfd. 400 Volts
9	W —36057	Condenser, 40 mfd. 300 Volts
10	W —36548	Condenser, 25 mfd. 25 Volts
11	G2 —34002	Condenser, 0.0001 mfd. 200 Volts
12	G1 —34002	Condenser, 0.00025 mfd. 200 Volts
13A	W —35758	Condenser, 0.008 mfd. 400 Volts
13B	W —35758	Condenser, 0.008 mfd. 400 Volts
14	W —34647	Condenser, 0.006 mfd. 400 Volts
15	W —32378	Condenser, 0.01 mfd. 400 Volts
16	W —30805	Condenser, 0.01 mfd. 400 Volts
17A	W —36541	Condenser, 0.02 mfd. 160 Volts
17B	W —36541	Condenser, 0.02 mfd. 160 Volts
18A	W —28621	Condenser, 0.02 mfd. 200 Volts
18B	W —28621	Condenser, 0.02 mfd. 200 Volts
19	W —32708	Condenser, 0.05 mfd. 400 Volts
20	W —23615	Condenser, 0.05 mfd. 400 Volts
21A	W —35936	Condenser, 0.05 mfd. 200 Volts
21B	W —35936	Condenser, 0.05 mfd. 200 Volts
21C	W —35936	Condenser, 0.05 mfd. 200 Volts
22Z, 22Y	G27—33006	Series Trimmer Condenser
23Z, 23X, 23Y	G37—33002	Var Tuning Condenser Gang
	—37376B	Dial Drive Assm.
	C —36658	Dial Face only
	—37551	Dial Hand
	—37554	Second Hand
	—37484	Dial Hand Screw
	—37543	Dial Hand Washer
24	B —33906A	A.C. Cord & Plug
25	W —36545	Resistor, 30,000 Ohm, 1 Watt
26	—22196	Resistor, 20,000 Ohm, ¼ Watt
27	—23403	Resistor, 150,000 Ohm, ¼ Watt
28A	—21455	Resistor, 300,000 Ohm, ¼ Watt
28B	—21455	Resistor, 300,000 Ohm, ¼ Watt
29	—23785	Resistor, 500,000 Ohm, ¼ Watt
30	—35927	Resistor, 2 Megohm, ¼ Watt
31	W —36549	Resistor, 200 Ohm, 6 Watts
32 Z, 32Y	W —32301	Resistor, 10,000 Ohms / Resistor, 15,000 Ohms
33	W —22873	Resistor, 220 Ohm (Flex) 2½ W
34	W —25937	Resistor, 275 Ohm (Flex) ½ W
35	W —22514	Resistor, 750 Ohm (Flex) ½ W
36	G75—28807	Socket, 6D6, 6 Prong
37A, 37B	G80—28807	Socket, 76, 5 Prong / Socket, 76, 5 Prong
38	G48—28807	Socket, 6B7, 7 Prong
39A, 39B, 39C	G25—28807	Socket, 42, 6 Prong / Socket, 42, 6 Prong / Socket, 42, 6 Prong
40	G53—28807	Socket, 5Z3, 4 Prong
	W —35772	Tube Shielf Half
	W —35773	Tube Shield Cap
	W —36280	Tube Shield Cap (Osc.)
	W —35774	Tube Shield Base
41	427CL—22	Speaker, (Table Model)
	627GL—27	Speaker. (Console Model)
42	—36547	Band Change Switch
43	G27—26719	Ant. & Grnd. Terminal
44	G5 —31128	Speaker Terminal
45Z, 45Y	—32063	Tone Control / Off & On Switch
46	G22—24628	A. F. Driver Transformer
47	G42—25669	Power Trans. 110 V., 60 Cy.
48	B —37685	Universal Power Transformer
49	W —36500	Tuning Meter
	W —36501	Tuning Meter Bracket
50	—32062	Volume Control
51	—36688	Resistor, 3 meg. ¼ Watt
52	W —21964	Resistor, 165 Ohm (Flex) ½ W
53	G47—28807	Socket, 6A7, 7 Prong
54	G6 —34002	Condenser, 25 mmf.
	B —36515	Escutcheon
	W —36311	Band Change Escutcheon
	W —36564	Band Change Escutcheon Indicator (Celluloid)
	W —36519	Knob, Tuning
	W —36520A	Knob, Vernier
	W —36518	Knob, (Tail) Band Change
	W —36521	Knob (2)
	G25—35954	Terminal Junction for Uni. P. T.

It is a five band receiver and the dial is divided into five sections as follows:

ORANGE— 150- 400 kilocycles (Weather Band)
BLACK — 540- 1,500 kilocycles (American Broadcast Band)
GREEN — 1,500- 4,000 kilocycles (Police and Amateur Band)
RED — 4,000-10,000 kilocycles (Night High Frequency Band)
VIOLET —10,000-21,000 kilocycles (Day High Frequency Band)

CROSLEY RADIO CORP.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 916

PARTS LIST—MODEL 916

Figures in first column refer to parts in Diagrams.

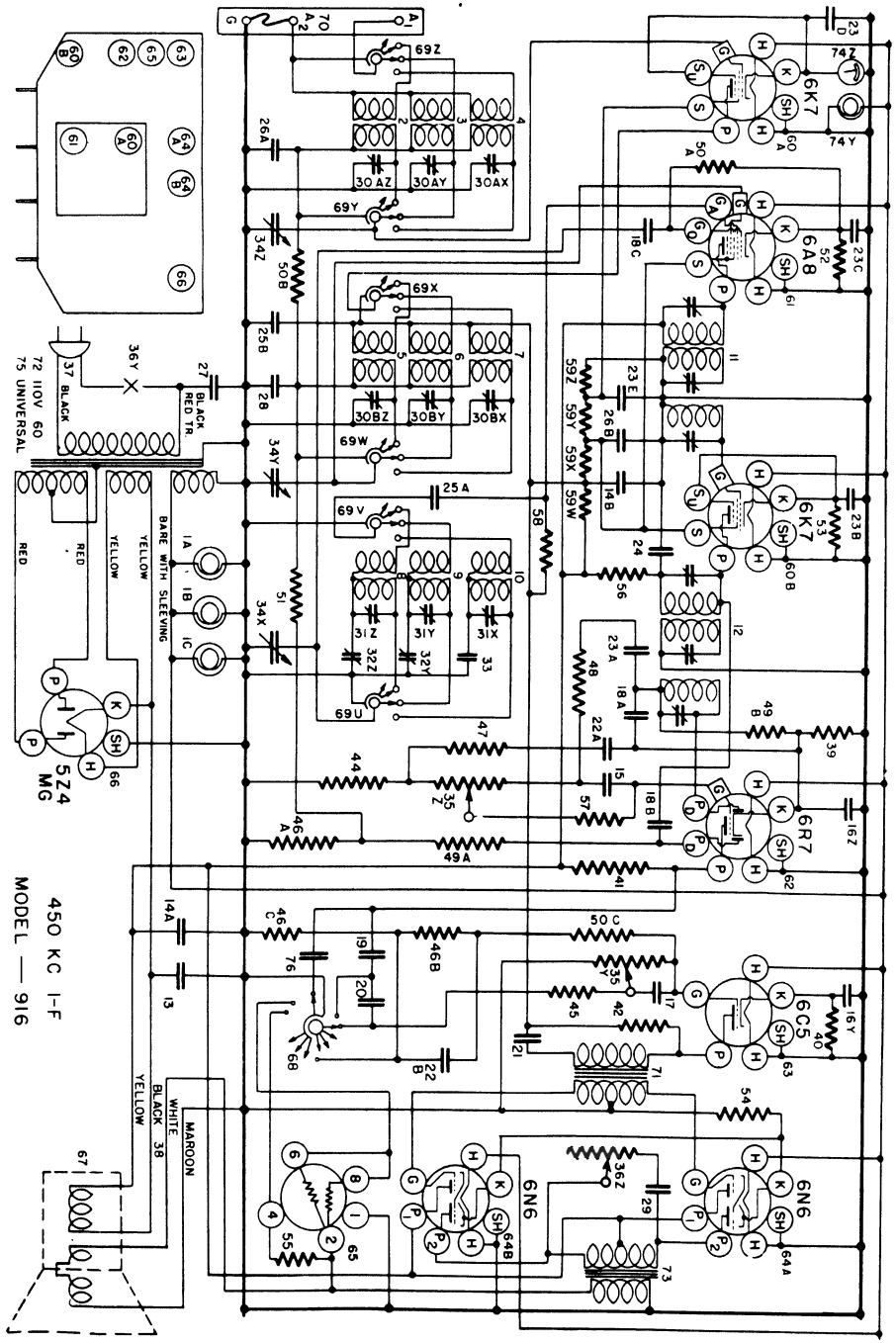
Item No.	Part No.	Description
1ABC	W —37922	Dial Light
	G3 —37965	Dial Light Socket
2	G94 —32000	Ant. Coil, B. C. B.
3	G95 —32000	Ant. Coil, Pol. B.
4	G113—32000	Ant. Coil, H. F. B.
5	G68 —32001	R. F. Coil, B. C. B.
6	G80 —32001	R. F. Coil, Pol. B.
7	G79 —32001	R. F. Coil, H. F. B.
8	G101—32002	Osc. Coil, B. C. B.
9	G102—32002	Osc. Coil, Pol. B.
10	G103—32002	Osc. Coil, H. F. B.
11	G90 —32001	1st I. F. Assembly
12	G91 —32001	2nd I. F. Assembly
13	W —36055	Condenser, 35. Mfd. 400 V. Electrolytic
14A	W —36057	Condenser, 40. Mfd. 300 V. Electrolytic
14B	W —36057	Condenser, 40. Mfd. 300 V. Electrolytic
15	G8 —34002	Condenser, .00001 Mfd. (Molded)
16Z	W —37778	Condenser, 12 Mfd. 25 V. (Electrolytic)
16Y	W —37778	Condenser, 12 Mfd. 25 V. (Electrolytic)
17	G6 —34002	Condenser, .000025 Mfd. (Molded)
18A	G2 —34002	Condenser, .0001 Mfd. (Molded)
18B	G2 —34002	Condenser, .0001 Mfd. (Molded)
18C	G2 —34002	Condenser, .0001 Mfd. (Molded)
19	W —32780 3	Condenser, .05 Mfd. 400 V.
20	G3 —34002	Condenser, .0005 Mfd. (Molded)
21	W —37732	Condenser, .3 Mfd. 160 V.
22A	W —31219	Condenser, .023 Mfd. 200 V.
22B	W —31219	Condenser, .023 Mfd. 200 V.
23A to 23E	W —36541	Condenser, .02 Mfd. 160 V.
24	W —30488	Condenser, .02 Mfd. 400 V.
25A	W —32378	Condenser, .01 Mfd. 400 V.
25B	W —32378	Condenser, .01 Mfd. 400 V.
26A	W —35936	Condenser, .05 Mfd. 200 V.
26B	W —35936	Condenser, .05 Mfd. 200 V.
27	W —30805	Condenser, .01 Mfd. 400 V.
28	W —32380	Condenser, .05 Mfd. 200 V.
29	W —23615	Condenser, .05 Mfd. 400 V.
30	W —37891	3 Section Shunt Trimmer Assembly
31	W —35951	3 Section Shunt Trimmer Assembly
32Z	W —37874	B. C. Osc. Series Trimmer Cond.
32Y		Pol. Osc. Series Trimmer Cond.
33	G18 —34000	H. F. Fixed Series Condenser
34	G47 —33002	3 Section Var. Tuning Condenser
	—41153	Dial Drive Unit
	C —41148	Dial Glass
	—41136	Mask for Dial
	W —40801	Dial Cushion
	W —40486	Dial Hand Screw
	—40485	Long Dial Hand
	—41145	Short Dial Hand
	—40537	Coupling Unit
	—41157	Belt (Drive)
	—40638	Indicator Cable
35Z	—41417	Volume Control 1st A. F. 3 Megohm
35Y		Volume Control 2nd A. F. 1 Megohm

Item No.	Part No.	Description
36Z	—37966	Tone Control
36Y		A. C. Switch
37	B —33906A	Power Cord & Plug
38	G3 —37918	Speaker Cable
39	—31093	Resistor, 2,700 Ohm ½ W.
40	W —21452	Resistor, 1,100 Ohm ½ W. Flex.
41	—37768	Resistor, 65,000 Ohm ½ W.
42	— 5370A	Resistor, 20,000 Ohm 1 W.
43		
44	—21454	Resistor, 1 Megohm ¼ W.
45	—21455	Resistor, 300,000 Ohm ¼ W.
46A	—23785	Resistor, 500,000 Ohm ¼ W.
46B	—23785	Resistor, 500,000 Ohm ¼ W.
46C	—23785	Resistor, 500,000 Ohm ¼ W.
47	—21453	Resistor, 40,000 Ohm ¼ W.
48	—23403	Resistor, 150,000 Ohm ¼ W
49A	—33344	Resistor, 400,000 Ohm ¼ W.
49B	—33344	Resistor, 400,000 Ohm ¼ W.
50A	—35600	Resistor, 100,000 Ohm ¼ W.
50B	—35600	Resistor, 100,000 Ohm ¼ W.
50C	—35600	Resistor, 100,000 Ohm ¼ W.
51	—37245	Resistor, 1.5 Megohm ¼ W.
52	W —28589	Resistor, 350 Ohm ½ W. Flex.
53	W —28106	Resistor, 500 Ohm ½ W. Flex.
54	W —23012A	Resistor, 40 Ohm ¼ W. Flex.
55	W —41193	Resistor, 1 Ohm 2½ W. Flex.
56	W —23013	Resistor, 2,000 Ohm 1¼ W. Flex.
57	—21273A	Resistor, 60,000 Ohm ¼ W.
58	W —37987	Resistor, 15,000 Ohm 1 W. Wire Wound
59	W —41225	4 Section Candohm
60A	G151—36400	Socket Type 6K7
60B	G151—36400	Socket Type 6K7
61	G156—36400	Socket Type 6A8
62	G164—36400	Socket Type 6R7
63	G152—36400	Socket Type 6C5
64A	G165—36400	Socket Type 6N6
64B	G165—36400	Socket Type 6N6
65	G167—36400	Socket For W41187 (5 prong tube)
66	G154—36400	Socket Type 5Z4
67	—40193	Speaker 633CJ4
68	W —41446	Switch, Multivox Control
69	C —37958E	Switch, Band Selector
70	G27 —26719	Ant. & Grd. Terminal Board Assy.
71	G1 —37995	Audio Input Transformer
72	G43 —25669	PowerSupply Transformer (110V.60Cy.)
73	G48 —24628	Audio Output Transformer
74Z	W —41259	Tuning Meter
74Y		Bulb for Meter
75	—37685A	Universal Power Transformer
76	W —41445	Condenser .036 Mfd. 400 V.
	MG54—41214	Complete Dial Assembly
	C —37894	Escutcheon
	B —37896A	Escutcheon Retaining Spring
	B —37898	Dial Lens
	B —37897	Lens Retaining Spring
	W —40365	Escutcheon Felt
	W —37339	Knob (3 required)
	W —40192B	Knob (2 required)

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	P_2	S	Su	G	K	Ga
6K7	R-F Amplifier	6.3	221	—	98	4	0	4	—
6A8	Osc-Mod	6.3	221	—	150	—	0	4.5	138
6K7	I-F Amplifier	6.3	260	—	138	5	0	5	—
6R7	Detector & 1st A-F Amplifier	6.3	130	—	—	—	0	6.5	—
6C5	2nd A-F Amplifier	6.3	150	—	—	—	0	6.5	—
6N6	(2) Output	6.3	285	278	—	—	0	3.2	—
5Z4	Rectifier	4.5	357	—	—	—	—	—	—
Phantom Conductor Tube (W41187)				Varies with power output.					

Voltage drop across speaker field 72 volts.
Power Output approximately 9 Watts.
Power Consumptoin approximately 117 Watts.
All readings taken on 117.5 volt power supply.



CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 955

PARTS LIST—MODEL 955

Figures in first column refer to parts in Diagrams.

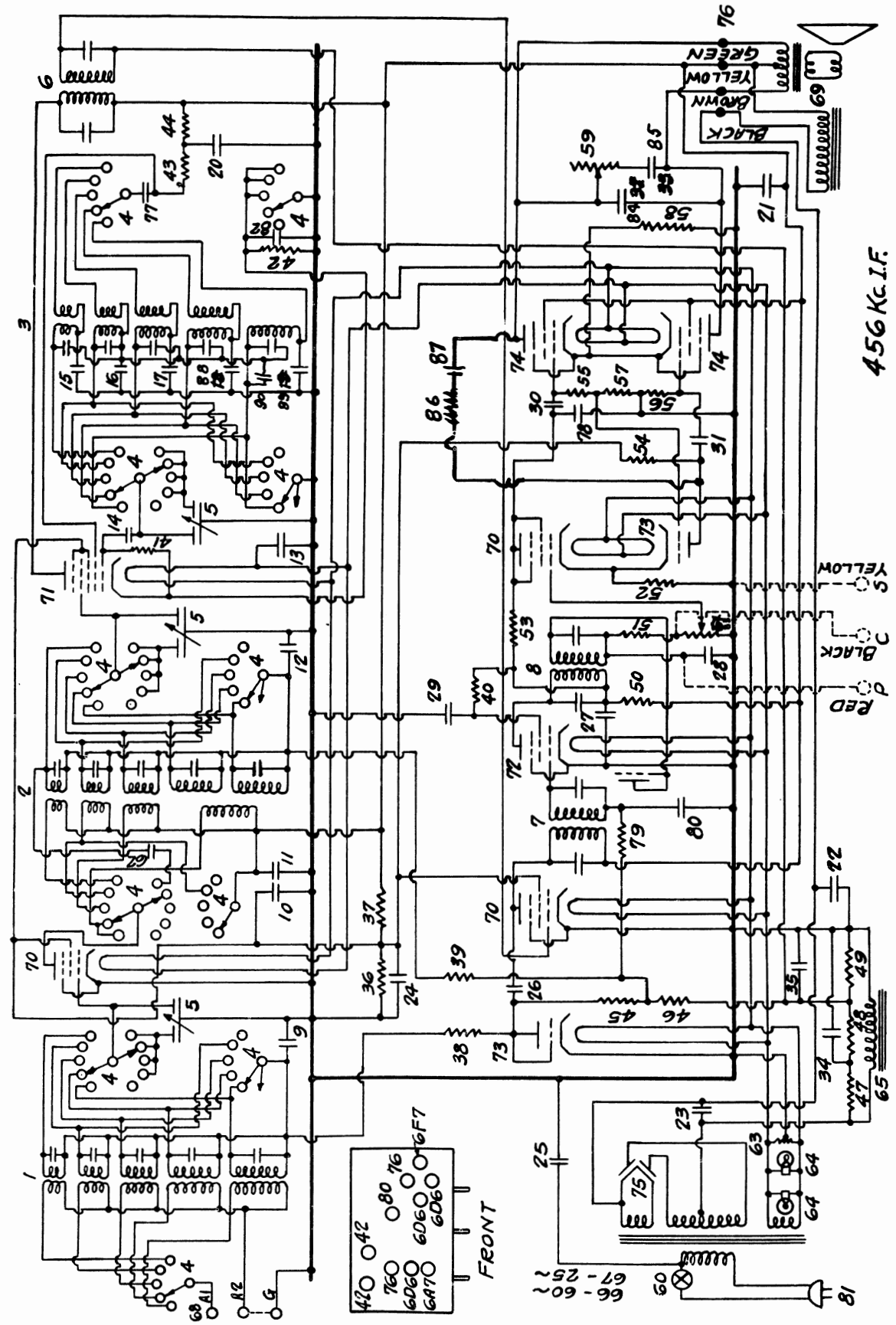
Item	Part No.	Name	Description
1A	W —37922	Bulb	Dial Light
1B	W —37922	Bulb	Dial Light
1C	W —37922	Bulb	Dial Light
1D	W —37922	Bulb	Indicator light
2A	W —37921	Bulb	Auto Expressionator Ballast
2B	W —37921	Bulb	Auto Expressionator Ballast
3	G94 —32000	Coil	Ant. 540-1900 Kc.
4	G95 —32000	Coil	Ant. 1900-6000 Kc.
5	G93 —32000	Coil	Ant. 6-18 Mc.
6	G90 —32004	Coil	1st I. F. Trans. Assm.
7	G92 —32004	Coil	2nd I. F. Trans. Assm.
8	G80 —32002	Coil	Osc. 540-1900 Kc.
9	G81 —32002	Coil	Osc. 1900-6000 Kc.
10	G78 —32002	Coil	Osc. 6-18 Mc.
11	G68 —32001	Coil	R. F. 540-1900 Kc.
12	G69 —32001	Coil	R. F. 1900-6000 Kc.
13	G66 —32001	Coil	R. F. 6-18 Mc.
14Z, 14Y	W —37778	Condenser	12 mfd. 25 Volt.
15A	W —36055	Condenser	35 mfd. 400 Volt
15B	W —36055	Condenser	35 mfd. 400 Volt
16	W —36057	Condenser	40 mfd. 300 Volt
17	G18 —34000	Condenser	.0056 mfd.—mica
18A	G2 —34002	Condenser	.0001 mfd.—mica
18B	G2 —34002	Condenser	.0001 mfd.—mica
18C	G2 —34002	Condenser	.0001 mfd.—mica
19	G1 —34002	Condenser	.00025 mfd.—mica
20A	W —35139	Condenser	.004 mfd. 400 Volt
20B	W —35139	Condenser	.004 mfd. 400 Volt
21	W —34047	Condenser	.006 mfd. 400 Volt
22	W —32378	Condenser	.01 mfd. 400 Volt
23	W —30805	Condenser	.01 mfd. 400 Volt
24A	W —36541	Condenser	.02 mfd. 160 Volt
24B	W —36541	Condenser	.02 mfd. 160 Volt
25A	W —35936	Condenser	.05 mfd. 200 Volt
25B	W —35936	Condenser	.05 mfd. 200 Volt
25C	W —35936	Condenser	.05 mfd. 200 Volt
26	W —32380	Condenser	.05 mfd. 200 Volt
27	W —29015	Condenser	.05 mfd. 400 Volt
28	W —24049B	Condenser	.1 mfd. 200 Volt
29	W —37732	Condenser	.3 mfd. 160 Volt
30Z, 30Y, 31Z, 31Y, 31X, 32AZ, 32AY, 32AX, 32BZ, 32BY, 32BX, 33Z, 33Y, 33X	—37874	Condenser	Series Trimmer
	—33051	Condenser	Series Trimmer
	W —37891	Condenser	Osc. Trimmer 540-1900 Kc.
	W —37891	Condenser	Osc. Trimmer 1900-600 Kc.
		Condenser	Osc. Trimmer 6-18 Mc.
		Condenser	R. F. Trimmer 540-1900 Kc.
		Condenser	R. F. Trimmer 1900-6000 Kc.
		Condenser	R. F. Trimmers 6-18 Mc.
		Condenser	Ant. Trimmer 540-1900 Kc.
	W —37891	Condenser	Ant. Trimmer 1900-6000 Kc.
		Condenser	Ant. Trimmer 6-18 Mc.
	G47 —33002	Condenser	3 Section Var. Tuning
34	B —33006A	Cable	Power Supply
35	G1 —37918	Cable	Speaker
36	—21453	Resistor	40,000 ohm, ¼ W.
37A	—23403	Resistor	150,000 ohm, ¼ W.
37B	—23403	Resistor	150,000 ohm, ¼ W.
38A	—21455	Resistor	300,000 ohm ¼ W.
38B	—21455	Resistor	300,000 ohm ¼ W.
38C	—21455	Resistor	300,000 ohm ¼ W.
39	—33344	Resistor	400,000 ohm, ¼ W.
40A	—23785	Resistor	500,000 ohm, ¼ W.
40B	—23785	Resistor	500,000 ohm, ¼ W.
40C	—23785	Resistor	500,000 ohm, ½ W.
40D	—23785	Resistor	500,000 ohm, ¼ W.
41	—35602	Resistor	1. megohm, ¼ W. Insul.
42	—26577	Resistor	3. megohm, ¼ W.
43A	—40445	Resistor	3.5 ohm, wire wound
43B	—40445	Resistor	3.5 ohm, wire wound
44A	W —28589	Resistor	350 ohm, ½ W. Flex.
44B	W —28589	Resistor	350 ohm, ½ W. Flex.
44C	W —28589	Resistor	350 ohm, ½ W. Flex.
45	—21878	Resistor	10,000 ohm, ¼ W. carbon
46	W —21452	Resistor	1,100 ohm, ½ W. Flex.
47A	W —23013	Resistor	2,000 ohm, 1¼ W. Flex.
47B	W —23013	Resistor	2,000 ohm, 1¼ W. Flex.
48	W —37991	Resistor	1,000 ohm, 1½ W. wire wnd
49Z, 49Y	W —37955	Resistor	4,000 ohm candohm
50	W —37987	Resistor	4,000 ohm
51	G154—36400	Socket	15,000 ohm
52A	G152—36400	Socket	Type 5Z4
52B	G152—36400	Socket	Type 6C5
53A	G151—36400	Socket	Type 6K7
53B	G151—36400	Socket	Type 6K7
54	G160—36400	Socket	Type 6Q7
55	G156—36400	Socket	Type 6L7
56A	G153—36400	Socket	Type 6F6
56B	G153—36400	Socket	Type 6F6
57	G1 —37965	Socket	Auto Express. Assem.
58	633—CJ—4	Speaker	
59Z, 59U	C —37958	Switch	Band Selector
59U	W —37956	Switch	Auto Expressionator
60	G27 —20719	Terminal	Ant. & Ground. Assem.
61	—37966	Tone Control & A. C. Switch	
62Z, 62Y	G1 —37995	Transformer	Audio
63	G43 —25069	Transformer	Power 110 V. 60 cycle
64	—37685	Transformer	Universal
65	G37 —24628	Transformer	Output
66	G36 —24628	Transformer	Auto Expressionator
67	—37907	Volume Control	3 meg. 1st A. F. Grid 1 meg. 2nd A. F. Grid
68Z, 68Y	—None		
69	—35601	Resistor	300,000 ohms, Ins.
70	W —22873	Resistor	220 ohms, 2½ W. Flex.
71	G6 —34002	Condenser	.000025 mfd.—mica
72	G3 —34002	Condenser	.0005 mfd.—mica
73	W —37988	Condenser	.017 mfd. 200 Volt
74	W —38021	Condenser	.02 mfd. 200 Volt
75	W —30488	Condenser	.02 mfd. 400 Volt
76	—22831	Resistor	15,000 ohm, ¼ W.
77A	—22831	Resistor	15,000 ohm, ¼ W.
77B	—35600	Resistor	100,000 ohm, ½ W. Ins.
78A	—35600	Resistor	100,000 ohm, ½ W. Ins.
78B	W —30960	Resistor	2600 ohm 1½ W. Flex.
79	W —32780B	Condenser	.05 mfd. 400 Volt
80	—37946	Dial Assy.	Complete
	—40531	Belt	Drive
	—40537	Coupling	Flex. Drive
	C —40196	Face	Celluloid Dial
	C —37908	Dial Face	Glass Dial
	—40485	Pointer	Long
	—40484	Pointer	Short
	—40486	Screw	Pointer Retaining
	B —37898	Lens	Dial
	B —37897	Spring	Dial Lens Retaining
	C —37894	Escutcheon	
	B —37896	Spring	Escutcheon Retaining
	W —40485	Felt	Escutcheon
	W —37117	Foot	Rubber Mgt.
	—40487	Cable	Indicator Control
	W —37339	Knob	3 Required
	W —40192	Knob	2 Required
	W —37909	Pulley	Band Selector Switch
	G2 —37965	Socket	Dial Light
	G3 —37965	Socket	Indicator Light

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go
6K7	R-F Amplifier	6.4	185	85	3.0	0	3.0	—
6L7	Modulator	6.4	180	85	—	0	3.0	-5 to -30
6C5	Oscillator	6.4	110	—	—	-5 to -30	0	—
6K7	I-F Amplifier	6.4	195	85	3.0	0	3	—
6Q7	Diode and A-F Amplifier	6.4	130	—	—	0	2.0	—
6C5	Output Driver	6.4	195	—	—	0	6.5	—
6F6	(2) Output	6.4	260	265	—	0	16.0	—
5Z4	Rectifier	4.9	350	—	—	—	—	—

VOLTAGE DROP ACROSS SPEAKER FIELD 80 VOLTS. POWER OUTPUT APPROXIMATELY 10 WATTS
POWER CONSUMPTION APPROXIMATELY 125 WATTS.
ALL READINGS TAKEN ON 117.5 VOLT POWER SUPPLY.

CROSLEY RADIO CORP.



Wiring Diagram of Model 1014 "Centurion"

SERVICE DATA -- MODEL 1014 CENTURION

MODEL 1014 "CENTURION"

SPECIFICATIONS

The Crosley Model 1014 is a ten tube superheterodyne all wave receiver designed for A.C. operation. It may be obtained for 110 volts, 60 cycles, or with a universal transformer for other voltages and frequencies. (See Universal Power Transformer). It is designed for five band operation covering the following frequencies:

Band 1. 150-350 Kilocycles.
Band 2. 540-1500 Kilocycles.
Band 3. 1500-4000 Kilocycles.
Band 4. 4000-10000 Kilocycles.
Band 5. 10000-22000 Kilocycles.

Bands 1 and 2 are calibrated on the dial in Myriacycles (10 Kc.). Bands 3, 4 and 5 are calibrated in Megacycles (1000 Kc.). It employs a retroactive automatic volume control together with level control, continuously variable tone control, class "A" audio amplification and band spread dial pointer, 36 to 1 ratio.

TUBES AND VOLTAGE LIMITS

The following are the tubes and voltages measured from the tube contact to chassis with a 500,000 ohm 500-Volt voltmeter with receiver in operating condition but with no signal to the antenna, and with a line voltage of 117.5 volts 60 cycle. Voltage limits are plus or minus 10% of values given.

TUBE VOLTAGES—MODEL 1014 "CENTURION"

Type	Where Used	Ef	Ek		Eg	Esg	Esup.	Ep	Es1	Ep1
			Bands 1-2	Bands 3-4-5						
6D6	R. F. Amp.	6.3	0	0	x	100	0	250	—	—
6A7	Osc. Mod.	6.3	11.0	0	x	100	0	250	—	—
6D6	1st I. F.	6.3	0	0	x	100	0	250	—	—
6F7	2nd I. F. & Det.	6.3	0	0	x	75	—	240	·0	0
76	A. V. C.	6.3	0	0	x	—	—	x	—	—
6D6	1st A. F. Amp.	6.3	4	4	0	40	40	40	—	—
76	Phase Inv.	6.3	4	4	0	—	—	50	—	—
(2) 42	Output	6.3	16	16	0	250	—	245	—	—
80	Rect.	5.0	—	—	—	—	—	—	—	—

VOLTAGE DROP ACROSS FILTER CHOKE 20 VOLTS
VOLTAGE DROP ACROSS FIELD COIL 65 VOLTS

x IN ABOVE TABLE INDICATES HIGH RESISTANCE IN CIRCUIT WHICH PREVENTS ACCURATE MEASUREMENT.

ALL Measurements Made With A 1000 Ohms Per Volt Voltmeter From Chassis

(The power consumption at 117.5 volts is approximately 95 watts.)

CIRCUIT DESCRIPTION

The circuit consists of one stage of R.F. amplification, an oscillator-detector, two stages of I.F. amplification, automatic volume control, second detector, two stages of A.F. amplification and power supply. The R.F. stage employs a Type 6D6 tube. A Type 6A7 tube is used as an oscillator-detector. The first I.F. stage employs a Type 6D6 tube and the second stage uses a Type 6F7 tube which also serves as a second detector. A Type 76 tube is used in the A.V.C. circuit and is actuated by the output of the first I.F. stage. The first A.F. stage uses a Type 6D6 tube, connected as a variable mu triode, which is used in conjunction with a Type 76 tube in a phase inverter circuit to drive a pair of Type 42 tubes in push-pull. A Type 80 Tube is used in the power supply.

UNIVERSAL POWER TRANSFORMER

The Model 1014 chassis for use on other than 110 volts, 60 cycles, is supplied with a universal power transformer designed to operate on 25 cycles and up. When leaving the factory it is wired for the voltage indicated on the name plate. It is possible however by a slight wiring change in power transformer circuit to adapt the set to a different voltage anywhere from 95 to 265 volts. To adapt the set to a different line voltage it is necessary to remove the chassis from the cabinet, remove bottom from chassis and locate the terminal strip on the bottom of the power transformer. Fig. 2. After careful measurement of the maximum and minimum values of line voltage and determining the average value, unsolder the wire of the A.C. line cord and solder it to the terminal which most nearly represents the line voltage at which the set is to be operated.

PHONOGRAPH PICKUP

Chasses equipped with a universal power transformer also have three terminals on the back for connecting a phonograph pickup. These terminals are marked P.C.S. and the pickup is connected through a double pole—single throw switch to these terminals as shown in Fig. 5.

PEAKING PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and will not need readjustment unless some coil or condenser has been replaced. Do not change the setting of any trimmer condenser unless it is definitely known that the adjustment is necessary. If re-alignment is found necessary, the circuits can be properly adjusted only with the use of a modulated test oscillator and output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate of one of the Type 42 tubes and the other terminal to the plate of the other Type 42 tube. Looking at the bottom of the tube with the filament prongs toward you the plate prong will be the first to the left of the filament prongs. Be sure that the meter is protected from D.C. by connecting a condenser. (.1 mfd. or larger—not electrolytic) in series with one of the leads.

PEAKING I. F. STAGES AT 456 Kc.

I. Connect the ground lead of the test oscillator to the chassis frame. Connect a .1 mfd., or larger, condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. The .1 mfd. condenser is necessary to prevent a short circuit which would remove the bias voltage.

II. Set the test oscillator at 456 kilocycles.

III. Turn the volume control of the receiver on full. Turn the station selector until the tuning condenser plates are completely meshed and set the band switch to band No. 5.

IV. (a) Peak both tuning condensers located on top of the first I.F. transformer shown on Fig. 4. NOTE: Be sure to use the lowest oscillator output that will give a reasonable scale deflection on the output meter. 30 to 90 volts output is satisfactory.

(b) Peak both tuning condensers located on top of the 2nd I. F. transformer shown on Fig. 4.

(c) Peak both tuning condensers located on top of the 3rd. I.F. transformer shown on Fig. 4.

V. Repeat IV to insure accurate adjustment of the I.F. tuning condensers.

PEAKING R. F. CIRCUITS

I. Connecting test oscillator to receiver: It is necessary to connect a dummy antenna in series with the test oscillator and the antenna terminal of the receiver. On bands 1 and 2 this consists of a .0002 mfd. *mica* condenser. On bands 3, 4 and 5 it consists of a *carbon* resistor of approximately 400 ohms. With the tuning condenser plates completely meshed make certain that the dial pointer is exactly horizontal. If not, loosen nut and set pointer horizontal and tighten nut again. The setting of the band spread pointer is not important.

II. To Peak Band No. 1. NOTE: Be sure to use the lowest oscillator output that will give a reasonable scale deflection on the output meter. 30 to 90 volts output is satisfactory.

(a) Set test oscillator at 350 Kc. Tune station selector to 350 Kc. (35 on dial). Then adjust oscillator parallel trimmer condenser, Fig. 3, for maximum output.

(b) With same dial settings peak the interstage and antenna parallel trimmer condenser for Band No. 1.

(c) (1) Set test oscillator at 150 Kc.

(2) Tune station selector in the region of 15—Band No. 1—on dial for maximum reading on the output meter.

(3) Close the oscillator series trimmer condenser for Band No. 1, Fig. 3, ⅛ turn and re-tune station selector to 150 Kc. signal for maximum output, noting reading on output meter.

(4) If meter reads higher after operation (3) repeat the operation again and again until no further improvement in the reading of the output meter can be obtained. If meter reads lower after operation (3) open the oscillator series trimmer condenser ⅛ turn and re-tune station selector to 150 Kc. signal, noting reading on output meter as above and repeat as many times as necessary to obtain the highest meter reading. Do not reset the parallel trimmer condensers at this frequency.

(d) Repeat operations (a) and (b) for more accurate adjustments.

III. To Peak Band No. 2.

(a) Set test oscillator at 1400 Kc. Tune station selector to 1400 Kc. (140 on dial). Then adjust oscillator parallel trimmer condenser for Band No. 2 for maximum output.

(b) With same dial settings peak the interstage and antenna parallel trimmer condensers for Band No. 2.

(c) (1) Set test oscillator at 600 Kc.

(2) Tune station selector in the region of 60—Band No. 2—on dial for maximum reading on the output meter.

(3) Close the oscillator series trimmer condenser for Band No. 2, Fig. 3, ⅛ turn and re-tune station selector to 600 Kc. signal for maximum output, noting reading on output meter.

(4) If meter reads higher after operation (3) repeat the operation again and again until no further improvement in the reading of the output meter can be obtained. If meter reads lower after operation (3) open the oscillator series trimmer condenser ⅛ turn and re-tune station selector to 600 Kc. signal, noting reading on output meter as above and repeat as many times as necessary to obtain the highest meter reading. Do not reset the parallel trimmer condensers at this frequency.

(d) Repeat operations (a) and (b) for more accurate adjustments.

IV. To Peak Band No. 3.

(a) Be sure to change dummy antenna as described in I under Peaking R.F. Circuits.

(b) Set test oscillator at 4 megacycles. Tune the station selector to 4 megacycles (4.0—Band No. 3 on dial). Then adjust oscillator parallel trimmer condenser for Band No. 3 for maximum output.

(c) With the same dial settings peak the interstage

and antenna parallel trimmer condensers for Band No. 3.

V. To Peak Band No. 4.

(a) Set test oscillator at 10 megacycles.

(b) Tune station selector to 10 megacycles (10—Band No. 4 on dial).

(c) Open oscillator parallel trimmer condenser for Band No. 4 about 3 turns from closed.

(d) Close the interstage parallel trimmer condenser for Band No. 4 and open 1/8 turn.

(e) Close the antenna parallel trimmer condenser for Band No. 4 and then open 1/2 turn.

(f) Peak the oscillator parallel trimmer condenser on the first signal heard when closing the condenser. As a check on the adjustment set the station selector to approximately 9 on the dial and try to tune in the 10 megacycle signal from the test oscillator. If a signal is heard the oscillator has been aligned on the correct frequency.

(g) Re-tune to 10 megacycles and peak the antenna parallel trimmer condenser for maximum output.

(h) Open the interstage parallel trimmer condenser another 1/8 turn and re-tune the station selector to the 10 megacycle signal.

(i) Repeat operation (h) as many times as necessary to obtain the highest reading on the output meter on first peak obtained when opening trimmer condenser from closed position.

(j) Repeat operation (g) above.

VI. To Peak Band No. 5.

(a) Set test oscillator at 21 megacycles.

(b) Tune station selector to 21 megacycles (21—Band No. 5 on dial).

(c) Open oscillator parallel trimmer condenser for Band No. 5 about 3 turns from closed.

(d) Close the interstage parallel trimmer condenser for Band No. 5 and open 1/8 turn.

(e) Close the antenna parallel trimmer condenser for Band No. 5 and then open 1/2 turn.

(f) Peak the oscillator parallel trimmer condenser on the first signal heard when closing the condenser. As a check on the adjustment set the station selector to approximately 20 on the dial and try to tune in the 21 megacycle signal from the test oscillator. If a signal is heard the oscillator has been aligned on the correct frequency.

(g) Re-tune to 21 megacycles and Peak the antenna parallel trimmer condenser for maximum output.

(h) Open the interstage parallel trimmer condenser another 1/8 turn and re-tune the station selector to the 21 megacycle signal.

(i) Repeat operation (h) as many times as necessary to obtain the highest reading on the output meter on first peak obtained when opening trimmer condenser from closed position.

(j) Repeat operation (g) above.

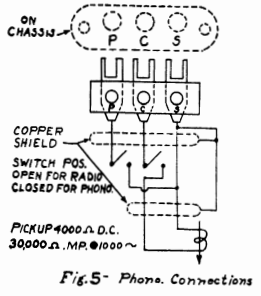


Fig. 5 - Phono. Connections

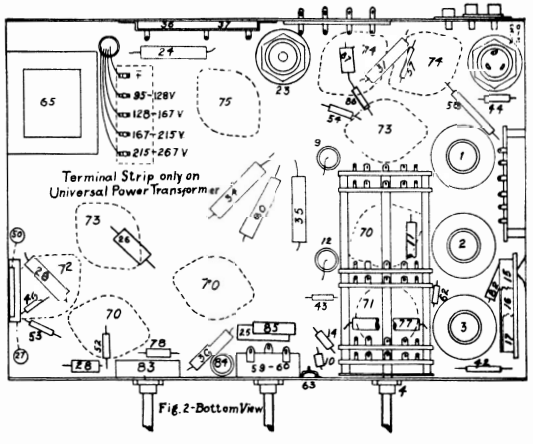


Fig. 2 - Bottom View

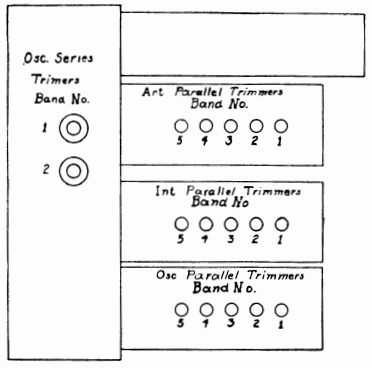


Fig. 3 End View

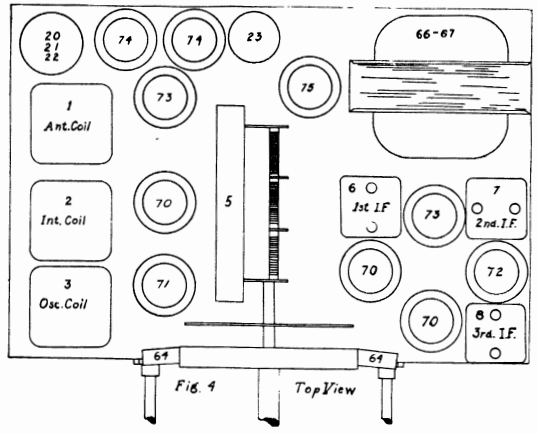


Fig. 4 Top View

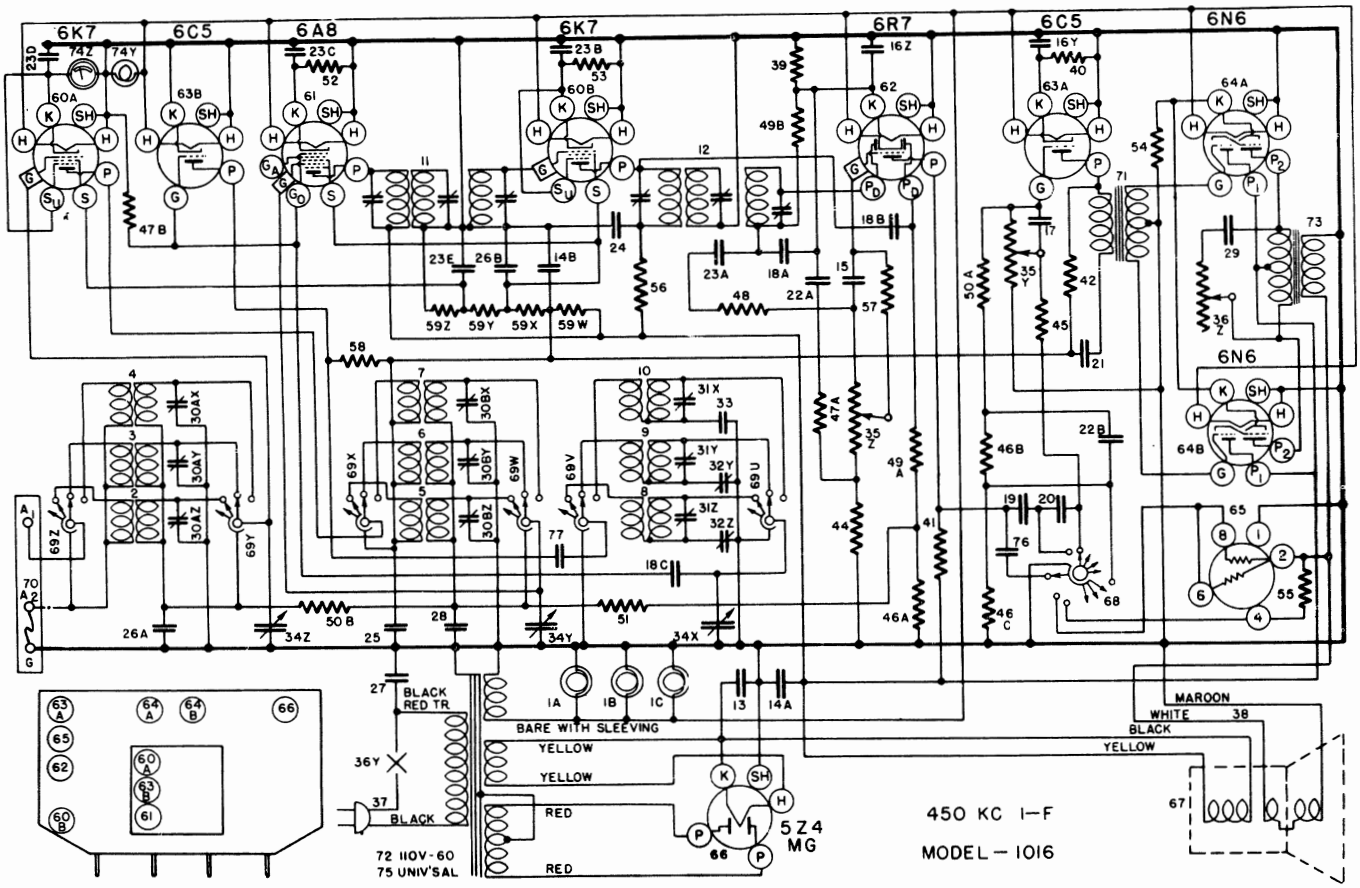
PARTS LIST—MODEL 1014 "CENTURION"

Figures in first column refer to parts shown in diagrams.

Item No.	Part No.	Description
1	G32—32000	Ant. Trans. Assembly
	G6 —34593	Ant. Coil Assembly Only
	G4 —34593	Ant. Coil Shield Assembly Only
	W —34683	Aligning Condenser Assembly Only
2	G20—32001	Inter. Trans. Assembly
	G7 —34593	Inter. Coil Assembly Only
	G5 —34593	Inter Coil Shield Assembly Only
	W —34683	Aligning Condenser Assembly Only
3	G25—32002	Osc. Trans. Assembly
	G8 —34593	Osc. Coil Assembly Only
	G5 —34593	Osc. Coil Shield Assembly Only
	W —34683	Aligning Condenser Assembly Only
	G6 —34002	.000025 Mfd. Condenser
4	B —34646	Band Change Switch
5	G28—32002	Variable Condenser Assembly
	G20—32000	Dial Drive Assembly
	W —34657A	Dial Hand
	W —34655B	Band Spread Pointer.
	G4 —27134	Dial Light Bracket Assembly
	W —32128	Light Diffuser
	W —32244	Diffuser Retainer
6	G27—32004	1st I. F. Trans. Assembly
7	G28—32004	2nd I. F. Trans. Assembly
8	G29—32004	3rd I. F. Trans. Assembly
9	W —32379	0.02 Mfd. 200 V. Condenser
10	W —32378	0.01 Mfd. 400 V. Condenser
11	G8 —34956	3500 MMfd. Condenser
12	W —32380	0.05 Mfd 200 V. Condenser
13	G1 —34002	0.00025 Mfd. Condenser
14	G1 —34002	0.00025 Mfd. Condenser
15	G1 —34000	1047 Mmfd. Condenser
16	G2 —34000	3104 Mmfd. Condenser
17	G10—34000	1050 Mmfd. Condenser
18	See Item 88	
19	See Item 89	
20		6. Mfd. 300 Volt
21	W —34596	8. Mfd. 475 Volt Condenser
22		8. Mfd. 475 Volt
23	W —29194B	12. Mfd. 475 Volt Condenser
24	W —29615	0.05 Mfd. 400 Volt Condenser
25	W —30885	0.01 Mfd. 400 Volt Condenser
26	G1 —34005	0.00025 Mfd. Condenser
27	W —29191A	0.01 Mfd. 400 Volt Condenser
28	G2 —32004	0.0001 Mfd. Condenser
29	W —29191A	0.01 Mfd. 400 Volt Condenser
30	W —29615	0.05 Mfd. 400 Volt Condenser
31	W —29615	0.05 Mfd. 400 Volt Condenser
32	See Item 84	
33	See Item 85	
34	W —29999A	0.25 Mfd. 400 Volt Condenser
35	W —29999A	0.25 Mfd. 400 Volt Condenser
36		15,000 Ohms
37	W —32301	10,000 Ohms Resistor
38	—26577	3 Megohm Resistor
39	—26577	3 Megohm Resistor
40	—23403	150,000 Ohms Resistor
41	—21875	100,000 Ohms Resistor
42	W —27503	1,400 Ohms Flex. Resistor
43	—24814	7,000 Ohms Resistor
44	—24814	7,000 Ohms Resistor
45	—21455	300,000 Ohms Resistor
46	—21455	300,000 Ohms Resistor
47	—23455	300,000 Ohms Resistor
48	—23403	150,000 Ohms Resistor
49	—21237A	60,000 Ohms Resistor
50	W —30127	450 Ohms Flex. Resistor
51	—21455	300,000 Ohms Resistor
52	—31093	2,700 Ohms Resistor
53	—23403	150,000 Ohms Resistor
54	—23403	150,000 Ohms Resistor
55	—23785	500,000 Ohms Resistor
56	—23785	500,000 Ohms Resistor
57	—21237A	60,000 Ohms Resistor
58	W —22873	220 Ohms Flex. Resistor
59	W —25594B	Tone Control
60		On-Off Switch
61	See Item 83	
62	G1 —34005	0.00025 Mfd. Condenser
63	W —32337	10-10 Ohms Resistor
64	See Item 5	Dial Light
65	G1 —24028	Filter Choke
66	G40—25969	Power Trans. 60 Cy 110 Volt
67	B —25007	25 Cy. Power Trans.
68	G16—26719	Ant. Gnd. Terminal
69	—48CL	Speaker (Console)
	—48CL	Speaker (Table)
70	G75—28807	Socket 6D6
	B—26009D	Tube Shield
	W —27081A	Tube Shield Base
71	G2 —33007	Socket 6A7
	W —33072	Socket Cushion
	W —28023A	Tube Shield
	G1 —33072	Tube Shield Base
72	G49—28807	Socket 6F7
	W —28023A	Tube Shield
	W —27081A	Tube Shield Base
73	G80—28806	Socket 76
	W —28023B	Tube Shield
	W —27081A	Tube Shield Base
74	G25—28807	Socket 42
75	G6 —28807	Socket 80
76	G5 —31128	Speaker Terminal Board
	W —34628	Terminal Board Cover
	W —34627	Terminal Board Insulator
77	W —34644	0.0006 Mfd 400 Volt Condenser
78	G1 —34007	0.00025 Mfd. Condenser
79	—26577	3 Megohm Resistor
80	W —28021	0.02 Mfd. 200 Volt Condenser
81	B —33086A	Cord and Plug
82	W —32378	.02 Mfd. 200 Volt Condenser
83	W —28532	Level Control .1 Megohm
84	W —35128	0.004 Mfd 400 Volt Condenser
85	W —29613	0.05 Mfd. 400 Volt Condenser
86	—35140	250,000 Ohm Resistor
87	G6 —34005	0.0002 Mfd 200 Volt Condenser
88	G20—32006	Osc. Trimmer Condenser
89	G20—32006	Osc. Trimmer Condenser
90	G6 —34002	0.00025 Mfd. Condenser
	W —34628B	Switch Knob
	W —31584B	Volume Control Knob
	W —31584B	Tone Control Knob
	W —33094A	Station Selector Knob
	W —33095A	Vernier Knob
	B —33708B	Escutcheon
	W —34307	Escutcheon Lens
	W —32085	Escutcheon Gasket
	W —34680	Band Change Plate
	W —34681	Volume Control Plate

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 1016



PARTS LIST—MODEL 1016

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description	Item No.	Part No.	Description
1ABC	W —37922	Dial Light	37	B —33906A	Power Cord & Plug
	G3 —37965	Dial Light Socket	38	G3 —37918	Speaker Cable
2	G94 —32000	Ant. Coil, B. C. B.	39	—31093	Resistor, 2,700 Ohm ½ W.
3	G95 —32000	Ant. Coil, Pol. B.	40	W —21452	Resistor, 1,100 Ohm ½ W. Flex.
4	G113—32000	Ant. Coil, H. F. B.	41	—37768	Resistor, 65,000 Ohm ½ W.
5	G68 —32001	R. F. Coil, B. C. B.	42	— 5370A	Resistor, 20,000 Ohm 1 W.
6	G80 —32001	R. F. Coil, Pol. B.	43	None	
7	G79 —32001	R. F. Coil, H. F. B.	44	—21454	Resistor, 1 Megohm ¼ W.
8	G101—32002	Osc. Coil, B. C. B.	45	—21455	Resistor, 300,000 Ohm ¼ W.
9	G102—32002	Osc. Coil, Pol. B.	46A	—23785	Resistor, 500,000 Ohm ¼ W.
10	G103—32002	Osc. Coil, H. F. B.	46B	—23785	Resistor, 500,000 Ohm ¼ W.
11	G90 —32004	1st I. F. Assembly	46C	—23785	Resistor, 500,000 Ohm ¼ W.
12	G91 —32004	2nd I. F. Assembly	47A	—21453	Resistor, 40,000 Ohm ¼ W.
13	W —36055	Condenser 35 Mfd. 400 V. Electrolytic	47B	—21453	Resistor, 40,000 Ohm ¼ W.
14A	W —36057	Condenser 40 Mfd. 300 V. Electrolytic	48	—23403	Resistor, 150,000 Ohm ¼ W.
14B	W —36057	Condenser 40 Mfd. 300 V. Electrolytic	49A	—33344	Resistor, 400,000 Ohm ¼ W.
15	G8 —34002	Condenser, .00001 Mfd. (Molded)	49B	—33344	Resistor, 400,000 Ohm ¼ W.
16Z	W —37778	Condenser, 12. Mfd. 25 V. Electrolytic	50A	—35600	Resistor, 100,000 Ohm ½ W.
16Y		Condenser, 12. Mfd. 25 V. Electrolytic	50B	—35600	Resistor, 100,000 Ohm ½ W.
17	G6 —34002	Condenser, .000025 Mfd. (Molded)	51	—37245	Resistor, 1.5 Megohm ¼ W.
18A	G2 —34002	Condenser, .0001 Mfd. (Molded)	52	W —28589	Resistor, 350 Ohm ½ W. Flex.
18B	G2 —34002	Condenser, .0001 Mfd. (Molded)	53	W —28106	Resistor, 500 Ohm ½ W. Flex.
18C	G2 —34002	Condenser, .0001 Mfd. (Molded)	54	W —23012A	Resistor, 40 Ohm ¾ W. Flex.
19	—32780B	Condenser, 05 Mfd. 400 V.	55	W —41193	Resistor, 1. Ohm 2½ W. Flex.
20	G3 —34002	Condenser, .0005 Mfd. (Molded)	56	W —23013	Resistor, 2,000 Ohm 1 ¼ W. Flex.
21	W —37732	Condenser, 3 Mfd. 160 V.	57	—21273A	Resistor, 60,000 Ohm ¼ W.
22A	W —31219	Condenser, .023 Mfd. 200 V.	58	W —37987	Resistor, 15,000 Ohm I. W. Wire Wound
22B	W —31219	Condenser, .023 Mfd. 200 V.	59	W —41225	4 Section Candohm
23A to 23E	W —36541	Condenser, .02 Mfd. 160 V.	60A	G151—36400	Socket Type 6K7
			60B	G156—36400	Socket Type 6A8
			61	G164—36400	Socket Type 6R7
24	W —30188	Condenser, .02 Mfd. 400 V.	62	G164—36400	Socket Type 6C7
25	W —32378	Condenser, .01 Mfd. 400 V.	63A	G152—36400	Socket Type 6C5
26A	W —35936	Condenser, .05 Mfd. 200 V.	63B	G152—36400	Socket Type 6C5
26B	W —35936	Condenser, .05 Mfd. 200 V.	64A	G165—36400	Socket Type 6N6
27	W —30806	Condenser, .01 Mfd. 400 V.	64B	G165—36400	Socket Type 6N6
28	W —32380	Condenser, .05 Mfd. 200 V.	65	G167—36400	Socket For W41187
29	W —25615	Condenser, .05 Mfd. 400 V.	66	G154—36400	Socket Type 5Z4
30	W —37891	3 Section Shunt Trimmer Assembly	67	733CJ4	Speaker
31	W —35951	3 Section Shunt Trimmer Assembly	68	—41446	Switch Multivox Control
32Z	W —37874	B. C. Osc. Series Trimmer Cond.	69	C —37958E	Switch Band Selector
32Y		Pol. Osc. Series Trimmer Cond.	70	G27 —26719	Ant. & Grd. Terminal Board Assembly
33	G18 —34000	H. F. Fixed Series Condenser	71	G1 —37995	Audio Input Transformer
34	G47 —33002	3 Section Var. Tuning Cond.	72	G43 —25669	Power Supply Transformer (110V. 60Cy.)
	MG54—41022	Dial Drive Assembly Complete	73	G48 —24628	Audio Output Transformer
	—41154	Drive Unit (only)	74Z	W —41259	Tuning Meter
	C —41149	Dial Glass	74Y		Tuning Meter Bulb
	—41137	Dial Mask	75	—37685A	Universal Power Transformer
	W —40804	Dial Glass Cushion	76	W —41445	Condenser. .036 Mfd. 400 V.
	—41144	Long Hand	77	W —34647	Condenser. .006 Mfd. 400 V.
	—41146	Short Hand		C —41219	Escutcheon
	W —40486	Hand Mtg. Screw		B —41233	Escutcheon Retaining Spring
	—40537	Coupling Unit		B —41232	Dial Lens
	—41157	Belt (Drive)		B —41234	Lens Retaining Spring
	—40638	Indicator Cable		W —40365	Escutcheon Felt
35Z	—41417	Volume Control 1st A. F. 3 Meg.		W —37339	Knob (3 required)
35Y		Volume Control 2nd A. F. 1 Meg.		W —40192B	Knob (2 required)
36Z	—37966	Tone Control			
36Y		A. C. Switch			

TUBE SOCKET VOLTAGE READINGS

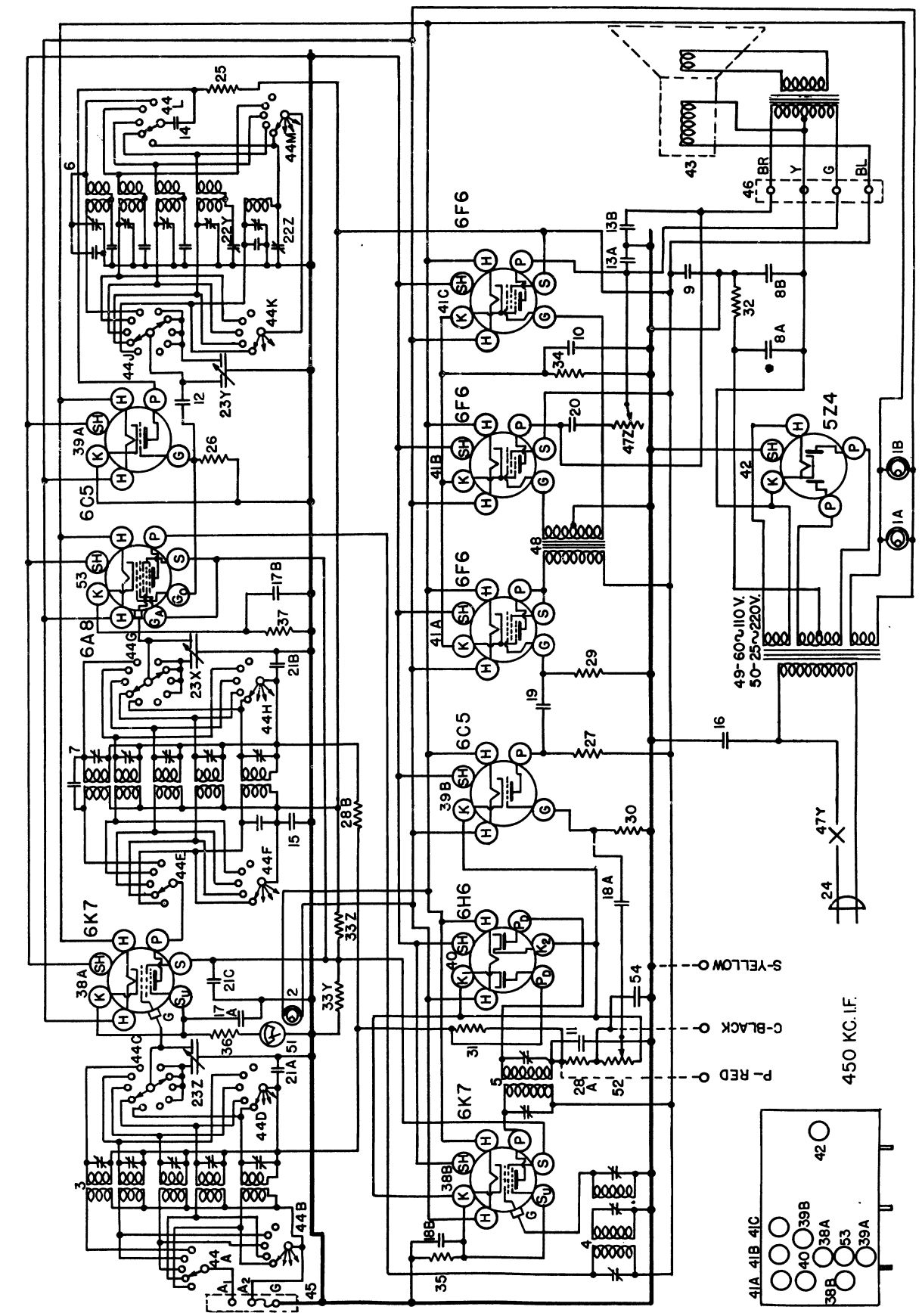
Tube	Function	H	P_1	P_2	S	Su	G	K	Ga
6K7	R-F Amplifier	6.3	221	—	98	4	0	4	—
6A8	Modulator	6.3	221	—	138	—	0	4.5	4.5
6C5	Oscillator	6.3	140	—	—	—	—	0	—
6K7	I-F Amplifier	6.3	260	—	138	5	0	5	—
6R7	Detector & 1st A-F Amplifier	6.3	130	—	—	—	0	6.5	—
6C5	2nd A-F Amplifier	6.3	150	—	—	—	0	6.5	—
6N6	(2) Output	6.3	278	285	—	—	0	3.2	—
5Z4	Rectifier	4.5	357	—	—	—	—	—	—

Phantom Conductor Tube (W41187) Varies with power output.

Voltage drop across speaker field 72 volts.
Power Output approximately 9 Watts.
Power Consumption approximately 117 Watts.
All readings taken on 117.5 volt power supply.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 1055



MODEL 1055

PARTS LIST—MODEL 1055

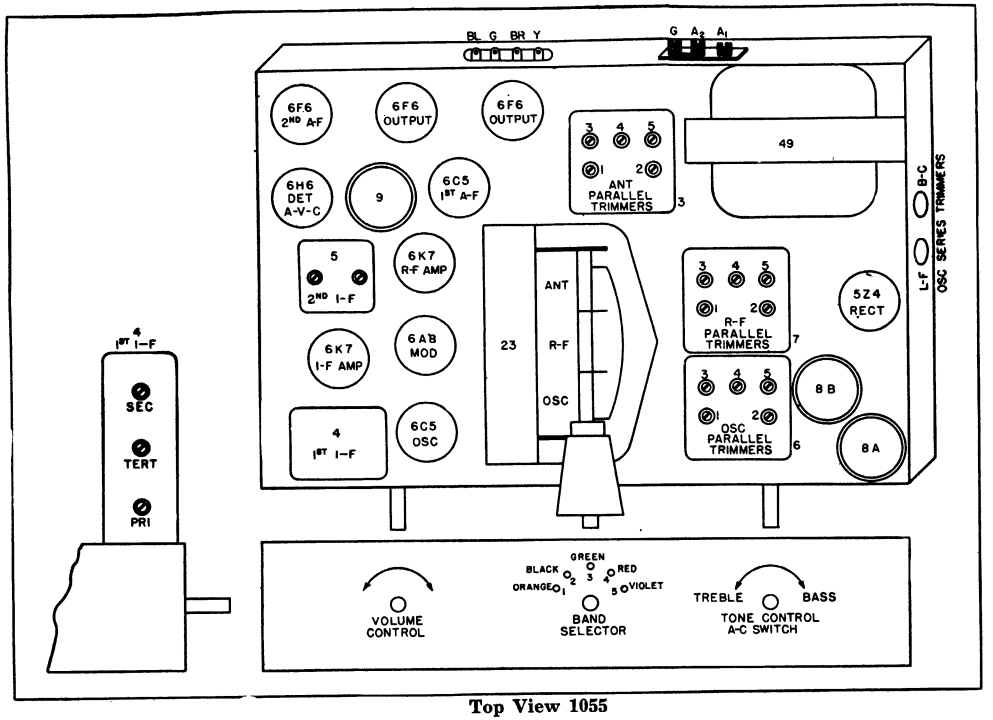
Figures in first column refer to parts shown in diagrams

Item No.	Part No.	Description
1A	36504	Dial Light Socket Assm.
1B	36504	Dial Light Socket Assm.
2	W —36557	Tuning Meter Bulb.
3	G63 —32000	Ant. Coil Assm. Complete
	G64 —32000	Ant. Coil only 150-400 Kc. (W. B.)
	G68 —32000	Ant. Coil only 540-1500 Kc. (B. B.)
	G65 —32000	Ant. Coil only 1500-4000 Kc. (P.B.)
	G67 —32000	Ant. Coil only 4-10 Mc. (S. W. B.)
	G66 —32000	Ant. Coil only 10-22 Mc. (S. W. B.)
	MG26—36542	Coil Support Base.
	W —36028	5 Section Trimmer Cond. Assm.
	MG9 —36168	Shield.
4	G66 —32004	1st I. F. Trans. Assm.
5	G67 —32004	2nd I. F. Trans. Assm.
6	G54 —32002	Osc. Coil Assm. Complete
	G55 —32002	Osc. Coil only 150-400 Kc.
	G56 —32002	Osc. Coil only 540-1500 Kc.
	G57 —32002	Osc. Coil only 1500-4000 Kc.
	G59 —32002	Osc. Coil only 4-10 Mc.
	G58 —32002	Osc. Coil only 10-22 Mc.
	MG26—36542	Coil Support Base.
	W —36028	5 Section Trimmer Cond. Assm.
	G7 —34007	Condenser 1750 mmf.
	G8 —34007	Condenser 4350 mmf. (2)
	G6 —34002	Condenser 25 mmf. (2)
	MG9 —36168	Shield.
7	G39 —32001	R. F. Coil Assm. Complete
	G40 —32001	R. F. Coil only 150-400 Kc.
	G44 —32001	R. F. Coil only 540-1500 Kc.
	G41 —32001	R. F. Coil only 1500-4000 Kc.
	G43 —32001	R. F. Coil only 4-10 Mc.
	G42 —32001	R. F. Coil only 10-22 Mc.
	MG27—36542	Coil Support Base.
	W —36028	5 Section Trimmer Cond. Assm.
	MG9 —36168	Shield.
8A	W —36055	Condenser 35 mfd. 400 Volts.
8B	W —36055	Condenser 35 mfd. 400 V.
9	W —36057	Condenser 40 mfd. 300 V.
10	W —36548	Condenser 25 mfd. 25 V.
11	G2 —34002	Condenser 0.0001 mfd. 200 V.
12	G1 —34002	Condenser 0.00025 mfd. 200 V.
13A	W —35758	Condenser 0.008 mfd. 400 V.
13B	W —35758	Condenser 0.008 mfd. 400 V.
14	W —35647	Condenser 0.006 mfd. 400 V.
15	W —32378	Condenser 0.01 mfd. 400 V.
16	W —30805	Condenser 0.01 mfd. 400 V.
17A	W —36541	Condenser 0.02 mfd. 160 V.
17B	W —36541	Condenser 0.02 mfd. 160 V.
18A	W —28621	Condenser 0.02 mfd. 200 V.
18B	W —28621	Condenser 0.02 mfd. 200 V.
19	W —32780	Condenser 0.05 mfd. 400 V.
20	W —23615	Condenser 0.05 mfd. 400 V.
21A	W —35936	Condenser 0.05 mfd. 200 V.
21B	W —35936	Condenser 0.05 mfd. 200 V.
21C	W —35936	Condenser 0.05 mfd. 200 V.
22Z, 22Y	G27 —33006	Condenser-trimmer.
23 Z, 23Y, 23X	G37 —33002	Var. Tuning Condenser Gang.
	—37376	Dial Drive Assembly.
	—37375A	Dial Face only.
	—37551	Dial Hand.
	—37554	Second Hand.
	—37484	Dial Hand Screw.
	—37543	Dial Hand Washer.
24	B —33906A	A. C. Cord & Plug.
25	W —36545	Resistor 30,000 Ohm.
26	—22196	Resistor 20,000 Ohm.
27	—23403	Resistor 150,000 Ohm.
28A	—21455	Resistor 300,000 Ohm.
28B	—21455	Resistor 300,000 Ohm.
29	—23785	Resistor 500,000 Ohm.
30	—35927	Resistor 2 Megohm.
31	—36688	Resistor 3 Megohm.
32	W —36549	Resistor 200 Ohm 6 Watt.
33Z, 33Y	W —32301	Resistor 10,000 Ohm. 15,000 Ohm.
34	W —22873	Resistor 220 Ohm (Flex.)
35	W —25937	Resistor 275 Ohm (Flex.)
36	W —21964	Resistor 165 Ohm (Flex.)
37	W —22514	Resistor 750 Ohm (Flex.)
38A	G151—36400	Socket, 6K7.
38B	G151—36400	Socket, 6K7.
39A	G152—36400	Socket, 6C5.
39B	G152—36400	Socket, 6C5.
40	G155—36400	Socket, 6H6.
41A	G153—36400	Socket, 6F6.
41B	G153—36400	Socket, 6F6.
41C	G153—36400	Socket, 6F6.
42	G154—36400	Socket, 5Z4.
43	427CL—22	Speaker, Table Model.
	627CL—27	Speaker, Console.
44	—36547A	Band Change Switch.
45	G27 —26719	Ant.-Grnd. Terminal.
46	G5 —31128	Speaker Terminal.
	W —34627	Terminal Board Insulator.
	W —34628	Terminal Board Cover.
47Z, 47Y	—32063	Tone Control. On-Off Switch.
48	G22 —24628	A. F. Transformer.
49	G42 —25669	Power Transformer 60 Cy. 110 V.
50	B —35007B	Universal Power Transformer.
51	W —36500	Tuning Meter.
	W —36501	Tuning Meter Bracket.
52	—32062	Volume Control.
53	G156—36400	Socket, 6A8.
54	G6 —34002	Condenser 0.0U0025 mfd.
	B —36515	Escutcheon.
	W —36564	Escutcheon indicator
	W —36311	Band Change Escutcheon.
	W —36519	Knob, Tuning.
	W —36520A	Knob, Vernier.
	W —36518	Knob (Tail) Band Change.
	W —36521	Knob (2)

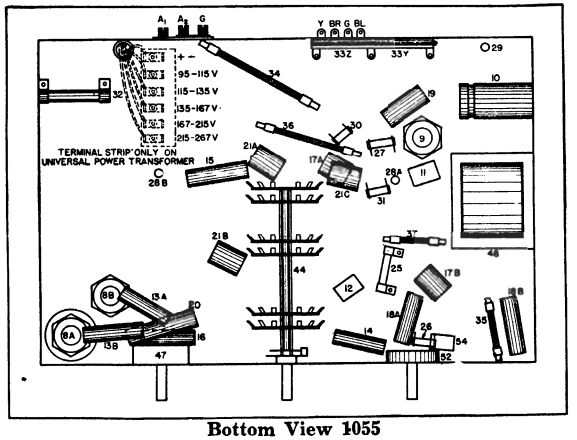
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go	Ga
6K7	R-F Amplifier	6.2	250	103	6	0	6	—	—
6A8	Modulator	6.2	250	103	—	0	6	−1 to −30	107
6C5	Oscillator	6.2	75	—	—	—	0	—	—
6K7	I-F Amp.	6.2	250	103	3	0	3	—	—
6H6	Detector & AVC	6.2	—	—	—	—	0	—	—
6C5	1st. A-F Amp.	6.2	70	—	—	0	3	—	—
6F6	2nd. A-F Amp.	6.2	218	218	—	0	18	—	—
6F6	Output	6.2	355	245	—	0	18	—	—
6F6	Output	6.2	355	245	—	0	18	—	—
5Z4	Rectifier	4.9	365	—	—	—	—	—	—

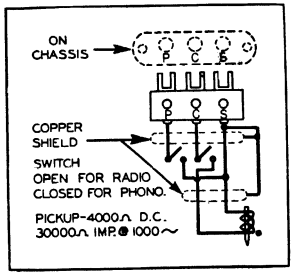
Measured on 117.5 Volt—60 Cycle Line. Power Consumption Approximately 123 Watts.



Top View 1055



Bottom View 1055

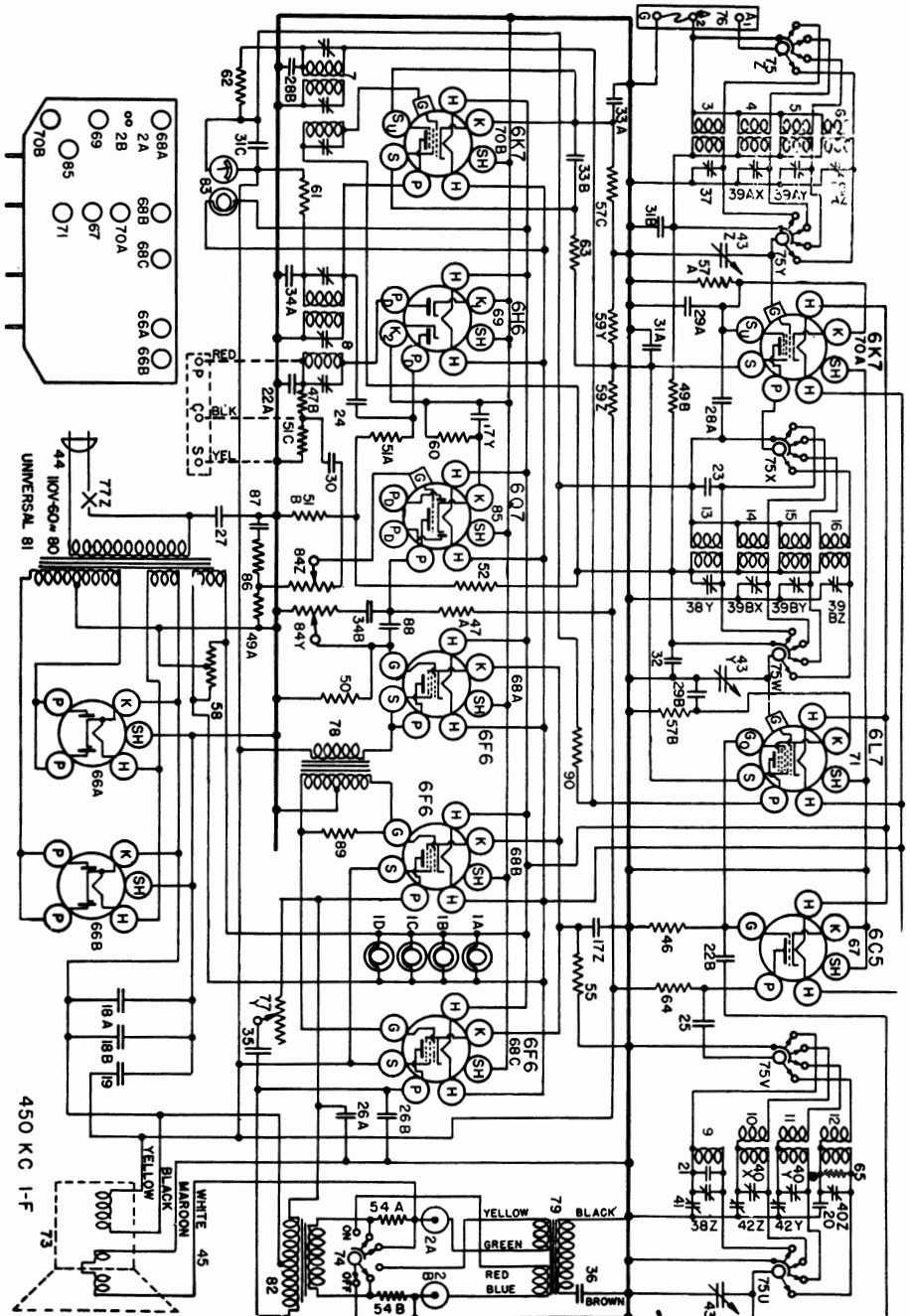


Phono Connections

CROSLEY RADIO CORP.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 1155



PARTS LIST—MODEL 1155

Figures in first column refer to parts in Diagrams.

Item No.		Part No.	Name	Description
1A	W	—37922	Bulb	Dial Light
B	W	—37922		Dial Light
C	W	—37922		Dial Light
D	W	—37922		IndicatorLight
2A	W	—40445	Bulb	Auto-Expressionator Ballast
B	W	—40445	Bulb	Auto-Expressionator Ballast
	G2	—37965	Socket	Auto-Expressionator Ballast
3	G64	—32000	Coil	Ant. 150-400 Kc.
4	G94	—32000	Coil	Ant. 540-1900 Kc.
5	G95	—32000	Coil	Ant. 1900-6000 Kc.
6	G93	—32000	Coil	Ant. 6-18 Mc.
7	G66	—32004	Coil	1st I. F. Assem.
8	G91	—32004	Coil	2nd I. F. Assem.
9	G79	—32002	Coil	Osc. 150-400 Kc.
10	G80	—32002	Coil	Osc. 540-1900 Kc.
11	G81	—32002	Coil	Osc. 1900-6000 Kc.
12	G78	—32002	Coil	Osc. 6-18 Mc.
13	G67	—32001	Coil	R. F. 150-400 Kc.
14	G68	—32001	Coil	R. F. 540-1900 Kc.
15	G69	—32001	Coil	R. F. 1900-6000 Kc.
16	G66	—32001	Coil	R. F. 6-18 Mc.
17Z	W	—37632	Condenser	25 Mfd., 25 Volt
17Y			Condenser	12 Mfd., 25 Volt
18A	W	—36055	Condenser	35 Mfd., 400 Volt
18B			Condenser	35 Mfd., 400 Volt
19	W	—36057	Condenser	40 Mfd., 300 Volt
20	G18	—34000	Condenser	.0056 Mfd., 300 Volt
21	G6	—34002	Condenser	.000025 Mfd., 200 Volt
22A	G2	—34002	Condenser	.0001 Mfd., 200 Volt
22B	G2	—34002	Condenser	.0001 Mfd., 200 Volt
23	G1	—34002	Condenser	.00025 Mfd., 200 Volt
24	G1	—34005	Condenser	.00025 Mfd., 300 volt
25	W	—34647	Condenser	.006 Mfd., 400 Volt
26A	W	—35139	Condenser	.004 Mfd., 400 Volt
26B	W	—35139	Condenser	.004 Mfd., 400 Volt
27	W	—30805	Condenser	.01 Mfd., 400 Volt
28A	W	—32378	Condenser	.01 Mfd., 400 Volt
28B	W	—32378	Condenser	.01 Mfd., 400 Volt
29A	W	—36541	Condenser	.02 Mfd., 160 Volt
29B	W	—36541	Condenser	.02 Mfd., 160 Volt
30	W	—28621	Condenser	.02 Mfd., 200 Volt
31A	W	—35936	Condenser	.05 Mfd., 200 Volt
31B	W	—35936	Condenser	.05 Mfd., 200 Volt
31C	W	—35936	Condenser	.05 Mfd., 200 Volt
32	W	—32380	Condenser	.05 Mfd., 200 Volt
33A	W	—27216	Condenser	.05 Mfd., 200 Volt
33B	W	—27216	Condenser	.05 Mfd., 200 Volt
34A	W	—32780	Condenser	.05 Mfd., 400 Volt
34B	W	—32780	Condenser	.05 Mfd., 400 Volt
35	W	—23615	Condenser	.05 Mfd., 400 Volt
36	W	—37732	Condenser	.3 Mfd., 160 Volt
37	W	—37954	Condenser	Single Ant. Trimmer
38Z	W	—37986	Condenser	Double Section Osc. Trimmer
38Y				R. F. Trimmer
39AZ	W	—37891	Condenser	Ant. Triple Sec. H. F. Trimmer
39AY				Pol. Trimmer
39AX				B. C. Trimmer
39BZ				H. F. Trimmer
39BY	W	—37891	Condenser	R. F. Triple Sec. Pol. Trimmer
39BX				B. C. Trimmer
40Z				H. F. Trimmer
40Y	W	—35951	Condenser	Triple Sec. Osc. Pol. Trimmer
40X				B. C. Trimmer
41		—37917	Condenser	I. F. Osc., Series Trimmer
42Z		—37874	Condenser	B. C. Osc. Series Trimmer
42Y				Pol. Osc. Series Trimmer
43Z				
43Y		G47—33002	Condenser	3 Section Var. Tuning
43X				
44		B —33906-A	Cable	Power Supply
45		G1 —37918	Cable	Speaker
46		—21453	Resistor	40,000 Ohms, ½ W.
47A		—35600	Resistor	100,000 Ohms, ¼ W. Insul.
47B		—35600	Resistor	100,000 Ohms, ¼ W. Insul.
48		—None		
49A		—35601	Resistor	300,000 Ohms, ¼ W. Insul.
49B		—35601	Resistor	300,000 Ohms, ½ W. Insul.
49C		—35601	Resistor	300,000 Ohms, ½ W. Insul.
50		—33334	Resistor	400,000 Ohms, ½ W. Carbon
51A		—36322	Resistor	500,000 Ohms, ½ W. Carbon
51B		—36322	Resistor	500,000 Ohms, ½ W. Carbon
51C		—36322	Resistor	500,000 Ohms, ½ W. Carbon
52		—21454	Resistor	1. Megohm, ½ W. Carbon
54A	W	—37933	Resistor	1.0 Ohms, 1 Watt
54B	W	—37933	Resistor	1.0 Ohms, 1 Watt
55	W	—22873	Resistor	220 Ohms, 2½ W. Flex.
56		None		
57A	W	—28589	Resistor	350 Ohms, ½ W. Flex.
57B	W	—28589	Resistor	350 Ohms, ½ W. Flex.
57C	W	—28589	Resistor	350 Ohms, ½ W. Flex.
58	W	—32337	Resistor	20 Ohm , Wire Wound
59Z	W	—37955	Resistor	4000 Ohms, Wire Wound
59Y			Resistor	4000 Ohms, Wire Wound
60	W	—30960	Resistor	2600 Ohms, 1½W. Flex.
61	W	—27503	Resistor	1400 Ohms, ¾ W.
62	W	—22180	Resistor	1650 Ohms, 1¼ W.
63	W	—23013	Resistor	2000 Ohms, 1¼ W.
64	W	—37987	Resistor	15000 Ohms, 1 W.
65		—21876	Resistor	10,000 Ohms, ¾ W.
66A	G54	—36400	Socket	Type 5Z4
66B			Socket	Type 5Z4
67	G152	—36400	Socket	Type 6C5
68A			Socket	Type 6F6
68B	G153	—36400	Socket	Type 6F6
68C			Socket	Type 6F6
69	G155	—36400	Socket	Type 6H6
70A			Socket	Type 6K7
70B	G151	—36400	Socket	Type 6K7
71	G159	—36400	Socket	Type 6L7
72		—None		
73		—634CJ4	Speaker	
74	W	—37956	Switch	Auto-Expressionator
75Z				
75Y	C	—37957-A	Switch	Band Selector
75X				
76	G27	—26719	Ter. Board	Ant. and Ground
77Y			Tone Con.	
77Z		—37966	On-off Switch	
78	G34	—24628	Transformer	Audio
79	G36	—24628	Transformer	Base Compensator
80	G1	—37900	Transformer	60 Cycle, 110 V. Power
81	G2	—37900	Transformer	Universal Power
82	G35	—24628	Transformer	Push-pull Output
83	W	—37962	Tuning Ind	Shadow-graph
84Z		—37907	Volume Control	1st A. F. Grid
84Y				Driver Grid
85	G160	—36400	Socket	Type 6Q7
86		—27086	Resistor	6400 Ohms
87	W	—37988	Condenser	.017 Mfd., 200 Volt
88	W	—30270	Condenser	.001 Mfd., 400 Volt
89		—27121	Resistor	5,000 Ohms, ¼ Watt
90		—34018	Resistor	200,000 Ohms ¼ Watt
		—37945	Dial Assem	Complete
		—40531	Belt	Drive
		—40537	Coupling	Flex. Drive
	C	—40195	Face	Celluloid Dial
	C	—37968	Face	Glass Dial
		—40485	Pointer	Long
		—40484	Pointer	Short
		—40486	Screw	Pointer Retaining
	B	—37898	Lens	Glass
	B	—37897	Ring	Lens Retaining
	C	—37894	Escutcheon	
	B	—37896	Spring	Escutcheon Retaining
	W	—37117	Foot	Rubber Mtg.
	W	—22334	Cable	Indicator Control
	W	—37339	Knob	3 required
	W	—40192	Knob	2 required
	W	—37909	Pulley	Band Selector Switch
	G2	—37965	Socket	Dial Light Assem.
	G3	—37965	Socket	Indicator Light

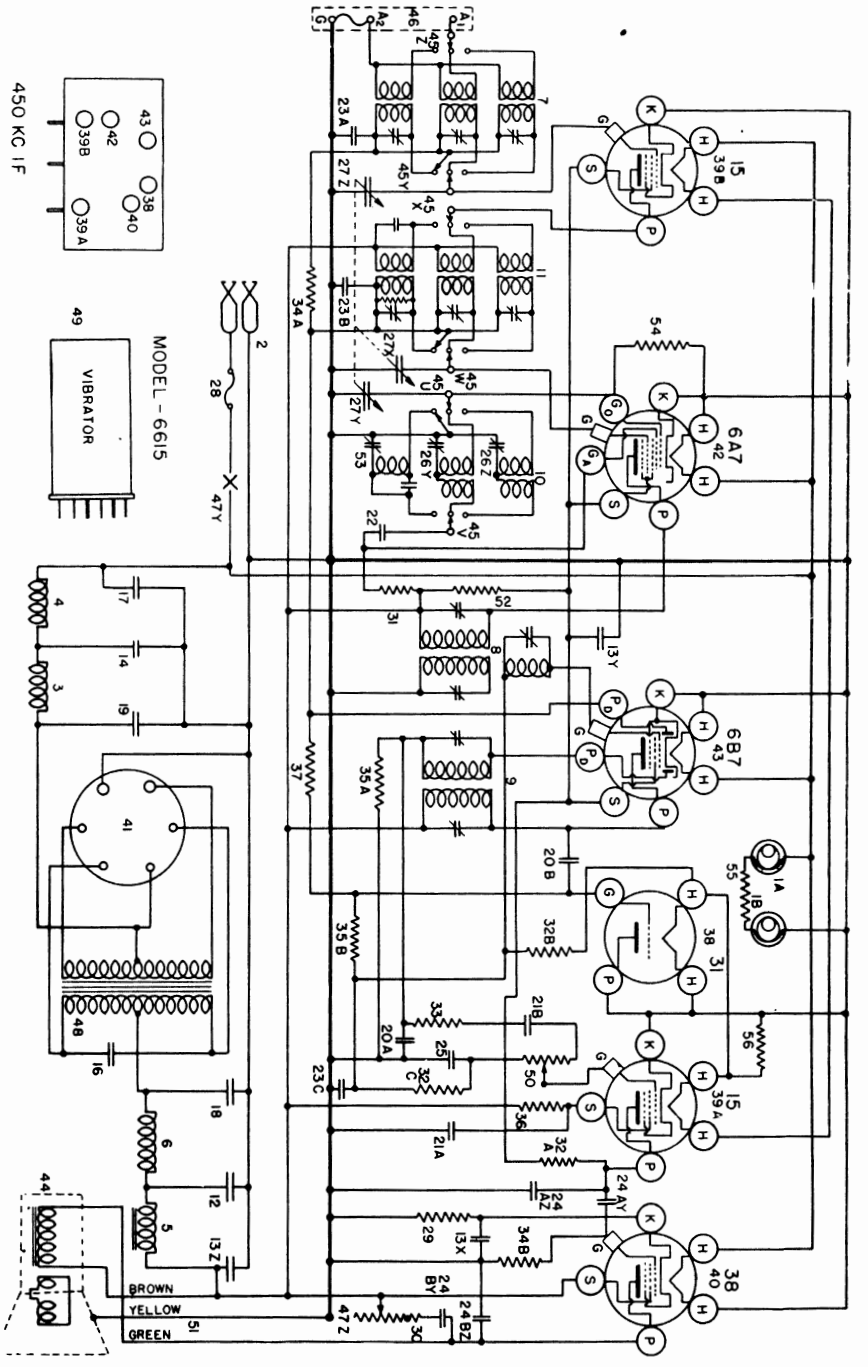
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	G	K	Go
6K7	R. F. Amplifier	6.3	238	100	3	0	3	—
6L7	Modulator	6.3	230	100	—	0	3.5	—5 to —30
6C5	Oscillator	6.3	140	—	—	—5 to —30	—	—
6K7	I-F Amplifier	6.3	230	95	3	0	3	—
6H6	Diode Detector	6.3	—	—	—	—	—	—
6Q7	A. F. Amplifier	6.3	155	—	—	0	2	—
6F6	Output Driver	6.3	210	210	—	0	17	—
6F6	(2) Output	6.3	360	235	—	0	17	—
5Z4	(2) Rectifiers	5.0	360	—	—	—	—	—

VOLTAGE DROP ACROSS SPEAKER FIELD 125 VOLTS. POWER OUTPUT APPROXIMATELY 15.5 WATTS. POWER CONSUMPTION APPROXIMATELY 140 WATTS. ALL READINGS TAKEN ON 117.5 VOLT POWER SUPPLY.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 6615



PARTS LIST—MODEL 6615

Figures in first column refer to parts in Diagrams.

Item No.	Part No.	Description
1A	G6 —27134	Dial Light Bracket Assem.
1B	G6 —27134	Dial Light Bracket Assem.
2	MG25—37103	Battery Cable
	—34903	Battery Clip (+)
	—34904	Battery Clip (—)
	W —37231	Battery Cable Clamp
3	MG7—37103	Choke, I.-F., "A" Sup. Filter
4	G10—32977	Choke, H-F., "A" Sup. Filter
5	G27—24628	Choke, I.-F., "B" Sup. Filter
6	G2 —24234	Choke, H-F., "B" Sup. Filter
7	G80—32000	Ant. Coil Assem. Complete
	G78—32000	Ant. Coil only, 150-400 Kc.
	G44—32000	Ant. Coil only, 1710-540 Kc.
	G79—32000	Ant. Coil only, 2.3 - 7.5 Mc.
	G12—36031	Coil Shield
	W —35951	3 Section Trimmer Cond.
	W —36033	Trimmer Cond. Bracket
	G6 —36031	Support Base
8	G79—32004	1st. I-F Coil Assem.
9	G78—32004	2nd. I-F Coil Assem.
10	G64—32002	Osc. Coil Assm. Complete
	G62—32002	Osc. Coil only, 150-400 Kc.
	G69—32002	Osc. Coil only, 1710-540 Kc.
	G63—32002	Osc. Coil only, 2.3 - 7.5 Mc.
	G13—36031	Coil Shield
	W —35951	3 Section Trimmer Cond.
	W —36033	Trimmer Cond. Bracket
	G11—36031	Support Base
	G6 —34002	Condenser, 25 Mmf.
11	G57—32001	R-F. Coil Assm. Complete,
	G55—32001	R-F. Coil only, 150-400 Kc.
	G59—32001	R-F. Coil only, 1710-540 Kc.
	G56—32001	R-F. Coil only, 2.3 - 7.5 Mc.
	G12—36031	Coil Shield
	W —35951	3 Section Trimmer Cond.
	W —36033	Trimmer Cond. Bracket
	G6 —36031	Support Base
	G1 —34002	Condenser, 0.00025 Mfd.
	G6 —34002	Condenser, 25 Mmf.
	—37590	Resistor, 750,000 Ohms, ½ W.
12	W —36057	Condenser, 40. Mfd., 300 V.
13Z		Condenser, 12. Mfd., 250 V.
13Y	W —34896	Condenser, 8. Mfd., 250 V.
13X		Condenser, 8. Mfd., 25 V.
14	W —32904	Condenser, 20 Mmfd.
15		
16	W —37214	Condenser, 0.001 Mfd., 1000 V.
17	W —37190	Condenser, 0.02 Mfd., 160 V.
18	W —37173	Condenser, 0.25 Mfd., 300 V.
19	W —37174	Condenser, 0.5 Mfd., 160 V.
20A	G2 —34002	Condenser, 100 Mmfd.
20B	G2 —34002	Condenser, 100 Mmfd.
21A	W —23191A	Condenser, 0.01 Mfd., 400 V.
21B	W —23191A	Condenser, 0.01 Mfd., 400 V.
22	W —32378	Condenser, 0.01 Mfd., 400 V.
23A	W —32379	Condenser, 0.02 Mfd., 200 V.
23B	W —32379	Condenser, 0.02 Mfd., 200 V.
23C	W —32379	Condenser, 0.02 Mfd., 200 V.
24AZ		Condenser, 0.001 Mfd., 400 V.
24AY	W —25537A	Condenser, 0.03 Mfd., 400 V.
24BZ		Condenser, 0.001 Mfd., 400 V.
24BY	W —25537A	Condenser, 0.03 Mfd., 400 V.
25	W —30321A	Condenser, 1.0 Mfd., 160 V.

Item No.	Part No.	Description
26Z	G29—33006	Condenser, I.-F., Series Osc. Trimmer
26Y		Condenser, B.C., Series Osc. Trimmer
27Z	G33—33002	3 Section Tuning Cond. Gang.
27X		
	MG25—37257	Dial Assm.
	C —37439A	Dial Face
	W —37198	Pointer
	W —32293	Pointer Nut (2)
28	G2 —33339	Fuse Panel
	W —37624	Fuse, 4 Amp.
	W —33310A	Fuse Cover
	W —34223	Cover Insulator
29	W —22514	Resistor, 750 Ohm, ½ W. Flex.
30	—37474	Resistor, 7,000 Ohm, ½ W.
31	—22831	Resistor, 15,000 Ohm, ½ W.
32A	—21875	Resistor, 100,000 Ohm, ¼ W.
32B	—21875	Resistor, 100,000 Ohm, ¼ W.
32C	—21875	Resistor, 100,000 Ohm, ¼ W.
33	—23403	Resistor, 150,000 Ohm, ¼ W.
34A	—23785	Resistor, 500,000 Ohm, ¼ W.
34B	—23785	Resistor, 500,000 Ohm, ¼ W.
35A	—21454	Resistor, 1.0 Megohm, ¼ W.
35B	—21454	Resistor, 1.0 Megohm, ¼ W.
36	—34883	Resistor, 2.0 Megohm, ¼ W.
37	—26577	Resistor, 3.0 Megohm, ¼ W.
38	G14—28807	Socket, "31"
39A	G88—28807	Socket, "15"
40	G15—28807	Socket, "38"
41	G92—28807	Socket, "V1B"
42	G47—28807	Socket, "6A7"
43	G48—28807	Socket, "6B7"
	W —35772	Tube Shield (Half), (6)
	W —35773	Tube Shield Cap, (3)
	W —35774	Tube Shield Base, (3)
44	33—MS—3	Speaker
	43—MS—3	Speaker (Console)
45Z		
to	MG38—37257	Band Change Switch
45U		
46	G27—26719	Terminal Board, Ant. and Grnd.
47Z		Tone Control
47Y	—36062	On-Off Switch
48	G7 —32769	Power Transformer
	MG19—37257	Power Transformer Can.
	W —32930A	Power Transformer Can. Cover
49	W —37216	Vibrator
	W —37225	Vibrator Cover, (Shield)
	W —33312A	Vibrator Sleeve, (Rubber)
50	—36060	Volume Control
51	W —35111	Speaker Cable
52	—37485	Resistor, 15,000 Ohm, ½ W.
53	G12—33005	Condenser, H-F., Series Osc.
54	—37472	Resistor, 50,000 Ohm, ¼ W.
55	W —37631	Resistor, 32.0 Ohm, ½ W. Flex.
56	W —37630	Resistor, 21.0 Ohm, ½ W Flex.
	MG9—37257	Syncronode Partition Assem.
	W —37227	Syncronode Cover
	W —37490	Transformer Shield
	B —33528	Escutcheon
	W —33984	Escutcheon Gasket
	D — 28	Escutcheon Screws (4)
	W —37340	Knob (Band Change)
	W —37339	Knob (3)

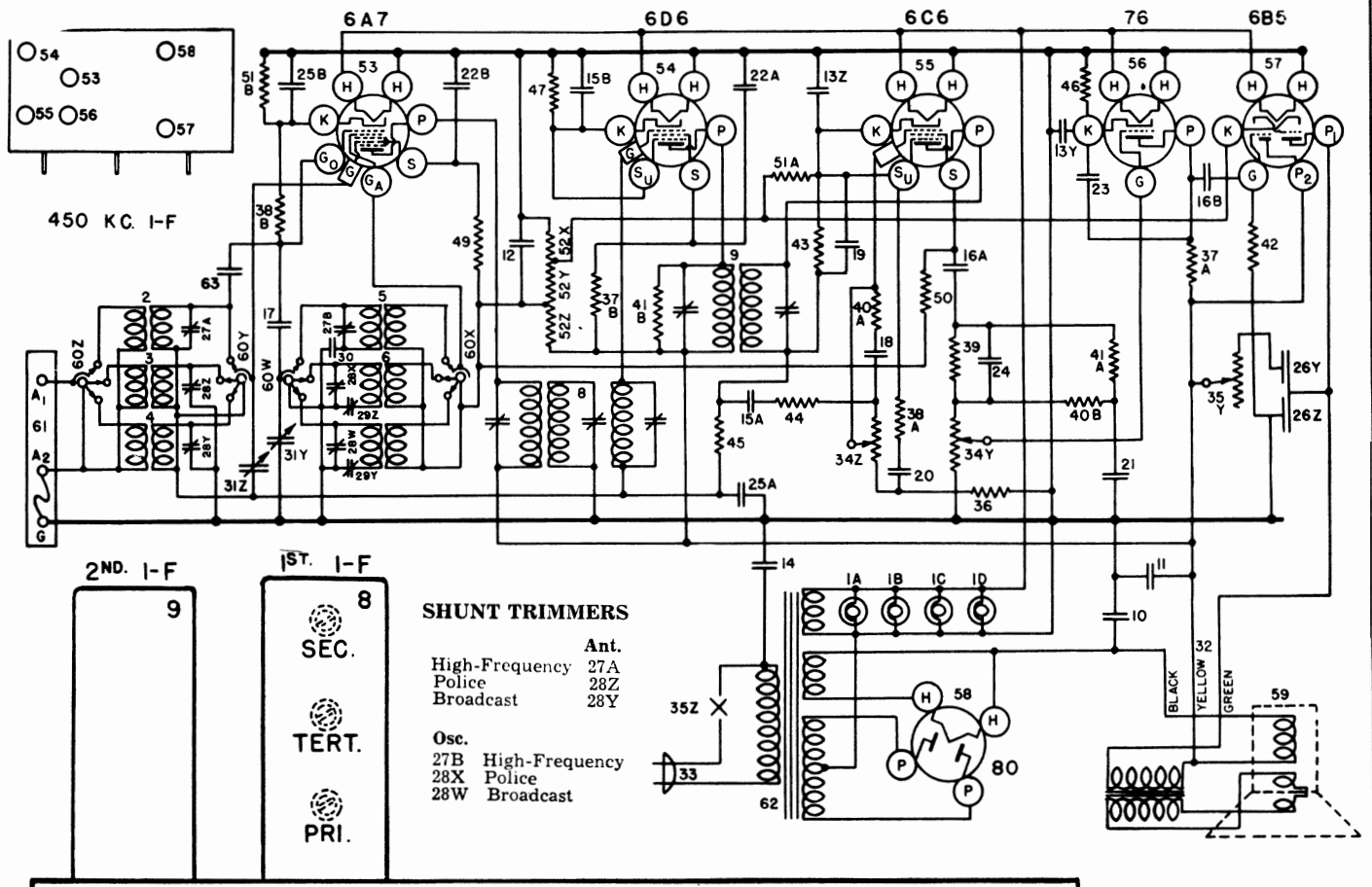
TUBE SOCKET VOLTAGE READINGS

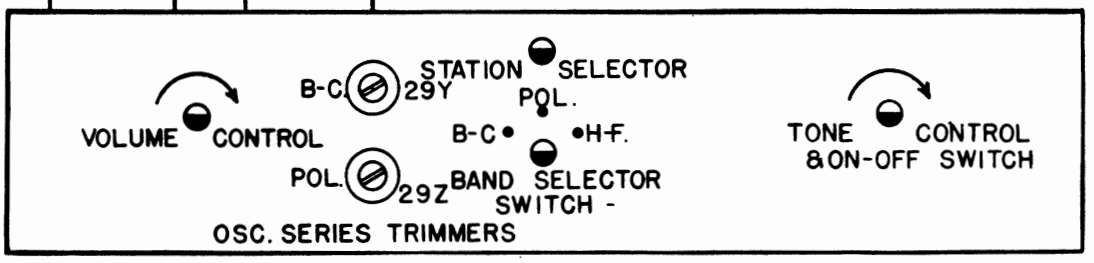
Tube	Function	H	P	S	G	K	Ga	Go
15	R-F Amplifier	2.0	150	85	-2	0	—	—
6A7	Osc.-Modulator	5.8	150	85	-2	0	120	-5 to -15
6B7	I-F Amp. & Detector	5.8	150	85	-2	0	—	—
15	A-F Amplifier	2.0	70	15	-2	0	—	—
38	Output	5.8	145	150	0	12	—	—
31	AVC Diode	2.0	—	—	—	—	—	—

"A" Battery Drain Approximately 2.5 Amperes. Power Output Approximately .9 Watt.

CROSLEY RADIO CORP.

WIRING DIAGRAM—MODEL 6625





PARTS LIST—MODEL 6625

Figure in first column refer to parts in Diagram.

Item	Part No.	Name	Description
1A	W —37922	Bulb, Dial Light	
1B	W —37922	Bulb, Dial Light	
1C	W —37922	Bulb, Dial Light	
1D	W —37922	Bulb, Dial Light	
2	G92—32000	Coil, Ant. 6000-18000 Kc.	
3	G90—32000	Coil, Ant. 1800-6000 Kc.	
4	G91—32000	Coil, Ant. 540-1800 Kc.	
5	G84—32002	Coil, Osc. 6000-18000 Kc.	
6	G83—32002	Coil, Osc. 1800-6000 Kc.	
7	G82—32002	Coil, Osc. 540-1800 Kc.	
8	G94—32004	Coil, 1st I-F Assm.	
9	G93—32004	Coil, 2nd I-F Assm.	
10	W —36055	Condenser, 35 mfd., 400 V.	
11	W —36057	Condenser, 40 mfd., 300 V.	
12	W —40325	Condenser, 50 mfd., 150 V.	
13	W —37778	Condenser, 12 mfd., 25 V.	
13Z	W —37778	Condenser, 12 mfd., 25 V.	
14	W —30805	Condenser, .01 mfd., 400 V.	
15A	W —36541	Condenser, .02 mfd., 160 V.	
15B	W —32780B	Condenser, .05 mfd., 400 V.	
16A	W —32780B	Condenser, .05 mfd., 400 V.	
16B	W —40325	Condenser, .000025 mfd. (molded)	
17	G4 —34002	Condenser, .000025 mfd. (molded)	
18	G2 —34002	Condenser, .0001 mfd. (molded)	
19	W —30323	Condenser, .01 mfd., 200 V.	
20	W —37988	Condenser, .017 mfd., 200 V.	
21	W —23142	Condenser, .02 mfd., 400 V.	
22A	W —27540	Condenser, .0025 mfd., 400 V.	
22B	W —27540	Condenser, .0005 mfd., 400 V.	
23	G5 —34002	Condenser, .00005 mfd. (molded)	
24	W —35936	Condenser, .05 mfd., 200 V.	
25A	W —35936	Condenser, .05 mfd., 200 V.	
25B	W —31052	Condenser, .004 mfd., 400 V.	
26Z	W —37954	Condenser, .05 mfd., 400 V.	
27A	W —37954	Condenser, H-F Ant. Shunt Trim.	
27B	W —37954	Condenser, H-F Ant. Shunt Trim.	
28Z	W —37822A	Condenser, Pol. Ant. Shunt Trim.	
28X	W —37822A	Condenser, B-C Ant. Shunt Trim.	
28W	W —37822A	Condenser, Pol. Osc. Shunt Trim.	
29Z	W —37822A	Condenser, B-C Osc. Shunt Trim.	
29Y	W —37822A	Condenser, Pol. Osc. Series Trim.	
30	G31—33006	Condenser, B-C Osc. Series Trim.	
31Z	G17—34000	Condenser, H-F Osc.	
31Y	G19—33001	Condenser, Var. Tuning Gang	
32	G4 —35696	Cable, Speaker	
33	B —33906A	Cable & Plug, Power Supply	
34Z	37907	Vol. Cont. 1st A-F Control, 3 Meg	
34Y		2nd A-F Control, 1 Meg	
35Y	—37908	Control, Tone	
35Z		Switch, On-Off	
36	—21455	Resistor, 300,000 Ohm, ¼ W.	
37A	—34489A	Resistor, 100,000 Ohm, 1 W.	
37B	—34489A	Resistor, 100,000 Ohm, 1 W.	

Item	Part No.	Name	Description
38A	—36761	Resistor 40,000 Ohm, ¼ W., Insul.	
38B	—36761	Resistor 40,000 Ohm, ¼ W., Insul.	
39	—31454	Resistor 1 Megohm, ½ W.	
40A	—34020	Resistor 250,000 Ohm, ¼ W.	
40B	—34020	Resistor 250,000 Ohm, ¼ W.	
41A	—37590	Resistor, 750,000 Ohm, ¼ W.	
41B	—37590	Resistor, 750,000 Ohm, ¼ W.	
42	—36222	Resistor, 500,000 Ohm, ¼ W.	
43	—33344	Resistor, 500,000 Ohm, ¼ W.	
44	—31454	Resistor, 1 Megohm, ½ W.	
45	—37245	Resistor, 1.5 Megohm, ¼ W.	
46	—21876	Resistor, 10,000 Ohm, ¼ W.	
47 W	—32514	Resistor, 750 Ohm, ½ W., Flex.	
48 W	—24537	Resistor, 60 Ohm, ½ W., Flex.	
49 W	—22851	Resistor, 15,000 Ohm, ¼ W.	
50 W	—31775	Resistor, 100,000 Ohm, ¼ W.	
51A W	—28106	Resistor, 500 Ohm, ½ W. Flex.	
51B W	—28106	Resistor, 800 Ohm, ½ W. Flex.	
52Z	—37829	Resistor, 10,000 Ohm	Candohm
52Y		Resistor, 25,000 Ohm	
53	G47—28807	Resistor, 65 Ohm	
54	G75—28807	Socket, 6A7 Type	
55	G74—28807	Socket, 6D6 Type	
56	G80—28807	Socket, 6C6 Type	
57	G90—28807	Socket, 76 Type	
58	G6 —28807	Socket, 6B5 Type	
59	—37916	Socket, 80 Type	
60 B	—37900	Speaker, Spec. 832—BJ-3	
61	G27—26710	Switch, 2 Sec. Band Selector	
62	G15—28500	Terminal Board, Ant. & Grnd.	
	G16—28500	Transformer, Power 110-60 Cy.	
	G17—28500	Transformer, Power 220-25 Cy.	
	W —35714	Base, Tube Shield	
	W —22331	Bulb, Dial Indicator Control	
	W —35773	Cap, Tube Shield	
	W —40537	Coupling, Flexible Drive	
	—37847	Dial Assy., Complete	
	W —40545	Diffuser, Light	
	—37994	Escutcheon, Cabinet	
	—37995	Escutcheon, Tuning Dial	
	—37968	Face, Glass Dial	
	W —40385	Gasket, Escutcheon Felt	
	—40484	Hand, Long	
	W —37339	Hand, Short	
	W —37182	Knob, 3 required	
	B —37188	Lens, Dial 1 required	
	W —37909	Pulley, Indicator Cable	
	W —37772	Shield, Tube (Half)	
	W —37814	Shield, Dial Light	
	G2 —37995	Socket, Dial Light	
	G3 —37995	Socket, Indicator Light	
	—37996	Suspension, Dial Retaining	
	B —37897	Spring, Dial Lens Retaining	

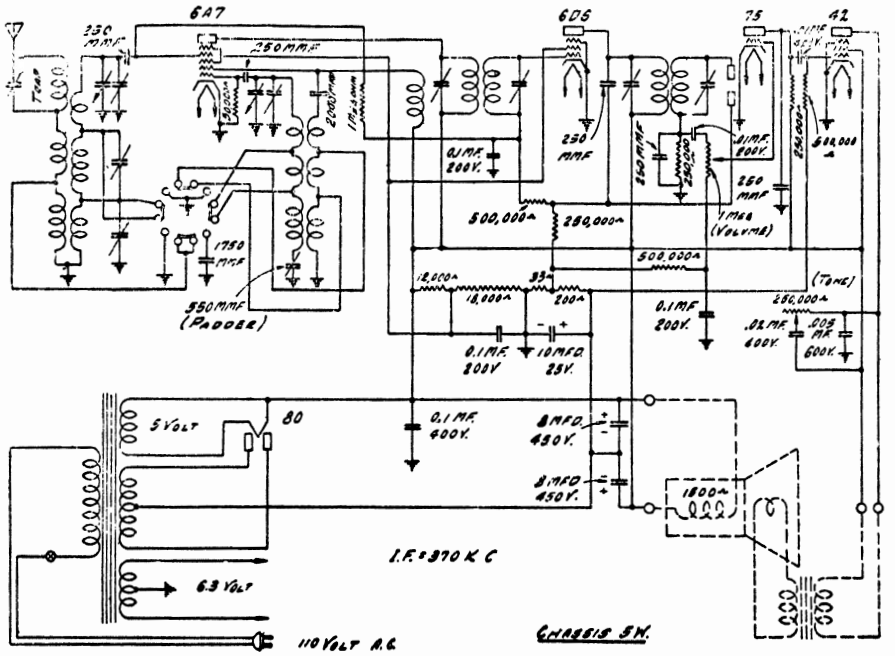
TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	P2	S	Ss	G	K	Go	Ga
6A7	Osc.-Modulator	6.3	285	—	100	—	0	5.0	0	140
6D6	I-F Amplifier	6.3	285	—	120	6.2	0	6.2	—	—
6C6	Det. & A-F Amplifier	6.3	0	—	75	2.6	0	2.6	—	—
76	2nd A-F Amplifier	6.3	140	255	—	—	0	1010	—	—
6B5	Output	6.3	350	—	—	—	—	2.3	—	—
80	Rectifier	4.9	350							

MEASURED ON 117.5 VOLT—60 CYCLE POWER SUPPLY.
POWER CONSUMPTION APPROXIMATELY 80 WATTS.
POWER OUTPUT APPROXIMATELY 3 WATTS.

Model 5-W

I.F. = 370 K.C.



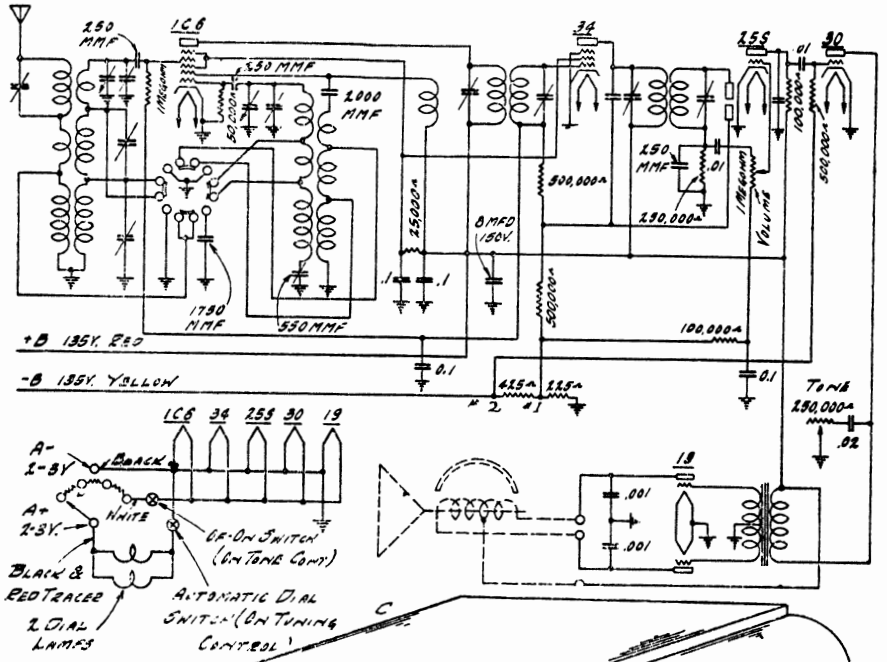
TUBE SOCKET VOLTAGES

Tube Number	Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7 — 1st Det.	*2	80	210	3.	6.3
6A7 — OSC.			200	4.	6.3
6D6—I. F.	2	80	210	7.	6.3
75—2nd Det.	2		100	.5	6.3
42—2nd Audio	**15	210	190	32.	6.3
80—Rect.					
				25 Per Plate	

*Terminal No. 5 on candohm to ground.
**Terminal No. 6 on candohm to ground.

Model 2-B

I.F. = 370 K.C.



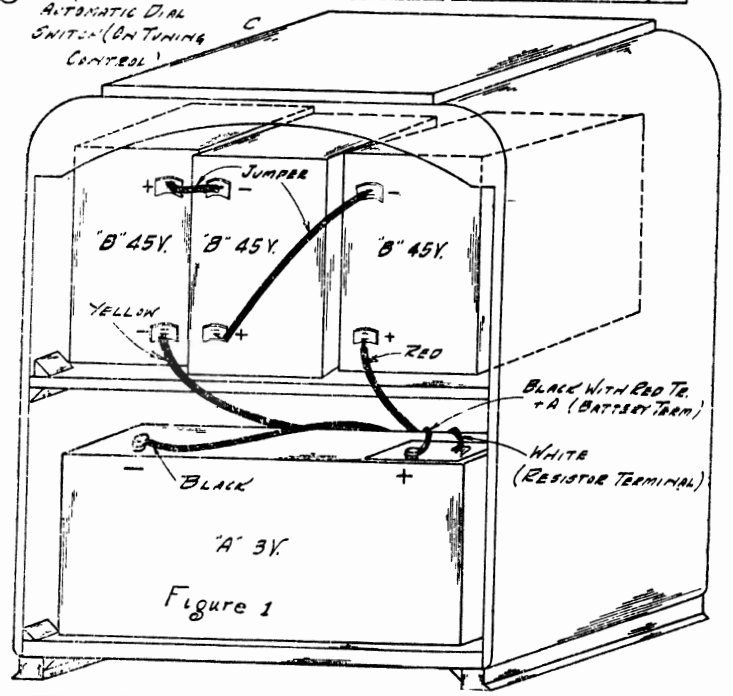
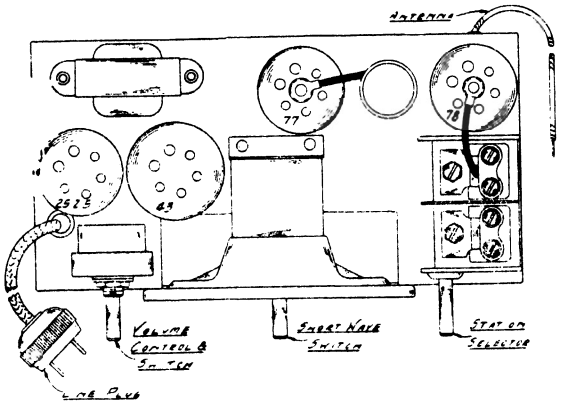


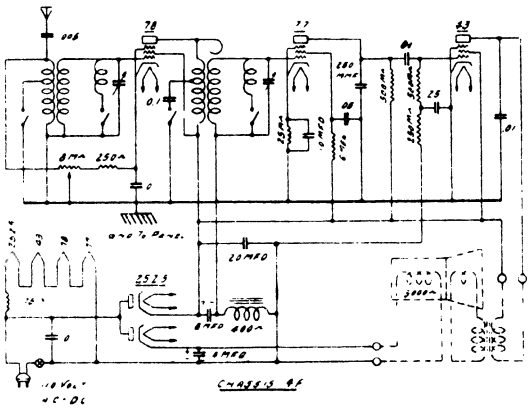
Figure 1

DETROLA RADIO CORP.

DETROLA RADIO CORP.

Model 4F





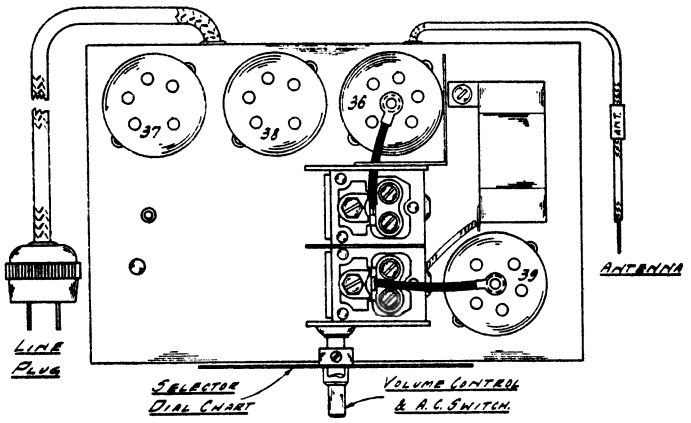
OPERATION INSTRUCTIONS

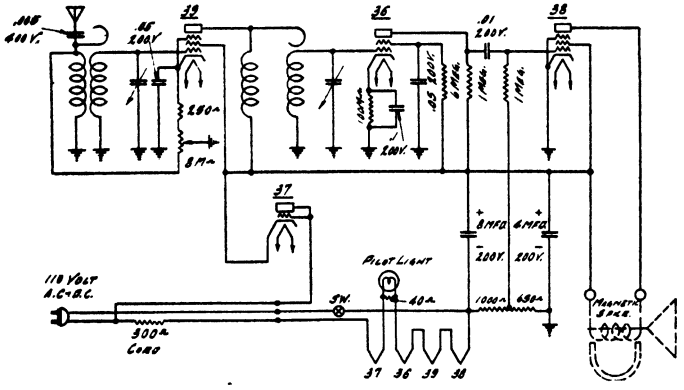
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated Set band switch either to right or left position, depending on class of reception desired. In left hand position, broadcast stations on frequencies between 550 and 1500 K.C. will be received. When the band switch is set to the right hand position, short wave stations operating on wave lengths from 75 to 200 meters will be heard. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left. The following tubes are used in this receiver:

1—No. 78 R. F. Amplifier
1—No. 77 Detector
1—No. 43 Audio Amplifier
1—No. 2525 Full Wave Rectfier

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

Model 4H

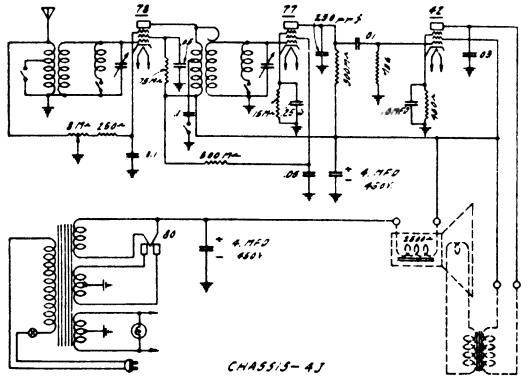




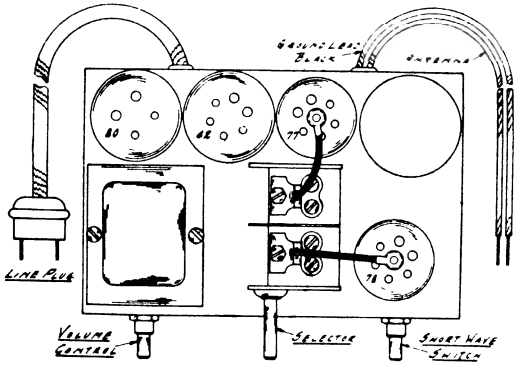
SCHEMATIC DIAGRAM

Chassis 4H

Model 4J



CHASSIS 4J



TUNING IN SIGNAL. Turn on power switch by turning volume control knob to right. The pilot lamp will light, indicating power supply to receiver. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval to heat points of operation. Set band switch either to right or left, depending on the class of reception desired. In the left-hand position, broadcast stations on frequencies between 550 and 1500 Kilocycles will be received. When the band switch is thrown to the right, stations operating on frequencies ranging from 1500 to 4800 Kilocycles will be heard. Next, turn the station selector knob slowly until some station is heard clearly and reduce the volume to below desired intensity.

The four tubes used in this set are as follows: 1—No. 280 Full Wave Rectifier; 1—No. 77 Radio Audio Amplifier; 1—No. 78 Detector; 1—No. 42 Audio Amplifier.

SERVICE SUGGESTIONS

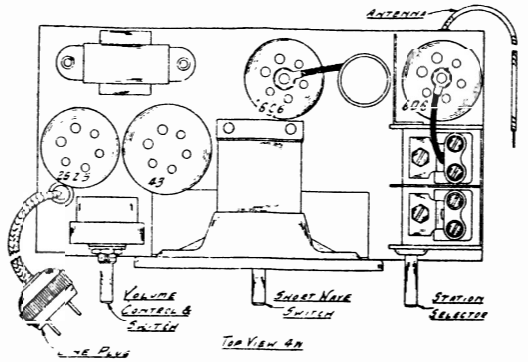
In changing tubes always remove the plug from light socket. Make sure all tubes are pushed firmly into their proper sockets and that clips are always fastened to caps on tops of tubes.

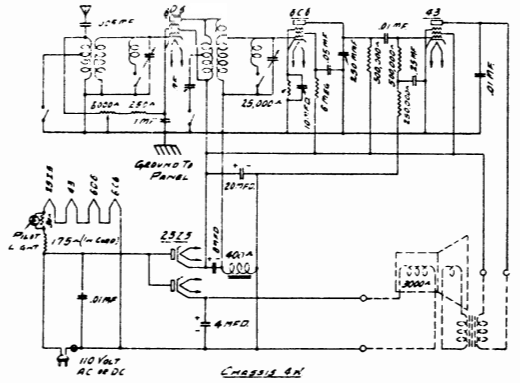
Be sure that aerial and ground are properly connected. A thirty to fifty-foot aerial is recommended for best operation.

To remove chassis from cabinet, first remove knobs. Then remove four screws from bottom of cabinet holding base. Remove screws holding speaker in cabinet and remove speaker and chassis as a unit.

DETROLA RADIO CORP.

Model 4W





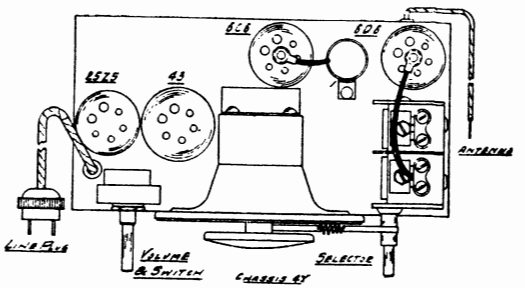
OPERATION INSTRUCTIONS

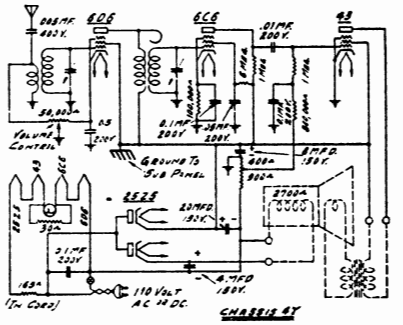
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated. Set band switch either to right or left position, depending on class of reception desired. In left hand position, broadcast stations on frequencies between 550 and 1500 K.C. will be received. When the band switch is set to the right hand position, short wave stations operating on wave lengths from 75 to 200 meters will be heard. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left. The following tubes are used in this receiver:

1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
1—No. 43 Audio Amplifier
1—No. 25Z5 Full Wave Rectifier

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

Model 4Y





OPERATION INSTRUCTIONS

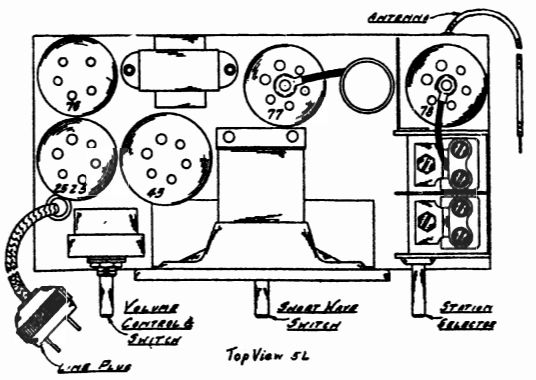
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. To operate: (1) Turn volume control knob to the extreme right. (2) Allow an interval of time for the tubes to become heated. (3) Turn station selector knob until station is heard. (4) Turn volume control knob to adjust volume to the desired intensity.

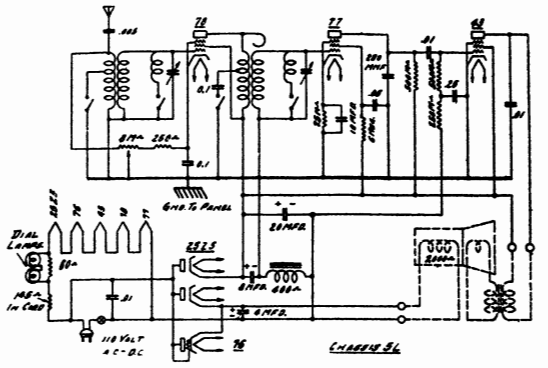
The following tubes are used in this receiver:

1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
1—No. 43 Audio Amplifier
1—No. 25Z5 Full Wave Rectifier

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

Model 5L





OPERATION INSTRUCTIONS

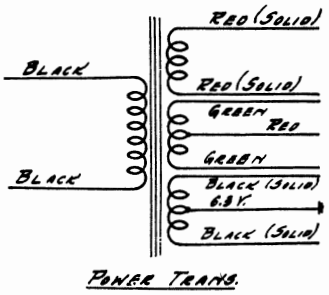
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated. Set band switch either to right or left position, depending on class of reception desired. In left hand position, broadcast stations on frequencies between 550 and 1500 K.C. will be received. When the band switch is set to the right hand position, short wave stations operating on wave lengths from 75 to 200 meters will be heard. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left. The following tubes are used in this receiver:

1—No. 78 R. F. Amplifier
1—No. 77 Detector
1—No. 43 Audio Amplifier
1—No. 25Z5 Full Wave Rectfier
1—No. 76 Half Wave Rectifier

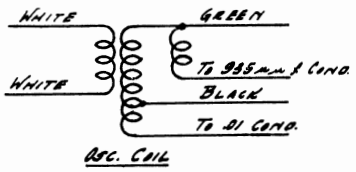
If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

DETROLA RADIO CORP.

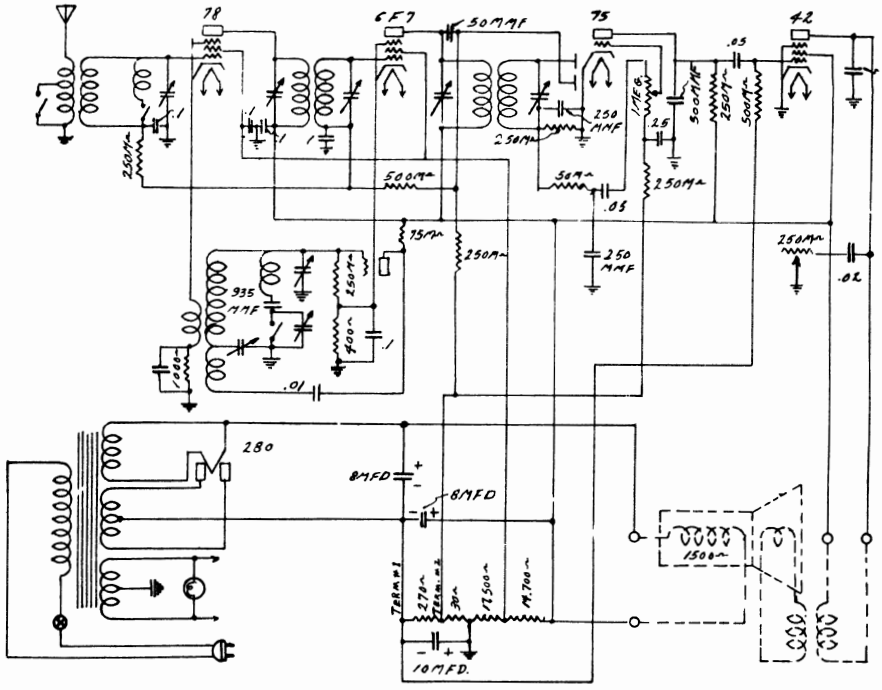
Model 5D



POWER TRANS.



OSC. COIL

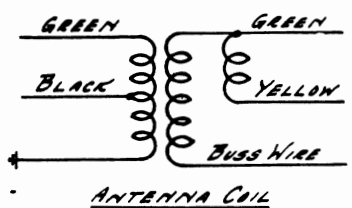


Schematic Diagram

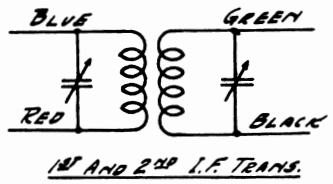
TUBE SOCKET VOLTAGES

Tube No.	Cathode to Heater Voltage	Cathode to Screen Voltage	Cathode to Plate Voltage	Cathode to Control Grid Voltage	Plate M.A.	Heater Voltage
78—1st Det.	4.5	100	230	* 6.5	4.25	6.3
6F7 Pentode I. F.	3	100	235	* 4.5	6 0	6.3
6F7 Triode OSC.			80	4.75	2.0	
75—2nd Det.	...	...	220	* 1.75	.4	6.3
42—2nd Audio	...	235	220	**16.5	28.	6.3
80—Rect.	..	...	...	.....	27 per plate	5.0

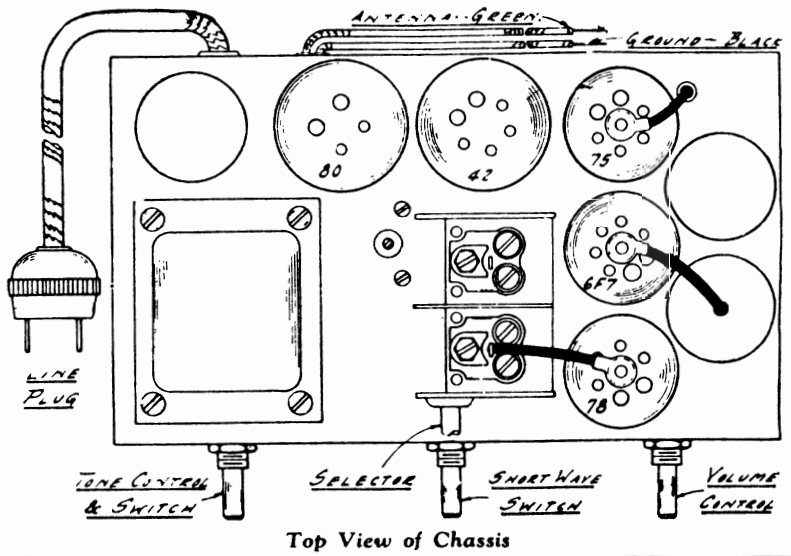
*Voltage from cathode to terminal No. 2 on the voltage divider.
**Voltage from cathode to terminal No. 1 on the voltage divider.
All voltage readings taken with high resistance Volt Meter (1000 ohms per volt) using test leads, all tubes in sockets, antenna grounded to chassis, no signal.



ANTENNA COIL



1ST AND 2ND I.F. TRANS.

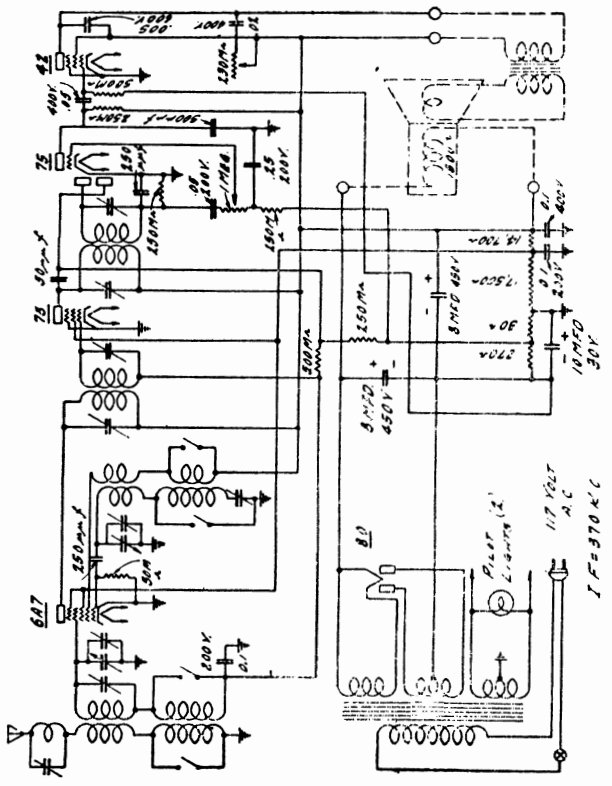


Top View of Chassis

DETROLA RADIO CORP.

Model 5X

SCHEMATIC DIAGRAM



TUBE SOCKET VOLTAGES

Tube Number	Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7 1st Det.	*1.75	92	225	4	6.3
6A7 OSC.	0	0	225	4	6.3
78—I. F.	*1.75	92	225	7	6.3
75—2nd Det.	*1.75	0	**110	.8	6.3
42—2nd Audio	***17	225	212	34	6.3
80—Rect.					

Service Notes

The 5-X is a 5 tube superheterodyne designed for receivers on frequencies from 540 to 1500 KC and from 5300 to 17,000 KC, which covers the standard broadcast and the European short wave broadcast.

The 5-X employes the following tubes, used in their respective circuits: 1 type 6A7 first detector and electron coupled oscillator; 1 type 78 intermediate amplifier; 1 type 75 second detector, AVC and first audio; 1 type 42 final audio stage; 1 type 80 double wave rectifier.

I. F. ADJUSTMENTS

Should it become necessary to check the adjustments of the I.F. and R.F. alignment of the receiver, it will be necessary to employ the use of a calibrated oscillator for the various frequencies used in this receiver in connection with a sensitive output meter.

In order to prevent the AVC from operating and giving a false reading while making alignment adjustments, the oscillator should be loosely coupled to the receiver so that only a small deflection will show on the output meter with the volume control of the receiver set at the maximum position. This applies to both I.F. and R.F. adjustments.

I. F. ALIGNMENT

To align the intermediate transformer the test oscillator should be adjusted to 370 KC and coupled to the control grid of the first detector and adjust the trimmer condensers on the first and second intermediate transformers for maximum reading on the output meter.

R. F. ALIGNMENT

The R.F. circuits: (1) Set pointer on tuning chart to 1400 KC with band switch in the broadcasting position. (2) Adjust test oscillator to 1400 KC and connect to antennae terminal on chassis. (3) Adjust trimmer on tuning condenser for maximum reading. (4) Reset dial pointer on test oscillator to 600 KC. (5) Reset test oscillator to 600 KC. (6) Adjust 600 KC padding condenser for maximum reading moving tuning condenser back and forth slowly while making adjustment. (7) Reset dial pointer and test oscillator to 1400 KC and readjust trimmer on tuning condenser for maximum reading on output meter.

SHORT WAVE ALIGNMENT

(1) Set dial pointer on 10 MC and band switch on short wave postion. (2) Adjust test oscillator to approximately 10 MC or for maximum reading on output meter. (3) Adjust 10 MC padding condenser mounting on top of chassis near tuning condenser for a further increase reading on output meter.

WAVE TRAP ADJUSTMENT

(1) To adjust wave trap to prevent reception of commercial code signals from stations operating on or about 370 KC, connect test oscillator to antennae terminal on chassis. (2) Adjust test oscillator to 370 KC. (3) Adjust wave trap to the condenser mounted on right hand end of the chassis for *minimum* signal on output meter.

The Model 5-X is an A.C. operated receiver utilizing an efficient 5 tube superheterodyne circuit. In addition to reception of the regular broadcast stations, provisions have been made on this receiver for the reception of European broadcast stations operating on wave lengths from 19 to 58 meters, which includes all the important European short wave stations.

POWER SUPPLY:

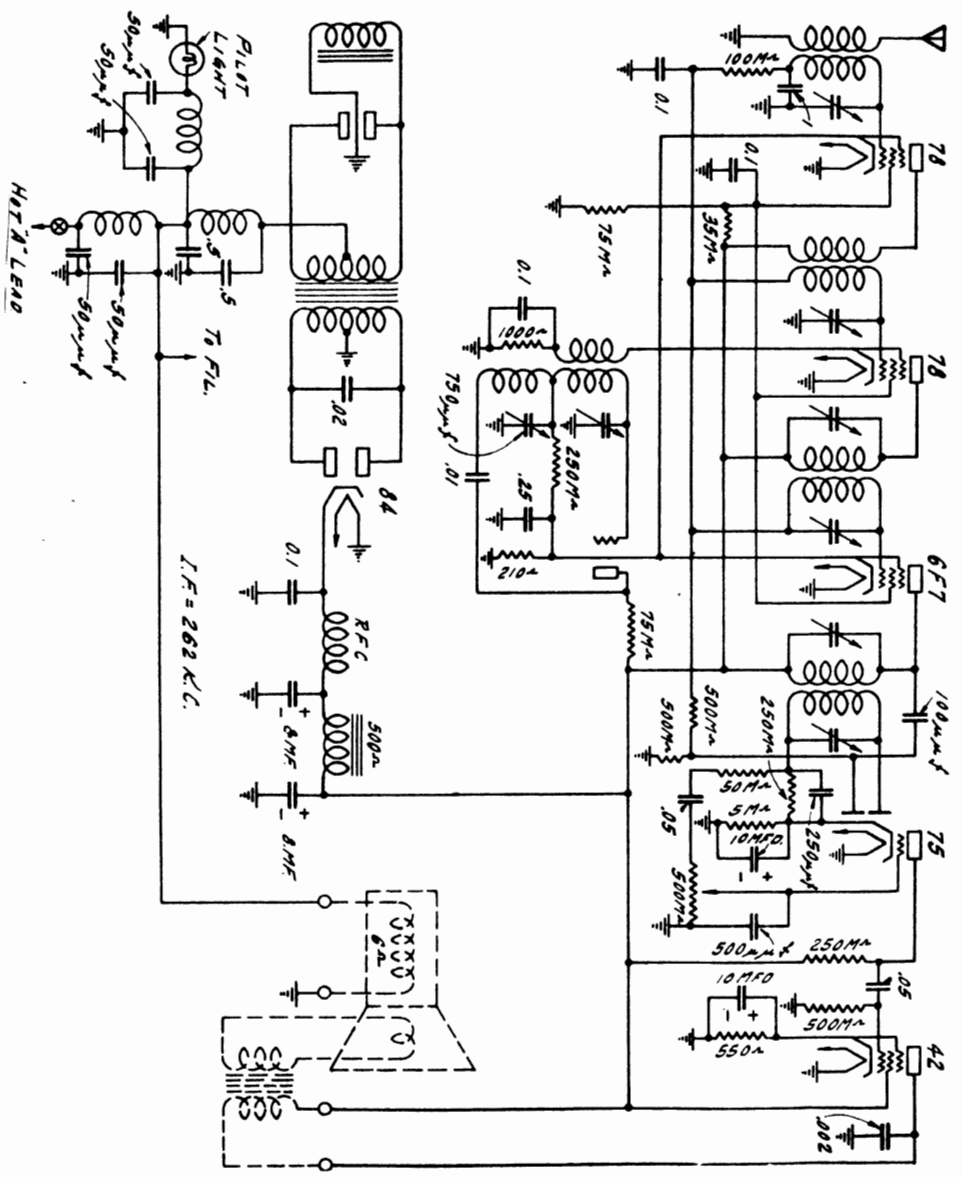
The Model 5-X may be supplied for operation on different sources of power supply; namely, 110 volts, 25 cycles; 110 volts, 60 cycles; and 200 volts, 60 cycles. The name plate on the rear of the chassis will specify power supply on which this receiver is to be operated. If there is any doubt about the voltage or frequency of your current, consult your local dealer or local power company before attempting to operate the receiver.

ANTENNA AND GROUND:

Best results will be obtained from an outside antenna 30 to 60 feet over all length, including lead in. For installations close to powerful broadcasting stations an antenna more than 40 feet in length should not be used. While for installations at a distance from broadcasting stations a longer antenna may be used with better results. Use the shortest antenna that will give adequate signal strength. It is important that a good ground connection be used. As a general rule water and steam pipes make good grounds. The ground lead should be as short and direct as possible. If a water or steam pipe is not available a metal rod may be driven into the ground to a depth of several feet which will make a very satisfactory ground. For short wave reception it is very important to have a good antenna installed as far removed as possible from power lines, metal drain spouts or other metal structures if possible. There are on the market today a number of short wave antennae designed especially for short wave reception. When these antennae are properly installed very good results can be obtained by their use.

DETROLA RADIO CORP.

Model 6A Auto Set



Service Data

Type and Number of Tubes Used:
2 Type 78 — 1 Type 6f7 — 1 Type 75
1 Type 42 — 1 Type 84

Total Battery Current	6.5 Amps.
Undistorted Output	.3 Watts
Speaker Field Current	.1 Amp.
Rectifier Output Voltage	250
Total Plate Current	50 M.A.

Plate Supply Unit

This receiver uses a vibrator type inverter and tube rectifier to provide a source of direct current voltage as plate and grid supply for all the tubes. This unit is very accurately adjusted at the factory, and service adjustment should not be attempted.

Low Volume

Low volume may be caused by weak or defective tubes (replace with set of tubes known to be in good condition), or antenna grounded or shielded due to wire netting not cut loose from the metal construction of the top.

Low Voltage

Low voltage may be caused by 84 rectifier, shorted filter or bypass condenser, defective power transformer or vibrator unit.

Excessive Hum

Excessive hum may be caused by defective 84 tube, or defective vibrator unit. In cases where the vibrator unit proves to be defective no adjustment should be attempted, the unit should be replaced with a new or replacement unit.

Continuity Test

By referring to the schematic diagrams in figures 5 and 6 a complete continuity test for open and short circuits can be made for all parts of the receiver. A suitable continuity test can be made by using 0 to 50 volt voltmeter and a 45 volt B battery. More accurate readings can be obtained by using a calibrated ohm meter.

R. F. and I. F. Adjustments

The trimmers on the tuning condenser and the intermediate transformers are very accurately adjusted with a crystal control oscillator before the receiver leaves the factory and should need little or no attention; however, to check the adjustments the following procedure should be followed.

I. F. Adjustments

In order to make the I. F. adjustments it is necessary to remove the top and bottom cover of the receiver case and proceed as follows, adjust test oscillator at 262 kilocycles, place the receiver in operation and connect the oscillator output to the grid of the first detector tube and connect the output meter across the voice coil of the loud speaker. Then connect the antenna lead to the ground of the chassis and adjust the tuning condenser so that no signal except the I. F. oscillator is heard at maximum volume. With the volume control at maximum, reduce the external oscillator output coupling until a small deflection is obtained at the output meter. Unless this is done the action of the A. V. C. will make it impossible to obtain a correct adjustment. Adjust trimmers for maximum reading on output meter.

R. F. Adjustments

The trimmers on the tuning condenser should be adjusted at 1400 kilocycles, and the padder condenser adjusted at 600 kilocycles respectively. Proceed as follows, adjust the test oscillator at 1400 kilocycles and couple to the antenna off the receiver. Set tuning condenser at minimum capacity and adjust pointer to 1550 kilocycles, reset tuning control to 1400 kilocycles. Place oscillator and receiver in operation and adjust oscillator output so that a weak signal is obtained on the output meter, adjust trimmers for maximum reading. To adjust 600 kilocycle position readjust oscillator and tuning control to 600 kilocycles and adjust the 750 M. M. F. padder condenser (mounted on the chassis near the loud speaker) for maximum reading.

TUBE SOCKET VOLTAGES

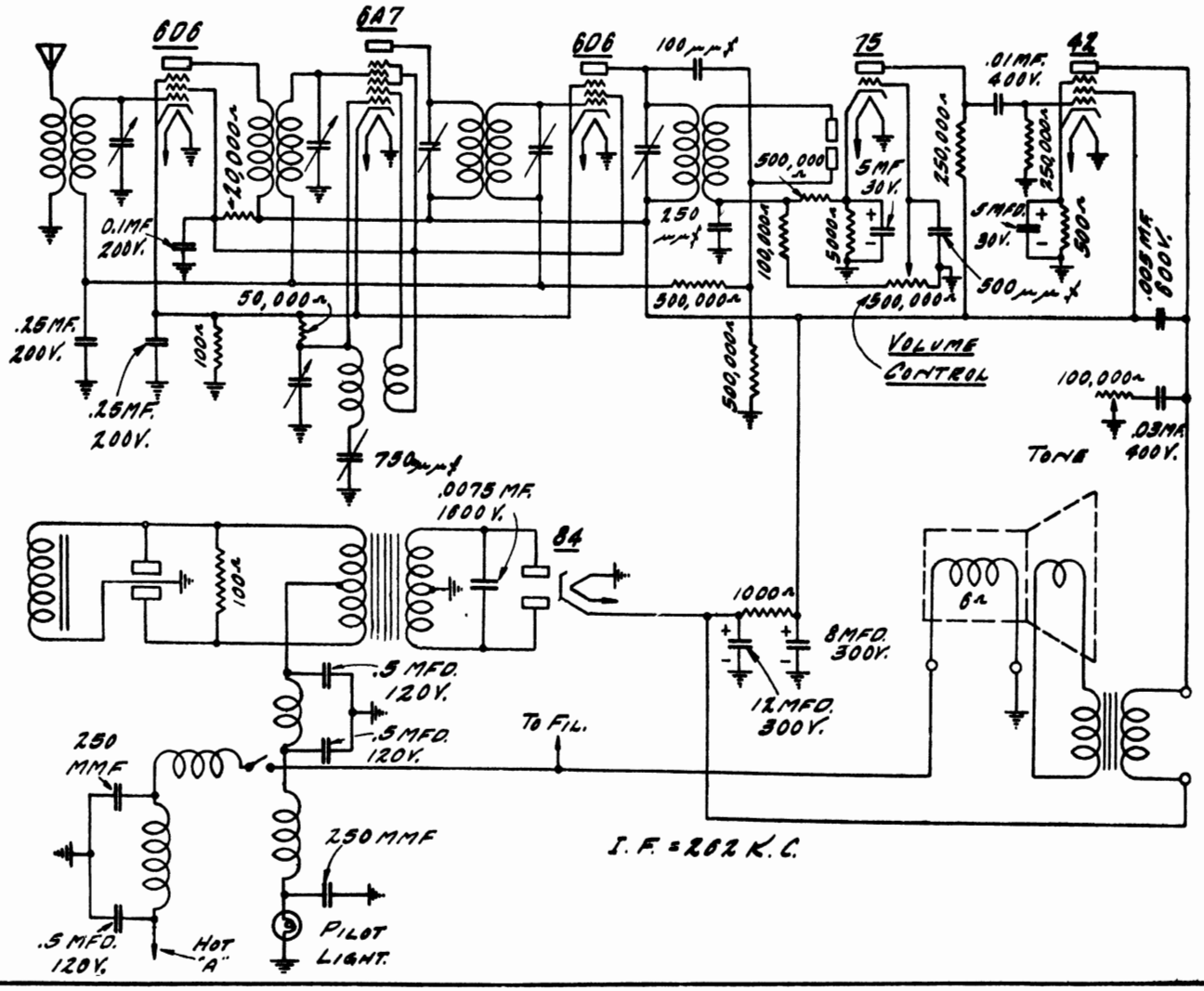
6.3 Volt Battery

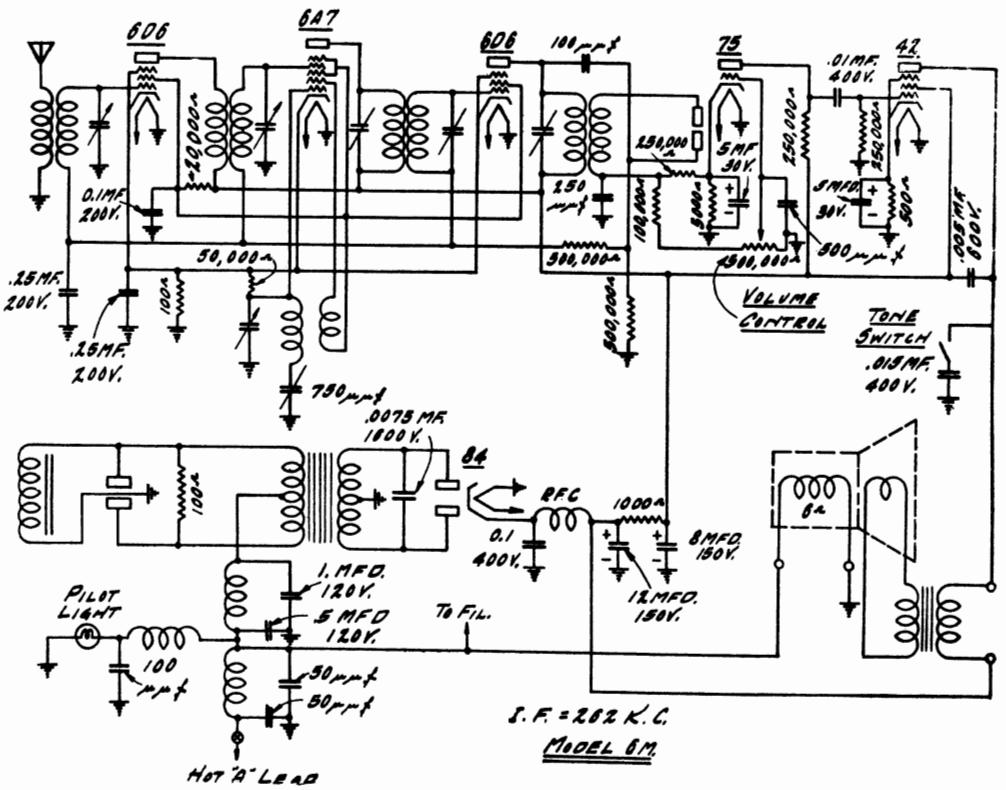
Tube No.	Cathode to Ground	Cathode to Screen Volts	Cathode to Plate Volts	Plate Current M. A.
78 R. F.	*3.5	100	250	6.0
78 First Detector	*5.	100	250	4.0
6F7 Pentode I. F.	*3.5	100	250	6.0
6F7 Triode OSC.		00	100	2.5
75 Second Detector A. V. C. First Audio	*1.7	00	**150	.3
42 Second Audio	*17.5	250	245	27.0
84 Rectifier				25 M.A. Per Plate

All the above voltage readings were taken by a high resistance volt meter (1000 ohms per volt) using test leads, all tubes in sockets no signal. (**750 volt scale) (*250 volt scale).

DETROLA RADIO CORP.

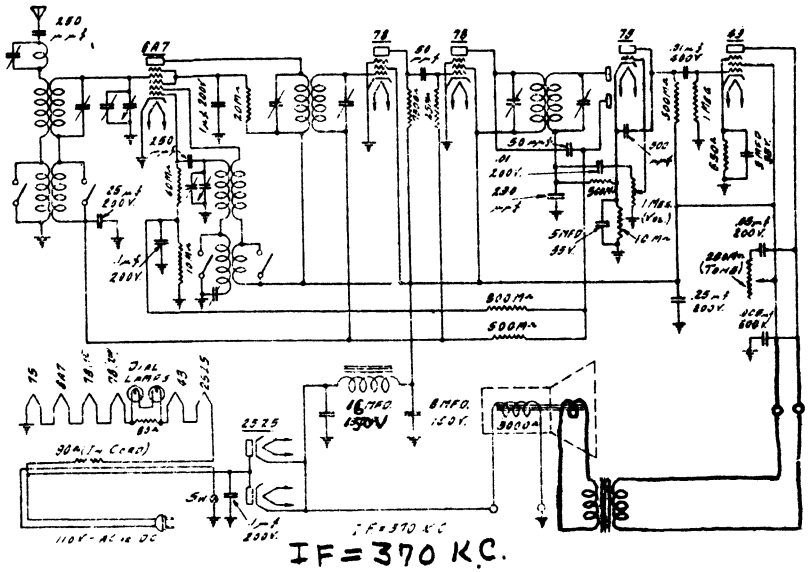
Schematic Diagram for Model 6-R.





Model
6M
Auto Set

Model 6-X Receiver



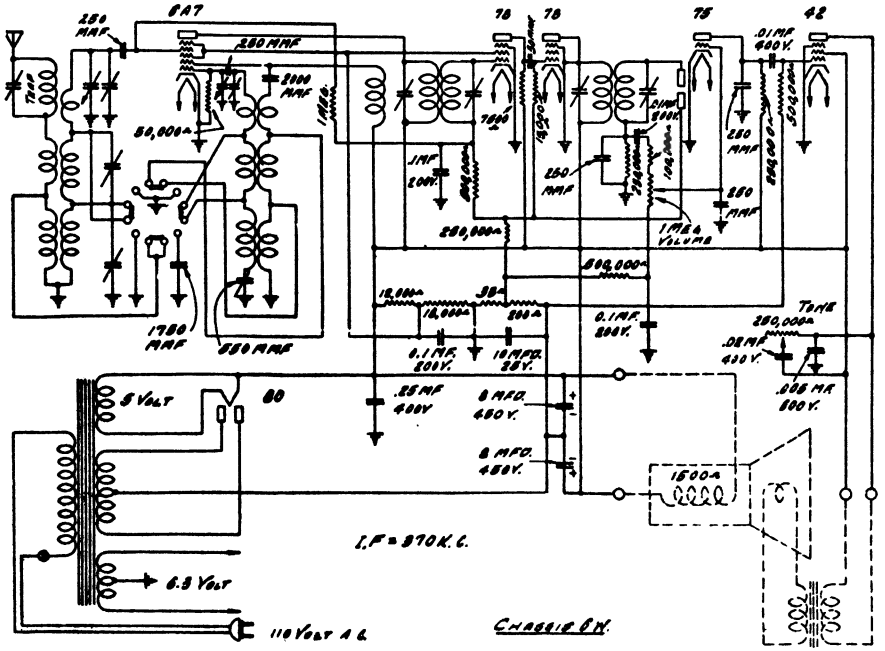
TUBE SOCKET VOLTAGES

Tube Number		Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7	1st Det.	0	50	95	1.5	6.3
	OSC.	2		95	3.	
78—1st I. F.		0	95	50	2.5	6.3
78—2nd I. F.		0	95	95	5.	6.3
75—2nd Det.		1.		30	.25	6.3
43—2nd Audio			95	75	20	25.
25z5—Rect.						25.

I. F. ALIGNMENT

To align the intermediate transformer the test oscillator should be adjusted to 370 KC and coupled to the control grid of the first detector and adjust the trimmer condensers on the first and second intermediate transformers for maximum reading on the output meter.

Model 6-W Receiver



TUBE SOCKET VOLTAGE

Tube Number		Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Heater Voltage
6A7	1st Det.	*2	85	210	3.	6.3
	OSC.			210	4.	
78—1st I. F.		*2	85	150	7.	6.3
78—2nd I. F.		*2	85	210	4.	6.3
75—2nd Det.		*2		110	.5	6.3
42—2nd Audio		**15	210	190	32.	6.3
80—Rect.					25 Per Plate	5.

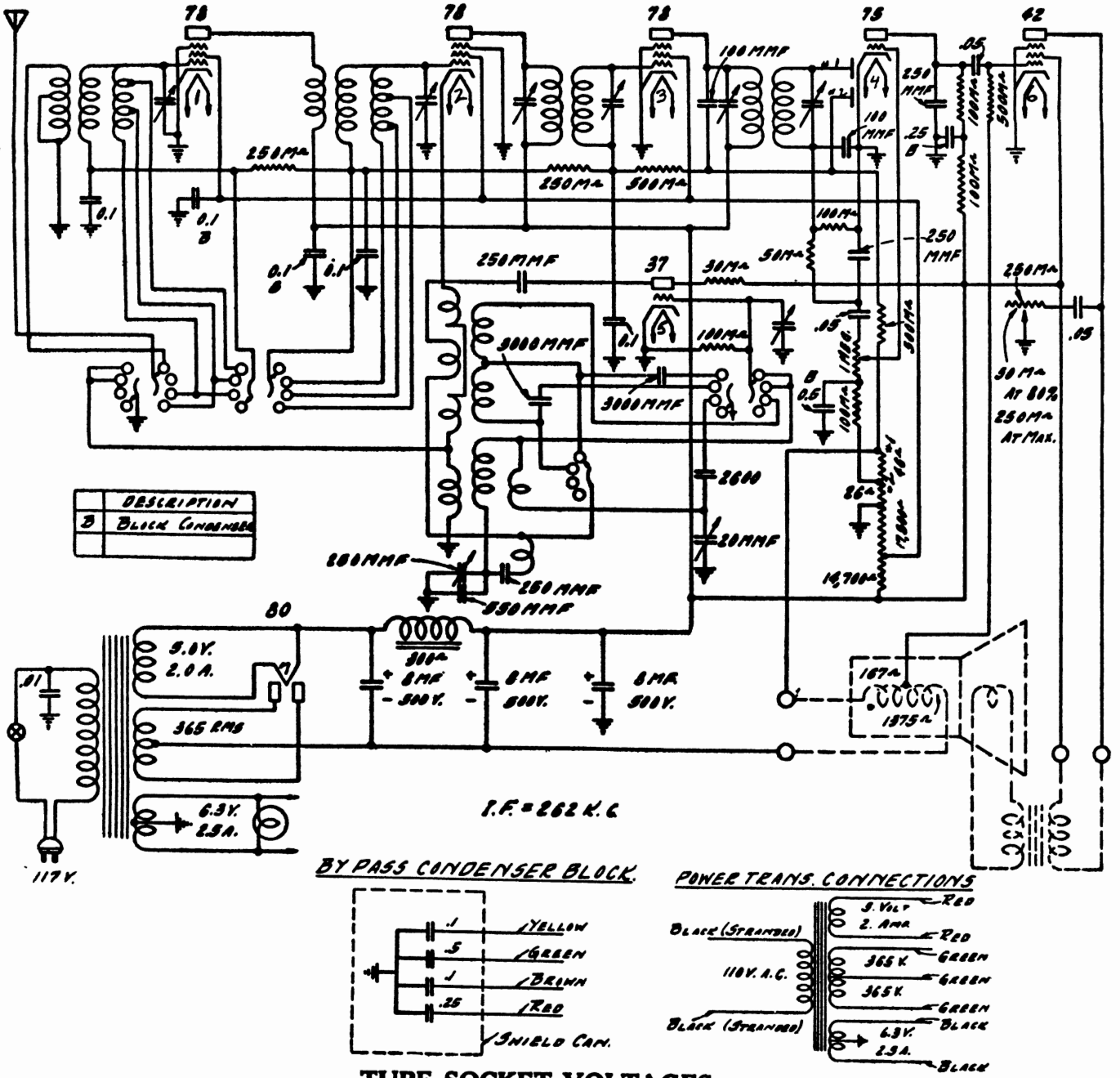
*Terminal No. 5 on candohm to ground.

**Terminal No. 6 on candohm to ground.

DETROLA RADIO CORP.

DETROLA RADIO CORP.

Model 7A

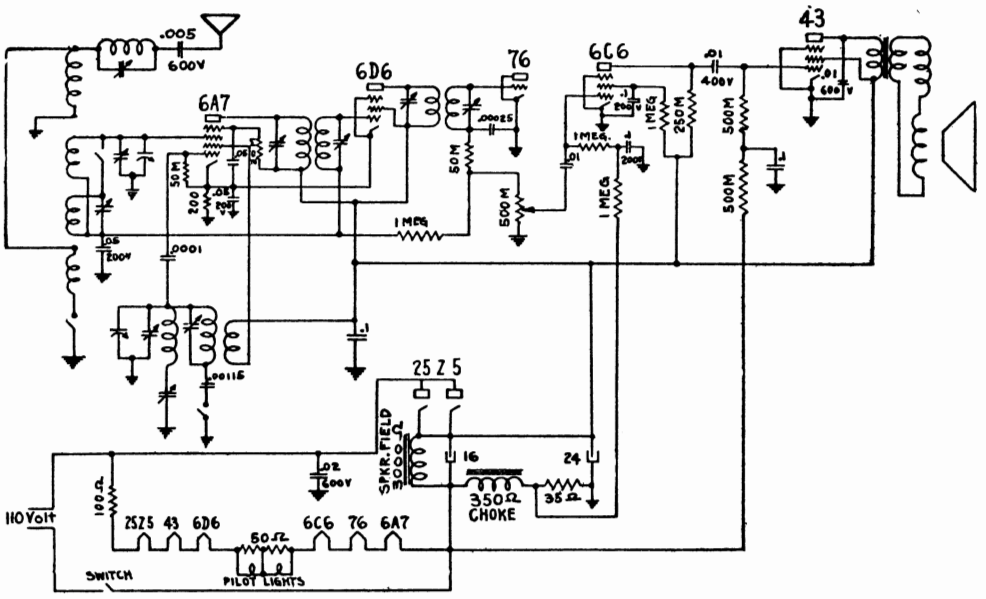


TUBE SOCKET VOLTAGES

Tube No.	Heater to Cathode Voltage	Control Grid to Cathode Voltage	Screen to Cathode Voltage	Plate to Cathode Voltage	Plate MA	Heater or Fil. Voltage
1—R. F.	0	4.5*	100	250	6.0	6.3
2—1st Det.	0	4.5*	100	250	6.0	6.3
3—I. F.	0	4.5*	100	250	6.0	6.3
4—2nd Det. AVC	0	2.0**	0	125	.75	6.3
5—Osc.	0	2.6	0	95	5.5	6.3
6—Audio	0	20.0	250	225	31.0	6.3
7—Rect.	0				32 per plate	5.0

Voltage reading taken with 1000 ohm per volt meter using test prods. All tubes in sockets, Ant. ground to chassis, no signal.
*Voltage from ground to terminal No. 1 ON THE VOLTAGE DIVIDER.
**Voltage from ground to terminal No. 2 ON THE VOLTAGE DIVIDER.

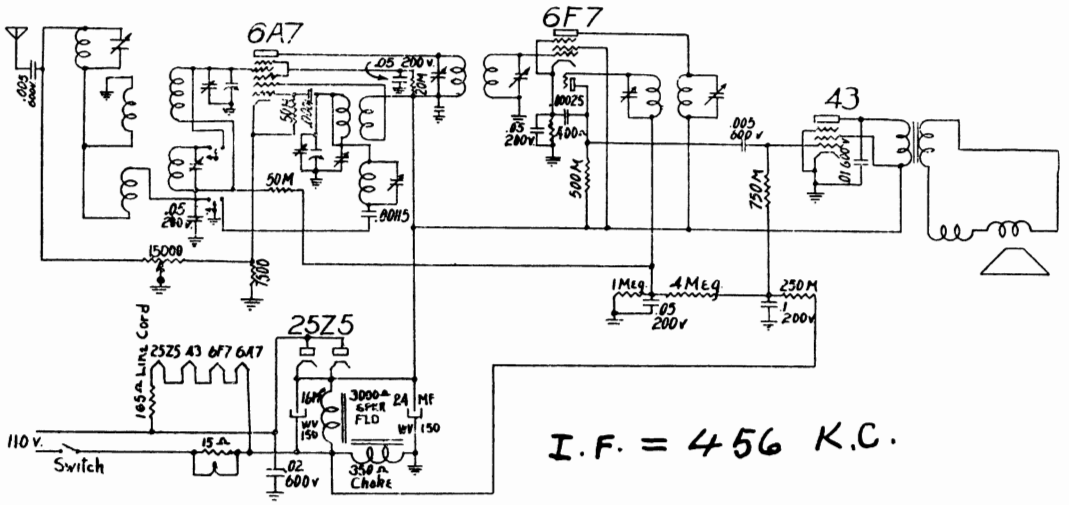
DETROLA RADIO CORP.



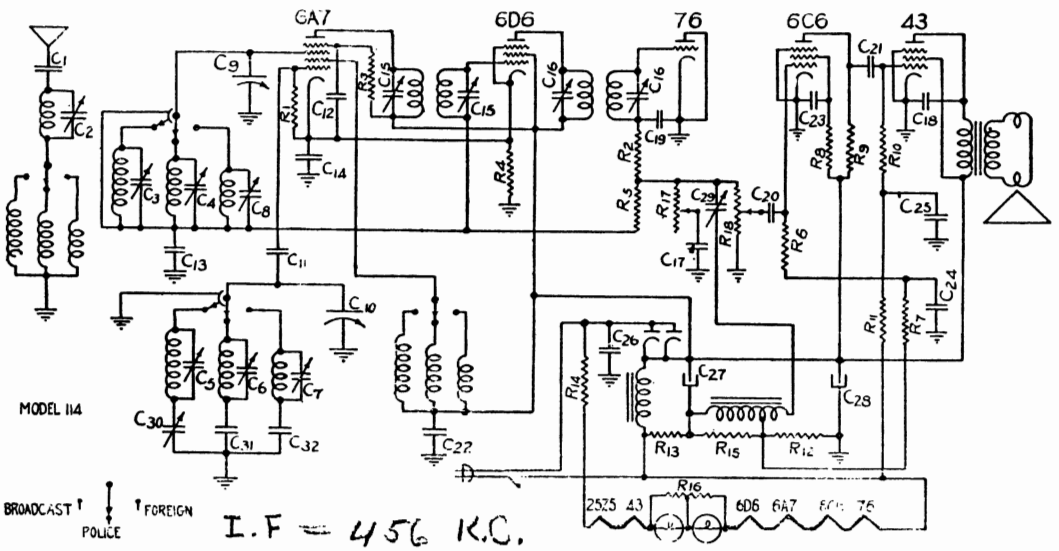
Model 100

I.F = 456 K.C.

Model 100-A



I.F. = 456 K.C.

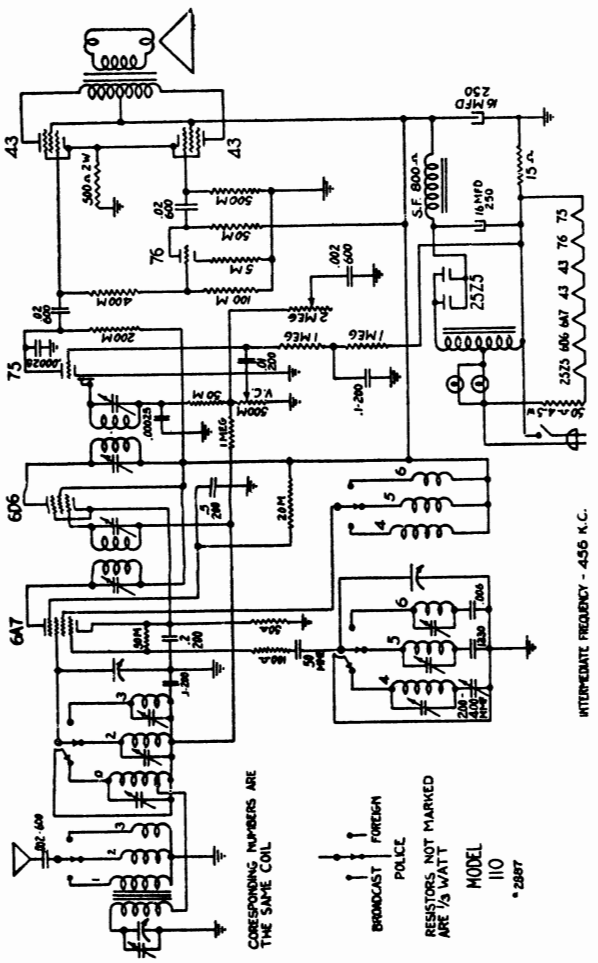


Model 114

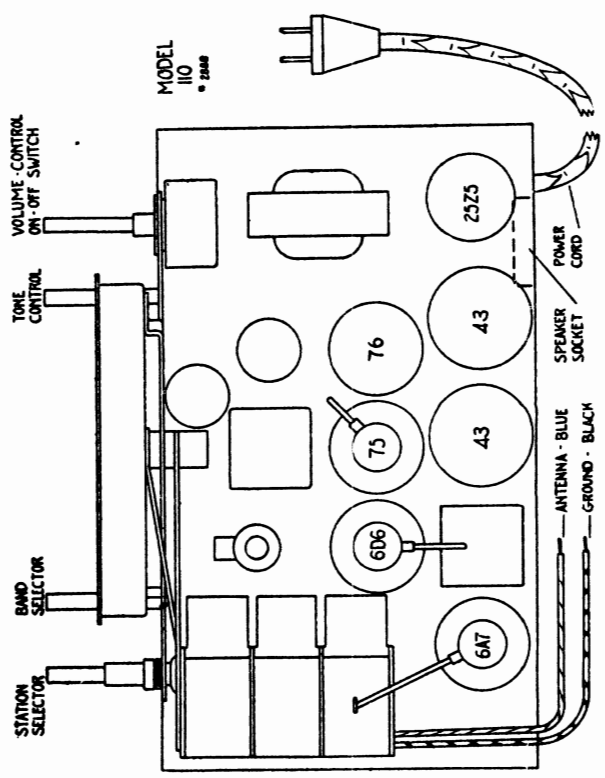
I.F = 456 K.C.

DETROLA RADIO CORP.

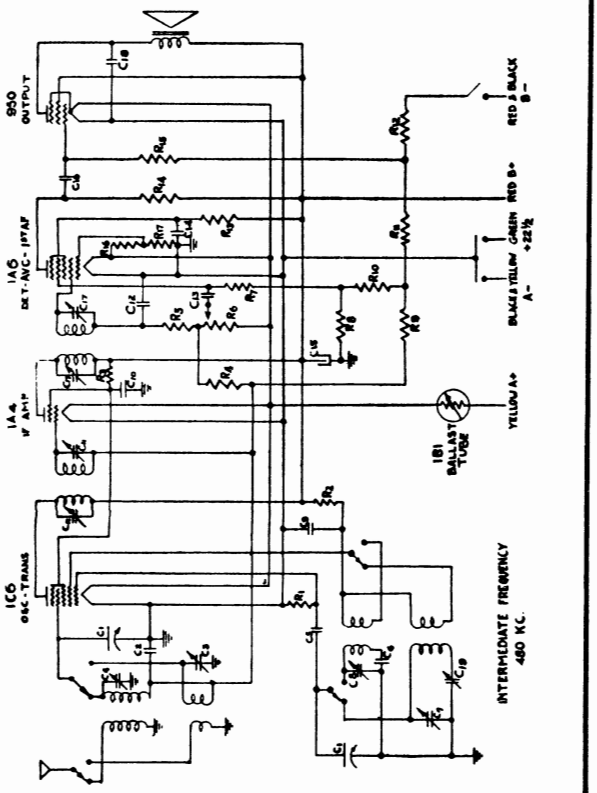
Model 110



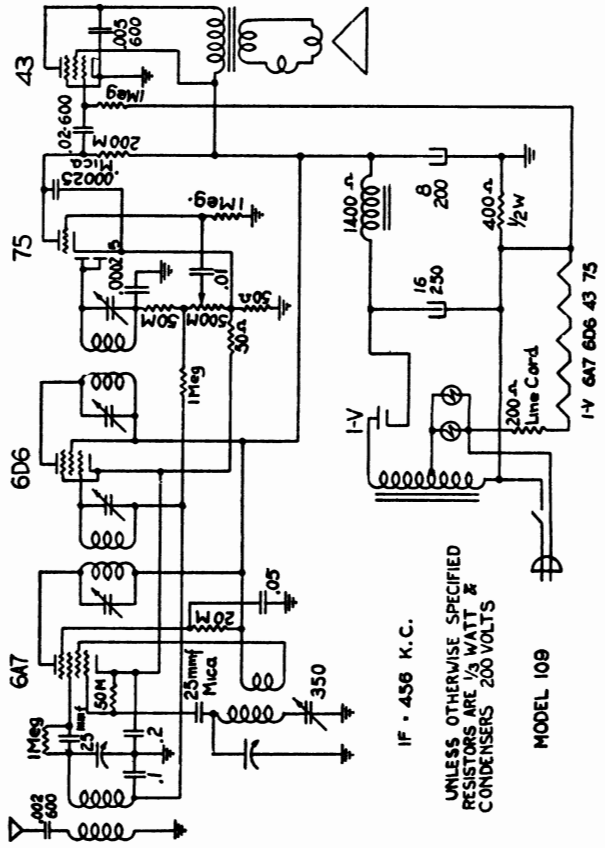
TUBE LAYOUT



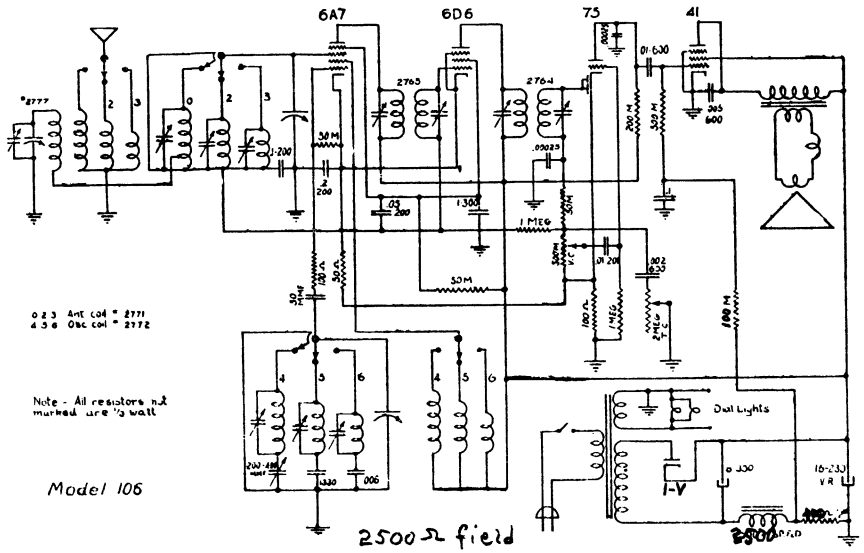
Model 103



Model 109

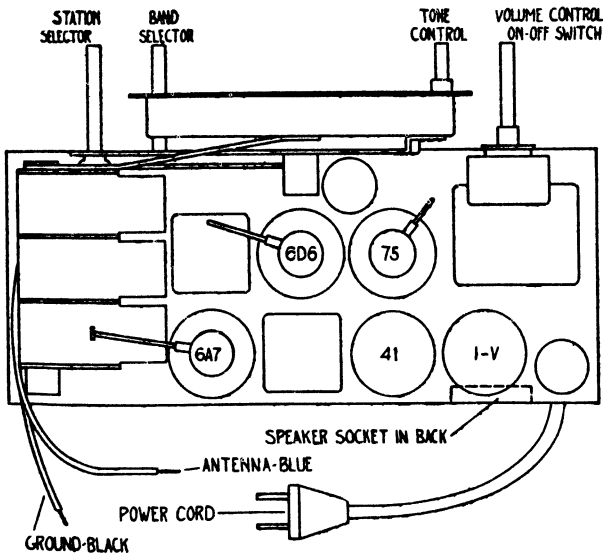


CIRCUIT DIAGRAM — MODEL 106

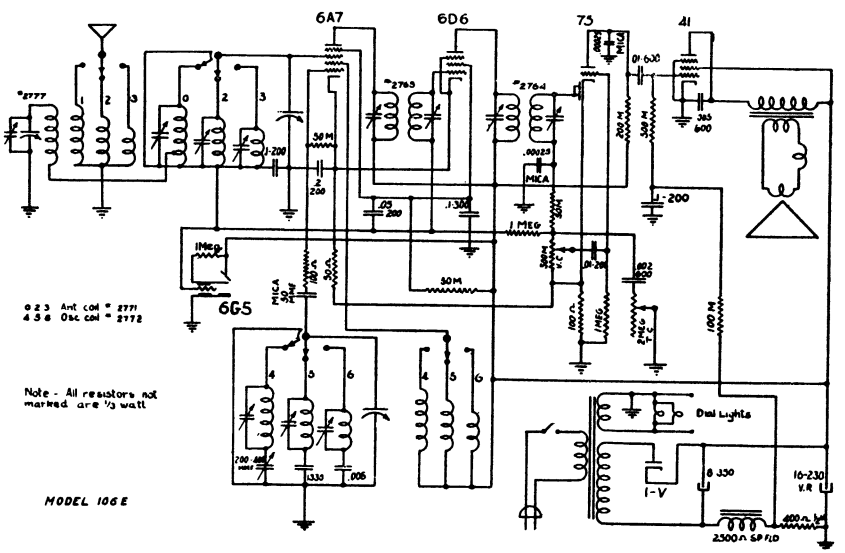


I.F. = 456 K.C.

TUBE LAYOUT CHART — MODEL 106

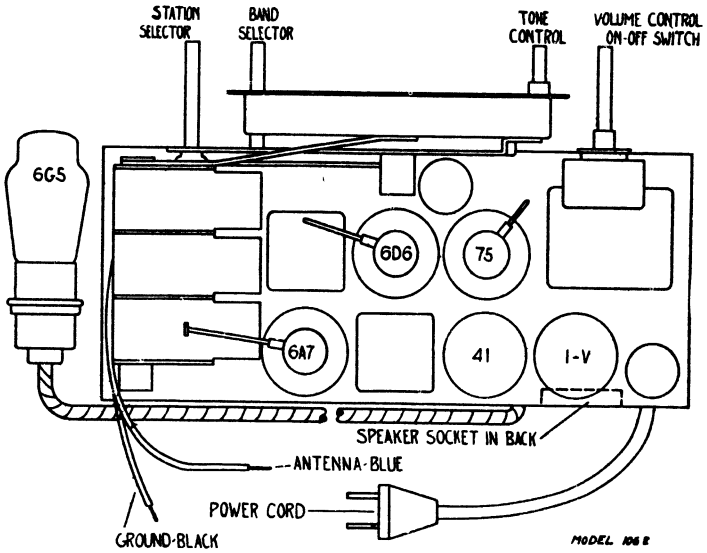


CIRCUIT DIAGRAM — MODEL 106 E



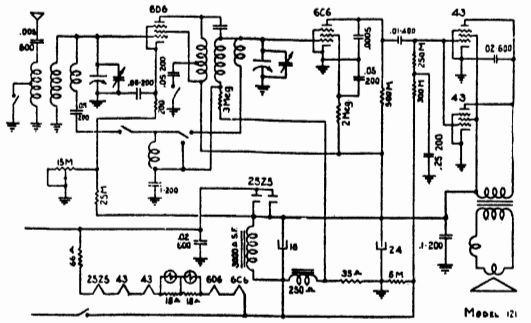
I.F. = 456 KC

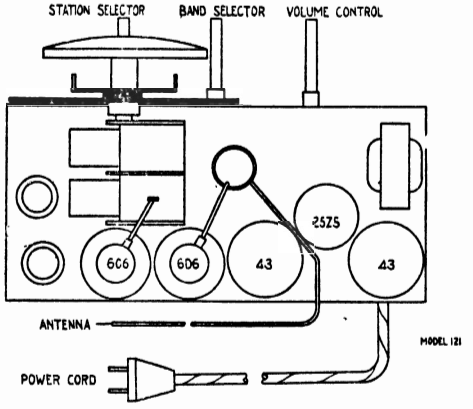
TUBE LAYOUT CHART — MODEL 106 E



DETROLA RADIO CORP.

Model 121





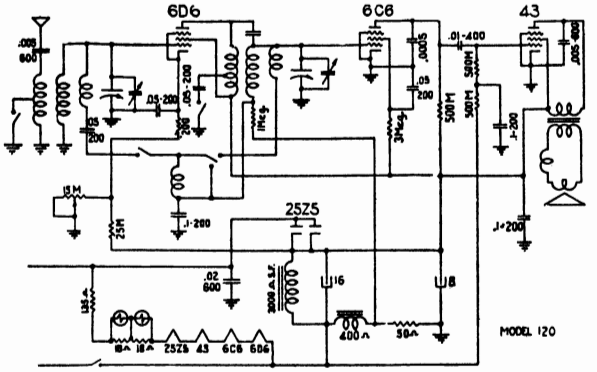
OPERATION INSTRUCTIONS

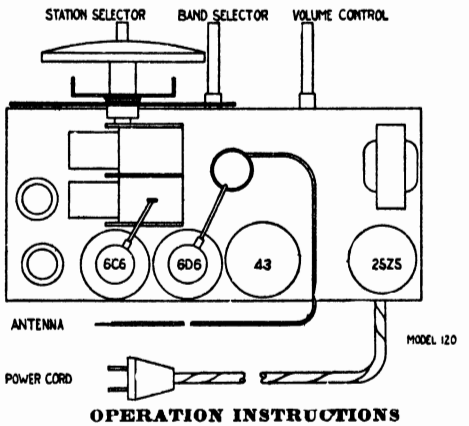
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated. Set band switch either to right or left position, depending on class of reception desired. In left hand position, broadcast stations on frequencies between 540 and 1600 K.C. will be received. When the band switch is set to the right hand position, short wave stations operating on wave lengths from 75 to 200 meters will be heard. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left. The following tubes are used in this receiver:

1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
2—No. 43 Power Output
1—No. 25Z5 Rectifier

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

Model 120





OPERATION INSTRUCTIONS

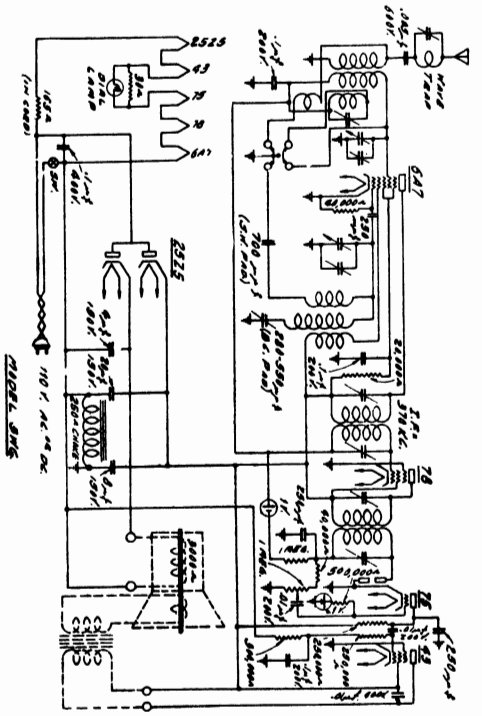
This receiver is designed to operate on 105 to 125 volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in socket as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated. Set band switch either to right or left position, depending on class of reception desired. In left hand position, broadcast stations on frequencies between 540 and 1600 K.C. will be received. When the band switch is set to the right hand position, short wave stations operating on wave lengths from 75 to 200 meters will be heard. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left. The following tubes are used in this receiver:

1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
1—No. 43 Power Output
1—No. 25Z5 Rectifier

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

Model 5WG

I.F. = 370 K.C.



OPERATING INSTRUCTIONS

This receiver is designed to operate on 105-125 Volt, direct or alternating current. Do not connect to any other source unless designated on the instruction card. When operating on direct current, if receiver fails to operate, reverse the attachment cord plug in the socket. The aerial furnished with the receiver should be strung around the picture moulding or under the rug. Under normal operating conditions the aerial furnished is sufficient.

SERVICE NOTES

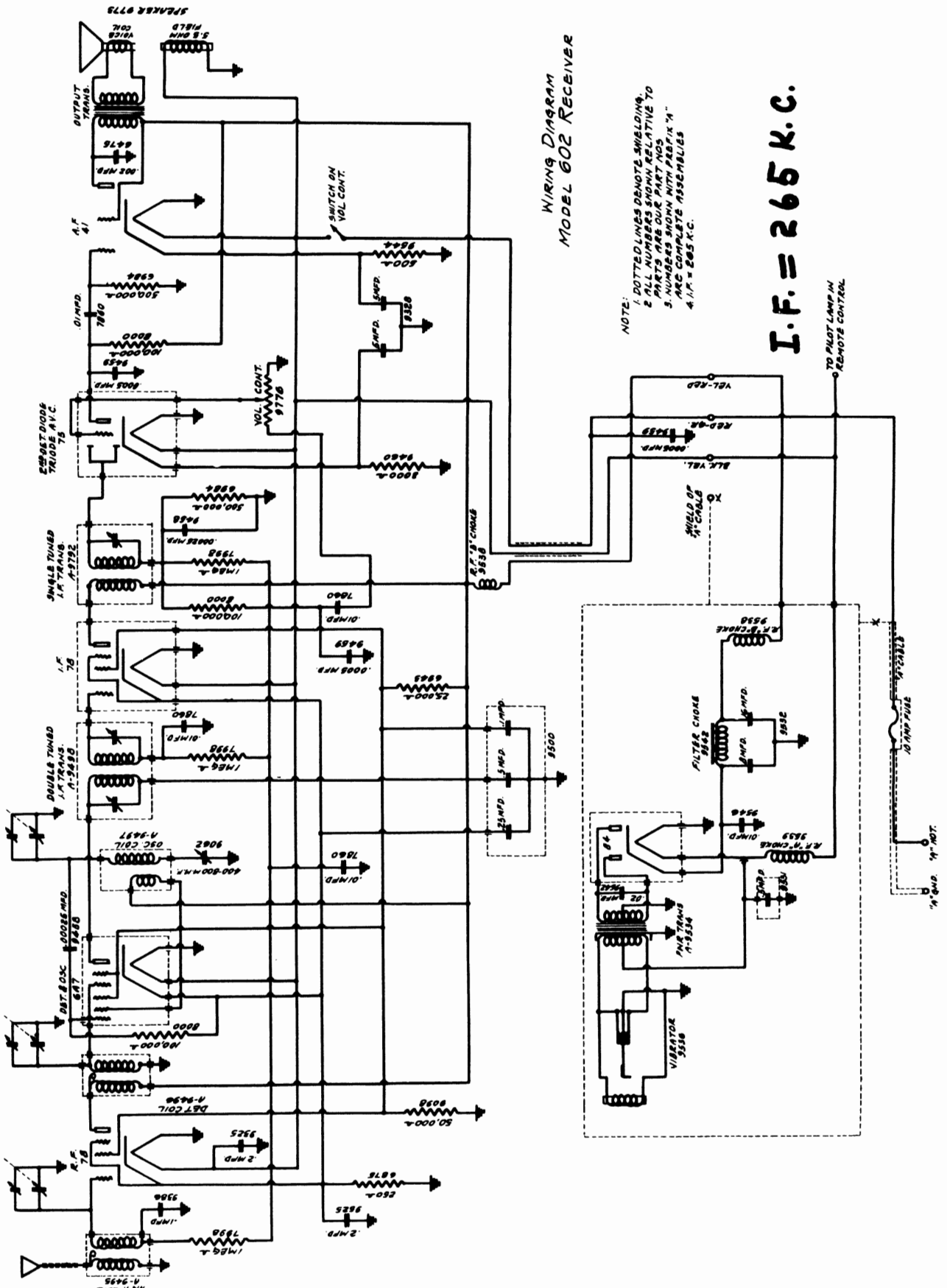
This receiver is designed for reception on the broadcast band covering frequencies from 550 to 1500 Kc., and on the short wave band from 1.5 to 4.2 MC. To check the I. F. Alignment, set test oscillator to 370 KC and connect to control grid of 6A7 tube. This set is equipped with automatic volume control and it will be necessary to attenuate the output from the oscillator so that it will not operate the automatic volume control. To check alignment of the R. F. circuits, connect oscillator to the antenna and set both oscillator and receiver to 1400 KC and adjust trimmers on tuning condenser for maximum output. The short wave trimmer condenser is mounted underneath the chassis and is adjusted with the receiver and test oscillator set on 3.5 MC.

The following tubes are used in this receiver: one 6A7 Detector Qscillator; one 78 I. F. Amplifier; one 75 Second Detector and Audio; one 43 Power Amplifier; one 25Z5 Full Wave Rectifier.

If for any reason this receiver should fail to operate properly, we suggest that you return it to the dealer from whom it was purchased for service.

ELECTRICAL RESEARCH LABS.

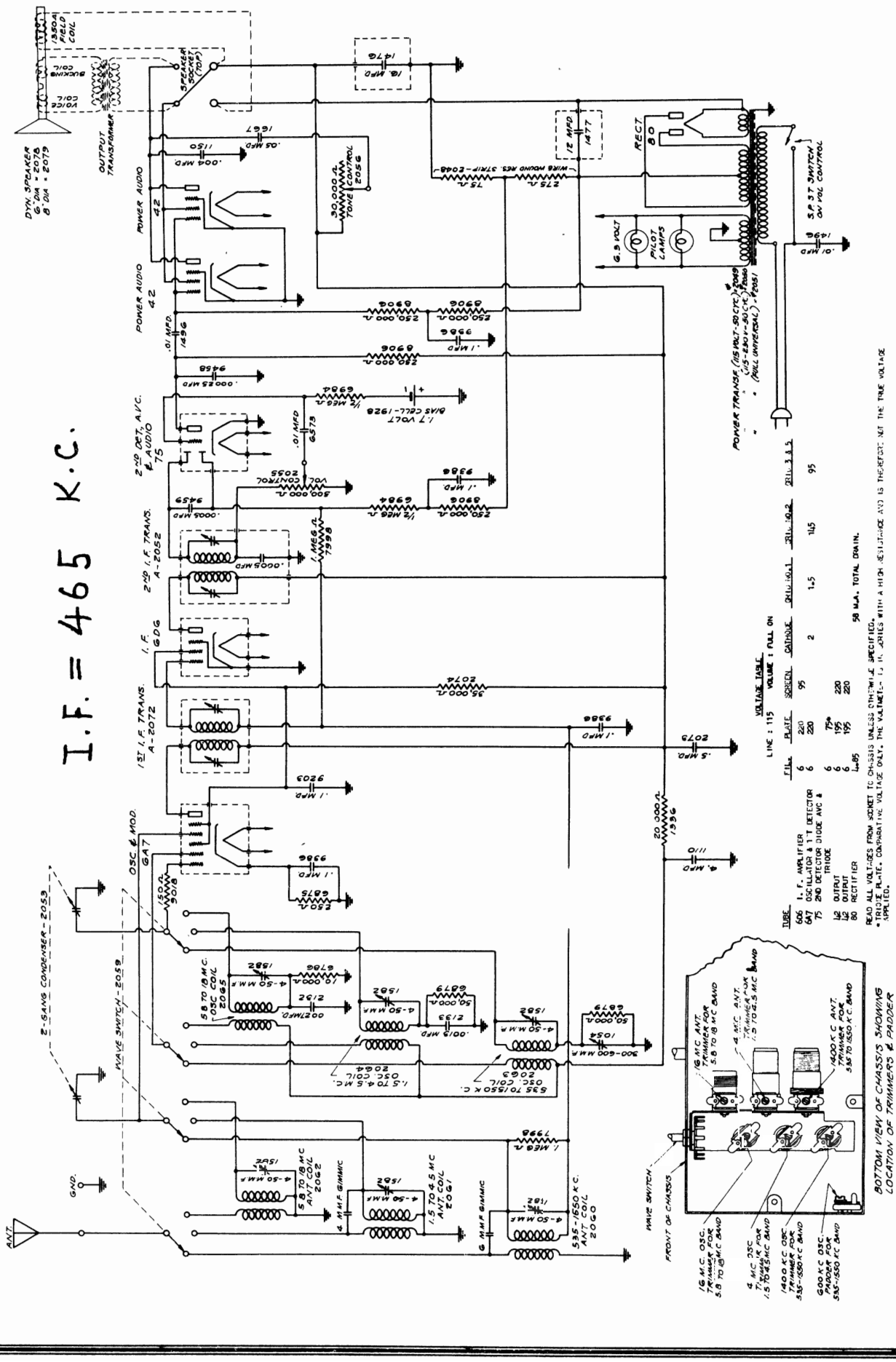
Model 6-Tube Super Car Set



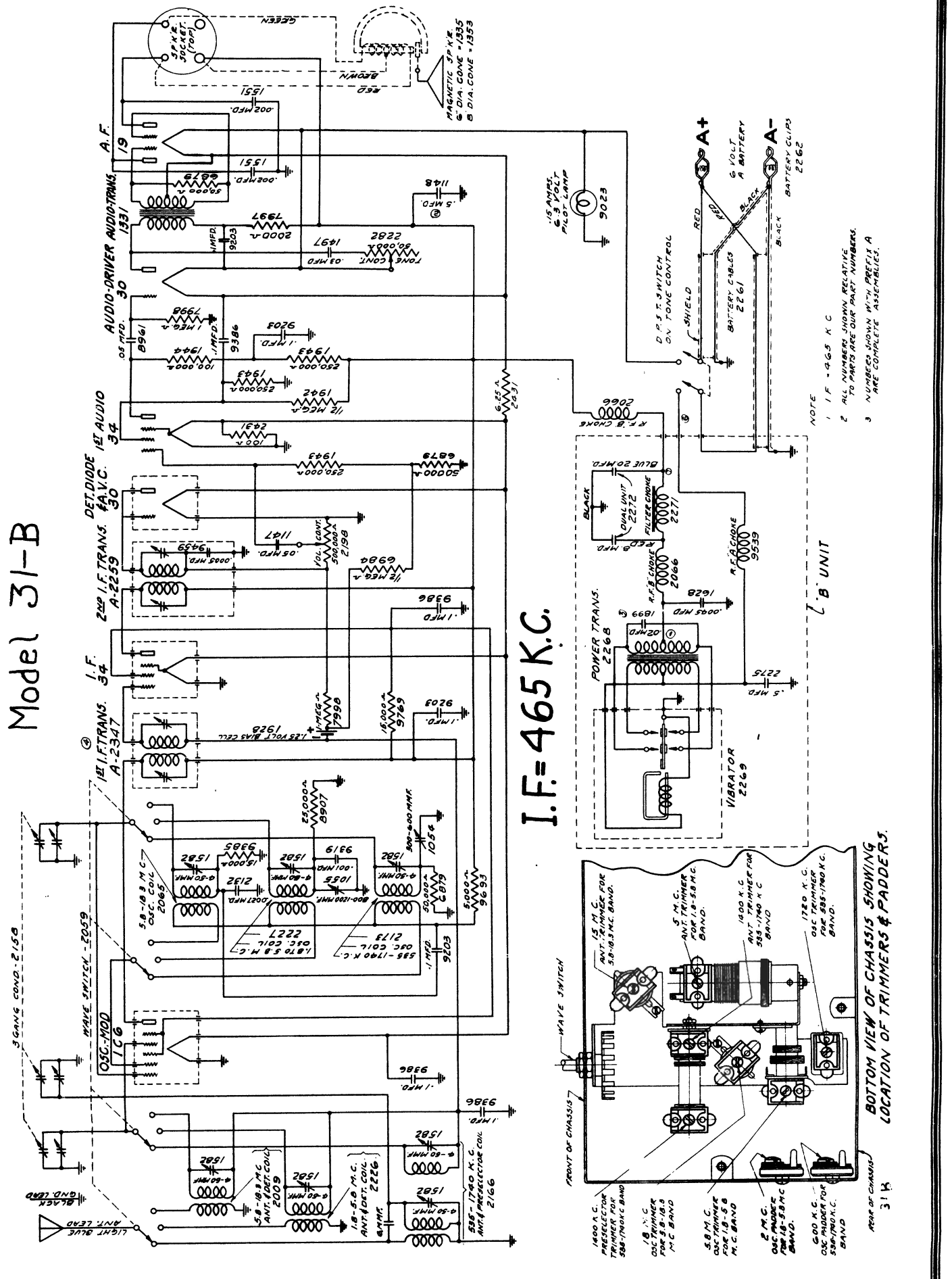
ELECTRICAL RESEARCH LABS.

Model 19-A

I.F. = 465 K.C.

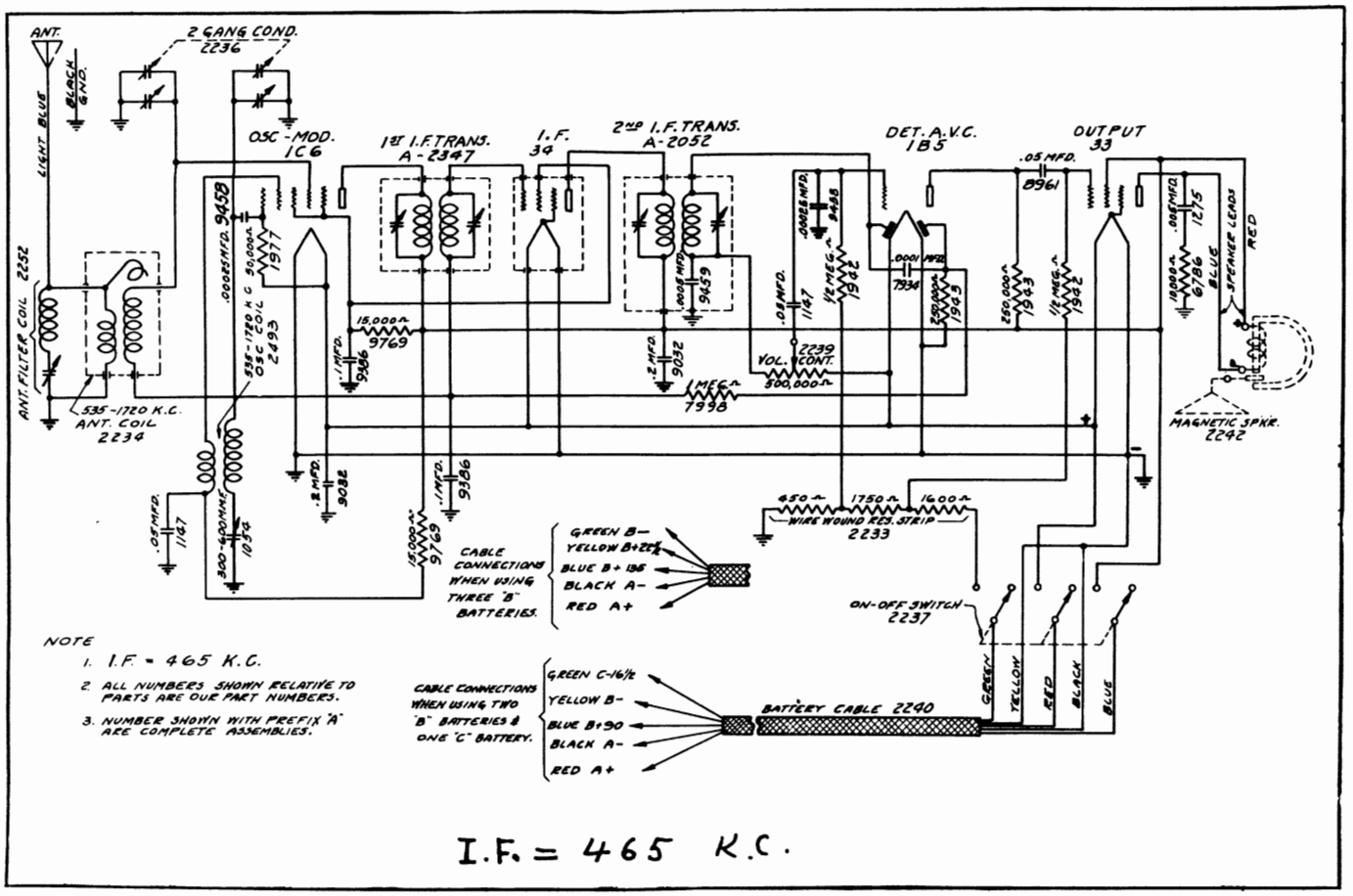


ELECTRICAL RESEARCH LABS.



ELECTRICAL RESEARCH LABS.

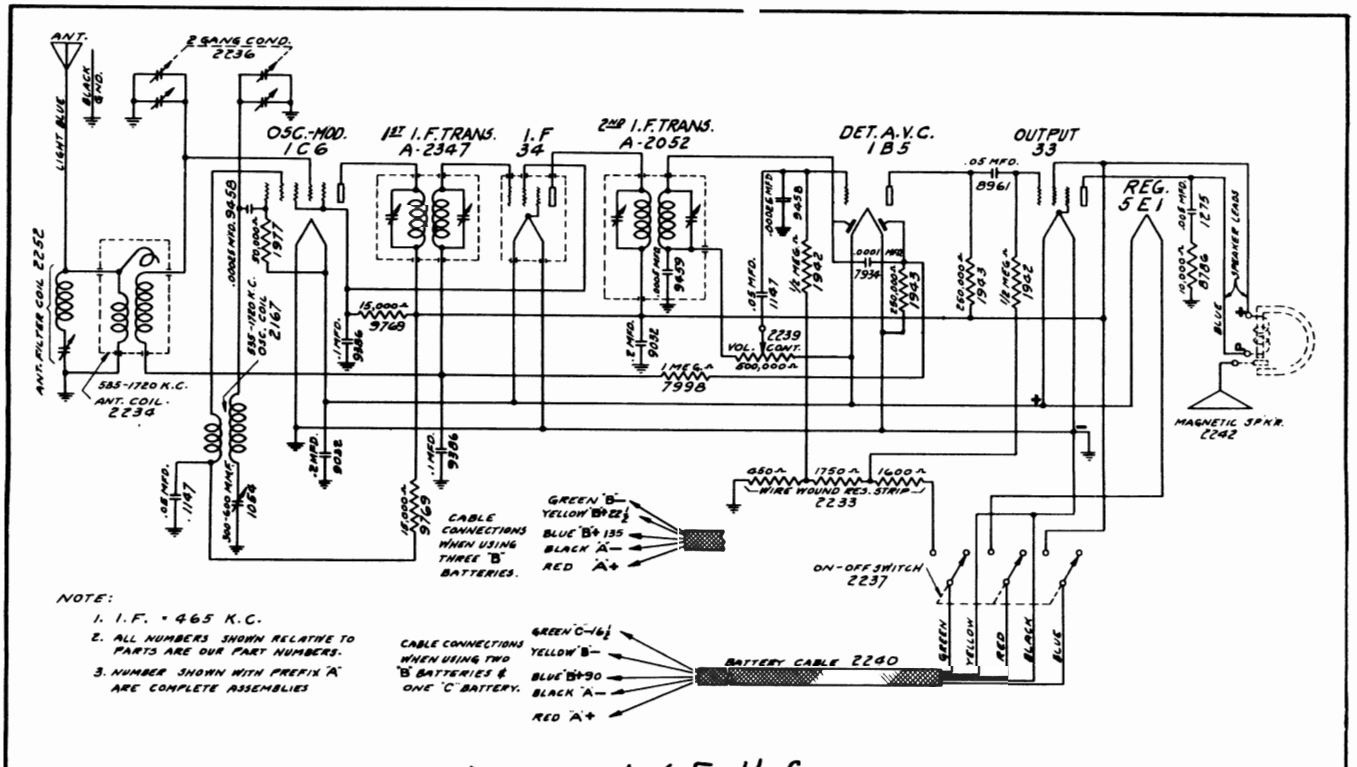
Model 32-B



NOTE
1. I.F. = 465 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBER SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

I.F. = 465 K.C.

Model 37-B

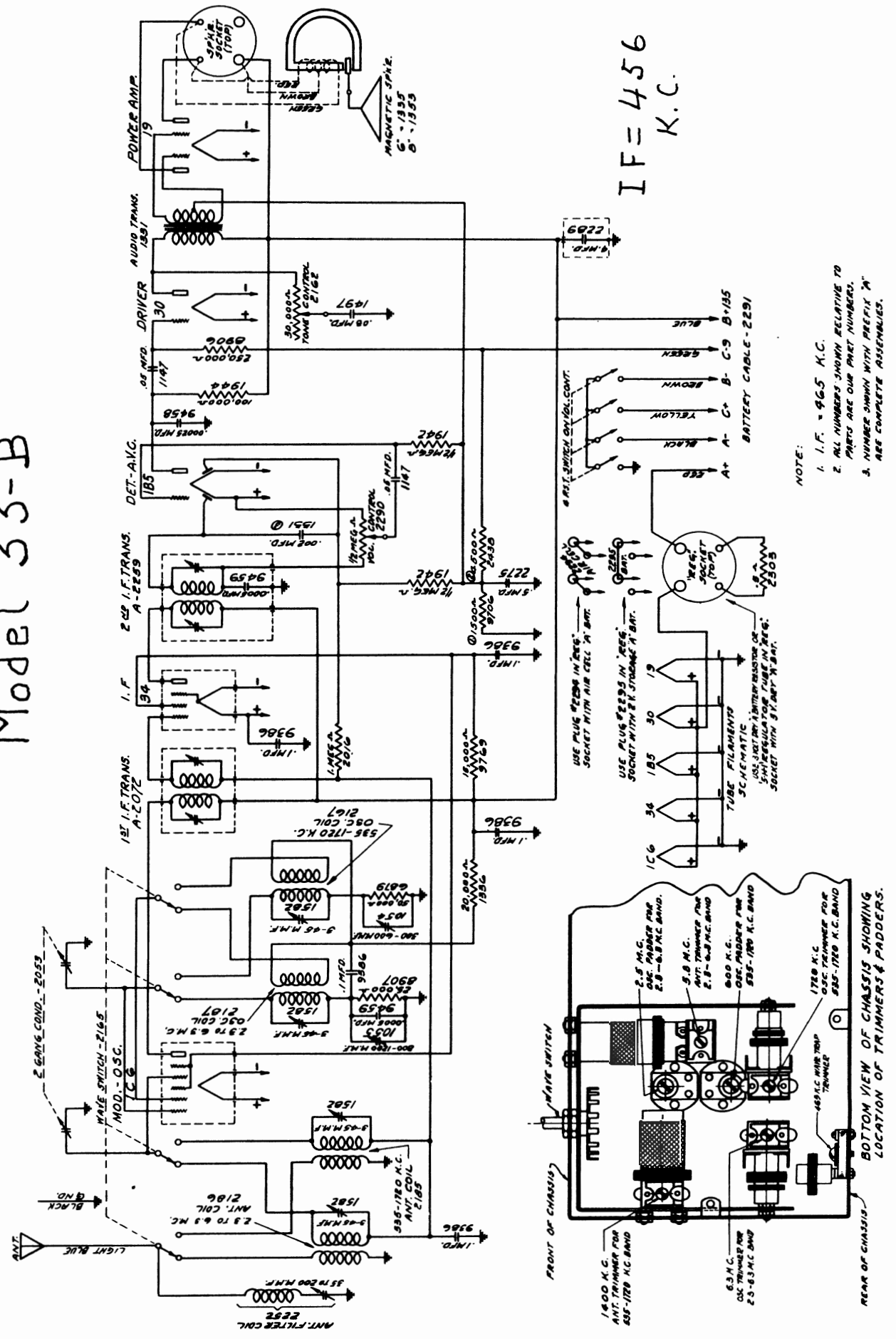


NOTE:
1. I.F. = 465 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBER SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES

I.F. = 465 K.C.

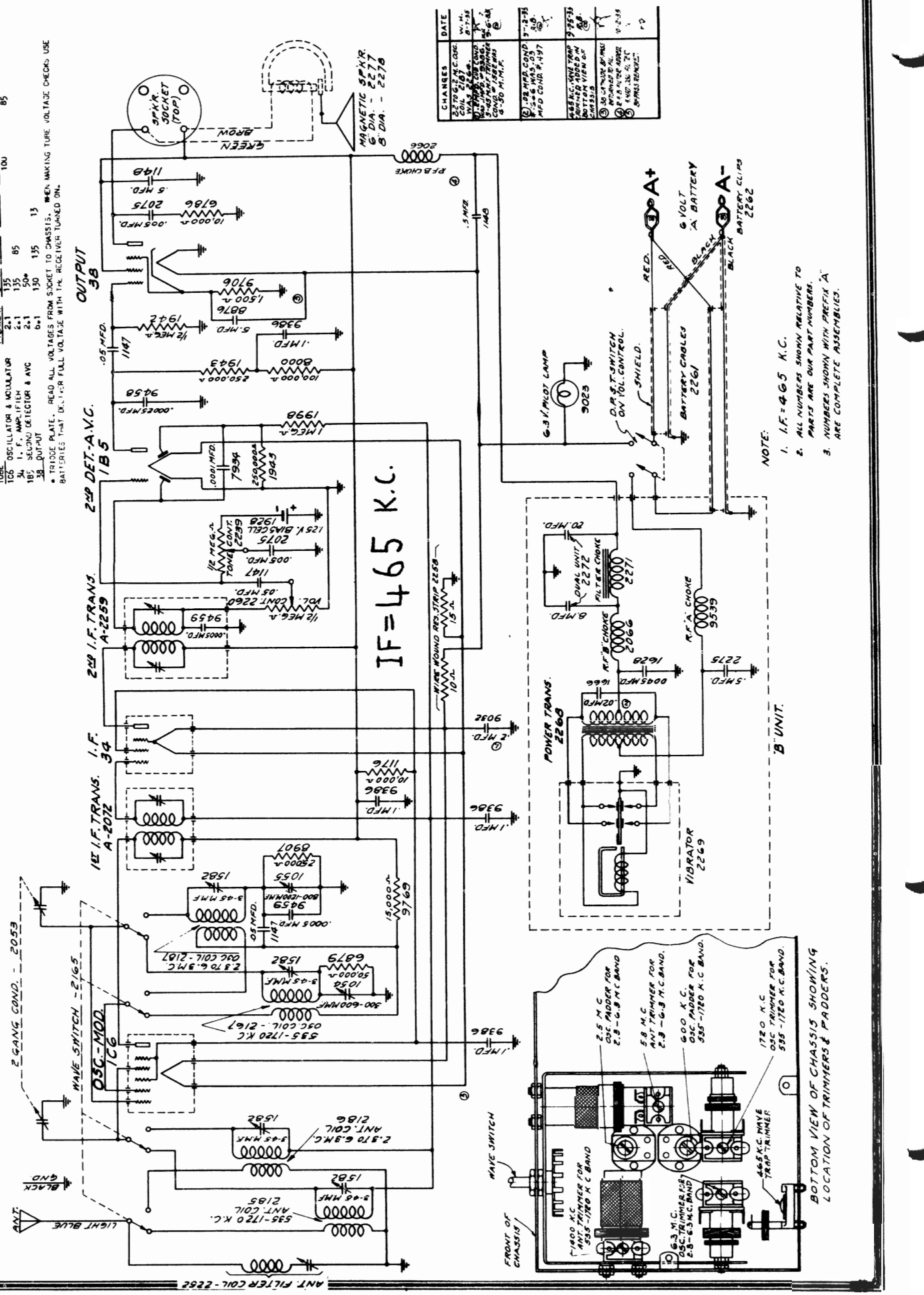
ELECTRICAL RESEARCH LABS.

Model 33-B


IF = 456 K.C.
POWER AMP. 19
AUDIO TRANS. 1931
DRIVER 30
DET.-A.V.C. 185
2 nd I.F. TRANS. A-2259
1st I.F. TRANS. A-2072
I.F 34
MOD.-OSC. 1C6
2 GANG COND.-2053
WAVE SWITCH-2165
ANT.
BLACK
LIGHT BLUE
ANT. FILTER COIL 2222
ANT. COIL 2186
OSC. COIL 2167
MAGNETIC SPKR. G - 1355 S - 1353
SPKR. SOCKET (TOP)
BROWN RED
.05 MFD. 1147
.00025 MFD. 9458
250,000Ω 6806
100,000Ω 1944
30,000Ω TONE CONTROL 2162
.08 MFD. 1497
.00025 MFD. 1551
.2 MEG. VOL. CONTROL 2290
.05 MFD. 1147
12 MEG. Ω 1942
.0002 MFD. 9459
.1 MFD. 9386
1.5 MEG. 2016
15,000Ω 3769
20,000Ω 1956
25,000Ω 6819
.0005 MFD. 1034
.00025 MFD. 1033
23,000Ω 8907
.00025 MFD. 1582
3-45 M.M.F.
380-600 M.M.F.
800-1500 M.M.F.
535-1720 K.C.
2378 to 6.3 M.C.
2.3 to 6.3 M.C.
35 to 200 M.M.F.
.1 MFD. 9386
.5 MFD. 2275
12 MEG. Ω 1942
2500Ω 2438
1500Ω 9504
.8Ω 2305
.1 MFD. 9386
.1 MFD. 9386
.1 MFD. 9386

ELECTRICAL RESEARCH LABS.

Model 34-B



BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDERS.

TUBE		FILAMENT	PLATE	SCREEN	CATHODE	GRID NO. 2	GRID NO. 3 AND S
1C6	OSCILLATOR & MODULATOR	2.1	135			100	85
34	I. F. AMPLIFIER	2.1	135	85			
1B5	SECOND DETECTOR & AVC	2.1	50*				
38	OUTPUT	6.1	130	135	13		

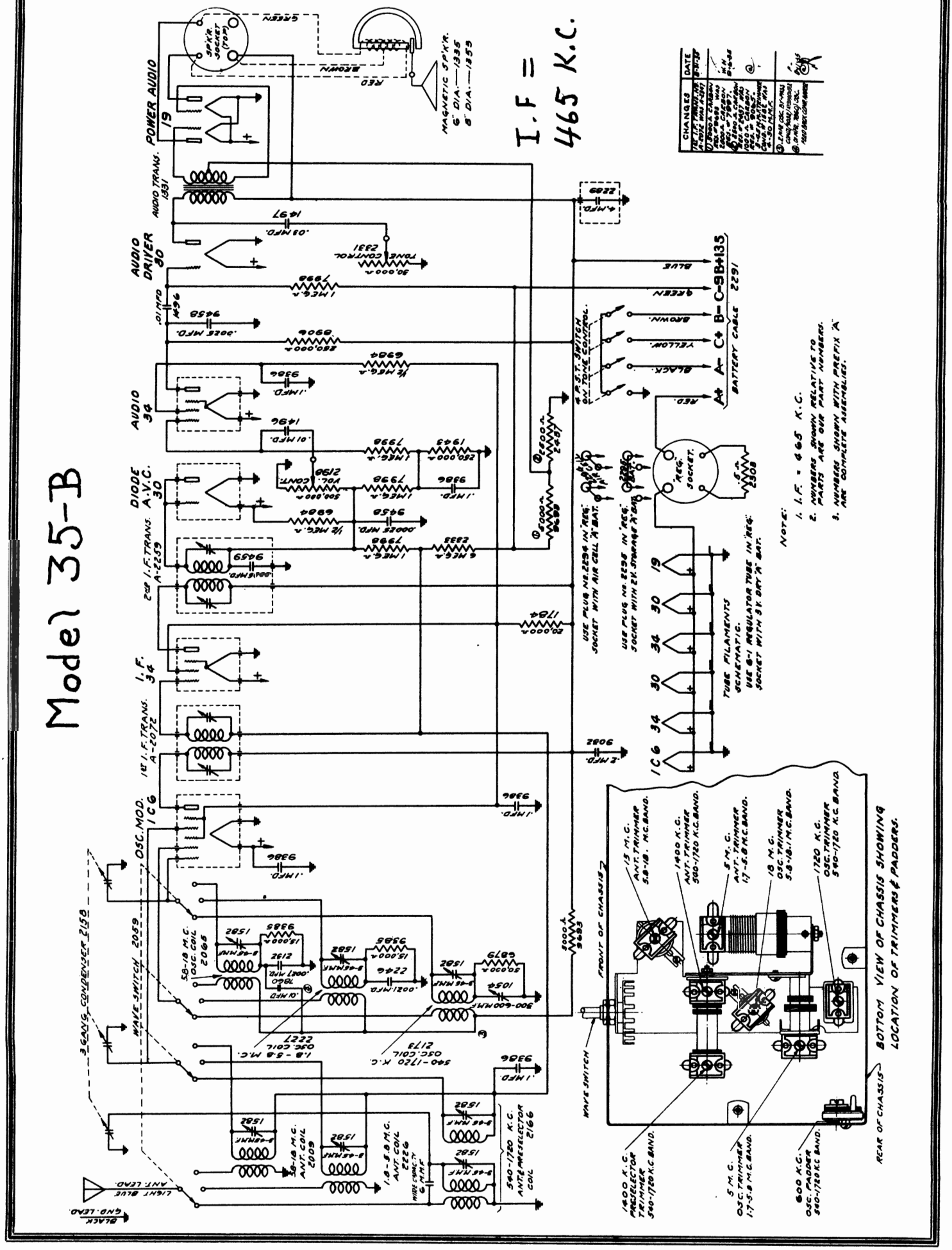
* TRIODE PLATE. READ ALL VOLTAGES FROM SOCKET TO CHASSIS. WHEN MAKING TUBE VOLTAGE CHECKS USE BATTERIES THAT DELIVER FULL VOLTAGE WITH THE RECEIVER TUNED ON.

CHANGES	DATE
2.2 TO 6.2 M.C. OSC. COIL 2187.	W.H. 9-7-35
(1) 100 MMF. CONDENSER ADDED ACROSS 2.5 M.C. PADDER COIL 2183 & 350 M.M.F.	9-6-35
(2) .02 MFD. CONDENSER 1.5 MEG. RESISTOR ADDED MFD CONDS. #1497	9-7-35
465 K.C. WAVE TRAP COIL ADDED ON BOTTOM VIEW OF CHASSIS	9-25-35
(3) 30 MMF. MICA CONDENSER ADDED ACROSS 2.5 M.C. PADDER	10-2-35
(4) 2.5 HENRY CHOKE 4 MFD. 25 VOLT ELECTROLYTIC BYPASS REMOVED	10-2-35

NOTE:
1. I.F. = 465 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

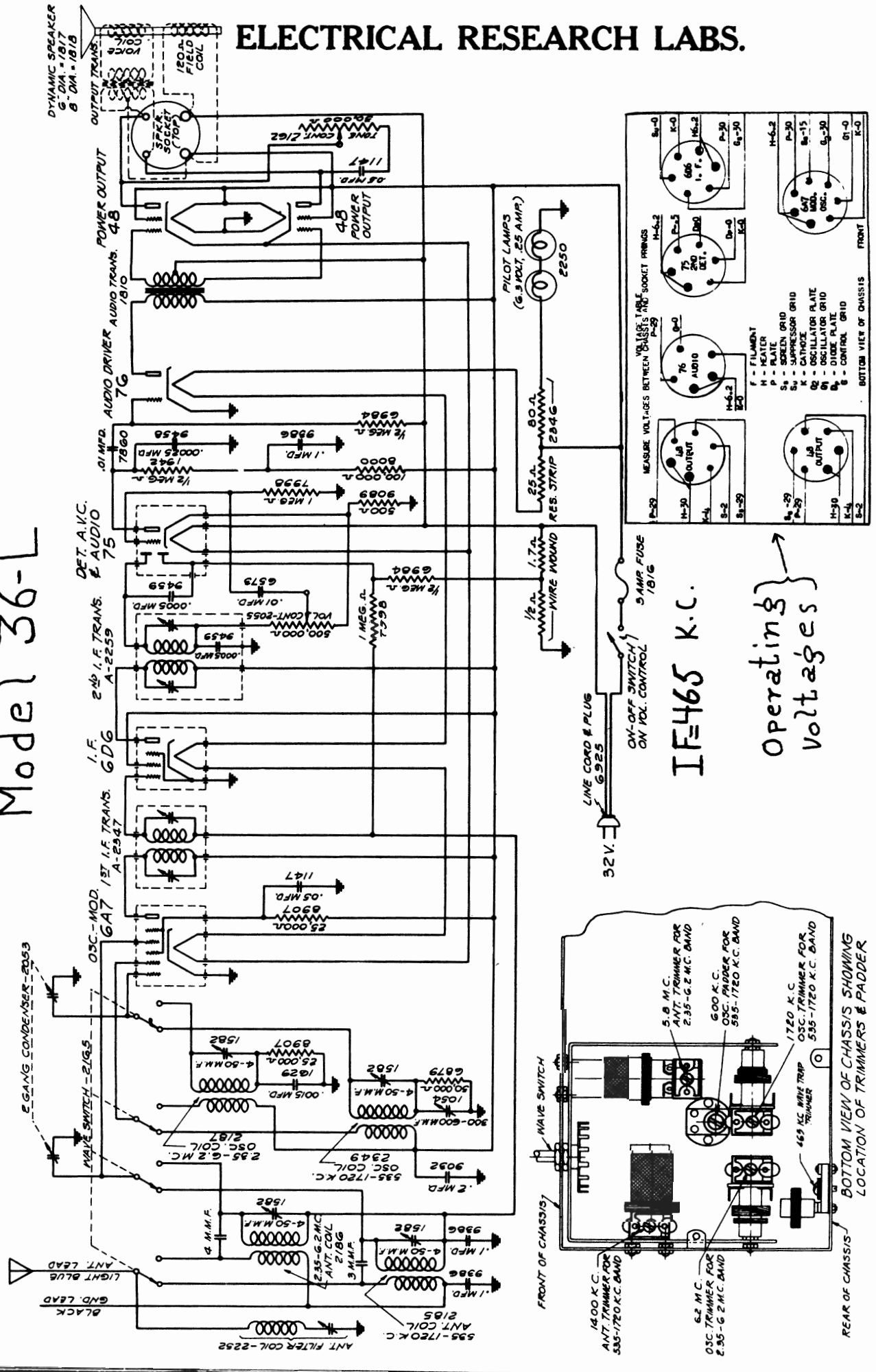
ELECTRICAL RESEARCH LABS.

Model 35-B



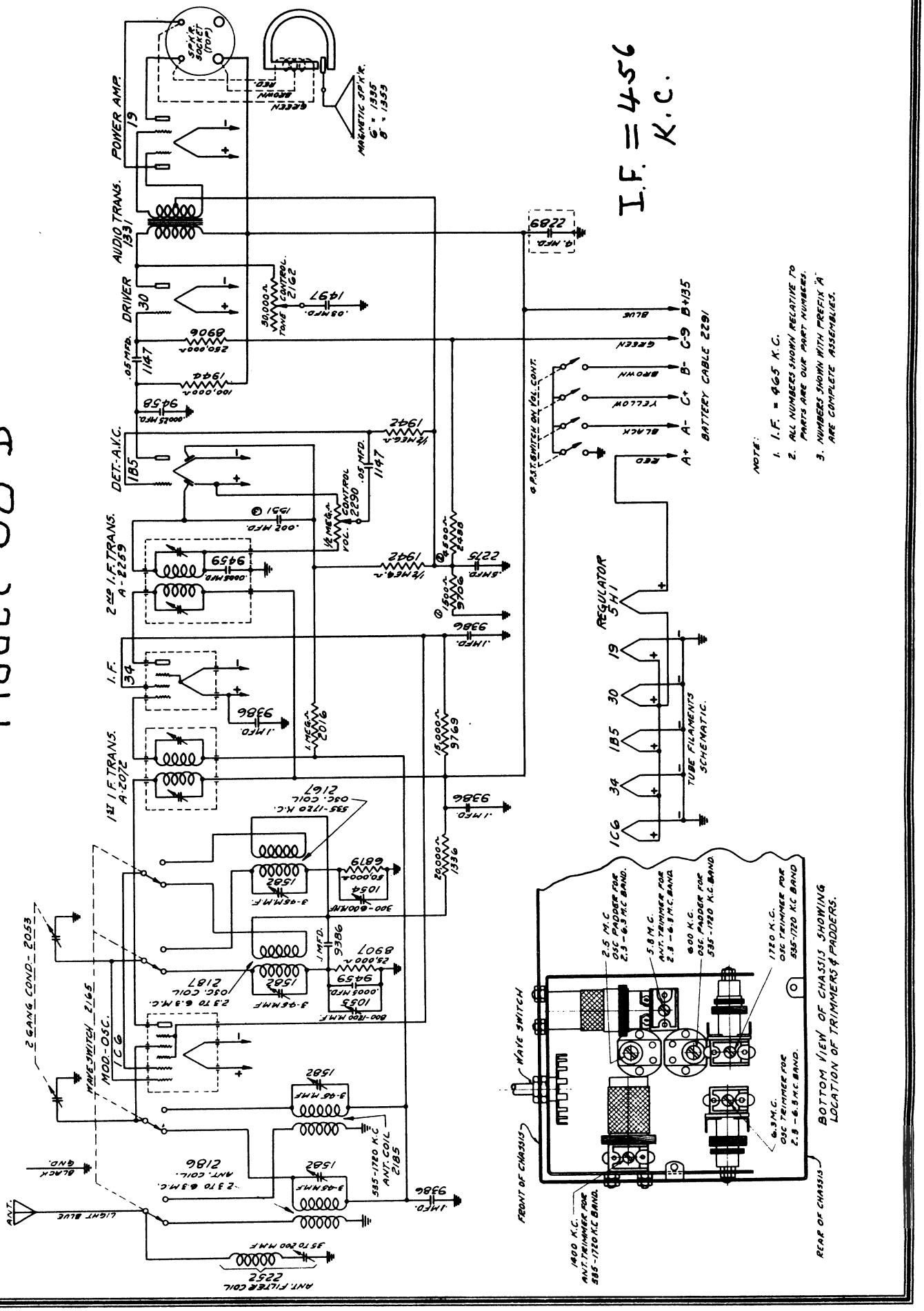
ELECTRICAL RESEARCH LABS.

Model 36-L

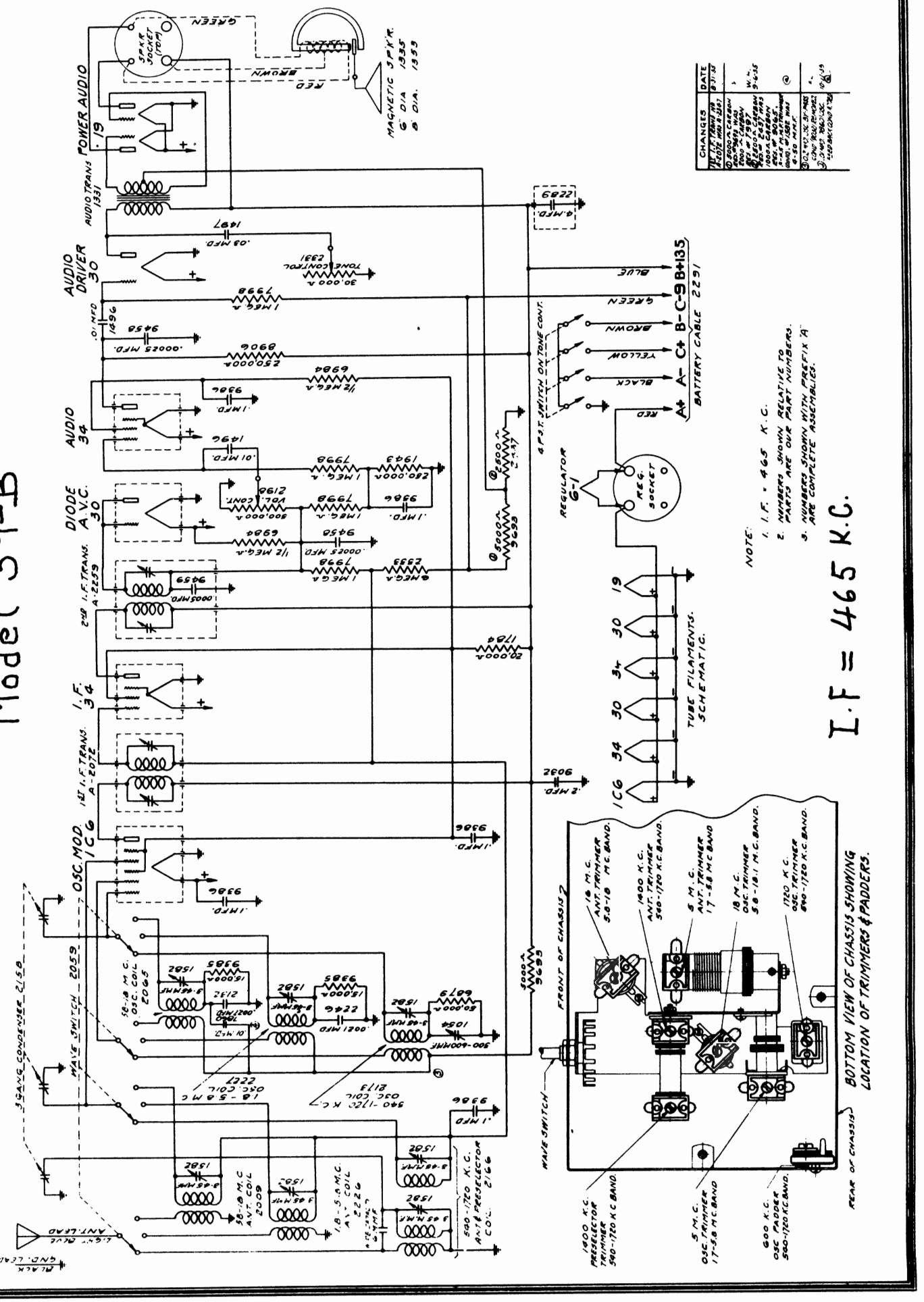


ELECTRICAL RESEARCH LABS.

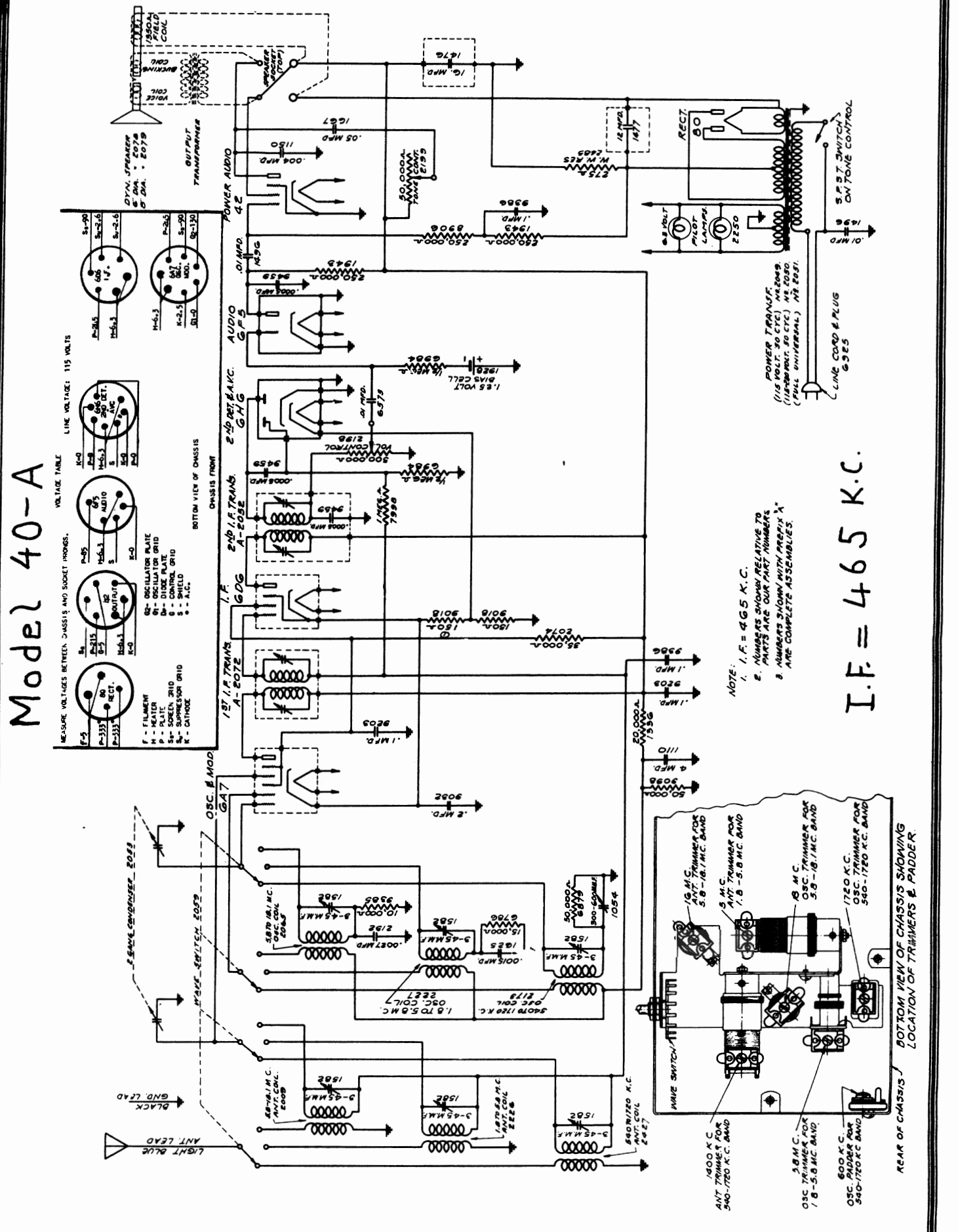
Model 38-B



ELECTRICAL RESEARCH LABS.

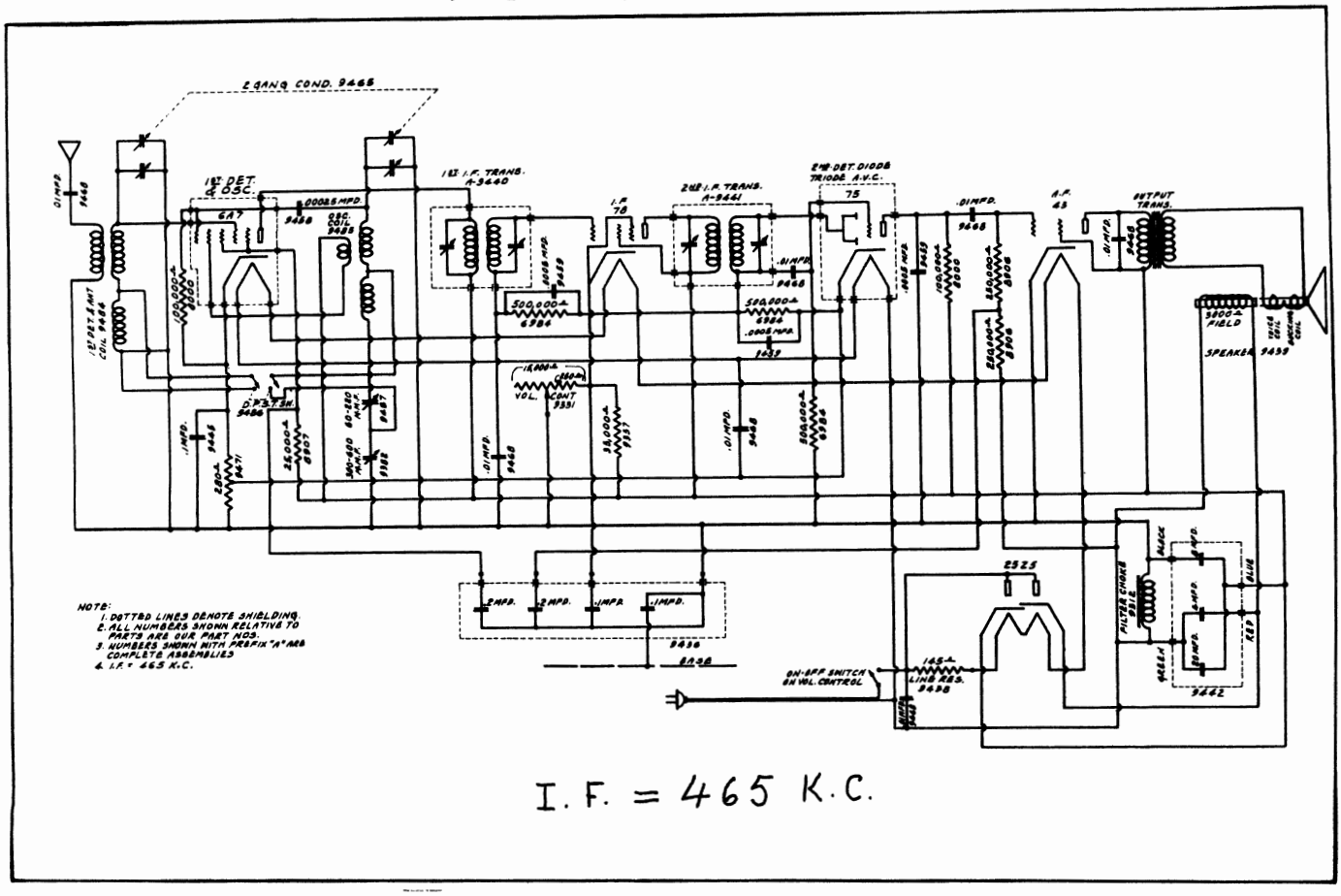


ELECTRICAL RESEARCH LABS.



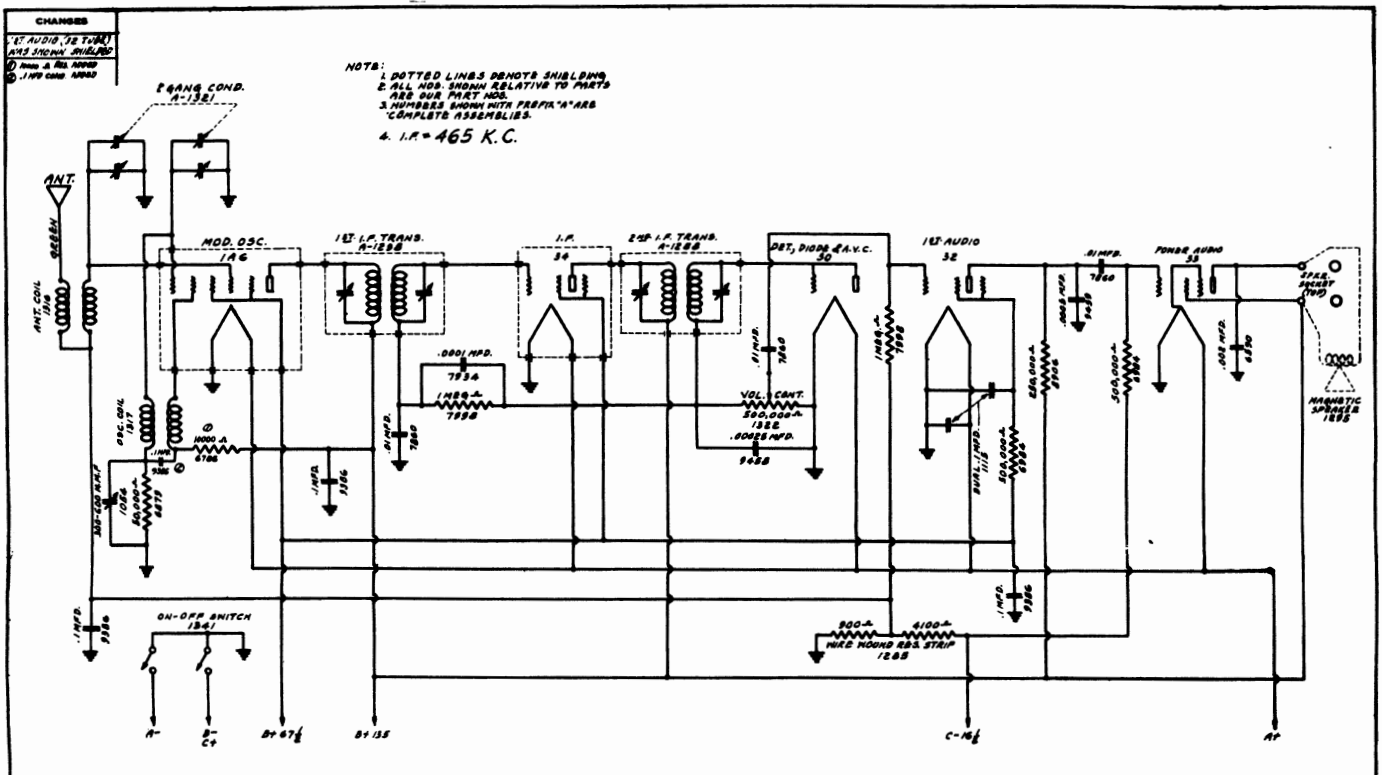
ELECTRICAL RESEARCH LABS.

Model 57-LW



I. F. = 465 K. C.

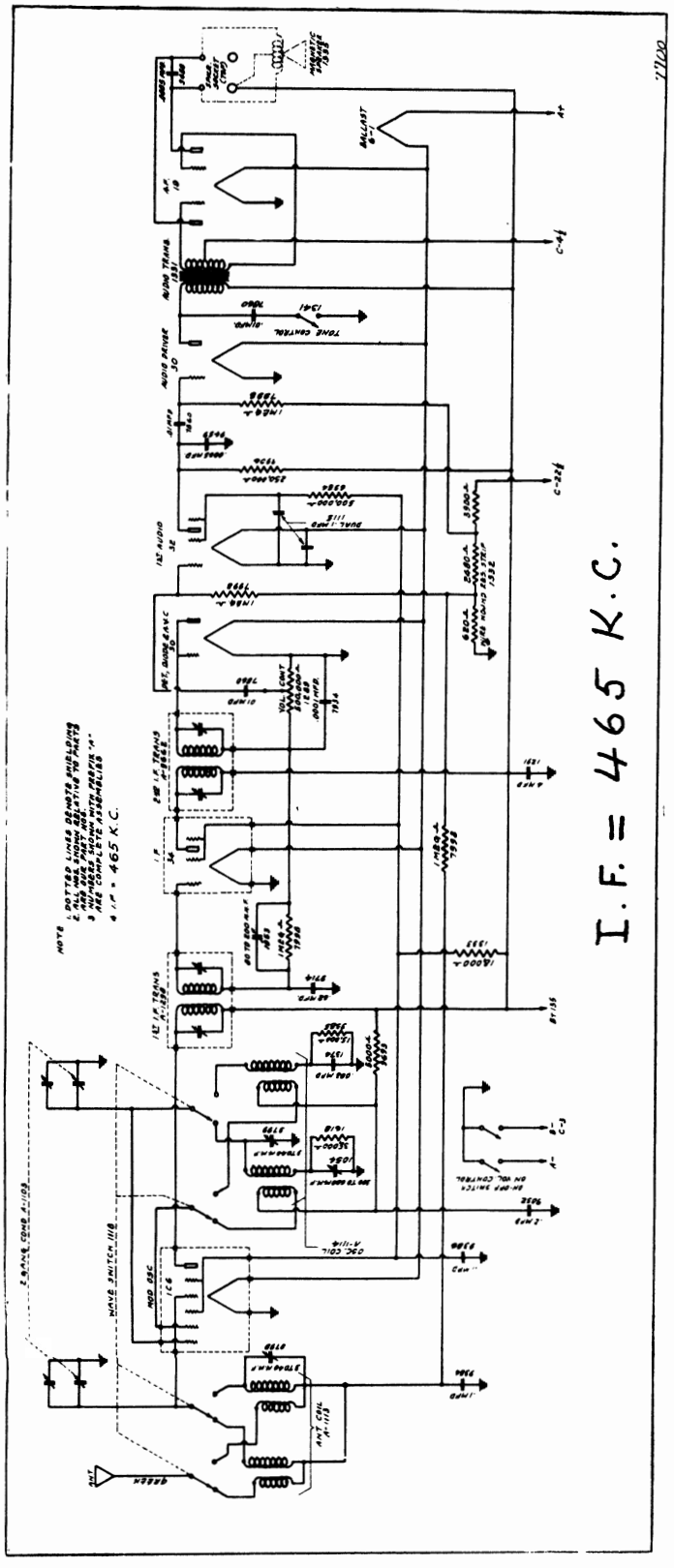
Model 6200



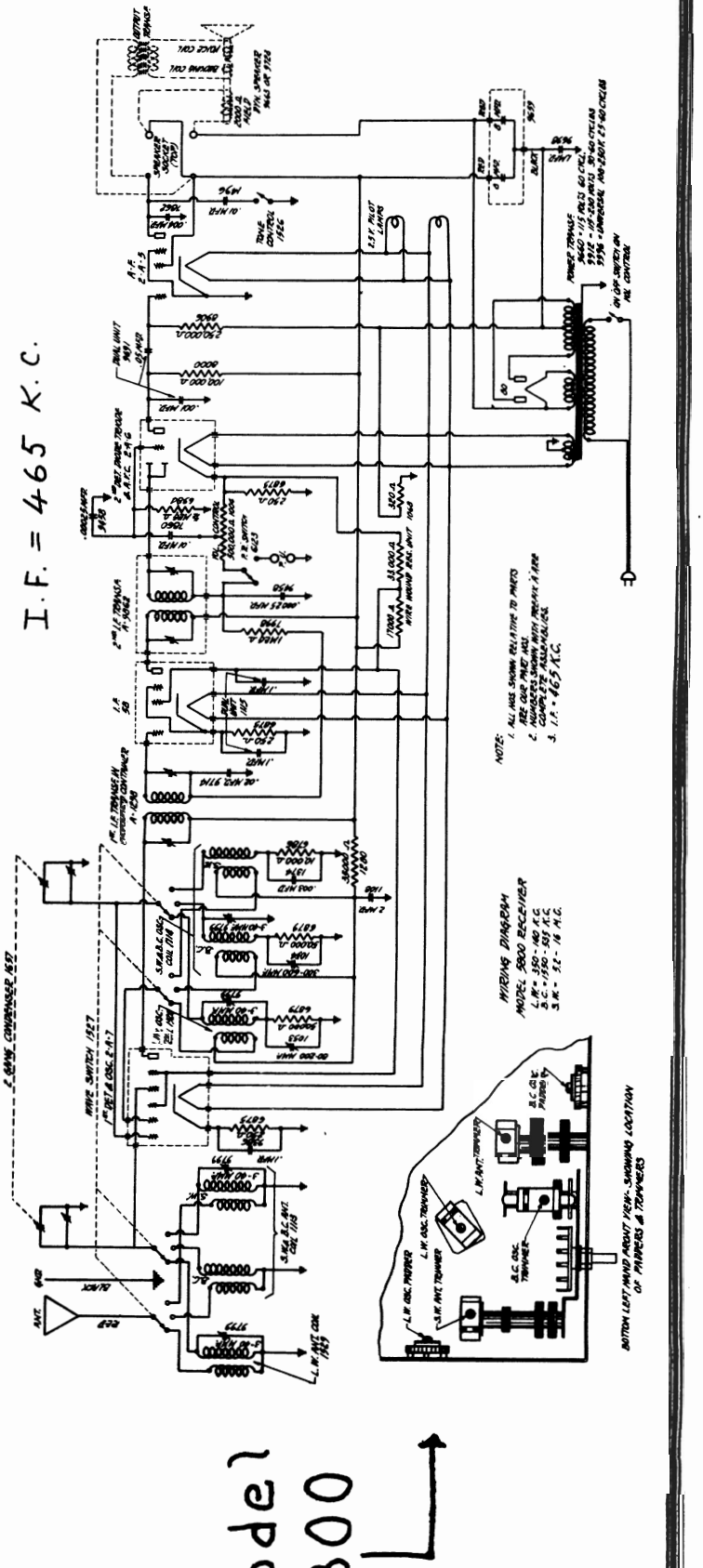
I. F. = 465 K. C.

ELECTRICAL RESEARCH LABS.

Model 7700



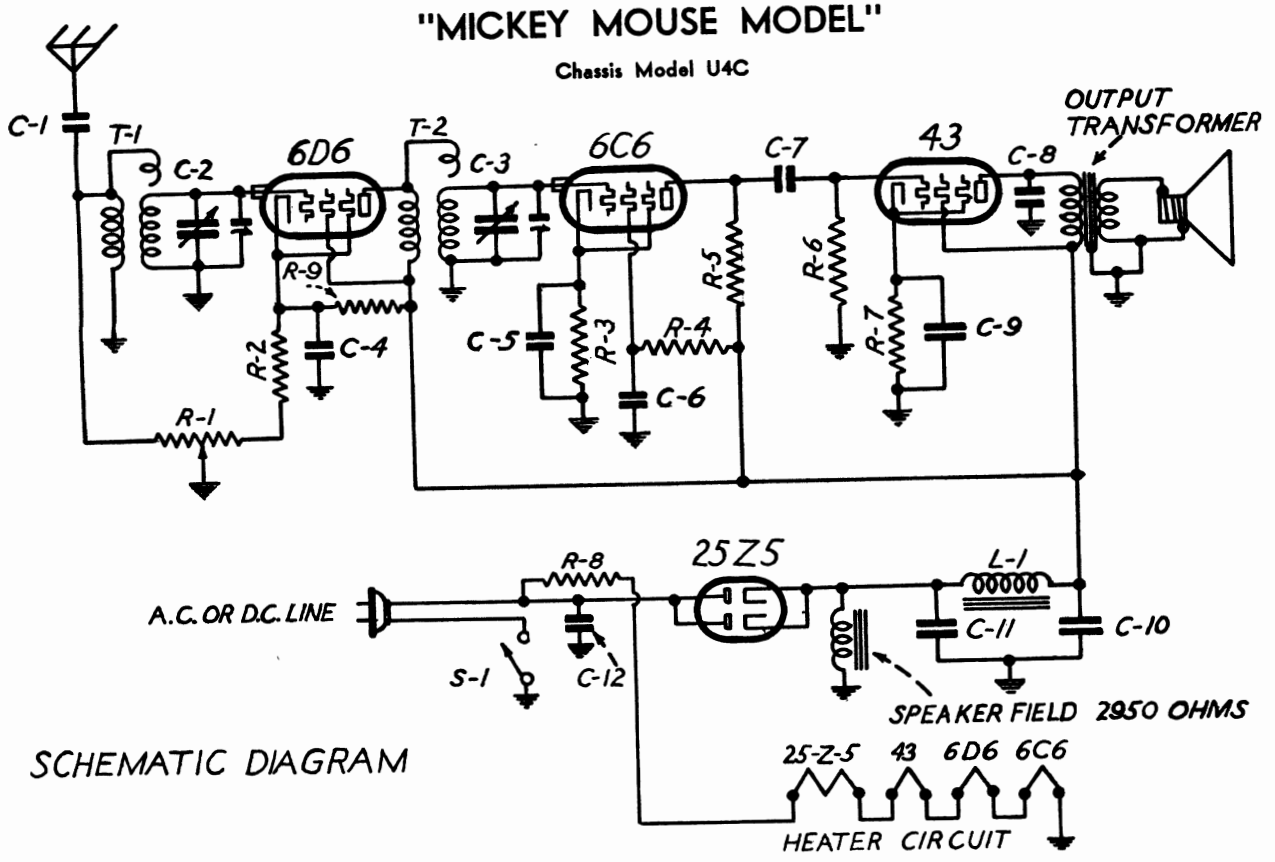
Model 5800



EMERSON RADIO & PHONOGRAPH CO., Inc.

"MICKEY MOUSE MODEL"

Chassis Model U4C



*ITEM	PART NO.	DESCRIPTION	PRICE List Price ea. Effective as of Sept. 1st, 1935
L1	ZZT-196	Iron-core filter choke—500 ohms	$ .60
T1	2WT-243	Antenna coil	.55
T2	2VT-242	Detector coil	.55
R1	2WR-218	Volume control with line switch—75,000 ohms	.75
R2	AAR-119	300 ohm ½ watt wire-wound resistor	.16
R3	OR-73	25,000 ohm ¼ watt carbon resistor	.16
†R4	HR-42	2 megohm ¼ watt carbon resistor	.16
R5, R6	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R7	KKR-135A	650 ohm 1 watt wire-wound resistor	.16
R8		185 ohm, 17 watt resistor built into line cord (see part no. KKW-46A below).	
†R9	KR-55	250,000 ohm ¼ watt carbon resistor	.16
C1	AAC-114	0.001 mf mica condenser	.16
C2, C3	RC-79	Two-gang variable condenser	1.85
C4, C6	AC-6	0.1 mf, 200 volt tubular condenser	.16
C5, C9, C10	2WC-239	Combination filter and by-pass electrolytic condenser block C5—5 mf, 25 volts. C10—8 mf, 150 volts. C9—5 mf, 25 volts.	1.55
C7	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C8	KC-58	0.01 mf, 400 volt tubular condenser	.16
C11	2WC-240	16 mf, 150 volt dry electrolytic condenser block	1.00
C12	2VC-242	0.1 mf, 250 volt a-c tubular condenser	.16
	2VS-157	5" dynamic speaker	3.25
	KKW-46A	Line cord with built-in resistance wire	.70

† See Production Changes below.

* Item number locates the article on the schematic diagram.

WHEN ORDERING REPLACEMENT PARTS SPECIFY PART NUMBERS

PRODUCTION CHANGES

In early production receivers—

a. R9 was omitted.

b. R4 was a 500,000 ohm ¼ watt carbon resistor.

VOLTAGE ANALYSIS

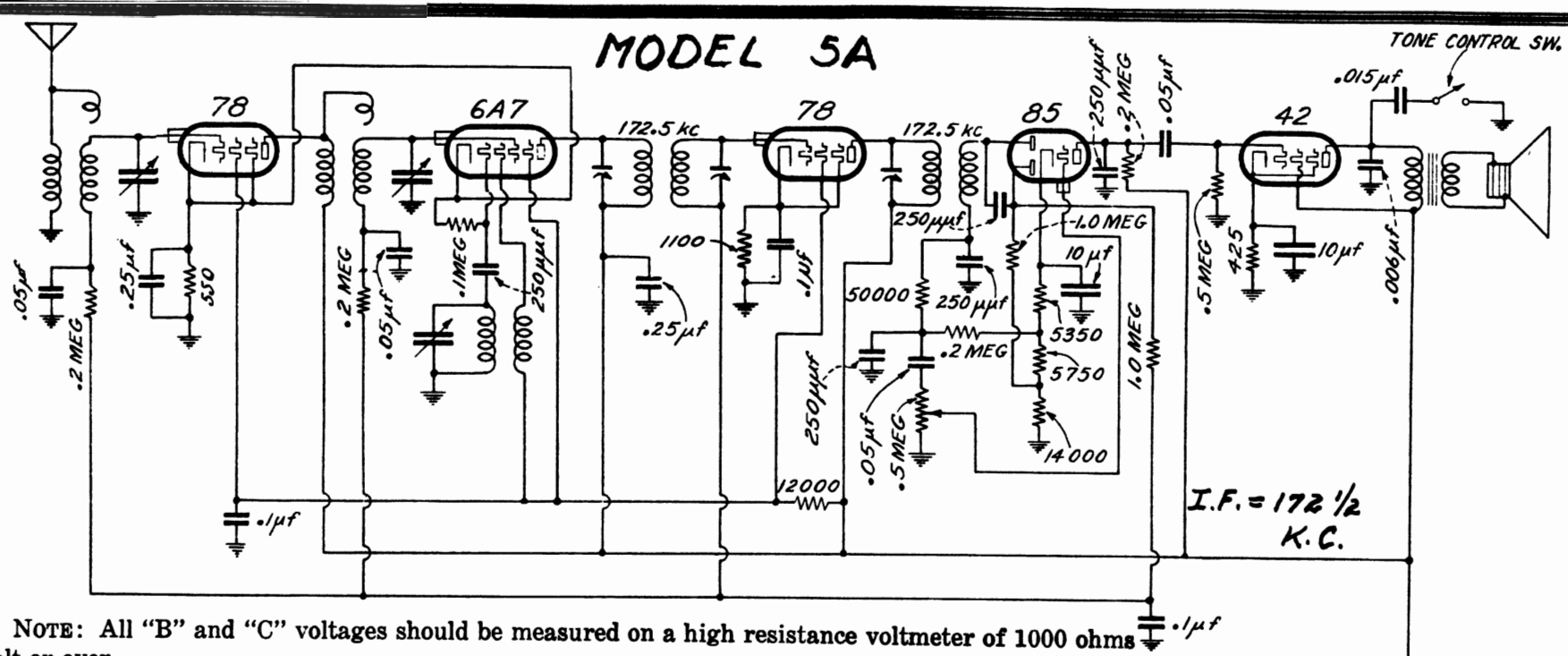
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a-c.

Tube	*Plate*	*Screen*	*Cathode*	*Fil.*
6D6	100	102	3	6.3
6C6	30	21	2	6.3
43	95	101	13	25.0

Voltage across speaker field (25Z5 cathode to chassis)—118 volts.

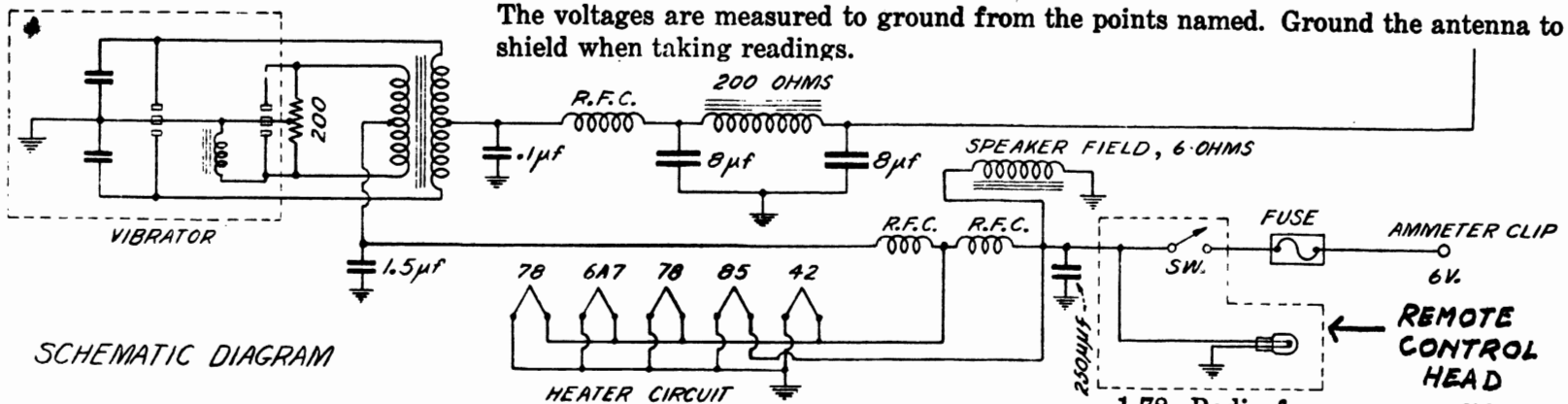
Voltage across choke (25Z5 cathode to 43 screen)—16.5 volts.

MODEL 5A



NOTE: All "B" and "C" voltages should be measured on a high resistance voltmeter of 1000 ohms per volt or over.

The voltages are measured to ground from the points named. Ground the antenna to its shield when taking readings.



SCHEMATIC DIAGRAM

Battery volts—6.3, voltage across heaters—5.5, voltage across speaker field—5.5:

Tube	*Plate*	*Screen*	*Cathode*	*Suppressor*	*Osc. Plate*
78	215	110	10	10	—
6A7	215	110	10	—	110
78	215	110	10	10	—
85	95	—	9.5	—	—
42	205	215	12.5	—	—

1-78 Radio frequency amplifier.

1-6A7 {Electron coupled oscillator, First detector.

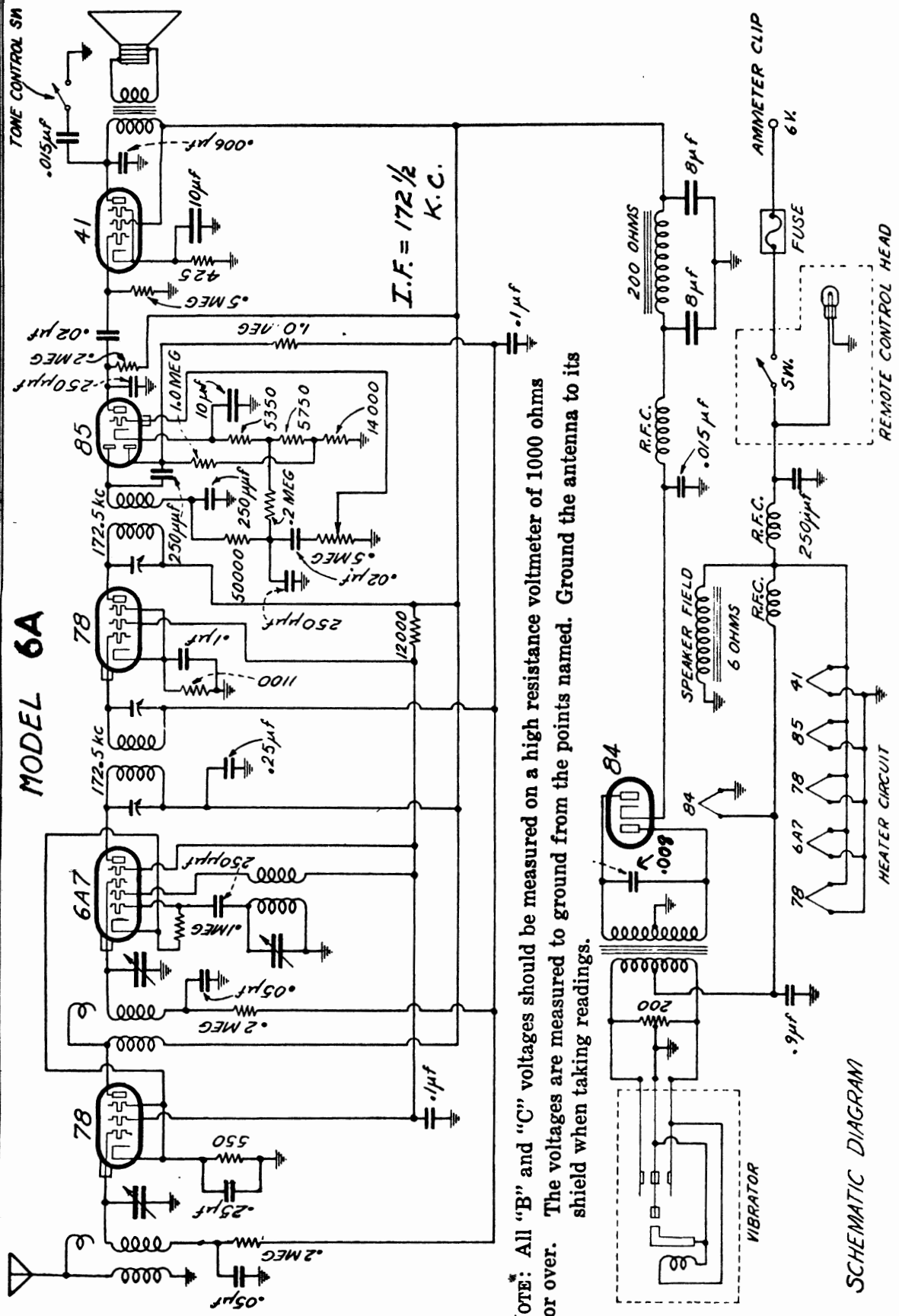
1-78 Intermediate frequency amplifier.

1-85 {Diode second detector, Audio frequency amplifier, Automatic volume control.

1-42 Output power tube.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 6A



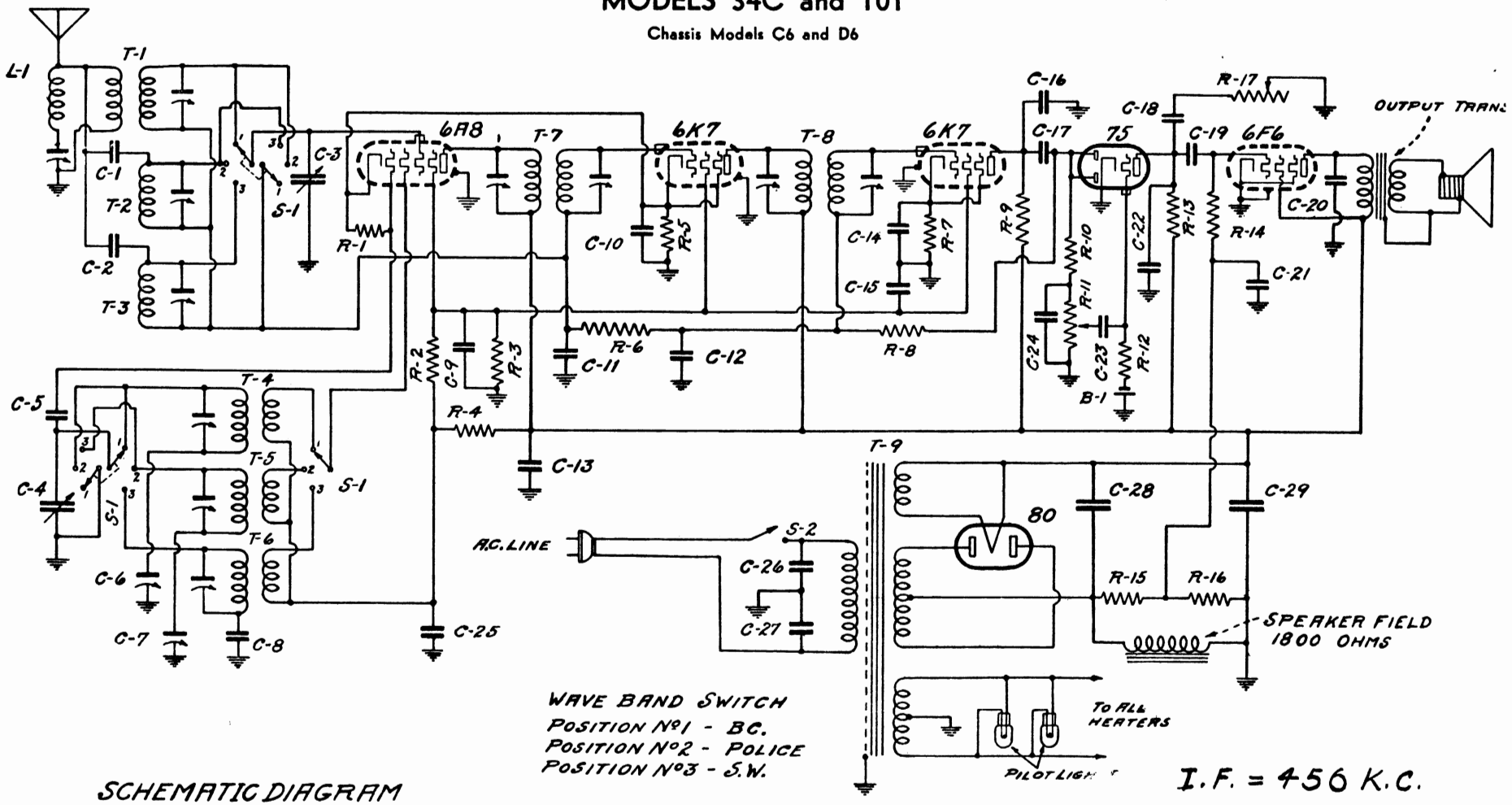
SCHEMATIC DIAGRAM

Tube	Plate	Screen	Cathode	Suppressor	Osc. Plate
78	210	110	6.5	6.5	—
6A7	210	110	6.5	—	110
78	210	110	6.5	6.5	—
85	85	—	9.	—	—
41	195	210	12.	—	—

NOTE: All "B" and "C" voltages should be measured on a high resistance voltmeter of 1000 ohms per volt or over. The voltages are measured to ground from the points named. Ground the antenna to its shield when taking readings.

MODELS 34C and 101

Chassis Models C6 and D6



SCHEMATIC DIAGRAM

The receiver should never be turned on with either the speaker plug or the 6F6 tube out of its respective socket, since the rapid rise in rectifier voltage will damage the electrolytic condenser.

Bias for the grid of the audio section of the 75 tube is obtained by means of a very small one-volt battery (bias cell) Do not put a voltmeter across this bias cell. If the set distorts, check the cell by temporarily replacing with a new cell or some other one-volt source and noting results. To remove the bias cell, simply pull up on the spring clip and lift the cell from its cup. The cell assembly is mounted on a bakelite strip on the inside of the right-hand chassis wall. On replacing the cell be sure the clip makes good contact.

Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.

When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.

Frequency range

540-1715 kc., 1670-4740 kc., 5.5-16 mc.

6A8 (metal) oscillator; 1st detector.
6K7 (metal) 1st i-f amplifier.
6K7 (metal) 2nd i-f amplifier (next to 75)
75 (glass) diode detector; a-f amplifier.
6F6 (metal) pentode output.
80 (glass) full-wave rectifier.

MODELS 102 and 104

Chassis Model A8

REPLACEMENT PARTS

* Item	Part No.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 Price
T3	NNT-150	Broadcast antenna coil	$ .90
T6	NNT-151	Broadcast detector coil	.90
T9	NNT-152	Broadcast oscillator coil	.90
T2	NNT-155	Intermediate band antenna coil	.50
T5	NNT-156	Intermediate band detector coil	.50
T8	NNT-157	Intermediate band oscillator coil	.50
T1	NNT-158	Short-wave antenna coil	.55
T4	NNT-159	Short-wave detector coil	.60
T7	NNT-160	Short-wave oscillator coil	.55
T10	NNT-153	456 kc first i-f transformer	1.75
T11	NNT-154	456 kc second i-f transformer	1.36
T12	NNT-191	Power transformer	3.90
L1	MMT-149	456 kc tunable wave-trap	.35
R13	NNR-156	Volume control—1.2 megohms	.70
R23	NNR-157A	Tone control—.5 megohms	.60
R24, R25	NNR-158	25,000 ohm metal clad wire-wound tapped resistor R24—10,000 ohms, 2.5 watts R25—15,000 ohms, 2 watts	.40
R21	AAR-107	250 ohm, 2 watt wire-wound resistor	.16
R1, R5	CCR-140	350 ohm, ½ watt wire-wound resistor	.16
R8	IIR-131	1000 ohm, ½ watt wire-wound resistor	.16
R7, R14	GR-85	2000 ohm, ¼ watt carbon resistor	.16
R17	ZR-101	3,300 ohm, ¼ watt carbon resistor	.16
R19	LR-64	5,000 ohm, ¼ watt carbon resistor	.16
R12	KR-63	15,00 ohm, ¼ watt carbon resistor	.16
R4, R15	KR-53	50,000 ohm, ¼ watt carbon resistor	.16
R16	LLR-154	75,000 ohm, ¼ watt carbon resistor	.16
R2, R3 R10, R22	KR-54	100,000 ohm, ¼ watt carbon resistor	.16
R18	KR-55	250,000 ohm, ¼ watt carbon resistor	.16
R9, R11	KR-56	500,000 ohm, ¼ watt carbon resistor	.16
R6	YR-97	15,000 ohm, ½ watt carbon resistor	.16
R20	NNR-204	95,000 ohm, ¼ watt carbon resistor	.16
C1, C2, C3	NNC-153	3 gang variable condenser	3.25
C12, C13	NNC-154A	Dual padding condenser C12, C13—800 to 1400 mmf	.75
C37, C38	NNC-155	Dual 8 mf, 450 w. v., dry electrolytic condenser	1.65
C24, C30	IC-43	5 mf, 25 volt tubular dry electrolytic condenser	.60
C16, C17	NNC-157	Seven-section condenser block	1.30
C20, C25		C16—.1 mf, 400 v. C27—.01 mf, 400 v.	
C27, C28		C17—.1 mf, 200 v. C28—.01 mf, 400 v.	
C33		C20—.05 mf, 200 v. C33— .9 mf, 400 v.	
		C25, C21—.25 mf, 400 v.	
C8	EC-24A	.0001 mf mica condenser	.16
C18, C19, C26	AC-7A	.00025 mf mica condenser	.16
C11	AAC-114	.001 mf mica condenser	.16
C15	NNC-181	.0015 mf mica condenser	.16
C22	IC-47	.0005 mf mica condenser	.16
C31, C32	NNC-214	.002 mf, 1000 v. tubular condenser	.16
C23	CCC-127	.01 mf, 200 v. tubular condenser	.16
C29	KC-58	.01 mf, 400 v. tubular condenser	.16
C6, C9	AC-6	.1 mf, 200 v. tubular condenser	.16
C5, C10	EEC-132	.1 mf, 400 v. tubular condenser	.16
C21	BC-12	.05 mf, 200 v. tubular condenser	.16
C4, C7	NNC-158	.05 mf, 200 v. tubular condenser, with mounting strap	.16
C35, C36	XXC-220	Dual .01 mf, 250 v. condenser	.30
S1	NNS-95	Wave-band switch, with shields	2.40
S2	NNS-109	On-off switch	.50
	NNS-118	8" dynamic speaker (for Model 104)	6.50
	NNS-121	10" dynamic speaker (for Model 102)	7.50
	NND-98	Airplane dial	5.25

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground with no signal. Line voltage for these readings was 117.5 volts, 60 cycles.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6K7 (r-f)	250	107	4.0	—	6.3 a.c.
6A8	250	100	3.5	190	6.3 a.c.
6K7 (i-f)	250	107	5.5	—	6.3 a.c.
75	100	—	0.9	—	6.3 a.c.
6C5	135	—	4.7	—	6.3 a.c.
6F6	245	250	15.5	—	6.3 a.c.
6F6	245	250	15.5	—	6.3 a.c.

Voltage across speaker field—100 volts.
B plus at 80 filament—350 volts.

MODELS 34C AND 101

CHASSIS C6 AND D6

REPLACEMENT PARTS

* ITEM	PART NO.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 PRICE
L1	MMT-149	456 kc tunable wave trap	$ .35
T1, T2, T3	XXT-186	Three band antenna coil assembly	1.75
T4, T5, T6	XXT-187	Three band oscillator coil assembly	1.75
T7	XXT-188A	456 kc 1st i-f transformer	1.15
T8	XXT-189A	456 kc 2nd i-f transformer	1.15
T9	XXT-190	Power transformer	2.85
R11	XXR-185A	Volume control—.25 megohm	.60
R17, S2	XXR-186A	Tone control with switch—.25 megohm	.80
R7	KR-51	2,500 ohm—¼ watt carbon resistor	.16
R1, R9	KR-53	50,000 " " " " "	.16
R10, R14	KR-54	100,000 " " " " "	.16
R13	LR-61	200,000 " " " " "	.16
R16	XXR-202	210,000 " " " " "	.16
R6	KR-55	250,000 " " " " "	.16
R12	KR-56	500,000 " " " " "	.16
R8	KR-57	1 meg. " " " " "	.16
R15	XXR-203	1.1 " " " " " "	.16
R5	FFR-126	500 ohm wire-wound resistor—½ watt	.16
R2, R3, R4	XXR-194	30,000 ohm metal clad wire-wound tapped resistor R2=10,400 ohms—1 watt R3=13,000 ohms—1 watt R4= 6,600 ohms—1¼ watt	.40
C3, C4	XXC-187	Two-gang variable condenser	2.15
C28, C29	XXC-188	Dual 8 mf dry electrolytic condenser	1.65
C6, C7	JJC-144D	Dual padding condenser C6—250 to 550 mmf. C7—800 to 1400 mmf.	.60
C1, C2, C16	IIC-133A	.000025 mf mica condenser	.16
C5	EC-24A	.0001 mf mica condenser	.16
C17	AC-7A	.00025 mf mica condenser	.16
C22, C24	IC-47	.0005 mf mica condenser	.16
C8	XXC-197	.0038 mf mica condenser	.25
C18	XXC-207	.005 mf-400 v. tubular condenser	.16
C20	ZC-115	.006 mf-1000 v. tubular condenser	.16
C23	CCC-127	.01 mf-200 v. tubular condenser	.16
C19	KC-58	.01 mf-400 v. tubular condenser	.16
C11, C12	BC-12	.05 mf-200 v. tubular condenser	.16
C26, C27	XXC-220	Dual .01 mf, 250 volt condenser	.30
C9, C14 C10, C15	AC-6	.1 mf-200 v. tubular condenser	.16
C13, C25	EEC-132	.1 mf-400 v. tubular condenser	.16
C21	BC-13	.25 mf-200 v. tubular condenser	.16
	XXS-127	6" dynamic speaker	4.25
	2BS-130	10" dynamic speaker	6.25
S1	XXS-117A	Wave-band switch	1.10
	KL-6	Pilot light, 6.3 volt, .15 amp. Mazda No. 40	.15
			2.10

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to ground, with no signal. Line voltage for these readings was 117.5 v., a.c., 60 cycles.

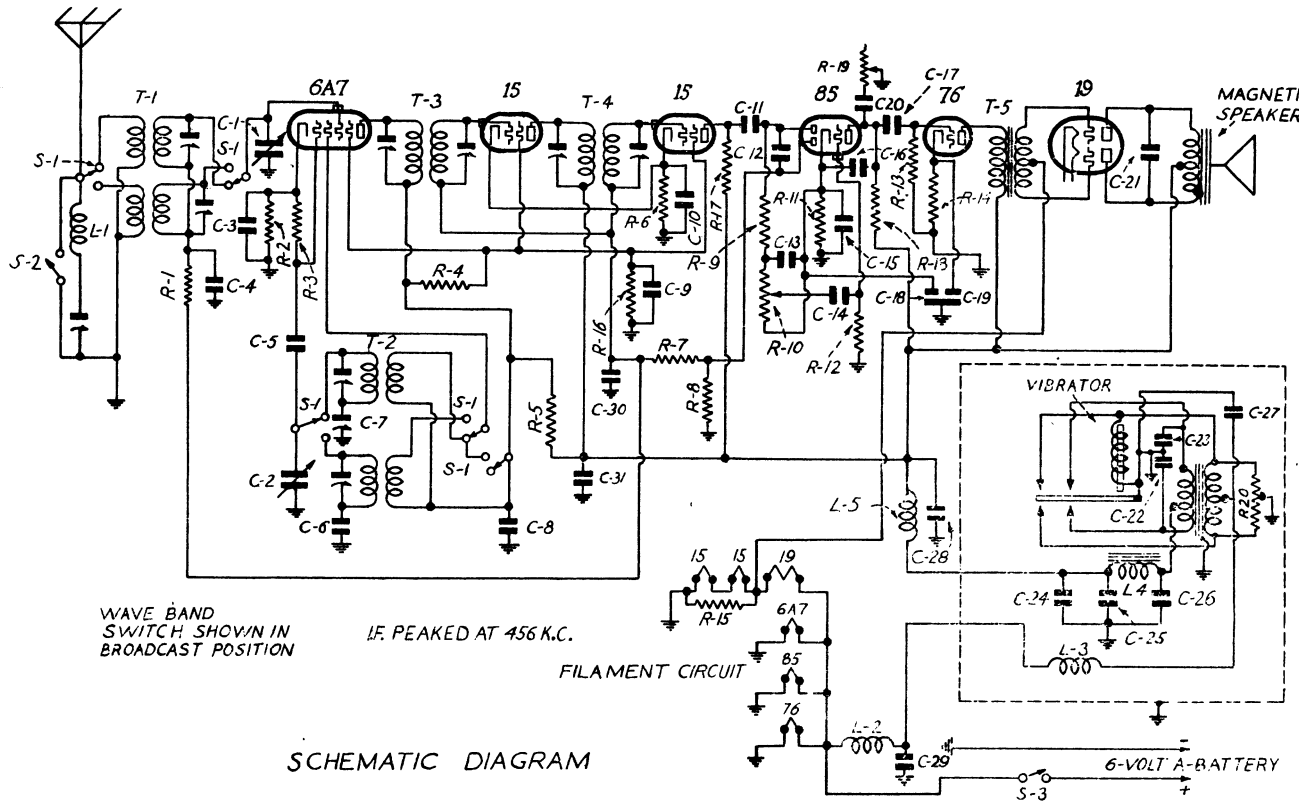
Tube	*Plate*	*Screen*	*Osc. Plate*	*Cathode*	*Fil*
6A8	250	75	160	5	6.3 a-c
6K7 1st i-f	250	75	—	5	6.3 a-c
6K7 2nd i-f	145	75	—	5	6.3 a-c
75	100	—	—	0	6.3 a-c
6F6	225	250	—	0	6.3 a-c

B plus at 80 filament—355 volts.
Voltage across speaker field—105 volts.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 34F7 and 101F7

Chassis Model F7



SCHEMATIC DIAGRAM

REPLACEMENT PARTS

*Item No.	Part No.	DESCRIPTION	PRICE
L1	MMT-149	Adjustable 456 kc wave trap	$ .35
L2	OOT-167	R-f "A" choke	.20
L3	2KT-240	R-f "A" choke	.45
L4	2KT-239	Iron-core filter choke—500 ohms	.80
L5	OOT-166A	R-f "B" choke (1 millihenry)	.30
T1	2KT-234	Two-band antenna coil	1.30
T2	2KT-235	Two-band oscillator coil	1.20
T3	2KT-236	456 kc first i-f transformer	1.15
T4	2KT-237	456 kc second i-f transformer	1.15
T5	2KT-232	Audio transformer	1.00
T6	2KT-238	Power transformer	2.75
R1, R18	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R2	FWR-133	650 ohm ½ watt wire-wound resistor	.16
R3	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R4, R5	LR-55	10,000 ohm ¼ watt carbon resistor	.16
R6	FWR-126	500 ohm ½ watt wire-wound resistor	.16
R7, R12	KR-57	1 megohm ¼ watt carbon resistor	.16
R8	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R9, R13	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R10, S3	2KR-209	Volume control with line switch—0.5 megohms	.80
R11	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R14	PR-79	1,000 ohm ¼ watt carbon resistor	.16
R15	LLR-147	100 ohm ½ watt wire-wound resistor	.16
R16	LLR-154	75,000 ohm ½ watt carbon resistor	.16
R17	OR-73	25,000 ohm ½ watt carbon resistor	.16
R19	2KR-210	Tone control—250,000 ohms	.55
R20	ZR-105	200 ohm wire-wound center tapped resistor	.16
C1, C2	XXC-187	Two-gang variable condenser	2.15
C3, C4, C9, C10, C30, C31	AC-6	0.1 mf, 200 volt tubular condenser	.16
C5	EC-24A	0.0001 mf mica condenser	.16
C6	AAC-111	0.003 mf mica condenser	.16
C7	2KC-198	Single adjustable padding condenser Range—200 to 400 mmf	.30
C8	BC-13	0.25 mf, 200 volt tubular condenser	.16
C11, C12, C16	AC-7A	0.00025 mf mica condenser	.16
C13, C14, C15	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C17	BC-12	0.05 mf, 200 volt tubular condenser	.16
C18, C19	FC-29	0.02 mf, 200 volt tubular condenser	.16
C20, C21	2KC-234	Dual 5 mf, 25 volt dry electrolytic condenser block	.75
C22, C23	HC-34	0.006 mf, 600 volt tubular condenser	.16
C24	2TC-189	0.015 mf, 1000 volt tubular condenser	.16
C25, C26	EEC-132	0.1 mf, 400 volt tubular condenser	.16
	2KC-237	Multiple 6 and 10 mf, 200 volt dry electrolytic condenser C25—10 mf, 200 volt C26—6 mf, 200 volt	2.00
C27	2KC-236	0.5 mf, 120 volt tubular condenser	.40
C28	2KC-249	Tubular 8 mf, 200 volt dry electrolytic condenser	.85
C29	EC-19	0.5 mf, 200 volt tubular condenser	.25
	2KS-151	6" magnetic speaker	4.50
	2KS-155	10" magnetic speaker for console	5.75
S1	2KS-152	Wave-band switch	.90
S2	OOS-108A	Local-distance switch	.12
	?KD-36	Airplane dial	1.75

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The battery voltage for these readings was 6.1 volts.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	95	63	3.0	95	6
15	157	63	1.8	—	2
15	114	63	1.8	—	2
85	53	—	5.5	—	6
76	150	—	5.7	—	6
19	153	—	—	—	2

Voltage from each control grid of the 19 tube to ground—4 volts.

With an input of 6.0 volts and 1.6 amperes the output of the power pack should be approximately 140 volts at .040 amperes.

EMERSON RADIO & PHONOGRAPH CO., Inc.

Model 36

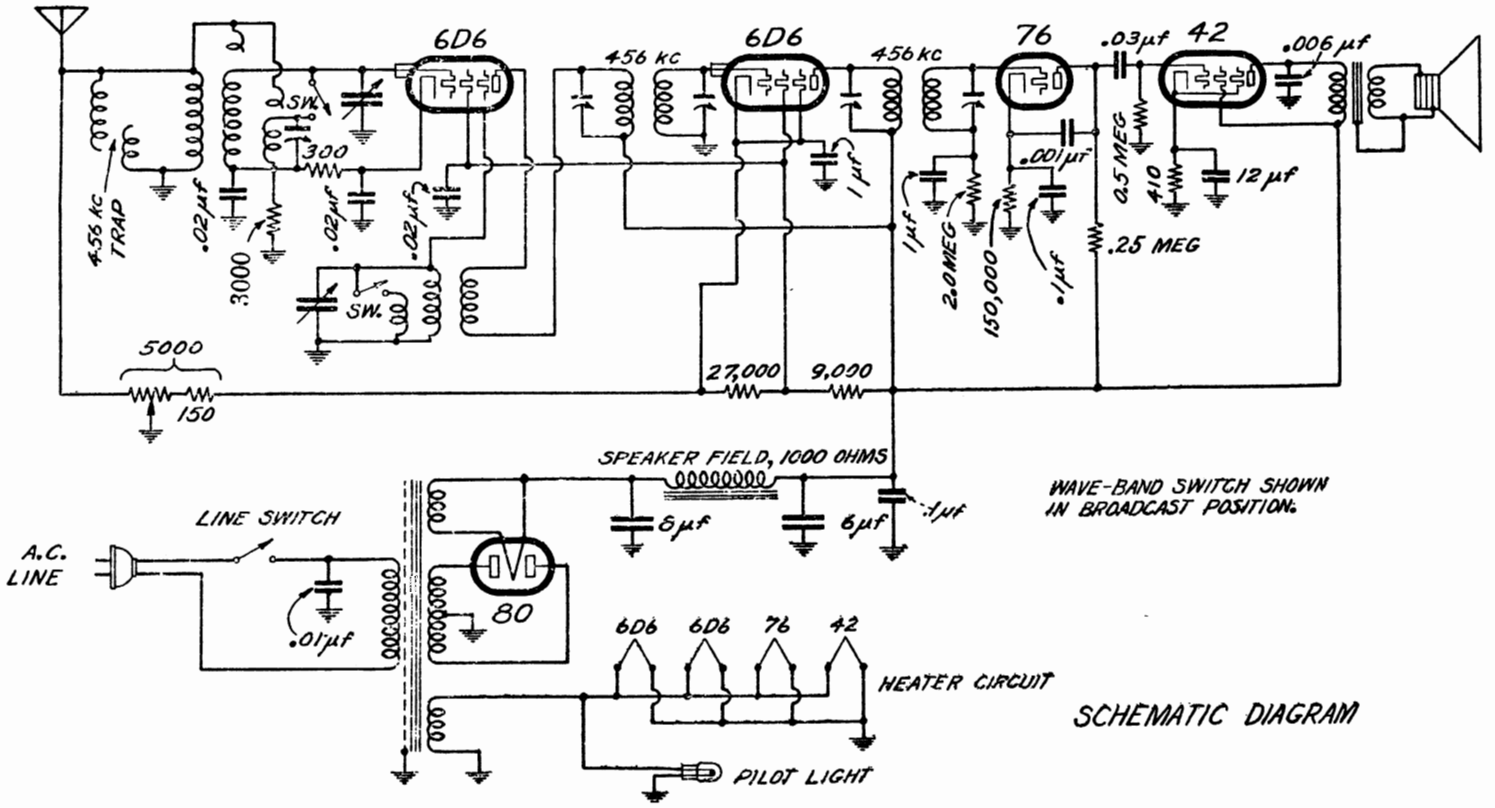
Chassis Model B5

FIVE-TUBE BROADCAST AND SHORT-WAVE SUPERHETERODYNE

115-120 Volts...A.C....60 Cycle

Broadcast Range
540 to 1530 kilocycles
(550 to 195 meters)

Short-Wave Range
1500 to 3200 kilocycles
(200 to 93 meters)



SCHEMATIC DIAGRAM

Description:

The Model 36 is a five-tube superheterodyne radio receiver bringing in regular broadcast stations, and, in addition, stations on the short-wave band down to 100 meters.

The following tubes are employed:

1 — 6D6 R.F. Pentode (1st Detector-Oscillator)
1 — 6D6 I.F. Amplifier
1 — 76 Triode (2nd Detector)
1 — 42 Output-Pentode
1 — 80 Rectifier

Unless marked otherwise, this receiver is designed to operate on 105-125 volts, 50-60 cycles, alternating current only.

Voltage Readings:

For the convenience of servicemen, the following voltage readings will serve as a guide in trouble shooting.

Readings are to be taken with all the tubes in their places, volume control turned on full and antenna wire grounded to chassis.

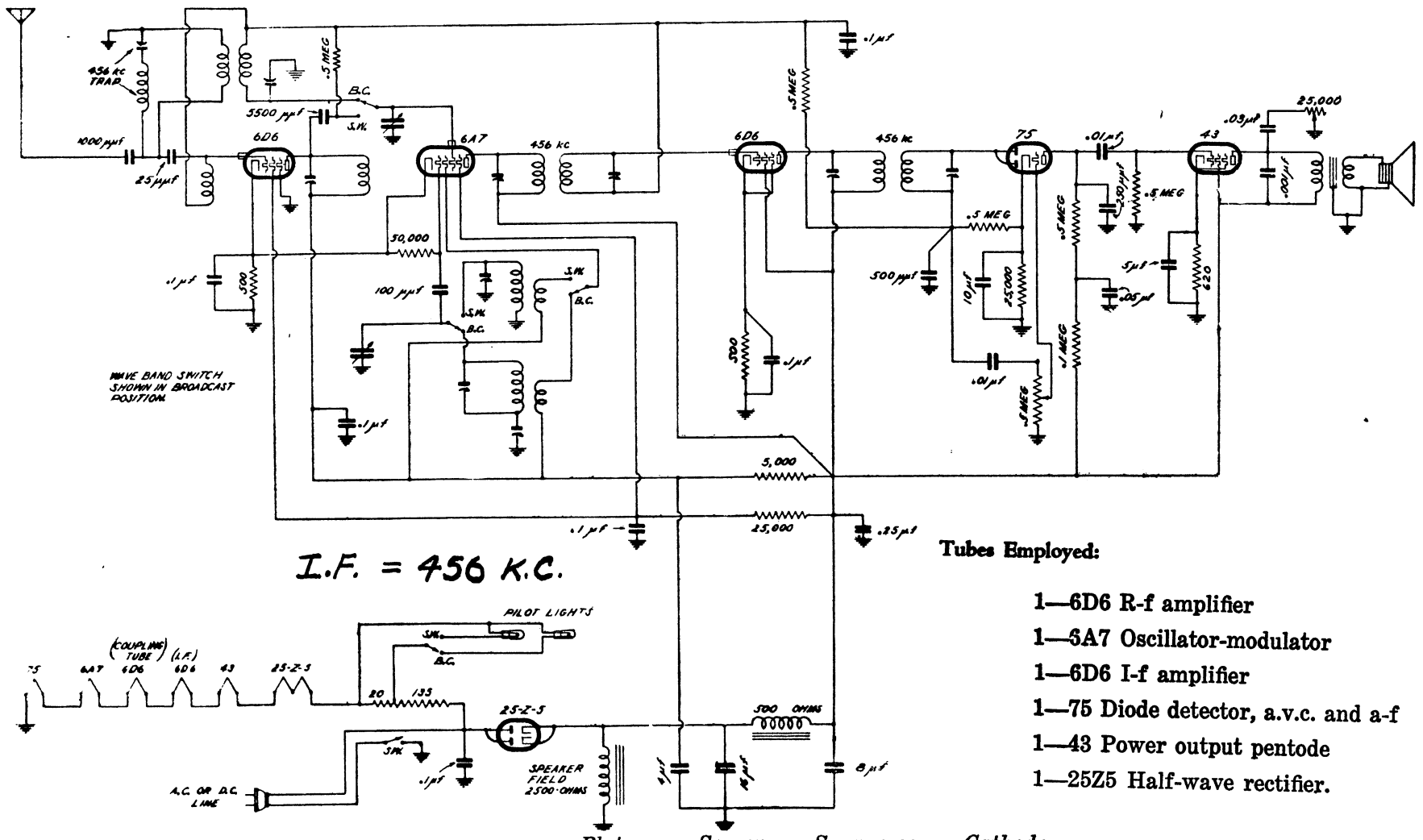
The d-c voltmeter used should be 1000 ohms per volt, or over. The readings tabulated below were taken at an a-c line voltage of 117.

	Fil.	Ground to Plate	Ground to Screen	Ground to Cathode
6D6 Osc. 1st Det.	6.3 a.c.	220 d.c.	120 d.c.	28.0 d.c.
6D6 I-f Amplifier	6.3 a.c.	220 d.c.	120 d.c.	3.0 d.c.
76 2nd Detector	6.3 a.c.	120 d.c.	.....	9.5 d.c.
42 Output	6.3 a.c.	210 d.c.	220 d.c.	13.0 d.c.
80 Rectifier	5.0 a.c.	.....	.....	.....

Voltage across speaker field, 60.

MODELS 38, 42, AND 49

Chassis Model U6



Tubes Employed:

1—6D6 R-f amplifier
1—6A7 Oscillator-modulator
1—6D6 I-f amplifier
1—75 Diode detector, a.v.c. and a-f
1—43 Power output pentode
1—25Z5 Half-wave rectifier.

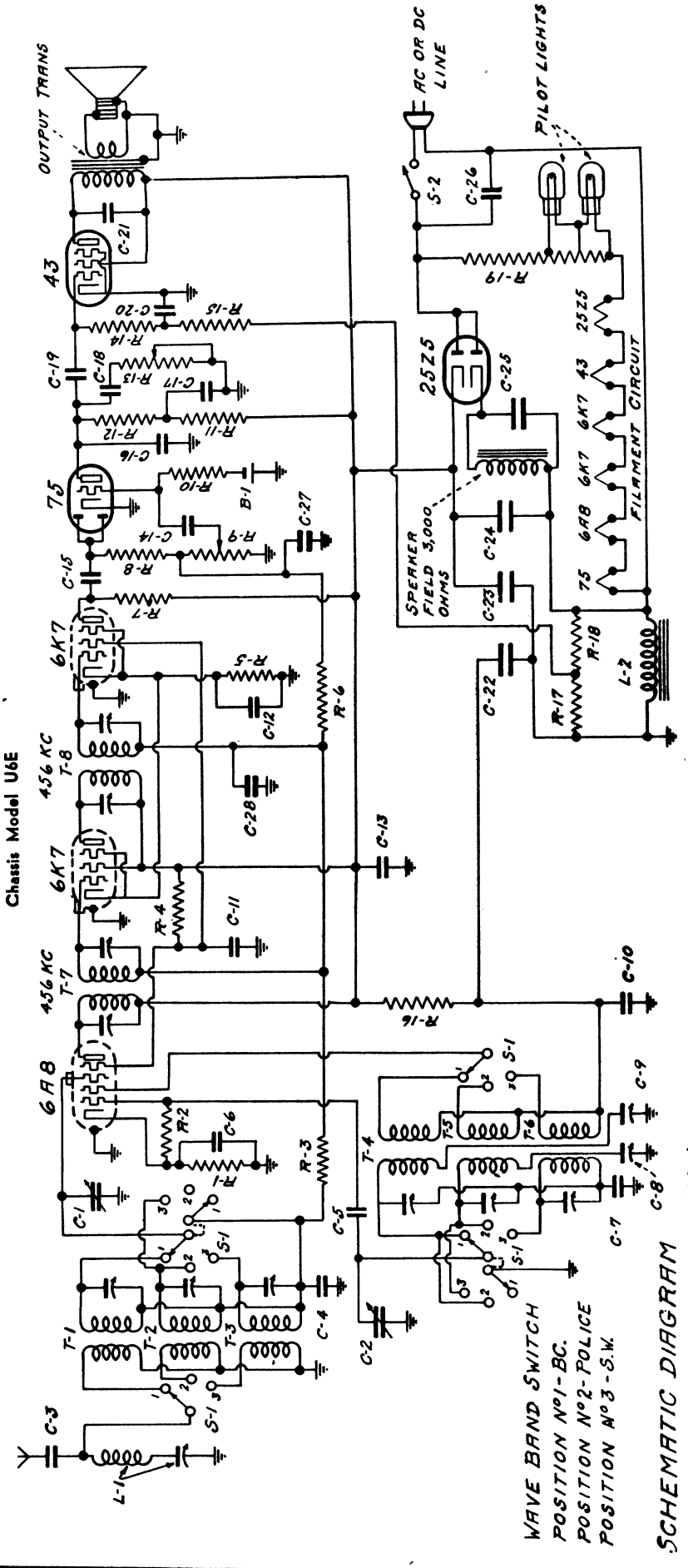
	Plate	*Screen*	*Suppressor*	*Cathode*
6D6 R.f.	80	45	0	3
6A7 Oscillator-Modulator	100	45	—	3
6D6 I.f.	100	100	4.0	4.0
75 A.f.	35	—	—	1
43 Output	95	100	—	13.5

The pilot light used is Mazda No. 40, 6-8 volts and .15 ampere, brown bead.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 101U

Chassis Model U6E



*Item	Part No.	DESCRIPTION
L1	MMT-149	Adjustable 456 kc wave trap
L2	ZZT-196	Filter choke—500 ohms
T1, T2, T3	ZZT-192A	Three-band antenna coil assembly
T4, T5, T6	ZZT-193	Three-band oscillator coil assembly
T7	XXT-188A	456 kc first i-f transformer
T8	XXT-189A	456 kc second i-f transformer
R1	AAR-119	300 ohm ½ watt wire-wound resistor
R2, R7, R11	KR-53	50,000 ohm ¼ watt carbon resistor
R3	HR-42	2 megohm ¼ watt carbon resistor
R4	ZZR-196	30,000 ohm ¼ watt carbon resistor
R5	LLR-149	400 ohm ½ watt wire-wound resistor
R6, R10	KR-57	1 megohm ¼ watt carbon resistor
R8	KR-54	100,000 ohm ¼ watt carbon resistor
R9	2FR-205A	Volume control—0.5 megohms
R12	LR-61	200,000 ohm ¼ watt carbon resistor
R13	XXR-186A	Tone control with line switch—250,000 ohm
R14, R15	KR-56	0.5 megohms ¼ watt carbon resistor
R16, R17	LR-55	10,000 ohm ¼ watt carbon resistor
R18	LR-54	5,000 ohm ¼ watt carbon resistor
R19	ZZR-192A	Wire-wound ballast resistor—130 ohms
C1, C2	XXC-187	Two-gang variable condenser
C3, C21	AAC-114	0.001 mf mica condenser
C4, C10, C26	AC-6	0.1 mf, 200 volt tubular condenser
C5	EC-24A	0.0001 mf mica condenser
C6, C11, C12 C13, C17, C20 C28	ZZC-191B	Seven-section condenser block C6 —0.2 mf, 200 v. C11—0.1 mf, 200 v. C17—0.1 mf, 200 v. C12—0.1 mf, 200 v. C20—0.1 mf, 200 v. C13—0.1 mf, 200 v. C28—0.05 mf, 200 v.
C7	ZZC-206	0.005 mf mica condenser
C8, C9	JJC-144C	Dual adjustable padding condenser C8—800 to 1400 mmf C9—250 to 550 mmf
C14, C19	CCC-127	0.01 mf, 200 volt tubular condenser
C15, C16, C27	AC-7A	0.00025 mf mica condenser
C18	BC-11	0.005 mf, 200 volt tubular condenser
C22, C23, C24	ZZC-192A	Multiple 4, 8 and 16 mf electrolytic condens C22—4 mf, 150 volts C23—8 mf, 150 volts C24—16 mf, 150 volts
C25	YC-96	Tubular 4 mf, 150 volt electrolytic condenser
S1	XXS-117A	Wave-band switch
	2FS-141	10" dynamic speaker
	KL-6	Pilot light, 6.3 volt, .15 amp. Mazda No. 40
B1	XXZ-213	Bias cell, one volt
	XXD-25B	Airplane dial
	XXZ-195	Escutcheon with crystal

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Osc. Plate
6A8	105	50	1.25	90
6K7 1st i-f	105	105	3.5	—
6K7 2nd i-f	62	50	3.5	—
75	57	—	0	—
43	92	105	0	—

Voltage across speaker field—114.
Voltage across filter choke—22

TUBE DATA

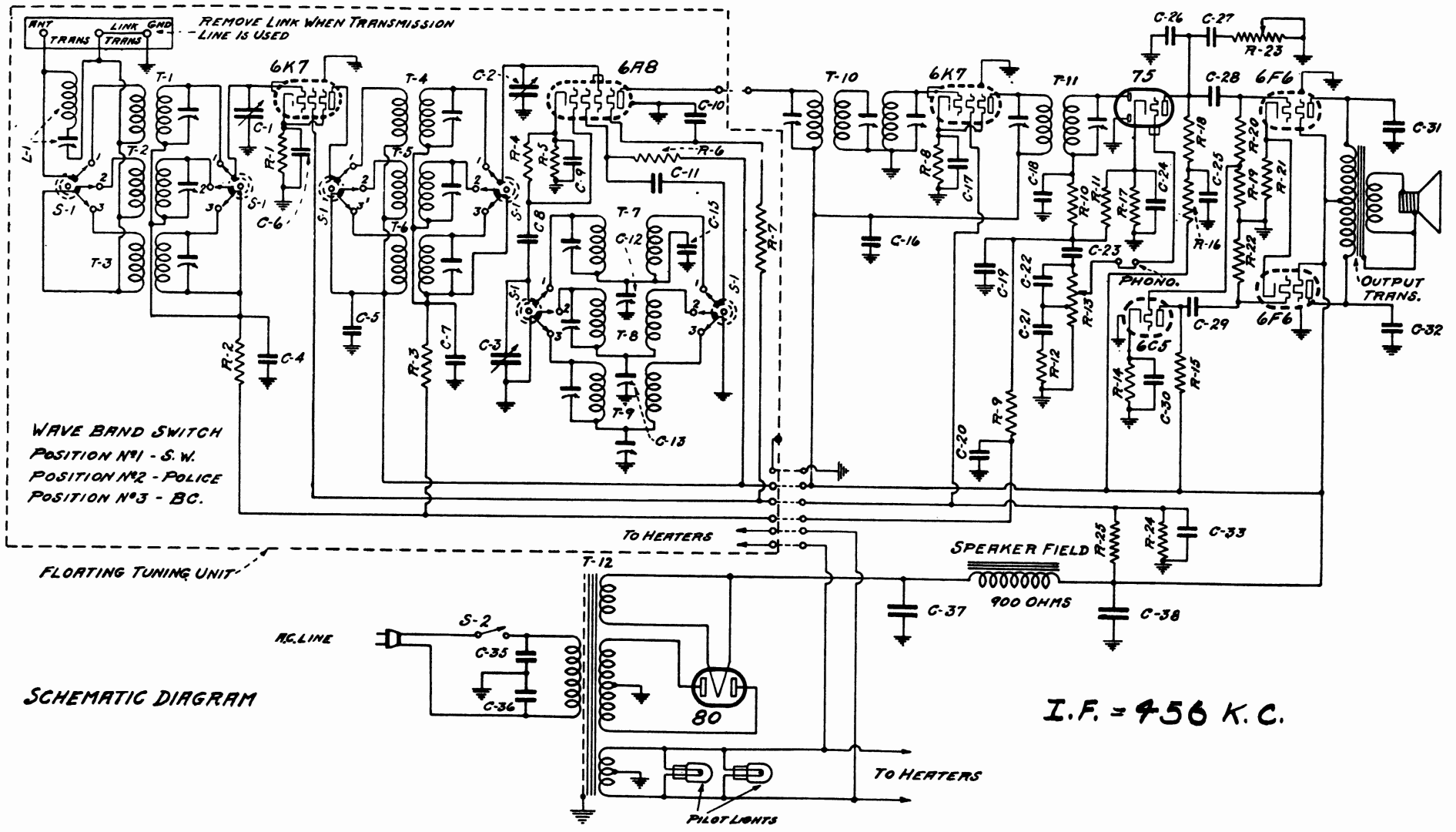
The tube complement is as follows:

1—6A8 (metal) Pentagrid oscillator-modulator
1—6K7 (metal) 1st i-f amplifier
1—6K7 (metal) 2nd i-f amplifier (adjacent to 75)
1—75 (glass) 2nd detector—a-f amplifier, a.v.c.
1—43 (glass) Power output pentode
1—25Z5 (glass) Half-wave rectifier

Voltage rating ..... 105-130 volts.
Current drain ..... 0.43 amps.
Frequency ranges .. 540 to 1660 kc, 1580 to 4750 kc, 5.5 to 16 mc.

MODELS 102 and 104

Chassis Model A8



SCHEMATIC DIAGRAM

The color coding of the power transformer leads is as follows:

Primary—two green leads
High voltage sec.—two black leads
High voltage center tap—yellow lead
6.3 v. sec.—two heavy blue leads
6.3 center tap—thin blue lead
5 v. sec.—two heavy red leads.

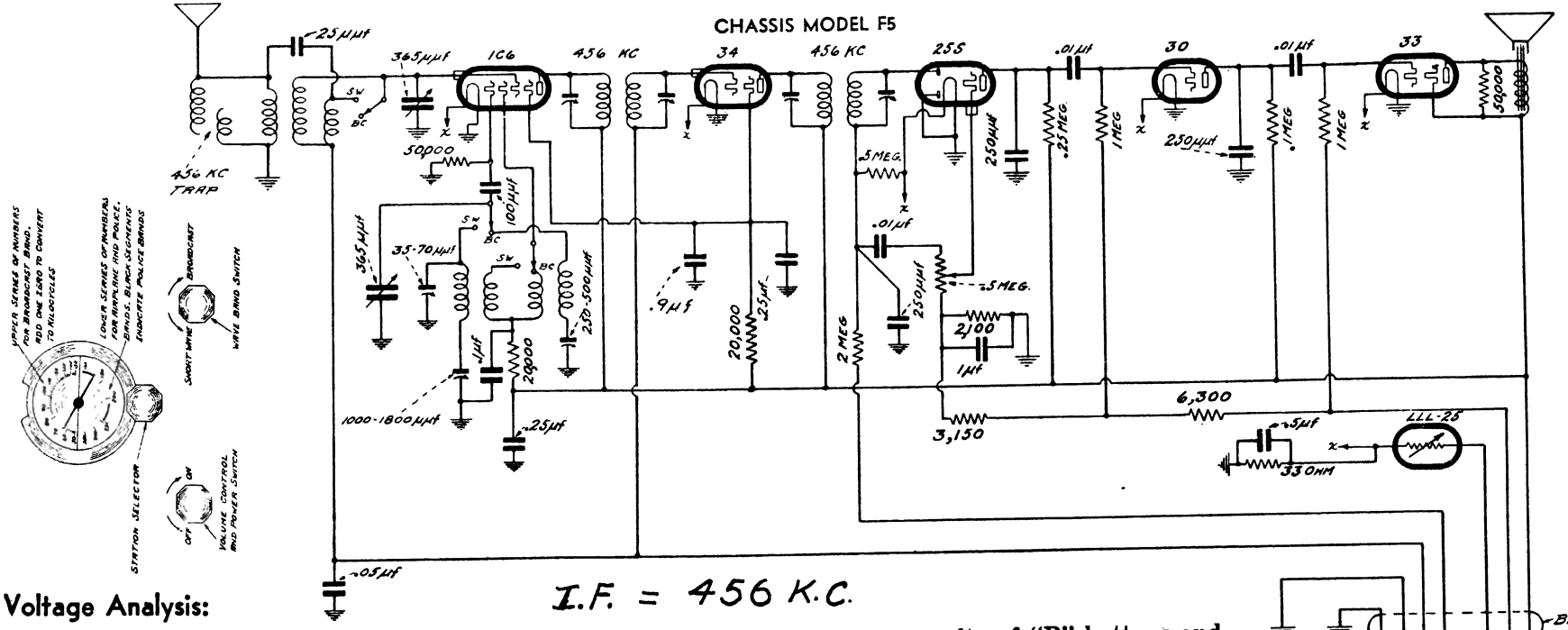
Voltage rating	110-120 volts.
Current drain	.73 amps.
Frequency ranges	540 to 1800 kc, 1710 to 5950 kc, 5.5 to 19.0 megacycles.

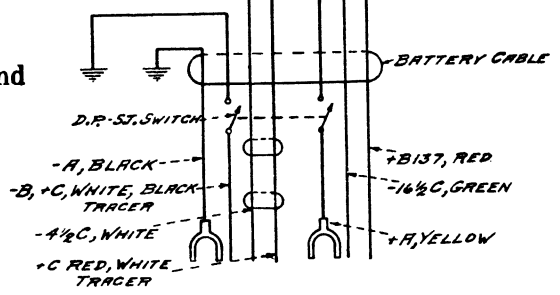
EMERSON RADIO & PHONOGRAPH CO., Inc.

Five-Tube Dual-Wave Battery-Operated Superheterodyne

MODEL 103

CHASSIS MODEL F5





Voltage Analysis:

Readings should be taken with 1000 ohms-per-volt voltmeter with 135 volts of "B" battery and 3 volts of "A" battery. Voltages listed below are from point indicated to ground.

Tube	*Plate*	*Screen*	*Bias*	*Osc. Plate*
33	125	135	—16.5	—
30	82	—	—3.0	—
25S	80	—	—1.5	—
34	135	57.0	0	—
1C6	135	57.0	0	80

BROADCAST RANGE
540 to 1700 kilocycles
(555 to 176 meters)

SHORT-WAVE RANGE
1620 to 3950 kilocycles
(185 to 76 meters)

The following batteries are recommended:

"A" battery (filament supply)—one 3 volt dry cell pack.

"B" battery (high voltage)—three 45 volt "B" batteries connected in series to give 135 volts.

"C" battery (bias)—one 4½ volt "C" battery.
one 22½ volt "C" battery.

These batteries can be completely housed in the cabinet. See label on inside of cabinet.

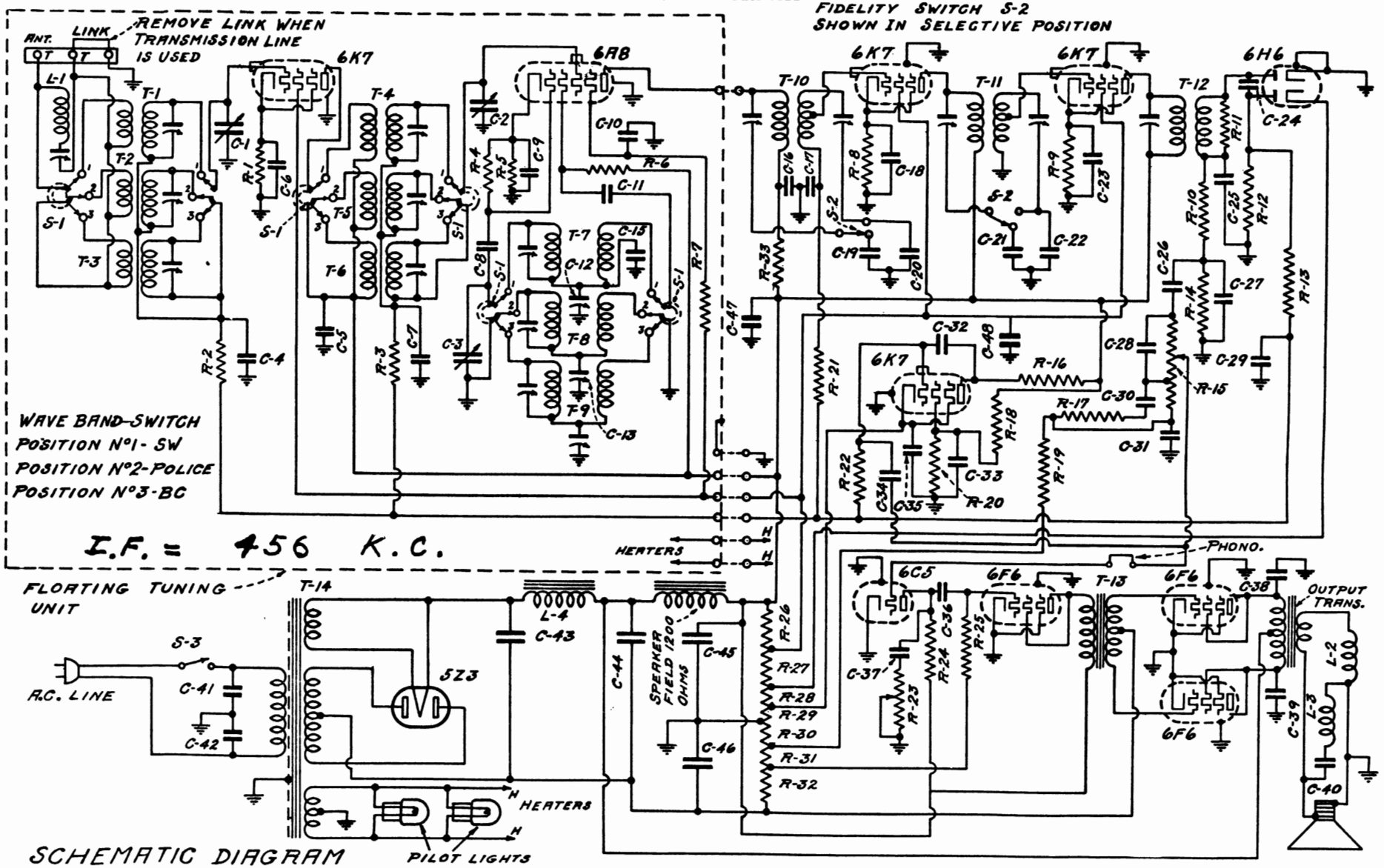
The tube complement is as follows:

1—1C6 Pentagrid converter and 1st detector.
1—34 Pentode i-f amplifier.
1—25S Duplex diode-triode 2nd detector and a.v.c.
1—30 Audio amplifier.
1—33 Pentode output.
1—LLL-25 Ballast tube for 3-volt operation.

Eleven-Tube, A.C., All-Wave Superheterodyne

MODEL 105

Chassis Model A11



SCHEMATIC DIAGRAM

The color coding of the power transformer leads is as follows:
Primary—two green leads
Electrostatic shield—bare stranded wire
High voltage sec.—two black leads
High voltage sec. center tap—yellow lead

6.3 v. sec. (Fil.)—two blue leads
6.3 v. sec. center tap—yellow lead
5 v. sec.—two red leads.

Voltage rating ..... 110-120 volts a-c
Current drain ..... 1.15 amps.
Frequency ranges .. 540 to 1800 kc, 1710 to 5950 kc, 5.5 to 19.0 megacycles

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 105 Chassis A-11

ADJUSTMENTS

The receiver was carefully aligned and checked at the factory by means of an oscillograph, and it is strongly recommended that servicemen use one for realignment.

An oscillator with frequencies of 456, 600, 1600, 1800, 5500, 6000 and 17,000 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Checking High-Fidelity Operation

On the oscillograph screen the peak of the selectivity curve (i-f response curve with fidelity-selectivity switch in selective position, clockwise) should appear in a position midway between the two peaks of the high-fidelity curve (i-f response curve with fidelity-selectivity switch in fidelity position, counter-clockwise). In other words the central vertical axis of the selectivity curve should be coincident on the screen with the central vertical axis of the high-fidelity curve.

An approximate check of the high-fidelity operation can be made with the use of the oscillator and output meter. First, the i-f's should be very carefully peaked at 456 kc *with the fidelity-selectivity switch in the selective position.* Turn the switch to the fidelity position, counter-clockwise, and vary the frequency of the oscillator. Two peaks should be observed on the output meter, approximately 7 kc on each side of the selectivity peak.

Alignment Procedure:

IMPORTANT: All adjustments should be made with the fidelity-selectivity switch in the selective position, clockwise.

I-f Alignment

The i-f transformers 2AT-203, 2AT-204 and 2AT-205 are located on extreme left side of chassis. Set wave-band switch at position A (clockwise) and condenser at minimum. Feed 456 kc to grid of 6A8 tube. Adjust the five i-f trimmers carefully for maximum response. Feed 456 kc through antenna and adjust 456 kc wave-trap for *minimum response.* This wave-trap is located at bottom rear of set, directly under the antenna binding post.

Broadcast Alignment

The three broadcast coils are in separate cans on top of tuner unit. (The tuner unit is the separate chassis section floated on rubber in center of chassis base). All trimmers for these coils are located at bottoms of cans and are available from bottom of chassis. NNT-150 is antenna coil, NNT-151 is detector coil and NNT-152 is oscillator coil. The oscillator coil has two adjusting screws; the one painted red is the series padder and the other is the trimmer. The antenna and detector coils have one trimmer each.

Set switch at A and pointer to 600 on dial. Feed 600 kc to antenna and adjust broadcast oscillator padder (red screw at bottom front of tuner unit, left-hand corner) for maximum response. Set pointer at 1600, feed 1600 kc to antenna and adjust oscillator trimmer beside red padder for maximum response, and then adjust r-f trimmer (through hole at about center of tuner unit), and antenna trimmer (through hole at rear of unit). Reset the pointer to 600, feed 600 kc to antenna and rock the variable condenser while resetting the oscillator padder for maximum response. Return to 1600, and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Police Alignment

The three police-band coils are the smaller ones located on the bottom side of the tuner unit, in row at left of wave-band switch (same side of switch as antenna binding post). The antenna coil is the one furthest from front of chassis, detector coil in center, and oscillator coil nearest front of chassis. The dual padder mounted on bottom, right-hand side of tuner unit has one padder for police-band oscillator coil and one for short-wave oscillator coil. The padder nearest wave-band switch is for the police band. Each of the three trimmers for the police-band coils is located on top of its respective coil.

Set switch at B (central position) and pointer to 1800 (2 divisions below 200 mark). Feed 1800 kc to antenna. Adjust oscillator series padder nearest to switch in right-hand corner for maximum response. Set pointer to 5500 and feed 5500 kc to antenna. First adjust oscillator trimmer (front one on row of smaller coils) for maximum response. If two peaks are obtained, select the *minimum capacity* peak. (See General Instructions below). Then adjust the antenna (rear) and detector (center) trimmers for maximum response. If two peaks are obtained, select the *maximum capacity* peak. Return pointer to 1800, feed 1800 kc to antenna, and rock variable condenser while adjusting police band oscillator padder for maximum response. Return to 5500 and check alignment. If a readjustment is necessary return to 1800 and repeat entire procedure.

Short-Wave Alignment

The three short-wave coils are the larger ones located on bottom side of tuner unit in row at right of wave-band switch. The antenna coil is the one furthest from front of chassis, detector coil in center and oscillator coil nearest front of chassis. On dual padding condenser the padder furthest from wave-band switch is for short-wave oscillator coil. Each of the three trimmers for the short-wave coils is located on top of its respective coil.

Set switch at C (counter-clockwise) and pointer at 6 megacycles. Feed 6000 kc to antenna. Adjust short-wave oscillator padder (furthest from switch on dual unit) for maximum response. Set pointer to 17 megacycles and feed 17000 kc to antenna. First adjust oscillator trimmer (front) for maximum response. If two peaks are obtained, select the *minimum capacity* peak. Then adjust the antenna (rear) and detector (center) trimmers for maximum response. If two peaks are obtained, select the *maximum capacity* peak. Return pointer to 6 mc, feed 6000 kc to antenna and rock variable condenser while adjusting the oscillator padder for maximum response. Return to 17 mc. Feed 17000 kc to antenna and check alignment.

Check the receiver on all three bands for dead spots which indicate incorrect alignment.

VOLTAGE ANALYSIS

Readings should be taken with a 1000-ohms-per-volt meter. Voltages listed below are from point indicated to ground with no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Control Grid*	*Fil.*
6K7 r-f amp.—on tuner unit	237	87	2.6	—	0	6.3 a.c.
6K7 1st i-f—left front corner	237	87	2.6	—	0	6.3 a.c.
6K7 2nd i-f—second from front at left	237	87	2.6	—	0	6.3 a.c.
6K7 tone control- beside 6C5	4	11	1.0	—	0	6.3 a.c.
6A8 1st det. osc.	237	85	3.0	175	0	6.3 a.c.
6H6 diode det.	—	—	7.8	—	0	6.3 a.c.
6C5 1st audio	95	—	0	—	—2	6.3 a.c.
6F6 driver—furthest left	225	225	0	—	—7	6.3 a.c.
6F6 output	350	350	0	—	—38	6.3 a.c.
6F6 output	350	350	0	—	—38	6.3 a.c.

Voltage at 5Z3 fil.—373

Voltage across speaker field—120

Voltage across choke—12

Voltages, to chassis, measured along voltage divider, starting at end near the 5Z3 tube. (The voltage divider is the long wire-wound tapped resistor on the rear chassis wall.)

Tap 1 (near 5Z3), 237 v.
Tap 2, 87 v.
Tap 3, 7.8 v.
Tap 4, 1.0 v.
Tap 5 (grounded), 0 v.
Tap 6, —5.3 v.
Tap 7, —20 v.
Tap 8, —38 v.

REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 PRICE
L1	MMT-149	456 kc tunable wave trap	$ .35
L2	2AT-208	10 kc filter choke—720 microhenries	.95
L3	2AT-209	10 kc filter choke—320 microhenries	.85
L4	2AT-206	Iron-core filter choke—90 ohms	2.50
T1	NNT-158	Short-wave antenna coil	.55
T2	NNT-155	Intermediate band antenna coil	.50
T3	NNT-150	Broadcast antenna coil	.90
T4	NNT-159	Short-wave detector coil	.60
T5	NNT-156	Intermediate band detector coil	.50
T6	NNT-151	Broadcast detector coil	.90
T7	NNT-160	Short-wave oscillator coil	.55
T8	NNT-157	Intermediate band oscillator coil	.50
T9	NNT-152	Broadcast oscillator coil	.90
T10	2AT-203	456 kc first i-f transformer	1.45
T11	2AT-204	456 kc second i-f transformer	1.45
T12	2AT-205	456 kc third i-f transformer	1.15
T13	2AT-210	Audio transformer	2.75
T14	2AT-211	Power transformer	6.00
R1, R5, R8, R9	CCR-140	350 ohm wire-wound resistor	.16
R2, R3, R18, R19, R21, R24, R25	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R4	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R6	YR-97	15,000 ohm ½ watt carbon resistor	.16
R7, R33	GR-85	2,000 ohm ¼ watt carbon resistor	.16
R10	OR-73	25,000 ohm ¼ watt carbon resistor	.16
R11, R14	LLR-154	75,000 ohm ½ watt carbon resistor	.16
R12	KR-56	0.5 megohm ¼ watt carbon resistor	.16
R13, R16, R22	KR-57	1 megohm ¼ watt carbon resistor	.16
R15	NNR-156	Volume control—1.2 megohms	.70
R17, R20	LR-64	5,000 ohm ¼ watt carbon resistor	.16
R23, S3	2AR-198	Tone control with line switch—0.5 megohms	.80
R26, R27, R28, R29, R30, R31, R32	2AR-199A	5,469 ohm wire-wound resistor (voltage divider)	1.30
		R26—3100 ohms, 8 watts	R30—36 ohms, 1 watt
		R27—1920 ohms, 5 watts	R31—107 ohms, 2.5 watts
		R28—155 ohms, 0.5 watts	R32—128 ohms, 2.5 watts
		R29—23 ohms, 0.1 watts	
C1, C2, C3	NNC-153	Three gang variable condenser	3.25
C4, C7	NNC-158	0.05 mf, 200 volt tubular condenser with mounting strap	.16
C5, C10	EEC-132	0.1 mf, 400 volt tubular condenser	.16
C6, C9	AC-6	0.1 mf, 200 volt tubular condenser	.16
C8, C25, C27	EC-24A	0.0001 mf mica condenser	.16
C11	AAC-114	0.001 mf mica condenser	.75
C12, C13	NNC-154A	Dual padding condenser	
		C12, C13—800 to 1400 mmf	
C15	NNC-181	0.0015 mf mica condenser	.16
C16, C18, C23, C29, C33, C35, C47, C48	2AC-210	Eight-section condenser block	2.00
		C16—0.1 mf, 400 v.	C33—0.1 mf, 200 v.
		C18—0.1 mf, 200 v.	C35—0.1 mf, 200 v.
		C23—0.1 mf, 200 v.	C47—0.5 mf, 400 v.
		C29—0.05 mf, 200 v.	C48—0.25 mf, 400 v.
C17	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C19, C20, C21, C22	2AC-216	0.004 mf mica condenser	.16
C24, C28, C32	AC-7A	0.00025 mf mica condenser	.16
C26, C36	LC-65	0.02 mf, 400 volt tubular condenser	.16
C30	LC-64	0.05 mf, 400 volt tubular condenser	.60
C31	IC-43	5 mf, 25 volt electrolytic tubular condenser	.16
C34, C37	KC-58	0.01 mf, 400 volt tubular condenser	.16
C38, C39	NNC-214	0.002 mf, 1000 volt tubular condenser	.80
C40	2AC-215	0.7 mf filter condenser in metal container	.30
C41, C42	XXC-220	Dual 0.01 mf, 250 v. tubular condenser in metal container	
C43, C44, C45, C46	2AC-209A	10 mf and triple 8 mf electrolytic filter and by-pass condenser block	3.20
		C43—8 mf, 450 v.	C45—8 mf, 450 v.
		C44—8 mf, 450 v.	C46—10 mf, 50 v.
	2AS-135	12" dynamic high-fidelity speaker	18.00
S1	NNS-95	Wave-band switch with shields	2.40

TUBE DATA

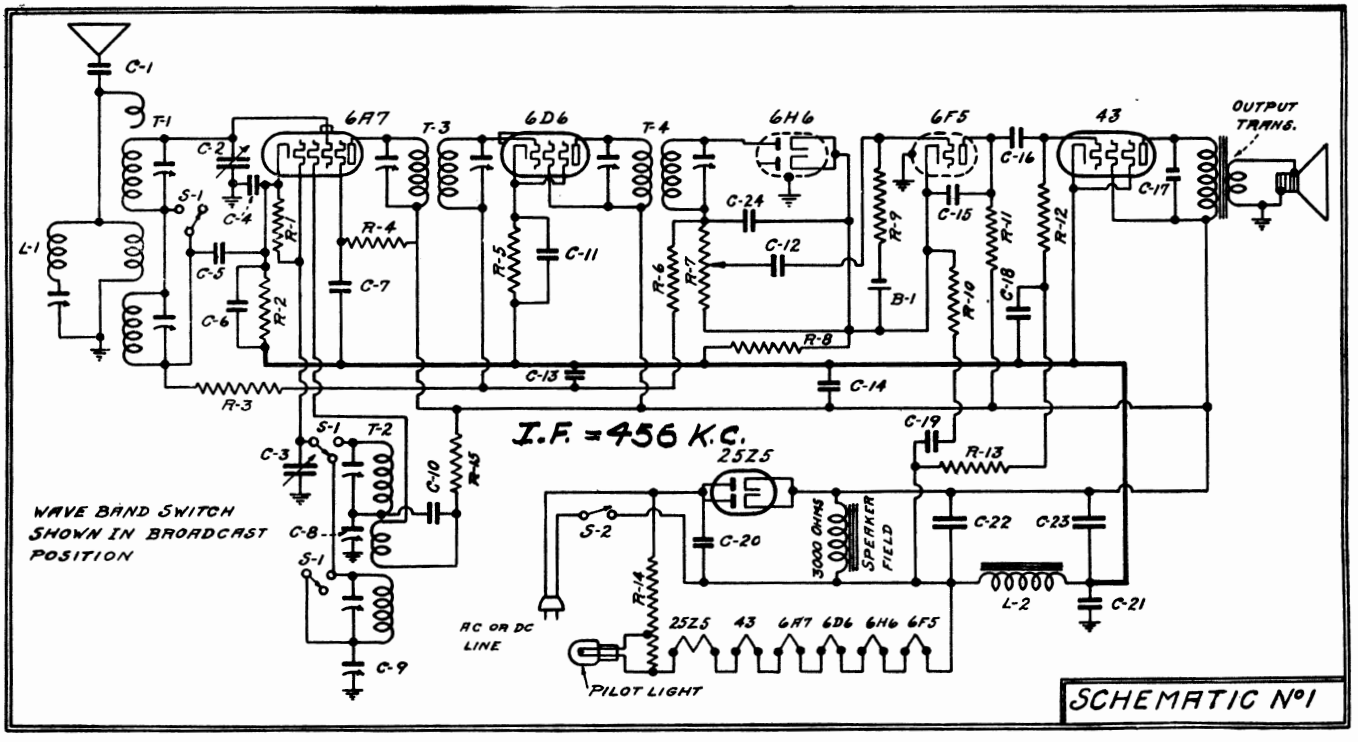
The tube complement is as follows:

1—6K7 (metal)—R-f amplifier
1—6K7 (metal)—1st i-f amplifier
1—6K7 (metal)—2nd i-f amplifier
1—6K7 (metal)—Automatic tone control and interstation noise suppressor
1—6A8 (metal)—Pentagrid oscillator-modulator
1—6H6 (metal)—Diode detector and automatic volume control
1—6C5 (metal)—1st audio amplifier
1—6F6 (metal)—Class "A B" driver
2—6F6's (metal)—Push-pull output
1—5Z3 (glass)—Full-wave rectifier.

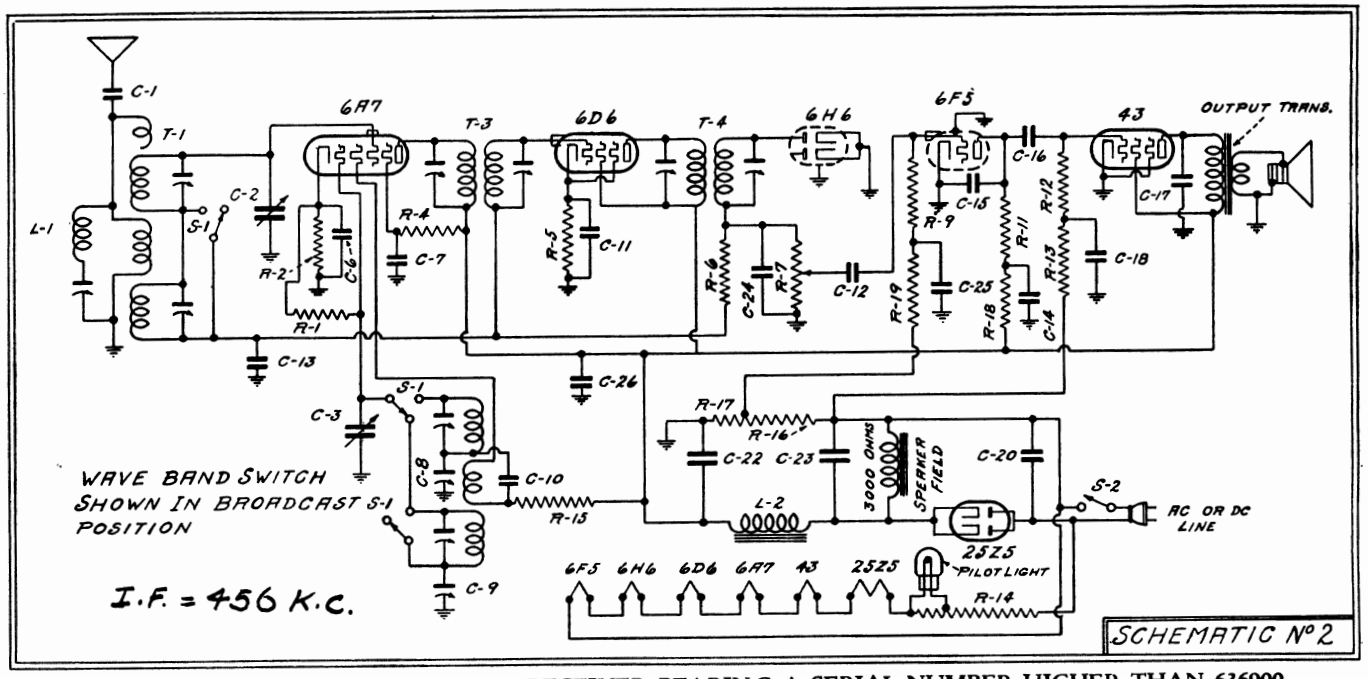
EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 106

Chassis Model U6B



THIS SCHEMATIC APPLIES TO ANY RECEIVER BEARING A SERIAL NUMBER LOWER THAN 636901.



THIS SCHEMATIC APPLIES TO ANY RECEIVER BEARING A SERIAL NUMBER HIGHER THAN 636900.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to 43 cathode (B minus). Line voltage for these readings was 117.5 volts, 60 cycles, a-c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	105	55	1.7	100	6 a-c
6D6	105	105	2.75	—	6 a-c
6H6	—	—	0	—	6 a-c
6F5	55	—	0	—	6 a-c
43	100	105	0	—	24 a-c

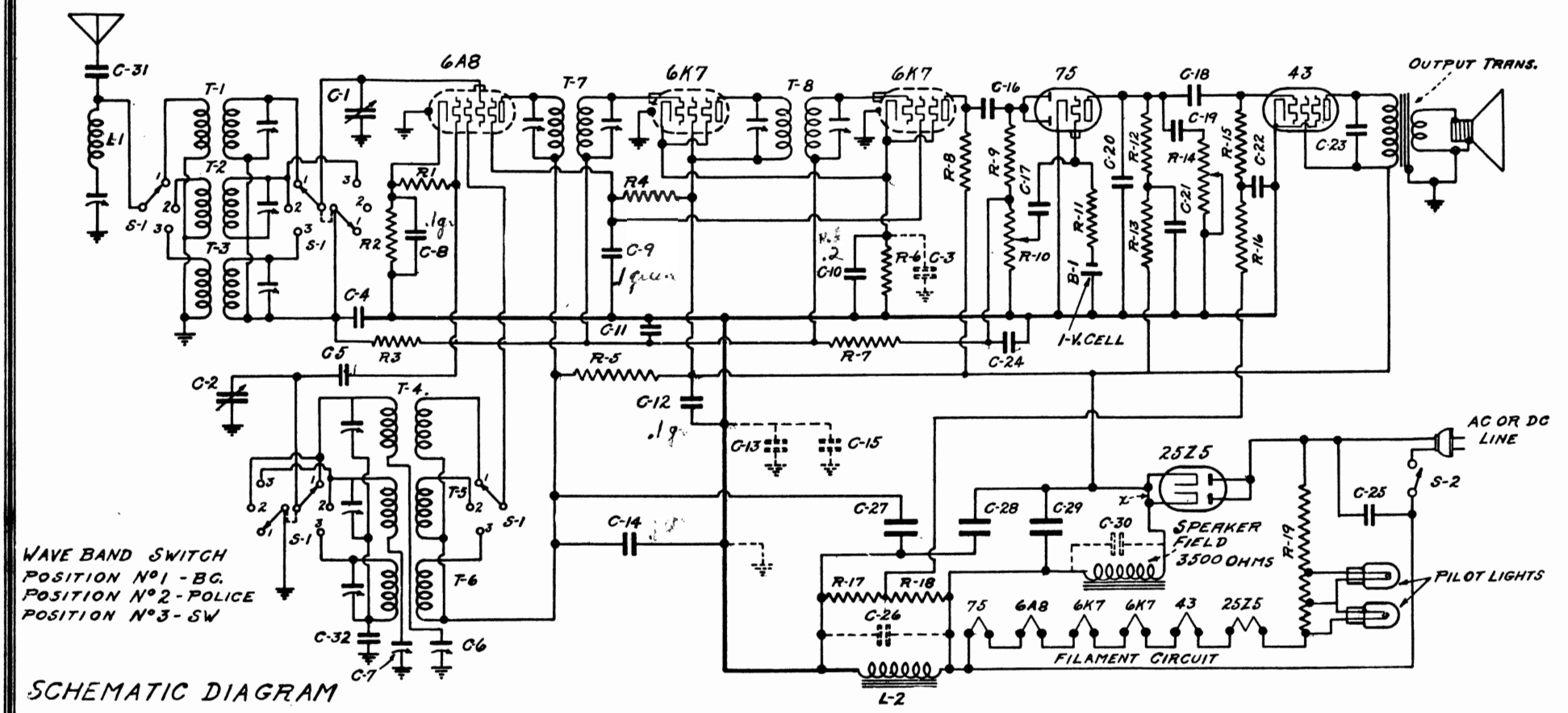
Voltage across choke (B minus to line switch)—20 volts.

Voltage across speaker field (25Z5 cathode to line switch)—125 volts.

In later production runs, the following changes were made:
C30 added and circuit broken at X; 25Z5 cathodes separated (see schematic). C26 removed.
B minus grounded to chassis. C15 and C13 removed. C21 placed in the condenser block.
R11 changed from 1 megohm carbon resistor to 0.5 megohm, ½ watt carbon resistor, our part KR-56.
R16 changed from 0.5 megohm carbon resistor to 0.25 megohm, ½ watt carbon resistor, our part KR-55.

MODELS 107 and 111

Chassis Model U6A



SCHEMATIC DIAGRAM

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (cathode of 43 tube). Line voltage for these readings was 117.5 volts, a.c., 60 cycles.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8	82	50	2	82	6
6K7 1st i-f	107	107	5	—	6
6K7 2nd i-f	65	50	5	—	6
75	50	—	0	—	6
43	95	107	0	—	24

Voltage across speaker field (25Z5 cathode to line switch) — 107 volts.

Voltage across choke (43 cathode to line switch) — 22 volts.

6A8 (metal) Pentagrid oscillator-modulator.
6K7 (metal) 1st i-f amplifier.
6K7 (metal) 2nd i-f amplifier (adjacent to 75)
75 (glass) 2nd detector—a-f amplifier—a.v.c.
43 (glass) Power output pentode.
25Z5 (glass) Half-wave rectifier.

Item	Part No.	DESCRIPTION	PRICE
L1	2PT-283	456 kc adjustable wave trap	$ .40
T1	2NT-226	Two-band antenna coil	1.10
T2	2NT-227	Two-band oscillator coil	.90
T3	2NT-230A	456 kc 1st i-f transformer	.90
T4	2NT-231A	456 kc 2nd i-f transformer	.90
T5	2PT-245	Power transformer	2.80
T6	2PT-244	Speaker output transformer	1.00
R1	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	BR-12	25,000 ohm 1 watt carbon resistor	.16
R4	2NR-217	40,000 ohm 1 watt carbon resistor	.16
R5	FFR-126	500 ohm ½ watt wire-wound resistor	.16
R6	IIR-130	150 ohm ½ watt wire-wound resistor	.16
R7, R8	KR-57	1 megohm ¼ watt carbon resistor	.16
R9, S2	2NR-214A	Volume control with line switch—250,000 ohms	.80
R10, R15	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R11, R14	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R12	2PR-223	500 ohm 1 watt wire-wound resistor	.16
R13	2PR-237	100 ohm 2 watt wire-wound resistor	.16
C1, C23	AAC-106A	0.00005 mf mica condenser	.16
C2, C8	BC-12	0.05 mf, 200 volt tubular condenser	.16
C3, C4	2NC-228A	Two-gang variable condenser	2.00
C5	2NC-231	Single adjustable padding condenser. Range—300 to 600 mmf	.35
C6	2NC-230	0.00135 mf mica condenser	.20
C7	KC-58	0.01 mf, 400 volt tubular condenser	.16
C9	BC-13	0.25 mf, 200 volt tubular condenser	.16
C10, C11, C22	AC-7A	0.00025 mf mica condenser	.16
C12	LC-65	0.02 mf, 400 volt tubular condenser	.16
C13	IC-47	0.0005 mf mica condenser	.16
C14	ZC-115	0.006 mf, 1000 volt tubular condenser	.16
C15	IC-43A	Tubular 5 mf, 25 volt dry electrolytic condenser	.60
C16	2TC-189	0.015 mf, 1000 volt tubular condenser	.16
C17	AC-6	0.1 mf, 200 volt tubular condenser	.16
C18	EEC-132	0.1 mf, 400 volt tubular condenser	.16
C19	2NC-246B	16 mf, 450 volt wet electrolytic condenser	.80
C20	2NC-246A	16 mf, 450 volt wet electrolytic condenser	.80
C21	2NC-250	0.01 mf, 250 volt a.c. condenser in tubular metal container	.20
C24	CCC-127	0.01 mf, 200 volt tubular condenser	.16
	2PS-160	5¼" dynamic speaker (without output transformer)	3.75
S1	TTS-111F	Wave-band switch	.40
S3	2TS-145C	Tone control switch	.25
	XL-9	Pilot light, 6.3 volt, .25 amp., Mazda No. 46	.16
	2PD-37	Edge-glo dial	1.80
	ZZZ-209A	Escutcheon with crystal	.50

PRODUCTION CHANGES

On early production:

a. Trimmer across secondary of broadcast antenna coil had rotor returned to ground.

b. Trimmer across secondary of short-wave oscillator coil had rotor returned to ground.

c. In very early sets 85 tube was used in place of 75, and .02 mf coupling condenser went directly to plate. One 100,000 ohm plate resistor was used in place of two resistors R-10 and R-15 shown in plate circuit. The control grid of the 85 in these receivers was connected directly to movable arm on the volume control, and R-14 and C-24 were not in the circuit.

d. Model 114 had 6D6, first i-f tube in place of 78. All production changes above also apply to model 114.

e. The second electrolytic condenser C19 was of the regulating type, part no. 2NC-247A.

f. The 456 kc wave-trap was originally part no. MMT-149.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground, with volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	219	74	2.3	150	6.3 a.c.
78	219	74	2.3	—	6.3 a.c.
75	75	—	3.2	—	6.3 a.c.
41	206	219	13.6	—	6.3 a.c.

B plus at cathode of 1-V tube—271 volts.
Voltage across the speaker field—50 volts.

Location of Coils and Trimmer Adjustments:

The two i-f transformers are located on the top of the chassis deck. The second i-f is the one directly behind the 6A7 tube. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The 456 kc wave trap is located on top of the chassis deck beside the antenna coil.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis deck (in the corner near the antenna coil) with the screw adjustment accessible through a hole in the front of the chassis.

The antenna coils for the broadcast and short-wave bands are wound on one form and mounted on bracket on top of chassis deck. The trimmers for these coils are accessible through holes in the bracket. The trimmer nearest the chassis is the short-wave antenna trimmer. The trimmer nearest the top of the bracket is the broadcast antenna trimmer.

The oscillator coil for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck. The trimmers for these coils are accessible through holes in the right-hand wall of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil, and the trimmer farthest from the front is for the broadcast oscillator coil.

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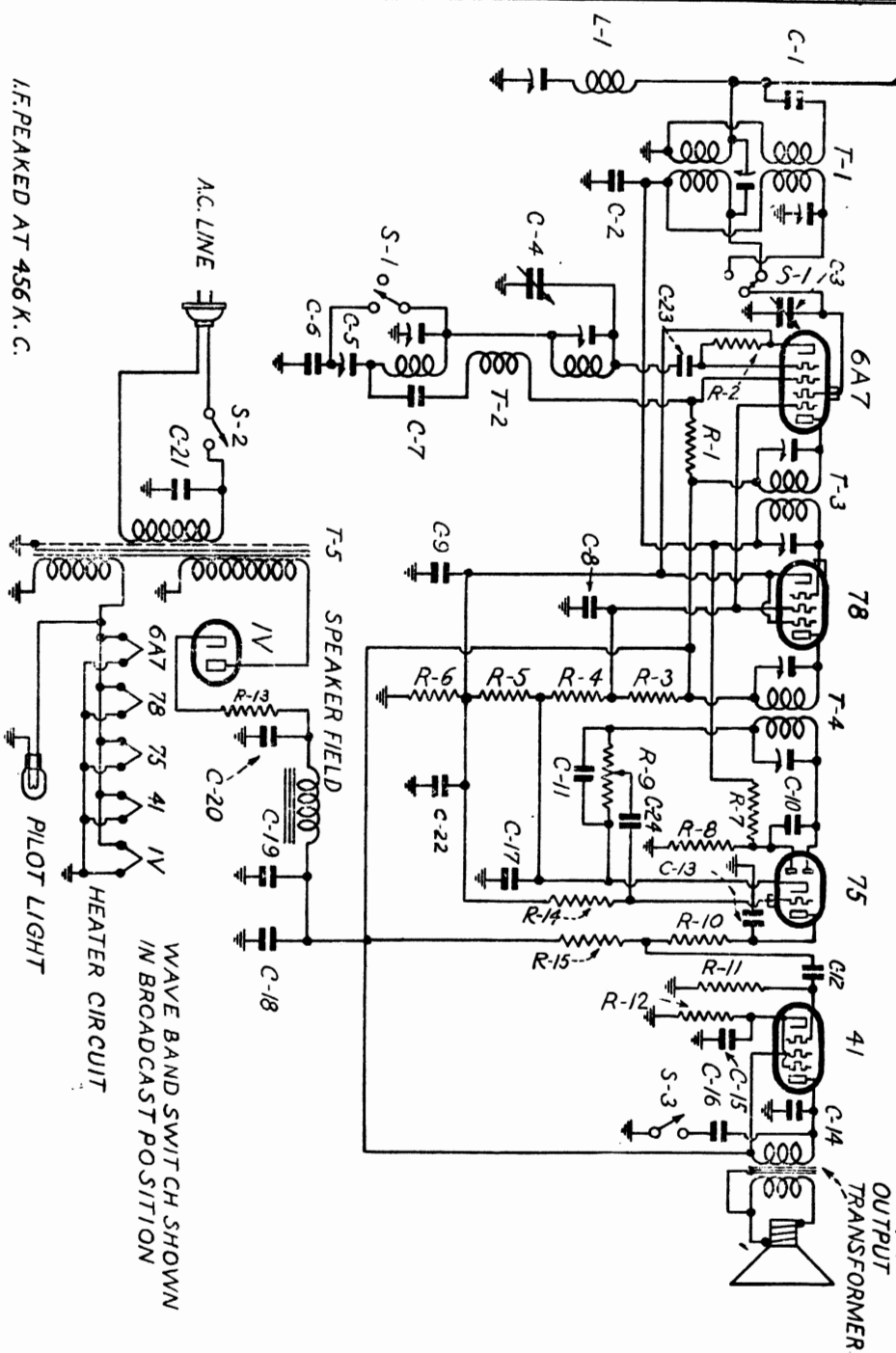
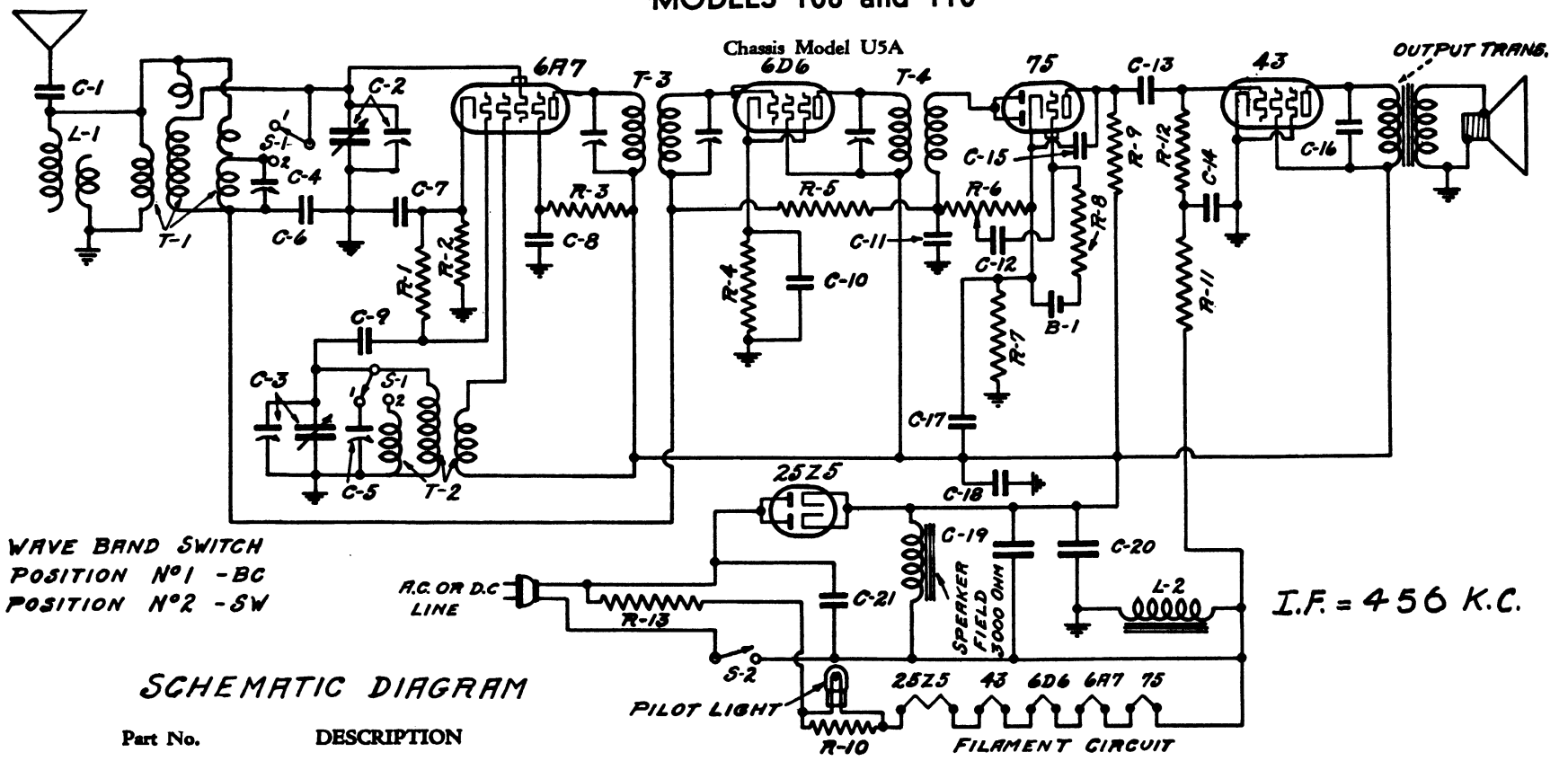
MODELS 107AC and 114

Chassis Model E5



MODELS 108 and 110



SCHEMATIC DIAGRAM

*Item	Part No.	DESCRIPTION
L2	ZZT-196	Filter choke—500 ohms
T1, L1	2DT-199	Two-band antenna coil with 456 kc wave trap
T2	2DT-200	Two-band oscillator coil
T3	2DT-201	456 first i-f transformer
T4	2DT-202A	456 kc second i-f transformer
R1	KR-53	50,000 ohm ¼ watt carbon resistor
R2	CCR-140	350 ohm ½ watt wire-wound resistor
R3	ZZR-196	30,000 ohm ¼ watt carbon resistor
R4	AAR-119	300 ohm ½ watt wire-wound resistor
R5, R8	KR-57	1 megohm ¼ watt carbon resistor
R6, S2	2DR-169	Volume control with line switch—0.5 megohm
R7	PR-79	1,000 ohm ¼ watt carbon resistor
R9, R11, R12	KR-56	0.5 megohm ¼ watt carbon resistor
R10	2DR-200	25 ohm wire-wound metal clad resistor
R13	2DW-62	145 ohm, 15 watt resistor wire in line cord
C1, C11	IC-47A	0.0005 mf mica condenser
C2, C3	2DC-202	Two gang variable condenser
C4, C5	2DC-212	Dual trimmer on bakelite strip 3 to 30 mmf—each trimmer
C6, C14, C21	AC-6	0.1 mf, 200 volt tubular condenser
C7, C8, C10	BC-12	0.05 mf, 200 volt tubular condenser
C9	EC-24A	0.0001 mf mica condenser
C12, C13	CCC-127	0.01 mf, 200 volt tubular condenser
C15	AC-7A	0.00025 mf mica condenser
C16	HC-34	0.006 mf, 600 volt tubular condenser
C17	EC-19	0.5 mf, 200 volt tubular condenser
C18	BC-13	0.25 mf, 200 volt tubular condenser
C19, C20	2DC-203	Multiple 8 and 16 mf electrolytic filter condenser C19—16 mf, 150 volts. C20—8 mf, 150 volts.

PRODUCTION CHANGES

Receivers bearing serial numbers higher than 758,100

R-9, changed from .5 megohm, KR-56 to 50,000 ohm,
R-12, changed from .5 megohm, KR-56 to 100,000 ohm,
R-11, changed from .5 megohm, KR-56 to 200,000 ohm,
C-13, changed from .01, CCC-127, to .02-200 volt,
C-14, changed from .1, AC-6, to .9-200 volt.

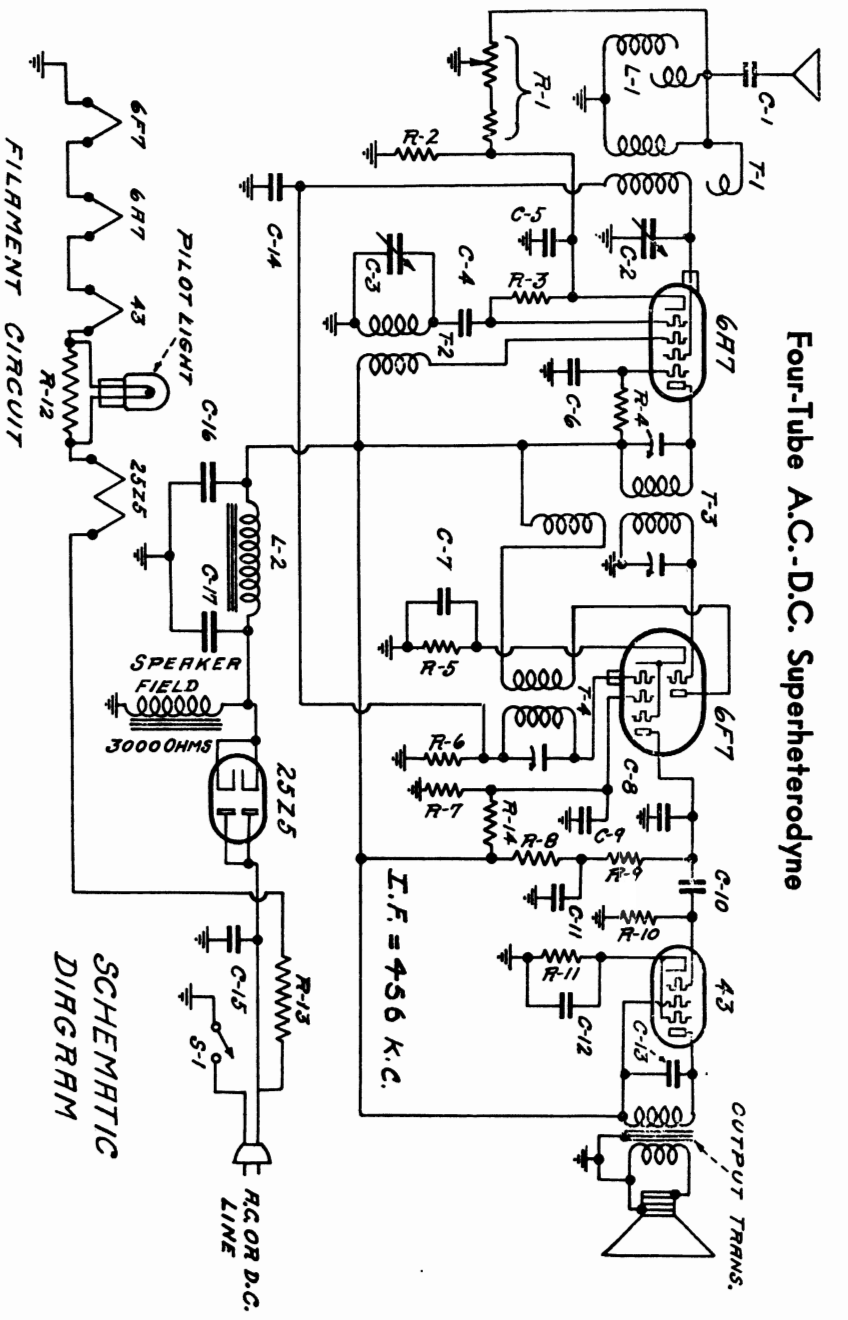
EMERSON RADIO & PHONOGRAPH CO., Inc.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 109

Chassis Model U4A

Four-Tube A.C.-D.C. Superheterodyne



*Item	Part No.	DESCRIPTION	PRICE
L2	KKT-138	Filter choke—300 ohms	$ .70
T1, L1	KKT-134	Antenna coil with 456 kc wave trap	.85
T2	KKT-135	Oscillator coil	.40
T3	KKT-136	456 kc first i-f transformer	1.40
T4	KKT-137B	456 kc second i-f transformer	1.10
R1, S1	KKR-134B	Volume control with line switch—75,000 ohms	.85
R2	KKR-153	6,000 ohm ¼ watt carbon resistor	.16
R3, R14	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R4, R8	OR-73	25,000 ohm ¼ watt carbon resistor	.16
R5	FFR-133	650 ohm ½ watt wire-wound resistor	.16
R6	KR-57	1 megohm ¼ watt carbon resistor	.16
R7	LR-65	10,000 ohm ¼ watt carbon resistor	.16
R9	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R10	KR-56	0.5 megohm ¼ watt carbon resistor	.16
R11	KKR-135A	650 ohm 1 watt wire-wound resistor	.16
R12	2DR-200	25 ohm wire-wound metal clad resistor	.20
R13	KKW-46A	185 ohm, 17-watt resistor wire, built into line cord	.70
C1	AAC-114	0.001 mf mica condenser	.16
C2, C3	KKC-142A	Two-gang variable condenser	2.15
C4	NC-70A	0.0002 mf mica condenser	.16
C5, C6, C9 C11, C14	AC-6A	0.1 mf, 200 volt tubular condenser	.16
C7, C12	KKC-145	Dual 5 mf, 25 volt tubular electrolytic condenser	.90
C8	AC-7A	0.00025 mf mica condenser	.16
C10, C13	KC-58A	0.01 mf, 400 volt tubular condenser	.16
C15	GC-87	0.1 mf, 400 volt tubular condenser	.16
C16, C17	KKC-143	8 and 12 mf electrolytic filter condenser C16—8 mf, 150 volts C17—12 mf, 150 volts	1.50

Location of I-f's and Trimmers:

The first i-f transformer, part No. KKT-136, is in an oblong coil can, located on top of the chassis directly behind the speaker. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part No. KKT-137B, is in a round coil can located on top of the chassis to the left of the speaker. The single trimmer for this i-f is accessible through a hole in the top of the coil can.

The oscillator and antenna trimmers are located on the top of the variable condenser. The oscillator trimmer is on the rear section and the antenna trimmer is on the front section.

Alignment Procedure:

1. Rotate variable condenser to minimum.
2. Feed 456 kc to grid of 6A7 tube.
3. Adjust the three i-f trimmers, repeating for maximum response.
4. Set dial pointer to 1425 and feed 1425 kc through the antenna.
5. Adjust the oscillator (rear) trimmer for maximum response.
6. Adjust antenna trimmer for maximum response.

VOLTAGE ANALYSIS

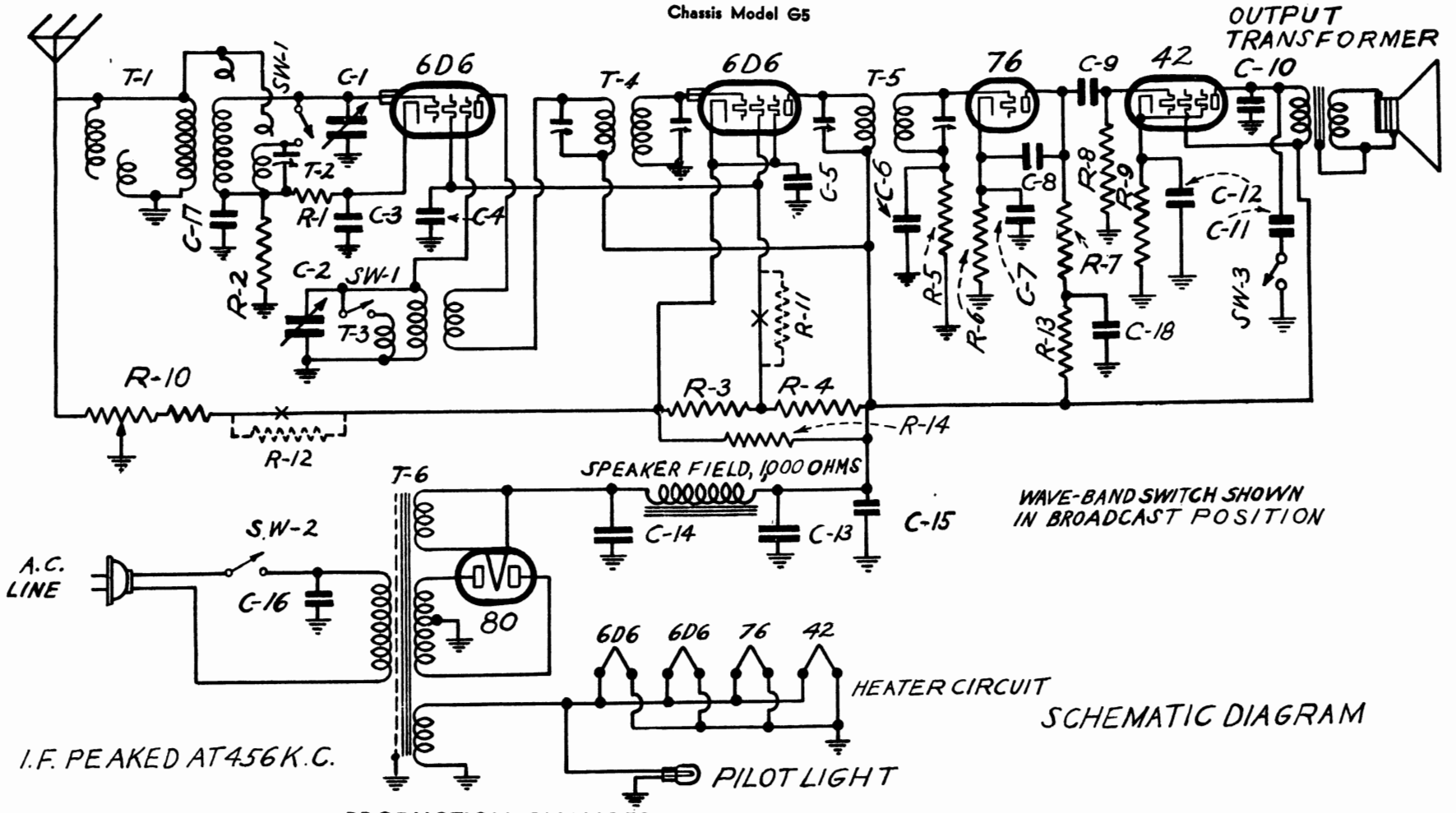
Voltage readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis).

Tube		*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7		105	60	1.35	105	5.5
6F7	Pentode	55	15	2.25	—	5.5
	Triode	105				
43		98	105	14.5	—	23.0

Voltage across speaker field—115
Voltage across choke—10.5

MODEL 116

Chassis Model G5



PRODUCTION CHANGES

Receivers bearing serial numbers from 119,051 to 122,050—

The two resistors R11 and R12, shown by dotted lines on the schematic diagram were used in the circuit.

Receivers bearing serial numbers higher than 753,600:
The bias stop on the volume control, R-10, made 200 ohms instead of 250 and the part number was changed from TTR-159C to TTR-159D.

R-3, 20,000 ohm resistor changed from ½ watt to 1 watt and part number changed from DDR-122 to GR-31

C-10, .006 output condenser, put across 43 plate and screen, instead of plate to ground.

Receivers with serial numbers above 753,800---R 6, 150,000 ohm resistor in 76 cathode circuit changed to 50,000 ohms, ½ watt

REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION	PRICE
L1	MMT-149	456 kc adjustable wave trap	$ .35
T1	2NT-226	Two-band antenna coil	1.10
T2	2NT-227	Two-band oscillator coil	.90
T3	2NT-230	456 kc first i-f transformer	.90
T4	2NT-231	456 kc second i-f transformer	.90
T5	2NT-233	Power transformer	2.70
R1	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	BR-12	25,000 ohm 1 watt carbon resistor	.16
R4	2NR-217	40,000 ohm 1 watt carbon resistor	.16
R5	FFR-126	500 ohm ½ watt wire-wound resistor	.16
R6	IIR-130	150 ohm ½ watt wire-wound resistor	.16
R7, R8	KR-57	1 megohm ¼ watt carbon resistor	.16
R9, S2	2NR-214	Volume control with line switch—250,000 ohms	.80
R10	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R11	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R12	CCR-118	450 ohm 1 watt wire-wound resistor	.16
C1, C23	AAC-106A	0.00005 mf mica condenser	.16
C2, C8	BC-12	0.05 mf, 200 volt tubular condenser	.16
C3, C4	2NC-228	Two gang variable condenser	2.00
C5	2NC-231	Single adjustable padding condenser Range—300 to 600 mmf	.35
C6	2NC-230	0.00135 mf mica condenser	.20
C7	KC-58	0.01 mf, 400 volt tubular condenser	.16
C9	BC-13	0.25 mf, 200 volt tubular condenser	.16
C10, C11, C22	AC-7A	0.00025 mf mica condenser	.16
C12	LC-65	0.02 mf, 400 volt tubular condenser	.16
C13	IC-47	0.0005 mf mica condenser	.16
C14	ZC-115	0.006 mf, 1000 volt tubular condenser	.16
C15	IC-43A	Tubular 5 mf, 25 volt dry electrolytic condenser	.60
C16	2TC-189	0.015 mf, 1000 volt tubular condenser	.16
C17	AC-6	0.1 mf, 200 volt tubular condenser	.16
C18	EEC-132	0.1 mf, 400 volt tubular condenser	.16
C19	2NC-247	16 mf, 405 volt wet electrolytic condenser (regulating type)	.80
C20	2NC-246	16 mf, 450 volt wet electrolytic condenser	.80
C21	2NC-250	0.01 mf, 250 volt a-c condenser in tubular metal container	.20
	2NS-122	6½" dynamic speaker	3.75
S1	TTS-111E	Wave-band switch	.40
S3	2TS-145B	Tone control switch	.25
	XL-9	Pilot light, 6.3 volt, .25 amp. Mazda No. 46	.15
	2ND-34B	Airplane dial	1.30
	2NZ-306	Escutcheon with crystal	.50
	2TM-211	Escutcheon reflector ring	.10

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis). Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	255	90	3.5	170	6.3 a.c.
6D6	255	90	3.5	—	6.3 a.c.
85	37	—	5.5	—	6.3 a.c.
42	240	255	15.0	—	6.3 a.c.

B plus at filament of 80 tube—325 volts

Voltage across speaker field—70 volts.

PRODUCTION CHANGES

In early production:

a. Airplane dial was part number 2ND-34 and had a grey dial face. Later dial, part number 2ND-34B, has a black dial face.

b. C19 and C20 were each 12 mf, 450 volt electrolytics.

c. R2 was originally in position indicated by dotted lines. It was later placed across the oscillator grid and cathode of the 6A7 tube (as now shown in the schematic) and at the same time C23 was added and C22 omitted.

Receivers bearing serial numbers higher than 761,440:

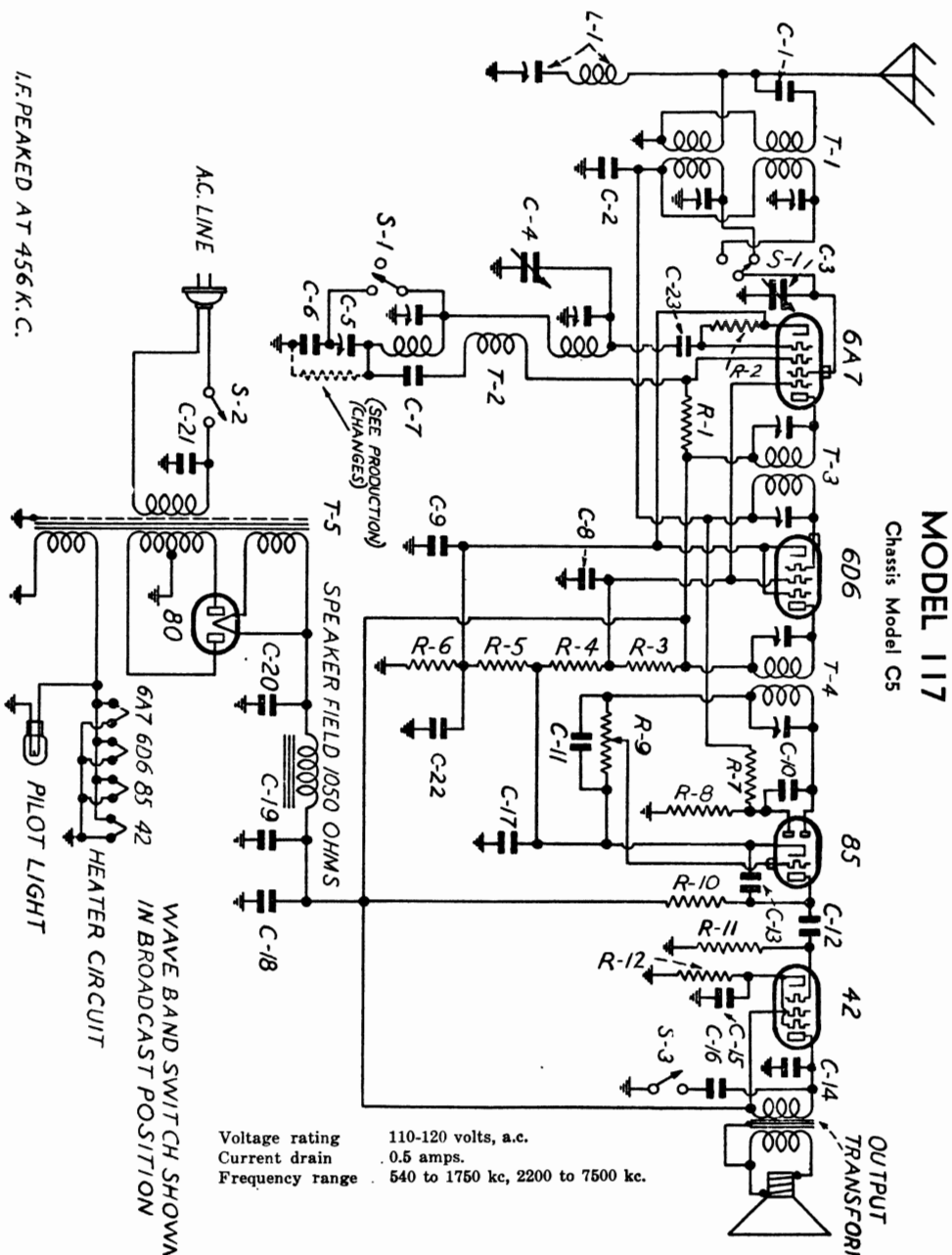
The compensator on the oscillator coil trimmer strip which formerly went from the grid condenser to ground now goes directly across the broadcast oscillator secondary. This change facilitates alignment.

The compensator on the antenna coil trimmer strip which formerly went from the grid end of the broadcast antenna secondary to ground now goes from the grid end of the broadcast antenna secondary directly to the antenna lead. This change introduces capacity coupling and increases the sensitivity at the high frequency end of the broadcast band.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 117

Chassis Model C5



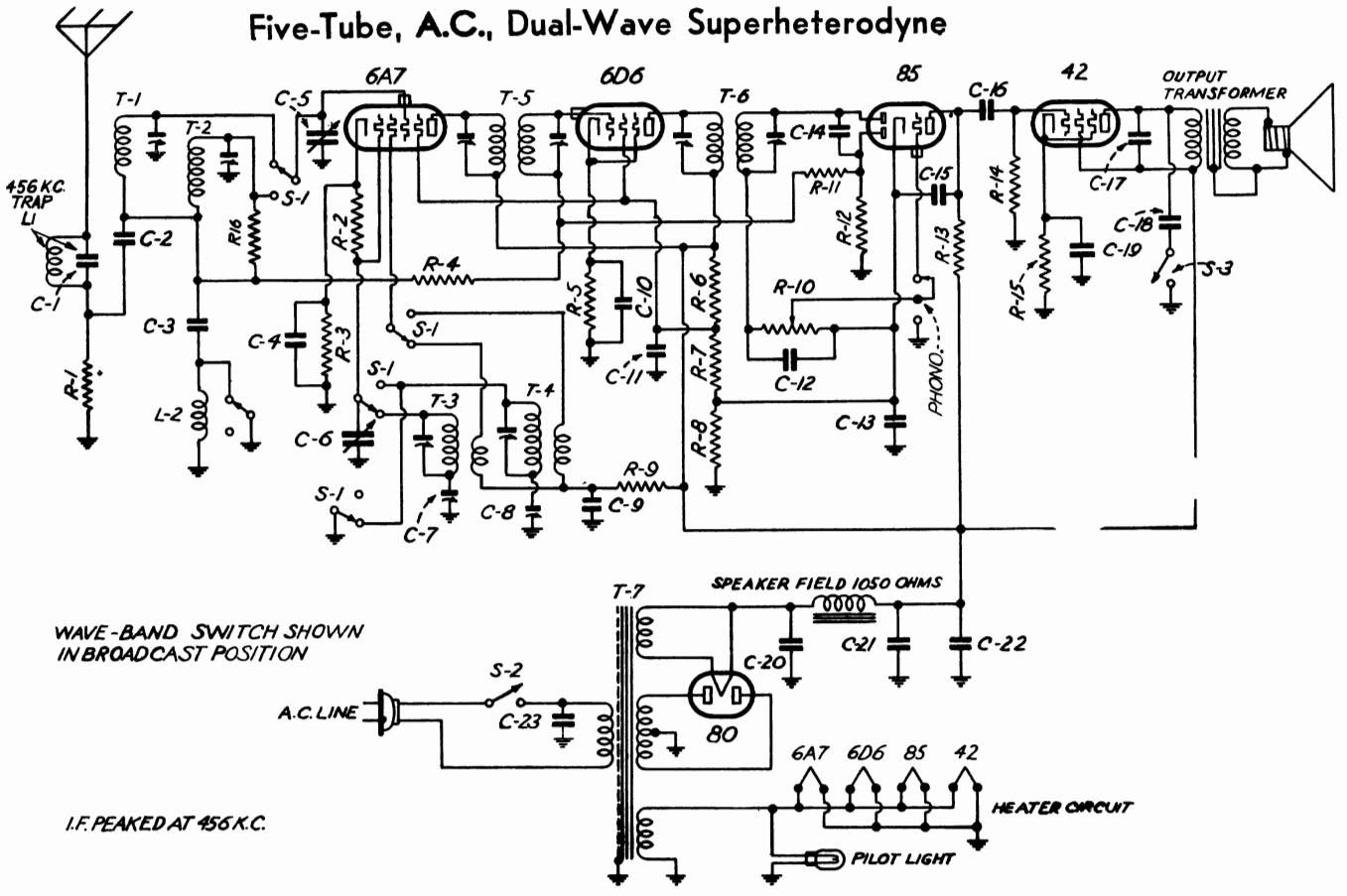
SCHEMATIC DIAGRAM

Voltage rating 110-120 volts, a.c.
Current drain 0.5 amps.
Frequency range 540 to 1750 kc, 2200 to 7500 kc.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODELS 117LW, L117LW, L122LW, L133LW, L135LW and L141LW

Five-Tube, A.C., Dual-Wave Superheterodyne



REPLACEMENT PARTS LIST

Item	Part No.	DESCRIPTION	PRICE
L1	2ZT-268	Fixed 456 kc wave-trap	$ .50
L2	2ZT-267	Trap inductor	.10
T1, T2	2ZT-265	Two band antenna coil assembly	1.10
T3, T4	2ZT-266	Two band oscillator coil assembly	.95
T5	2NT-230	456 kc first I-f transformer	.90
T6	2NT-231	456 kc second I-f transformer	.90
T7	2NT-233	Power transformer	2.70
R1	LR-64	5,000 ohm ¼ watt carbon resistor	.16
R2	KR-63	50,000 ohm ¼ watt carbon resistor	.16
R3	CCR-140	350 ohm ½ watt wire-wound resistor	.16
R4, R14	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R5	2ZR-231	450 ohm ½ watt wire-wound resistor	.16
R6	BR-12	25,000 ohm 1 watt carbon resistor	.16
R7	2NR-217	40,000 ohm 1 watt carbon resistor	.16
R8	PR-79	1,000 ohm ¼ watt carbon resistor	.16
R9	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R10, S2	2NR-214D (for LW chassis)	Volume control with line switch—250,000 ohms	.80
	2NR-214 (for K5 chassis)	Volume control with line switch—250,000 ohms	.80
R11, R12, R16	KR-57	1 megohm ¼ watt carbon resistor	.16
R13	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R15	CCR-118	450 ohm 1 watt wire-wound resistor	.16
C1		Condenser supplied with trap 2ZT-268	
C2	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C3	2ZC-283	0.0025 mf mica condenser	.20
C4, C10, C18	AC-8	0.1 mf, 200 volt tubular condenser	.16
C5, C6	2NC-228 (for K5 chassis)	Two-gang variable condenser	2.00
	3EC-284 (for LW chassis)	Two-gang variable condenser	2.45
C7, C8	2ZC-257	Dual adjustment padding condenser C7-250 to 500 mmf C8-100 to 200 mmf	.45
C9	KC-58	0.01 mf, 400 volt tubular condenser	.16
C11, C12, C15	BC-12	0.05 mf, 200 volt tubular condenser	.16
C14	IC-47	0.0006 mf mica condenser	.16
C16	AC-7A	0.00025 mf mica condenser	.16
C17	LC-65	0.02 mf, 400 volt condenser	.16
C18	ZC-115	0.006 mf, 1000 volt tubular condenser	.16
C19	2TC-189	0.015 mf, 1000 volt tubular condenser	.16
C20	IC-48A	Tubular 5 mf, 25 volt dry electrolytic condenser	.80
C21	2NC-246	16 mf, 450 volt wet electrolytic condenser (regulating type)	.80
C22	2NC-247	16 mf, 405 volt wet electrolytic condenser	.80
C23	IC-46	0.5 mf, 400 volt tubular condenser	.20
	2NC-250	0.01 mf, 250 volt a.c. tubular condenser in metal container	.20
	2NS-122	6½" dynamic speaker	3.75
	2ZS-168 (for K5 chassis)	Wave-band switch	1.15
	2ZS-168A (for LW chassis)	Wave-band switch	1.15

Tube Data

The tube complement is as follows:
1-6A7, oscillator-modulator
1-6D6, i-f amplifier
1-85, diode detector, a.v.c., a-f amplifier
1-42 or 41, power output pentode.
(In chassis model LLW the output tube is a 41. The 42 tube was used only in the K5 chassis)
1-80, full-wave rectifier.

VOLTAGE ANALYSIS

Reading should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground with volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

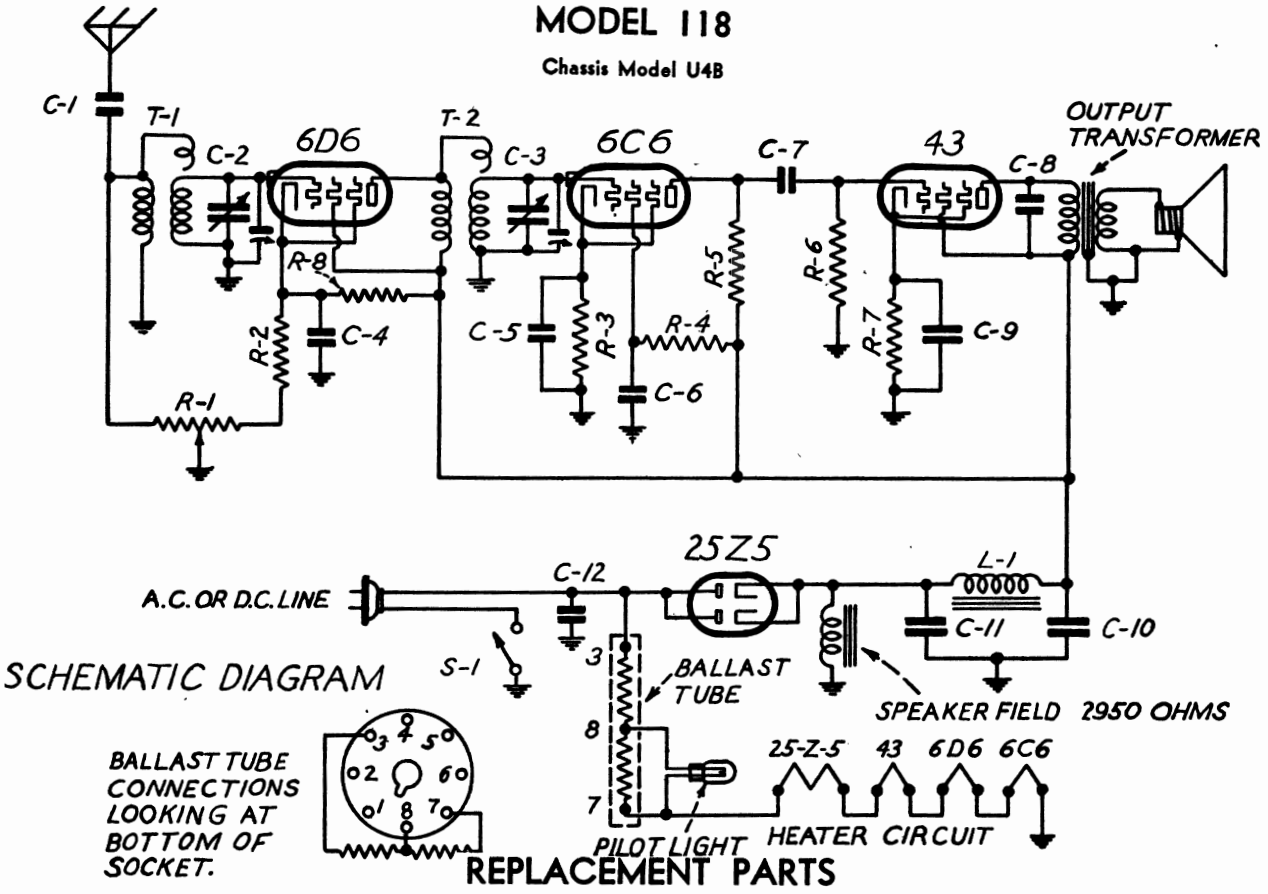
Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	250	90	3.8	143	6.3 a.c.
6D6	250	90	3.3	—	6.3 a.c.
85	35	—	4.1	—	6.3 a.c.
42 or 41	240	250	15.0	—	6.3 a.c.

B plus at filament of 80 tube—325 volts.
Voltage across speaker field—75 volts.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 118

Chassis Model U4B



REPLACEMENT PARTS

*ITEM	PART NO.	DESCRIPTION	PRICE List Price as. Effective as of Srpt. 1st, 1935
L1	ZZT-196A	Iron-core filter choke—500 ohms	$ .60
T1	2VT-241	Antenna coil	.55
T2	2VT-242	Detector coil	.55
R1, S1	2VR-219A	Volume control with line switch—75,000 ohms	.75
R2	AAR-119	300 ohm ½ watt wire-wound resistor	.16
R3	OR-73	25,000 ohm ¼ watt carbon resistor	.16
†R4	HR-42	2 megohm ¼ watt carbon resistor	.16
R5, R6	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R7	KKR-135A	650 ohm 1 watt wire-wound resistor	.16
†R8	KR-55	250,000 ohm ¼ watt carbon resistor	.16
	2VR-215	Ballast resistor tube (voltage dropping resistor—overall voltage drop is 55 volts)	.60
C1	AAC-114	0.001 mf mica condenser	.16
†C2, C3	2VC-244	Two-gang variable condenser	1.90
C4, C6	AC-6	0.1 mf, 200 volt tubular condenser	.16
C5, C9 C10, C11	GGC-137A	Combination by-pass and filter condenser block: C5—5 mf, 25 volts. C9—5 mf, 25 volts. C10— 8 mf, 150 volts. C11—16 mf, 150 volts.	2.25
C7	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C8	KC-58	0.01 mf, 400 volt tubular condenser	.16
C12	2VC-242	0.1 mf, 250 volt a-c tubular condenser	.16
	2VS-157	5" dynamic speaker	3.25
	XL-9	Pilot light, 6.3 volts, .25 amps, Mazda No. 46	.15
	2SD-35	Airplane dial	1.20

† See Production Changes below.
* Item number locates the article on the schematic diagram.

WHEN ORDERING REPLACEMENT PARTS SPECIFY PART NUMBERS

PRODUCTION CHANGES

Receivers bearing serial numbers up to about 708,040 did not have a resistor connected from the cathode of the 6D6 tube to B plus. (This resistor is R8 on schematic diagram.)

In receivers bearing serial numbers up to 712,500 the variable condenser was part no. 2VC-238. The variable condenser now indicated in the parts listed above was used in receivers bearing serial numbers above 712,500. (The part no. is stamped on the end plate of the condenser.)

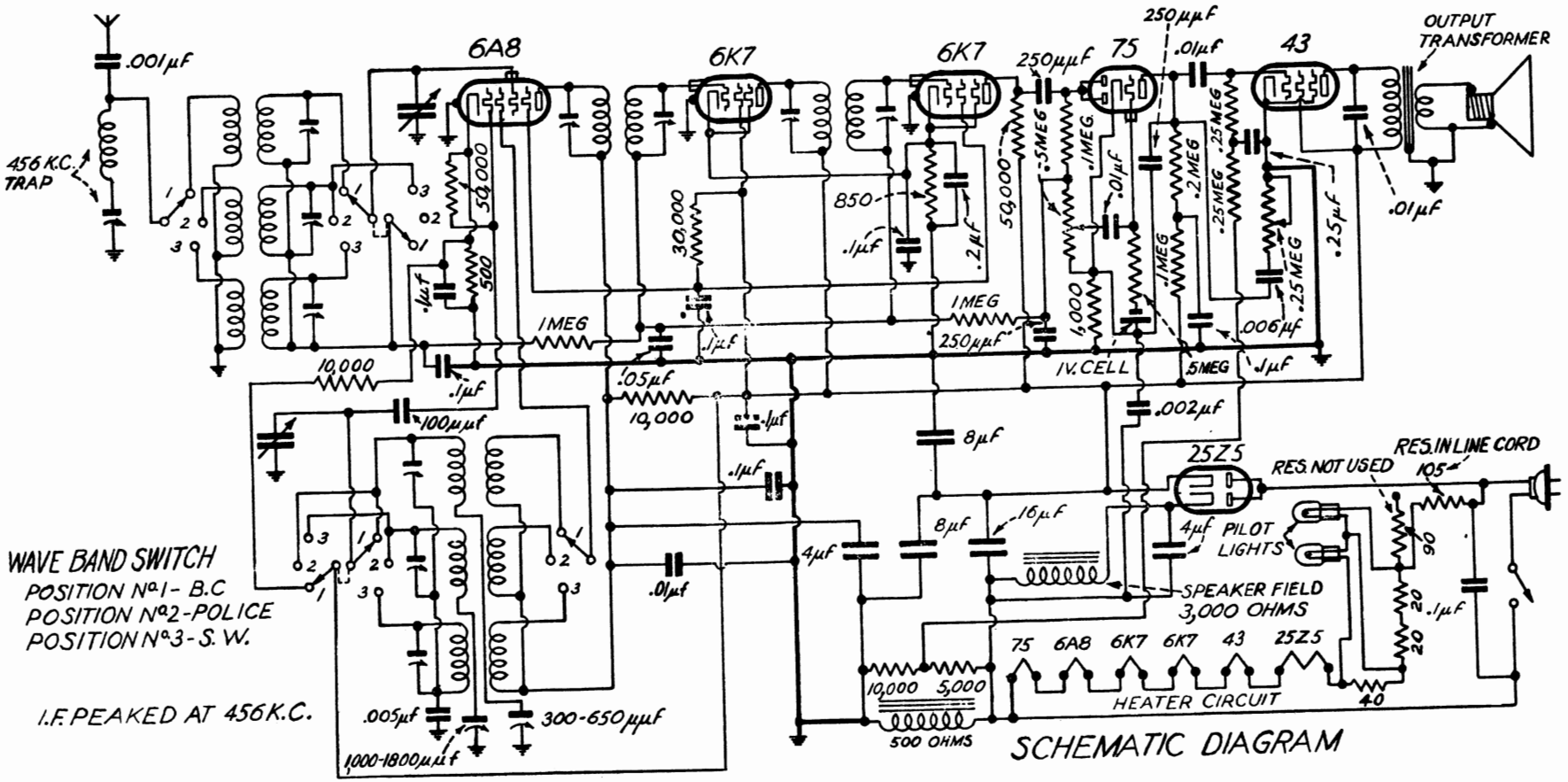
In receivers bearing serial numbers up to 720,250, R4 was a 500,000 ohm ¼ watt carbon resistor.

Receivers bearing serial numbers lower than 740,750:
C-8, .01 output condenser, was originally across 43 plate and ground, instead of to screen.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODEL 119

Chassis Model U6A (Revised)



SCHEMATIC DIAGRAM

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (cathode of 43 tube). Line voltage for these readings was 117.5 volts, a.c., 60 cycles.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8	78	50	*7	78	6
6K7 1st i-f	107	107	4.7	—	6
6K7 2nd i-f	70	50	5	—	6
75	45	—	0.2	—	6
43	95	107	0	—	24

Voltage across speaker field (25Z5 cathode to line switch) — 107 volts.

Voltage across choke (43 cathode to line switch) — 22 volts.

The tube complement is as follows:

1—6A8 (metal) Pentagrid oscillator-modulator.
1—6K7 (metal) 1st i-f amplifier.
1—6K7 (metal) 2nd i-f amplifier (adjacent to 75).
1—75 (glass) 2nd detector—a-f amplifier—a.v.c.
1—43 (glass) Power output pentode.
1—25Z5 (glass) Half-wave rectifier.

*Voltage indicated is with wave-band switch in broadcast position. On the police and short-wave bands this voltage is 2.3 volts.

EMERSON RADIO & PHONOGRAPH CO., Inc.

Model 119 - Chassis U6A (Revised)

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600, 1700, 4500 and 15,000 kc should be used. In addition, an output meter should be used across the voice coil or output transformer for observing maximum response.

I-f Alignment

The i-f transformers ZZT-194 and ZZT-195 are located on the top of the chassis. The four trimmers, two for each i-f transformer, are located at the tops of the cans. Set the wave-band switch to broadcast (extreme clockwise position) and rotate variable condenser to minimum. Feed 456 kc to grid of the 6A8 tube and adjust the four i-f trimmers for maximum response. Then feed 456 kc through the antenna and adjust the wave-trap trimmer for *minimum response*. The trimmer is on the wave-trap, which is located on top of the chassis behind the speaker.

Location of Coils

The antenna coils for the three bands are wound on one form and mounted on top of the chassis. The three trimmers for these coils are mounted on a bakelite strip above the tubing. The trimmer furthest from the end of chassis is for the short-wave antenna coil. The central trimmer is for the police antenna coil and the trimmer nearest the end of chassis is for the broadcast antenna coil.

The oscillator coils for the three bands are wound on one form and mounted underneath the chassis deck on the right-hand wall with the trimmers facing out. The trimmer screws are available through three holes in the chassis wall. The trimmer closest to front is for the broadcast oscillator coil, the central trimmer is for the police oscillator coil and the trimmer furthest from front is for the short-wave oscillator coil.

The adjusting screws for the dual padder are also available at the right-hand chassis wall. The screw closer to the front is for the broadcast band and the other is for the police band. The short-wave band has no adjustable padder.

Broadcast Alignment

Set the wave-band switch to broadcast position (extreme clockwise) and dial pointer to 600. Feed 600 kc through antenna lead and adjust broadcast padder (lower row on right wall, closest to front) for maximum response. Set pointer to 1600, feed 1600 kc and adjust the broadcast oscillator trimmer (top row on right wall, closest to front) for maximum response, and then the broadcast antenna trimmer (on antenna coil, nearest the end of chassis). Return pointer to 600 and rock the variable condenser (rotate condenser back and forth through small arc) while adjusting the broadcast padder for maximum response. If a readjustment is necessary return to 1600 and realign the antenna and oscillator trimmers.

Police Alignment

Set the wave-band switch to police (central position), pointer to 1700 and feed 1700 kc through antenna lead. Adjust police band padder (furthest from front on right wall, lower row) for maximum response. Set pointer to 4500 and feed 4500 kc. Adjust police band oscillator trimmer (central trimmer on right wall, upper row) for maximum response. If two peaks are heard, select the one of minimum capacity (see General Instructions below), then adjust police band antenna trimmer (central one on top) for maximum response, selecting the peak of maximum capacity. Again feed 1700 kc, with pointer at 1700, rock variable condenser and adjust police band padder for maximum response. Realign at 4500 if necessary.

Short-Wave Alignment

Set wave-band switch to counter-clockwise (short-wave) position and pointer at 15 megacycles. Feed 15,000 kc through antenna. Adjust short-wave oscillator trimmer (furthest from front on right wall, top row) for maximum response. If two peaks are obtained, select the one of minimum capacity.

Check all three bands for dead spots or incorrect image responses.

General Instructions

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on the antenna trimmers. The last motion in adjusting trimmers should always be a tightening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

In aligning antenna trimmers on the high-frequency signals there is usually a tendency for the oscillator to drift, due to interlocking. To compensate for this, always keep re-tuning the variable condenser.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

2. Bias for the grid of the audio section of the 75 tube is obtained by means of a very small one-volt battery (bias cell). The cell assembly is mounted on a bakelite strip in the front corner of the chassis near the volume control. Do not put a voltmeter across this bias cell. If the set distorts, check it by temporarily replacing with a new cell, or some other one-volt source, and noting results. To remove the bias cell, simply pull up on the spring clip and lift the cell from its cup.

3. The filament dropping resistor is a resistance wire in the special line cord. The cord will, therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.

REPLACEMENT PARTS

*ITEM	PART NO.	DESCRIPTION
L1	OOT-166A	R-f "B" choke—1 millihenry
L2	QQT-179	Iron-core filter choke—200 ohms
L3	ZT-98E	Layer-wound r-f "A" choke
L4	OOT-167B	Single-layer r-f "A" choke
T1	OOT-161C	Antenna coil
T2	OOT-162A	R-f interstage coil
T3	QQT-170	172.5 kc first i-f transformer
T4	ZT-95B	172.5 kc second i-f transformer
T5	OOT-163C	Oscillator coil
T6	3DT-282	Power transformer
R1, R3	LR-61	200,000 ohm ¼ watt carbon resistor
R2	3DR-239	250 ohm ½ watt wire-wound resistor
R4, R11	KR-54	100,000 ohm ¼ watt carbon resistor
R5	AAR-119	300 ohm ½ watt wire-wound resistor
R6, R16, R17	LLR-147	100 ohm ½ watt wire-wound resistor
R7	OOR-161B	Volume control—500,000 ohms
R8, R12	KR-57	1 megohm ¼ watt carbon resistor
R9	KR-53	50,000 ohm ¼ watt carbon resistor
R10	LR-65	10,000 ohm ¼ watt carbon resistor
R13	KR-55	250,000 ohm ¼ watt carbon resistor
R14	FFR-133	650 ohm ½ watt wire-wound resistor
R15	OOR-162	12,000 ohm 1¼ watt metal-clad wire-wound resistor
C1, C2, C3	QQC-168	Three-gang variable condenser
C4, C7, C14	BC-12	0.05 mf 200 volt tubular condenser
C5, C6, C9	3DC-270	Five-section condenser block
C10, C25		C5—0.25 mf, 200 volts C10—0.1 mf, 200 volts C6—0.1 mf, 100 volts C25—0.25 mf, 350 volts C9—0.1 mf, 300 volts
C8, C13	AC-7A	0.00025 mf mica condenser
C11, C24	EC-24A	0.0001 mf mica condenser
C12, C16	QQC-169C	Filter and by-pass dry electrolytic condenser block
C19, C20		C12—10 mf, 25 volts C19—8 mf, 350 volts C16—10 mf, 25 volts C20—8 mf, 350 volts
C15	LC-64	0.05 mf 400 volt tubular condenser
C17	ZC-115	0.006 mf, 1000 volt tubular condenser
C18	3DC-272	0.015 mf, 600 volt tubular condenser with mounting strap
C21	QQC-173	0.015 mf, 600 volt tubular condenser
C22	3DC-271	0.0075 mf, 1600 volt tubular condenser
C23	BBC-131	0.9 mf, 200 volt tubular condenser
C26	IC-47	0.0005 mf mica condenser

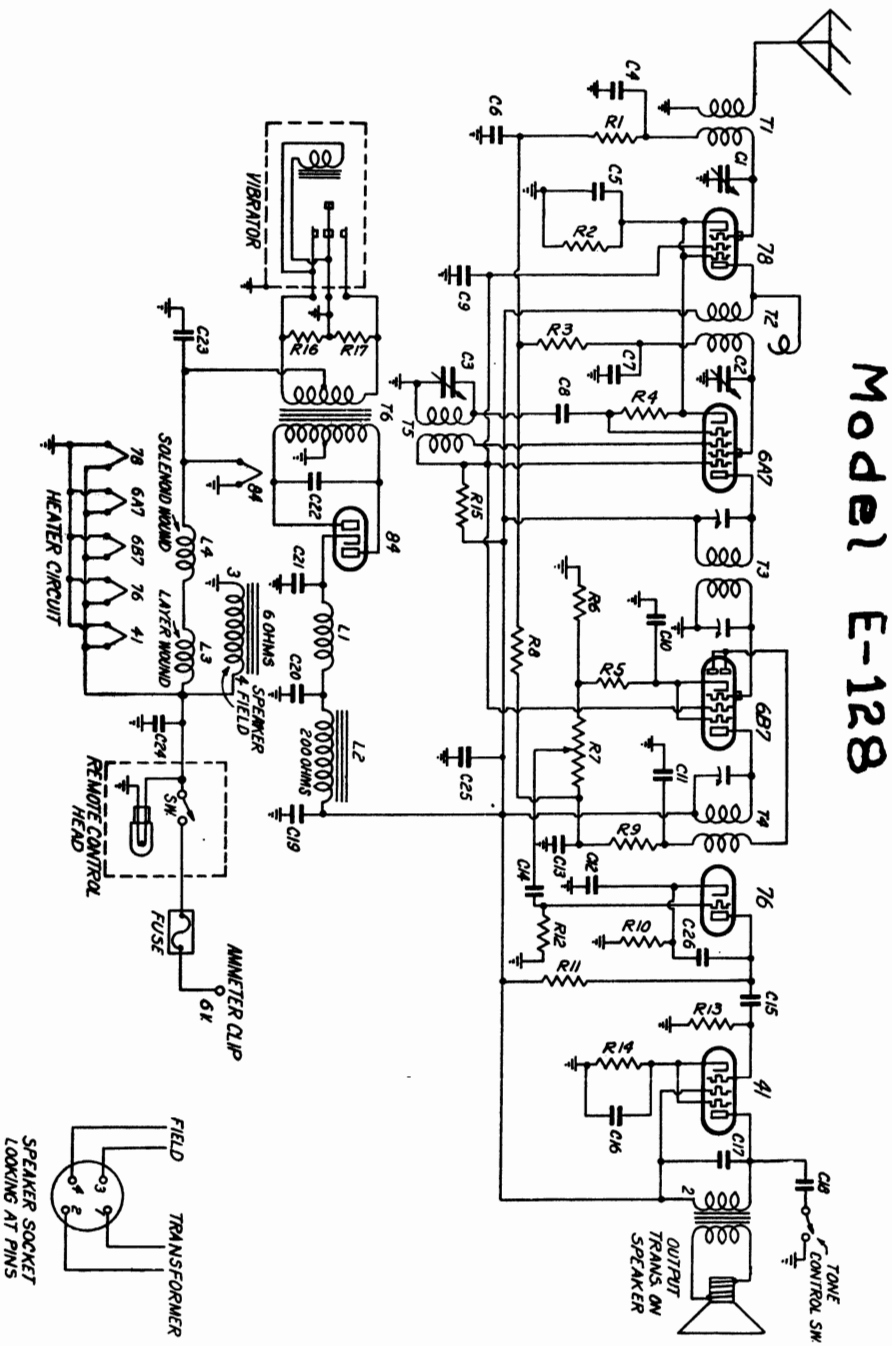
Intermediate Transformers

To align the intermediate frequency transformers, use a good modulated oscillator set for 172.5 kc. Rotate the variable condenser to the position of minimum capacity, turn the volume control on full and ground the antenna.

Connect the test oscillator output between the grid of the 6A7 tube and ground. Connect an output meter across the primary of the speaker transformer, or across the voice coil. Using the smallest output from the test oscillator that will give a definite reading on the meter, adjust the two i-f transformers for maximum response. Use a non-metallic screw driver if possible.

Radio Frequency and Oscillator

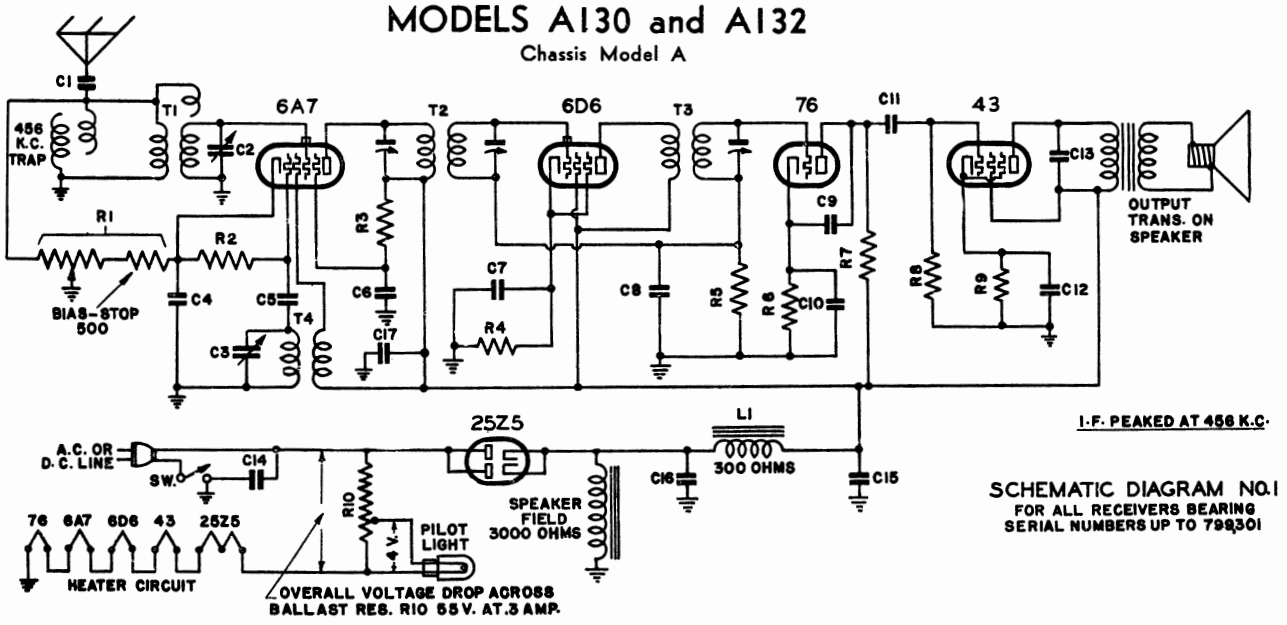
Couple the test oscillator through a standard dummy antenna (a .0002 mf condenser may be substituted) to the antenna lead and ground of the receiver, with the variable condenser in the *minimum* capacity position. Feed 1530 kc. and adjust the oscillator trimmer (center) on the variable condenser for maximum response. Set the test oscillator to some frequency near 1400 kc and swing the variable until this signal is heard. Adjust the antenna and r-f trimmers (front and rear) on the variable condenser for maximum response. Reduce the output of the test oscillator and repeat.



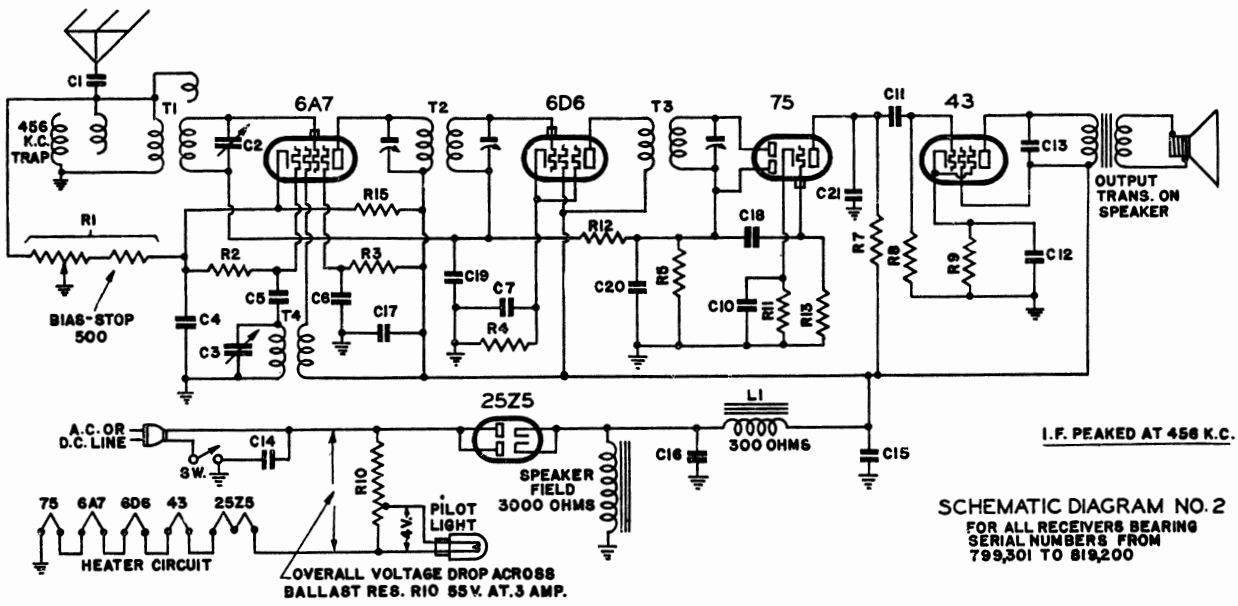
EMERSON RADIO & PHONOGRAPH CO., Inc.

MODELS A130 and A132

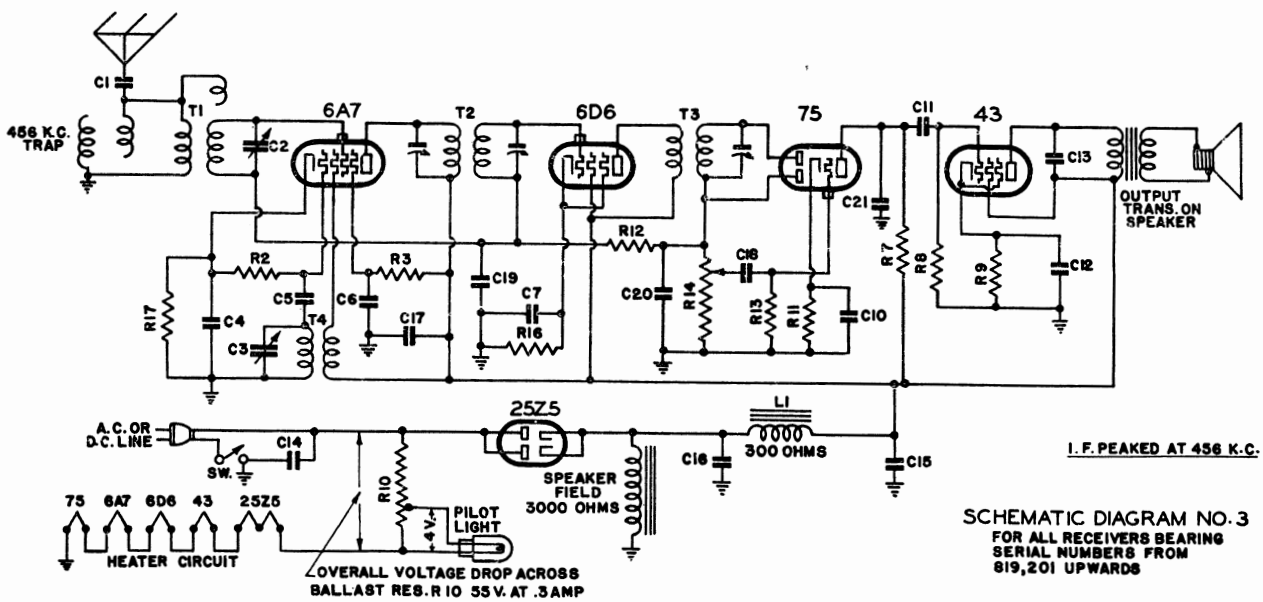
Chassis Model A



SCHEMATIC DIAGRAM NO. 1
FOR ALL RECEIVERS BEARING SERIAL NUMBERS UP TO 799,301



SCHEMATIC DIAGRAM NO. 2
FOR ALL RECEIVERS BEARING SERIAL NUMBERS FROM 799,301 TO 819,200



SCHEMATIC DIAGRAM NO. 3
FOR ALL RECEIVERS BEARING SERIAL NUMBERS FROM 819,201 UPWARDS

MODELS A-130 AND A-132

CHASSIS MODEL A

ADJUSTMENTS

An oscillator with frequencies of 456 kc and 1500 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Location of I-f Transformers and Trimmers

The first i-f transformer, part number 3CT-274, is in an oblong coil can located on the top of the chassis directly behind the variable condenser. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part number UUT-181 is in a round coil can located on top of the chassis to the right of the speaker. The single trimmer for this i-f is accessible through a hole in the top of the coil can.

The oscillator and antenna trimmers are located on the top of the variable condenser. The oscillator trimmer is on the rear section of the variable condenser and the antenna trimmer is on the front section of the variable condenser.

Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 456 kc to the grid cap of the 6A7 tube.
3. Adjust the three i-f trimmers, repeating for maximum response.
4. Set the dial pointer to 1500 and feed 1500 kc to the antenna lead through a standard broadcast dummy antenna. (A .0002 mf mica condenser may be used as a substitute).
5. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
6. Adjust the antenna trimmer (on front section of variable condenser) for maximum response.

Tube Data

The tube complement, for sets bearing serial numbers above 799301, is as follows:

1—6A7 pentagrid oscillator-modulator.
1—6D6 first i-f amplifier.
1—75 diode detector, audio amplifier, automatic volume control.
1—43 pentode power output.
1—25Z5 dual half-wave rectifier.

On sets bearing serial numbers below 799301, the 75 tube is replaced with a 76 tube, which functions only as a second detector.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

The voltage analysis on sets bearing serial numbers above 799,301 is as follows:

Tube	*Plate*	*Screen*	*Osc. Plate*	*Cathode*	*Fil.*
6A7	112	50	112	1.5	6 a.c.
6D6	112	112	—	4.6	6 a.c.
75	40	—	—	0.5	6 a.c.
43	100	112	—	15.0	25 a.c.

The voltage analysis on sets bearing serial numbers below 799,301 is as follows:

Tube	*Plate*	*Screen*	*Osc. Plate*	*Cathode*	*Fil.*
6A7	112	50	112	2.5	6 a.c.
6D6	112	112	—	5.5	6 a.c.
76	50	—	—	5.0	6 a.c.
43	100	112	—	15.0	25 a.c.

Voltage across speaker field, (25Z5 cathode to ground)—125 volts.
Voltage across filter choke, (25Z5 cathode to B plus)—12 volts.
Voltage drop across ballast tube, (See R10, schematic)—45 volts, a.c.
Voltage drop across the pilot light section of ballast tube—4 volts, a.c.

REPLACEMENT PARTS

* ITEM Schematic No. 1	* ITEM Schematic No. 2	* ITEM Schematic No. 3	PART No.	DESCRIPTION	PRICE
L1	L1	L1	3CT-276	Filter choke	$ .60
T1	T1	T1	3FT-280	Antenna coil with 456 kc. wave trap	.75
T2	T2	T2	3CT-274	456 kc first i-f transformer	1.00
T3	T3	T3	UUT-181	456 kc second i-f transformer	1.00
T4	T4	T4	3FT-281	Oscillator coil	.35
R1	R1	——	TTR-159E	Volume control with line switch—5000 ohms with 500 ohm bias stop	.80
R2	R2	R2	KR-53	50,000 ohm ½ watt carbon resistor	.16
R3	R3	R3	ZZR-196	30,000 ohm ¼ watt carbon resistor	.16
R4	R4	——	ZZR-197	850 ohm ½ watt wire-wound resistor	.16
R5	——	——	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R6	——	——	LLR-154	75,000 ohm ¼ watt carbon resistor	.16
R7	R7	R7	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R8	R8	R8	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R9	R9	R9	KKR-135	650 ohm ½ watt wire-wound resistor	.16
R10	R10	R10	2UR-224	Plug-in type ballast resistor	.55
——	R11	R11	LR-64	5,000 ohm ¼ watt carbon resistor	.16
——	R12	R12	NNR-220	3 megohm ¼ watt carbon resistor	.16
——	R13	R13	NNR-220	3 megohm ¼ watt carbon resistor	.16
——	——	R14	3FR-256	Volume control with line switch—500,000 ohms	.70
——	R15	——	LLR-154	75,000 ohm ¼ watt carbon resistor	.16
——	——	R16	FFR-126	500 ohm ½ watt wire-wound resistor	.16
——	——	R17	AAR-119	300 ohm ½ watt wire-wound resistor	.16
C1	C1	C1	AAC-114	0.001 mf mica condenser	.16
C2, C3	C2, C3	C2, C3	3FC-269	Two-gang variable condenser	1.95
C4	C4	C4	FC-29	0.02 mf 200 volt tubular condenser	.16
C5	C5	C5	NC-70A	0.0002 mf mica condenser	.16
C6	C6	C6	AC-6	0.1 mf 200 volt tubular condenser	.16
C7	C7	C7	FC-29	0.02 mf 200 volt tubular condenser	.16
C8	——	——	AC-6	0.1 mf 200 volt tubular condenser	.16
C9	——	——	AAC-114	0.001 mf mica condenser	.16
C10, C12	C10, C12	C10, C12	KKC-145	Dual 5 mf, 25 volt electrolytic condenser	.90
C11	C11	C11	KC-58	0.01 mf 400 volt tubular condenser	.16
C13	C13	C13	HC-34	0.006 mf 600 volt tubular condenser	.16
C14	C14	C14	2VC-242	.1 mf 250 volt a.c. tubular condenser	.16
C15, C16	C15, C16	C15, C16	3CC-261	20 mf 150 volt electrolytic condenser	.60
C17	C17	C17	AC-6	.1 mf 200 volt tubular condenser	.16
——	C18	C18	CCC-127	.01 mf 200 volt tubular condenser	.16
——	C19	C19	AC-6	.1 mf 200 volt tubular condenser	.16
——	C20	C20	NC-70A	0.0002 mf mica condenser	.16
——	C21	C21	NC-70A	0.0002 mf mica condenser	.16
			3FS-179	6" dynamic speaker	3.25
			XL-9	Pilot light, 6.3 volt, .25 amp., Mazda No. 46	.15
			3FZ-352	Dial face	.10
			3CZ-336	Dial drive belt	.10
			3CZ-337	Dial drive shaft and pulley	.05
			3CZ-339	Dial idler pulley	.05
			3CZ-341	Condenser shaft pulley	.10
			3CZ-340	Dial idler pulley spring	.02
			3FZ-353	Dial pointer	.05
			3FZ-351	Escutcheon with crystal. (For model A-130)	.70
			3FZ-398	Dial crystal. (For model A-132)	.35
			3FZ-399	Clip for dial crystal. (Model A-132)	.01

The first i-f transformer (one directly behind variable condenser) is of the plug-in type. To remove, unsolder all leads under the chassis, pinch together the prongs of the plug-in fastener and lift out.

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

PRODUCTION CHANGES

Schematic no. 1 applies to all receivers bearing serial numbers up to 799,301.

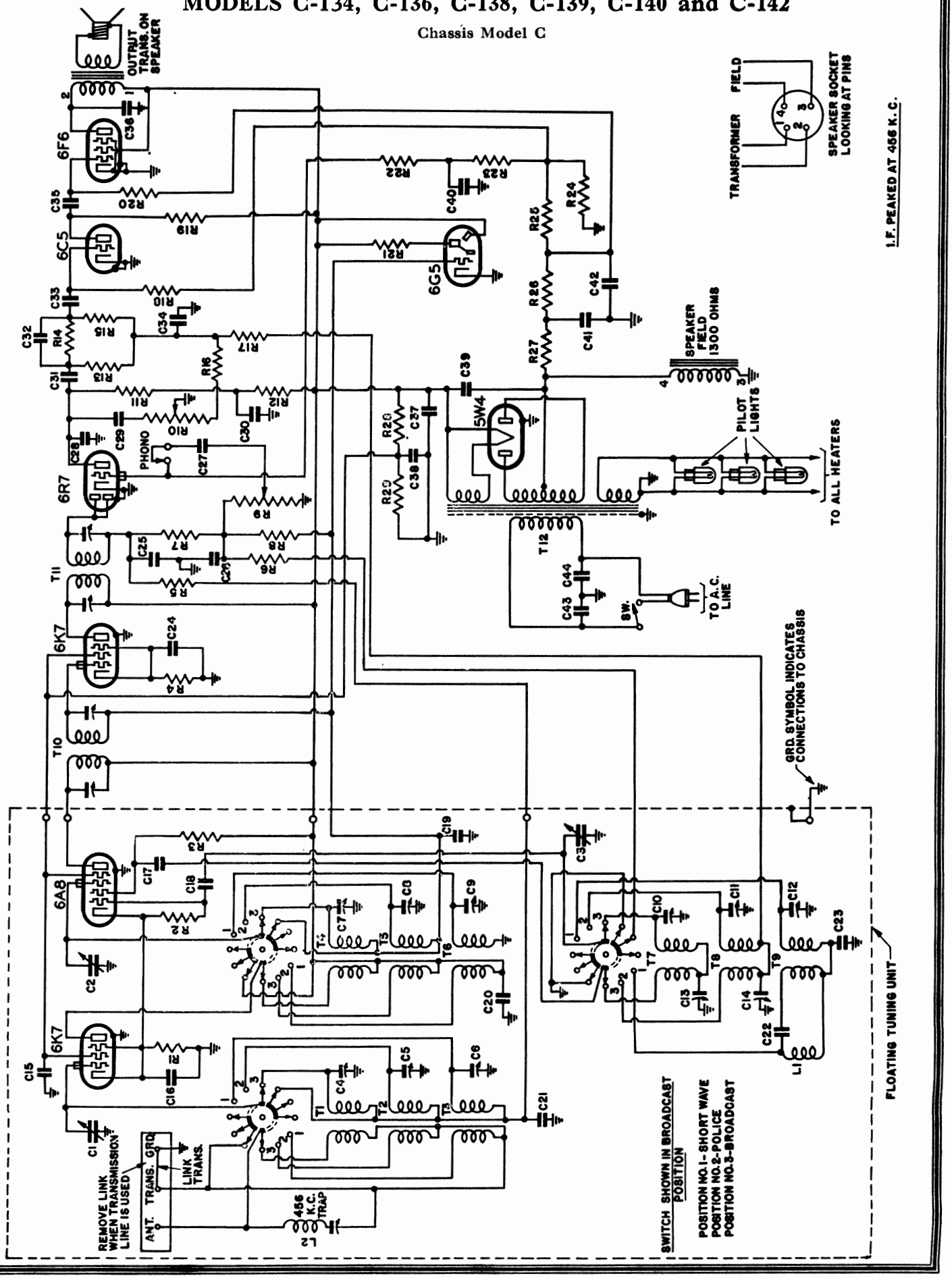
Schematic no. 2 applies to all receivers bearing serial numbers from 799,301 to 819,200.

Schematic no. 3 applies to all receivers bearing serial numbers above 819,200.

EMERSON RADIO & PHONOGRAPH CO., Inc.

MODELS C-134, C-136, C-138, C-139, C-140 and C-142

Chassis Model C



C-134, C-136, C-138, C-139, C-140 Chassis C

REPLACEMENT PARTS LIST

*Item No.	Part No.	DESCRIPTION	List Price as Effective as of Aug. 1st, 1936 PRICE
L1	3AT-291	Oscillator choke	$ .20
L2	2PT-283	456 kc wave trap	.60
T1	3AT-251	Broadcast antenna coil	.95
T4	3AT-252	Broadcast detector coil	.95
T7	3AT-253	Broadcast oscillator coil	.75
T2	3AT-254	Police-band antenna coil	.60
T5	3AT-255	Police-band detector coil	.60
T8	3AT-256	Police-band oscillator coil	.50
T3	3AT-257	Short-wave antenna coil	.60
T6	3AT-258	Short-wave detector coil	.70
T9	3AT-259	Short-wave oscillator coil	.50
T10	3BT-269	456 kc first i-f transformer	2.00
T11	3AT-261	456 kc second i-f transformer	1.90
T12	3BT-271	Power transformer	5.40
R1	3AR-245	220 ohm, ½ watt wire-wound resistor	.16
R2, R16, R20	KR-53	50,000 ohm, ¼ watt carbon resistor	.16
R3	YR-97	15,000 ohm, ½ watt carbon resistor	.16
R4	FFR-126	500 ohm, ½ watt wire-wound resistor	.16
R5, R8, R14 R18, R21, R23 R6, R7, R11	KR-57	1 megohm, ¼ watt carbon resistor	.16
R15, R26	KR-54	100,000 ohm, ¼ watt carbon resistor	.16
R9	NNR-157B	Volume control—500,000 ohms	.90
R10	NNR-157B	Tone control—500,000 ohms	.90
R12, R17	OR-73	25,000 ohm, ¼ watt carbon resistor	.16
R13	KR-55	250,000 ohm ¼ watt carbon resistor	.16
R19	2CR-193	30,000 ohm, ½ watt carbon resistor	.16
R22	KR-56	500,000 ohm, ¼ watt carbon resistor	.16
R24	KR-63	15,000 ohm, ¼ watt carbon resistor	.16
R25	3BR-247	40,000 ohm, ¼ watt carbon resistor	.16
R27	LLR-152	150,000 ohm, ¼ watt carbon resistor	.16
R28	3BR-246	10,000 ohm, 2 watt carbon resistor	.28
R29	2TR-225	12,000 ohm, 2 watt carbon resistor	.28
C1, C2, C3	3AC-276	Three gang variable condenser	7.40
C4, C5, C6 C7 C8, C9, C10, C11, C12	3AC-278	1.5 to 12 mmf. trimmer condensers—(See Production Changes)	.15
C13, C14	JJC-144C	Dual adjustable padding condenser C13—250 to 500 mmf. C14—800 to 1400 mmf.	.90
C15	LC-65	0.02 mf, 400 volt tubular condenser	.20
C16, C24	AC-6	0.1 mf, 200 volt tubular condenser	.20
C17	AAC-114	0.001 mf mica condenser	.20
C18	AAC-106A	0.00005 mf mica condenser	.20
C19	NNC-158	0.05 mf, 200 volt tubular condenser	.20
C20, C35	EEC-132	0.1 mf, 400 volt tubular condenser	.20
C21, C40 C41, C42	BC-13	0.25 mf, 200 volt tubular condenser	.20
C22	IIC-133A	0.000025 mf mica condenser	.20
C23	XXC-197	0.0038 mf mica condenser	.35
C25	EC-24A	0.0001 mf mica condenser	.20
C26	IC-47	0.0005 mf mica condenser	.20
C27, C33, C34	CCC-127	0.01 mf, 200 volt tubular condenser	.20
C28	AC-7A	0.00025 mf mica condenser	.20
C29	KC-58	0.01 mf, 400 volt tubular condenser	.20
C30	AAC-112	0.25 mf, 400 volt tubular condenser	.20
C31	LC-64	0.05 mf, 400 volt tubular condenser	.20
C32	NC-70A	0.0002 mf mica condenser	.20
C36	ZC-115	0.006 mf, 1000 volt tubular condenser	.20
C37	3BC-289	40 mf, 300 volt wet electrolytic condenser	1.30
C38	3BC 281	8 mf, 250 volt dry electrolytic condenser	1.00
C39	3BC-282	12 mf, 400 volt wet electrolytic condenser	1.15
C43, C44	XXC-220	Dual 0.01 mf, 250 volt a.c. metal clad tubular condenser	.45
	3AS-166	Wave-band switch	2.25
	3BS-169	On-off switch	.50
	3BS-191	8" dynamic speaker (for Models C-134 and C-140)	8.80
	3BS-176	12" dynamic speaker (for Models C-136, C-138, C-139, and C-142)	10.60
	XL-9	Pilot light, 6.3 volt, .25 amp. Mazda No. 46	.20
	3AD-41	Dial plate with band-indicator mechanism	2.20
	3AZ-397	Dial face	1.25
	3AZ-369	Idler pulley	.05
	3AZ-370	Idler pulley spring	.05
	3AZ-371	Dial drive belt	.20
	3AZ-414	Planetary dial drive (for two knob assembly)	1.85
	3AZ-372	Planetary dial drive (for single knob assembly)	1.85
	3AZ-366	Frequency indicating pointer	.10
	3AZ-367	Band-spread pointer	.15

PRODUCTION CHANGES

On early receivers C4, C5, C6, C7, C8, C9, C10, C11 and C12 were air trimmers part No. 3AC-252. On these trimmers a clockwise rotation of the trimmer screw decreases the capacity.

ADJUSTMENTS

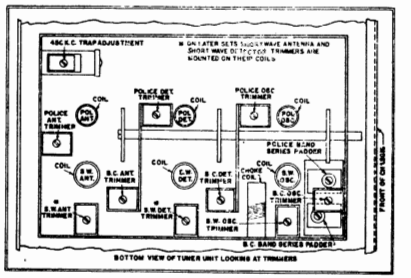
An oscillator with frequencies of 456, 600, 1600, 1800, 6000 and 16000 kc should be used.

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a standard dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for the broadcast band dummy antenna, a .0001 mf condenser for police-band antenna and a 400 ohm resistor for the short-wave antenna.

The i-f transformers are located on the extreme left side of the chassis. The transformer nearest the front of the chassis is the first i-f transformer. The four trimmers for the i-f adjustment are available through holes in the tops of the cans.

The broadcast, police and short-wave coils are all located on the tuner unit. The tuner unit is the separate chassis section floated on rubber and mounted in center of chassis. The location of the trimmers for the coils is shown in the illustration at the right. The three coils for the broadcast band are in separate cans on top of the tuner unit.



I-f Alignment

Set the wave-band switch at the broadcast (clockwise) position and the variable condenser at the minimum capacity position. Feed 456 kc to the grid cap of the 6A8 tube. Adjust the four i-f trimmers carefully for maximum response. Feed 456 kc through a dummy antenna into the antenna terminal and adjust 456 wave-trap for *minimum response.*

Broadcast Alignment

Both pointers on the dial should coincide vertically at 890 kc. The gold pointer may be slipped around its shaft. With the wave-band switch at the broadcast (clockwise) position, set the pointer at 60, feed 600 kc through the antenna (using a standard dummy antenna), and adjust the broadcast series padder for maximum response. Move pointer to 160, feed 1600 kc to the antenna and adjust the oscillator trimmer for maximum response, then adjust detector and antenna trimmers. Reset the pointer to 60, feed 600 kc to antenna and rock the variable condenser (rotate the condenser back and forth through a small arc) while resetting the oscillator padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Police Alignment

Set the switch at police (central) position and the pointer at 1.8. Feed 1800 kc to antenna (using a 0.0001 mf condenser for a dummy antenna), and adjust the police band series padder for maximum response. Move the pointer to 6.0, feed 6000 kc to the antenna and adjust the police-band oscillator for maximum response. If two peaks are obtained select the minimum capacity peak. (See General Instructions below.) Then adjust the antenna and detector trimmers for maximum response. If two peaks are obtained select the maximum capacity peak. Return the pointer to 1.8, feed 1800 kc to the antenna and rock the variable condenser while adjusting the police-band series padder for maximum response. Return to 6000 and check alignment. If readjustment is necessary return to 1800 and repeat entire procedure.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 16, feed 16000 kc to antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator for maximum response. If two peaks are obtained choose minimum capacity peak. Then adjust the detector and antenna trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peaks on antenna and r-f trimmers. The last motion in adjusting trimmers should always be a tightening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

In aligning antenna trimmers on the high-frequency signals there is usually a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep re-tuning the variable condenser as you align.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground, with no signal. Line voltage for these readings was 117.5 volts, 60 cycles.

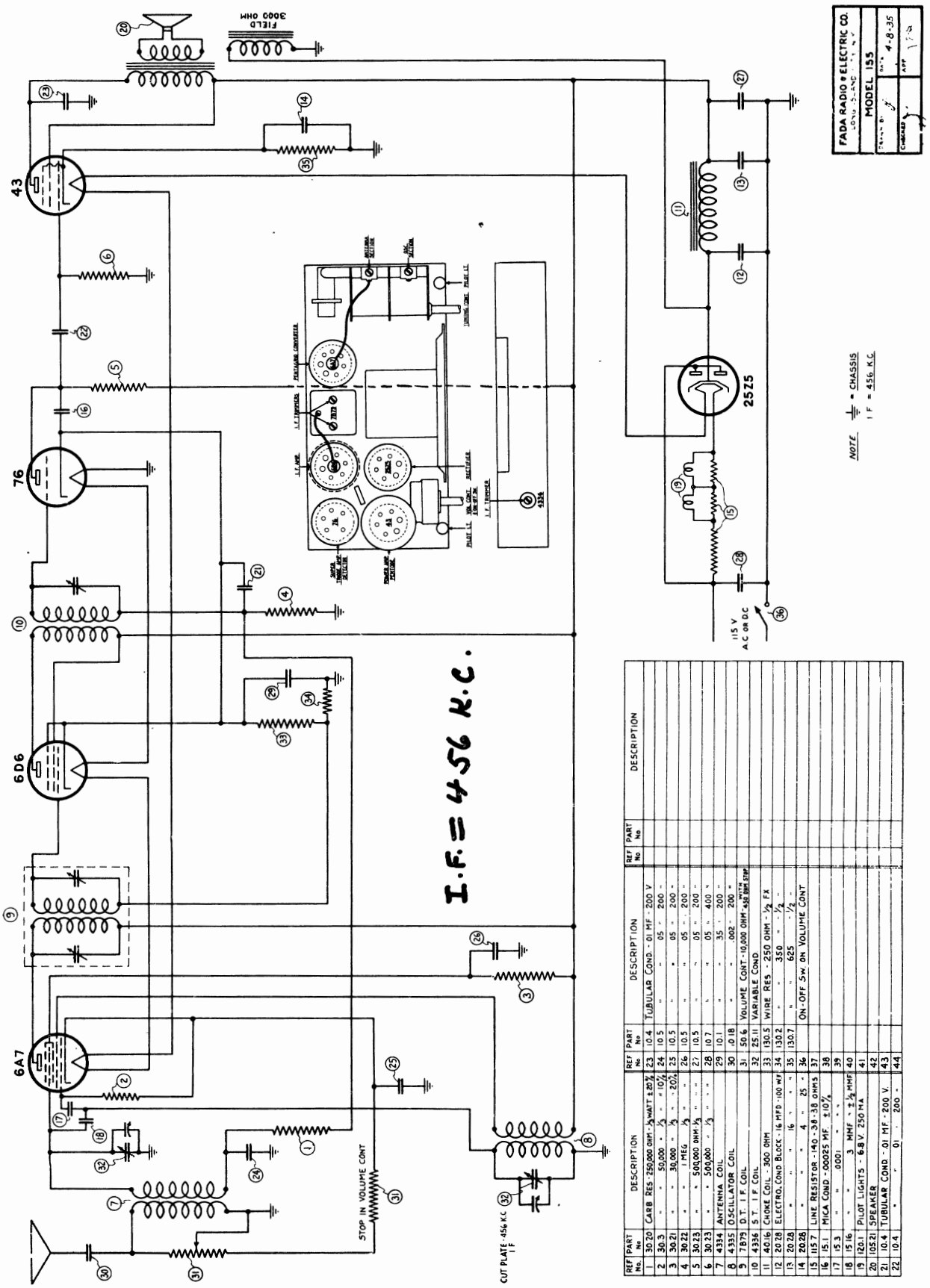
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6K7 (r-f)	250	100	3.8	—	6.3 a.c.
6A8	250	100	3.8	180	6.3 a.c.
6K7 (i-f)	250	100	3.6	—	6.3 a.c.
6R7	90	—	0	—	6.3 a.c.
6C5	150	—	0	—	6.3 a.c.
6F6	240	250	0	—	6.3 a.c.
6G5	10 (blue lead)	250 (red lead)	0	—	6.3 a.c.

Voltage across speaker field—100 volts.

B plus at 5W4 filament to B minus (center tap of secondary)—350 volts.

FADA RADIO & ELECTRIC CO.

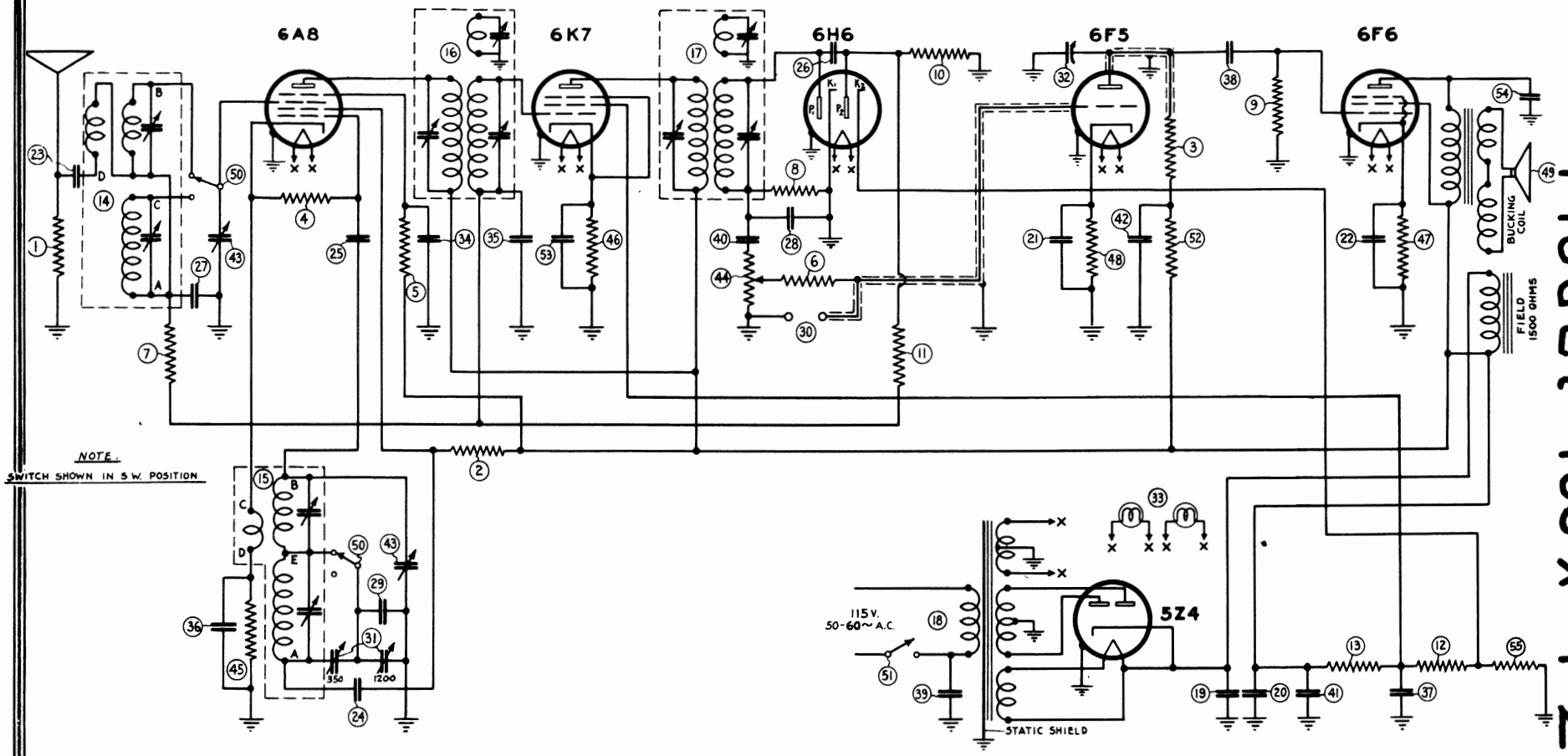
Model 155



REF No.	PART No	DESCRIPTION	REF No	PART No	DESCRIPTION	REF No	PART No	DESCRIPTION
1	30.20	CARB RES - 250,000 OHM - ½ WATT ± 20%	23	10.4	TUBULAR COND - .01 MF - 200 V			
2	30.3	" " 50,000 " - ½ " " 10%	24	10.5	" " .05 " - 200 "			
3	30.21	" " 30,000 " - ½ " " 20%	25	10.5	" " .05 " - 200 "			
4	30.22	" " 1 MEG - ½ " " "	26	10.5	" " .05 " - 200 "			
5	30.23	" " 500,000 OHM - ½ " " "	27	10.5	" " .05 " - 200 "			
6	30.23	" " 500,000 " - ½ " " "	28	10.7	" " .05 " - 400 "			
7	4334	ANTENNA COIL	29	10.1	" " .35 " - 200 "			
8	4335	OSCILLATOR COIL	30	.0.18	" " .002 " - 200 "			
9	7879	D.T. I.F. COIL	31	50.6	VOLUME CONT - 10,000 OHM - WITH SWITCH			
10	4336	S.T. I.F. COIL	32	25.11	VARIABLE COND			
11	40.16	CHOKE COIL - 300 OHM	33	130.5	WIRE RES - 250 OHM - ½ FX			
12	20.28	ELECTRO. COND BLOCK - 16 MFD - 100 MF	34	130.2	" " 350 " - ½ "			
13	20.28	" " " 16 " " "	35	130.7	" " 625 " - ½ "			
14	20.28	" " " 4 " " 25 "	36		ON-OFF SW ON VOLUME CONT			
15	115.7	LINE RESISTOR - 140 - 38 - 38 OHMS	37					
16	15.1	MICA COND - .00025 MF. ±10%	38					
17	15.3	" " .0001 " "	39					
18	15.16	" " 3 MMF ± ½ MMF	40					
19	126.1	PILOT LIGHTS - 6.8 V. 250 MA	41					
20	105.21	SPEAKER	42					
21	10.4	TUBULAR COND - .01 MF - 200 V.	43					
22	10.4	" " .01 " - 200 "	44					

FADA RADIO & ELECTRIC CO.

Model 160 X-Y-Z

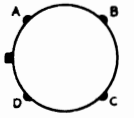


REF No	PART No	DESCRIPTION	REF No	PART No.	DESCRIPTION	REF No.	PART No	DESCRIPTION
1	30.31	CARB. RES - 10,000 OHMS - 1/3 W ± 20%	23	15.7	MICA COND. - .002 MFD. ± 10%	45	130.5	WIRE RES. - 250 OHMS - 1/2 W. FX.
2	30.31	" " 10,000 " " " "	24	15.7	" .002 " " "	46	130.6	" " 500 " " " "
3	30.4	" " 250,000 " " " " 10%	25	15.3	" .0001 " " "	47	130.6	" " 500 " " " "
4	30.3	" " 50,000 " " " " "	26	15.3	" .0001 " " "	48	130.14	" " 2000 " " " "
5	30.26	" " 50,000 " " " " 20%	27	15.6	" .0025 " " 3%	49	105.4	SPEAKER - 1500 "
6	30.26	" " 50,000 " " " " "	28	15.2	" .0005 " " 10%	50	45.1	BAND SWITCH
7	30.20	" " 250,000 " " " " "	29	15.22	" .004 " " "	51		ON-OFF " ON VOL. CONT.
8	30.20	" " 250,000 " " " " "	30	125.1	PHONO JACK	52	30.26	CARB. RES. - 50,000 OHMS - 1/2 W ± 20%
9	30.5	" " 500,000 " " " " 10%	31	25.43	PADDING COND 350 - 1200 MFD	53	10.2	TUBULAR COND. - .1 MFD. - 200 V
10	30.5	" " 500,000 " " " " "	32	55.1	TONE CONTROL	54	10.13	" " .002 " 400 "
11	30.22	" " 1 MEG " " " " 20%	33	120.3	PILOT LIGHTS - 6.8 V. - .15 A.	55	30.39	CARB. RES. - 6,000 OHMS - 1/2 W ± 10%
12	30.38	" " 30,000 " 1/2 " " 10%	34	10.7	TUBULAR COND. - .05 MFD - 400 V.			
13	30.37	" " 35,000 " 1 " " "	35	10.5	" " .05 " 200 "			
14	4579	ANTENNA COIL - B.C. & S.W.	36	10.5	" " .05 " " "			
15	4581	OSCILLATOR " " "	37	10.7	" " .05 " 400 "			
16	4489A	1ST I. F. COIL	38	10.7	" " .05 " " "			
17	4490A	2ND " "	39	10.7	" " .05 " " "			
18	40.4	POWER TRANS - 115 V. 50-60 ~	40	10.4	" " .01 " 200 "			
19	20.33A	ELECTRO COND. BLOCK - 8 MFD 450 W.V.	41	10.9	" " .1 " 400 "			
20	20.33A	" " " 8 " " "	42	10.14	" " .25 " " "			
21	20.33A	" " " 5 " 25 "	43	25.44	VARIABLE COND			
22	20.33A	" " " 5 " " "	44	50.13	VOLUME CONT - 1 MEG.			

NOTE: ⏚ = CHASSIS

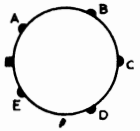
I. F. = 456 K.C.

ANTENNA COIL



A - B = .025 OHMS
A - C = 4.64 "
A - D = .295 "

OSCILLATOR COIL



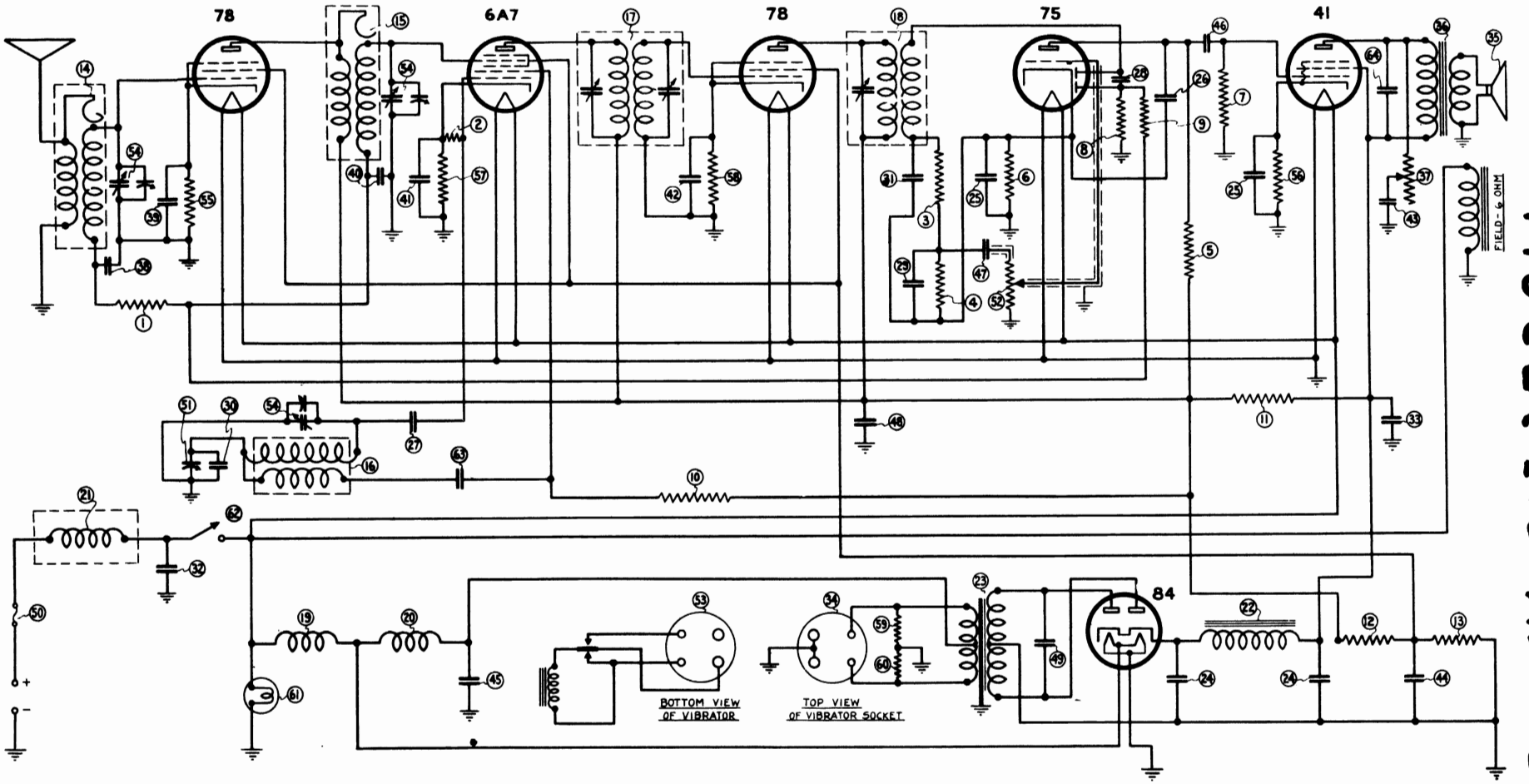
E - A = 4.04 OHMS
E - B = .025 "
C - D = .32 "

1ST I.F. TRANS.	2ND I.F. TRANS
PRI. = 8.5 OHMS	PRI. = 8.5 OHMS
LINK = 13.0 "	LINK = 13.0 "
SEC. = 13.0 "	SEC. = 13.0 "

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.	
MODEL 160	
DRAWN BY JD	DATE 6-29-35
CHECKED BY	APP RFS

FADA RADIO & ELECTRIC CO.

Model 166 Auto Set



I.F. = 175 K.C.

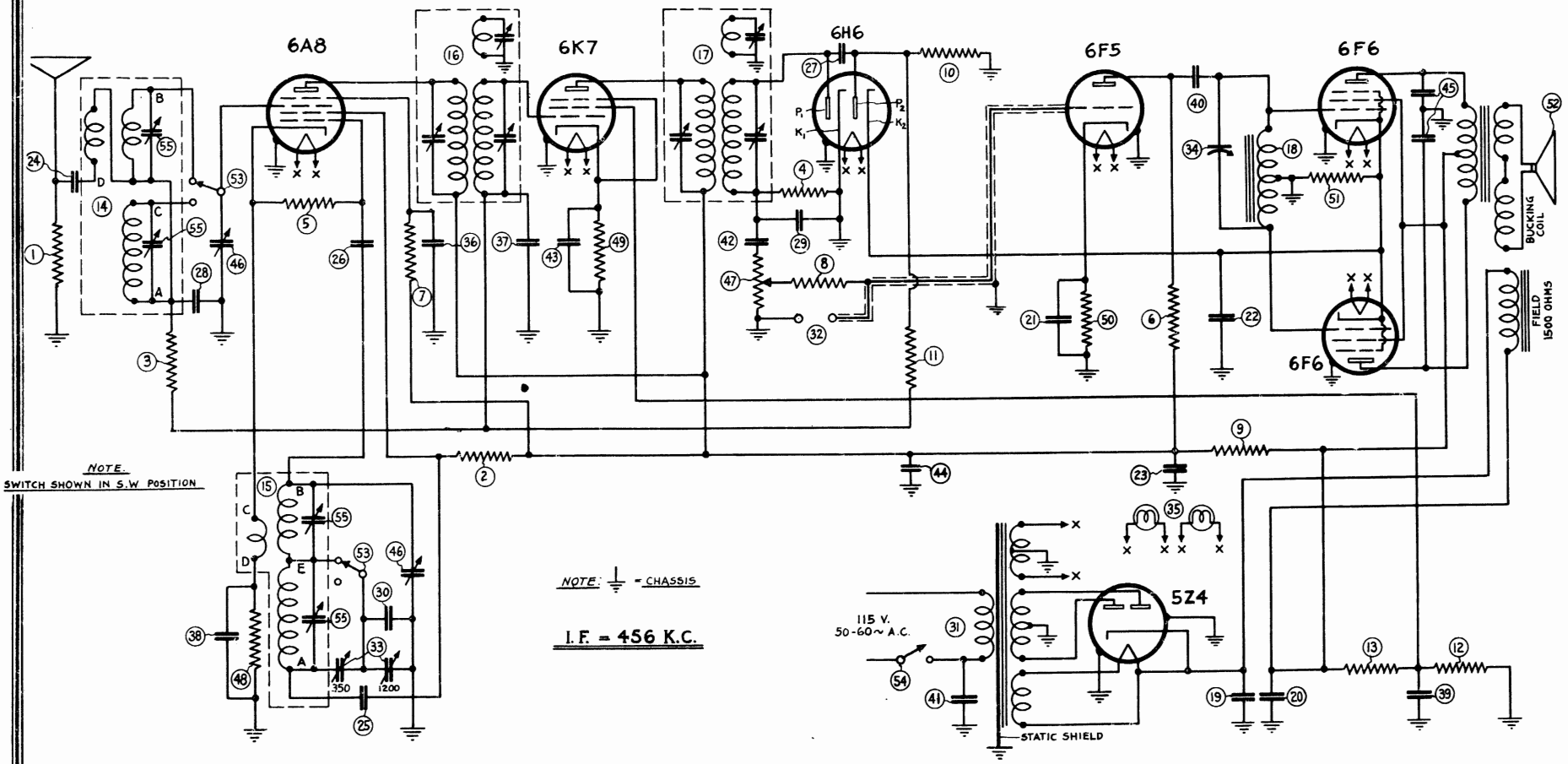
REF. No.	PART No.	DESCRIPTION
1	30.20	CARB. RES. - 250,000 OHM - 1/3 WATT ± 20%
2	30.3	" " 50,000 " 1/3 " ± 10%
3	30.3	" " 50,000 " 1/3 " "
4	30.24	" " 100,000 " 1/3 " ± 20%
5	30.24	" " 100,000 " 1/3 " "
6	30.1	" " 5,000 " 1/3 " ± 10%
7	30.23	" " 500,000 " 1/3 " ± 20%
8	30.23	" " 500,000 " 1/3 " "
9	30.23	" " 500,000 " 1/3 " "
10	30.11	" " 25,000 " 1/3 " ± 10%
11	30.25	" " 5,000 " 2 " ± 20%
12	30.13	" " 20,000 " 1 " ± 10%
13	30.26	" " 50,000 " 1/3 " ± 20%
14	4303	ANTENNA COIL
15	4304	R.F. COIL
16	4422	OSCILLATOR COIL
17	717	D.T. I.F. COIL
18	4423	S.T. I.F. COIL
19	4414	R.F. CHOKE
20	4414	R.F. CHOKE
21	4424	SHIELDED CHOKE (SPARK FILTER CHOKE)
22	40.1	AUDIO CHOKE COIL - 300 OHM
23	40.15	POWER TRANSFORMER
24	20.29	ELECTRO COND. - DUAL - 8 MFD. - 350 W.V.
25	20.30	" " " 4 " 25 W.V. TUB
26	15.7	MICA COND. - .002 MFD ± 10%
27	15.3	" " .0001 " "
28	15.3	" " .0001 " "
29	15.3	" " .0001 " "
30	15.11	" " .0004 " "
31	15.2	" " .0005 " "
32	15.10	" " .00005 " "
33	15.4	" " .001 " "
34	65.20	VIBRATOR SOCKET
35	105.22	LOUD SPEAKER
36	40.22	OUTPUT TRANSFORMER
37	55.4	TONE CONT. RES - 100,000 OHM
38	10.5	TUBULAR COND. - .05 MFD. - 200 V
39	10.5	" " .05 " 200 "
40	10.5	" " .05 " 200 "
41	10.5	" " .05 " 200 "
42	10.5	" " .05 " 200 "
43	10.7	" " .05 " 400 "
44	10.7	" " .05 " 400 "
45	10.21	TUBULAR COND. - .5 MFD. 120 V
46	10.10	TUBULAR COND. - .01 " 400 "
47	10.4	" " .01 " 200 "
48	10.14	" " .25 " 400 "
49	10.20	" " .01 " 1000 "
50	90.13	FUSE - 10 AMP
51	25.34	PADDING COND. - .000650 MFD.
52	50.8	VOLUME CONTROL + 1 MEG.
53	90.17	VIBRATOR
54	25.33	VARIABLE COND - .000367 MFD.
55	130.12	WIRE RES - 750 OHM - 1/2 FX.
56	130.1	" " 625 " 1/2 "
57	130.8	" " 1000 " 1/2 "
58	130.8	" " 1000 " 1/2 "
59	130.13	" " 100 " 1 WATT
60	130.13	" " 100 " 1 "
61	90.31	PILOT LIGHT - MAZDA # 51
62		ON-OFF SW. ON VOL CONT. (52)
63	15.4	MICA COND. - .001 MFD. ± 10%
64	10.3	TUBULAR " .006 MFD. - 400 V.
65		
66		

REF No.	PART No	DESCRIPTION

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.	
MODEL 166 • MOTOSET	
DRAWN BY	DATE 4-13-35
CHECKED BY	APP. CHIEF ENG.

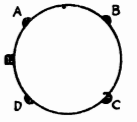
FADA RADIO & ELECTRIC CO.

Model 170 X-Y-Z



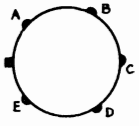
REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION
1	30.31	CARB RES. - 10,000 OHMS - ½ W. ± 20%	23	20.34	ELECTRO COND. - 6 MFD. 450 W.V.	45	10.17	TUBULAR COND. - DUAL - .001 - .001 MFD. 600 V
2	30.31	" " 10,000 " " " "	24	15.7	MICA COND. .002 MFD. ± 10%	46	25.45	VARIABLE COND.
3	30.20	" " 250,000 " " " "	25	15.7	" " .002 " " "	47	50.14	VOLUME CONT. - 1 MEG.
4	30.20	" " 250,000 " " " "	26	15.3	" " .0001 " " "	48	130.5	WIRE RES. - 250 OHMS - ½ W. Fx.
5	30.3	" " 50,000 " " " " 10%	27	15.3	" " .0001 " " "	49	130.6	" " 500 " " " "
6	30.3	" " 50,000 " " " " "	28	15.6	" " .0025 " " 3%	50	130.12	" " 750 " " " "
7	30.26	" " 50,000 " " " " 20%	29	15.2	" " .0005 " " 10%	51	130.9	" " 315 " 1 " "
8	30.26	" " 50,000 " " " " "	30	15.22	" " .004 " " "	52	105.7	SPEAKER - 1500 "
9	30.36	" " 5,000 " " " " "	31	40.10	POWER TRANS. - 115 V. 50-60 - -	53	45.13	BAND SWITCH
10	30.5	" " 500,000 " " " " 10%	32	125.1	PHONO JACK	54		ON-OFF " ON VOL. CONT.
11	30.22	" " 1 MEG " " " " 20%	33	25.43	PADDING COND. - DUAL - 350-1200 MMF.	55		MIN. ADJ. ON COIL
12	30.14	" " 50,000 " ½ " " 10%	34	55.5	TONE CONTROL			
13	30.37	" " 35,000 " 1 " " "	35	120.3	PILOT LIGHTS - 6.8 V. - .15 A.			
14	4579	ANTENNA COIL - B.C & S.W.	36	10.7	TUBULAR COND. - .05 MFD. - 400 V			
15	4581	OSCILLATOR " " "	37	10.5	" " .05 " 200 "			
16	4489B	1ST. I. F. COIL	38	10.5	" " .05 " " "			
17	4490B	2ND " " "	39	10.7	" " .05 " 400 "			
18	40.7	AUDIO COUPLING CHOKE	40	10.7	" " .05 " " "			
19	20.33B	ELECTRO COND BLOCK - 8 MFD. 450 W.V.	41	10.7	" " .05 " " "			
20	20.33B	" " " 8 " " " "	42	10.4	" " .01 " 200 "			
21	20.33B	" " " 5 " 25 " "	43	10.2	" " .1 " " "			
22	20.33B	" " " 5 " " " "	44	10.9	" " .1 " 400 "			

ANTENNA COIL



A-B = .025 OHMS
A-C = 4.64 "
A-D = .295 "

OSCILLATOR COIL



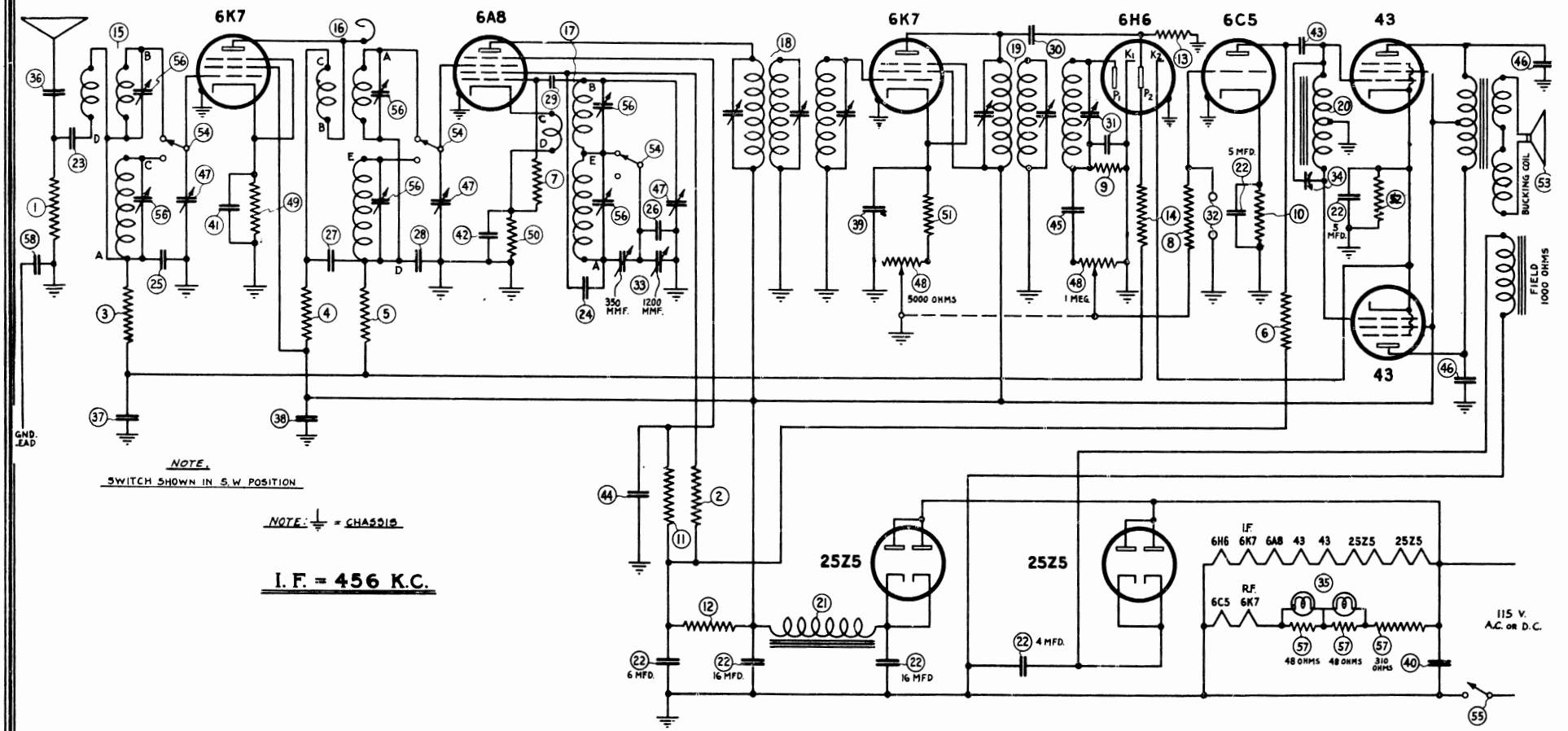
E-A = 4.04 OHMS
E-B = .025 "
C-D = .32 "

1ST I. F. TRANS.
PRI. = 8.5 OHMS
LINK = 13.0 "
SEC. = 13.0 "

2ND I. F. TRANS.
PRI. = 8.5 OHMS
LINK = 13.0 "
SEC. = 13.0 "

FADA RADIO & ELECTRIC CO LONG ISLAND CITY, N.Y.	
MODEL 170	
DRAWN JD	DATE 6-29-35
CHECKED BY	APPROVED RFS

Model 192 X-Y-Z



REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION
1	30.2	CARB. RES - 10,000 OHM - ½ W ±10%	23	15.7	MICA COND - .002 MFD. -10%	45	10.4	TUBULAR COND. - .01 MFD - 200 V.			
2	30.2	" " 10,000 " " " "	24	15.7	" " .002 " " "	46	10.17	" " DUAL - .001 - 600 V.			
3	30.20	" " 250,000 " " " -20%	25	15.6	" " .0025 " -3%	47	25.46	VARIABLE COND.			
4	30.30	" " 1,400 " " " -10%	26	15.21	" " .003 " -5%	48	50.12	VOL. CONTROL - DUAL - 5000 OHM - 1 MEG			
5	30.32	" " 25,000 " " " -20%	27	15.2	" " .0005 " -10%	49	130.5	WIRE RES. - 250 OHMS 10% ½ FX.			
6	30.11	" " 25,000 " " " -10%	28	15.20	" " .00275 " -3%	50	130.5	" " 250 " " " "			
7	30.3	" " 50,000 " " " "	29	15.3	" " .0001 " -10%	51	130.6	" " 500 " " " "			
8	30.26	" " 50,000 " " " -20%	30	15.3	" " .0001 " "	52	130.9	" " 315 " " 1 "			
9	30.5	" " 500,000 " " " -10%	31	15.1	" " .00025 " "	53	105.19	SPEAKER - 1000 OHMS			
10	30.15	" " 2,000 " " " "	32	125.1	PHONO JACK	54	45.15	BAND SWITCH			
11	30.10	" " 30,000 " " " "	33	25.43	PADDING COND. - 350 - 1200 MMF.	55		ON-OFF SW. ON TONE CONT. (34)			
12	30.12	" " 4,000 " " " "	34	55.2	TONE CONTROL WITH ON-OFF SW	56		MIN. ADJ. ON COILS			
13	30.22	" " 1 MEG " " " -20%	35	120.3	PILOT LIGHTS 6.-8.V. .15 A.	57	115.10	LINE RESISTOR - 48-48-310 OHMS			
14	30.28	" " 2 " " " " "	36	10.18	TUBULAR COND - .002 MFD - 200 V.	58	10.23	TUBULAR COND. - .006 - 200 V			
15	4579	ANTENNA COIL	37	10.26	" " .02 " " "						
16	4580	R. F. COIL	38	10.2	" " .1 " " "						
17	4581	OSCILLATOR COIL	39	10.2	" " .1 " " "						
18	4489C	1ST I. F. COIL	40	10.2	" " .1 " " "						
19	4490C	2ND I. F. COIL	41	10.5	" " .05 " " "						
20	40.7	AUDIO COUPLING CHOKE	42	10.5	" " .05 " " "						
21	40.3	CHOKE COIL - 200 OHMS	43	10.5	" " .05 " " "						
22	20.32	ELECTRO. COND. 6-16-16-4 MFD. 150 W.V. 8-8 MFD. 25 W.V.	44	10.5	" " .05 " " "						

ANTENNA COIL

A - B = .051 OHMS
A - C = 4.785 "
A - D = .341 "

R.F. COIL

D - A = .0875 OHMS
D - E = 4.735 "
B - C = 5.785 "

OSCILLATOR COIL

C - D = .415 OHMS
E - A = 3.915 "
E - B = .045 "

1ST I.F. TRANS.

PRI. = 8.5 OHMS
LINK = 13.0 "
SEC. = 13.0 "

2ND I.F. TRANS.

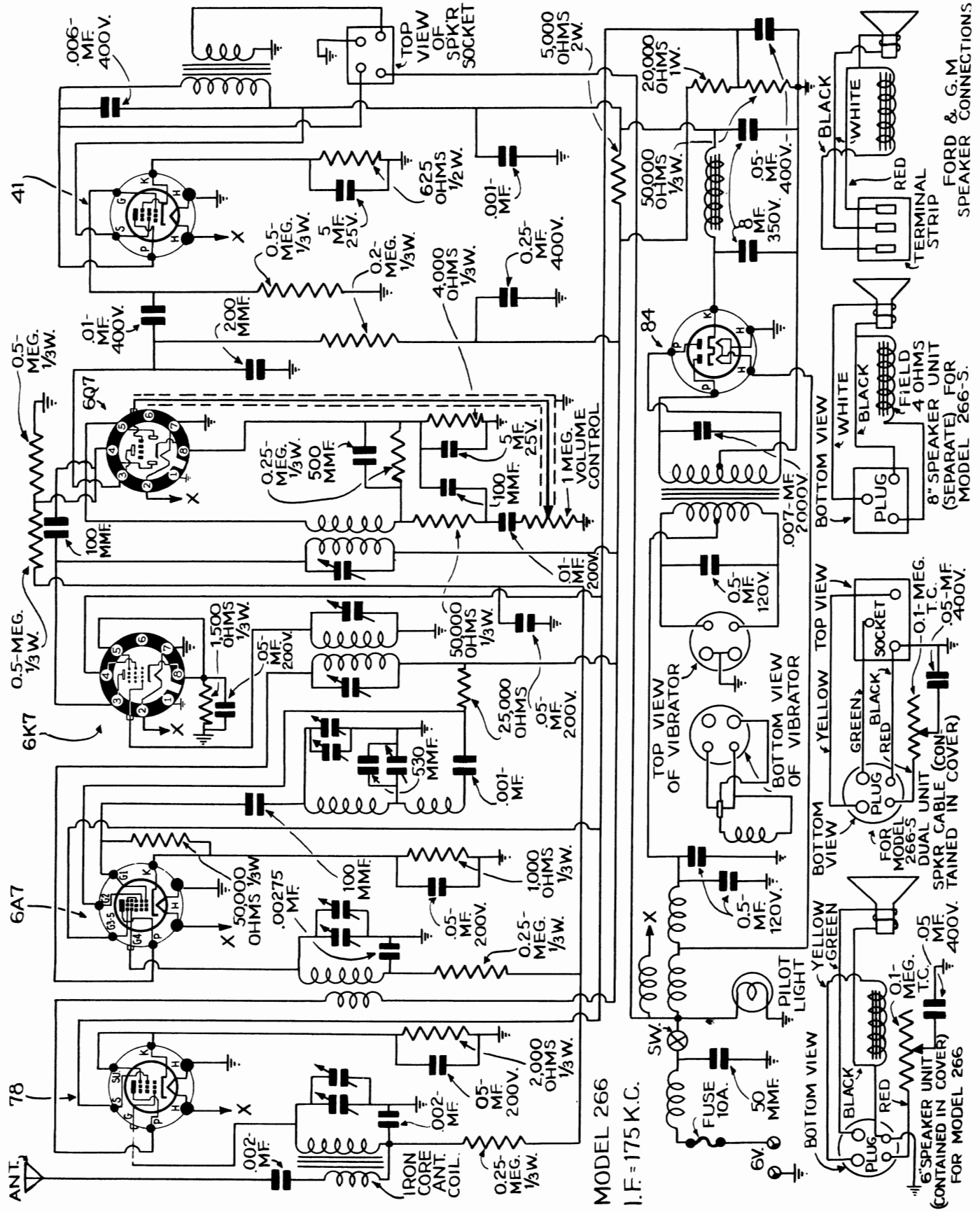
PRI. = 8.5 OHMS
LINK = 13 "
SEC. = 13 "

FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODEL 192
DRAWN BY JP
DATE 6-29-35
CHECKED RLW
APP. FES

FADA RADIO & ELECTRIC CO.

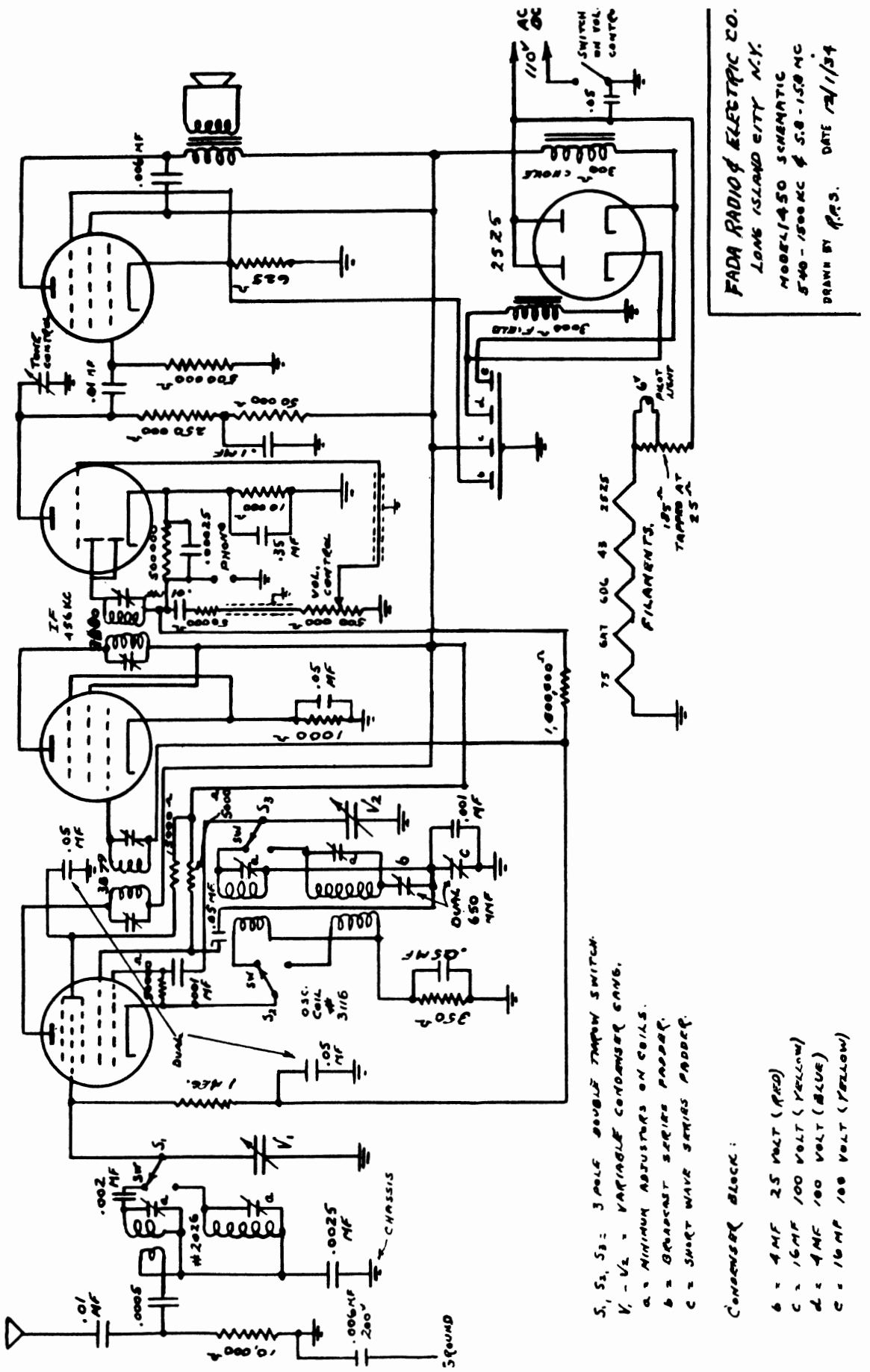
FADA RADIO & ELECTRIC CO.

Model 266



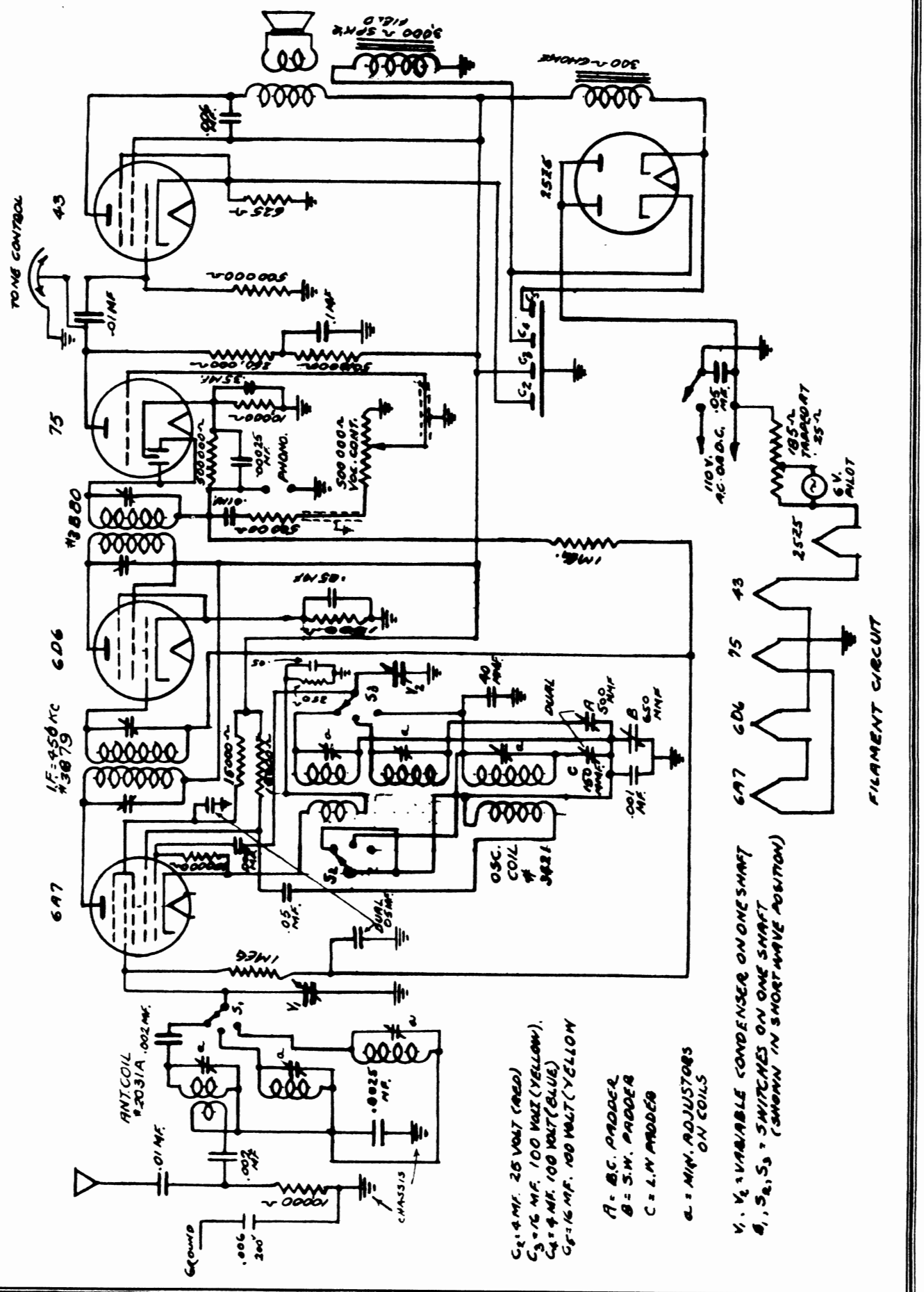
FADA RADIO & ELECTRIC CO.

Model 1450



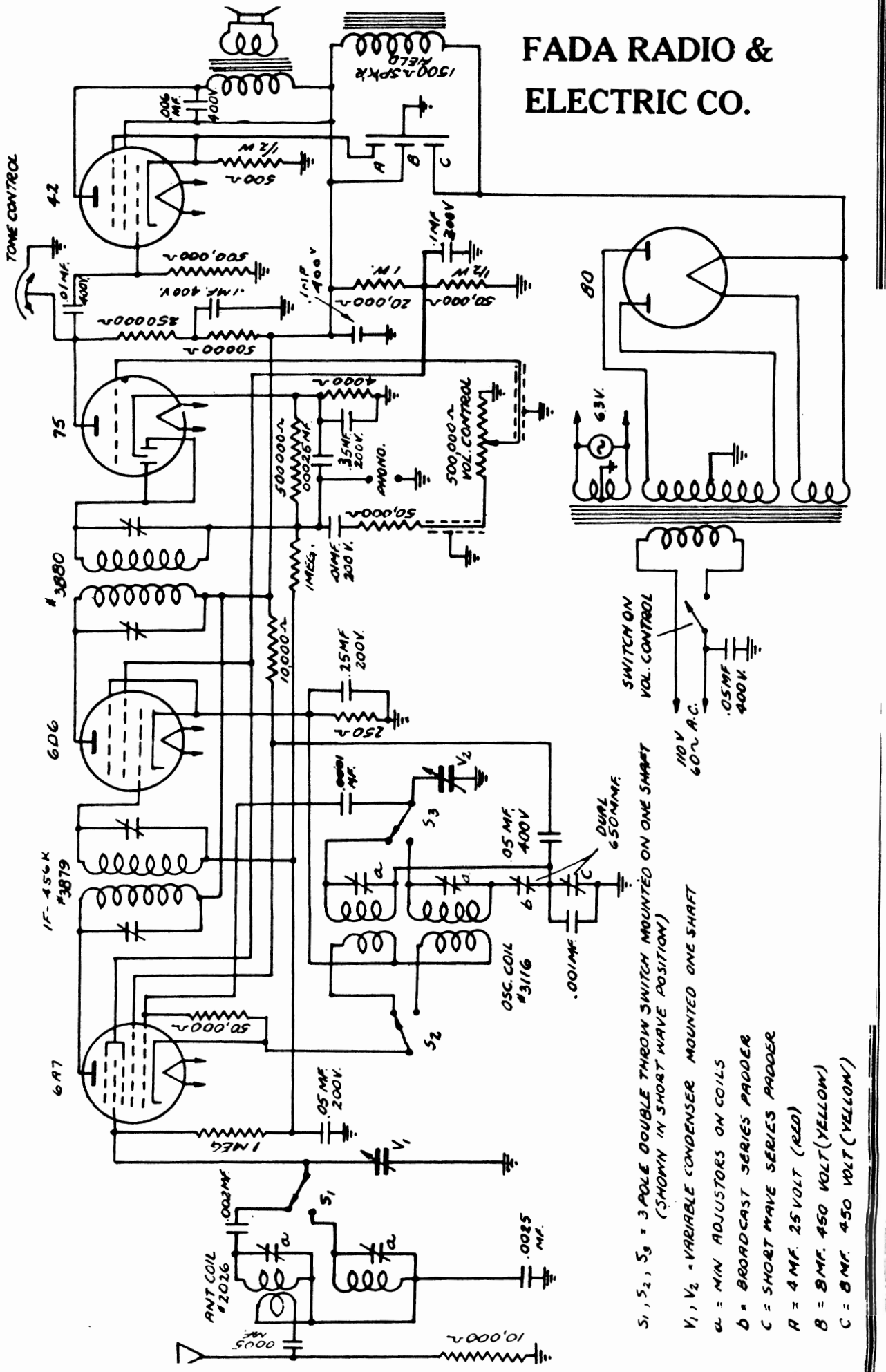
FADA RADIO & ELECTRIC CO.

Model 1451



FADA RADIO & ELECTRIC CO.

Model 1452



S1, S2, S3 = 3 POLE DOUBLE THROW SWITCH MOUNTED ON ONE SHAFT (SHOWN IN SHORT WAVE POSITION)

V1, V2 = VARIABLE CONDENSER MOUNTED ONE SHAFT

a = MIN ADJUSTORS ON COILS

b = BROADCAST SERIES PADDER

C = SHORT WAVE SERIES PADDER

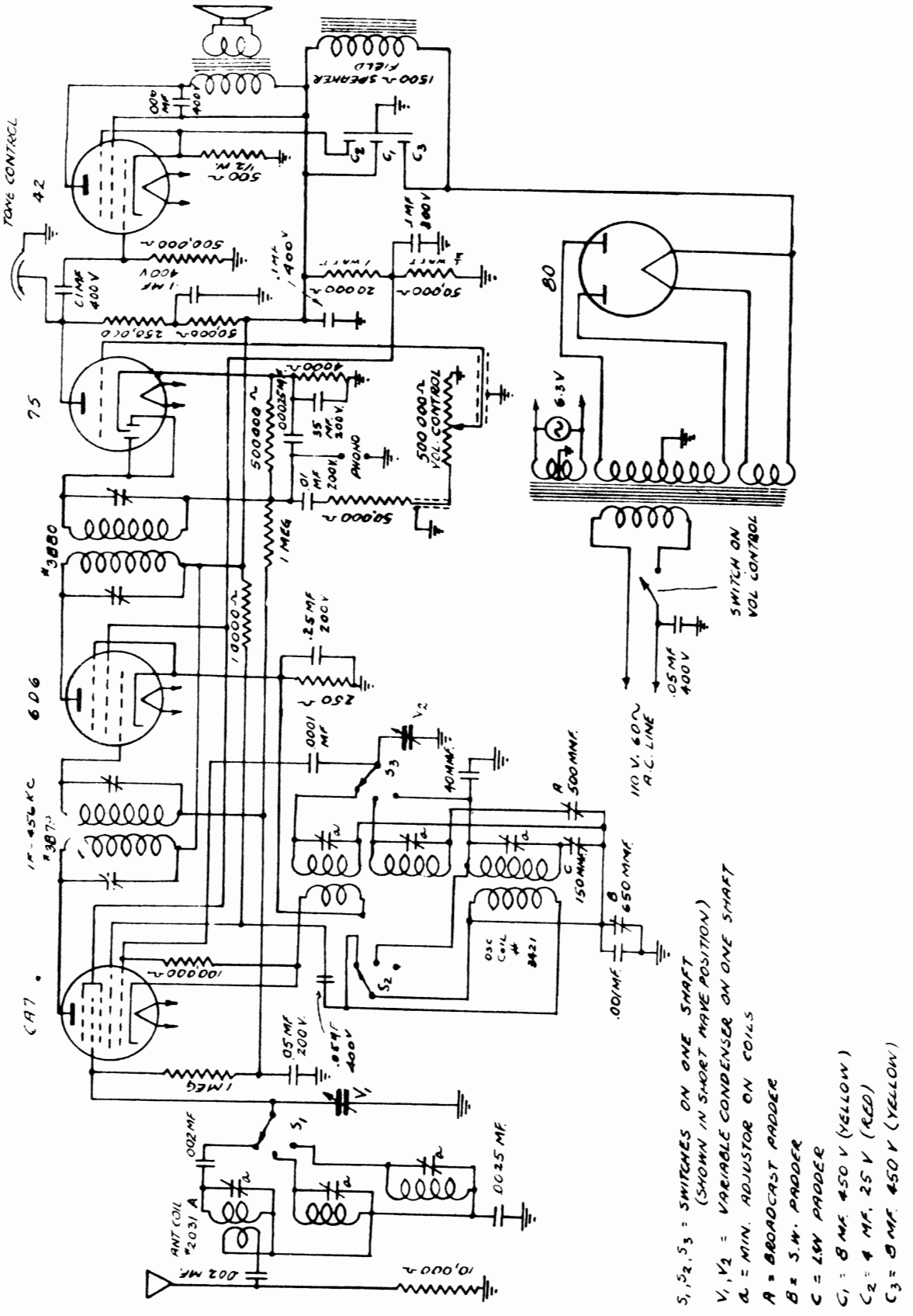
A = 4 MF. 25 VOLT (RED)

B = 8 MF. 450 VOLT (YELLOW)

C = 8 MF. 450 VOLT (YELLOW)

FADA RADIO & ELECTRIC CO.

Model 1453



S_1, S_2, S_3 = SWITCHES ON ONE SHAFT (SHOWN IN SHORT WAVE POSITION)

V_1, V_2 = VARIABLE CONDENSER ON ONE SHAFT

A = MIN. ADJUSTOR ON COILS

A = BROADCAST PADDER

B = S.W. PADDER

C = L.W. PADDER

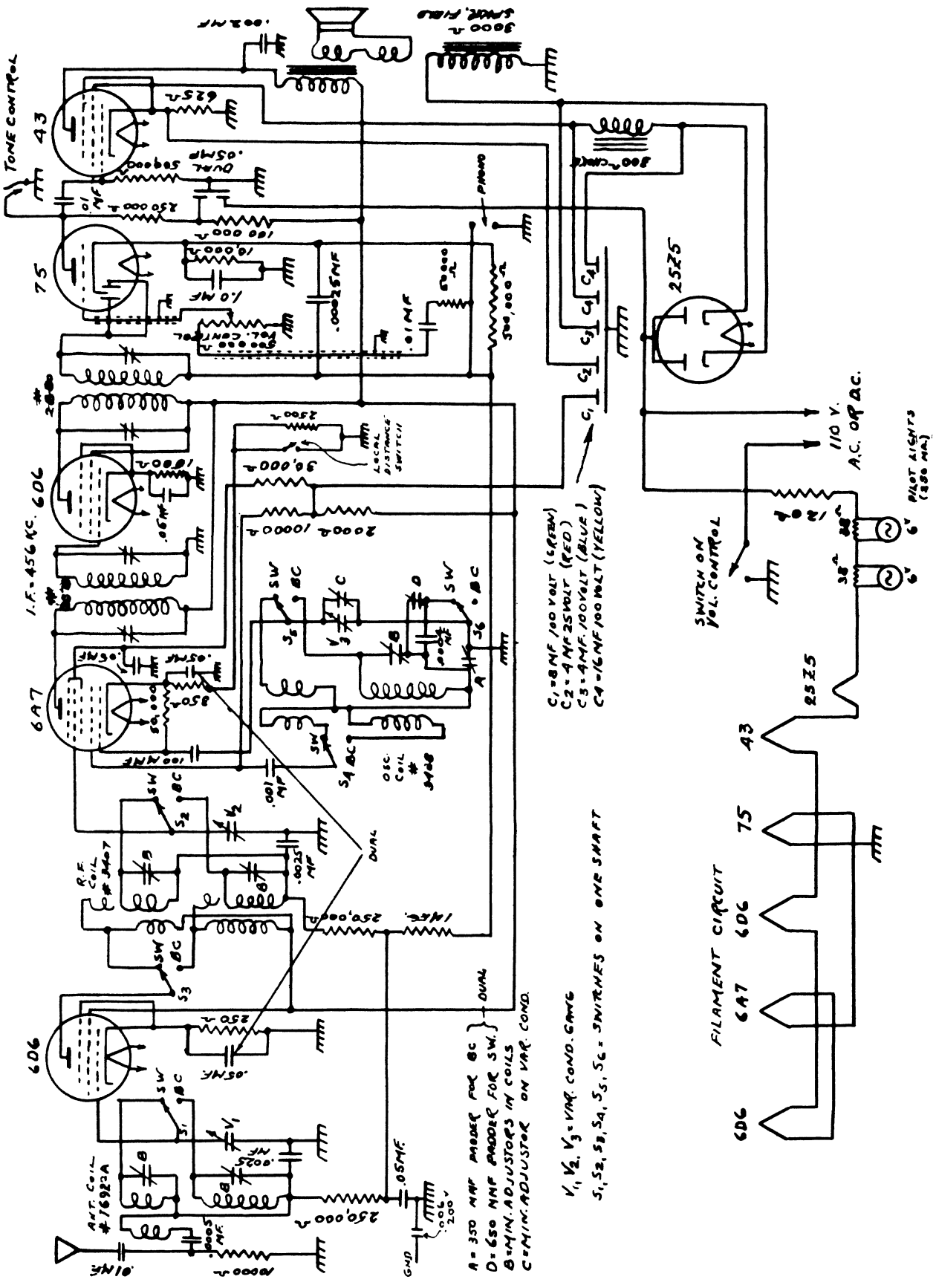
C_1 = 8 MF. 450 V (YELLOW)

C_2 = 4 MF. 25 V (RED)

C_3 = 8 MF. 450 V (YELLOW)

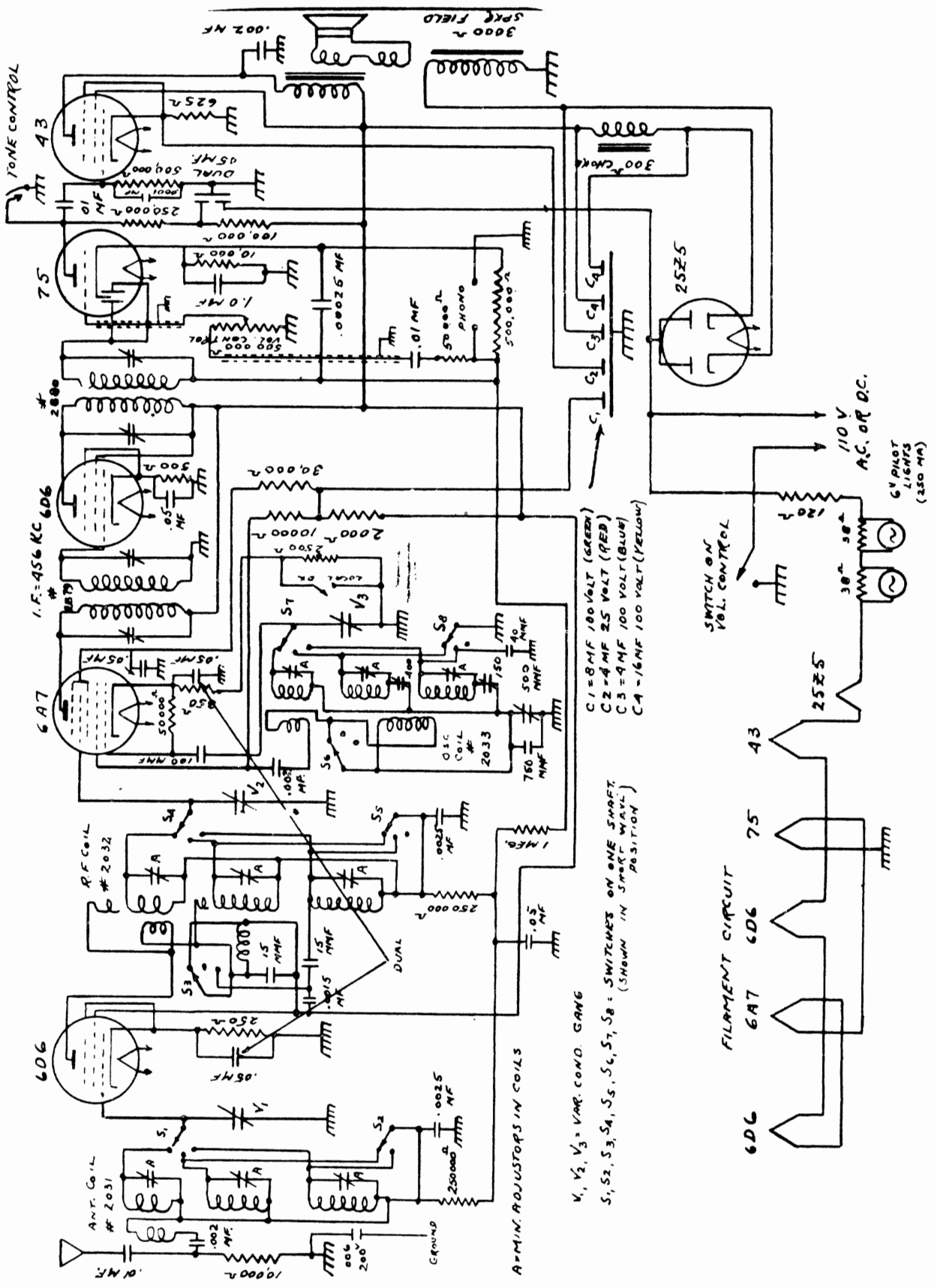
FADA RADIO & ELECTRIC CO.

Model 1460



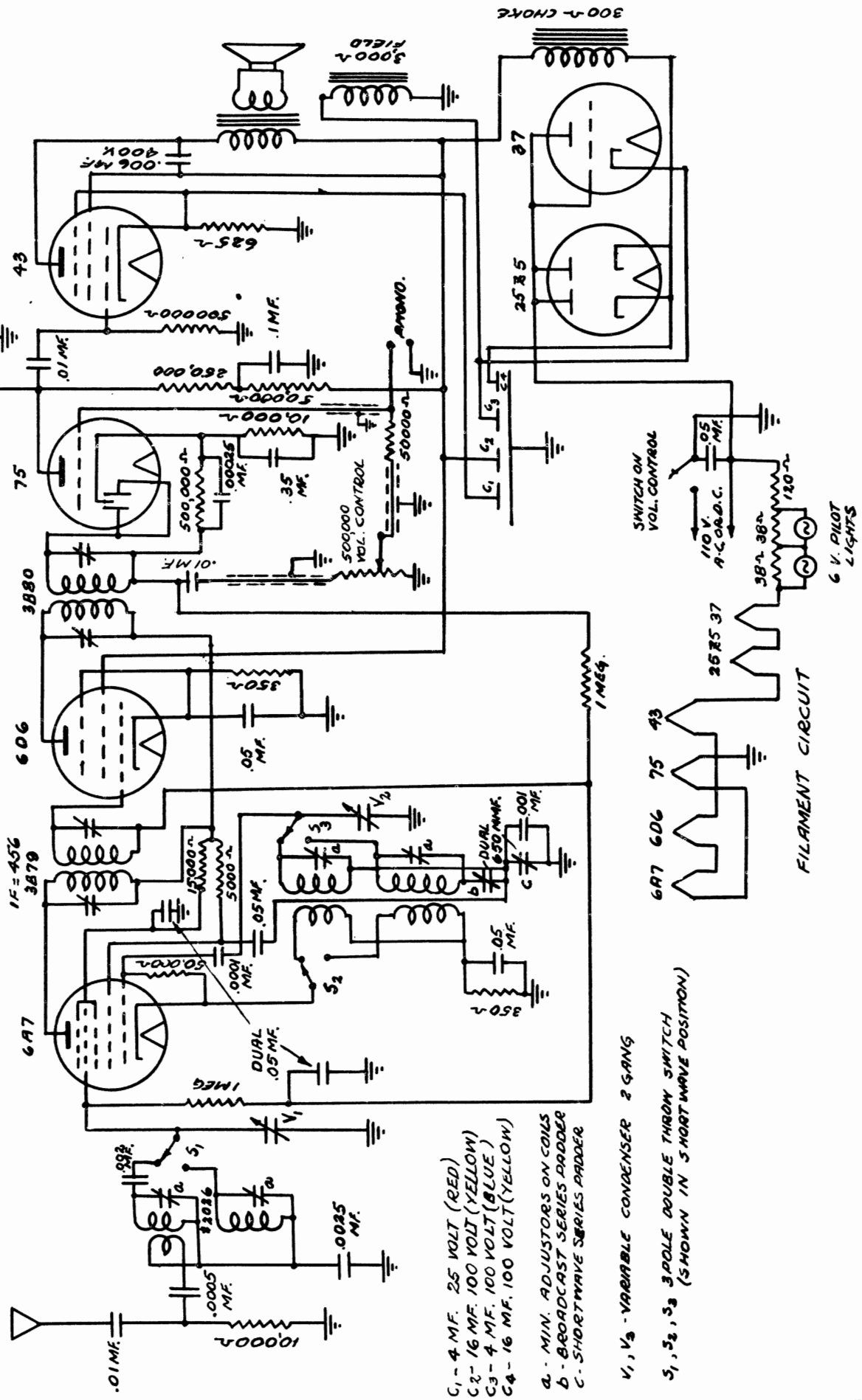
FADA RADIO & ELECTRIC CO.

Model 1461



FADA RADIO & ELECTRIC CO.

Model 1462



C_1 - 4 MF. 25 VOLT (RED)
C_2 - 16 MF. 100 VOLT (YELLOW)
C_3 - 4 MF. 100 VOLT (BLUE)
C_4 - 16 MF. 100 VOLT (YELLOW)

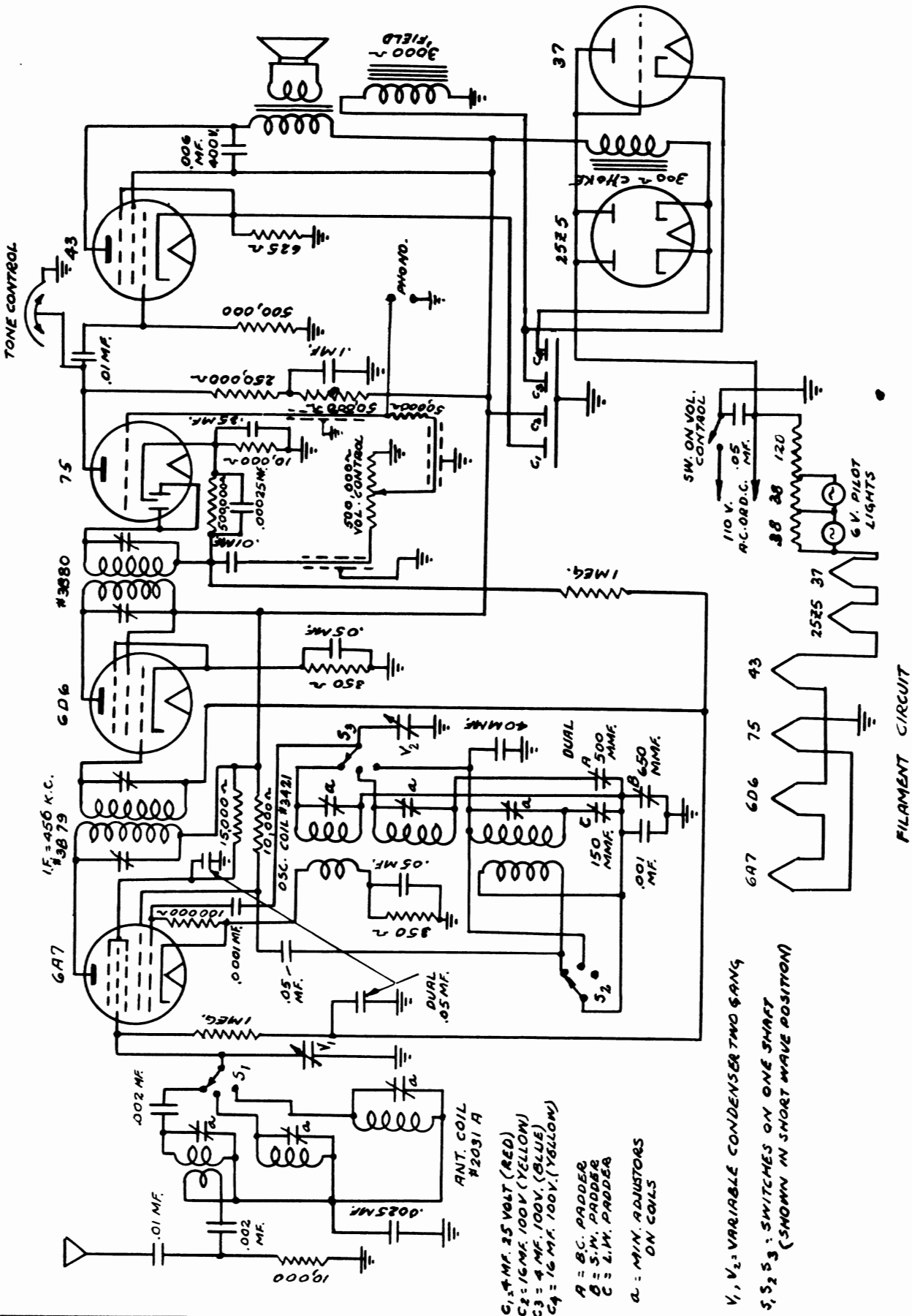
a - MIN. ADJUSTORS ON COILS
b - BROADCAST SERIES PADDER
c - SHORTWAVE SERIES PADDER

V_1, V_2, V_3 - VARIABLE CONDENSER 2 GANG

S_1, S_2, S_3 3 POLE DOUBLE THROW SWITCH (SHOWN IN SHORTWAVE POSITION)

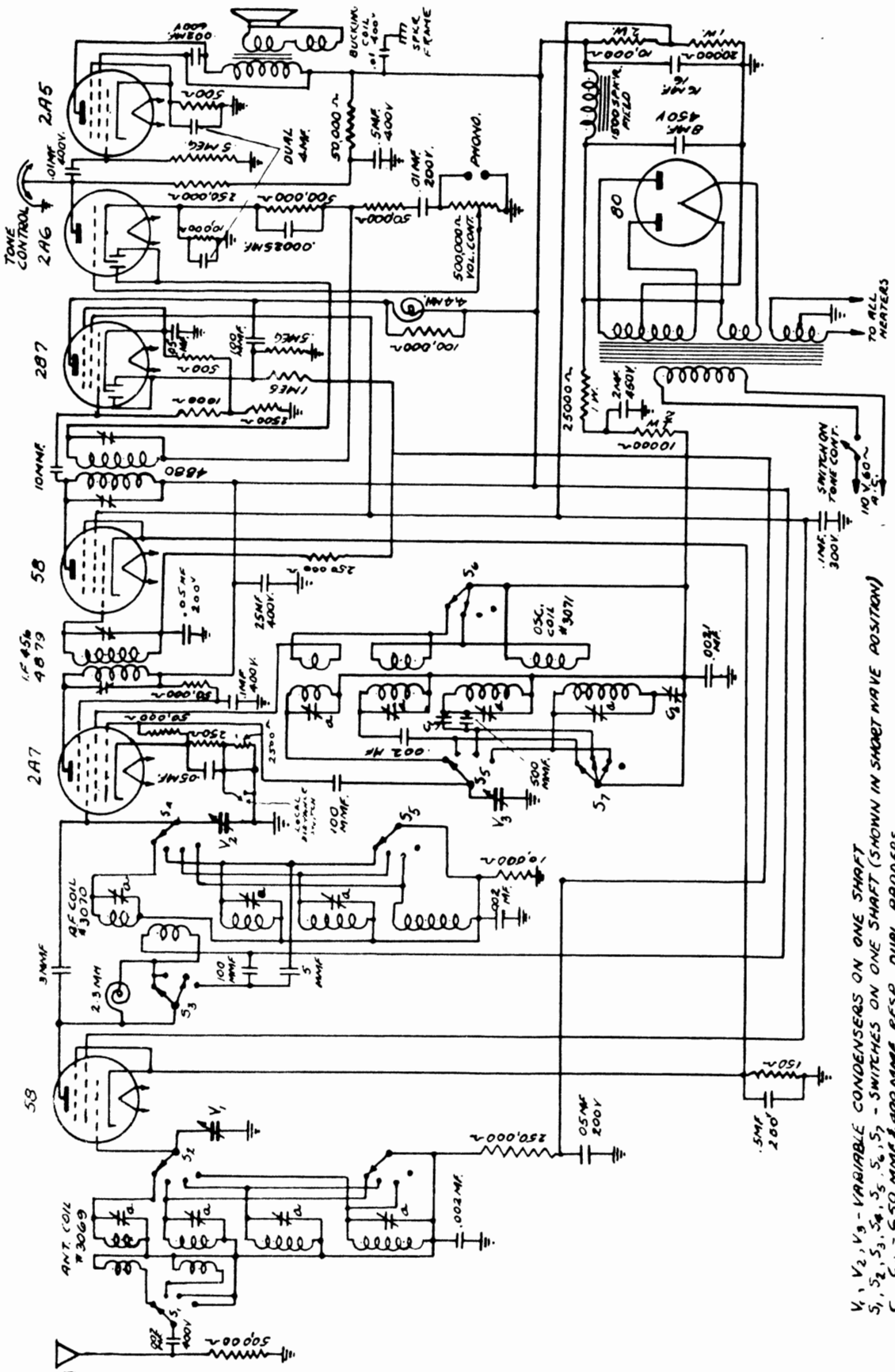
FADA RADIO & ELECTRIC CO.

Model 1463



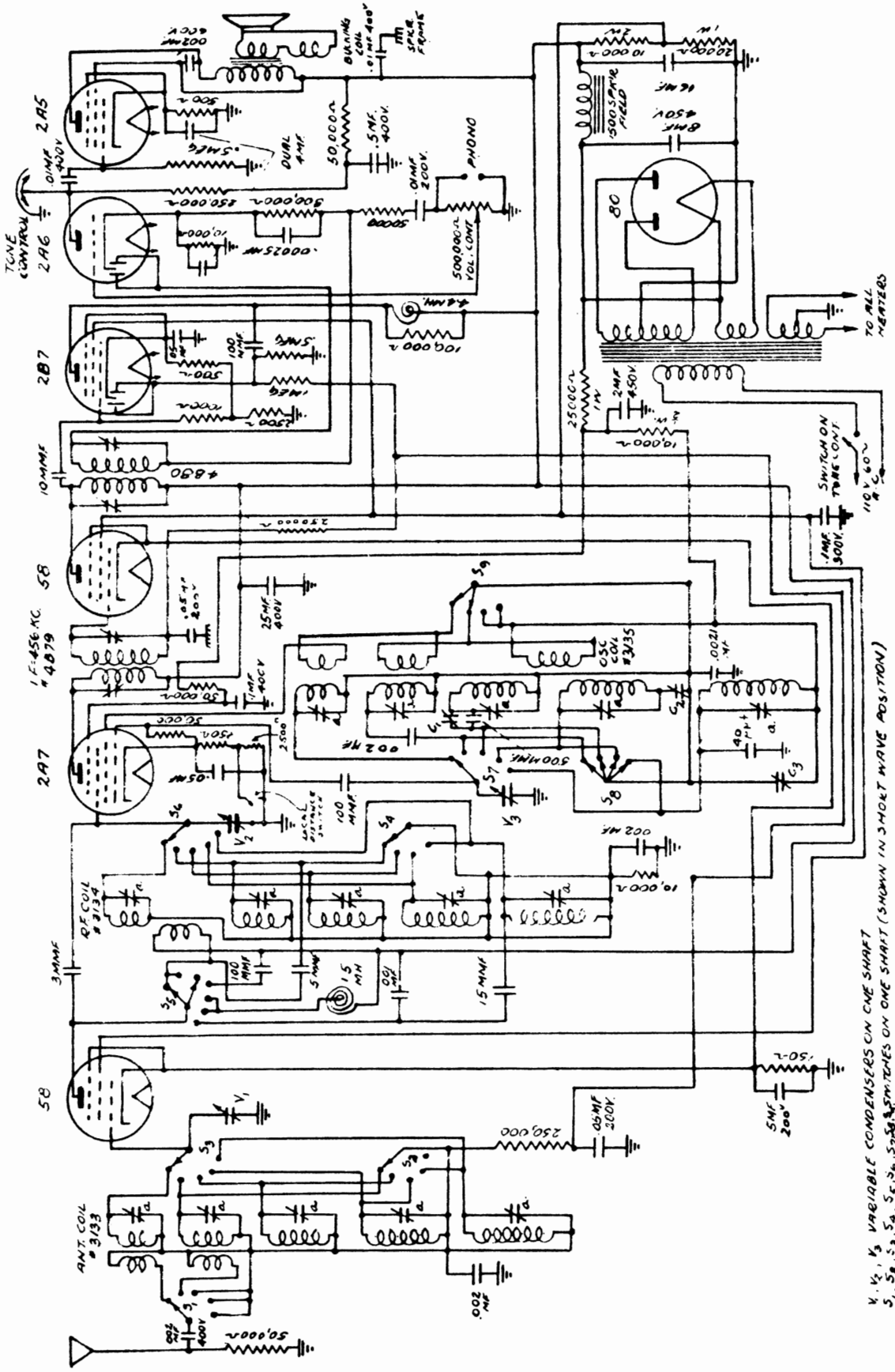
FADA RADIO & ELECTRIC CO.

Model 1470



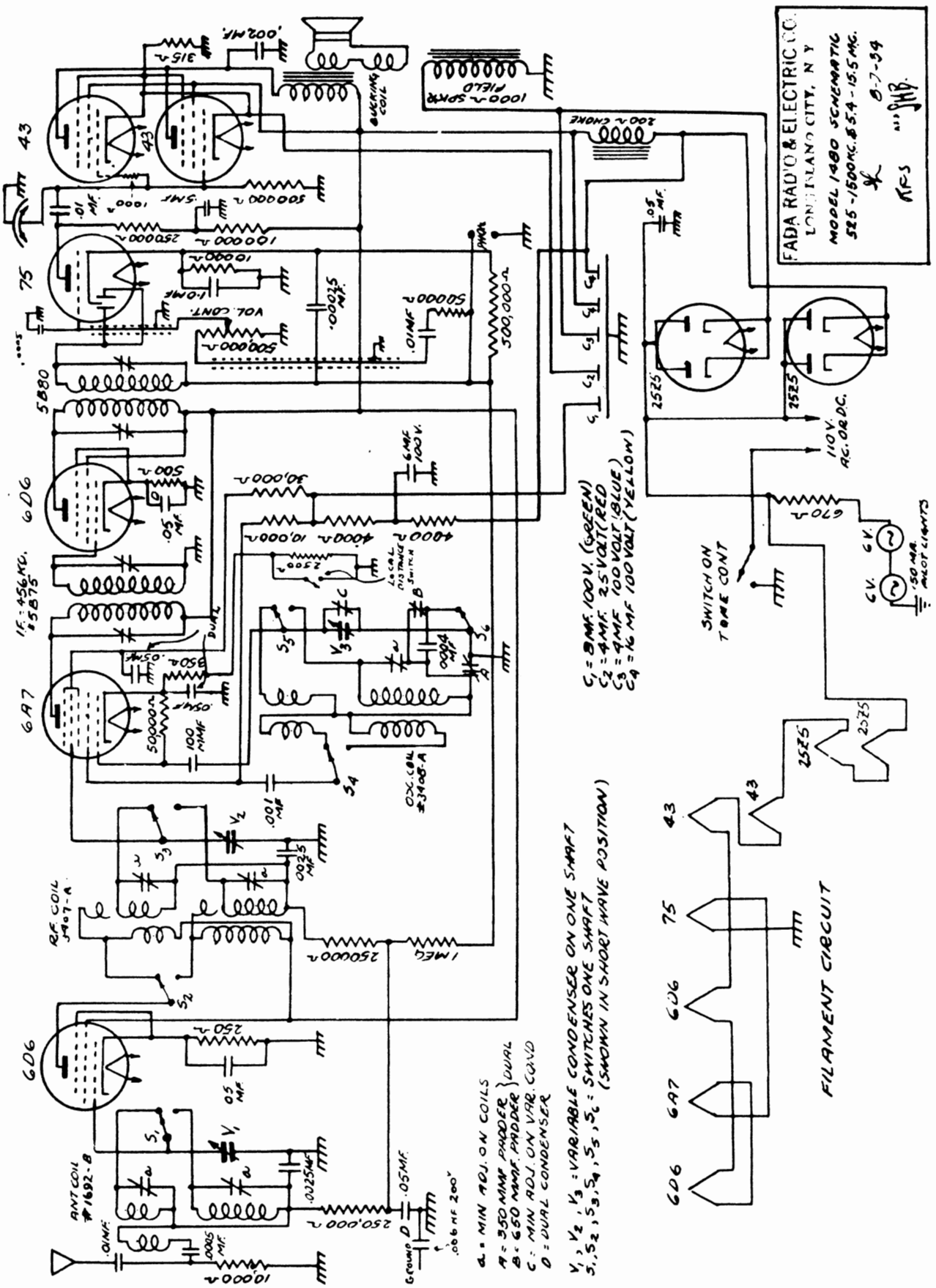
FADA RADIO & ELECTRIC CO.

Model 1471


TONE CONTROL
PHONO
VOL. CONT.
SWITCH ON TONE CONT.
TO ALL HEATERS
I.F. 456 KC. #4879
OSC. COIL #3135
R.F. COIL #3134
ANT. COIL #3133
250,000
50,000
500,000
10,000
2500
1500
150,000
300,000
2200000
.002 MF
.05 MF
.1 MF
.5 MF
.02 MF
.05 MF 200V.
.1 MF 300V.
.002 MF 400V.
.005 MF 400V.
.01 MF 400V.
.02 MF 400V.
.05 MF 400V.
.1 MF 400V.
.5 MF 400V.
1 MF 400V.
2 MF 450V.
8 MF 450V.
16 MF 450V.
10 MMF
15 MMF
100 MMF
200 MMF
300 MMF
.002 MF
.0025 MF
.05 MF 200V.
.1 MF 400V.
.5 MF 400V.
1 MF 400V.
2 MF 400V.
4 MF 400V.
25 MF 400V.
.05 MF 200V.
.1 MF 200V.
.5 MF 200V.
1 MF 200V.
2 MF 200V.
4 MF 200V.
25 MF 200V.
.05 MF 400

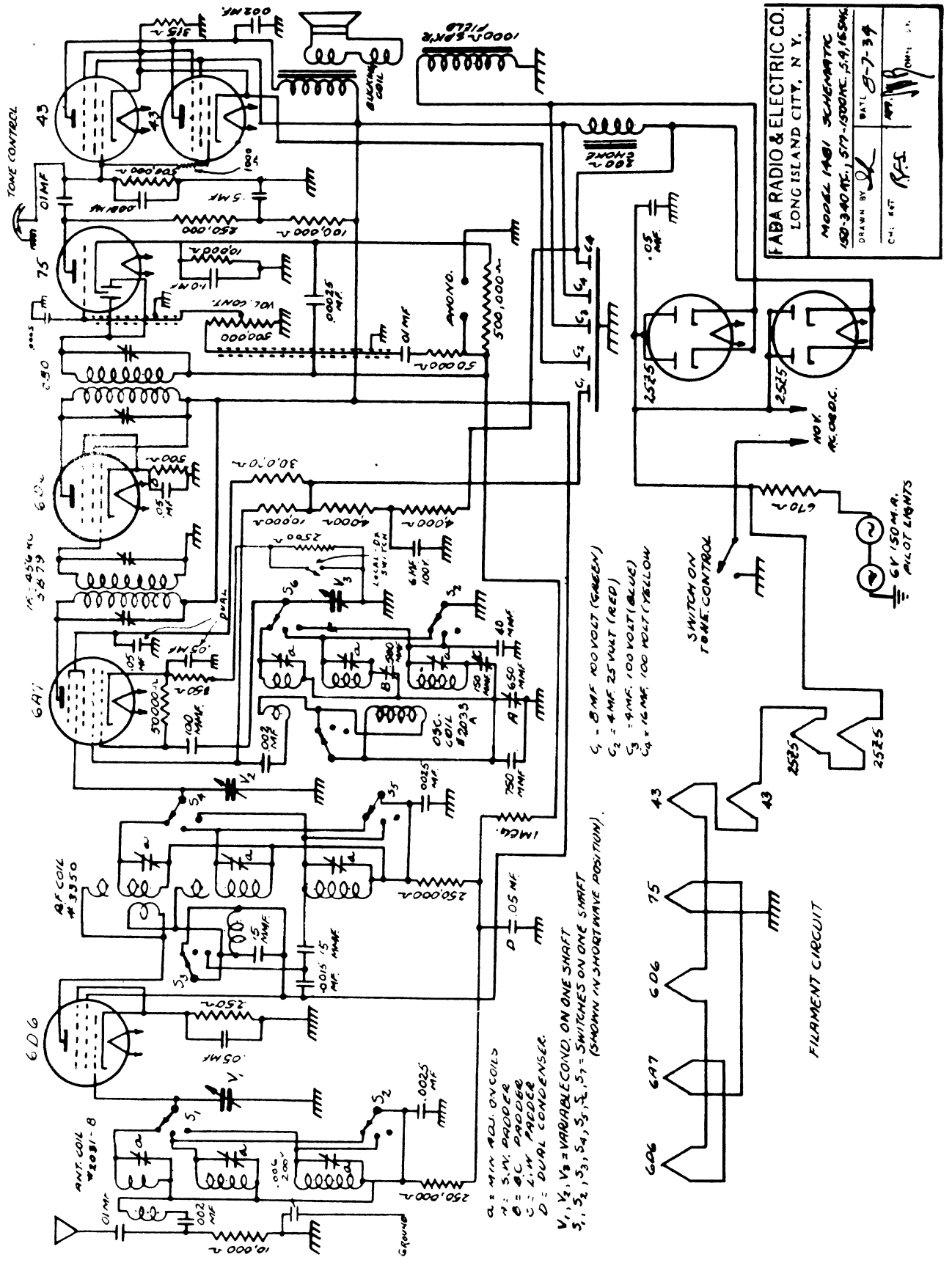
FADA RADIO & ELECTRIC CO.

Model 1480



FADA RADIO & ELECTRIC CO.

Model 1481



FAIRBANKS MORSE INC.

SCHEMATIC DIAGRAM MODEL C-6

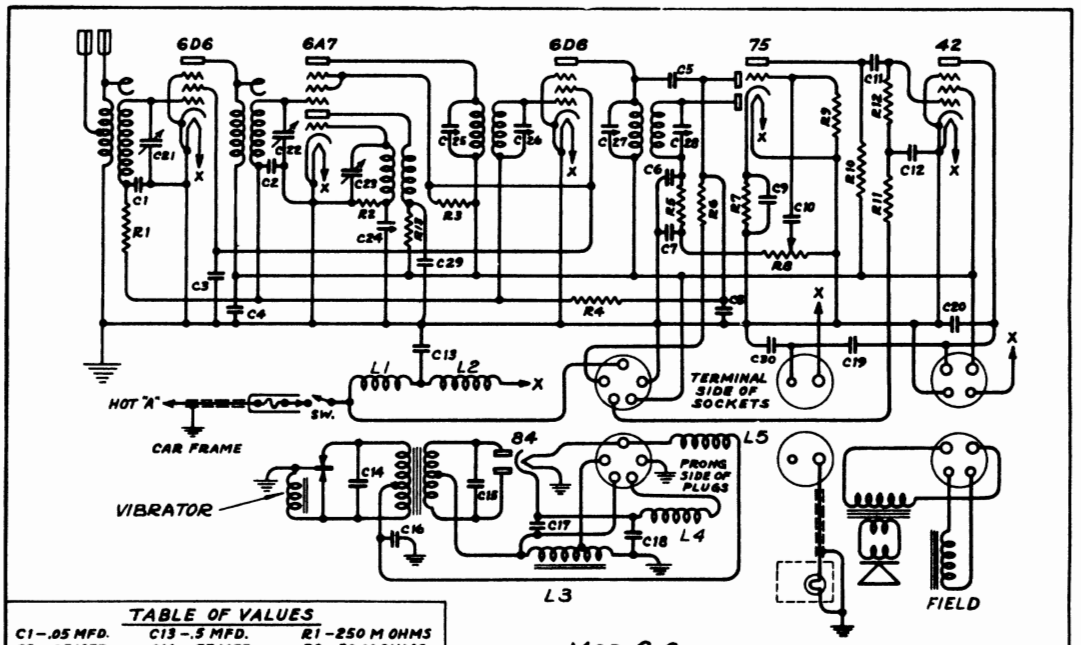


TABLE OF VALUES

C1 - .05 MFD.	C13 - .5 MFD.	R1 - 250 M OHMS
C2 - .05 MFD.	C14 - .25 MFD.	R2 - 50 M OHMS
C3 - .1 MFD.	C15 - .02 MFD.	R3 - 20 M OHMS
C4 - .25 MFD.	C16 - .25 MFD.	R4 - 250 M OHMS
C5 - 50 MMFD.	C17 - 8 MFD.	R5 - 25 M OHMS
C6 - 200 MMFD.	C18 - 8 MFD.	R6 - 250 M OHMS
C7 - 200 MMFD.	C19 - .02 MFD.	R7 - 6000 OHMS
C8 - 500 MMFD.	C20 - .006 MFD.	R8 - 250 M OHM V.C.
C9 - .25 MFD.	C29 - .01 MFD.	R9 - 500 M OHMS
C10 - .01 MFD.	C30 - 500 MMFD.	R10 - 100 M OHMS
C11 - .01 MFD.		R11 - 250 M OHMS
C12 - .1 MFD.	R13 - 40 M OHMS	R12 - 250 M OHMS

MOD. C-6
AUTO RADIO RECEIVER

I.F. = 177.5 K.C.

FAIRBANKS-MORSE
HOME APPLIANCES, INC.
CHICAGO, U.S.A.
SD-32335

SCHEMATIC DIAGRAM MODEL 64

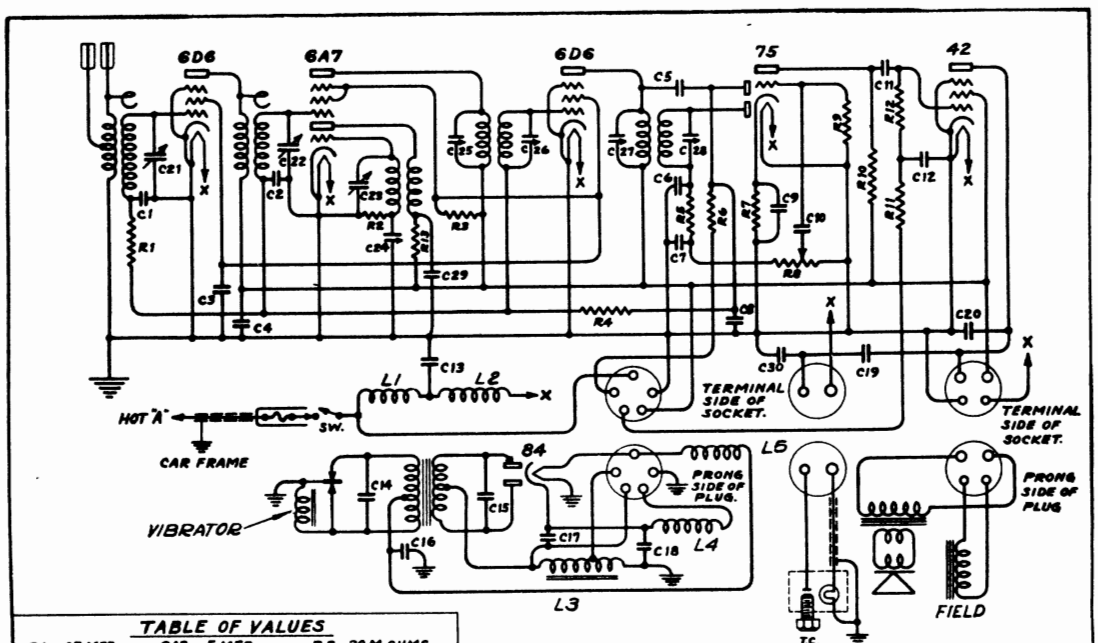


TABLE OF VALUES

C1 - .05 MFD.	C13 - .5 MFD.	R3 - 20 M OHMS
C2 - .05 MFD.	C14 - .25 MFD.	R4 - 250 M OHMS
C3 - .1 MFD.	C15 - .02 MFD.	R5 - 25 M OHMS
C4 - .25 MFD.	C16 - .25 MFD.	R6 - 250 M OHMS
C5 - 50 MMFD.	C17 - 8 MFD.	R7 - 6000 OHMS
C6 - 200 MMFD.	C18 - 8 MFD.	R8 - 250 M OHM V.C.
C7 - 200 MMFD.	C19 - .02 MFD.	R9 - 500 M OHMS
C8 - 500 MMFD.	C20 - .006 MFD.	R10 - 100 M OHMS
C9 - .25 MFD.	C29 - .01 MFD.	R11 - 250 M OHMS
C10 - .01 MFD.	C30 - 500 MMFD.	R12 - 250 M OHMS
C11 - .01 MFD.	R1 - 250 M OHMS	R13 - 40 M OHMS
C12 - .1 MFD.	R2 - 50 M OHMS	

MOD. 64
AUTO RADIO RECEIVER

I.F. = 177.5 K.C.

FAIRBANKS-MORSE
HOME APPLIANCES, INC.
CHICAGO, U.S.A.
SD-21235

FAIRBANKS MORSE INC.

PARTS LIST Models C-6, 64 and 74

Part Number	Description of Part	List Price
14954	Variable Condenser (3-Gang)	$ 4.50
14971	Brass and Rubber Coupling (Condenser Drive)	.30
14970	Oscillator Coil, less can	1.00
14969	R.F. Coil, less can	1.00
14968	Antenna Coil, less can	1.00
14966	I.F. Transformer and can (First)	1.50
14967	I.F. Transformer and can (Second)	1.50
T-107	Input Transformer (Audio) (74)	2.50
T-108	Vibrator Transformer (74)	3.50
14952	Vibrator Transformer (64 and C-6)	3.50
S5934	Socket, 42 Tube	.10
S5933	Socket, 75 Tube	.10
S5931	Socket, 6D6 Tube	.10
S5932	Socket, 6A7 Tube	.10
S5935	Socket, 84 Tube	.10
Z-161	Socket, 85 Tube	.10
Z-159	Socket, 6A6 Tube	.10
Z-160	Socket, 41 Tube	.10
S5936	Socket, Vibrator	.10
S5813	Tube Shield Assembly	.15
V6515	Volume Control, 250,000 ohm	1.50
V6501	Tone Control, 50,000 ohm	1.00
R1116	25,000 ohm 1/4 Watt Carbon Resistor	.20
R1236	250,000 ohm 1/4 Watt Carbon Resistor	.20
R1266	500,000 ohm 1/4 Watt Carbon Resistor	.20
R1191	100,000 ohm 1/4 Watt Carbon Resistor	.20
R996	6,000 ohm 1/4 Watt Carbon Resistor	.20
R1146	50,000 ohm 1/4 Watt Resistor	.20
R-1551	3,000 ohm 1/2 Watt Resistor (R-10 on 74)	.20
R-2901	20,000 ohm 10 Watt Resistor	.40
3526	6-8 Volt Pilot Light Bulb	.15
3527	15 Ampere Fuse	.05
14953	"B" Choke (L-3) (64,74,C-6)	1.50
14978	"A" Choke Assembly, in can (L-1,L-2,C-13)	2.00
C-215	Padder Condenser	.35
C-214	I.F. Trimmer Condenser	.35
14979	R.F. "B" Choke, 11 ohms	.40
14983	"A" Cable, Shielded	.75
3517	Idler Gear for Standard Square Control Head	.50
3518	Knob Shaft and Gear for Square Control Head	.50
14984	Antenna Cable, Shielded	.75
5402	Flexible Volume Control Cable, 24"	.80
5399	Flexible Tuning Control Cable, 24"	.80
14981	Vibrator (64,74,C-6)	3.50
5361	Control Head (Square) (64 and 74)	6.00
5365	Control Head (General Motors)	6.00
5353	Control Head (Round-Instrument Panel Mounting)	6.00
5363	Control Head (Cathedral) (C-6)	4.50
1882	5" Speaker, less front (C-6)	4.50
14992	6" Speaker, Complete, less front (64)	6.50
14993	8" Speaker, less housing (74)	
N-145	Speaker Housing with Grill (74)	
3531	Tone Control and Pilot Cable, with plug	
A-135	Speaker Cable and Plug (74)	
EL-24	Electrolytic Condenser, Dual 8 Mfd.	
C-166	Electrolytic Condenser, 8 Mfd. (C11 on 74)	
EC-35	.25 Mfd. 120 V. Condenser	
EC-36	.02 Mfd. 1200 V. D.C. Condenser	
EC-37	.25 Mfd. 120 V. Condenser	
EC-7	.25 Mfd. Tubular Condenser	
EC-5	.1 Mfd. Tubular Condenser	
EC-2	.01 Mfd. Tubular Condenser	
EC-26	.05 Mfd. Tubular Condenser	
EC-3	.02 Mfd. Tubular Condenser	
EC-4	.05 Mfd. Tubular Condenser	
EC-12	.006 Mfd. Tubular Condenser	
EC-17	.15 Mfd. Tubular Condenser	
C-165	.03 Mfd. Tubular Condenser (Tone)	
C-15	.01 Mfd. 1200 V. (Hi-temp)	
C-322	.0002 Mfd. Dual Mica Condenser	
C-310	.00005 Mfd. Mica Condenser	
C-306	.0005 Mfd. Mica Condenser	
C-305	.0002 Mfd. Mica Condenser	
11007	By-pass Condenser (Ignition)	
11008	Distributor Suppressor	
A104	Dome Light Filter Assembly	
N-129	Grill Cloth, Black	
3519	Mounting Plate, Cadmium Plated	
3520	Mounting Bolt, Cadmium Plated	
3521	Mounting Nut, Cadmium Plated	
3522	Mounting Washer, Cadmium Plated	
3523	Antenna Connectors (in chassis)	
3524	Power Pack Connector Plug	
3525	Power Pack Connector Socket	
3526	Knob for Square (#5361) Control Head	
3527	Set Screw for #3526 Knob	
3528	Set Screw for Control Cable Bushing	.01
3529	Mounting Bracket for #5361 Control Head	.30
5360	Mounting Bracket for #5353 Control Head	.25
5362	Mounting Bracket for #5361 Control Head	.25
3530	Acorn Nut for Front Cover	.01

FAIRBANKS MORSE INC.

SCHEMATIC DIAGRAM MODEL 74

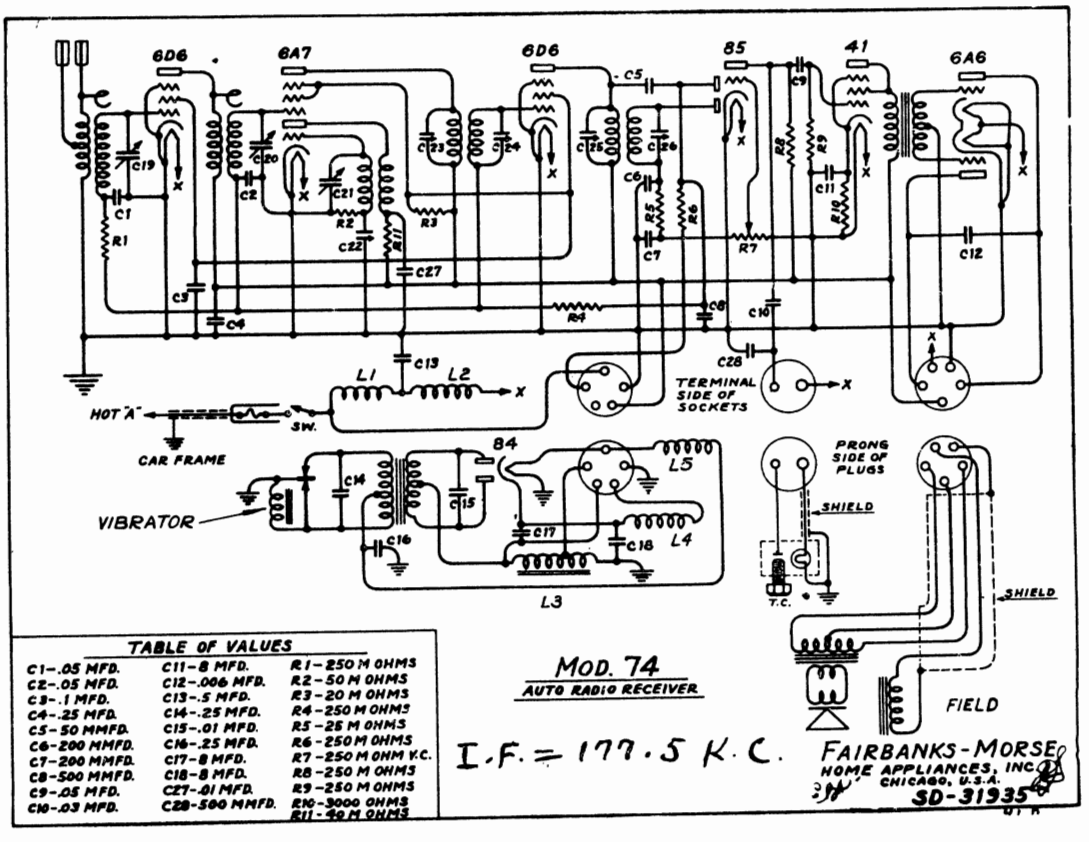


TABLE OF VALUES

C1-.05 MFD.	C11-8 MFD.	R1-250 M OHMS
C2-.05 MFD.	C12-.006 MFD.	R2-50 M OHMS
C3-.1 MFD.	C13-.5 MFD.	R3-20 M OHMS
C4-.25 MFD.	C14-.25 MFD.	R4-250 M OHMS
C5-50 MMFD.	C15-.01 MFD.	R5-25 M OHMS
C6-200 MMFD.	C16-.25 MFD.	R6-250 M OHMS
C7-200 MMFD.	C17-8 MFD.	R7-250 M OHM V.C.
C8-500 MMFD.	C18-8 MFD.	R8-250 M OHMS
C9-.05 MFD.	C27-.01 MFD.	R9-250 M OHMS
C10-.03 MFD.	C28-500 MMFD.	R10-3000 OHMS R11-40 M OHMS

VOLTAGE TABLE MODELS C-6, 64, AND 74

Tube	Models	Filament	Cathode	Oscillator Grid	Oscillator Plate	Control Grid	Suppressor Grid	Screen Grid	Plate
6D6 R.F.	C-6,64	6	- -			-.1	- -	95	245
		8	- -			-.2	- -	120	330
	74	6	- -			- -	- -	75	235
		8	- -			- -	- -	90	315
6A7 Osc. Det.	C-6,64	6	- -	-7	125	-.1		95	245
		8	- -	-13	120	-.1		120	330
	74	6	- -	-4	75	-.2		75	235
		8	- -	-6	90	-.25		90	315
6D6 I.F.	C-6,64	6	- -			-.2	- -	95	245
		8	- -			-.2	- -	120	325
	74	6	- -			-.2	- -	75	235
		8	- -			-.25	- -	90	315
75 Det.	C-6,64	6	2			- -			160
		8	2			- -			210
85 Det.	74	6	-.05			-.05			12.5
		8	-.15			-.15			17
41 Driver	74	6	- -			- -	- -	- -	25
		8	- -			- -	- -	- -	35
6A6 Output	74	6	- -			-.1 Eq.			235 Eq.
		8	- -			-.15 "			310 "
42 Output	C-6,64	6	- -			-10	- -	245	240
		8	- -			-15	- -	330	325

All voltages as measured in relation to ground with 1000 ohms per volt meter

Voltages less than 3 measured on 3 volt scale.
Voltages less than 30 and more than 3 measured on 30 volt scale
Voltages less than 300 and more than 30 measured on 300 volt scale.
Voltages less than 600 and more than 300 measured on 600 volt scale.

All Measurements Made With Volume Control "Full-On".

FAIRBANKS MORSE INC.

Model 4015 Chassis 40

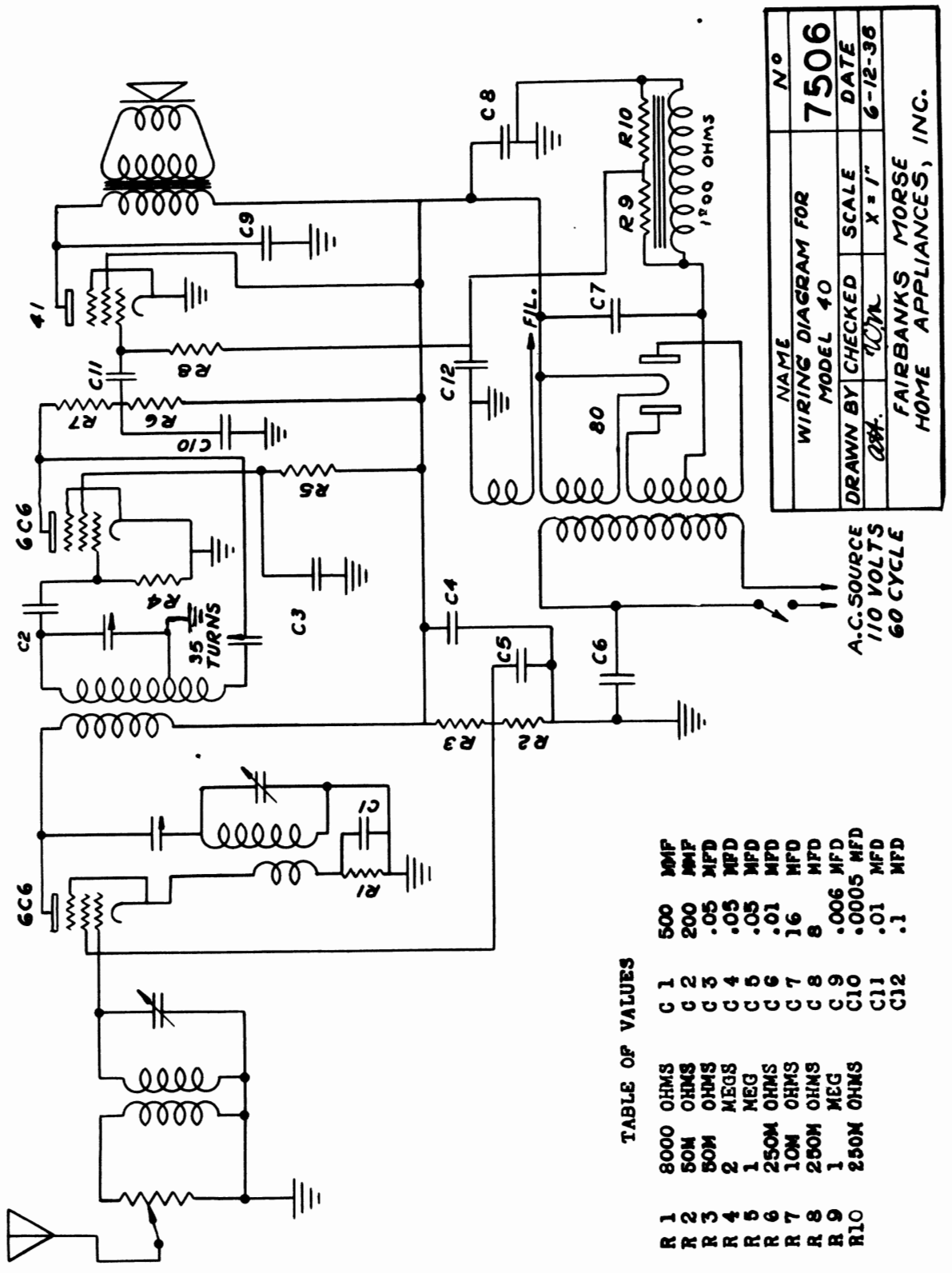
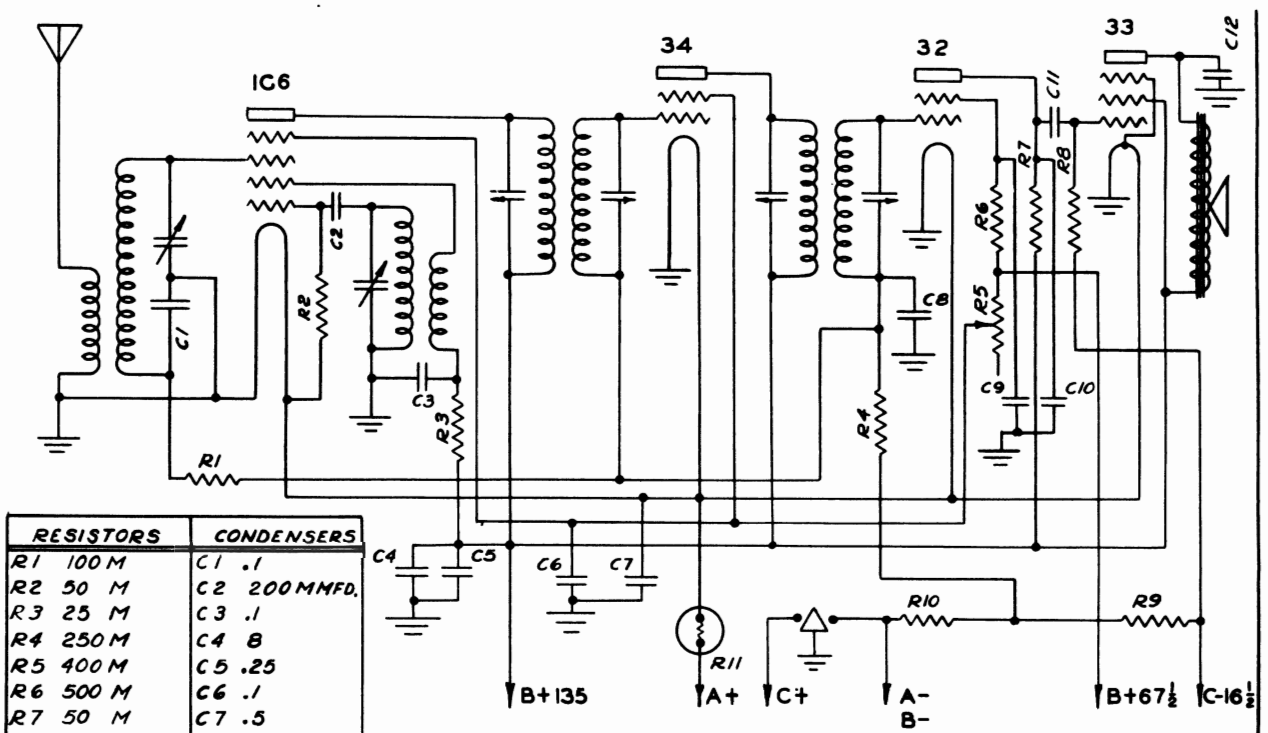


TABLE OF VALUES

R 1	8000 OHMS	C 1	500	MMF
R 2	50M OHMS	C 2	200	MMF
R 3	50M OHMS	C 3	.05	MFD
R 4	2 MEGS	C 4	.05	MFD
R 5	1 MEG	C 5	.05	MFD
R 6	250M OHMS	C 6	.01	MFD
R 7	10M OHMS	C 7	16	MFD
R 8	250M OHMS	C 8	8	MFD
R 9	1 MEG	C 9	.006	MFD
R10	250M OHMS	C10	.0005	MFD
		C11	.01	MFD
		C12	.1	MFD

FAIRBANKS MORSE INC.

Model 4015 Chassis 41



RESISTORS	CONDENSERS
R1 100 M	C1 .1
R2 50 M	C2 200 MMFD.
R3 25 M	C3 .1
R4 250 M	C4 8
R5 400 M	C5 .25
R6 500 M	C6 .1
R7 50 M	C7 .5
R8 500 M	C8 .1
R9 5 M	C9 .05
R10 1000	C10 200 MMFD.
R11 .6	C11 .02
	C12 .02

NAME			Nº
WIRING DIAGRAM FOR MODEL # 41			7521
DRAWN BY	CHECKED	SCALE	DATE
AH.			9-11-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

COLOR CODES

FIRST I.F, TRANSFORMERS

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green

SECOND I.F. TRANSFORMERS

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green

STANDARD R M A
RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value.
The END COLOR represents the SECOND FIGURE of the resistance value.
The DOT COLOR represents the NUMBER OF CIPHERS following the first two figures.

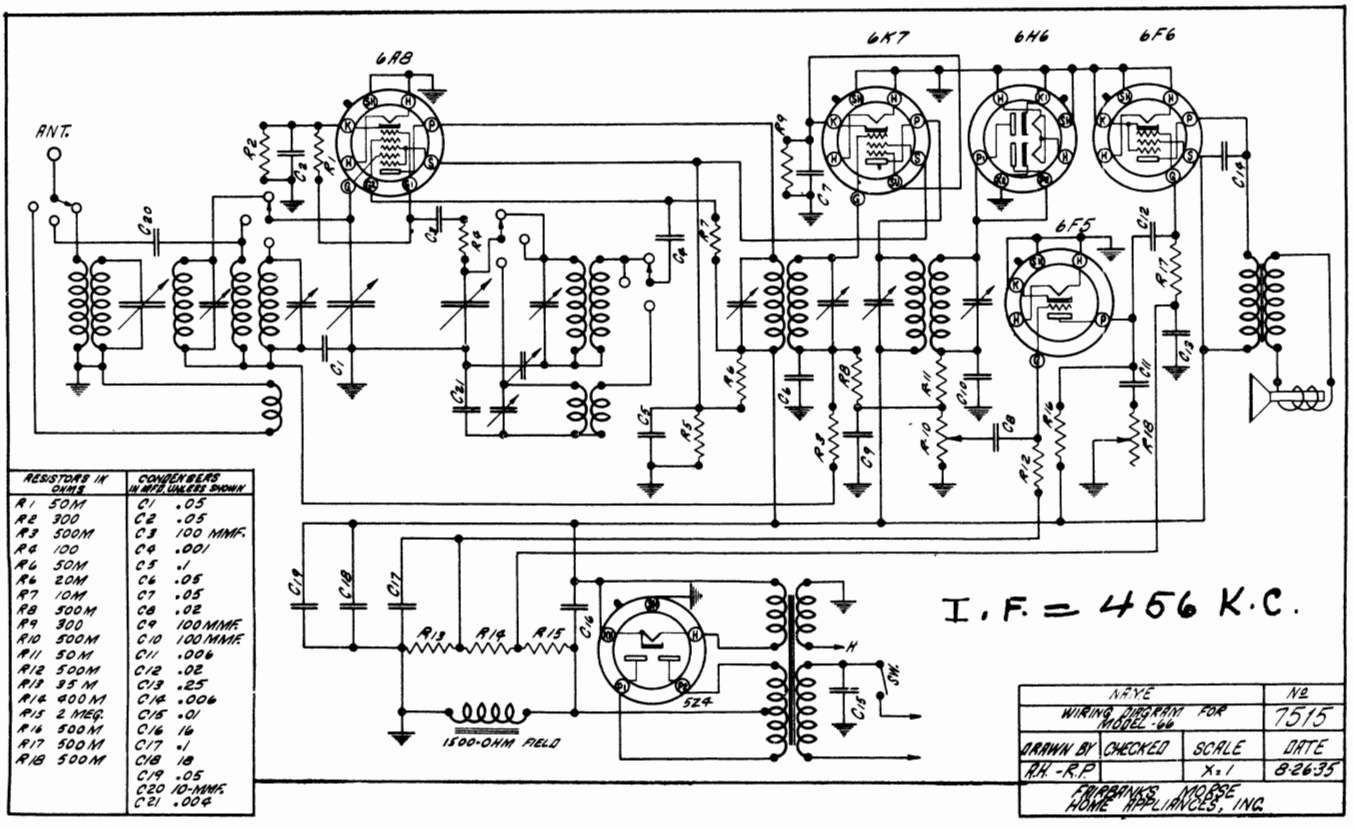
MICA CONDENSERS

(Capacity in Micromicrofarads)

The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity.
The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity.
The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures.
The colors on the condensers should be read from left to right with the condenser in an upright position.

FAIRBANKS MORSE INC.

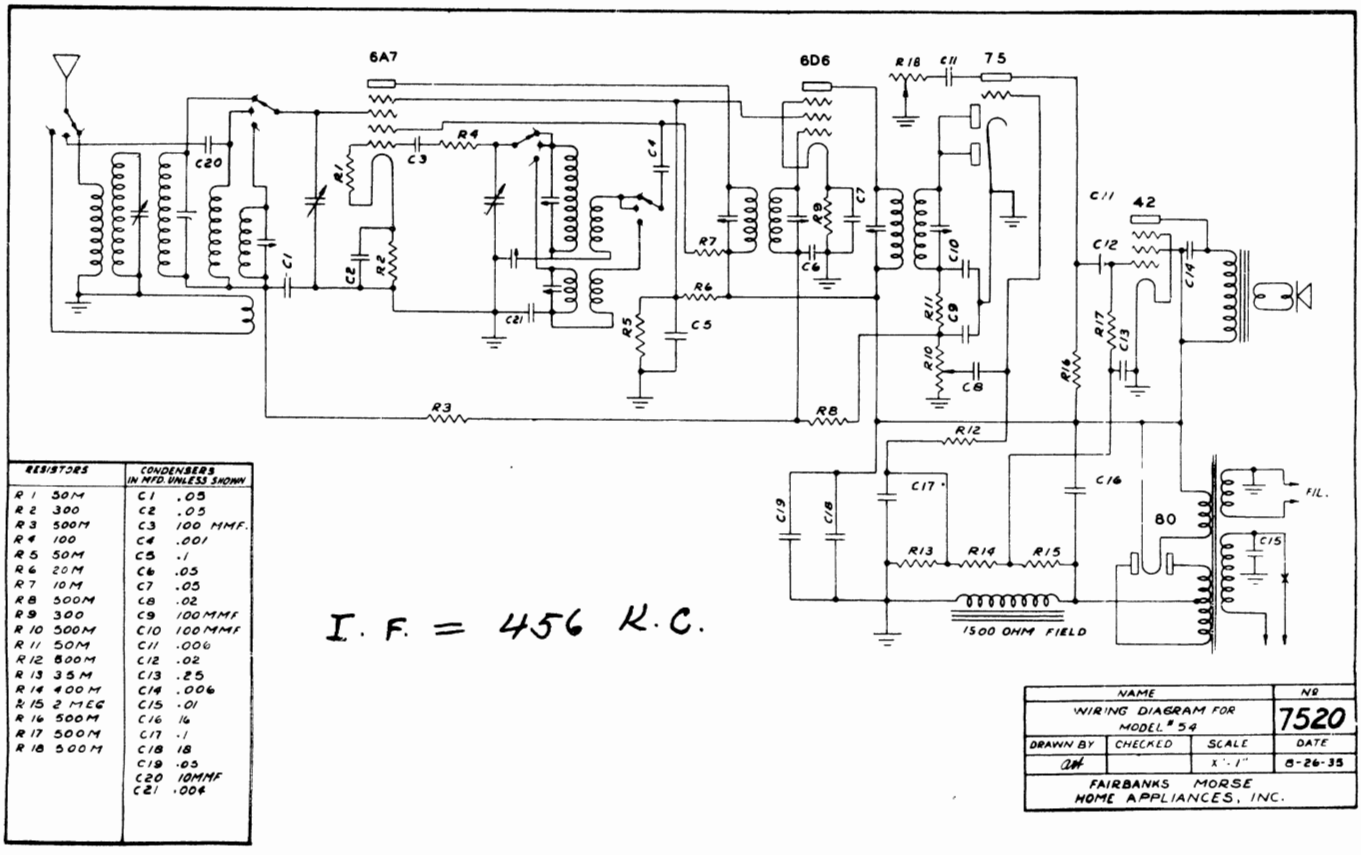
Models 6616-6645 Chassis 66



RESISTORS IN OHMS	CONDENSERS IN MFD. UNLESS SHOWN
R1 50M	C1 .05
R2 300	C2 .05
R3 500M	C3 100 MMF.
R4 100	C4 .001
R5 50M	C5 .1
R6 20M	C6 .05
R7 10M	C7 .05
R8 500M	C8 .02
R9 300	C9 100 MMF.
R10 500M	C10 100 MMF.
R11 50M	C11 .006
R12 500M	C12 .02
R13 35M	C13 .25
R14 400M	C14 .006
R15 2 MEG.	C15 .01
R16 500M	C16 16
R17 500M	C17 .1
R18 500M	C18 18
	C19 .05
	C20 10 MMF.
	C21 .006

NAME			NO.
WIRING DIAGRAM FOR MODEL 66			7515
DRAWN BY	CHECKED	SCALE	DATE
R.H. - R.P.		X.1	8.26.35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

Models 5416-5445 Chassis 54



RESISTORS	CONDENSERS IN MFD. UNLESS SHOWN
R 1 50M	C1 .05
R 2 300	C2 .05
R 3 500M	C3 100 MMF.
R 4 100	C4 .001
R 5 50M	C5 .1
R 6 20M	C6 .05
R 7 10M	C7 .05
R 8 500M	C8 .02
R 9 300	C9 100 MMF.
R 10 500M	C10 100 MMF.
R 11 50M	C11 .006
R 12 500M	C12 .02
R 13 35M	C13 .25
R 14 400M	C14 .006
R 15 2 MEG	C15 .01
R 16 500M	C16 16
R 17 500M	C17 .1
R 18 500M	C18 18
	C19 .05
	C20 10MMF
	C21 .006

NAME			NO.
WIRING DIAGRAM FOR MODEL 54			7520
DRAWN BY	CHECKED	SCALE	DATE
RH		X'-1"	8-26-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

Models 5416-5445 Chassis 54

OHMS	VOLTS	VOLTS	OHMS
		180	80M
		-7.5	50M
50M	100	0	2-MEG.
		3.5	300
70M	240	0	0
.1	6.3A.C.		

6A7
OSC. I-DET.

OHMS	VOLTS	VOLTS	OHMS
1800	-105	-105	1800
70M	240	240	70M

80
RECT.

OHMS	VOLTS	VOLTS	OHMS
		3	300
50M	100	0	1-MEG.
70M	240	3	300
.1	6.3A.C.	0	0

6D6
I-F.

OHMS	VOLTS	VOLTS	OHMS
70M	240	-3.5	1-MEG.
70M	225	0	0
.1	6.3A.C.	0	0

42
OUTPUT

OHMS	VOLTS	VOLTS	OHMS
		-2	550M
550M	-.2	-.2	530M
570M	80	0	0
.1	6.3A.C.	0	0

75
1-ST. DET.-A.V.C.
A.F.

Models 6616-6645 Chassis 66

OHMS	VOLTS	VOLTS	OHMS
50M	220	-8	50M
		240	80M
70M	270		
.1	6.3A.C.		
0	0	3	300

6A8
OSC. I-DET.

OHMS	VOLTS	VOLTS	OHMS
570M	100	-.2	535M
0	0	6.3A.C.	.1
0	0	0	0

6F5
1-A.F.

OHMS	VOLTS	VOLTS	OHMS
50M	220	2.75	300
		0	1-MEG.
70M	270		
.1	6.3A.C.	0	0
0	0	2.75	300

6K7
I.F.

OHMS	VOLTS	VOLTS	OHMS
70M	270	-.2	750M
72M	255		
0	0	6.3A.C.	.1
0	0	0	0

6F6
2-A.F.

OHMS	VOLTS	VOLTS	OHMS
0	0	-.3	550M
550M	-.3		
.1	6.3A.C.	0	0
0	0	0	0

6H6
2-DET.
A.V.C.

OHMS	VOLTS	VOLTS	OHMS
2100	-115	-115	2100
70M	270	270	70M
0	0		

5Z4
RECT.

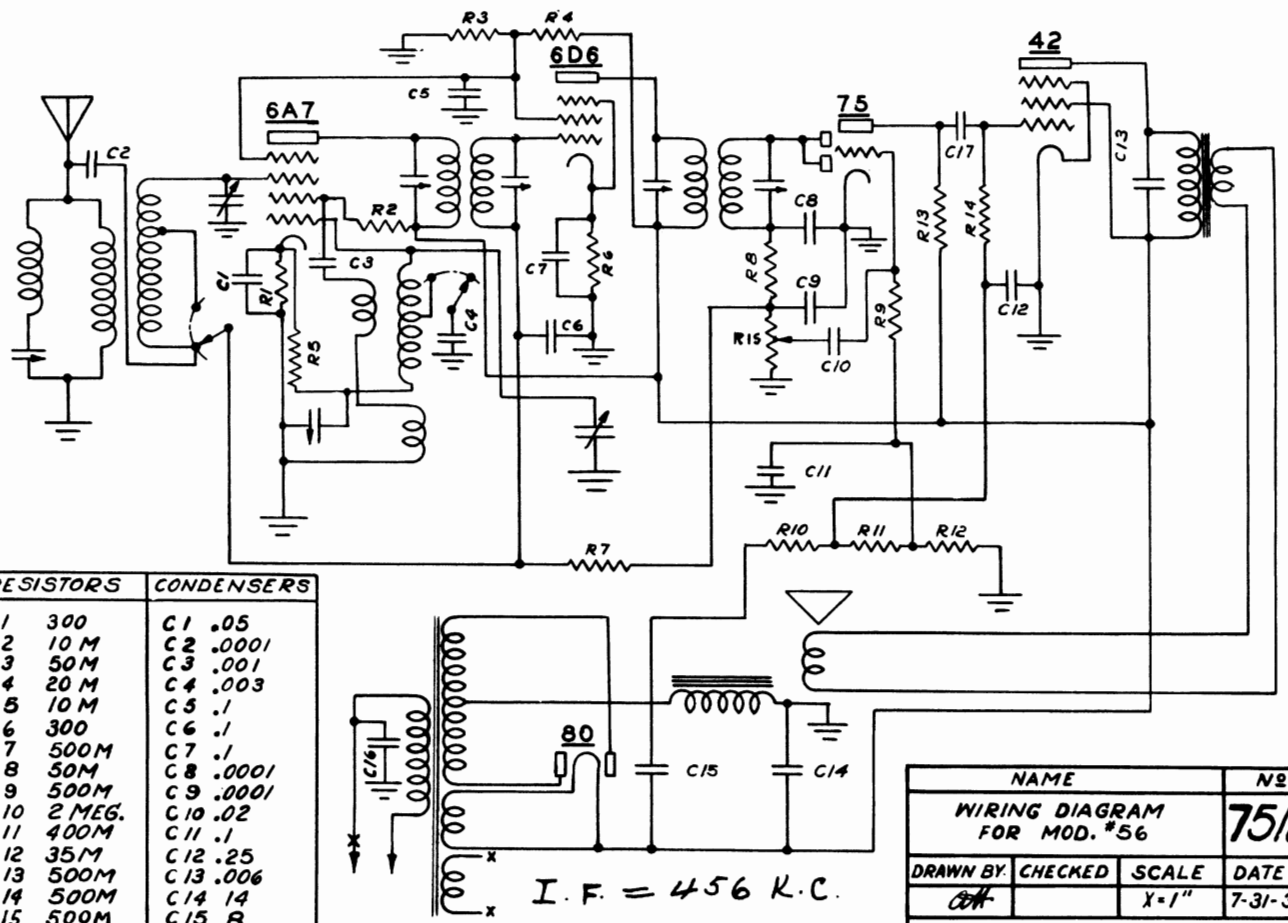
SUGGESTED SERVICE PROCEDURE

If the receiver does not operate properly, test all tubes in a reliable tube tester or better still, replace the tubes in the receiver, one by one, with tubes known to be good. Most difficulties will be found in or centered around defective tubes. If, after replacing any defective tubes, the receiver is still inoperative, remove the chassis from the cabinet and conduct a careful resistance and voltage analysis.

The voltage and resistance charts Shown above give detailed information regarding the resistance from various points to various other points in the chassis. The measured voltage from the various tube socket contacts to ground is also given. When these charts are followed faithfully, little difficulty should be experienced in finding almost any fault that may develop.

FAIRBANKS MORSE INC.

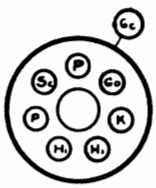
Models 5619-5645 Chassis 56



I. F. = 456 K.C.

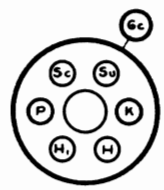
RESISTORS		CONDENSERS	
R1	300	C1	.05
R2	10 M	C2	.0001
R3	50 M	C3	.001
R4	20 M	C4	.003
R5	10 M	C5	.1
R6	300	C6	.1
R7	500 M	C7	.1
R8	50 M	C8	.0001
R9	500 M	C9	.0001
R10	2 MEG.	C10	.02
R11	400 M	C11	.1
R12	35 M	C12	.25
R13	500 M	C13	.006
R14	500 M	C14	14
R15	500 M	C15	8
		C16	.01
		C17	.02

NAME			Nº
WIRING DIAGRAM FOR MOD. #56			75/2
DRAWN BY	CHECKED	SCALE	DATE
		X=1"	7-31-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			



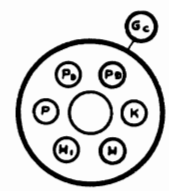
6A7

VOLTS		OHMS
6.3 A.C.	H1	0
0	H	0
3	K	300
0	Gc	1 MEG.
-3	Gp	1900
200	Pp	80 M
100	Sc	50 M
260	P	35 M



6D6

VOLTS		OHMS
6.3 A.C.	H1	0
0	H	0
2.8	K	300
0	Gc	1 MEG.
2.8	Sg	300
100	Sc	50 M
260	P	70 M



75

VOLTS		OHMS
6.3 A.C.	H1	0
0	H	0
0	K	0
-5	Gc	500 M
-1	Pp	500 M
-1	Pp	500 M
90	P	600 M

80

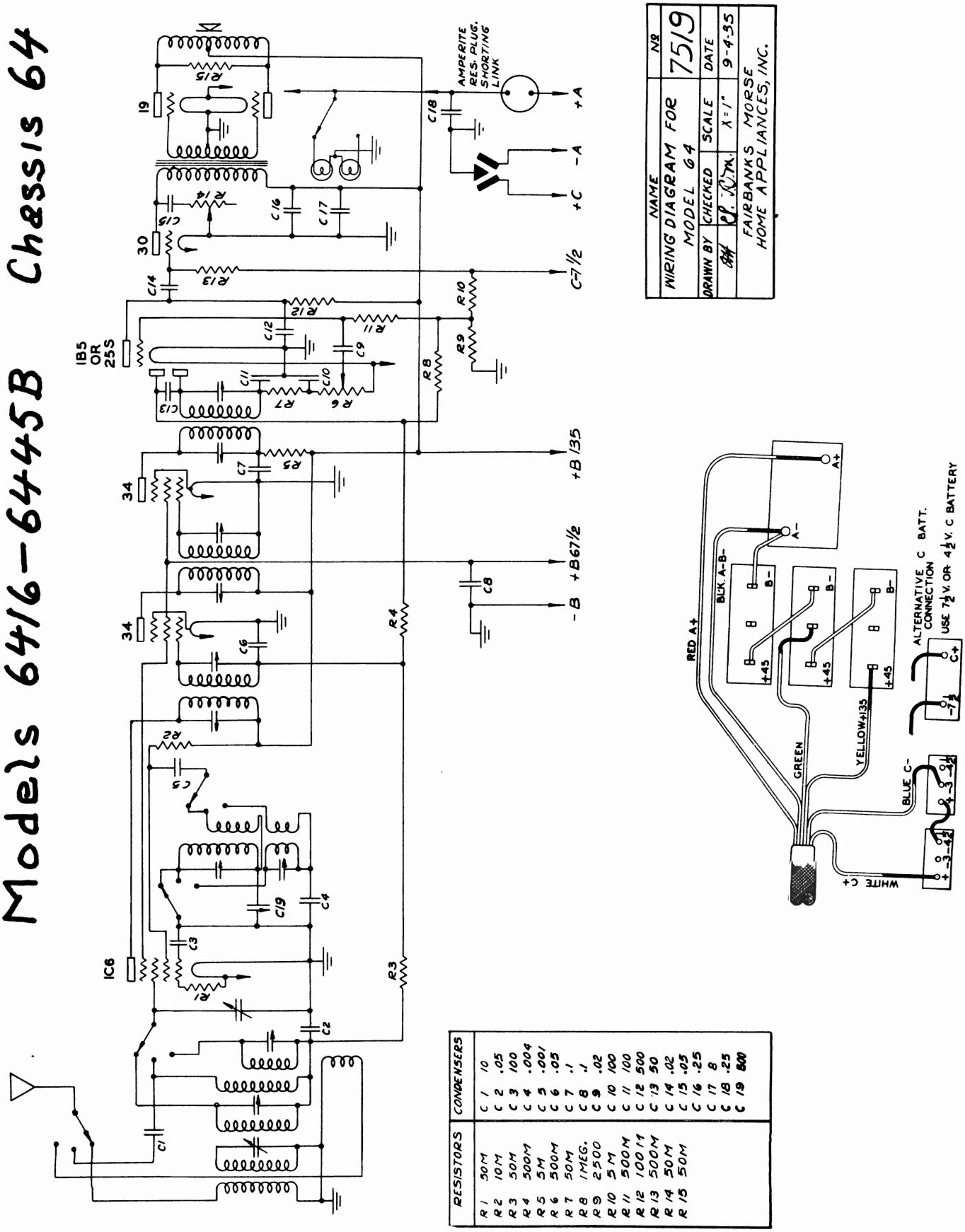
VOLTS		OHMS
260	F.	70 M
260	F	70 M
A.C.	P.	2000
A.C.	P	2000

42

VOLTS		OHMS
6.3 A.C.	H1	0
0	H	0
0	K	0
-7	G	1 MEG.
260	Sc	70 M
245	P	70 M

FAIRBANKS MORSE INC.

Models 6416-6445B Chassis 64



NAME	No
WIRING DIAGRAM FOR MODEL 64	7519
DRAWN BY	CHECKED	SCALE	DATE
		X=1"	9-4-35

FAIRBANKS MORSE HOME APPLIANCES, INC.

RESISTORS	CONDENSERS
R1 50M	C 1 10
R2 10M	C 2 .05
R3 50M	C 3 100
R4 500M	C 4 .004
R5 5M	C 5 .001
R6 500M	C 6 .05
R7 50M	C 7 .1
R8 1MEG.	C 8 .1
R9 2500	C 9 .02
R10 5M	C 10 100
R11 500M	C 11 100
R12 1001I	C 12 500
R13 500M	C 13 50
R14 50M	C 14 .02
R15 50M	C 15 .05
	C 16 .25
	C 17 8
	C 18 .25
	C 19 800

FAIRBANKS MORSE INC.

Models 6416-6445B Chassis 64

TUBES AND CIRCUIT

The model 64 chassis employs a type 1C6 pentagrid converter. The incoming signal is supplied to this tube through a preselector coil arrangement. This tube serves the dual function of first detector and oscillator. Two type 34 tubes are employed as the intermediate frequency amplifiers. These tubes and the three intermediate frequency transformers are responsible for most of the selectivity and gain in the receiver.

A type 1B5 tube performs the triple function of diode detector, automatic volume control and first audio amplifier tube. The output of the triode section of the type 1B5 tube is resistance coupled to a type 30 tube, driving a type 19 tube in the power output stage.

AUTOMATIC VOLUME CONTROL

A type 1B5 tube is employed to perform the triple function of second detector, delayed automatic volume control and first audio amplifier. In the diode section of this tube, one plate is used for the audio signal, while the other is used for A.V.C. The first detector and first intermediate frequency tubes have a fixed minimum bias applied to their grids which is obtained from a voltage divider network consisting of resistors R-9 and R-10, connected across the "C" battery. An isolating resistor R- 8 is connected between this point and the return circuit of the grids. Through this arrangement, a minimum fixed bias of approximately 2.5 volts will be applied to the tubes.

An R.F. voltage is applied to the A.V.C. diode plate from the secondary of the third intermediate frequency transformer through condenser C-13, is rectified and, in so doing, current flows from the plate to the filament and to ground, is picked up where resistor R-9 is grounded, flows through resistors R-9 and R-8, back to the plate, thus completing the circuit. This current creates a voltage drop across resistor R-8 that is in proportion to the strength of the incoming signal. This voltage is applied to the grids of the controlled tubes, through isolating resistors R-3 and R-4, and is added to the fixed bias on the tubes, thus producing automatic volume control. The A.V.C. diode plate has the same fixed bias applied to it as is applied to the grids of the controlled tubes, thus producing delay action.

An R.F. voltage is also applied to the second diode plate from the secondary of the third I.F. transformer. Current flows from plate to filament, through resistors R-6 and R-7, through the secondary of the I.F. transformer, back to the plate. This current when rectified produces an audio voltage across resistor R-6, the manual volume control. This voltage is taken off on the sliding arm of the volume control through condenser C-9 and is applied to the grid of the triode section of the 1B5 tube, which is the first audio amplifier.

ALIGNMENT PROCEDURE

To insure obtaining the performance the model 64 chassis is capable of delivering, it is essential that it be aligned perfectly. For this reason, it is urged that the following instructions be studied carefully before any alignment adjustments are attempted.

Proper adjustment of the various tuned circuits will be possible only through the use of an accurate and reliable signal generator employed in conjunction with an output meter, which may be connected from plate to ground on the output tube.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

INTERMEDIATE FREQUENCY ALIGNMENT

1 - Turn the gang condenser to maximum capacity (fully meshed).

2 - Set the band selector switch on "Broadcast" position.

2 - Supply a 456 kilocycle signal from the signal generator to the grid of the type 1C6 detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.

4 - Adjust the six trimmers of the three intermediate frequency transformers stage by stage (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 1.

The oscillator, adjustable, series padding condenser is used for tracking the oscillator at the low frequency end of the broadcast band. The padding condenser may be adjusted from the top of the chassis through the hole indicated in Figure 1. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT Before making any alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

FAIRBANKS MORSE INC.

Models 6416-6445B Chassis 64

ALIGNMENT PROCEDURE (CONTINUED)

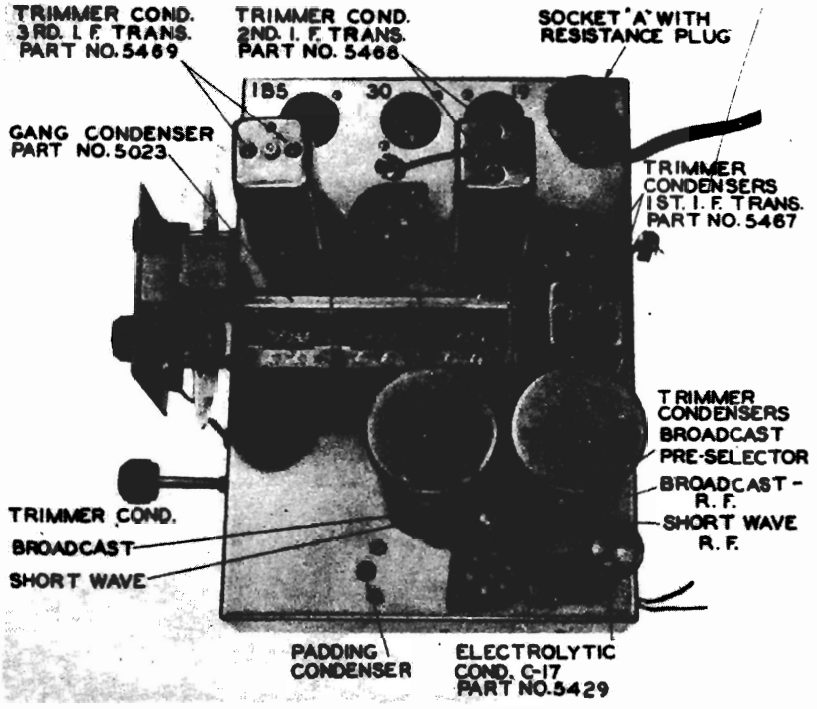


FIGURE 1

BROADCAST BAND

1 - Turn the band selector switch to the broadcast (counter-clockwise) position.

2 - Tune the receiver to 1500 kilocycles.

3 - Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a 200 Mmfd. (.0002 Mfd.) condenser connected in series with the signal generator lead.

4 - Adjust the broadcast band radio frequency and preselector trimmers (see Figure 1) for maximum output with minimum input from the signal generator.

5 - Tune the receiver to 600 kilocycles.

6 - Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.

7 - Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.

8 - Check at 1715 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

POLICE BAND

1 - Turn the band selector switch to the police band (center) position.

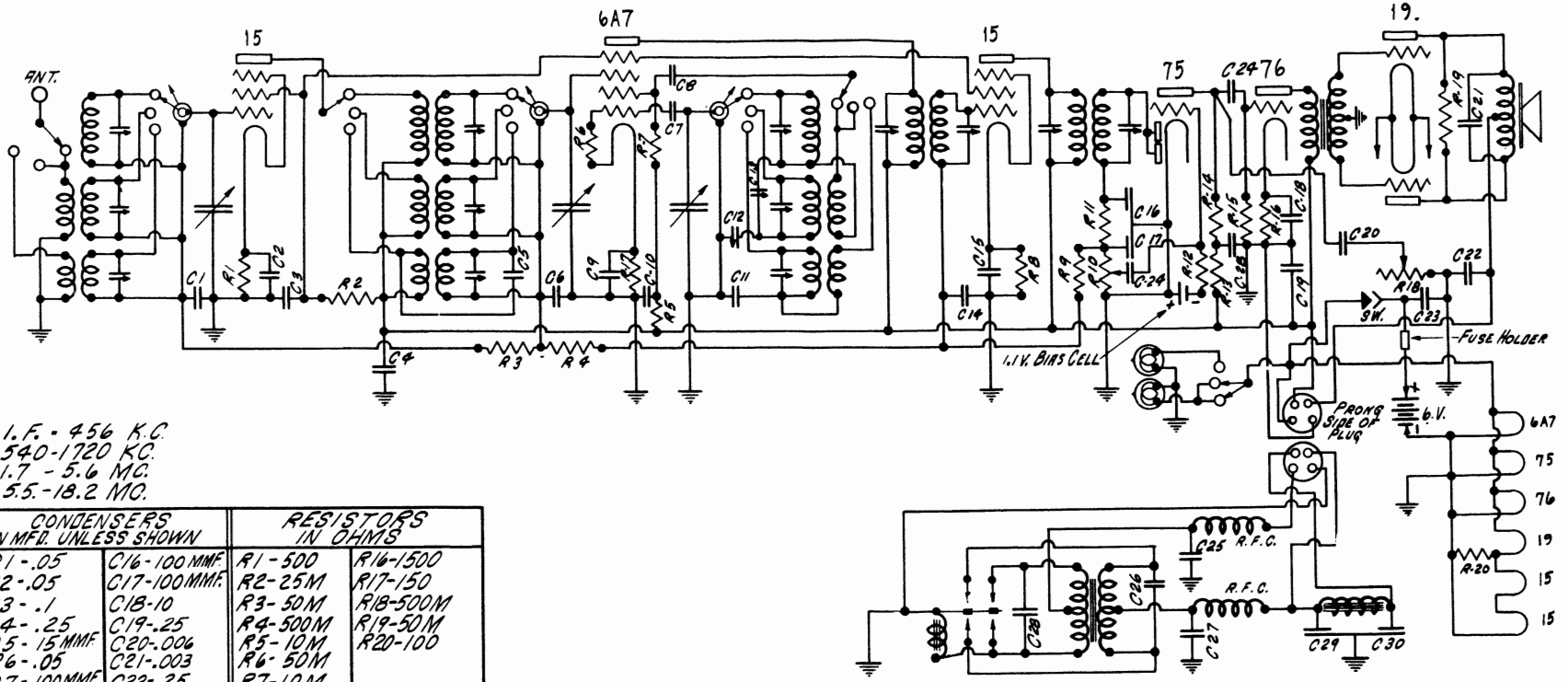
2 - Tune the receiver to 2.4 megacycles.

3 - Supply a 2.4 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.

4 - The 2.4 megacycle signal should be received near the calibrated section of the dial. If this is not the case, check the oscillator tube, switch connections and coils. No adjustment is necessary on this band.

FAIRBANKS MORSE INC.

Models 6717-6746 Chassis 67



1.F. - 456 K.C.
540-1720 KC.
1.7 - 5.6 MC.
5.5-18.2 MC.

CONDENSERS IN MFD. UNLESS SHOWN		RESISTORS IN OHMS	
C1 - .05	C16 - 100 MMF.	R1 - 500	R16 - 1500
C2 - .05	C17 - 100 MMF.	R2 - 25M	R17 - 150
C3 - .1	C18 - 10	R3 - 50M	R18 - 500M
C4 - .25	C19 - .25	R4 - 500M	R19 - 50M
C5 - 15 MMF.	C20 - .006	R5 - 10M	R20 - 100
C6 - .05	C21 - .003	R6 - 50M	
C7 - 100 MMF.	C22 - .25	R7 - 10M	
C8 - .001	C23 - .25	R8 - 500	
C9 - .05	C24 - .02	R9 - 500M	
C10 - 8	C25 - .25	R10 - 500M	
C11 - .004	C26 - .01	R11 - 50M	
C12 - 1500 MMF.	C27 - .1	R12 - 500M	
C13 - 500 MMF.	C28 - .25	R13 - 250M	
C14 - .05	C29 - 8	R14 - 250M	
C15 - .05	C30 - 8	R15 - 500M	

NAME			NO.
WIRING DIAGRAM FOR MODEL # 67			7522
DRAWN BY	CHECKED BY	SCALE	DATE
R. P	C.W. Chu	X-1"	11-15-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

OHMS	VOLTS		VOLTS	OHMS
			70	500M
			0	1-MEG.
300M	150		1	450
0	2		0	0

15-R.F.

OHMS	VOLTS		VOLTS	OHMS
			-.05	500M
500M	-.05		-.15	750M
750M	55		0	0
0	0		6	3.5

75
2-DET. 1-A.F

OHMS	VOLTS		VOLTS	OHMS
0	100		0	1-MEG.
0	70		-1.2	50M
4	150 / 6		1 / 0	200 / 0

6A7
OSC. MIXER

OHMS	VOLTS		VOLTS	OHMS
			0	500M
300M	145		5	1-M
0	0		6	3.5

76
DRIVER

MODEL - 67 - 6-TUBE

OHMS	VOLTS		VOLTS	OHMS
0	70		0	1-MEG.
			.9	
100	150 / 4		2	

15-I.F.

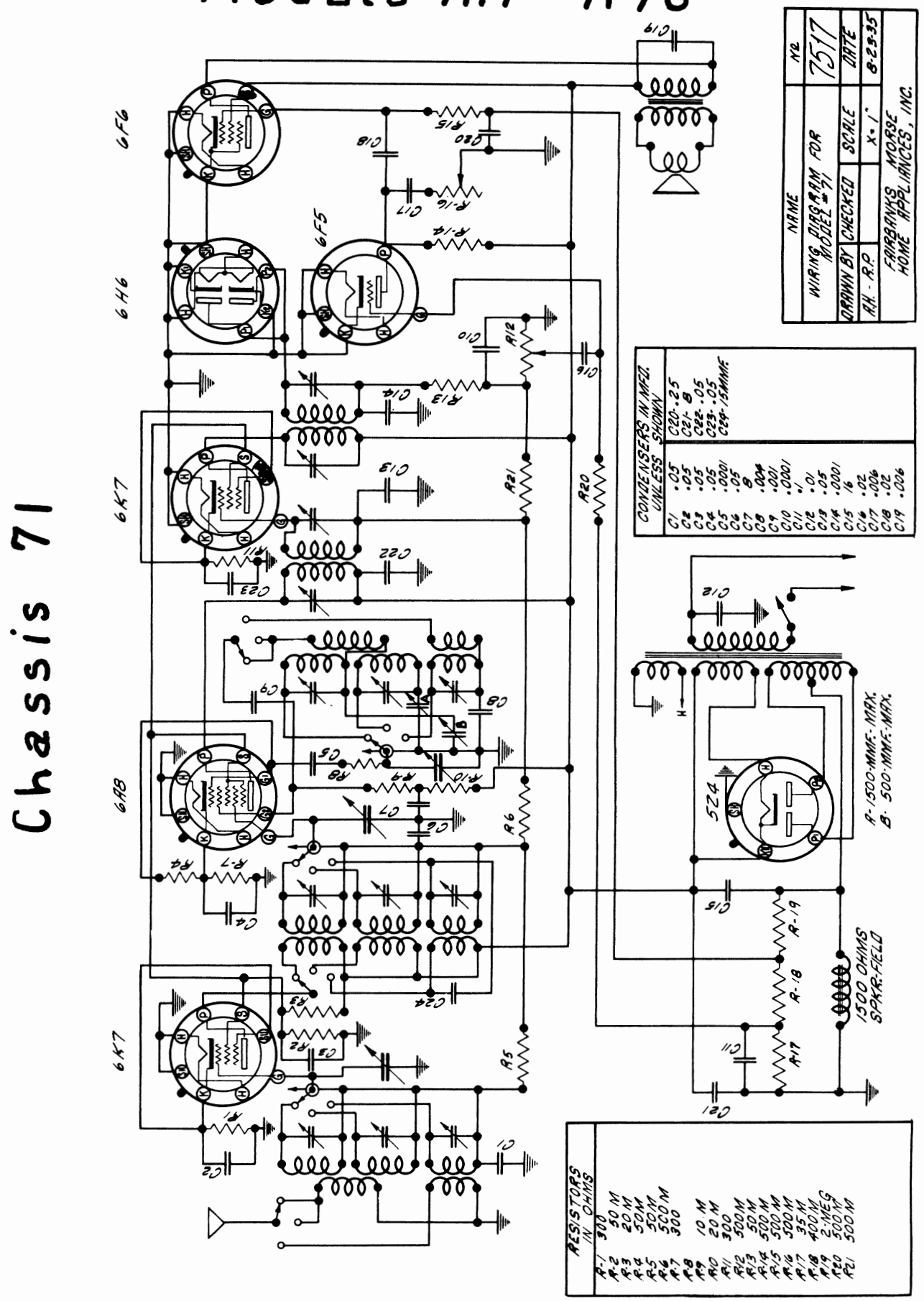
OHMS	VOLTS		VOLTS	OHMS
250	0		0	250
200M	155		155	200M
3.5	6		4	100

19
OUTPUT

FAIRBANKS MORSE INC.

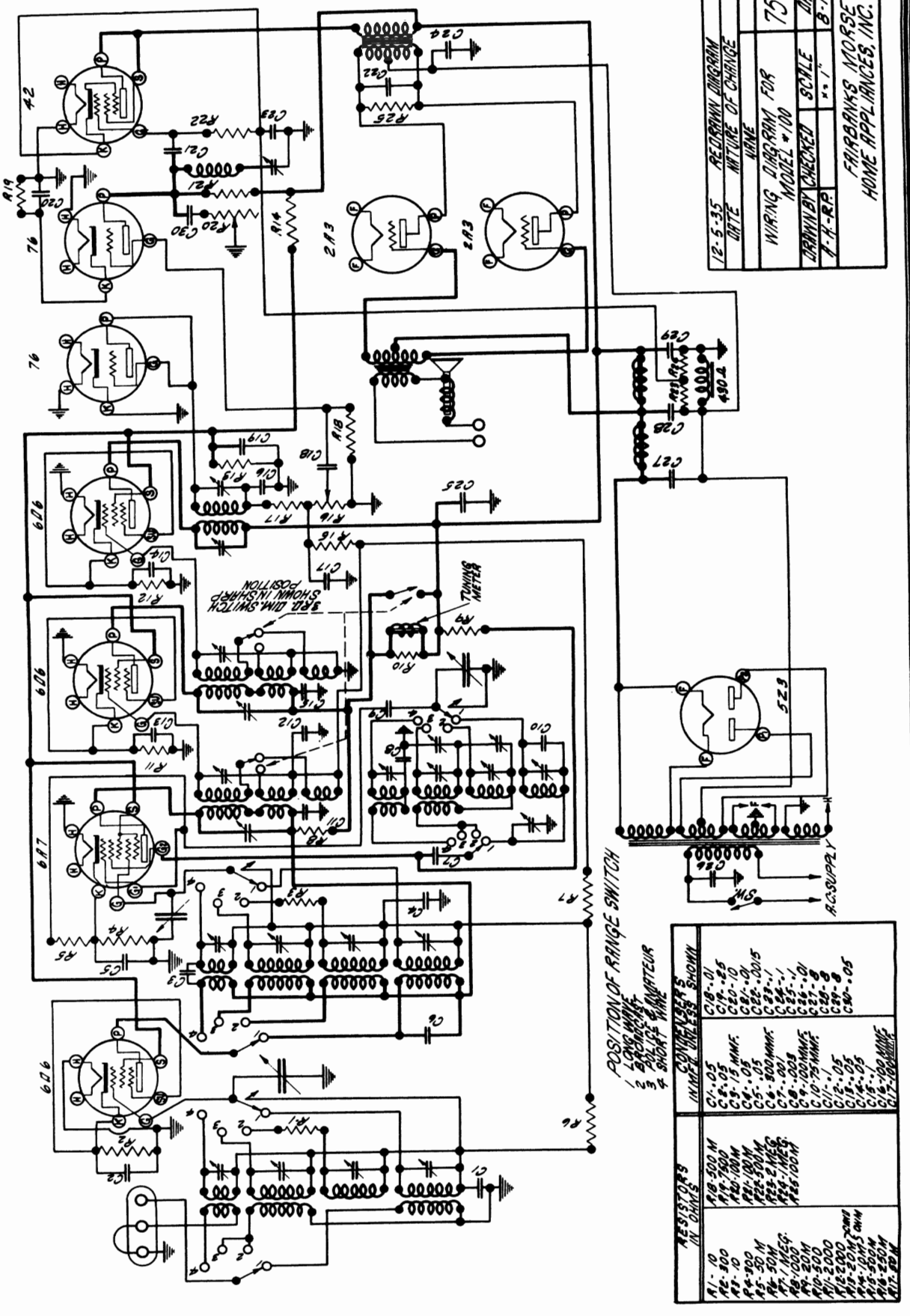
Models 7117 – 7146

Chassis 71

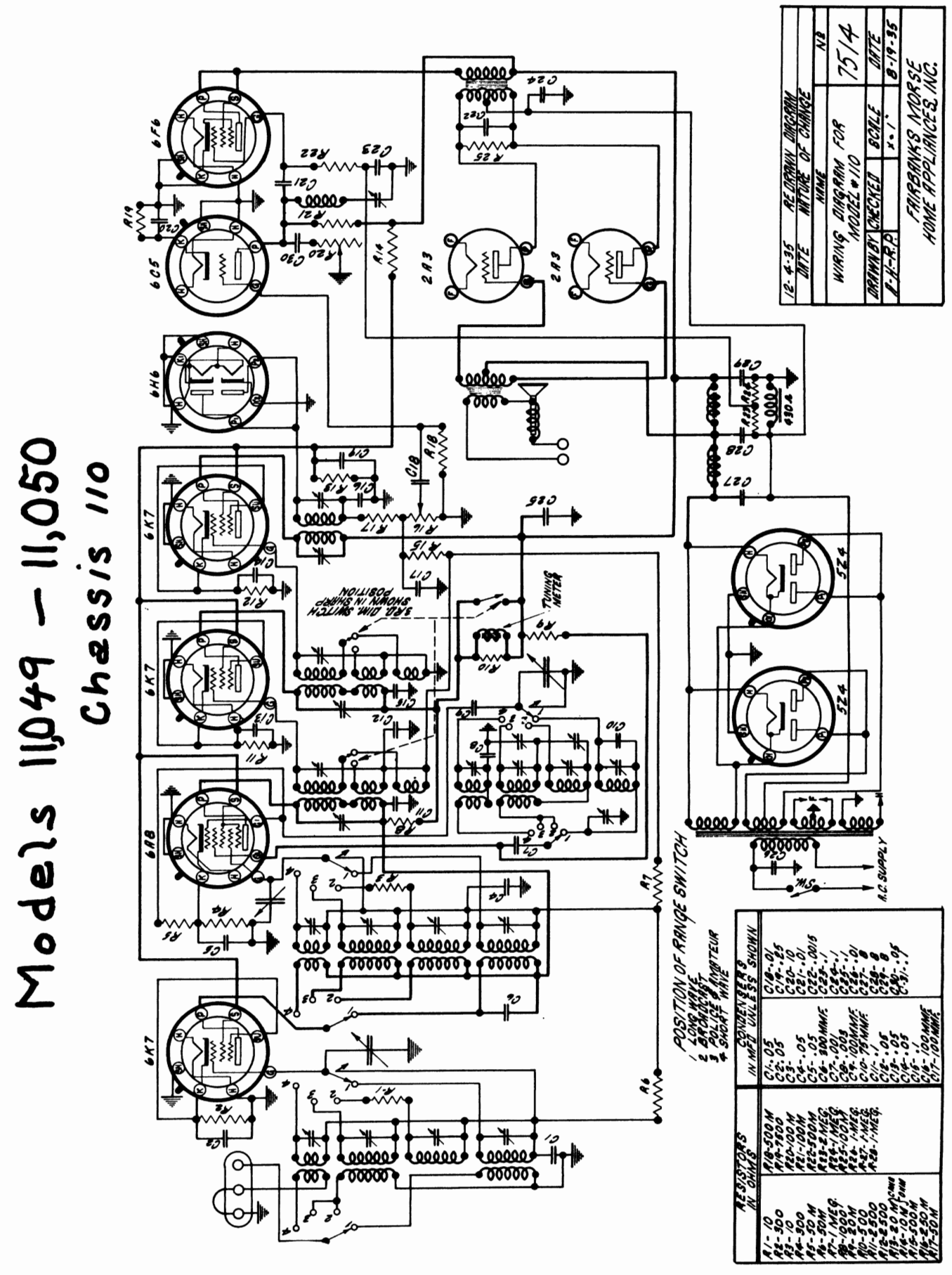


FAIRBANKS MORSE INC.

Models 10,049 — 10,050
Chassis 100

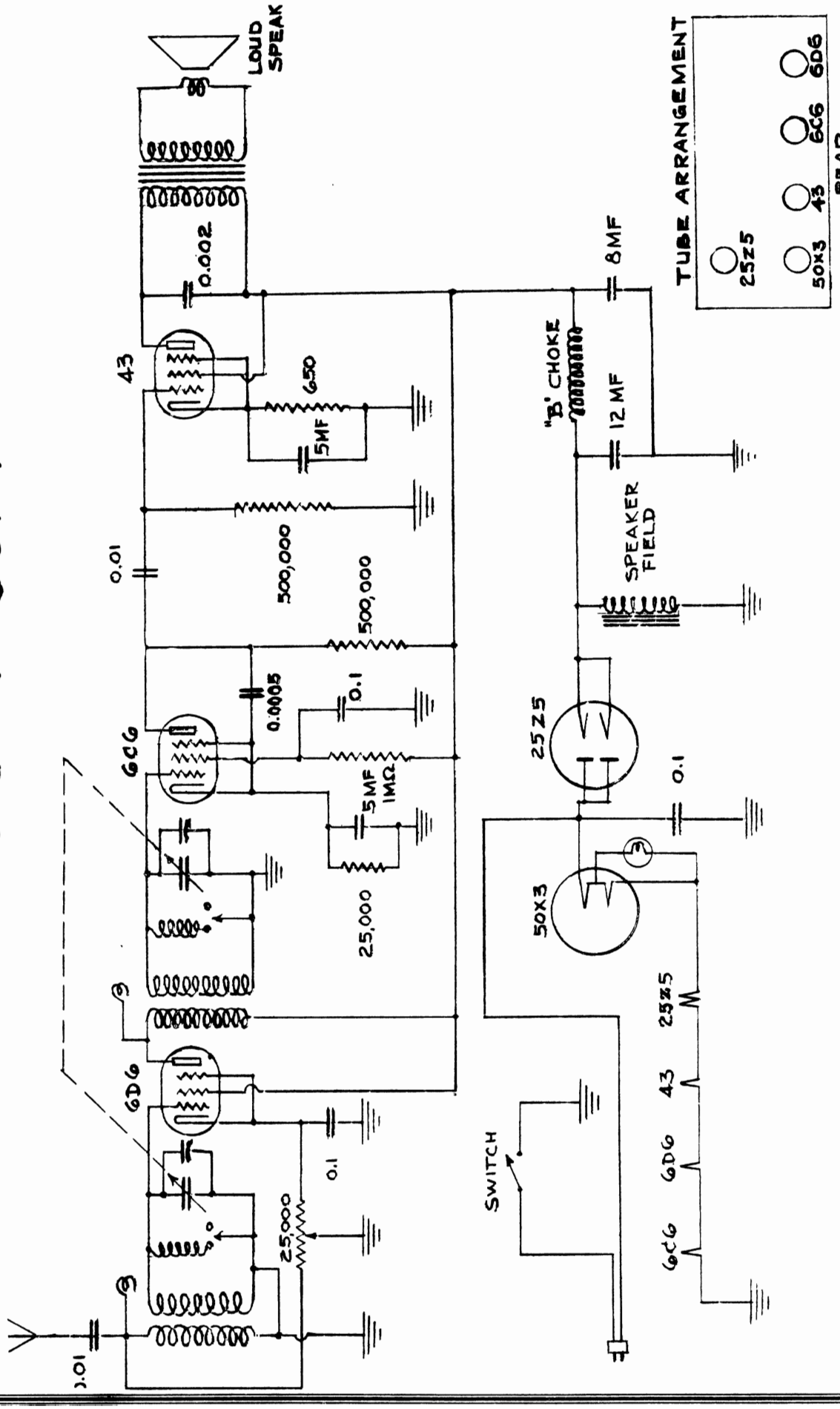


FAIRBANKS MORSE INC.



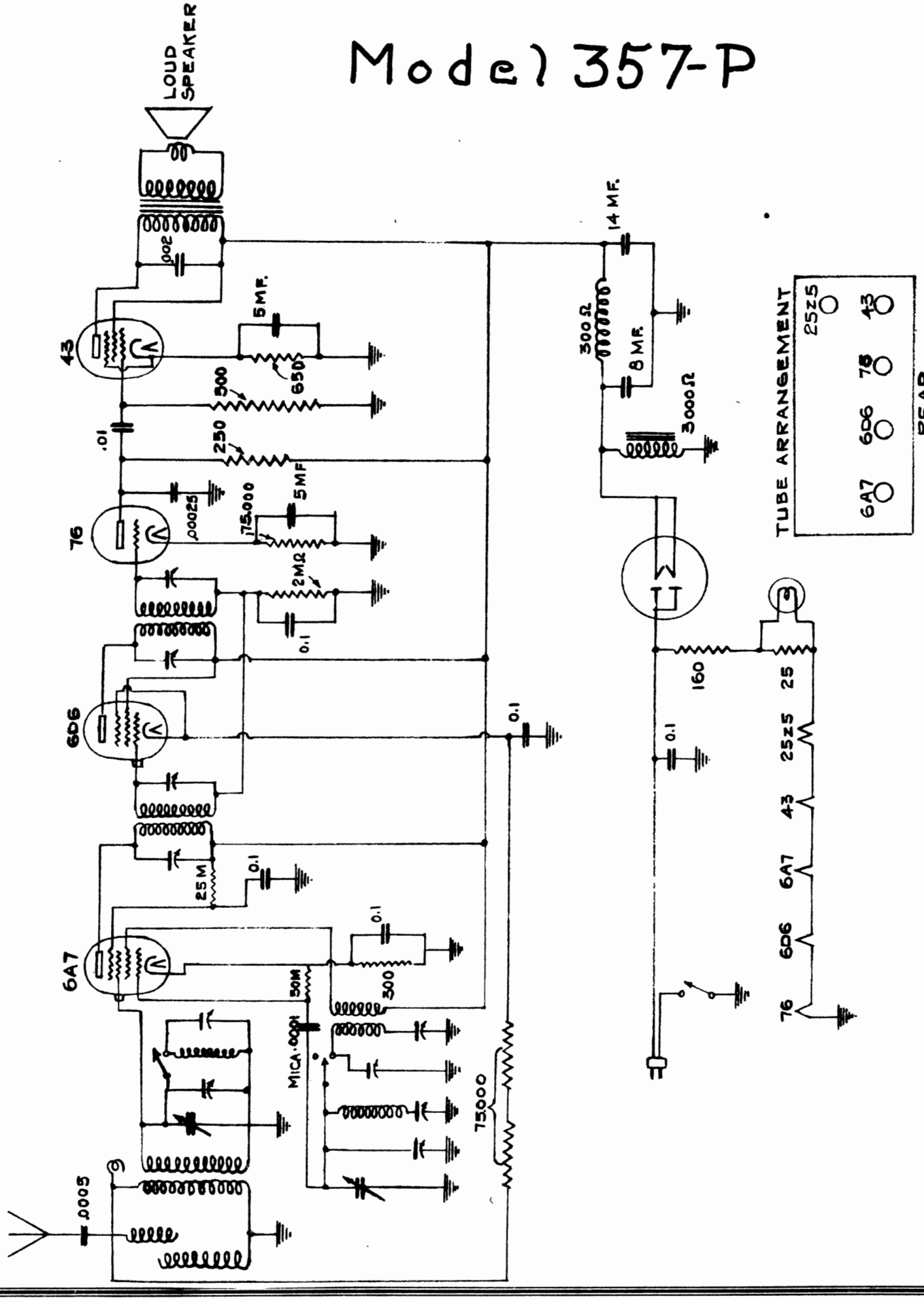
FREED EISEMANN RADIO CORP.

Model 351-P



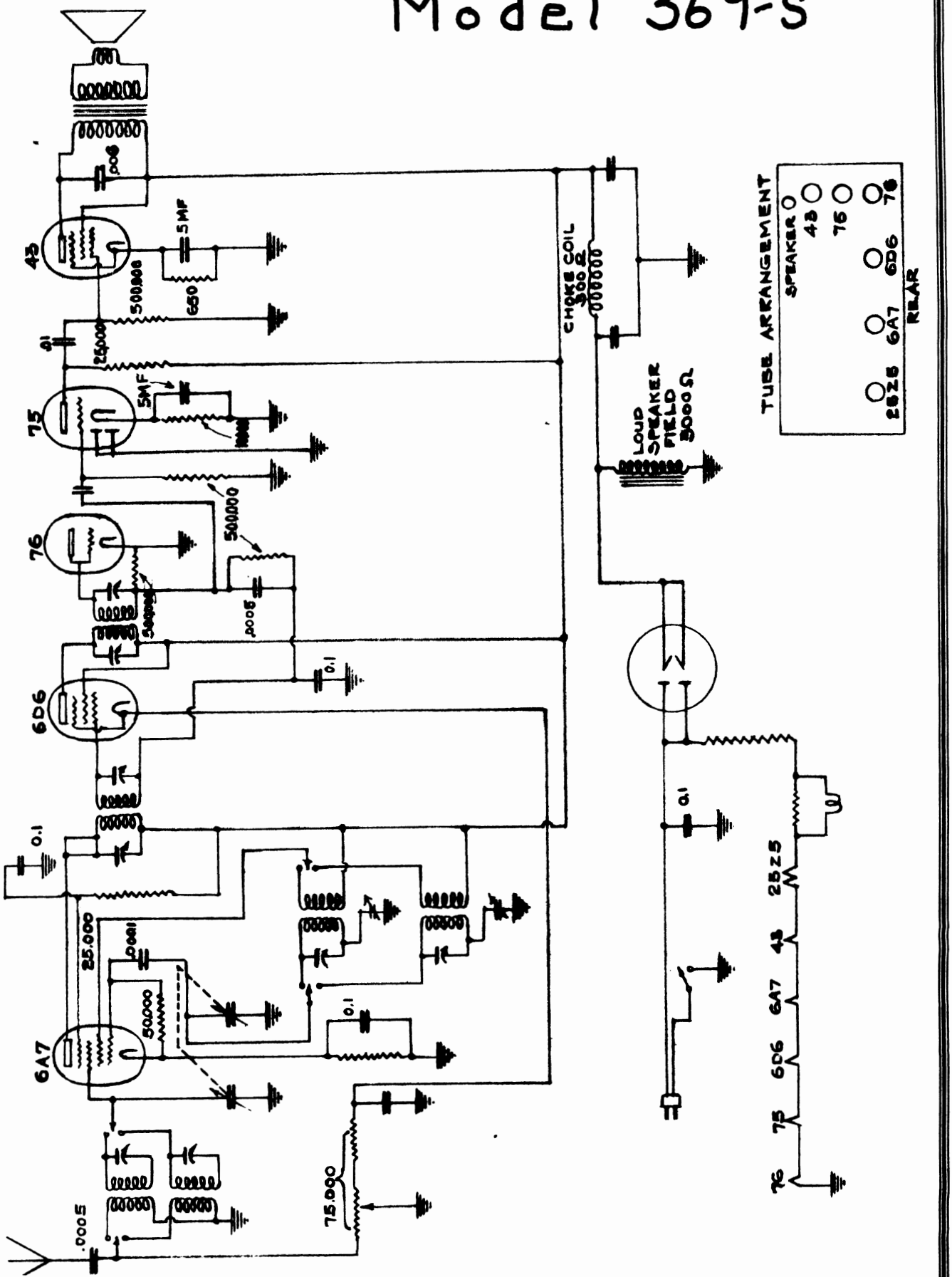
FREED EISEMANN RADIO CORP.

Model 357-P



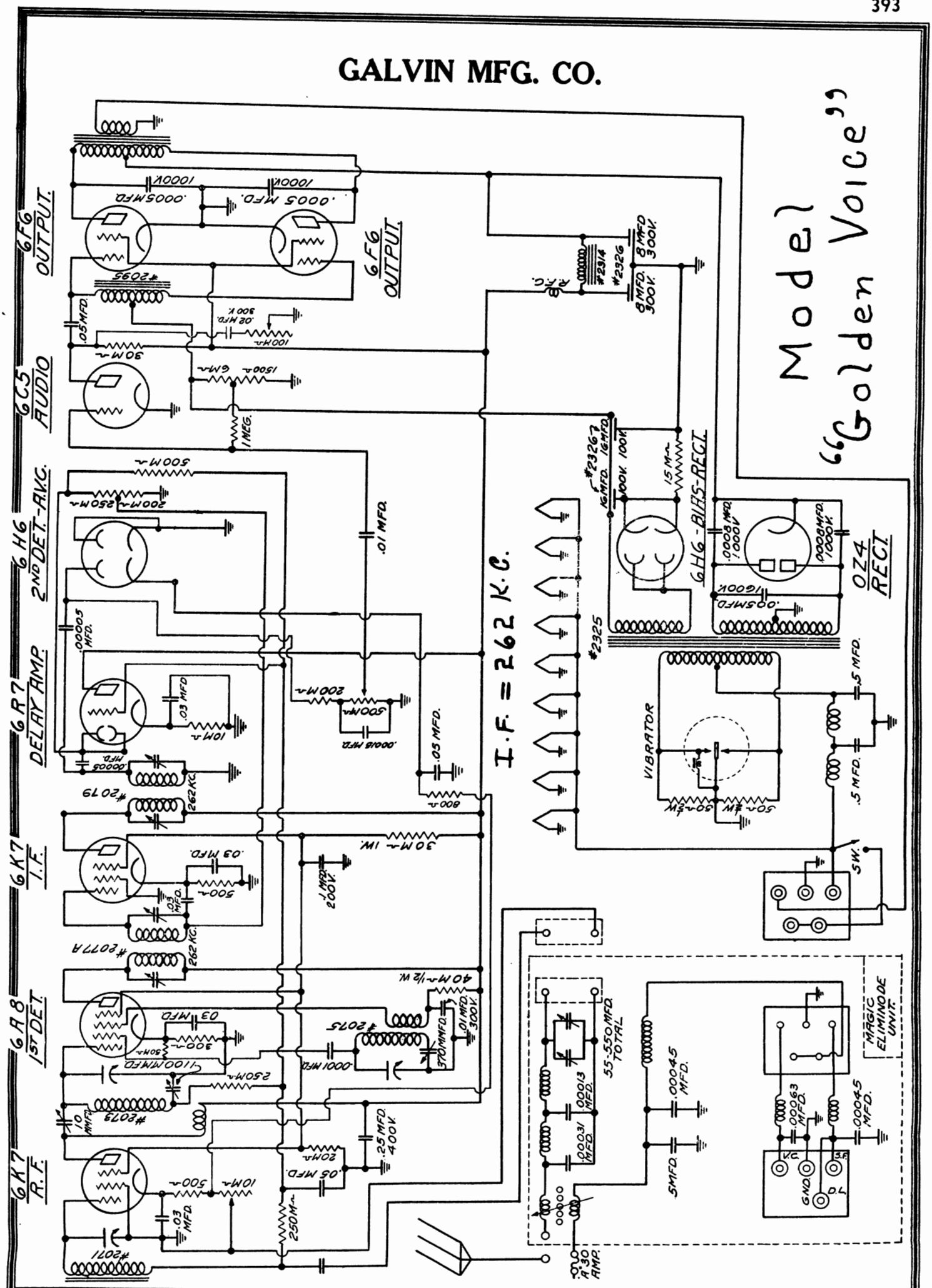
FREED EISEMANN RADIO CORP.

Model 369-S



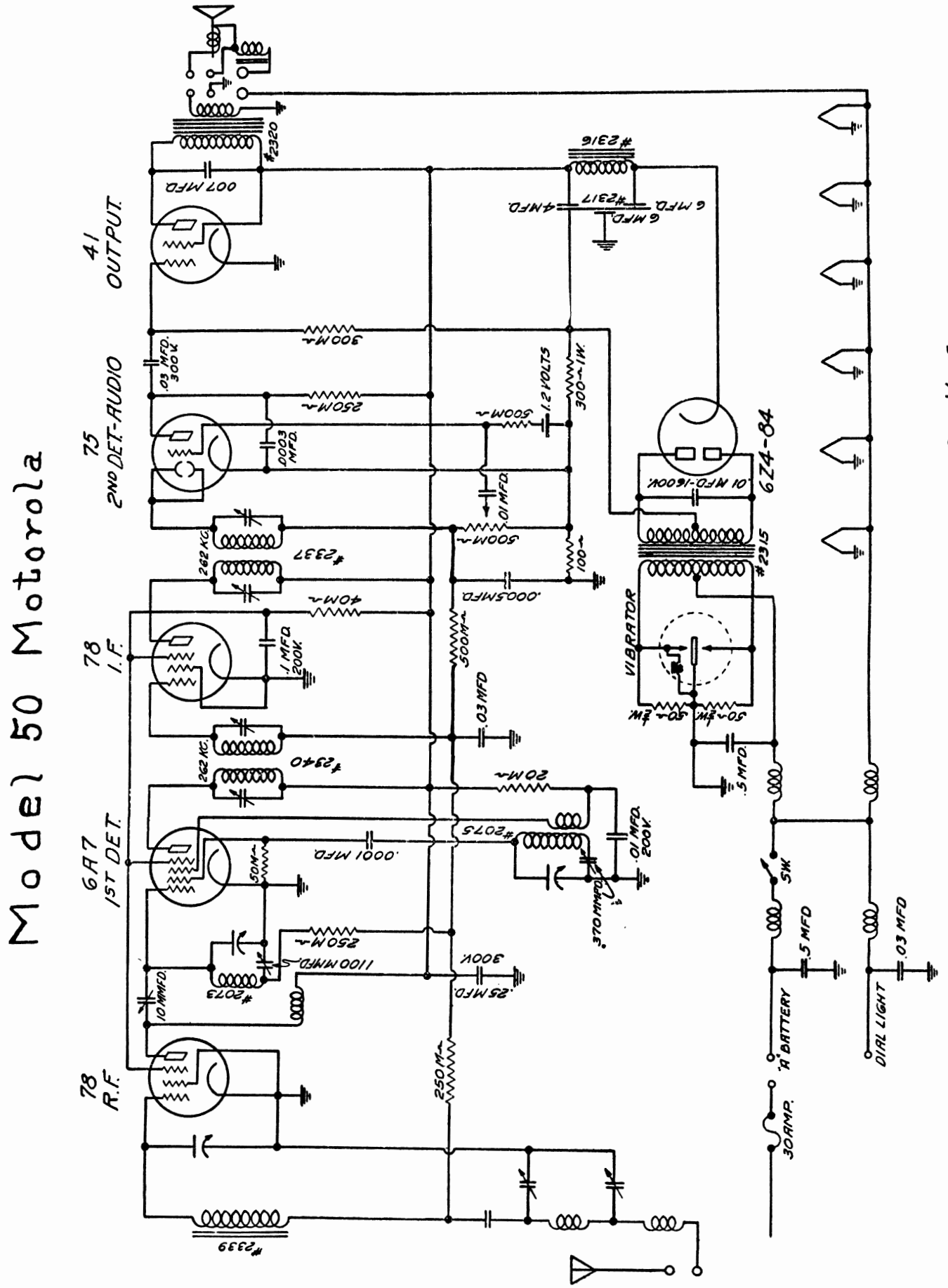
GALVIN MFG. CO.

Model "Golden Voice"

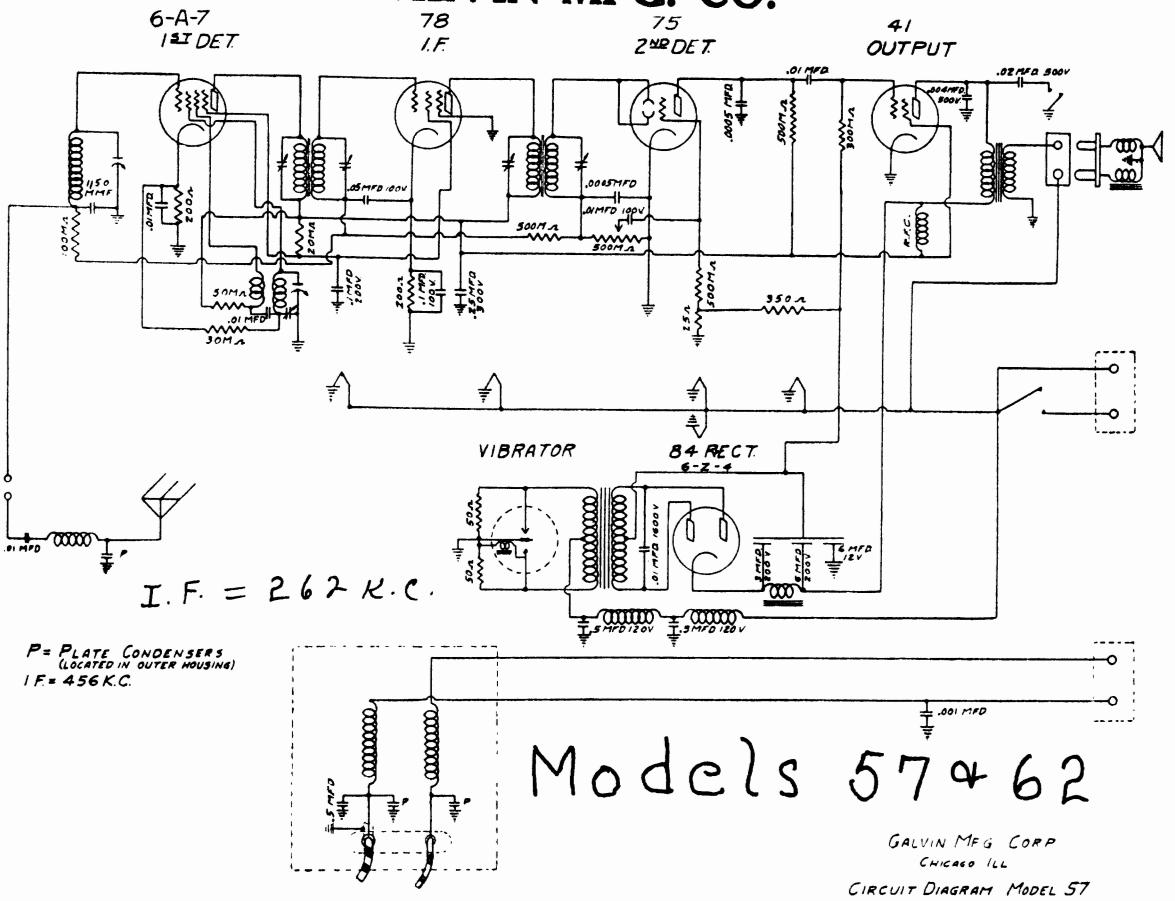


GALVIN MFG. CO.

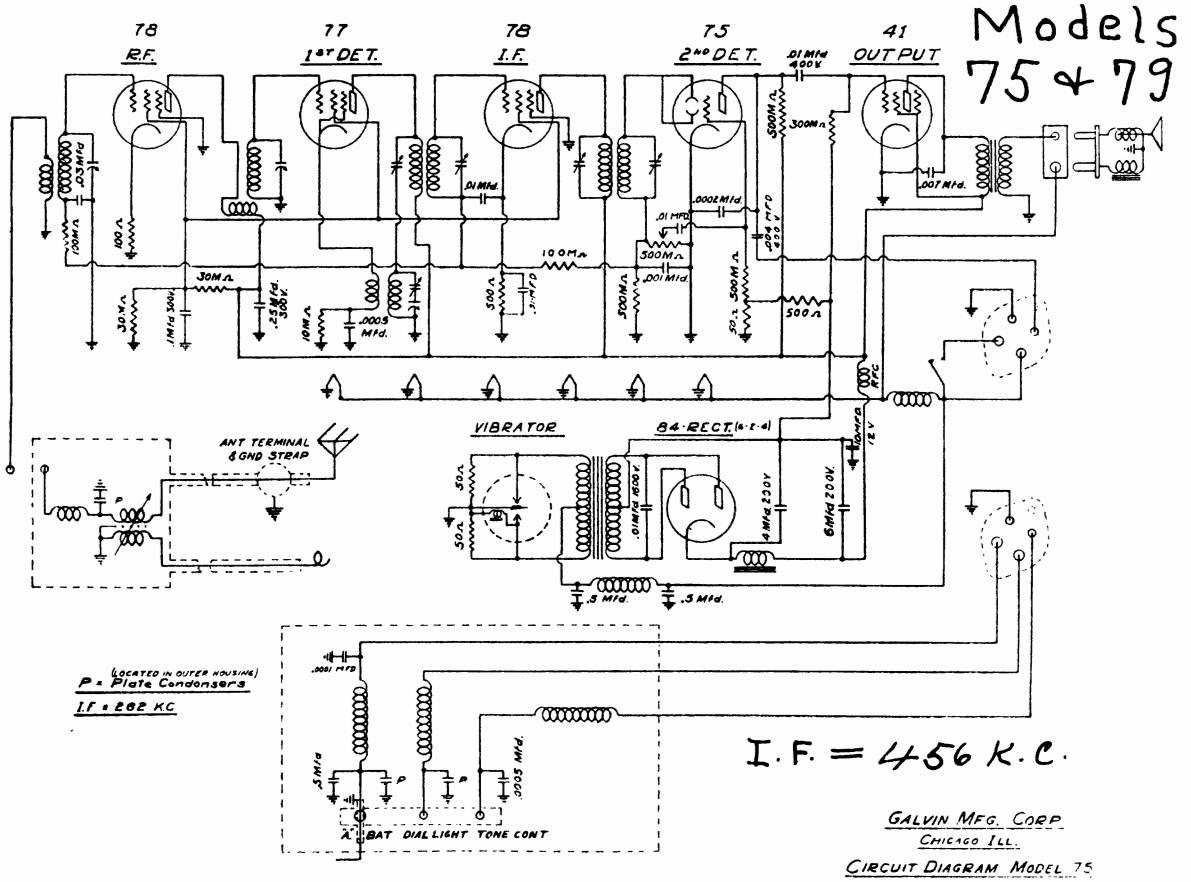
Model 50 Motorola



GALVIN MFG. CO.



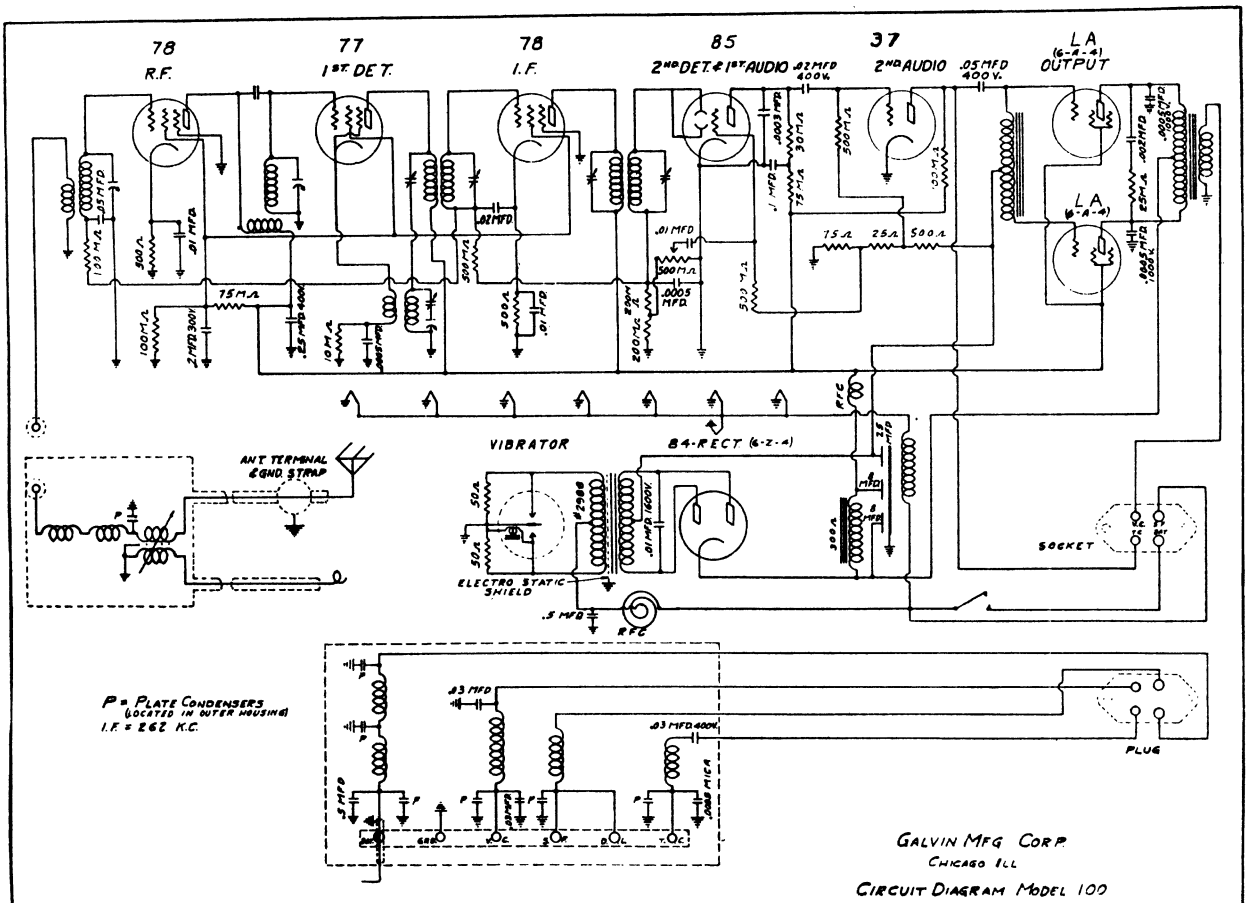
Model No. 62 Circuit is the same as Model No. 57 except that No. 62 uses an Iron Core Antenna Coil.



Model No. 79 Circuit is the same as Model No. 75 except that No. 79 uses an Iron Core Antena Coil.

GALVIN MFG. CO.

Models 100 and 110



Model No. 110 Circuit is the same as Model No. 100 except that No. 110 uses an Iron Core Antenna Coil.

Models 57, 62, 75, 79, 100, 110

ALIGNMENT PROCEEDURE

ALIGNMENT OF THE I. F. TRANSFORMERS:

Models No. 75, No. 79, No. 100 and No. 110—Connect the feeder from the oscillator to the grid of the No. 77 autodyne tube. Remove the grid connection and connect a 500 M resistor from grid of the tube to ground.

Rotate the variable condensers to full open position.

Set the oscillator to a frequency of 262 K. C. adjust the I. F. and diode feeder trimmers to obtain maximum reading on the output meter.

Models No. 57 and No. 62—the same procedure as above is followed, with the exception that the service oscillator is set at 456 K. C. and the I. F. and diode feeder trimmers are adjusted to that frequency.

ALIGNMENT OF VARIABLE CONDENSERS:

All Models—connect the feeder from a service oscillator to the antenna lead of the set and adjust the oscillator to 1540 K. C. Next, completely open the condenser, going to minimum capacity, and adjust the oscillator trimmer on the condenser gang for greatest reading on the output meter.

Now set the service oscillator to 1400 K. C. and rotate the variable condenser for a peak reading on the output meter of the signal from the oscillator. Then adjust the R. F. and antenna trimmers on the condenser gang for maximum reading of the output meter.

Next set the service oscillator to 600 K. C. Close the condenser gang until the signal is again tuned in and rotate the condensers back and forth while adjusting the oscillator padder condenser for highest reading on the output meter. The variable condensers should now track perfectly and coincide with the dial calibration.

The tuning condensers may also be aligned by using the MOTOROLA alignment gauge. When this is used it is only necessary to insert the gauge between the sections of the variable condenser gang. Set the rotor plates of the condensers to the line marked 1400. Adjust all three trimmers to maximum output. Then reset to the 600 K. C. line and adjust the 600 K. C. padder. The balance of the frequency calibration lines on the gauge may be used for further checking if desired.

BENCH SERVICING OF MODELS No. 57, No. 62, No. 75, No. 79, No. 100 and No. 110:

All of the above models are equipped with plug-in chassis so that they may be removed from the set housing without affecting the original installation in the car.

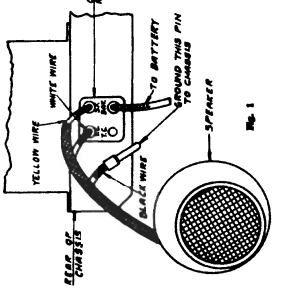
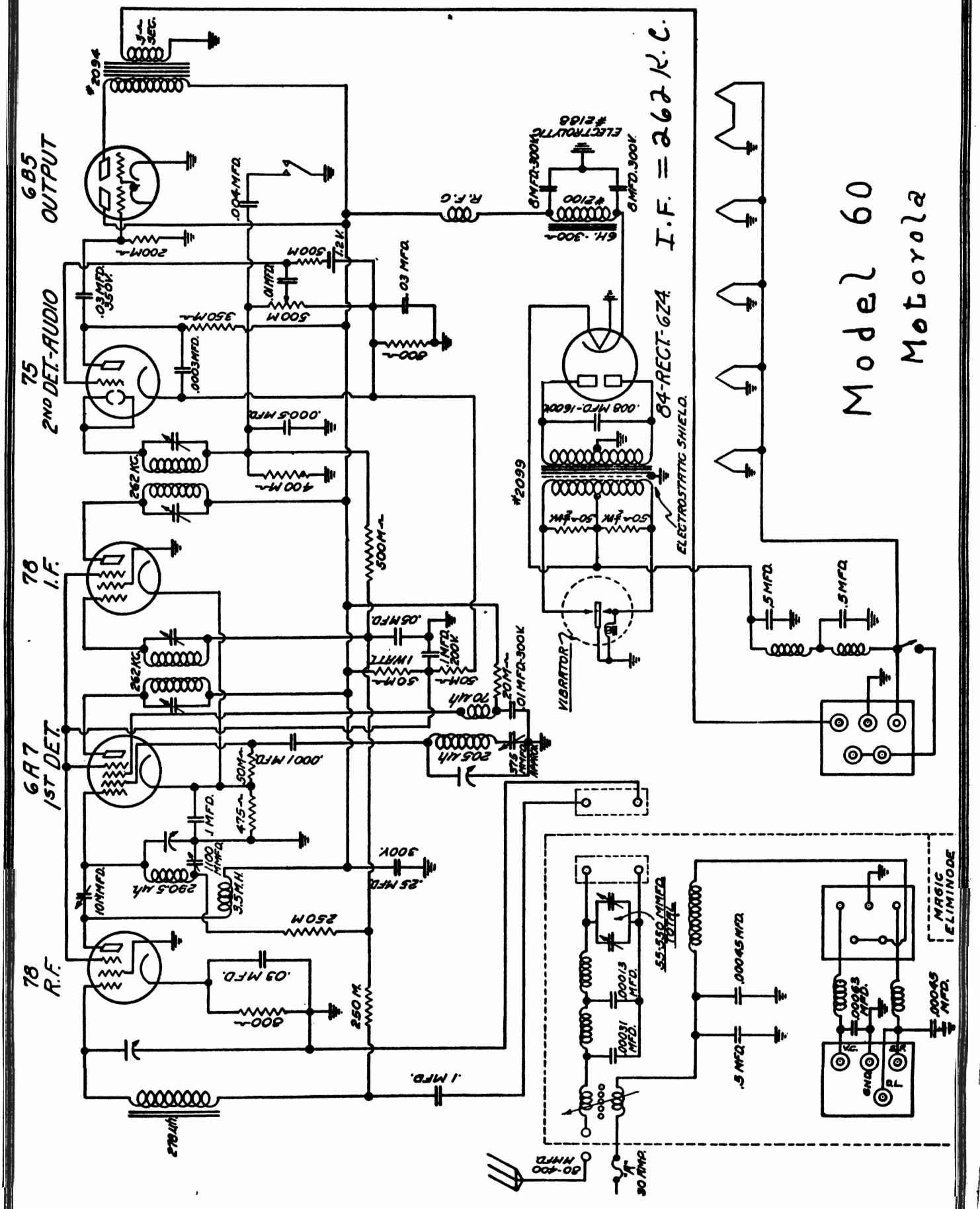


Fig. 1

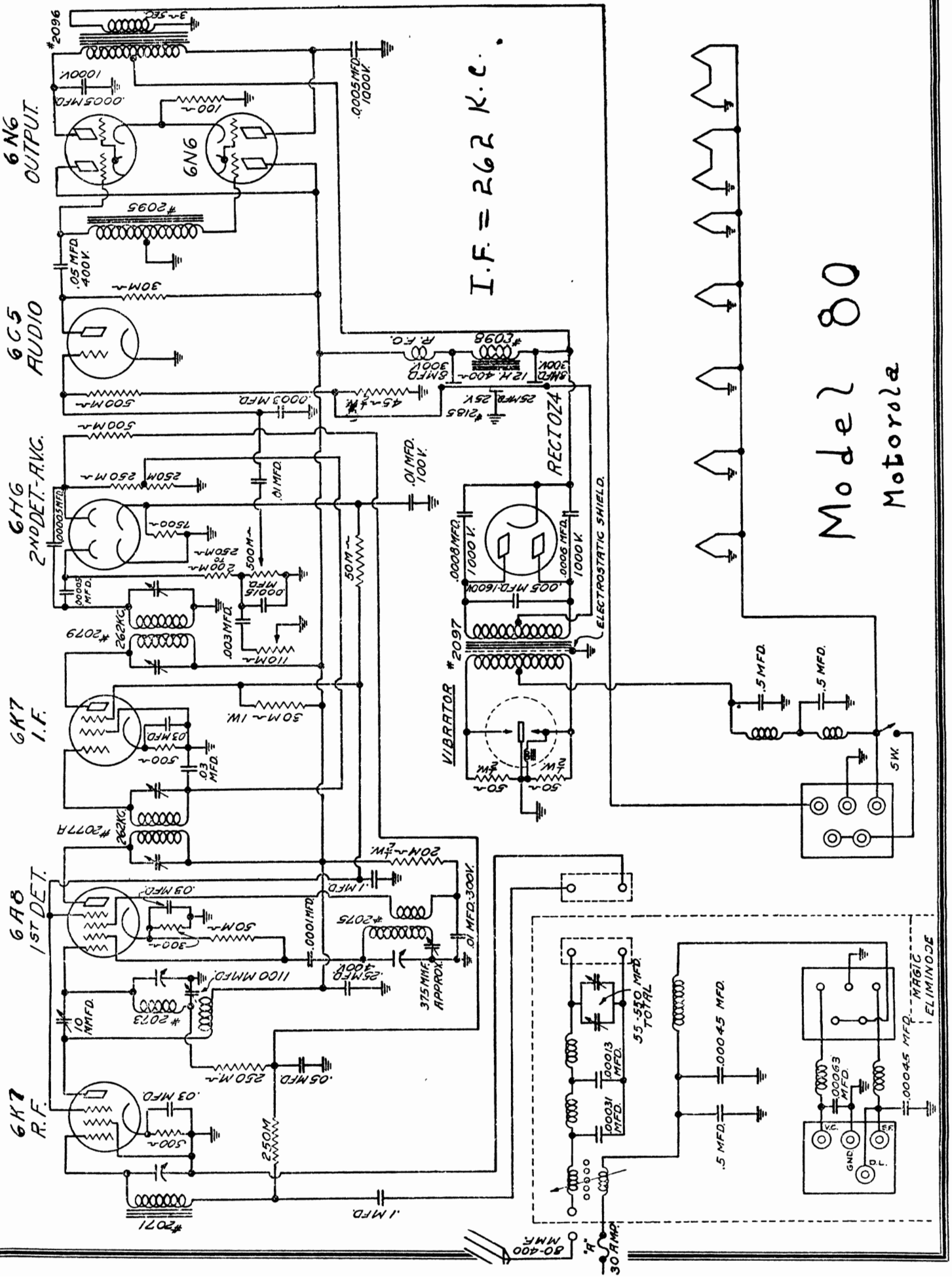
Figure (1) shows the rear view of the chassis of Model No. 100 or No. 110, illustrating the method of connecting the speaker to the set on the test bench, thereby eliminating the use of an extension service cable. The connector pin for the Bat. supply lead may be secured from an old tube base.

The Models No. 75 and No. 79 may be placed in operation on the service bench by connecting the hot "A" battery lead to one of the large pins of the 4 contact chassis plug. No. service extension cable is required. The Models No. 57 and No. 62 may be operated by connecting the hot "A" lead into the top connection of the two-way receptacle.

GALVIN MFG. CO.



GALVIN MFG. CO.



GAROD RADIO CORP.

Model 26

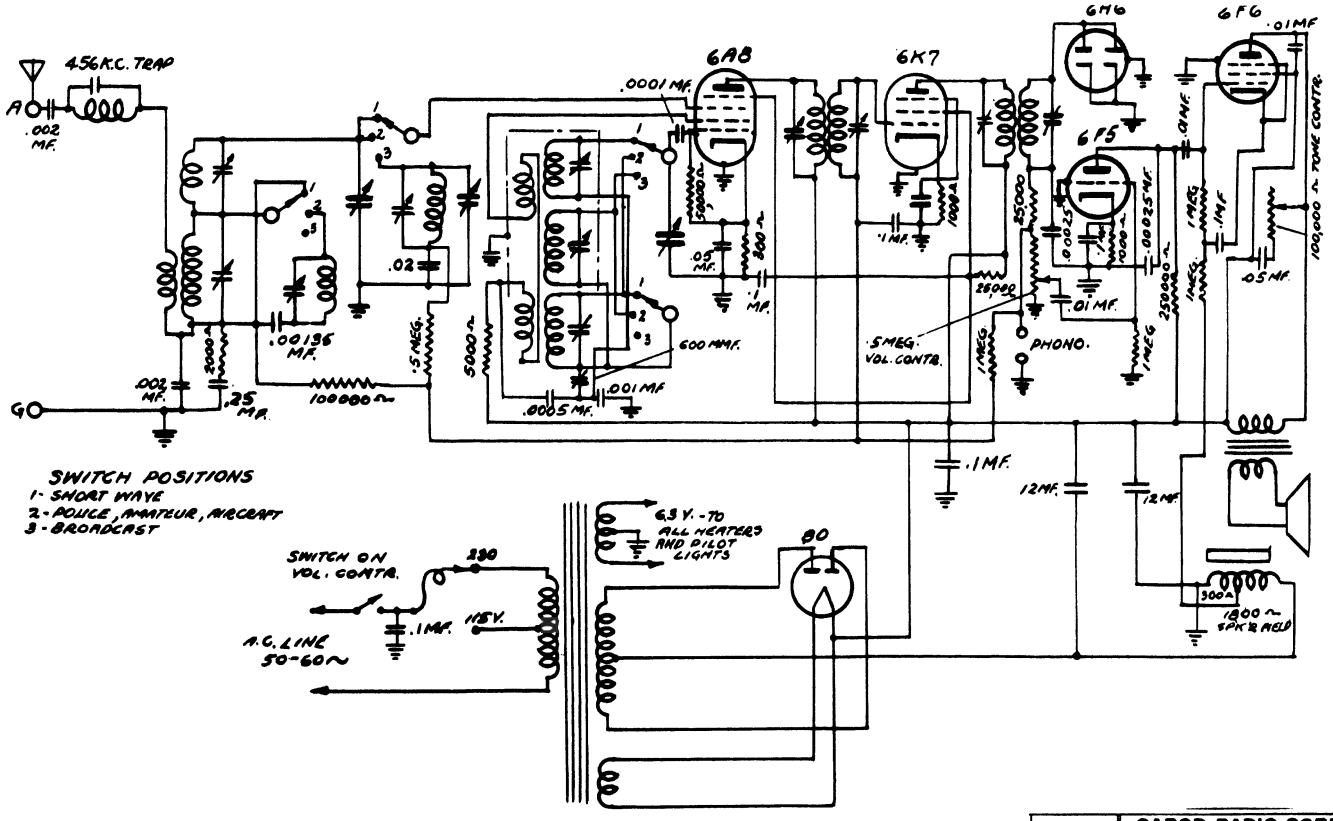
I. F. = 456 K C

DATE	10-21-35
DR.	RL
TR.	
CH.	HJ
APPROVED	

GAROD RADIO CORP.
NEW YORK, U. S. A.

6 TUBE - 3 BAND - A.C RECEIVER

USED ON: 26 — SCALE:



Model 49

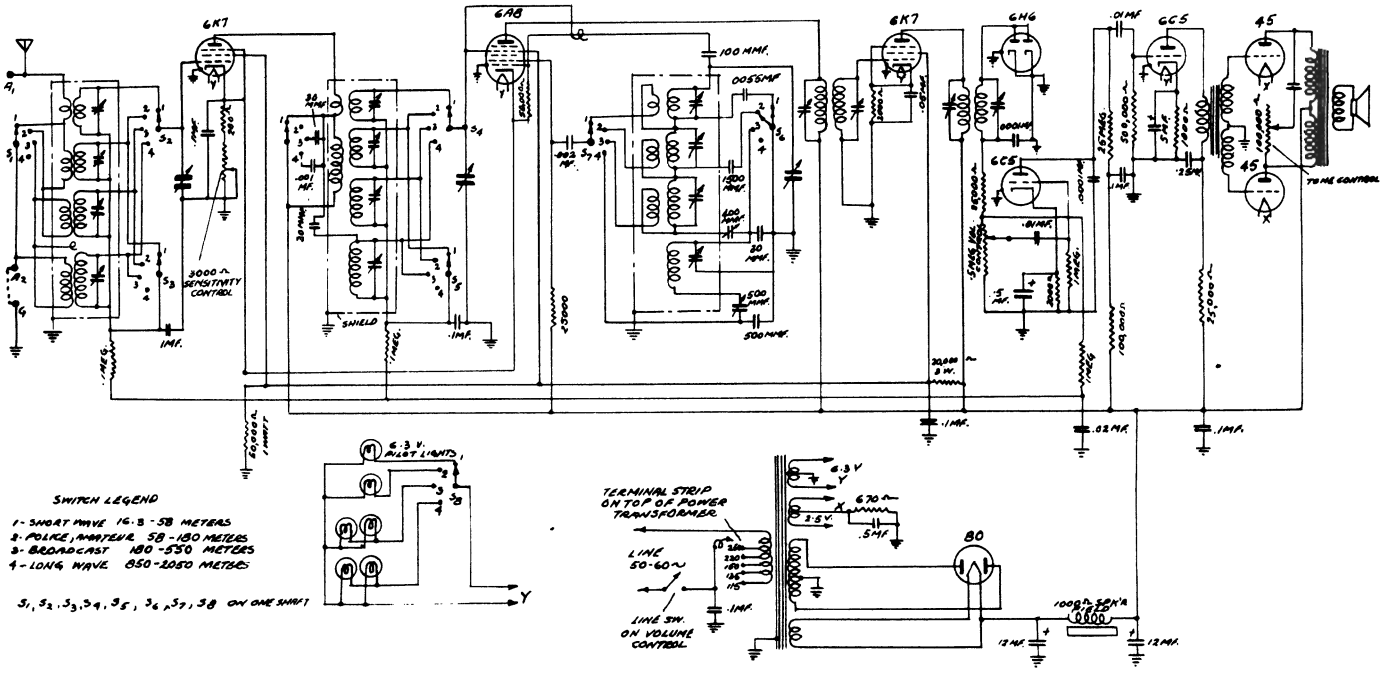
I. F = 456 K. C.

DATE	10-21-35
DR.	D. T.
TR.	
CH.	HJ
APPROVED	

GAROD RADIO CORP.
NEW YORK, U. S. A.

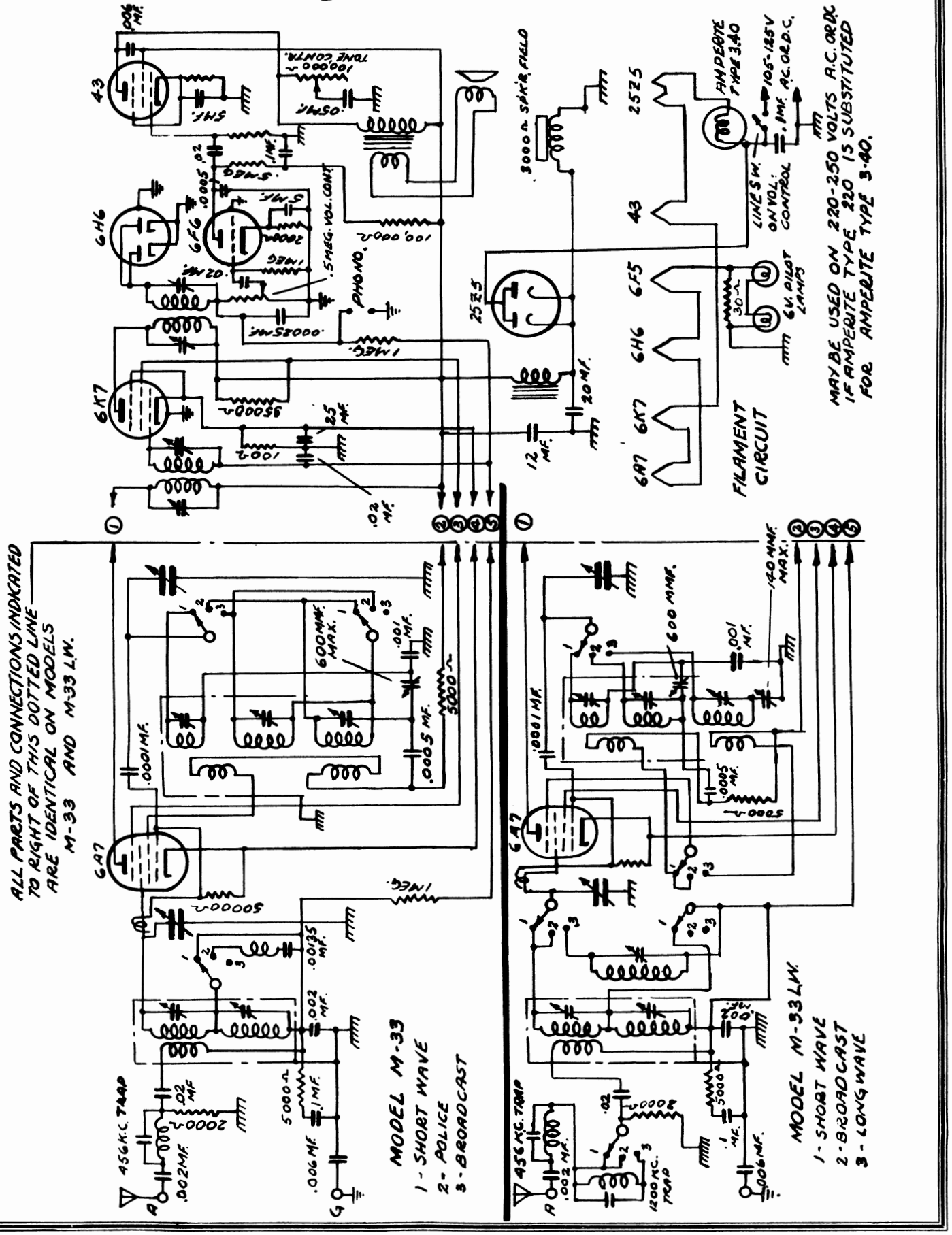
9 TUBE - 4 BAND - A.C RECEIVER

USED ON: 49 — SCALE:



GAROD RADIO CORP.

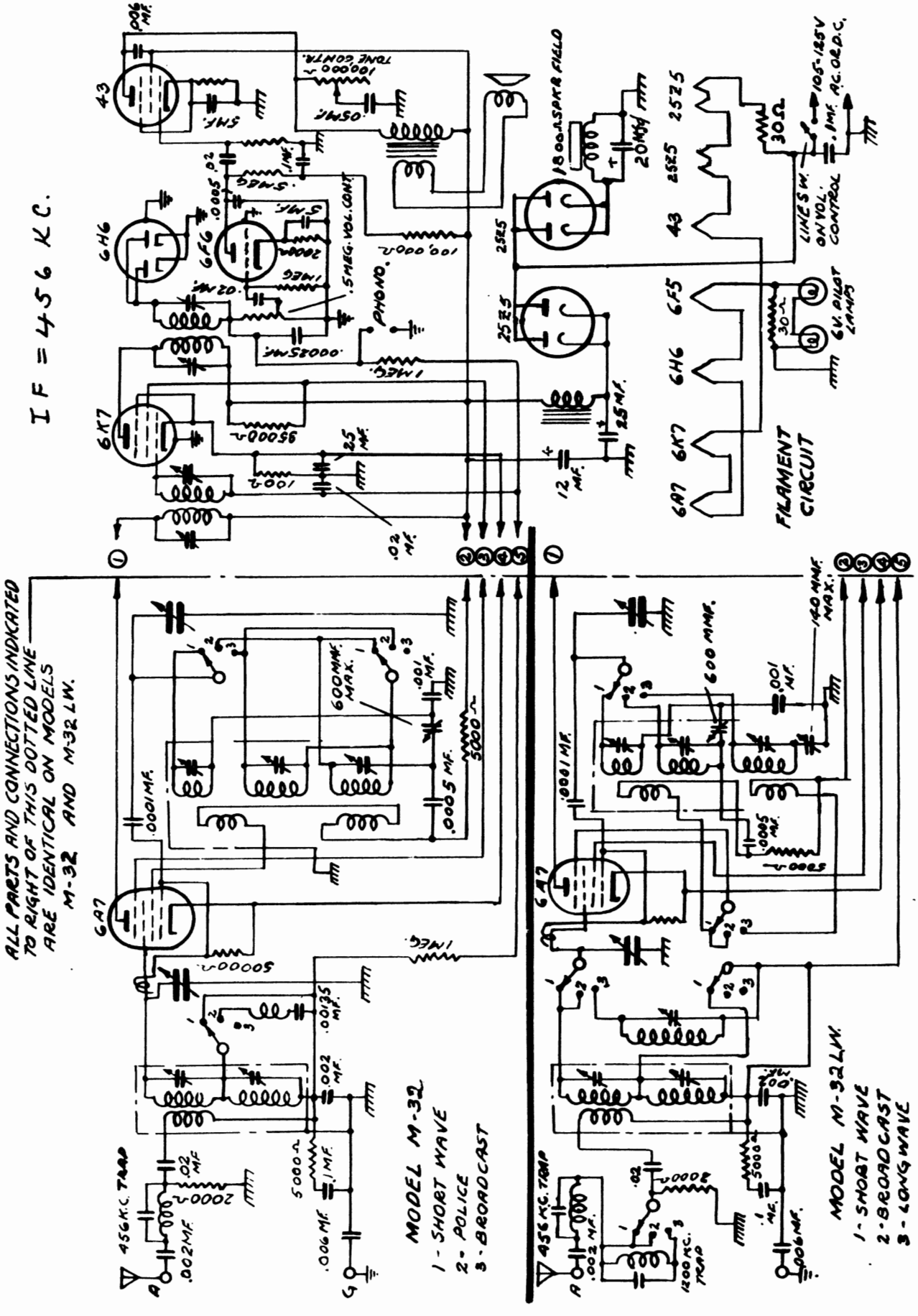
Models M31, M31LW, M33, M33LW



GAROD RADIO CORP.

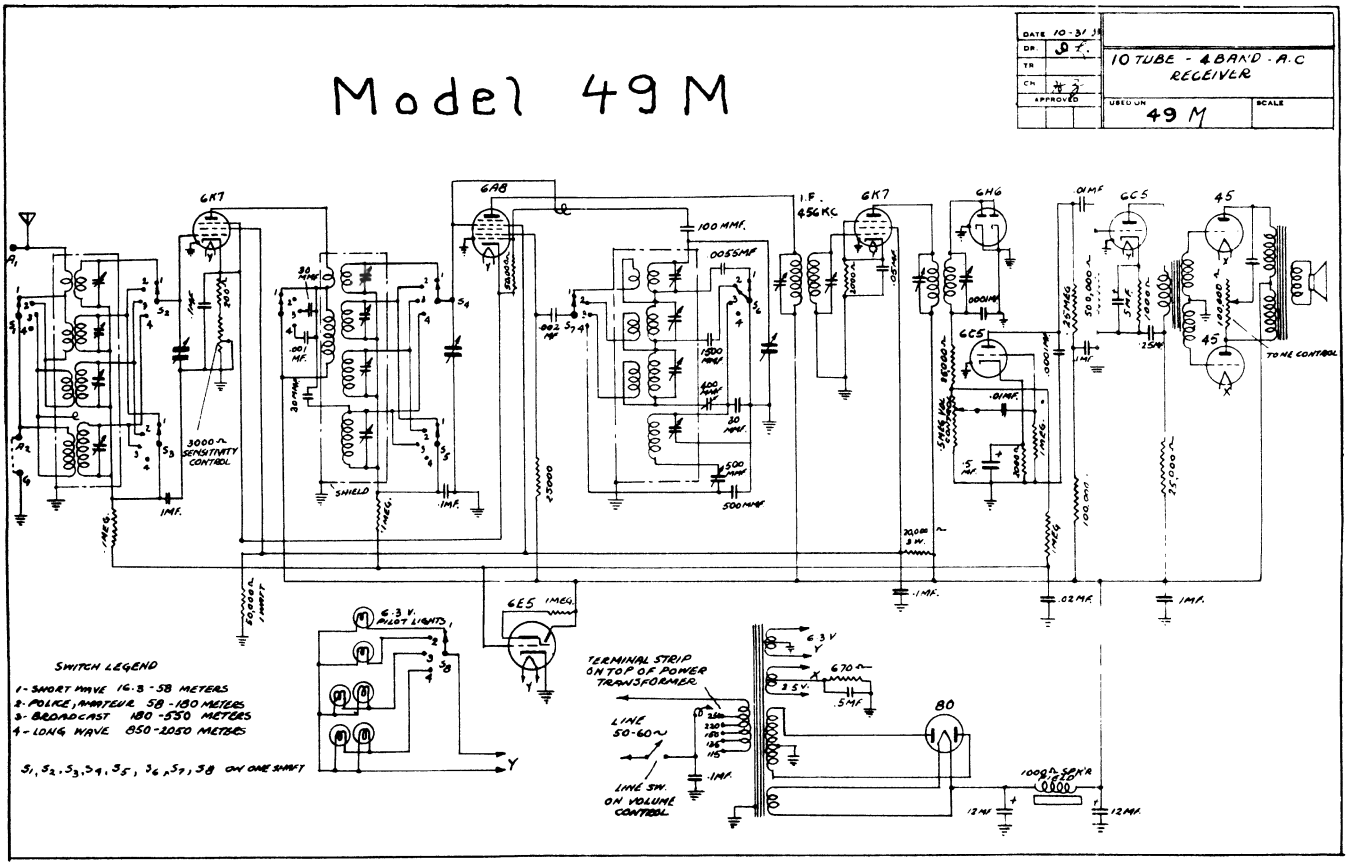
Models M-32 and M-32-LW

IF = 456 KC.



GAROD RADIO CORP.

Model 49M



ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave bands and an output meter for indicating the effect of adjustments are required.

It is important to remember that in receivers of this kind which are equipped with automatic volume control it is necessary to use the minimum possible signal from the signal generator; otherwise the A.V.C. action will tend to nullify the variations in output as the trimmers are adjusted.

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis to the right and rear of the gang condenser.

10 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 10 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 10 mc signal is tuned in exactly as the 10 mc calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the tops of the shield cans which are found on the chassis to the right and rear of the gang condenser. There are four trimmers on each of these cans, the selector, 1st. detector, oscillator and preselector. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotes the trimmer for the no. 1 band.

5 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2. and the receiver and signal generator both set at 5 mc., the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can and is located diagonally opposite the red painted trimmer. The other trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 mc. adjustment should then be rechecked. The 1.7 mc. Padder is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one at the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 4 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 150 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 kc. adjustment should then be rechecked. The 150 kc. padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

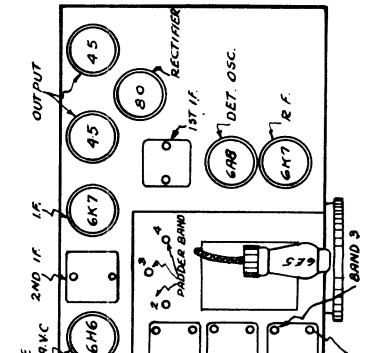
MODEL 49M

TUBE	FUNCTION	HEATER	PLATE	SC. GR.	CATH	OSC. PL.
6K7	Preselector	6.3	230	110	4	
6A8	Det. osc.	6.3	230	110	4	120
6K7	I.F. amp.	6.3	230	110	0	
6H6	2nd Det.	6.3			0	
6C5	1st audio	6.3	25	1		
6C5	2nd audio	6.3	190		7	
45 (2)	Output	2.5	280			
80	Rectifier	5.0				

Note: 6B5 used only on later series of Model #49.

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a low impedance AC voltmeter.



Models 33, 33LW, 31, 31LW, 32, 32LW

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have first been thoroughly investigated. An accurately calibrated signal generator which will cover the various wave-bands, and an output meter for indicating the effects of adjustments, are required.

MODEL 33LW, 31LW, 32LW

I.F.ADJUSTMENT - The signal generator is set at 456 kc. The "hot" lead from the signal generator is connected to the grid cap on the 1st detector (6A7) tube, the clip having first been removed from the tube cap. The ground lead is connected to the receiver gnd. post. The oscillator section (front) of the gang tuning condenser is short-circuited and the volume control turned on full. The i.f. trimmers are then adjusted for maximum gain in the receiver. These trimmers are located on top of the i.f. transformer shield cans, which are situated in the rear of the chassis, to the left. The one nearest the front is the 1st i.f. transformer and the rear one is the 2nd i.f. transformer.

16 MEGACYCLE ADJUSTMENT - The short-circuit is removed from the oscillator condenser and the grid clip replaced in its normal position on the cap of the 6A7 tube. The "hot" lead fron the signal generator is connected to the antenna post of the receiver and the ground lead to the ground post of the receiver. With the volume control set at maximum and a minimum input signal from the signal generator, the band switch is set at position no. 1 and the receiver dial set at 16 mc. The oscillator trimmer is adjusted so as to bring the signal in at this setting. This trimmer is found on the side of the oscillator coil shield can which is located directly in front of the i.f. transformers. The upper trimmer is the one for this wave-band. After the oscillator is adjusted, the antenna trimmer is adjusted for maximum output. This is found on the front of the antenna coil can which is directly in front of the 6A7 tube. The lower trimmer is the one for this band. There are no other adjustments on this band.

1400 KILOCYCLE ADJUSTMENT - With the receiver and signal generator both set at 1400 kc. the procedure outlined above is repeated. The trimmers are adjusted for maximum gain of the receiver. These trimmers are located on the coil shield cans; the oscillator trimmer for this band is the bottom one on the oscillator can; the detector trimmer, is the upper one on the detector or antenna coil can. The 600 kc. padder is on the front sub-panel.

600KC PADDER ADJUSTMENT - With all connections as above, the signal generator is set at 600KC and the signal tuned in on the dial. The padder for this frequency is found on the front sub-panel of the receiver, directly under the wave band switch. This padder should be adjusted for maximum response of the receiver, while the tuning condenser is rocked slightly back and forth. The 1400 kc adjustment should then be rechecked.

LONG WAVE ADJUSTMENT - With the receiver and signal generator both set at 325 kc. the procedure outlined above is repeated. The trimmers are located on the left side panel of the chassis; the one towards the rear is the oscillator trimmer, and the one near the front is the antenna trimmer. The series padder for this band is located in the lower left hand corner of the front sub-panel.

MODEL 31 - 32 - 33

The alignment procedure for the Model 32 - 32LW is exactly the same as for the model 33LW, 31LW except for the location of the trimmers, and the designation of the bands. These are as follows:

Short wave band - Oscillator trimmer is the upper one on the oscillator coil can.
Antenna trimmer is the lower one on the antenna coil can.
No series padder.

Broadcast band - Oscillator trimmer is the lower one on the antenna coil can.
Antenna trimmer is the upper one on the antenna coil can.
600 kc. series padder is on the top of the chassis directly in front of the oscillator coil.

Police band -- Trimmers are on the left side panel of the chassis. The one towards the rear is the oscillator shunt trimmer; the one towards the front is the antenna shunt trimmer.

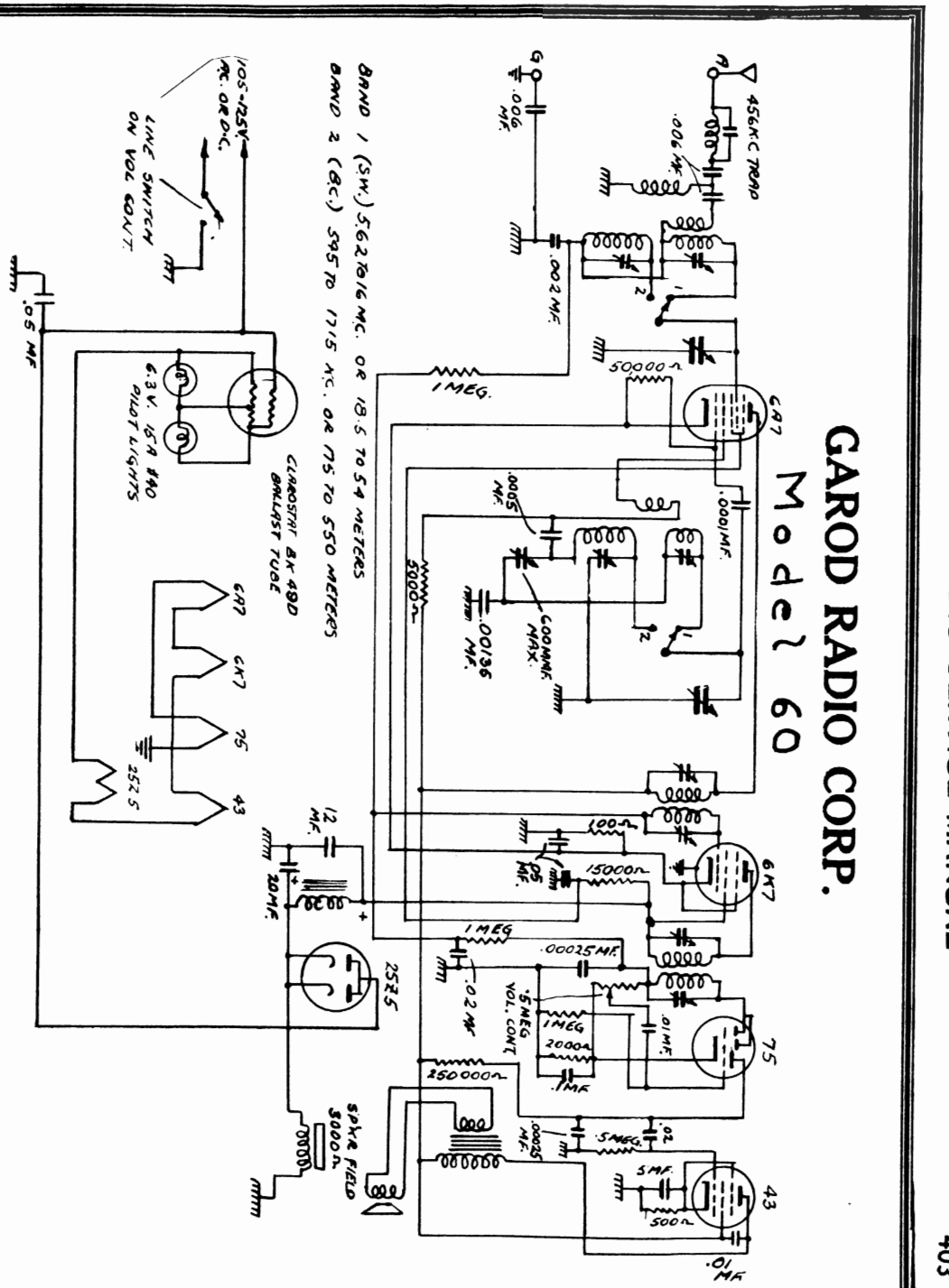
NOTE: These bands must be aligned in the sequence shown.

VOLTAGE TABLE

TUBE	FUNCTION	H'T'R	PLATE	SC.GR	CATH.	OSC.PL.
6A7	det.-osc.	4.5	100.2	47.0	---	90.0
6K7	i.f. ampl.	4.3	100.2	47.0	---	---
6H6	diode det.	4.5	---	---	---	---
6F5	1st audio	4.4	40.0	---	---	---
43	audio outp.	20.2	94.0	100.0	12.3	---
2525	rectifier	21.0	114.0	---	---	---

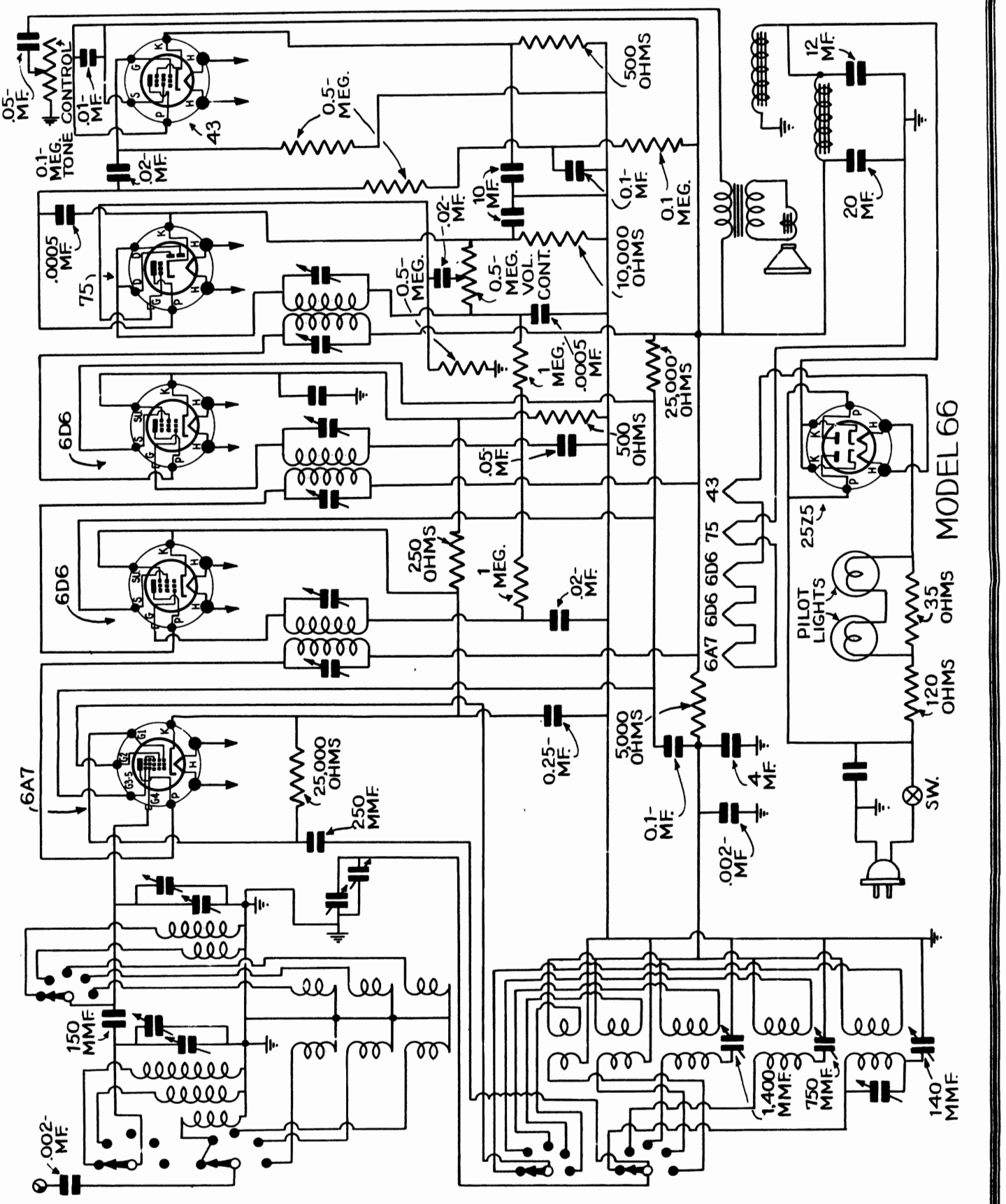
NOTE: Fil. voltages measured with a low impedance AC-voltmeter. Actually, the voltages at 110V line are approximately 6 volts and 23 volts for the 6, 3, and 2 volt tubes respectively.

Model 32 exactly same as Model 31, but 600 kc. padder is located on the left front of the chassis. Model 32LW same as 31LW.



GAROD RADIO CORP.

Model 66



GAROD RADIO CORP.

Model 104 M

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is important to remember that in receivers of this kind which are equipped with automatic volume control it is necessary to use the minimum possible signal from the signal generator; otherwise the A.V.C. action will tend to nullify the variations in output as the trimmers are adjusted.

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans to the right and rear of the gang condenser.

1: MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 18 mc signal is tuned in exactly at the 18 mc calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotesthe trimmer for the no. 1. band.

5 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2. and the receiver and signal generator both set at 5 mc. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The .5 mc. adjustment should then be rechecked. The 1.7 mc. Padder is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one at the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3. band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 150 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 kc. adjustment should then be rechecked. The 150 kc. padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

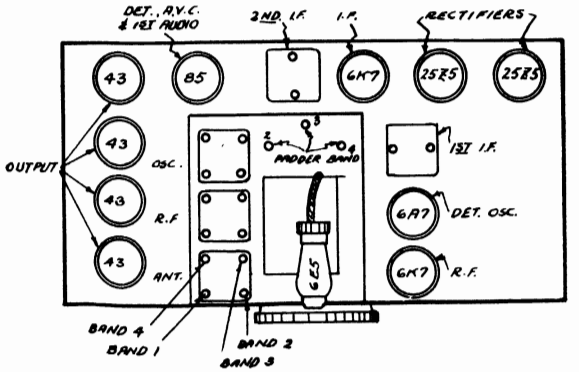
MODEL #104M

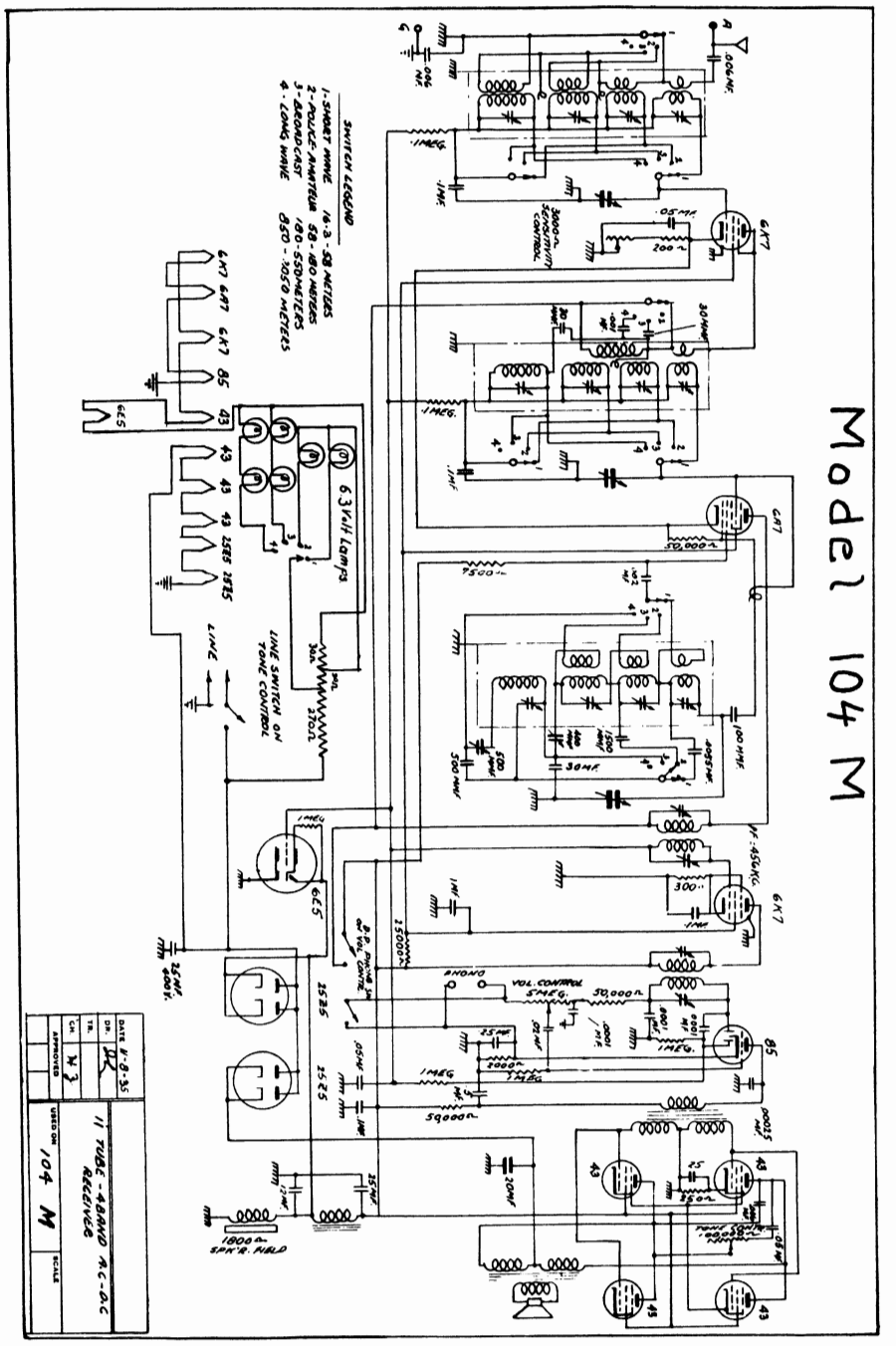
TUBE	FUNCTION	HEATER	PLATE	SC. GR.	CATH	OSC. PL.
6K7	Preselector	4.5	95	95	1.75	
6A7	Det. osc.	4.5	95	55	1.75	80
6K7	I F amp.	4.5	95	55	1.0	
85	2nd det. and 1st audio	4.5	40		2.0	
43 (4)	Audio output	21	120		15	
25z5	Rectifier	21			120	

Note: 6E5 used only in later series of Model #104

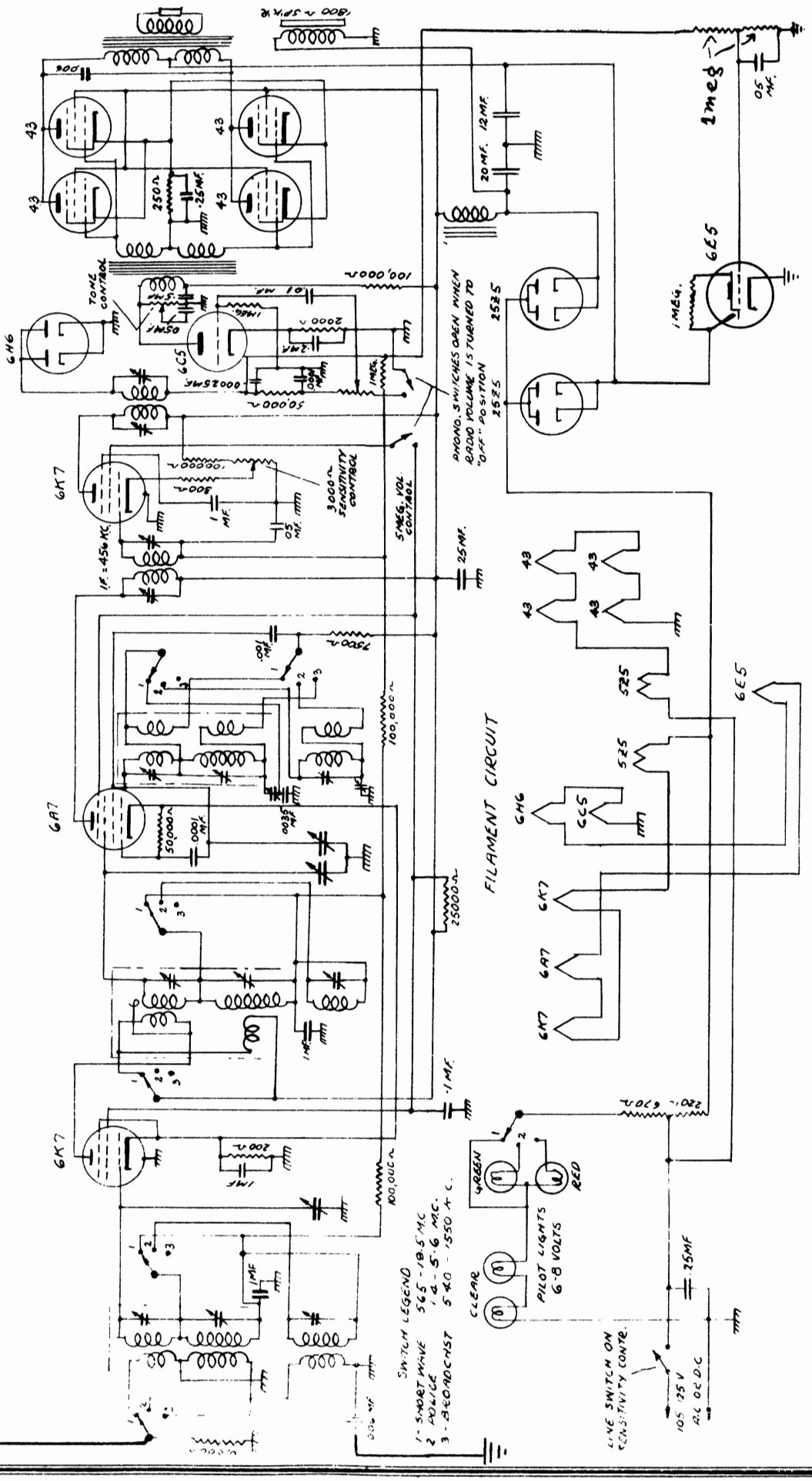
All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position.

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a low impedance AC voltmeter.



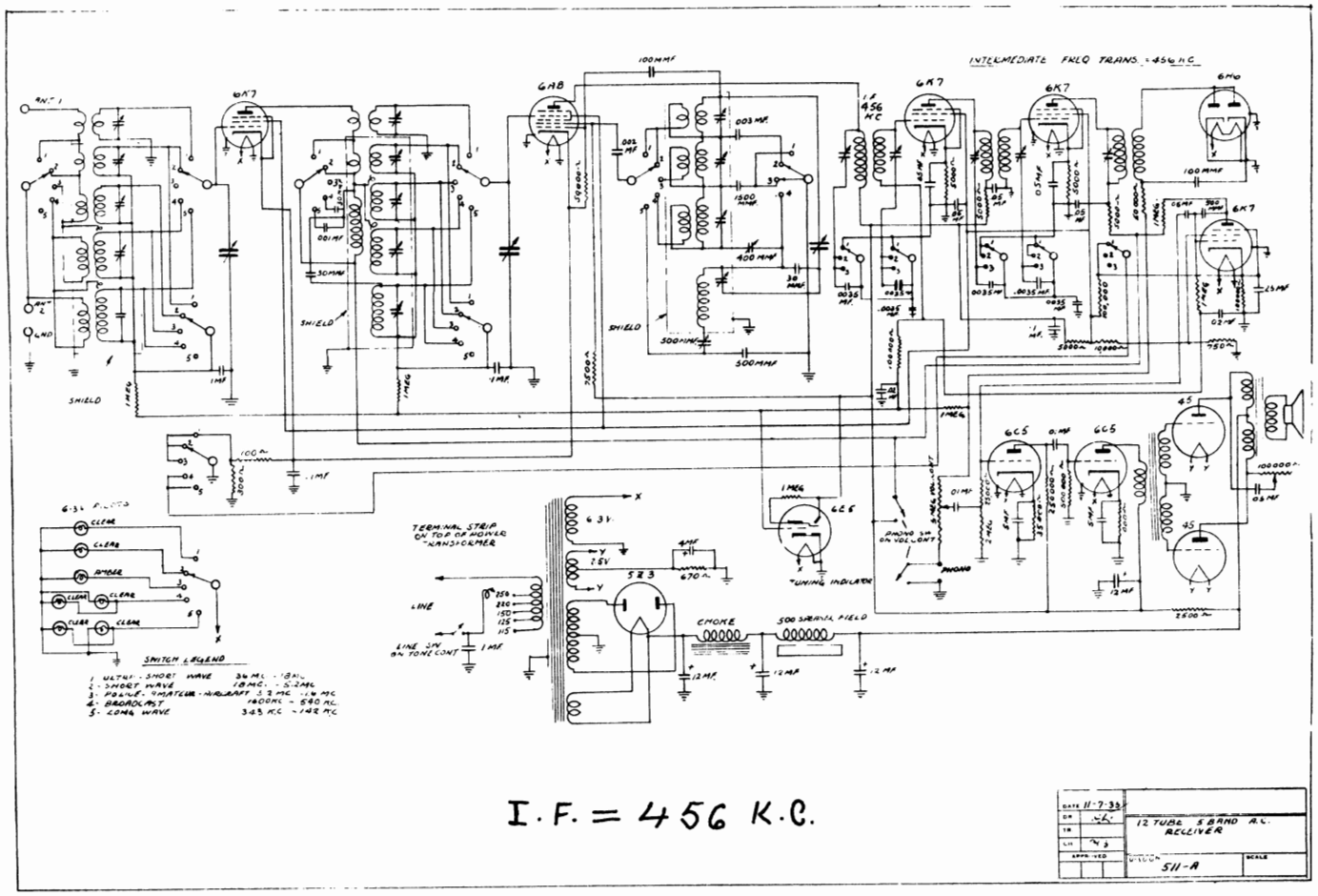


GAROD RADIO CORP.



GAROD RADIO CORP.

Model 511A


INTERMEDIATE FREQ TRANS. 456 K.C.
6K7
6A8
6M6
6G5
6H6
45
523
SHIELD
TERMINAL STRIP ON TOP OF MOVER TRANSFORMER
SWITCH LEGEND
TUNING INDICATOR
CHOKE
500 OHM FIELD
LINE
100MMF
400 MMF
500MMF
.003 MF
.001 MF
.05 MF
.1 MF
.01 MF
.02 MF
.15 MF
.12 MF
.047 MF
.0035 MF
.0025 MF
.1 MEG
.5 MEG
.25 MEG
.02 MEG
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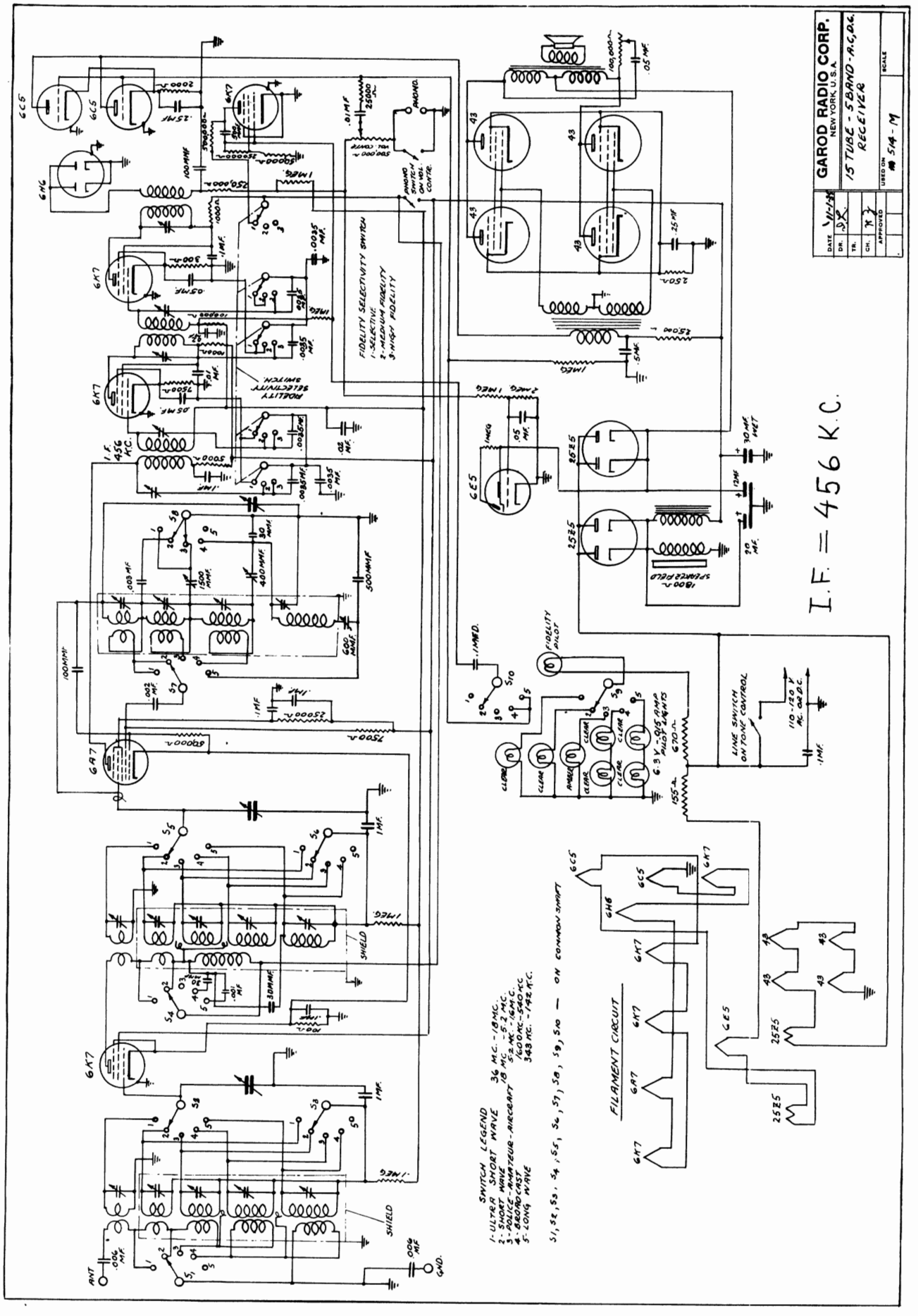
GAROD RADIO CORP.



GAROD RADIO CORP.

Model 514-M

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is important to remember that in receivers of this kind which are equipped with automatic volume control it is necessary to use the minimum possible signal from the signal generator; otherwise the avc action will tend to nullify the variations in output as the trimmers are adjusted. A surer method is to make the avc tube inoperative. This may be done by breaking the lead from the avc tube plate to the gang switch.

I.F.ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis. The third i.f. transformer has only one trimmer. This is the one at the left rear of the chassis. The other two transformers have two trimmers each.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 2. The oscillator trimmer condenser is adjusted so that the 18 mc signal is tuned in exactly as the 18 mc calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denote the trimmer for the no. 2 band.

36 MEGACYCLE ADJUSTMENT - With the band switch in position for the no. 1 band, the receiver and signal generator are both set at 36 mc. and the procedure outlined above is repeated. There is no oscillator trimmer for this band, a harmonic from the no. 2 band of the oscillator being used. The trimmer for the preselector stage is located on the underside of the chassis near the front and center. The first detector or interstage trimmer is located behind the band selector switch, also on the underside of the chassis.

5.2 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 3. and the receiver and signal generator both set at 5.2 mc. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5.2 mc. adjustment should then be rechecked. The 1.7 mc. Padder is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one at the group of three found here.

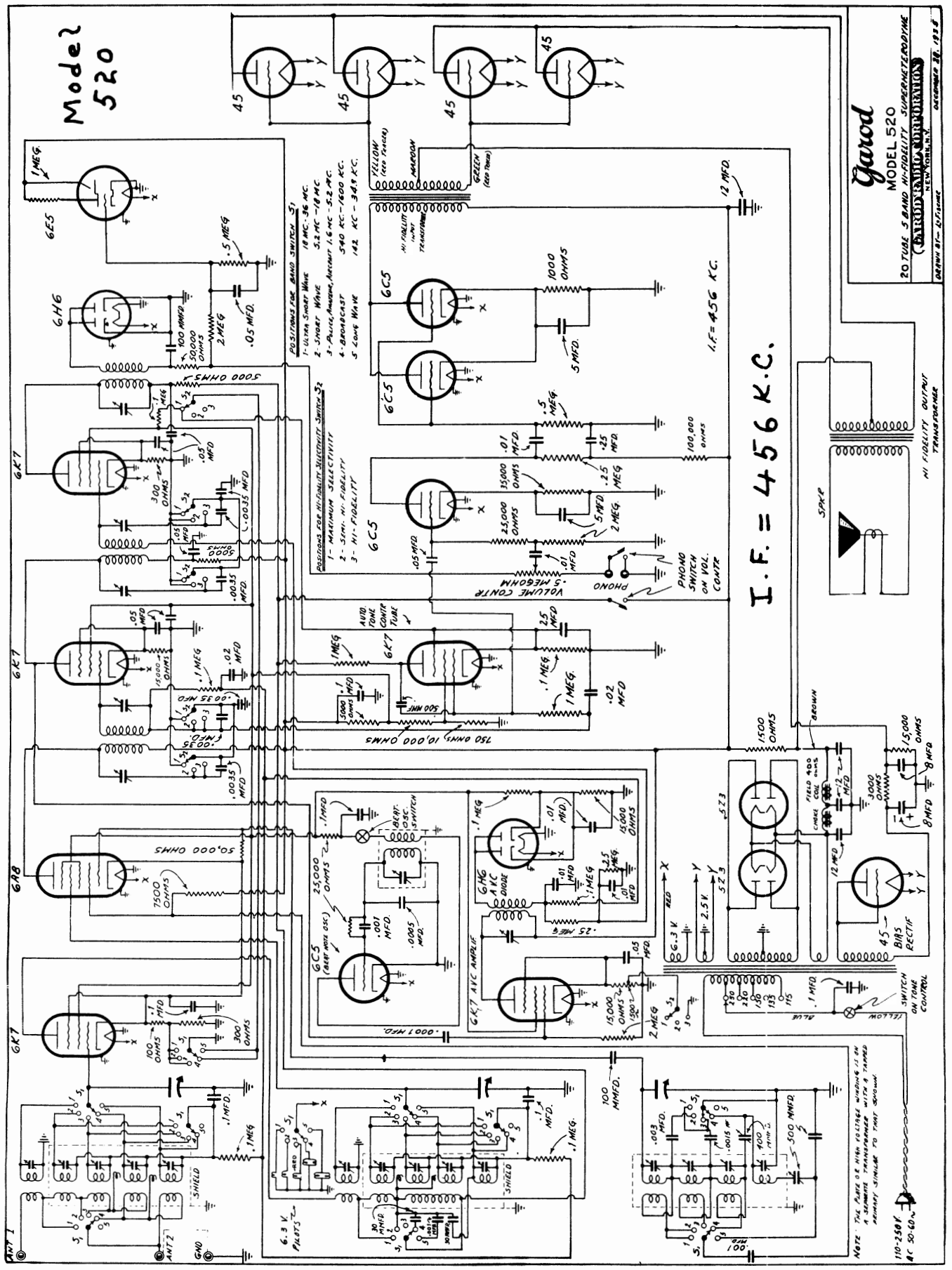
1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 4 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 140 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 kc. adjustment should then be rechecked. The 140 kc. padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

GAROD RADIO CORP.



Model 520

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted except by an experienced serviceman and only after all other possible causes of faulty operation have first been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave bands is required. Either a suitable output meter or the cathode-ray tuning indicator may be used for indicating the effects of adjustments. It is necessary, in all of the ensuing procedure, that the signal generator be attenuated as much as possible.

I.F. ADJUSTMENT - The i.f. transformers are housed in the polished metal shield on the chassis. The location of these transformers is indicated in the accompanying diagram. The trimmers are on the tops of the transformer cans. The first and second i.f. transformers have two trimmers each and the detector coupling transformer has only one trimmer. These trimmers are adjusted at 456 kc. for maximum gain. In making this adjustment, the oscillator (rear) section of the tuning condenser should be short-circuited and the signal generator connected between the grid cap of the 6A8 and the ground post of the receiver. The selectivity switch should of course be in the high selectivity position.

SHORT WAVE BAND - With the output from the signal generator connected across the aerial and ground terminals of the receiver, and the volume control in position for maximum volume, the oscillator trimmer for this band is adjusted for maximum response as indicated by the 6E5. This adjustment must be made with the dial set at exactly 17 mc., otherwise the calibration will be off. The series padder for this band should then be adjusted by setting the signal generator at a frequency of 5.5 megacycles and tuning the signal in on the receiver. The tuning condenser is rotated slightly back and forth as the padder screw is adjusted for maximum output. The 17 mc. adjustment should then be re-checked. If the dial calibration is off, the procedure should be repeated again.

ULTRA SHORT WAVE BAND - The trimmers for this band are adjusted at 36 megacycles in the manner described above. They are located on the under side of the chassis and are not shown on the chassis layout diagram. There are only two trimmers for this band, the oscillator operating on harmonics of the short wave band.

POLICE BAND ADJUSTMENT - The trimmers for this band are adjusted at 4.8 megacycles in the manner described and the series padder at 1.7 mc. exactly as indicated in the SHORT WAVE BAND ADJUSTMENT procedure.

BROADCAST BAND - The adjustments for this band are as described above. The trimmers are adjusted at 1400 kc. and the padder at 600 kc.

LONG WAVE BAND - The adjustments for this band are made in the prescribed manner, the trimmers being adjusted at 340 kc. and the padder at approximately 150 kc.

A.V.C. AMPLIFIER ADJUSTMENT - The a.v.c. has a separate amplifier which is tuned as follows: The signal generator is set at 1400 kc. and the signal tuned in on the receiver, as indicated by the minimum opening in the 6E5 beam. The a.v.c. trimmer is then adjusted to give the WIDEST opening in the beam. The receiver is then carefully retuned and the adjustment repeated.

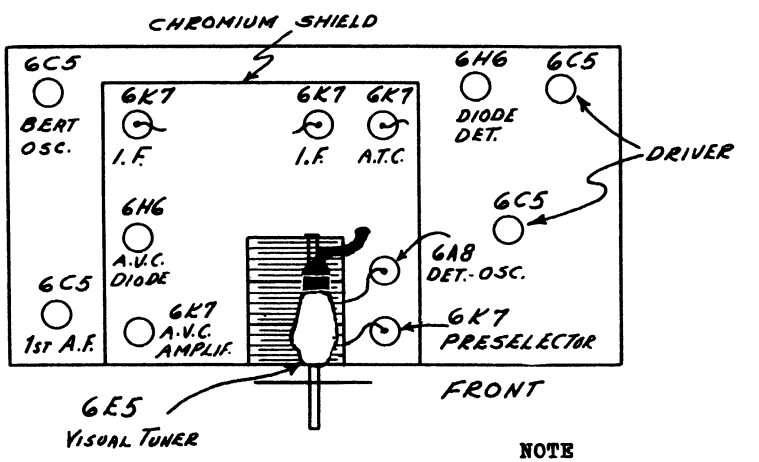
BEAT NOTE OSCILLATOR ADJUSTMENT - A weak unmodulated signal from the signal generator is tuned in on the receiver as indicated by the minimum opening in the 6E5 beam. The beat oscillator switch is then turned on. An audible note should be heard whose pitch may be varied by adjusting the screw on the small square can on the left side of the chassis. This should be so adjusted that when the station is tuned in exactly, no beat is heard (zero beat). If no beat note is audible when first turned on, rotation of this same screw should bring in the note.

VOLTAGE TABLE

TUBE	FUNCTION	H'T'R	PLATE	SCR.GR.	SUPPR.GR.	CATH.	OSC.PL.
6K7	preselector	6	250	95	5	5	---
6A8	det.-osc.	6	250	95	---	5	220
6K7	1st i.f. amp.	6	200	95	10	10	---
6K7	2nd i.f. amp.	6	225	95	A	A	---
6H6	diode det.	6	---	---	---	0	---
6C5	1st audio	6	90	---	---	7	---
6C5) 6C5)	driver	6	250	---	---	9	---
45's	audio output	2.2	290	---	---		---
6K7	A.T.C.	6	10	7	0	0	---
6C5	a.v.c. diode	6	---	---	---	10	---
6K7	a.v.c. amp.	6	250	95	9	9	---
6E5	tuning indicator	6	250 (target)	---	---	0	---
523) 523)	rectifier	4.3	---	---	---	---	---
45	grid bias rectifier	2.2	75	---	---	---	---

All voltages measured between socket terminals and chassis. The Antenna is disconnected. The band switch is in the Broadcast position. The High Fidelity switch is in the "Selective" position. The voltmeter resistance is 250,000 ohms when measuring plate or screen potentials; and 30,000 ohms when measuring cathode and suppressor potentials. Line voltage: 115 volts. Power consumption: 200 watts.

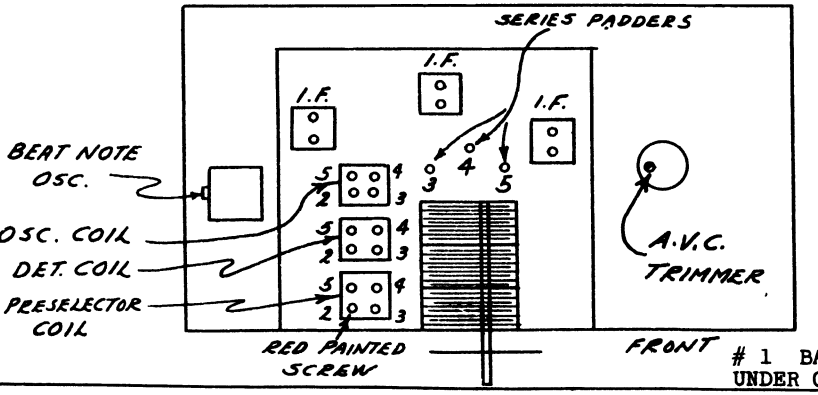
TOP VIEW OF CHASSIS SHOWING LOCATION OF TUBES



NOTE

AUDIO OUTPUT AND RECTIFIER TUBES ARE IN POWER SUPPLY CHASSIS.

TOP VIEW OF CHASSIS SHOWING LOCATION OF ALIGNING TRIMMERS

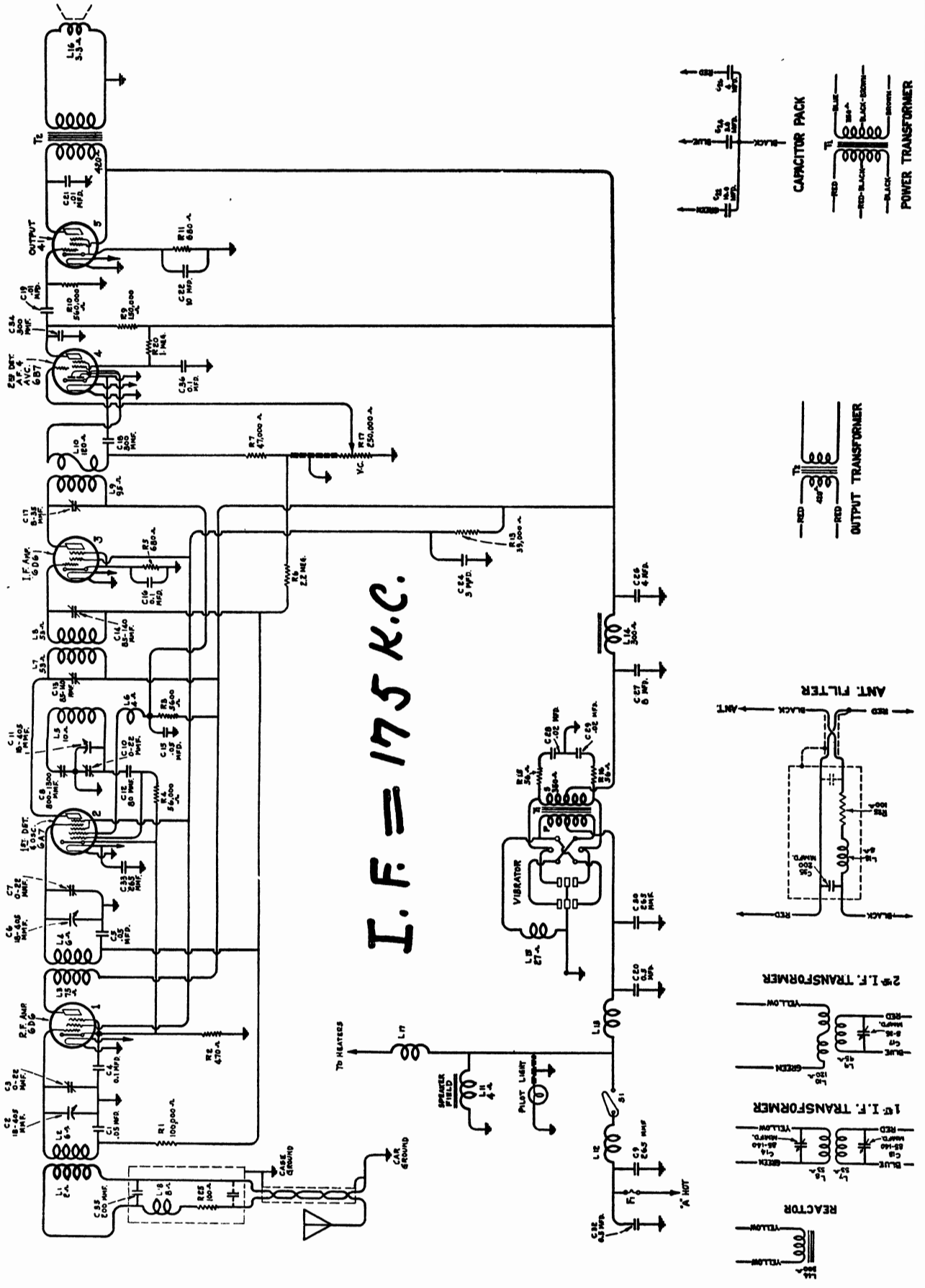


1 BAND TRIMMERS UNDER CHASSIS

GAROD RADIO CORP.

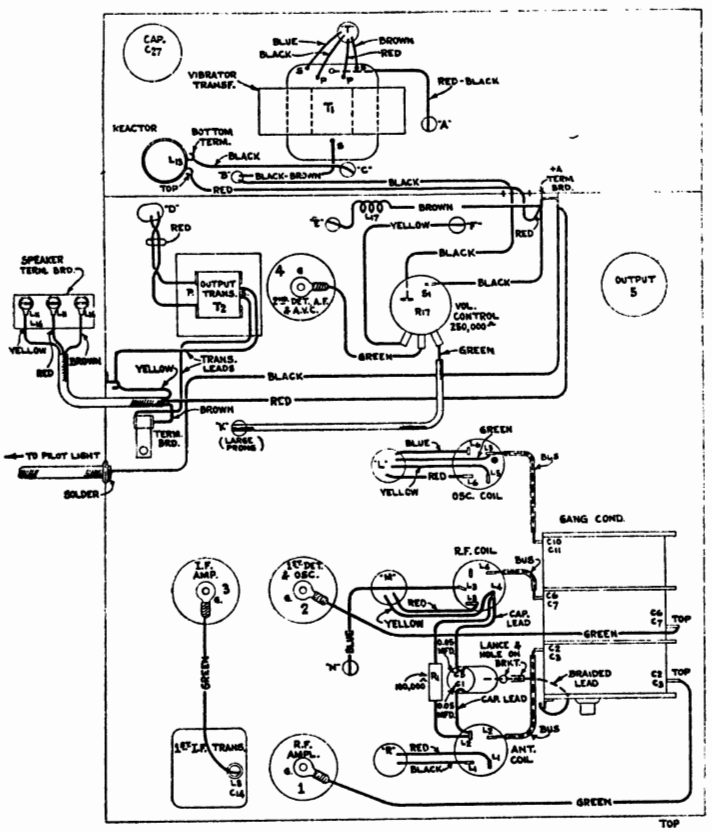
GENERAL ELECTRIC CO.

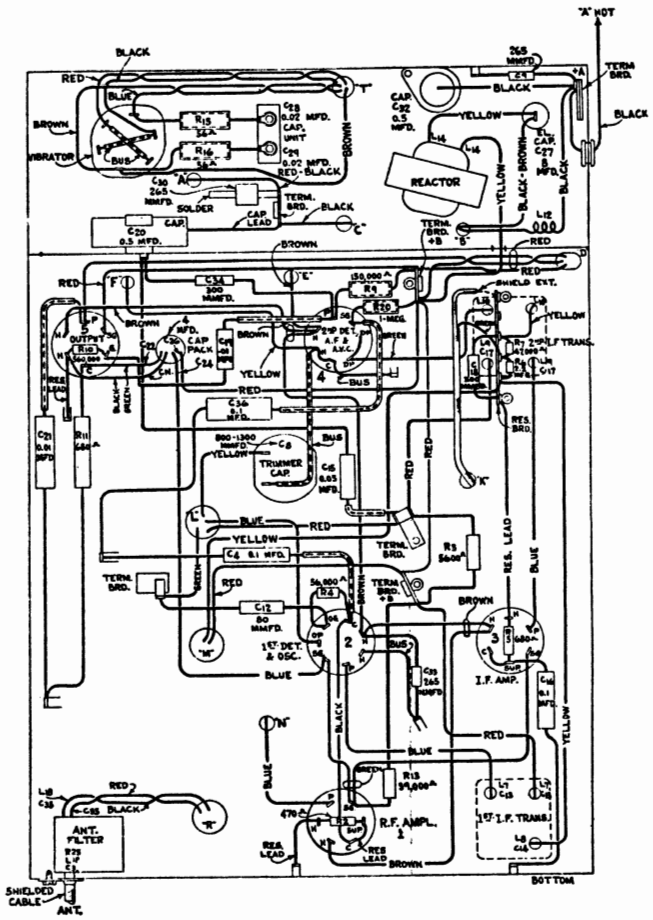
MODEL D-50

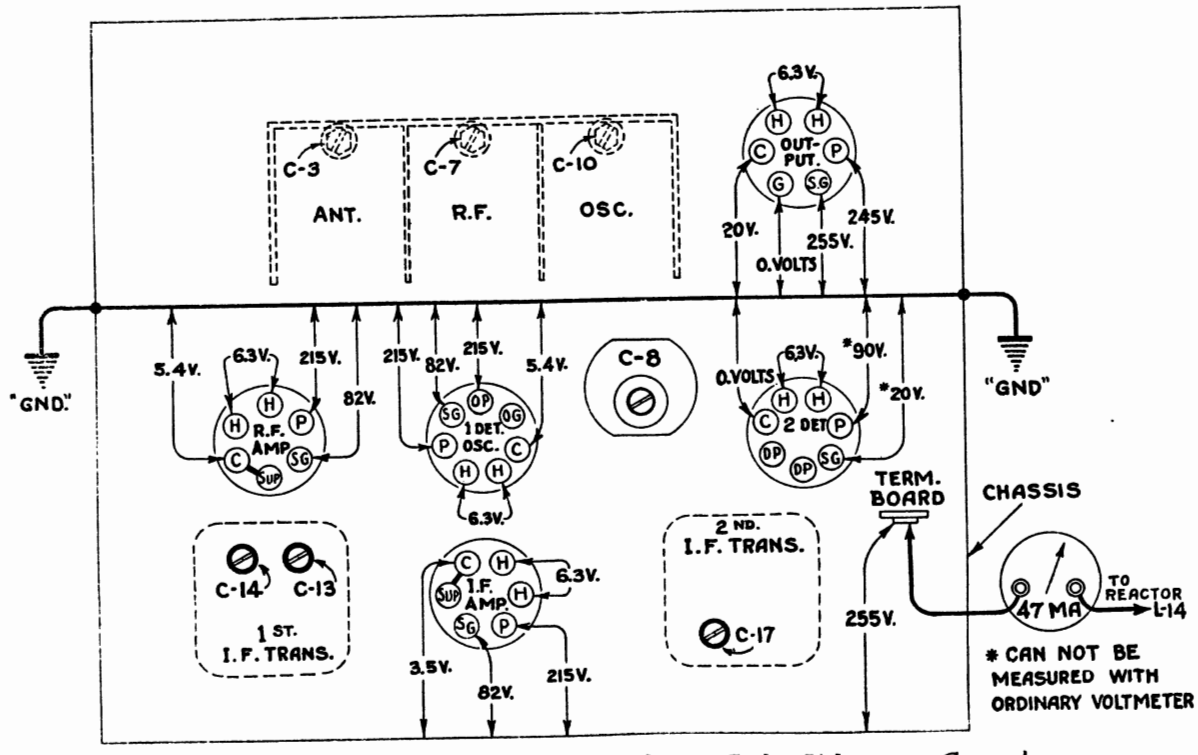


GENERAL ELECTRIC CO.

MODEL D-50



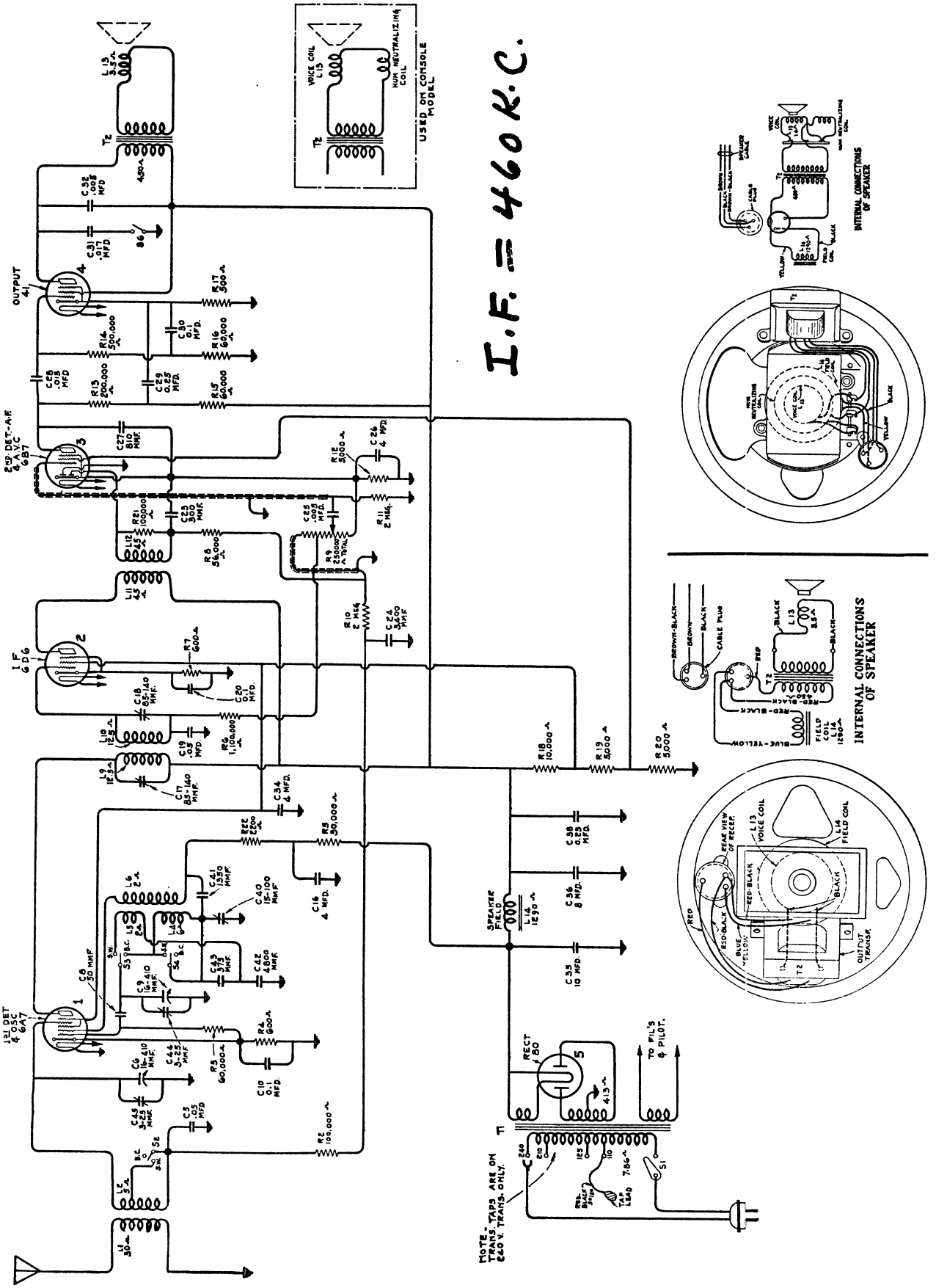




Trimmer Locations and Radiotron Socket Voltages to Ground

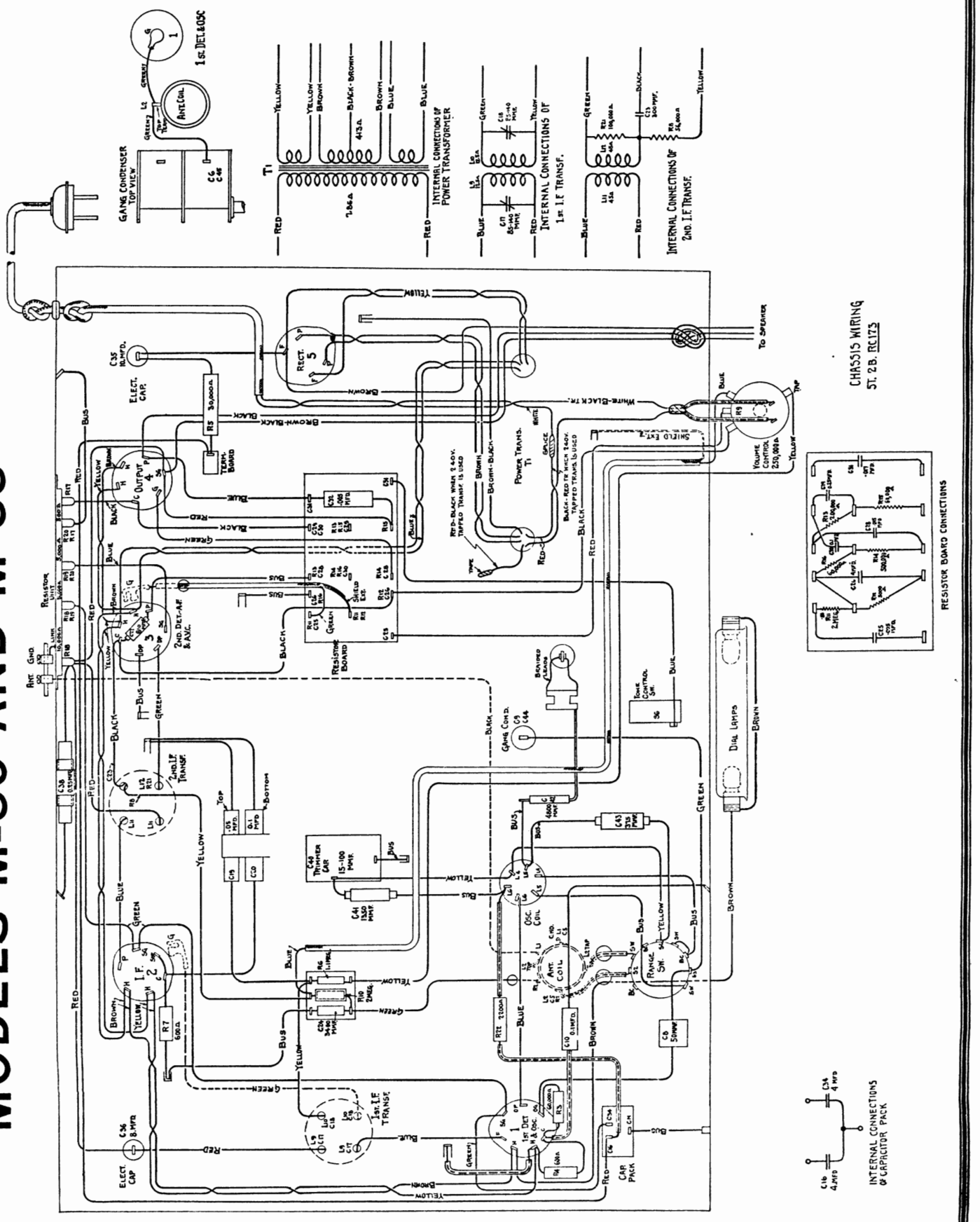
GENERAL ELECTRIC CO.

MODELS M-50 AND M-55



GENERAL ELECTRIC CO.

MODELS M-50 AND M-55



GENERAL ELECTRIC CO.

MODELS M-50 AND M-55

Five-Tube, Two-Band, A. C. Receivers

Five Radiotrons are associated in combination with a Superheterodyne circuit. Two of the Radiotrons are applied so as to obtain plural functions, thereby gaining more than the adequate results normally expected of a five-tube receiver. In the first stage of the circuit an RCA-6A7 pentagrid converter tube is employed as detector and local oscillator, the related external high-frequency circuits consisting of a tuned antenna transformer with a short-wave tap, and a three-winding oscillator coil assembly with changeover switches ganged to the antenna transformer s-w switch. Within the first detector tube, mixing of the signal and oscillator voltages is accomplished through electron coupling, the i-f appearing in the plate circuit.

The i-f system operates at 460 kc. as the basic frequency. The presence of the natural period transformer at the i-f output should be especially noted. Its use minimizes the number of line-up adjustments.

The combined second detector-audio amplifier-a.v.c. stage utilizes an RCA-6B7, a duplex-diode pentode Radiotron. One diode connects directly to ground, the other is used for detection. Part of the detected signal is filtered to remove the audible fluctuations and is applied to the first and second stages as a means of providing automatic volume control. The audio component of the detected signal is amplified by the RCA-6B7 and conveyed to a resistance-capacitance coupling network.

A power amplifier pentode, RCA-41, is used in the output stage and is coupled by a transformer to the low impedance voice coil of the speaker.

Full-wave rectification is employed in the power-supply stage. The speaker field winding serves in the filter circuit as a reactor.

SERVICE DATA

(1) Line-Up Capacitor Adjustments

This receiver must be in correct electrical alignment in order to obtain maximum efficiency and best quality of performance. The circuits should be realigned after each major service or repair operation, and whenever there are positive indications that the adjustments have deviated from normal by ordinary usage. These indications will be present together and will have the nature of: low sensitivity, poor tone quality and irregular double-peaked tuning.

A definite procedure must be applied in readjusting the line-up trimmers. The proper oscillator and indication equipment must also be used. Certain standard service instruments, which are useful for receiver adjustment, have been designed and made available by the manufacturer of this receiver. These are illustrated and described on page 2.

(2) I-F Tuning Adjustments

There are two i-f transformers associated in the intermediate amplifier system. The first of these transformers is tuned by accessible trimmers. The second transformer has a natural tuning inherent to its design. To obtain the correct alignment, proceed as follows:

(a) Short circuit the antenna and ground terminals and tune the receiver so that no signal is received. Set the volume control to its maximum position. Ground the receiver.

(b) Connect the output of the test oscillator between the first detector control grid and chassis ground. Attach an indicating meter, such as is illustrated on page 2, to the speaker circuit.

(c) Place the external oscillator into operation at 460 kc. Adjust the output so that a slight registration occurs on the output indicator. The output should be set at as low a value as will give a convenient indication during adjustment; this requirement is important in that the a.v.c. action is voided by such a method. Adjust the secondary and primary trimmers (C18 and C17) of the first i-f transformer for maximum receiver output.

R-F and Oscillator Adjustments

Three trimmers are provided, two for adjustment at 1720 kc. and one for oscillator line-up at 600 kc. No adjustments are required on the short-wave bands. Locations of the trimmers are shown on Figure 5. They should be adjusted in the following manner:

(a) Connect the output of the modulated Full Range Oscillator to the antenna and ground terminals of the receiver. Check the position

GENERAL ELECTRIC CO.

Models M-50 and M-55

of the dial pointer. It should set exactly on the radial line, adjacent to the dial reading of 540 when the tuning capacitor plates are at full mesh. After correcting the dial pointer, place the receiver in operation and set the selector at 1720 kc., advance the volume control to maximum and turn the range switch to its broadcast position.

(b) Adjust the frequency of the external oscillator to 1720 kc. and regulate its output until a perceptible indication appears on the output indicator. This indication should be held at a minimum during the adjustments. The trimmers C44 and C45 should then be tuned to the point giving peak receiver output.

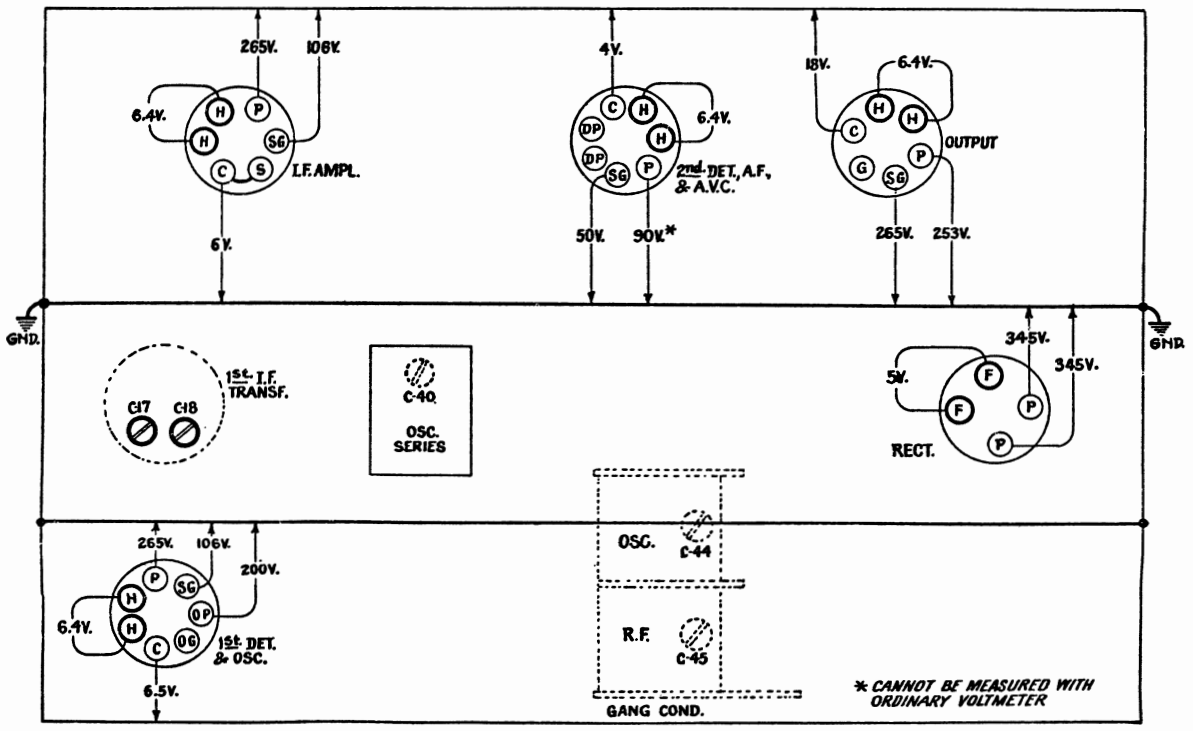
(c) Retune the test oscillator, setting its frequency to 600 kc. Turn the receiver selector control to the point where the incoming oscillator signal is received best. *This point will not always be exactly at 600 on the dial.* Then adjust the low-frequency trimmer C40, simultaneously rocking the tuning capacitor slowly through the signal until maximum receiver output results from these combined operations. This adjustment must be made irrespective of dial calibration. It is advisable to repeat the 1720 kc. adjustment of the oscillator trimmer C44 in order to correct for any change caused by the tuning of C40.

Radiotron Socket Voltages

The various normal operating voltages are given on Figure 5. As specified, they are referred to the chassis ground. Accuracy of measurements will be a function of the internal resistance of the voltmeter used. It is advisable to employ a meter having at least 1000 ohms per volt, and for each reading use the highest range which will give an acceptably accurate reading. General deviations from the values given, due to line voltage difference, should not be taken as indicating a defective condition. The erratic departure from normal of a single value or group of values should form the basis of circuit diagnosis.

Code Interference

In certain localities near to high-powered radiotelegraph stations operating at frequencies in the vicinity of 460 kc., slight code interference may be present. This adverse condition usually occurs over the entire tuning range, the strength of the interference not being affected by changing the station selector. A shielded wave trap, such as Part No. 4539, is adaptable for suppressing interference of this type. It should be connected in series with the antenna lead at the receiver, with its *green* lead to the antenna, and its *yellow* lead to the antenna terminal. The trap must be accurately tuned to the interfering signal. The shield of the trap should be securely grounded to the receiver chassis.

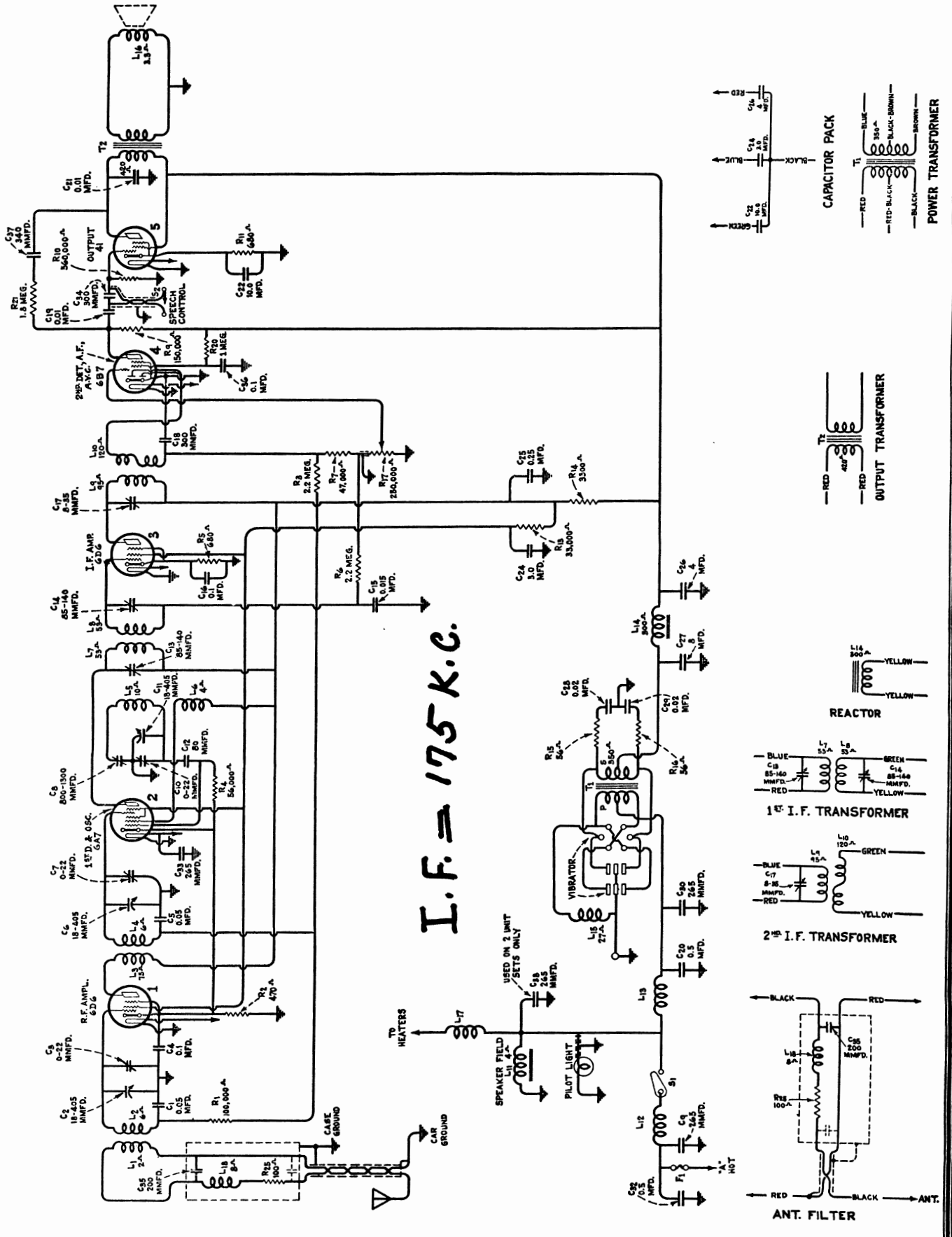


—Trimmer Locations and Radiotron Socket Voltages

(Measured at 115 volts line supply—Maximum Volume Control—No Signal)

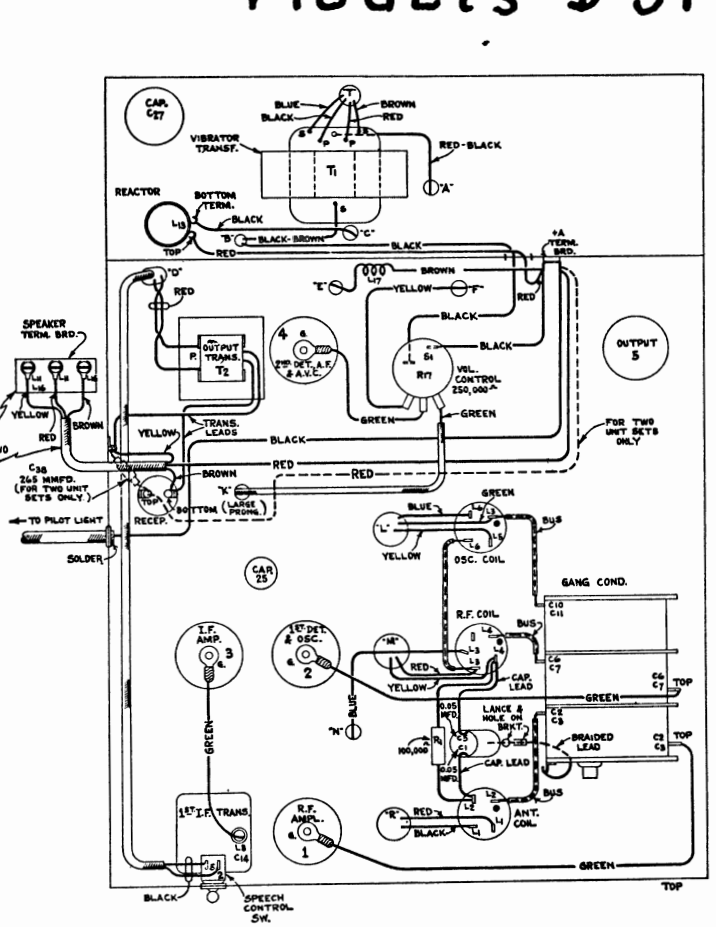
GENERAL ELECTRIC CO.

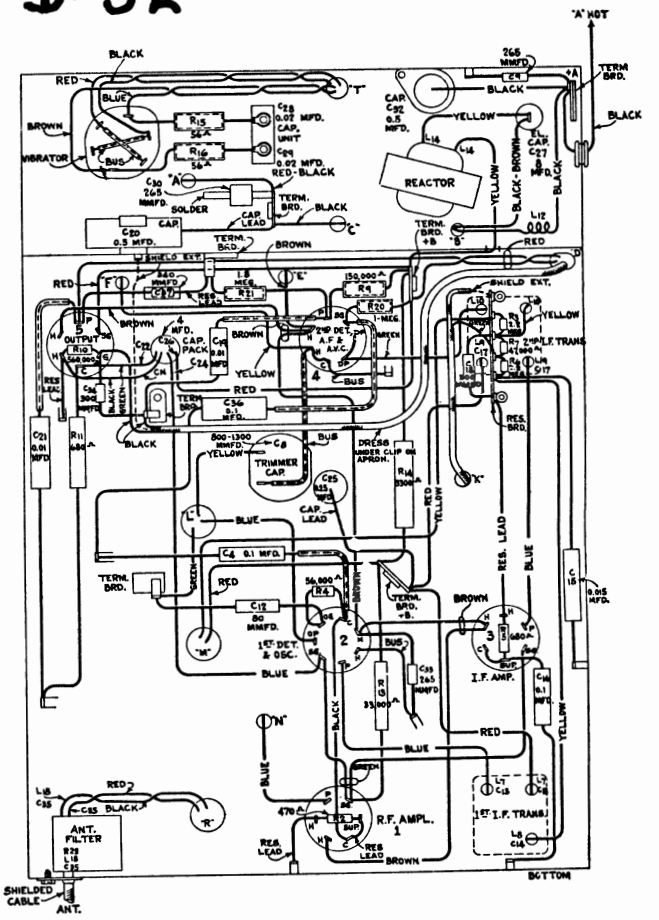
Models D-51—D-52

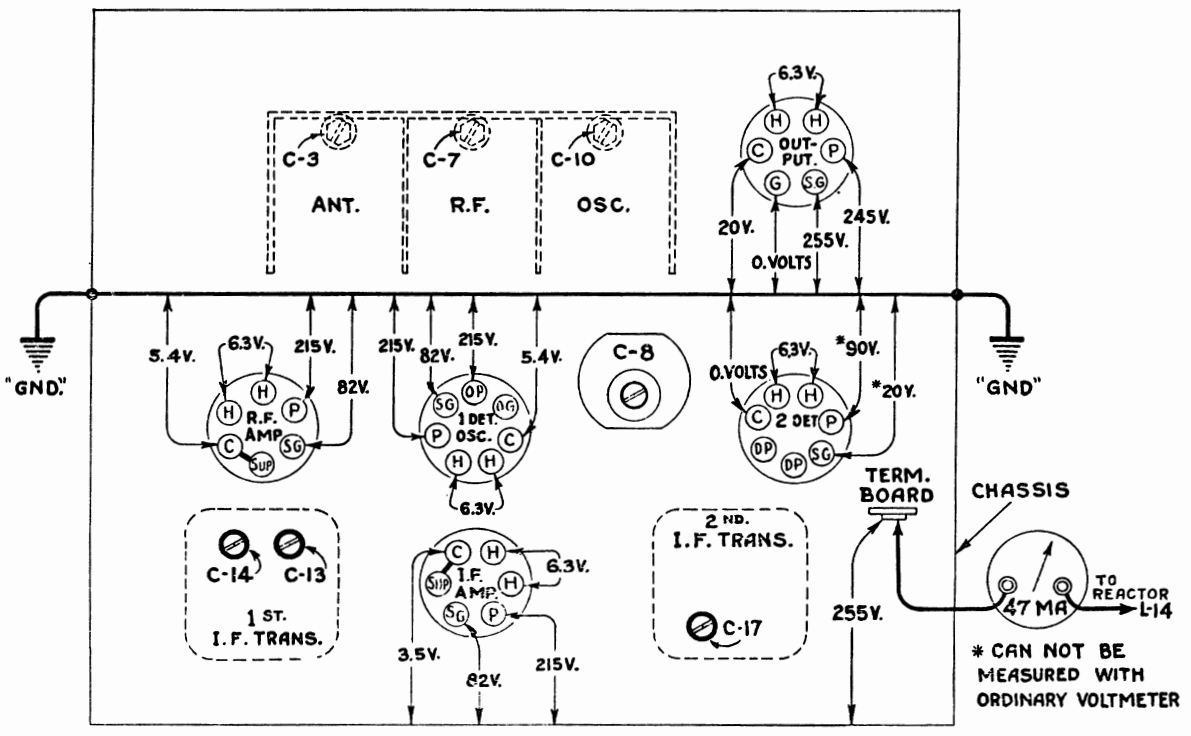


GENERAL ELECTRIC CO.

Models D-51—D-52





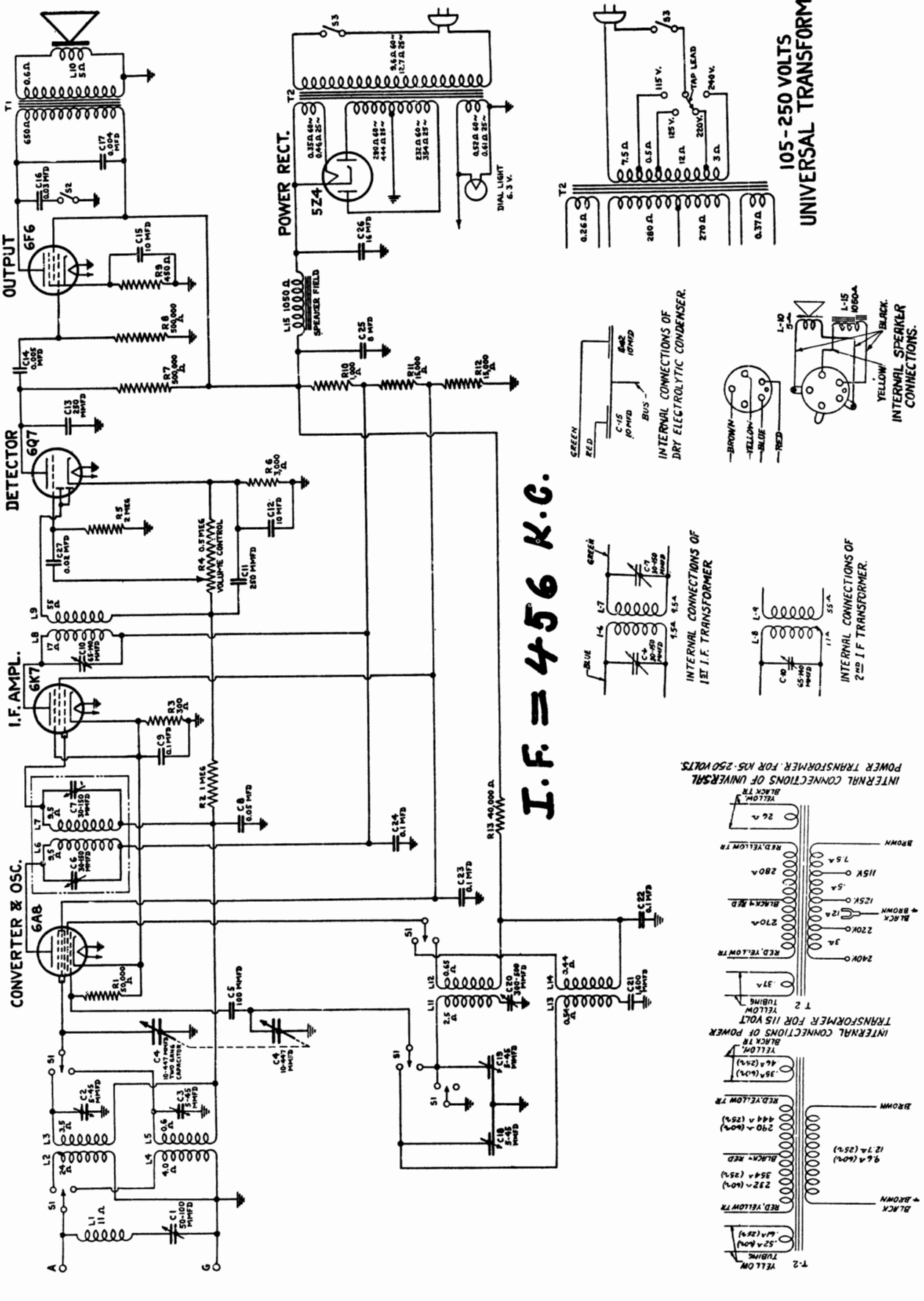


Trimmer Locations and Radiotron Socket Voltages to Ground

(Measured at 6.6 volts battery supply—Volume Control Maximum—No Signal)

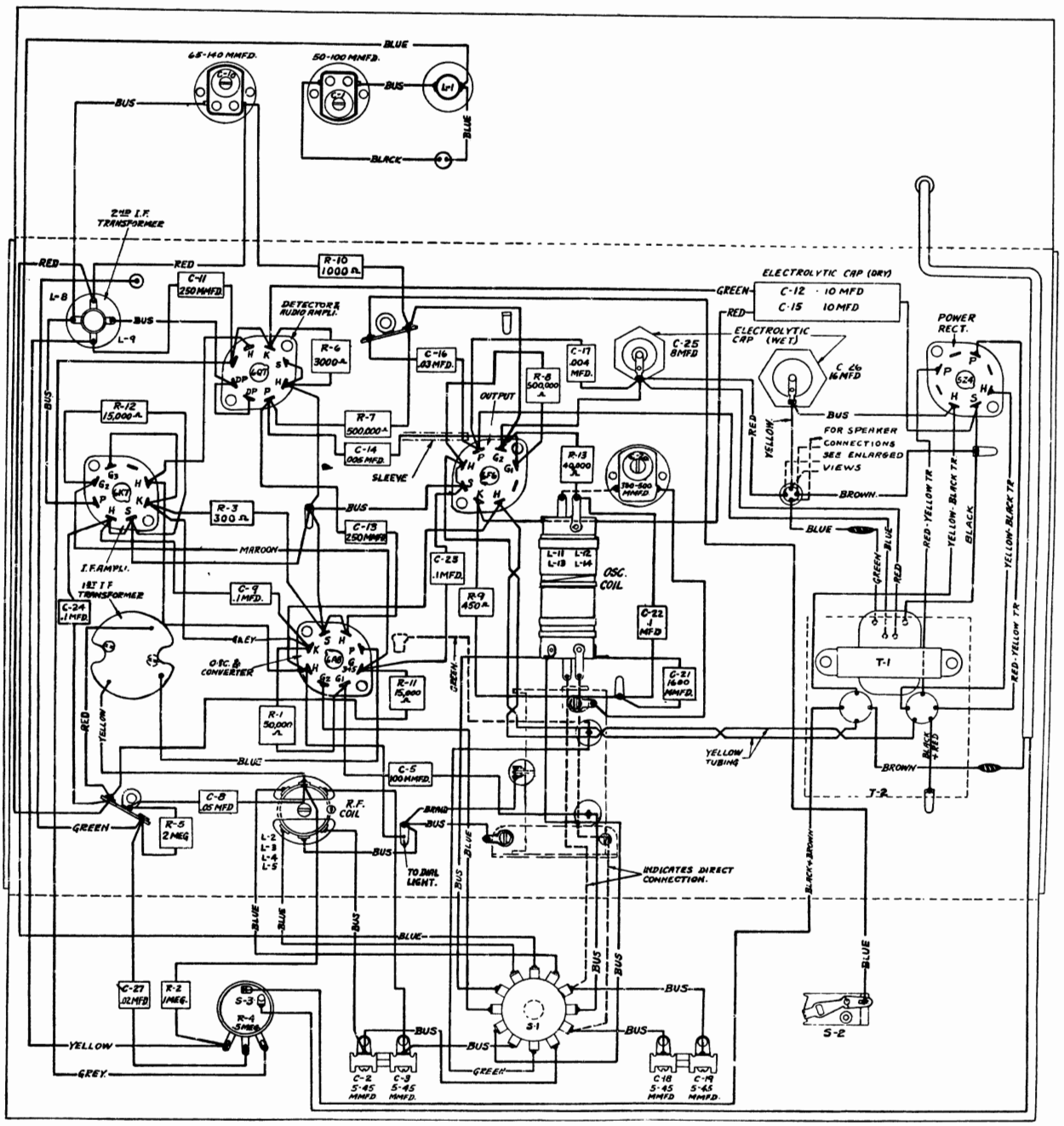
GENERAL ELECTRIC CO.

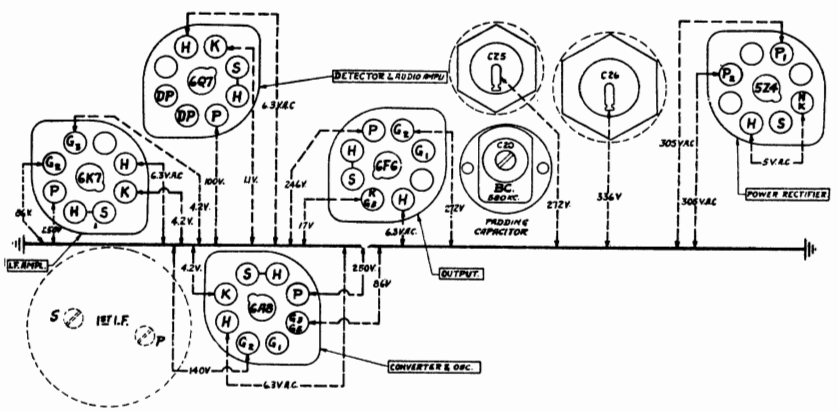
MODELS A-52 AND A-55



GENERAL ELECTRIC CO.

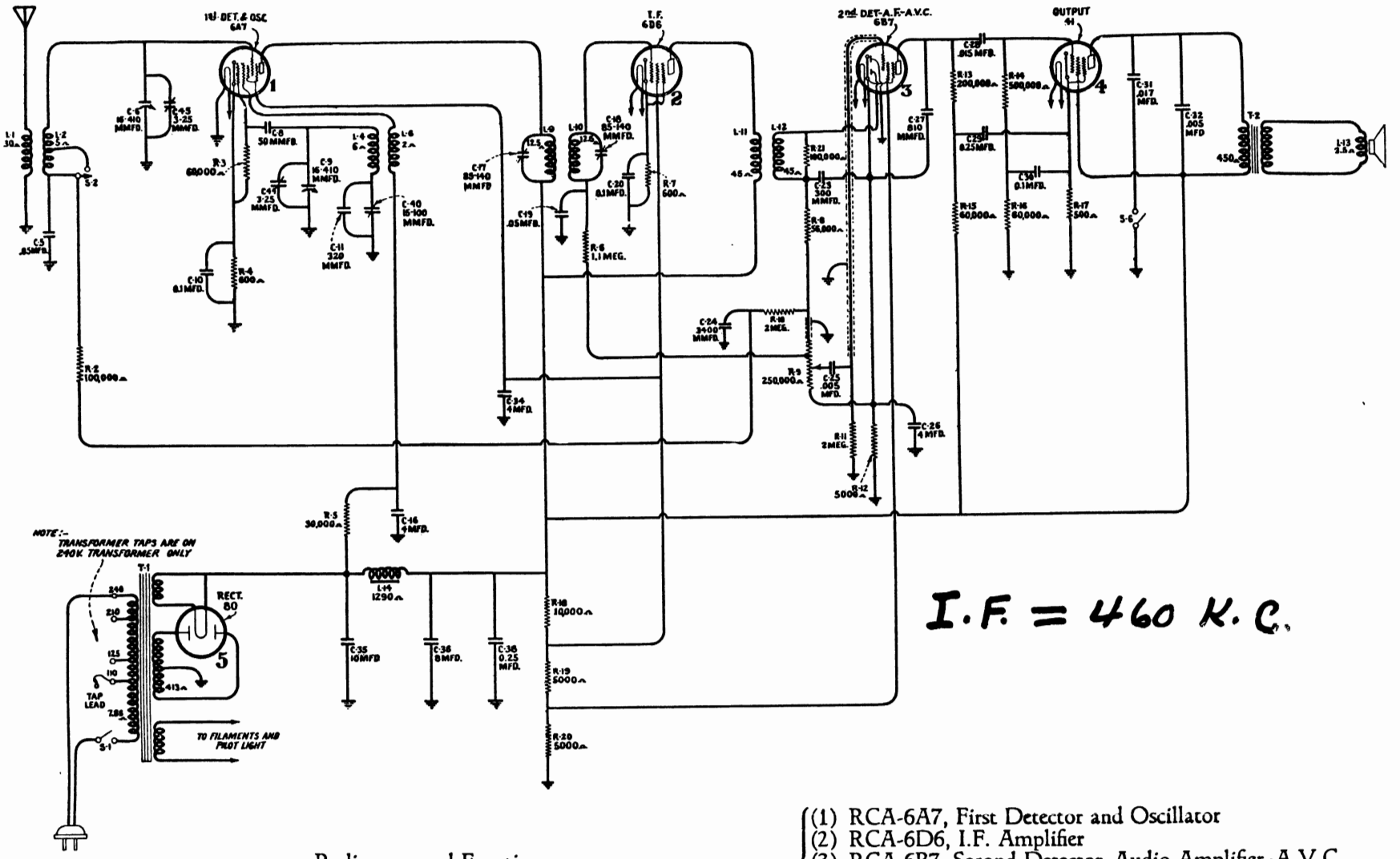
MODELS A-52 AND A-55





MODEL M-52

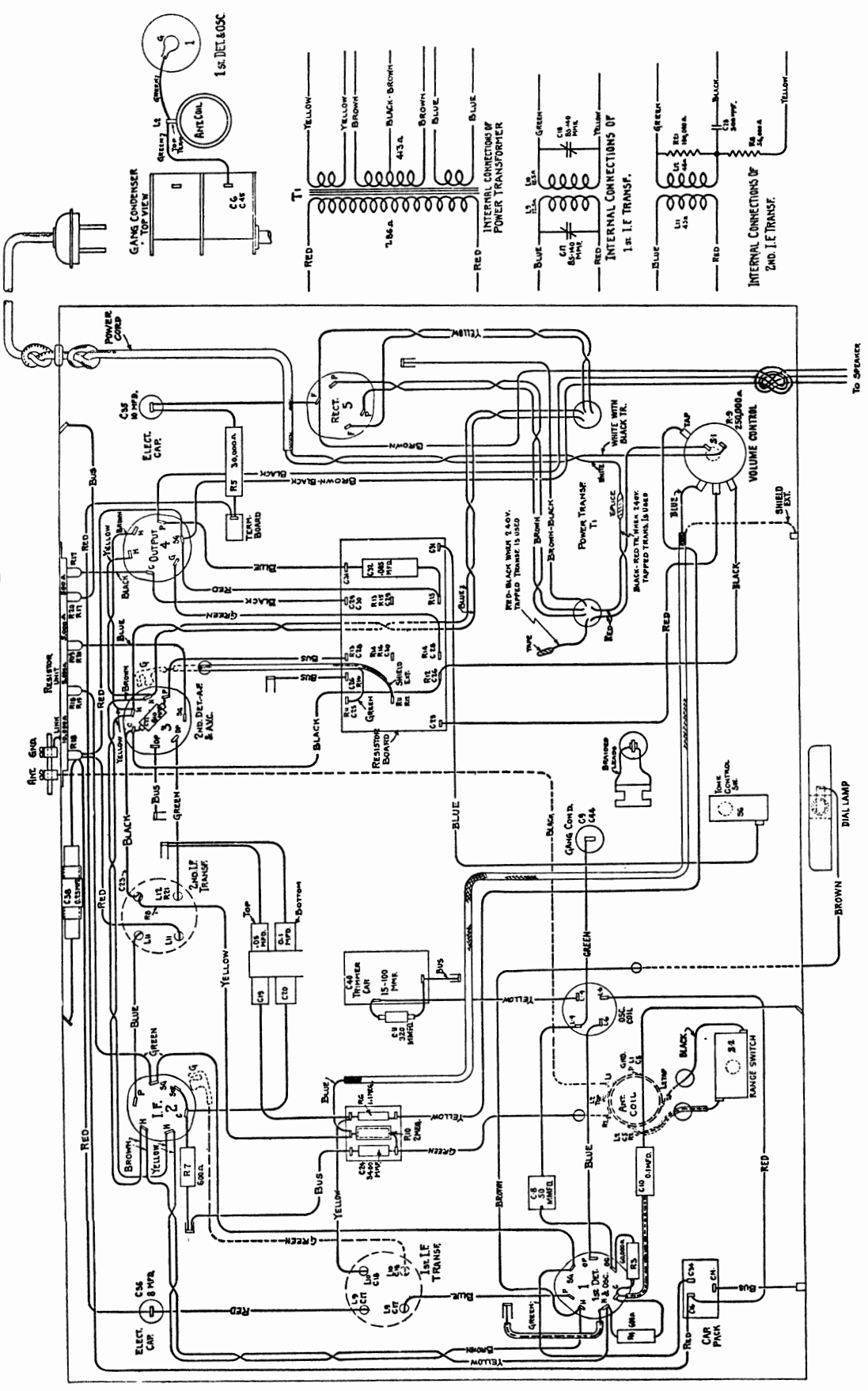
GENERAL ELECTRIC CO.



Radiotrons and Functions	(1) RCA-6A7, First Detector and Oscillator (2) RCA-6D6, I.F. Amplifier (3) RCA-6B7, Second Detector–Audio Amplifier–A.V.C. (4) RCA-41, Power Output (5) RCA-80, Rectifier
Tuning Frequency Ranges	540 KC. to 1720 KC. and 1600 KC. to 3500 KC.
Alignment Frequencies	460 KC. (I.F.), 1720 KC. (R.F. and Oscillator) 600 KC. (Oscillator)
Undistorted Output	1.75 Watts
Maximum Output	3.5 Watts
Loudspeaker	6-Inch, Electro-Dynamic

GENERAL ELECTRIC CO.

MODEL M-52



GENERAL ELECTRIC CO.

MODEL M-52

SERVICE DATA

(1) Line-Up Capacitor Adjustment:

This receiver must be in correct electrical alignment in order to obtain maximum efficiency and best quality of performance. The circuits should be realigned after each major service or repair operation, and whenever there are positive indications that the adjustments have deviated from normal by ordinary usage. These indications will be present together and will have the nature of: low sensitivity, poor tone quality and irregular double-peaked tuning.

A definite procedure must be applied in readjusting the line-up trimmers. The proper oscillator and indication equipment must also be used. A number of standard service instruments, which are useful for receiver adjustments, have been designed and made available by the manufacturer of this receiver. These are illustrated and described on page 2.

(2) I-F Tuning Adjustments:

There are two i-f transformers associated in the intermediate amplifier system. The first of these transformers is tuned by accessible trimmers. The second transformer has a natural tuning inherent to its design and does not require adjustment. To obtain the correct alignment proceed as follows:

(a) Short circuit the antenna and ground terminals and tune the receiver so that no signal is received. Set the volume control to its maximum position. Ground the receiver.

(b) Connect the output of the test oscillator between the first detector control grid and chassis ground. Attach an indicating meter, such as is illustrated on page 2, to the speaker circuit.

(c) Place the external oscillator into operation at 460 kc. Adjust the output so that a slight registration occurs on the output indicator. The output should be set at as low a value as will give a convenient indication during adjustment; this requirement is important in that the a.v.c. action is voided by such a method. Adjust the secondary and primary trimmers (C18 and C17) of the first i-f transformer for maximum receiver output.

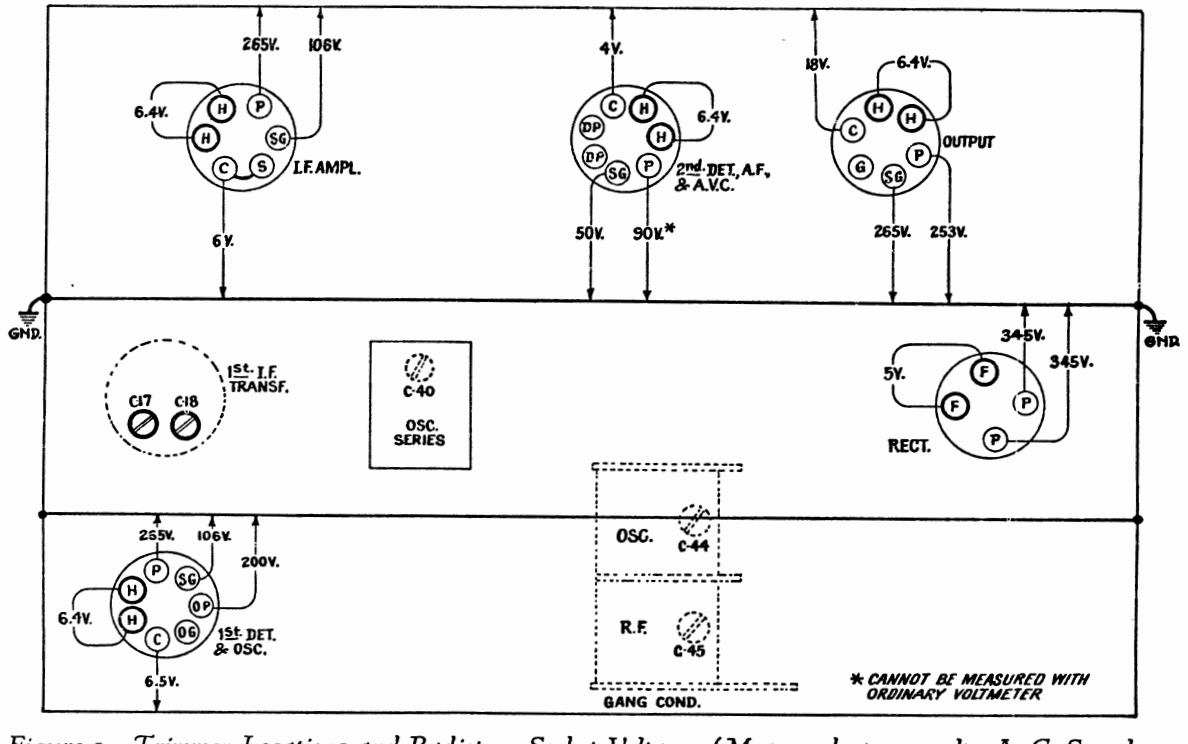


Figure 3—Trimmer Locations and Radiotron Socket Voltages (Measured at 115 volts A. C. Supply—Maximum Volume Control—No Signal)

GENERAL ELECTRIC CO.

Model M-52

R. F. and Oscillator Adjustments:

Three trimmers are provided, two for adjustment at 1720 kc. and one for oscillator line-up at 600 kc. No adjustments are required on the short-wave bands. Locations of the trimmers are shown on Figure 3. They should be adjusted in the following manner:

(a) Connect the output of the modulated Full Range Oscillator to the antenna and ground terminals of the receiver. Check the position of the dial pointer. It should set exactly on the radial line, adjacent to the dial reading of 540 when the tuning capacitor plates are at full mesh. After correcting the dial pointer, place the receiver in operation and set the selector at 1720 kc., advance the volume control to maximum and turn the range switch to its broadcast position.

(b) Adjust the frequency of the external oscillator to 1720 kc. and regulate its output until a perceptible indication appears on the output indicator. This indication should be held at a minimum during the adjustments. The trimmers C44 and C45 should then be tuned to the point giving peak receiver output.

(c) Re-tune the test oscillator, setting its frequency to 600 kc. Turn the receiver selector control to the point where the incoming oscillator signal is received best. *This point will not always be exactly at 600 on the dial.* Then adjust the low-frequency trimmer, C40, simultaneously rocking the tuning capacitor slowly through the signal until maximum receiver output results from these combined operations. This adjustment must be made irrespective of dial calibration. It is advisable to repeat the 1720 kc. adjustment of the oscillator trimmer C44, in order to correct for any change caused by the tuning of C40.

Radiotron Socket Voltages

The various normal operating voltages are given on Figure 3. As specified, they are referred to the chassis ground. Accuracy of measurements will be a function of the internal resistance of the voltmeter used. It is advisable to employ a meter having at least 1000 ohms per volt, and for each reading use the highest range which will give an acceptably accurate reading. General deviations from the values given, due to line voltage difference, should not be taken as indicating a defective condition. The erratic departure from normal of a single value or group of values should form the basis of circuit diagnosis.

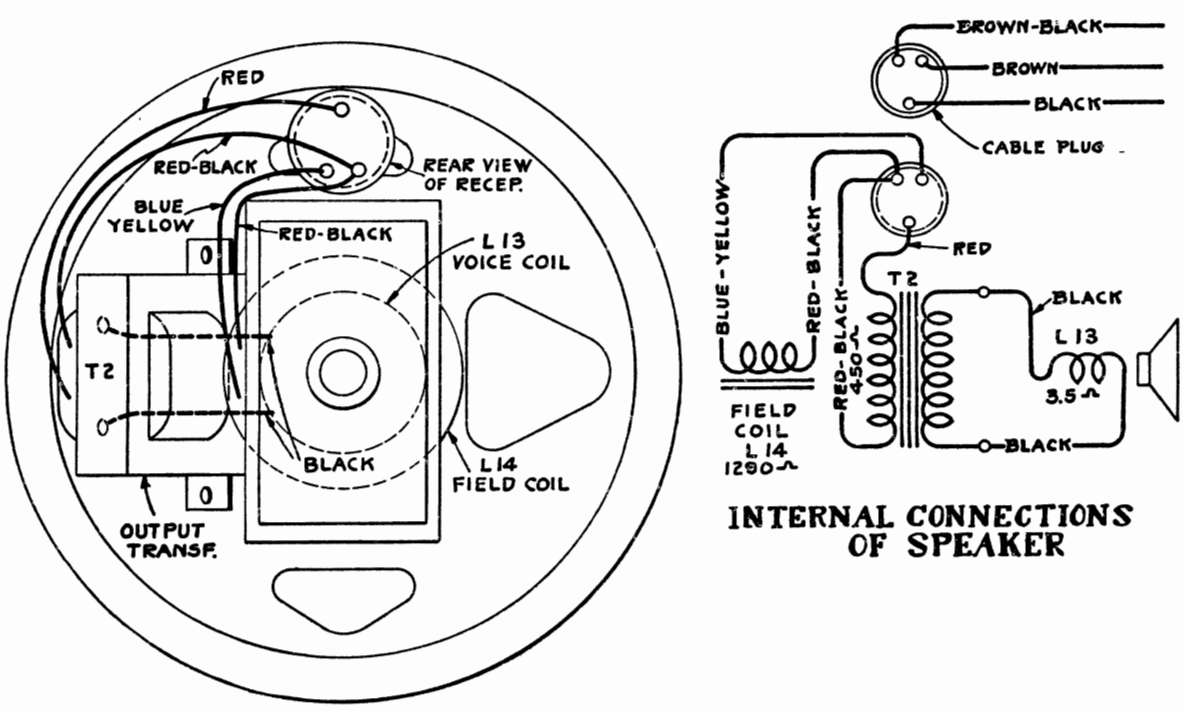


Figure 4—Loudspeaker Wiring

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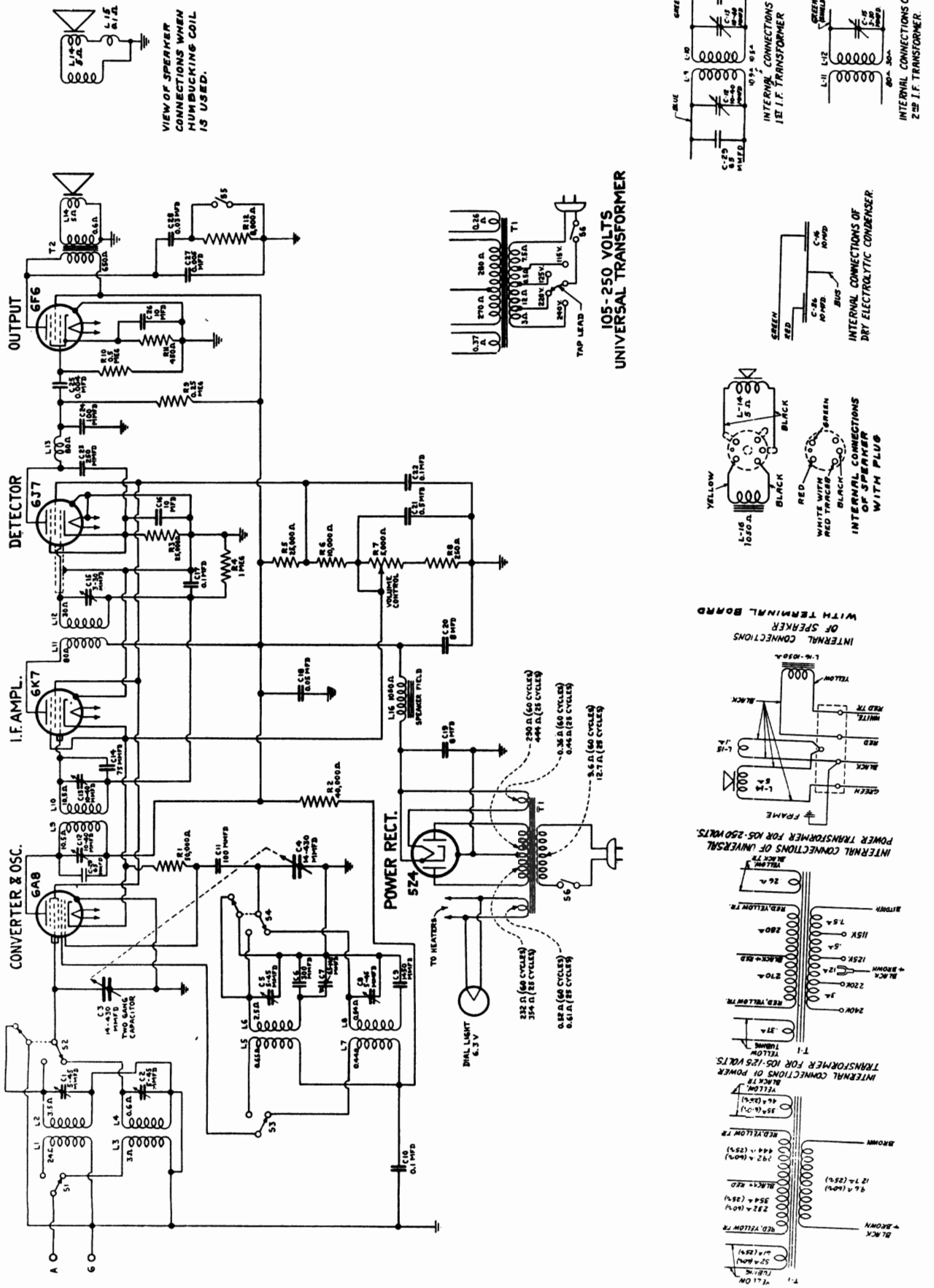
MODEL A-53



GENERAL ELECTRIC CO.

MODEL A-53

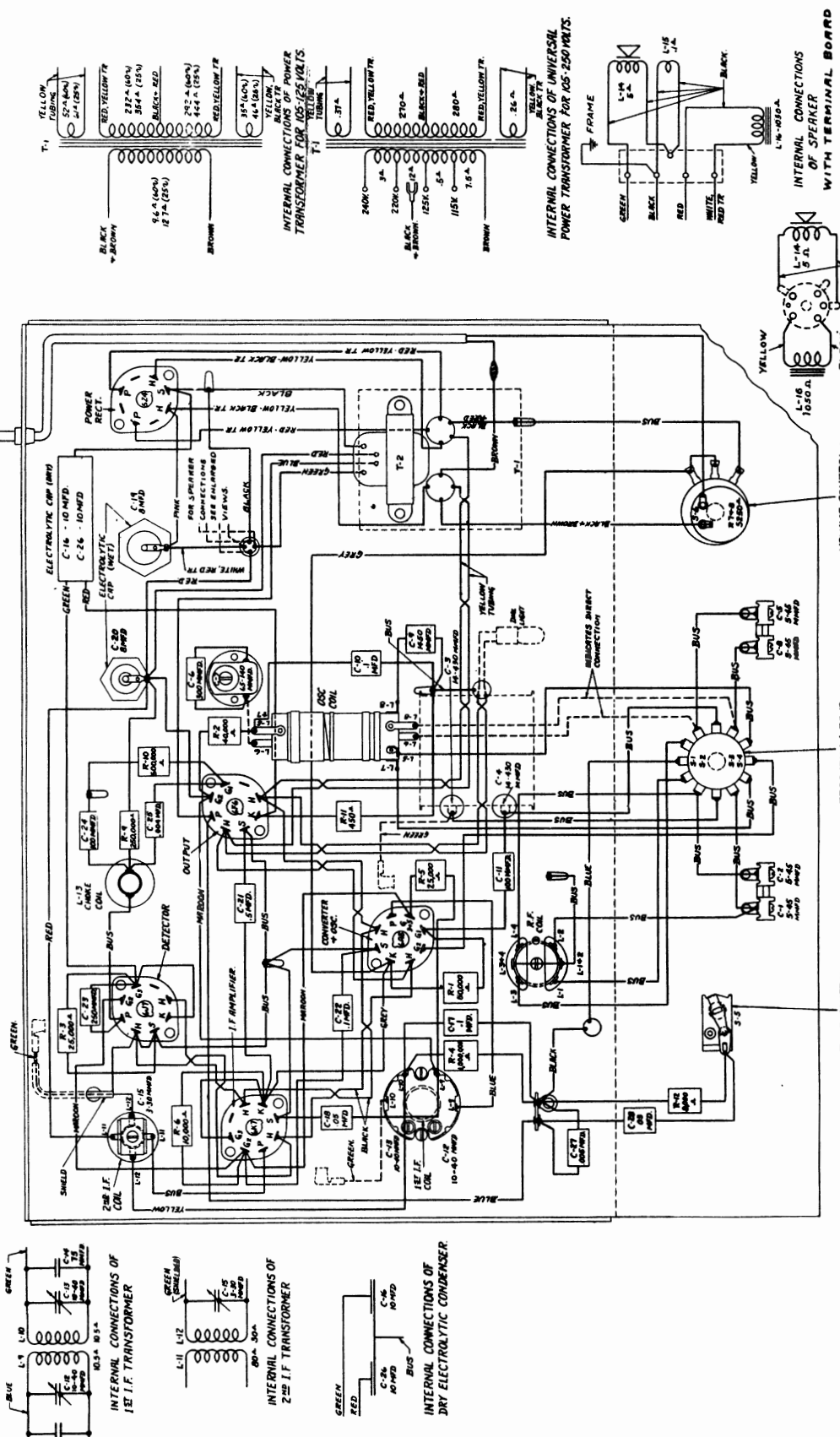


Fig. 3 Chassis Wiring Diagram

MODEL A-53

SERVICE DATA

Physical Specifications

Model	A-53
Height	15¼ in.
Width	11⅛ in.
Depth	6¼ in.
Weight Packed	18 lb.

Electrical Specifications

Rating Label	Power Supply—Volts		Frequency—Cycles	Power—Watts
A	105–125		50–60	65
C	105–125		25–60	70
V	105–120	115–130	40–60	70
	200–230	220–250		

Tuning Frequency Range

Broadcast 540–1600 kc.
Short Wave 2.4–6.8 mc. (2400–6800 kc.)
Control Drive Ratio: 5 to 1

Electrical Power Output

Undistorted 1.5 watts
Maximum 3.0 watts

Loud-speaker—Electrodynamic

Cone: 7 in. overall, 6 in. effective diameter
Cone coil impedance: 5 ohms at 400 cycles

Tubes

Oscillator and Converter:	6A8—Pentagrid Converter
I. F. Amplifier	6K7—Triple-Grid Super-Control Amplifier
Detector	6J7—Triple-Grid Detector Amplifier
Audio Power Amplifier	6F6—Power Amplifier Pentode
Rectifier	5Z4—Full-wave Rectifier
Dial Lamp	MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

The signal from the antenna is applied to the control grid of the 6A8 tube through the R.F. coil the secondary of which is tuned to the incoming signal by the rear section of the tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc. higher in frequency. The local signal is generated by the oscillator section of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the tuning condenser in conjunction with the oscillator coil and padding capacitors.

The combination of the two signals produces the intermediate frequency of 465 kc. This particular frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, the first of which has both primary and secondary tuned. The second transformer is unshielded and has only the secondary tuned to 465 kc.

Control of volume is obtained by the use of a variable resistor in the cathode circuits of the 6A8 and 6K7 tubes.

The output of the I. F. amplifier is applied to the grid of the 6J7 tube, used as a biased power detector. This tube has in its grid circuit a 1-megohm resistor, which is also tied to the grid-return of the 6K7 tube. The purpose of this arrangement is to prevent excessive overloading of the 6J7 detector when the volume control is turned up on a strong signal.

The output of the 6J7 detector is resistance coupled to the grid of the 6F6 power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .03-mfd. capacitor which is normally connected from the plate of the 6F6 to ground through a resistor. When it is desired to reduce the high frequency output of the receiver, the resistor is short-circuited by the tone control switch connecting the .03-mfd. capacitor directly from the 6F6 plate to ground.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube and utilizing the loud-speaker field as a filter reactor which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

Before making any adjustments to the R. F. circuits, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "tuning wand" into the antenna coil. The "tuning wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the antenna coil, the inductance is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in the coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand at the 1500-kc. point or the 6.0-mc. point, a decrease in resonant frequency of that circuit by increasing the antenna trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in antenna trimmer capacity is indicated. In the event that the brass cylinder end causes an increase in output at the 580-kc. point when inserted in the antenna coil, it is necessary to increase the oscillator padder capacity, meanwhile rocking the tuning dial. An increase in output, resulting from inserting the iron-filled end, indicates a decrease in oscillator padder capacity.

Alignment Frequencies

I. F.	Broadcast	Short-wave
465 kc.	580 kc.	6000 kc.
	1500 kc.	

In order to properly align this receiver, it will be necessary to have the following service tools:

1. Test Oscillator capable of producing the above alignment frequencies.
2. Non-metallic alignment screwdriver.
3. Output meter.

Trimmer locations as well as socket voltages are illustrated in Fig. 4.

(1) ***I. F. Alignment***

The I. F. amplifier should be tuned to 465 kc.; set the oscillator dial at this frequency. Set the volume control at maximum and short-circuit the antenna and ground leads. Tune the receiver to a point where no signal comes in and ground the chassis.

Connect the test oscillator output between the 6A8 converter tube grid and the chassis. Connect the output meter across the cone coil of the speaker and adjust the oscillator output until a small deflection is observed in the output meter.

The three I. F. trimmers are adjusted in the following sequence:

1. Secondary trimmer on second I. F. transformer.
2. Secondary trimmer on first I. F. transformer.
3. Primary trimmer on first I. F. transformer.

Throughout all adjustments the output should be maintained at a low level by decreasing the test oscillator output as the various stages are brought in line. After these adjustments have been made the same procedure should be repeated as a final check. The I. F. alignment will then be complete.

(2) ***R. F. Alignment***

The R. F. and oscillator transformers are aligned at 580, 1500, and 6000 kc. With the tuning condenser plates fully meshed, line up the pointer and dial by adjusting the dial set screws so that the line at the extreme end of the dial is indicated.

Broadcast Band

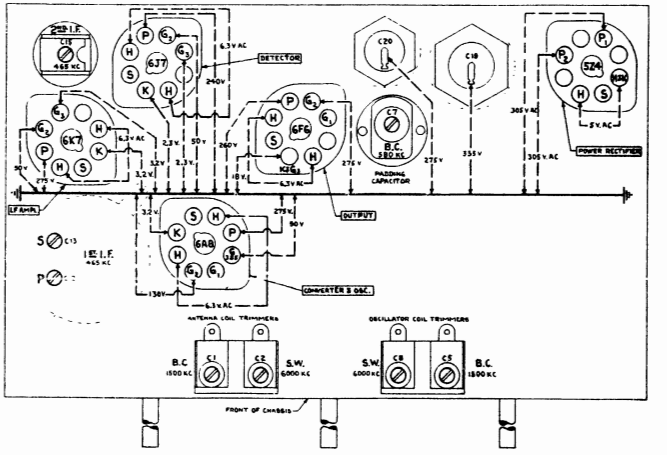
With the band switch in the clockwise position, set the tuning dial to 1500 kc. Set the test oscillator at 1500 kc. and adjust the oscillator trimmer for the broadcast band for maximum output. Next, set the R. F. trimmer for maximum output, taking care that the output from the test oscillator is not high enough to overload any part of the set. After these adjustments, tune the set and the test oscillator to 580 kc. Adjust the broadcast padding capacitor for maximum output while rocking the tuning condenser back and forth until maximum output is obtained. The dial setting after this adjustment may not agree exactly with the frequency, but this is not important.

To complete the broadcast band line-up, repeat the adjustment at 1500 kc. as before.

Short-wave Band

With the frequency band switch in the counter-clockwise position, set the receiver dial to 6.0 mc. Set the test oscillator at 6000 kc. and adjust the short-wave oscillator trimmer for maximum output. Next, set the short-wave R. F. trimmer for maximum output. Repeat these adjustments a second time. After aligning the S. W. band, turn the test oscillator to approximately 6930 kc. with the receiver dial still at 6 mc. Increase the test oscillator output until a signal is heard in the neighborhood of 6930 kc. This is the image frequency and if the set has been properly aligned the sensitivity at this point will be much less than at 6000 kc. In the event the image frequency cannot be found, the alignment should be rechecked at 6.0 mc. It will be noticed that the oscillator trimmer will have two positions at which the signal will give maximum output. The position which gives the lower trimmer capacitance obtained by turning the trimmer screw counterclockwise is the proper adjustment.

When these adjustments have been completed the receiver will be in alignment.

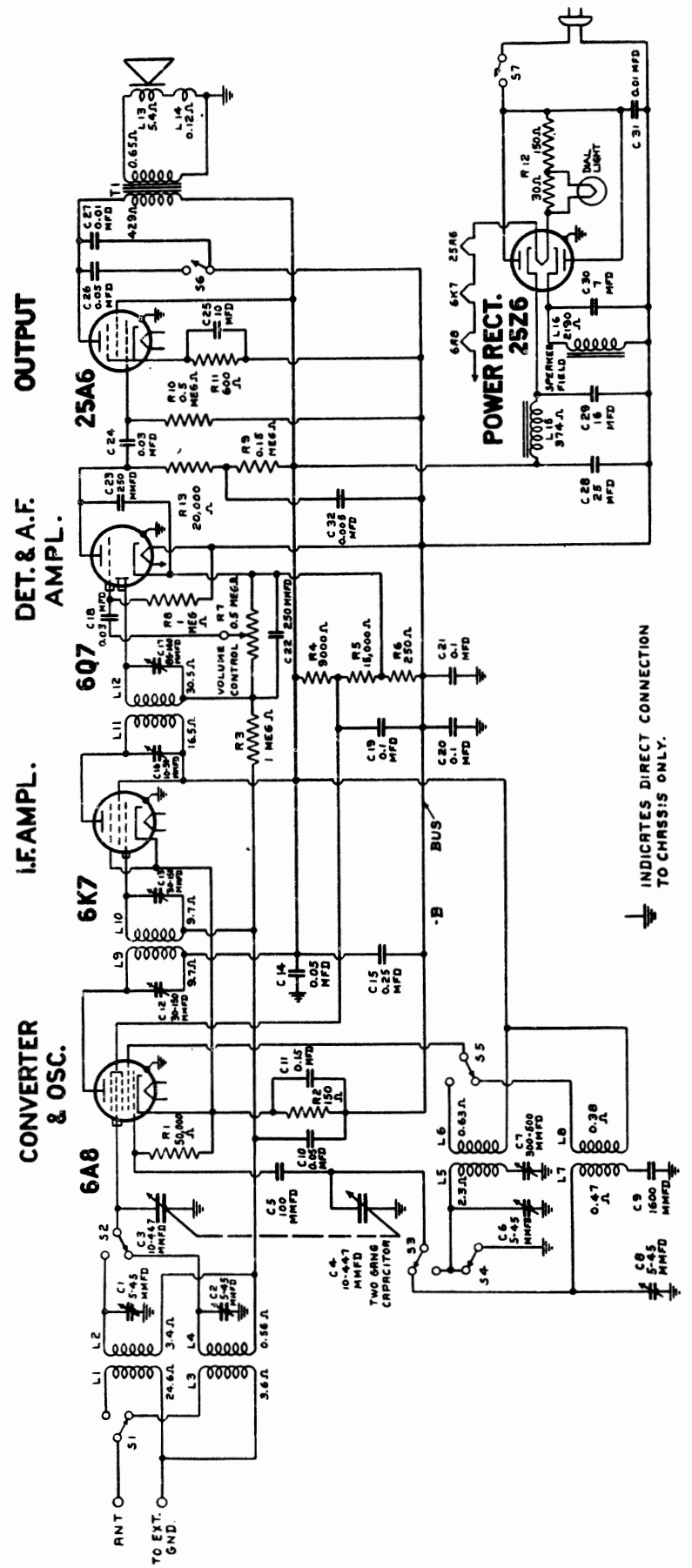


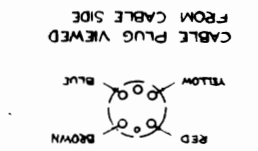
VIEWED FROM UNDERSIDE OF CHASSIS

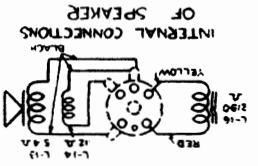
Fig. 4 Trimmer Locations and Socket Voltages

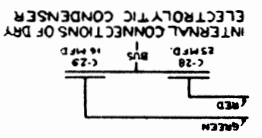
GENERAL ELECTRIC CO.

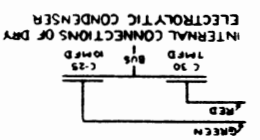
MODEL A-54

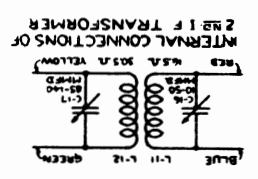


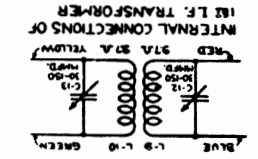












GENERAL ELECTRIC CO.

Model A-54

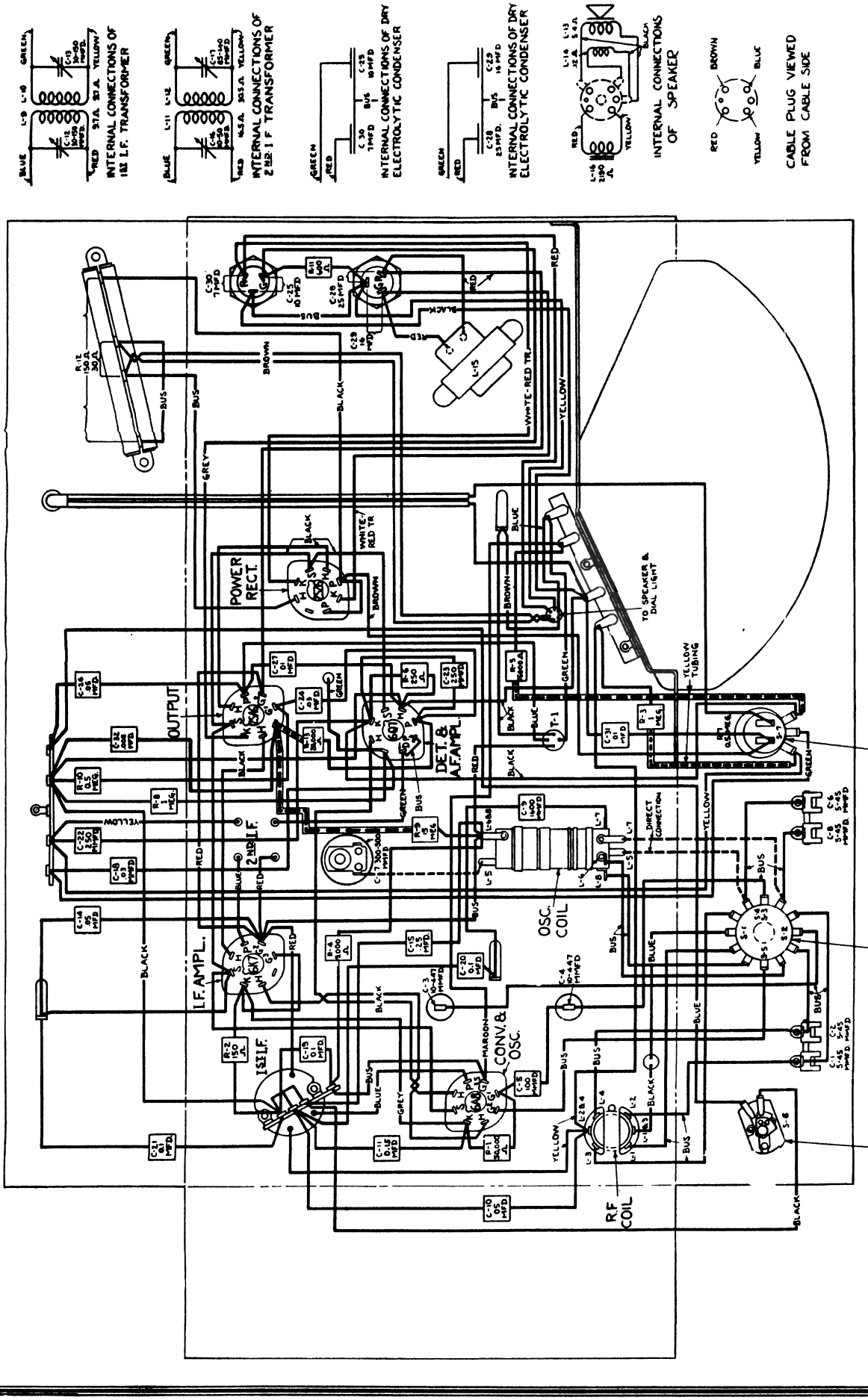


Fig. 2. Chassis Wiring Diagram

Model A-54

SERVICE DATA

Physical Specifications

Model	A-54
Height	9¾ in.
Width	14 in.
Depth	7 in.
Weight Packed	16 lb.

Electrical Specifications

Power Supply—Volts	Frequency Cycles on A.C.	Power Watts
105–130 A.C. or D.C.	25-133	60 max.

Tuning Frequency Range

Broadcast	540-1720 kc.
Short-wave	2.3-7.0 mc.
Tuning Control Drive Ratio:	5:1

Electrical Power Output

Undistorted	0.4 watt
Maximum	1.1 watts

Loud-speaker—Electrodynamic

Cone: 6½ in. type
Cone Coil Impedance 5.5 ohms at 400 cycles.

Tubes

Oscillator and Converter	6A8 Pentagrid Converter.
I.F. Amplifier	6K7 Triple-Grid Super-Control Amplifier.
Detector, AVC and First Audio Amplifier	6Q7 Duo-Diode High-mu Triode.
Audio Power Amplifier	25A6 Power Amplifier Pentode.
Rectifier	25Z6 Rectifier.
Dial Lamp	Mazda No. 46.

DESCRIPTION OF ELECTRICAL CIRCUIT

The signal from the antenna is applied to the control grid of the 6A8 tube through the R.F. transformer, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc. higher in frequency. The local signal is generated by the oscillator section of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the tuning condenser in conjunction with the oscillator coils and padding capacitors.

The combination of the two signals produces the intermediate frequency of 465 kc. This particular frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, both of which have tuned primaries and secondaries.

The output of the I.F. amplifier is rectified by the diode section of the 6Q7 tube, providing automatic volume control bias as well as detection. The audio frequency voltage developed across R-7 is applied through C-18 to the grid of the triode section of this tube from the variable arm of R-7 which constitutes the volume control of the receiver. The D.C. voltage developed across R-7 is applied to the control grids of the 6A8 and 6K7 tubes for automatic volume control.

The output of the 6Q7 amplifier section is resistance coupled to the grid of the 25A6 power amplifier pentode. The plate circuit of the 25A6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .05-mfd. capacitor which is connected from the plate of the 25A6 tube to "B-" lead through the tone control switch. When it is desired to reduce the high frequency output of the receiver the tone control switch is closed by turning the tone control knob to the right.

When the receiver is used on alternating current, plate and grid voltages and loud-speaker field current are supplied by a 25Z6 rectifier tube and its associated filter circuits. Each section of the 25Z6 tube acts as a separate half-wave rectifier, one for speaker field current, and one for plate and grid voltages, and each section has its own filter circuit.

When the receiver is used on a D.C. supply the 25Z6 rectifier tube remains in the circuit and serves two purposes. If the power cord should be plugged in with incorrect polarity, the 25Z6 tube protects the filter condensers from damage. On correct D.C. polarity the 25Z6 tube aids the filter circuits in smoothing the supply, thus minimizing line noise.

The heaters of all tubes and the dial light with its shunt ballast resistor (the 30-ohm section of R12) are all in series and are furnished current from the power line through a dropping resistor (the 150-ohm section of R12).

Note that the chassis is not connected directly to either the ground lead or to the power supply, but is by-passed to the "B-" lead by various condensers.

ALIGNMENT PROCEDURE

Before making any adjustments to the R.F. circuits, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "tuning wand" into the antenna coil. The "tuning wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the antenna coil, the inductance is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in the coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand at the 1500-kc. point or the 6.0-mc. point, a decrease in resonant frequency of that circuit by increasing the antenna trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in antenna trimmer capacity is indicated. In the event that the brass cylinder end causes an increase in output at the 580-kc. point when inserted in the antenna coil, it is necessary to increase the oscillator padder capacity, meanwhile rocking the tuning dial. An increase in output, resulting from inserting the iron-filled end, indicates a decrease in oscillator padder capacity.

ALIGNMENT FREQUENCIES

I.F.	Broadcast	Short-wave
465 kc.	580 kc. 1500 kc.	6000 kc.

In order to properly align this receiver, it will be necessary to have the following service tools:

1. Test Oscillator capable of producing the above alignment frequencies.
2. Non-metallic alignment screwdriver.
3. Output meter.

Trimmer locations as well as socket voltages are illustrated in Fig. 3.

(1) I.F. Alignment

The I.F. amplifier should be tuned to 465 kc.; set the test oscillator dial at this frequency. Set the volume control at maximum and short-circuit the antenna and ground leads. Tune the receiver to a point where no signal comes in.

Connect the test oscillator output between the 6A8 converter tube grid (with the grid cap on) and the chassis. Connect the output meter across the cone coil of the speaker and adjust the oscillator output until a small deflection is observed in the output meter.

The four I.F. trimmers are adjusted in the following sequence:

1. Secondary trimmer on second I.F. transformer.
2. Primary trimmer on second I.F. transformer.
3. Secondary trimmer on first I.F. transformer.
4. Primary trimmer on first I.F. transformer.

Throughout all adjustments the output should be maintained at a low level by decreasing the test oscillator output as the various stages are brought in line. After these adjustments have been made, the same procedure should be repeated as a final check. The I.F. alignment will then be complete.

(2) R.F. Alignment

The R.F. and oscillator transformers are aligned at 580, 1500, and 6000 kc. With the tuning condenser plates fully meshed, line up the pointer and dial by adjusting the dial set screws so that the line at the extreme end of the dial is indicated.

(a) Broadcast Band

With the band switch in the clockwise position, set the tuning dial to 1500 kc. Set the test oscillator at 1500 kc. and adjust the oscillator trimmer for the broadcast band for maximum output. Next, set the R.F. trimmer for maximum output, taking care that the output from the test oscillator is not high enough to overload any part of the set. After these adjustments, tune the set and the test oscillator to 580 kc. Adjust the broadcast padding capacitor for maximum output while rocking the tuning condenser back and forth until maximum output is obtained. The dial setting after this adjustment may not agree exactly with the frequency, but this is not important.

To complete the broadcast band line-up, repeat the adjustment at 1500 kc. as before.

(b) Short-wave Band

With the frequency band switch in the counterclockwise position, set the receiver dial to 6.0 mc. Set the test oscillator at 6000 kc. and adjust the short-wave oscillator trimmer for maximum output. Next, set the short-wave R.F. trimmer for maximum output. Repeat these adjustments a second time. After aligning the S. W. band, turn the test oscillator to approximately 6930 kc. with the receiver dial still at 6.0 mc. Increase the test oscillator output until a signal is heard in the neighborhood of 6930 kc. This is the image frequency and if the set has been properly aligned the sensitivity at this point will be much less than at 6000 kc. In the event the image frequency cannot be found, the alignment should be rechecked at 6.0 mc. It will be noticed that the oscillator trimmer will have two positions at which the signal will give maximum output. The position which gives the lower trimmer capacitance obtained by turning the trimmer screw counterclockwise is the proper adjustment.

When these adjustments have been completed the receiver will be in alignment.

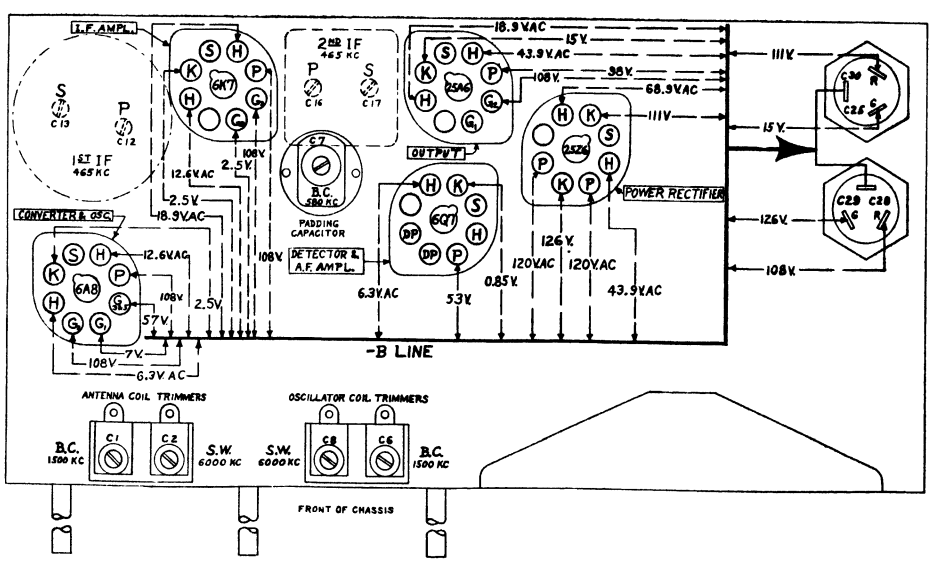
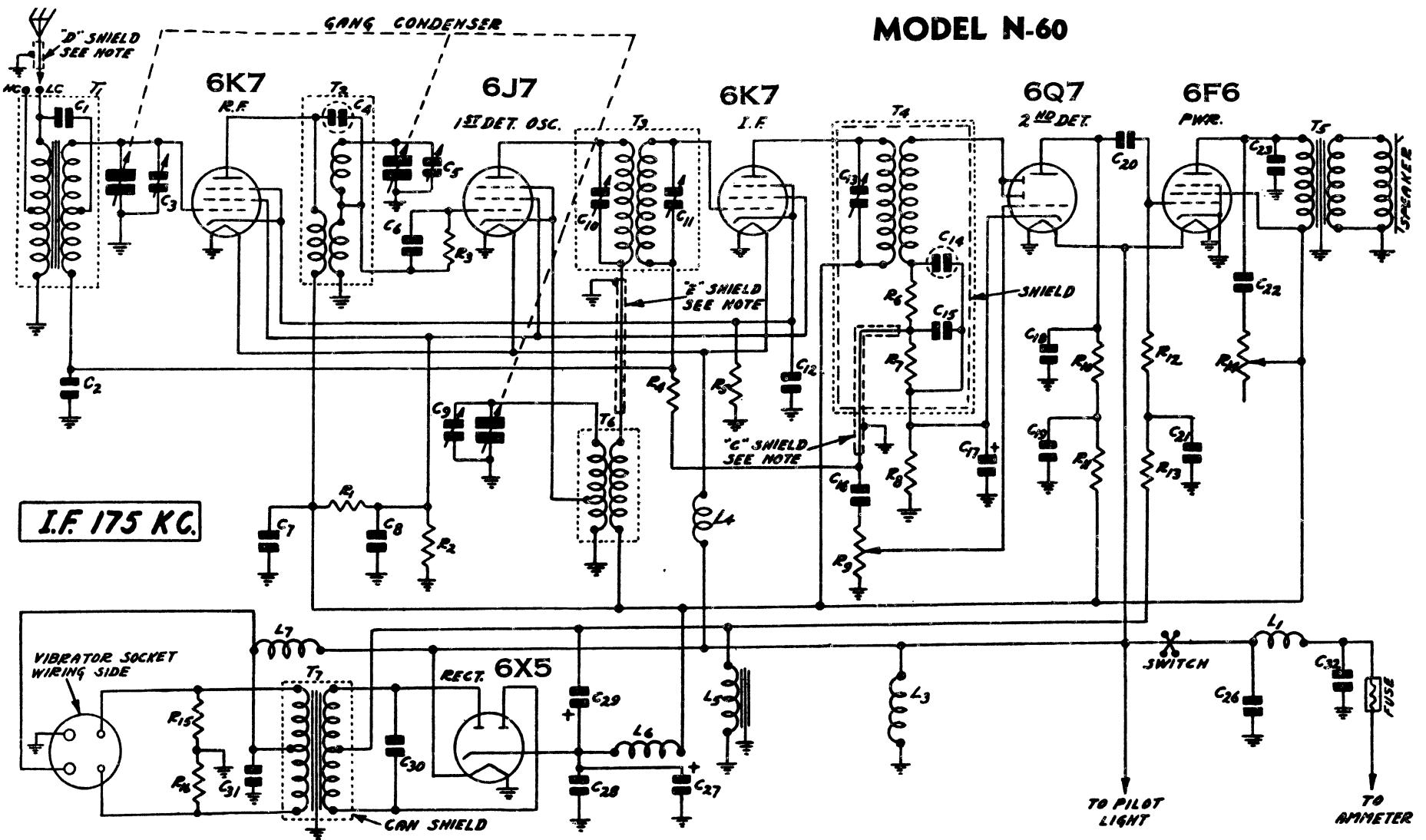


Fig. 3. Trimmer Locations and Socket Voltages (120 V., 60 Cycle, AC Supply)

MODEL N-60

GENERAL ELECTRIC CO.



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1 10 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } Dual
C11 70-150 mmf. }
C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.
C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C26 2000 mmf.
C28 2000 mmf.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C32 2000 mmf.
C17 4.0 mf. 25 V. } Electrolytic
C27 5.0 mf. 350 V. } Block
C29 8.0 mf. 350 V. }

R 1 17000 ohm 1.0 W.
R 2 20000 ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Vol. Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.
R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

T 1 Antenna Trans.
T 2 R.F. Inter. Trans.
T 3 1st I.F. Trans.
T 4 2nd I.F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 3 Speaker Field 5.3 ohm
L 4 Filament Reactor
L 5 Filter Reactor
L 6 "B" Reactor
L 7 Vibrator Reactor

MODEL N-60

6 Tube Automobile Radio
SERVICE MANUAL AND PARTS LIST

Form 1204-J

SPECIFICATIONS

Power Consumption - - 7.0 Amperes at 6.0 Volts	Tuning Frequency Range - - - 530 to 1650 KC
Power Output (Undistorted) - - - - - 3 Watts	Intermediate Frequency - - - - - - 175 KC
Power Output (Maximum) - - - - - 4 Watts	Speaker - - - - - - - - - - 6 inch Dynamic

Circuit

This model is a 6 tube automobile receiver covering the standard wave band. It has a tuning range as shown in the specifications above. The signal is fed through an antenna transformer with tuned secondary into a 6K7 tube which functions as an R.F. amplifier. The output of this tube is fed through another R.F. transformer with tuned secondary into a 6J7 tube which functions as the first detector and oscillator. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency 175 KC above the frequency to which the R.F. circuits are tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are tuned by small trimmer condensers.

A 6Q7 dual diode-triode tube functions as a diode 2nd detector, AVC tube and a one stage audio amplifier. AVC voltage is applied to the control grid circuits of the 6K7 R.F. and I.F. tubes. The manual volume control varies the audio voltage applied to the grid of the 6Q7 tube.

In the output stage a 6F6 tube is employed. A dynamic reproducer is used.

The vibrator in the power unit interrupts the current through the primary of the power transformer. The use of a vibrating interrupter in the primary circuit and a high ratio transformer results in the application of high voltage AC to the rectifier tube plates. The 6X5 full wave rectifier tube, filter choke, and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

Alignment and Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

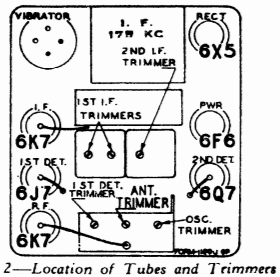


Fig. 2—Location of Tubes and Trimmers

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC. Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. **The antenna trimmer is on the center tuning condenser section—see Fig. 2.** Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

General Service Data

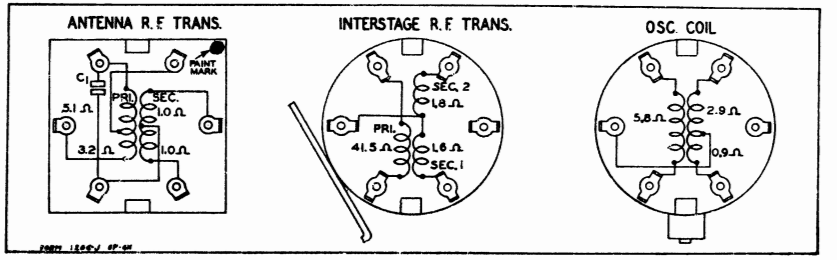


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Coil	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	R. F. Coil (Interstage R. F.)	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2
T5	Dynamic Speaker Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	"A" Line Reactor	Small
L4	Filament Reactor	.22
L5	Power Reactor	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

Model N-60

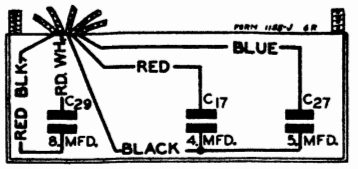


Fig. 4—Condenser Block—Internal Wiring

Installation and Noise Suppression

The necessary information for installing this receiver and for suppression of ignition and generator noise is contained in the Installation Manual which is packed with each receiver. Two additional items regarding reduction of noise can be mentioned as follows:

Be sure that the cover is well grounded to the chassis case—clean off paint or particles of dirt which may prevent a good ground.

In extreme cases of motor noise it is advisable to peen the distributor rotor arm, that is, increase the length of the arm by using a small machinist's hammer. This will lessen the gap between the rotor arm and the stationary contacts, reducing the spark. Be sure, after peening the arm, that it does not strike the stationary contacts.

Voltages at Sockets

In the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

VOLTAGES AT SOCKETS

Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6K7	R. F. Amp.	5.6	230	100	4.6	8.0
6J7	1st Det. Osc.	5.6	230	100	0	2.8
6K7	I. F. Amp.	5.6	230	100	4.6	8.0
6Q7	2nd Det.	5.8	100(1)		1.6	0.4
6F6	Power	5.8	220	240	18.0(2)	29.0
6X5	Rectifier	5.8				53.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

Instrument Panel Mounting Kits

Car	Year & Model	Instrument Panel Kit No.	List Price
Buick	1936	5516	$ .85
Chevrolet	1935-36 Standard & Master	5511	.65
Chrysler	1936 All Models	5519	.85
DeSoto	1936 Airflow Airstream-Custom	5526	.85
	Airstream-DeLuxe	5527	
Dodge	1936 DeLuxe	5513	.85
Ford	1936 Standard & DeLuxe	5510	.65
	1935 DeLuxe		
Hudson	1936	5517	$ .85
Oldsmobile	1936	5514	.85
Packard	1936 120-8	5524	.85
	1400 Std. 8	5525	
Plymouth	1936 DeLuxe	5512	.65
Pontiac	1935-36 Standard DeLuxe 6 & 8	5515	.65
Studebaker	1936 Dictator	5522	.85
	President	5523	
Terraplane	1936	5518	.85
Steering column and under instrument panel kit		5509	.65

The panel kits listed above include only the escutcheon plate, dial crystal, knobs, special brackets and small items such as screws.

The steering column and under panel kit permits the installation of the No. 4 Universal Head in all cars in which the head cannot be mounted on the instrument panel.

Additional panel kits may be available at a later date, in which case a supplementary listing will be issued.

Control Head Mounting

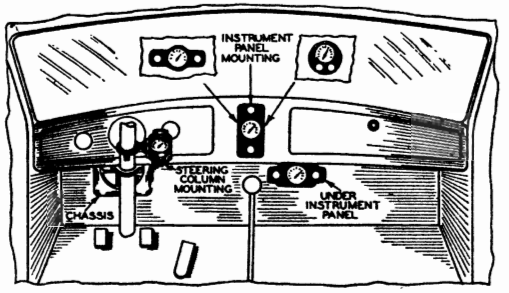


Fig. 5—Various Control Head Mountings

This auto receiver is supplied with a new type of control head known as the No. 4 Universal. This head in conjunction with suitable escutcheon plates and mounting brackets can be mounted in the instrument panel of practically all widely sold 1936 automobiles. In the case of 1935 and earlier cars, it can be mounted in the instrument panel, under the panel or on the steering column.

The escutcheon plate, mounting brackets and knobs for the various cars are put up in kit form.

The control head, volume control fitting, flexible shafts, pilot lamp assembly, dial scale and pointer are packed with each receiver.

In Fig. 5 are shown the various locations at which the control head is mounted. The head is intended for installation primarily in the instrument panel of the car. Most 1936 and many 1935 cars have a name plate or ash receiver on the instrument panel, the removal of which permits installation of the radio control head. Complete installation data is contained in the instruction booklet packed with each receiver.

Replacement Parts

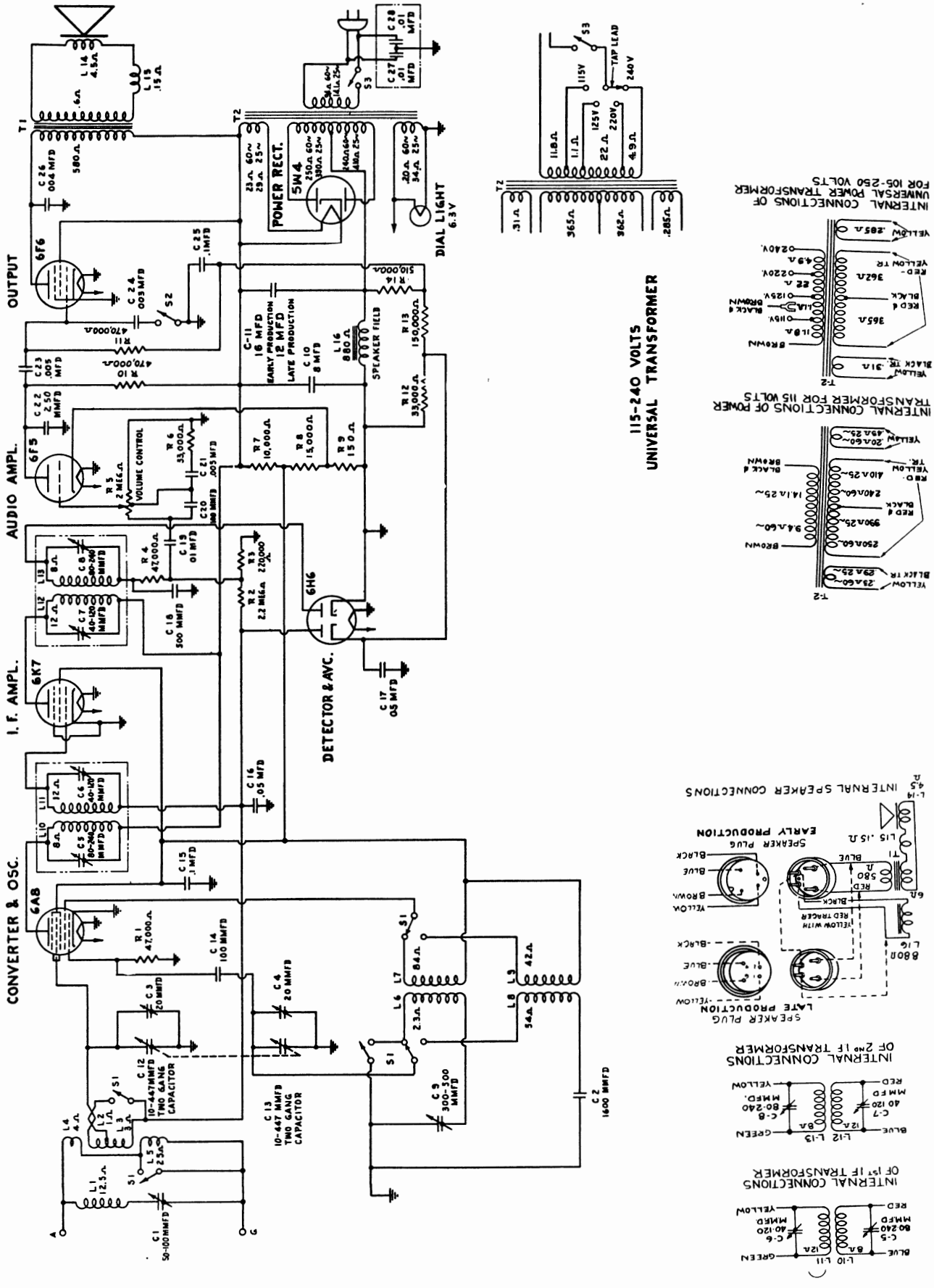
Insist on genuine factory-tested parts which may be purchased from authorized dealers.

RECEIVER ASSEMBLIES

Stock No.	Description	List Price
RA-751	ASSEMBLY—Chassis Case only	$ 3.60
RC-758	CABLE—Pilot Light Cable	.65
RC-759	CABLE—Battery Cable—Long External Section	.35
RC-761	CABLE—Battery Cable—Short Chassis Section	.35
RC-762	CABLE—Speaker Cable Complete	.55
RC-763	CABLE—20" Flexible Drive Cable (Vol. Control)	1.10
RC-764	CABLE—20" Flexible Drive Cable (Tuning)	1.10
RC-765	CABLE—25" Flexible Drive Cable (Vol. Control)	1.30
RC-766	CABLE—25" Flexible Drive Cable (Tuning)	1.30
RC-767	CABLE—36" Flexible Drive Cable (Vol. Control)	1.65
RC-768	CABLE—36" Flexible Drive Cable (Tuning)	1.65
RC-769	CABLE—Shielded Antenna Cable	.85
RC-770	CAPACITOR—.02 mfd. 600 V. Tubular (C22)	.20
RC-771	CAPACITOR—Multiple Tubular (C19, C21)	.50
RC-772	CAPACITOR—Multiple Tubular (C8, C12)	.45
RC-773	CAPACITOR—Multiple Tubular (C7, C20)	.45
RC-774	CAPACITOR—.01 mfd. 360 V. Tubular (C16)	.15
RC-775	CAPACITOR—.002 mfd. 600 V. Tubular (C23)	.15
RC-776	CAPACITOR—.05 mfd. 180 V. Tubular (C2)	.20
RC-777	CAPACITOR—.0075 mfd. 1600 V. Tubular (C30)	.25
RC-778	CAPACITOR—.5 mfd. 180 V. Tubular (C31)	.40
RC-779	CAPACITOR—4 mfd. 25 V., 5 mfd. 350 V., 8 mfd. 350 V. Dry Electrolytic (C17, C27, C29)	2.55
RC-780	CAPACITOR—250 mmfd. Moulded (C18)	.15
RC-781	CAPACITOR—2000 mmfd. Moulded (C26, C28, C32)	.20
RC-782	CAPACITOR—10 mmfd. Moulded (C1)	.15
RC-783	CONDENSER—Three Gang Tuning Condenser Complete	5.50
RC-784	CAPACITOR—35 mmfd. Moulded (C6)	.10
RC-785	CAPACITOR—1st I.F. Trimmer Capacitor (C10, C11)	.40
RC-786	CAPACITOR—2nd I.F. Trimmer Capacitor (C13)	.30
RC-787	CAPACITOR—250 mmfd. Moulded (C15)	.15
RC-788	CAPACITOR—Generator Capacitor	.45
RC-789	CHOKE—CONDENSER Unit (Not shipped with set—Required only in extreme cases of motor noise)	1.50
RF-750	FASTENER—Case Cover Snap Fastener	.10
RF-751	FUSE—20 Ampere	.10
RG-750	GRID CAP	.10
RG-753	GEAR—Gang Condenser Drive Gear (Square Hole)	.25
RG-754	GEAR—Gang Condenser Backlash Gear (Round Hole)	.25
RG-755	GEAR—Gang Condenser Pinion Drive Gear Assembly	.30
RK-750	KNOB—Knob for Tone Control	10
RL-750	REACTOR—Power Reactor (L5)	.90
RL-751	REACTOR—"A" Line Reactor (L1)	.30
RL-752	REACTOR—Vibrator Reactor (L7)	$ .50
RL-753	REACTOR—"A" and "B" Reactor Assembly (L4, L6)	.60
RL-770	COIL—Ant. Coil Complete (T1)	1.70
RL-771	COIL—R.F. Coil Complete (T2)	1.70
RL-772	COIL—Oscillator Coil Complete (T6)	1.05
RL-780	LAMP—Pilot—General Electric No. 51	.15
RP-750	PLUG—Male Speaker Plug	.15
RR-750	RESISTOR—50 ohm 1/2 watt carbon (R15, R16)	.15
RR-751	RESISTOR—100,000 ohm 1/5 watt carbon (R13)	.15
RR-752	RESISTOR—500,000 ohm 1/5 watt carbon (R3, R12)	.10
RR-753	RESISTOR—150,000 ohm 1/5 watt carbon (R10)	.10
RR-754	RESISTOR—50,000 ohm 1/5 watt carbon (R6, R11)	.10
RR-755	RESISTOR—6,000 ohm 1/5 watt carbon (R8)	.15
RR-756	RESISTOR—350 ohm 1/5 watt carbon (R5)	.15
RR-757	RESISTOR—20,000 ohm 1/2 watt carbon (R2)	.15
RR-758	RESISTOR—1 megohm 1/5 watt carbon (R4)	.10
RR-760	RESISTOR—17,000 ohm 1 watt carbon (R1)	.15
RR-762	RESISTOR—500,000 ohm 1/5 watt carbon (R7)	.15
RS-750	SPEAKER—6" Dynamic Speaker	5.75
RS-760	SUPPRESSOR—Distributor Suppressor	.35
RS-761	SUPPRESSORS—Spark Plug (Not shipped with set) ea.	.35
RS-770	SOCKET—6K7 Tube Socket	.15
RS-771	SOCKET—Vibrator Socket	.10
RS-772	SOCKET—Three Prong Socket	.10
RS-773	SOCKET—6J7 Tube Socket	.15
RS-774	SOCKET—6Q7 Tube Socket	.15
RS-775	SOCKET—6F6 Tube Socket	.15
RS-776	SOCKET—6X5 Tube Socket	.15
RS-781	SET SCREWS—8-32 x 1/8" to secure cables in Chassis Anchor Bushings doz.	.15
RS-783	SHIELD—Fuse Shield	.10
RS-785	SPRING—Gang Condenser Backlash Spring	.10
RT-750	TONE CONTROL 150,000 ohm rheostat (R14)	.70
RT-760	TRANSFORMER—Output Transformer (T5)	2.45
RT-770	TRANSFORMER—Power Transformer (T7)	3.15
RT-780	TRANSFORMER—1st I.F. Transformer Complete (T3)	1.45
RT-781	TRANSFORMER—2nd I.F. Transformer Complete (T4)	1.85
RV-750	VIBRATOR—Vibrator Unit Complete	3.40
RV-770	VOLUME CONTROL—2 megohm potentiometer (R9)	1.15
RX-750	SCREW ASSEMBLY—Mounting Assembly for set. Includes Four 5/16"-18 Double Ended Bolts, One 5/16" Shakeproof Lockwasher, Eight Flat Washers, Eight 5/16"-18 hex. nuts, Four 5/16"-18 Spring Locknuts	.35

GENERAL ELECTRIC CO.

MODELS E-61, E-62 AND E-68



GENERAL ELECTRIC CO.

MODELS E-61, E-62 AND E-68

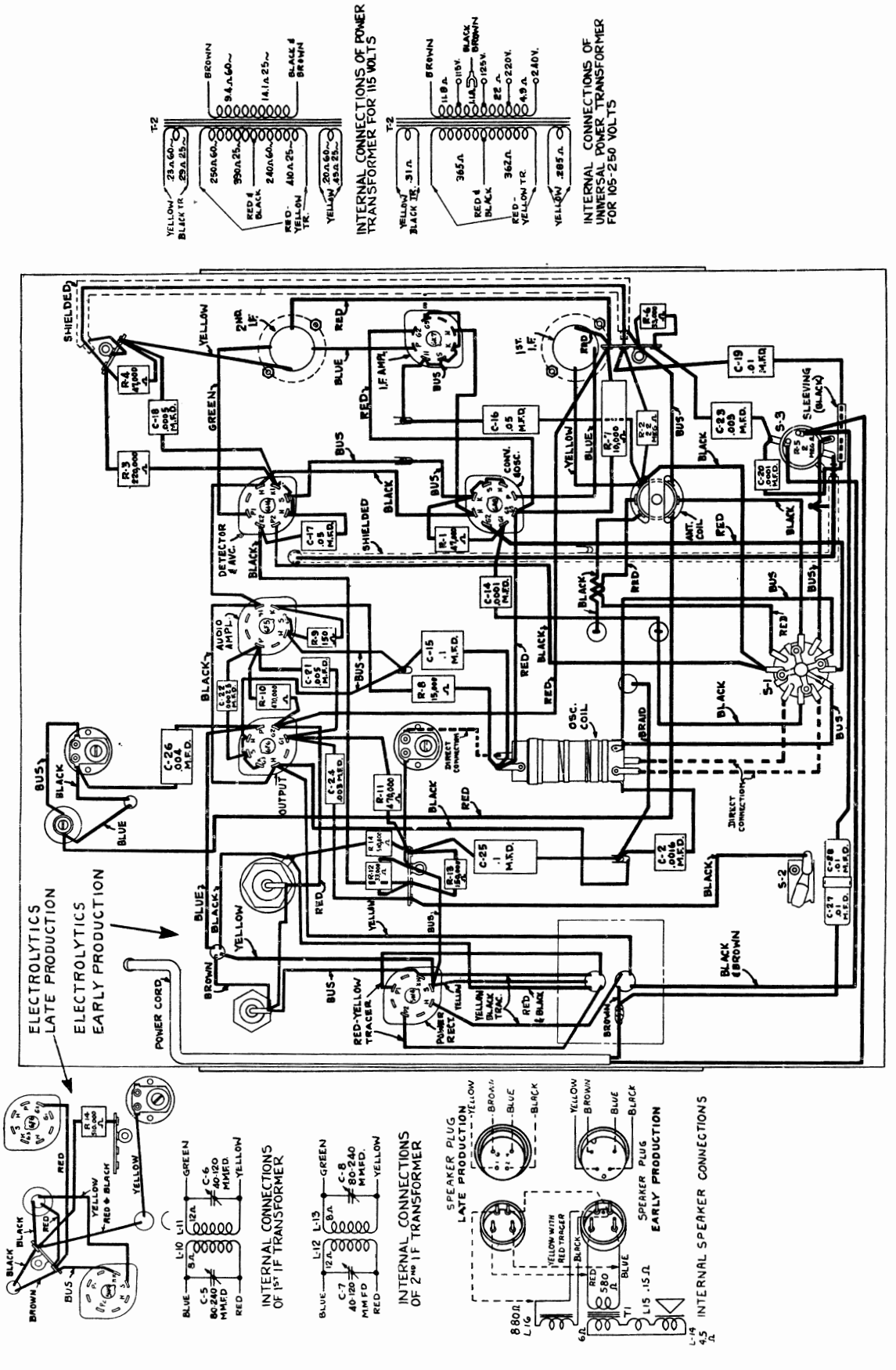


Fig. 2. Chassis Wiring Diagram

Models E61- E62- E68

SERVICE DATA

Physical Specifications

Model	E-61	E-62	E-68
Height	16 11/16 in.	9 5/8 in.	37 1/2 in.
Width	11 1/2 in.	17 1/8 in.	22 1/2 in.
Depth	7 23/32 in.	7 1/8 in.	9 1/2 in.
Weight packed	19 lb	19 lb	45 lb

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	105–130	50–60	70
C	105–130	25–60	70
V	105–130 and 200–250	40–60	75

NOTE: Taps on universal transformers (rating "V") are accessible by removing the cap cover mounted on the top of the transformer. Schematic and wiring diagrams of the universal transformer are shown in Figures 1 and 2, respectively.

Tuning Frequency Range

Broadcast . . . . 540-1750 KC
Short Wave. . . . 2.2-7.0 MC (22,00-7.000 KC)

Tuning Control Drive Ratio

Single Speed. . . . . 5 to 1

Electrical Power Output

Undistorted. . . . . 2.0 Watts
Maximum. . . . . 5.0 Watts

Loud-speaker—Electrodynamic

Cone Model E-61. . . 8 in.
Model E-62. . 6 1/2 in.
Model E-68. . . . 12 in.
Cone Coil Impedance at 400 Cycles
6 1/2 in. Speaker . . . 3.3 ohms
8 and 12in. Speaker. . 5.5 ohms

Tube

Oscillator and Converter	6A8 Pentagrid Converter
I. F. Amplifier	6K7 Triple-grid Super-control Amplifier
Detector and AVC	6H6 Twin Diode
First Audio Amplifier	6F5 High Gain Triode
Audio Power Amplifier	6F6 Power Amplifier Pentode
Rectifier	5Z4 Full-wave Rectifier
Dial Lamps	MAZDA No. 46.

DESCRIPTION OF ELECTRICAL CIRCUIT

Models E-61, E-62 and E-68 employ six metal envelope tubes in a superheterodyne circuit giving the excellent selectivity and sensitivity inherent in this type circuit. Ample undistorted output is obtained through diode detection and two high gain audio amplifier stages.

The signal from the antenna is applied to the control grid of the 6A8 tube through the R. F. coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 KC higher in frequency. The local signal is generated by the oscillator elements of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors.

The combination of the two signals produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two I. F. transformers, each with two tuned circuits. An I. F. wave trap is provided across the antenna and ground terminals to eliminate interfering signals of the I. F. frequency.

The output of the I. F. amplifier is applied to one plate of the 6H6 diode rectifier, which is a combined detector, initial bias and automatic volume control tube. The direct-current component of the rectified signal, through one diode of the 6H6, produces a voltage drop across R-3. This voltage drop provides automatic bias for the converter and I. F. amplifier tubes and so gives automatic volume control action. The other diode of the 6H6 provides an initial bias for the tubes on the automatic volume control circuit under conditions of little or no signal. This initial bias diode, under conditions of small signal, draws current which flows through resistors R-2 and R-3. The resulting voltage is the required minimum operating bias for the controlled tubes. Upon receiving signals above the level of the initial bias, the initial bias diode stops drawing current and the automatic volume control diode takes over the controlling bias.

The manual volume control, R-5, selects the amount of audio signal applied to the grid of the 6F5 audio amplifier tube, and this regulates the output of the receiver. The output of the 6F5 tube is resistance coupled to the grid of the 6F6 power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .003 mfd. capacitor, connected in series with a two point grounding switch, S-2, in the grid circuit of the 6F6 power pentode. When it is desired to reduce the high frequency output of the receiver, the switch, S-2, is turned to its counterclockwise grounding position.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5W4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal to the receiver from the test oscillator at the alignment frequency and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a rod of insulating material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of the R. F. coil, the inductance of this coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the R. F. circuits are in exact alignment, inserting either end of the tuning wand into the coil will result in a decrease in output. When an increase of signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase of signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer Adjustment Required
Metal Ring	Decrease	None
Iron Filings	Decrease	
Metal Ring	Increase	Decrease capacity
Iron Filings	Decrease	
Metal Ring	Decrease	Increase capacity
Iron Filings	Increase	

ALIGNMENT FREQUENCIES

I. F.	Broadcast	Wave Trap
465 KC	580 KC	465 KC
	1500 KC	

In order to align these receivers properly it is necessary to have available:

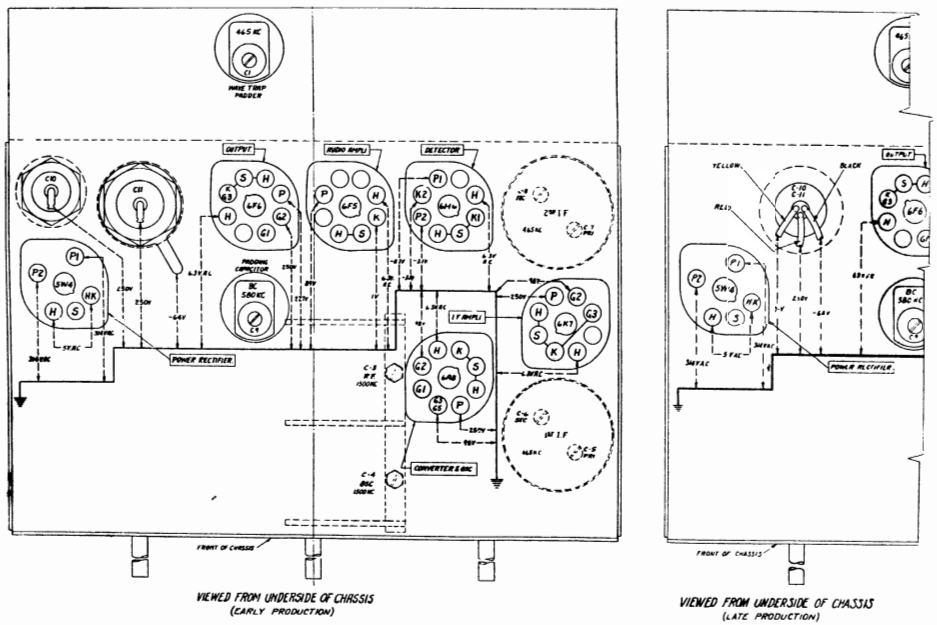
1. A modulated test oscillator capable of producing the above alignment frequencies.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.

The location of all alignment trimmer capacitors, as well as socket voltages, is shown in Fig. 3.

1. I. F. Alignment

Set the frequency band switch of the receiver to the broadcast position and turn the volume control to maximum (extreme clockwise position). Tune the receiver to some point above 1500 KC so that no signal is heard, short-circuiting the antenna and ground terminals if necessary, and ground the chassis.

Remove the control grid clip from the 6A8 tube and connect the test oscillator output between chassis



Measured at 125 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

Fig. 3. Trimmer Locations and Socket Voltages

Models E61 - E62 - E68

and the dome terminal of the 6A8 tube. The I. F. amplifier is tuned to 465 KC; set the oscillator dial at this frequency. Make sure that a d-c path exists between the output terminals of the test oscillator; if an ohmmeter does not show continuity between the test oscillator terminals, connect a resistor of fairly high resistance between the 6A8 dome terminal and chassis to provide a d-c grid return path.

Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the volume control at maximum, a small indication is observed on the output indicator.

Adjust the secondary trimmer of the second I. F. transformer until a peak output reading is obtained. Maintaining a small output indication, adjust next the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer, and lastly, the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

During both I. F. and R. F. alignments, the test oscillator signal should be maintained at the lowest level that will give a good output indication, keeping the receiver volume control at maximum and adjusting the test oscillator output control to give the required indication.

I. F. Wave Trap Alignment

After completion of the I. F. alignment, with the test oscillator still set on 465 KC, apply this frequency to the antenna post of the receiver through a dummy antenna. This dummy antenna consists of a 400 ohm resistor in series with a 250 mmfd. capacitor and should be connected in series between the test oscillator output and the receiver antenna post. With the 465 KC signal applied to the receiver antenna post, adjust the I. F. Wave Trap trimmer for minimum output indication.

2. R. F. Alignment

The R. F. and Oscillator trimmers are aligned at 580 and 1500 KC. First of all, check the position of the dial pointer. To do this, rotate the gang condenser to the maximum capacity position, i.e., plates fully meshed. While in this position, align the pointer with the last black line on the scale by loosening the dial drum set screws and rotating the drum on the gang shaft. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output of the test oscillator, preferably using the dummy antenna described above between the test oscillator and the receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Broadcast 540-1750 Kc

Set the frequency band switch to the broadcast position. Tune the test oscillator to 1500 KC and set the dial pointer on the receiver to this frequency. Adjust the broadcast oscillator trimmer on the front section of the gang condenser for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the broadcast oscillator trimmer is obtained, adjust the broadcast R. F. trimmer on the rear section of the gang for maximum output.

Now set the test oscillator at 580 KC and tune the receiver to that frequency. Slowly, rocking the tuning condenser back and forth through the signal, adjust the 580 KC padding capacitor for maximum output. When this has been done, return to 1500 KC on the receiver and test oscillator and recheck the alignment at that frequency for maximum output. The broadcast band should now be in alignment.

Short Wave—2.2—7.0 M.C. {2,200-7000 Kc}

No separate short wave trimmers are provided on this receiver. The correct adjustment of the broadcast band at 580 and 1500 KC automatically aligns the short wave band.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism is rigidly mounted to the frame of the tuning condenser by means of two removable, self-tapping screws. The complete assembly is rubber-mounted on rubber cushions at the points of support.

The dial mechanism consists of the following parts:

1. Dial Scale
2. Reflector
3. Mounting Bracket
4. Dial Pointer
5. Dial Pointer Drive Cable
6. Drive Cable Tension Spring
7. Two Idler Pulleys
8. Cable Drum (mounted on condenser shaft)
9. Vernier Drive

To Replace Dial Scale or Reflector

Twist the supporting tabs at either end of the scale into alignment with the slots and remove the scale and reflector. Disengage the old scale from the reflector and insert the new scale in its place with the mounting slots in alignment. Replace scale and reflector on the bracket and twist the inner corner of each tab over the outer edge of the slot with which it is engaged.

To Replace Dial Pointer

Disengage the clamping tabs at the rear of the slider from the cable by bending down the center one of the three tabs. Place the new pointer on the scale in a position to agree with the calibration. Secure the pointer to the cable by pinching together the clamping tabs with enough pressure to hold firmly without damaging the cable.

To Replace Dial Pointer Drive Cable

Remove the dial pointer as explained above and set the tuning condenser gang for maximum capacity (plates all meshed). Remove the old cable from the cable drum and engage one end of the new cable with the upper end of the keyhole slot in the drum circumference. Draw the cable clockwise over the top of the drum and through the notch in the right-hand end of the bracket, then around the idler pulley and to the left, close to the scale, passing around the idler pulley mounted in the tension spring and clockwise over the top of the drum. Note that the pulleys are held in place by the tension on the cable. Release the spring tension on the drive cable by pressing inwardly on the tension idler pulley, then insert the free end of the cable in the keyhole slot.

To Replace Cable Drum

Remove the dial scale and reflector bracket as explained elsewhere. The cable drum can then be removed by loosening the two set screws in the hub. When replacing the cable drum, set the condenser so that all plates are fully meshed. The right-hand end of the radial slot in the drum web should then be approximately $\frac{1}{16}$ of an inch clear of the tuning knob shaft bearing bushing. Locate the cable drum axially on the condenser shaft so as to clear the heads of the two mounting bracket screws.

To Replace Mounting Bracket

Remove the dial scale and reflector bracket, also the cable drum. Access may be had to the mounting bracket self-tapping screws when this is done. In replacing the mounting bracket it is necessary to insure that the lower edge of the bracket is parallel to and at height above the top of the cabinet chassis support panel of $5\frac{1}{8}$ inches.

SOCKET VOLTAGES

Tube No.		Plate to Ground Volts D-c	Screen Grid to Ground Volts D-c	Cathode to Ground Volts D-c	Cathode Current M.A.	Heater Volts A-c
6A8	Oscillator	98	...	0	...	...
	Converter	250	98	...	12.0	6.3
6K7 I. F. Amplifier		250	98	0	9.0	6.3
6H6 Detector and AVC		...	...	0	...	6.3
6F5 Audio Amplifier		*89	...	1.00	0.3	6.3
6F6 Output		227	250	0	36	6.3
5W4 Power Rectifier		628/314 RMS	...	250	64	5.0

Measured at 125 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

* Measured on 1000-volt scale.

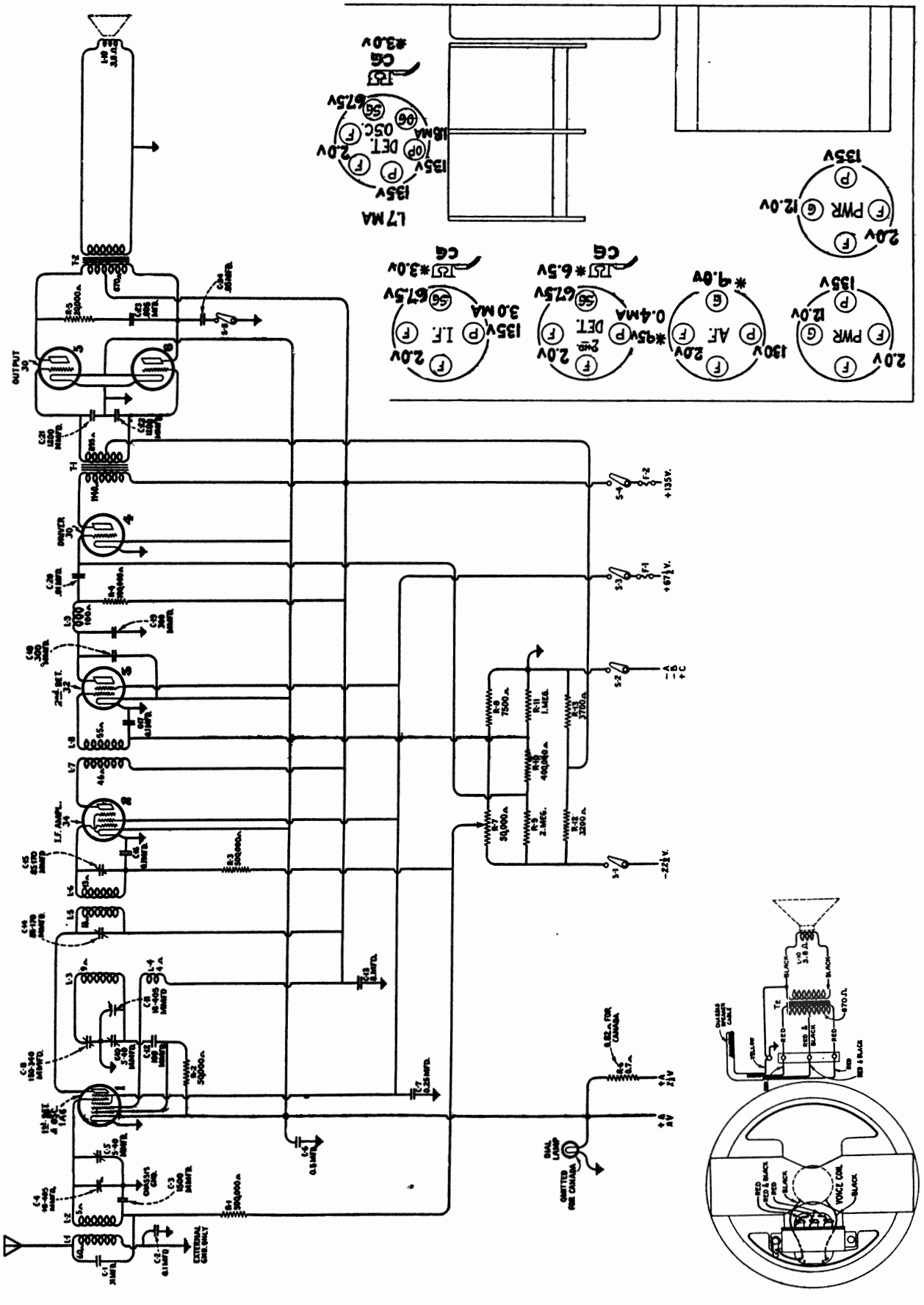
REPLACEMENT PARTS

Insist on genuine factory-tested parts, which may be purchased from authorized dealers

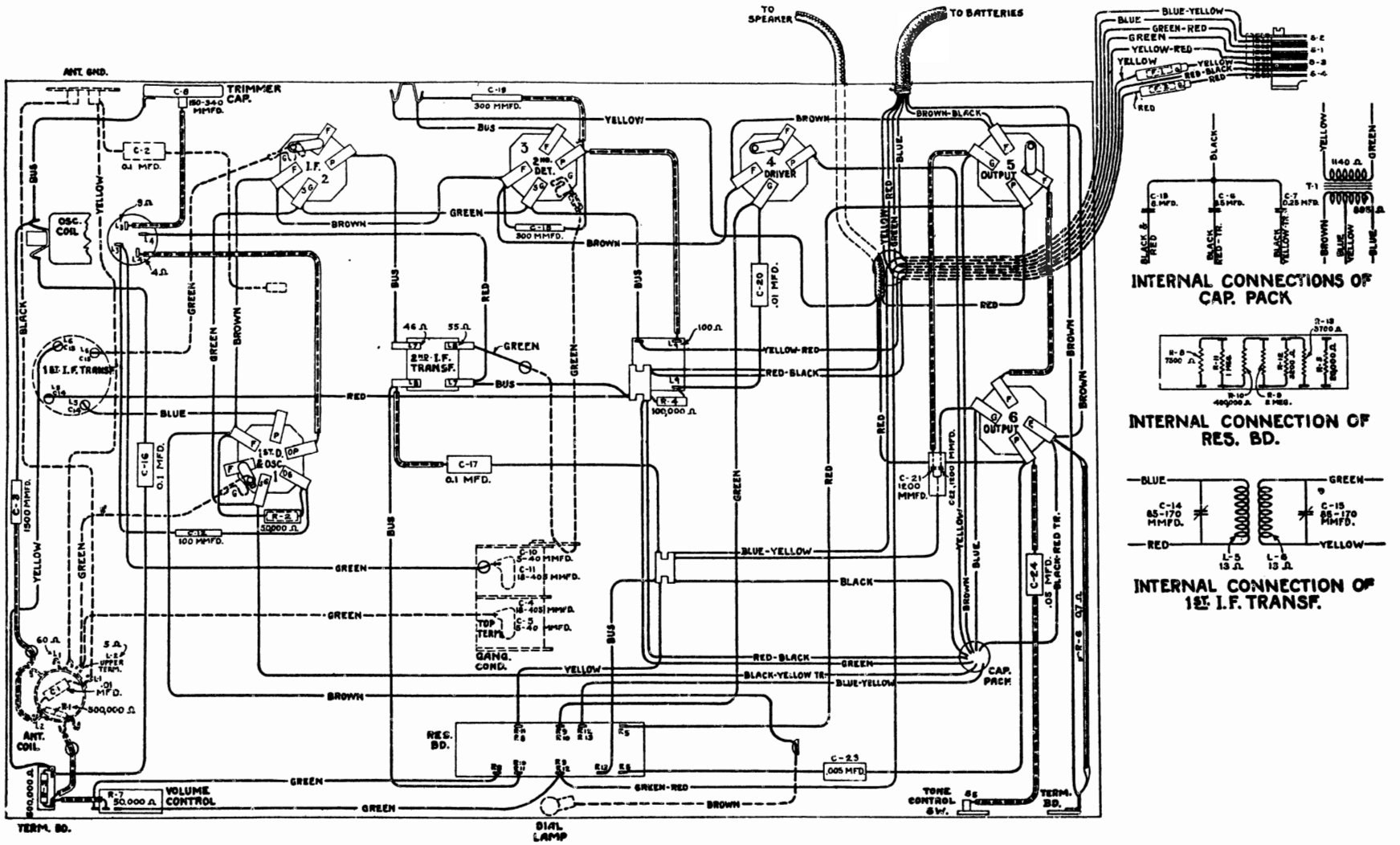
Stock No.	Description	List Price
	RECEIVER ASSEMBLIES	
RB-040	BOARD—Terminal Board Near Osc. Padder	$0.10
RB-041	BOARD—Terminal Board on Rear Chassis Wall	.10
RB-134	BRACKET—Dial Light Bracket	.15
RB-135	BRACKET—Dial Support Bracket	.15
RC-014	CAPACITOR—.003 mfd. 200 V Paper (C-24)	.25
RC-018	CAPACITOR—.004 mfd. 600 V Paper (C-26)	.30
*RC-024	CAPACITOR—.005 mfd. 200 V Paper (C-21)	.25
*RC-029	CAPACITOR—.005 mfd. 400 V Paper (C-23)	.30
*RC-034	CAPACITOR—.01 mfd. 200 V Paper (C-19)	.25
*RC-072	CAPACITOR—.05 mfd. 200 V Paper (C-16, C-17)	.25
*RC-096	CAPACITOR—.1 mfd. 200 V Paper (C-15, C-25)	.30
RC-235	CAPACITOR—100 mmfd. Mica (C-14, C-20)	.25
RC-261	CAPACITOR—250 mmfd. Mica (C-22)	.25
RC-298	CAPACITOR—500 mmfd. Mica (C-18)	.30
*RC-348	CAPACITOR—1600 mmfd. Mica (C-2)	.35
*RC-403	CAPACITOR—8 mfd. 350 V Wet Electrolytic (C-10)	1.00
RC-413	CAPACITOR—16 mfd. 375 V Wet Electrolytic (C-11)	1.25
RS-162	SHIELD—Chassis End Shield (E-61 only)	$0.20
RS-163	SHIELD—Chassis End Shield (E-68 Only)	.25
*RS-200	SOCKET—8 Pin Tube Socket (Pkg. of 5)	.75
*RS-204	SOCKET—5 Pin Tube Socket (Pkg. of 5)	.75
RS-321	SWITCH—Tone Control Switch (S-2)	.30
RS-322	SWITCH—Frequency Band Change Switch (S-1)	.75
RS-415	SPRING—Spring Bracket Supporting Cable Pulley (Pkg. of 2)	.10
RT-067	TRANSFORMER—Power Transformer 105-125 V 40-60 cycle (T-2)	4.00
RT-068	TRANSFORMER—Power Transformer 105-125 V 25 & 60 cycle (T-2)	8.15
RT-069	TRANSFORMER—Power Transformer 105 to 130-200 to 250 V Universal (T-2)	8.50
RT-220	TRANSFORMER—1st I.F. Transformer Complete with Trimmers (L-10, L-11) (C-5, C-6)	1.75
RT-221	TRANSFORMER—2nd I.F. Transformer Complete with Trimmers (L-12, L-13) (C-7, C-8)	1.80
RV-013	VOLUME CONTROL—Volume Control and Power Switch (R-5, S-3)	1.10
RW-104	WINDOW—Dial Window	.15
*RW-101	WASHER—Felt Washer for Control Shafts (Pkg. of 10)	.45
*RW-103	WASHER—Insulating Washer for Mounting 16 mfd. Electrolytic (Pkg. of 10)	.20

GENERAL ELECTRIC CO.

MODEL C-62



MODEL C-62



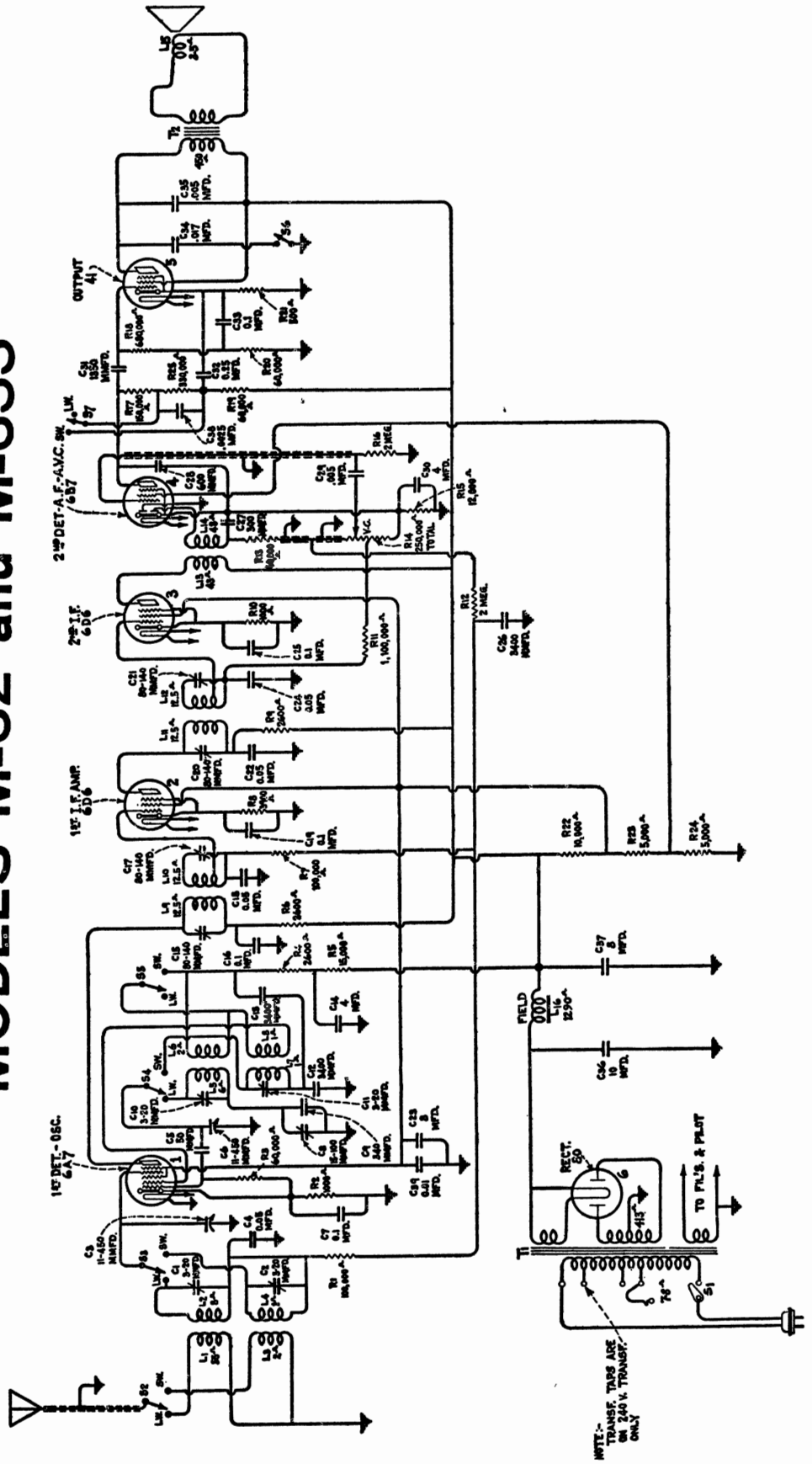
—Chassis Wiring Diagram

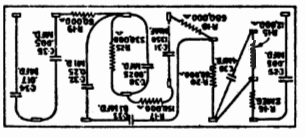
Tuning Frequency Range ..... 540 KC.–1600 KC.
Maximum Undistorted Output ..... 0.7 Watt
Line-up Frequencies ..... I.F., 460 KC. Osc.–Det., 1400 KC. and 600 KC.

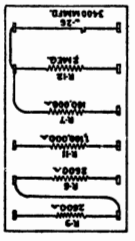
GENERAL ELECTRIC CO.

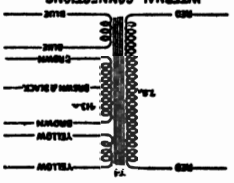
GENERAL ELECTRIC CO.

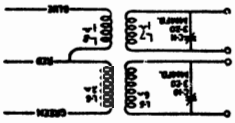
MODELS M-62 and M-655

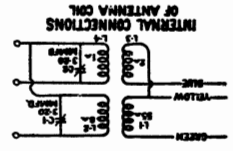


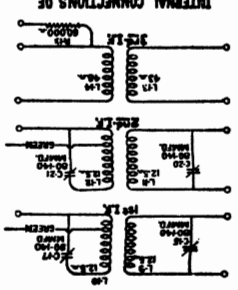

RESISTOR BOARD CONNECTIONS




INTERNAL CONNECTIONS OF POWER TRANSFORMER


INTERNAL CONNECTIONS OF OSCILLATOR COIL


INTERNAL CONNECTIONS OF ANTENNA COIL


INTERNAL CONNECTIONS OF I.F. TRANSFORMERS

GENERAL ELECTRIC CO.

MODELS M-62 and M-655

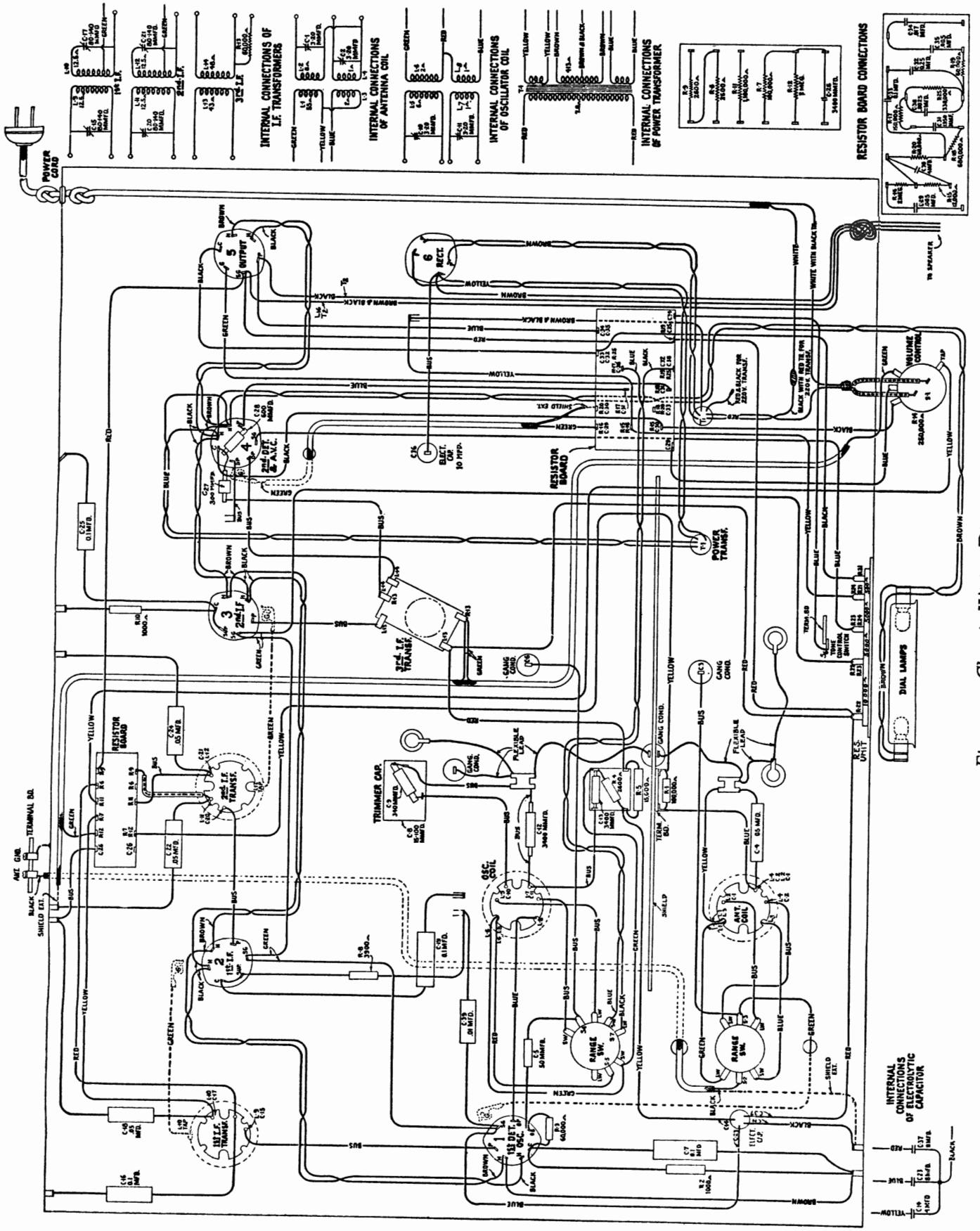


Figure 4—Chassis Wiring Diagram

MODELS M-62 and M-655

(1) Line-Up Adjustments

Maximum efficiency and best quality of performance will only be obtained when the circuits are in proper alignment. "Trimmer" capacitors are provided at accessible locations on the receiver chassis for accurately realigning the circuits when they have deviated from normal. Incorrect alignment is usually evidenced by low sensitivity, poor quality and irregular double-peaked tuning.

It is important in re-adjusting the line-up trimmers to use proper oscillator and indicator apparatus.

I-F Tuning Adjustments

The four i-f trimmer screws shown on Figure 2 must be tuned to 460 kc., as explained below:

(a) Short circuit the antenna and ground terminals of the receiver to prevent external signal pick-up. Set the volume control to maximum and attach a good ground connection to the receiver.

(b) Feed the test oscillator output to the control grid of the first-detector. Connect an output indicator to the voice coil circuit. Regulate the oscillator output control so that a slight indication occurs on the indicating instrument.

(c) Adjust the secondary and primary trimmers of the second i-f transformer for maximum (peak) output. Then tune the first i-f transformer in a similar manner. The oscillator output should be maintained at as low a level as will give a good output indication. This will keep the signal from being affected by the a.v.c. action of the receiver. A slight improvement in line-up may be obtained by repeating the above procedure, since there is an interlocking effect between the several tuned circuits.

R-F and Oscillator Adjustments

The trimmer capacitor locations for the r-f and oscillator stages are indicated on Figure 2. Their adjustments should be performed as follows:

(a) Attach the oscillator output to the antenna-ground terminals of the receiver.

(b) Check the dial pointer and correct its position if necessary. It should be coincident with the dial marking adjacent to 540 when the gang condenser plates are in full mesh.

(c) With the external oscillator tuned to 1720 kc., and its output adjusted for the critical minimum at full volume control, set the station selector to the 1720 scale marking. Turn the range switch to its right position and adjust the trimmers C10 and C1 on Figure 2 to give

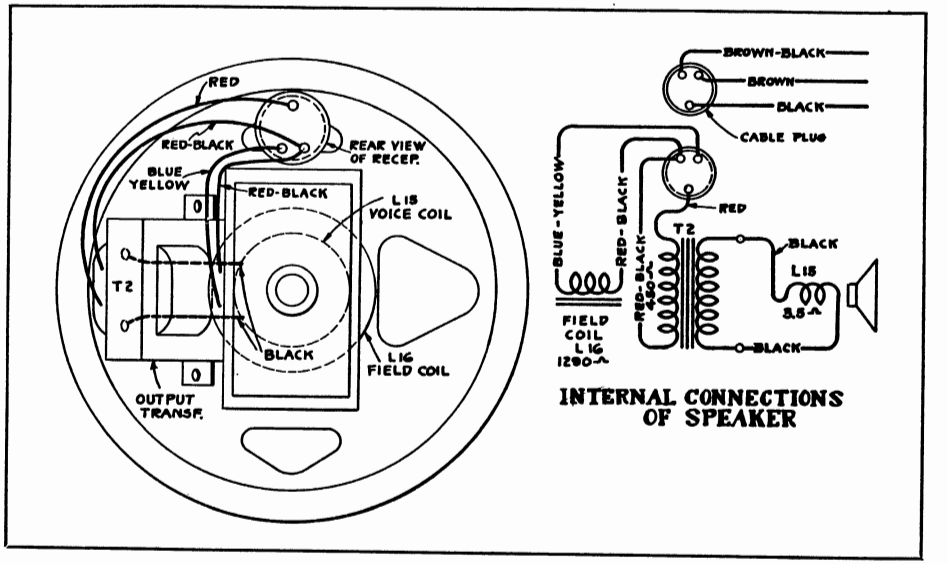


Figure 7—Loudspeaker Wiring—Table Model

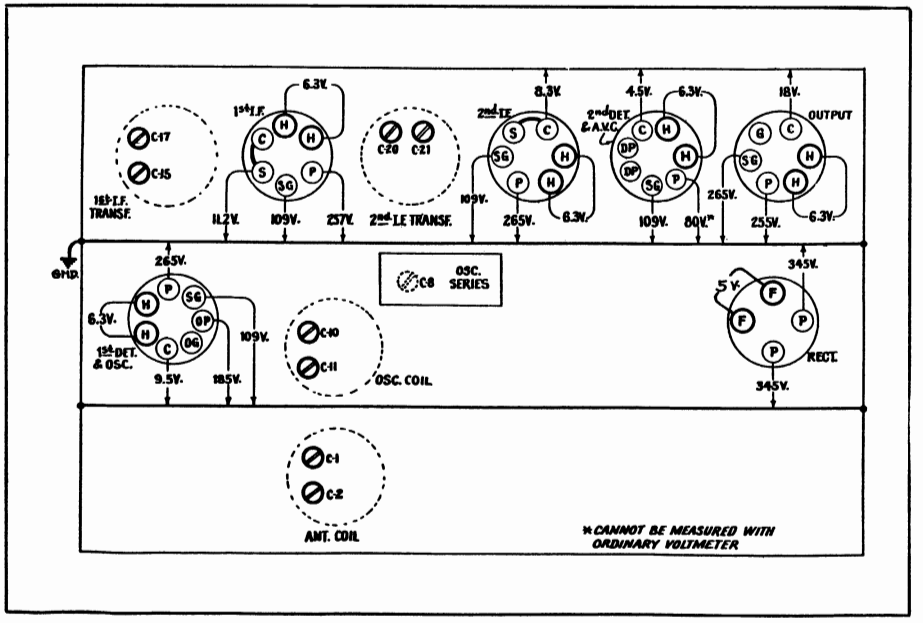


Figure 2—Trimmer Locations and Radiotron Socket Voltages to Ground
(Measured at 115-volt A.C. Supply—Maximum Volume Control—No Signal)

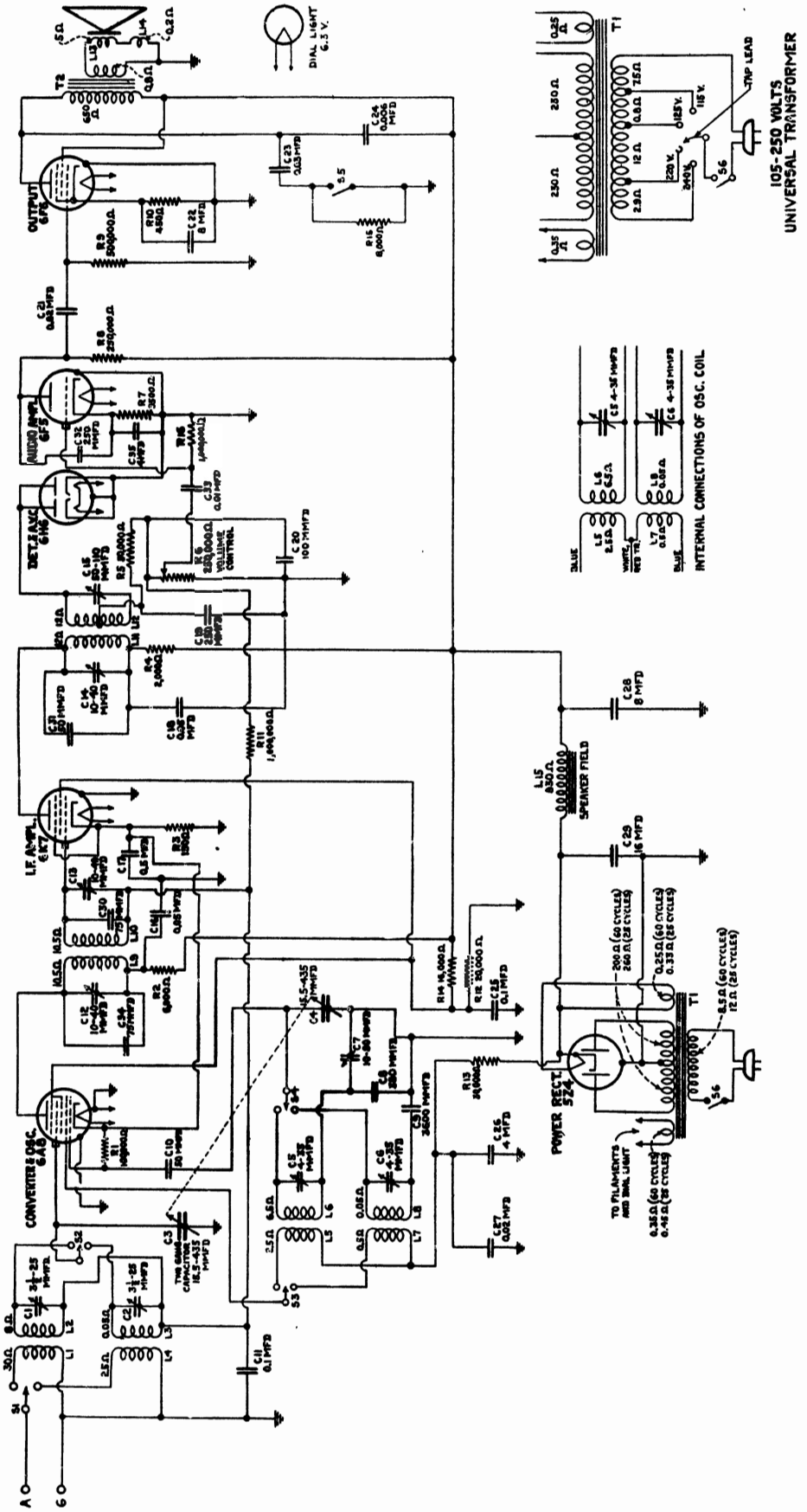
RADIOTRON SOCKET VOLTAGES
(Referred to ground)
Maximum Volume Control—No Signal—115 Volts A. C. Input

Radiotron		Plate to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Cathode to Ground Volts, D.C.	Plate Current	Heater Volts
RCA-6A7	Oscillator	185	—	—	4.5	—
	Detector	265	109	9.5	1.6	6.3
RCA-6D6 First I.F.		257	109	11.2	2.2	6.3
RCA-6D6 Second I.F.		265	109	8.3	6.6	6.3
RCA-6B7 Second Det.		80*	109	4.5	0.3	6.3
RCA-41 Power		255	265	18.0	30.0	6.3
RCA-80 Rectifier		345/345	—	—	68.0	5.0

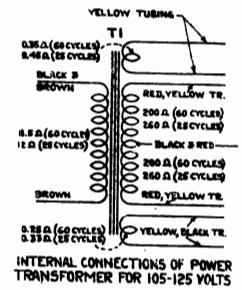
*Calculated from +B.

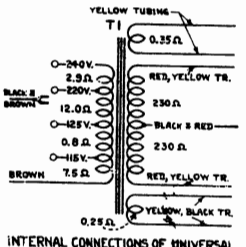
GENERAL ELECTRIC CO.

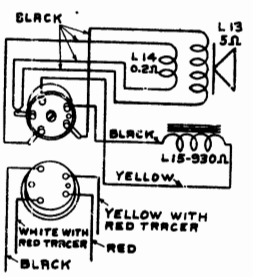
MODELS A-63 AND A-65

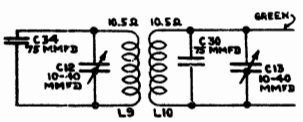


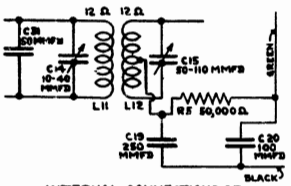
INTERNAL CONNECTIONS OF OSC. COIL

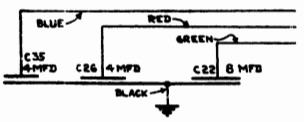


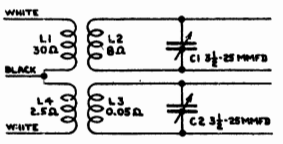












GENERAL ELECTRIC CO.

MODELS A-63 AND A-65

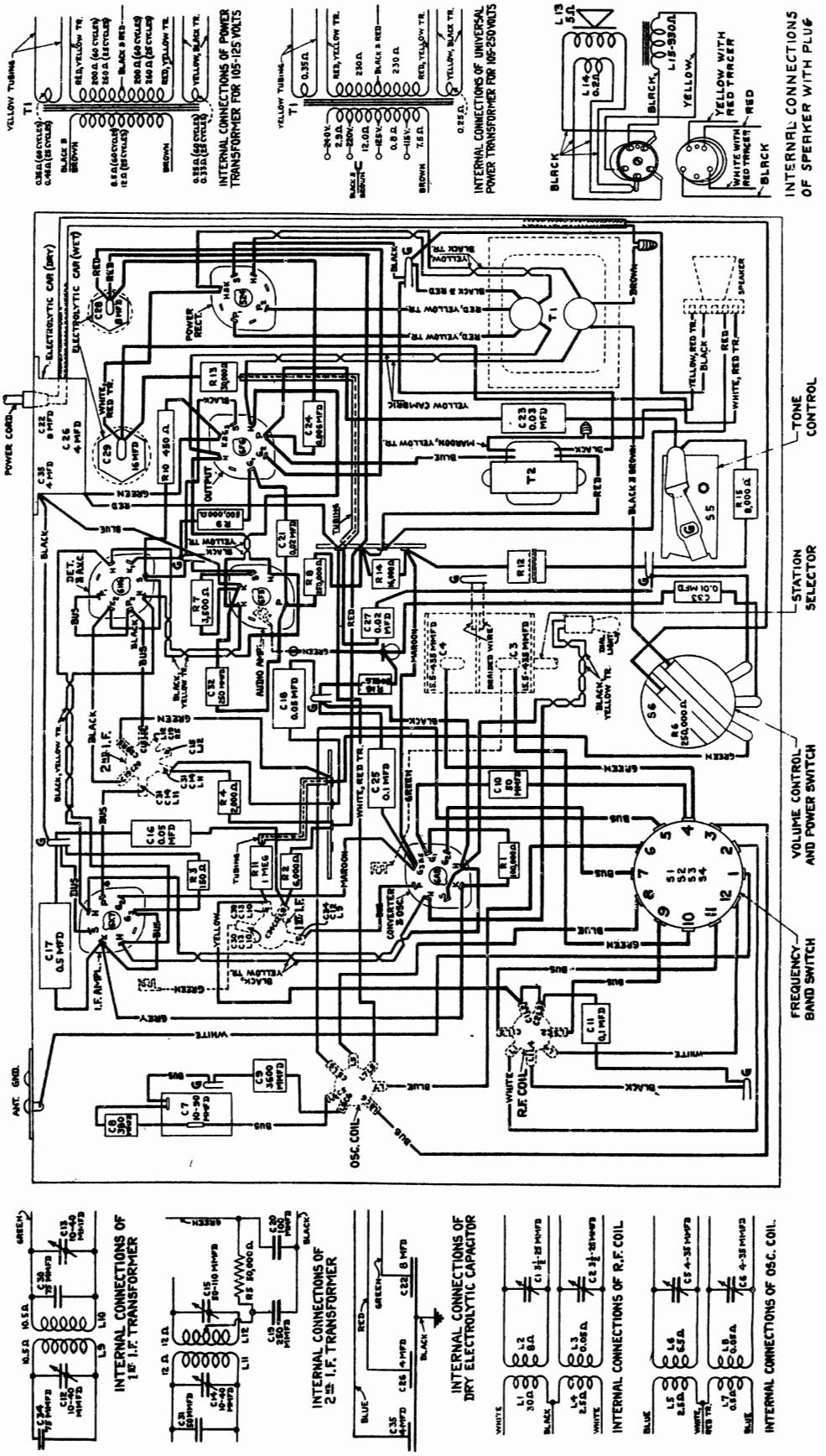


Fig. 2. Chassis Wiring Diagram

Models A63 – A65

SERVICE DATA

Physical Specifications

	A-63	A-65
Model		
Height	18⅛ in.	38⅛ in.
Width	12¾ in.	21 in.
Depth	8½ in.	12¼ in.
Weight packed	25 lb	50 lb

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	105–125	50–60	75
C	105–125	25–60	80
V	105–120 115–130 200–230 220–250	40–60	80

NOTE: Taps on universal transformers (Rating "V") are accessible by removing the cap cover mounted on the top of the transformer. Schematic and wiring diagrams of the universal transformer are shown in Figures 2 and 3, respectively.

Tuning Frequency Range

Broadcast	540–1600 kc
Short Wave	5.4–16.0 mc (5400–16,000 Kc)

Tuning Control Drive Ratio: 40 to 1

Electrical Power Output

Undistorted	1.75 watts
Maximum	3.5 watts

Loudspeaker—Electrodynamic

Cone: Model A-63 7 in. overall, 6 in. effective diameter
Model A-65 8 in. overall, 7 in effective diameter

Cone coil impedance: 5 ohms at 400 cycles

Tubes

Oscillator and Converter.....6A8 Pentagrid Converter
I.F. Amplifier.....6K7 Triple-grid Super-control Amplifier
Detector and AVC.....6H6 Twin Diode
First Audio Amplifier.....6F5 High-mu Triode
Audio Power Amplifier.....6F6 Power Amplifier Pentode
Rectifier.....5Z4 Full-wave Rectifier
Dial Lamp: MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Models A-63 and A-65 employ six metal envelope tubes in a superheterodyne circuit giving the excellent selectivity and sensitivity inherent in this type circuit. Separate groups of coils are used for each frequency band. Ample undistorted output is obtained through diode detection and two audio amplifier stages.

The signal from the antenna is applied to the control grid of the 6A8 tube through the R. F. coil, the secondary of which is tuned to the incoming signal by the first section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc higher in frequency. The local signal is generated by the oscillator elements of this tube, and the proper frequency difference is maintained throughout the tuning range by the second section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors.

The combination of the two signals produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-6. This voltage drop provides automatic bias for the converter and I. F. amplifier tubes and so gives automatic volume control action.

The manual volume control selects the amount of audio signal applied to the grid of the first audio amplifier tube and thus regulates the output of the receiver. The output of the first audio amplifier tube is resistance coupled to the grid of the 6F6 audio power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loudspeaker by means of a step-down output transformer.

The tone control circuit consists of a .03-mfd. capacitor which is normally connected from the plate of the 6F6 to ground through a resistor. When it is desired to reduce the high frequency output of the receiver, the resistor is short-circuited by the tone control switch connecting the .03-mfd. capacitor directly from the 6F6 plate to ground.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube and utilizing the loudspeaker field as a filter reactor which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the center of a particular coil, through the opening provided in the top of the shield, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer adjustment required
Brass cylinder	Decrease	None
Iron filings	Decrease	None
Brass cylinder	Increase	Decrease capacity
Iron filings	Decrease	Decrease capacity
Brass cylinder	Decrease	Increase capacity
Iron filings	Increase	Increase capacity

In Models A-63 and A-65 the broadcast band R. F. and oscillator coils are located in the upper half of their respective shield cans; the short-wave coils in the lower half.

Alignment Frequencies

I. F.	Broadcast	Short Wave
465 kc	600 kc	15,000 kc
	1500 kc	

In order to align these receivers properly, it is necessary to have available a modulated test oscillator capable of producing the above alignment frequencies, a non-metallic alignment screwdriver, and an output meter. The location of all trimmer capacitors as well as socket voltages is shown in Fig. 3.

1. *I. F. Alignment*

Set the frequency band switch of the receiver in the clockwise position, short-circuit the antenna and ground terminals and tune the receiver so that no signal is heard. Set the volume control at maximum and ground the chassis.

The I. F. amplifier is tuned to 465 kc; set the test oscillator dial at this frequency. Connect the test oscillator output between the converter tube (6A8) control grid and chassis. Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed in the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good output indication.

Adjust the secondary trimmer of the second I. F. transformer until a maximum output reading is obtained. Maintain a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer, and lastly, the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

2. *R. F. Alignment*

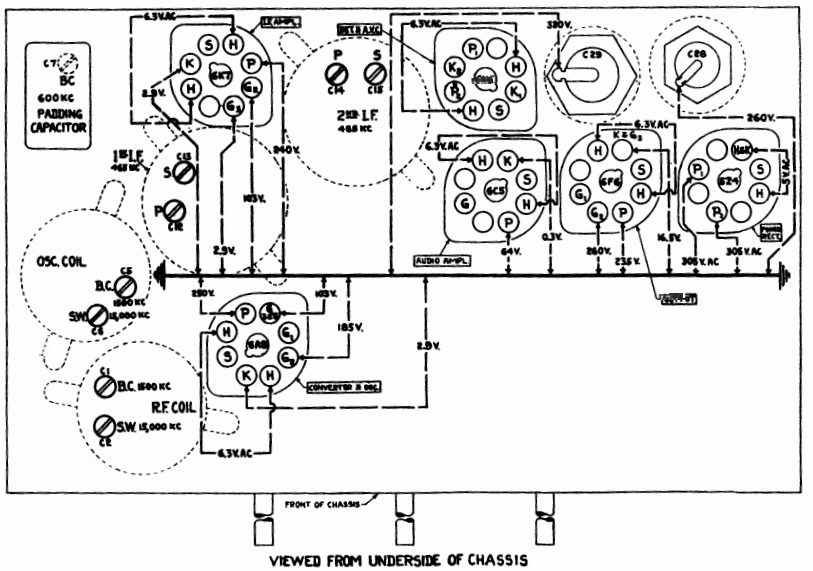
The R. F. and oscillator trimmers are aligned at 600, 1500 and 15,000 kc. Line up the pointer and dial so that with the tuning condenser plates fully meshed, the pointer indicates the mark at the extreme right-hand end of the dial. Make sure the antenna and ground terminals of the receiver are not short circuited and connect to them the output from the test oscillator. Connect the output meter across the speaker cone coil.

Broadcast—With the band switch turned clockwise, set the tuning dial at 1500 kc. Set the test oscillator at this frequency and adjust its output so that with the receiver volume control in its extreme clockwise position, a small deflection is observed on the output meter. Adjust the broadcast oscillator trimmer for maximum output. There, as before, maintain the output meter at a small deflection during the entire alignment process. When optimum adjustment on the broadcast oscillator trimmer is obtained, adjust the broadcast R. F. trimmer for maximum output. Now set the test oscillator and receiver at 600 kc. Adjust the 600 kc padding capacitor for maximum output while rocking the tuning condenser back and forth through the signal. When this has been done, return to 1500 kc on the receiver and test oscillator and recheck the alignment for maximum output.

Short Wave—Place the band switch in the counterclockwise position and set the receiver and test oscillator at 15,000 kc. Adjust the short-wave oscillator trimmer for maximum output. Next adjust the short-wave R. F. trimmer for maximum output while rocking the tuning condenser back and forth through the signal.

It will be noticed on the short-wave band that the oscillator and R. F. trimmers will have two positions at which the signal will give maximum output. The position which uses the lower trimmer capacitance obtained by turning the screw counterclockwise is the proper adjustment for the oscillator, while the position that uses the higher capacitance is proper for the R. F. trimmer.

When these adjustments have been completed, the receiver will be in alignment.

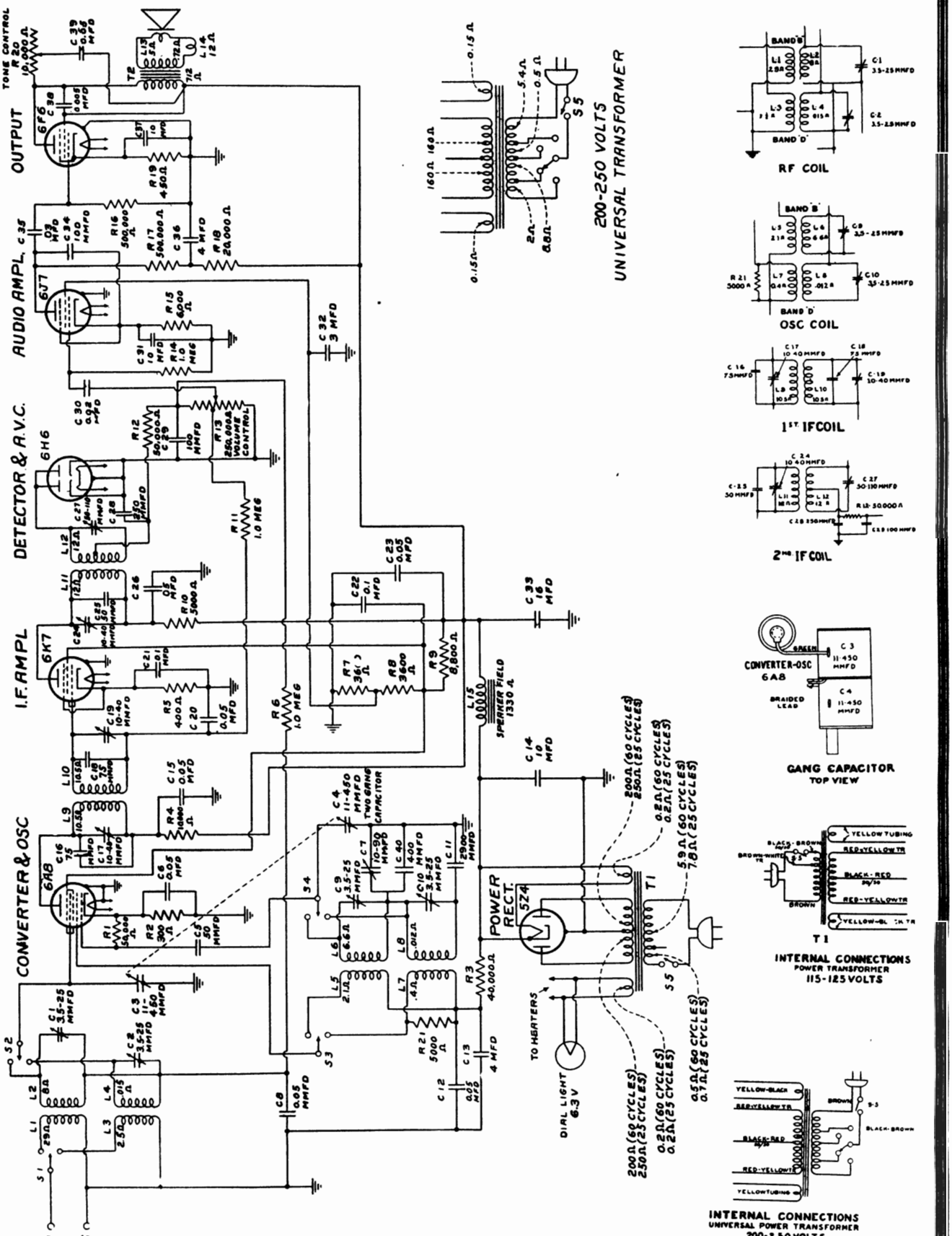


VIEWED FROM UNDERSIDE OF CHASSIS

Fig. 3. Trimmer Locations and Socket Voltages

GENERAL ELECTRIC CO.

MODELS A-64 AND A-67



GENERAL ELECTRIC CO.

MODELS A-64 AND A-67

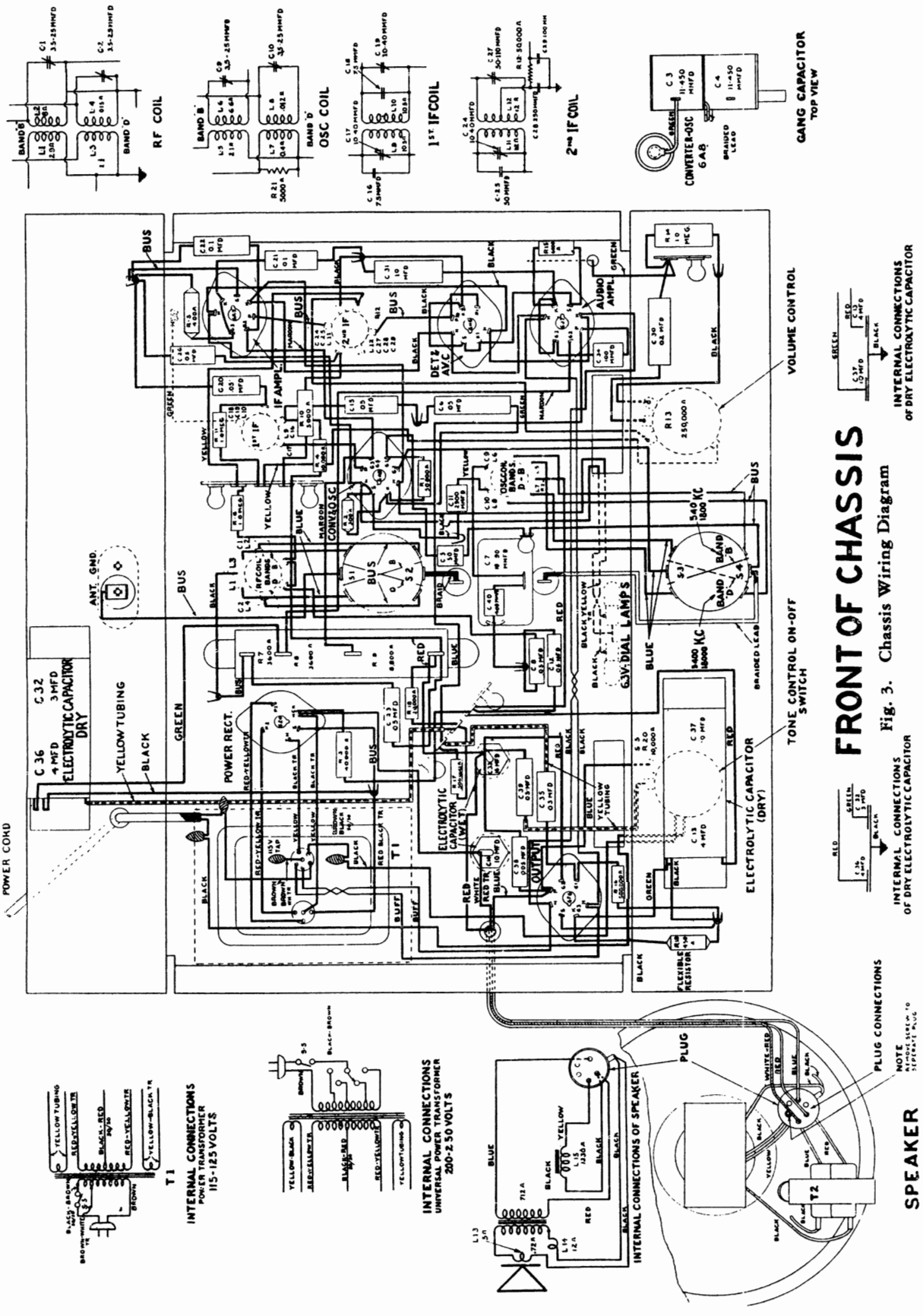


Fig. 3. Chassis Wiring Diagram

A-64 and A-67

SERVICE DATA

Physical Specifications

Model	A-64	A-67
Height	$19\frac{11}{16}$ in	$39\frac{5}{8}$ in.
Width	14 in.	$23\frac{3}{4}$ in.
Depth	10 in.	$11\frac{13}{16}$ in.
Weight Packed	33 lb	65 lb

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	105–130	50–60	85
C	105–130	25–60	90
V	105–130 and 200–250	40–60	90

NOTE: Taps on universal transformers (rating "V") are accessible by removing the cap cover mounted on the top of the transformer. Schematic and wiring diagrams of the universal transformer are shown in Figures 2 and 3, respectively.

Tuning Frequency Range

Broadcast. . .540-1800 KC
Short Wave. . . . . 5.4-18.0 MC (5400-18,000 KC)

Tuning Control Drive Ratio

Fast Tuning. . . . . $5\frac{1}{2}$ to 1
Vernier Tuning. . . . 55 to 1

Electrical Power Output

Undistorted. . . . . 2.0 Watts
Maximum. . . . . 3.0 Watts

Loud-speaker—Electrodynamic

Cone: Model A-64 8 in. overall, 7 in. effective diameter
Model A-67 $10\frac{1}{4}$ in. overall, $9\frac{1}{4}$ in. effective diameter.
Cone Coil Impedance: 5 ohms at 400 cycles.

Tube

Oscillator and Converter . . 6A8 Pentagrid Converter
I. F. Amplifier. . . . . 6K7 Triple-grid Super-control Amplifier
Detector and AVC. . . . . 6H6 Twin Diode
First Audio Amplifier. . . . . 6J7 Triple-grid Detector Amplifier
Audio Power Amplifier. . . . 6F6 Power Amplifier Pentode
Rectifier. . . . . 5Z4 Full-wave Rectifier
Dial Lamps. . . . . MAZDA No. 46.

DESCRIPTION OF ELECTRICAL CIRCUIT

Models A-64 and A-67 employ six metal envelope tubes in a superheterodyne circuit giving the excellent selectivity and sensitivity inherent in this type circuit. Separate groups of coils are used for each frequency band. Ample undistorted output is obtained through diode detection and two audio amplifier stages.

The signal from the antenna is applied to the control grid of the 6A8 tube through the R. F coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 KC higher in frequency. The local signal is generated by the oscillator elements of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors.

The combination of the two signals produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two I. F. transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-13. This voltage drop provides automatic bias for the converter and I. F. amplifier tubes and so gives automatic volume control action. Full automatic bias is applied to the converter tube, while a part of this voltage, taken from a tap on R-13, is applied to the I. F. amplifier tube, which handles a somewhat larger signal voltage than the converter tube.

The manual volume control selects the amount of audio signal applied, through coupling capacitor C-30, to the grid of the 6J7 audio amplifier tube, and this regulates the output of the receiver. The output of the 6J7 tube is resistance coupled to the grid of the 6F6 power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .05-mfd capacitor connected in series with a continuously variable 0-10,000 ohm resistance across the primary of the output transformer. When it is desired to reduce the high frequency output of the receiver, resistance is cut out of the circuit by turning the tone control knob counterclockwise.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal to the receiver from the test oscillator at the alignment frequency and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a rod of insulating material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of either R. F. coil through the opening provided in the top of the coil shield, the inductance of that coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the R. F. circuits are in exact alignment, inserting either end of the tuning wand into the particular R. F. coil being used will result in a decrease in output. When an increase of signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase of signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer Adjustment Required
Metal Ring	Decrease	None
Iron Filings	Decrease	
Metal Ring	Increase	Decrease capacity
Iron Filings	Decrease	
Metal Ring	Decrease	Increase capacity
Iron Filings	Increase	

In Models A-64 and A-67 the broadcast band R. F. and oscillator coils are located in the upper half of their respective shield cans; the short-wave coils, in the lower half.

ALIGNMENT FREQUENCIES

I. F.	Broadcast	Short-wave
465 KC	580 KC	18,000 KC
	1740 KC	

In order to align these receivers properly it is necessary to have available:

1. A modulated test oscillator capable of producing the above alignment frequencies.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.

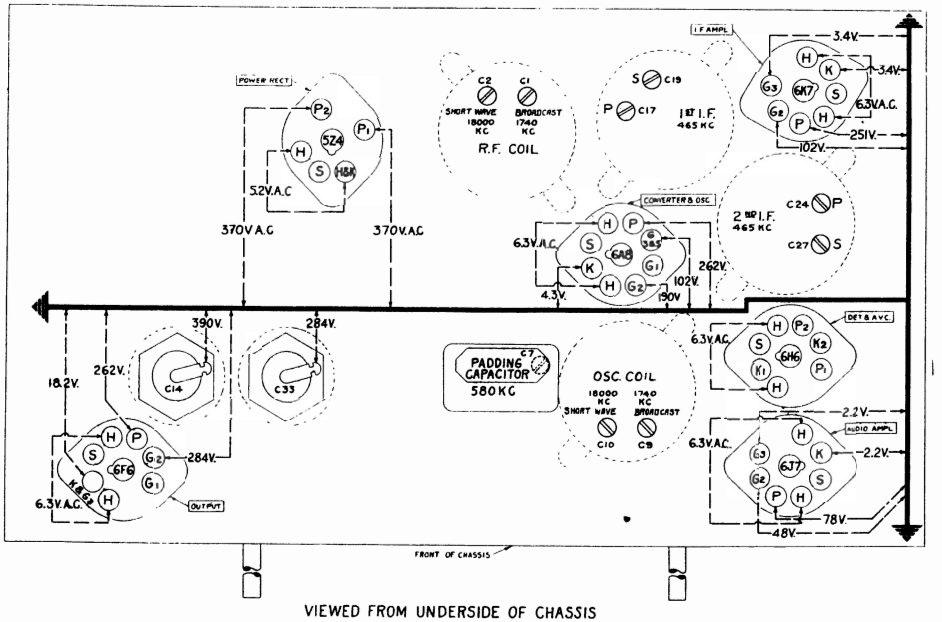
The location of all alignment trimmer capacitors as well as socket voltages, is shown in Fig. 4

1. *I. F. Alignment*

Set the frequency band switch of the receiver to the broadcast position and turn the volume control to maximum (extreme clockwise position). Tune the receiver to some point above 1500 KC so that no signal is heard, short-circuiting the antenna and ground terminals if necessary, and ground the chassis.

Remove the control grid clip (green lead) from the 6A8 tube and connect the test oscillator output between chassis and the dome terminal of the 6A8 tube. The I. F amplifier is tuned to 465 KC; set the oscillator dial at this frequency. Make sure that a d-c path exists between the output terminals of the test oscillator; if an ohmmeter does not show continuity between the test oscillator terminals, connect a resistor of fairly high resistance between the 6A8 dome terminal and chassis to provide a d-c grid return path.

Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control



VIEWED FROM UNDERSIDE OF CHASSIS

Measured at 125 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

Fig. 4. Trimmer Locations and Socket Voltages

Models A-64 and A-67

so that, with the volume control at maximum, a small indication is observed on the output indicator.

Adjust the secondary trimmer of the second I. F. transformer until a peak output reading is obtained. Maintaining a small output indication, adjust next the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer, and lastly, the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

During both I. F. and R. F. alignments, the test oscillator signal should be maintained at the lowest level that will give a good output indication, keeping the receiver volume control at maximum and adjusting the test oscillator output control to give the required indication.

2. R. F. Alignment

The R. F. and oscillator trimmers are aligned at 580, 1740 and 18,000 KC. Check the position of the dial pointer as outlined in the section on adjustment of the dial mechanism. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output from the test oscillator, preferably using a dummy antenna of 250 mmfd. in series with 200 ohms between the test oscillator and receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Broadcast—540-1800 KC.

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 1740 KC and set the dial pointer on the receiver to this frequency. Adjust the broadcast oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the broadcast oscillator trimmer is obtained, adjust the broadcast R. F. trimmer for maximum output.

Now set the test oscillator at 580 KC and tune the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 580 KC padding capacitor for maximum output. When this has been done, return to 1740 KC on the receiver and test oscillator and recheck the alignment for maximum output. The broadcast band should now be in alignment.

Short Wave—5.4-18.0 MC (5400-18,000 KC)

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator at 18,000 KC and set the dial pointer on the receiver to that frequency. Adjust the short-wave oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 17,070 on the receiver dial. It may be necessary to increase input to the receiver from the test oscillator for this check. Return the receiver to the correct scale reading (18,000 KC) and reduce the test oscillator output to its previous value.

Reduce the capacitance of the R. F. trimmer to a minimum. While slowly rocking the tuning condenser back and forth through the 18,000 KC signal, increase the short-wave R. F. trimmer capacitance until a maximum response point is obtained.

It will be noticed on the short-wave band that the oscillator and R. F. trimmers will have two positions at which the signal will give maximum output. The position corresponding to the lower trimmer capacitance obtained by turning the trimmer screw counter-clockwise is the proper adjustment for the oscillator trimmer, while the position corresponding to the higher capacitance is proper for the R. F. trimmer.

When these adjustments have been completed the receiver should be in alignment.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism is rigidly mounted to the frame of the tuning condenser by means of two removable screws, the complete assembly being rubber-mounted by means of rubber cushions and bushings at points of support. The dial pointer, station selector reduction drive, and tuning condenser drive drum are interconnected by means of the drive cord and drive cable; the frequency band switch, cylindrical dial scale and switch operating shaft, by gear and toggle assemblies.

1. Position of Drum on Condenser Shaft

With set screws (19) loosened and tuning condenser plates fully engaged, place the drum in the position shown in Fig. 5 so that the top rim of the drum is $\frac{3}{64}$ in. away from the mounting plate. Guide (48) should stop at equal distances from each end of the mounting plate slot.

2. Removing and Replacing Scale

Pry out fastener (39) and remove the scale by lowering that end below the ear and taking the scale out of cap assembly (24), holding parts (24), (11) and (7) in place. Replace, locating tabs of caps (24) and (25) in slots of scale. Replace fastener (39).

3. Locating Scale

Loosen the two gear set screws (16). Rotate the scale upward until there is slight tension on spring (11) with the pointer indicating on the broadcast (Band "B") scale. With the frequency band switch in the broadcast position, place gear (7) in mesh with the gear on part (6) and tighten the two set screws (16).

4. Replacing Drive Cord

The position of the dial scale pointer with respect to the tuning condenser drum is held fixed by means of a special metal braid cable connecting the drum with the guide (48). Tension is maintained on the cable through the drum spring (12) and drive cord. To replace either the drive cable or the drive cord, remove the dial scale for convenient access to guide (48). Unhook spring (12) from tab (46) to release tension. Unhook the cable or cord from guide (48) and unwind from the pulleys and drum. To replace the cable, rethread to agree with Fig. 5, and rehook drum spring (12) as shown.

5. Replacing Reduction Drive

To replace the reduction drive, unhook spring (12), loosening the drive cord. Unscrew palnut (44) and remove drive. Replace with new drive and rehook drive cord.

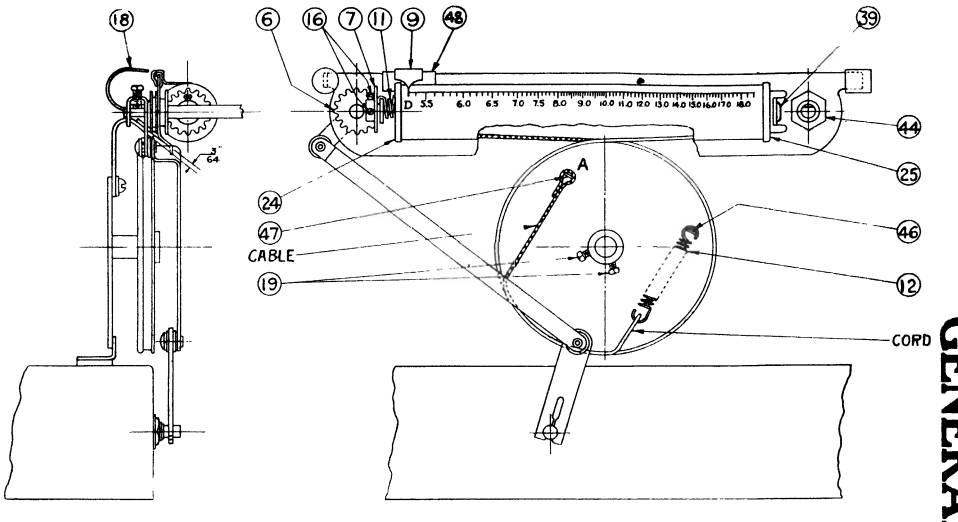


Fig. 5. Dial Mechanism

6. Replacing Toggle Assembly

Loosen the set screw holding the toggle mechanism on shaft (6) and spread the fork on the lower lever arm enough to remove it from the band switch shaft. Replace with new assembly. Rotate shaft (6) clockwise, until there is slight tension on spring (11) with the scale in the Band "B" position. Place upper lever arm in shaft and tighten set screw.

7. Setting Dial Pointer

The dial pointer (9) is soldered to the guide (48). To set the pointer mechanically, turn the tuning condenser rotor so that the plates are fully engaged, and solder the pointer to indicate the extreme left-hand line on the Band "D" scale as shown in Fig. 5.

8. Replacing Dial Lamp

Take hold of the terminals of the lamp bracket and push up until the lamps protrude above the opening in reflector (18). Lamps may then be replaced in socket clips. After replacing lamps, slide the socket mounting bracket back into the mounting clip.

SOCKET VOLTAGES

Tube No.		Cathode to Ground Volts D-c	Screen Grid to Ground Volts D-c	Plate to Ground Volts D-c	Cathode Current M.A.	Heater Volts A-c
6A8	Oscillator	.	.	190	.	.
	Converter	4.3	102	262	12.7	6.3
6K7 I. F. Amplifier		3.4	102	251	8.1	6.3
6H6 Detector and AVC		...	...	...	...	6.3
6J7 Audio Amplifier		2.2	48	78*	.38	6.3
6F6 Output		18.2	284	262	38.7	6.3
5Z4 Power Rectifier		.	..	740/370 Rms	76.1	5.2

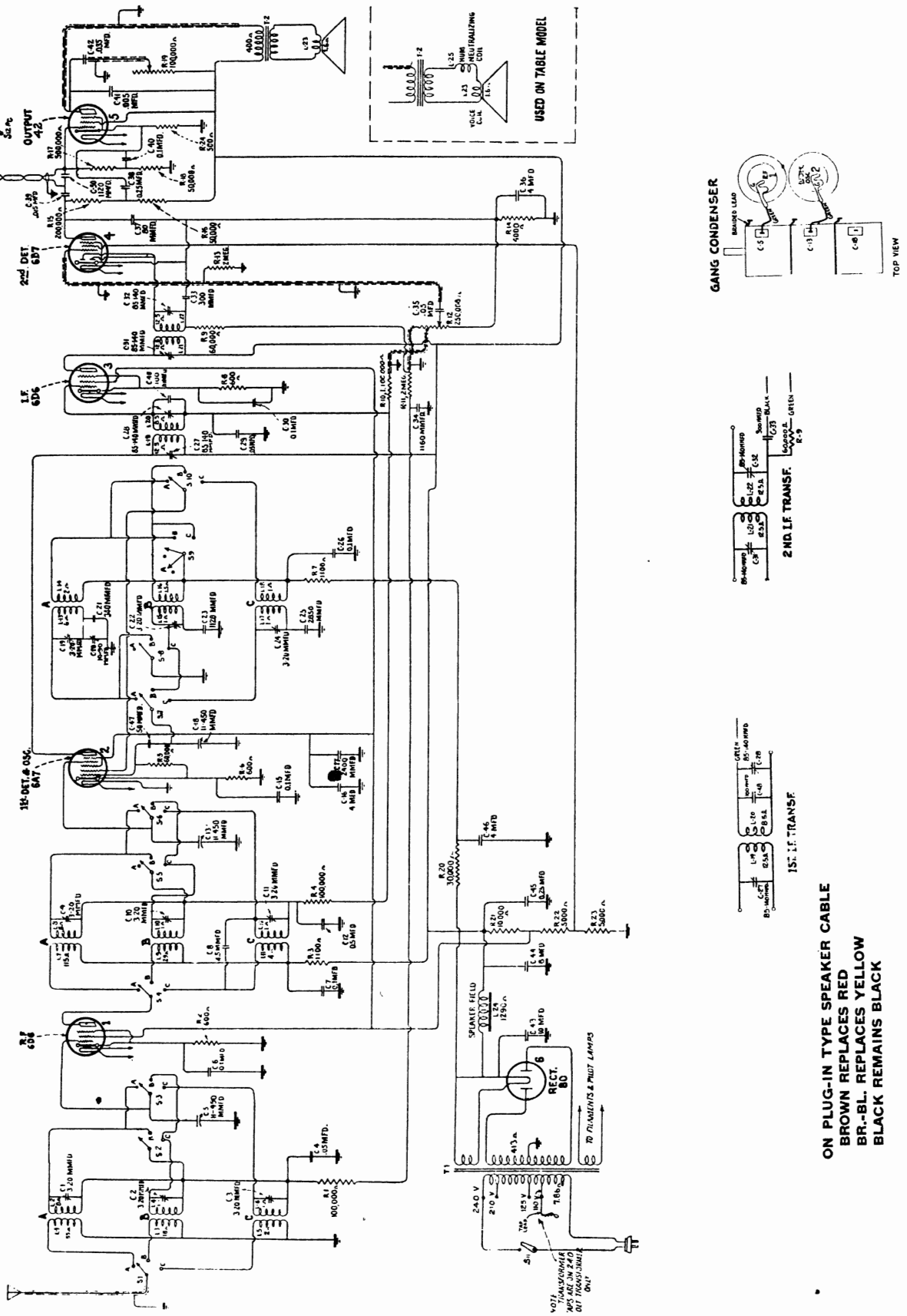
Measured at 125 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

*Measured on 1000-volt scale.

GENERAL ELECTRIC CO.

MODEL M-66 MODEL M-61

(1935 Production)



GENERAL ELECTRIC CO.

MODEL M-66 MODEL M-61 (1935 Production)

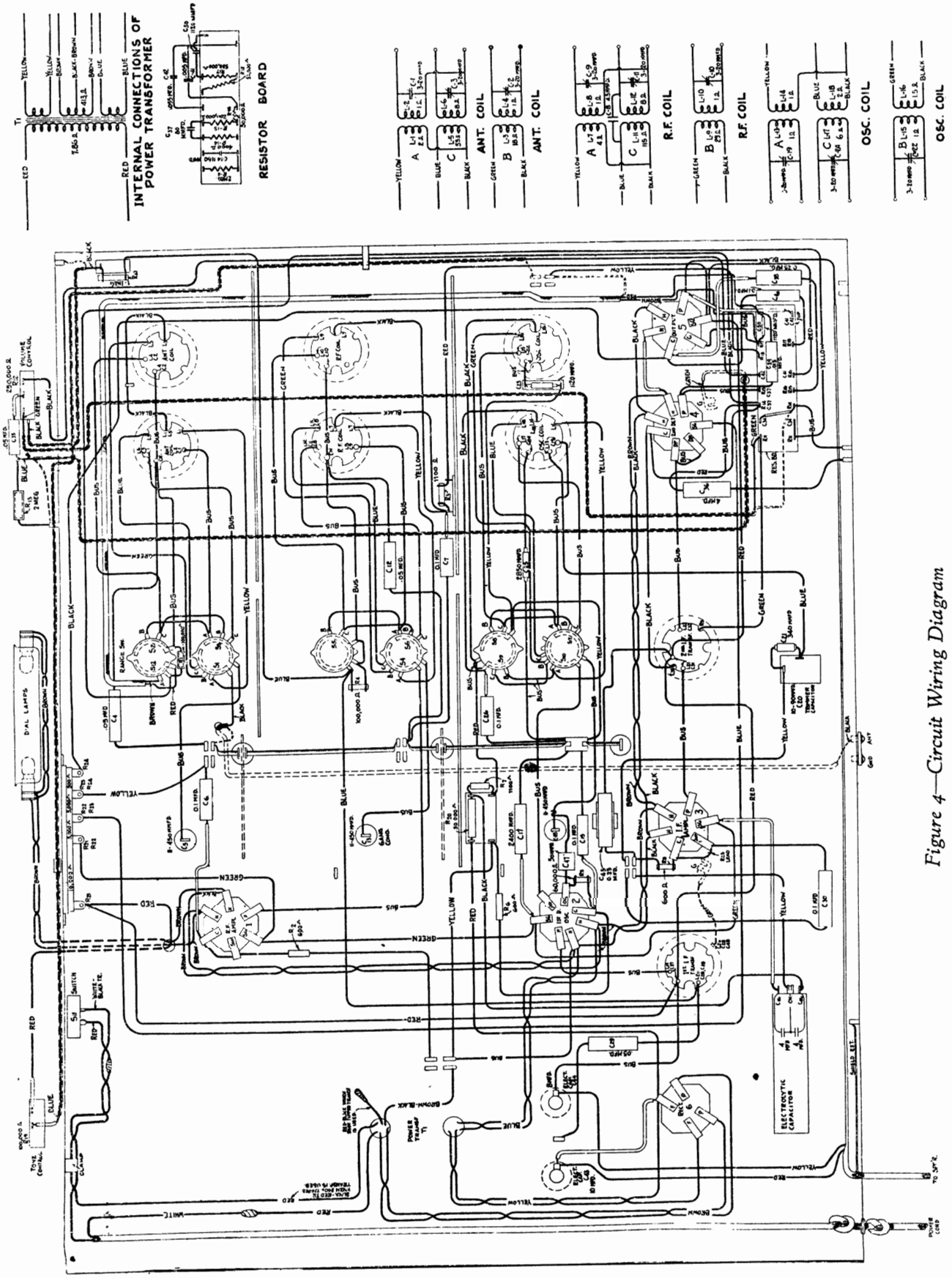


Figure 4—Circuit Wiring Diagram

GENERAL ELECTRIC MODELS M-66 AND M-61

Six-Tube, Three-Band, A. C. Superheterodyne Receivers

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Voltage and Frequency Ratings	105–125 Volts, 50–60 Cycles 105–125 Volts, 25–60 Cycles 100–130/195–250 Volts, 50–60 Cycles
Power Consumption	Approximately 80 Watts
Number and Type of Radiotrons	2 RCA-6D6, 1 RCA-6A7, 1 RCA-6B7, 1 RCA-42, 1 RCA-80—Total, 6
Tuning Frequency Range Limits	Band "A"— 540 K. C.– 1,720 K. C. Band "B"—1,720 K. C.– 5,400 K. C. Band "C"—5,400 K. C.–18,000 K. C.
Alignment Frequencies	460 K. C., 600 K. C., 1,720 K. C., and 18,000 K. C.
Maximum Undistorted Output	1.75 Watts
Maximum Output	3.5 Watts

PHYSICAL SPECIFICATIONS

	Model M-66	*Model M-61*
Height	39 Inches	20⅜ Inches
Width	24 Inches	17¼ Inches
Depth	11 13/16 Inches	11¼ Inches

These receivers, both of which employ the same chassis, are manufactured from a design that includes such requirements as "all-wave" reception, high sensitivity, good selectivity and pleasing tone quality. The tuning ranges listed above cover the standard broadcasting band, and extend into the shorter wave regions for reception of foreign and trans-oceanic broadcast signals.

Uniform tonal quality is realized from the output of these instruments. With the efficiently designed reproducer units, and the amplification system supplying them, more than adequate volume may be obtained; the undistorted limit of output being 1.75 watts.

Special operating features used on this chassis include a "full vision-airplane dial," a dual-ratio vernier drive, a high frequency tone control, automatic volume control, and a visual indicator for the three-position band switch.

DESCRIPTION OF ELECTRICAL CIRCUIT

The general circuit arrangement consists of an R. F. stage, a combined oscillator and first detector, an I. F. stage, a combined second detector—audio amplifier—AVC Stage, and a single Pentode output stage. An RCA-80 rectifier, together with a suitable filtering system, provides plate and grid voltages for all tubes and field excitation for the loudspeaker. Figure 3 shows the schematic circuit diagram, Figure 4 the chassis wiring, and Figures 7 to 10 the loudspeaker wiring.

The signal enters the receiver through a shielded antenna lead and is applied to the grid of the R. F. tube through the antenna coupling transformer. The secondary of this transformer is tuned to the signal frequency by means of one unit of the gang-capacitor. The output of this stage is transformer coupled to the grid circuit of the first detector, which is also tuned to the signal frequency by a unit of the gang-capacitor.

Combined with the signal in the first detector is the local oscillator, which is always at a 460 K. C. frequency difference (higher) from the signal frequency. A separate coil system and the third unit of the gang-capacitor are used in this circuit.

In conjunction with these three tuned circuits, it is well to point out that three different groups of tuned circuits are used, one for each tuning band. A three-position selector switch is provided for selecting the band in which the desired signal is located. In addition to selecting the desired coil system, additional groups of contacts are provided for short-circuiting the preceding lower frequency R. F. and detector coils and the two preceding oscillator coils. This is to prevent "dead" spots due to the absorption effects caused by the coils, the natural period of which, with tuning capacitor disconnected, fall in the next higher frequency band.

The output of the first detector, which is the I. F. signal (460 K. C.), is fed directly through two tuned circuits to the grid of the I. F. amplifier stage. The I. F. stage, which utilizes Radiotron RCA-6D6, has two transformers, which consist of four tuned circuits, all of which are tuned to 460 K. C.

The output of the I. F. amplifier is then applied to the diode electrodes of the RCA-6B7, which cause detection. The direct current component of the rectified signal produces a voltage drop across resistor R-12. The full voltage drop constitutes the automatic bias voltage for the R. F., while a tap is provided for the first detector and I. F. voltage. These automatic bias voltages for the R. F. first detector and I. F. give the automatic volume control action of the receiver. The volume control arm selects the amount of audio voltage that is applied to the grid of the RCA-6B7 and thereby regulates the audio output of the entire receiver.

The output of the RCA-6B7 is introduced to the RCA-42 output tube through the resistance-capacitance coupling network. By inspection of the schematic, it may be seen that band switch contacts are arranged to affect the frequency response of this coupling system by changing the total value of the capacitance. The purpose of such change with band position is to make possible the desired fidelity on the short-wave bands, and to maintain the utmost fidelity on the regular broadcast band.

In the power output stage, the RCA-42 is operated as a Pentode amplifier. It provides high audio gain and good quality. The usual step-down plate transformer is used for matching the tube to the cone coil of the loudspeaker.

The tone control consists of a variable resistor and fixed capacitor connected in series across the primary of the output transformer. At the minimum resistance position of the variable resistor, maximum attenuation of the high audio frequencies is obtained.

Plate and grid voltages for all tubes are supplied from the output of the rectifier-filter system. An RCA-80 is used as a rectifier and a suitable network of capacitors and resistors gives the necessary filtering and voltages. The loudspeaker field is used as a filter reactor.

(1) LINE-UP PROCEDURE

Properly aligned, this receiver performs outstandingly; improperly aligned, there may be a tendency towards low sensitivity and distorted quality of reproduction. Inasmuch as the line-up procedure is more or less involved, it is important that these instructions be carefully followed.

Equipment

To align this receiver, proper test equipment must be used. Such consists of a modulated R. F. oscillator having proper frequency range, an output indicator, an alignment tool and a tuning wand. These parts, shown on page 2, have been developed by the manufacturer of this receiver for use by service men to duplicate the original factory adjustments.

Checking with Tuning Wand

Before making any R. F., oscillator or first detector adjustments, the accuracy of the existing adjustments may be checked with a tuning wand (Stock No. 6679). This wand consists of a bakelite rod having a brass cylinder at one end and a special finely divided iron insert at the other end. Inserting the cylinder into the center of a coil lowers its inductance, while inserting the iron end increases its inductance. From this, it is seen that unless the trimmer for a particular coil is properly aligned, the wand may increase the output of the receiver. A perfect adjustment is evidenced by a lowering of output when either end of the wand is inserted into a coil.

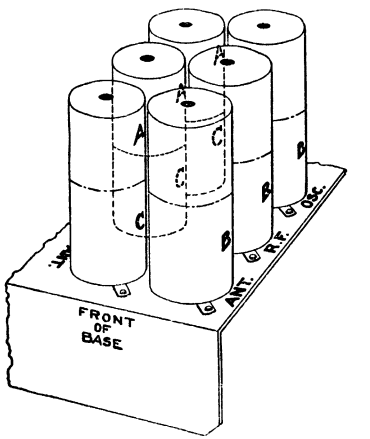


Figure 1—Location of Coils in Shields

The shield over each R. F. coil assembly has a hole at its top for entrance of the tuning wand. The location of the various coils inside of their shields is shown in Figure 1. An example of the proper manner of using the tuning wand would be to assume the external oscillator were set at 1,720, the signal tuned in, and the output indicator connected across the voice coil of the loudspeaker. Then the tuning wand should be inserted, first one end and then the other end, into the top of the three transformers at the left of the R. F. assembly, facing the front of the chassis. A perfect adjustment of the trimmer would be evidenced by a reduction in output when each end of the wand is inserted into each of the three transformers. If one end —for example, the iron end—when inserted in one coil caused an increase in output, then that circuit is high. An increase in the trimmer capacitance would be the proper remedy.

(2) I. F. TUNING CAPACITOR ADJUSTMENTS

Although this receiver has one I. F. stage, there are two transformers, each having two adjustable capacitors requiring adjustment. The transformers are all peaked, being tuned to 460 K. C.

M-66, M-61 (1935 Prod.)

A detailed procedure for making this adjustment follows:

(a) Connect the output of an external oscillator operating at 460 K. C. between the first detector grid and ground. Connect the output indicator across the voice coil of the loudspeaker

(b) Place the receiver in operation and adjust the station selector until a point is reached (B and A) where no signals are heard and turn the volume control to its maximum position. Reduce the oscillator output until a slight indication is obtained in the receiver output indicator.

(c) Refer to Figure 2. Adjust the trimmers of the I. F. transformers until a maximum output is obtained. Go over the adjustments a second time.

This completes the I. F. adjustments. It is good practice to follow the I. F. adjustments with the R. F. and oscillator adjustments due to interlocking which always occurs between the two.

(3) R. F. OSCILLATOR AND FIRST DETECTOR ADJUSTMENTS

Four R. F., oscillator and first detector adjustments are required in band "A." Three are required in bands "B" and "C."

To properly align the various bands, each must be aligned individually in the order given. This is "A," "B" and "C." The preliminary set-up requires that the external oscillator be connected between the antenna and ground terminals of the receiver and the output indicator be connected across the voice coil of the loudspeaker. The volume control must be at its maximum position and the output of the oscillator must be at the minimum value possible to get an output indication under these conditions. In the high frequency bands, it may be necessary to disconnect the oscillator from the receiver and place it at a distance in order to get a sufficiently low input to the receiver.

The dial pointer must be properly set before starting actual adjustments. This is done by turning the variable capacitor until it is at its maximum capacity position. One end of the pointer should point exactly at the horizontal line at the lowest frequency end of band "A," while the other end should point to within 1/16 inch of the horizontal line at the highest frequency end of band "A."

Figure 2 shows the location of the trimmers for each band. Care must be exercised to only adjust the trimmers in the band under test.

Band "A"

(a) Set the band switch at "A."

(b) The oscillator series capacitor, located on the rear apron of the chassis, should be set at about the center of its range.

(c) Tune the external oscillator to 1,720 K. C., set the pointer at 1,720 K. C. and adjust the oscillator, detector and R. F. trimmers for maximum output.

(d) Shift the external oscillator frequency to 600 K. C. Tune in the 600 K. C. signal, irrespective of scale calibration, and adjust the series trimmers, located on rear apron of chassis, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 1,720 K. C. as described in (c).

Band "B"

(a) Set the band switch at "B."

(b) The detector and antenna trimmers should first be tightened to approximately 3/4 maximum capacity (turned 3/4 inch).

(c) Tune the external oscillator to 5,160 K. C., set the pointer at 5,160 K. C. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.

(d) Check for the image signal, which will be received at approximately 4,240 K. C. on the dial, if the trimmer is set properly in accordance with (c). It may be necessary to increase the external oscillator output for this check.

(e) Reduce the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal disappears. *The first detector circuit is then aligned with the oscillator circuit and the RCA-6A7 tube is blocked.* Then increase the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal is peaked for maximum output.

(f) The antenna trimmer should now be peaked for maximum output. It is not necessary to rock the main tuning capacitor while making this adjustment.

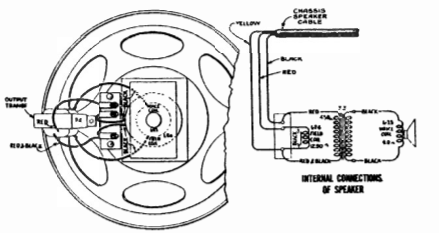


Figure 8—Console Loudspeaker Wiring (without cable plug)

Band "C"

(a) Set the band switch at "C."

(b) The detector and antenna trimmers should first be tightened to approximately 3/4 maximum capacity (turned 3/4 in.)

(c) Tune the external oscillator to 18,000 K. C., set the pointer at 18 M. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.

(d) Check for the image signal, which will be received at approximately 17,080 on the dial, if (c) has been properly done. It may be necessary to increase the external oscillator output for this check.

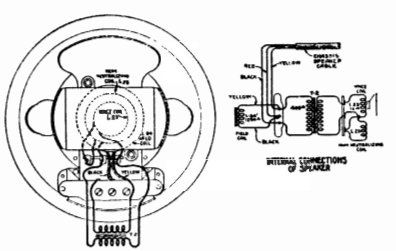


Figure 7—Table Loudspeaker Wiring (without cable plug)

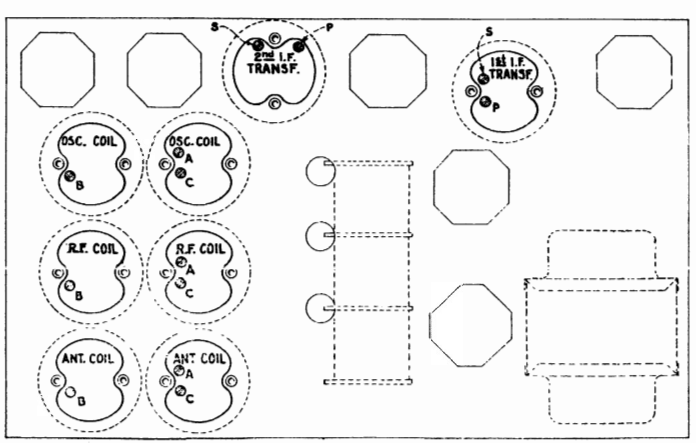


Figure 2—Location of Line-up Capacitors

RADIOTRON SOCKET VOLTAGES

115-Volt A. C. Line—No Signal—Volume Control—Maximum

Radiotron Number		Cathode to Ground Volts, D. C.	Screen Grid to Ground, Volts, D. C.	Plate to Ground, Volts, D. C.	Plate Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		6.0	105	265	9.0	6.3
RCA-6A7	Det.	6.0	105	265	3.5	6.3
	Osc.	—	—	220	4.5	
RCA-6D6—I. F.		6.0	105	265	9.0	6.3
RCA-6B7—2nd Detector		3.0	50	90*	0.7	6.3
RCA-42—Power		16.5	265	245	30.0	6.3
RCA-80—Rectifier		—	—	690 (RMS)	70.0	5.0

*Voltage calculated from 265 V. + B.

Models M-66, M-61 (1935 Production)

(e) Reduce the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal disappears. *The first detector circuit is then aligned with the oscillator circuit and the RCA-6A7 tube is blocked.* Then increase the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal is peaked for maximum output.

(f) The antenna trimmer should now be peaked for maximum output. It is not necessary to rock the main tuning capacitor while making this adjustment.

(4) VOLTAGE READINGS

The voltages specified are those at the various tube sockets while the receiver is in operating condition. No allowance has been made for currents drawn by the meter, and if low-resistance meters are used, such allowances must be made.

(5) POWER TRANSFORMER CONNECTIONS

The 220-volt power transformer furnished with some instruments includes taps for operating on 110-volt lines. Figure 5 shows the schematic circuit of the transformer and the proper voltage to be applied to the various taps. The taps are located on the power transformer assembly and are accessible without removing the chassis from the cabinet.

(6) VARIATIONS OF MODEL M-61

This Service Note does not apply in complete detail to the original six-tube chassis employed in Model M-61 during 1934 production. The modifications found on the present chassis do not affect the general service procedure, but rather account for certain minor changes in wiring layout. Notice should be taken that the power output stage uses an RCA-42 instead of the original RCA-41.

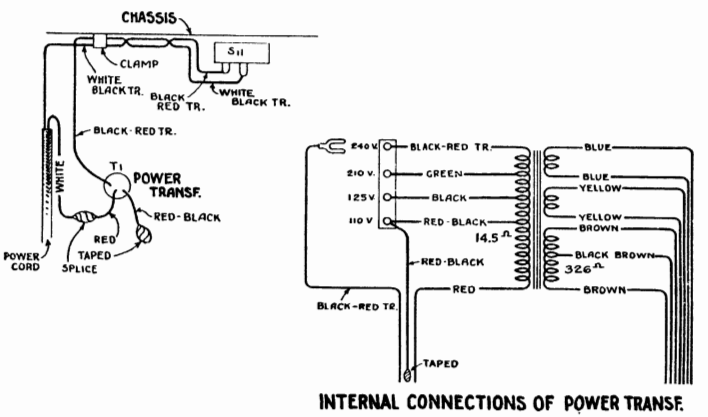


Figure 5—Universal Transformer Connections (50–60 Cycles)

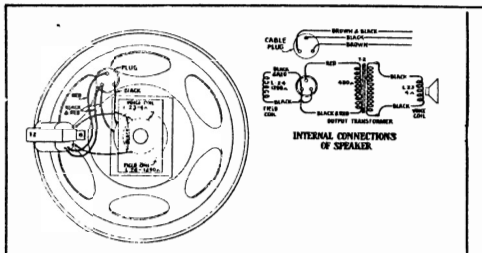


Figure 9—Console Model Loudspeaker (with cable plug)

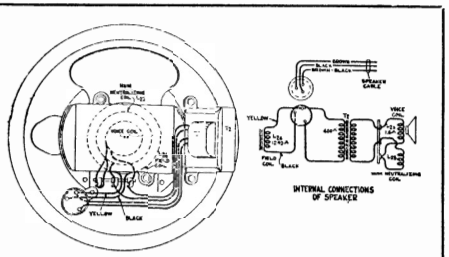
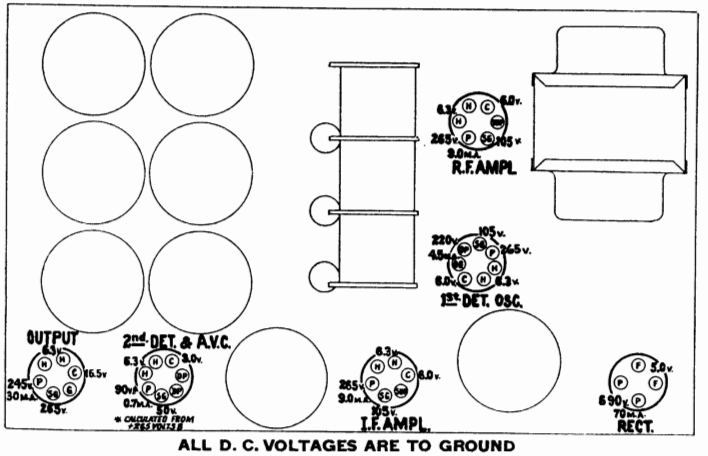


Figure 10—Table Model Loudspeaker Wiring (with cable plug)



ALL D. C. VOLTAGES ARE TO GROUND

Figure 6—Tube Socket Voltages

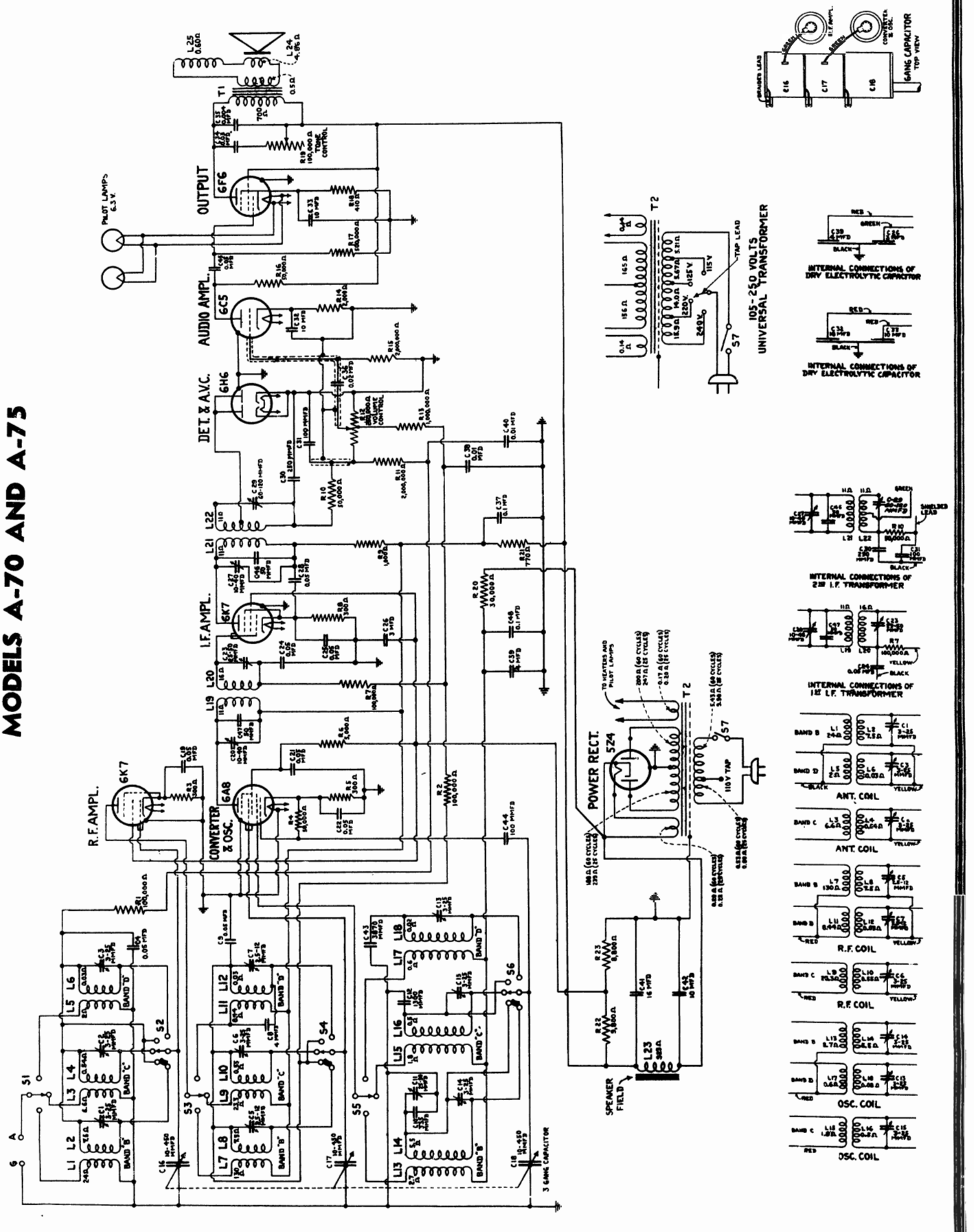
REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	Description	List Price
	RECEIVER ASSEMBLIES	
4427	Bracket—Volume control or tone control mounting bracket	$0.18
4244	Cap—Contact cap—Package of 5	.20
3861	Capacitor — Adjustable trimmer capacitor (C20)	.78
5094	Capacitor—50 mmfd. (C47)	.20
4662	Capacitor—80 mmfd. (C37)	.24
4811	Capacitor—340 mmfd. (C21)	.25
4412	Capacitor—1120 mmfd. (C23)	.25
4515	Capacitor—1160 mmfd. (C34)	.22
4634	Capacitor—1120 mmfd. (C50)	.35
4523	Capacitor—2400 mmfd. (C17)	.26
4524	Capacitor—2850 mmfd. (C25)	.35
4792	Capacitor—.015 mfd. (C39)	.22
4518	Capacitor—.05 mfd. (C35)	.52
4836	Capacitor—.05 mfd. (C4, C12, C29)	.30
4841	Capacitor—.1 mfd. (C6, C15, C30, C40)	.22
4885	Capacitor—.1 mfd. (C7, C26)	.28
3597	Capacitor—.25 mfd. (C38, C45)	.40
4525	Capacitor— 4.0 mfd. (C36)	.70
4428	Capacitor—8 mfd. (C44)	$1.05
7790	Capacitor—10 mfd. (C43)	1.05
4692	Capacitor pack—Comprising one 0.035 mfd. and one 0.005 mfd. capacitors (C41, C42)	.30
7589	Capacitor pack—Comprising two 4. mfd. capacitors (C16, C46)	1.64
4358	Clamp—Electrolytic capacitor mounting clamp	.15
4808	Coil—Antenna coil "Band B" (L3, L4, C2)	1.92
7803	Coil—Antenna coil "Band A-C" (L1, L2, L5, L6, C1, C3)	1.82
4815	Coil—Detector coil "Band B" (L9, L10, C10)	1.80
7805	Coil—Detector coil "Band A-C" (L7, L8, L11, L12, C8, C9, C11)	2.15
7807	Coil—Oscillator coil "Band A-C" (L13, L14, L17, L18, C19, C24)	1.62
4807	Coil—Oscillator coil "Band B" (L15, L16, C22)	1.85
7801	Condenser—3-gang variable tuning condenser (C5, C13, C18)	4.42
4340	Lamp—Dial lamp—Package of 5	.60
3218	Resistor—600 ohms—Carbon type—¼ watt (R2, R6, R8)—Package of 5	1.00

GENERAL ELECTRIC CO.

MODELS A-70 AND A-75



GENERAL ELECTRIC CO.

MODELS A-70 AND A-75

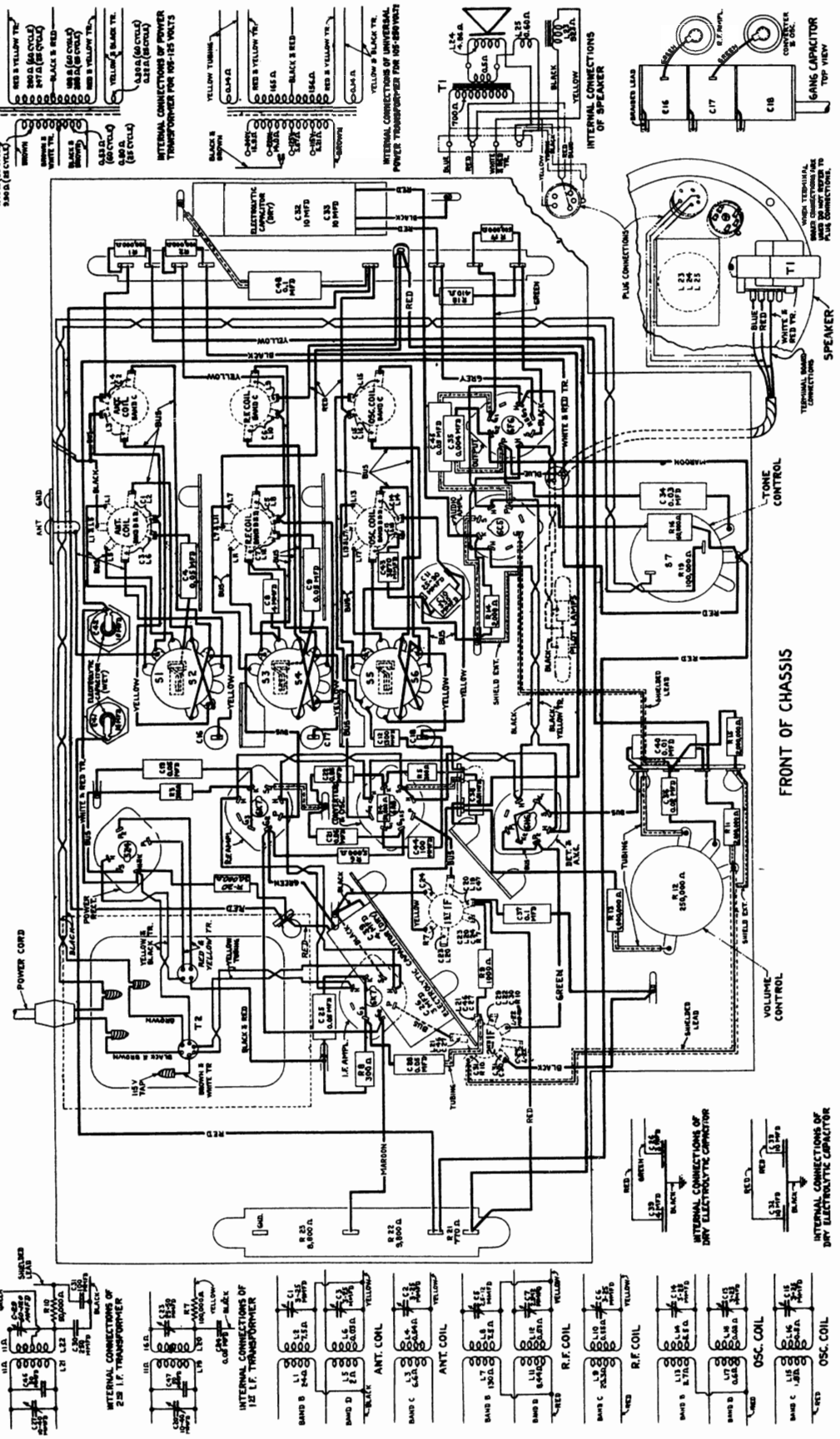


Fig. 3. Chassis Wiring Diagram

Models A-70 and A-75

SERVICE DATA

Physical Specifications

	A-70	A-75
Model		
Height	20 3/8 in.	40 3/8 in.
Width	14 3/4 in.	23 5/8 in.
Depth	11 1/16 in. (Knobs project beyond)	11 1/2 in. (Knobs project beyond)
Weight packed	34 lb.	68 lb.

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	105–130	50–60	100
C	105–130	25–60	105
V	105–130 and 200–250	40–60	105

NOTE: Taps on universal transformers (Rating "V") are accessible by removing the cap cover mounted on the top of the transformer. Schematic and wiring diagrams of the universal transformer are shown in Fig. 2 and 3, respectively.

Tuning Frequency Range

Band "B"	540–1750 kc
Band "C"	1.75–6.0 mc. (1750–6000 kc.)
Band "D"	6.0–19.5 mc. (6000–19,500 kc.)

Tuning Control Drive Ratio

Fast Tuning	5 1/2 to 1
Vernier Tuning	55 to 1

Electrical Power Output

Undistorted	2.0 watts
Maximum	3.7 watts

Loud-speaker—Electrodynamic

Cone: Model A-70 8 in. overall, 7 in. effective diameter

Model A-75 10 1/4 in. overall, 9 1/4 in. effective diameter

Cone Coil Impedance: 5 ohms at 400 cycles

Tubes

R. F. Amplifier	6K7 Triple-grid Super-control Amplifier
Converter and Oscillator	6A8 Pentagrid Converter
I. F Amplifier	6K7 Triple-grid Super-control Amplifier
Detector and AVC	6H6 Twin Diode
Audio Amplifier	6C5 Detector Amplifier Triode
Output	6F6 Power Amplifier Pentode
Power Rectifier	5Z4 Full-wave Rectifier
Dial Lamps	MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Models A-70 and A-75 employ seven metal envelope tubes to perform the above functions in a superheterodyne circuit, giving the excellent selectivity and sensitivity inherent in this type circuit Separate groups of coils are used for each frequency band Ample undistorted output is obtained through diode detection and two audio amplifier stages.

The signal from the antenna is applied to the control grid of the 6K7 R. F. amplifier tube through the antenna coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. The secondary of the coil for the band next lower in frequency to the one in use is short-circuited by the band switch to prevent absorption of energy at its resonant frequency which falls in the next higher band.

The amplified radio frequency signal is impressed on the control grid of the 6A8 converter and oscillator tube through the R. F. coil, the secondary of which is tuned to the signal frequency by the center section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc. higher in frequency. The local signal is generated by the oscillator elements of this tube and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors. The oscillator section of the main tuning condenser, although of the same capacity as the other two sections, is larger physically to permit wider spacing of the plates, thereby reducing the possibility of microphonic feedback howl.

The combination of the signal frequency with the local oscillator frequency in the converter tube produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-12. This voltage drop provides automatic bias for the R. F. and I. F. amplifier and converter tubes and so gives automatic volume control action. Full automatic bias voltage is applied to the R. F. amplifier tube, while half this voltage, from the midtap of R-12, is applied to the converter tube and I. F. amplifier, which handle a somewhat larger signal voltage than the R. F. amplifier.

The manual volume control selects the amount of audio signal applied through coupling capacitor C-36 to the grid of the 6C5 audio amplifier tube, and this regulates the output of the receiver. The output of the 6C5 tube is resistance coupled to the grid of the 6F6 power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .03-mfd. capacitor connected in series with a continuously variable 0-100,000-ohm resistance across the primary of the output transformer. When it is desired to reduce the high frequency output of the receiver, resistance is cut out of the circuit by operating the tone control knob.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal at the alignment frequency from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the center of a particular coil, through the opening provided in the top of the shield, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand		Trimmer Adjustment Required
Wand	Signal	
Brass cylinder	Decrease	None
Iron filings	Decrease	
Brass cylinder	Increase	Decrease capacity
Iron filings	Decrease	
Brass cylinder	Decrease	Increase capacity
Iron filings	Increase	

Fig. 4 shows the location of the antenna, R. F. and oscillator coils for each of the three frequency bands of Model A-70 and A-75 receivers.

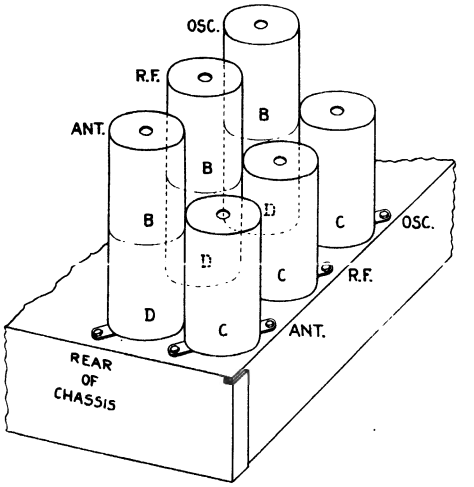


Fig. 4. Coil Locations

ALIGNMENT FREQUENCIES

I. F.	Band "B"	Band "C"	Band "D"
465 kc.	580 kc. 1740 kc.	6000 kc.	18,000 kc.

In order to align these receivers properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 465, 580, 1740, 6000, and 18,000 kc.
2. An output indicator, such as a high resistance a-c. voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp output indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
4. A tuning wand.

The location of all trimmer capacitors, as well as socket voltages to chassis, is shown in Fig. 5.

1. I. F. Alignment

Set the frequency band switch of the receiver to Band "B," short-circuit the antenna and ground terminals and tune the receiver at some point above 1500 kc. so that no signal is heard. Set the volume control at its maximum position and ground the chassis.

The I. F. amplifier is tuned to 465 kc.; set the test oscillator dial at this frequency. Connect the test oscillator output between the converter tube (6A8) control grid and chassis. Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed in the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good readable output indication.

Adjust the secondary trimmer of the second I. F. transformer until a maximum output reading is obtained. Maintain a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer and lastly the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

2. R. F. Alignment

Band "B" requires four trimmer adjustments, while Band "C" and Band "D" each require three adjustments. Care should be taken to adjust only the trimmers of the band under test. Check the position of the dial pointer as outlined in the section on adjustment of the dial mechanism. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output from the test oscillator, preferably using a dummy antenna of 250 mmfd. in series with 200 ohms between the test oscillator and receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Band "B"—540–1740 kc.

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 1740 kc. and set the dial pointer on the

Models A-70 and A-75

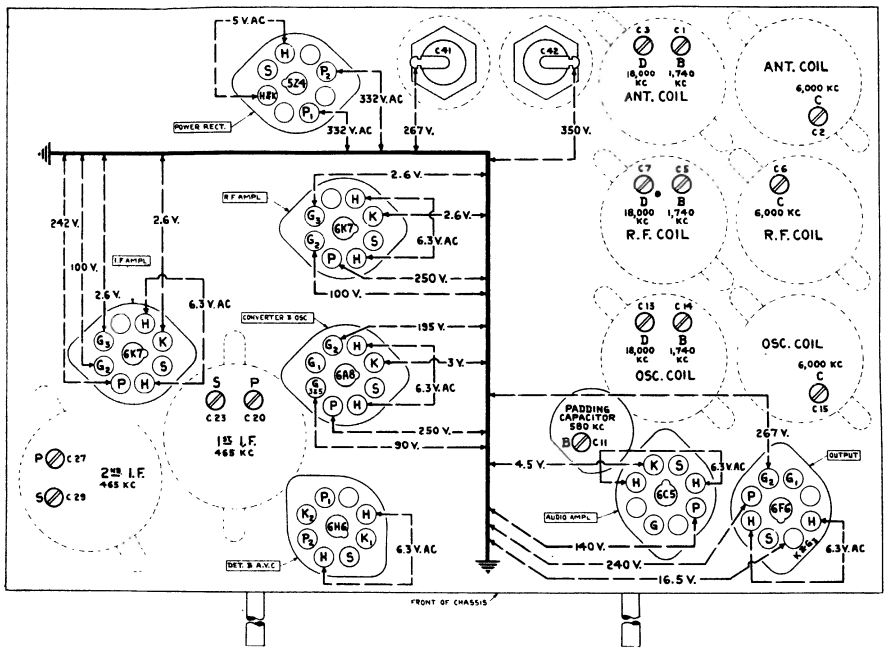


Fig. 5. Trimmer Locations and Socket Voltages

receiver to this frequency. Adjust the Band "B" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the Band "B" oscillator trimmer is obtained, adjust the Band "B" R. F. and antenna trimmers for maximum output.

Now tune the test oscillator to 580 kc. and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 580-kc. padding capacitor for maximum output. When this has been done, return to 1740 kc. on the receiver and test oscillator and recheck the alignment for maximum output. Band "B" should now be in alignment.

Band "C"—1.75–6.0 mc. (1750–6000 kc.)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 6000 kc. and set the dial pointer on the receiver to this frequency. Adjust the Band "C" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 5070 kc. on the receiver dial. It should be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (6000 kc.) and reduce the test oscillator output to its previous value. Then adjust the Band "C" R. F. and antenna trimmers for maximum output.

Band "D"—6.0–19.5 mc. (6000–19,500 kc.)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 18,000 kc. and set the dial pointer on the receiver to this frequency Adjust the Band "D" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 17070 on the receiver dial. It may be necessary to increase input to the receiver from the test oscillator for this check. Tune the receiver to the correct scale reading (18,000 kc.) and reduce the test oscillator output to its previous value.

Reduce the capacitance of the R. F. trimmer to a minimum. While slowly rocking the tuning condenser through the 18,000-kc. point, increase the Band "D" R. F. trimmer capacitance until a maximum response point is obtained. The Band "D" antenna trimmer should next be peaked. It is not necessary to rock the tuning condenser while making this last adjustment.

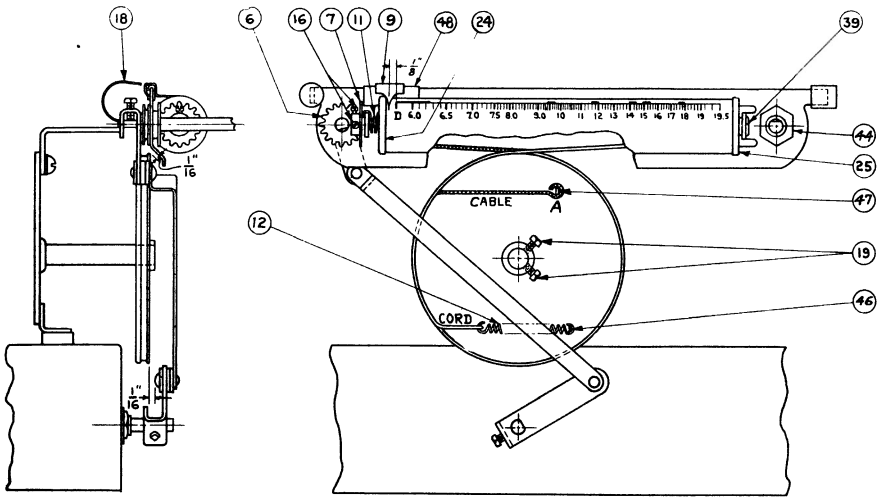


Fig. 6. Dial Mechanism

Adjustment of Dial Mechanism

The dial mechanism is rigidly mounted to the frame of the tuning condenser by means of two removable screws, the complete assembly being rubber-mounted by means of rubber cushions and bushings at points of support. The dial pointer, station selector knob, and tuning condenser drive drum are interconnected by means of the drive cord and drive cable; the frequency band switch, the cylindrical dial scale and switch knob, by gear and toggle assemblies.

1. Position of Drum on Condenser Shaft

With set screws (19) loosened and tuning condenser plates fully engaged, place the drum in the position as shown in Fig. 6 so that drum spring (12) is approximately horizontal, and the top rim of the drum is $\frac{1}{16}$ in. away from the mounting plate. Guide (48) should stop at equal distances from each end of the mounting plate slot.

2. Removing and Replacing Scale

Pry out fastener (39), and remove the scale by lowering that end below the ear and taking the scale out of cap assembly (24), holding parts (24), (11), and (7) in place. Replace, locating tabs of caps (24) and (25) in slots of scale. Replace fastener (39).

3. Locating Scale

Loosen the two gear set screws (16). Rotate the scale upward until there is slight tension on spring (11) with the pointer indicating on the Band "D" scale. With the frequency band switch in the Band "D" position, place gear (7) in mesh with the gear on part (6) and tighten the two set screws (16).

4. Replacing Drive Cord

The position of the dial scale pointer with respect to the tuning condenser drum is held fixed by means of a special metal braid cable connecting the drum with the guide (48). Tension is maintained on the cable through the drum spring (12) and drive cord. To replace either the drive cable or the drive cord, remove the dial scale for convenient access to guide (48). Unhook spring (12) from tab (46) to release tension. Unhook the cable or cord from guide (48) and unwind from the pulleys and drum. To replace the cable rethread to agree with Fig. 6, and rehook drum spring (12) as shown.

5. Replacing Reduction Drive

To replace the reduction drive, unhook spring (12), loosening the drive cord. Unscrew palnut (44) and remove drive. Replace with new drive and rehook drive cord.

6. Replacing Toggle Assembly

Loosen the two set screws holding the toggle mechanism on the band change switch and on shaft (6) Replace with new assembly, setting lower lever arm $\frac{1}{16}$ in. away from the condenser drive drum as shown in Fig. 6, and tighten set screw on frequency band switch shaft. Rotate shaft (6) clockwise until there is slight tension on spring (11) with the scale in the Band "D" position. Place upper lever arm in shaft and tighten set screw

7. Setting Scale Pointer

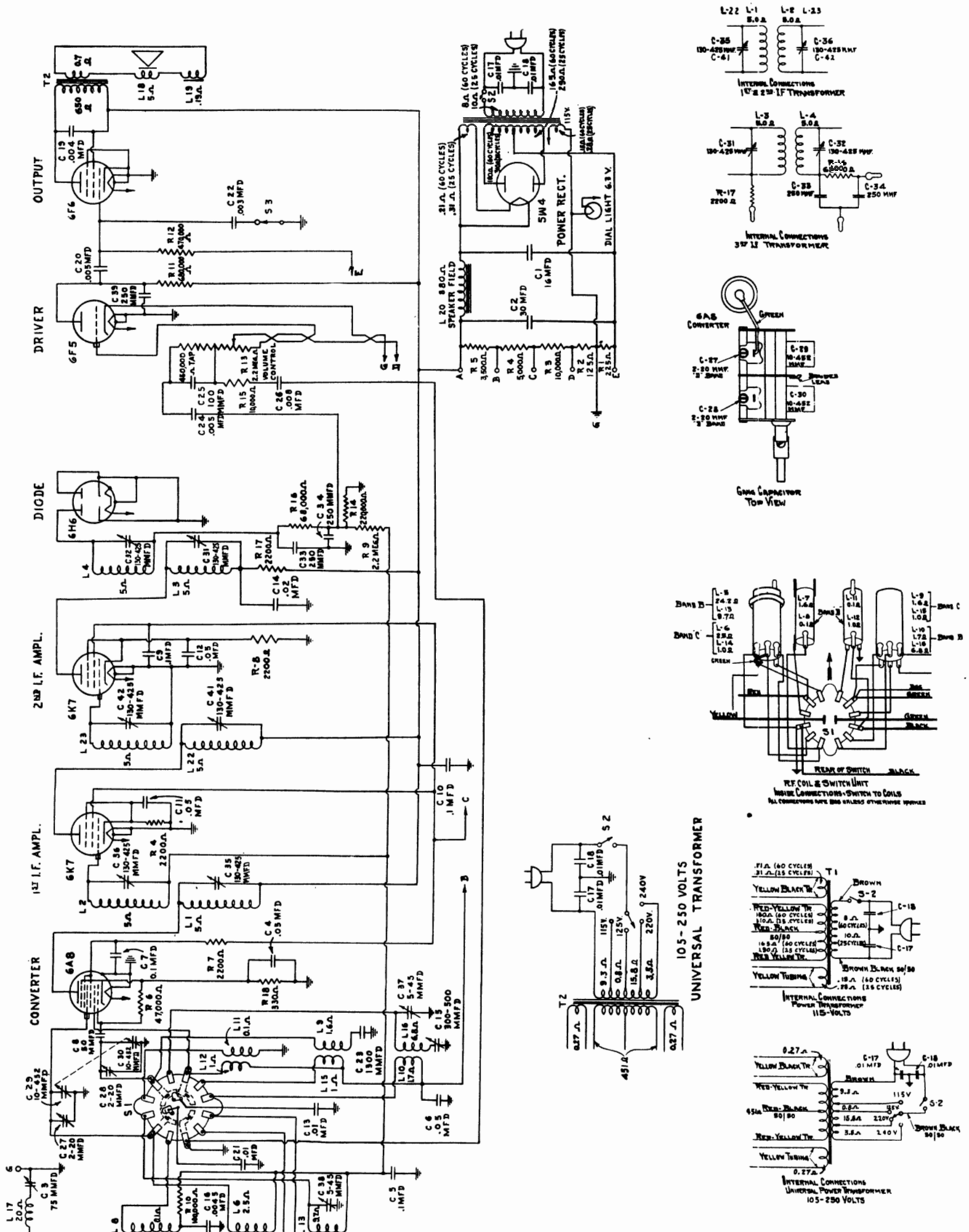
The scale pointer is soldered to the slider. To set the pointer mechanically, turn the tuning condenser rotor so that the plates are fully engaged, and solder the pointer to indicate $\frac{1}{8}$ in. to the left of the extreme left-hand line on the Band "D" scale as shown in Fig. 6.

8. Replacing Dial Lamp

Take hold of terminals of lamp bracket and push up until lamps protrude above the opening in reflector (18). Lamps may then be replaced in socket clips. After replacing lamps, slide the socket mounting bracket back into the mounting clip.

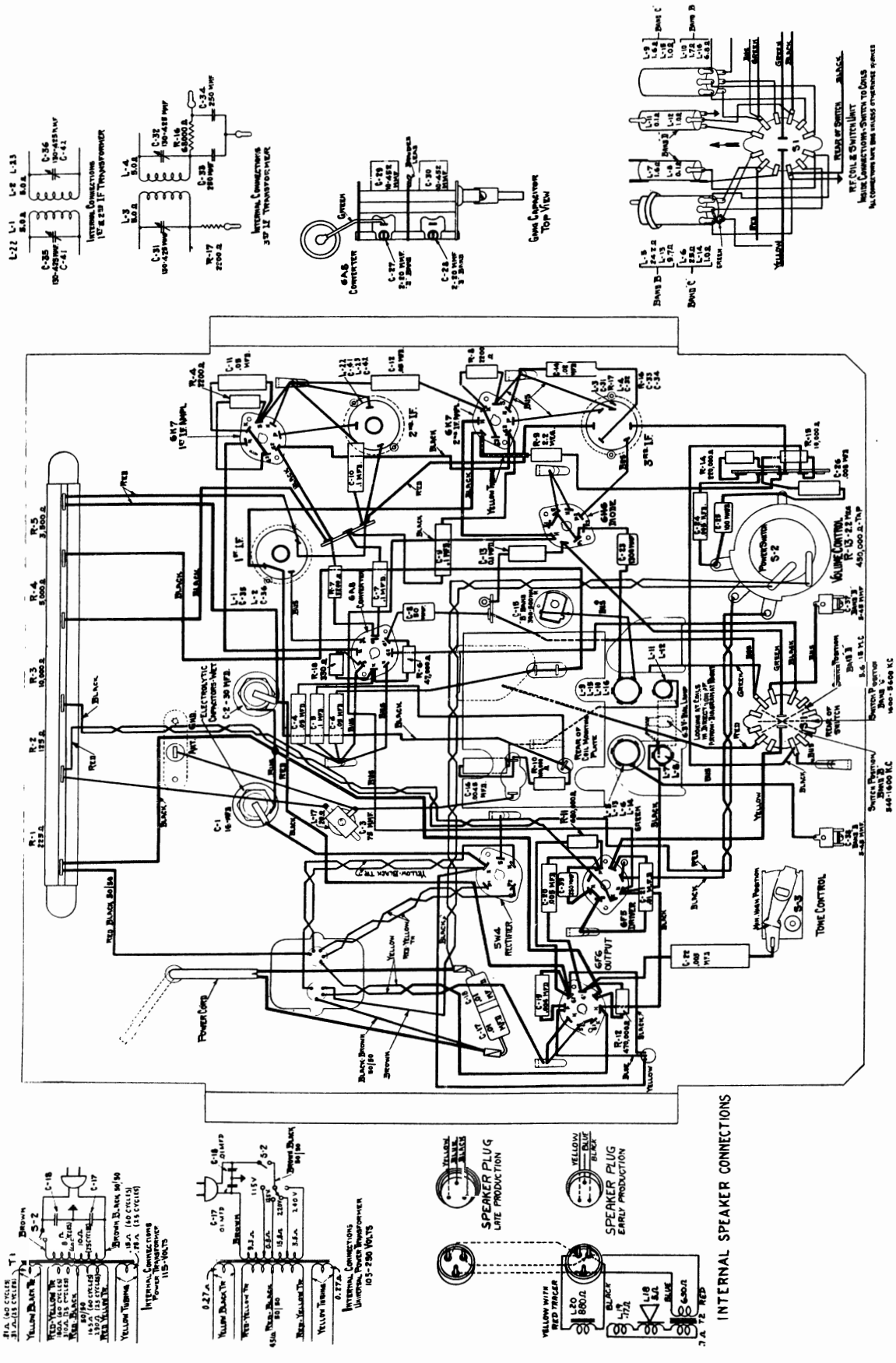
GENERAL ELECTRIC CO.

MODELS E-71, E-72 AND E-76



GENERAL ELECTRIC CO.

Models E-71, E-72, E-76



GENERAL ELECTRIC CO.

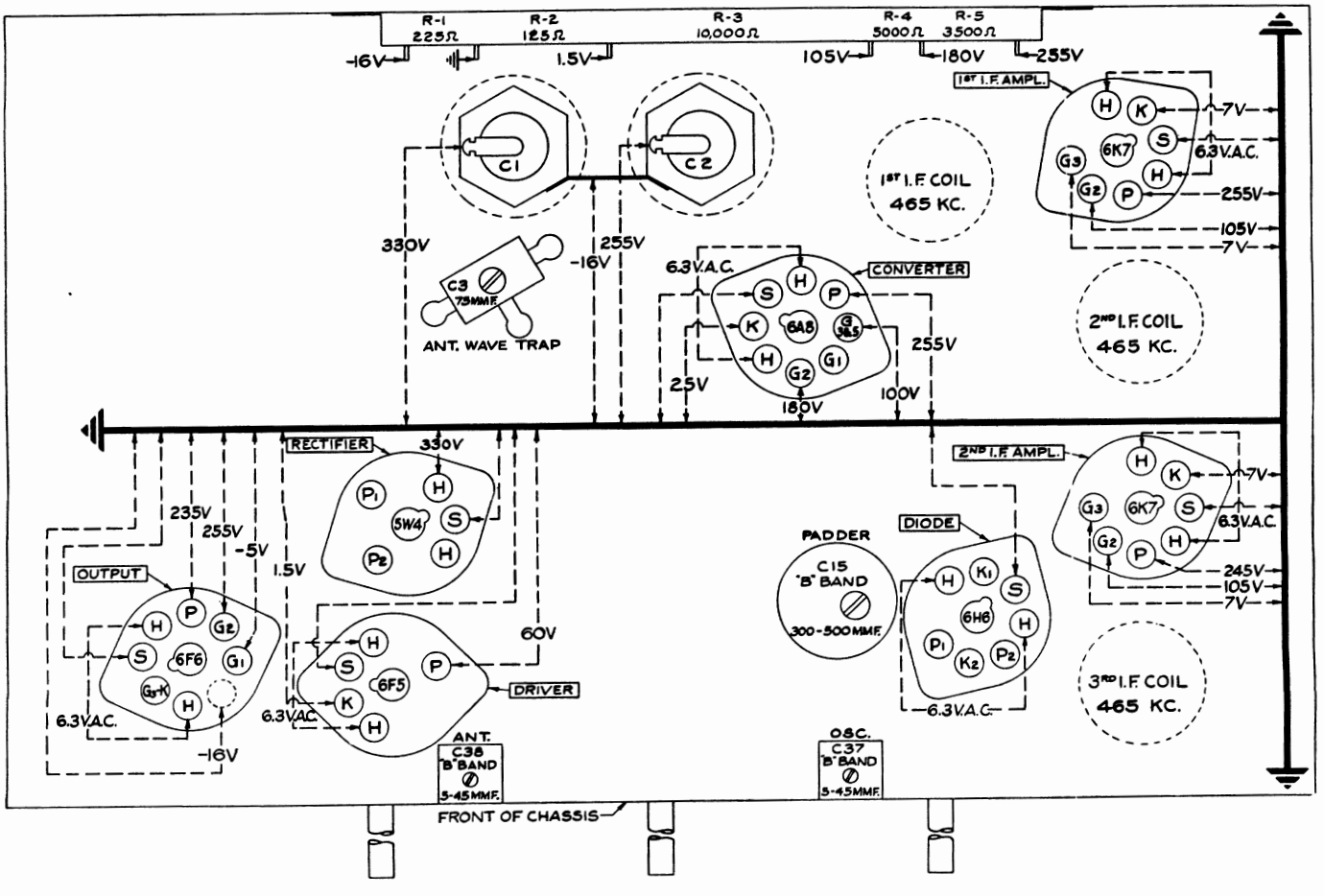
Models E-71, E-72, E-76

SOCKET VOLTAGES

Tube No.		Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6A8	Oscillator	2.5	. . .	180	12.0	6.3
	Converter	. . .	100	255		
6K7 1st I. F. Amp.		7.0	105	255	9.0	6.3
6K7 2nd I. F. Amp.		7.0	105	245	9.0	6.3
6H6 Detector & AVC.		. . .	. . .	. . .	. . .	6.3
6F5 Audio Amplifier		1.5	. . .	* 60	0.3	6.3
6F6 Output		. . .	255	235	36.0	6.3
5W4 Power Rectifier		300 D.C.	. . .	650/325 R.M.S.	70.0	5.0

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

* Supply voltage minus drop in load resistor.



VIEWED FROM UNDERSIDE OF CHASSIS

GENERAL ELECTRIC CO.

MODEL D-72

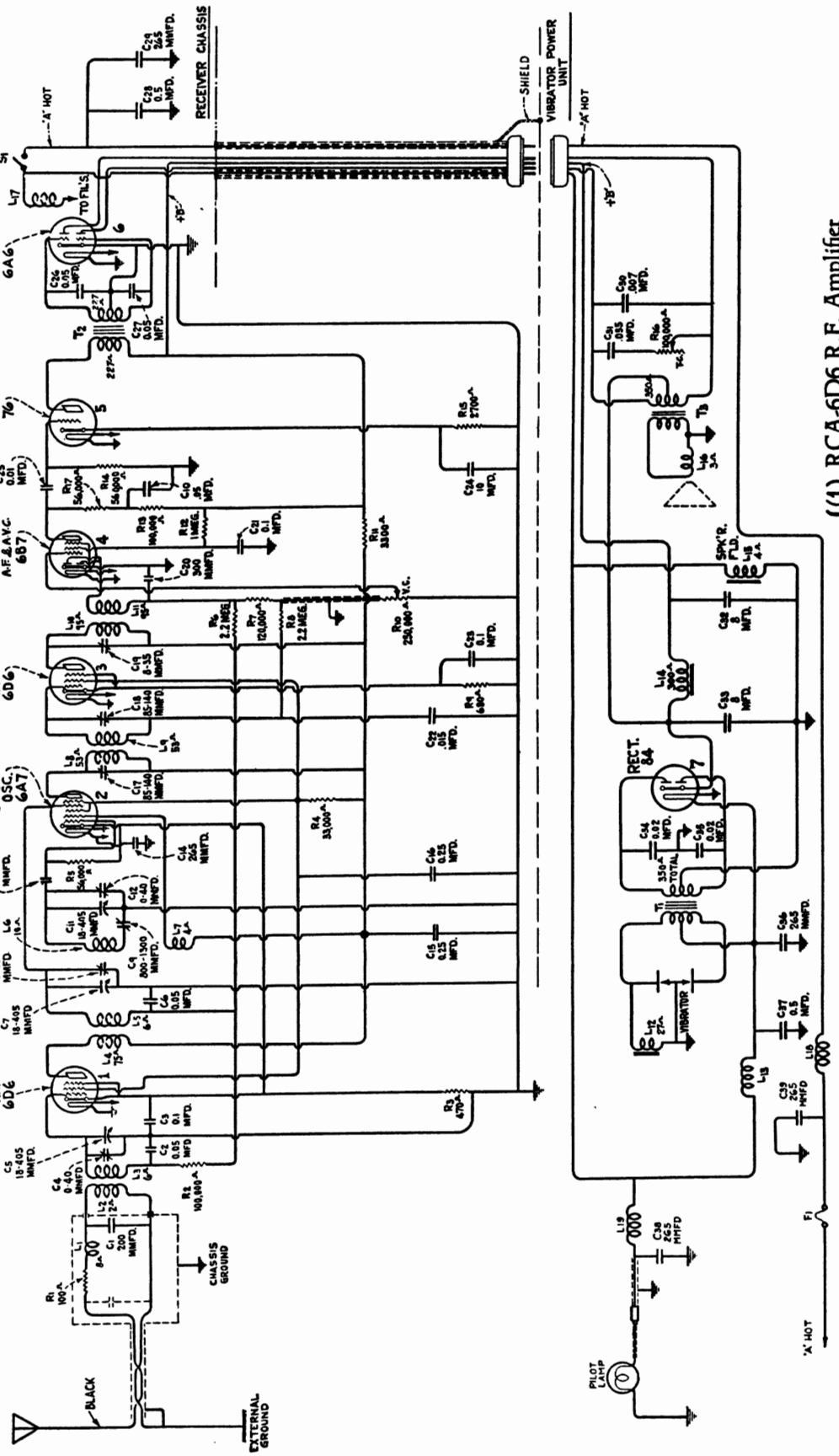


Figure 3—Schematic Circuit Diagram

Radiotron Complement.....

(1) RCA-6D6 R.F. Amplifier
(2) RCA-6A7 Oscillator and First Detector
(3) RCA-6D6 I.F. Amplifier
(4) RCA-6B7 Second Detector, A.F. Amplifier and A.V.C.
(5) RCA-76 A.F. Amplifier
(6) RCA-6A6 Power Output
(7) RCA-84 Rectifier

GENERAL ELECTRIC CO.

MODEL D-72

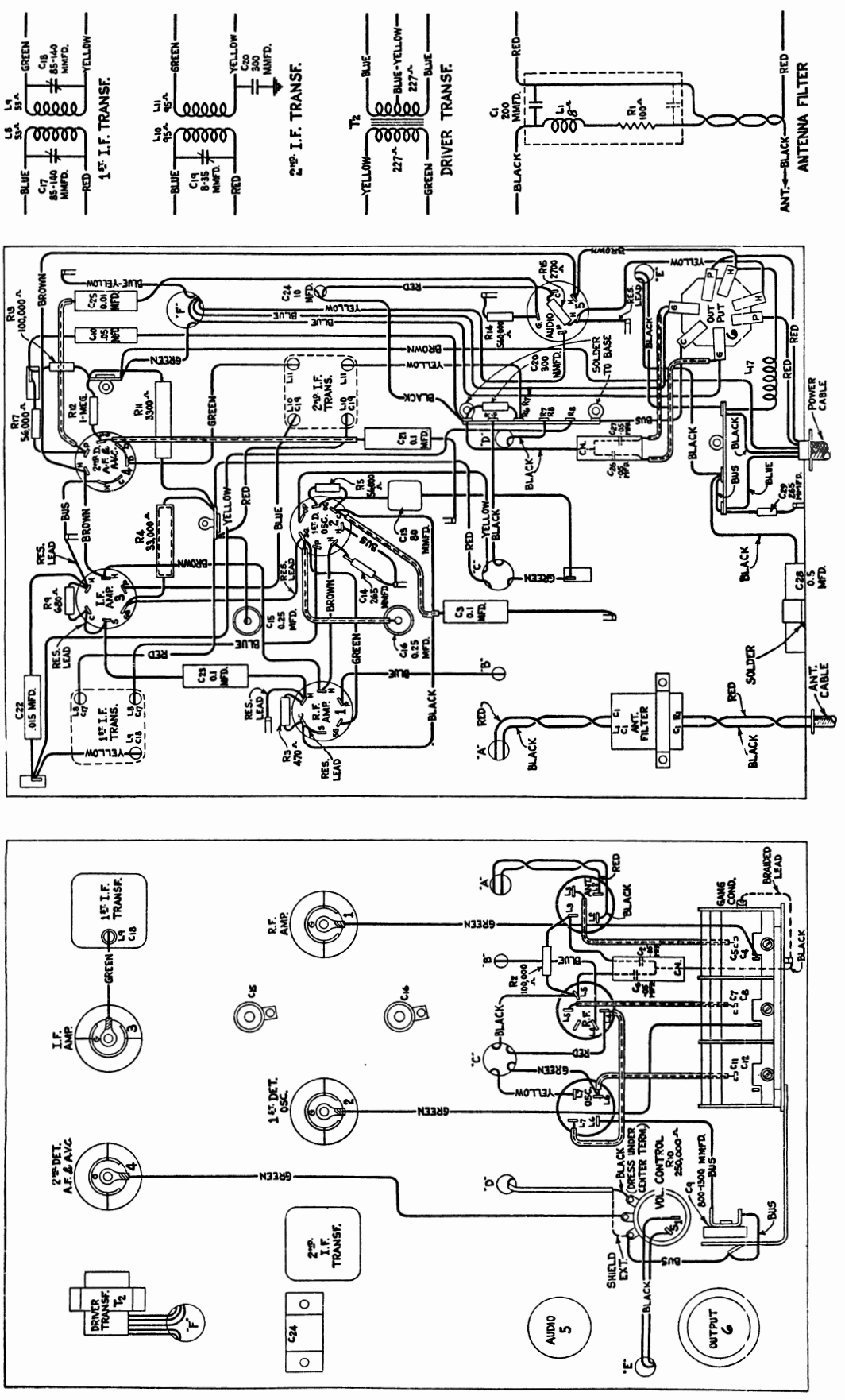


Figure 4—Chassis Wiring Diagram

Model D-72

DESCRIPTION OF ELECTRICAL CIRCUIT

The electrical arrangement of the receiver is shown in the schematic of Figure 3. A corresponding wiring layout is shown in Figure 4, where the actual physical relations and coding of conductors are given.

The tube line-up in the superheterodyne circuit consists of seven Radiotrons. In sequence, there is an r-f stage, a dual first detector and oscillator stage, a single i-f stage, a combined second detector-audio amplifier-a.v.c. stage, an audio driver stage, a push-pull power output stage, and a full-wave rectifier. There are five circuits which are tuned to the signal desired, to strengthen its magnitude and reject undesired signals and interference.

The following describes the functions of the various stages of the receiver: Beginning at the antenna circuit, there is a special transmission line and "noise filter" circuit, which, in conjunction with the tuned input system, acts selectively to the entire broadcast range and drastically attenuates signals and interference outside the limits of the band (540–1600 kc.). These properties of the filter circuit and minimizing of primary to secondary capacity coupling in first r-f transformer cause a very great reduction of the ignition noise present when the car is in operation. The ground of the input coil does not appear at the usual point on the chassis frame, but instead is extended as part of the antenna transmission line lead-in to the outer termination of the shield, where it grounds to the frame of the car. This arrangement prevents r-f disturbances which are circulating in the car frame (ground) from becoming mutual to the receiver input. The characteristics of the transmission line section of the antenna lead-in are such as to favor the operation of the noise filter. Its distributed capacitance due to length, conductor sizes, insulation, etc., is of such value as to operate with the inductance and capacitance elements of the input system to obtain a "band-pass" filtering effect. The filter has an acceptance band between 540 kc. and 1600 kc., and sharply defined cut-off below and above these two limits. It is generally possible, because of this input arrangement, to dispense with the usual spark-plug and distributor suppressors without encountering substantial ignition interference on latest types of cars.

After passing through the input filter the signal is applied by transformer action to the control grid of the r-f stage. An RCA-6D6 at this point performs the function of an r-f amplifier, its super-control property being adapted as means of preventing cross-modulation and securing a wide range of volume control. The first (front) section of the tuning condenser is connected to sharply tune the secondary of the antenna coupling transformer.

A second r-f coupling transformer transmits the signal to the following receiver stage, which comprises a combination first detector and local oscillator. The secondary inductance of this transformer is tuned by the second (center) section of the variable capacitor and connects to the detector grid of the RCA-6A7 Radiotron. The local oscillator circuit is established by mutual arrangement of the several elements within this tube. Here the incoming signal is mixed with the local oscillator frequency. The difference frequency beat (i. f.) of these two combined signals is detected by the tube and transferred by a closely coupled transformer to the intermediate-frequency amplifier tube, an RCA-6D6. Both windings of this i-f transformer are tuned by trimmers. The second i-f transformer which joins the RCA-6D6 to the second detector stage has only one trimmer, that being in shunt with its primary winding.

The RCA-6B7 second detector stage receives the i-f signal on its diode plates. Detection takes place as a result of the rectifying action of the diodes and develops a current through the resistors R7 and R10. The d-c voltage drop across the resistance R7 plus R10 is used for automatically regulating the control grid bias of the r-f and first detector stages. The amplification thus becomes dependent upon the signal strength. This process (a.v.c.) compensates for fading signals and tendency toward reduction of signals due to change of antenna direction and shielding effect of buildings, etc. A smaller portion of the d-c voltage obtained by detection is tapped from the juncture of R7 and R10 and is carried to the control grid of the i-f stage. This likewise furnishes automatic volume control, but in a smaller degree.

The audio and d-c components of the detected signal are selected from the resistor R10 by its movable arm and applied to the control grid of the RCA-6B7. The d-c obtained from the signal and applied to the grid prevents overload as the volume control is advanced. Amplification results and the signal passes on to the audio-driver stage. The RCA-76 Radiotron used as an a-f amplifier is resistance-capacitance coupled to the detector stage output. Its plate is matched to the power output stage by a transformer.

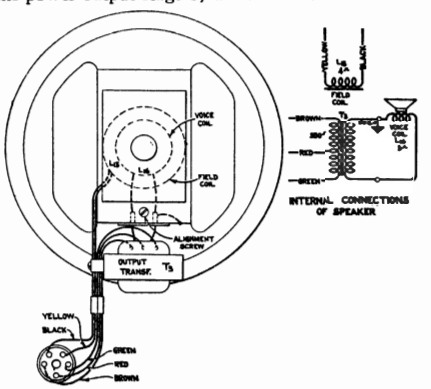


Figure 1—Loudspeaker Wiring

The output stage utilizes an RCA-6A6 tube which performs as a push-pull type. It delivers a high level-high quality signal to the remote loudspeaker unit.

The power supply system consists of a mechanical vibrator for interrupting the d-c from the battery in order to transform the current to high voltage, which in turn is rectified by a full-wave tube, an RCA-84. The vibrator used is adapted for convenient removability by having its base constructed for "plug-in" mounting.

SERVICE DATA

The general mechanical layout of this receiver is judiciously arranged to facilitate any tests, repairs or adjustments that may become necessary. All information needed for proper servicing is presented by the schematics, wiring diagrams and text of this booklet.

LINE-UP ADJUSTMENTS

Maximum efficiency and best quality of performance can only be obtained when the receiver circuits are in correct alignment. The circuits should be realigned after each major service operation and whenever there are positive indications that the adjustments have deviated from normal by ordinary usage.

A definite procedure must be adhered to in readjusting the line-up trimmers. Proper oscillator and indication equipment are also required. Certain standard service instruments, useful for receiver adjusting, have been devised and made available by the manufacturer of this receiver. These are illustrated and described on Page 2.

Preparatory Details

(a) **Dial Calibration**—The tuning condenser flexible shaft engages a gear system within the control unit which actuates the dial pointer. To adjust the mechanical relations of the variable condenser and the dial pointer so that accurate calibration is obtained:—rotate the station selector knob until the variable capacitor is at full mesh, which will carry the dial pointer to its minimum frequency position; then remove the tuning knob, loosen the set screw in the bushing and rotate the bushing until the pointer sets exactly opposite the last radial line at the low-frequency end of the scale. (The line referred to is the second one counter-clockwise of the 550 kc. marking.)

(b) **General Procedure**—The "Output Indicator" should be attached to the voice coil or speaker input circuit; and for each adjustment, the oscillator output increased until a noticeable registration or glow occurs on the indicator. The signal from the oscillator should be held as low as possible consistent with getting a good indication, with the receiver volume control at its maximum position. This method of procedure prevents the automatic volume control from affecting the adjustments.

I-F Adjustments

Three trimmers are provided in the i-f system. Two are located on the first i-f transformer, and one on the second i-f transformer. Their physical positions are

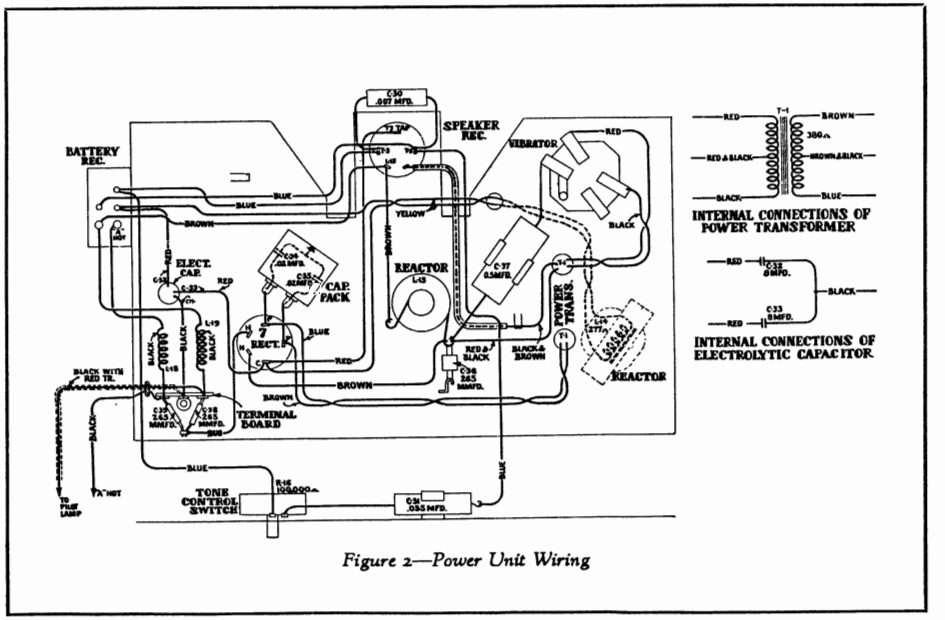


Figure 2—Power Unit Wiring

shown in Figure 5. To correct their alignment proceed as follows:

(a) Connect the output of the "Full Range Oscillator" to the first detector grid and ground, and adjust its frequency to 175 kc. Tune the station selector to a point where no signals are received.

(b) Tune each of the trimmer capacitors C19, C18 and C17 in order. C19 should be set for maximum (peak) output. C18 and C17 should be roughly adjusted for maximum output and then carefully "trimmed" so that a flat-topped response is obtained. This may be checked by shifting the external oscillator frequency through a range two kilocycles each side of the 175 kc. and noting whether or not the receiver output remains substantially constant.

R. F., Detector and Oscillator Adjustments

Three adjustments are used at the high-frequency end of the tuning range. They are located on the gang condenser as shown by the diagram of Figure 5. One trimmer (C9) is used in the oscillator circuit for alignment at 600 kc., it being located as shown in Figure 5.

The external oscillator should be connected to the antenna-ground input at the outer end of the lead-in shield through a 300-ohm resistor in the antenna side. Tuning should be done as follows:

(a) Adjust the frequency of the external oscillator to 1400 kc. and turn the station selector until the dial pointer is at the 1400 kc. marking.

(b) Tune the oscillator high-frequency trimmer, C12, the detector trimmer C8 and the r-f trimmer C4 for maximum receiver output.

(c) Set the external oscillator to a frequency of 600 kc. and rotate the station selector until this signal is accurately tuned. Then adjust the oscillator trimmer C9, simultaneously rocking the tuning condenser slowly through the signal until maximum obtainable output results from the two combined operations. This adjustment should be made irrespective of dial calibration.

(d) Recheck the adjustment of the 1400 kc. oscillator trimmer (C12) as in (b) to correct any reflective errors caused by the procedure of (c).

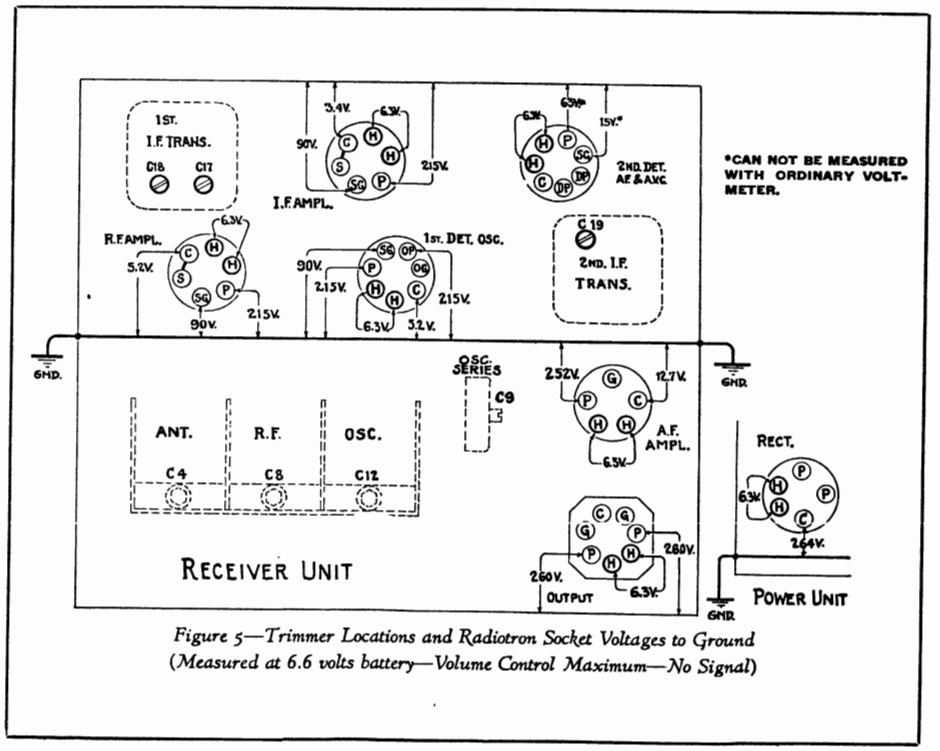


Figure 5—Trimmer Locations and Radiotron Socket Voltages to Ground (Measured at 6.6 volts battery—Volume Control Maximum—No Signal)

Radiotrons

Under ordinary usage within the ratings specified for voltage supply tube life will be consistent with that obtained in other applications. Their deterioration and approach to failure is usually evidenced by noisy or intermittent operation, loss of sensitivity and distorted tone quality.

It is not feasible to test the Radiotrons in the receiver sockets due to likelihood of errors being caused by the associated circuits. Their removal and check with standard tube testing apparatus is therefore advisable.

Tuning Condenser Drive

The coupling of the flexible drive shaft to the variable tuning condenser is through a worm-gear arrangement. Figure 6 shows the two gears and their positions. Smooth operation should be obtained over the entire tuning range. The presence of binding or backlash may cause irregularity in the tuning. To correct these conditions, it will be necessary to remove the chassis from the case and the following procedure applied:—Loosen the two screws behind the condenser drive gear which clamp the worm-gear support plate, and shift the plate upward or downward to change the degree of gear mesh and tension of the spring as required for smooth operation. The screws should then be carefully re-tightened.

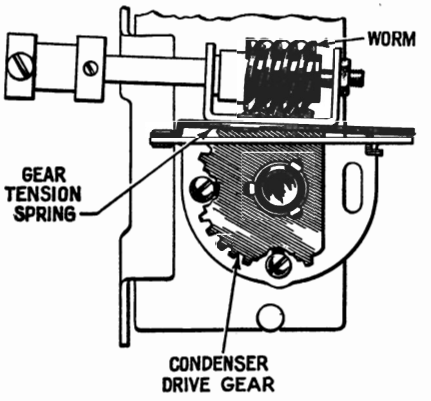


Figure 6—Condenser Drive Mechanism

Pilot Lamp

A novel type of mounting is provided for the pilot lamp. It consists of a miniature socket attached to a heavy screw which threads into the case of the control unit. The head of this screw is accessible from the underside of the control unit and may be removed with a large screwdriver whenever it becomes necessary to replace the pilot lamp. The power switch should be turned to "off" in order to prevent blowing the fuse if the lamp socket should come in contact with the grounded control case.

Power Unit Interrupter

The mechanical interrupter used in combination with a tube rectifier in the power unit is constructed so as to be conveniently exchanged. Its base is of the "plug-in" type. The adjustments of this device have been correctly set during manufacture by means of special equipment. They should therefore be left undisturbed. In cases of faulty operation, a renewal should be installed.

Speaker Cone Alignment

In the event the cone coil becomes mis-aligned, it will be necessary to correct its centering by an adjustment provided on the speaker assembly. The coil is supported by an external spider. Two round-head brass screws secure its mounting. To center the cone, loosen these two screws and insert a small rod or nail into the hole adjacent to one of these screws and pry the cone mounting into the position which gives normal operation.

Miscellaneous Service Hints

1. The grounding of the outer end of the antenna lead shield is quite critical in that ignition interference may be minimized by selecting the proper point of attachment to the car frame, determined by experiment for each individual installation.

2. In some cars, ignition interference may be introduced through lack of sufficient shielding on the antenna lead-in. In such cases, a shield should be placed over the exposed section of lead and carried as near to the antenna as possible. It should be solidly grounded.

3. Interference in the form of a grating scratch may arise from static collecting on the front wheels of the car due to road surface friction in dry weather. The insulation caused by the grease of the wheel hub enables this action to develop. A number of devices are available through automotive supply dealers which are designed to eliminate this type of trouble. They all serve to form a solid grounding tie between the hub and the axle, and thus drain the static to the frame of the car (ground).

4. The screws holding the chassis to the case must all be in place and tightly installed, inasmuch as they appreciably affect the ground resistance of the assembly and will consequantly have a bearing on the amount of ignition noise received.

GENERAL ELECTRIC CO.

MODELS E-81 AND E-86

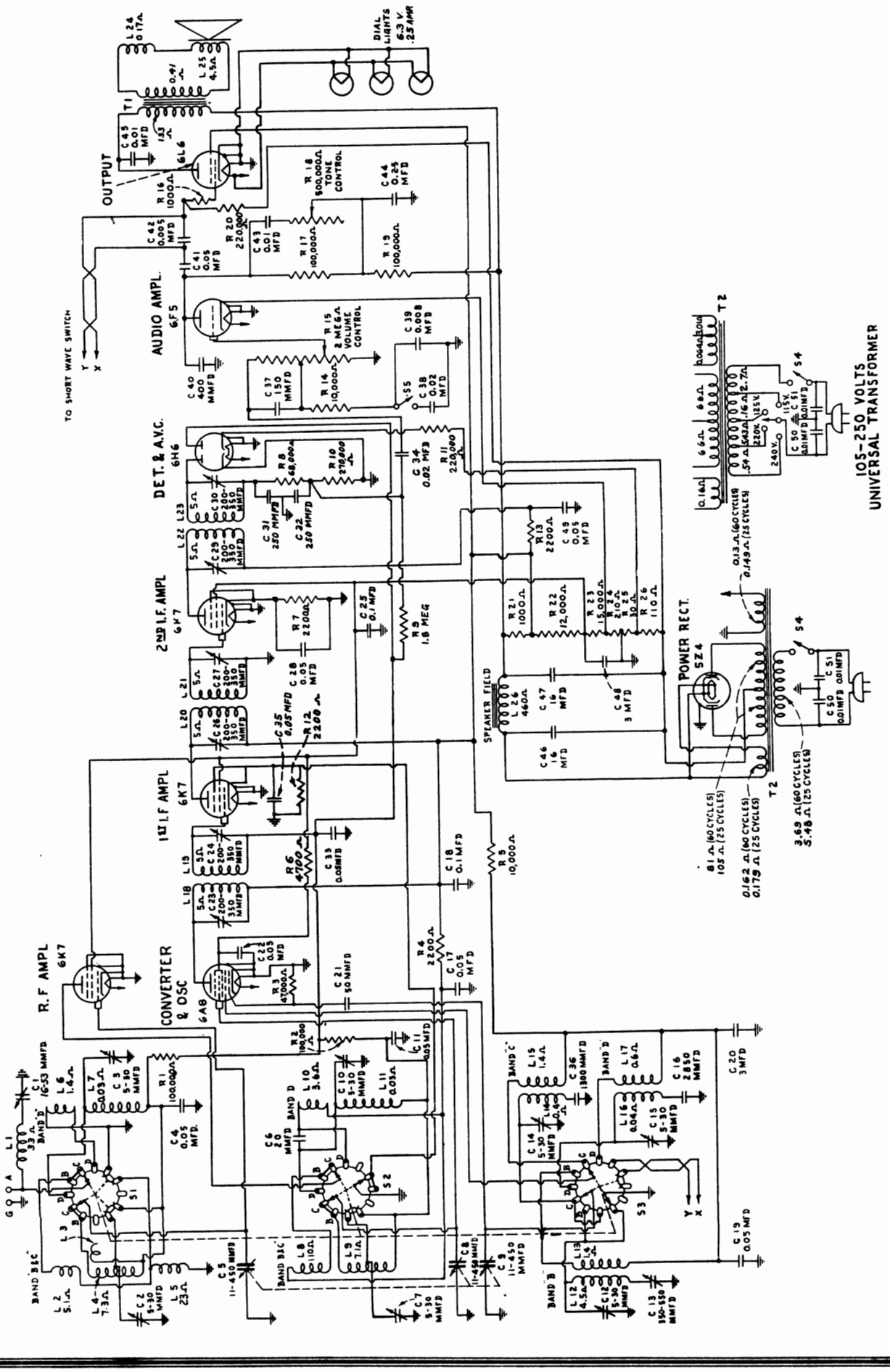


Fig. 1. Schematic Circuit Diagram

GENERAL ELECTRIC CO.

MODELS E-81 AND E-86

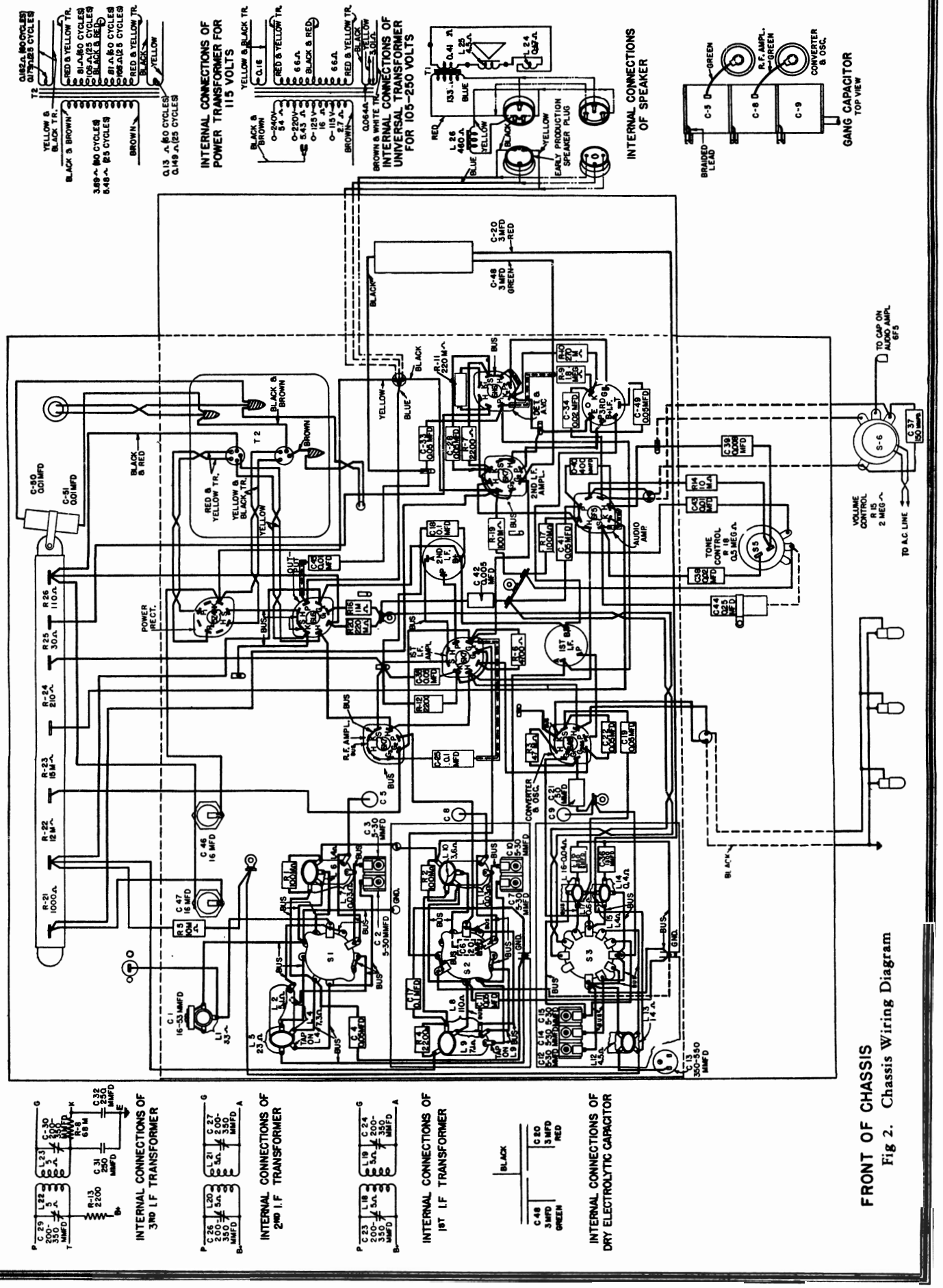


Fig 2. Chassis Wiring Diagram

Models E-81, E-86

SERVICE DATA

Physical Specifications

	E-81	E-86
Model		
Height	19¾ in.	39 in.
Width	15¾ in.	24 in.
Depth	11⅜ in.	11$\frac{5}{16}$ in.
Weight packed	38 lb	63 lb

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115	50–60	100
C	115	25–60	100
V	105–130 and 200–250	40–60	105

NOTE—Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

Tuning Frequency Range

Band "B"	540–1680 kc.
Band "C"	1680–6000 kc.
Band "D"	6.0–18.0 mc. (6,000–18,000 kc.)

Tuning Control Drive Ratio

Fast Tuning	8 to 1
Vernier Tuning	40 to 1

Electrical Power Output

Undistorted	6.5 watts
Maximum	14.0 watts

Loud-speaker—Electrodynamic

Cone: Model E-81..... 8 inch
Model E-86.....12 inch
Cone Coil Impedance at 400 cycles.....5.5 ohms

Tubes

R. F. Amplifier ....6K7 Triple-grid Super-control Amplifier
Converter and
Oscillator.....6A8 Pentagrid Converter
First
I. F. Amplifier....6K7 Triple-grid Super-control Amplifier
Second
I. F. Amplifier....6K7 Triple-grid Super-control Amplifier
Detector and AVC..6H6 Twin Diode
Audio Amplifier....6F5 High Gain Triode
Output.....6L6 Beam Power Amplifier Tetrode
Power Rectifier.....5Z4 Full-wave Rectifier
Dial Lamps.....MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Models E-81 and E-86 employ eight metal envelope tubes in a superheterodyne circuit, giving the excellent sensitivity and selectivity inherent in this type circuit. The radio frequency section of this eight-tube chassis utilizes a novel type of construction known as the "Junior Sentry Box." This type construction permits using extremely short connecting leads and isolates each radio frequency circuit in its own particular shielded section. Separate groups of coils are used for each band in the oscillator section. The antenna and R. F. sections are composed of two coils, a separate coil for the "D" band and a composite coil for the "B" band and "C" band. Operation on the "C" band is obtained by shorting out a section of the antenna and R. F. "B" band coils.

The signal from the antenna is applied to the control grid of the 6K7 R. F. amplifier tube through the antenna coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. The antenna coil, for bands "B" and "C," contains two primary coils connected for operation on the "B" band; however, when the band switch is turned to the "C" band position, the lower primary coil, L-5, is shorted out. The high frequency trimming adjustment, for the "B" band antenna and R. F. stages, is accomplished by two adjustable trimmers connected from the "C" band tap on each coil to ground. The capacity coupling coil, L-3, acts only on the "C" band and its function is similar to that of a fixed antenna stage trimmer for that band.

The amplified radio frequency signal is impressed upon the signal control grid of the 6A8 converter tube through the R. F. coil, the secondary of which is tuned to the signal frequency by the center section of the main tuning condenser. In the 6A8 tube, the incoming signal is combined with the local oscillator signal which is 465 kc. different in frequency. The local signal is generated by the oscillator elements of this tube and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coils and padding capacitors.

The combination of the signal frequency with the local oscillator frequency in the 6A8 converter tube produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance.

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I. F. transformers and two 6K7 amplifier tubes. Each I. F. transformer has two tuned circuits. The first I. F. amplifier 6K7 is operated on both self bias and on AVC for the broadcast band, since its grid return connects to the AVC bus. On the two short-wave bands the self bias resistor is shorted out by one of the band switch sections and this tube receives only AVC bias. The second I.F. amplifier 6K7 tube operates on self bias for all bands. This enables the second I.F. tube to provide maximum power to the 6H6 diode rectifier.

The output of the I.F. amplifier is applied to one plate of the 6H6 diode rectifier, which is a combined second detector, initial bias and automatic volume control tube. The direct current component of the rectified signal, through one diode of this tube, produces a voltage drop across resistor R-10 This voltage drop provides automatic bias for the R. F amplifier, converter and the first I.F. amplifier, and thus gives automatic volume control action. The other diode of the 6H6 provides an initial bias for the tubes on the AVC circuit under conditions of little or no signal. This initial bias diode, under conditions of small signal, draws current which flows through resistors R-9 and R-10. The resulting voltage is the required minimum operating bias for the tubes on the AVC circuit. Upon receiving signals above the level of the initial bias, the initial bias diode stops drawing current and the automatic volume control diode takes over the controlling bias.

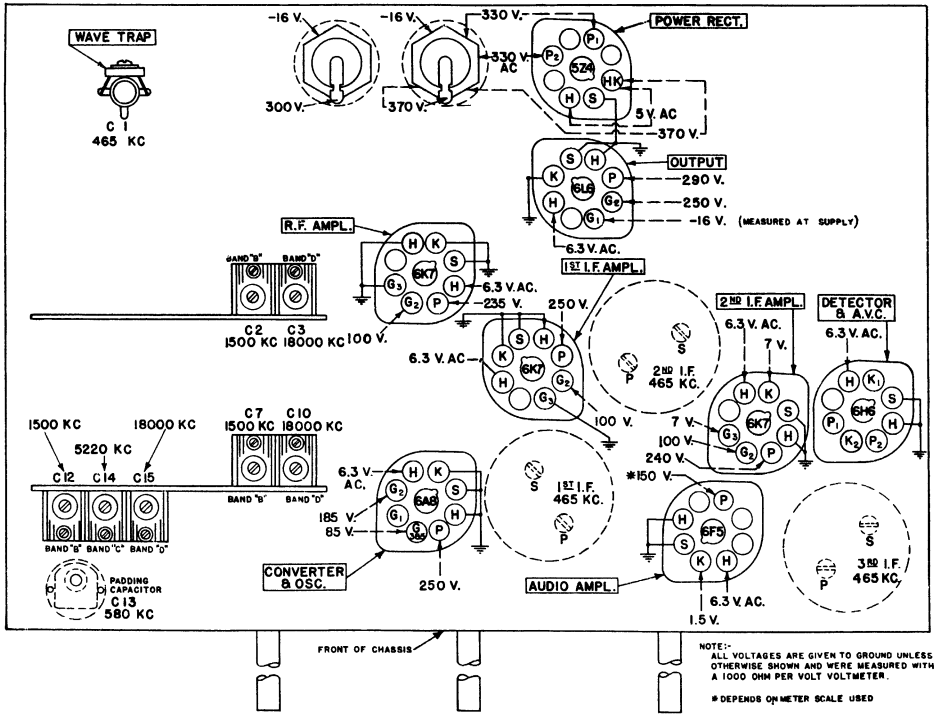
The audio frequency present across R-10 is impressed upon the volume control R-15 through capacitor C-34. The movable arm on the volume control selects the amount of audio signal applied to the control grid of the 6F5 audio amplifier tube and thus regulates the output of the receiver. Across the volume control, R-15, is placed a compensating network of capacitors and a resistor. The music-speech switch is found in this circuit, and when closed places capacitor C-38 in shunt with C-39, which results in the accentuation of the low audio frequencies. The output of the 6F5 audio tube is resistance coupled to the grid of the 6L6 beam power tetrode. The plate circuit of the 6L6 is suitably matched to the electrodynamic loudspeaker by means of a step-down output transformer.

The tone control is found in the plate circuit of the 6F5 first audio tube and consists of capacitor C-43 in series with a variable resistor R-18 across the 6F5 plate resistor R-17. Cutting out resistance in R-18 lessens the treble response of the receiver. Between the plate of the 6F5 first audio tube and the grid of the 6L6 tetrode output tube are found two capacitors in series, C-41 and C-42. The smaller capacitor, C-42, is shorted out by the wave band switch for operation on the broadcast band. On the two short-wave bands it is left in the circuit to attenuate the low frequency response and thereby lessen the tendency toward microphonic howl.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube; which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The tuning wand consists of a rod of insulating material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of a particular coil the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.



VIEWED FROM UNDERSIDE OF CHASSIS

Fig. 3. Trimmer Location and Socket Voltages

Models E-81, E-86

Changes Indicated by Wand

Wand	Signal	Timmer adjustment required
Metal ring	Decrease	None
Iron filings	Decrease	
Metal ring	Increase	Decrease capacity
Iron filings	Decrease	
Metal ring	Decrease	Increase capacity
Iron filings	Increase	

Alignment Frequencies

I.F.	Band "B"	"Band "C"	Band "D"
465 kc.	580 kc.	5220 kc.	18,000 kc.
	1500 kc.		

In order to align this receiver properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 465, 580, 1500, 5220, and 18,000 kc.
2. An output indicator, such as a high resistance a-c. voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
4. A tuning wand.

The location of all trimmer capacitors is shown in Fig. 3.

1. I. F. Alignment

Set the frequency band switch of the receiver to Band "D," short circuit the antenna and ground terminals and tune the receiver to some point near maximum tuning condenser capacity where no signal is heard. Set the volume control at its maximum position and ground the chassis.

The I. F. amplifier is tuned to 465 kc.; set the test oscillator so as to produce a signal at this frequency. Connect the test oscillator output between the top grid terminal of the 6K7 2nd I. F. tube and the chassis using a .05-mfd. capacitor (RC-072) in series with the oscillator output lead to the top grid connection. First remove the grid lead connecting to the same point from the 2nd I. F. transformer. Provide a path for grid bias by connecting a 10,000-ohm resistor (RQ-083) between grid cap and top grid terminal of tube.

Connect the output meter across the voice coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed in the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good readable output indication.

Adjust the secondary trimmer of the third I. F. transformer until a maximum output reading is obtained. Maintain a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the third I. F. transformer for maximum output. This transformer is then adjusted and should not require readjustment when aligning transformers ahead of it.

Transfer the test oscillator connections to the top grid terminal of the 6K7 1st I. F. tube, replace the grid lead on 2nd I. F. tube and reduce the output of the test oscillator as low as possible consistent with obtaining an easily readable indication on the output meter. Adjust secondary and primary trimmers respectively on the 2nd I. F. transformer until maximum deflection of the output meter is obtained.

Transfer the test oscillator connections to the top grid terminal of the 6A8 converter tube and replace the grid cap connection on the 6K7 1st I. F. tube. It will probably be found desirable to set the tone control for minimum high response and to reduce the volume control setting to lessen noise reproduced due to the extremely high sensitivity of this receiver. Again adjust the test oscillator output to as low a value as will allow accurate adjustment. Adjust secondary and primary trimmers respectively on the 1st I.F. transformer until maximum deflection on the output meter is obtained.

I. F. alignment is now complete.

2. I. F. Wave Trap Alignment

Set the band switch to Band "B" and tune receiver to about 1000 kc. With the test oscillator still set at 465 kc. remove the shorting connections between antenna and ground terminals and apply this signal to the antenna terminal through a dummy antenna consisting of a 400-ohm resistor and 250-mmfd. capacitor in series. With the 465 kc. signal applied to the antenna terminal, adjust the I. F. Wave Trap Trimmer for ***minimum*** output indication.

3. R. F. Alignment

First check the position of the dial pointer by rotating the tuning condenser to maximum capacity position, i.e., plates fully meshed. At this position, the pointer should coincide with the end mark at the left-hand end of the scale. If it does not, it may be set by loosening the dial drum set screws and rotating the drum on the tuning condenser shaft. Hold the tuning condenser rotor while doing this, to prevent its rotating. Tighten the two set screws after the pointer is correctly set.

Band "B" (540-1680 Kc.)

Set the test oscillator for operation at 1500 kc. and connect its output to the antenna terminal of the receiver through the dummy antenna described under I. F. Wave Trap Alignment. Tune the receiver until the pointer is at 1500 on the scale. Set the tone control for minimum high response and reduce the volume control setting so as to avoid excessive noise response. Adjust the Band "B" oscillator, R. F., and antenna trimmers respectively (C-12, C-7, and C-2, Fig. 3) to give maximum deflection on the output meter. Maintain the test oscillator output at the lowest level which will give an easily readable output indication.

Now set the test oscillator at 580 kc., and tune the receiver to resonance with this signal. Adjust the 580 kc. padding capacitor, C-13, rocking the tuning condenser back and forth through resonance as the padding capacitor is adjusted and note the deflection of the tuning meter each time the receiver is tuned through resonance. Leave the padding capacitor at the setting which gives greatest deflection.

Retune the receiver to 1500 kc., and set the test oscillator for this frequency. Check the alignment by again adjusting the Band "B" oscillator, R. F. and antenna trimmers for maximum deflection on the tuning meter.

Band "C" (1680-6000 Kc.)

No trimmers are provided for alignment of the R. F. and antenna transformers in Band "C" of these receivers. Correct tracking between R. F. and antenna transformers is obtained by the action of the capacity coil, L-3, and between oscillator and the other tuned circuits by means of the adjustable oscillator trimmer C-14 and the fixed padding capacitor, C-54.

Turn the band switch to Band "C." Set the test oscillator at 5220 kc. and tune the receiver to resonance at this frequency. Adjust the Band "C" oscillator trimmer, C-14, for maximum output indication on the tuning meter, rocking the tuning condenser back and forth through resonance while making this adjustment.

Band "D" (6.0-18.0 Mc.)

Turn the band switch to Band "D." Set the test oscillator at 18,000 kc. (18.0 mc.) and tune the receiver until the pointer coincides with the 18.0 mc. mark. Adjust the Band "D" oscillator trimmer, C-15, to give maximum output indication. It will probably be found that there will be two settings of the oscillator trimmer that will give an output response. The lower capacity setting of the trimmer is the one that should be used. To be sure that correct adjustment has been obtained, tune for the image signal at 17.07 mc. with the test oscillator set at 18.0 mc. It may be necesssary to increase the test oscillator output to obtain response at this point.

Retune the receiver to 18.0 mc. and adjust Band "D" antenna and R. F. trimmers, respectively (C-3 and C-10), for maximum output indication. When adjusting the R. F. trimmer, C-10, rock the tuning condenser back and forth through resonance as in the 580-kc. padding capacitor adjustment.

Alignment of the receiver is now complete.

VISUAL ALIGNMENT OF I.F.

In order to realize to full advantage the performance built into these receivers at the factory, circuit alignment using cathode ray oscilloscope equipment is much to be preferred. The oscilloscopic method is particularly advantageous in aligning the I.F. tuned circuits.

For visual alignment it is necessary to vary the frequency of an unmodulated test oscillator signal over a range extending on both sides of the peak frequency. This variation must take place in synchronism with the horizontal traverse of the cathode ray beam on its screen. The frequency modulator must, therefore, provide means for synchronizing the periodic test frequency variation with the cathode ray horizontal deflection circuit. The test oscillator may advantageously have facilities for audio frequency amplitude modulation of a fixed radio frequency test signal, as well as for frequency modulation, but audio modulation is not required for visual I. F. alignment.

Instead of an output meter across the speaker voice coil, the vertical plates of the cathode ray tube are connected across the load resistor of the diode rectifier. With the frequency modulator in operation, in conjunction with the test oscillator, the resonance curve of the circuit under test will be then shown on the screen.

Preliminary Procedure

For visual alignment, adjust the receiver controls and connect the test oscillator as outlined in the section entitled "I. F. Alignment" under "ALIGNMENT PROCEDURE." Connect the vertical deflecting plates of the cathode ray tube across the diode rectifier load resistor, R-10. The location of this resistor is clearly shown in Fig. 2.

Place the oscilloscope in operation as an output indicator and proceed as outlined in the section entitled, "I. F. Alignment."

Alignment Adjustments

Adjust the oscilloscope so that the luminescent spot on the cathode ray screen traces a horizontal line across the screen. Now place the frequency modulator and test oscillator in operation to give an unmodulated radio frequency signal varying from one side to the other of 465 kc. Adjust the oscilloscope and test oscillator controls to show a single overall resonance curve of the signal I.F. channel on the cathode ray tube screen. Do not change the test oscillator setting thereafter.

To align the I.F. transformers, follow in sequence the same procedure outlined in the sections under "ALIGNMENT PROCEDURE" describing this operation. Instead of aligning for maximum output on an output indicator, the object should be to make the curve symmetrical. If the sweep circuit is so arranged that two symmetrically reversed curves appear on the screen, the curves should be made to coincide by adjusting the I.F. trimmer capacitors.

Visual R.F. alignment may be carried out in the same general manner as above by applying a suitable frequency-modulated signal between the antenna and ground terminals of the receiver and connecting the cathode ray vertical deflecting plates across the diode rectifier load resistor.

SOCKET VOLTAGES

Tube No.		Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R. F. Amplifier		....	100	235	8.0	6.3
6A8	Oscillator	....	....	185	10.3	6.3
	Converter	....	85	250		
6K7 1st I. F. Amplifier		†	100	250	8.0	6.3
6K7 2nd I. F. Amplifier		7	100	240	3.1	....
6H6 Detector and AVC		....	....	....	....	6.3
6F5 Audio Amplifier		1.5	....	*150	0.6	6.3
6L6 Output		**	250	290	63.5	6.3
5Z4 Power Rectifier		354 D. C.	....	660/330 R.M.S	100.0	5.0

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.
†Shorted to gnd. on "C" & "D" Bands.
*Supply volts minus drop in load resistor.
**Bias on control grid −16.0 volts.

GENERAL ELECTRIC CO.

MODELS A-82 AND A-87

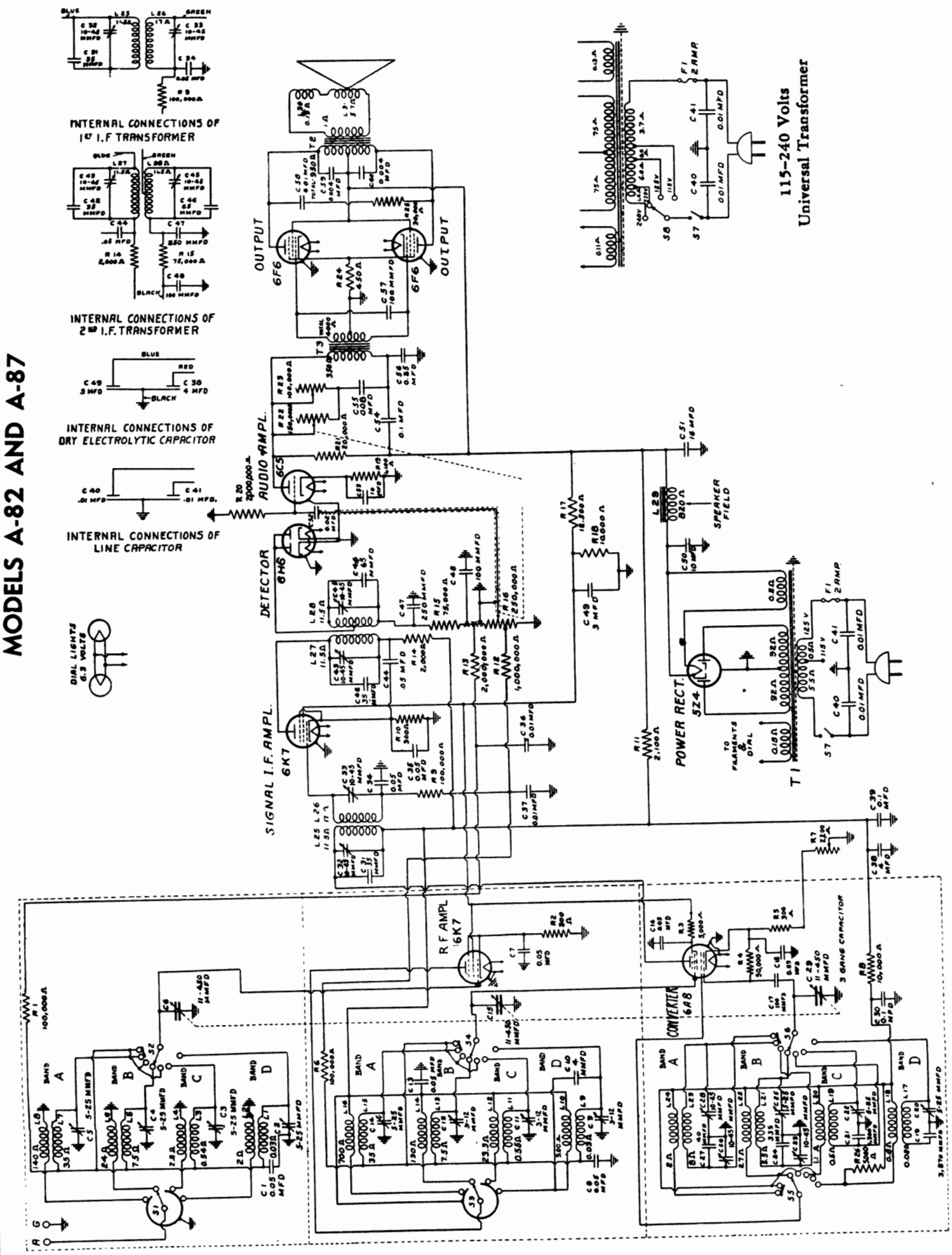


Fig. 2 Schematic Circuit Diagram

GENERAL ELECTRIC CO.

MODELS A-82 AND A-87

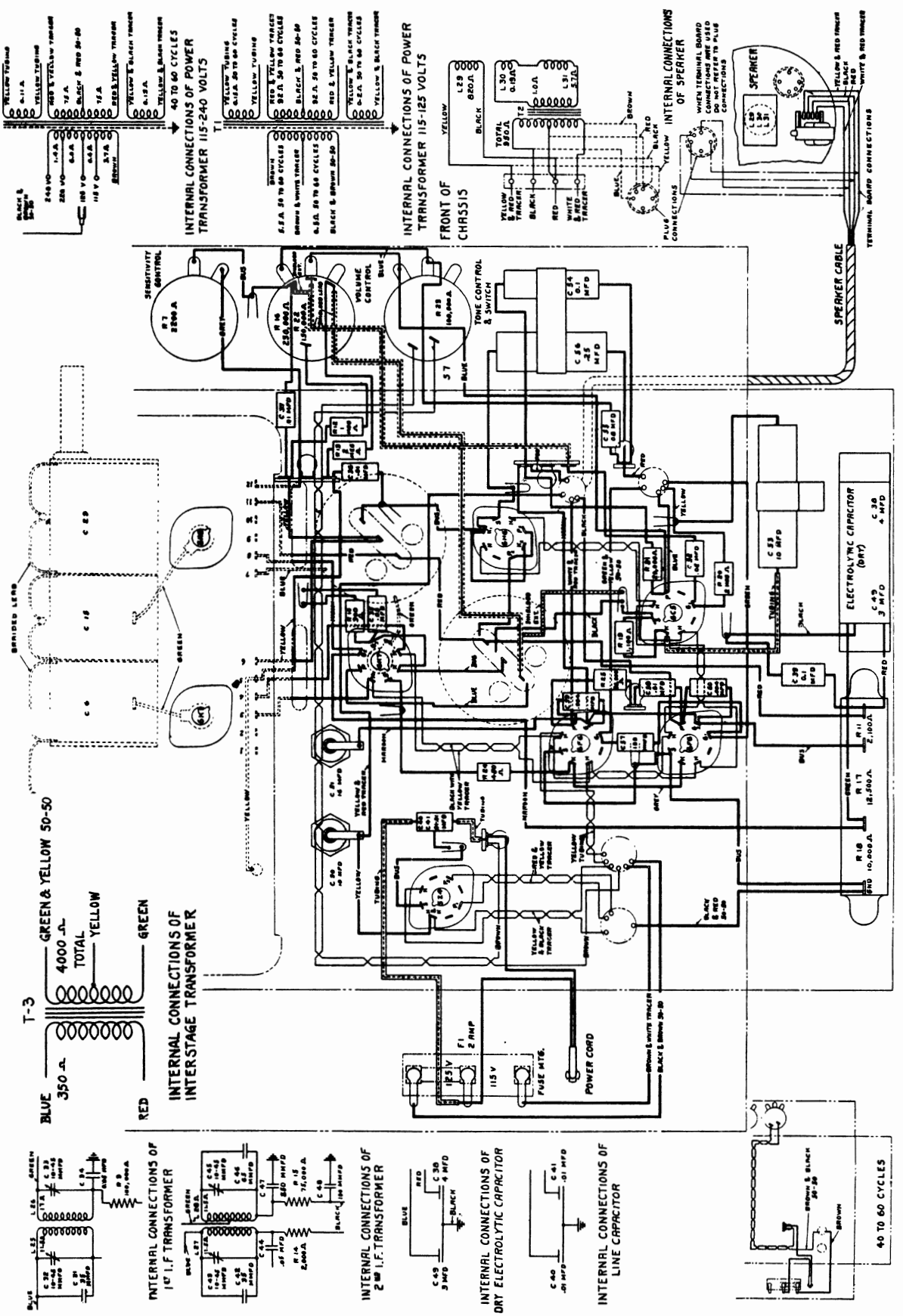


Fig. 3 Chassis Wiring Diagram

(Rating "V" Receivers

Models A-82, A-87

SERVICE DATA

Physical Specifications

Model	A-82	A-87
Height	21⅝ in.	40⅛ in.
Width	17⅛ in.	23 in.
Depth	13¹¹⁄₃₂ in.	13¹¹⁄₃₂ in.
Weight packed	53 lb	85 lb

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption Watts
A	105–130	50–60	105
C	105–130	25–60	110
V	105–130 and 220–250	40–60	110

NOTE—Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

Tuning Frequency Range

Band "A"	140–410 kc
Band "B"	540–1750 kc
Band "C"	1.75–6.0 mc (1750–6000 kc)
Band "D"	6.0–19.5 mc (6000–19,500 kc)

Tuning Control Drive Ratio

Fast Tuning	5½ to 1
Vernier Tuning	55 to 1

Electrical Power Output

Undistorted	5.0 watts
Maximum	7.0 watts

Loud-speaker—Electrodynamic

Cone: Model A-82 10¼ in. overall, 9¼ in. effective diameter
Model A-87 10¼ in. overall, 9¼ in. effective diameter
Cone Coil Impedance: 5 ohms at 400 cycles

Tubes

R. F. Amplifier. . . . . 6K7 Triple-grid Super-control Amplifier
Converter and Oscillator. . . . . 6A8 Pentagrid Converter
I. F. Amplifier. . . . . 6K7 Triple-grid Super-control Amplifier
Detector and AVC. . 6H6 Twin Diode
Audio Amplifier. . . . 6C5 Detector Amplifier Triode
Output. . . . . Two 6F6 Power Amplifier Pentodes (Push-pull)
Power Rectifier. . . . . 5Z4 Full-wave Rectifier
Dial Lamps. . . . . Mazda No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Models A-82 and A-87 employ eight metal envelope tubes in a superheterodyne circuit, giving the excellent sensitivity and selectivity inherent in this type circuit. Separate groups of coils are used for each frequency band, all radio frequency coils being housed in the "Sentry Box" unit, together with their associated band switches, capacitors, resistors and tube sockets. This type of construction permits using extremely short connecting leads and isolates each radio frequency circuit in its own particular shielded compartment. Permanence of alignment adjustments is assured through use of the new "Permaliner" air-dielectric trimmer capacitors in all tuned circuits.

The signal from the antenna is applied to the control grid of the 6K7 R. F. amplifier tube through the antenna coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. The secondary of the coil for the band next lower in frequency to the one in use is short-circuited by the band switch to prevent absorption of energy at its resonant frequency, which falls in the next higher band. The primaries of all coils not in use are also short-circuited by the band switch.

The amplified radio frequency signal is impressed on the control grid of the 6A8 converter and oscillator tube through the R. F. coil, the secondary of which is tuned to the signal frequency by the center section of the main tuning condenser. The sensitivity control consists of a variable resistor in the cathode circuit of the 6A8 converter tube. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc higher in frequency. The local signal is generated by the oscillator elements of this tube and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors. The oscillator section of the main tuning condenser, although of the same capacity as the other two sections, is larger physically to permit wider spacing of the plates, thereby reducing the possibility of microphonic feedback howl.

The combination of the signal frequency with the local oscillator frequency in the converter tube produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-16. This voltage drop provides automatic bias for the R. F. and I. F. amplifier tubes and converter tube and so gives automatic volume control action. Full automatic bias is applied to the R. F. amplifier tube, while a part of this voltage, from a tap on R-16, is applied to the converter tube and I. F. amplifier, which handle somewhat larger signal voltage than the R. F. amplifier.

The manual volume control selects the amount of audio signal applied through coupling capacitor C-52 to the grid of the 6C5 audio amplifier tube, and thus regulates the output of the receiver. This is a dual control, the second or lo-note compensation section acting to preserve proper balance between high and low audio frequencies as the volume is changed, by means of a variable 150,000-ohm resistance (R-22) in series with a capacitor (C-55) across the primary of the interstage audio transformer. The tone control consists of a variable 100,000-ohm resistor (R-23) connected in parallel with the lo-note compensation section of the volume control, so as to permit attenuation of the higher audio frequencies as desired.

The output of the 6C5 tube is coupled to the grids of the push-pull 6F6 output pentodes by means of a resistance capacity network working into the interstage audio transformer The plate circuits of the 6F6 output pentodes are suitably matched to the loud-speaker by means of a step-down output transformer.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a rod of insulating material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of a particular coil through the openings provided in the "Sentry Box" compartment shields, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer adjustment required
Metal Ring	Decrease	None
Iron filings	Decrease	
Metal Ring	Increase	Decrease capacity
Iron filings	Decrease	
Metal Ring	Decrease	Increase capacity
Iron filings	Increase	

Fig. 6 shows the location of the antenna, R. F. and oscillator coils for each of the four frequency bands of Models A-82 and A-87 receivers. Openings are provided in the coil shields for insertion of the tuning wand into the antenna or R. F. coil of any band. No provision is made for checking the alignment of the oscillator circuits, as this is easily determined by noting the dial calibration.

Alignment Frequencies

I. F.	Band "A"	Band "B"	Band "C"	Band "D"
465 kc	140 kc	580 kc	6000 kc	18,000 kc
	410 kc	1740 kc		

In order to align this receiver properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 140, 410, 465, 580, 1740, 6000, and 18,000 kc.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
4. A tuning wand.

The location of all trimmer capacitors is shown in Fig. 5. *It should be noted that on all "Permaliner" trimmer capacitors, clockwise rotation of the adjusting screw decreases capacity, while counterclockwise rotation increases capacity.*

1. I. F. Alignment

Set the frequency band switch of the receiver to Band "B," short-circuit the antenna and ground terminals and tune the receiver at some point above 1500 kc so that no signal is heard. Set the volume control and sensitivity control at maximum (extreme clockwise position) and ground the chassis.

The I. F. amplifier is tuned to 465 kc; set the test oscillator dial at this frequency. Make sure that a d-c path exists between the output terminals of the test oscillator, then remove the control grid clip (green lead) from the 6A8 tube and connect the test oscillator output between chassis and the dome terminal of the 6A8 tube. Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed on the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good readable output indication.

Adjust the secondary trimmer of the second I. F. transformer until a maximum output reading is obtained, maintaining a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer and lastly the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

2. R. F. Alignment

Bands "A" and "B" each require four trimmer adjustments, while Bands "C" and "D" each require three adjustments. Care should be taken to adjust only the trimmers of the band under test. Check the position of the dial pointer with the tuning condenser plates fully engaged as outlined in the section on adjustment of the dial mechanism. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output from the test oscillator, preferably using a dummy antenna of 250 mmfd in series with 200 ohms between the test oscillator and the receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Band "A," 140-410 kc

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 410 kc, and turn the dial pointer on the receiver to this frequency. Adjust the Band "A" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small deflection on the output indicator. When optimum adjustment on the Band "A" oscillator trimmer is obtained, adjust the Band "A" R. F. and antenna trimmers for maximum output.

Now tune the test oscillator to 140 kc and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 140-kc padding capacitor for maximum output. When this has been done, return to 410 kc on the receiver and test oscillator and recheck the alignment for maximum output. This completes alignment of Band "A."

Band "B," 540-1750 kc

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 1740 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "B" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the Band "B" oscillator trimmer is obtained, adjust the Band "B" R. F. and antenna trimmers for maximum output.

Models A-82, A-87

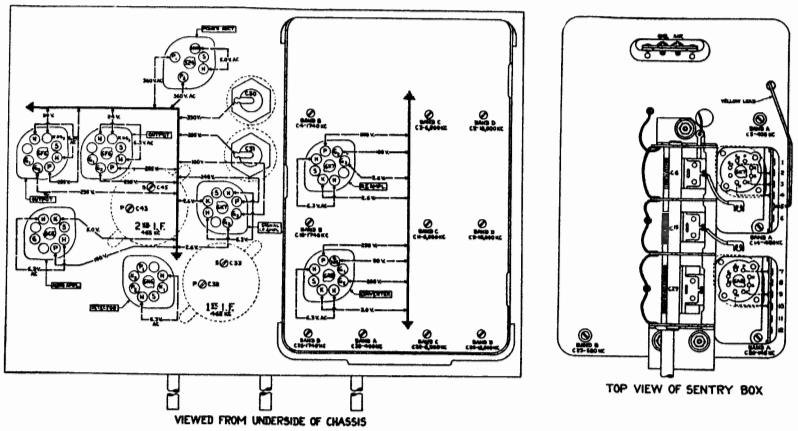


Fig. 5 Trimmer Locations and Socket Voltages

Now tune the test oscillator to 580 kc and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 580-kc padding capacitor for maximum output. When this has been done, return to 1740 kc on the receiver and test oscillator and recheck the alignment for maximum output. Band "B" should now be in alignment.

Band "C," 1.75-6.0 mc (1750-6000 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 6000 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "C" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 5070 kc on the receiver dial. It should be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (6000 kc) and adjust the test oscillator output to its previous value. Then adjust the Band "C" R. F. and antenna trimmers for maximum output.

Band "D," 6.0-19.5 mc (6000-19,500 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 18.000 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "D" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 17,070 on the receiver dial. It may be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (18.000 kc) and adjust the test oscillator output to its previous value.

Reduce the capacitance of the R. F. trimmer to a minimum. While slowly rocking the tuning condenser through the 18,000-kc point, increase the Band "D" R. F. trimmer capacitance until a maximum response point is obtained. The Band "D" antenna trimmer should now be peaked. It is not necessary to rock the tuning condenser while making the last adjustment.

When these adjustments have been completed, the receiver will be in alignment.

METHOD OF SERVICE PROCEDURE—SENTRY BOX

The "Sentry Box" assembly includes the tuning condenser and dial mechanism as well as the coil and switch compartments. The complete unit may be dismounted from the chassis by removing the side-fastening bolts, unscrewing the dial mechanism anchoring nut and unsoldering the leads to the chassis from the terminal strips.

In order to remove the coil shield cans it is necessary to take out the frequency band switch shaft. With the "Sentry Box" dismounted from the chassis the dial gears may be disengaged and the switch shaft removed merely by lifting the reduction drive end of the dial assembly, allowing the switch shaft gear to pass the dial scale cap shaft. With the "Sentry Box" mounted in place, removal of the switch shaft requires removing the dial scale gear and cap shaft.

Each compartment shield can houses a bracket assembly comprising the coils, band switch and other component parts associated with that particular circuit. With the band switch shaft out, any shield can be easily removed by unscrewing the two mounting stud nuts ("Y," Fig. 6).

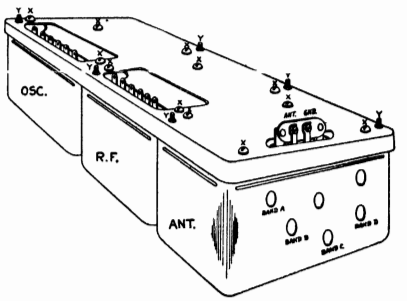


Fig. 6 "Sentry Box" Coil Locations and Assembly

In most cases, coils or Permaliner trimmer capacitors may be replaced merely by removing their particular shield can. It is an easy matter, however, to remove each complete bracket assembly by taking out the mounting bolts ("X," Fig. 6) and unsoldering the bus or braid connections to the tuning condenser. In the case of the R. F. or oscillator units it will also be necessary to unsolder the external leads to the respective terminal boards of these units.

Permaliner trimmers are replaced by unsoldering the bus lead from the trimmer terminal, and then unsoldering the Permaliner case from its mounting cup. The latter operation may require the use of two soldering irons.

Coils are replaceable by merely unsoldering the coil lugs from the switch lugs. If it is necessary to replace a section of the band switch, however, it will be found expedient to remove the complete bracket and coil assembly for easy access to the switch lugs.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism is rigidly mounted at one end to the tuning condenser frame by two removable screws and anchored to the chassis deck at the other end by a rubber-cushioned nut. The dial pointer, station selector knob, and tuning condenser drive drum are interconnected by means of the drive cord and drive cable; the frequency band switch and cylindrical scale by the switch shaft and scale gears.

1. Position of Drum on Condenser Shaft

With set screws (5) loosened and tuning condenser plates fully engaged, place the drum in the position shown in Fig. 7. The drum should be located on the tuning condenser shaft so as to be in line with the drive cord pulleys ($\frac{1}{16}$ in. from the dial mechanism mounting bracket), and so that, with condenser plates fully engaged, guide (38) occupies the position shown in Fig. 7.

2. Removing and Replacing Scale

Pry out fastener (40) and remove the scale by lowering the fastener end below the mounting ear. Take the scale out of cap assembly (29). Replace by placing tabs of caps (29) and (30) in slots of scale. Replace fastener (40).

3. Removing and Replacing Band Switch Shaft

To remove the band switch shaft with the "Sentry Box" assembled in place, the dial scale cap and gear must be removed. This is done by removing the cylindrical scale as in paragraph 2. Then loosen set screws (9) and remove cap (29), spring (7) and gear (8).

When replacing the switch shaft, note that the shaft will fit the switch gang slots in only one position; turn the shaft before inserting so that the locating button will pass through the keyed side of the slots. Note also that the brass bearing just behind the switch shaft gear determines the forward position of the gear. Insert the bushing just far enough into the index plate hub so that the shaft gear meshes snugly with the scale gear, then tighten the set screw.

4. Locating Scale

Loosen the two gear set screws (9). Rotate the scale backward until there is slight tension on spring (7) with the pointer indicating on the Band "A" scale. With the frequency band switch in the Band "A" position, place gear (8) in mesh with the gear on part (6) and tighten the two set screws (9).

5. Replacing Drive Cord and Drive Cable

The position of the dial scale pointer with respect to the tuning condenser drum is held fixed by a special metal braid cable (12) connecting the drum with guide (38). Tension is maintained on the cable through the drum spring (13) and drive cord (11). To replace either the drive cable or the drive cord, remove the dial scale for convenient access to guide (38). Unhook spring (13) from its drum tab to release tension. Unhook the cable or cord from guide (38) and unwind from the pulleys and drum. To replace the cable or cord, rethread to agree with Fig. 7, and rehook drum spring (13) as shown.

6. Replacing Reduction Drive

To replace the reduction drive, unhook spring (13), loosening the drive cord. Unscrew pal nut (47) and remove drive. Replace with new drive and rehook drive cord.

7. Setting Scale Pointer

The scale pointer is soldered to the slider. To set the pointer mechanically, turn the tuning condenser rotor so that the plates are fully engaged, and solder the pointer to indicate a point $\frac{1}{32}$ in. to the left of the extreme left-hand mark on the scale on Band "B."

8. Replacing Dial Lamp

The dial lamp sockets are easily accessible by lifting them clear of the dial mechanism. Lamps may then be replaced in their sockets. After replacing lamps, slide the socket clip back onto the mounting bracket.

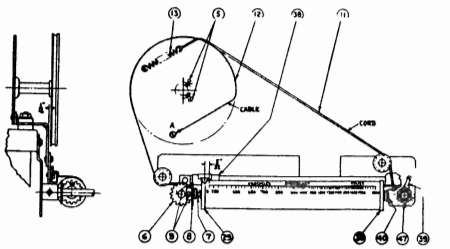


Fig. 7 Dial Mechanism

GENERAL ELECTRIC CO.

Models A-82, A-87

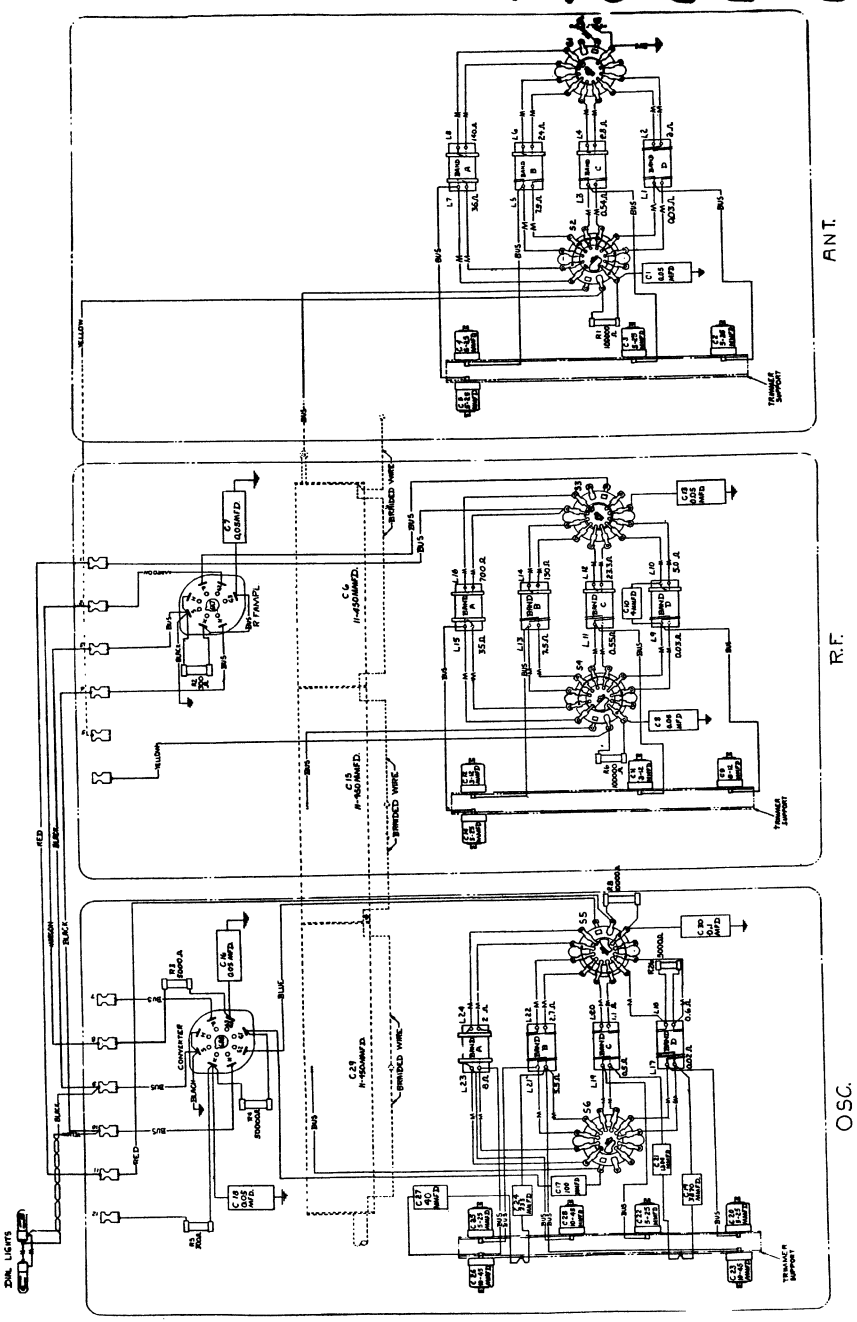


Fig. 4 "Sentry Box" Wiring Diagram

CIRCUIT ANALYSIS—SENTRY BOX

A table of socket voltages is shown below. If it is found desirable to check voltages at the sockets mounted in the "Sentry Box," only the shield can for the socket measured should be off while measurements are being taken.

MODELS A-82 AND A-87

Voltages at Tube Sockets

Fuse in 125 V. Clip—125 Volts A-C Line—

Maximum Volume and Sensitivity—No Signal

Tube No.	Cathode to Ground Volts D-c	Screen Grid to Ground Volts D-c	Plate to Ground Volts D-c	Cathode Current M.A.	Heater Volts A-c
6K7 R. F.	2.6	100	250	8.7	6.3
6A8 Oscillator	....	....	195	....	...
6A8 Converter	3.0	90	250	10.0	6.3
6K7 I. F.	2.6	100	242	8.7	6.3
6H6 Detector	....	....	....	....	6.3
6C5 A. F.	5.0	....	195	5.0	6.3
6F6 A. F. Power	24	295	285	26.5	6.3
6F6 A. F. Power	24	295	285	26.5	6.3
5Z4 Rectifier	....	....	720/360 Rms	96.0	5.0

REPLACEMENT PARTS

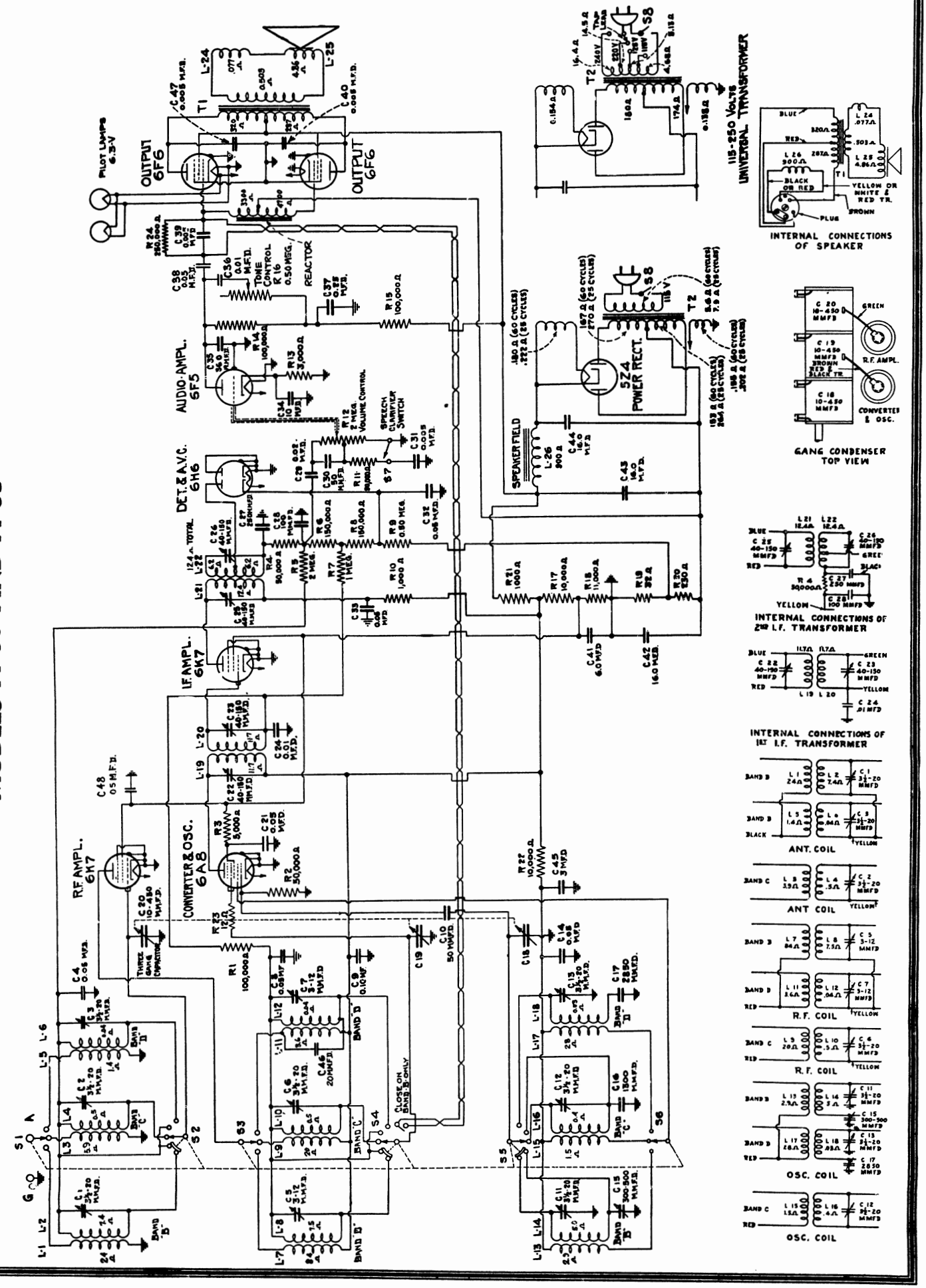
Insist on genuine factory-tested parts, which may be purchased from authorized dealers.

RECEIVER CHASSIS ASSEMBLIES

Stock No.	Description	List Price
RB-007	BOARD—Fuse board. Rating "V" Receivers	$0.40
RB-008	BOARD—Terminal Board (Double terminal)	.10
RB-009	BOARD—Terminal Board (Single terminal)	.15
RB-011	BOARD—Fuse board, Rating "A" or "C" Receivers	.30
RB-200	BRACE—Dial Opening Brace (Model A-82)	.30
RC-022	CAPACITOR—.004 Mfd. 400 Volt (C-59, C-60) Paper Dielectric	.25
RC-034	CAPACITOR—.01 Mfd. 200 Volt (C-36, C-37) Paper Dielectric	.25
RC-040	CAPACITOR—.01 Mfd. 400 Volt (C-58) Paper Dielectric	.25
RC-046	CAPACITOR—.02 Mfd. 200 Volt (C-52) Paper Dielectric	.25
RC-072	CAPACITOR—.05 Mfd. 200 Volt (C-35) Paper Dielectric)	.25
RC-094	CAPACITOR—.08 Mfd. 400 Volt (C-55) Paper Dielectric	.25
RC-123	CAPACITOR—.1 Mfd. 400 Volt (C-39, C-54) Paper Dielectric	.35
RC-150	CAPACITOR—.25 Mfd. 400 Volt (C-56) Paper Dielectric	.35
RC-235	CAPACITOR—100 mmfd. (C-57) Mica Dielectric Moulded Case	.25
RC-405	CAPACITOR—10 Mfd. 480 Volt (C-50) Wet Electrolytic	1.15
RC-408	CAPACITOR—16 Mfd. 470 Volt (C-51) Wet Electrolytic	1.15
RC-502	CAPACITOR—One 4 Mfd. 450 Volt (C-38). one 3 Mfd. 150 Volt (C-49) Dry Electrolytic Pack	1.40
RC-504	CAPACITOR—10 Mfd. 25 Volt (C-53) Dry Electrolytic	.80
RC-750	CAPACITOR—Line Capacitor, Two .01 Mfd. (C-40, C-41)	.50
RC-801	CABLE—Speaker Cable	$0.50
RC-851	CORD—Power Cord with Plug	.60
RC-951	CLAMP—For mounting C-54 and C-56	.10
RC-952	CLAMP—For mounting C-53	.10
RE-005	ESCUTCHEON—Dial Escutcheon	.80
RF-003	FOOT—Chassis Mounting Foot with Cushions, pkg. of 2	.30
RI-003	INSULATOR—Escutcheon Shaft Insulator Bushing, pkg. of 10	.40
RK-002	KNOB—Tuning, Volume, Tone, Sensitivity or Band Switch, pkg. of 5	.50
RN-001	NUT—Escutcheon Mounting Nut, pkg. of 10	.45
RP-002	PLATE—Fuse Cover Plate	.15
RP-014	PLATE—Escutcheon Mounting Plate, pkg. of 2	.25
RP-016	PLATE—Dial Mechanism Mounting Plate Assembly	.15
RR-006	RESISTOR—300 ohms ¼ watt (R-10) Carbon Resistor, pkg. of 5	.70
RR-009	RESISTOR—1100 ohms ¼ watt (R-19) Carbon Resistor, pkg. of 5	1.05
RR-067	RESISTOR—1 megohm ¼ watt (R-12) Carbon Resistor, pkg. of 5	.70
RR-068	RESISTOR—2 megohms ¼ watt (R-13, R-20) Carbon Resistor, pkg. of 5	.60
RR-239	RESISTOR—20,000 ohms 1 watt (R-21) Carbon Resistor, pkg. of 5	.85
RR-242	RESISTOR—30,000 ohms 1 watt (R-25) Carbon Resistor, pkg. of 5	.85
RR-250	RESISTOR—450 ohms 2 watts (R-24) Carbon Resistor	.50
RR-701	RESISTOR—Tapped Resistor (R-11, R-17, R-18)	.95
RR-900	REFLECTOR—Dial Lamp Reflector	.15
RS-110	SHIELD—Second I. F. Transformer Shield	.30
RS-115	SHIELD—First I. F. Transformer Shield	.35
RS-200	SOCKET—Eight-pin Tube Socket, pkg. of 5	.75
RS-204	SOCKET—Five-pin Tube Socket, pkg. of 5.	.75

GENERAL ELECTRIC CO.

MODELS A-83 AND A-85



GENERAL ELECTRIC CO.

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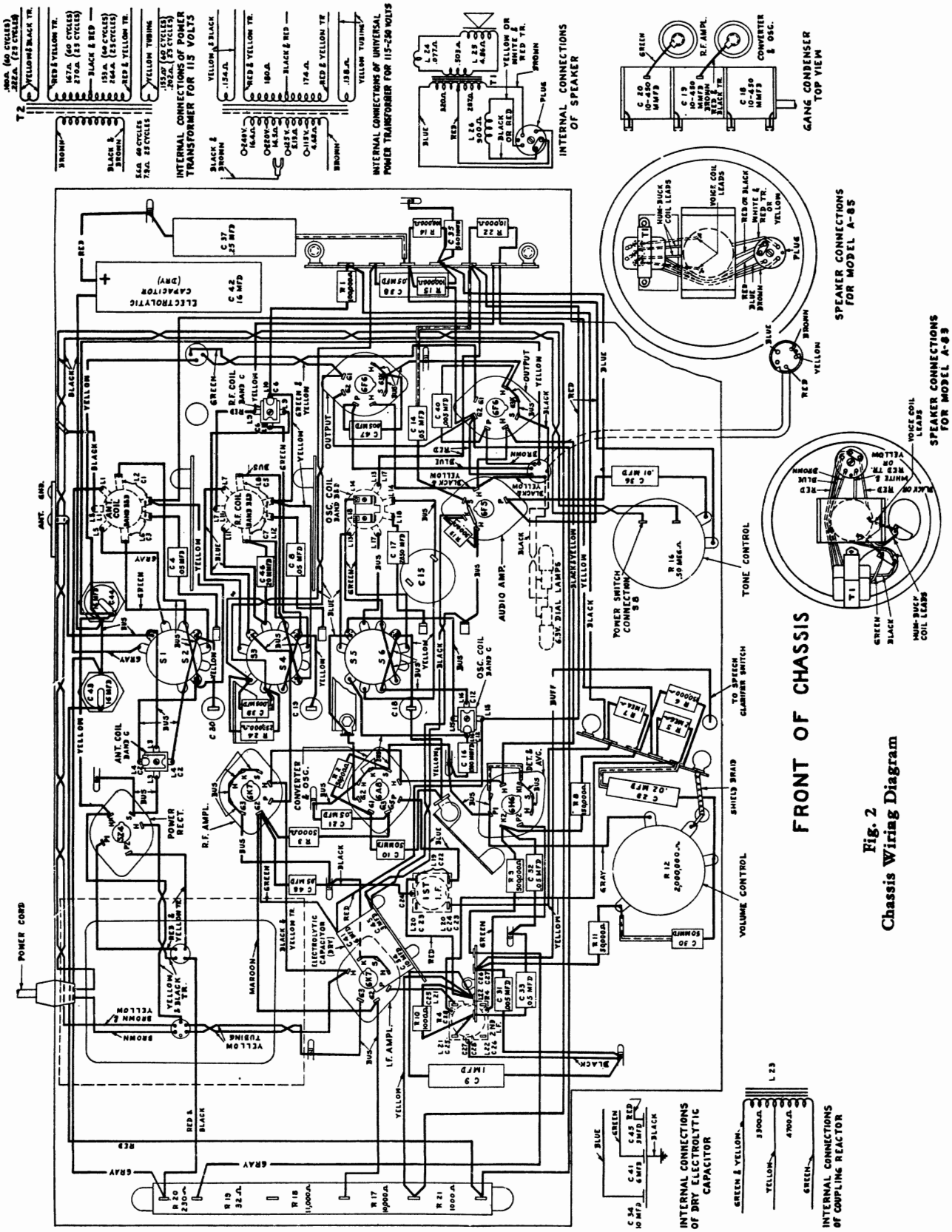


Fig. 2
Chassis Wiring Diagram

Models A-83, A-85

SERVICE DATA

Physical Specifications

Model	A-83	A-85
Height	20¼ in.	40¾ in.
Width	14¾ in.	23⅝ in.
Depth	11¼ in. (Knobs project beyond)	11½ in. (Knobs project beyond)
Weight packed	40 lb.	70 lb.

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115	50–60	100
C	115	25–60	105
V	105–130 and 200–250	40–60	105

NOTE: Taps on universal transformers (Rating "V") are accessible by removing the cap cover mounted on the top of the transformer. Schematic and wiring diagrams of the universal transformer are shown in Fig. 1 and 2, respectively.

Tuning Frequency Range

Band "B"	540–1720 kc
Band "C"	1.72–5.8 mc (1720–5800 kc)
Band "D"	5.8–18.0 mc (5800–18,000 kc)

Tuning Control Drive Ratio

Fast Tuning	5½ to 1
Vernier Tuning	55 to 1

Electrical Power Output

Undistorted	6 watts
Maximum	11 watts

Loud-speaker—Electrodynamic

Cone Model A-83 9 in. type.
Model A-85 11 in. type.
Cone Coil Impedance: 5 ohms at 400 cycles

Tubes

R. F. Amplifier.....6K7 Triple-grid Super-control Amplifier
Converter and Oscillator.....6A8 Pentagrid Converter
I. F. Amplifier.....6K7 Triple-grid Super-control Amplifier
Detector and AVC..6H6 Twin Diode
Audio Amplifier....6F5 Detector Amplifier Triode
Output.....2—6F6 Power Amplifier Pentodes
Power Rectifier.....5Z4 Full-wave Rectifier
Dial Lamps.....MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Models A-83 and A-85 employ eight metal envelope tubes to perform the above functions in a superheterodyne circuit, giving the excellent selectivity and sensitivity inherent in this type circuit. Separate groups of coils are used for each frequency band. Ample undistorted power output is obtained through use of diode detection and a push-pull power amplifier final audio stage.

The signal from the antenna is applied to the control grid of the 6K7 R. F. amplifier tube through the antenna coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. The secondary of the coil for the band next lower in frequency to the one in use is short-circuited by the band switch to prevent absorption of energy at its resonant frequency which falls in the next higher band.

The amplified radio frequency signal is impressed on the control grid of the 6A8 converter and oscillator tube through the R. F. coil, the secondary of which is tuned to the signal frequency by the center section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc higher in frequency. The local signal is generated by the oscillator elements of this tube and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors.

The combination of the signal frequency with the local oscillator frequency in the converter tube produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-6 and R-8. This voltage drop provides automatic bias for the R. F. and I. F. amplifier and converter tubes and so gives automatic volume control action. Full automatic bias voltage is applied to the R. F. amplifier tube, while half this voltage is applied to the converter tube and I. F. amplifier, which handle a somewhat larger signal voltage than the R. F. amplifier.

Condenser C-29 couples the audio signal to the volume control (R-12) and to the speech clarifier network (C-30, C-31, R-11). When switch S7 is open the frequency response is correct for music, while closing this switch raises the level of certain frequencies and renders speech extremely understandable. The amount of signal impressed on the control grid of the 6F5 audio amplifier tube is selected by the variable arm on the volume control, this in turn determining the output of the receiver.

The output of the 6F5 tube is capacitively coupled to the coupling reactor (L23) which gives a balanced excitation to the 6F6 push-pull power amplifier. The tone control consisting of R-16 and C-36 is connected across the 6F5 plate resistor. Cutting out resistance in R-16 lessens the treble response of the receiver.

The 6F6 tubes are connected in pentode and their plate circuit is suitably matched to the dynamic speaker by a step-down transformer T1.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal at the alignment frequency from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the center of a particular coil, through the opening provided in the top of the shield, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer Adjustment Required
Brass cylinder	Decrease	None
Iron filings	Decrease	
Brass cylinder	Increase	Decrease capacity
Iron filings	Decrease	
Brass cylinder	Decrease	Increase capacity
Iron filings	Increase	

Fig. 3 shows the location of the antenna, R. F., and oscillator coils for each of the three frequency bands of Model A-83 and A-85 receivers.

ALIGNMENT FREQUENCIES

I. F.	Band "B"	Band "C"	Band "D"
465 kc	580 kc 1500 kc	5220 kc	18,000 kc

In order to align these receivers properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 465, 580, 1500, 5220 and 18,000 kc.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp output indicator.
3. An alignment tool consisting of an insulating shaft with a small screw-driver blade.
4. A tuning wand.

The location of all trimmer capacitors, as well as socket voltages to chassis, is shown in Fig. 4.

1. I. F. Alignment

In order to maintain proper bias voltage during I. F. alignment, the test oscillator should be connected to the 6A8 converter tube control grid through a .01-mfd. (or larger) capacitor. The normal grid cap connection should be removed and a 25,000-ohm to 50,000-ohm resistor connected between it and the 6A8 control grid. The ground side of the test oscillator may then be connected directly to the chassis.

Set the frequency band switch of the receiver to Band "B", short-circuit the antenna and ground terminals and tune the receiver at some point above 1500 kc so that no signal is heard. Set the volume control at its maximum position and ground the chassis.

The I. F. amplifier is tuned to 465 kc; set the test oscillator dial at this frequency. Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed in the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good readable output indication.

Adjust the secondary trimmer of the second I. F. transformer until a maximum output reading is obtained. Maintain a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer and lastly the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

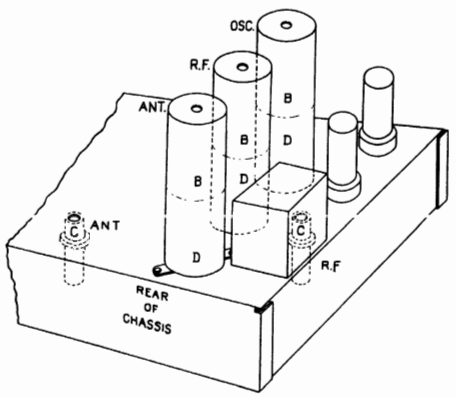


Fig. 3. Coil Locations

2. R. F. Alignment

Band "B" requires four trimmer adjustments, while Band "C" and Band "D" each require three adjustments. Care should be taken to adjust only the trimmers of the band under test. Check the position of the dial pointer as outlined in the section on adjustment of the dial mechanism. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output from the test oscillator, preferably using a dummy antenna of 250 mmfd. in series with 200 ohms between the test oscillator and receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Band "B"—540-1720 kc

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 1500 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "B" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the Band "B" oscillator trimmer is obtained, adjust the Band "B" R. F. and antenna trimmers for maximum output.

Now tune the test oscillator to 580 kc and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 580 kc padding capacitor for maximum output. When this has been done, return to 1500 kc on the receiver and test oscillator and recheck the alignment for maximum output. Band "B" should now be in alignment.

Band "C"—1.72–5.8 mc (1720–5800 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 5220 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "C" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 4290 kc on the receiver dial. It should be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (5220 kc) and reduce the test oscillator output to its previous value. Then adjust the Band "C" R. F. and antenna trimmers for maximum output.

Band "D"—5.8–18.0 mc (5800–18,000 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 18,000 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "D" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 17070 on the receiver dial. It may be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (18,000 kc) and reduce the test oscillator output to its previous value.

Reduce the capacitance of the R. F. trimmer to a minimum. While slowly rocking the tuning condenser through the 18,000 kc point, increase the Band "D" R. F. trimmer capacitance until a maximum response point is obtained. The Band "D" antenna trimmer should next be peaked. It is not necessary to rock the tuning condenser while making this last adjustment.

Models A-83, A-85

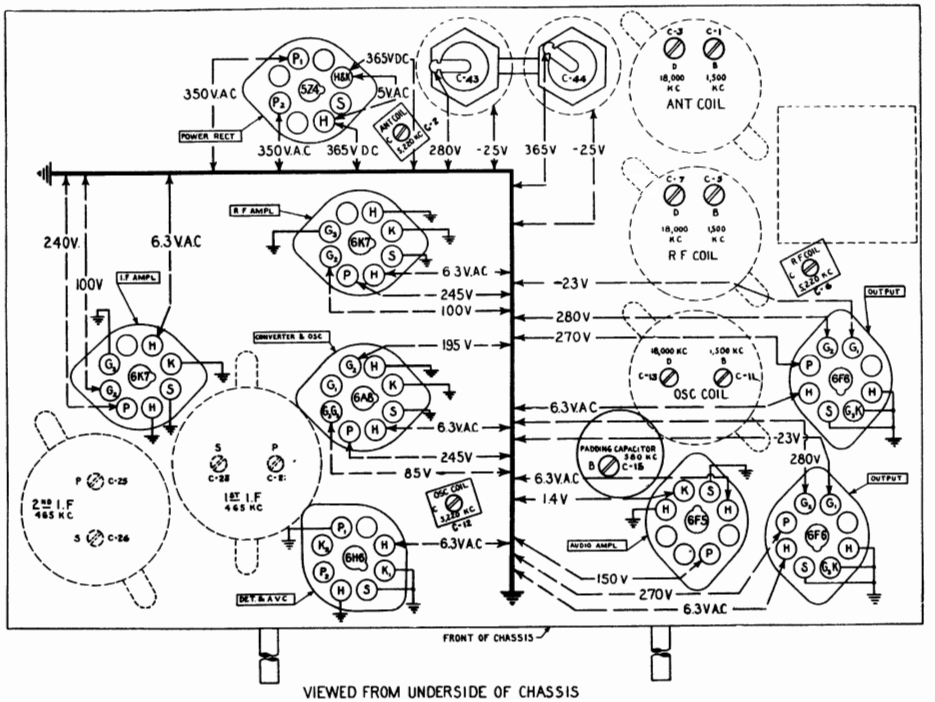


Fig. 4. Trimmer Locations and Socket Voltages

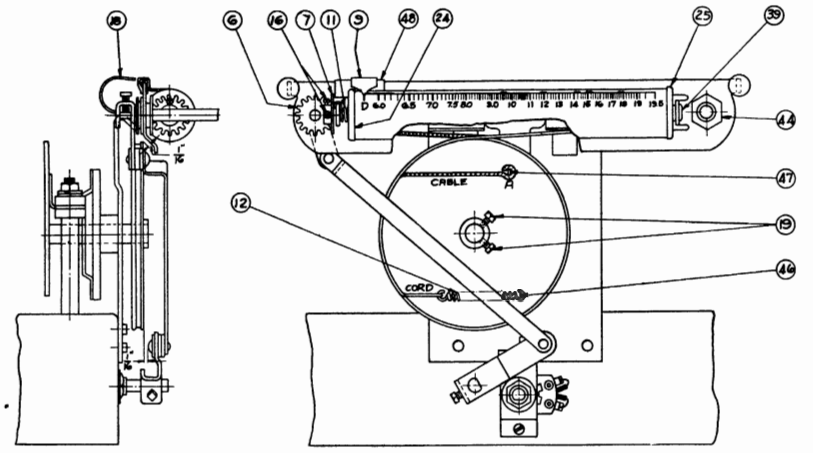


Fig. 5. Dial Mechanism

SOCKET VOLTAGES

Tube No.		Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R. F. Amplifier		0	100	245	8.7	6.3
6A8	Oscillator	...	...	195	10.0	6.3
	Converter	0	85	245		
6K7 I. F. Amplifier		0	100	240	8.7	6.3
6H6 Detector and A.V.C.		...	...	...	...	6.3
6F5 Audio Amplifier		1.5	..	150	0.5	6.3
6F6 Output (each tube)		0	280	270	30	6.3
5Z4 Power Rectifier		...	...	...	87	5.0

Measured at 115 volt supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

DIAL MECHANISM ADJUSTMENTS

The dial mechanism is rigidly mounted to the chassis. The tuning condenser is mounted by means of rubber cushions and bushings at points of support. The dial pointer, station selector knob, and tuning condenser drive drum are interconnected by means of the drive cord and drive cable; the frequency band switch, the cylindrical dial scale and switch knob, by gear and toggle assemblies.

1. Position of Drum on Condenser Shaft

With set screws (19) loosened and tuning condenser plates fully engaged, place the drum in the position as shown in Fig. 5 so that drum spring (12) is approximately horizontal, and the top rim of the drum is $\frac{1}{16}$ in. away from the mounting plate. Guide (48) should stop at equal distances from each end of the mounting plate slot.

2. Removing and Replacing Scale

Pry out fastener (39), and remove the scale by lowering that end below the ear and taking the scale out of cap assembly (24), holding parts (24), (11), and (7) in place. Replace, locating tabs of caps (24) and (25) in slots of scale. Replace fastener (39).

3. Locating Scale

Loosen the two gear set screws (16). Rotate the scale upward until there is slight tension on spring (11) with the pointer indicating on the Band "D" scale. With the frequency band switch in the Band "D" position, place gear (7) in mesh with the gear on part (6) and tighten the two set screws (16)

4. Replacing Drive Cord

The position of the dial scale pointer with respect to the tuning condenser drum is held fixed by means of a special metal braid cable connecting the drum with the guide (48). Tension is maintained on the cable through the drum spring (12) and drive cord. To replace either the drive cable or the drive cord, remove the dial scale for convenient access to guide (48). Unhook spring (12) from tab (46) to release tension. Unhook the cable or cord from guide (48) and unwind from the pulleys and drum. To replace the cable, rethread to agree with Fig. 5 and rehook drum spring (12) as shown.

5. Replacing Reduction Drive

To replace the reduction drive, unhook spring (12), loosening the drive cord. Unscrew palnut (44) and remove drive. Replace with new drive and rehook drive cord.

6. Replacing Toggle Assembly

Loosen the two set screws holding the toggle mechanism on the band change switch and on shaft (6). Replace with new assembly, setting lower lever arm $\frac{1}{8}$ in. away from the condenser drive drum as shown in Fig. 5 and tighten set screw on frequency band switch shaft. Rotate shaft (6) clockwise until there is slight tension on spring (11) with the scale in the Band "D" position. Place upper lever arm in shaft and tighten set screw.

7. Setting Scale Pointer

The scale pointer is soldered to the slider. To set the pointer mechanically, turn the tuning condenser rotor so that the plates are fully engaged, and solder the pointer to indicate the extreme left-hand line on the Band "D" scale as shown in Fig. 5.

8. Replacing Dial Lamp

Take hold of terminals of lamp bracket and push up until lamps protrude above the opening in reflector (18). Lamps may then be replaced in socket clips. After replacing lamps, slide the socket mounting bracket back into the mounting clip.

GENERAL ELECTRIC CO.

Model A-88

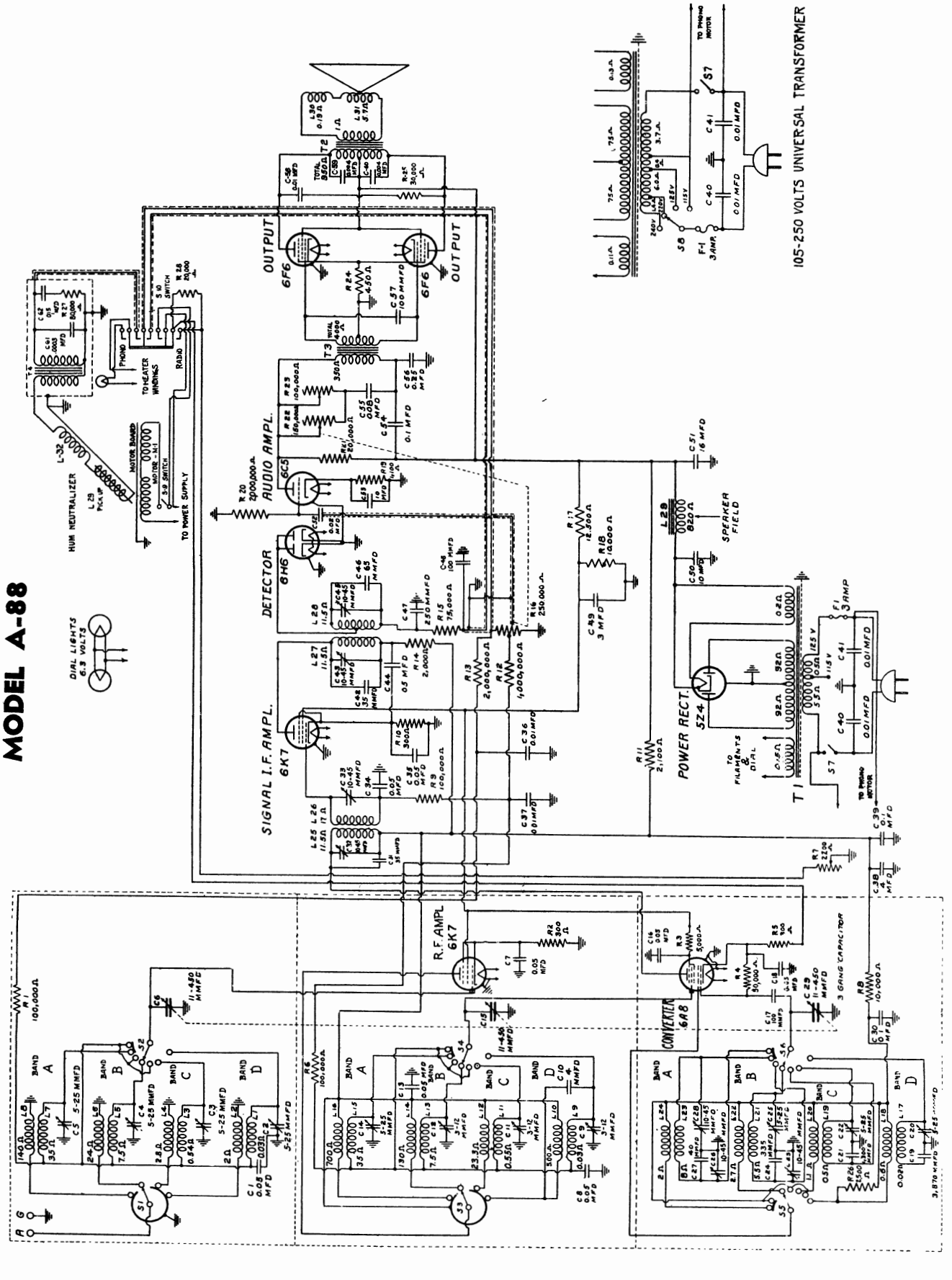


Fig. 1 Schematic Circuit Diagram

GENERAL ELECTRIC CO.

MODEL A-88

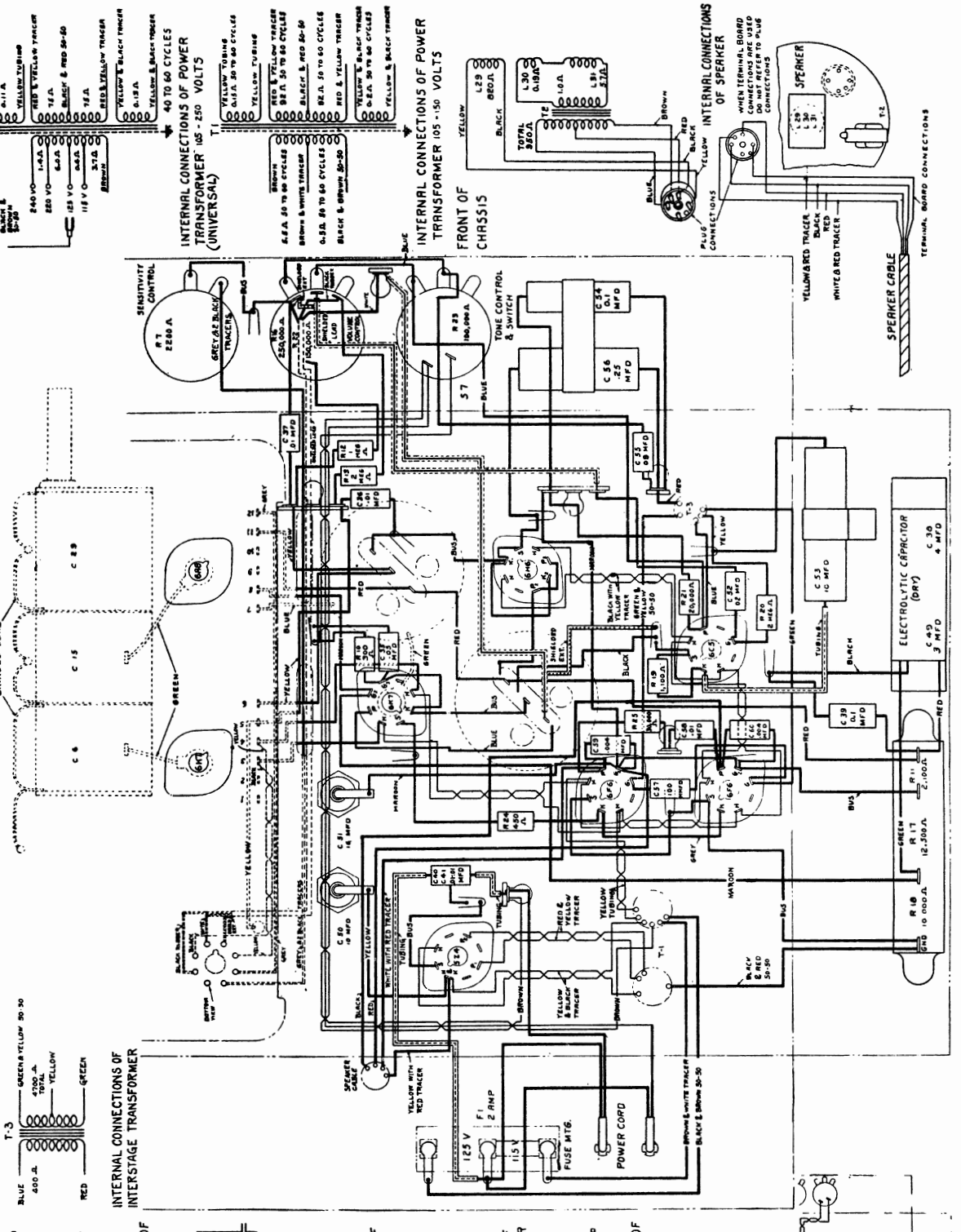


Fig. 2 Chassis Wiring Diagram

GENERAL ELECTRIC CO.

Model A-88

"Sentry Box" Wiring

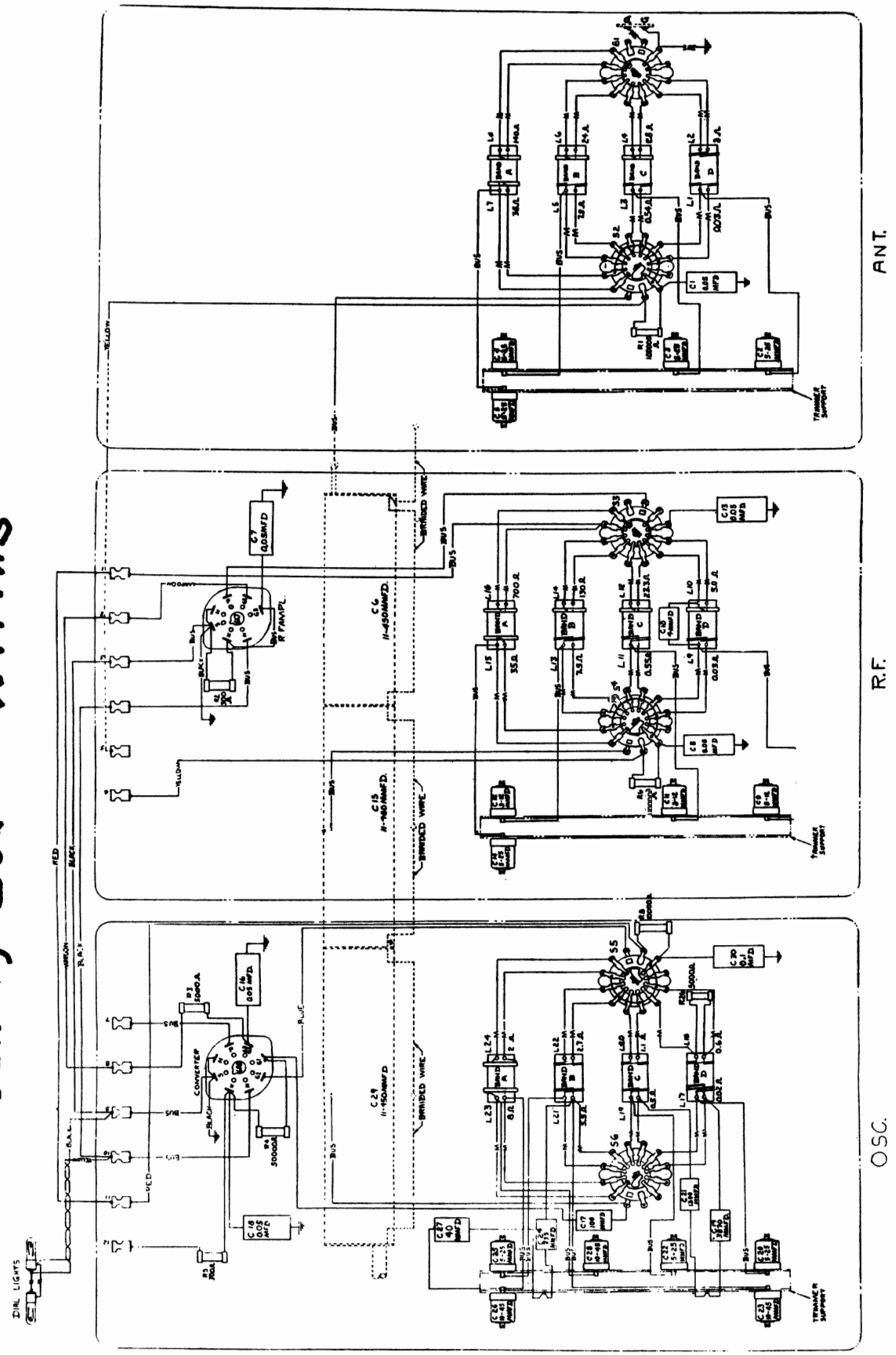


Fig. 3 "Sentry Box" Wiring Diagram

GENERAL ELECTRIC CO. Model A-88

ADJUST AND TIGHTEN NUT SO AS TO PROVIDE APPROXIMATELY 1/32 INCH BETWEEN SLOT IN LINK AND SCREW, WHEN BUMPER IS IN CONTACT WITH STOP BRACKET.

TO ADJUST RISE AND SWING OF TONE ARM:—WITH MANUAL INDEX LEVER IN 12" POSITION AND ROLLER ON MAIN LEVER **A** ENGAGED IN CAM AT HALF CYCLE POSITION AS SHOWN, AND SWITCH LEVER **B** IS AGAINST STOP SCREW **C**, ADJUST EYEBOLT **D** SO NEEDLE POINT (ORANGE SHANK) IS 11/16" + 1/32" — .000 ABOVE TURNTABLE FELT. AT THE SAME TIME ADJUST SCREW **C** SO THAT NEEDLE LANDS AT A RADIUS OF 5 13/16" + 1/16" — .000 FROM CENTER OF TURNTABLE SPINDLE. THIS ADJUSTMENT CAN BE FACILITATED BY USING 7 TWELVE-INCH RECORDS (NOT WARPED) WHICH MEASURES 11/16" TOTAL, AND ADJUSTING RISE TO 3/8" TO 13/32" ABOVE RIM OF TOP RECORD. LANDING RADIUS 5 13/16" + 1/16" — .000.

ADJUST NEEDLE HEIGHT BY MEANS OF TRIP ROD UNTIL NEEDLE POINT OF AN "ORANGE SHANK" NEEDLE IS 1/16 +.010 INCH BELOW TOP SURFACE OF THE RUBBER PICKUP REST.

ADJUST SCREW UNTIL FRICTION WILL JUST FORCE FINGER TO MOVE TRIP PAWL. (WITH COVER REMOVED)

TO ADJUST MANUAL INDEX FINGER - PLACE MANUAL INDEX LEVER IN THE POSITION SHOWN - SET MANUAL INDEX FINGER TO FORCE TRIP PAWL AGAINST STOP PIN - TIGHTEN SET SCREW.

ADJUST AUTOMATIC SWITCH AS FOLLOWS - PLACE MANUAL INDEX LEVER IN POSITION SHOWN AND WITH SWITCH IN TRIPPED POSITION, ADJUST IT UNTIL THE CONTACT POINTS ARE OPENED .020 +.010 INCH AS INDICATED (TURNTABLE REMOVED)

ADJUST SCREW SO EJECTOR TIP IS DIRECTLY ABOVE SPINDLE.

BUMPER
ADJUSTMENT NUT
STOP BRACKET
SCREW
LINK
D
STOP PIN
TRIP PAWL
INDEX FINGER
A
B
C

EJECTOR TIP WITH RUBBER SILENCER REMOVED

ADJUST EJECTOR TIP IN LINE WITH SPINDLE

RUBBER PICKUP REST

ROLLER

IF ROLLER FAILS TO ROLL BACK DURING AUTOMATIC CYCLE ADJUST SCREW UPWARD TO PROVIDE A GREATER INCLINE DURING THE CYCLE. DO NOT ADJUST SO HIGH AS TO CAUSE EJECTOR TIP TO FAIL TO TOUCH TOP OF TURNTABLE FELT AT HIGHEST POINT.

.092 ±.004

ADJUST TURNTABLE HEIGHT BY INSERTION OR REMOVAL OF THRUST WASHERS

SECTIONAL VIEW OF EJECTOR TIP ASSEMBLY

ADJUSTING SCREW
EJECTOR TIP FIBER CENTER
RUBBER SILENCER
EJECTOR TIP RETAINING NUT
EJECTOR TIP

END OF EJECTOR TIP FIBER CENTER SHOULD BE FLUSH WITH EJECTOR TIP.

EJECTOR TIP SHOULD ROTATE FREELY

Fig. 8 Automatic Record Changer Adjustments

GENERAL ELECTRIC CO.

Model A-88

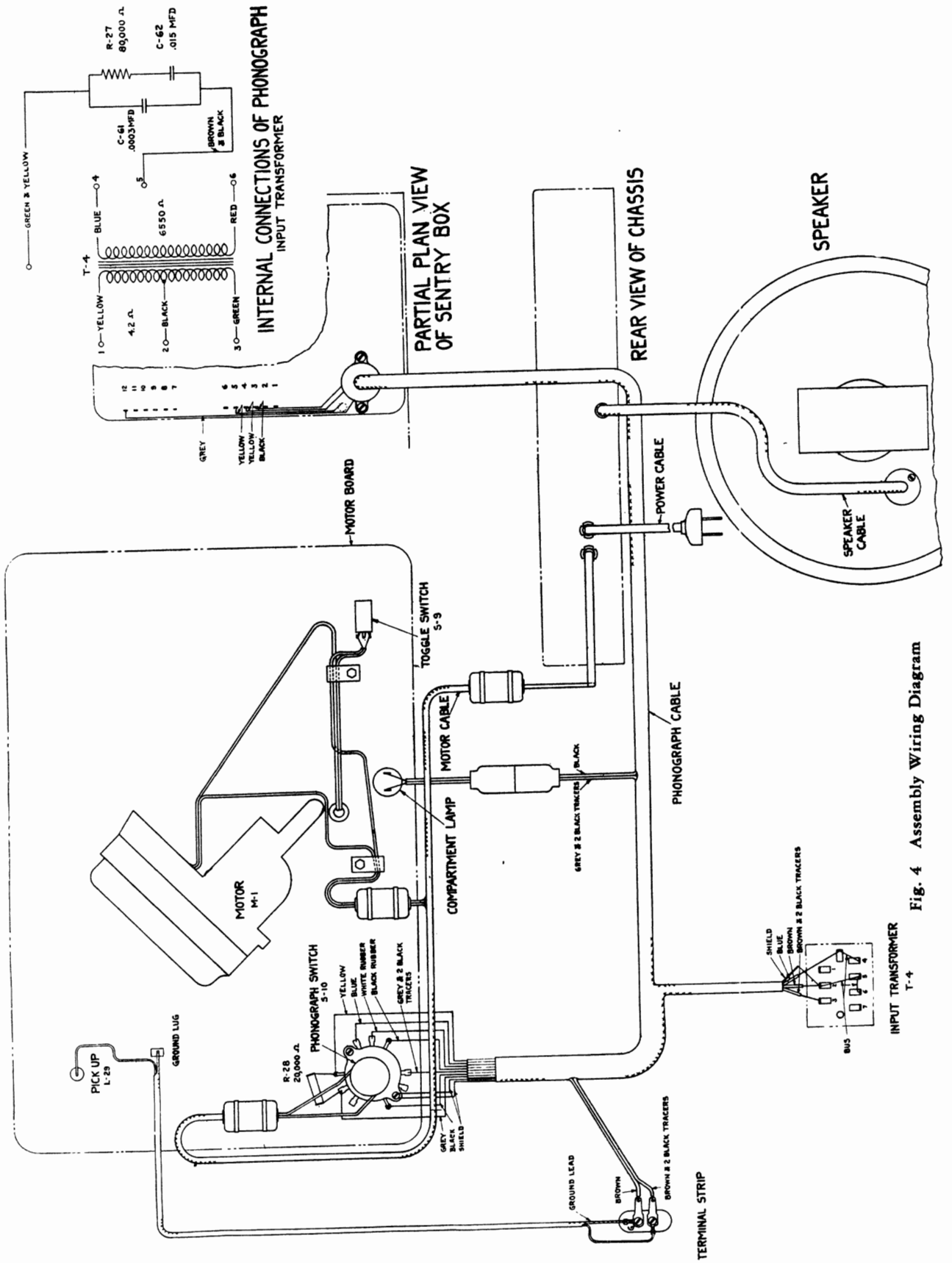


Fig. 4 Assembly Wiring Diagram

Model A-88

SERVICE DATA

Physical Specifications

Model	A-88
Height	44⅛ in.
Width	31⅜ in.
Depth	18½ in.
Weight packed	202 lb.

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A 6	105–130	60	150
A 5	105–130	50	150
C 2	105–130	25	150
V 6	105–130/200–250	60	150
V 5	105–130/200–250	50	150
V 4	105–130/200–250	40	150

NOTE.—Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

Tuning Frequency Range

Band "A" 140–410 kc
Band "B" 540–1750 kc
Band "C" 1.75–6.0 mc (1750–6000 kc)
Band "D" 6.0–19.5 mc (6000–19,500 kc)

Tuning Control Drive Ratio

Fast Tuning 5½ to 1
Vernier Tuning 55 to 1

Electrical Power Output

Undistorted 5.0 watts
Maximum 8.1 watts

Loud-speaker—Electrodynamic

Cone: 10¼ in. overall, 9¼ in. effective diameter

Cone Coil Impedance: 5 ohms at 400 cycles

Phonograph Pick-up

Viscoloid Damped
Pick-up Coil Impedance: 4:6 ohms at 1000 cycles

Record Changer

Record Ejector Type
Capacity: Nine 10-in. records or eight 12-in. records
Turntable Speed: 78 rpm
Time to complete record-changing cycle: 4½ seconds.

Tubes

R.F. Amplifier	6K7 Triple-grid Super-control Amplifier
Converter and Oscillator	6A8 Pentagrid Converter
I.F. Amplifier	6K7 Triple-grid Super-control Amplifier
Detector and AVC	6H6 Twin Diode
Audio Amplifier	6C5 Detector Amplifier Triode
Output	Two 6F6 Power Amplifier Pentodes (Push-pull)
Power Rectifier	5Z4 Full-wave Rectifier
Dial Lamps	MAZDA No. 46

DESCRIPTION OF ELECTRICAL CIRCUIT

Radio

Model A-88 employs eight metal envelope tubes in a superheterodyne circuit, giving the excellent sensitivity and selectivity inherent in this type circuit. Separate groups of coils are used for each frequency band, all radio frequency coils being housed in the "Sentry Box" unit, together with their associated band switches, capacitors, resistors and tube sockets. This type of construction permits using extremely short connecting leads and isolates each radio frequency circuit in its own particular shielded compartment. Permanence of alignment adjustments is assured through use of the new "Permaliner" air-dielectric trimmer capacitors in all tuned circuits.

The signal from the antenna is applied to the control grid of the 6K7 R. F. amplifier tube through the antenna coil, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. The secondary of the coil for the band next lower in frequency to the one in use is short-circuited by the band switch to prevent absorption of energy at its resonant frequency, which falls in the next higher band. The primaries of all coils not in use are also short-circuited by the band switch.

The amplified radio frequency signal is impressed on the control grid of the 6A8 converter and oscillator tube through the R. F. coil, the secondary of which is tuned to the signal frequency by the center section of the main tuning condenser. The sensitivity control consists of a variable resistor in the cathode circuit of the 6A8 converter tube. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc higher in frequency. The local signal is generated by the oscillator elements of this tube and the proper frequency difference is maintained throughout the tuning range by the front section of the main tuning condenser in conjunction with the oscillator coil and padding capacitors. The oscillator section of the main tuning condenser, although of the same capacity as the other two sections, is larger physically to permit wider spacing of the plates, thereby reducing the possibility of microphonic feedback howl.

The combination of the signal frequency with the local oscillator frequency in the converter tube produces the intermediate frequency of 465 kilocycles. This particular intermediate frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, each with two tuned circuits.

The output of the I. F. amplifier is applied to the 6H6 diode rectifier, which is a combined detector and automatic volume control tube. The direct current component of the rectified signal produces a voltage drop across R-16. This voltage drop provides automatic bias for the R. F. and I. F. amplifier tubes and converter tube and so gives automatic volume control action. Full automatic bias is applied to the R. F. amplifier tube, while a part of this voltage, from a tap on R-16, is applied to the converter tube and I. F. amplifier, which handle somewhat larger signal voltage than the R. F amplifier.

The manual volume control selects the amount of audio signal applied through coupling capacitor C-52 to the grid of the 6C5 audio amplifier tube, and thus regulates the output of the receiver. This is a dual control, the second or lo-note compensation section acting to preserve proper balance between high and low audio frequencies as the volume is changed, by means of a variable 150,000-ohm resistance (R-22) in series with a capacitor (C-55) across the primary of the interstage audio transformer. The tone control consists of a variable 100,000-ohm resistor (R-23) connected in parallel with the lo-note compensation section of the volume control, so as to permit attenuation of the higher audio frequencies as desired.

The output of the 6C5 tube is coupled to the grids of the push-pull 6F6 output pentodes by means of a resistance capacity network working into the interstage audio transformer. The plate circuits of the 6F6 output pentodes are suitably matched to the loud-speaker by means of a step-down output transformer.

Plate and grid voltages for all tubes are supplied by the power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

Phonograph

The record-reproducing facilities consist of a low impedance magnetic pick-up with its associated inertia-type tone arm, and the compensated volume control, audio amplifier and loud-speaker of the receiver. In changing from radio reception to phonograph reproduction the radio-phono switch simultaneously disconnects the 6H6 diode from the volume control, connects the secondary of the phonograph input transformer across this control, and renders the radio frequency amplifier inoperative by inserting a high resistance in the cathode circuit of the 6A8 converter and oscillator tube.

The turntable assembly consists of the perfected automatic record changer, which is simple and foolproof in operation. A separate motor switch is provided to permit starting and stopping the phonograph motor independently without operating the radio-phono switch.

Alignment Procedure

Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil involved. The "Tuning Wand" consists of a rod of insulating material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of a particular coil through the openings provided in the "Sentry Box" compartment shields, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer adjustment required
Metal Ring	Decrease	None
Iron filings	Decrease	
Metal Ring	Increase	Decrease capacity
Iron filings	Decrease	
Metal Ring	Decrease	Increase capacity
Iron filings	Increase	

Fig. 6 shows the location of the antenna, R. F. and oscillator coils for each of the four frequency bands of Model A-88 receiver. Openings are provided in the coil shields for insertion of the tuning wand into the antenna or R. F. coil of any band. No provision is made for checking the alignment of the oscillator circuits, as this is easily determined by noting the dial calibration.

Alignment Frequencies

I. F.	Band "A"	Band "B"	Band "C"	Band "D"
465 kc	140 kc	580 kc	6000 kc	18,000 kc
	410 kc	1740 kc		

In order to align this receiver properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 140, 410, 465, 580, 1740, 6000, and 18,000 kc.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
4. A tuning wand.

The location of all trimmer capacitors is shown in Fig. 5. ***It should be noted that on all "Permaliner" trimmer capacitors, clockwise rotation of the adjusting screw decreases capacity, while counterclockwise rotation increases capacity.***

1. I. F. Alignment

Set the frequency band switch of the receiver to Band "B," short-circuit the antenna and ground terminals and tune the receiver at some point above 1500 kc so that no signal is heard. Set the volume control and sensitivity control at maximum (extreme clockwise position) and ground the chassis.

The I. F. amplifier is tuned to 465 kc; set the test oscillator dial at this frequency. Make sure that a d-c path exists between the output terminals of the test oscillator, then remove the control grid clip (green lead) from the 6A8 tube and connect the test oscillator output between chassis and the dome terminal of the 6A8 tube. Connect the output meter across the cone coil of the speaker and adjust the test oscillator output control so that, with the receiver volume control at maximum, a small deflection is observed on the output meter. During both I. F. and R. F. alignment, the test oscillator signal should be maintained at the lowest level that will give a good readable output indication.

Adjust the secondary trimmer of the second I. F. transformer until a maximum output reading is obtained, maintaining a small deflection on the output meter throughout alignment by adjusting the test oscillator output. Next, adjust the primary trimmer of the second I. F. transformer for maximum output. Continue this procedure, adjusting the secondary trimmer of the first I. F. transformer and lastly the primary trimmer of the first I. F. transformer. After completing this procedure, repeat it a second time for final alignment. The I. F. alignment will then be complete.

2. R. F. Alignment

Bands "A" and "B" each require four trimmer adjustments, while Bands "C" and "D" each require three adjustments. Care should be taken to adjust only the trimmers of the band under test. Check the position of the dial pointer with the tuning condenser plates fully engaged as outlined in the section on adjustment of the dial mechanism. Make sure the antenna and ground terminals of the receiver are not short-circuited and connect to them the output from the test oscillator, preferably using a dummy antenna of 250 mmfd in series with 200 ohms between the test oscillator and the receiver antenna terminal. Connect the output indicator across the speaker cone coil.

Band "A," 140-410 kc

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 410 kc, and turn the dial pointer on the receiver to this

Model A-88

Fuse in 125-volt Clip—125 Volts A-C Line. Controls at Maximum Volume and Sensitivity. No Signal Tuned In.

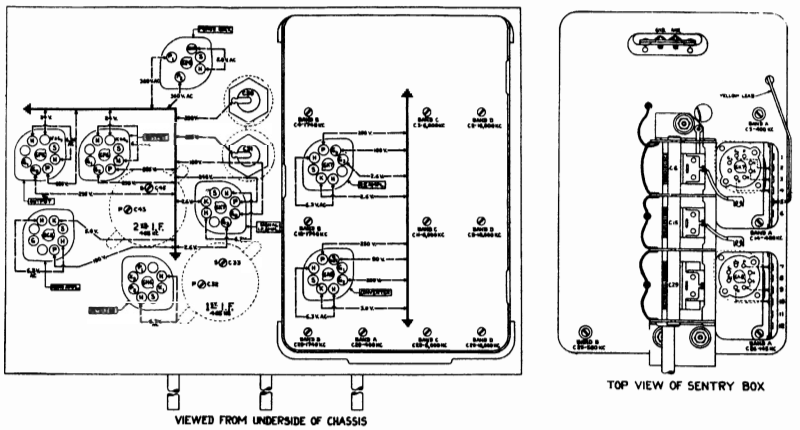


Fig. 5 Trimmer Locations and Socket Voltages

frequency. Adjust the Band "A" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small deflection on the output indicator. When optimum adjustment on the Band "A" oscillator trimmer is obtained, adjust the Band "A" R. F. and antenna trimmers for maximum output.

Now tune the test oscillator to 140 kc and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 140-kc padding capacitor for maximum output. When this has been done, return to 410 kc on the receiver and test oscillator and recheck the alignment for maximum output. This completes alignment of Band "A."

Band "B," 540-1750 kc

Set the frequency band switch to the position where the dial indicates the above range. Tune the test oscillator to 1740 kc and set the dial pointer on the receiver to this frequency Adjust the Band "B" oscillator trimmer for maximum output, keeping the receiver volume control at its extreme clockwise position and adjusting the test oscillator output to maintain a small reading on the output indicator. When optimum adjustment on the Band "B" oscillator trimmer is obtained, adjust the Band "B" R. F. and antenna trimmers for maximum output.

Now tune the test oscillator to 580 kc and set the receiver to that frequency. Slowly rocking the tuning condenser back and forth through the signal, adjust the 580-kc padding capacitor for maximum output. When this has been done, return to 1740 kc on the receiver and test oscillator and recheck the alignment for maximum output. Band "B" should now be in alignment.

Band "C," 1.75-6.0 mc (1750-6000 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 6000 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "C" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 5070 kc on the receiver dial. It should be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (6000 kc) and adjust the test oscillator output to its previous value. Then adjust the Band "C" R. F. and antenna trimmers for maximum output.

Band "D," 6.0-19.5 mc (6000-19,500 kc)

Set the band switch to the position where the dial indicates the above range. Tune the test oscillator to 18,000 kc and set the dial pointer on the receiver to this frequency. Adjust the Band "D" oscillator trimmer for maximum output, using the first peak obtained when increasing the capacitance from minimum to maximum.

Check for the image signal which should be received at about 17,070 on the receiver dial. It may be necessary to increase input to the receiver from the test oscillator for this check. Retune the receiver to the correct scale reading (18,000 kc) and adjust the test oscillator output to its previous value.

Reduce the capacitance of the R. F. trimmer to a minimum. While slowly rocking the tuning condenser through the 18,000-kc point, increase the Band "D" R. F. trimmer capacitance until a maximum response point is obtained. The Band "D" antenna trimmer should now be peaked. It is not necessary to rock the tuning condenser while making the last adjustment.

When these adjustments have been completed. the receiver will be in alignment.

METHOD OF SERVICE PROCEDURE—SENTRY BOX

The "Sentry Box" assembly includes the tuning condenser and dial mechanism as well as the coil and switch compartments. The complete unit may be dismounted from the chassis by removing the side-fastening bolts, unscrewing the dial mechanism anchoring nut and unsoldering the leads to the chassis from the terminal strips.

In order to remove the coil shield cans it is necessary to take out the frequency band switch shaft. With the "Sentry Box" dismounted from the chassis the dial gears may be disengaged and the switch shaft removed merely by lifting the reduction drive end of the dial assembly, allowing the switch shaft gear to pass the dial scale cap shaft. With the "Sentry Box" mounted in place, removal of the switch shaft requires removing the dial scale gear and cap shaft.

Each compartment shield can houses a bracket assembly comprising the coils, band switch and other component parts associated with that particular circuit. With the band

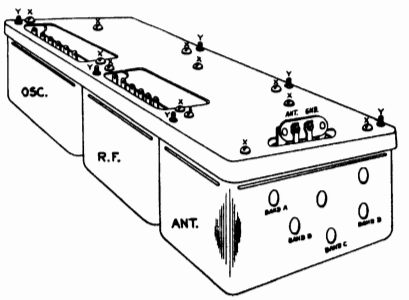


Fig. 6 "Sentry Box" Coil Locations and Assembly

switch shaft out, any shield can be easily removed by unscrewing the two mounting stud nuts ("Y," Fig. 6).

In most cases, coils or Permaliner trimmer capacitors may be replaced merely by removing their particular shield can. It is an easy matter, however, to remove each complete bracket assembly by taking out the mounting bolts ("X," Fig. 6) and unsoldering the bus or braid connections to the tuning condenser. In the case of the R. F. or oscillator units it will also be necessary to unsolder the external leads to the respective terminal boards of these units.

Permaliner trimmers are replaced by unsoldering the bus lead from the trimmer terminal, and then unsoldering the Permaliner case from its mounting cup. The latter operation may require the use of two soldering irons.

Coils are replaceable by merely unsoldering the coil lugs from the switch lugs. If it is necessary to replace a section of the band switch, however, it will be found expedient to remove the complete bracket and coil assembly for easy access to the switch lugs.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism is rigidly mounted at one end to the tuning condenser frame by two removable screws and anchored to the chassis deck at the other end by a rubber-cushioned nut. The dial pointer, station selector knob, and tuning condenser drive drum are interconnected by means of the drive cord and drive cable; the frequency band switch and cylindrical scale by the switch shaft and scale gears.

1. *Position of Drum on Condenser Shaft*

With set screws (5) loosened and tuning condenser plates fully engaged, place the drum in the position shown in Fig. 7. The drum should be located on the tuning condenser shaft so as to be in line with the drive cord pulleys ($\frac{1}{16}$ in. from the dial mechanism mounting bracket), and so that, with condenser plates fully engaged, guide (38) occupies the position shown in Fig. 7.

2. *Removing and Replacing Scale*

Pry out fastener (40) and remove the scale by lowering the fastener end below the mounting ear. Take the scale out of cap assembly (29). Replace by placing tabs of caps (29) and (30) in slots of scale. Replace fastener (40).

3. *Removing and Replacing Band Switch Shaft*

To remove the band switch shaft with the "Sentry Box" assembled in place, the dial scale cap and gear must be removed. This is done by removing the cylindrical scale as in paragraph 2. Then loosen set screws (9) and remove cap (29), spring (7) and gear (8).

When replacing the switch shaft, note that the shaft will fit the switch gang slots in only one position; turn the shaft before inserting so that the locating button will pass through the keyed side of the slots. Note also that the brass bearing just behind the switch shaft gear determines the forward position of the gear. Insert the bushing just far enough into the index plate hub so that the shaft gear meshes snugly with the scale gear, then tighten the set screw.

4. *Locating Scale*

Loosen the two gear set screws (9). Rotate the scale backward until there is slight tension on spring (7) with the pointer indicating on the Band "A" scale. With the frequency band switch in the Band "A" position, place gear (8) in mesh with the gear on part (6) and tighten the two set screws (9).

5. *Replacing Drive Cord and Drive Cable*

The position of the dial scale pointer with respect to the tuning condenser drum is held fixed by a special metal braid cable (12) connecting the drum with guide (38). Tension is maintained on the cable through the drum spring (13) and drive cord (11). To replace either the drive cable or the drive cord, remove the dial scale for convenient access to guide (38). Unhook spring (13) from its drum tab to release tension. Unhook the cable or cord from guide (38) and unwind from

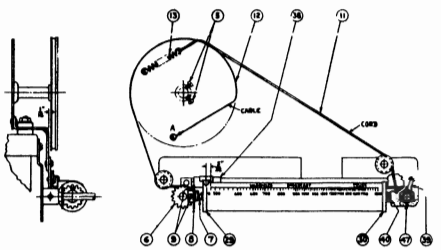


Fig. 7 Dial Mechanism

the pulleys and drum. To replace the cable or cord, rethread to agree with Fig. 7, and rehook drum spring (13) as shown.

6. *Replacing Reduction Drive*

To replace the reduction drive, unhook spring (13), loosening the drive cord. Unscrew pal nut (47) and remove drive. Replace with new drive and rehook drive cord.

7. *Setting Scale Pointer*

The scale pointer is soldered to the slider. To set the pointer mechanically, turn the tuning condenser rotor so that the plates are fully engaged, and solder the pointer to indicate a point $\frac{1}{8}$ in. to the left of the extreme left-hand mark on the scale on Band "B."

8. *Replacing Dial Lamp*

The dial lamp sockets are easily accessible by lifting them clear of the dial mechanism. Lamps may then be replaced in their sockets. After replacing lamps, slide the socket clip back onto the mounting bracket.

AUTOMATIC RECORD EJECTOR

The record-changing mechanism is designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in Fig. 8.

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

The tip of the record ejector is adjustable in relation to the turntable spindle, the two being exactly coaxial when properly adjusted. To align the tip, remove the rubber silencer of the ejector assembly, loosen ejector tip retaining nut and slide the tip assembly to the position where it is in true line with the axis of the turntable spindle. This adjustment may be simplified by placing several records on the turntable, depressing the spindle through the top record hole and lining up the ejector tip in the spindle hole of the record.

To insure that the ejector tip rotates freely, apply a slight amount of oil to the shank of the tip at the point where it is in contact with the ball bearing.

MAGNETIC PICKUP

The pickup used in the phonograph unit is of an improved design, having several variations from the usual type of pickup. The magnetic assembly is one rigid piece. The horseshoe magnet is solidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and provides a damping effect on the movement of the armature. A neutralizing coil is mounted in the magnet assembly in such manner that it balances out hum induced by stray magnetic fields but does not affect the audio signal. The frequency response is uniform over a wide range.

Service operations which may be necessary on the pickup are as follows:—

Centering Armature

Refer to Fig. 9 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, the screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

Damping Block

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing the armature and viscoloid assembly from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly cleaned with fine emery cloth and then inserted into the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron constructed as shown in Fig. 10 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides. The pickup should then be carefully reassembled and the armature centered as previously explained.

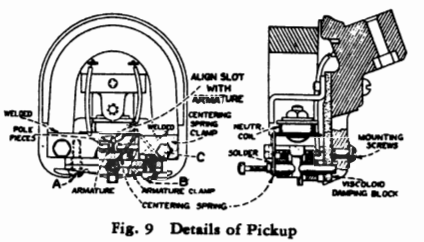


Fig. 9 Details of Pickup

Fig. 10 Special Soldering-iron Tip

Replacing Coils

Whenever there is defective operation due to open or shorted pickup coils, these coils should both be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-a-way illustrations. It is important to readjust the armature as previously explained after reassembly of the mechanism. It is also necessary to have the hum and signal coils mounted in proper relation to each other in order that there may be the intended neutralization between them. Make certain that the slot in the center screw of the neutralizing coil is aligned directly over the armature tip, as illustrated. Only rosin core solder should be used for soldering the coil leads in the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care, due to the fact that the magnet and pole pieces are one unit and the magnetic circuit remains closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. This should be done by placing the pickup assembly on the poles of a standard pickup magnetizer and charging the pickup in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which may be purchased from authorized dealers.

RECEIVER CHASSIS ASSEMBLIES

Stock No.	Description	List Price
RB-007	BOARD—Fuse board. Rating "V" Receivers	$0.40
RB-008	BOARD—Terminal Board (Double terminal)	.10
RB-009	BOARD—Terminal Board (Single terminal)	.15
RB-011	BOARD—Fuse board, Rating "A" or "C" Receivers	.30
RC-022	CAPACITOR—.004 Mfd. 400 Volt (C-59, C-60) Paper Dielectric	.25
RC-034	CAPACITOR—.01 Mfd. 200 Volt (C-36, C-37) Paper Dielectric	.25
RC-040	CAPACITOR—.01 Mfd. 400 Volt (C-58) Paper Dielectric	.25
RC-046	CAPACITOR—.02 Mfd. 200 Volt (C-52) Paper Dielectric	.25
RC-072	CAPACITOR—.05 Mfd. 200 Volt (C-35) Paper Dielectric	.25
RC-094	CAPACITOR—.08 Mfd. 400 Volt (C-55) Paper Dielectric	.25
RC-123	CAPACITOR—.1 Mfd. 400 Volt (C-39, C-54) Paper Dielectric	.35
RC-150	CAPACITOR—.25 Mfd. 400 Volt (C-56) Paper Dielectric	.35
RC-235	CAPACITOR—100 mmfd. (C-57) Mica Dielectric Moulded Case	.25
RC-405	CAPACITOR—10 Mfd. 480 Volt (C-50) Wet Electrolytic	1.15
RC-408	CAPACITOR—16 Mfd. 470 Volt (C-51) Wet Electrolytic	1.15
RC-502	CAPACITOR—One 4 Mfd. 450 Volt (C-38), one 3 Mfd. 150 Volt (C-49) Dry Electrolytic Pack	1.40
RC-504	CAPACITOR—10 Mfd. 25 Volt (C-53) Dry Electrolytic	.80
RC-750	CAPACITOR—Line Capacitor, Two .01 Mfd. (C-40, C-41)	.50
RC-801	CABLE—Speaker Cable	.50
RC-851	CORD—Power Cord with Plug	.60
RC-951	CLAMP—For mounting C-54 and C-56	.10
RC-952	CLAMP—For mounting C-53	.10
RE-005	ESCUTCHEON—Dial Escutcheon	.80
RF-003	FOOT—Chassis Mounting Foot with Cushions, pkg. of 2	.30
RI-003	INSULATOR—Escutcheon Shaft Insulator Bushing, pkg. of 10	.40
RK-002	KNOB—Tuning, Volume, Tone, Sensitivity or Band Switch, pkg. of 5	.50
RN-001	NUT—Escutcheon Mounting Nut, pkg. of 10	.45
RP-002	PLATE—Fuse Cover Plate	.15
RP-014	PLATE—Escutcheon Mounting Plate, pkg. of 2	.25
RP-016	PLATE—Dial Mechanism Mounting Plate Assembly	.15
RR-006	RESISTOR—300 ohms ¼ watt (R-10) Carbon Resistor, pkg. of 5	$0.70
RR-009	RESISTOR—1100 ohms ¼ watt (R-19) Carbon Resistor, pkg. of 5	1.05
RR-067	RESISTOR—1 megohm ¼ watt (R-12) Carbon Resistor, pkg. of 5	.70
RR-068	RESISTOR—2 megohms ¼ watt (R-13, R-20) Carbon Resistor, pkg. of 5	.60
RR-239	RESISTOR—20,000 ohms 1 watt (R-21) Carbon Resistor, pkg. of 5	.85
RR-242	RESISTOR—30,000 ohms 1 watt (R-25) Carbon Resistor, pkg. of 5	.85
RR-250	RESISTOR—450 ohms 2 watts (R-24) Carbon Resistor	.50
RR-701	RESISTOR—Tapped Resistor (R-11, R-17, R-18)	.95
RR-900	REFLECTOR—Dial Lamp Reflector	.15
RS-110	SHIELD—Second I. F. Transformer Shield	.30
RS-115	SHIELD—First I. F. Transformer Shield	.35
RS-200	SOCKET—Eight-pin Tube Socket, pkg. of 5	.75
RS-204	SOCKET—Five-pin Tube Socket, pkg. of 5	.75
RS-800	SENSITIVITY CONTROL—Rheostat 2200 ohms (R-7)	.85
RT-081	TRANSFORMER—Power Transformer (T-1) 50-60 cycles, 105-130 volts (Rating "A")	6.75
RT-082	TRANSFORMER—Power Transformer (T-1) 25-60 cycles, 105-130 volts (Rating "C")	9.70
RT-083	TRANSFORMER—Power Transformer (T-1) 40-60 cycles, 105-130, 200-250 volts (Rating "V")	8.25
RT-204	TRANSFORMER—First I. F. Transformer (C-31, C-32, C-33, C-34, L-25, L-26, R-9)	2.95
RT-205	TRANSFORMER—Second I. F. Transformer (C-42, C-43, C-44, C-45, C-46, C-47, C-48, L-27, L-28, R-14, R-15)	3.30
RT-502	TRANSFORMER—Interstage Audio Transformer (T-3)	4.25
RT-701	TONE CONTROL—Rheostat 100,000 ohms (R-23) and Power Switch (S-7)	1.25
RV-003	VOLUME CONTROL—Potentiometer 250,000 ohms (R-16) and Rheostat 150,000 ohms (R-22)	1.70
RW-002	WINDOW—Dial Window	.15
RX-002	CUSHION ASSEMBLY—Tuning Condenser Mounting Cushions, Nuts and Washers	.10
RX-004	SCREW ASSEMBLY—Chassis Mounting Screws and Washers	.10

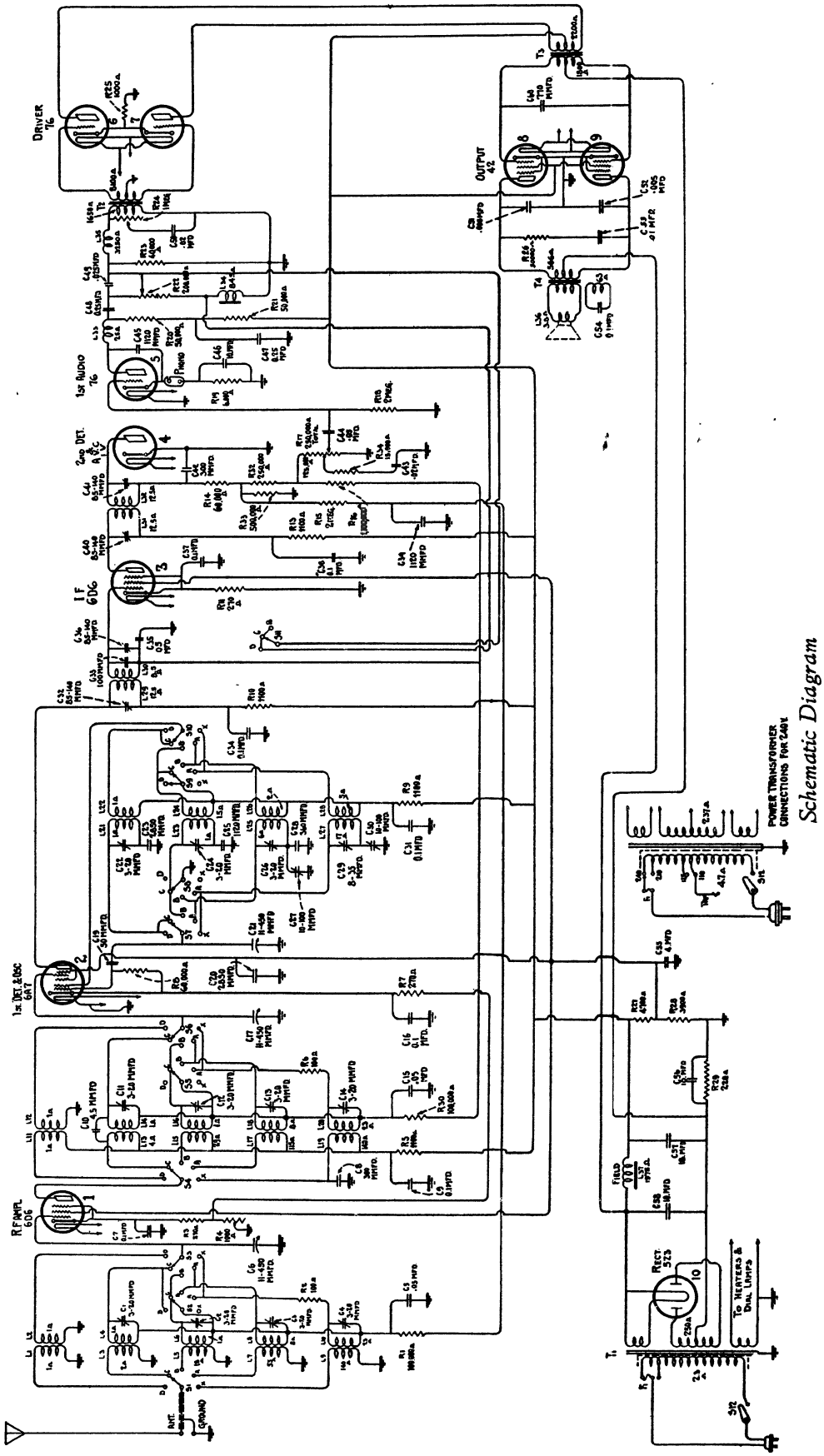
"SENTRY BOX" ASSEMBLIES

Stock No.	Description	List Price
RA-001	ASSEMBLY—Antenna Compartment Assembly Complete	$9.00

GENERAL ELECTRIC CO.

SUPPLEMENT to GENERAL ELECTRIC RADIO MODEL M-106 SERVICE NOTES

Late Production of the General Electric Radio Model M-106 uses Radiotron RCA-1-V as the second detector instead of Radiotron RCA-76. The changes in the schematic and chassis wiring diagrams are shown on this and the reverse page.



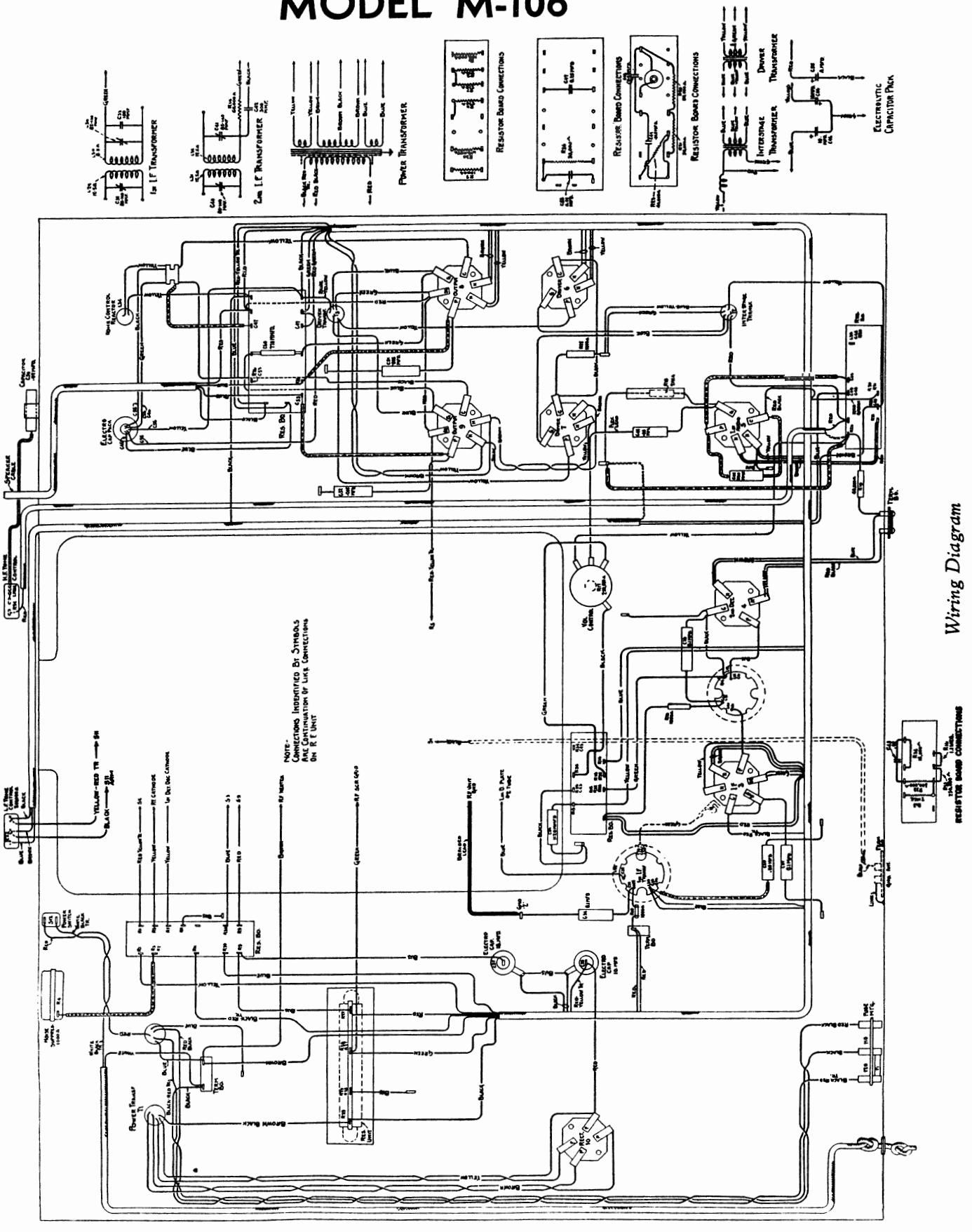
Schematic Diagram

GENERAL ELECTRIC CO.

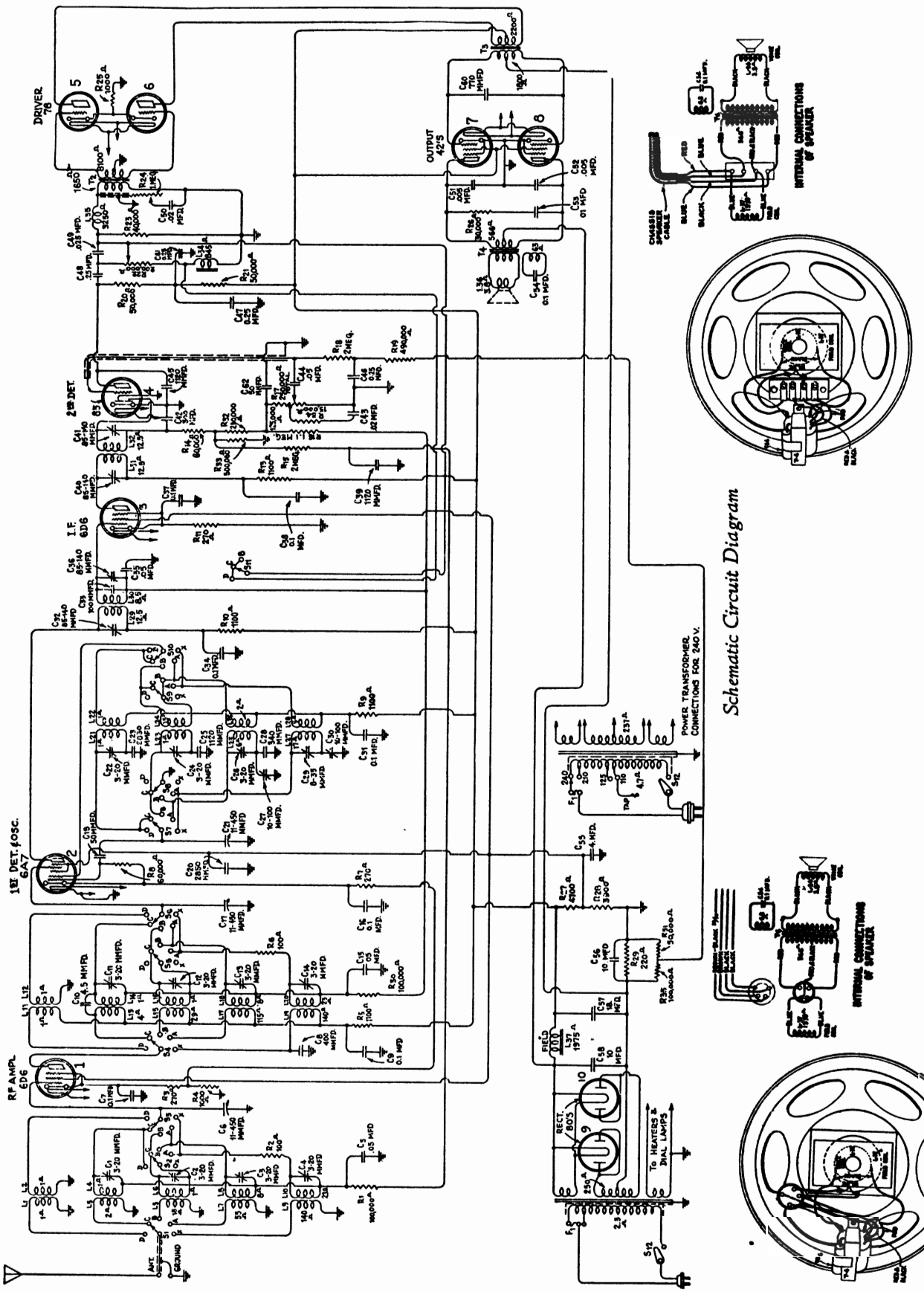
SUPPLEMENT

to

MODEL M-106



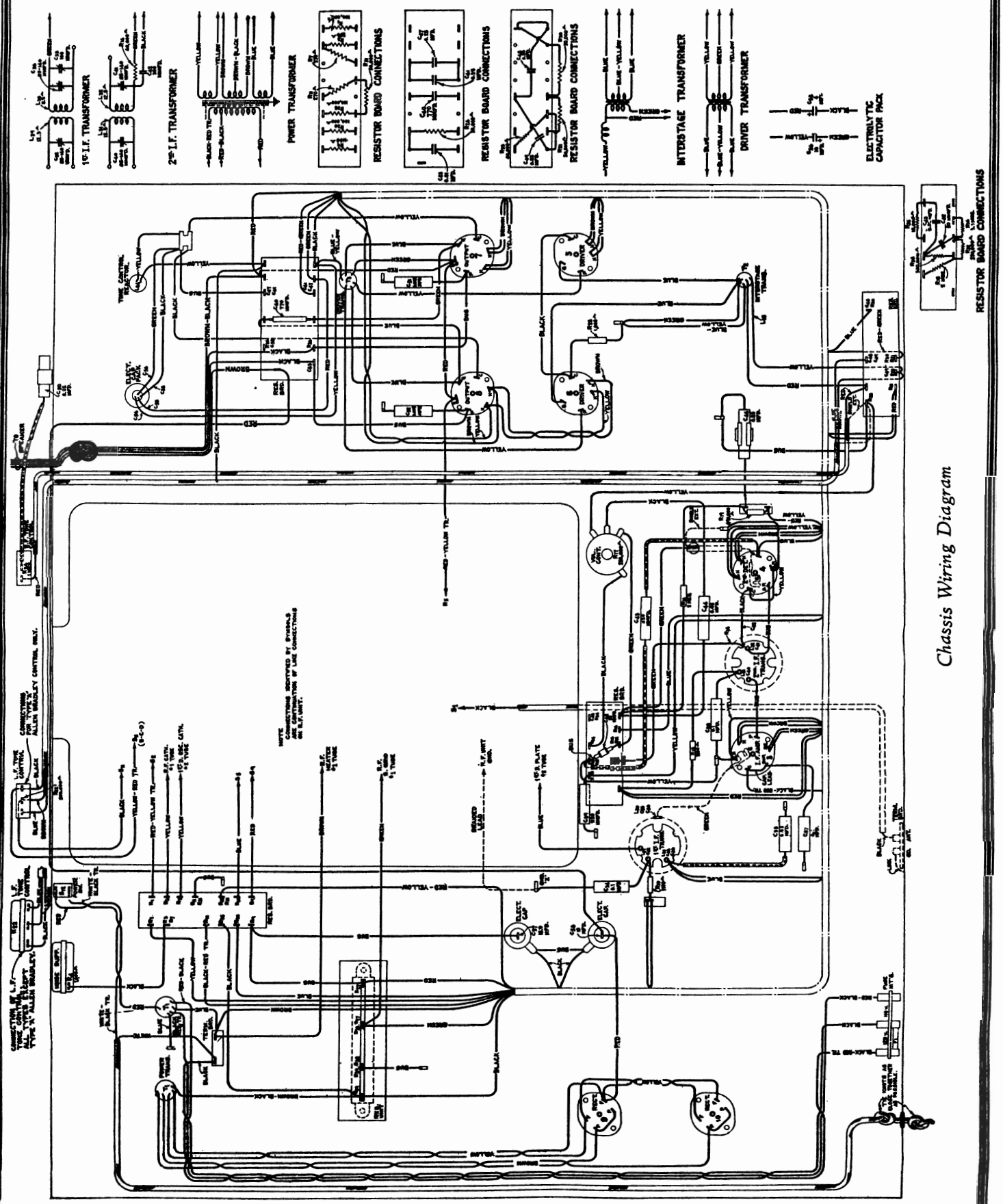
GENERAL ELECTRIC CO.
MODELS M-106 AND M-107
(1935 PRODUCTION)



GENERAL ELECTRIC CO.

MODELS M-106 AND M-107

(1935 PRODUCTION)



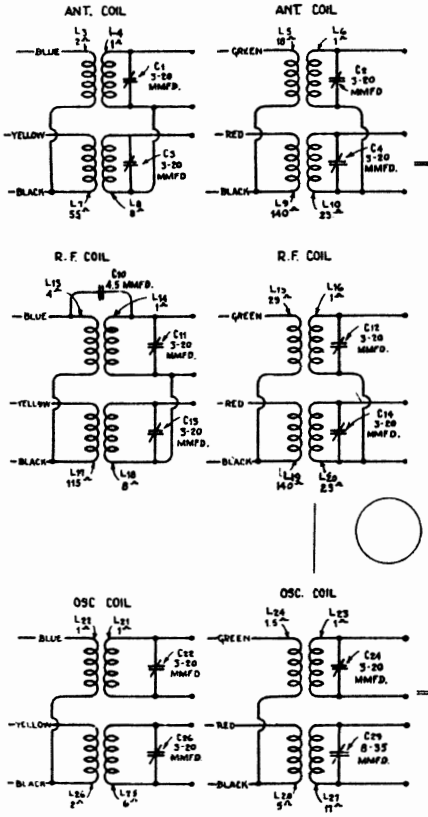
Chassis Wiring Diagram

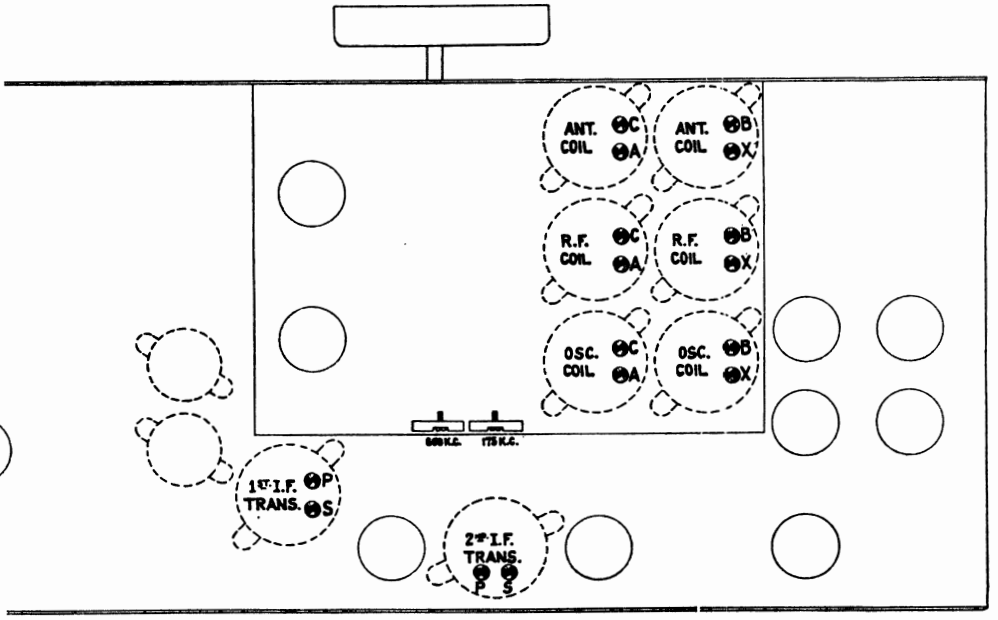
GENERAL ELECTRIC CO.
MODELS M-106 AND M-107
(1935 PRODUCTION)
RADIOTRON SOCKET VOLTAGES

120-Volt A. C. Input—Volume and Sensitivity Controls Maximum—Band Switch at "A"—No Signal

Radiotron Type and Purpose		Cathode to Ground Volts, D. C.	Screen Grid to Ground Volts, D. C.	Plate to Ground Volts, D. C.	Cathode Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		2.5	101	242	9.2	6.3
RCA-6A7	Detector	2.8	101	244	10.9	6.3
	Oscillator	—	—	244		
RCA-6D6—I. F.		2.5	101	242	9.2	6.3
RCA-85—2nd Det. AVC		0	—	107*	1.4	6.3
RCA-76—Driver		11.4	—	247	5.6	6.3
RCA-76—Driver		11.4	—	247	5.6	6.3
RCA-42—Power		0	247	376	21.0	6.3
RCA-42—Power		0	247	376	21.0	6.3
RCA-80—Rectifier		—	—	768/384 R. M. S.	56.0	5.0
RCA-80—Rectifier		—	—		56.0	5.0

*Cannot be measured with ordinary voltmeter.

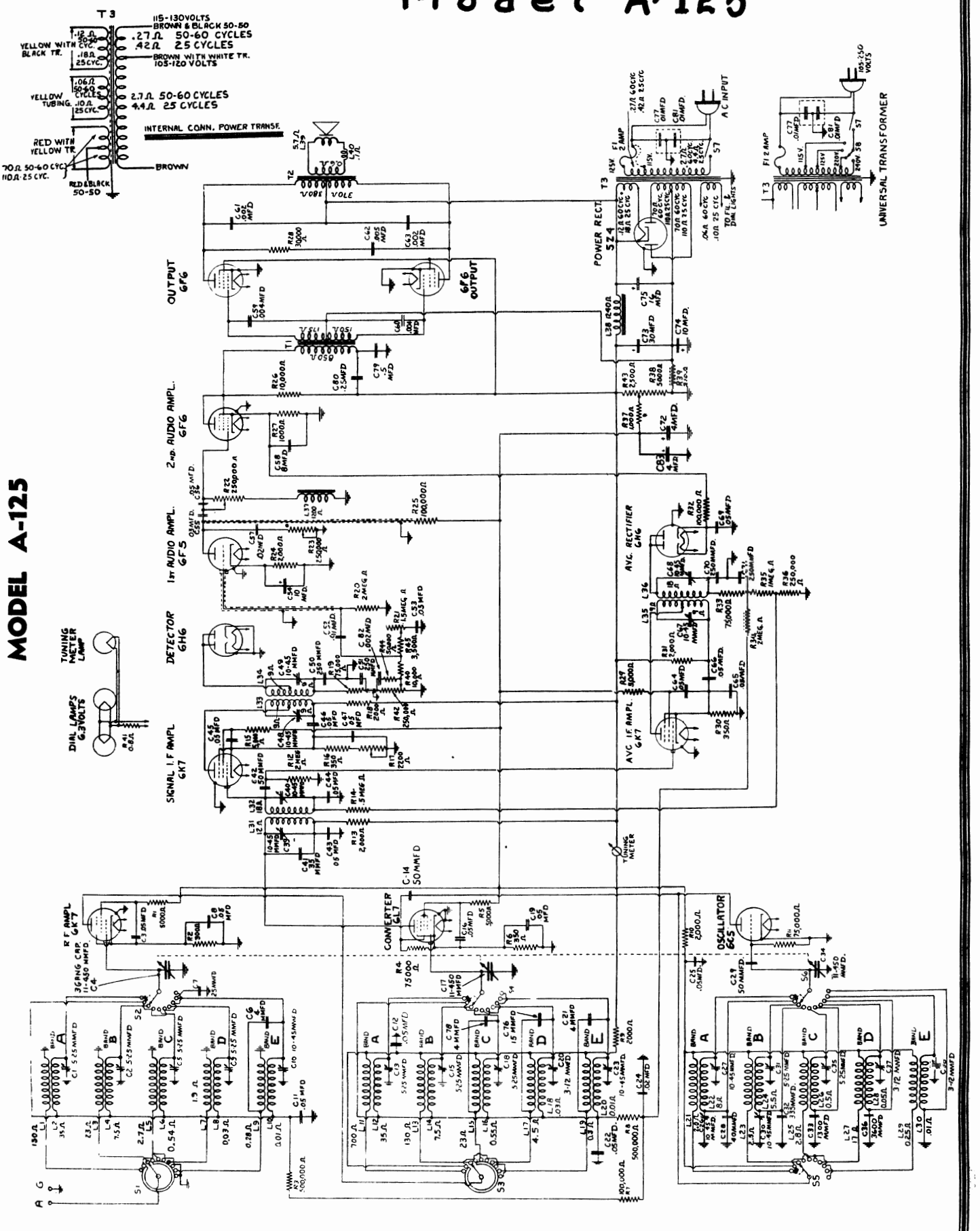




Location of Trimmer Capacitors

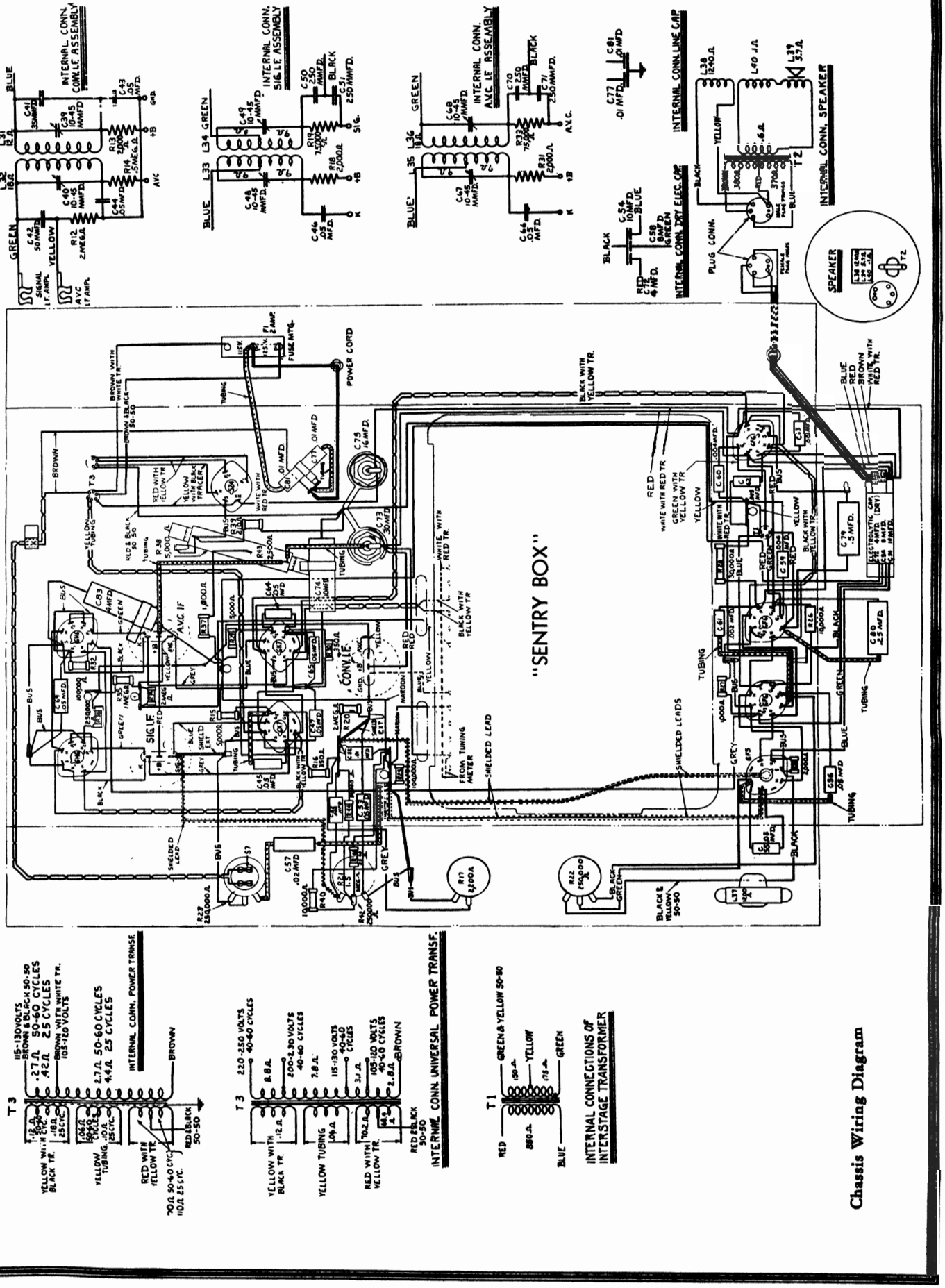
GENERAL ELECTRIC CO.

Model A-125



GENERAL ELECTRIC CO.

Model A-125

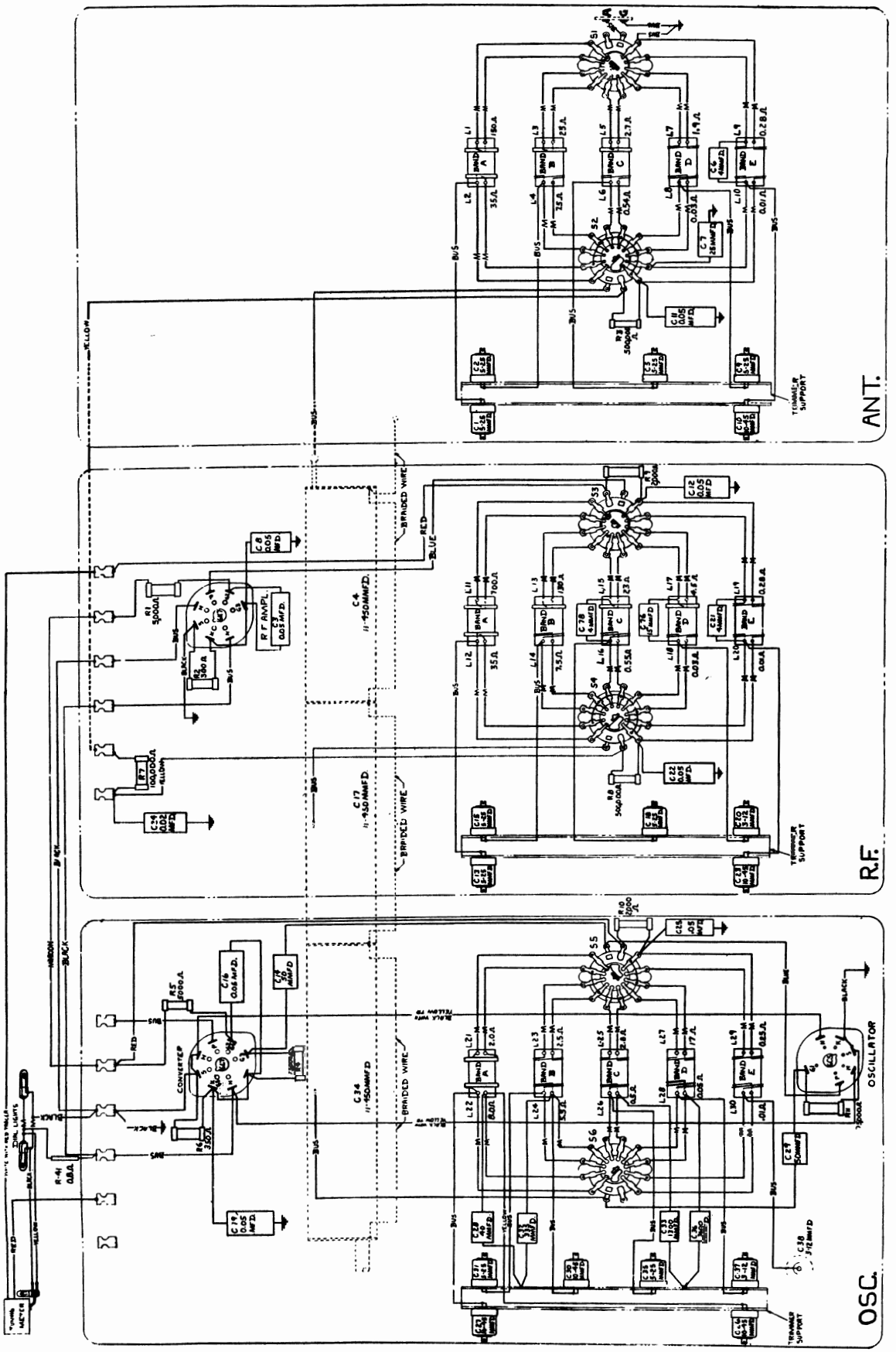


Chassis Wiring Diagram

GENERAL ELECTRIC CO.

Model A-125

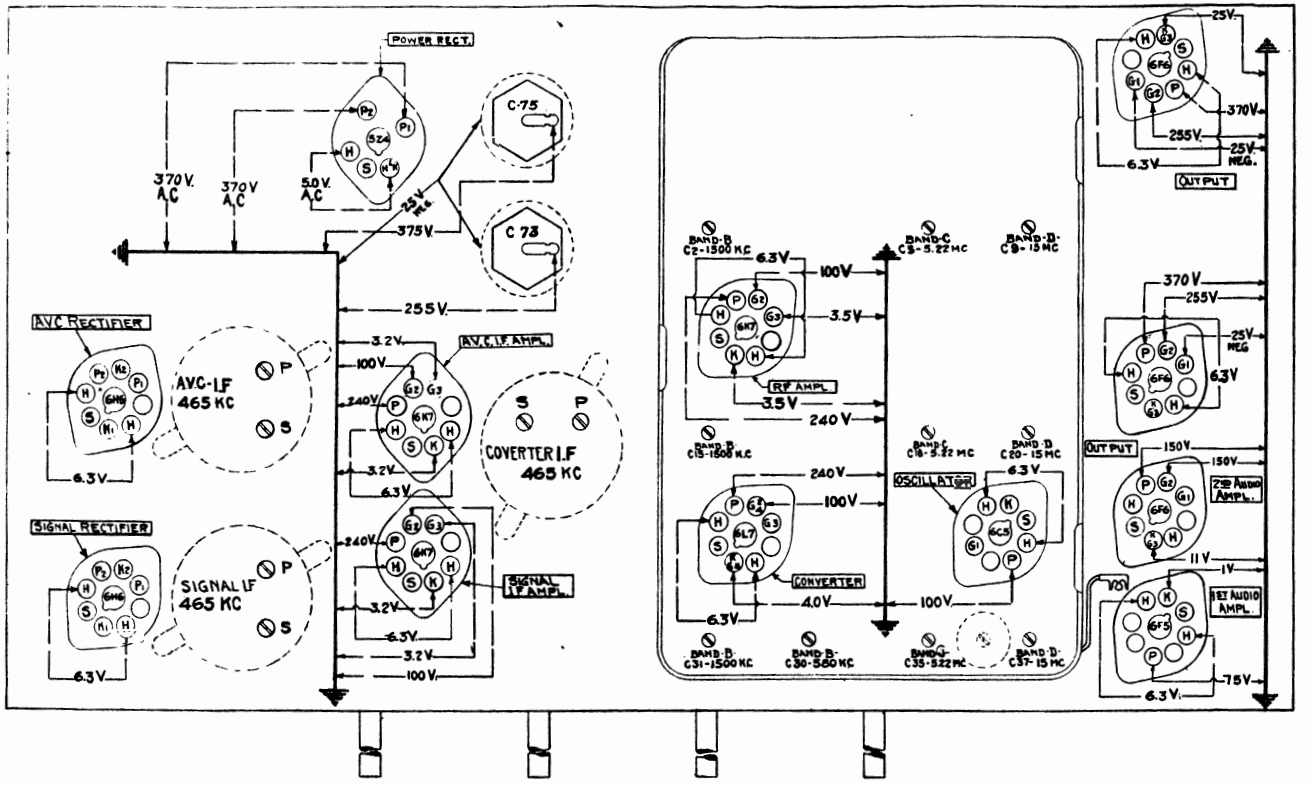
"Sentry Box" Wiring



"Sentry Box" Wiring Diagram

MODEL A-125

Fuse in 125 Volt Clip—125 Volts A-C Line
Controls at Maximum Volume and Sensitivity.
No Signal Tuned in.



FRONT

VIEWED FROM UNDER SIDE OF CHASSIS

TOP VIEW OF SENTRY BOX

Trimmer Locations and Socket Voltages

Tubes

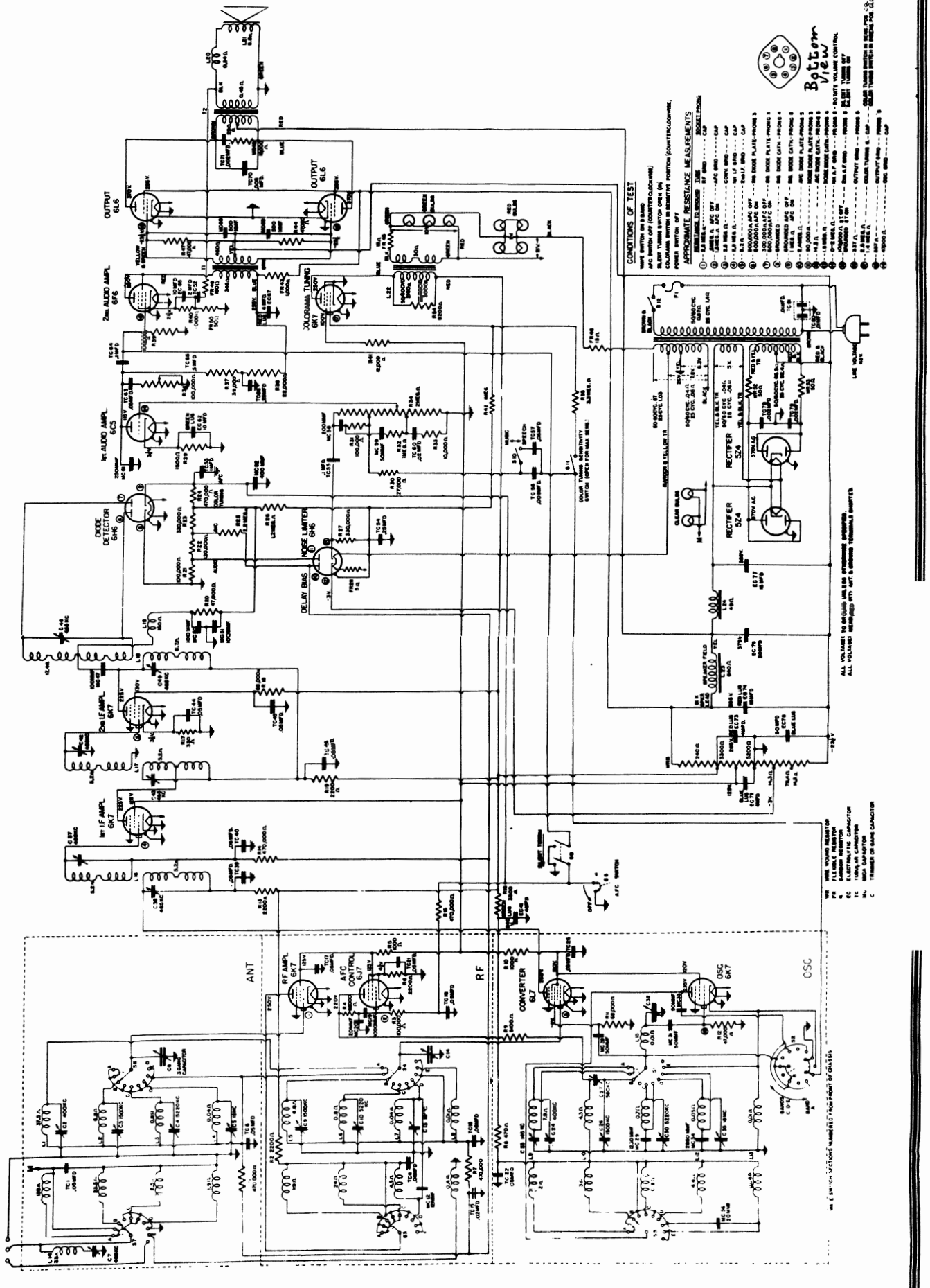
R.F. Amplifier.....6K7 Triple-grid Super-control Amplifier
Converter.....6L7 Converter Amplifier Hexode
Oscillator.....6C5 Detector Amplifier Triode
I.F. Signal Amplifier.....6K7 Triple-grid Super-control Amplifier
I.F. AVC Amplifier.....6K7 Triple-grid Super-control Amplifier
Detector.....6H6 Twin Diode
AVC Rectifier.....6H6 Twin Diode
First Audio Amplifier.....6F5 High-mu Triode
Second Audio Amplifier.....6F6 Power Amplifier Pentode (Triode Connection)

Tuning Frequency Range

Band A	140–410 kc
Band B	540–1740 kc
Band C	1.74–5.6 mc (1740–5600 kc)
Band D	5.6–18.0 mc (5600–18,000 kc)
Band E	18.0–40.0 mc (18,000–40,000 kc)

GENERAL ELECTRIC CO.

Model E-155



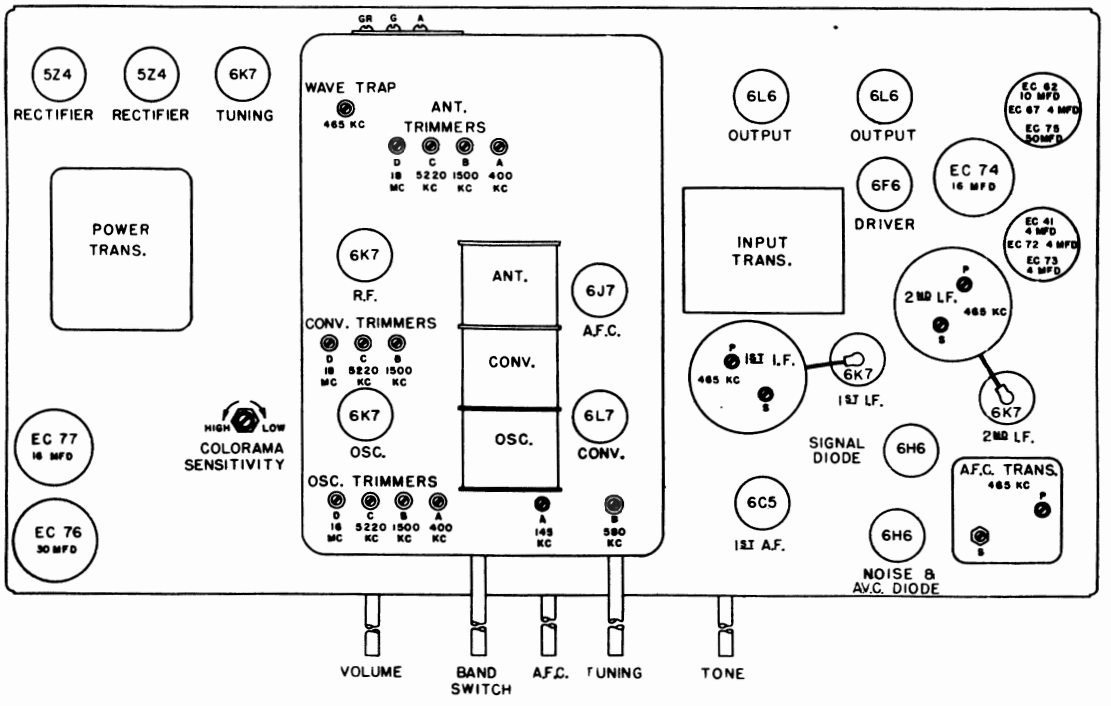
GENERAL ELECTRIC CO.

Model E-155

ALIGNMENT PROCEDURE MODEL E 155

IF Alignment with Oscilloscope

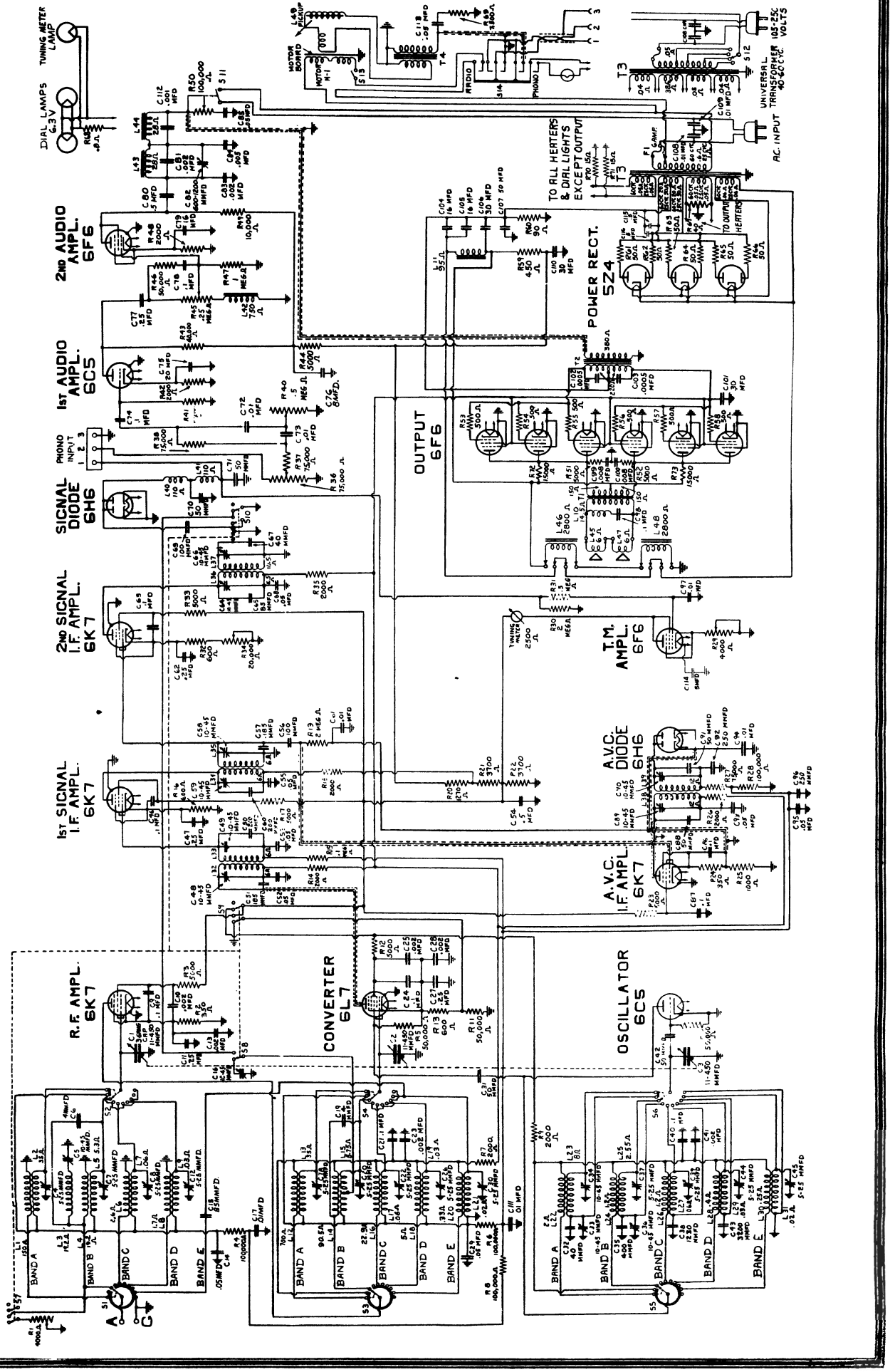
OPERATION	BAND SWITCH SETTING	INPUT FREQUENCY	POINT OF INPUT	DUMMY ANT.	TRIMMER	REMARKS
1	B Band	465 KC Sweep	1st IF Grid	.05 MFD or Larger	AFC Pri. 2nd IF Sec. 2nd IF Pri.	Gang plates closed-AFC switch off-Silent tuning switch open-connect audio input of oscilloscope to the junction of R-23, R-24
2	"	"	Converter Grid	"	1st IF Sec. 1st IF Pri.	Adjust for a single symmetrical curve of maximum amplitude.
3	"	"	"	"	AFC Sec.	AFC Switch on-connect audio input of oscilloscope to detector 6H6 cathode prong #8-adjust trimmer for a symmetrical curve-curve depends on type of sweep used.
4						Repeat NO. 1
5						Repeat NO. 2
6	B Band	465 KC Sweep	Antenna Post	250 MMF 400 Ohms	Wave Trap	Adjust for minimum amplitude
	IF Alignment with Output Meter					
1	B Band	465 KC	1st IF Grid	.05 MFD or Larger	AFC Pri. 2nd IF Sec. 2nd IF Pri. AFC Sec.	Gang plates closed-AFC switch off-Silent tuning switch open-connect output meter across voice coil-adjust AFC Sec(Hex) trimmer carefully for minimum output. Keep input signal low and volume control on as far as possible.
2	"	"	Converter Grid	"	1st IF Sec. 1st IF Pri.	
3	"	"	Antenna Post	250 MMF 400 Ohms	Wave Trap	Adjust trimmer for minimum output
	RF Alignment					
1	B Band					Close gang plates-adjust pointer to first line at left end of tuning scale
2	"	1500 KC	Antenna Post	250 MMF 400 Ohms	Oscillator Converter Antenna	Connect output meter across voice coil-tone control counter clockwise - AFC off
3	"	Noise	"	"	Oscillator Padder	Adjust for maximum noise output in vicinity of 580 KC-tone control clockwise-for this adjustment only
4						Repeat NO. 2
5	A Band	400 KC	"	"	Oscillator Antenna	
6	"	145 KC	"	"	Oscillator Padder	
7						Repeat NO. 5
8	C Band	5220 KC	"	"	Oscillator Converter Antenna	
9	D Band	18 MC	"	"	Oscillator Converter Antenna	Rock the tuning condenser when adjusting converter trimmer
10	B Band	Approx. 1000 KC Strong Local or osc. signal	"	"	AFC Sec. (Hex)	Place a high resistance voltmeter across 6J7 cathode resistor. Adjust trimmer so that opening and closing AFC switch will produce no change in voltmeter reading when signal has been tuned to maximum with AFC switch off



TOP VIEW OF CHASSIS SHOWING TRIMMER LOCATIONS

GENERAL ELECTRIC CO.

Model A-208



Model 470 (Chassis 4C)

PARTS PRICE LIST

PART NO	DESCRIPTION	REQ.	PRICE
20962	GRID CAP	1	.01
22858	RESISTOR 1 MEG	1	.15
23849	RESISTOR 500 M.	2	.15
23853	RESISTOR 50 M	1	.15
23998	RESISTOR 250M	1	.15
26564	TUBE SHIELD BASE	2	.10
28045	PILOT LIGHT BULB	1	.15
28728	TUB. CONDENSER 1 MFD	2	.30
28728	TUB. CONDENSER .25MFD	1	.35
29087	TUBE SHIELD	2	.10
29135	TUB CONDENSER 10 MFD	3	.25
29567	TUB CONDENSER .02MFD	1	.25
30143	TUB. CONDENSER .05 MFD	1	.25
30182	COIL SHIELD ONLY	1	.25
31075	4 PRONG SOCKET	1	.10
31079	6 PRONG SOCKET	1	.15
31080	7 PRONG SOCKET	2	.15
31172	DIAL WINDOW	1	.20
31208	ELEC CONDENSER 8 MFD	1	2.00
31209	DIAL POINTER	1	.15
31210	PILOT LIGHT ASSEM	1	.10
31211	REFLECTOR DIAL MTG.	1	.25
31219	TERMINAL BOARD	1	.05
31224	CANDOHM 400-1400Ω	1	.30
31237	DIAL CHART	1	.30
31339	CONDENSER 2000 MMF.	1	.25
31817	MTG BRK & SOCKET	1	.35
31819	VARIABLE CONDENSER	1	3.50
31831	SOCKET INSUL (80 SOCKET)	1	.03
31864	TUB CONDENSER .005MFD	1	.25
32460	KNOB	3	.20
33087	2ND I.F. TRIMMER ASSEM	1	.50
33144	RESISTOR 20 M	1	.25
33325	TRANSFORMER 50-60~	1	4.50
33326	TRANSFORMER 25-50~	1	7.00
33332	1ST. I.F COIL & SHIELD	1	1.95
33334	OSCILLATOR COIL ASSEM	1	.60
33336	ANTENNA COIL ASSEM	1	.70
33382	SPEAKER CABLE ASSEM.	1	.35
33402	2ND I.F COIL & TRIMM ASSEM	1	1.20
33407	VOLUME CONTROL	1	.90
33409	LINE SWITCH	1	.35
33471	LINE CORD	1	.40
33700	VERTICAL TERM ASSEM	1	.10
31116	RESISTOR-1 OHM	1	.20
32599	CABINET-NOT AVAILABLE		
34435	CONDENSER .02MFD AUDIO	1	.25
62556	SCREW-CHASSIS MTG	4	.01
63839	FELT WASHER	3	.01
63847	WASHER-CHASSIS MTG	4	.01

SPEAKER PARTS

28644	YOKE & POLE PIECE ASSEM	1	1.10
29038	CONE MTG GASKET	1	.10
33202	TERMINAL STRIP ASSEM	1	.20
33203	TERMINAL STRIP COVER	1	.15
29741	OUTPUT TRANSFORMER	1	1.75
29769	CLAMP RING	1	.05
29786	FIELD COIL	1	2.60
3 6S	SPEAKER COMPLETE	*	10.00
31355	CONE & VOICE COIL ASSEM	1	1.00

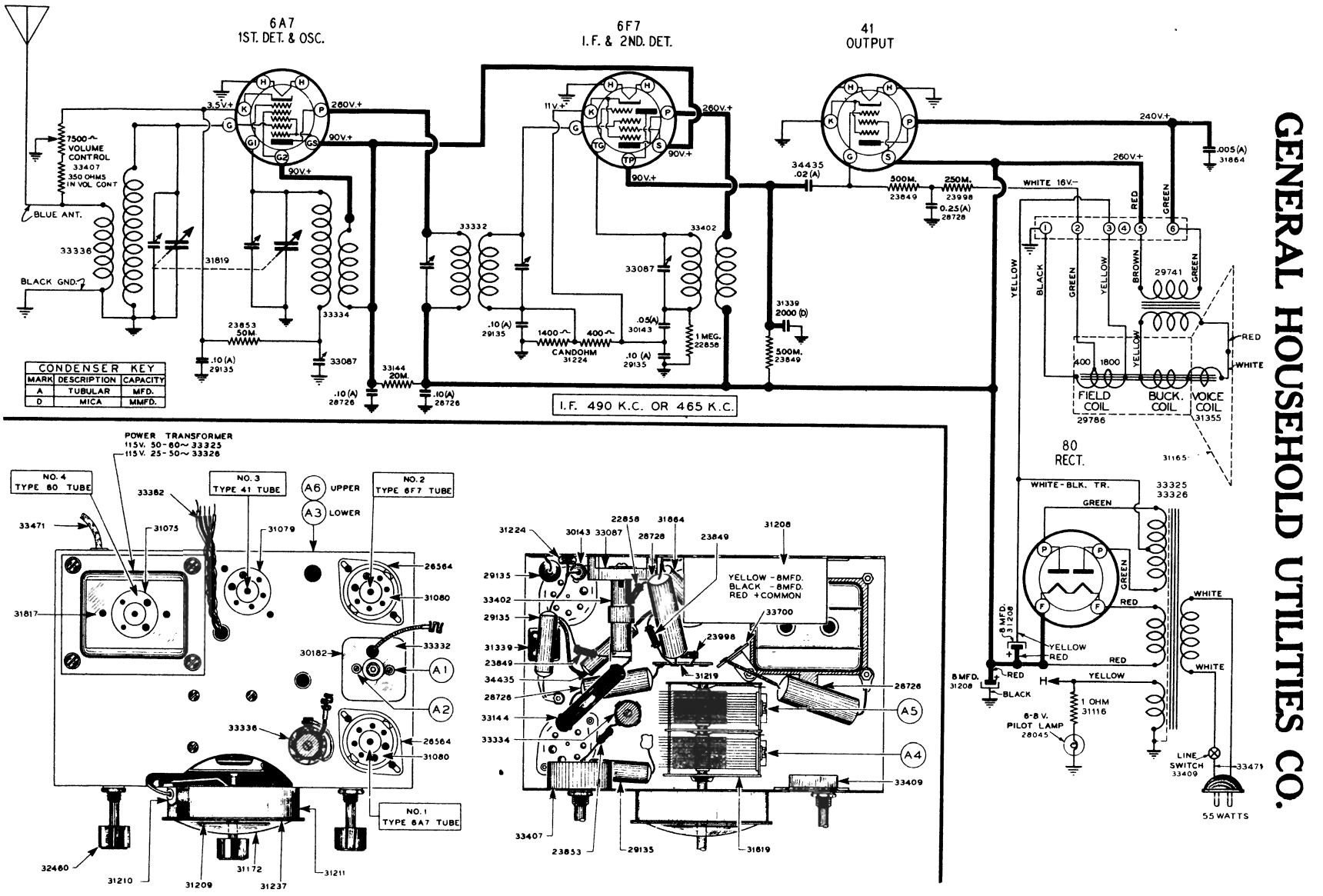
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Grunow Radio

CHASSIS TYPE 4-C

RECEIVER MODEL	SPEAKER
470	8B3

GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO, U.S.A. R.A.S. 68



CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

GENERAL HOUSEHOLD UTILITIES CO.

Models 501-520-530-550 (chassis 5B)

GENERAL HOUSEHOLD UTILITIES CO.

PARTS PRICE LIST

PART NO	DESCRIPTION	REQ	PRICE
20962	GRID CAP	3	.02
22856	RESISTOR 25M OHMS	1	.20
23358	INSULATED TERMINAL	1	.05
23849	RESISTOR 500M OHMS	4	.20
23852	RESISTOR 10M OHMS	1	.20
23853	RESISTOR 50M OHMS	1	.20
23998	RESISTOR 250M OHMS	6	.20
24416	INSULATED TERMINAL	1	.03
24487	MICA CONDENSER 250MF	1	.20
26198	OSC COIL SHIELD	1	.10
26209	INSULATOR, VAR COND	1	.03
26245	OSC MOUNTING STRIP	1	.05
26247	1ST I F SHIELD	1	.15
26564	TUBE SHIELD BASE	2	.10
27150	VARIABLE CONDENSER	1	2.70
27151	ELECTROLYTIC COND	1	2.80
27153	CANDOHM 100 OHMS	1	.20
27155	CANDOHM 21-21 OHMS	1	.25
27162	ANTENNA COIL	1	1.00
27163	VOLUME CONTROL	1	1.10
27171	PILOT LAMP SOCKET	1	.20
27172	PILOT LAMP SOCKET	1	.15
27176	RESISTOR PANEL	1	.20
27184	OSCILLATOR COIL	1	.50
27185	1ST I F COIL COMPLETE	1	1.30
27186	2ND I F COIL COMPLETE	1	1.75
27188	TRIMMER CONDENSER	1	.35
27331	FILTER CHOKE	1	1.10
27404	ATTACHMENT CORD	1	.70
27466	KNOB-MODEL 501	2	.25
27740	SELECTOR DIAL	1	.25
27741	VOLUME CONTROL DIAL	1	.25
27992	CANDOHM 45 OHMS	1	.20
28045	PILOT LAMP	2	.15
28125	GND. BINDING POST	1	.10
28127	ANTENNA HANK	1	.30
28179	BYPASS CONDENSER	1	2.00
28721	TUB CONDENSER .01 MFD	3	.25
28723	TUB. CONDENSER .05MFD.	1	.25
29083	MICA CONDENSER 50MMF	2	.20
29087	TUBE SHIELD	2	.10
29453	TUB CONDENSER .01 MFD	1	.20
29903	GRILL-MOD 550-520	1	1.00
29904	ESCUTCHEON-MODEL 550	2	.40
29905	KNOB-MODEL 550	2	.20
29909	CABINET SHIELD ASSEM	1	.25
29911	2ND I F SHIELD	1	25
31079	TUBE SOCKET-8 PRONG	4	.15
31080	TUBE SOCKET-7 PRONG	1	.15
32246	KNOB-MODEL 530	2	.25
32247	KNOB-MODEL 520	2	.25
32758	CONDENSER SHAFT	1	.10
32759	CONDENSER BALL RACE	1	.20
32760	BALL BEARING	3	.02
33263	SELECTOR DIAL	1	.25
33264	VOLUME CONTROL DIAL	1	.25
33484	ESCUTCHEON 520-530	2	.40
33487	GRILL-MODEL 530	1	1.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

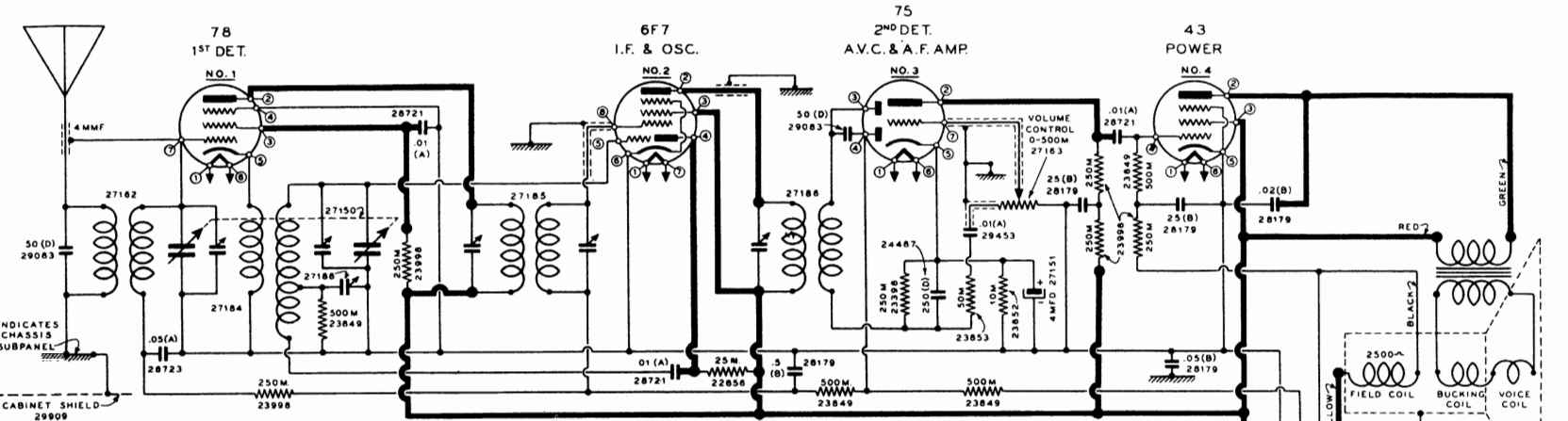
62521	SCREW-CABINET SHIELD	2	.01
62522	SCREW-CABINET BACK	6	.01
62570	SCREW-CHASSIS MOUNT'G	4	.01
63847	WASHER-CHASSIS MT'G.	4	.01

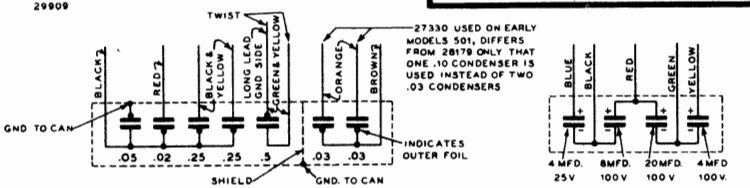
SPEAKER PARTS 501&550 ONLY

26321	CONE HEAD ASSEMBLY	1	2.70
27152	SPEAKER COMPLETE	1	5.50
28435	FIELD COIL	1	1.10
28436	BUCKING COIL	1	30
28437	OUTPUT TRANSFORMER	1	1.40

SPEAKER PARTS 520&530 ONLY

34420	OUTPUT TRANSFORMER	1	1.40
34498	SPEAKER-COMPLETE	1	5.50



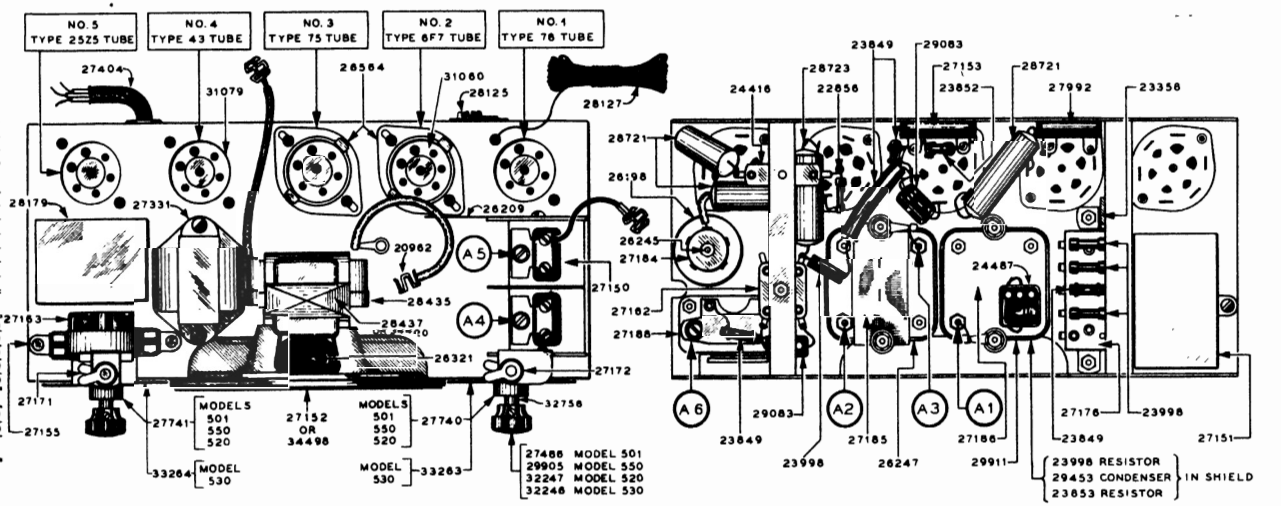


28179 BY-PASS CONDENSER
(REPLACES 27330)

ELECTROLYTIC CONDENSER
27151

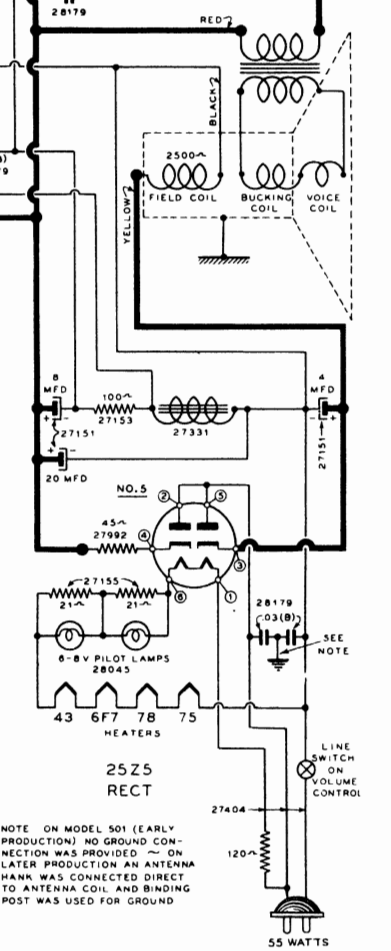
RANGE-540-1720 K.C.

CONDENSER KEY		
MARK	DESCRIPTION	CAPACITY
A	TUBULAR	MFD
B	BY-PASS	MFD
D	MICA	MMFD



CHASSIS TOP VIEW

CHASSIS BOTTOM VIEW



NOTE ON MODEL 501 (EARLY PRODUCTION) NO GROUND CONNECTION WAS PROVIDED ~ ON LATER PRODUCTION AN ANTENNA HANK WAS CONNECTED DIRECT TO ANTENNA COIL AND BINDING POST WAS USED FOR GROUND

POWER SUPPLY 105-125 V. A.C. OR D.C

I.F. 455 K.C.

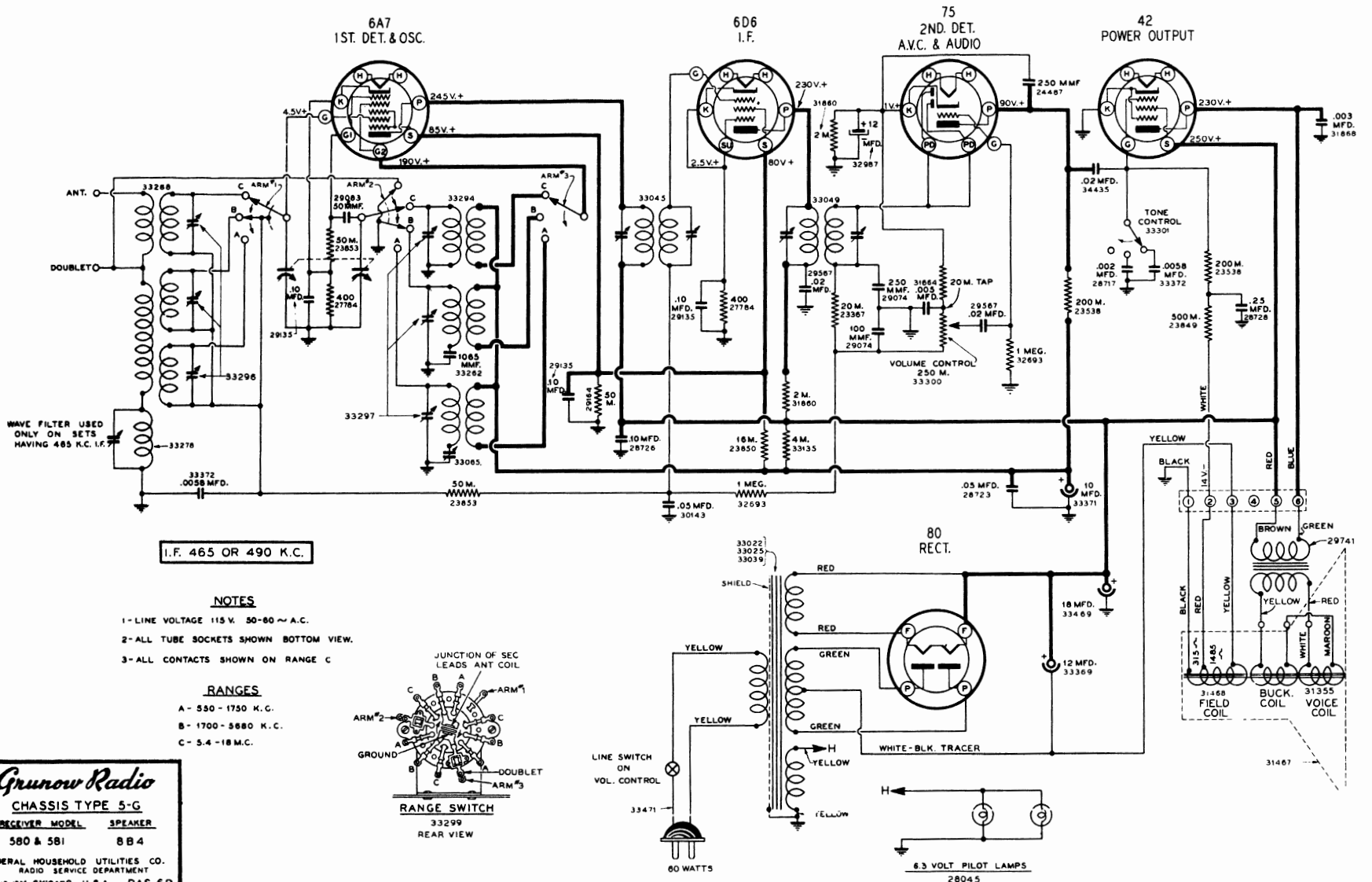
Grunow Radio

CHASSIS TYPE 5-B

RECEIVER MODEL	SPEAKER
501-550-520 & 530	5"

GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT

Models 580-581 (Chassis 5G)



NOTES

1 - LINE VOLTAGE 115 V. 50-60 ~ A.C.

2 - ALL TUBE SOCKETS SHOWN BOTTOM VIEW.

3 - ALL CONTACTS SHOWN ON RANGE C

RANGES

A - 550 - 1750 K.C.

B - 1700 - 5680 K.C.

C - 5.4 - 18 M.C.

Grunow Radio

CHASSIS TYPE 5-G

RECEIVER MODEL	SPEAKER
580 & 581	884

GENERAL HOUSEHOLD UTILITIES CO. RADIO SERVICE DEPARTMENT
RS AUG. 1935 CHICAGO. U.S.A. RAS 69

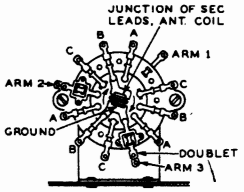
CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range switch is a simple four pole triple throw switch with its contacts in a convenient position over the coil forms allowing operation with very short wire leads.

Models 620-621 (Chassis 6HB)



NOTES

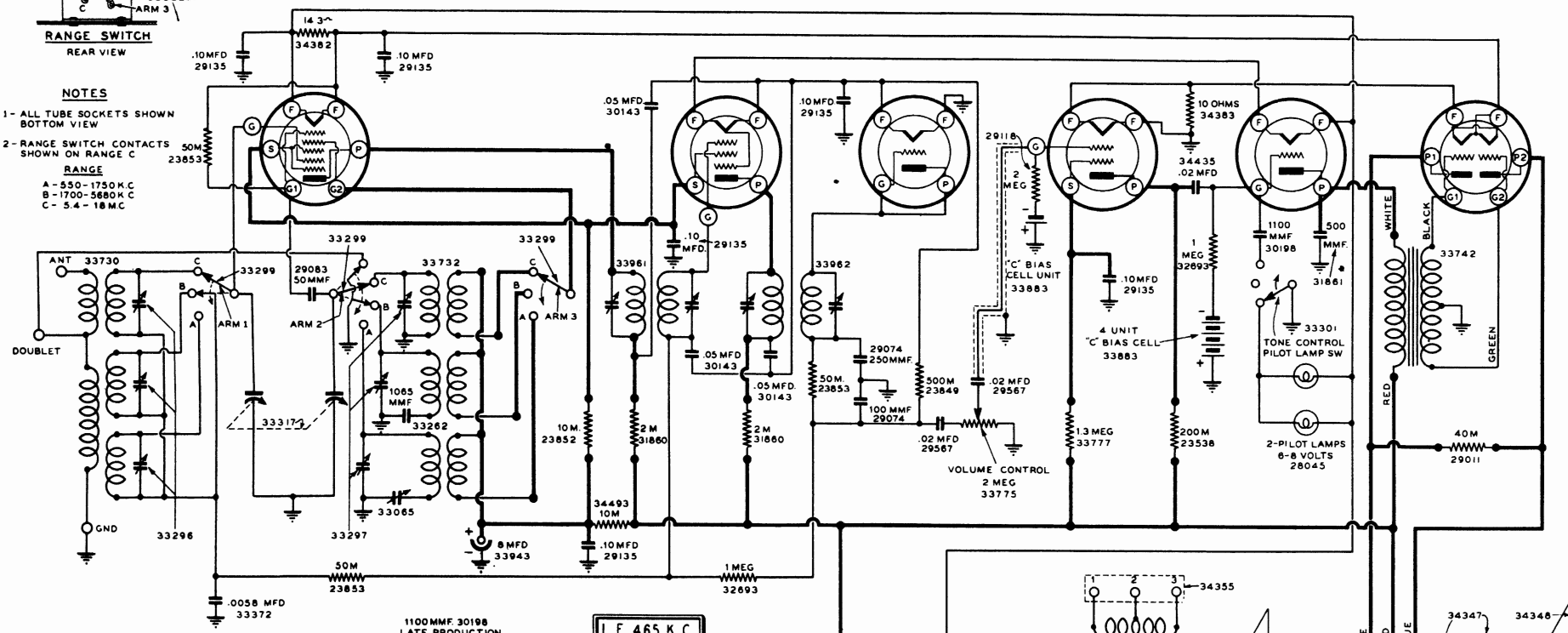
1 - ALL TUBE SOCKETS SHOWN BOTTOM VIEW

2 - RANGE SWITCH CONTACTS SHOWN ON RANGE C

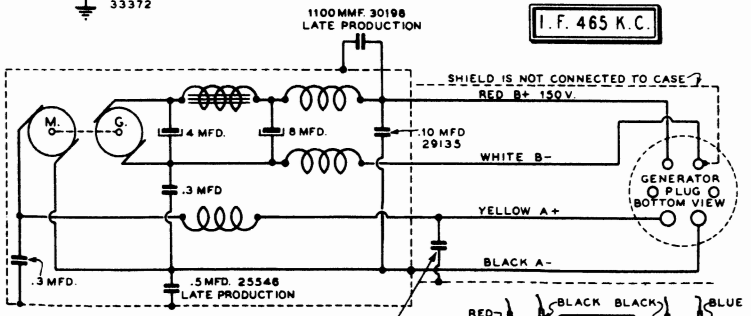
RANGE

A - 550 - 1750 K.C
B - 1700 - 5680 K.C
C - 5.4 - 18 M.C

1C6	34	30	32	30	19
1ST DET.- OSC.	I.F.	2ND DET.-A.V.C.	A.F. AMP.	AUDIO DRIVER	POWER OUTPUT

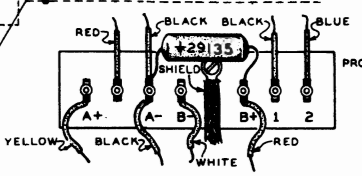


I.F. 465 K.C.

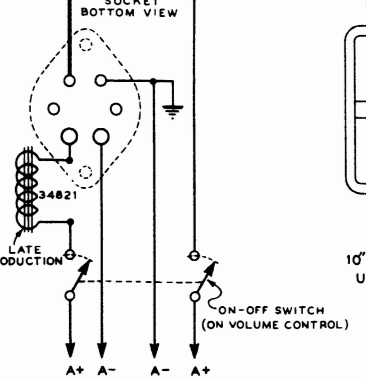


MOTOR-GENERATOR UNIT
34495

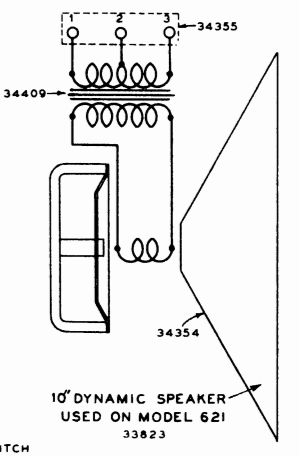
IF GENERATOR IS HARD TO FILTER ON "C" BAND, TRY ADDING CONDENSER FROM A+ TO SHIELD AT THE CASE. USE SHORT LEADS AND CONDENSER FROM .5 MFD. TO 12 MFD. 25V. (32987)



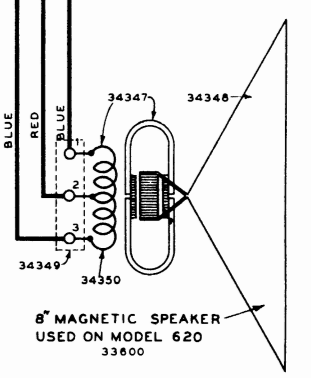
DETAIL OF TERMINAL BOARD



"A" CURRENT = 1.85 AMP.



10" DYNAMIC SPEAKER USED ON MODEL 621
33823



8" MAGNETIC SPEAKER USED ON MODEL 620
33600

REVISED & CHECKED 3-30-36 D.T.

6 VOLT BATTERY RECEIVER

Grunow Radio

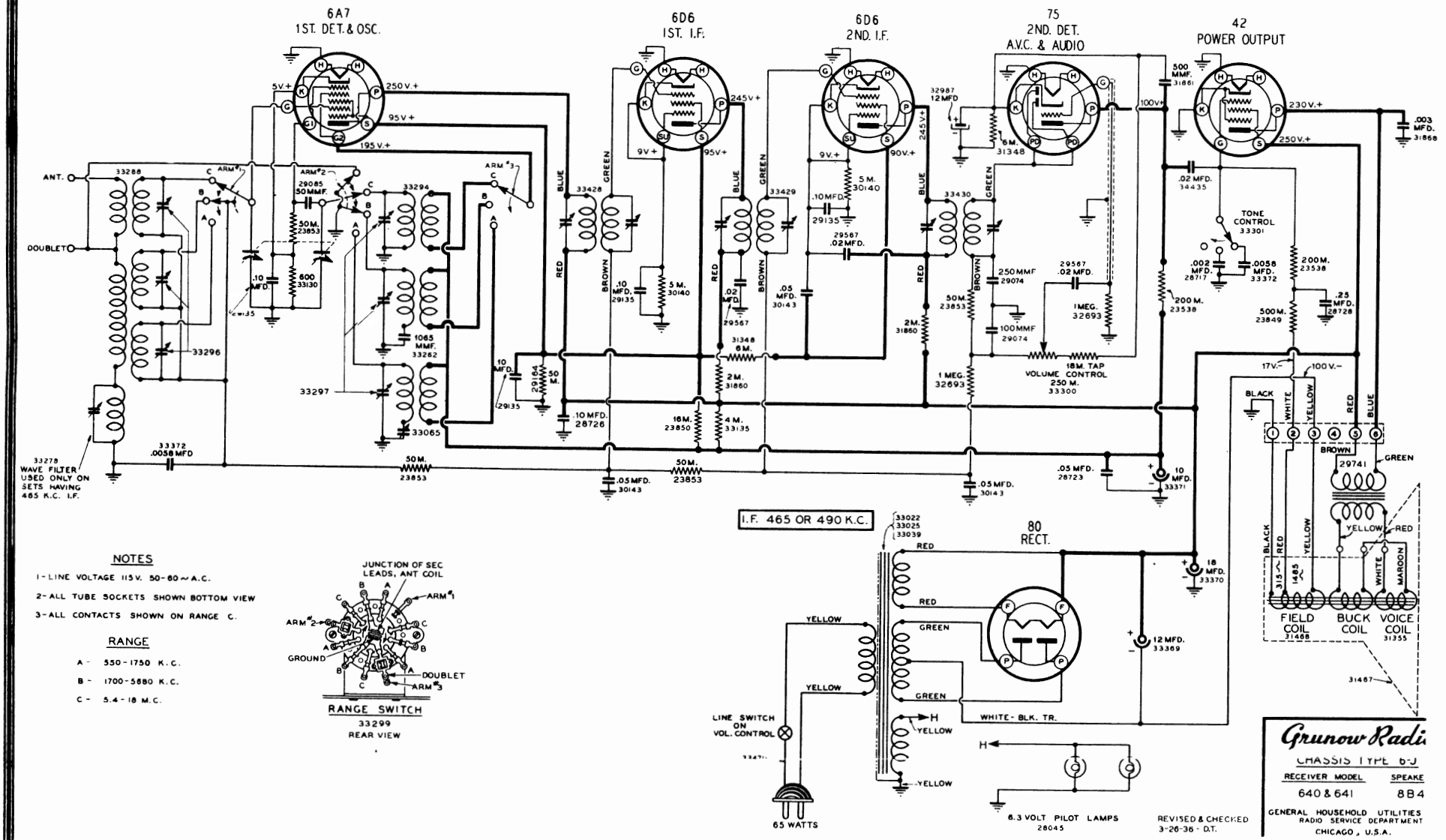
CHASSIS TYPE 6 H B

RECEIVER MODEL	SPEAKER
620	8" MAGNETIC
621	10" DYNAMIC

GENERAL HOUSEHOLD UTILITIES CO
RADIO SERVICE DEPARTMENT
CHICAGO, U.S.A.

GENERAL HOUSEHOLD UTILITIES CO.

Models 640-641 (chassis 6J)



NOTES

1- LINE VOLTAGE 115 V. 50-60 ~ A.C.

2- ALL TUBE SOCKETS SHOWN BOTTOM VIEW

3- ALL CONTACTS SHOWN ON RANGE C.

RANGE

A - 550 - 1750 K.C.

B - 1700 - 5680 K.C.

C - 5.4 - 18 M.C.

REVISED & CHECKED 3-26-36 - D.T.

Grunow Radio

CHASSIS TYPE 6-J

RECEIVER MODEL	SPEAKE
640 & 641	8B4

GENERAL HOUSEHOLD UTILITIES RADIO SERVICE DEPARTMENT CHICAGO, U.S.A.

GENERAL HOUSEHOLD UTILITIES CO.

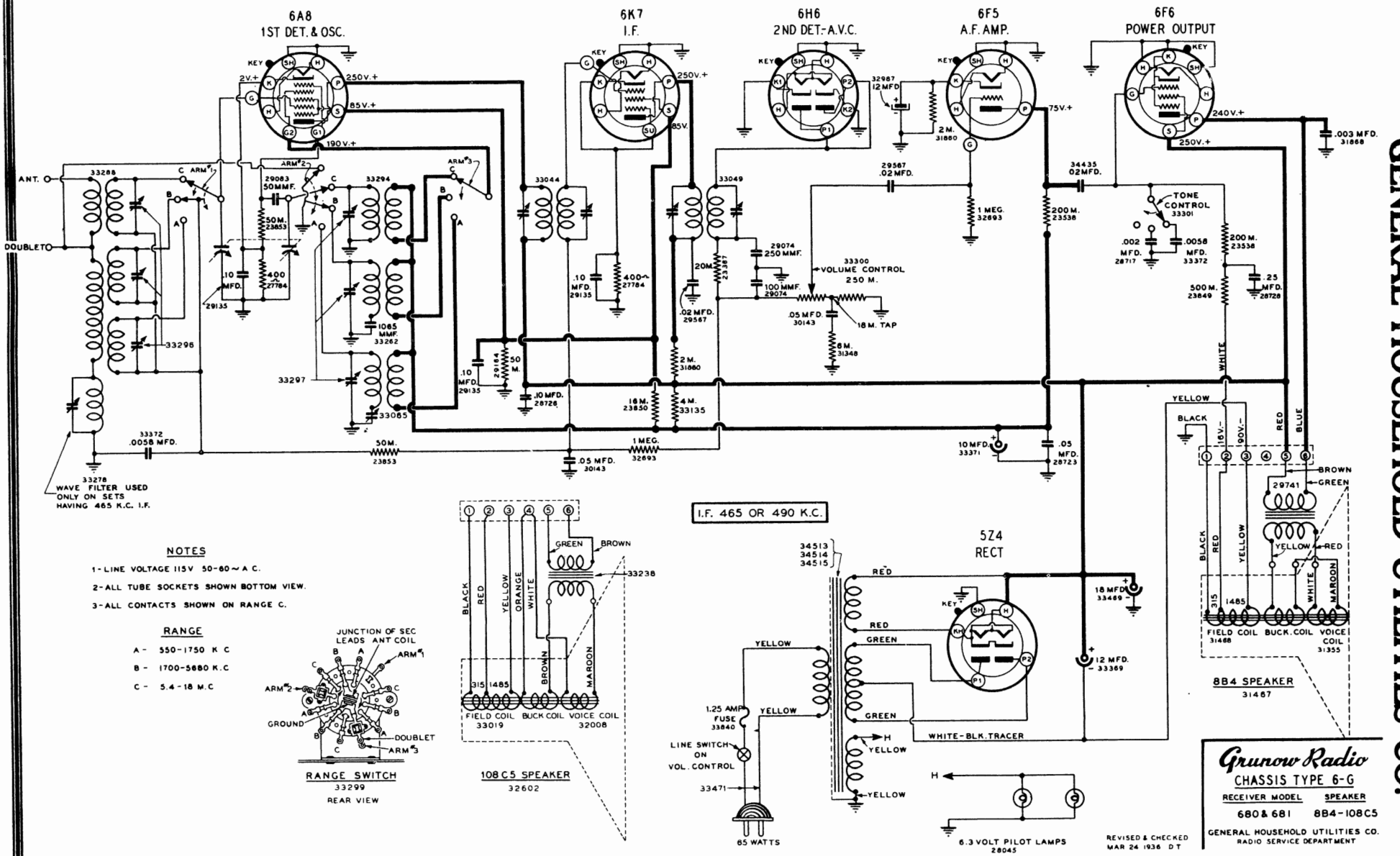
CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range switch is a simple four pole triple throw switch with its contacts in a convenient position over the coil forms allowing operation with very short wire leads.

Models 680-681 (Chassis 6G)



NOTES

1-LINE VOLTAGE 115V 50-60~A.C.

2-ALL TUBE SOCKETS SHOWN BOTTOM VIEW.

3-ALL CONTACTS SHOWN ON RANGE C.

RANGE

A- 550-1750 K.C.

B- 1700-5680 K.C.

C- 5.4-18 M.C.

REVISED & CHECKED MAR 24 1936 D.T.

Grunow Radio

CHASSIS TYPE 6-G

RECEIVER MODEL	SPEAKER
680 & 681	8B4-108C5

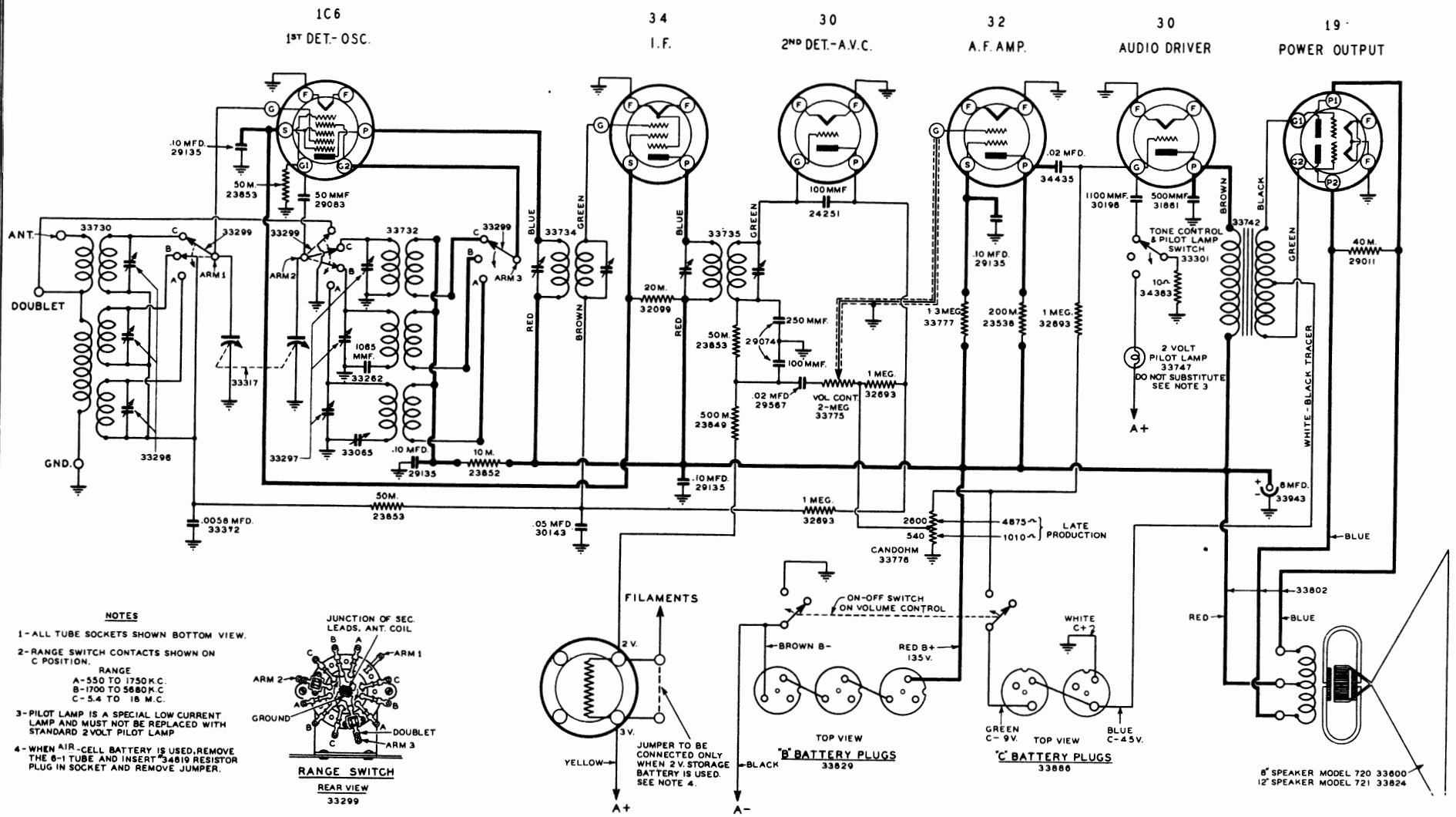
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT

GENERAL HOUSEHOLD UTILITIES CO.

The GRUNOW 6G Chassis is a six tube, 115 V -50-60 cycle A.C., three band receiver with A.V.C., Tone Control and a "Band Spread" dial. The tubes used are: 6A8 1st Detector and Oscillator, 6K7 I.F. Amplifier, 6H6 2nd Detector and A.V.C., 6F5 1st Audio Amplifier, 6F6 Power Output tube and a 5Z4 Rectifier tube.

The frequency range is divided into three bands or divisions, one covering the band of 550 to 1750 K.C. (A), one the band from 1700 to 5680 K.C. (B), and the other from 5.4 to 18 megacycles (C).

Models 720-721 (Chassis 7DB)



NOTES

1- ALL TUBE SOCKETS SHOWN BOTTOM VIEW.

2- RANGE SWITCH CONTACTS SHOWN ON C POSITION.
RANGE
A- 550 TO 1750 K.C.
B- 1700 TO 5680 K.C.
C- 5.4 TO 18 M.C.

3- PILOT LAMP IS A SPECIAL LOW CURRENT LAMP AND MUST NOT BE REPLACED WITH STANDARD 2 VOLT PILOT LAMP

4- WHEN AIR-CELL BATTERY IS USED, REMOVE THE 6-1 TUBE AND INSERT 34819 RESISTOR PLUG IN SOCKET AND REMOVE JUMPER.

RANGE SWITCH
REAR VIEW
33299

6-1
VOLTAGE REGULATOR
34450

USE 6-1 TUBE WITH 3 VOLT DRY "A" BATTERY.
USE JUMPER WITH 2 VOLT STORAGE BATTERY.
USE 34819 RESISTOR WITH 2V. AIR-CELL BATTERY.

I.F. 465 K.C.

2 VOLT BATTERY RECEIVER

Grunow Radio

CHASSIS TYPE 7DB

RECEIVER MODEL	SPEAKER
720	8" MAGNETIC
721	12" MAGNETIC

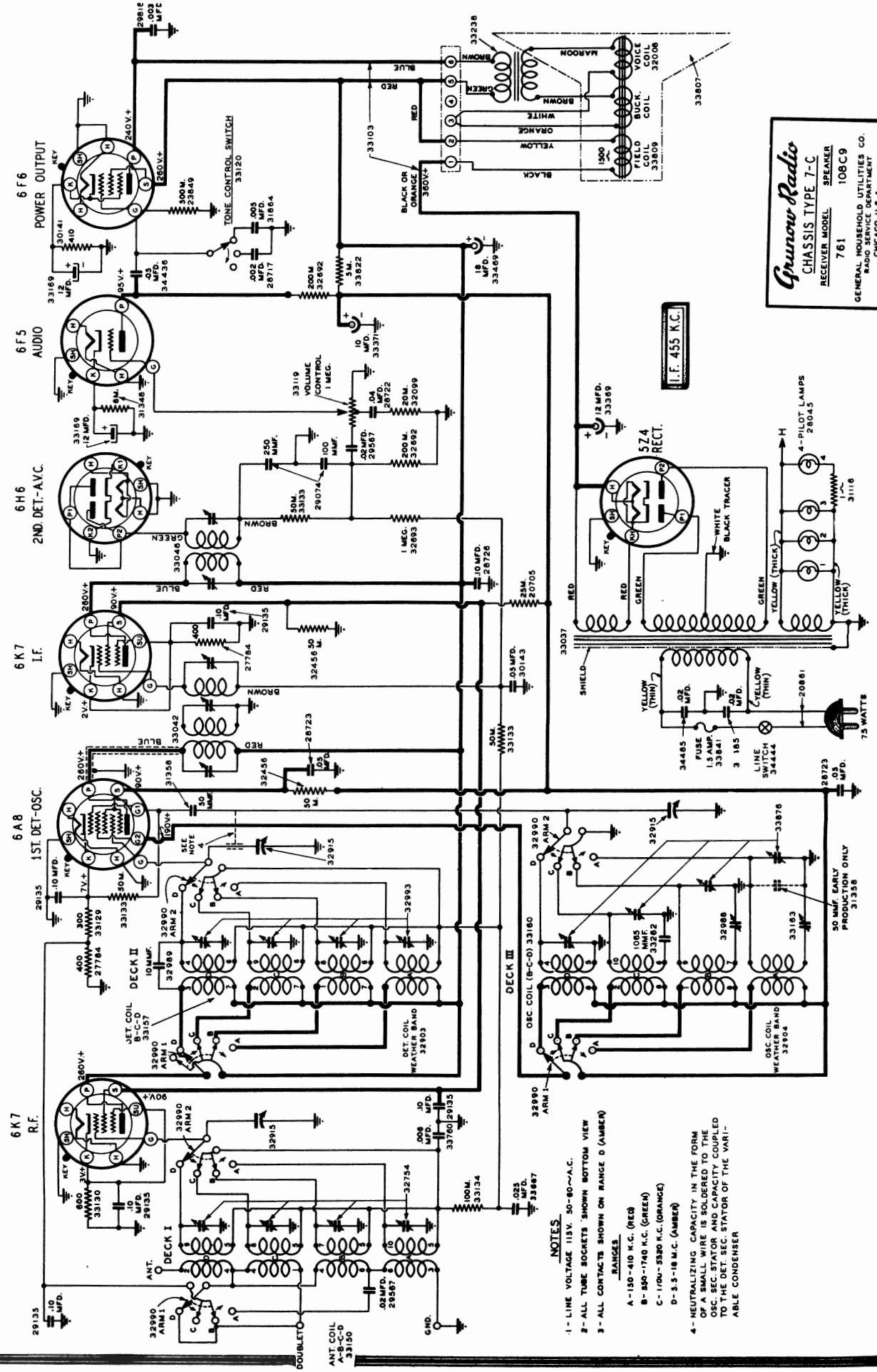
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO, U.S.A.

DT NOV. 1935 RAS110

GENERAL HOUSEHOLD UTILITIES CO.

GENERAL HOUSEHOLD UTILITIES CO.

Models 760-761 (Chassis 7C)



GENERAL HOUSEHOLD UTILITIES CO.

Models 760-761 (Chassis 7C)

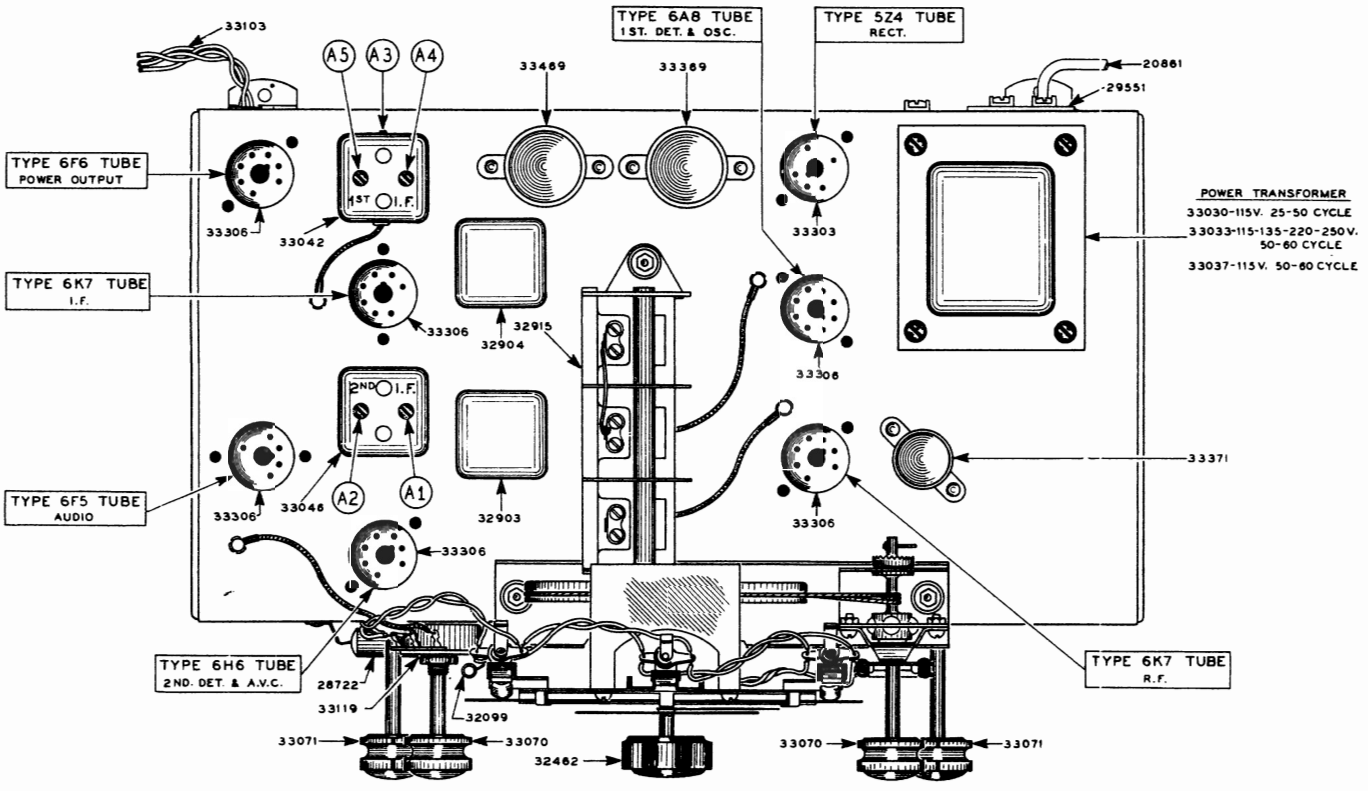


FIG. 1

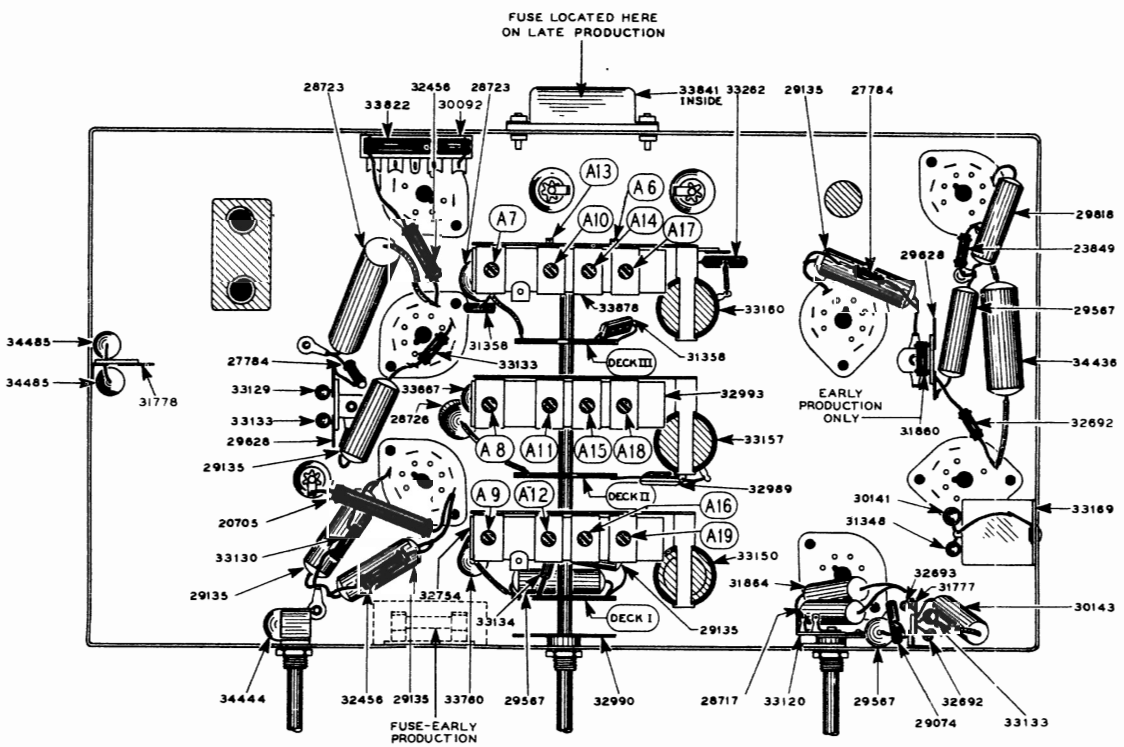


FIG. 2

CHASSIS 7C
NOV. 1935
RAS 111

GENERAL HOUSEHOLD UTILITIES CO.

Models 760-761 (Chassis 7C)

Grunow Radio

Chassis Type 7C

Receiver Models 760—761
Speaker Type 108C9

GENERAL HOUSEHOLD UTILITIES COMPANY

34371 Chicago, U. S. A.

INTRODUCTION

The GRUNOW 7C Chassis is a seven tube, 115 V 50-60 cycle A.C., four band receiver with A.V.C., Tone Control and a "Band Spread" dial. The tubes used are: 6K7 R.F. Amplifier, 6A8 1st Detector and Oscillator, 6K7 I.F. Amplifier, 6H6 2nd Detector and A.V.C., 6F5 Audio Amplifier, 6F6 Power Output tube and a 5Z4 Rectifier tube.

The frequency range is divided into four bands or divisions, one covering the band of approximately 550 to 1750 K.C. (Green), one the band from approximately 1700 to 5500 K.C. (Orange), one the band of approximately 5.4 to 18 megacycles (Amber), and the weather band covering from approximately 150 to 410 K.C. (Red).

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range Switch is a simple three deck multiple pole, positive acting switch, used to connect the various coils into their proper circuits, and is designed in such a way that the coils being used are isolated from coils of the two succeeding bands of a lower frequency. In the case of the detector circuit both the higher and lower frequency bands, above and below the circuit selected, are shorted out. This switching arrangement not only selects the proper coils for each band, but grounds the unused section, allowing the receiver to work at maximum sensitivity and selectivity on all four ranges.

The Range Switch and Coil Assembly is shown schematically in figure (3) and it will be noted that deck I (Antenna) is the one toward the front of the chassis, deck II (Detector) in the center position and deck III (Oscillator) toward the rear of the chassis. The diagram shows the exact position of the coil and switch lugs, and little difficulty should be experienced in making any necessary repairs or inspection.

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align the 7C Chassis without proper equipment. Alignment condensers are shown in the accompanying illustrations, and are numbered in order of procedure — I.F. Condensers on top and side of the I.F. Transformers.

1. EQUIPMENT:

(A) Test Oscillator.

A modulated Oscillator capable of producing signals at the I.F., Broadcast, Short-Wave, and weather Band frequencies is necessary for alignment of the 7C Chassis.

(B) Insulated Screw Driver — (all bakelite or fibre) about 6" long.

(C) Output Meter.

This may be any of the standard Output Meters, but should be sufficiently sensitive to provide a good deflection at low signal strength.

(D) Coupling Means.

Coupling Condensers of 200 mmf., .25 mfd., and a 400 Ohm resistor should be used when coupling oscillator to receiver during alignment as specified in the procedure.

(E) The receiver should be aligned in a location free from local interference (interference caused by motors — flashers — automobile ignition, etc.) as high frequency disturbances will cause difficulties when the short wave section is being adjusted. (A screen room is to be recommended.)

2. DIAL SETTING:

Turn dial knob until condensers are fully meshed. The dial pointer (Hour hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock.

The minute hand should be at 12 o'clock or in a vertical position.

3. I.F. ALIGNMENT:

(A) Connect signal lead of test oscillator to grid of 6A8 (1st detector tube) through .25 mfd. condenser. Connect the ground lead to the chassis.

(B) Before any adjustment of circuit constants is attempted, allow the chassis to "heat up" to normal operating temperature. This heating period should take from 20 to 30 minutes and is necessary to allow all coils and condensers to reach their normal temperatures so that when alignment is completed, there will be no inductance or capacity changes due to thermal expansion or contraction.

It is good to remember this heating condition when logging station — that is, do not attempt to log or tune in a station previously logged on a "cold" chassis, as the station being tuned in would "drift" and the calibration on the previously logged station would be incorrect.

(C) Set Dial pointer to 1400 K.C. and range switch on "Green" (No. 2) position.

(D) Place test Oscillator in operation at 455 K.C. Turn receiver volume control and tone control to maximum.

(E) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.

(F) Adjust the five I.F. Trimmers, A1, A2, A3, A4, A5, located on the I.F. Transformers on top of chassis Fig. (1), until maximum output is obtained. During alignment, maintain as low a value of signal as will allow obtaining of accurate adjustment.

4. 175 K.C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.

(B) Connect the test oscillator ground lead to the ground post of chassis.

(C) Place test oscillator in operation at 175 K.C.

(D) Tune in signal to maximum (this point does not have to be exactly at 175 K.C. dial setting) range switch on "Red" (No. 1) position.

(E) Adjust the 175 K.C. Padding Condenser (A6) Fig. 2 (which is on rear of Chassis) in direction of signal increase. At the same time rock the tuning condenser back and forth through resonance while adjusting padding condenser, until maximum output is obtained.

5. 350 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 350 K.C.

(B) Turn dial pointer to 350 K.C.

(C) Turn range switch to "Red" (No. 1) position.

(D) Adjust "weather Band" oscillator trimmer (A7) Fig. 2, to maximum output.

(E) Adjust Detector Trimmer (A8) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A9) Fig. 2, to maximum output.

6. RECHECK 175 K.C. PADDER CONDENSER — See 4 — above.

7. 1400 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 1400 K.C.

(B) Turn dial pointer to 1400 K.C.

(C) Turn range switch to range "Green" (No. 2) position.

(D) Adjust broadcast oscillator trimmer (A10) Fig. 2, to maximum output.

(E) Adjust 1st Det. Trimmer (A11) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A12) Fig. 2, to maximum output.

8. 600 K.C. ALIGNMENT:

(A) Place test Oscillator in operation at 600 K.C.

(B) Tune in signal to maximum (this point does not have to be exactly at 600 K.C. dial setting.)

(C) Adjust the 600 K.C. Padding Condenser (A13), Fig. 2, which is on rear of Chassis, in direction of signal increases. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

9. RECHECK 1400 K.C. ALIGNMENT: See 7 above.

10. 5000 K.C. ALIGNMENT:

(A) Set range switch to "Orange" (No. 3) position.

(B) Place test Oscillators in operation at 5000 K.C.

(C) Turn dial pointer to 5000 K.C.

(D) Adjust Set Oscillator Trimmer (A14), Fig. 2, to maximum output.

(E) Adjust Detector Trimmer (A15) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A16), Fig. 2, to maximum output.

11. 18 M. C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 400 Ohm resistor to Antenna binding post of Chassis.

(B) Connect the ground lead to ground terminal of Chassis.

(C) Set Range Switch to "Amber" (No. 4) position and turn dial pointer to 18 M.C.

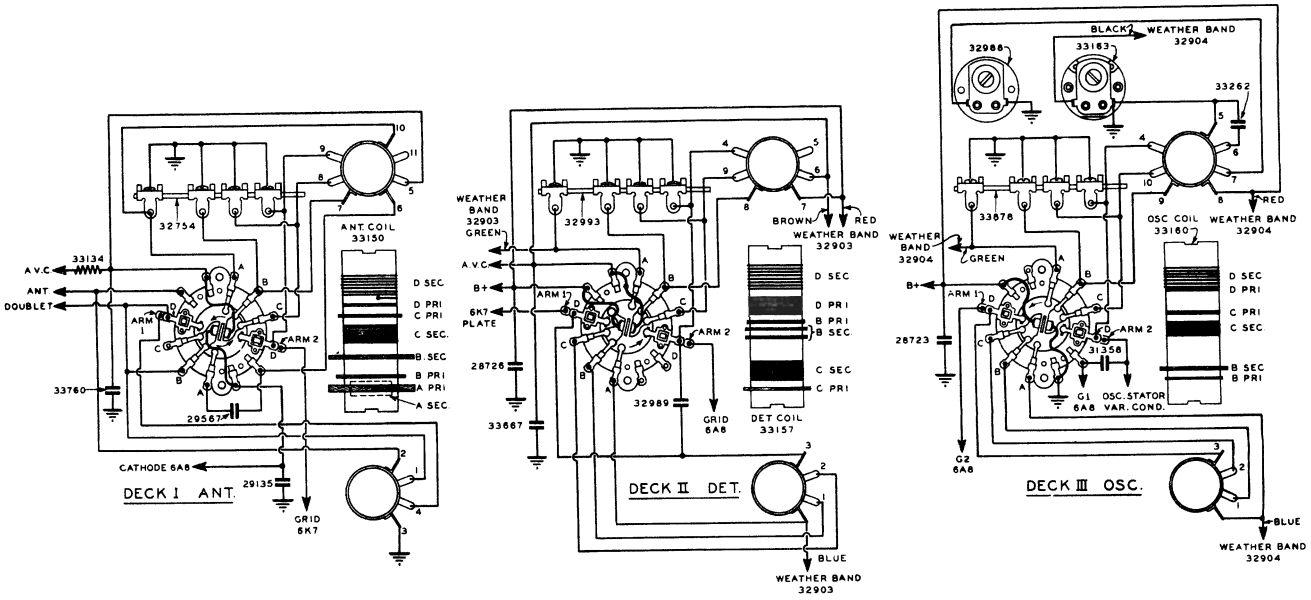
(D) Place Test Oscillator in operation at 18 M.C.

(E) Adjust set oscillator Trimmer (A17) Fig. 2, to maximum output.

(F) Adjust Detector Trimmer (A18) Fig. 2, to maximum output.

(G) Adjust Antenna Trimmer (A19) Fig. 2, to maximum output.

(H) On the 18 M.C. Oscillator Alignment it will be noted that there are two settings at which the signal will be received. Use the lower of the images for alignment point, that is, the setting giving most capacity or the point at which the trimmer screw is farthest in.



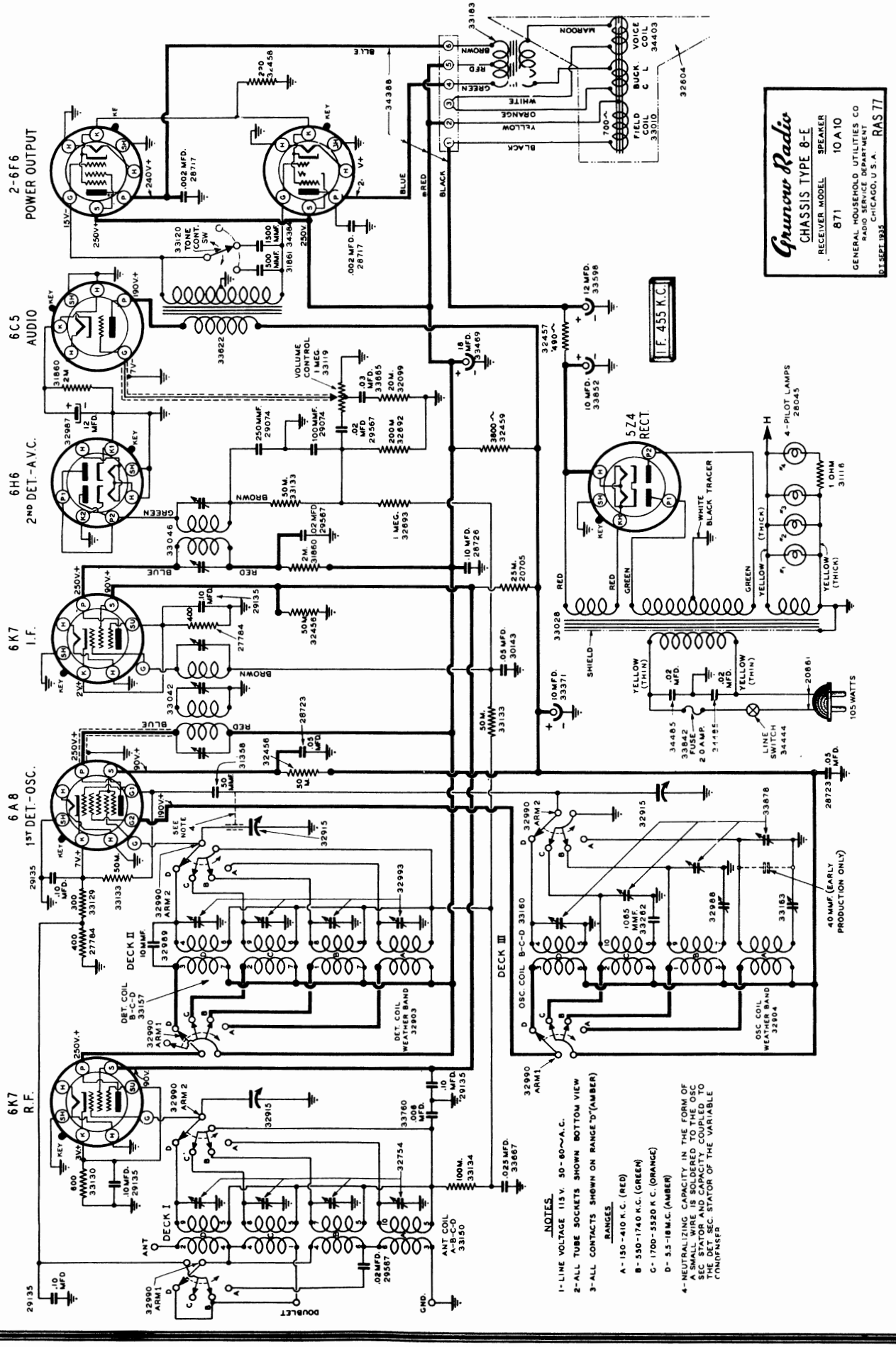
SCHEMATIC DIAGRAM RANGE SWITCH & COIL ASSEMBLY

7C & 8E

FIG. 3

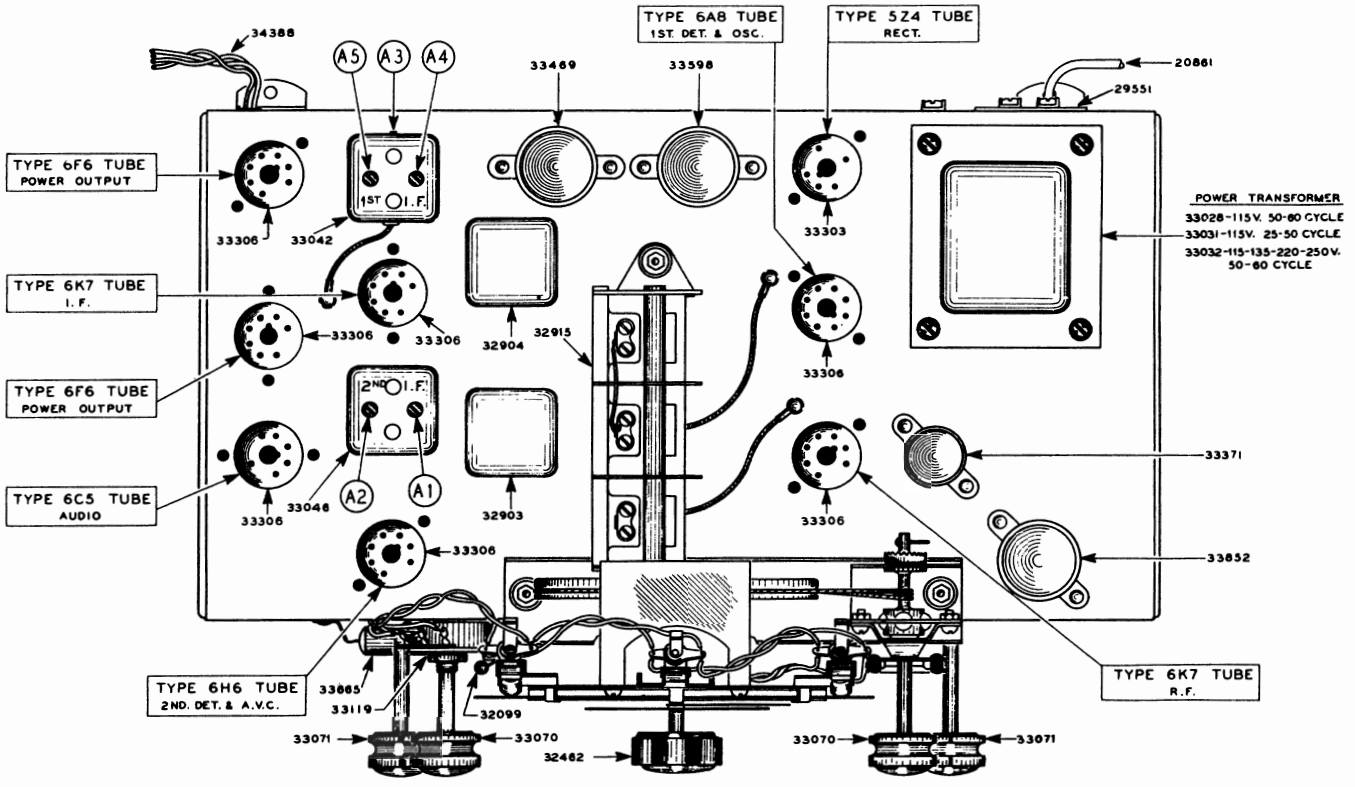
GENERAL HOUSEHOLD UTILITIES CO.

Model 871 (chassis 8E)



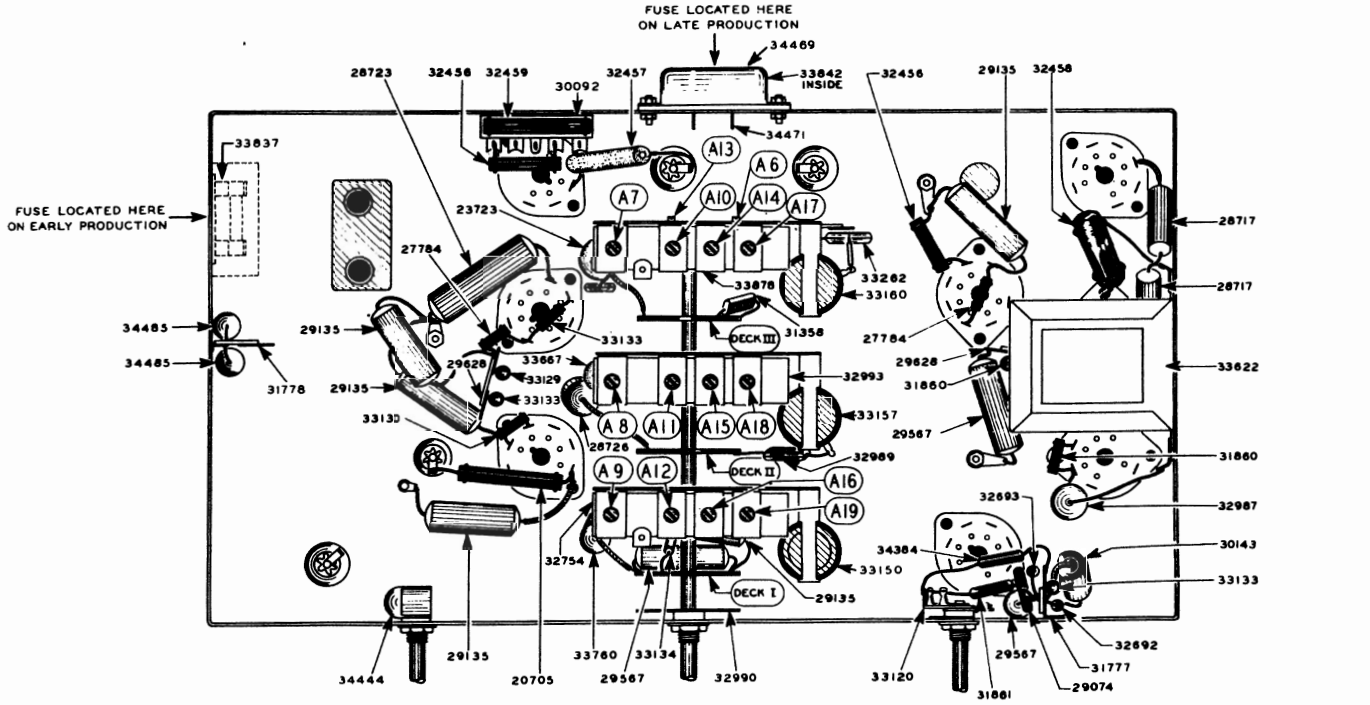
GENERAL HOUSEHOLD UTILITIES CO.

Model 871 - Chassis 8E



TOP VIEW

FIG. 1



BOTTOM VIEW

FIG. 2

CHASSIS 8E
NOV. 1935
RAS 102

GENERAL HOUSEHOLD UTILITIES CO.

Model 871 - Chassis 8E

Grunow Radio

Chassis Type 8E
Receiver Model 871
Speaker Type 10A10.

GENERAL HOUSEHOLD UTILITIES COMPANY
34373 Chicago, U. S. A.

INTRODUCTION

The GRUNOW 8-E Chassis is an eight tube, 115 V-50-60 cycle A.C., four band receiver with A.V.C., Tone Control and a "Band Spread" dial. The tubes used are: 6K7 R.F. Amplifier, 6A8 1st Detector and Oscillator, 6K7 I.F. Amplifier, 6H6 2nd Detector and A.V.C., 6C5 Audio Amplifier, 2-6F6 Output tubes and a 5Z4 Rectifier tube.

The frequency range is divided into four bands or divisions, one covering the band of approximately 550 to 1750 K.C. (Green), one the band from approximately 1700 to 5500 K.C. (Orange), one the band of approximately 5.4 to 18 megacycles (Amber), and the weather band covering from approximately 150 to 410 K.C. (Red).

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range Switch is a simple three deck multiple pole, positive acting switch, used to connect the various coils into their proper circuits and is designed in such a way that the coils being used are isolated from coils of the two succeeding bands of a lower frequency. In the case of the detector circuit both the higher and lower frequency bands, above and below the circuit selected, are shorted out. This switching arrangement not only selects the proper coils for each band, but grounds the unused section, allowing the receiver to work at maximum sensitivity and selectivity on all four ranges.

The Range Switch and Coil Assembly is shown schematically in figure (3) and it will be noted that deck I (Antenna) is the one toward the front of the chassis, deck II (Detector) in the center position and deck III (Oscillator) toward the rear of the chassis. The diagram shows the exact position of the coil and switch lugs and little difficulty should be experienced in making any necessary repairs or inspection.

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align the 8-E Chassis without proper equipment. Alignment condensers are shown in the accompanying illustration, and are numbered in order of procedure — I.F. Condensers on top and side of the I.F. Transformers.

1. EQUIPMENT:

(A) Test Oscillator.

A modulated Oscillator capable of producing signals at the I.F., Broadcast, Short-Wave, and weather Band frequencies is necessary for alignment of the 8-E Chassis.

(B) Insulated Screw Driver — (all bakelite or fibre) about 6" long.

(C) Output Meter.

This may be any of the standard Output Meters, but should be sufficiently sensitive to provide a good deflection at low signal strength.

(D) Coupling Means.

Coupling Condensers of 200 mmf., .25 mfd., and a 400 Ohm resistor should be used when coupling oscillator to receiver during alignment as specified in the procedure.

(E) The receiver should be aligned in a location free from local interference (Interference caused by motors — flashers — automobile ignition, etc.) as high frequency disturbances will cause difficulties when the short wave section is being adjusted. (A screen room is to be recommended.)

2. DIAL SETTING:

Turn knob until condensers are fully meshed. The dial pointer (Hour hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock.

The minute hand should be at 12 o'clock or in a vertical position.

3. I.F. ALIGNMENT:

(A) Connect signal lead of test oscillator to grid of 6A8 (1st detector tube) through .25 mfd. condenser. Connect the ground lead to the chassis.

(B) Before any adjustment of circuit constants is attempted, allow the chassis to "heat up" to normal operating temperature. This heating period should take from 20 to 30 minutes and is necessary to allow all coils and condensers to reach their normal temperatures so that when alignment is completed, there will be no inductance or capacity changes due to thermal expansion or contraction.

It is good to remember this heating condition when logging station — that is, do not attempt to log or tune in a station previously logged on a "cold" chassis, as the station being tuned in would "drift" and the calibration on the previously logged station would be incorrect.

(C) Set Dial pointer to 1400 K.C. and range switch on "Green" (No. 2) position.

(D) Place test Oscillator in operation at 455 K.C. Turn receiver volume control and tone control to maximum.

(E) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.

(F) Adjust the five I.F. Trimmers, A1, A2, A3, A4, A5, located on the I.F. Transformers on top of chassis Fig. (1), until maximum output is obtained. During alignment, maintain as low a value of signal as will allow obtaining of accurate adjustment.

4. 175 K.C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.

(B) Connect the test oscillator ground lead to the ground post of chassis.

(C) Place test oscillator in operation at 175 K.C.

(D) Tune in signal to maximum (this point does not have to be exactly at 175 K.C. dial setting) range switch on "Red" (No. 1) position.

(E) Adjust the 175 K.C. Padding Condenser (A6) Fig. 2 (which is on rear of Chassis) in direction of signal increase. At the same time rock the tuning condenser back and forth through resonance while adjusting padding condenser, until maximum output is obtained.

5. 350 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 350 K.C.

(B) Turn dial pointer to 350 K.C.

(C) Turn range switch to "Red" (No. 1) position.

(D) Adjust "weather Band" oscillator trimmer (A7) Fig. 2, to maximum output.

(E) Adjust Detector Trimmer (A8) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A9) Fig. 2, to maximum output.

6. RECHECK 175 K.C. PADDER CONDENSER — See 4 — above.

7. 1400 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 1400 K.C.

(B) Turn dial pointer to 1400 K.C.

(C) Turn range switch to range "Green" (No. 2) position.

(D) Adjust broadcast oscillator trimmer (A10) Fig. 2, to maximum output.

(E) Adjust 1st Det. Trimmer (A11) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A12) Fig. 2, to maximum output.

8. 600 K.C. ALIGNMENT:

(A) Place test Oscillator in operation at 600 K.C.

(B) Tune in signal to maximum (this point does not have to be exactly at 600 K.C. dial setting.)

(C) Adjust the 600 K.C. Padding Condenser (A13), Fig. 2, which is on rear of Chassis, in direction of signal increases. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

9. RECHECK 1400 K.C. ALIGNMENT: See 7 above.

10. 5000 K.C. ALIGNMENT:

(A) Set range switch to "Orange" (No. 3) position.

(B) Place test Oscillators in operation at 5000 K.C.

(C) Turn dial pointer to 5000 K.C.

(D) Adjust Set Oscillator Trimmer (A14), Fig. 2, to maximum output.

(E) Adjust Detector Trimmer (A15) Fig. 2, to maximum output.

(F) Adjust Antenna Trimmer (A16), Fig. 2, to maximum output.

11. 18 M C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 400 Ohm resistor to Antenna binding post of Chassis.

(B) Connect the ground lead to ground terminal of Chassis.

(C) Set Range Switch to "Amber" (No. 4) position and turn dial pointer to 18 M.C.

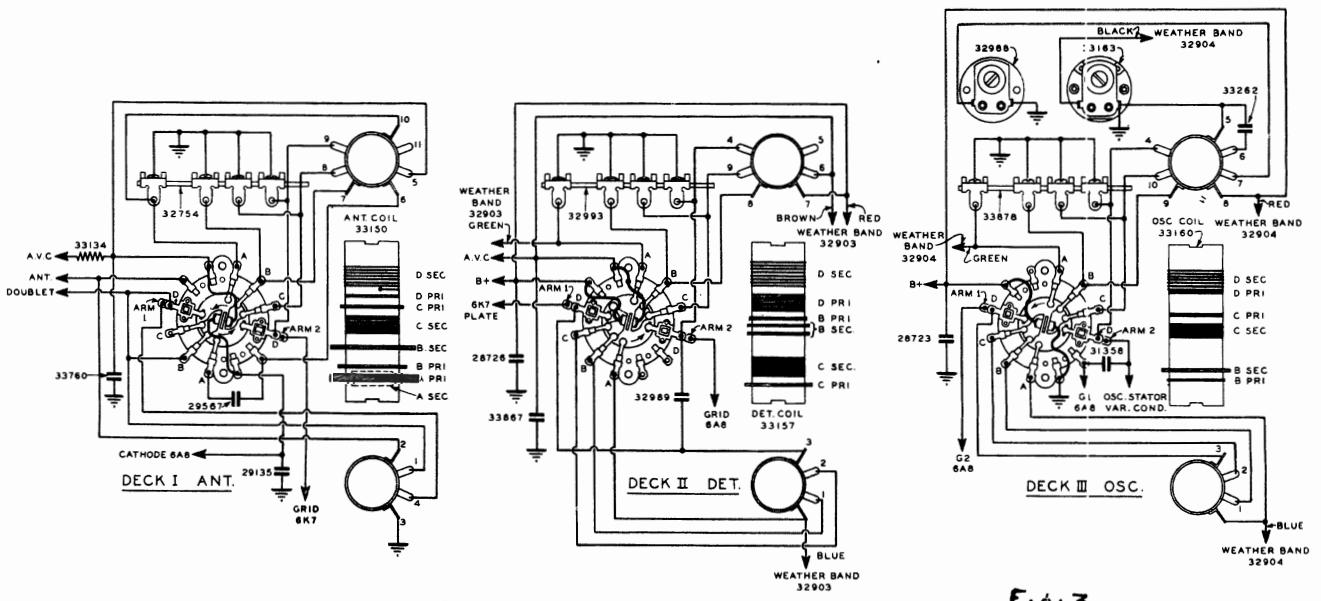
(D) Place Test Oscillator in operation at 18 M.C.

(E) Adjust set oscillator Trimmer (A17) Fig. 2, to maximum output.

(F) Adjust Detector Trimmer (A18) Fig. 2, to maximum output.

(G) Adjust Antenna Trimmer (A19) Fig. 2, to maximum output.

(H) On the 18 M.C. Oscillator Alignment it will be noted that there are two settings at which the signal will be received. Use the lower of the images for alignment point, that is, the setting giving most capacity or the point at which the trimmer is farthest in.

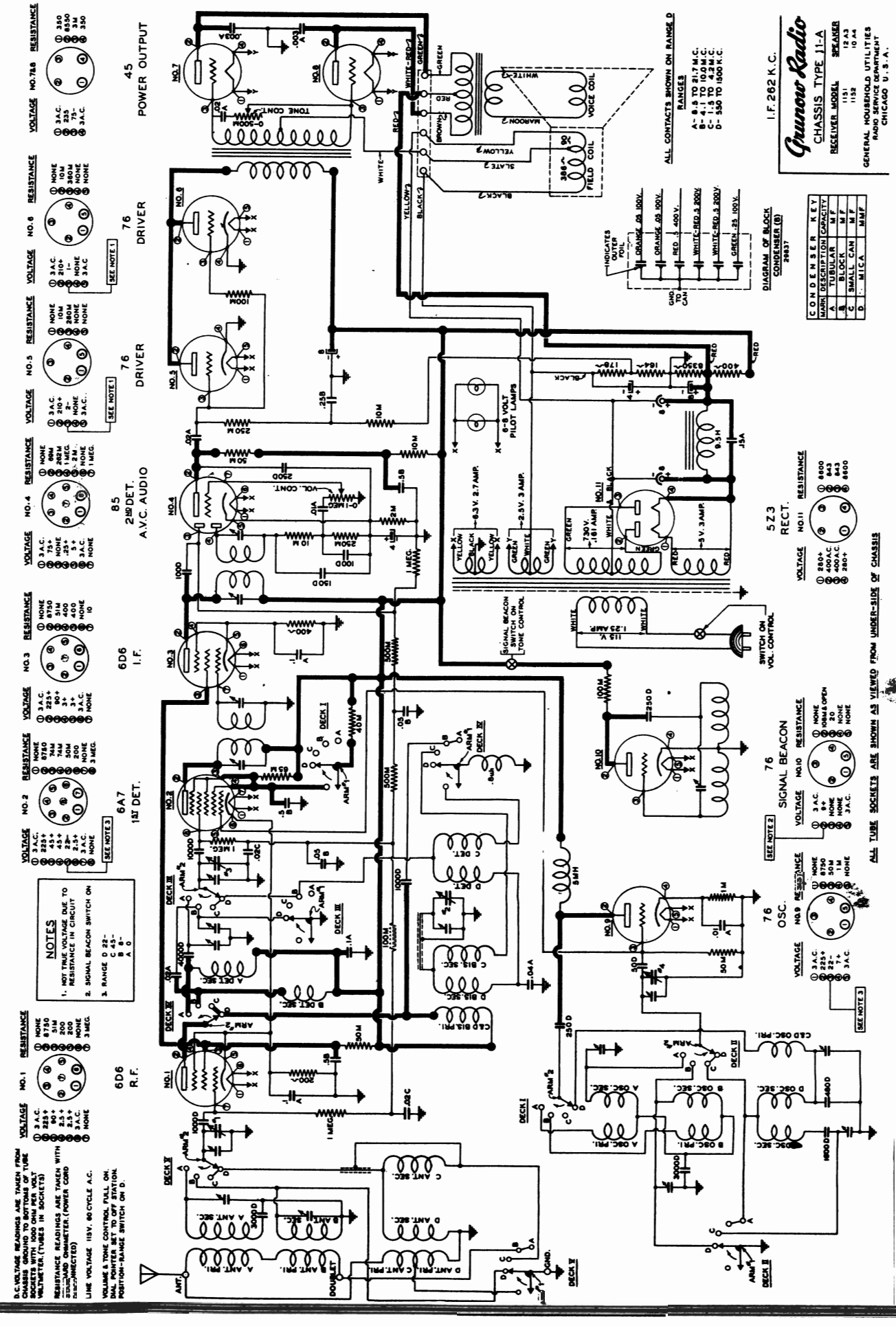


SCHEMATIC DIAGRAM RANGE SWITCH & COIL ASSEMBLY
7C & 8E

Fig. 3

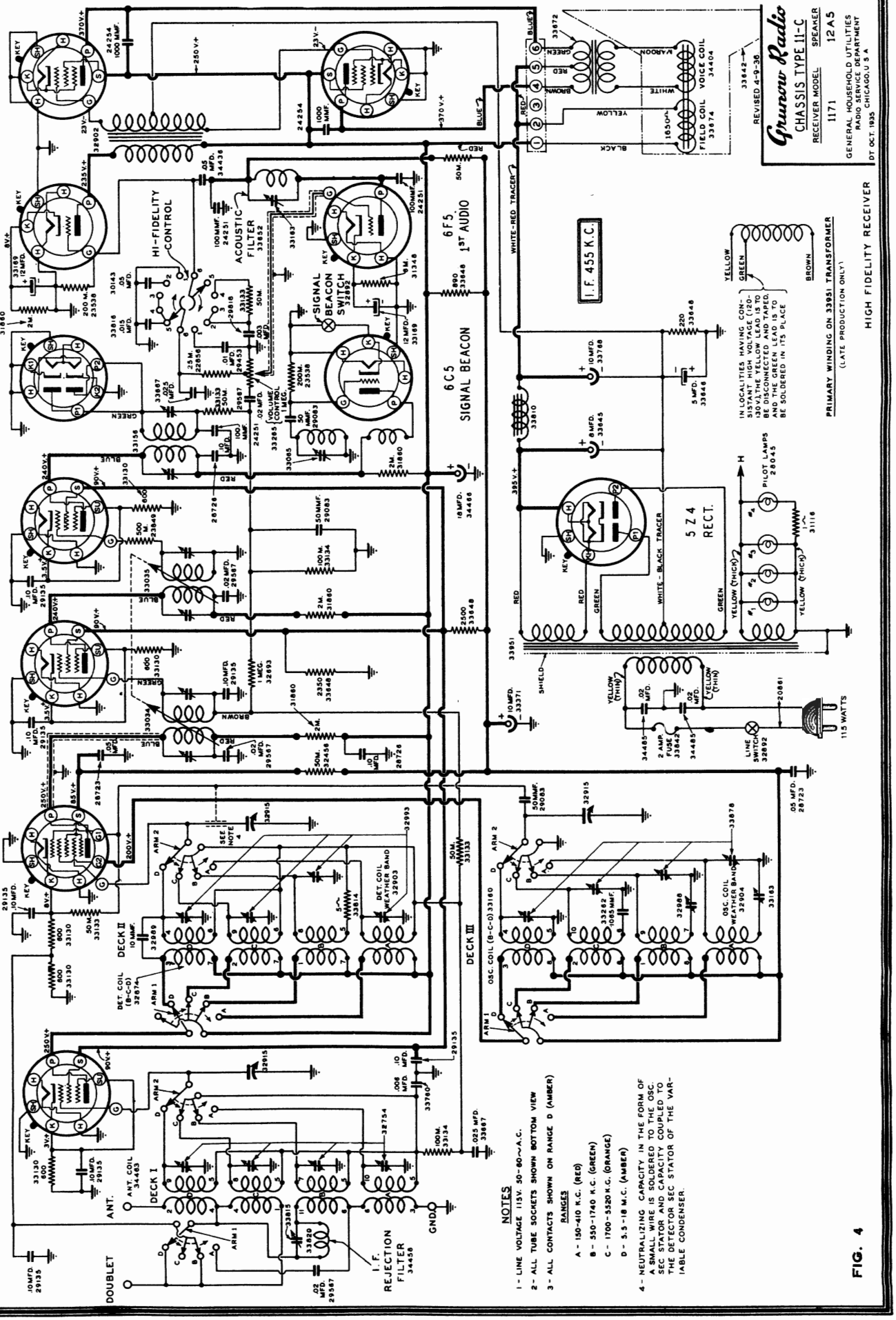
GENERAL HOUSEHOLD UTILITIES CO.

Models 1151-1152 Chassis 11A



GENERAL HOUSEHOLD UTILITIES CO.

Model 1171 — Chassis 11C



NOTES

1 - LINE VOLTAGE 115V. 50-80~A.C.

2 - ALL TUBE SOCKETS SHOWN BOTTOM VIEW

3 - ALL CONTACTS SHOWN ON RANGE D (AMBER)

RANGES

A - 130-410 K.C. (RED)

B - 350-1740 K.C. (GREEN)

C - 1700-3520 K.C. (ORANGE)

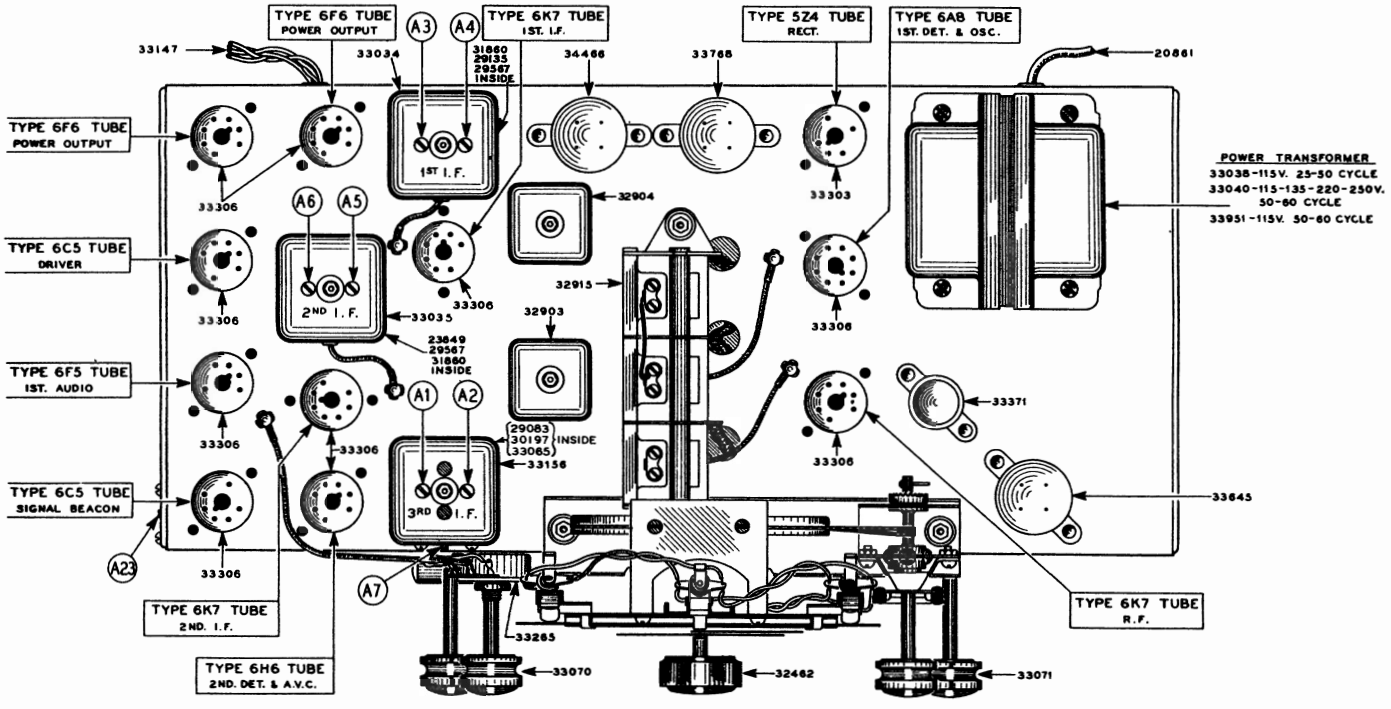
D - 5.5-18 M.C. (AMBER)

4 - NEUTRALIZING CAPACITY IN THE FORM OF A SMALL WIRE IS SOLDERED TO THE OSC. SEC STATOR AND CAPACITY COUPLED TO THE DETECTOR SEC STATOR OF THE VARIABLE CONDENSER.

FIG. 4

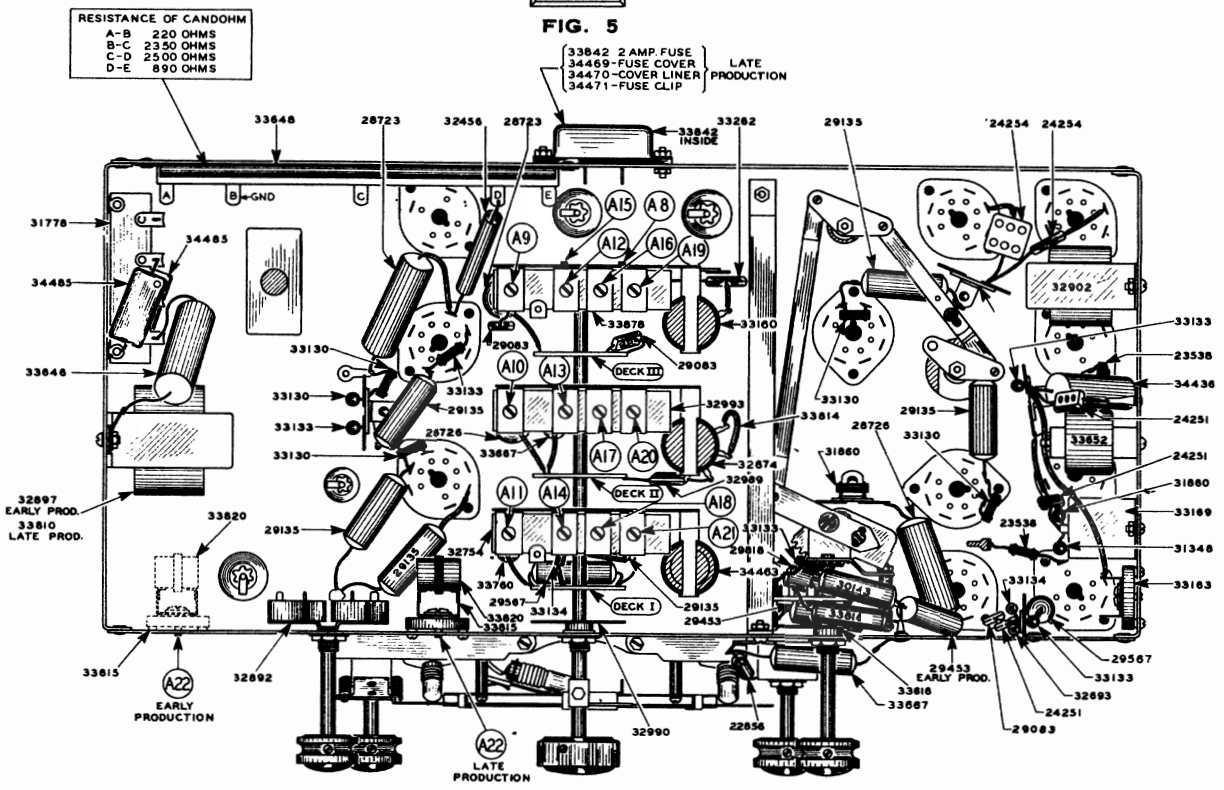
GENERAL HOUSEHOLD UTILITIES CO.

Model 1171 — Chassis 11C



TOP VIEW

FIG. 5



BOTTOM VIEW

FIG. 6

CHASSIS 11C
NOV. 1935
RAS 112

GENERAL HOUSEHOLD UTILITIES CO.

Model 1171 — Chassis 11C

Grunow Radio

Chassis Type 11C

Receiver Model 1171
Speaker Type 12A5

GENERAL HOUSEHOLD UTILITIES COMPANY

34374 Chicago, U. S. A.

INTRODUCTION

The GRUNOW 11C Chassis is an eleven tube, 115 volt 50-60 cycle A.C., four band receiver with A.V.C., an expanded I.F. system of Hi-fidelity control, Tone Control, "Band Spread" dial and Signal Beacon. The tubes used are: 6K7 R.F. Amplifier, 6A8 1st Detector and Oscillator, 6K7 1st I.F. Amplifier, 6K7 2nd I.F. Amplifier, 6H6 2nd Detector and A.V.C., 6F5 1st Audio Amplifier, 6C5 Driver Stage, 6C5 Signal Beacon, 2-6F6 Push-Pull Power Output tubes and a 5Z4 Rectifier tube.

The frequency range is divided into four bands or divisions, one covering the band of approximately 550 to 1750 K.C. (Green), one the band from approximately 1700 to 5500 K.C. (Orange), one the band of approximately 5.4 to 18 megacycles (Amber), and the weather band covering from approximately 150 to 410 K.C. (Red).

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range Switch is a simple three deck multiple pole, positive acting switch, used to connect the various coils into their proper circuits, and is designed in such a way that the coils being used are isolated from coils of the two succeeding bands of a lower frequency. In the case of the detector circuit both the higher and lower frequency bands, above and below the circuit selected, are shorted out. This switching arrangement not only selects the proper coils for each band, but grounds the unused section, allowing the receiver to work at maximum sensitivity and selectivity on all four ranges.

The Range Switch and Coil Assembly is shown schematically in figure (3) and it will be noted that deck I (Antenna) is the one toward the front of the chassis, deck II (Detector) in the center position and deck III (Oscillator) toward the rear of the chassis. The diagram shows the exact position of the coil and switch lugs, and little difficulty should be experienced in making any necessary repairs or inspection.

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align the 11C Chassis without the proper equipment. Alignment condensers are shown in the accompanying illustrations and are numbered in order of procedure—I.F. Condensers on top of the I.F. Transformers.

1. EQUIPMENT:

(A) Test Oscillator.

A modulated Oscillator capable of producing signals at the I.F. Broadcast, Short-Wave, and Weather Band frequencies is necessary for alignment of the 11C Chassis.

(B) Insulated Screw Driver—(all bakelite or fibre) about 6" long.

(C) Output Meter.

This may be any of the standard Output Meters, but should be sufficiently sensitive to provide a good deflection at low signal strength.

(D) Coupling Means.

Coupling Condensers of 200 mmf., .25 mfd., and a 400 Ohm resistor should be used when coupling oscillator to receiver during alignment as specified in the procedure.

(E) The Receiver should be aligned in a location free from local interference (interference caused by motors—flashers—automobile ignition, etc.) as high frequency disturbances will cause difficulties when the short wave section is being adjusted. (A screen room is to be recommended.)

2. DIAL SETTING:

Turn dial knob until condensers are fully meshed. The dial pointer (Hour Hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock. The minute hand should be at 12 o'clock or in a vertical position.

3. I.F. ALIGNMENT:

EXPLANATION

The GRUNOW High-Fidelity system is incorporated in this Chassis and the following procedure must be strictly adhered to:

The I.F. circuit of this chassis is known as an "expanded I.F. system." In order to reproduce programs of a "High-Fidelity nature" it is not only necessary to build an audio system capable of reproducing all the notes of the audio-spectrum at a mean output level, but it is also necessary to build a radio-frequency system that will pass signals without cutting off the sidebands. In other words, the selectivity of the receiver must be broad enough to pass all high-fidelity signals when desired—and be so designed that the selectivity may be increased at will, so that nearby powerful transmitting stations will not interfere with other local or distant stations. This variable selectivity is accomplished by changing the mutual inductance in two of the I.F. Transformers—the coupling being changed by means of a control knob on the front of the receiver, which also acts as a tone control.

This control varies the transformer coupling, giving maximum selectivity on position No. 1, and broadest selectivity and highest fidelity on position No. 6.

When aligning the I.F. transformers see that the control is in position (No. 1) of greatest selectivity.

Fig. No. 1 shows a graphical picture of the results obtained, first with the control on No. 1 position, or maximum selectivity, second, on No. 6 position, showing the selectivity of the receiver broadened to its greatest extent, permitting the higher frequency sidebands to be passed through the selective circuit with the result that tone quality is greatly improved.

It will be noted that both peaks (No. 6) are practically the same height, and that both slopes are symmetrical.

The third curve represents a condition wherein the I.F. transformers are NOT properly peaked, and it will be noted that one peak is proportionately too high and the other has been practically lost. This illustration is shown merely as an example of what to expect when the receiver is not properly aligned.

Before any adjustment of circuit constants is attempted, allow the Chassis to "heat up" to normal operating temperature. This heating period should take from 20 to 30 minutes and is necessary to allow all coils and condensers to reach their normal temperatures so that when alignment is completed, there will be no inductance or capacity changes due to thermal expansion or contraction.

It is good to remember this heating condition when logging station—that is, do not attempt to log or tune in a station previously logged on a "cold" chassis, as the station being tuned in would "drift" and the calibration on the previously logged station would be incorrect.

(A) Connect signal lead of test oscillator to grid of 6A8 (1st detector tube) through .25 mfd., condenser. Connect the ground lead to the chassis.

(B) Set dial pointer to 1400 K.C. and range switch on "Green" (No. 2) position.

(C) Place test Oscillator in operation at 455 K.C. Turn receiver volume control to maximum and HI-FIDELITY CONTROL to POSITION No. 1, which is the maximum selectivity position.

(D) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.

(E) Adjust six I.F. Trimmers, A1, A2, A3, A4, A5, A6, located on the I.F. Transformers on top of Chassis, Fig. (5) until maximum output is obtained. During alignment, maintain as low a value of signal as will allow obtaining of accurate adjustment.

(F) Turn the on and off switch clockwise to the Signal Beacon position.

(G) Adjust Signal Beacon trimmer (A7) Fig. 5, which is located on side of I.F. transformer (near dial) to Zero beat with the 455 K.C. incoming signal.

4. 175 K.C. ALIGNMENT:

(A) Connect signal lead of test Oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.

(B) Connect the test Oscillator ground lead to the ground post of Chassis.

(C) Place test Oscillator in operation at 175 K.C.

(D) PLACE HI-FIDELITY CONTROL IN POSITION NO. 2.

(E) Turn range switch to "Red" (No. 1) position.

(F) Tune in signal to maximum (this point does not have to be exactly at 175 K.C. dial setting.)

(G) Adjust the 175 K.C. Padding Condenser (A8) Fig. 6 (which is on rear of Chassis) in direction of signal increase. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

5. 350 K.C. ALIGNMENT:

(A) Place test Oscillator in operation at 350 K.C.

(B) Turn dial pointer to 350 K.C.

(C) Turn range switch to "Red" (No. 1) position.

(D) Place Hi-Fidelity Control in position No. 2.

(E) Adjust "weather band" oscillator trimmer (A9), Fig. 5, to maximum output.

(F) Adjust Detector Trimmer (A10) Fig. 6 to maximum output.

(G) Adjust Antenna Trimmer (A11), Fig. 6 to maximum output.

6. RECHECK 175 K.C. PADDER CONDENSER—See 4—Above.

7. 1400 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 1400 K.C.

(B) Turn dial pointer to 1400 K.C.

(C) Turn range switch to range "Green" (No. 2) position.

(D) Hi-Fidelity Control remains in No. 2 position.

(E) Adjust broadcast oscillator trimmer (A12) Fig. 6 to maximum output.

(F) Adjust 1st Det. Trimmer (A13) Fig. 6 to maximum output.

(G) Adjust Antenna Trimmer (A14) Fig. 6 to maximum output.

8. 600 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 600 K.C.

(B) Tune in signal to maximum (this point does not have to be exactly at 600 K.C. dial setting).

(C) Adjust the 600 K.C. Padding Condenser (A15), Fig. 6, which is on rear of Chassis, in direction of signal increase. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

9. RECHECK 1400 K.C. ALIGNMENT—See 7—Above.

10. 5000 K.C. ALIGNMENT:

(A) Set Range Switch to "Orange" (No. 3) position.

(B) Place test Oscillators in operation at 5000 K.C.

(C) Turn Dial Pointer to 5000 K.C.

(D) Adjust Set Oscillator Trimmer (A16) Fig. 6 to maximum output.

(E) Adjust Detector Trimmer (A17) Fig. 6 to maximum output.

(F) Adjust Antenna Trimmer (A18) Fig. 6 to maximum output.

11. 18 M.C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 400 Ohm Resistor to Antenna binding post of Chassis.

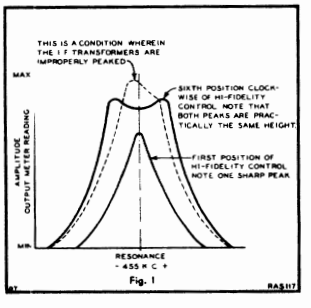


Fig. 1

CIRCUIT ALIGNMENT PROCEDURE (Continued)

(B) Connect the ground lead to ground terminal of Chassis.

(C) Set Range Switch to "Amber" (No. 4) position and turn dial pointer to 18 M.C.

(D) Place test Oscillator in operation at 18 M.C.

(E) Adjust set oscillator Trimmer (A19) Fig. 6 to maximum output.

(F) Adjust Detector Trimmer (A20) Fig. 6 to maximum output.

(G) Adjust Antenna Trimmer (A21) Fig. 6 to maximum output.

(H) On the 18 M.C. Oscillator Alignment it will be noted that there are two settings at which the signal will be received. Use the lower of the images for alignment point, that is, the setting giving most capacity or the point at which the trimmer screw is farthest in.

12. ALIGNMENT OF "I.F. REJECTOR FILTER" CIRCUIT:

Due to interference caused by commercial code stations operating on wave lengths near the frequency at which the I.F. amplifiers of this receiver are aligned, an I.F. filter has been incorporated in the antenna circuit to act as a rejector system, thereby lessening the possibility of this form of interference entering the receiver.

The filter should be tuned to the same frequency as the I.F. Transformers, and this operation should be performed after the set has been completely aligned.

(A) Connect signal lead of test oscillator to antenna binding post through a 200 mmf. condenser.

(B) Connect ground lead to ground terminal of chassis.

(C) Set dial pointer to 1400 K.C. and range switch on Green (No. 2) position.

(D) Place test oscillator in operation at 455 K.C.—turn receiver volume control to maximum and Hi-Fidelity control to No. 2 position.

(E) Attenuate test oscillator output so that a fairly strong signal is applied, and tune filter condenser (A22) Fig. (6) so that the output meter indicates a minimum reading.

13. TUNING ACOUSTIC FILTER:

The I.F. system of a Hi-Fidelity receiver is expanded or broadened so that audio frequencies of the higher musical range will be passed through the selective circuits. It is desirous to pass audio frequencies only up to a value of 10,000 cycles, so that the entire musical range may be reproduced, at the same time frequencies above this value must be cut off—so that station noises and atmospheric disturbances are not admitted to the speaker system.

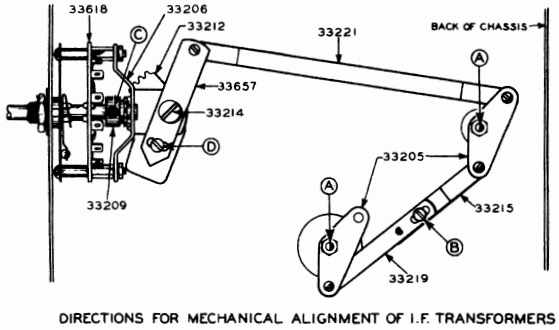
An acoustic filter is incorporated in this chassis, that may be tuned so that frequencies above 10,000 cycles are excluded. This filter is tuned as follows:

(A) After all other adjustments are completed, apply a 10,000 cycle note, produced by an audio oscillator or phonograph frequency record, connecting one of the signal leads to the grids of the 6F5 (1st A.F. tube) and the ground lead to the chassis.

(B) Set Hi-Fidelity control to maximum (No. 6) position.

(C) Attenuate audio signal so as to obtain a good reading on the output meter.

(D) Tune acoustic filter condenser (A23) Fig. (5) until a MINIMUM output is indicated on the output meter.



DIRECTIONS FOR MECHANICAL ALIGNMENT OF I.F. TRANSFORMERS

FLATS(A)ON THE VERTICAL SHAFTS SHOULD BE MADE PARALLEL WITH EACH OTHER BY ADJUSTING CONNECTING ARM AT(B). TURN THE HIGH-FIDELITY SWITCH CLOCK-WISE AS FAR AS IT WILL GO, (NO. 6 POSITION). IF THE SWITCH DOES NOT TURN TO NO. 6 POSITION, LOOSEN SET SCREW(C) AND TURN SWITCH WITH GEAR LOOSE. WITH SWITCH IN THIS POSITION, MOVE THE LEVER ARMS SO THAT THE FLATS (A) ARE PARALLEL TO THE BACK OF THE CHASSIS BY ADJUSTING LEVER AT(D). TIGHTEN ALL SCREWS AND BE SURE THE SWITCH COVERS ALL SIX POSITIONS EASILY WITHOUT BINDING. NOW PROCEED WITH ELECTRICAL ALIGNMENT

FIG. 2

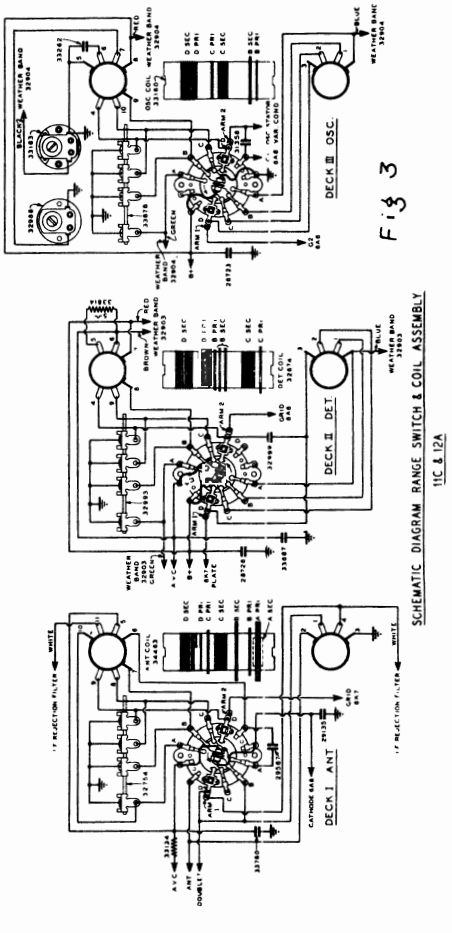


Fig 3

GENERAL HOUSEHOLD UTILITIES CO.

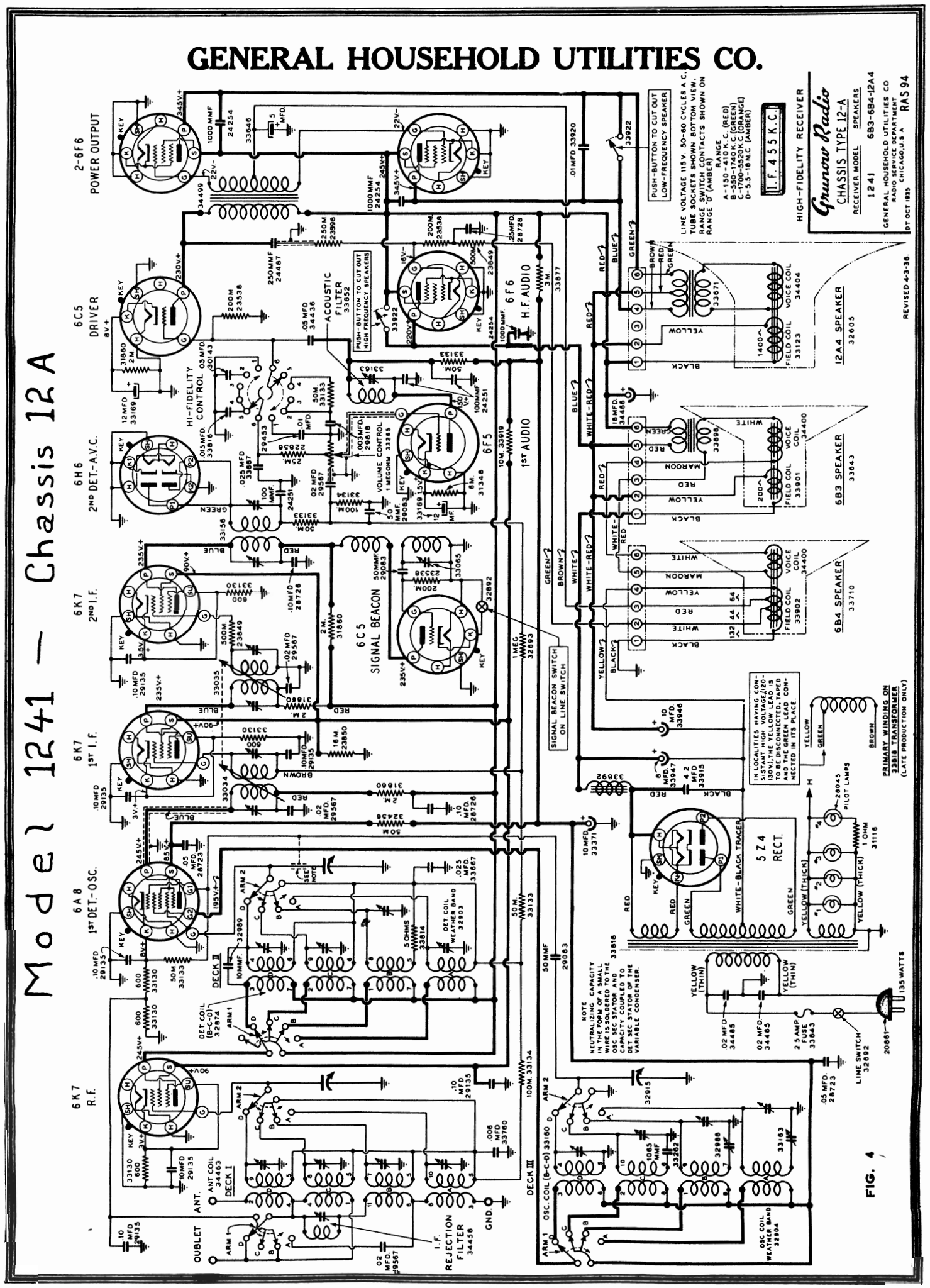
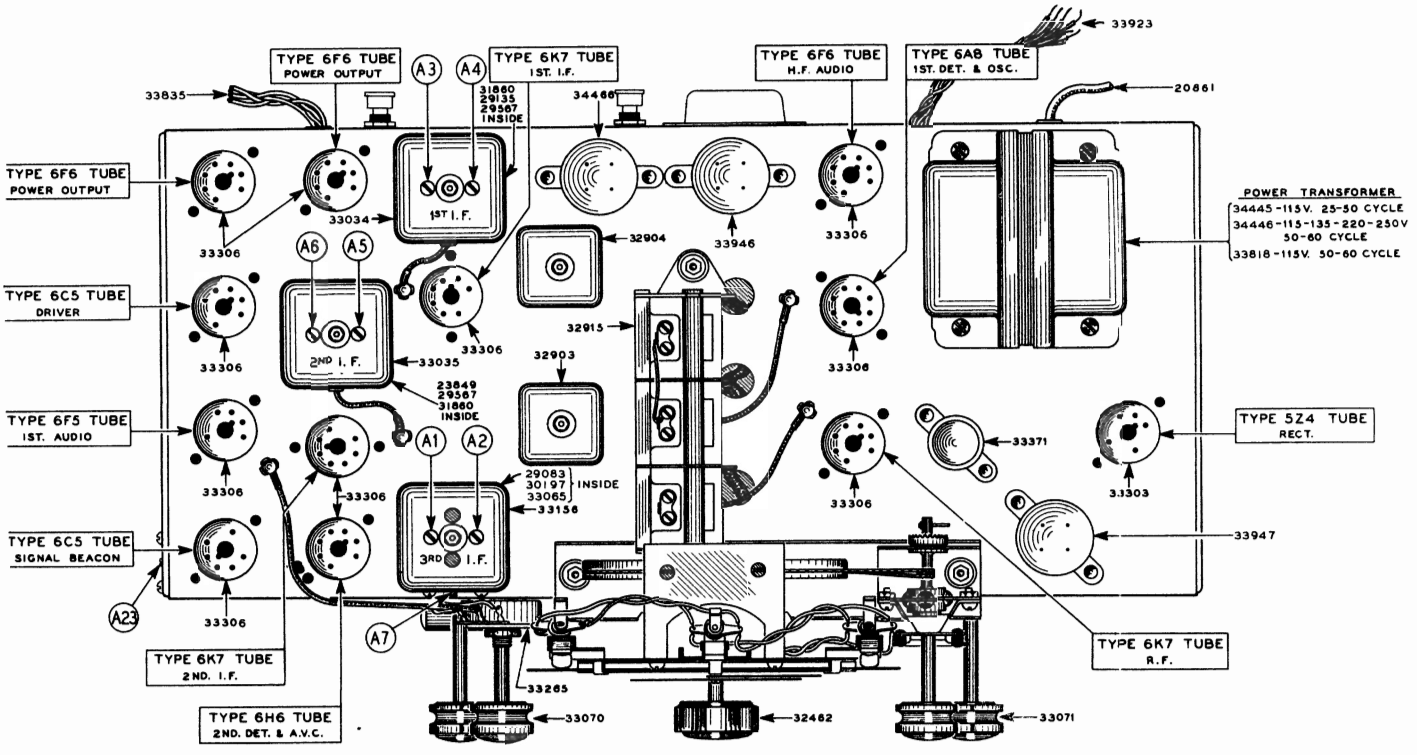


FIG. 4

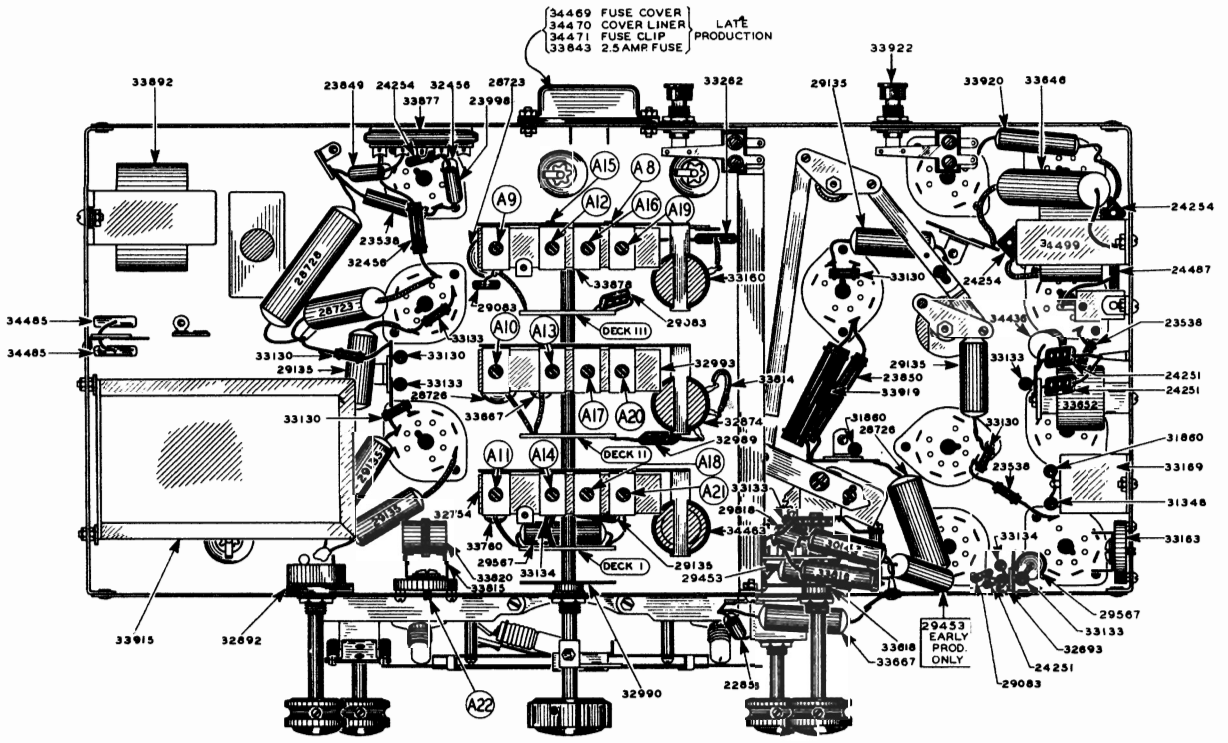
GENERAL HOUSEHOLD UTILITIES CO.

Model 1241 - Chassis 12A



TOP VIEW

FIG. 5



BOTTOM VIEW

FIG. 6

CHASSIS 12A
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RAS 116

GENERAL HOUSEHOLD UTILITIES CO.

Model 1241-Chassis 12A

Grunow Radio

Chassis Type 12A

Receiver Model 1241
Speaker Types 12A4—6B3—6B4

GENERAL HOUSEHOLD UTILITIES COMPANY

34375 Chicago, U. S. A.

INTRODUCTION

The GRUNOW 12A Chassis is a twelve tube, 115 Volt 50-60 Cycle A.C., four band receiver with A.V.C., an expanded I.F. system of Hi-fidelity control, Tone Control, "Band Spread" dial and Signal Beacon. The tubes used are: 6K7 R.F. Amplifier, 6A8 1st Detector and Oscillator, 6K7 1st I.F. Amplifier, 6K7 2nd I.F. Amplifier, 6H6 2nd Detector and A.V.C., 6F5 1st Audio Amplifier, 6C5 Driver Stage, 6F6 High Frequency Audio Channel Power Output, 6C5 Signal Beacon, 2-6F6 Push-Pull Low Frequency Audio Channel Power Output tubes and a 5Z4 Rectifier tube.

The frequency range is divided into four bands or divisions, one covering the band of approximately 550 to 1750 K.C. (Green), one the band from approximately 1700 to 5500 K.C. (Orange), one the band of approximately 5.4 to 18 megacycles (Amber), and the weather band covering from approximately 150 to 410 K.C. (Red).

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man to make a quick check of the chassis constants. The socket layouts given on the schematic diagram show each socket from the underside.

THE RANGE SWITCH

The Range Switch is a simple three deck multiple pole, positive acting switch, used to connect the various coils into their proper circuits, and is designed in such a way that the coils being used are isolated from coils of the two succeeding bands of a lower frequency. In the case of the detector circuit both the higher and lower frequency bands, above and below the circuit selected, are shorted out. This switching arrangement not only selects the proper coils for each band, but grounds the unused section, allowing the receiver to work at maximum sensitivity and selectivity on all four ranges.

The Range Switch and Coil Assembly is shown schematically in figure (3) and it will be noted that deck I (Antenna) is the one toward the front of the chassis, deck II (Detector) in the center position and deck III (Oscillator) toward the rear of the chassis. The diagram shows the exact position of the coil and switch lugs, and little difficulty should be experienced in making any necessary repairs or inspection.

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align the 12A Chassis without the proper equipment. Alignment condensers are shown in the accompanying illustrations and are numbered in order of procedure—I.F. Condensers on top of the I.F. Transformers.

1 EQUIPMENT:

(A) Test Oscillator.

A modulated Oscillator capable of producing signals at the I.F Broadcast, Short-Wave, and Weather Band frequencies is necessary for alignment of the 12A Chassis.

(B) Insulated Screw Drive—(all bakelite or fibre) about 6" long.

(C) Output Meter.

This may be any of the standard Output Meters, but should be sufficiently sensitive to provide a good deflection at low signal strength.

(D) Coupling Means.

Coupling Condensers of 200 mmf., .25 mfd., and a 400 Ohm resistor should be used when coupling oscillator to receiver during alignment as specified in the procedure.

(E) The Receiver should be aligned in a location free from local interference (interference caused by motors—flashers—automobile ignition, etc.) as high frequency disturbances will cause difficulties when the short wave section is being adjusted. (A screen room is to be recommended.)

2. DIAL SETTING:

Turn dial knob until condensers are fully meshed. The dial pointer (Hour Hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock. The minute hand should be at 12 o'clock or in a vertical position.

3. I.F. ALIGNMENT:

EXPLANATION

The GRUNOW High-Fidelity system is incorporated in this Chassis and the following procedure must be strictly adhered to:

The I.F. circuit of this chassis is known as an "expanded I.F. system." In order to reproduce programs of a "High-Fidelity nature" it is not only necessary to build an audio system capable of reproducing all the notes of the audio-spectrum at a mean output level, but it is also necessary to build a radio-frequency system that will pass signals without cutting off the sidebands. In other words, the selectivity of the retsiver must be broad enough to pass all high-fidelity signals when desired—and be so designed that the selectivity may be increased at will, so that nearby powerful transmitting stations will not interfere with other local or distant stations. This variable selectivity is accomplished by changing the mutual inductance in two of the I.F. Transformers—the coupling being changed by means of a control knob on the front of the receiver, which also acts as a tone control.

This control varies the transformer coupling giving maximum selectivity on position No. 1, and broadest selectivity and highest fidelity on position No. 6.

When aligning the I.F. transformers see that the control is in position (No. 1) of greatest selectivity.

Fig. No. 1 shows a graphical picture of the results obtained, first with the control on No. 1 position, or maximum selectivity, second, on No. 6 position, showing the selectivity of the receiver broadened to its greatest extent, permitting the higher frequency sidebands to be passed through the selective circuit with the result that tone quality is greatly improved.

It will be noted that both peaks (No. 6) are practically the same height, and that both slopes are symmetrical.

The third graph represents a condition wherein the I.F. transformers are NOT properly peaked, and it will be noted that one peak is proportionately too high and the other has been practically lost. This illustration is shown merely as an example of what to expect when the receiver is not properly aligned.

Before any adjustment of circuit constants is attempted, allow the Chassis to "heat up" to normal operating temperature. This heating period should take from 20 to 30 minutes and is necessary to allow all coils and condensers to reach their normal temperatures so that when alignment is completed, there will be no inductance or capacity changes due to thermal expansion or contraction.

It is good to remember this heating condition when logging station—that is, do not attempt to log or tune in a station previously logged on a "cold" chassis, as the station being tuned in would "drift" and the calibration on the previously logged station would be incorrect.

(A) Connect signal lead of test oscillator to grid of 6A8 (1st Detector tube) through .25 mfd., condenser. Connect the ground lead to the chassis.

(B) Set dial pointer to 1400 K.C. and range switch on "Green" (No. 2) position.

(C) Place test Oscillator in operation at 455 K.C. Turn receiver volume control to maximum and HI-FIDELITY CONTROL to POSITION No. 1, which is the maximum selectivity position.

(D) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.

(E) Adjust six I.F. Trimmers, A1, A2, A3, A4, A5, A6, located on the I.F. Transformers on top of Chassis, Fig. (4) until maximum output is obtained. During alignment maintain as low a value of signal as will allow obtaining of accurate adjustment.

(F) Turn the on and off switch clockwise to the Signal Beacon position.

(G) Adjust Signal Beacon trimmer (A7) Fig. 4, which is located on side of I.F. transformer (near dial) to Zero beat with the 455 K.C. incoming signal.

4. 175 K.C. ALIGNMENT:

(A) Connect signal lead of test Oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.

(B) Connect the test Oscillator ground lead to the ground post of Chassis.

(C) Place test Oscillator in operation at 175 K.C.

(D) PLACE HI-FIDELITY CONTROL IN POSITION NO. 2.

(E) Turn range switch to "Red" (No. 1) position.

(F) Tune in signal to maximum (this point does not have to be exactly at 175 K.C. dial setting.)

(G) Adjust the 175 K.C. Padding Condenser (A8) Fig. 5 (which is on rear of Chassis) in direction of signal increase. At some time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

5. 350 K.C. ALIGNMENT:

(A) Place test Oscillator in operation at 350 K.C.

(B) Turn dial pointer to 350 K.C.

(C) Turn range switch to "Red" (No. 1) position.

(D) Place Hi-Fidelity Control in position No. 2.

(E) Adjust "weather band" oscillator trimmer (A9), Fig. 5, to maximum output.

(F) Adjust Detector Trimmer (A10) Fig. 5 to maximum output.

(G) Adjust Antenna Trimmer (A11), Fig. 5 to maximum output.

6. RECHECK 175 K.C. PADDER CONDENSER—See 4—Above.

7. 1400 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 1400 K.C.

(B) Turn dial pointer to 1400 K.C.

(C) Turn range switch to range "Green" (No. 2) position.

(D) Hi-Fidelity Control remains in No. 2 position.

(E) Adjust broadcast oscillator trimmer (A12) Fig. 5 to maximum output.

(F) Adjust 1st Det. Trimmer (A13) Fig. 5 to maximum output.

(G) Adjust Antenna Trimmer (A14) Fig. 5 to maximum output.

8. 600 K.C. ALIGNMENT:

(A) Place test oscillator in operation at 600 K.C.

(B) Tune in signal to maximum (this point does not have to be exactly at 600 K.C. dial setting).

(C) Adjust the 600 K.C. Padding Condenser (A15), Fig. 5, which is on rear of Chassis, in direction of signal increases. At some time rock the tuning condenser back and forth through resonance while adjusting padding condenser until maximum output is obtained.

9. RECHECK 1400 K.C. ALIGNMENT—See 7—Above.

10. 5000 ALIGNMENT:

(A) Set Range Switch to "Orange" (No. 3) position.

(B) Place test Oscillators in operation at 5000 K.C.

(C) Turn Dial Pointer to 5000 K.C.

(D) Adjust Set Oscillator Trimmer (A16) Fig. 5 to maximum output.

(E) Adjust Detector Trimmer (A17) Fig. 5 to maximum output.

(F) Adjust Antenna Trimmer (A18) Fig. 5 to maximum output.

11. 18 M.C. ALIGNMENT:

(A) Connect signal lead of test oscillator through 400 Ohm Resistor to Antenna binding post of Chassis.

(B) Connect the ground lead to ground terminal of Chassis.

(C) Set Range Switch to "Amber" (No. 4) position and turn dial pointer to 18 M.C.

(D) Place test Oscillator in operation at 18 M.C.

(E) Adjust set oscillator Trimmer (A19) Fig. 5 to maximum output.

(F) Adjust Detector Trimmer (A20) Fig. 5 to maximum output.

(G) Adjust Antenna Trimmer (A21) Fig. 5 to maximum output.

(H) On the 18 M.C. Oscillator Alignment will be noted that there are two settings at which the signal will be received. Use the lower of the images for alignment point, that is, the setting giving most capacity or the point at which the trimmer screw is farthest in.

12. ALIGNMENT OF "I.F. REJECTOR FILTER" CIRCUIT:

Due to interference caused by commercial code stations operating on wave lengths near the frequency at which the I.F. amplifiers of this receiver are aligned, an I.F. filter has been incorporated in the antenna circuit to act as a rejector system, thereby lessening the possibility of this form of interference entering the receiver.

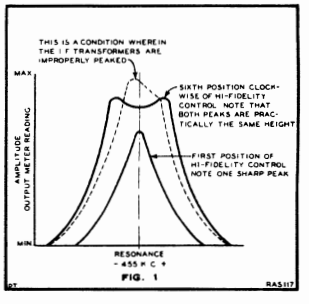


FIG. 1

CIRCUIT ALIGNMENT PROCEDURE (Continued)

The filter should be tuned to the same frequency as the I.F. Transformers, and this operation should be performed after the set has been completely aligned.

(A) Connect signal lead of test oscillator to antenna binding post through a 200 mmf. condenser.

(B) Connect ground lead to ground terminal of chassis.

(C) Set dial pointer to 1400 K.C. and range switch on Green (No. 2) position.

(D) Place test oscillator in operation at 455 K.C.—turn receiver volume control to maximum and Hi-Fidelity control to No. 2 position.

(E) Attenuate test oscillator output so that a fairly strong signal is applied, and tune filter condenser (A22) Fig. (4) so that the output meter indicates a minimum reading.

13. TUNING ACOUSTIC FILTER:

The I.F. system of a Hi-Fidelity receiver is expanded or broadened so that audio frequencies of the higher musical range will be passed through the selective circuits. It is desirous to pass audio frequencies only up to a value of 10,000 cycles, so that the entire musical range may be reproduced, at the same time frequencies above this value must be cut off—so that station noises and atmospheric disturbances are not admitted to the speaker system.

An acoustic filter is incorporated in this chassis, that may be tuned so that frequencies above 10,000 cycles are excluded. This filter is tuned as follows:

(A) After all other adjustments are completed, apply a 10,000 cycle note, produced by an audio oscillator or phonograph frequency record, connecting one of the signal leads to the grid of the 6F5 (1st A.F. tube) and the ground lead to the chassis.

(B) Set Hi-Fidelity control to maximum (No. 6) position.

(C) Attenuate audio signal so as to obtain a good reading on the output meter.

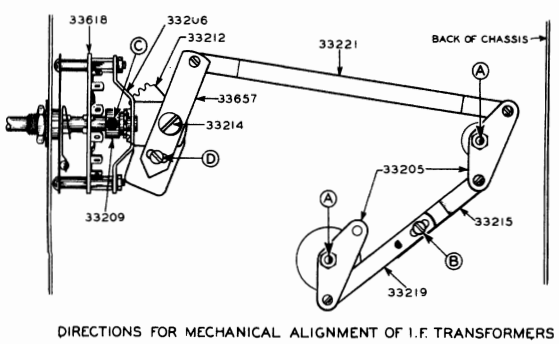
(D) Tune acoustic filter condenser (A23) Fig. (4) until a MINIMUM-output is indicated on the output meter.

SPEAKER SYSTEM

The 12A Chassis is designed to work into the Grunow triple speaker system. This complete system consists of a dual audio arrangement wherein a two channel audio amplifier is used—one channel comprising a 6F6 tube coupled to two small speakers reproduces the high notes of the musical range and the other channel comprising two types 6F6 tubes in push-pull coupled to a large speaker reproduces the low and middle register of the musical range. If it becomes necessary to replace or change any part of the speaker system, care should be taken to see that the polarity of all transformers, voice coils and tube connections remain as originally connected, otherwise there is a possibility of the speakers working out of "phase," causing one of the speakers to cancel out certain frequency responses of the other.

To determine whether the speakers are in phase—short out the voice coil on the large speaker and reverse the voice coil leads on one of the small speakers, connecting the lead on the small speaker in the position of strongest and best response. Then with the large speaker working with the two small speakers, change the polarity of the large speaker voice coil, connecting it in the position of strongest and best response.

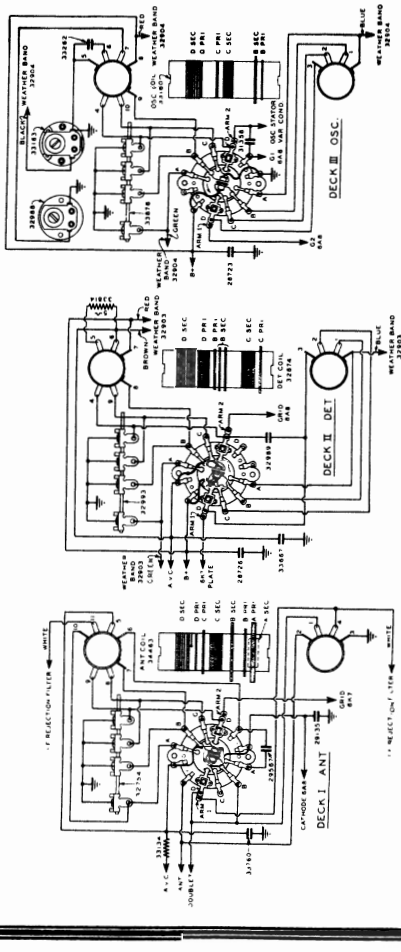
When making this test it is a good idea to have the receiver tuned to a good musical broadcast program.



DIRECTIONS FOR MECHANICAL ALIGNMENT OF I.F. TRANSFORMERS

FLATS(A)ON THE VERTICAL SHAFTS SHOULD BE MADE PARALLEL WITH EACH OTHER BY ADJUSTING CONNECTING ARM AT(B). TURN THE HIGH-FIDELITY SWITCH CLOCK-WISE AS FAR AS IT WILL GO, (NO 6 POSITION). IF THE SWITCH DOES NOT TURN TO NO. 6 POSITION, LOOSEN SET SCREW(C) AND TURN SWITCH WITH GEAR LOOSE. WITH SWITCH IN THIS POSITION, MOVE THE LEVER ARMS SO THAT THE FLATS (A) ARE PARALLEL TO THE BACK OF THE CHASSIS BY ADJUSTING LEVER AT(D). TIGHTEN ALL SCREWS AND BE SURE THE SWITCH COVERS ALL SIX POSITIONS EASILY WITHOUT BINDING. NOW PROCEED WITH ELECTRICAL ALIGNMENT

FIG. 2

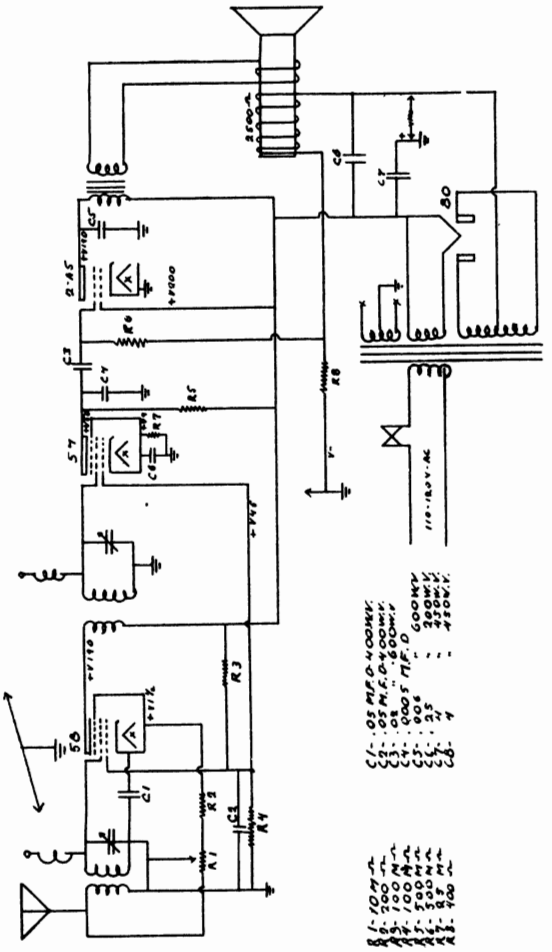


SCHEMATIC DIAGRAM RANGE SWITCH & COIL ASSEMBLY 11C & 12A

FIG 3

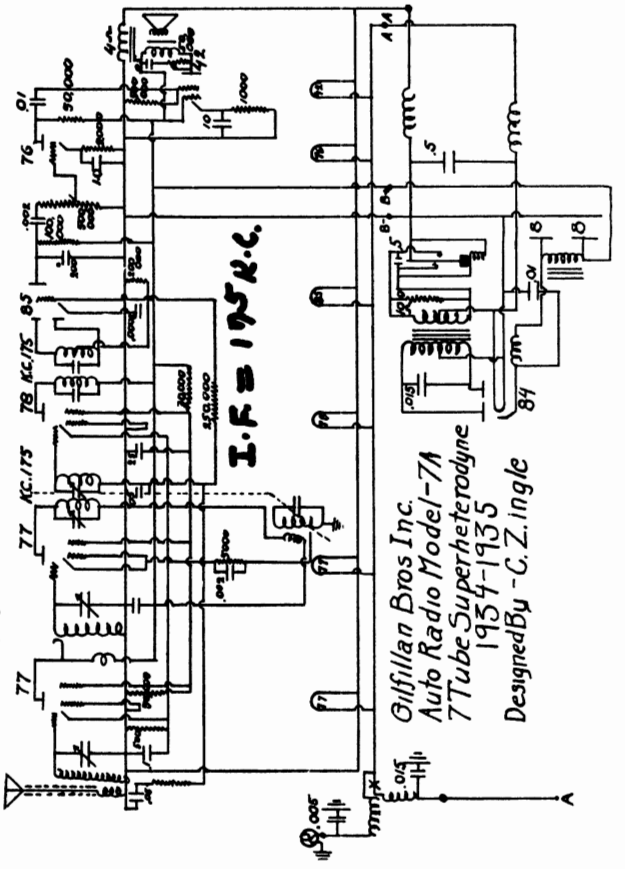
GILFILLIAN BROS., Inc.

Models 4-Tube T.R.F.'s 7-A and 510



4-Tube T.R.F.

4 Tube T.R.F.
1934-1935

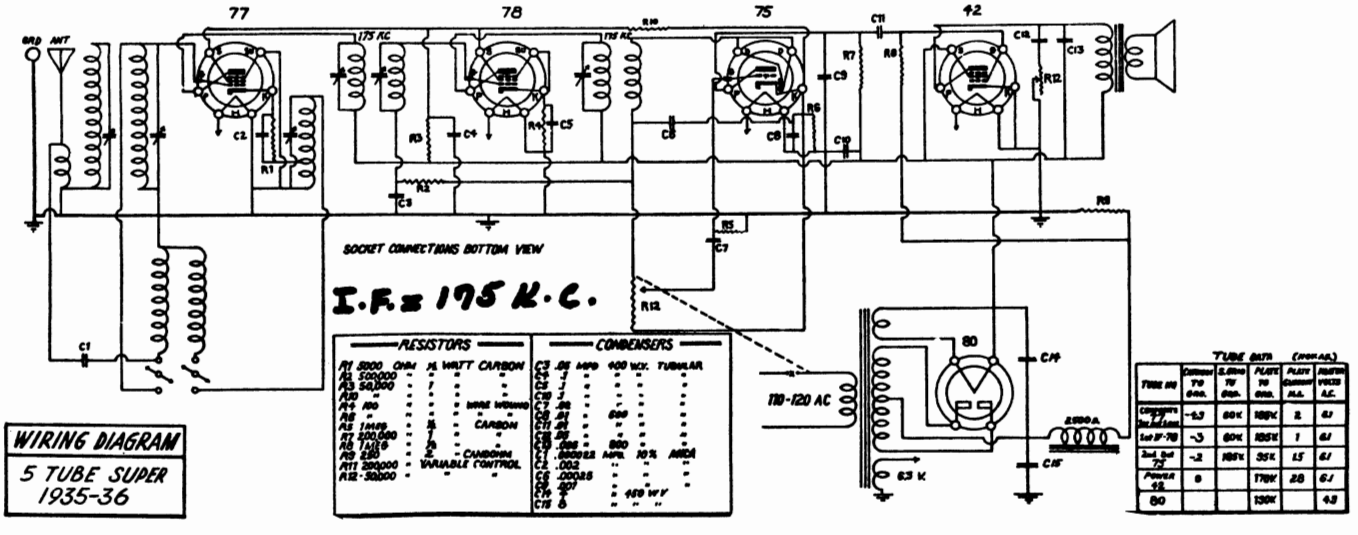


Model 7A

I.F. = 175 K.C.

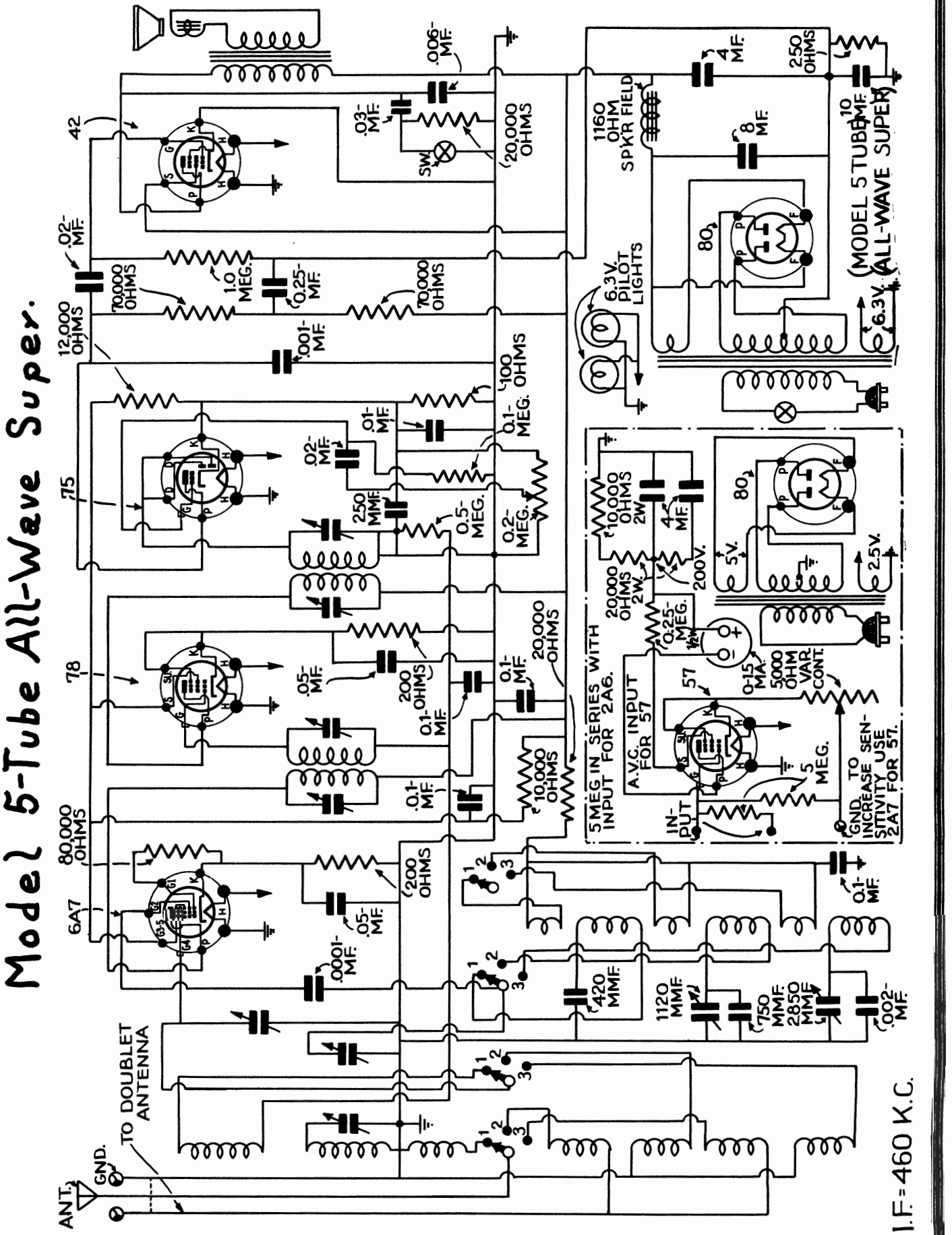
Gilfillan Bros Inc.
Auto Radio Model-7A
7 Tube Superheterodyne
1934-1935
Designed By - C. Z. Ingle

5 TUBE SUPER MODEL 510



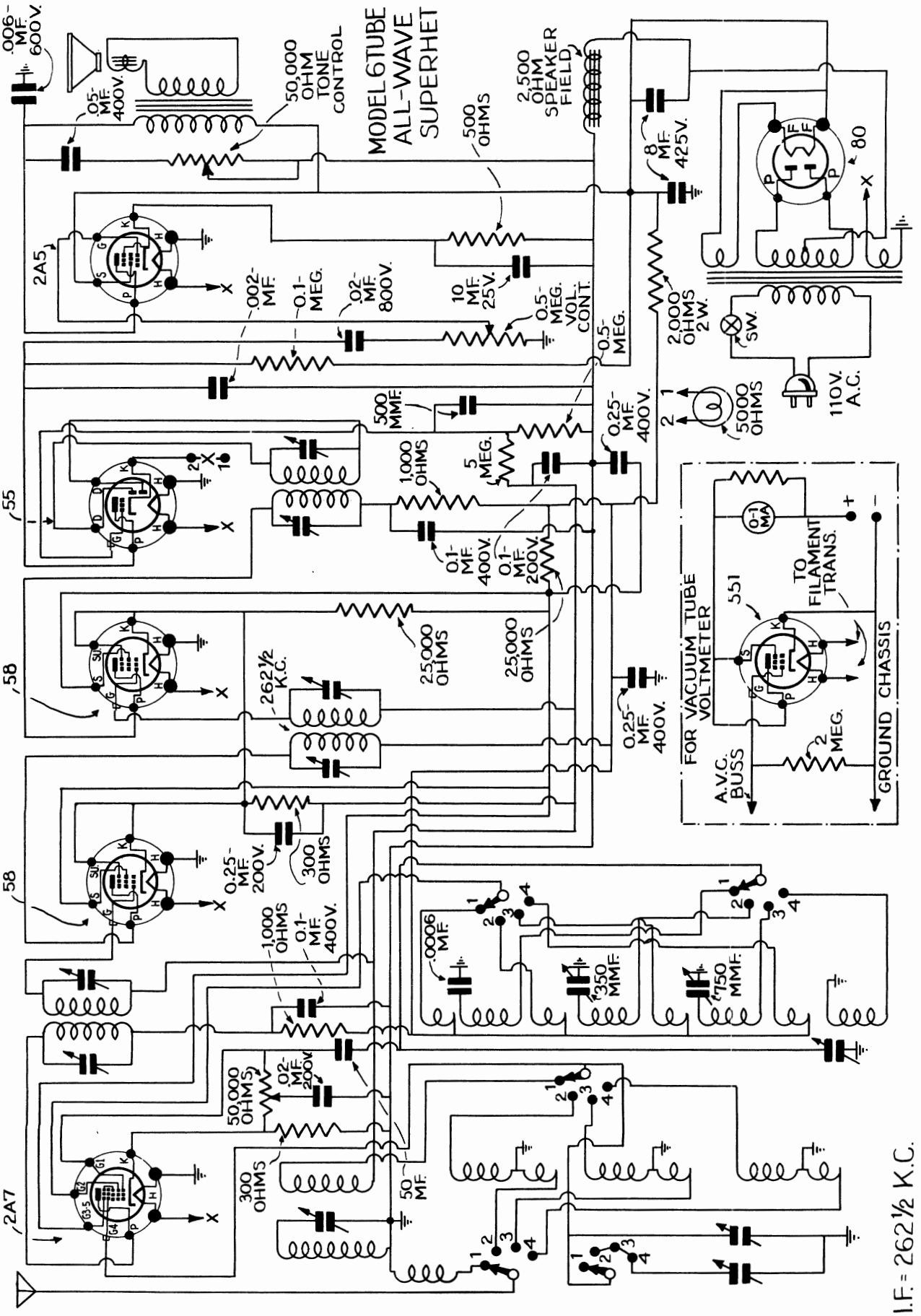
WIRING DIAGRAM
5 TUBE SUPER
1935-36

GILFILLIAN BROS., Inc.

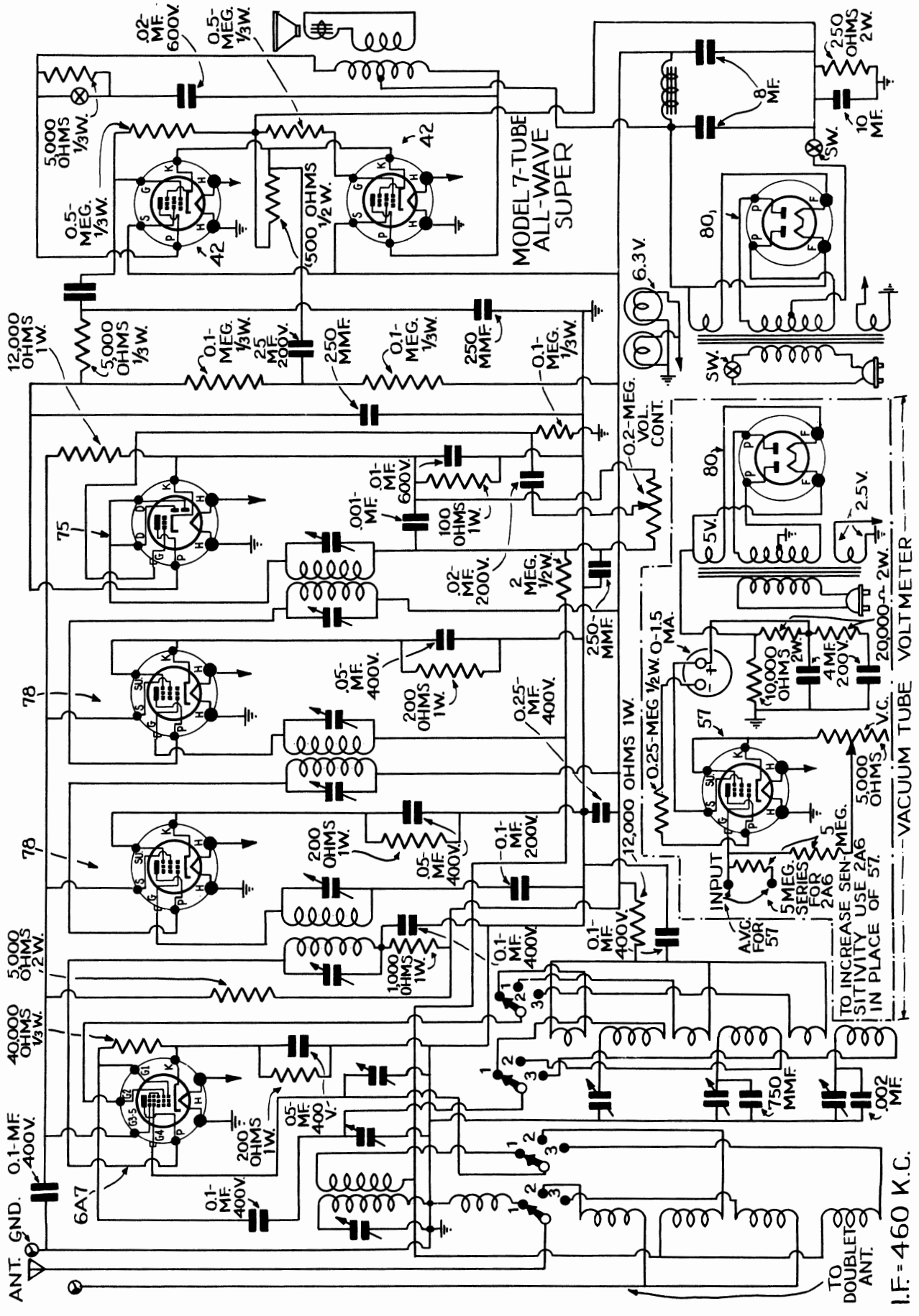


GILFILLIAN BROS., Inc.

Model 6-Tube All-Wave Super

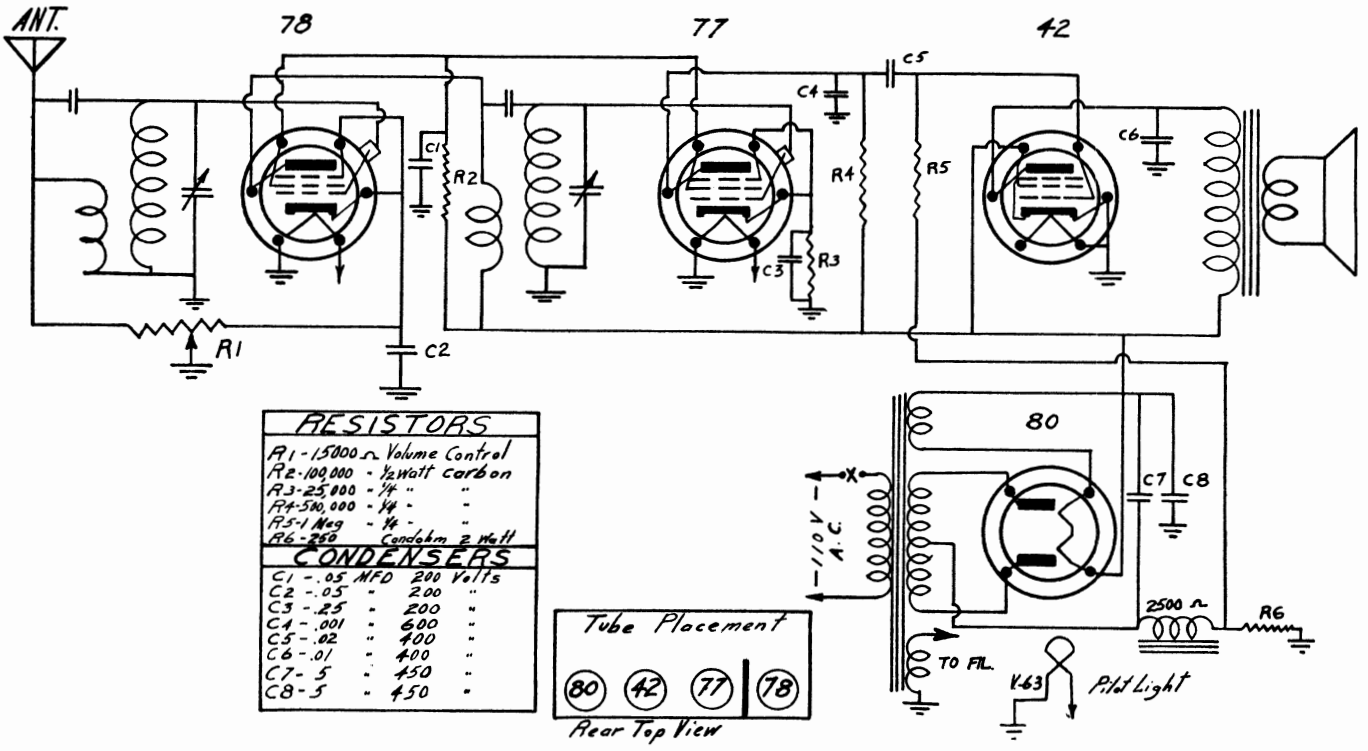


GILFILLIAN BROS., Inc.



GILFILLIAN BROS., Inc.

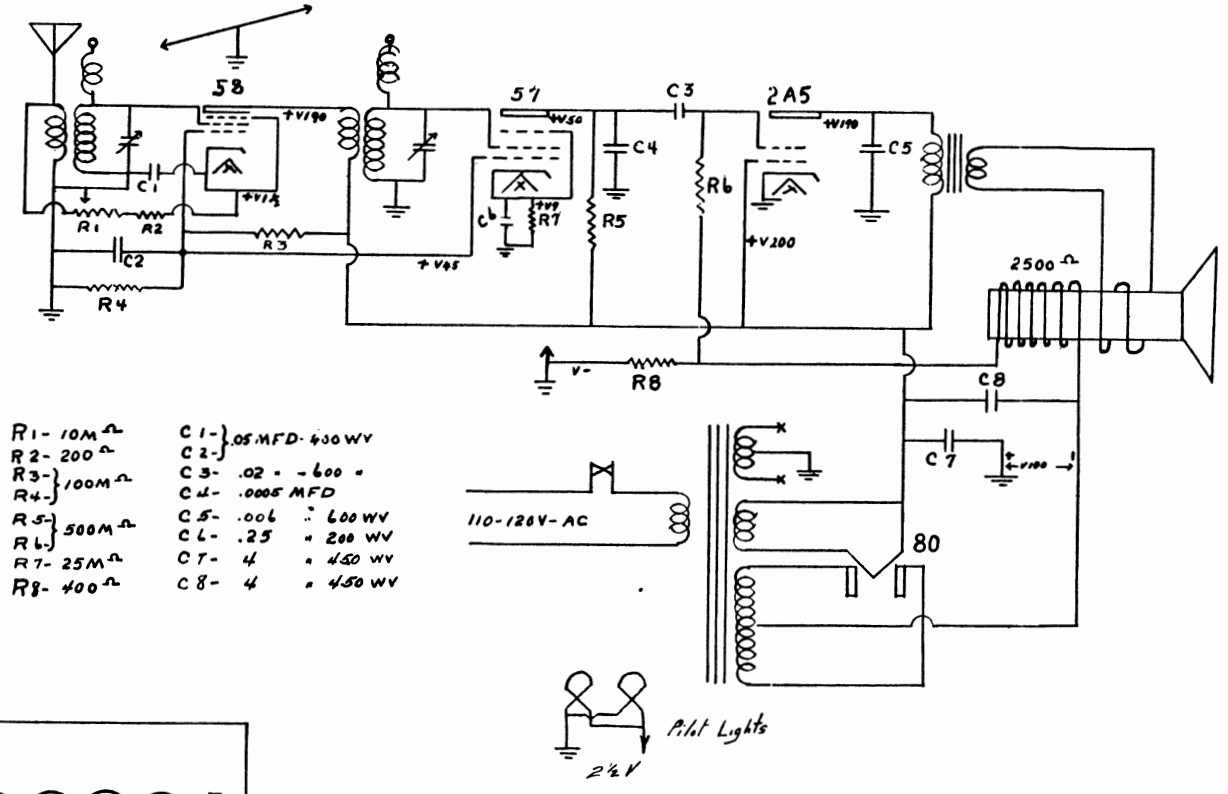
Model 42 A



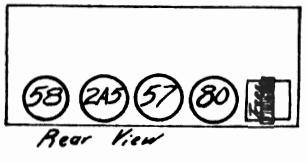
RESISTORS	
R1 - 15000 Ω	Volume Control
R2 - 100,000	½ Watt Carbon
R3 - 25,000	¼ " "
R4 - 500,000	¼ " "
R5 - 1 Meg	¼ " "
R6 - 250	Candohm 2 Watt

CONDENSERS		
C1 - .05 MFD	200	Volts
C2 - .05 "	200	"
C3 - .25 "	200	"
C4 - .001 "	600	"
C5 - .02 "	400	"
C6 - .01 "	400	"
C7 - 5 "	450	"
C8 - 5 "	450	"

Model 43 A

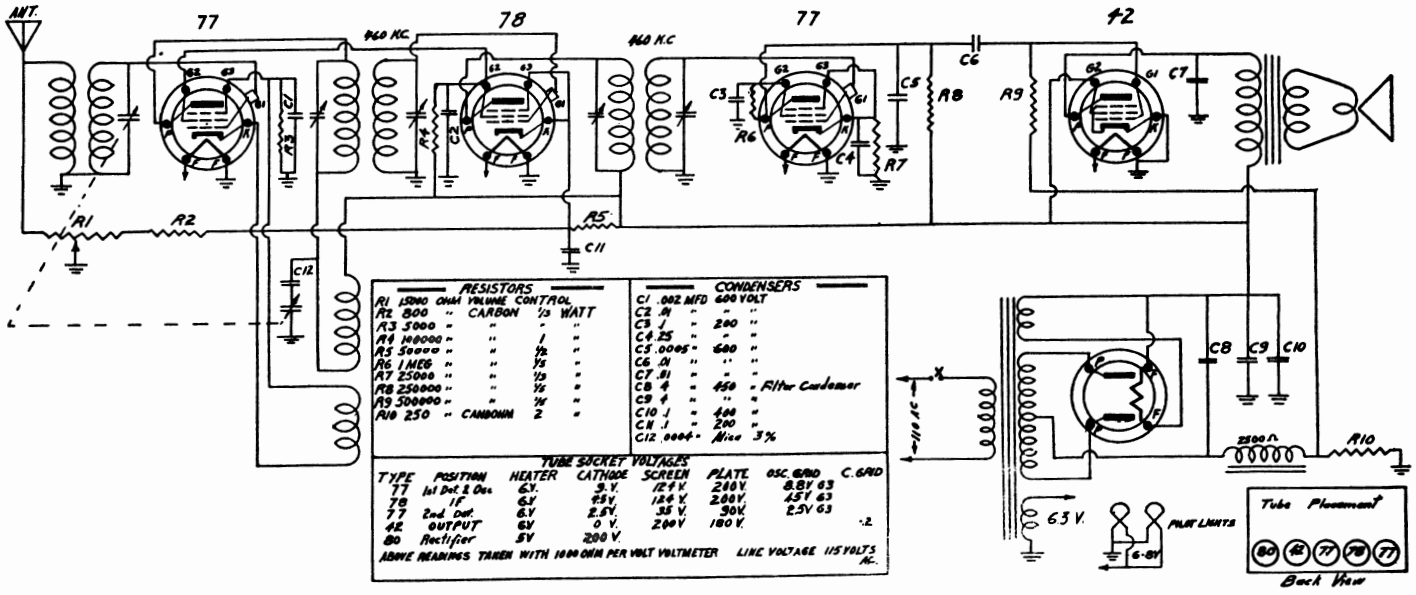


R1 - 10M Ω		C1 - }	.05 MFD - 400 WV
R2 - 200 Ω		C2 - }	
R3 - }	100M Ω	C3 -	.02 " - 600 "
R4 - }		C4 -	.0005 MFD
R5 - }	500M Ω	C5 -	.006 " 600 WV
R6 - }		C6 -	.25 " 200 WV
R7 - 25M Ω		C7 -	4 " 450 WV
R8 - 400 Ω		C8 -	4 " 450 WV



GILFILLIAN BROS., Inc.

Models 52A and 54A



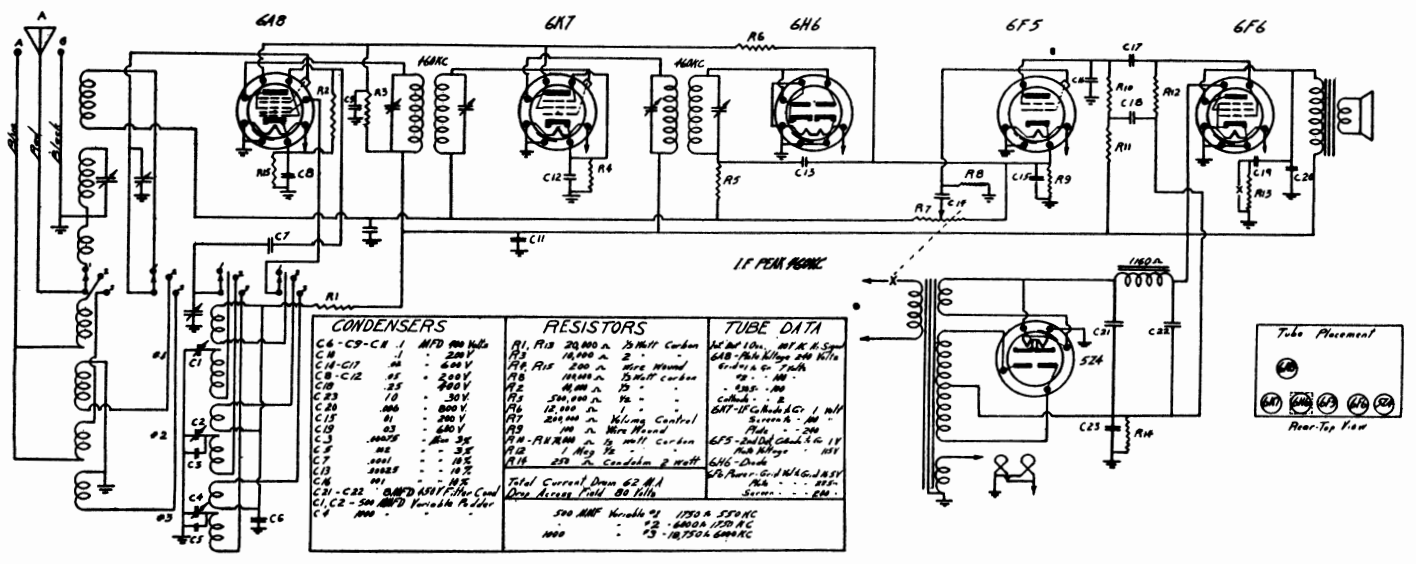
RESISTORS				CONDENSERS			
R1	15000 OHM	VOLUME CONTROL		C1	.002 MFD	600 VOLT	
R2	800 "	CARBON	1/3 WATT	C2	.01 "	" "	
R3	5000 "	"	"	C3	.1 "	200 "	
R4	100000 "	"	1 "	C4	.25 "	" "	
R5	50000 "	"	½ "	C5	.0005 "	600 "	
R6	1 MEG "	"	⅓ "	C6	.01 "	" "	
R7	25000 "	"	⅓ "	C7	.01 "	" "	
R8	250000 "	"	⅓ "	C8	4 "	450 " Filter Condenser	
R9	500000 "	"	⅓ "	C9	4 "	" "	
R10	250 "	CARBON	2 "	C10	.1 "	400 "	
				C11	.1 "	200 "	
				C12	.0004 "	Mica 3%	

TUBE SOCKET VOLTAGES

TYPE	POSITION	HEATER	CATHODE	SCREEN	PLATE	OSC. GRID	C. GRID
77	1st Det. & Osc.	6V.	3V.	125 V.	240 V.	8.8V 63	
78	IF	6V.	3V.	124 V.	240 V.	4.5V 63	
77	2nd Det.	6V.	2.5V.	35 V.	90 V.	2.5V 63	
42	OUTPUT	6V.	0 V.	200 V.	180 V.		-2
80	Rectifier	5V.	280 V.				

ABOVE READINGS TAKEN WITH 1000 OHM PER VOLT VOLTMETER LINE VOLTAGE 115 VOLTS A.C.

Model 63-B — 63-X

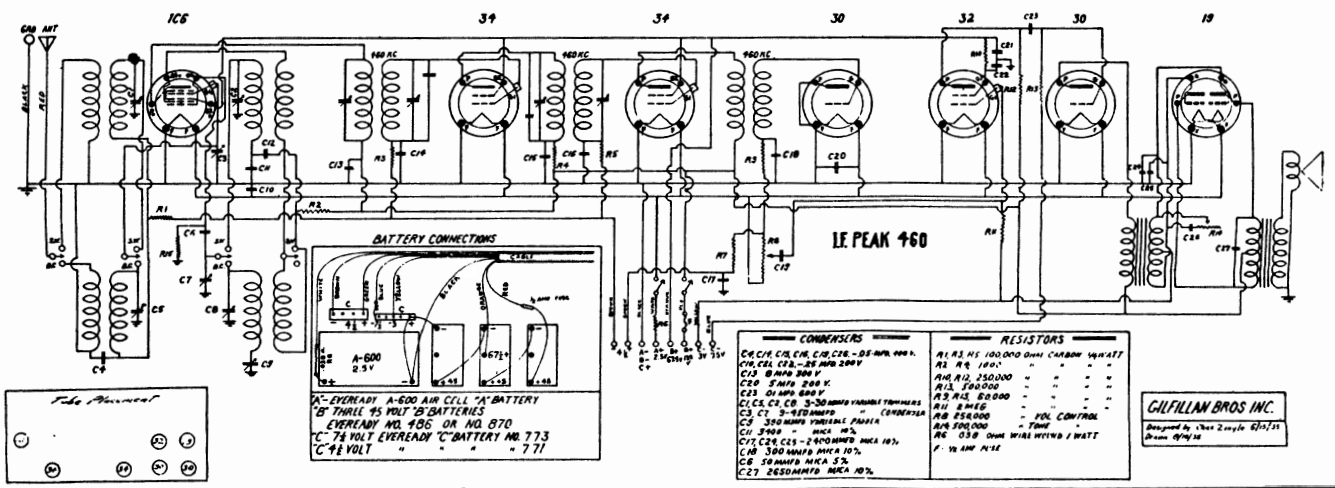


CONDENSERS			RESISTORS			TUBE DATA
C6 - C9 - C14	.1	MFD 400 Volts	R1, R13	20,000 Δ	1/2 Watt Carbon	
C10	"	- 200 "	R2	10,000 Δ	2 " -	
C14 - C17	"	- 600 V	R3, R15	200 Δ	Wire Wound	
C8 - C12	.05	- 600 V	R4	100,000 Δ	1/2 Watt Carbon	
C16	.25	- 400 V	R7	2,500,000 Δ	Volume Control	
C23	.1	- 30 V	R9	100 Δ	Wire Wound	
C18	.006	- 600 V	R10-R11-R12	1/2 watt Carbon		
C15	.01	- 200 V	R14	250 Δ	Condenser 2 watt	
C19	.03	- 600 V				
C3	.000475	- Mica 3%				
C5	.005	- " 3%				
C7	.0001	- " 10%				
C13	.00025	- " 10%				
C24	.001	- " 10%				
C21 - C22	.0005 MFD ASSIT. Mica Cond					
C1, C2	- 500 MMFD Variable Padder					
C4	.000	- -				

Total Current Drain 62 M.A.
Drop Across Field 80 Volts

500 MMF Variable #1 1750 Δ 550 KC
" " #2 - 6000 Δ 1720 KC
1000 " " #3 - 18,750 Δ 6490 KC

7 TUBE BATTERY SET MODEL 77A & 76A

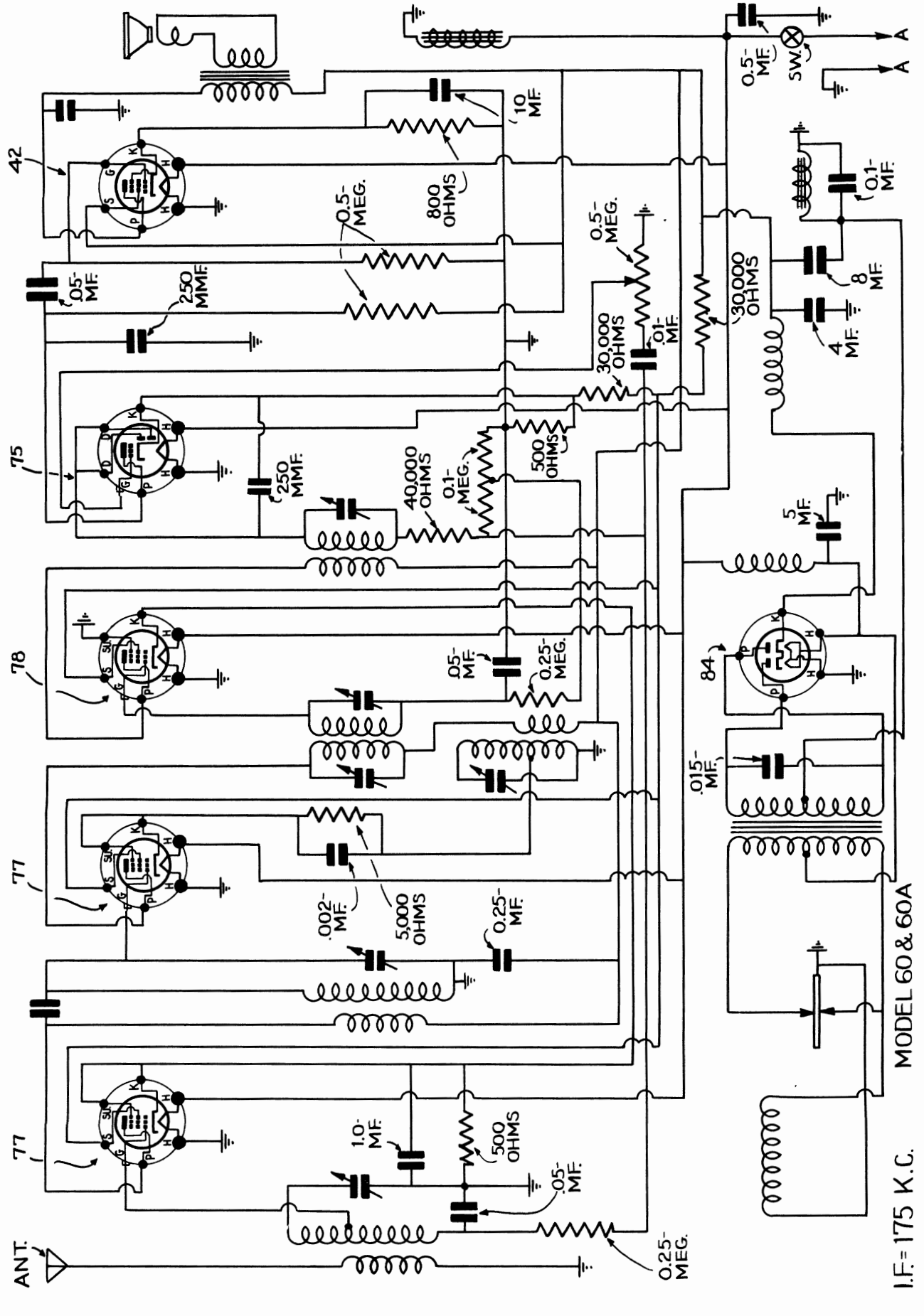


"A"- EVEREADY A-600 AIR CELL "A" BATTERY
"B" THREE 45 VOLT "B" BATTERIES
EVEREADY NO. 486 OR NO. 870
"C" 7½ VOLT EVEREADY "C" BATTERY NO. 773
"C" 4½ VOLT " " " " 771

CONDENSERS	RESISTORS
C6, C9, C11, C14, C18, C20 - .05 MFD. 400 V.	R1, R3, R5 100,000 OHMS CARBON 1/2 WATT
C10, C21, C22 - .25 MFD 200 V.	R2 R9 100 " " " "
C13 8 MFD 300 V.	R4, R12, 250,000 " " " "
C20 5 MFD 200 V.	R13 100,000 " " " "
C23 .01 MFD 600 V.	R5, R15, 50,000 " " " "
C1, C2, C3, C8 3-30 MMFD VARIABLE TRIMMERS	R11 5 MEG " " " "
C3, C7 3-570 MMFD " CONDENSER	R8 250,000 - VOL CONTROL
C5 350 MMFD VARIABLE PADDER	R10 500,000 - TAPP "
C11 .3400 " MICA 10%	R6 930 OHMS WIRE WOUND 1 WATT
C12, C24, C25 - 2400 MMFD MICA 10%	F - 1½ AMP FUSE
C16 300 MMFD MICA 10%	
C6 50 MMFD MICA 5%	
C27 2650 MMFD MICA 10%	

Designed by Chas Zeagler 6/27/35
Drawn 6/29/35

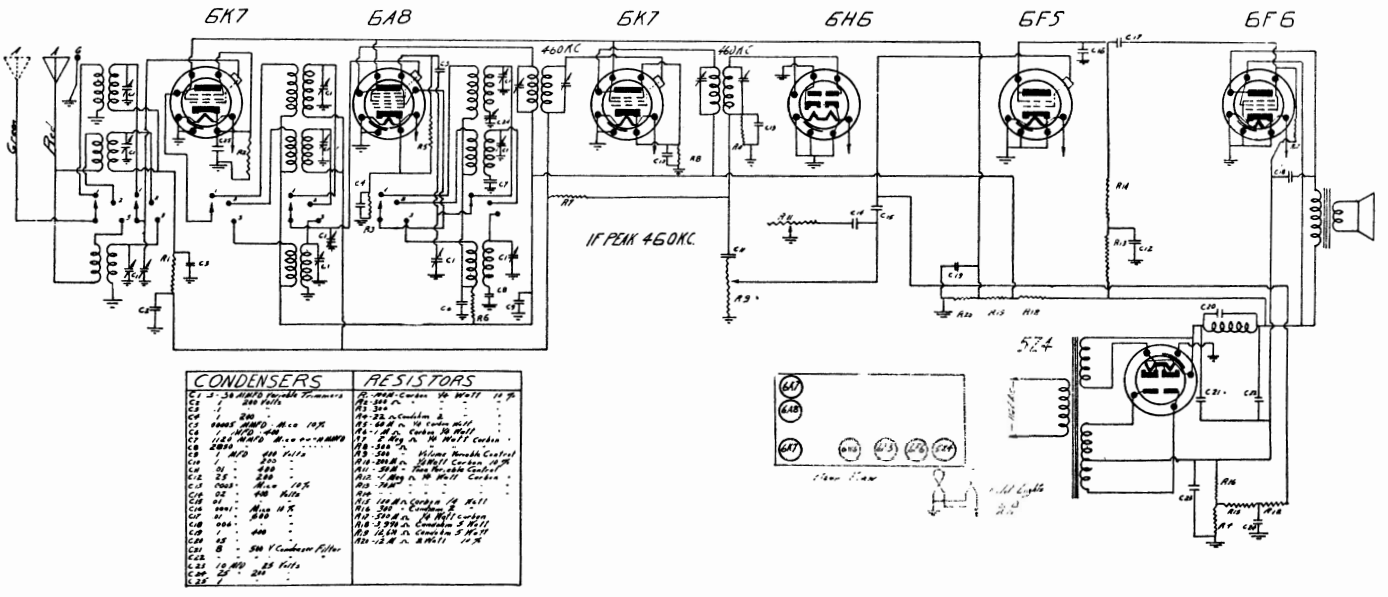
GILFILLIAN BROS., Inc.



GILFILLIAN BROS., Inc.

Model 78B-78X

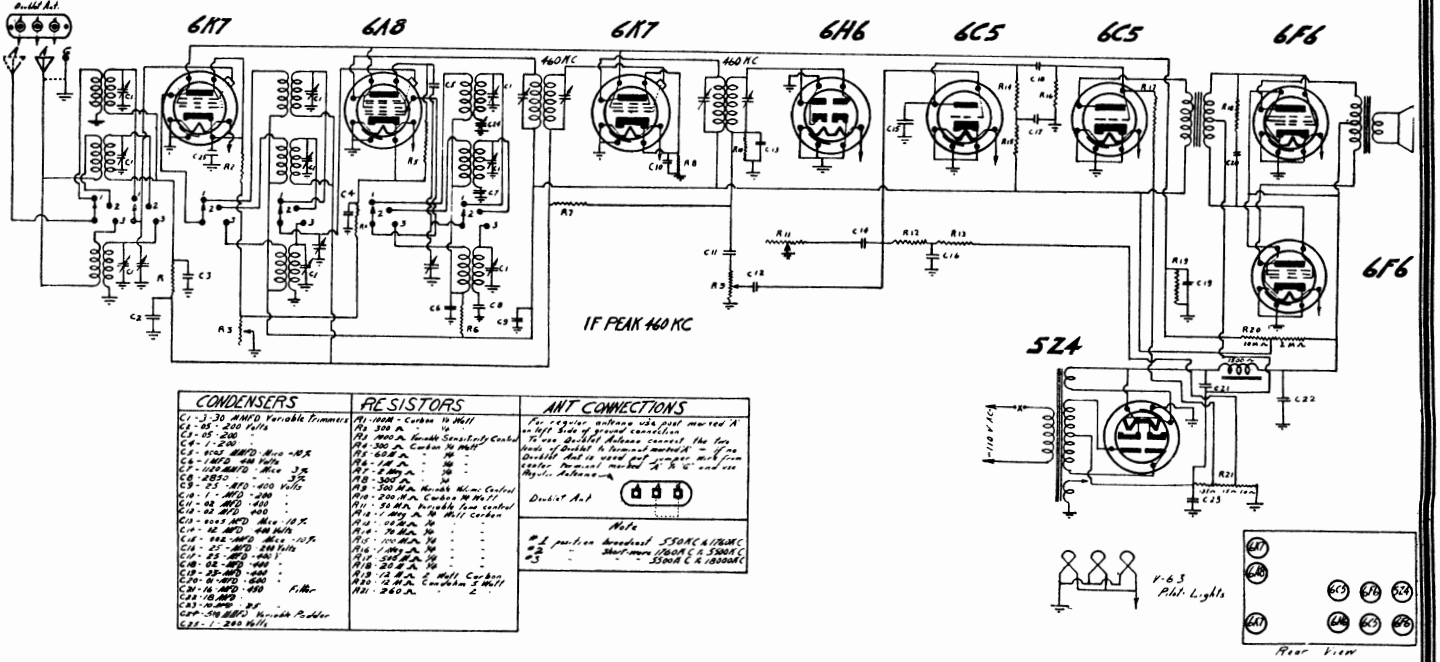
7 TUBE ALL-WAVE



CONDENSERS	RESISTORS
C1 - 3-30 MMFD Variable Trimmers	R1 - 1000 Ω - Carbon ½ Watt - 10%
C2 - .05 - 200 Volts	R2 - 300 Ω - " - "
C3 - .05 - 200 "	R3 - 300 Ω - " - "
C4 - .1 - 200 "	R4 - 75 Ω - Carbon ½ "
C5 - 100 MMFD - Mica - 10%	R5 - 1 Meg Ω - Volume Variable Control
C6 - .1 MFD - 400 Volts	R6 - 250 Ω - Carbon ½ Watt - 10%
C7 - 520 MMFD - Mica - 3%	R7 - 2 Meg Ω - ½ Watt Carbon
C8 - 250 " - " - 3%	R8 - 300 Ω - " - "
C9 - .05 - MFD - 400 Volts	R9 - 300 Ω - " - "
C10 - .1 - MFD - 400 "	R10 - 250 M Ω - Carbon ½ Watt
C11 - .02 - MFD - 400 "	R11 - 50 M Ω - Variable Tone Control
C12 - .02 MFD - 400 "	R12 - 1 Meg Ω - ½ Watt Carbon
C13 - 100 MMFD - Mica - 10%	R13 - 1 Meg Ω - " - "
C14 - .1 - MFD - 400 Volts	R14 - 1 Meg Ω - ½ " - "
C15 - .002 - MFD - Mica - 10%	R15 - 600 Ω - " - "
C16 - .05 - MFD - 200 Volts	R16 - 1 Meg Ω - " - "
C17 - .05 - MFD - 400 "	R17 - 2 Meg Ω - " - "
C18 - .02 - MFD - 400 "	R18 - 300 Ω - " - "
C19 - .05 - MFD - 400 "	R19 - 250 M Ω - Volume Variable Control
C20 - .1 - MFD - 400 "	R20 - 250 M Ω - Carbon ½ Watt
C21 - .16 MFD - 400 "	R21 - 50 M Ω - Variable Tone Control
C22 - .16 MFD - "	R22 - 1 Meg Ω - ½ Watt Carbon
C23 - 1 MFD - "	R23 - 1 Meg Ω - " - "
C24 - .5 MFD - "	R24 - 1 Meg Ω - " - "
C25 - 1 - 200 Volts	R25 - 100 M Ω - " - "
	R26 - 1 Meg Ω - " - "
	R27 - 1 Meg Ω - " - "
	R28 - 250 Ω - " - "
	R29 - 1/2 Ω - 2 Watt Carbon
	R30 - 12 M Ω - Carbon ½ Watt
	R31 - 260 Ω - " 2 "

Models 96B-96X and 97B-97X

9 TUBE ALL-WAVE



CONDENSERS	RESISTORS	ANT CONNECTIONS
C1 - 3-30 MMFD Variable Trimmers	R1 - 1000 Ω - Carbon ½ Watt	For regular antenna use post marked A at left side of panel connection. To use Doublet Antenna connect the two leads of Doublet to terminals marked A - G. Doublet Ant is used for longer wave reception. Terminal marked A & G are used for Aerial Antenna.
C2 - .05 - 200 Volts	R2 - 300 Ω - " - "	
C3 - .05 - 200 "	R3 - 1000 Ω - Variable Sensitivity Control	
C4 - .1 - 200 "	R4 - 300 Ω - Carbon ½ Watt	
C5 - 1000 MMFD - Mica - 10%	R5 - 600 Ω - " - "	
C6 - .1 MFD - 400 Volts	R6 - 1 Ω - " - "	
C7 - 520 MMFD - Mica - 3%	R7 - 2 Meg Ω - " - "	
C8 - 250 " - " - 3%	R8 - 300 Ω - " - "	
C9 - .05 - MFD - 400 Volts	R9 - 300 Ω - " - "	
C10 - .1 - MFD - 400 "	R10 - 250 M Ω - Volume Control	
C11 - .02 - MFD - 400 "	R11 - 50 M Ω - Variable Tone Control	
C12 - .02 MFD - 400 "	R12 - 1 Meg Ω - ½ Watt Carbon	
C13 - 100 MMFD - Mica - 10%	R13 - 1 Meg Ω - " - "	
C14 - .1 - MFD - 400 Volts	R14 - 1 Meg Ω - " - "	
C15 - .002 - MFD - Mica - 10%	R15 - 600 Ω - " - "	
C16 - .05 - MFD - 200 Volts	R16 - 1 Meg Ω - " - "	
C17 - .05 - MFD - 400 "	R17 - 2 Meg Ω - " - "	
C18 - .02 - MFD - 400 "	R18 - 300 Ω - " - "	
C19 - .05 - MFD - 400 "	R19 - 1/2 Ω - 2 Watt Carbon	
C20 - .1 - MFD - 400 "	R20 - 12 M Ω - Carbon ½ Watt	
C21 - .16 MFD - 400 " Filter	R21 - 260 Ω - " 2 "	
C22 - .16 MFD - "		
C23 - 1 MFD - "		
C24 - .5 MFD - "		
C25 - 1 - 200 Volts		

Note
* 2 position broadcast 550 KC & 1720 KC
** 3 " Short wave 1720 KC & 5500 KC
*** " 5500 KC & 18000 KC

ALIGNING PROCEEDURE

Model 116X-117X

(1) If set is weak, first check all tubes.

(2) If set does not oscillate properly on all bands, change 6A8 tube.

(3) If calibration is off from 1050 K.C. to 550 K.C. on broadcast band, variable padder has moved. It will not be necessary to completely re-balance. Variable padder is located on front of chassis under band indicator.

To re-adjust padder move variable condenser until dial reads 600 K.C. Adjust padder slowly until stations or signal on 600 K.C. calibrated on dial.

FOR COMPLETE RE-ALIGNING

A good all wave oscillator and vacuum tube voltmeter is necessary.

(1) First connect vacuum tube voltmeter to A.V.C. bus.

(2) To balance I.F.'s set oscillator on 460 K.C. and feed output of oscillator into grid of 6A8. Turn I.F. trimmers slowly for maximum gain on vacuum tube voltmeter. Do not re-balance unless you are sure I.F.'s are out of line as they have been balanced for maximum gain at factory with crystal oscillator.

(3) Disconnect oscillator from set and connect to antenna to balance broadcast band, leaving vacuum tube voltmeter connected to set. Calibrate low frequency end of dial with variable padder; to calibrate high frequency end of broadcast band use trimmer located on coil assembly (see trimmer placement) and set dial on 1300 K.C.; adjust trimmer slowly until station or signal on 1300 K.C. calibrates at this point. (It is not necessary to use 1300 K.C. exactly but any signal near this frequency can be used for calibrating so long as dial is first set correct frequency.) Then balance R.F. and antenna coil trimmers for maximum gain.

BROADCAST AND SHORTWAVE TRIMMER PLACEMENT

With chassis in upright position and power transformer resting on bench, the trimmers are located on coil assembly as follows:

First coil section trimmers are on oscillator coils. No. 1 trimmer is used for calibrating high frequency end of red band (16-50 meters). No 2 trimmer is used for calibrating green band (50-200 meters). No. 3 trimmer is for calibrating high frequency end of broadcast band.

Second coil assembly section trimmers are on R.F. coils. No. 1 trimmer used to balance R.F. coil on red band. No. 2 trimmer used to balance R.F. coil on green band. No. 3 trimmer to balance R.F. coil on broadcast band.

Third coil assembly section trimmers are used to balance antenna coils. No. 1 trimmer red band. No. 2 trimmer green band. No. 3 trimmer broadcast band.

RED BAND 16-50 METERS

Before recalibrating and balancing check calibration on a good short wave station signal; W8XK during the day time should calibrate near 15210 K.C. and 11870 K.C.

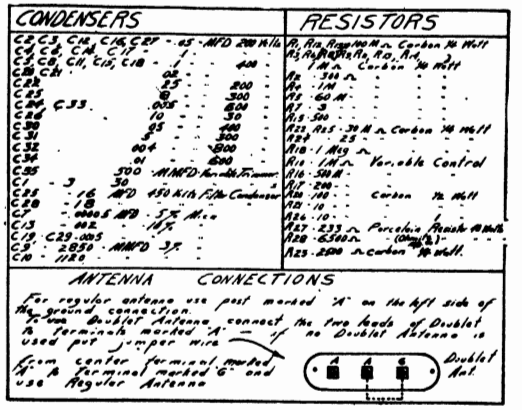
To recalibrate set service oscillator on 15,000 K.C. and connect to antenna. Adjust oscillator trimmer until signal hits on 15,000 K.C. then adjust R.F. and antenna coil trimmers for maximum gain with vacuum tube voltmeter.

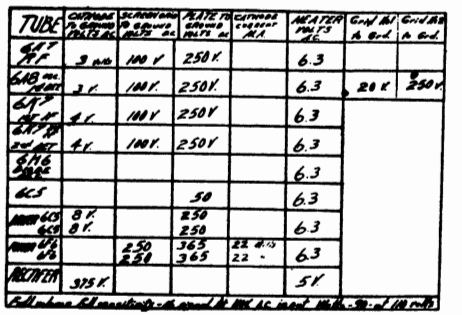
GREEN BAND 50-200 METERS

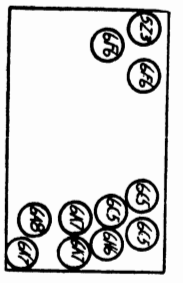
Set Service oscillator on 3600 K.C. and adjust oscillator trimmer for calibrating dial to 3600 K.C., then adjust R.F. and antenna trimmers for maximum gain on vacuum tube voltmeter.

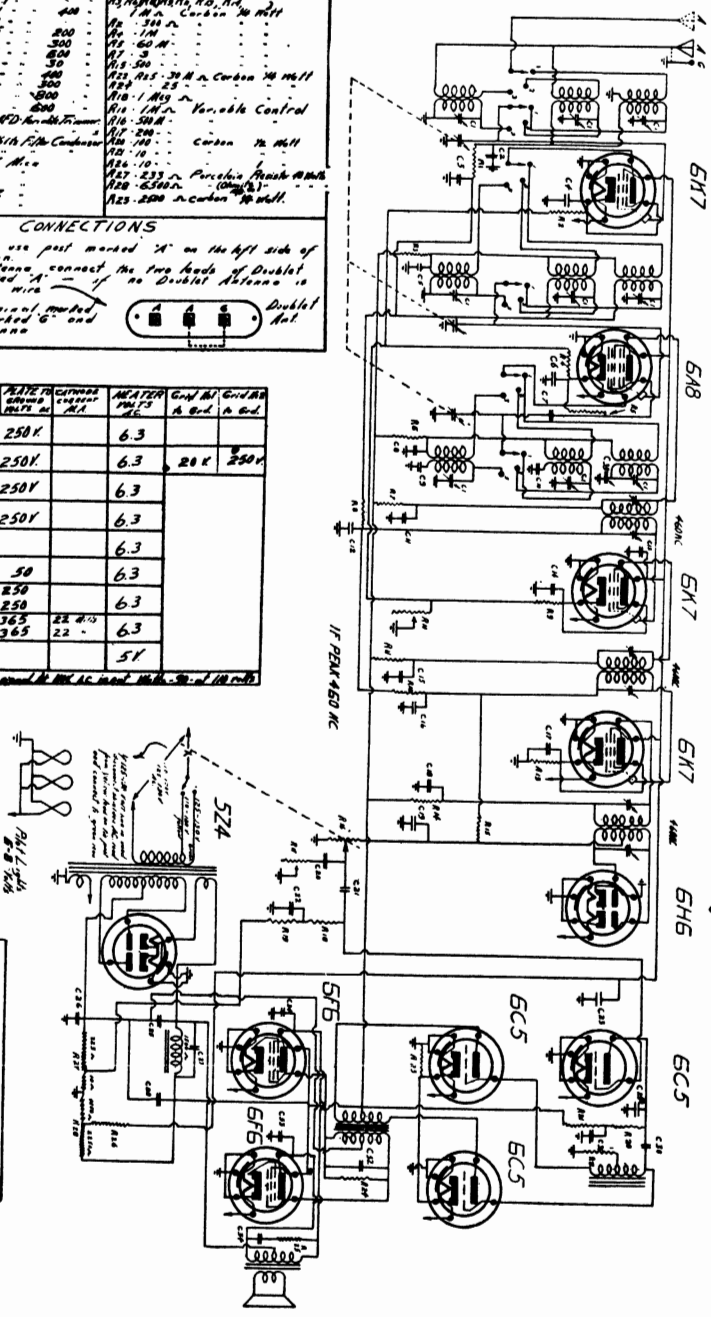
Short wave bands have been calibrated and balanced at factory with crystal oscillators.

(Do not bend variable condenser plates.)

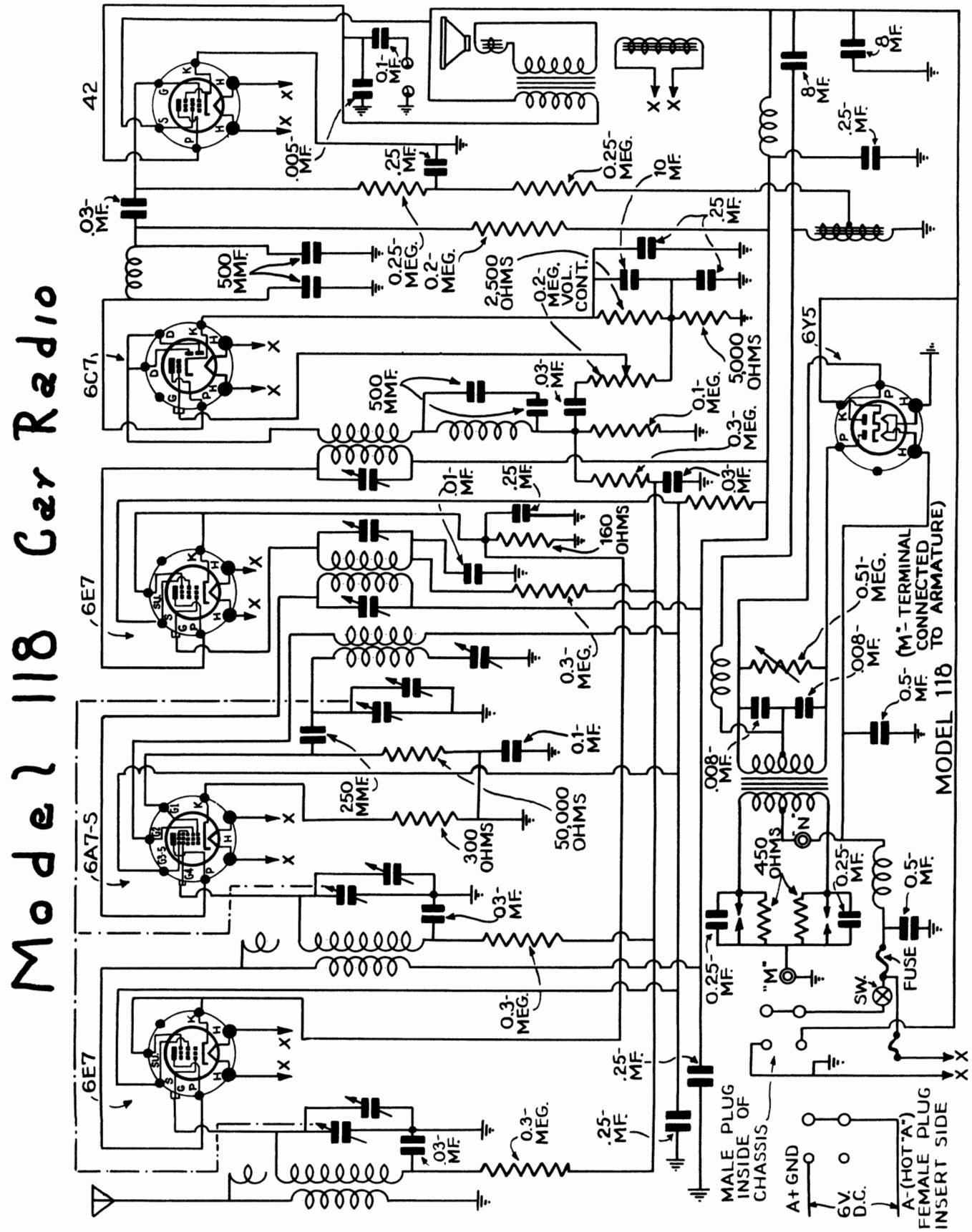






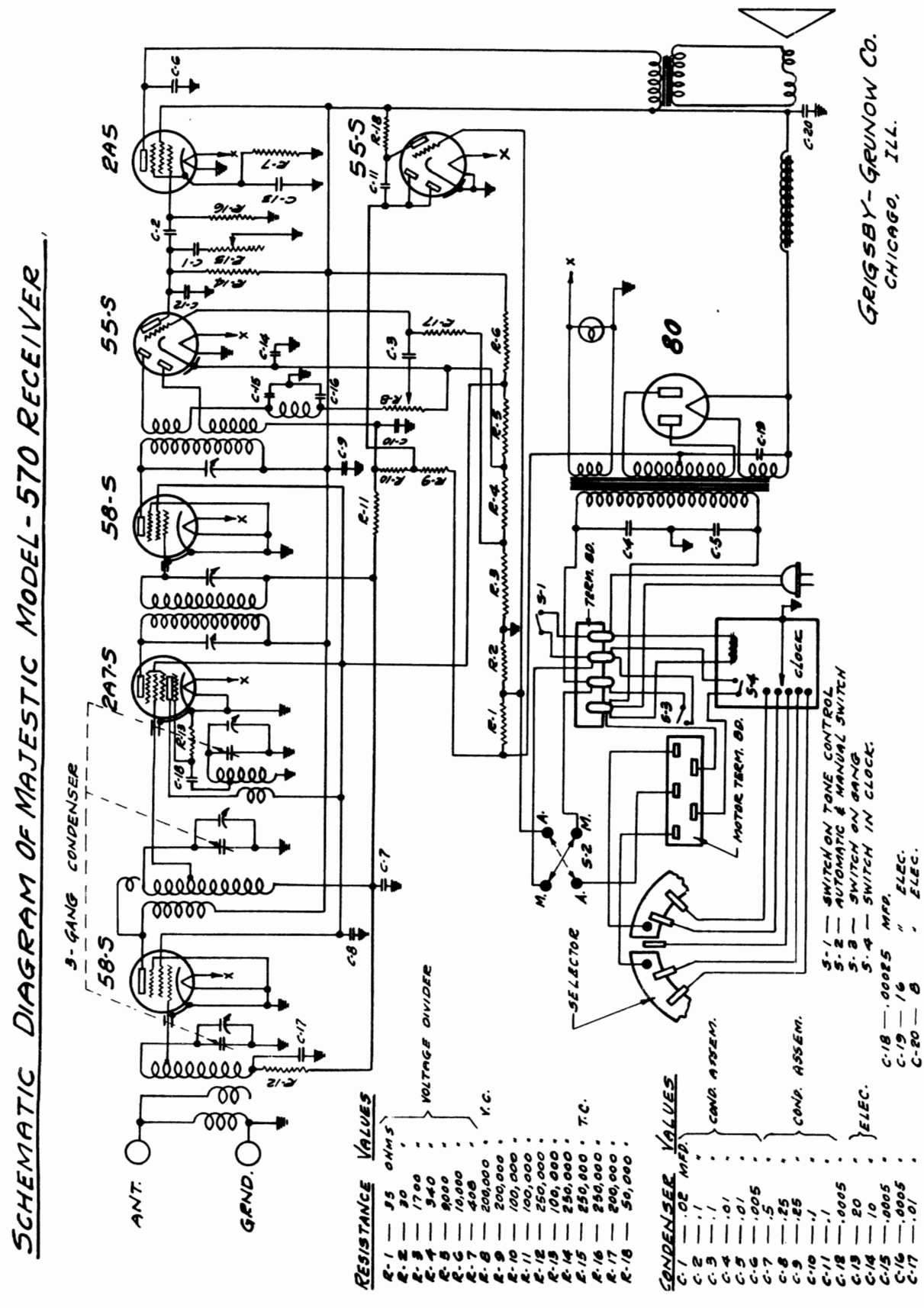


GRIGBY-GRUNOW CO.



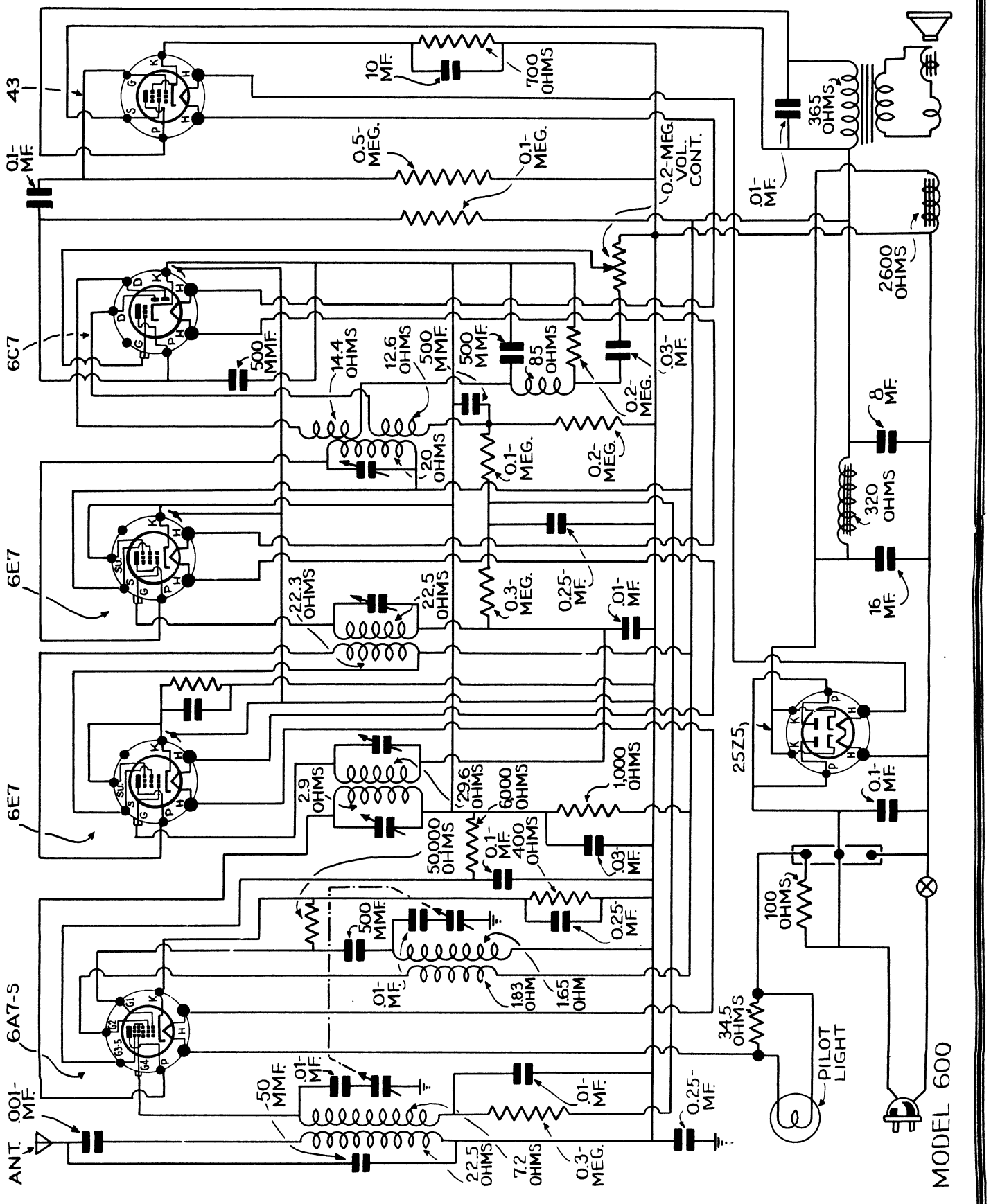
GRIGBY-GRUNOW CO.

Model 570 Automatic



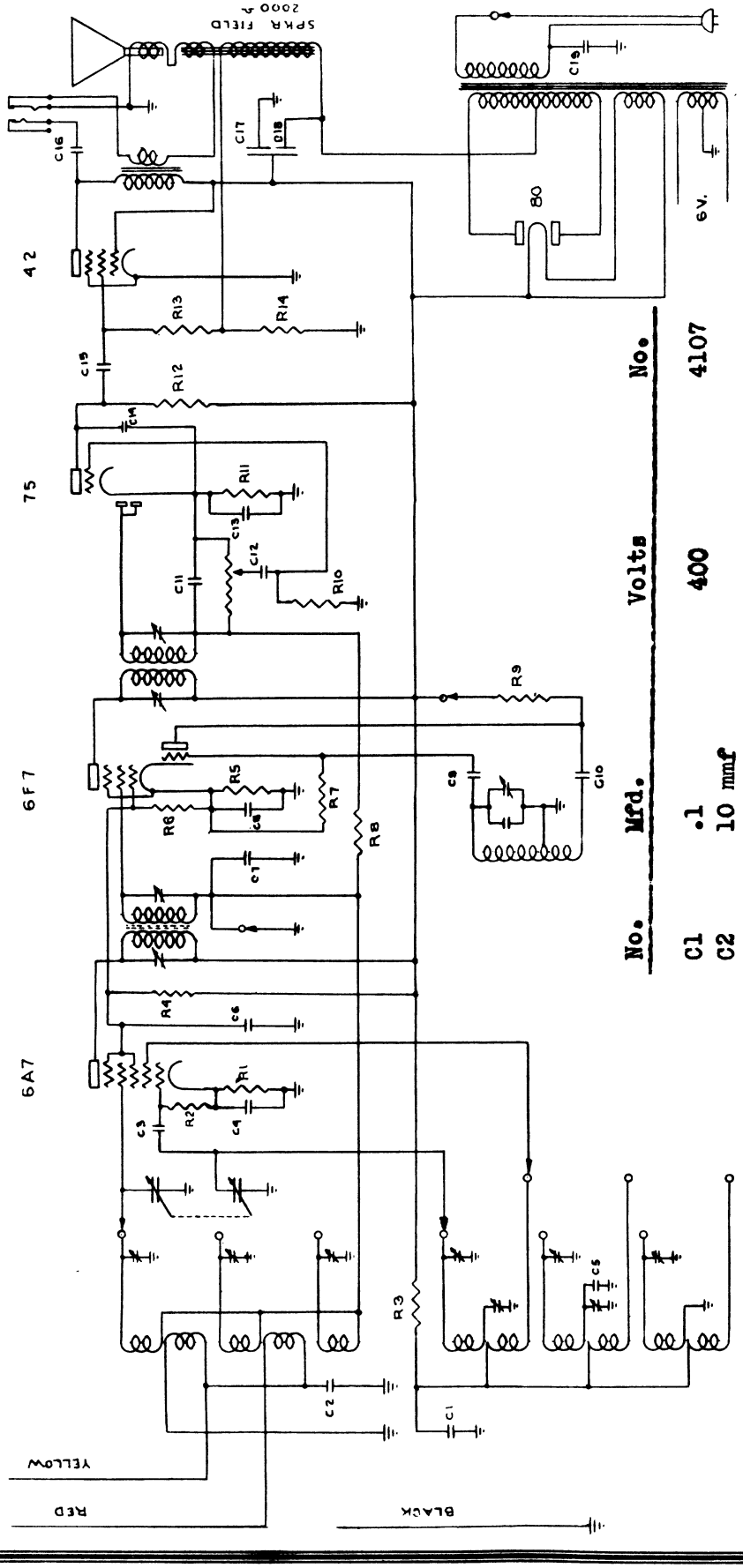
GRIGBY-GRUNOW CO.

Model 600



HALLICRAFTERS, INC.

Model 5PA "SKY-BUDDY"



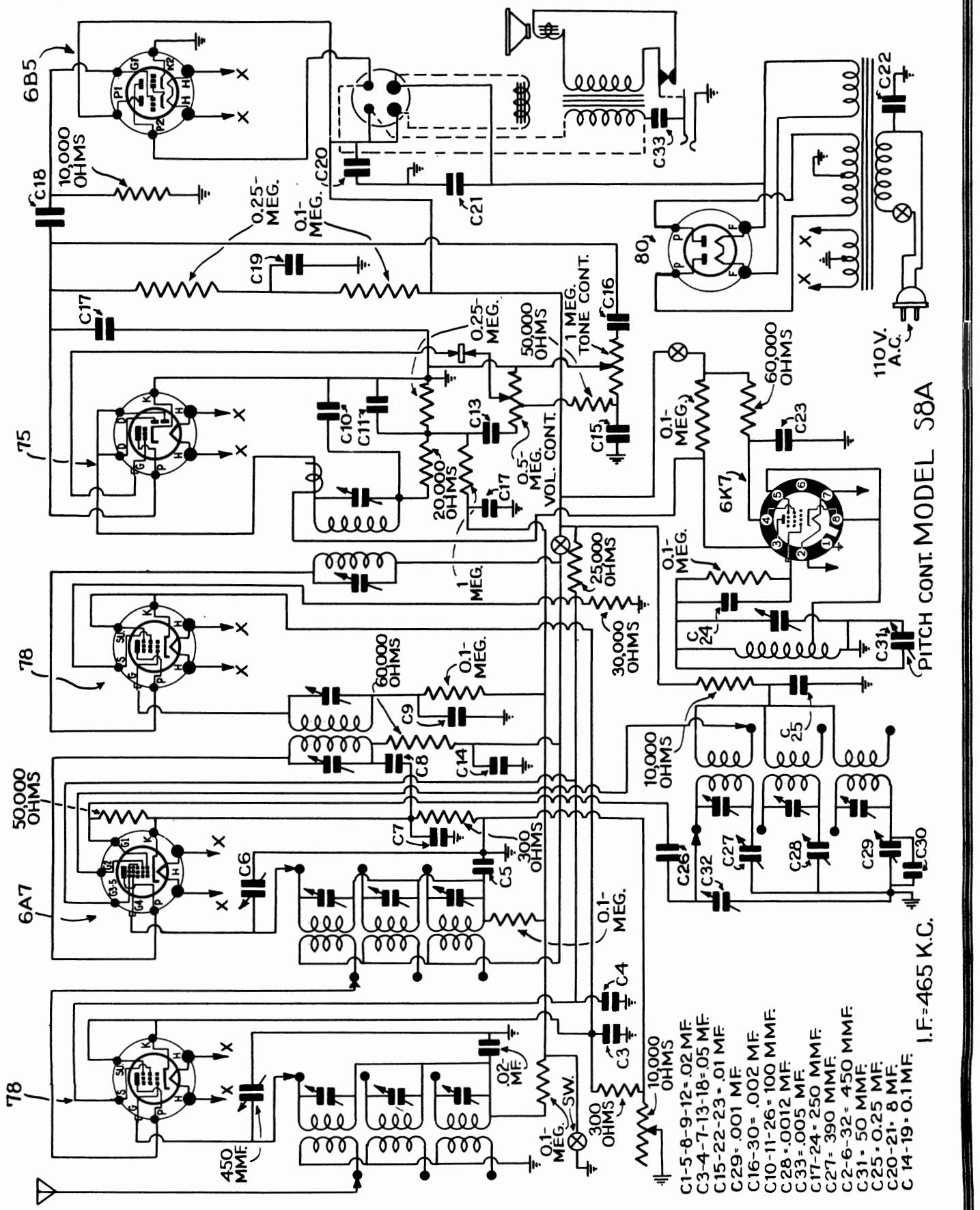
No. 1 Band - 1680 KC to 545 KC
No. 2 Band - 1680 KC to 5.5 MC
No. 3 Band - 5.5 MC to 16 MC

No.	Mfd.	Volts	No.
C1	.1	400	4107
C2	10 mmf		
C3	100 mmf		
C4	.1	200	4003
C5	1000 mmf		4106
C6	.1	400	4102
C7	.05	200	4107
C8	.1	200	4104
C9	250		4106
C10	.01	400	4007
C11	250 mmf		4101
C12	.01	400	4007
C13	.1	200	4101
C14	250 mmf		4106
C15	.01	400	4007
C16	.05	400	4101
C17	8.mfd		4105
C18	4.mfd		4214
C19	.01	400	4101

No.	Ohms	No.
R1	250	2217 - 10%
R2	30,000	2078
R3	25,000	2074
R4	25,000	2074
R5	200	2214 - 10%
R6	25,000	2074
R7	100,000	2093
R8	1 meg	2108
R9	100,000	2093
R10	1 meg	2108
R11	4000	2061
R12	250,000	2099
R13	400,000	2117
R14	250	2413 - Wire

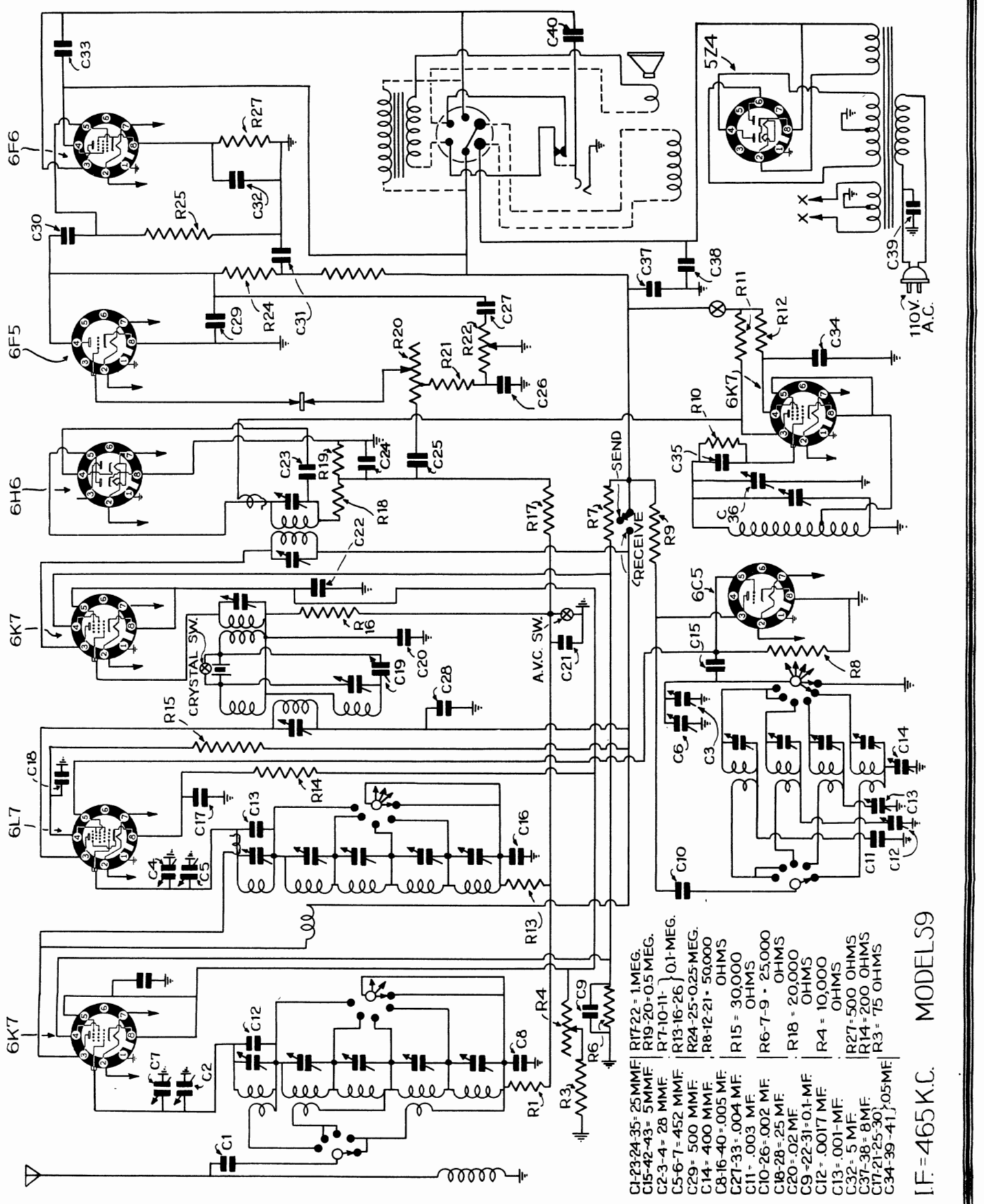
HALLICRAFTERS, INC.

Model S8A Communications Set



HALLICRAFTERS, INC.

Model S-9 Super SKYRIDER



HAMMARLUND MFG. CO.

MAINTENANCE INSTRUCTIONS FOR "SUPER PRO"

GENERAL – The receiver has been carefully inspected and adjusted and servicing is not generally necessary over long periods of operation. Vacuum tubes should be tested at regular intervals and those indicating low sensitivity should be replaced. All adjustments originally were made with R.C.A. tubes and it is strongly recommended that the same type tubes be used for replacement purposes.

If the receiver becomes completely inoperative, it may be due to a shorted filter or by-pass condenser or an open resistor. By measuring voltages and comparing them with the tabulations in the chart, the defective parts can be easily determined. We do not believe that detailed continuity tests should be described since most operators are familiar with the ordinary procedure for determining defective component parts. In both receiver and power supply units, the bottom cover plates may be removed so that all parts are accessible. Values of any resistor or capacitor may be obtained by locating the number on the schematic wiring diagram, and referring to the parts list.

ALIGNMENT – The receiver has been accurately aligned at the factory and under normal operating conditions, should retain this adjustment indefinitely. When replacing tubes or making periodical inspections, it may be desirable to check the alignment. Removing the dust cover and bottom cover plate of the receiver, will make all adjustment easily accessible. The many tuned circuits requiring adjustment may make the alignment procedure appear complicated but if the following instructions are carefully carried out, no difficulty should be experienced in obtaining the optimum performance of the receiver. CAUTION – Any changes in re-alignment from original setting will be relatively small and extreme care should be exercised when checking adjustments. This is especially

true of the H.F. Oscillator circuits S,T,W,X, and Y. Do not manipulate the insulated screw driver indiscriminately.

EQUIPMENT REQUIRED

1 – TEST OSCILLATOR – An accurately calibrated instrument producing modulated signals covering a range of 465 K.C. to 20 M.C. This test oscillator should have an output of the order of 100 micro-volts and an output impedance of 100 Ohms for best results when aligning the R.F. and H.F. Oscillator circuits. For I.F. alignment these values are not critical. The frequency calibration of the test oscillator is extremely important, if the receiver alignment is to be correct.

2 – OUTPUT METER – This meter should respond to the modulation frequency of the test oscillator and should provide at least half-scale deflection for one volt.

3 – INSULATED SCREW DRIVER (9/64" wide – .025" thick at bit)

PRELIMINARY PROCEDURE

Place the "ON-OFF" switch in the "ON" position and allow the receiver to warm up approximately one hour before beginning adjustments. Turn the knurled thumb nuts located on the tops of coil assemblies D.D.-E.E. and H.H. until the tops of the thumb nuts are flush with the tops of the threaded rods. Connect the output meter to the "PHONES" terminals located at the rear of the receiver chassis.

I.F. - A.V.C. - BEAT OSC. ALIGNMENT

Adjust the test oscillator to 465 K.C. and connect the output to the control grid of the 1st Detector tube (6A7) through a fixed condenser. Front panel controls should be set as follows:

R.F. Gain Control MINIMUM (turn full left)
I.F. Gain Control MINIMUM (turn full left)
A.V.C. – MANUAL switch on "MANUAL"

C.W. – M.O.D. – switch on "MOD"
PHONES – SPEAKER Switch on "PHONES"
SEND-RECEIVE Switch on "RECEIVE"
BAND SWITCH on 540-1160 K.C.
AUDIO GAIN CONTROL MAXIMUM (turn full right)
TONE CONTROL (turn full left)
SELECTIVITY (turn full left)
BAND SPREAD DIAL set on 100

MAIN TUNING DIAL set near low frequency end of scale, being careful not to conflict with a powerful local signal. Adjust the I.F. gain control so that a reading of approximately one volt is obtained on the output meter. As the various circuits are adjusted for resonance reduce the I.F. gain control to prevent overloading. Adjust the two trimmer capacitors in each of the following coil assemblies for peak voltage readings on the output meter – A.A. – B.B. – C.C. – D.D. – E.E. Then adjust the trimmer capacitor on coil assembly G.G. to minimum (dip) reading on the output meter. Now reduce the A.F. gain to nearly zero and throw the A.V.C. switch to A.V.C. Then adjust the I.F. gain Control until the panel meter reads between 2 and 3. Then adjust the capacitors on H.H. for minimum panel meter reading. There should be a pronounced dip of the panel meter as each of these adjustments is made. It is advisable to switch over to "SPEAKER" at frequent intervals during alignment to make sure there is no overloading. If everything is operating properly the output meter reading will also dip to minimum as the capacitors on coil assembly H.H. are adjusted.

Set the A.V.C.-MANUAL Switch on MANUAL, the C.W.-MOD-switch on C.W. and adjust the trimmer capacitors on coil assembly F.F. for zero beat. For this adjustment the Beat oscillator control knob, on the front panel

should be adjusted half-way, or with the stop pin on shaft vertical or pointing upwards. This completes the alignment of the I.F. – A.V.C. and Beat Oscillator circuits all of which are accessible on top of the receiver chassis. After these adjustments have been made, the entire procedure should be repeated to insure accuracy. The knurled thumb nuts on coil assemblies D.D. – E.E. and H.H. should now be returned to their original settings by turning them to the right until the tops of the thumb nuts are 7/16" below the tops of the threaded rods.

CRYSTAL FILTER I.F. ALIGNMENT

The above procedure for aligning the I.F. circuit also applies to receivers with crystal filters, except that the test oscillator must be accurately set to the frequency of the crystal. This can be accomplished by setting the frequency of the test oscillator (when connected to the grid of the first detector) for maximum response with the crystal in circuit and the crystal selectivity control set at maximum. When the frequency of the test oscillator has been correctly adjusted to that of the crystal the I.F. circuits can be tuned as described above with the crystal cut out of circuit. Unless this procedure is carefully carried out, maximum crystal efficiency will not be obtained, since the peak of the I.F. selectivity curve must coincide exactly with the resonant peak of the crystal.

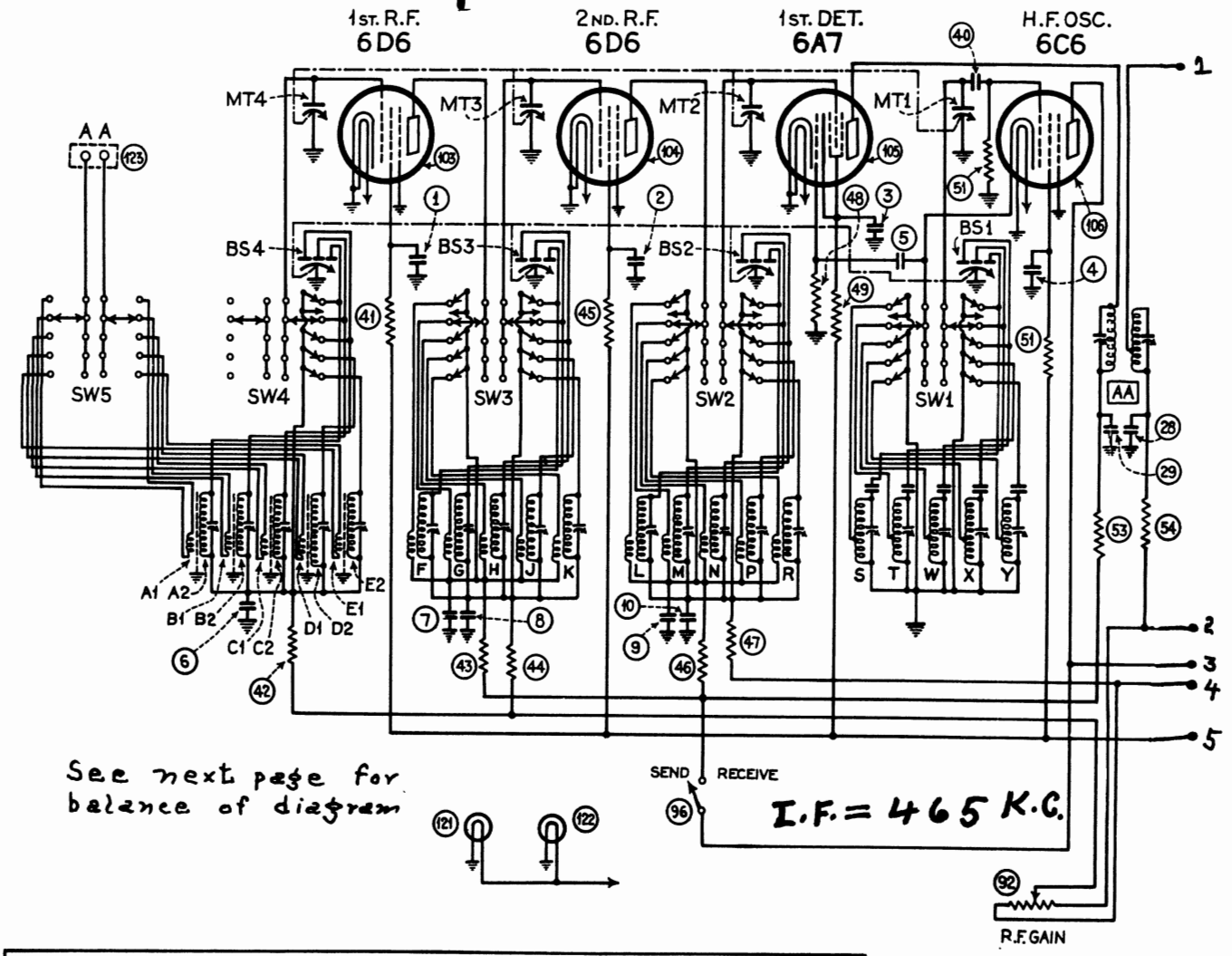
H.F. OSCILLATOR AND R.F. ALIGNMENT

Connect the output of the test oscillator to the "A.A." terminal strip. Keep the output meter in the same position as previous test. The controls on the front panel should be set as follows:

Band Change Switch on 540 – 1160 K.C.
Main Tuning Dial on 1100 K.C.
Band spread Dial on 100 (continued on page 538)

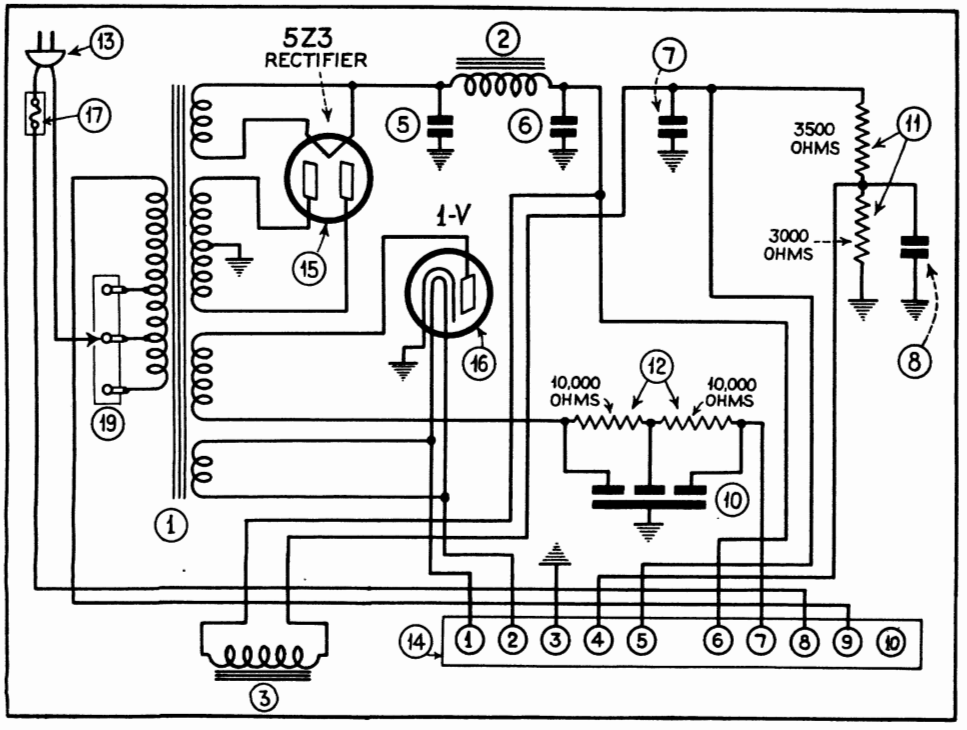
HAMMARLUND MFG. CO.

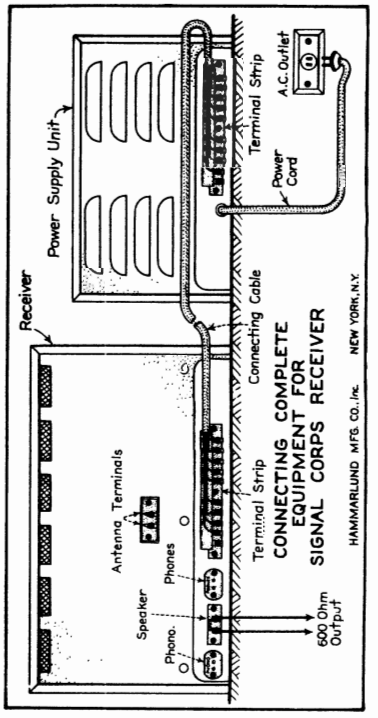
"Super-Pro"



See next page for balance of diagram

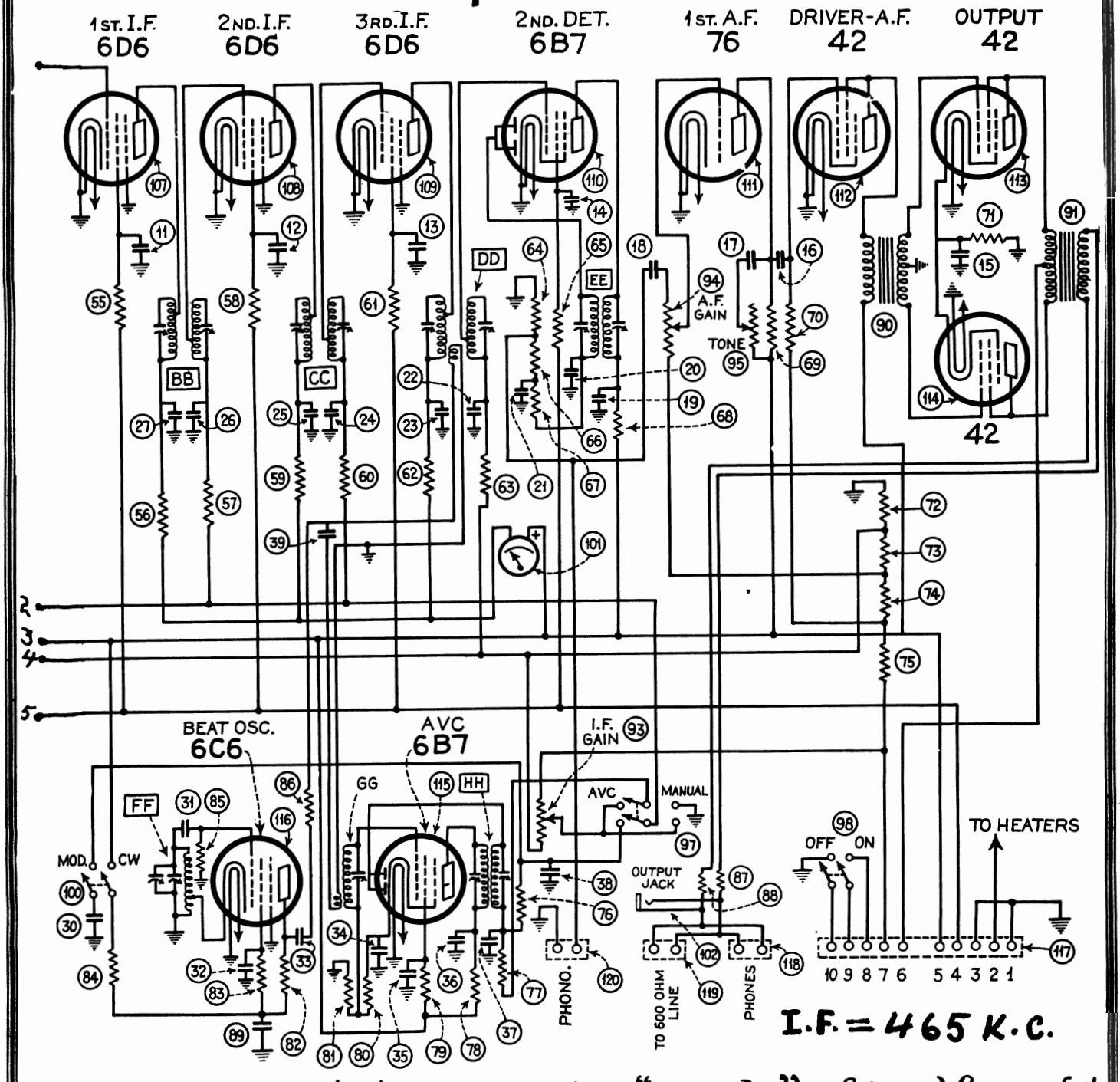
I.F. = 465 K.C.





HAMMARLUND MFG. CO.

"Super-Pro"



Difference between standard "Super-Pro" & Signal Corps Set

The Signal Corps receiver is not equipped with a speaker and the output is designed to feed into a 600 ohm line. Consequently, an additional filter choke is used in the power supply to take the place of the speaker field which is furnished with the standard model. The standard model is equipped with a phone speaker switch located on the front panel instead of a phone jack. The Standard Model is designed to have an antenna impedance to match a 115 ohm transmission line whereas the Signal Corps' model is designed for a 300 ohm transmission line input. The output of the standard model is approximately 15 watts.

HAMMARLUND MFG. CO.
"Super Pro"

R.F. Gain Control "Full On"

I.F. Gain Control "To Produce appropriate output meter reading"

Audio Gain Control "Full On"

Tone Control "Turn Full left"

C.W. - MOD switch on "MOD"

A.V.C.-MANUAL Switch on "MANUAL"

SEND - RECEIVE Switch on "RECEIVE"

PHONES-SPEAKER Switch on "PHONES"

Turn the receiver over, bottom side up, placing a small block of wood under the rear of the switch section to protect the shield cans and tubes. The main tuning unit bottom plate should remain in place while H.F. oscillator and R.F. adjustments are being made. In order to facilitate the alignment of these stages, we have indicated in dotted lines, the coil positions beneath the bottom cover plate, to-gether with all capacity and inductance adjusters. Capacity adjusting condensers are located on the coil bases and inductance adjusters extend through the top of each coil. The coil markings correspond to the designations on the schematic wiring diagram. Set the test oscillator to produce a 1100 K.C. signal. Adjust the trimmer capacitor "Y" until a peak reading is obtained in the output meter. Now set the main tuning condenser dial to 600 K.C. and adjust the test oscillator for a 600 K.C. signal. Turn the inductance adjustment on coil "Y" for a peak reading on the output meter. As these two adjustments react on each other it will be necessary to repeat them until no further change in either capacity or inductance is necessary. This realignment should only be done after making sure that the calibration of main dial is incorrect.

Turn the main tuning dial to 1100 K.C. and set the test oscillator for 1100 K.C. signal. Adjust each capacitor on coil "R" - "K" - "E2" in

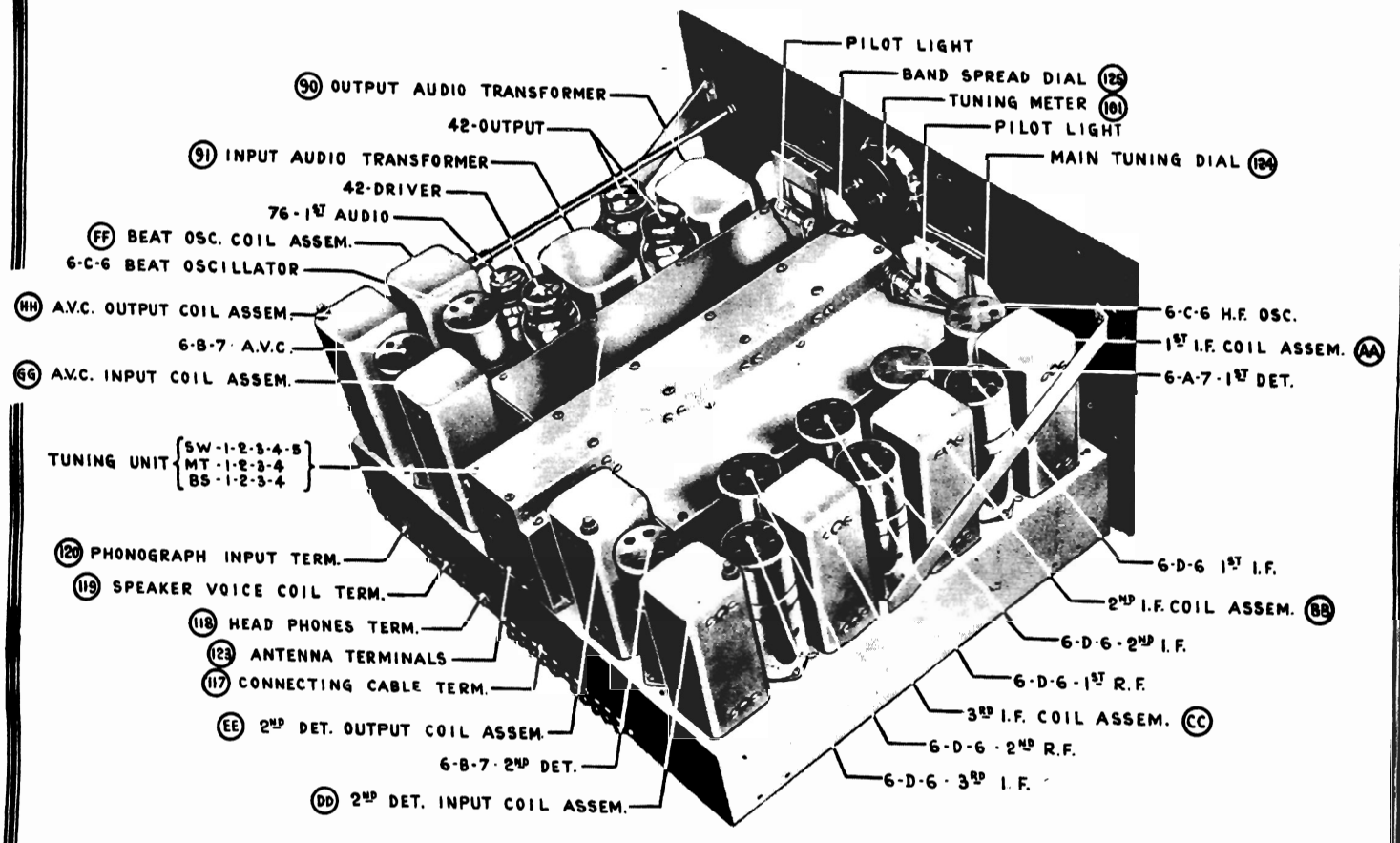
the order named, for peak reading on the output meter. The I.F. gain control should be adjusted so that no overloading occurs and an appropriate reading on the output meter is maintained. Now set the main tuning dial at 600 K.C. and the test oscillator on the same frequency and turn the "inductance adjustments" on coil "R" - "K" - "E1" for peak reading on the output meter. These adjustments are also interlocking and should be repeated until no further improvement can be noticed. This completes the H.F. Oscillator and R.F. coil alignment for the frequency range of 540 to 1160 K.C.

The alignment procedure of the H.F. Oscillator and R.F. coils in the remaining frequency ranges is exactly the same as outlined for the 540-1160 K.C. band, test oscillator frequencies and main tuning dial settings vary as follows:

RANGE	CAPACITY ADJUSTING FREQUENCY	COILS	INDUCTANCE ADJUSTING FREQUENCY	COILS
1160 to 2500 K.C.	2500 K.C.	X-P-J-D2	1200 K.C.	X-P-J-D1
2.5 to 5.0 MC	5.0 MC	W-N-H-C2	2.5 MC	W-N-H-C1
5.0 to 10.0 MC	10.0 MC	T-M-G-B2	5.0 MC	T-M-G-B1
10.0 to 20.0 MC	20.0 MC	S-L-F-A2	10.0 MC	S-L-F-A1

The capacity and inductance adjustments in each band should be rechecked until no further peak changes are noted. The receiver will then be completely aligned. On the three highest frequency bands, care should be exercised to avoid adjusting the H.F. oscillator coils to an image frequency.

The check on the alignment of the receiver on all bands is now complete and if instructions have been carefully carried out optimum performance should be obtained.



HAMMARLUND MFG. CO.

"Super-Pro"

"SUPER-PRO" PARTS LIST

(This parts list should be used to identify parts shown in the illustrations and schematic diagrams, and as an aid in ordering replacement parts.)

SCHEMATIC DESIGNATION	DESCRIPTION - RECEIVER PARTS	PART NUMBER
A1	Antenna Input Coil Assembly 2.5 to 5.0 M.C.	SA 46
A2	Antenna Output Coil Assembly 2.5 to 5.0 M.C.	SA 46 A1
B1	Antenna Input Coil Assembly 5.0 to 10.0 M.C.	SA 47
B2	Antenna Output Coil Assembly 5.0 to 10.0 M.C.	SA 47 B1
C1	Antenna Input Coil Assembly 10.0 to 20.0 M.C.	SA 48
C2	Antenna Output Coil Assembly 10.0 to 20.0 M.C.	SA 48 C1
D1	Antenna Input Coil Assembly 1160 to 2500 K.C.	SA 49
D2	Antenna Output Coil Assembly 1160 to 2500 K.C.	SA 49 D1
E1	Antenna Input Coil Assembly 540 to 1160 K.C.	SA 50
E2	Antenna Output Coil Assembly 540 to 1160 K.C.	SA 50 E1
F	1st. R.F. Coil Assembly 2.5 to 5.0 M.C.	SA 46 A2
G	1st. R.F. Coil Assembly 5.0 to 10.0 M.C.	SA 47 B2
H	1st. R.F. Coil Assembly 10.0 to 20.0 M.C.	SA 48 C2
J	1st. R.F. Coil Assembly 1160 to 2500 K.C.	SA 49 D2
K	1st. R.F. Coil Assembly 540 to 1160 K.C.	SA 50 E2
L	2nd. R.F. Coil Assembly 2.5 to 5.0 M.C.	SA 46 A3
M	2nd. R.F. Coil Assembly 5.0 to 10.0 M.C.	SA 47 B3
N	2nd. R.F. Coil Assembly 10.0 to 20.0 M.C.	SA 48 C3
P	2nd. R.F. Coil Assembly 1160 to 2500 K.C.	SA 49 D3
R	2nd. R.F. Coil Assembly 540 to 1160 K.C.	SA 50 E3
S	High Frequency Osc. Coil Assembly 2.5 to 5.0 M.C.	SA 46 A4
T	High Frequency Osc. Coil Assembly 5.0 to 10.0 M.C.	SA 47 B4
W	High Frequency Osc. Coil Assembly 10.0 to 20.0 M.C.	SA 48 C4
X	High Frequency Osc. Coil Assembly 1160 to 2500 K.C.	SA 49 D4
Y	High Frequency Osc. Coil Assembly 540 to 1160 K.C.	SA 50 E4
AA	1st. I.F. Transformer Coil Assembly	SA 38
BB	2nd. I.F. Transformer Coil Assembly	SA 39
CC	3rd. I.F. Transformer Coil Assembly	SA 39
DD	2nd. Detector Input Coil Assembly	SA 40
EE	2nd. Detector Output Coil Assembly	SA 41
FF	Beat Osc. Coil Assembly	SA 44
GG	A.V.C. Input Coil Assembly	SA 42
HH	A.V.C. Output Coil Assembly	SA 41
1-2-3-4-34 11-12-13-14-22-32-35	Capacitor Fixed Tubular Type .05 MFD 200 Volts	3816
6-8-10-18 38-39	Capacitor Fixed Tubular Type .02 MFD 200 Volts	3814
7-9-16-33 17-19-23-25	Capacitor Fixed Tubular Type .02 MFD 400 Volts	3815
27-36-89-29	Capacitor Fixed Tubular Type .05 MFD 400 Volts	3817
24-26-28	Capacitor Fixed Tubular Type .01 MFD 200 Volts	3813
30-124	Capacitor Fixed Tubular Type .25 MFD 200 Volts	3819
5-20-21	Capacitor Fixed Mica Type 60 MMFD	3903
31	Capacitor Fixed Mica Type .0001 MFD	3913
40	Capacitor Fixed Mica Type .0001 MFD	3929
37	Capacitor Fixed Mica Type .003 MFD	3902
15	Capacitor Fixed Tubular 50 MFD 50 Volts	3835
52	Capacitor Fixed Tubular .25 MFD 400 Volts	3820
41-45-55-58-61-65	Resistor 10,000 Ohms, Carbon Type 1 Watt	3802
42-44-47-48 54-57-60-63-64	Resistor 100,000 Ohms, Carbon Type 1/3 Watt	3811
69-84	Resistor 50,000 Ohms, Carbon Type 1 Watt	3803

SCHEMATIC DESIGNATION	DESCRIPTION - RECEIVER PARTS	PART NUMBER
51	Resistor 50,000 Ohms, Carbon Type 1/3 Watt	3917
43-46-49-50 53-56-59-62 68-78-82	Resistor 5,000 Ohms, Carbon Type 1 Watt	3801
66-67-70	Resistor 200,000 Ohms, Carbon Type 1/3 Watt	3812
71-80	Resistor 750 Ohms, Wire Wound, 10 Watt	3836
72	Resistor 300 Ohms, Carbon Type 1 Watt	3806
73	Resistor 600 Ohms, Carbon Type 1 Watt	3807
74	Resistor 1100 Ohms, Carbon Type 1 Watt	3808
75	Resistor 3,000 Ohms, Carbon Type 1 Watt	3809
76-77-83	Resistor 500,000 Ohms, Carbon Type 1 Watt	3805
79	Resistor 60,000 Ohms, Carbon Type 1 Watt	3804
81	Resistor 4,000 Ohms, Carbon Type 1 Watt	3810
*87-88	Resistor 300 Ohms, Carbon Type 3 Watt	3914
90	Audio Input Transformer	2985
91	Audio Output Transformer	2986
92	Radio Frequency Gain Control 1 megohm	3890
93	Int. Frequency Gain Control 50,000 Ohms	3891
94	Audio Frequency Gain Control 250,000 Ohms	3889
95	Tone Control 50,000 Ohms	3888
96	Send-Receive Switch	2988
97	A.V.C. Manual Switch	2990
98	Off-On Switch	2983
99	Speaker - Phone Switch	2990
100	C W - Mod Switch	2983
101	Tuning Meter	3894
*102	Output Jack	3892
103-104-107 108-109	Tube Socket 6D6	3821
105	Tube Socket 6A7	3822
106-116	Tube Socket 6C6	3823
110-115	Tube Socket 6B7	3824
111	Tube Socket 76	3825
112-113-114	Tube Socket 42	3826
117	Connecting Terminal Strip	3838
118	Phones Terminal Strip	3850
119	Speaker or Output Terminal Strip	3843
120	Phonograph Terminal Strip	3849
121-122	Pilot Light Mazda #40 6.3. Volts	3920
123	Antenna Terminal Strip	3842
MT4 MT1 MT2 MT3	Main Tuning Condensers	SA 6
BS 1-2-3-4	Band Spread Condensers	SA 7
SW 1-2-3-4-5	Band Change Switch	SA 2
* ———	Signal Corps Name Plate	3893

SCHEMATIC DESIGNATION	DESCRIPTION - MISCELLANEOUS PARTS	PART NUMBER
———	Speaker Voice Coil Connecting Cable	SA 65
———	Speaker Field Coil Connecting Cable	SA 66
———	Metal Dust Cover Standard Model	2975
———	Operating Knobs Large	3856
———	Operating Knobs Small	3857
———	Panel Cap Nuts	2951
———	Dust Cover Thumb Screws	2952
———	Meter Clamp	3926
———	Main Tuning Dial Assembly	SA 25
———	Band Spread Dial Assembly	SA 27
———	Selectivity Control Shaft Assembly	SA 68

HAMMARLUND MFG. CO.

"Super Pro"

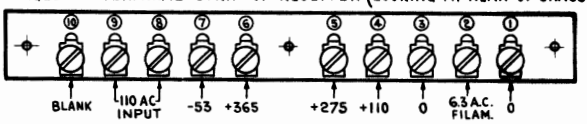
SCHEMATIC DESIGNATION	DESCRIPTION – MISCELLANEOUS PARTS	PART NUMBER
———	Selectivity Control Cam Lever Assembly	SA 30
———	Audio Gain Control Shaft	SA 70
———	Beat Oscillator Control Shaft	SA 71
———	Beat Oscillator Control Shaft Coupling	SA 69
———	Band Switch Knob and Dial Assembly	SA 74
———	Connecting Cable	SA 35
* ———	Emergency Battery Connecting Cable	SA 67
SCHEMATIC DESIGNATION	**DESCRIPTION – POWER SUPPLY PARTS**	**PART NUMBER**
1	Power Transformer 110 Volts – 60 Cycle A.C.	2980
2	1st. Filter Choke	2981
* 3	2nd. Filter Choke	2982
4	Fuse Block	3859
5	Filter Condenser 4 MFD Electrolytic – 500 Volt	3833
6-7-8	Filter Condenser 16 MFD Electrolytic – 450 Volt	3832
10	Filter Condenser 8-8-7-MFD Electrolytic – 450 Volt	3834
11	Resistor Voltage Divider–6500 Ohm Wire Wound 30 Watts	3854
12	Resistor Grid Bias 20,000 Ohms Wire Wound 15 Watts	3855
13	A.C. Input Cord and Plug	P.S.Cord
14	Connecting Terminal Strip	3838
15	Tube Socket 5Z3	3828
16	Tube Socket 1-V	3827
17	Fuse 2 AMP	3921
19	Line Voltage Adjusting Strip	3840
20	Speaker Field Terminal Strip	SA 35
———	Dust Cover Standard Model	2975
———	Dust Cover Rack and Panel Model	2976

* *Army Models Only*

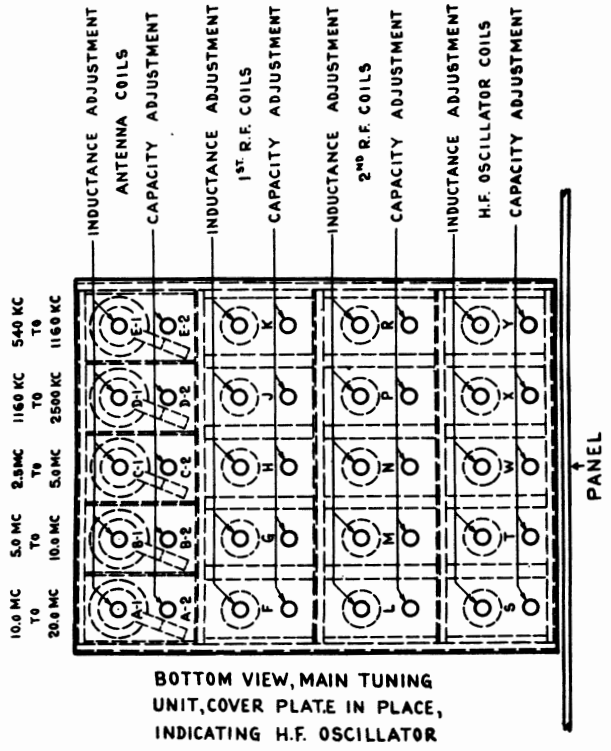
TABULATION OF VOLTAGES APPLIED TO RECEIVER TUBES

TUBE	FUNCTION IN RECEIVER	PLATE VOLTAGE	SCREEN VOLTAGE	CATHODE VOLTAGE	PLATE CURRENT MILLIAMPS.
6-A-7	1ST DETECTOR	260	80	0	3.
6-C-6	HIGH FREQ OSCILLATOR	275	110	0	2.5
6-D-6	1ST RADIO FREQ.	275	110	0	1.5
6-D-6	2ND " "	275	110	0	1.5
6-D-6	1ST INTERMEDIATE FREQ	275	110	0	2.
6-D-6	2ND " "	275	110	0	2.
6-D-6	3RD " "	275	110	0	2.
6-B-7	2ND DETECTOR	260	100	0	3.
6-B-7	AUTOMATIC VOLUME CONTROL	230	145	45	7.
6-C-6	BEAT OSCILLATOR	150	30	0	.4
76	1ST AUDIO	175	0	0	2.5
42	DRIVER	260	260	0	23.
42	CLASS A.B. AUDIO	360	360	35	21.
42	" " " "	360	360	35	21.

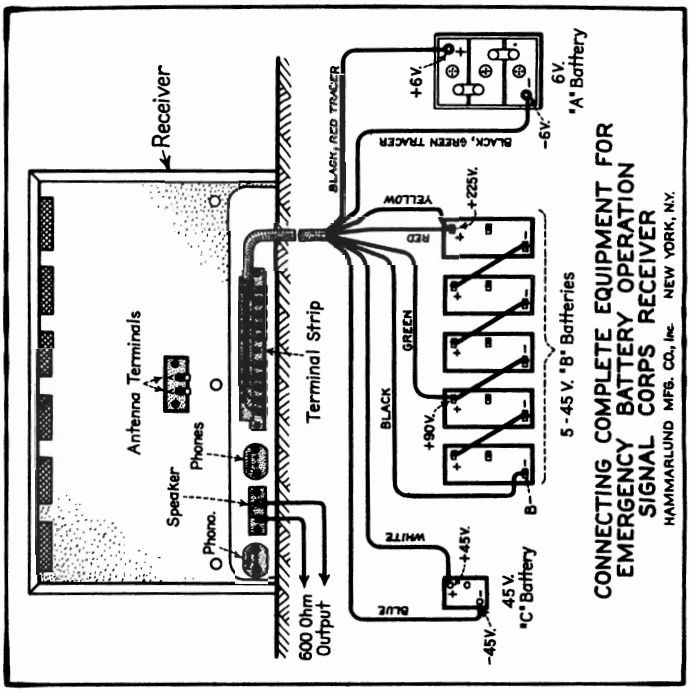
VOLTAGES AT TERMINAL STRIP OF RECEIVER (LOOKING AT REAR OF CHASSIS)



ALL MEASUREMENTS WERE MADE ON A 120 VOLT A.C. POWER SUPPLY LINE WITH LINE VOLTAGE ADJUSTMENT SET AT THE 125 VOLT TAP. R.F.–I.F. AND AUDIO GAIN CONTROLS SHOULD BE SET AT MINIMUM. THE A.V.C. MANUAL SWITCH SHOULD BE IN THE MANUAL POSITION, THE CW-MOD SWITCH IN THE C.W. POSITION, AND THE "SEND-RECEIVE" SWITCH IN THE RECEIVE POSITION. D.C. VOLTAGE READINGS WERE OBTAINED WITH A VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT USING THE CHASSIS AS A COMMON TERMINAL. VOLTAGES WITHIN ± 10% OF THE VALUES GIVEN SHOULD BE CONSIDERED SATISFACTORY. THE 6.3 VOLT A.C. FILAMENT READING IS OBTAINED BETWEEN CHASSIS AND TERMINAL № 2 ON STRIP. TERMINAL № 10 ON STRIP IS BLANK EXCEPT WHEN USED FOR BATTERY OPERATION IN WHICH CASE IT PROVIDES A SHORT TO CHASSIS WITH POWER SWITCH IN "ON" POSITION AND OPEN WHEN POWER SWITCH IS IN THE "OFF" POSITION.

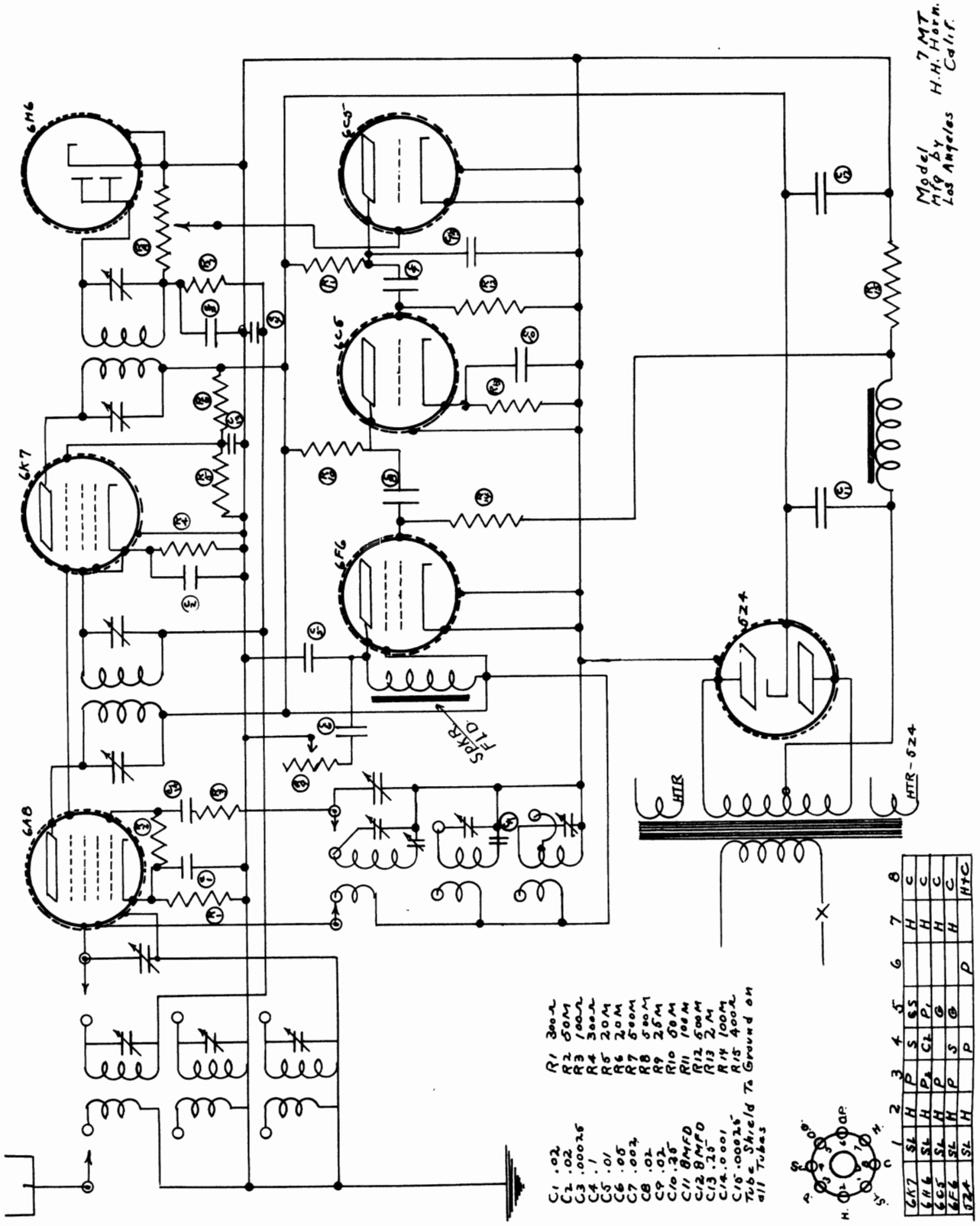


BOTTOM VIEW, MAIN TUNING UNIT, COVER PLATE IN PLACE, INDICATING H.F. OSCILLATOR AND R.F. COIL ADJUSTMENTS



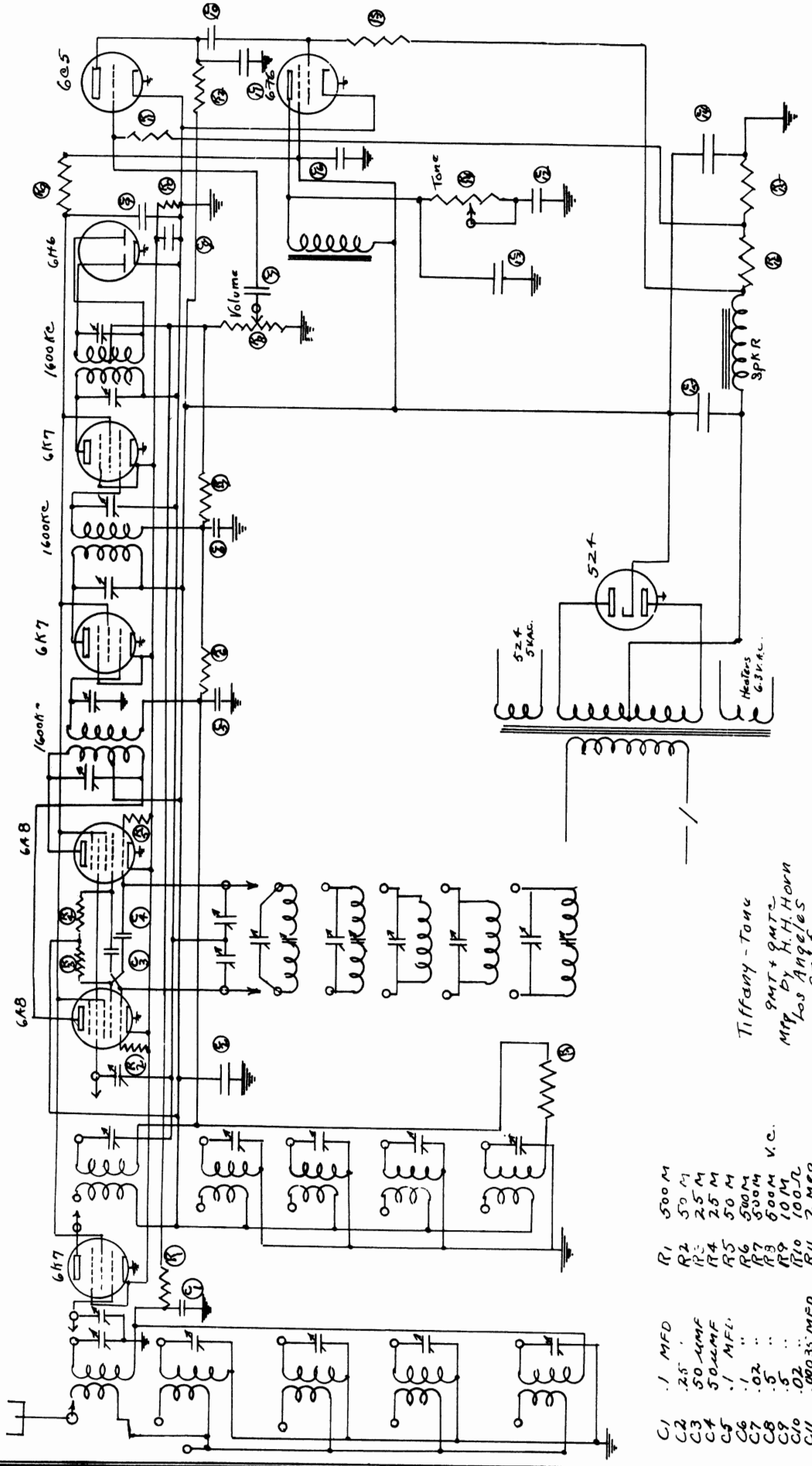
HERBERT H. HORN RADIO MFG. CO.

Model 7MT



HERBERT H. HORN RADIO MFG. CO.

Models 9MT and 9MTC

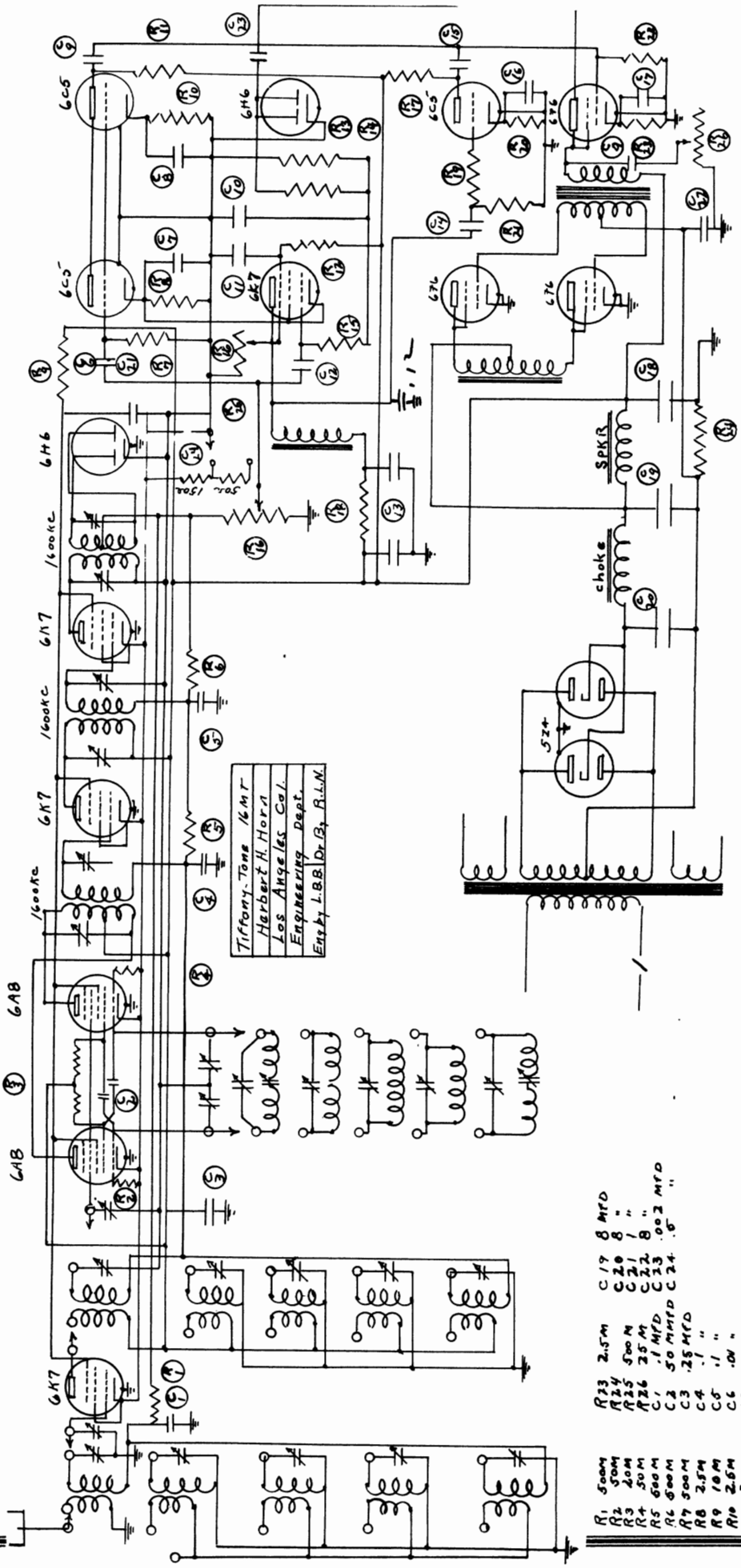


Tiffany - Tone
9MT + 9MTC
By H.H. Horn
Mfg. Los Angeles Calif.

C1	.1 MFD	R1	500 M
C2	.25 "	R2	50 M
C3	50 MMF	R3	25 M
C4	50 MMF	R4	25 M
C5	.1 MFD	R5	50 M
C6	.1 "	R6	500M
C7	.02 "	R7	500M
C8	.5 "	R8	500M V.C.
C9	.5 "	R9	10M
C10	.02 "	R10	100Ω
C11	.00035 MFD	R11	2 MEG
C12	.05 MFD	R12	100M
C13	.01 "	R13	500M
C14	16 "	R14	25M T.C.
C15	16 "	R15	20Ω
C16	.25 "	R16	300Ω
		R17	600Ω

HERBERT H. HORN RADIO MFG. CO.

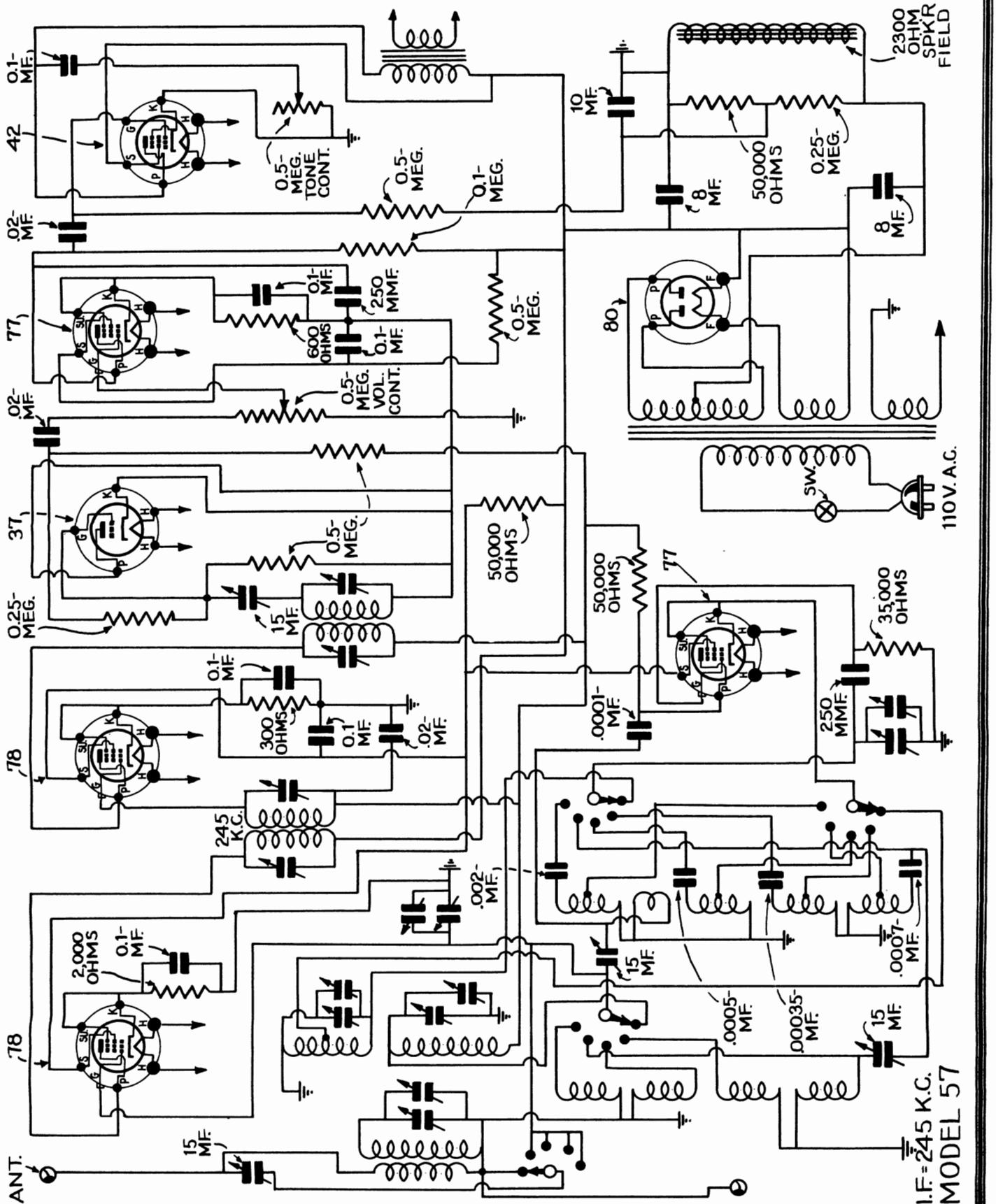
Model 16MT



R1	500M	R23	2.5M	C19	.8 MFD
R2	50M	R24	500M	C20	.8 "
R3	1.0M	R25	50M	C21	.1 "
R4	50M	R26	2.5M	C22	.8 "
R5	600M	C1	.1 MFD	C23	.002 MFD
R6	600M	C2	.50 MFD	C24	.6 "
R7	500M	C3	.25 MFD		
R8	2.5M	C4	.1 "		
R9	1.0M	C5	.1 "		
R10	2.5M	C6	.04 "		
R11	50M	C7	.10 "		
R12	500M	C8	.10 "		
R13	600M	C9	.05 "		
R14	500M	C10	.11 "		
R15	600M	C11	.11 "		
R16	500M	C12	.02 "		
R17	50M	C13	.8 "		
R18	100M	C14	.05 "		
R19	600M	C15	.25 "		
R20	2.5	C16	.10 "		
R21	600M	C17	.8 "		
R22	500M	C18	.8 "		

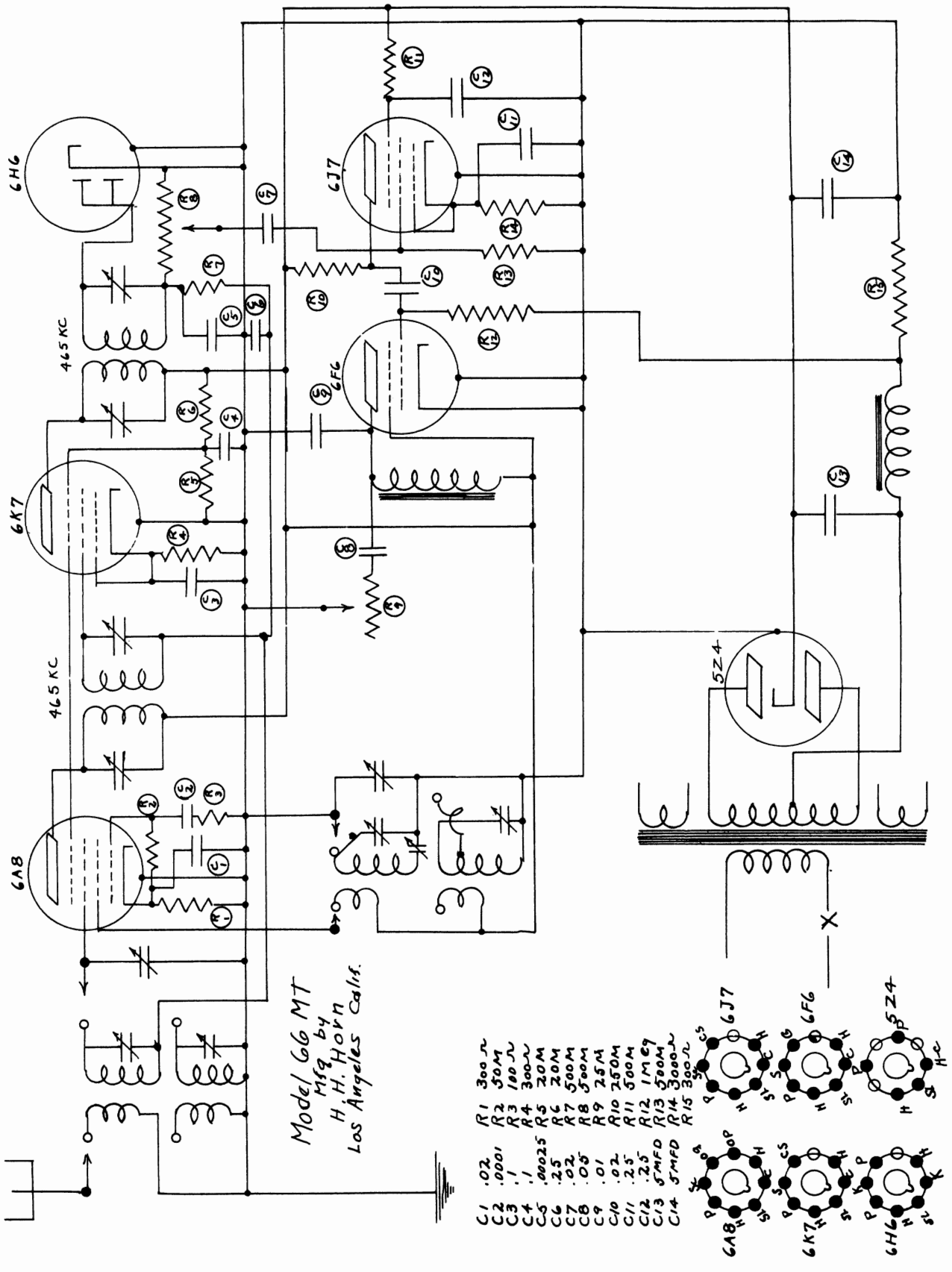
HERBERT H. HORN RADIO MFG. CO.

Model 57



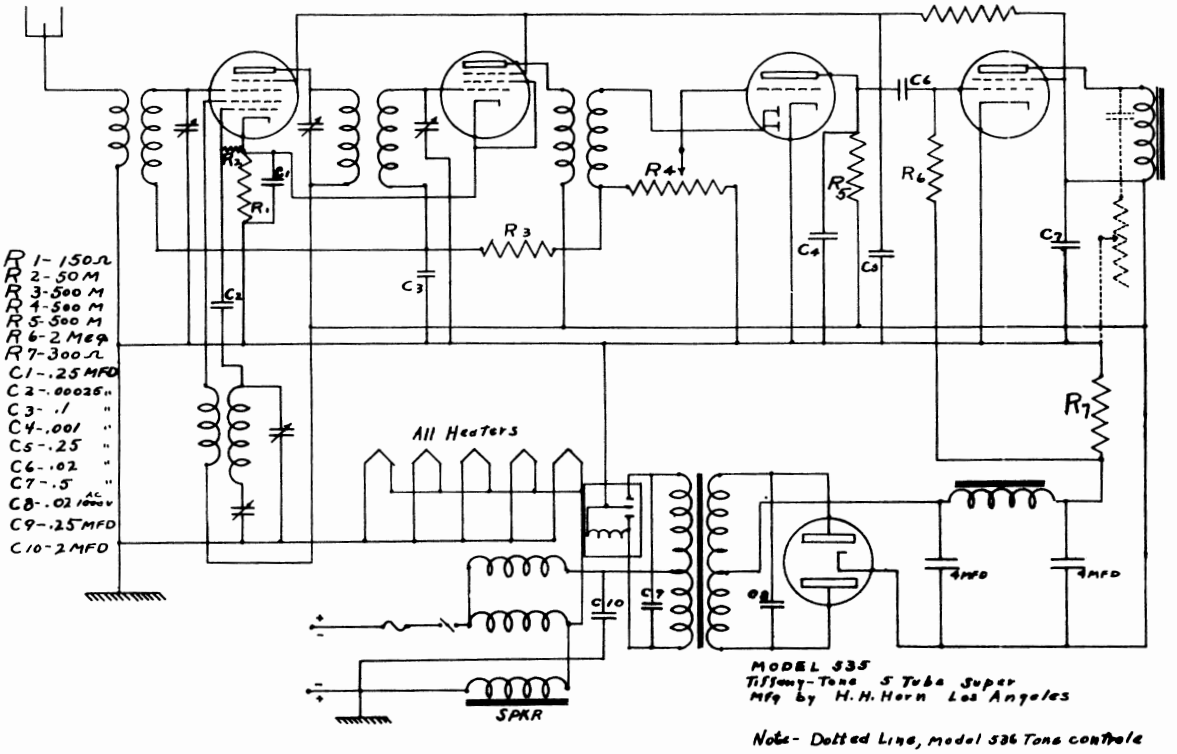
HERBERT H. HORN RADIO MFG. CO.

Model 66 MT

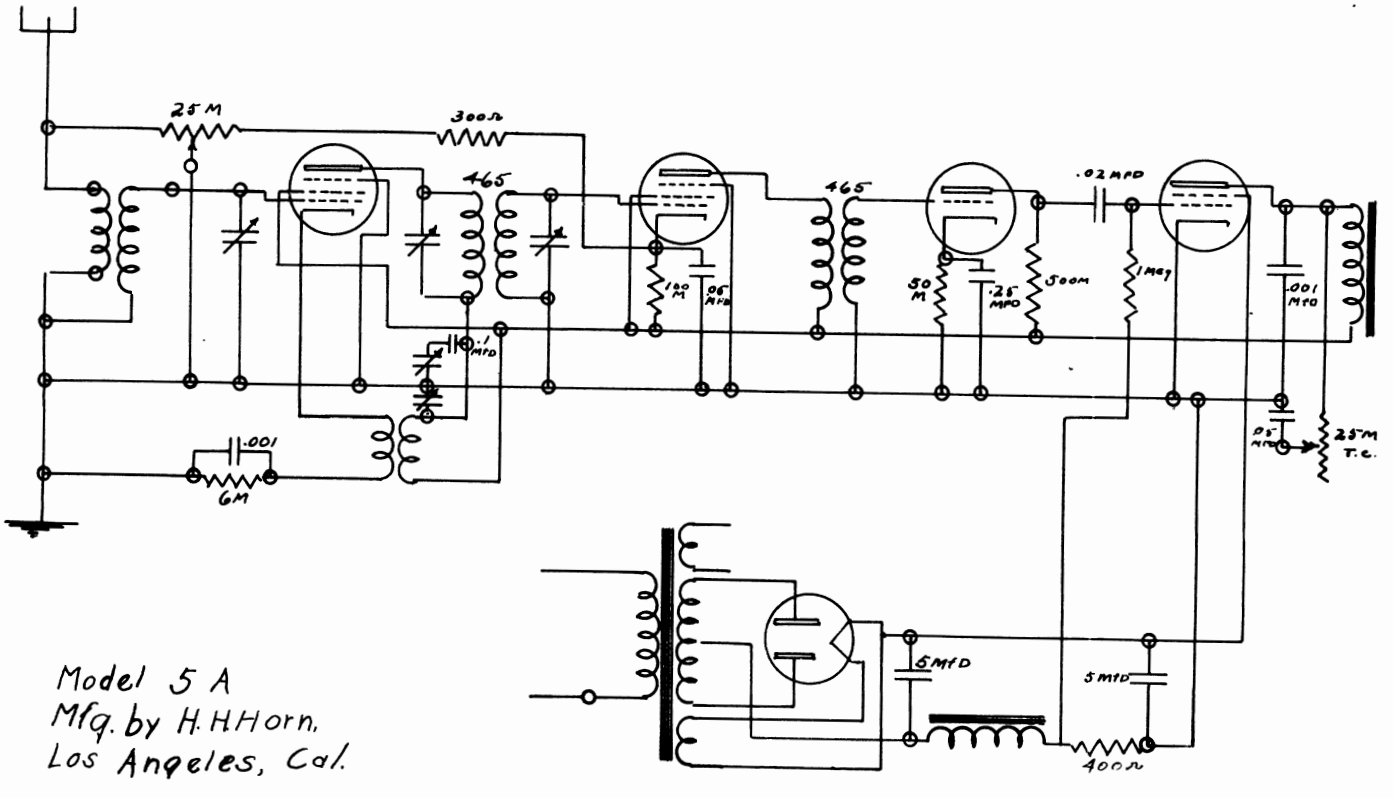


HERBERT H. HORN RADIO MFG. CO.

Models 535-536



Model 5A



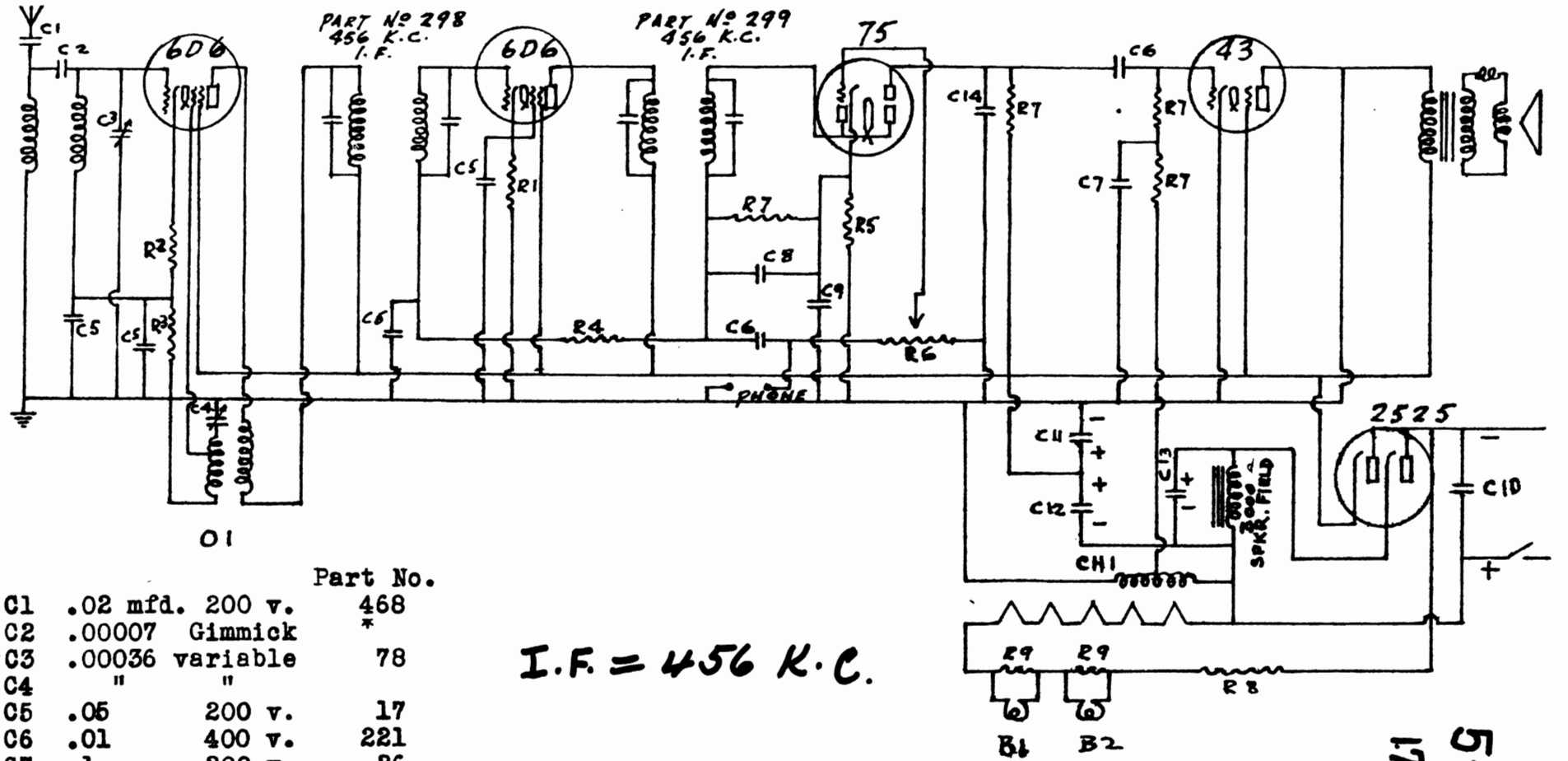
Model 5 A
Mfg. by H. H. Horn,
Los Angeles, Cal.

METRO ELECTRICAL INDUSTRIES, Inc.

5-Tube A.C.-D.C.

175-550 Meters

1934



I.F. = 456 K.C.

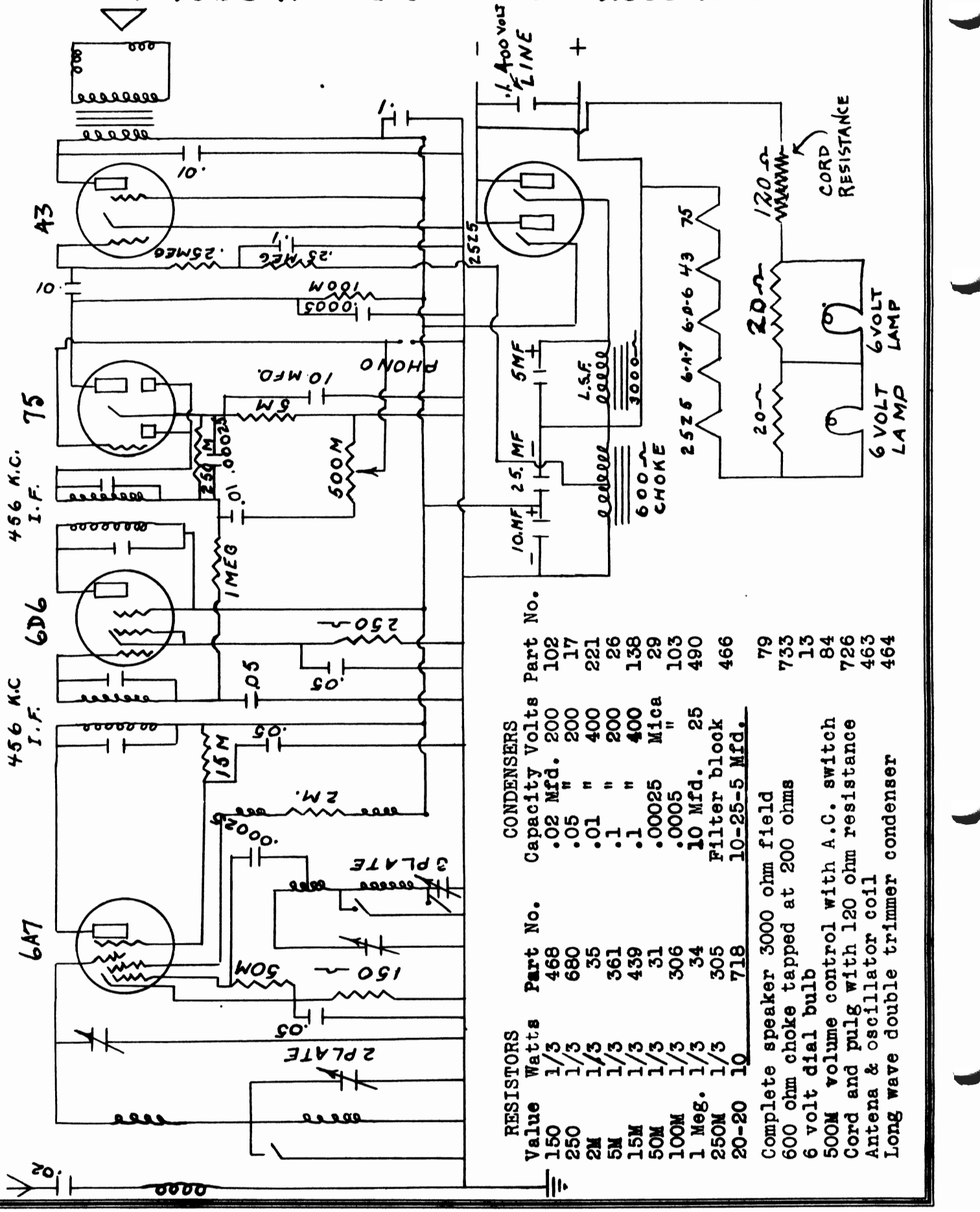
			Part No.
C1	.02 mfd.	200 v.	468
C2	.00007	Gimmick	*
C3	.00036	variable	78
C4	"	"	
C5	.05	200 v.	17
C6	.01	400 v.	221
C7	.1	200 v.	26
C8	.00025	Mica	29
C9	10. mfd.	25 v.	490
C10	.1	400 v.	138
C11	10 Mfd.	Filter	
C12	25 "	Block	466
C13	5 "		
C14	.0005	Mica	103
R1	250	1/3 Watt	680
R2	300	" "	180
R3	3M	" "	549
R4	1 Megohm	" "	34
R5	5M	" "	361
R7	250M	" "	305

	Part No.
R6 500.000 ohms volume control & switch	84
R8 Service cord & plug with 120 ohm restr.	726
R9 40 ohm, 10 watt center tapped resistor	718
Complete speaker 3000 ohm field	79
CH1 600 ohm choke tapped at 200 ohms	733
A1 antenna coil	302
O1 Oscillator coil	303
B1, B2, 6.volt dial bulbs	13

*The phrase gimmick designates a wire wound around another wire

HETRO ELECTRICAL INDUSTRIES, Inc.

5-Tube A.C.-D.C. 200-2000 Meters

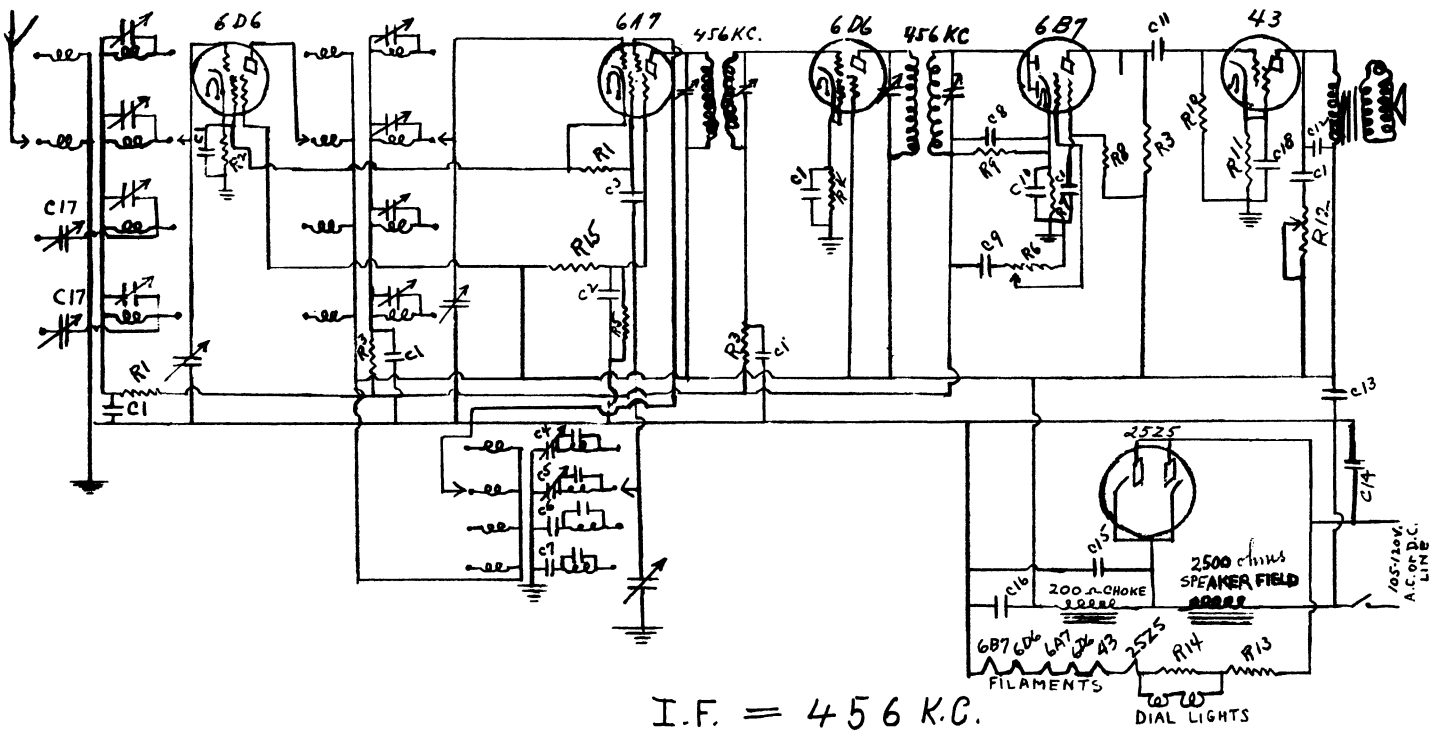


RESISTORS		
Value	Watts	Part No.
150	1/3	468
250	1/3	680
2M	1/3	35
5M	1/3	361
15M	1/3	439
50M	1/3	31
100M	1/3	306
1 Meg.	1/3	34
250M	1/3	305
20-20	10	718

CONDENSERS		
Capacity	Volts	Part No.
.02 Mfd.	200	102
.05 "	200	17
.01 "	400	221
.1 "	200	26
.1 "	400	138
.00025	Mica	29
.0005	"	103
10 Mfd.	25	490
Filter block		466
10-25-5 Mfd.		

Complete speaker 3000 ohm field	79
600 ohm choke tapped at 200 ohms	733
6 volt dial bulb	13
500M volume control with A.C. switch	84
Cord and pulg with 120 ohm resistance	726
Antena & oscillator coil	463
Long wave double trimmer condenser	464

Model 6-Tube AC-DC



I.F. = 456 K.C.

These models should not be used with currents higher than 125 volts without an external voltage reducer. Do not remove tubes or speaker while the receiver is operating. Do not use a ground connection unless in series with a condenser of at least 400 volts test. If after the set has been connected to D.C. for 1 minute fails to operate, reverse the the plug in the current outlet.

ALIGNMENT: The use of a service oscillator or signal generator is imperative.

I.F. transformers. Connect signal generator to grid of 6A7 through a .05 mfd. condenser, with the rotor plates of the tuning condenser completely out, adjust the trimmer on top of the transformers to a 456 KC signal from the generator. Volume control at maximum, attenuate signal so that automatic volume control action is not obtained.

To align the ANTENNA, RF, and OSCILLATOR stages, the antenna and ground leads of the signal generator should be connected to the antenna and ground connections of receiver.

ANTENNA, R.F., and OSCILLATOR stages are adjusted with the trimmers located inside of the shields. See diagram for positions. 1st Short wave band should adjusted with a signal of 16 megacycles. 2nd Short Wave band at 6 megacycles (6000 cycles). Medium wave No. 3 at 1500 kilocycles. Long Waves No. 4, at 300 kilocycles.

The OSCILLATOR trimmers will affect the dial settings and should not be changed unless absolutely necessary.

CAUTION; DO NOT ATTEMPT TO ALIGN THE SET UNLESS YOU HAVE SOME EXPERIENCE AND IS ABSOLUTELY NECESSARY.

HETRO ELECTRICAL INDUSTRIES, Inc.

HETRO ELECTRICAL INDUSTRIES, Inc. Chicago, Ill. U.S.A.

CONDENSERS

C 1 .05 mfd. 200 volts
C 2 .1 " " "
C 3 .0005 mica
C 4 3 plate padder
C 5 5 " "
C 6 .003 mica
C 7 .005 "
C 8 .00025 "
C 9 .01 mfd. 400 volts
C10 10 " 25 "
C11 .02 " 400 "
C12 .006 " " "
C13 .5 " 200 "
C14 .05 " 400 "
*C15 24. " 200 "
*C16 16. " " "
C17 30 mmfd. Trimmer
*C18 10. mfd. 25 volts.

*C15, C16, C18 are in one container. Part #C2092

RESISTORS

R 1 50.000 ohms 1/3 watt
R 2 200 " " "
R 3 250.000 " " "
R 4 250 " " "
R 5 10.000 " " "
R 6 500.000 " volume control with line switch.
R 7 3.000 ohms 1/3 watt
R 8 1 megohm " "
R 9 300.000 ohms " "
R10 500.000 " " "
R11 500 " " "
R12 40.000 " Tone control
*R13 115 " One unit
*R14 53 " One unit
R15 4.000 " 1/3 watt

*R13, R14 are in a single unit Candohm. Part #659

APROXIMATE NORMAL TUBE VOLTAGES MEASURED WITH A 0-300 VOLT, 1000 OHM PER VOLT DC. VOLTMETER, VOLUME CONTROL IN FULL POSITION.

Tubes	Plate	Screen	Cathode
43	90 to 100	95 to 105	13 to 15
6B7	15 to 20	10 to 15	1 to 1½
6D6 IF.	95 to 105	95 to 105	2½ to 3½
6D6 RF.	95 to 105	95 to 105	3 to 4
6A7 Det.	95 to 105	60 to 70	3 to 4

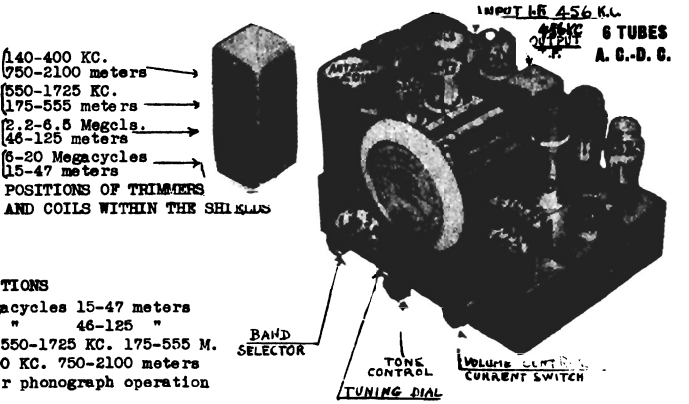
6A7 Oscillator plate voltage 95 to 105
Across speaker field 95 to 105 volts D.C.

6 TUBES
A. C.-D. C.

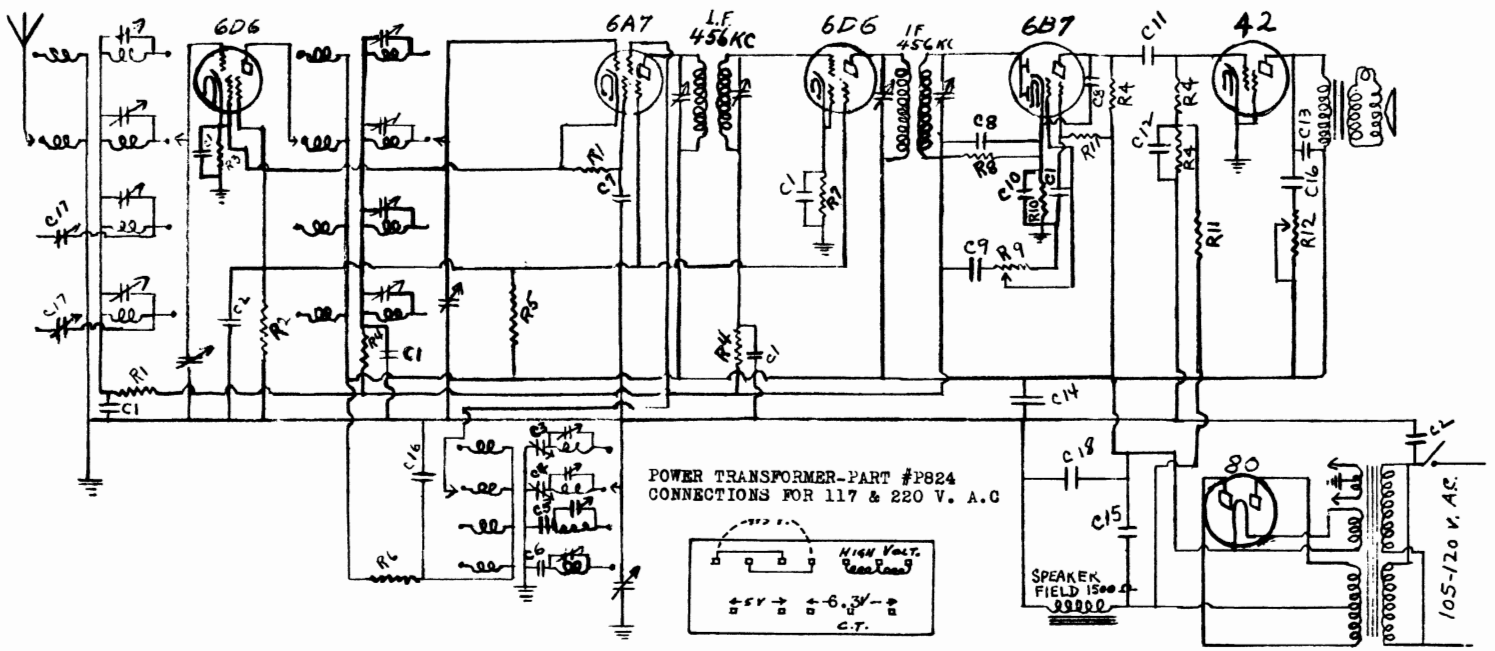
15 to 2100 Meters
Sept. 1933

BAND SELECTOR SWITCH POSITIONS

1-Short waves 6 to 20 megacycles 15-47 meters
2-Short waves 2.2 to 6.5 " 46-125 "
3-Medium waves-Broadcast 550-1725 KC. 175-555 M.
4-Extra long waves 140-400 KC. 750-2100 meters
Extreme right position for phonograph operation



Model 6-Tube AC Superhet



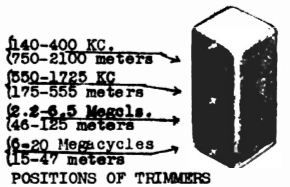
6 TUBE A.C. 15-2100 METERS

CONDENSERS

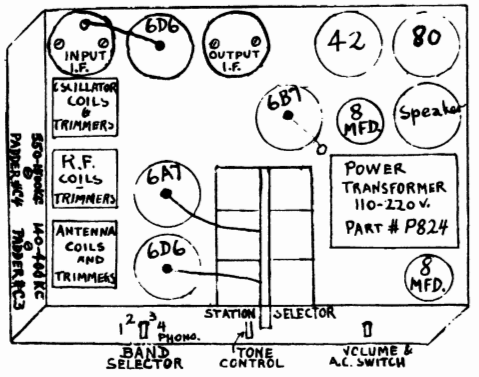
C 1	.05 Mfd.	200 volts	
C 2	.1 "	400 "	
C 3	3 plate padder		
C 4	5 plate padder		
C 5	.003 mica		
C 6	.005 "		
C 7	.0005 "		
C 8	.00025 "		
C 9	.01 Mfd.	400 volts	
C10	10. "	25 "	
C11	.02 "	400 "	
C12	.1 "	200 "	
C13	.006 "	400 "	
C14	.5 "	400 "	
C15	8. "	Electrolytic	
C16	.05 "	400 volts	
C17	30 mmfd.	trimmers	
C18	30. Mfd.	Electrolytic	

RESISTORS

R 1	50.000	ohms	1/3 watt
R 2	25.000	"	1/2 "
R 3	250	"	1/3 "
R 4	50.000	"	" "
R 5	15.000	"	" "
R 6	20.000	"	" "
R 7	500	"	" "
R 8	300.000	"	" "
R 9	500.000	"	volume with A.C. switch
R10	5.000	ohms	1/3 watt
R11	1 megohm	"	"
R12	40.000	ohms	tone control



POSITIONS OF TRIMMERS AND COILS WITHIN THE SHIELDS



BAND SELECTOR SWITCH POSITIONS

1-Short waves 6 to 20 megacycles 15-47 meters
2-Short Waves 2.2 to 6.5 " 46-125 "
3-Medium waves-Broadcast 550-1725 KC. 175-555 M.
4-Extra long waves 140-400 KC. 750-2100 meters
Extreme right position for phonograph operation

ALIGNMENT: The use of a service oscillator or signal generator is imperative.

I.F. TRANSFORMERS: Connect the signal generator to the grid of the 6A7 tube through a .05 mfd. or smaller capacity condenser, set the rotor plates of the tuning condenser completely out and adjust the trimmers on top of the I.F. transformers to a 456 KC signal from the generator. Volume control must be at maximum and the signal from the generator attenuated to a minimum so that no action is obtained from the automatic volume control.

ANTENNA, R.F., and OSCILLATOR stages. Connect the antenna and ground leads of the generator to the antenna and ground of the receiver. To align first short wave band set the generator and the receiver at 16 megacycles, adjust the trimmers of this band to maximum output. The same procedure is to be followed in aligning the other bands and adjustments should be made at the following frequencies: Second short-wave band at 6 megacycles (6000 KC.); Medium-wave #3 at 1500 KC.; Extra long-wave #4 at 300 KC. See diagram for trimmer and coil positions inside of shields. The OSCILLATOR trimmers will affect the dial setting and should not be changed unless absolutely necessary.

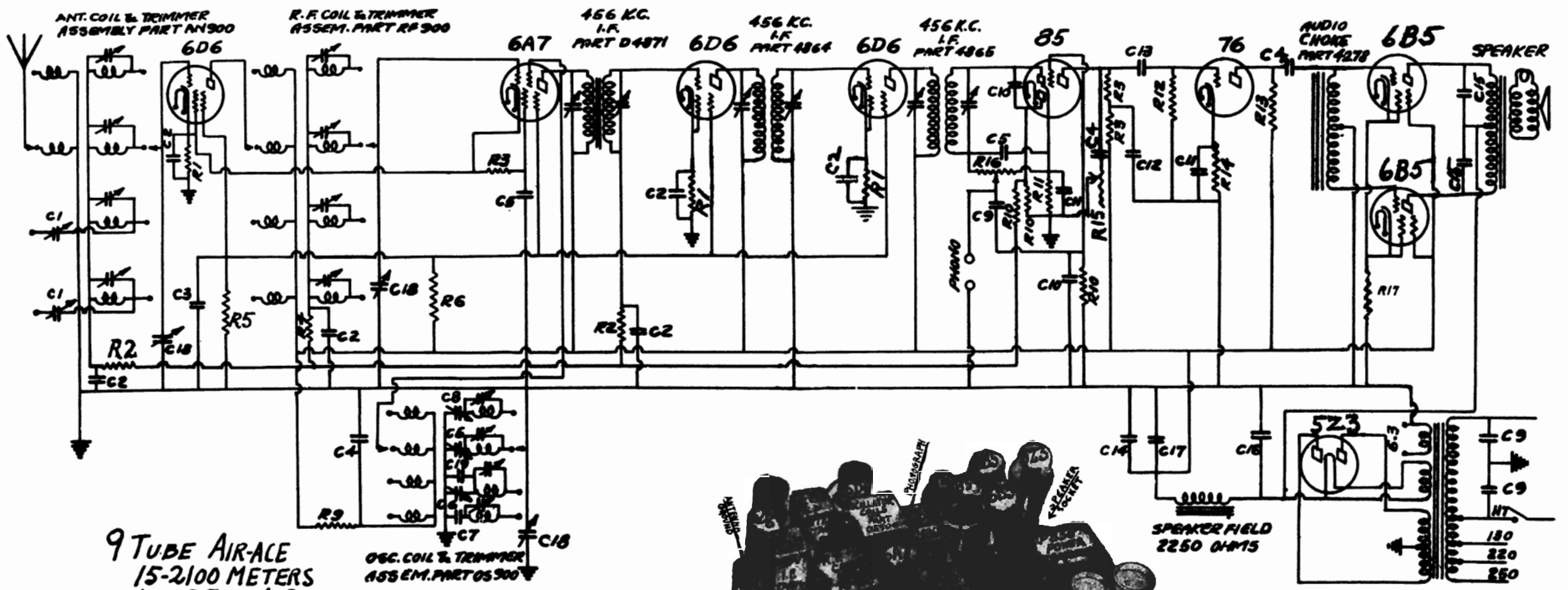
CAUTION: DO NOT ATTEMPT TO ALIGN THE RECEIVER UNLESS YOU HAVE SOME EXPERIENCE. IF THE RECEIVER PERFORMS WELL DO NOT RE-ALIGN. Signal generators usually emit a harmonic signal of slightly higher frequency than the fundamental and in adjusting the lower setting should be used. All adjustments should be made with a minimum input signal from the generator.

APPROXIMATE NORMAL TUBE VOLTAGES MEASURED WITH A 0-300 VOLT, 1000 OHM PER VOLT D.C. VOLTMETER WITH VOLUME CONTROL IN FULL POSITION

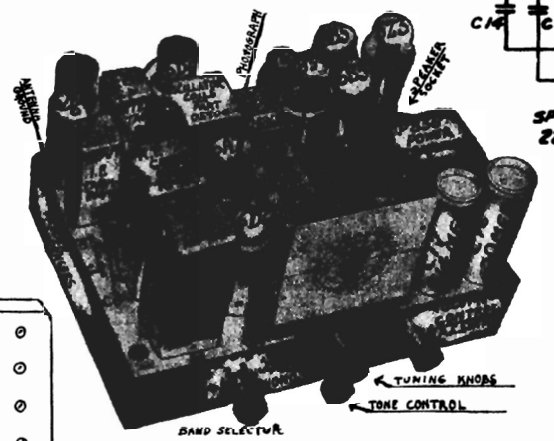
Tubes	Plate	Screen	Cathode	Grid
42	225-235	230-240	0	1 to 2-
6B7	35-45	25-35	3½-4½	
6D6 IF.	230-240	70-80	3½-4½	
6D6 RF.	230-240	70-80	3½-4½	
6A7 Det.	230-240	70-80	3½-4½	
6A7 Osc.	155-165	- -	- -	

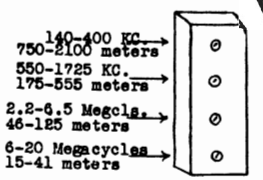
Across speaker field 85-95 negative.

Air Ace Series 6B5

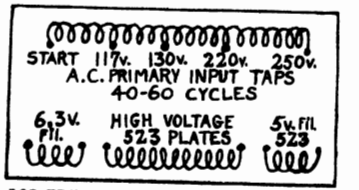


9 TUBE AIR-ACE
15-2100 METERS
100-250 V. A.C.
SERIES 6B5
MARCH 1936





POSITIONS OF TRIMMERS AND COILS WITHIN THE SHIELDS



LOCATIONS OF CONNECTIONS IN POWER TRANSFORMER. PART NO. P836

CONDENSERS

C 1 Trimmers	30 mmfds.
C 2 .05 mfd.	200 volts
C 3 .25 "	200 "
C 4 .05 "	400 "
C 5 .0005 mica	
C 6 5 plate padder	
C 7 .005 mfd. mica	
C 8 3 plate padder	
C 9 .01 mfd.	400 volts
C10 .0001 mfd. mica	
C11 10. mfd.	25 volts
C12 .5 "	300 volts
C13 .02 "	400 volts
C14 .1 "	400 volts
C15 .004 "	600 volts
C16 30 mfd.	electrolytic
C17 14 mfd.	electrolytic
C18 420 mfd.	tuning cond.
C19 .002 mfd.	mica

RESISTORS

R 1	250 ohms 1/3 watt
R 2	250.000 ohms 1/3 watt
R 3	50.000 " " "
R 4	250.000 " " "
R 5	4.500 Candohm "F"
R 6	5.500 Voltage divider
R 9	25.000 ohms 1/3 watt
R10	1 meghom " "
R11	5.000 ohms " "
R12	500.000 " " "
R13	100.000 " " "
R14	3.000 " " "
R15	500.000 ohms Tone control
R16	500.000 ohms Volume control with A.C. switch.
R17	250 ohms, 3 Watts.

BAND SELECTOR SWITCH POSITIONS

1-Short waves 6 to 20 megacycles 15-47 meters
2-Short waves 2.2 to 6.5 " 46-125 "
3-Medium waves-Broadcast 550-1725 KC. 175-555 M.
4-Extra long waves 140-400 KC. 750-2100 meters
Extreme right position for phonograph operation.

Tube socket voltages

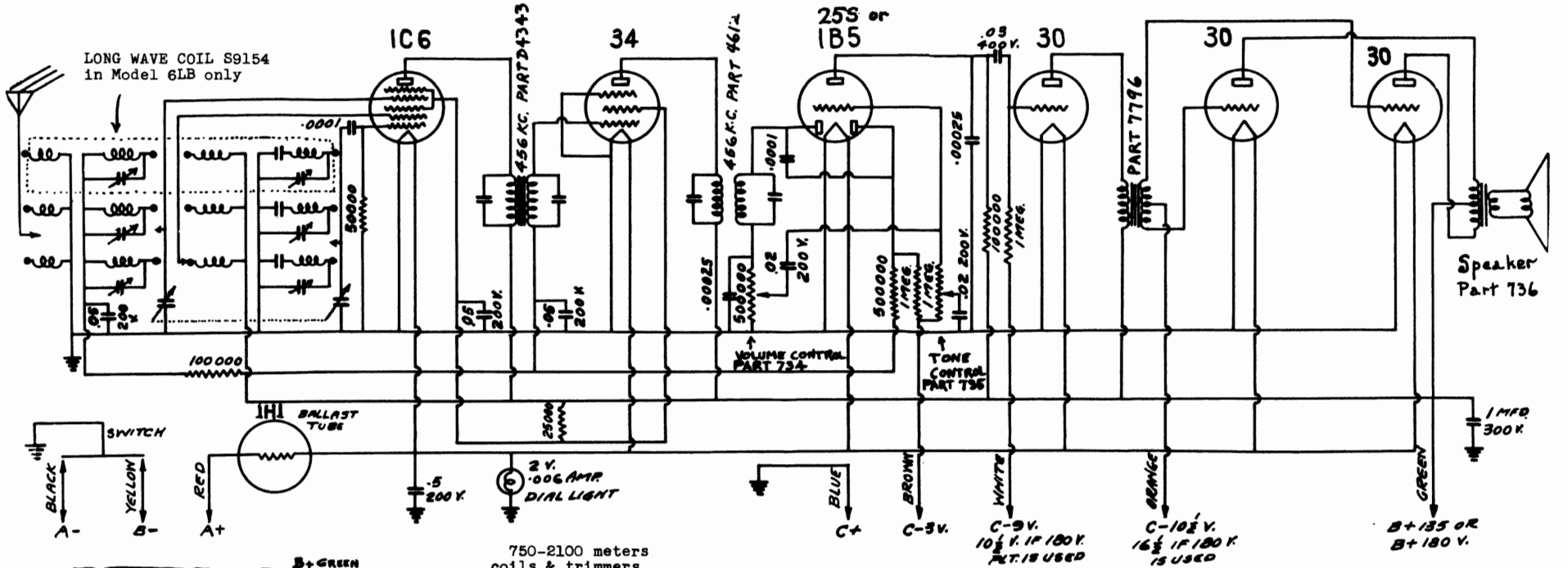
Tubes	Screen Grid to Ground	Plate to Ground	Cathode to Ground	Filament Heater
85	----------	75 to 85	5 to 7	6.3
76	----------	95 --105	5 - 7	6.3
6D6 I.F.	85-95	235-245	3 - 4	6.3
6D6 R.F.	85-95	235-245	3 - 4	6.3
6A7 Detector	85-95	235-245	3 - 4	6.3
" Oscillator	85-95	145-155	3 - 4	6.3
6B5's	235-245	360-370		6.3

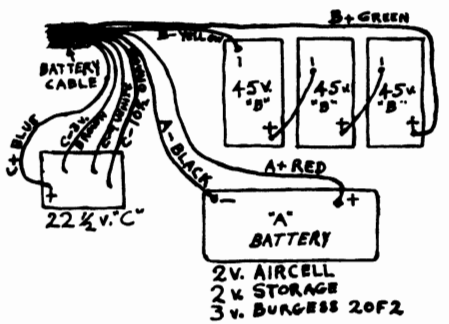
523 filament to ground 360 to 370 volts

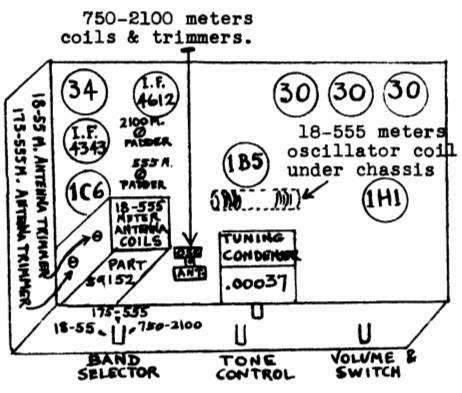
Voltage drop across 125 to 130 volts. All voltages taken with volume control full on and no signal in receiver. 1000 ohms per volt resistance in volt meter used.

HETRO ELECTRICAL INDUSTRIES, Inc.

Models 6SB and 6LB - 1935







Battery equipment: 135 or 180 volts "B"
22 1/2 volts "C"
2 or 3 volts "A"

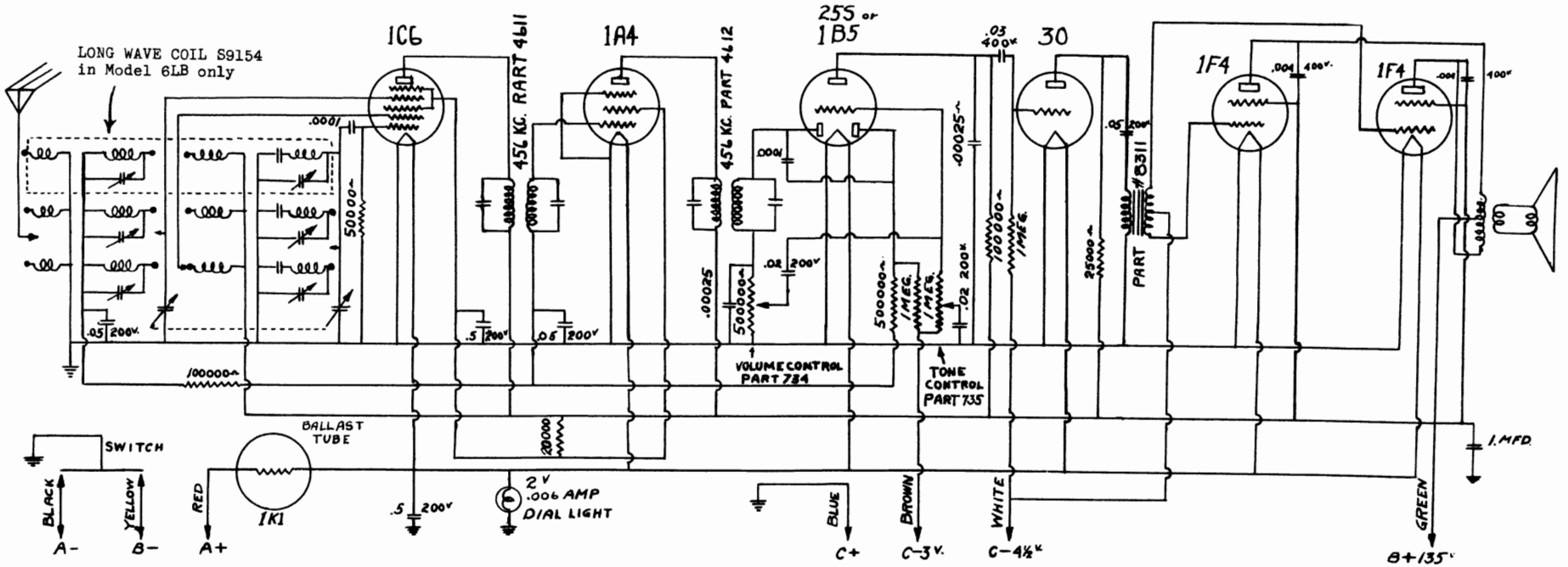
7 TUBE BATTERY RECEIVERS
Model 6SB 18-52 175-555 meters.
Model 6LB 18-52 175-555 750-2100 meters.

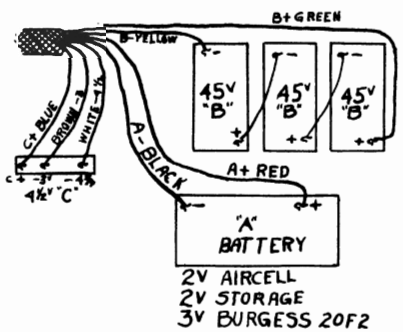
JULY -1935

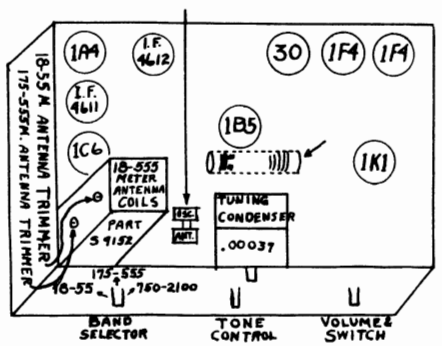
Before connecting the batteries be sure that the switch is in the "off" position, volume control knob must be all the way to left.
Check all the battery connections very carefully or serious damage to the tubes may result. Make sure that all the tubes are firmly inserted in their sockets. Use a good antenna from 75 to 100 ft. long and a good ground for best results.
In battery operated receivers the two most common causes of low volume are run down batteries and defective tubes. Test your batteries from time to time. If no tube tester is available, procure a new set of tubes, or a set that is operating satisfactorily in another receiver. Insert these in the chassis one at the time and note any difference in performance. Misalignment or poor tracking of tuning condenser may also be the cause, but do not try to align the receiver in case of low volume unless other causes have first been investigated.
The aligning of the I.F. transformers is done in the regular manner. The I.F. frequency is 456 K.C. The first I.F. has iron core and the selectivity and sensitivity of the receiver are greatly affected by its alignment. Alignment of the Short Wave band should be done at about 19 meters, the broadcast band at 1500 K.C. and the long wave band at about 350 K.C. If no signal generator is available these adjustments may be effected with a transmitting signal, but anyone without some technical knowledge should not attempt to align the set. All receivers are carefully adjusted before leaving the factory. The oscillator trimmers seldom need attention.

HETRO ELECTRICAL INDUSTRIES, Inc.

Models 6SB and 6LB — 1936







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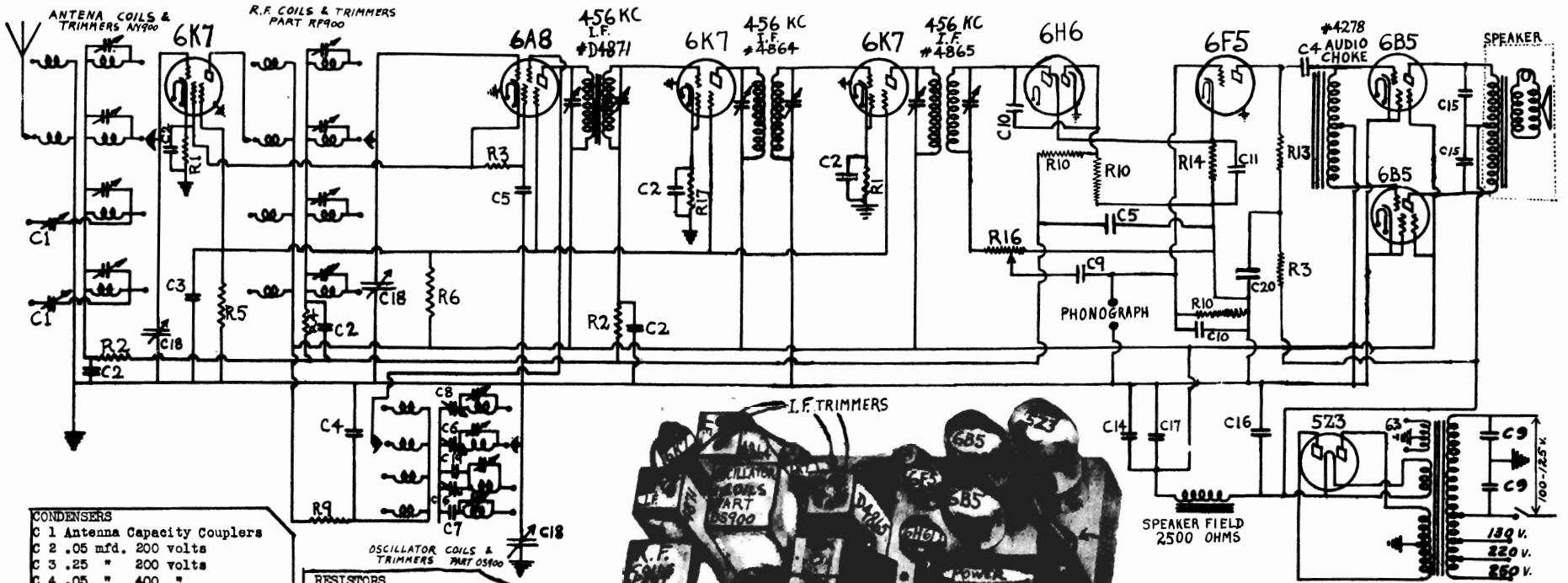
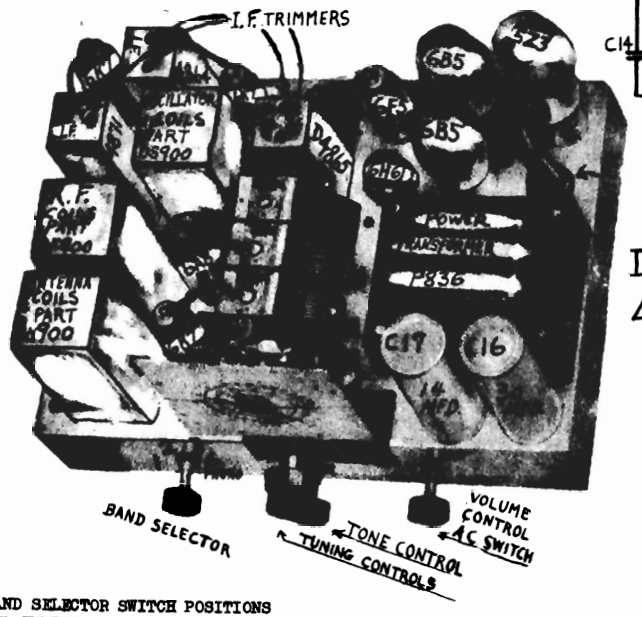
Air-Ace Series M – 1935





I.F. = 456 K.C.

CONDENSERS

C 1 Antenna Capacity Couplers
C 2 .05 mfd. 200 volts
C 3 .25 " 200 volts
C 4 .05 " 400 "
C 5 .0005 mica
C 6 5 plates padder X32
C 7 .005 mfd. mica
C 8 3 plates padder X33
C 9 .01 mfd. 400 volts
C10 .0001 mfd. mica
C11 10. mfd. 25 volts
C12 .5 " 300 volts
C13 .02 " 400 volts
C14 .1 " 400 volts
C15 .004 " 600 volts
C16 30 mfd. 450V. electrolytic X1
C17 14 mfd. 450V. electrolytic X2
C18 420 mfd. tuning condenser
C19 .002 mfd. mica
C20 8 mfd. 450V. electrolytic X3

RESISTORS

R 1 250 ohms 1/3 watt
R 2 250.000 ohms 1/3 watt
R 3 50.000 " " "
R 4 250.000 " " "
R 5 4.500 Candohm "F" } X7
R 6 5.500 Voltage divider }
R 9 25.000 ohms 1/3 watt
R10 1 megohm " "
R11 5.000 ohms " "
R12 500.000 " " "
R13 100.000 " " "
R14 3.000 " " "
R15 500.000 ohms Tone Control X72
R16 500.000 ohms Volume Control with A. C. switch X25
R17 350 ohms 1/3 watt

A.C. PRIMARY INPUT TAPS

START 117v. 135v. 220v. 250v.

6.3 v. FILAMENT — HIGH VOLTAGE 5Z3 PLATES — 5 v. FILAMENT

LOCATIONS OF THE CONNECTIONS IN POWER TRANSFORMER. PART P856

TUBE SOCKET VOLTAGES

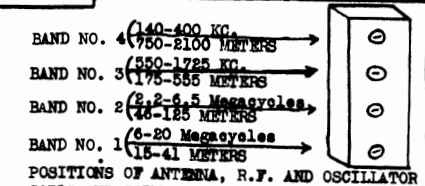
Tubes	Screen Grid to Ground	Plate to Ground	Cathode to Ground	Filament Heater
6H6			2 to 3	6.3
6F5		160-170	2 to 3	6.3
6K7 I.F.	85-95	235-245	3 to 4	6.3
6K7 R.F.	85-95	235-245	3 to 4	6.3
6A8 Detector	85-95	235-245	3 to 4	6.3
" Oscillator	85-95	145-155	3 to 4	6.3
6B5's	235-245	360-370		6.3

5Z3 filament to Ground 360 to 370 volts.

VOLTAGE DROP ACROSS SPEAKER FIELD 125 to 130 volts.

All voltages taken with volume control full on and no signal in receiver. 1000 ohms per volt resistance in volt meter used.

AIR-ACE
SERIE "M"
DEC. 1935. H.F.I.



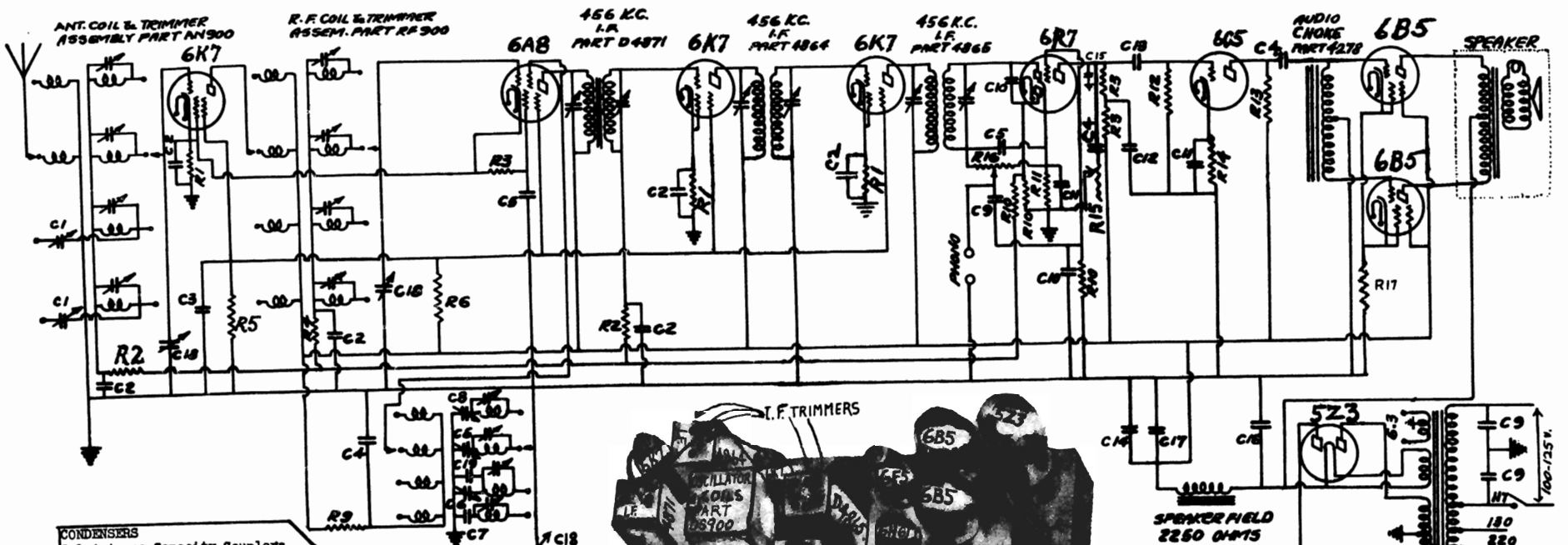
POSITIONS OF ANTENNA, R.F. AND OSCILLATOR COILS AND TRIMMERS WITHIN THE SHIELDS

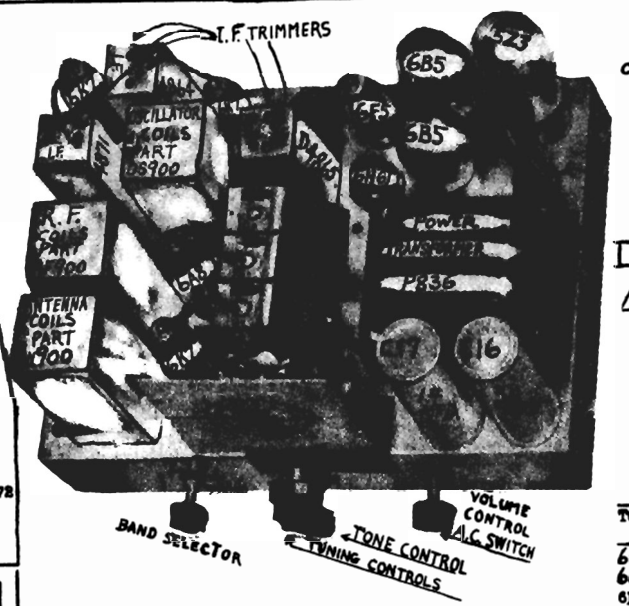
BAND SELECTOR SWITCH POSITIONS AND TUNING DIAL RANGES

BAND NO. 1-SHORT WAVES 6 to 20 MEGACYCLES, 15 to 47 METERS
BAND NO. 2-SHORT WAVES 2.2 to 6.5 MEGACYCLES, 46-125 METERS
BAND NO. 3-MEDIUM WAVES 550 to 1725 KILOCYCLES, 175 to 555 METERS
BAND NO. 4-EXTRA LONG WAVES 140 to 400 KILOCYCLES, 750 to 2100 METERS
EXTREME POSITION TO THE RIGHT FOR PHONOGRAPH OPERATION

HETRO ELECTRICAL INDUSTRIES, Inc.

Air Ace Series M - 1936





CONDENSERS
C 1 Antenna Capacity Couplers
C 2 .05 mfd. 200 volts
C 3 .25 " 200 volts
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C 5 .0005 mica
C 6 5 plates padder X32
C 7 .005 mfd. mica
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C 9 .01 mfd. 400 volts
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C11 10. mfd. 25 volts
C12 .5 " 300 volts
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C14 .1 " 400 volts
C15 .004 " 600 volts
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C17 14 mfd. 450V. electrolytic X2
C18 420 mfd. tuning condenser
C19 .002 mfd. mica
C20 8 mfd. 450V. electrolytic X3

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R 2 250.000 ohms 1/3 watt
R 3 50.000 " " "
R 4 250.000 " " "
R 5 4.500 Candohm "F" } X7
R 6 5.500 Voltage divider }
R 9 25.000 ohms 1/3 watt
R10 1 megohm " "
R11 1.500 ohms " "
R12 500.000 " " "
R13 100.000 " " "
R14 3.000 " " "
R15 500.000 ohms Tone Control X72
R16 500.000 ohms Volume Control with A. C. switch X25
R17 250 ohms 3 watt

I.F. = 456 K.C.

START 117v. 130v. 220v. 250v.
A.C. PRIMARY INPUT TAPS
40-60 CYCLES
6.3V. FIL. | HIGH VOLTAGE 523 PLATES | 5v. FIL. 523

LOCATIONS OF CONNECTIONS IN POWER TRANSFORMER. PART NO. P836

Tube socket voltages

Tubes	Screen Grid to Ground	Plate to Ground	Cathode to Ground	Filament Heater
6R7	----------	75 to 85	5 to 7	6.3
6C5	----------	95 --105	5 - 7	6.3
6D6 I.F.	85-95	235-245	3 - 4	6.3
6D6 R.F.	85-95	235-245	3 - 4	6.3
6A7 Detector	85-95	235-245	3 - 4	6.3
" Oscillator	85-95	145-155	3 - 4	6.3
6B5's	235-245	360-370		6.3

523 filament to ground 360 to 370 volts

Voltage drop across 125 to 130 volts. All voltages taken with volume control full on and no signal in receiver. 1000 ohms per volt resistance in volt meter used.

AIR-ACE
SERIE "M"
MARCH 1936
H.E.I.

BAND NO. 4 (140-400 KC. 750-2100 METERS)
BAND NO. 3 (550-1725 KC. 175-555 METERS)
BAND NO. 2 (2.2-6.5 Megacycles 46-125 METERS)
BAND NO. 1 (6-20 Megacycles 15-41 METERS)

POSITIONS OF ANTENNA, R.F. AND OSCILLATOR COILS AND TRIMMERS WITHIN THE SHIELDS

BAND SELECTOR SWITCH POSITIONS AND TUNING DIAL RANGES

BAND NO. 1-SHORT WAVES 6 to 20 MEGACYCLES, 15 to 47 METERS
BAND NO. 2-SHORT WAVES 2.2 to 6.5 MEGACYCLES, 46-125 METERS
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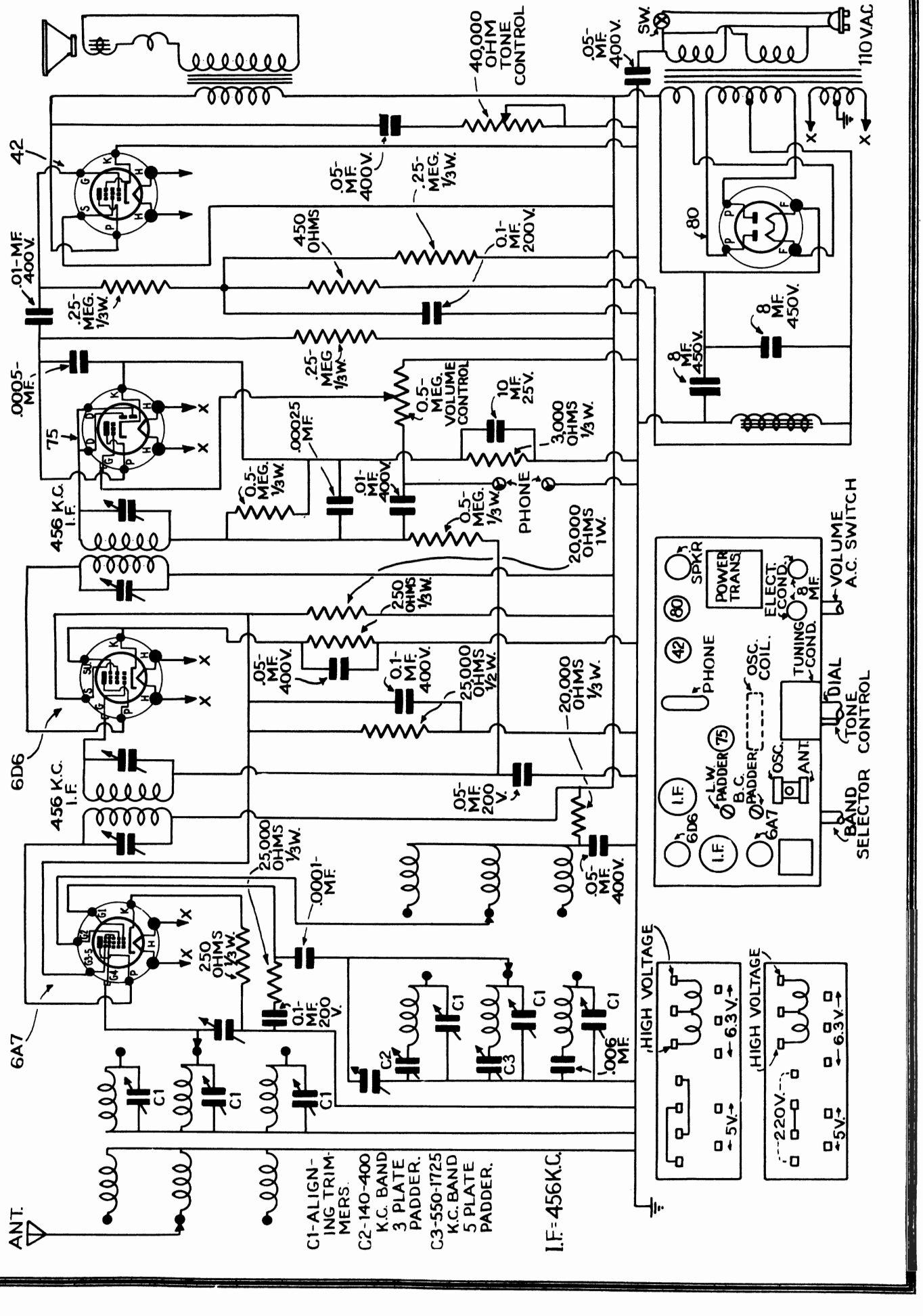
EXTREME POSITION TO THE RIGHT FOR PHONOGRAPH OPERATION

HETRO ELECTRICAL INDUSTRIES, Inc.

HETRO ELECTRICAL INDUSTRIES, Inc.

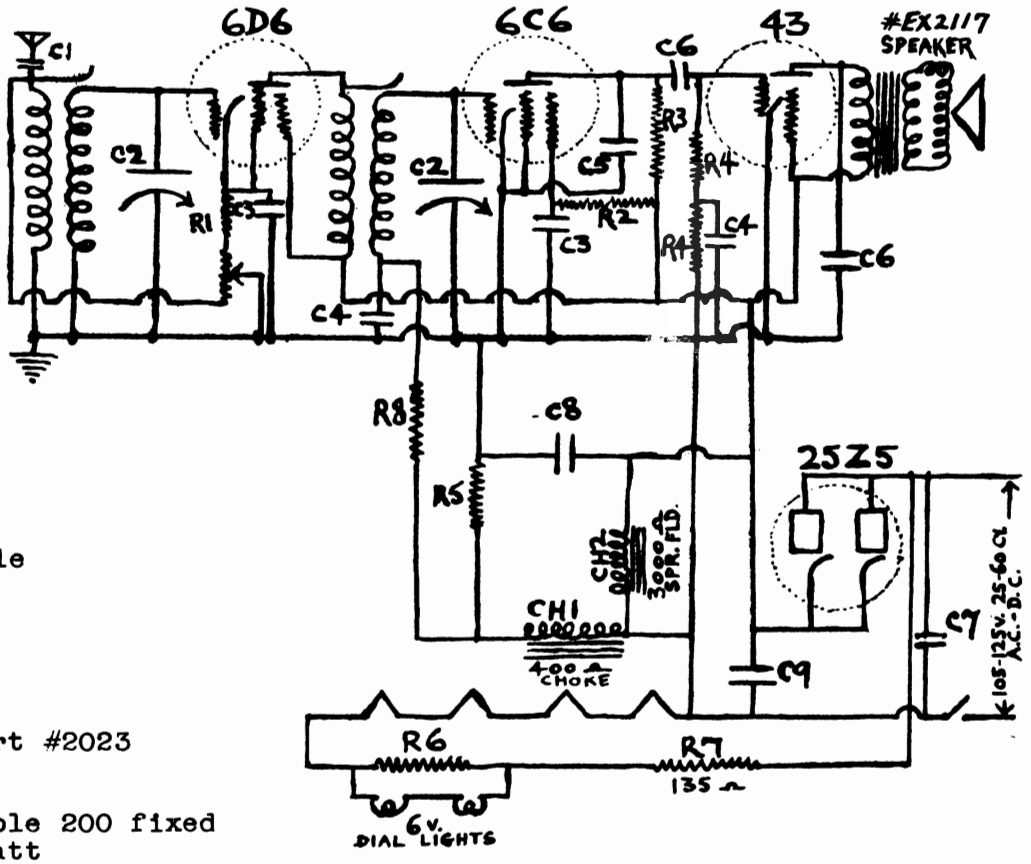


HETRO ELECTRICAL INDUSTRIES, Inc.

Model 239

MODEL
293
Series V

4 TUBE T.R.F.
Compact
A. C. - D. C.
200 to 550 Meters.



CONDENSERS		VOLTS
C1	.01	400 v.
C2	.00037	Variable
C3	.05	200 v.
C4	.25	"
C5	.00025	mica
C6	.01	400 v.
C7	.05	"
C8	12.0	200
C9	16.0	" Part #2023

RESISTANCES		WATTS
R1	25000 ohm	variable 200 fixed
R2	2.000,000	1/3 watt
R3	500.000	"
R4	250.000	"
R5	100	"
R6	40	" Part FH-40
R7	135	Service cord & plug, Part No. 682
R8	1.000,000	1/3 watt

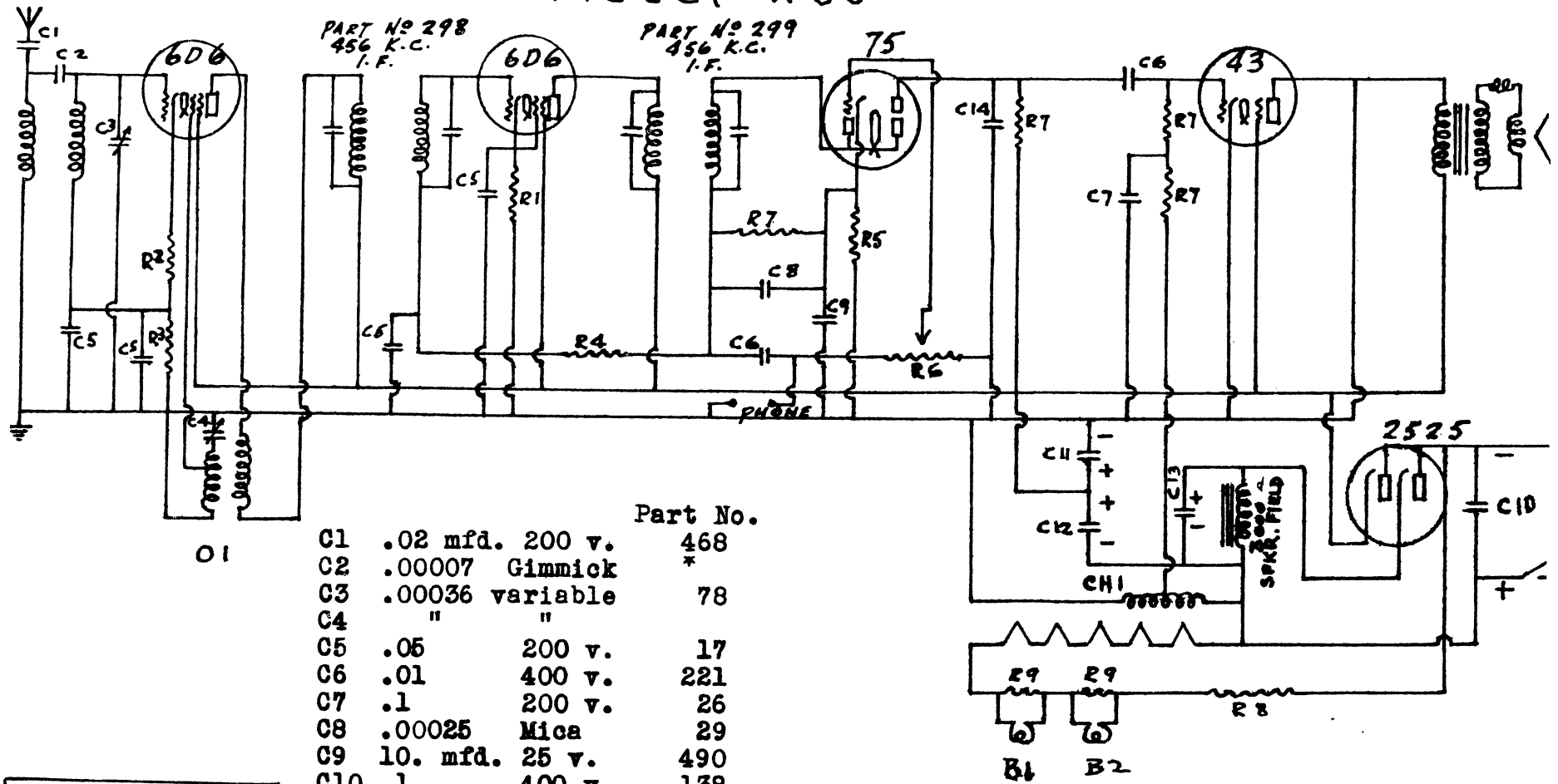
REPLACEMENT PARTS

Speaker Part #EX2117 Filter Choke Part #T341 Dial bulb Part #13
Antena Coil Part A1015 R.F. Coil Part #B1049 Volume control & switch #329
Tubes; 25Z5, 6D6, 6C6, 43. Adaptor for 220-240 volts operation #319.

OPERATING INSTRUCTIONS

Do not remove the tubes from the sockets while the current is on. For maximum distance additional antenna may be used. DO NOT USE A GROUND. Do not shorten or wet the service cord. It is better to place the receiver where the air circulates freely to avoid extreme heat inside of the receiver. The service cord contains a resistance that disipates heat in reducing the voltage, do not tie knots in it, heat will dissipate quicker when stretched. Better reception and less hum is sometimes obtained by reversing the service cord plug in the socket of the A.C. or D.C. line. The knob on the left hand side is the VOLUME CONTROL that also acts as a sensitivity regulator. When tuning distant stations, advance the volume control knob clockwise, until a click, thud or whistle is heard; this is the oscillation point. By keeping the volume control slightly below this point and the receiver functioning close to the oscillating stage, maximum sensitivity and output on distant stations will be obtained.

Model 295



			Part No.
C1	.02 mfd.	200 v.	468
C2	.00007	Gimmick	*
C3	.00036	variable	78
C4	"	"	
C5	.05	200 v.	17
C6	.01	400 v.	221
C7	.1	200 v.	26
C8	.00025	Mica	29
C9	10. mfd.	25 v.	490
C10	.1	400 v.	138
C11	10 Mfd.	Filter	
C12	25 "	Block	466
C13	5 "		
C14	.0005	Mica	103
R1	250	1/3 Watt	680
R2	300	" "	180
R3	3M	" "	549
R4	1 Megohm	" "	34
R5	5M	" "	361
R7	250M	" "	305

	Part No.
R6 500.000 ohms volume control & switch	84
R8 Service cord & plug with 120 ohm restr.	726
R9 40 ohm, 10 watt center tapped resistor	718
Complete speaker 3000 ohm field	79
CH1 600 ohm choke tapped at 200 ohms	733
A1 antenna coil	302
O1 Oscillator coil	303
B1, B2, 6 volt dial bulbs	13

*The phrase gimmick designates a wire wound around another wire

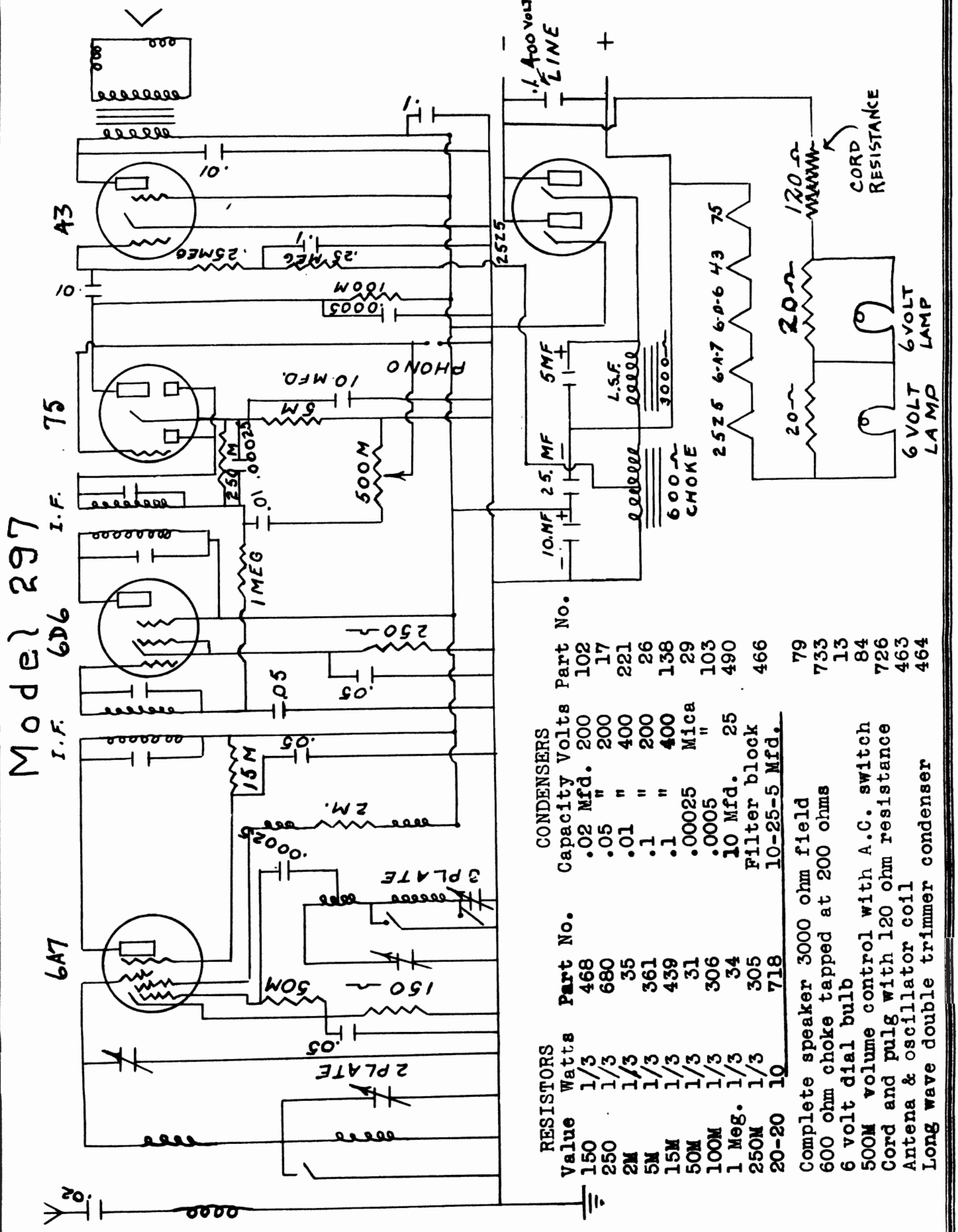
5 TUBE A.C.D.C.
·175-555 METERS·
AUG.-1934.

PRINTED IN U. S. A.

HETRO ELECTRICAL INDUSTRIES, Inc.

HETRO ELECTRICAL INDUSTRIES, Inc.

Model 297



CONDENSERS

Capacity	Volts	Part No.
.02 Mfd.	200	102
.05 "	200	17
.01 "	400	221
.1 "	200	26
.1 "	400	138
.00025	Mica	29
.0005	"	103
10 Mfd.	25	490
Filter block		466
10-25-5 Mfd.		

RESISTORS

Value	Watts	Part No.
150	1/3	468
250	1/3	680
2M	1/3	35
5M	1/3	361
15M	1/3	439
50M	1/3	31
100M	1/3	306
1 Meg.	1/3	34
250M	1/3	305
20-20	10	718

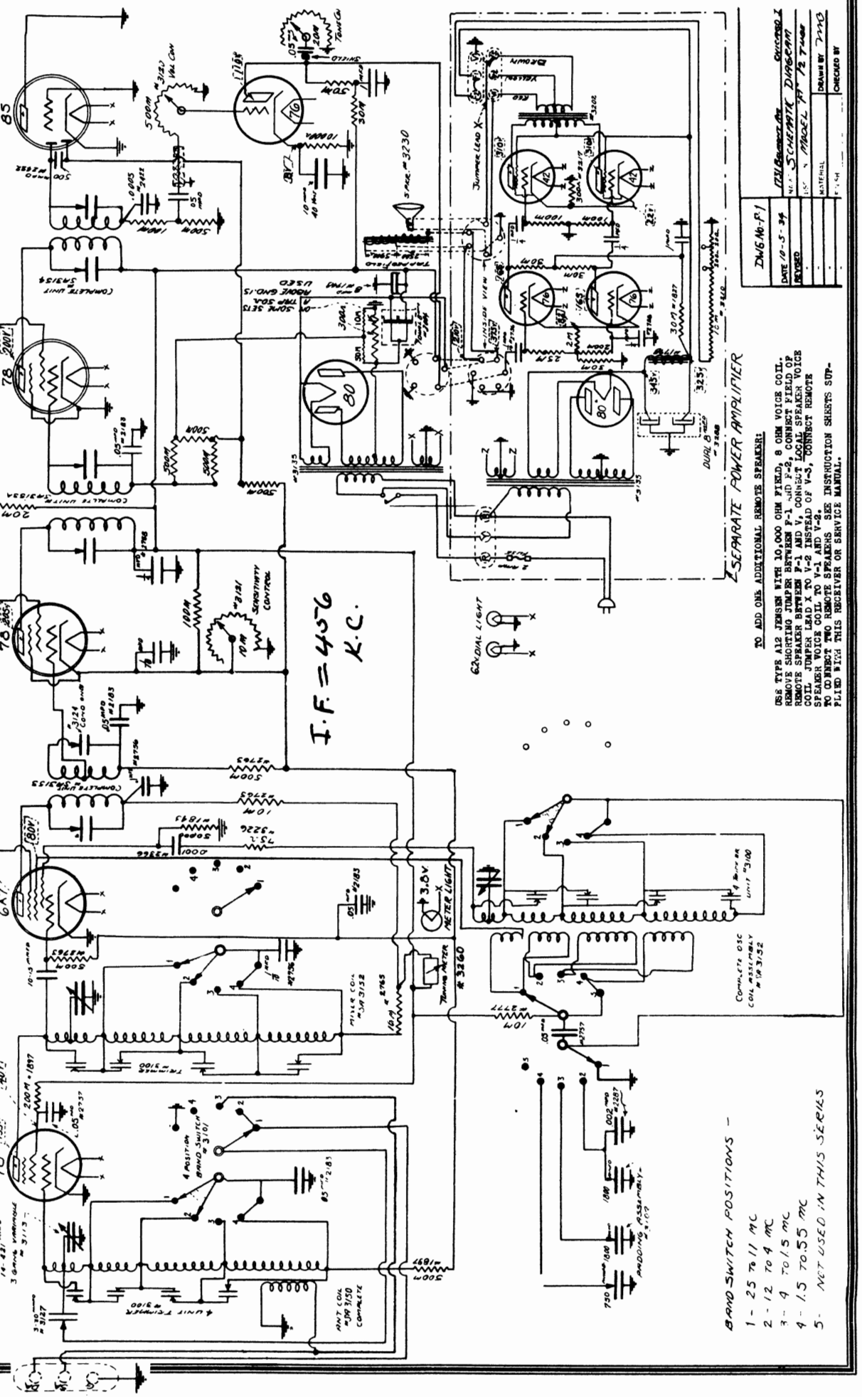
Complete speaker 3000 ohm field	79
600 ohm choke tapped at 200 ohms	733
6 volt dial bulb	13
500M volume control with A.C. switch	84
Cord and pulg with 120 ohm resistance	726
Antena & oscillator coil	463
Long wave double trimmer condenser	464

HOWARD RADIO CO.

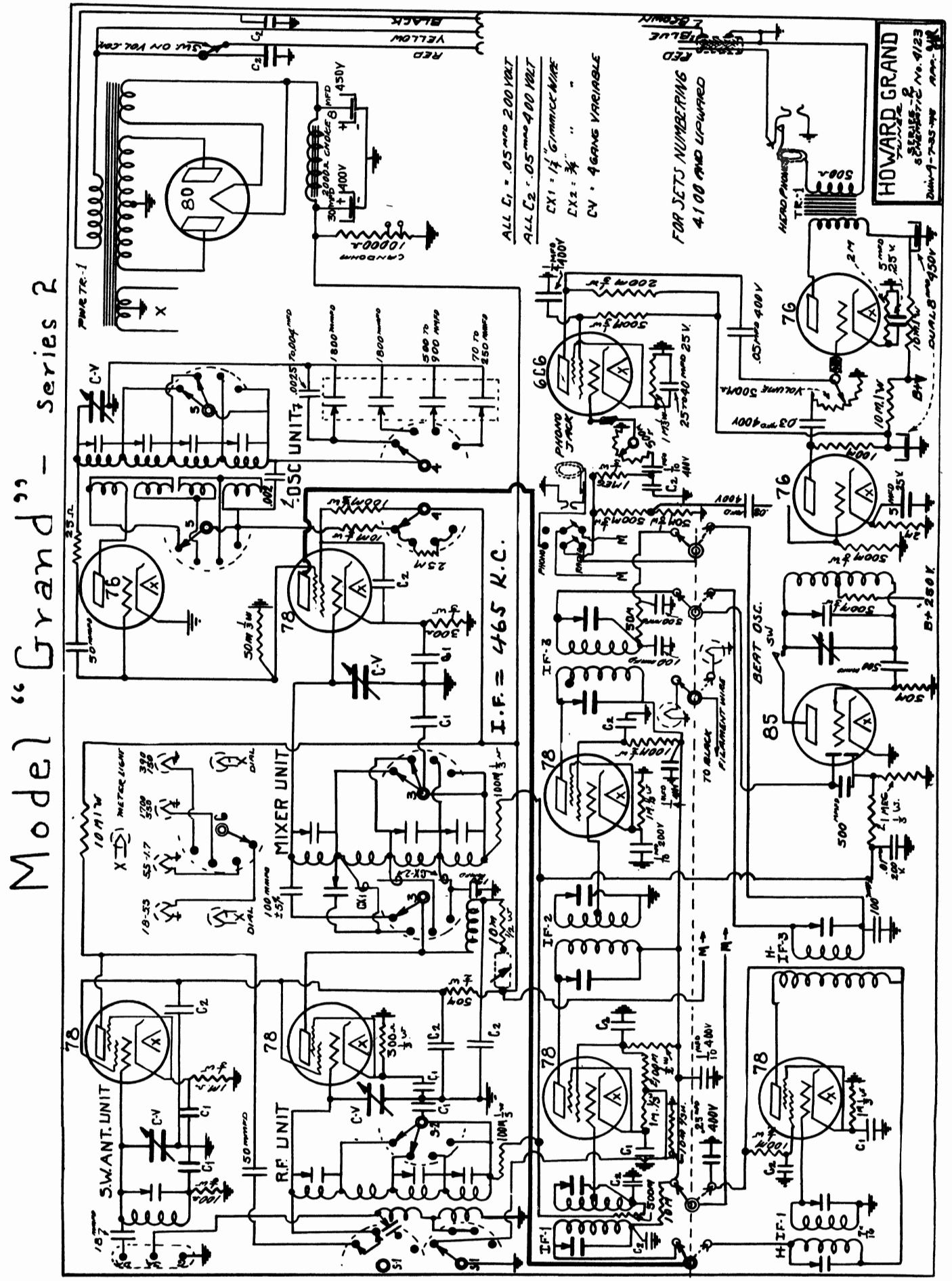
Model F Series A

IF STAGES PEAKED AT 465 KC.

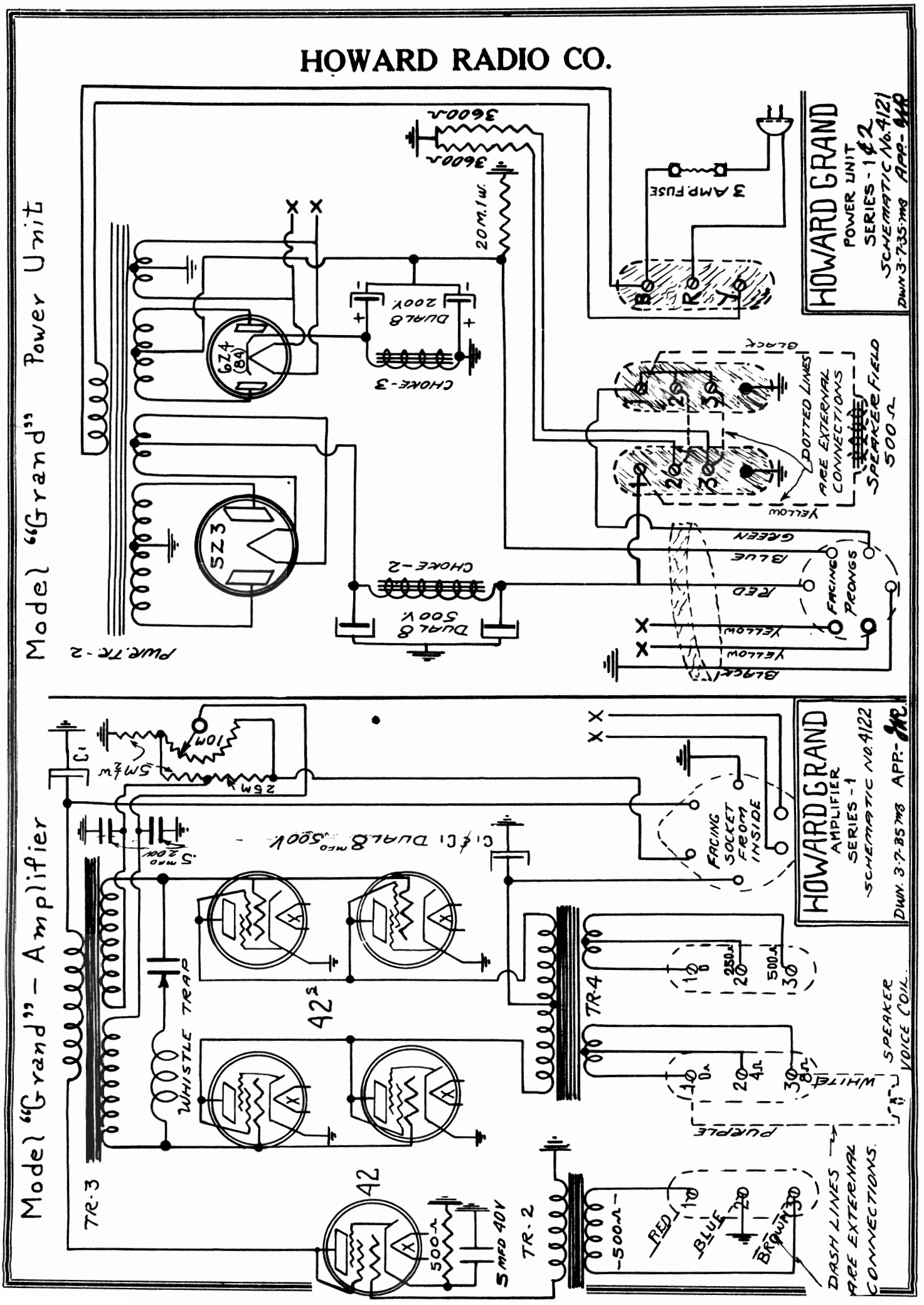
VOLTAGES SHOWN INDICATE POTENTIAL FROM GROUND, LINE VOLTAGE 115V.



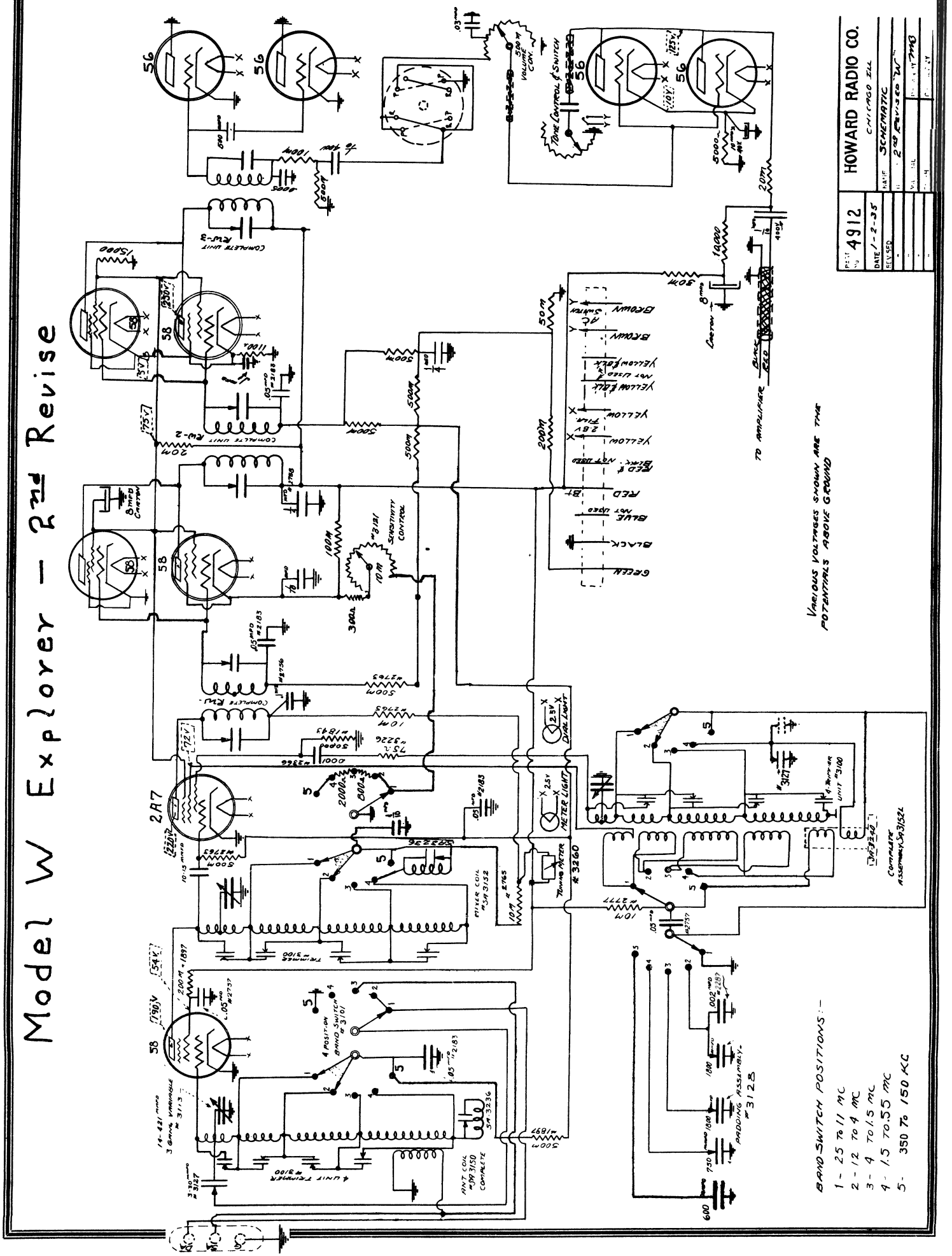
HOWARD RADIO CO.



HOWARD RADIO CO.

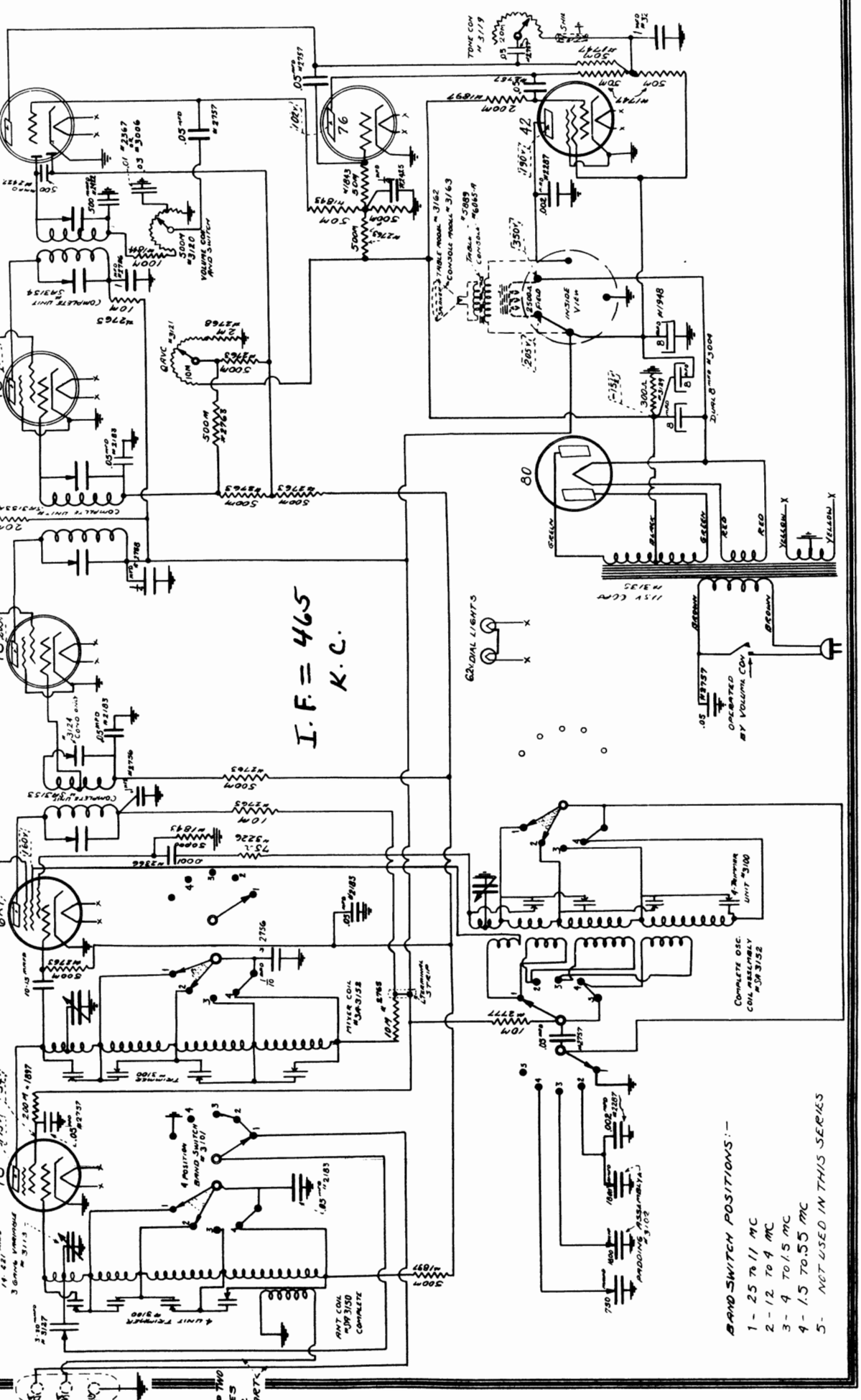


HOWARD RADIO CO.



HOWARD RADIO CO.

Model D-8



HOWARD RADIO CO.

Model D8 Series A

IF STAGES PEAKED AT 465 KC

VOLTAGES SHOWN INDICATE POTENTIAL FROM GROUND, LINE VOLTAGE 115 V.

THE WIRES OF THE MAIN CIRCUITS ARE COLOR CODED AS FOLLOWS -

B+ - RED
PLATE - BLUE
SCREEN - BROWN
GROUND & NO RETURNS - BLACK
GRID - GREEN

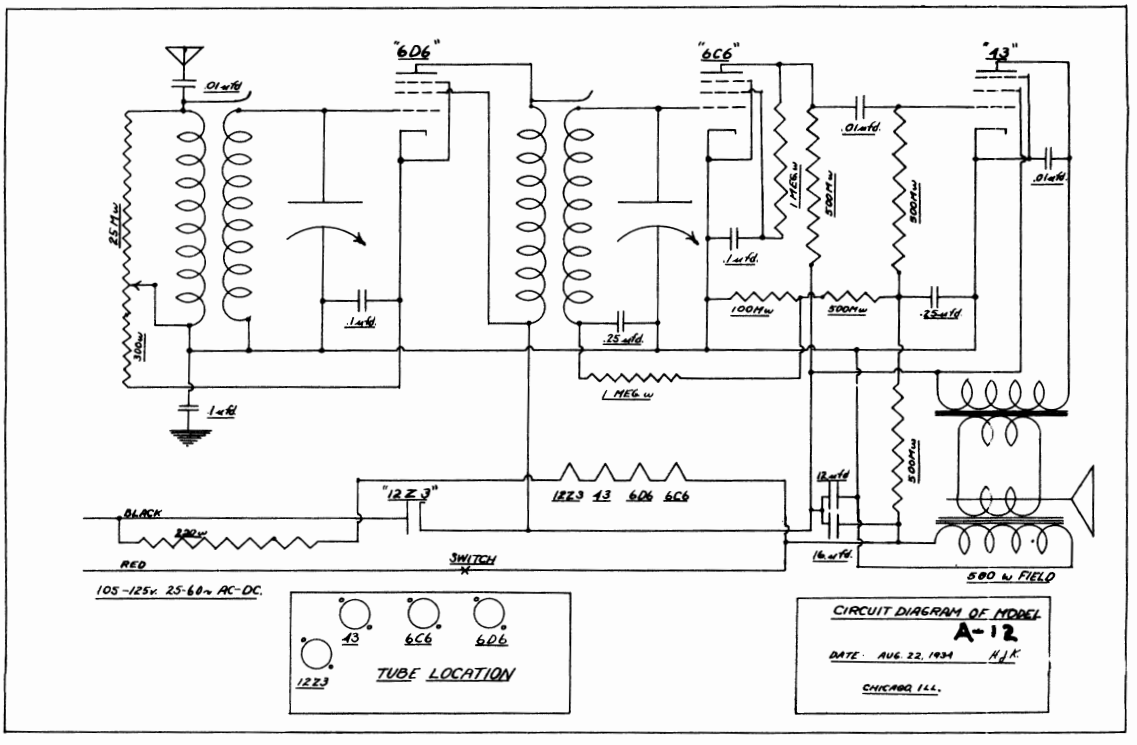
DWG NO. D-1
DATE - 9-1-34
REVISED -
NAME SCHEMATIC DIAGRAM
MODEL D8
LICENSE NO 1731
DRAWN BY - TWB
CHECKED BY -

BAND SWITCH POSITIONS :-

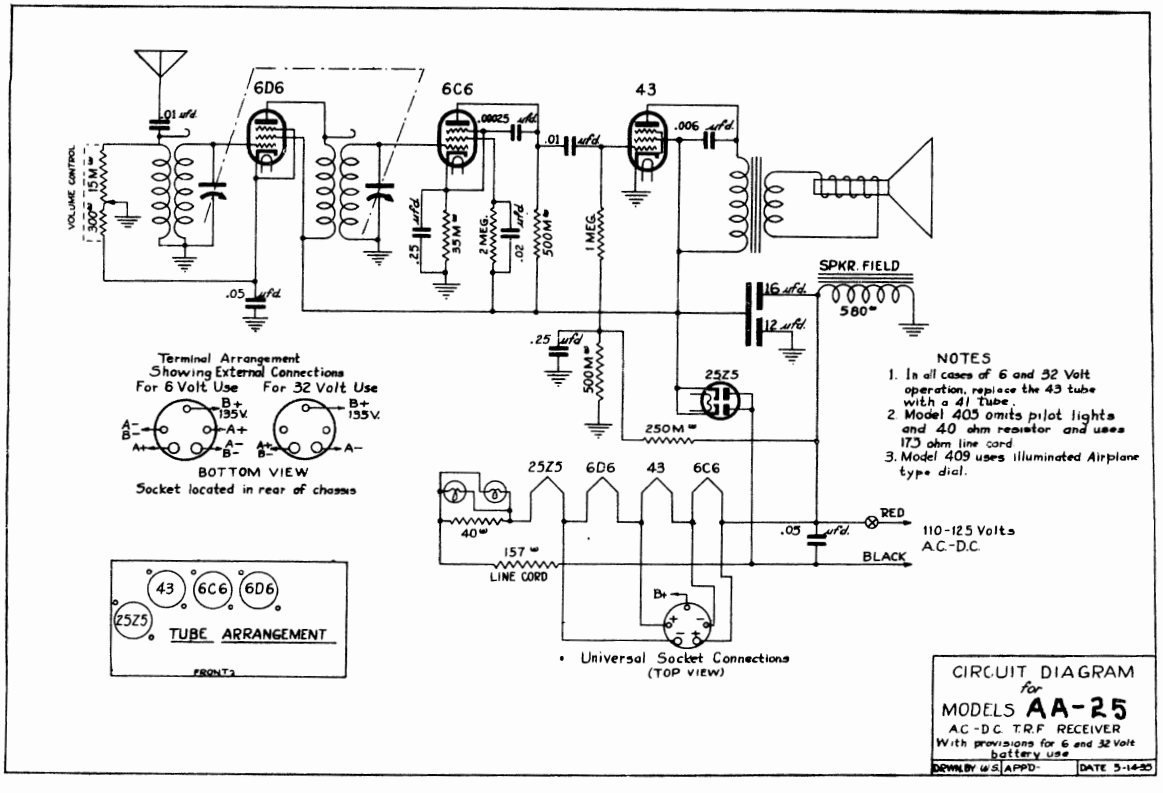
1 - 25 TO 11 MC
2 - 12 TO 4 MC
3 - 4 TO 1.5 MC
4 - 1.5 TO .55 MC
5 NOT USED IN THIS SERIES

HOWARD RADIO CO.

Model A-12

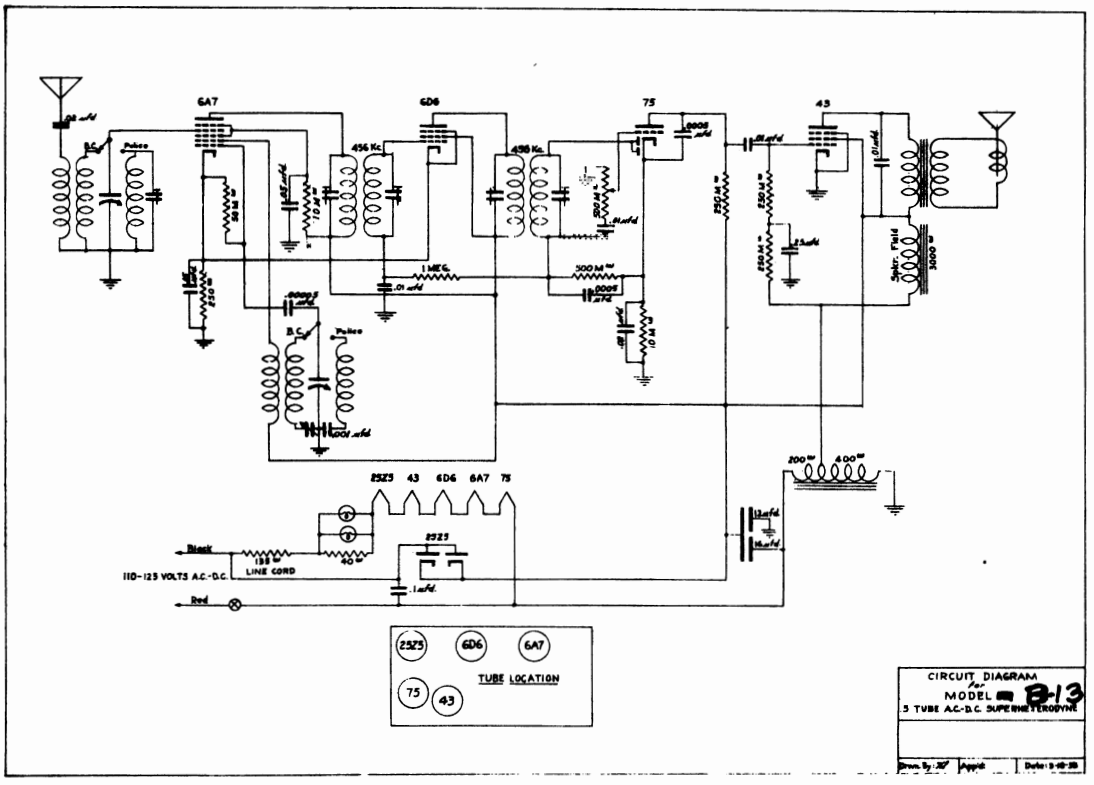


Model AA25

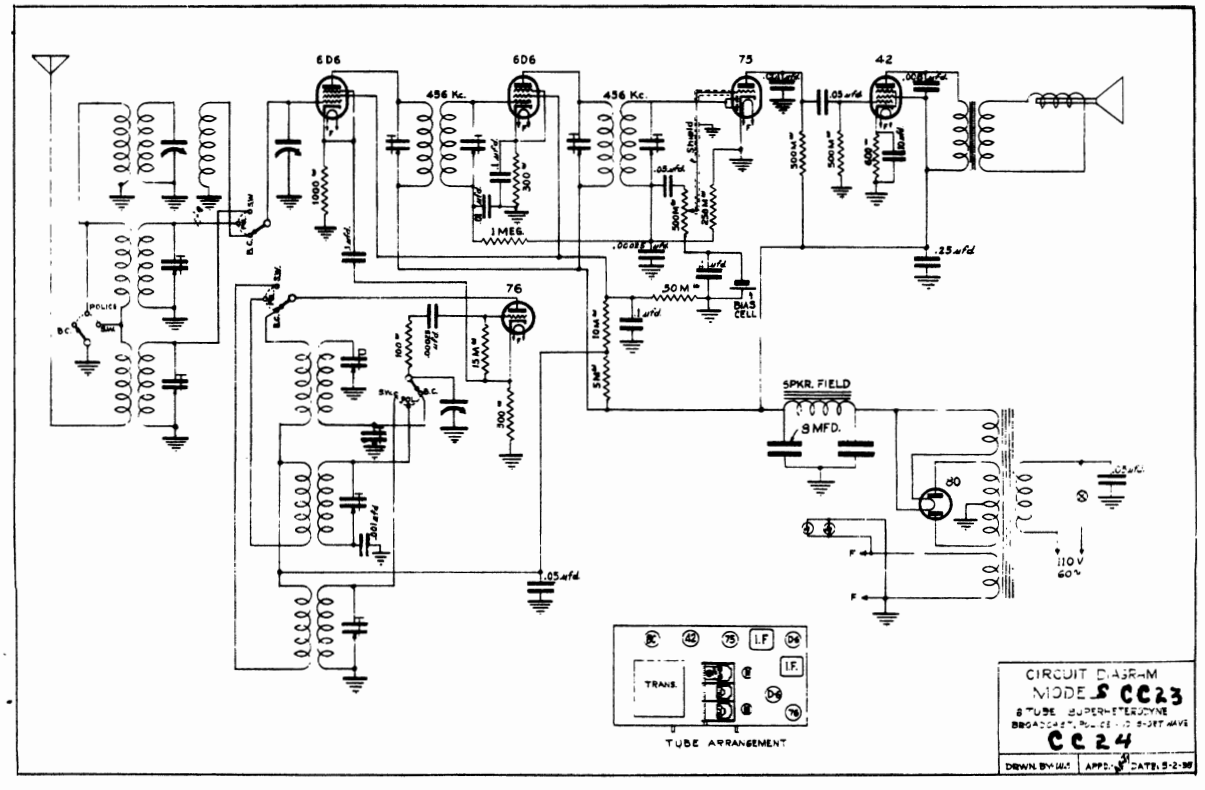


HOWARD RADIO CO.

Model B-13

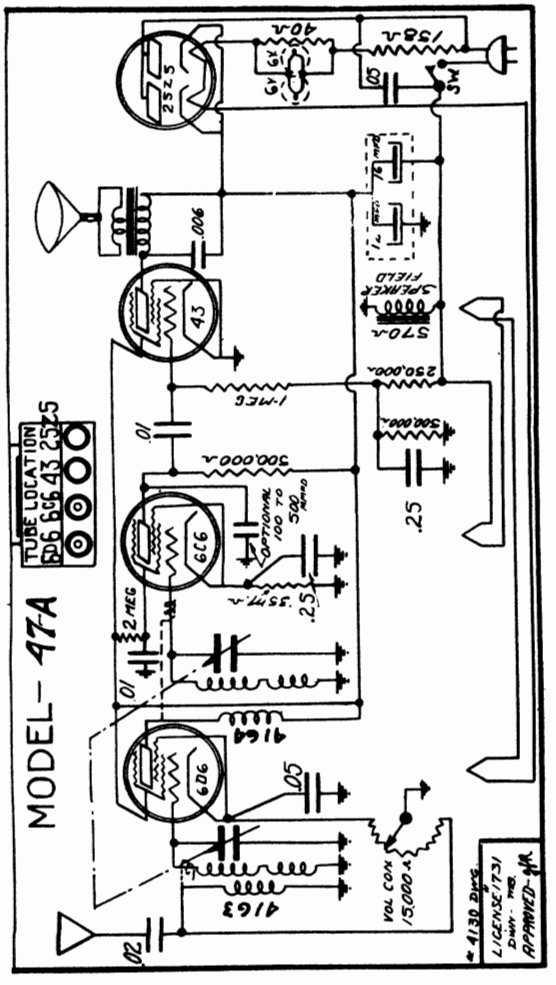


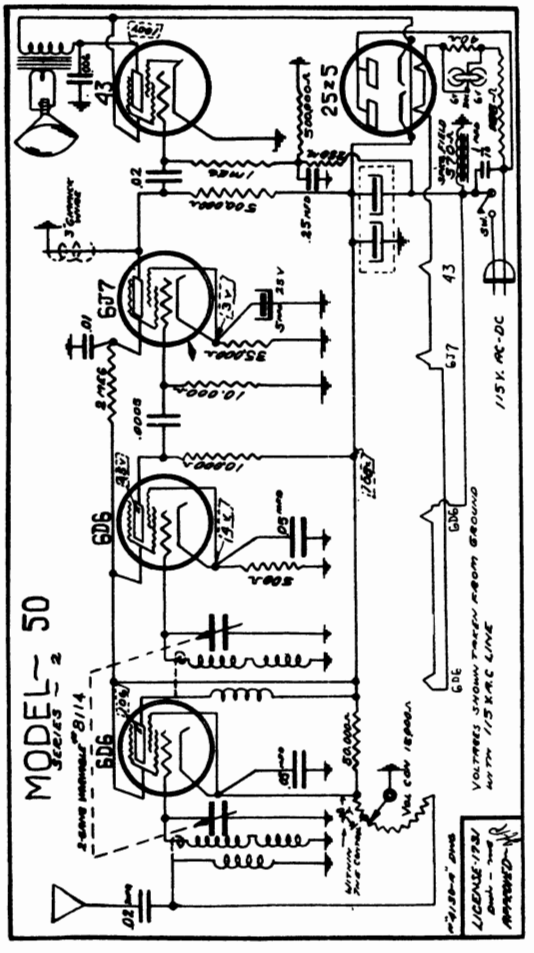
Models CC23 - CC24

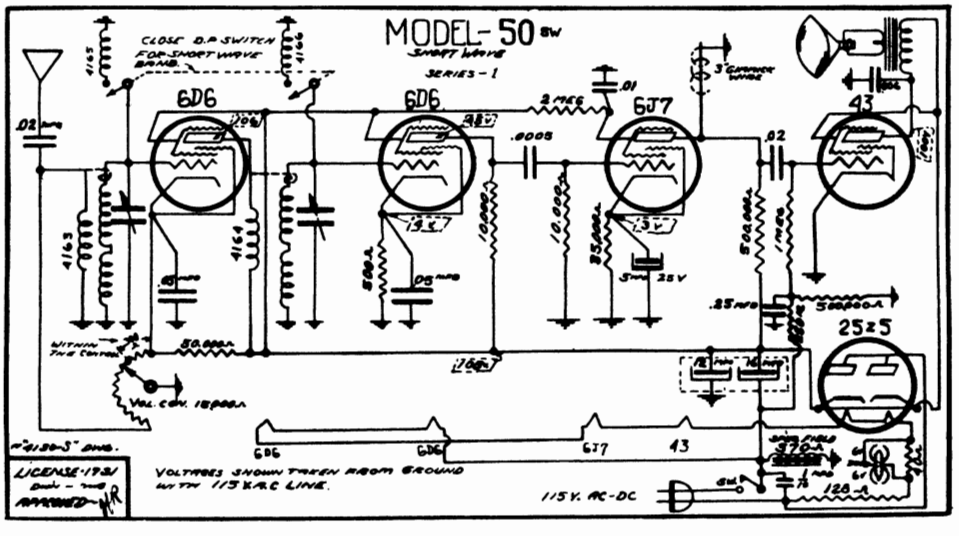


HOWARD RADIO CO.

Models 47-A, 50, 50-SW
(Series 1) (Series 2)

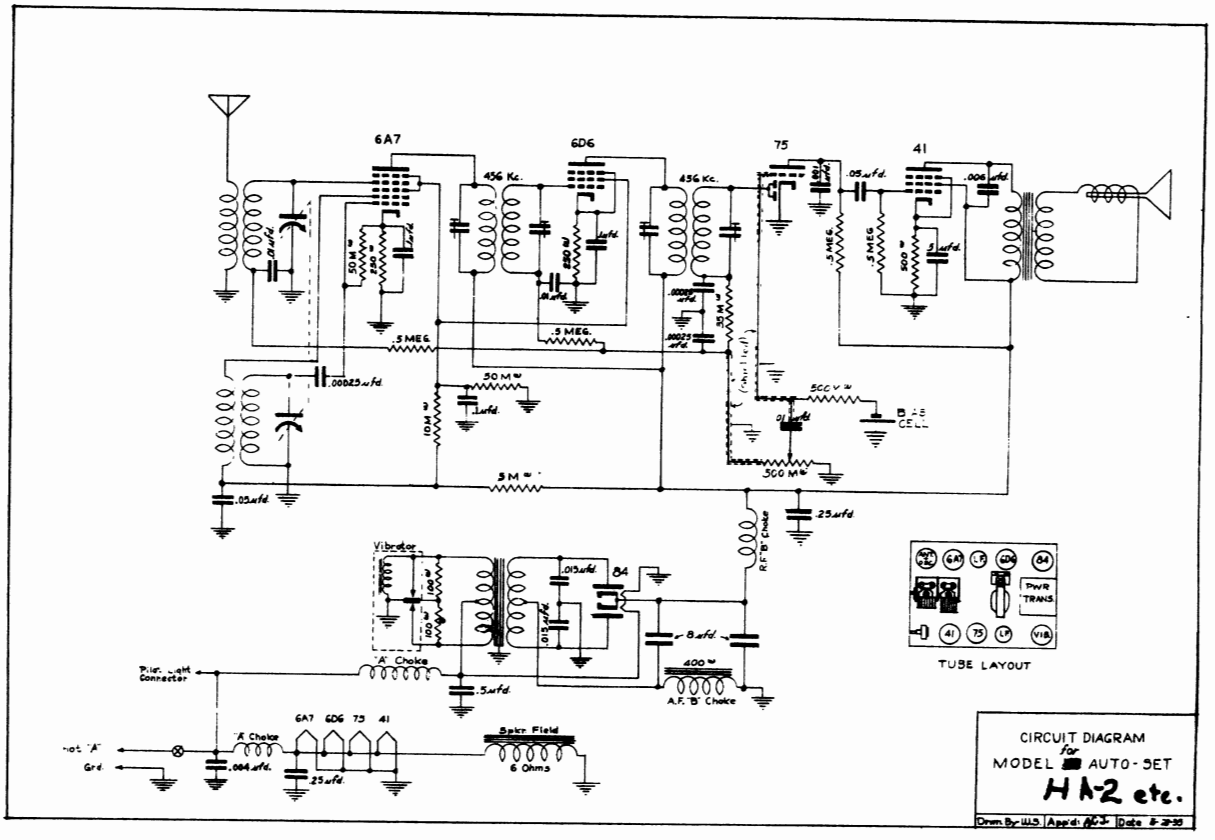




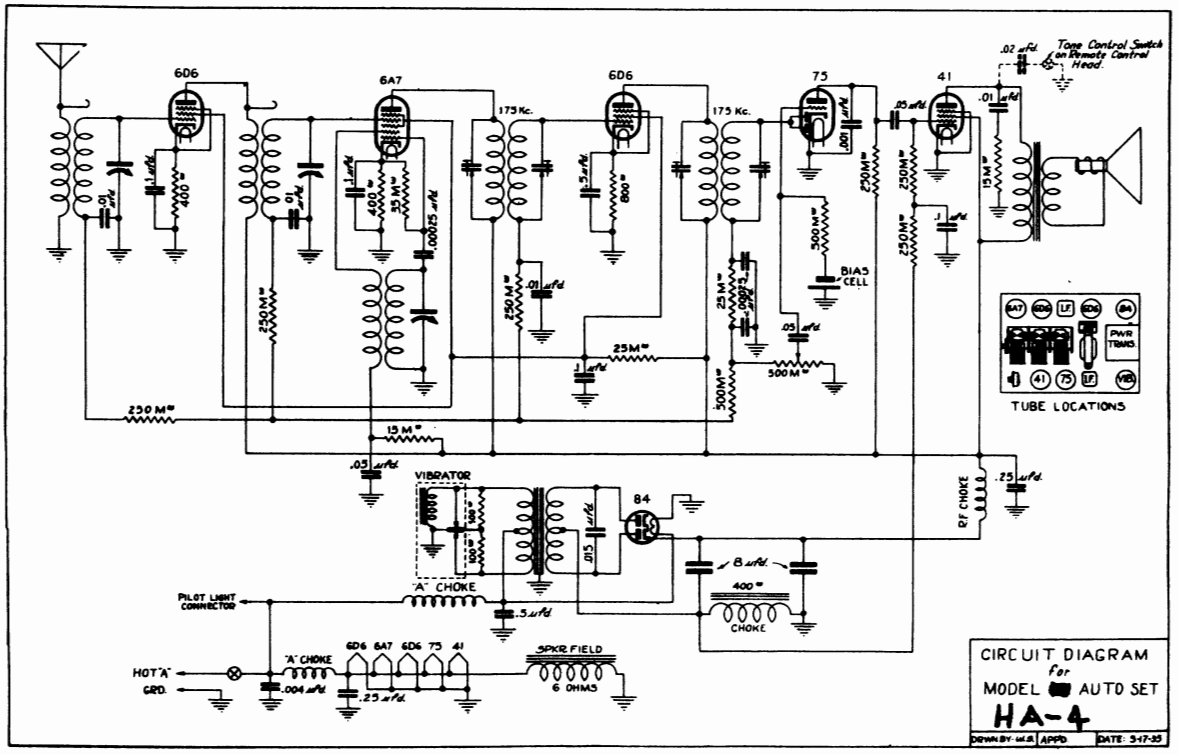


HOWARD RADIO CO.

Models 52, 502, HA2



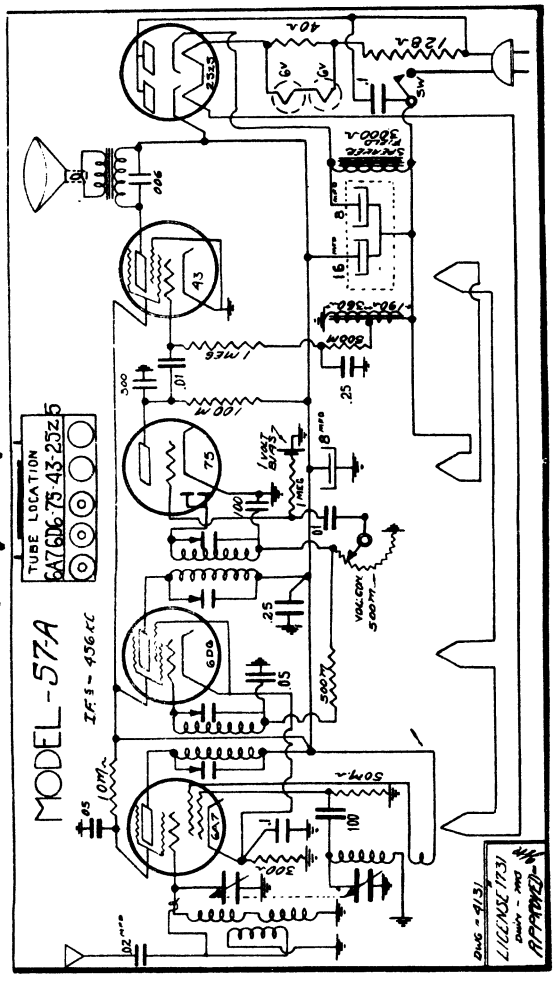
Model HA-4



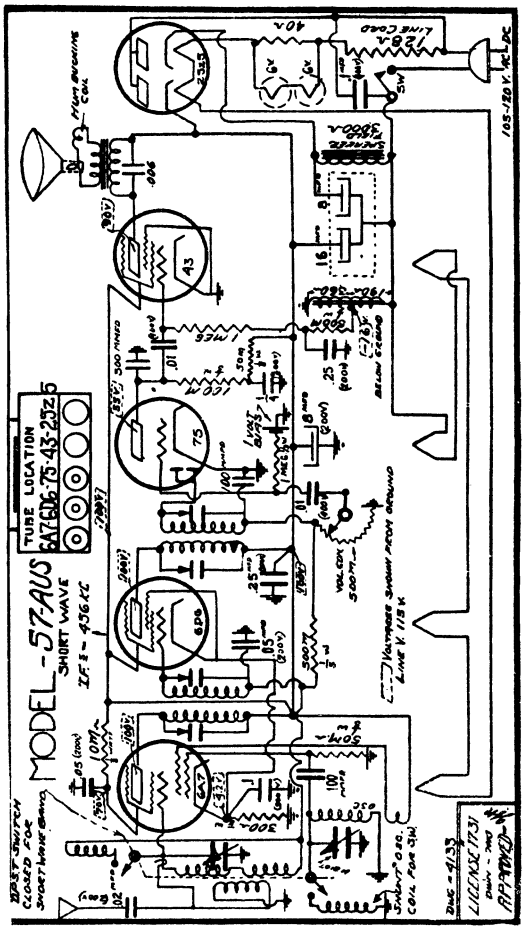
HOWARD RADIO CO.

Models 57-A, 57-AUS, 60 (Series 1)

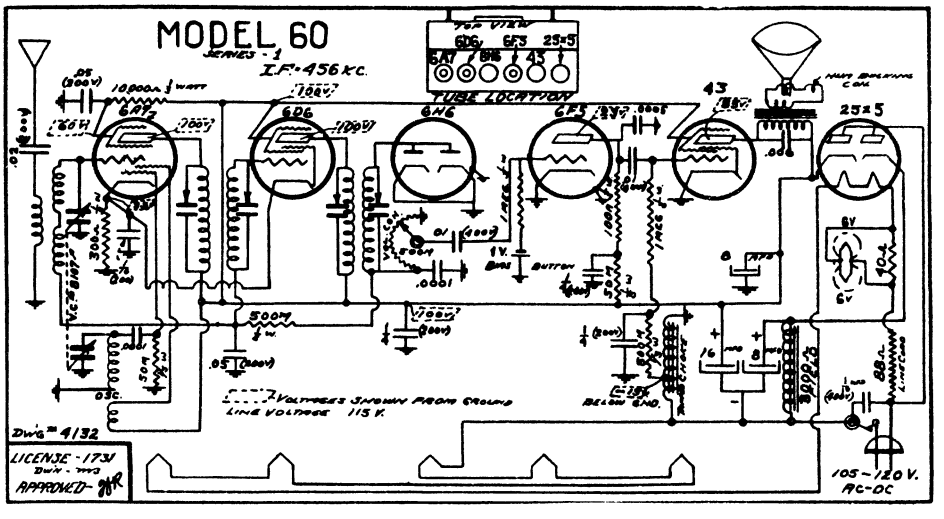
57-A



57-AUS

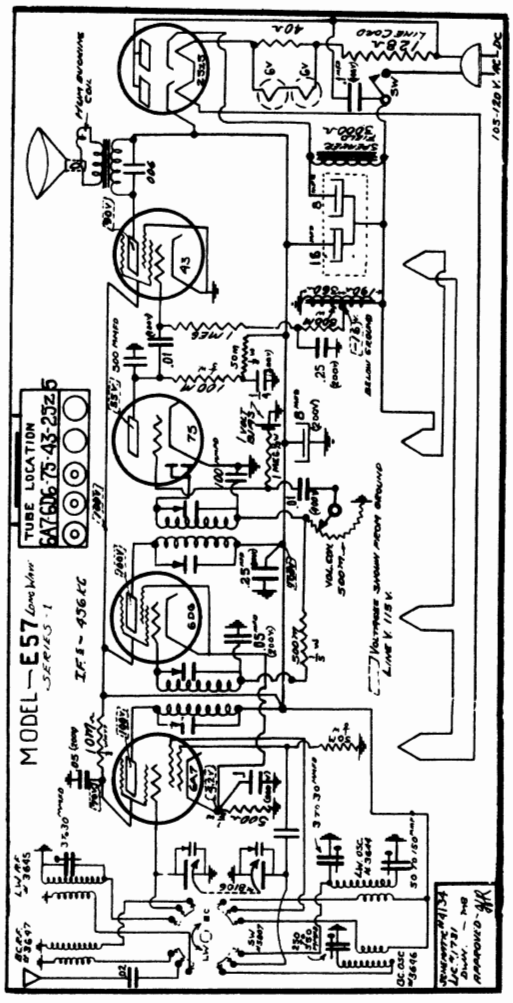


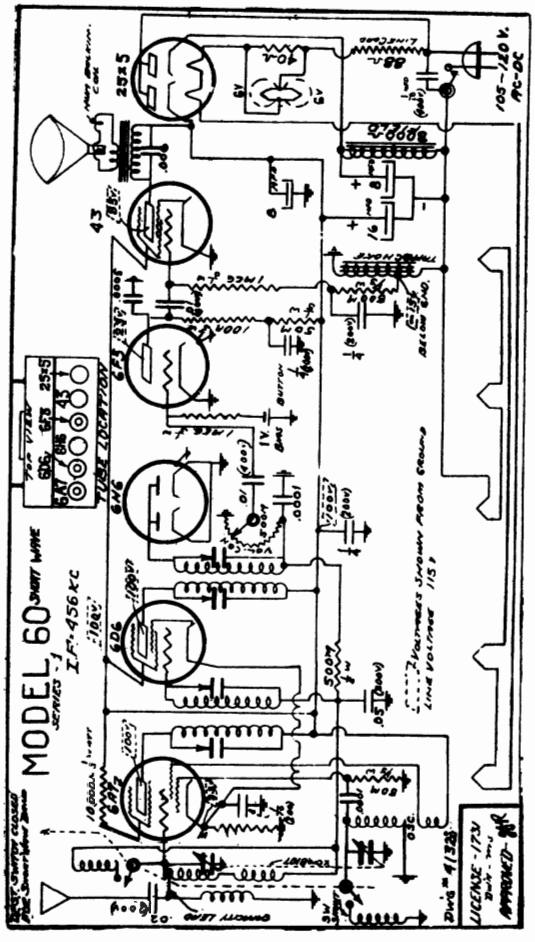
60



HOWARD RADIO CO.

Models E-57 (Series 1) and 60-SW (Series 1)





NOTES ON E-57 LONG WAVE

The service notes given on previous page on standard 57 models apply to the E-57 long wave model generally.

The proceedure in aligning the set is the same except that the regular Broadcast band 540 to 1500 KC must be aligned before the long wave band.

The Broadcast band oscillator padding condenser on this model is located near the center of the chassis and mounted through the back side of chassis.

To align the 150 to 350 KC band, set dial hand to 300 KC and peak oscillator trimmer (this trimmer is the one behind the variable condenser and under the 6-A-7 tube) to 300 KC.

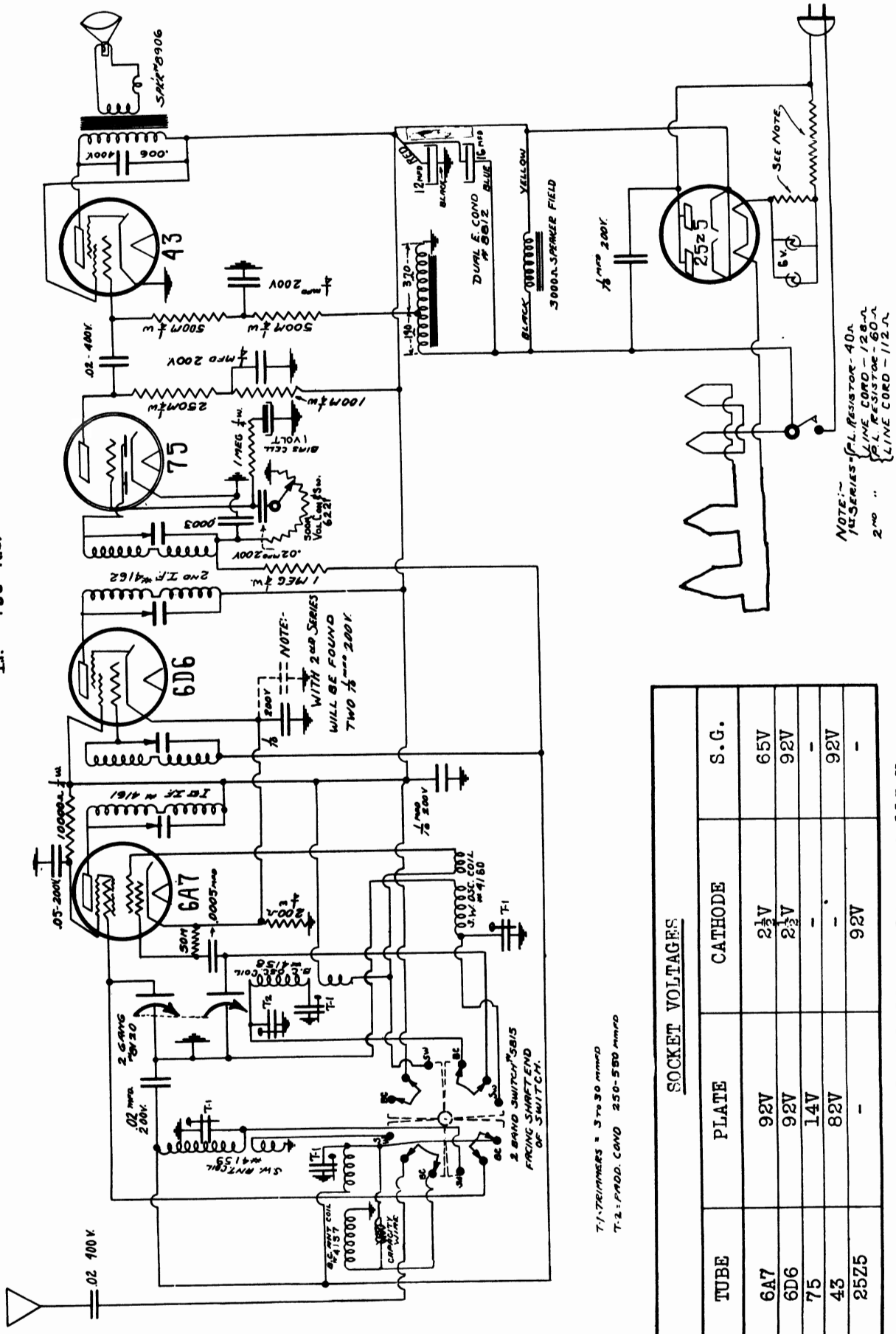
Peak the R.F. trimmer (the one near the top of the chassis directly over the variable condenser) to 300 KC after the oscillator trimmer has been set.

Rotate dial to 150 KC and peak oscillator padding condenser to 150 KC this is the condenser mounted through the front of the chassis below the dial.

HOWARD RADIO CO.

Model 58

IF 465 K.C.

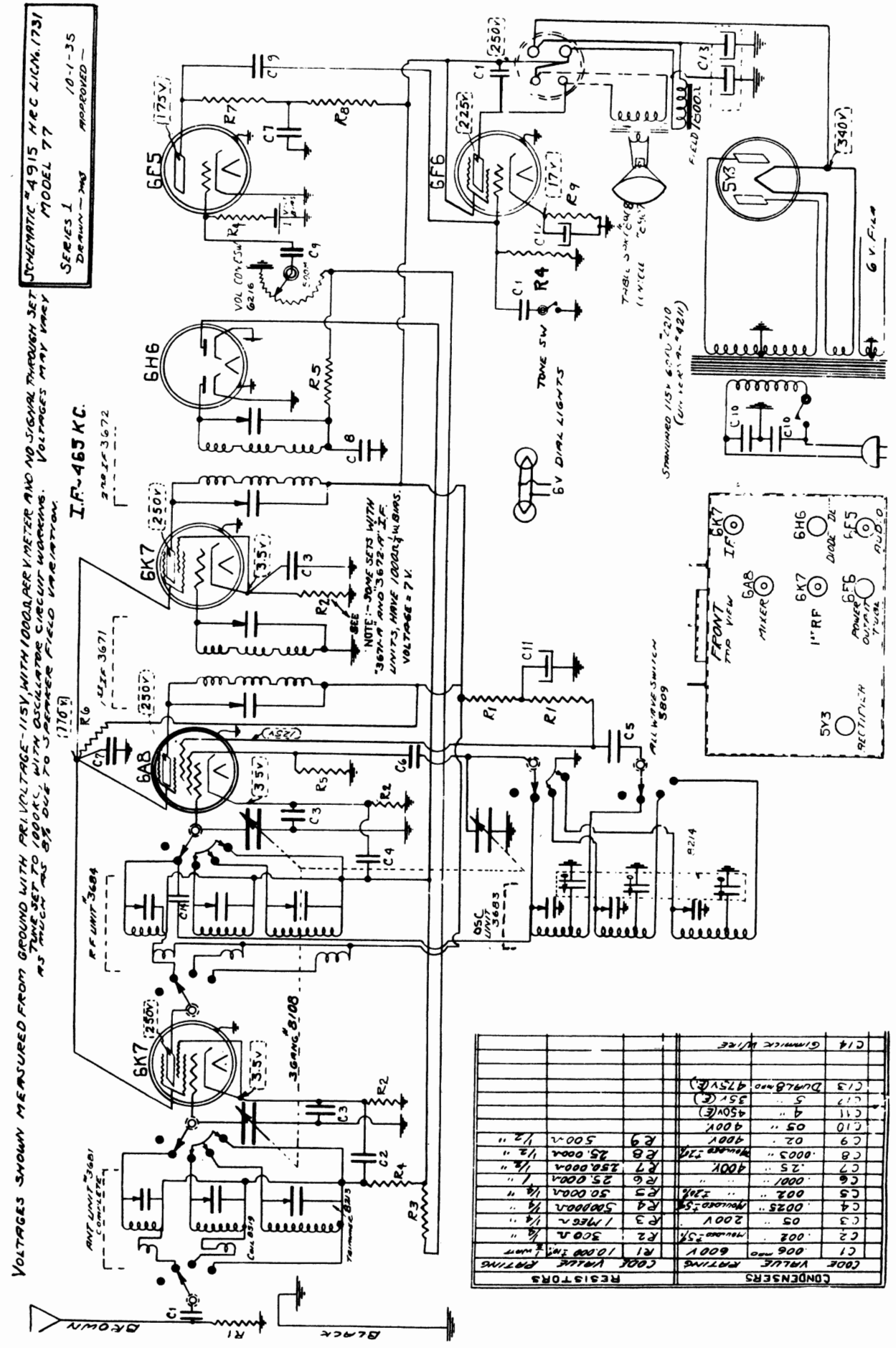


SOCKET VOLTAGES			
TUBE	PLATE	CATHODE	S.G.
6A7	92V	2½V	65V
6D6	92V	2½V	92V
75	14V	-	-
43	82V	-	92V
25Z5	-	92V	-

Taken from ground with line voltage at 115 V.

HOWARD RADIO CO.

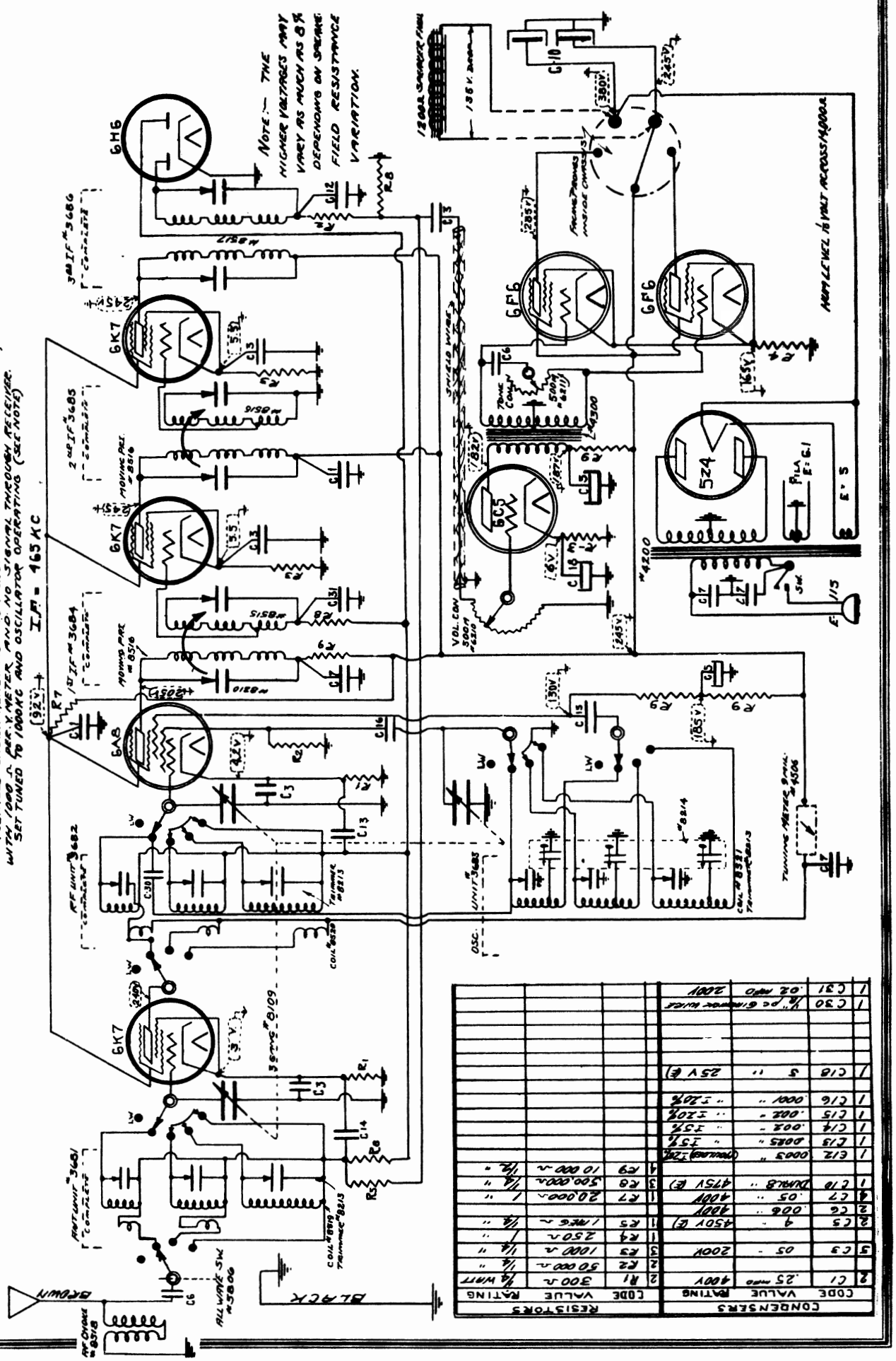
MODELS — 77T and 77C



CONDENSERS			RESISTORS		
CODE	VALUE	RATING	CODE	VALUE	RATING
C1	.006 mfd	600 V	R1	10,000 Ω	1 watt
C2	.002 "	Moulded ±5%	R2	350 Ω	1/4 "
C3	.05 "	200 V	R3	1 MEG Ω	1/4 "
C4	.0025 "	Moulded ±5%	R4	500000 Ω	1/4 "
C5	.002 "	1200 "	R5	50,000 Ω	1/4 "
C6	.0001 "	" "	R6	25,000 Ω	1 "
C7	.25 "	400 V	R7	250,000 Ω	1 "
C8	.0003 "	Moulded ±2%	R8	25,000 Ω	1/2 "
C9	.02 "	400 V	R9	500 Ω	1/2 "
C10	.05 "	400 V			
C11	4 "	450 V (E)			
C12	5 "	35 V (E)			
C13	DUAL 8 mfd	475 V (E)			
C14	GIMMICK WIRE				

HOWARD RADIO CO.

MODELS — 99T and 99C

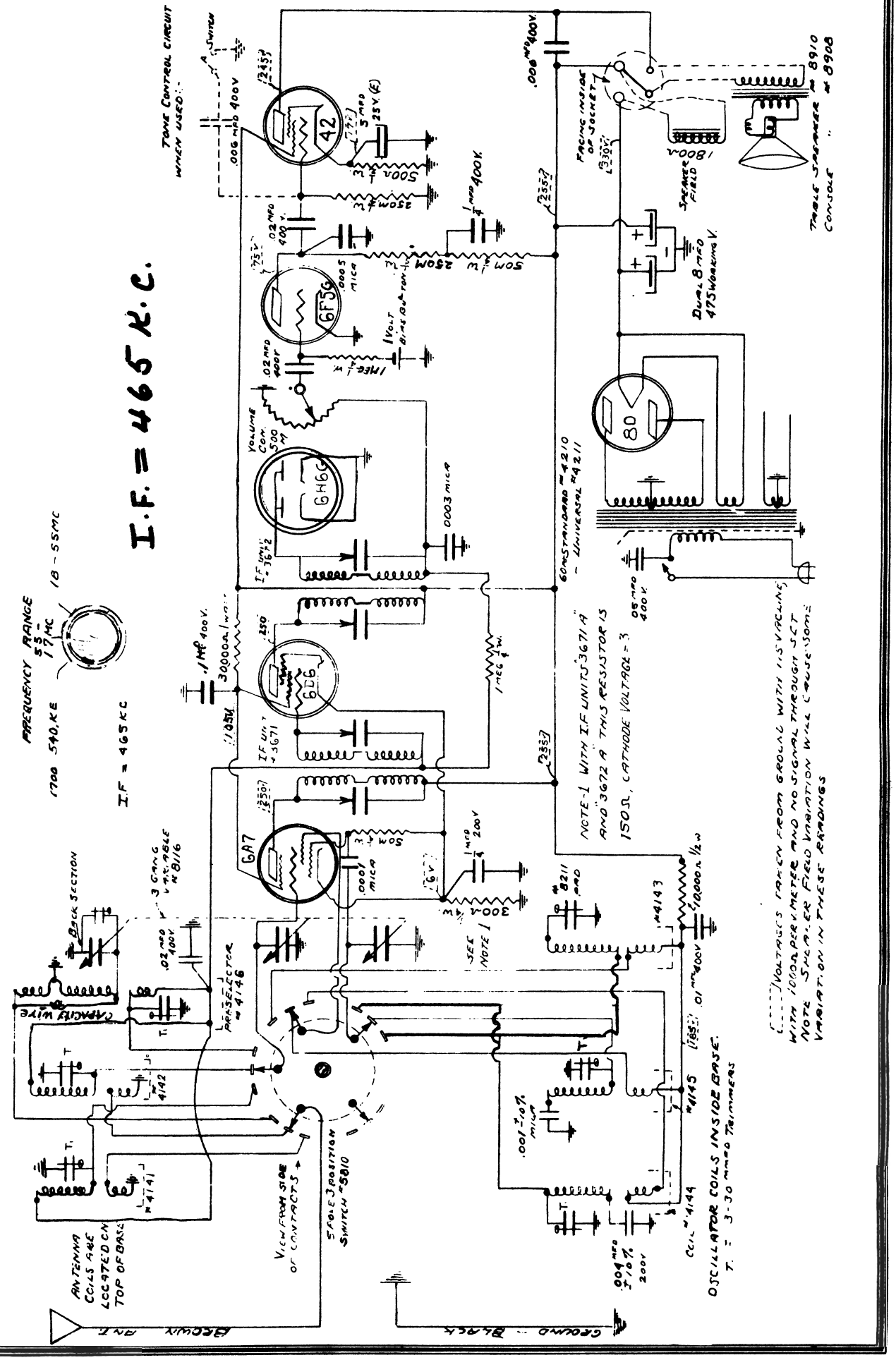


CONDENSERS				REGISTORS			
CODE	VALUE	RATING		CODE	VALUE	RATING	
2 C1	.25 mmfd	400V		2 R1	300 Ω	¼ WATT	
				2 R2	50 000 Ω	½ "	
3 C3	.05 -	200V		3 R3	1000 Ω	½ "	
				1 R4	250 Ω	1 "	
2 C5	4 -	450V (E)		1 R5	1 MEG Ω	¼ "	
2 C6	.006 "	400V		1 R7	20 000 Ω	1 "	
4 C7	.05 "	400V		3 R8	500 000 Ω	¼ "	
1 C10	DUAL 8 "	475V (E)		4 R9	10 000 Ω	½ "	
1 C12	.0003 "	(TWISTED) 2%					
1 C13	.0085 "	" 5%					
1 C14	.002 -	" 5%					
1 C15	.002 -	" ±20%					
1 C16	.0001 "	" ±20%					
1 C18	8 "	25V (E)					
1 C30	½" DC GRID-LEAK MICA						
1 C31	.02 MFD	200V					

HOWARD RADIO CO.

MODELS 626-1626-67

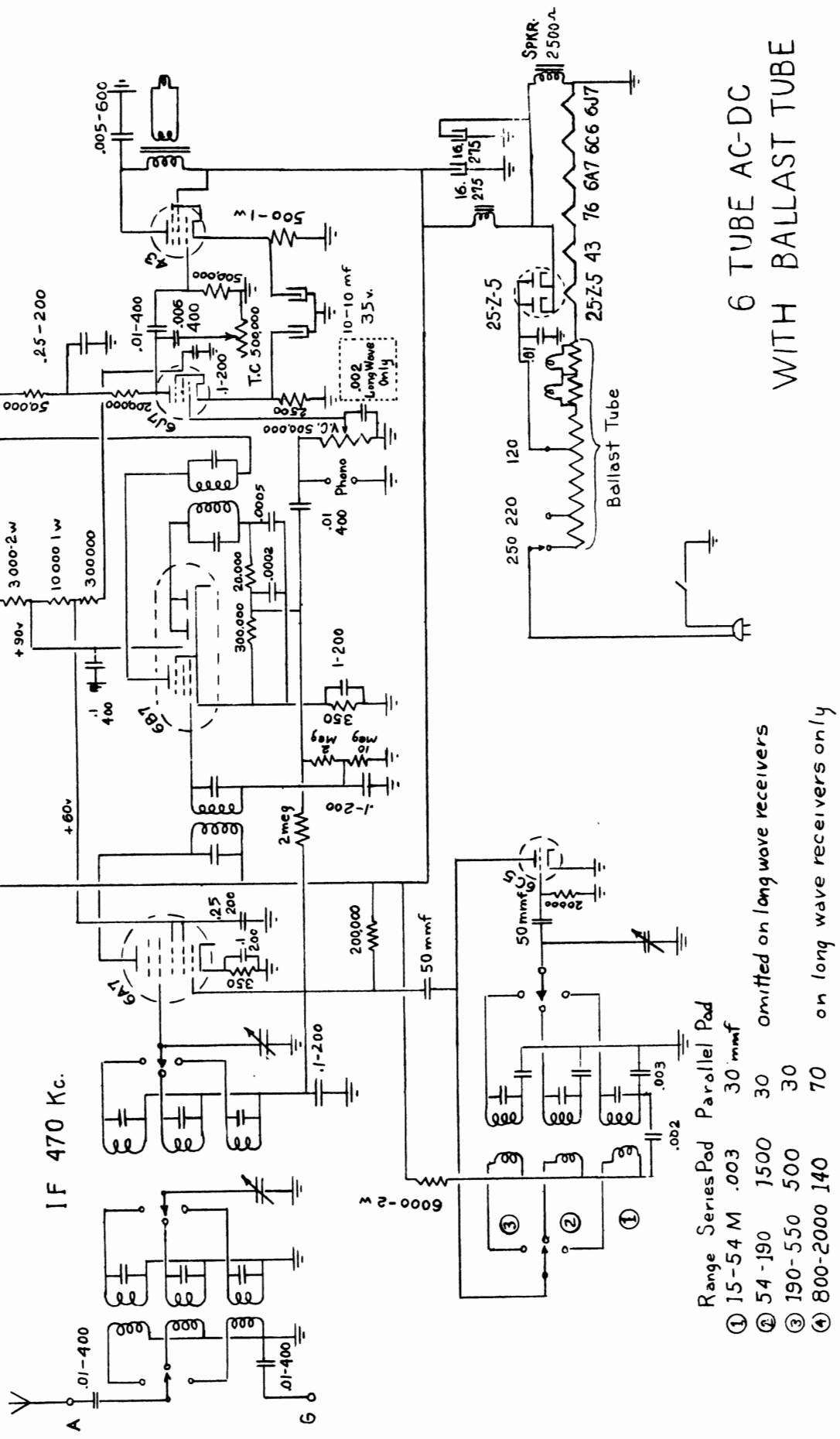
I.F. = 465 K.C.



I. C. A. EXPORT CORP.

Models 62 JW and 63 AW

6 TUBE AC-DC
WITH BALLAST TUBE



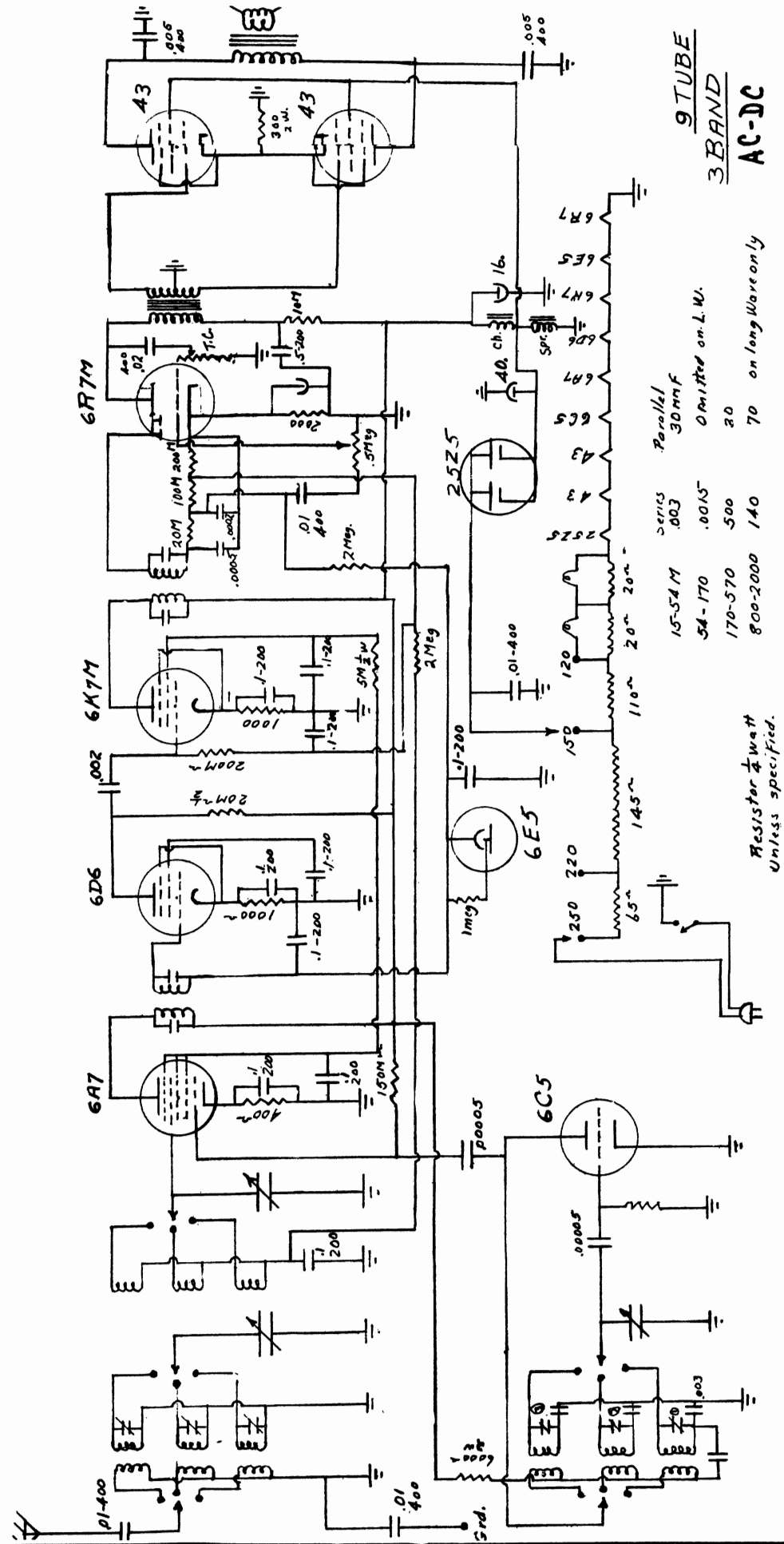
Range	Series Pad	Parallel Pad
① 15-54 M	.003	30 mmf
② 54-190	1500	30
③ 190-550	500	30
④ 800-2000	140	70

omitted on long wave receivers

on long wave receivers only

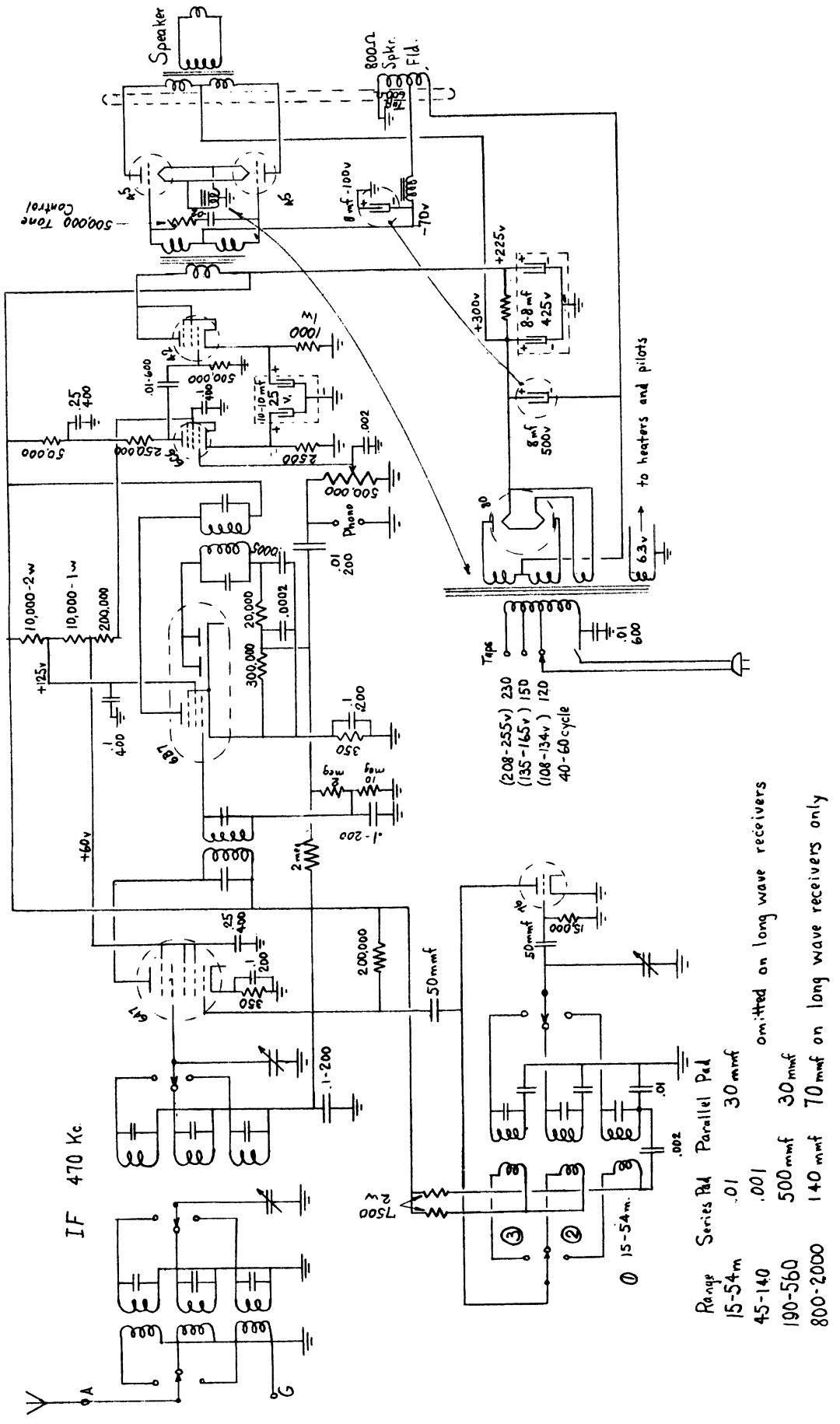
I. C. A. EXPORT CORP.

Models 95C and 95D



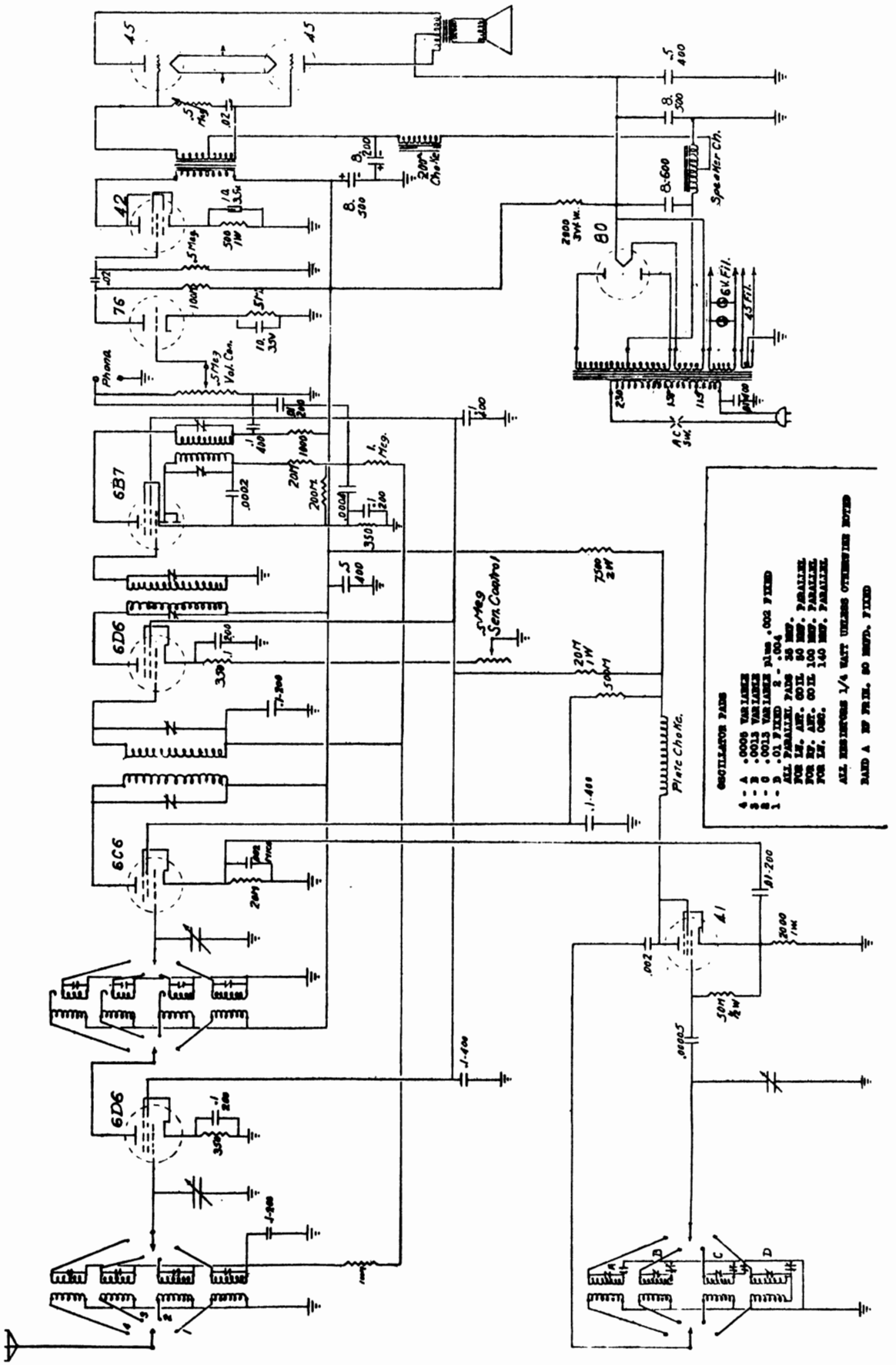
I. C. A. EXPORT CORP.

Models 810 and 850



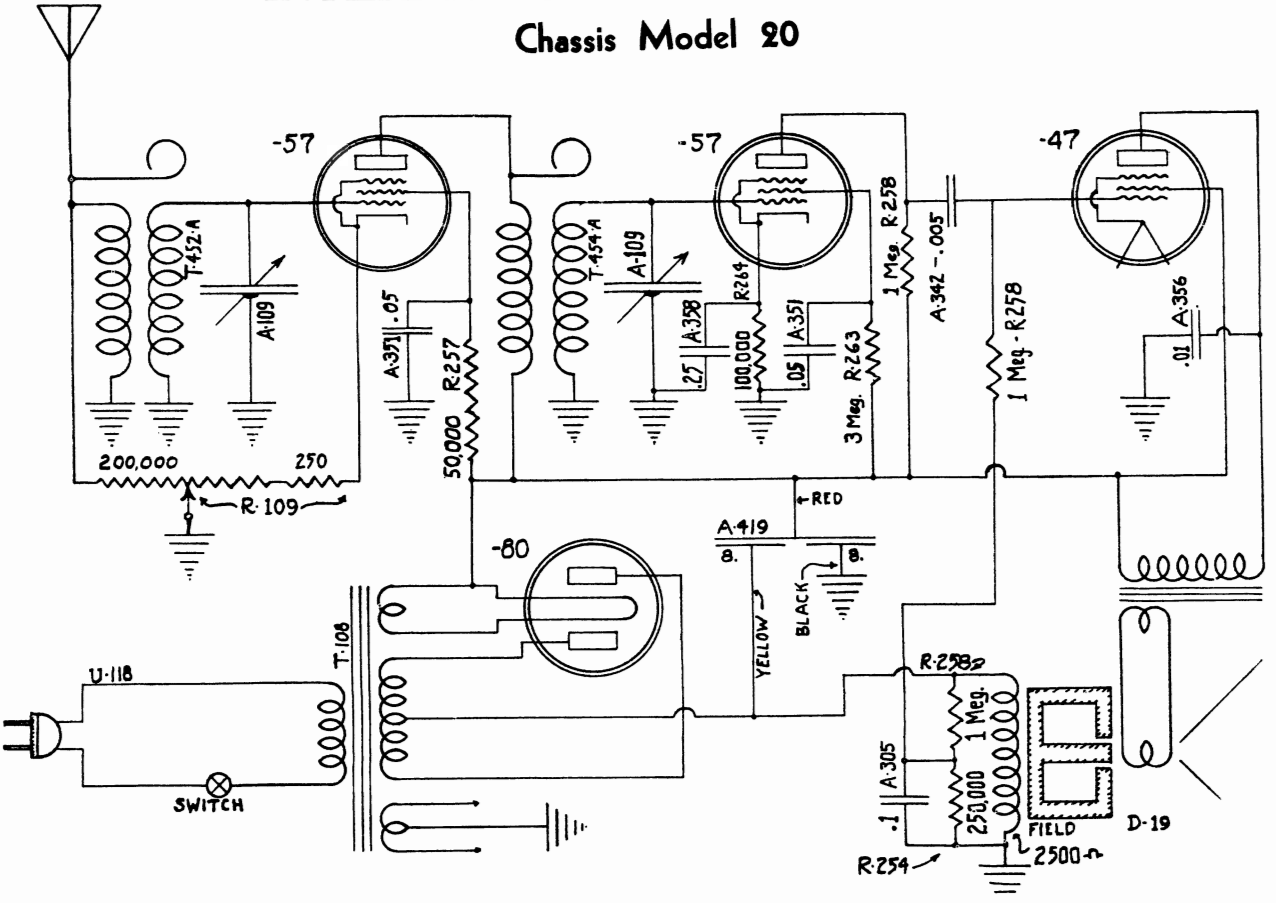
I. C. A. EXPORT CORP.

Models 1100SW and 1150 LW

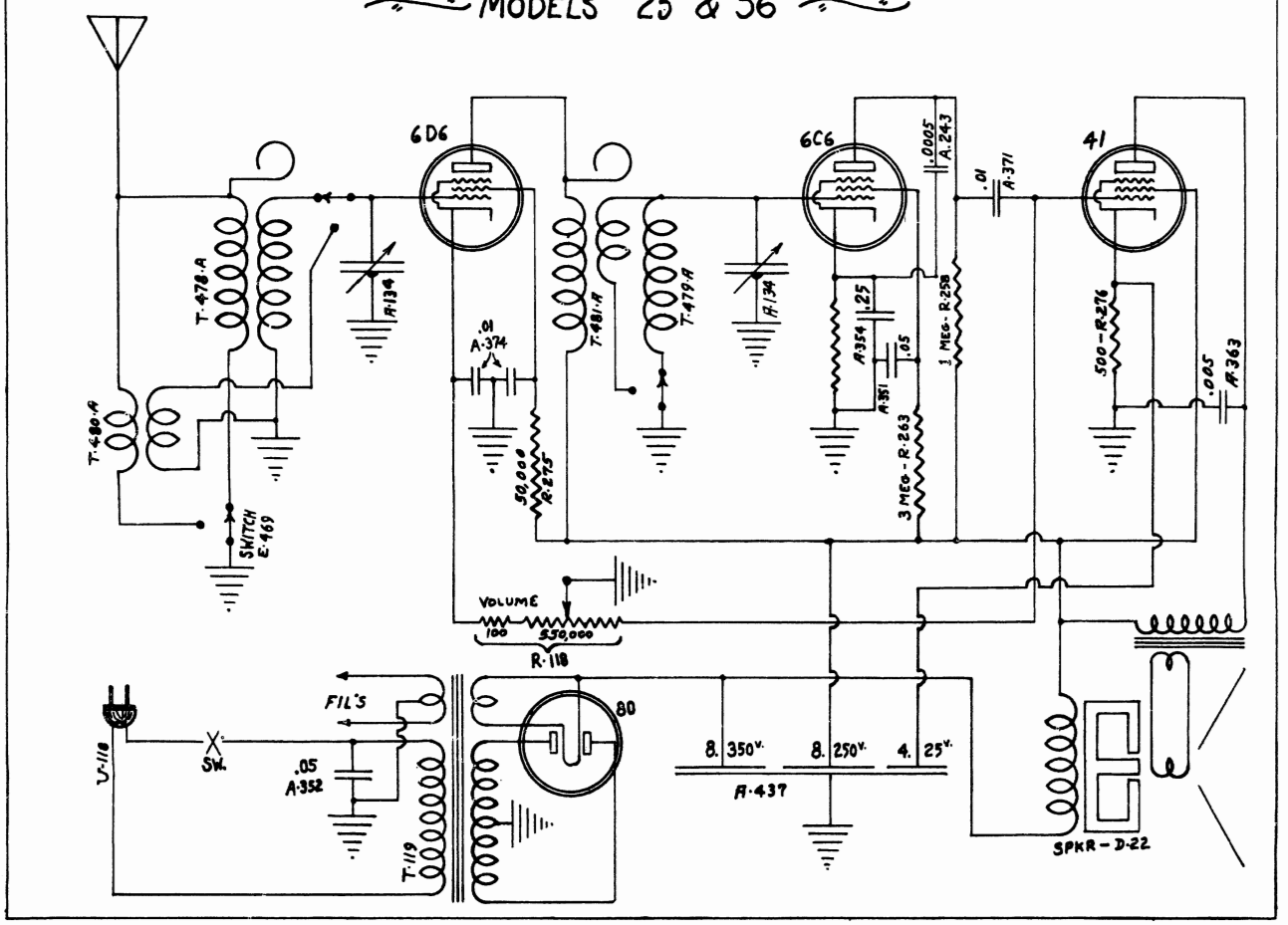


INTERNATIONAL RADIO CORP.

Chassis Model 20



MODELS 25 & 56



AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

Position	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
6J7	R. F.	Shell	HTR.	250	95	0	—	HTR.	7
6J7	Det.	Shell	HTR.	25	20	10	—	HTR.	10
6F6	A. F.	Shell	HTR.	240	250	0	—	HTR.	20
5Z4	Rect.	Shell	345	—	A.C.	—	A.C.	—	345

Line 118 volts. Volume Control Full On. 10% Variation Allowable.

ALIGNMENT DATA

The rear section of the 2 gang condenser tunes the R. F. stage; the front section the detector. The R. F. section only, has a trimmer condenser connected across it. The small semi-adjustable condenser attached to the detector section is the coupling condenser connected between the R. F. tube plate and Detector control grid.

Alignment may be accomplished using either a signal generator or weak broadcast signals although the signal generator is preferable. An output meter should be connected from the plate of the 6F6 tube to ground (blue and black speaker wires).

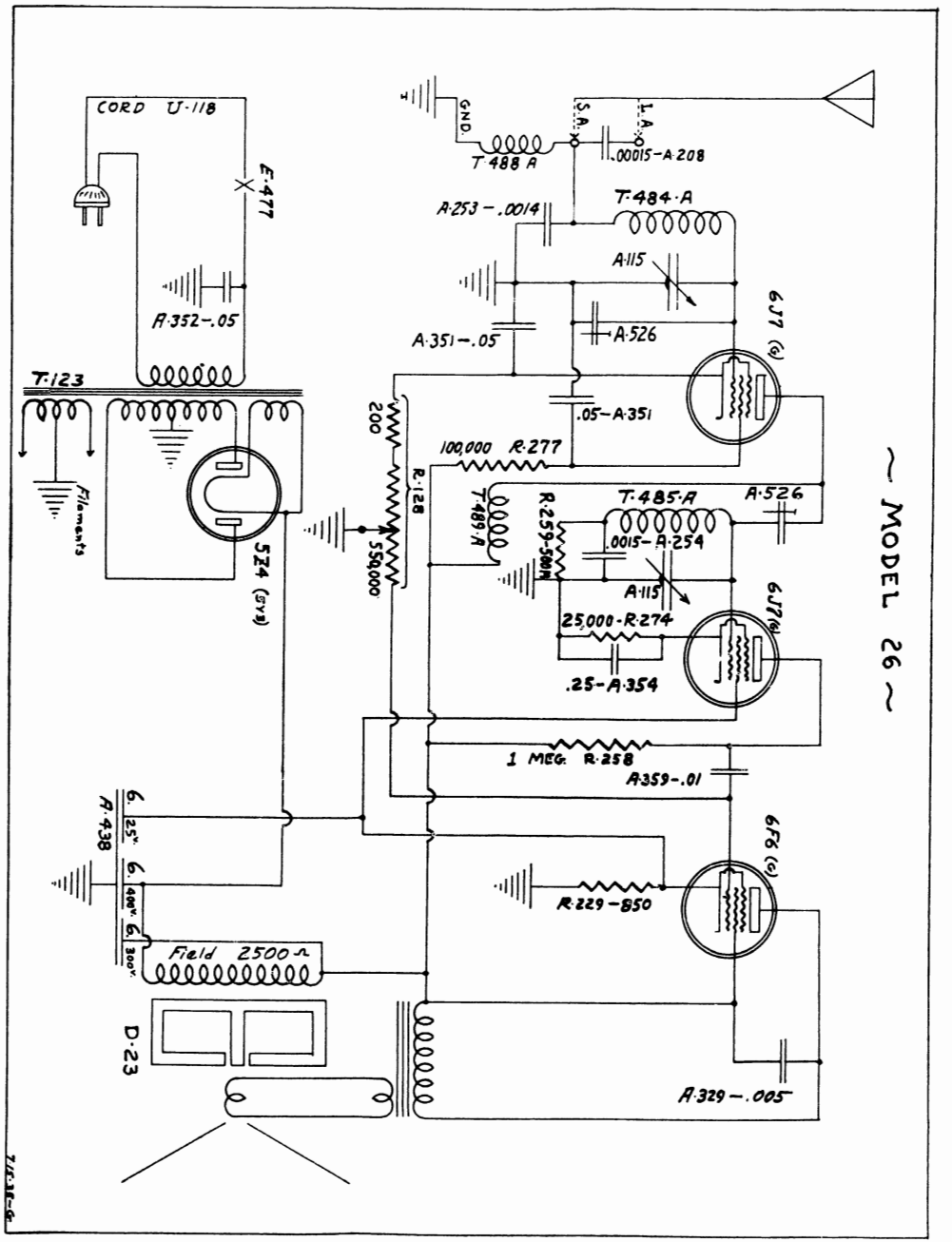
Set signal generator at 1400 kilocycles and feed signal to antenna binding post. Keep the output from signal generator as low as possible. Tune in signal on radio and make adjustments for maximum output. Rock the tuning condenser back and forth across the signal while adjusting the R. F. trimmer for resonance.

Next check the alignment at 1000 Kc. Insert a thin bakelite, celluloid or mica feeler strip between the plates of the variable condensers to determine whether the circuits are properly matched. The action is this—the dielectric constant of the celluloid feeler strip being higher than that of the air it displaces, results in an increase of capacity. Open the variable condenser just enough to indicate two or three points below maximum signal. As the feeler is inserted the meter reading should indicate increasing signal and then decreasing as the feeler is inserted farther. This procedure should be followed on both sections. Should the meter fail to show an increase in signal as the strip is inserted in one section this indicates too great a capacity for the section. This may be corrected by bending the outside rotor plates out at the point where they begin to mesh with the stator.

After checking the alignment at 1000 Kc. repeat the process at 600 Kc.

INTERSTAGE COUPLING CONDENSER

The interstage coupling condenser connected between the plate of the R.F. tube and control grid of the detector should be adjusted so there is slight oscillation at the high frequency end of the band when the volume control is in full on position. Slight oscillation may be noticed also at the low frequency end.



INTERNATIONAL RADIO CORP.

~ MODEL 52 ~

AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

Position	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
6A8	Det.-Osc.	Shell	HTR.	195	70	— 10	140	HTR.	3
6K7	I. F.	Shell	HTR.	210	90	1.5	—	HTR.	1.5
6J7	2nd Det.	Shell	HTR.	50	15	.4	—	HTR.	.4
6F6	A. F.	Shell	HTR.	200	210	0	—	HTR.	15
5Z4	Rect.	Shell	300	—	A.C.	—	A.C.	—	300

Line 118 volts. Switch on Broadcast Position. Volume Control Full On. 10% Variation Allowable.

ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. The signal from the signal generator *must be kept at a very low level.*

Essential Data: The intermediate frequency used is 448 Kc. On the broadcast band the oscillator frequency is 448 Kc. higher than the signal frequency. On the short wave band it is 448 Kc. lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band 1400 and 600 kilocycles; Short wave band 12 and 6 megacycles.

It is permissible to bend condenser plates when aligning the broadcast band but not the short wave band.

Intermediates: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result.

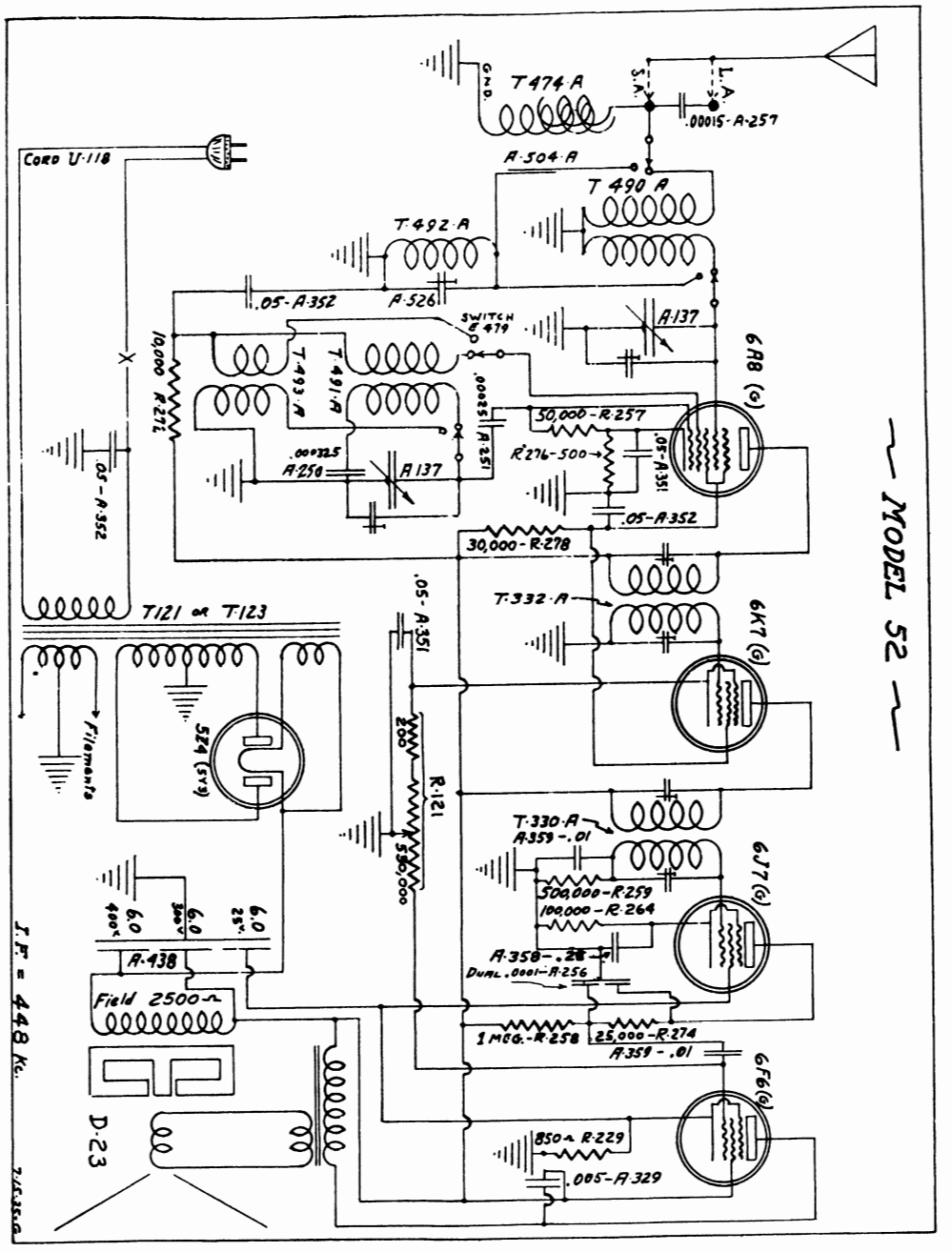
Broadcast Band: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer (on condenser gang) for maximum reading.

There is no adjustable padder condenser in this model so resonance on the low frequency end is accomplished by bending plates on the tuning condensers.

Short Wave Band: There is a separate trimmer condenser across the short wave detector coil. It is mounted on the bottom of the chassis at the end. Adjustment should be made at 12 megacycles. Instead of bending condenser plates at 6 megacycles, alignment is accomplished by spreading or crowding turns on the short wave detector coil. If much crowding or spreading is necessary it is advisable to go back and recheck at 12 megacycles.

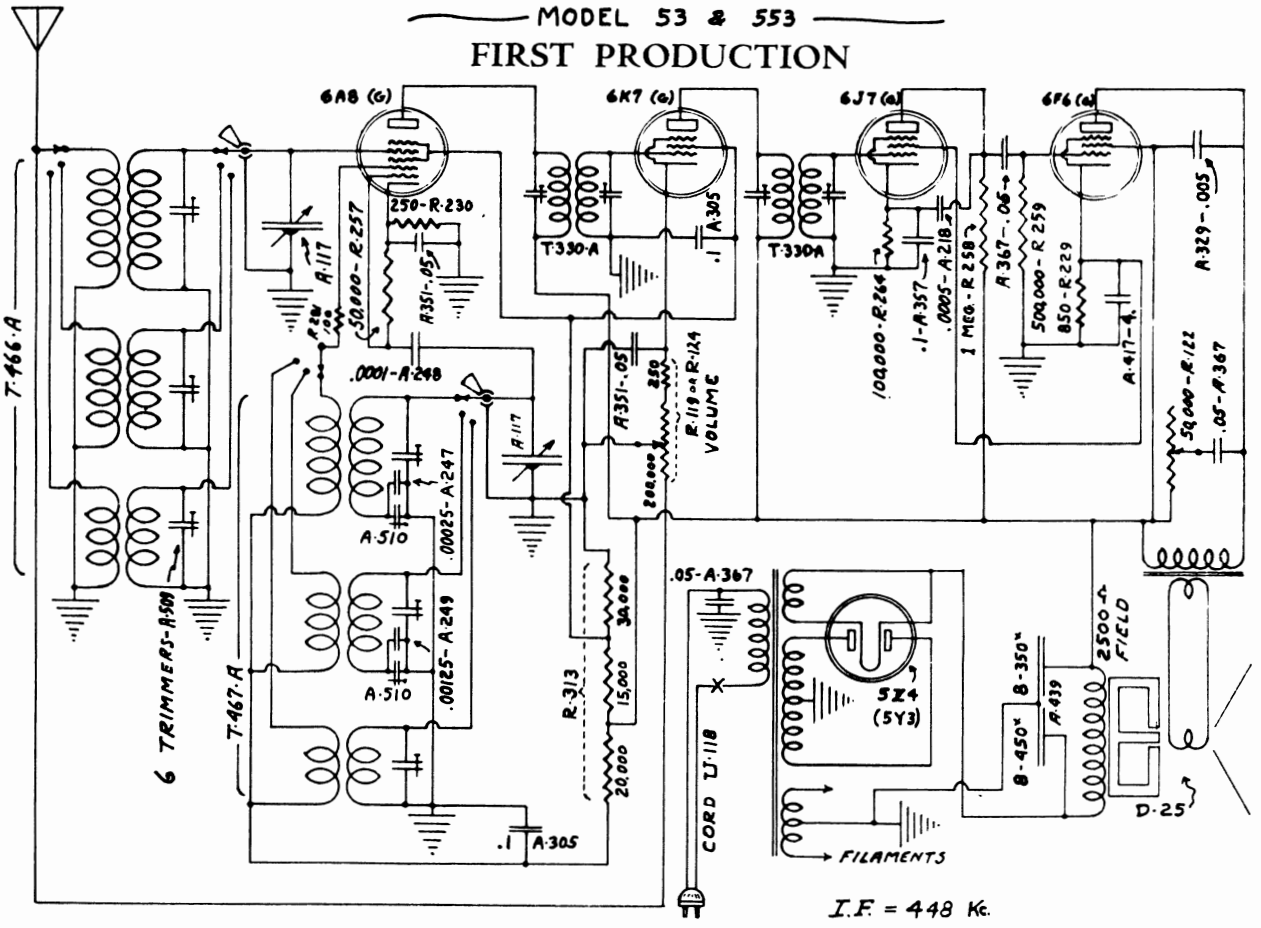
MICROPHONIC HOWL

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

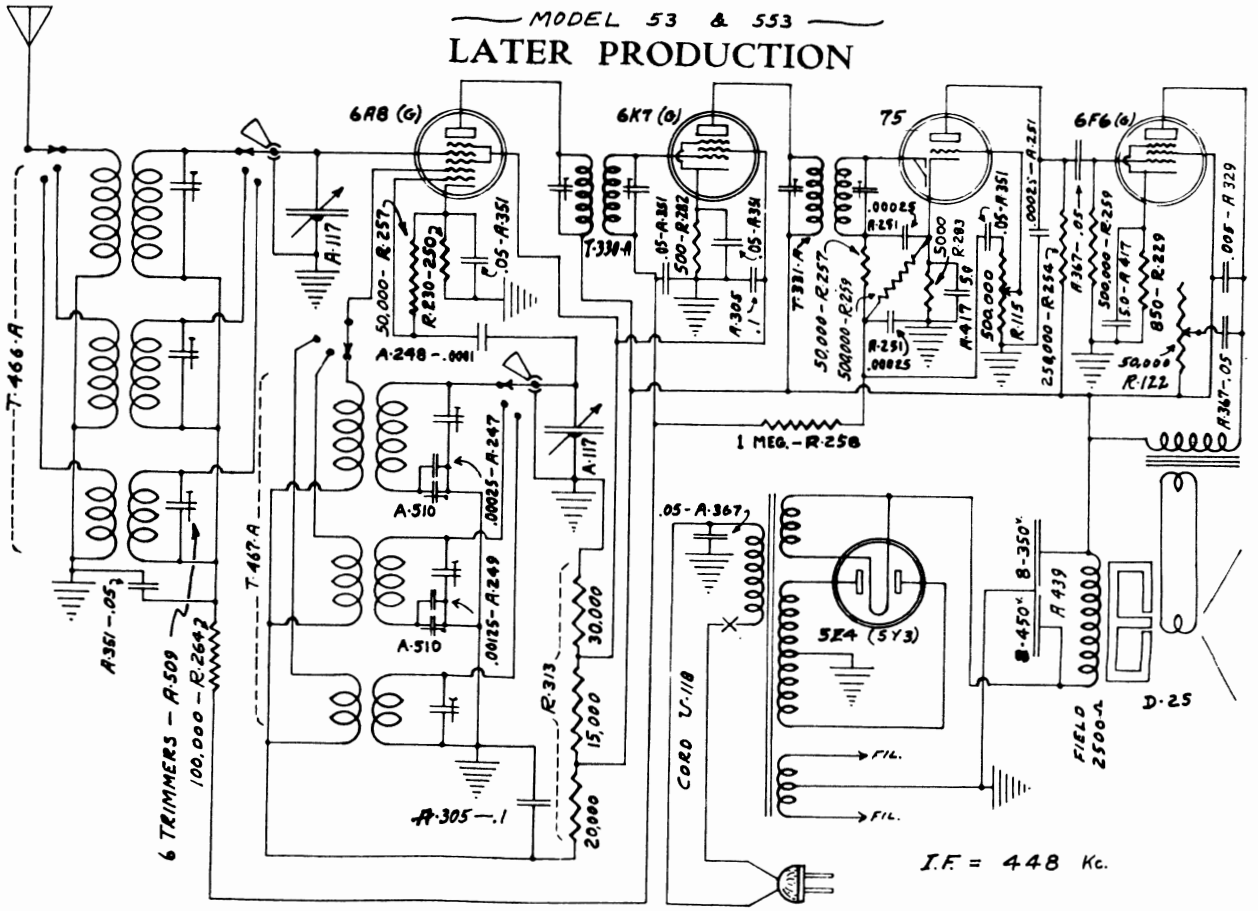


INTERNATIONAL RADIO CORP.

MODEL 53 & 553
FIRST PRODUCTION



MODEL 53 & 553
LATER PRODUCTION



Models 53 & 553

This chassis is designed to operate from 115 volt, 60 cycle, alternating current power lines. It is a three band receiver covering the American broadcast, police and airport, and Foreign shortwave bands. The following tubes are employed:

6A8	(metal) or 6A8G (glass) 1st Detector-Oscillator	6K7	(metal) or 6K7G (glass) I. F. Amplifier
*6J7	(metal) or 6J7G (glass) 2nd Detector	*	75 (glass) 2nd Detector, A.V.C. and 1st A.F.
6F6	(metal) or 6F6G (glass) Pentode output	5Z4	(metal) or 5Y3 (glass) Rectifier

*6J7 or 6J7G used in first production; 75 used in later production.

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. Glass counterpart types should be shielded. The metal tubes need not be. Shielding provisions are provided. The 75 tube must be shielded at all times.

TWO CIRCUITS

It will be noted by referring to the circuit diagram that sets of early production did not incorporate A.V.C. In later production the 6J7 tube has been replaced with a 75 and A.V.C. added. In other respects the two circuits are identical.

ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. Tone control should be turned "high." The signal from the signal generator *must be kept at a very low level.*

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1,400 and 600 Kc.; Middle band, 6,000 and 2,400 Kc.; Short wave band 15 megacycles.

Do not bend tuning condenser plates when aligning or it will be impossible to make all three bands track correctly.
The front section of the two gang condenser is the oscillator section, the rear section the first detector.

INTERMEDIATES: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I. F. oscillation may result.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected in many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc.

MIDDLE BAND: Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padder condenser at 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

SHORT WAVE BAND: Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padder condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency .

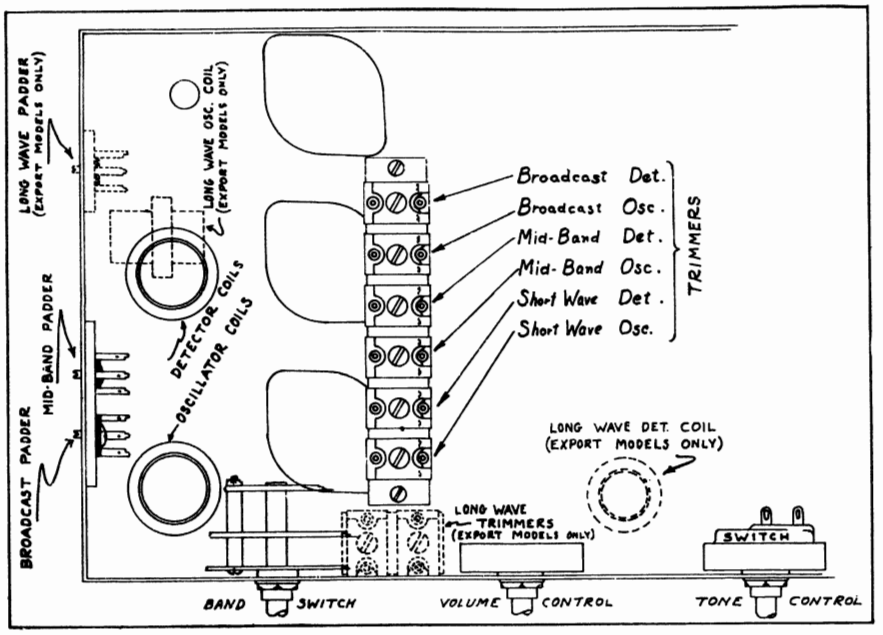
MICROPHONIC HOWL

The 2 gang condenser is cushion mounted to eliminate vibration of the plates. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

LONG WAVE-EXPORT MODEL

Model 53 is also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, mid-band, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave padder at 160 Kc. See sketch for location of coils and condensers.

Some export sets also contain a 25 cycle power transformer (part number T-502) which has a tapped primary winding allowing operation from 125, 150 or 250 volt A.C. power lines The tap switch is made available by removing part of the cover of the power transformer. 25 cycle sets may be used on 60 cycle although the converse is not true.



AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

Position	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
6A8	Det.-Osc.	Shell	HTR.	265	98	—5	138	HTR.	1
6K7	I. F.	Shell	HTR.	265	98	1	—	HTR.	1
*6J7	2nd Det.	Shell	HTR.	55	20	5	—	HTR.	5
6F6	A. F.	Shell	HTR.	255	265	0	—	HTR.	20
5Z4	Rect.	Shell	390	—	A.C.	—	A.C.	—	390

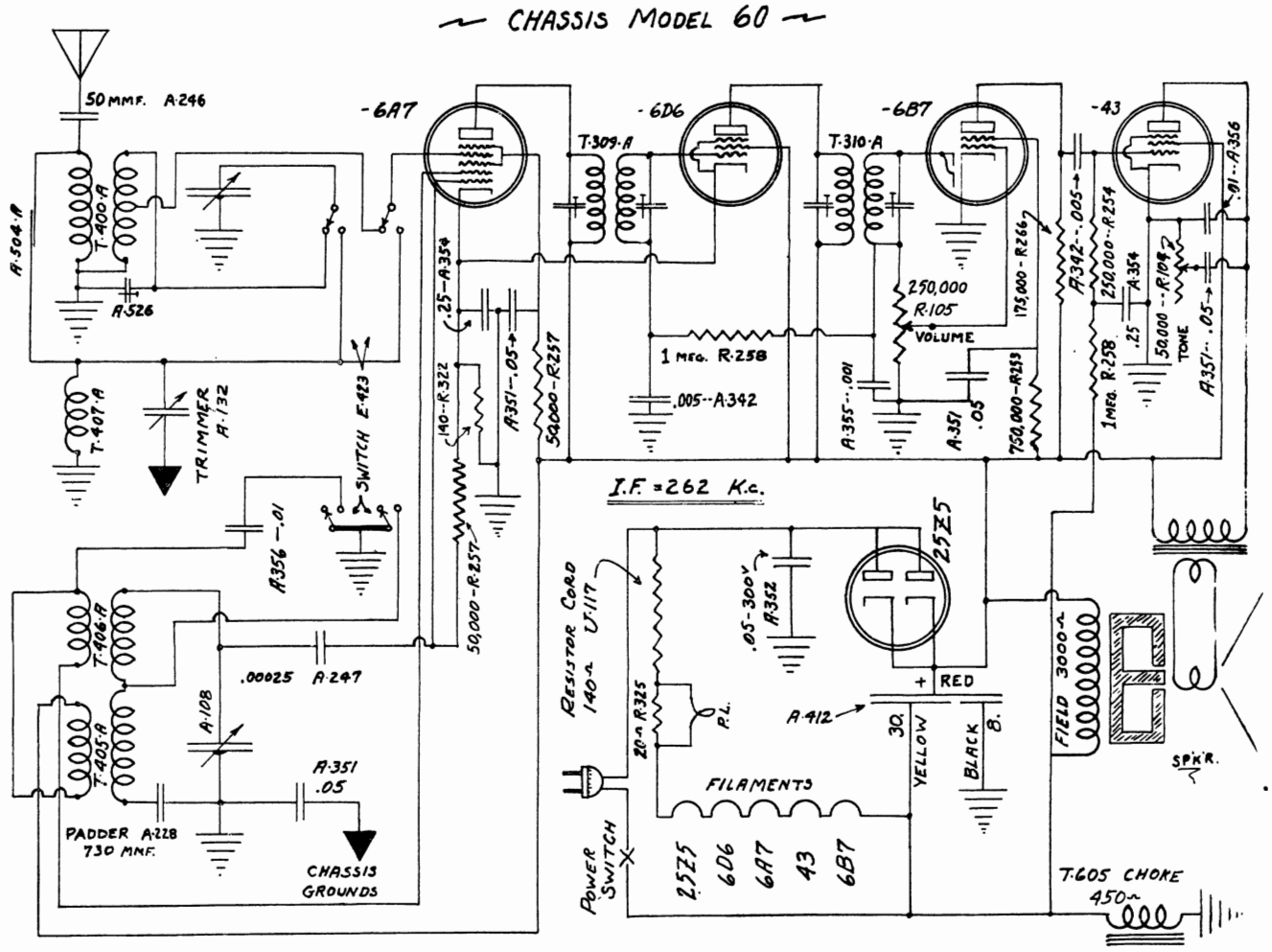
	Position	E_K	E_P	E_{DP}
*75	2nd Det.	1.5	95	0

*6J7 used in early production—75 in later production.

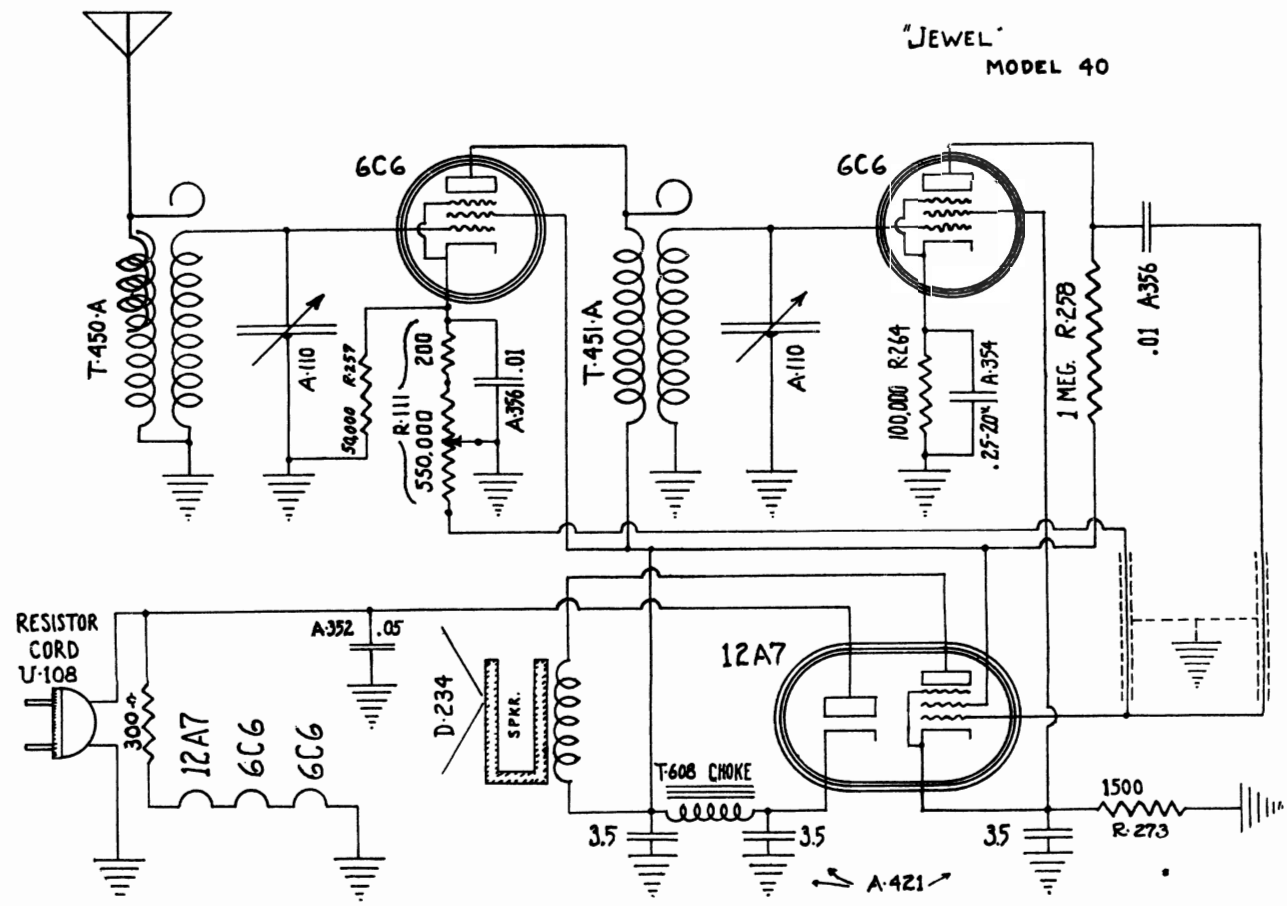
Line 118 Volts. Switch On Broadcast Position. Volume Control Full On. 10% Variation Allowable.

INTERNATIONAL RADIO CORP.

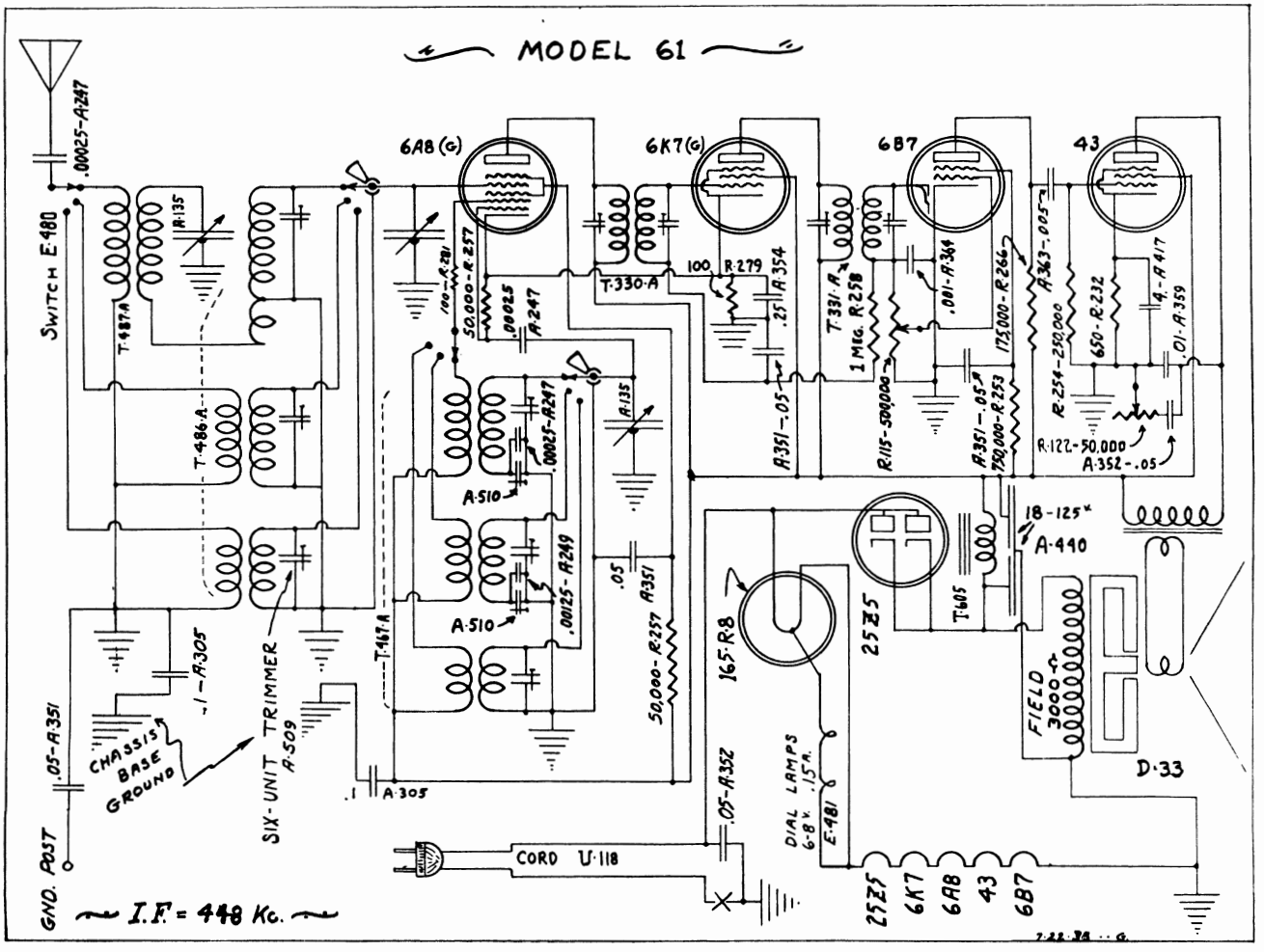
CHASSIS MODEL 60



"JEWEL" MODEL 40



INTERNATIONAL RADIO CORP.



The standard type of output meter should be used to indicate signal strength. It should be connected from the plate of the 43 tube to ground. Tone control should be turned "high". The signal from the signal generator *must be kept at a very low level.*

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1400 and 600 Kc.; Middle band, 6000 and 2400 Kc.; Short wave band 15 megacycles.

In aligning on broadcast band it is permissible to bend plates on the *band pass section only* of the three gang condenser. Do not bend plates when aligning the middle and short wave bands.

The front section of the three gang condenser is the oscillator section; the middle section, first detector; the rear section, band pass. The band pass is in circuit only on the broadcast band.

INTERMEDIATES: To align the IF circuits first remove the grid clip from the 6A8 tube and connect a 1/2 meg. resistance from the 6A8 grid (top of tube terminal) to ground. Set the signal generator to 448 Kc. and feed its modulated signal direct to the grid of the 6A8 through a 100 mmf. condenser. Adjust the first IF transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second IF transformer. If adjustments are not made accurately selectivity will be poor and IF may oscillate.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) and band pass trimmer (on condenser gang) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected on many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc. It is permissible to bend plates on the band pass section only in resonating circuits.

MIDDLE BAND: Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padder condenser 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

SHORT WAVE BAND: Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padder condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency.

PILOT LAMPS

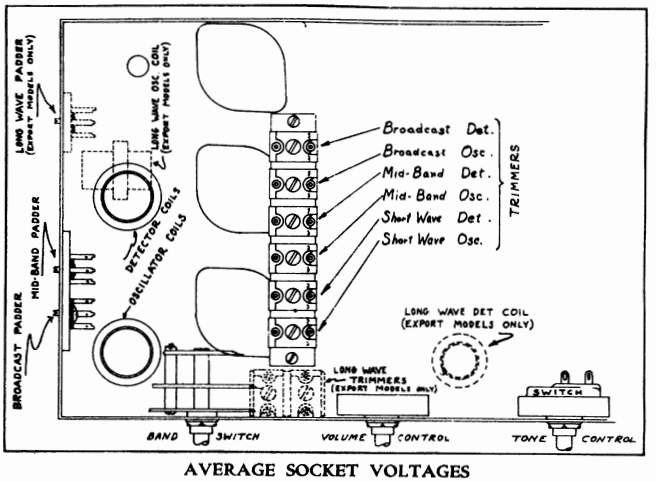
The pilot lamps are special 6-8 volt drawing only .15 amperes. It is necessary lamps of this rating only be used. In ordering specify our part number E-481.

MICROPHONIC HOWL

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

LONG WAVE-EXPORT MODEL

Model 61 is also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, mid-band, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave padder at 160 Kc. See sketch for location of coils and condensers.



AVERAGE SOCKET VOLTAGES

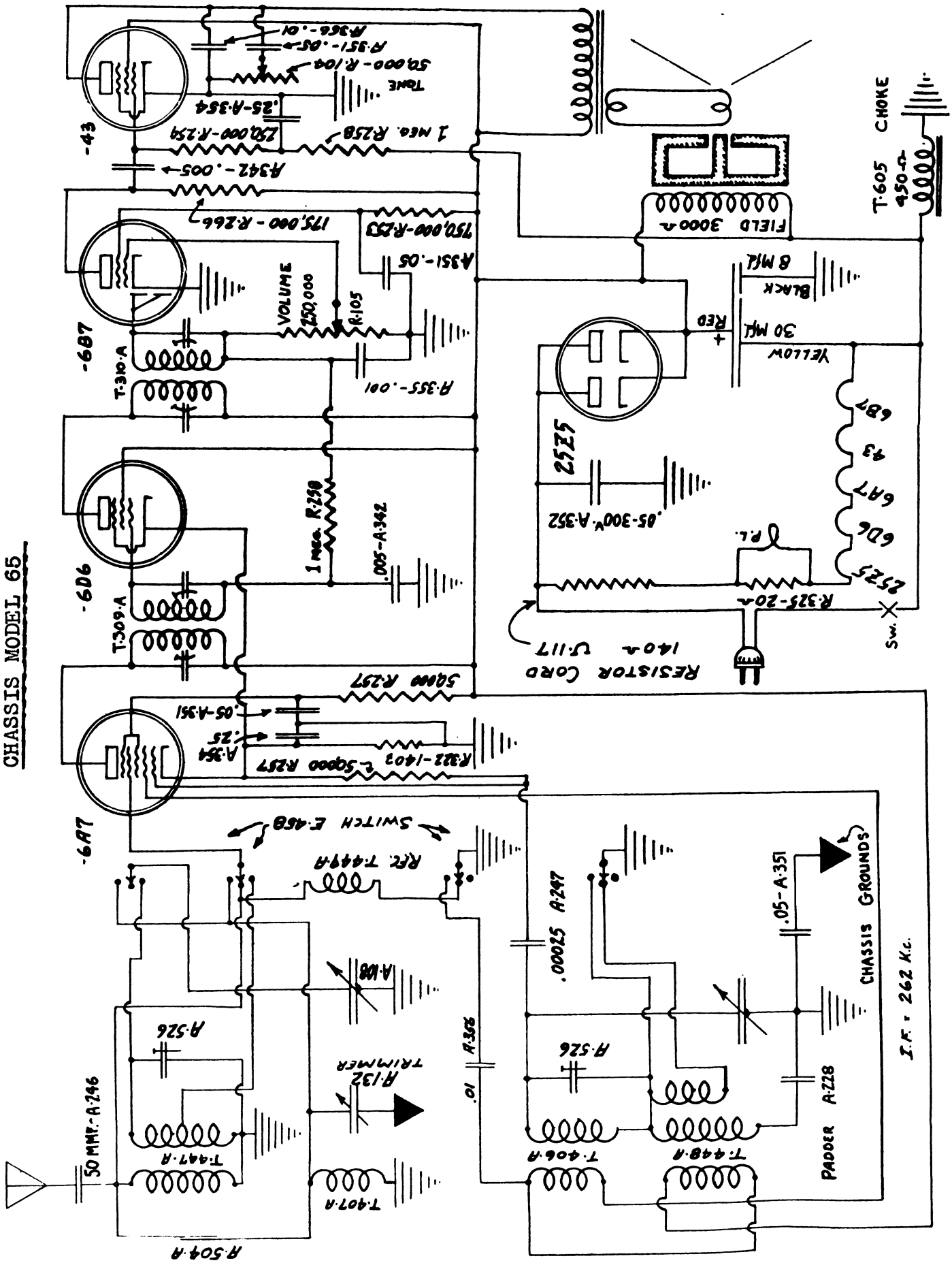
Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

	Position	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
6A8	Det.-Osc.	Shell	HTR.	90	27	0	90	HTR.	0
6K7	I. F.	Shell	HTR.	90	90	0	—	HTR.	0
		E_K	E_{G2}	E_P	E_{DP}				
6B7	2nd Det.	0	7	12	0				
43	A. F.	12	90	85	—				
25Z5	Rect.	105	—	A.C.	—				

Line 118 Volts. Switch On Broadcast Position. Volume Control Full On. 10% Variation Allowable.

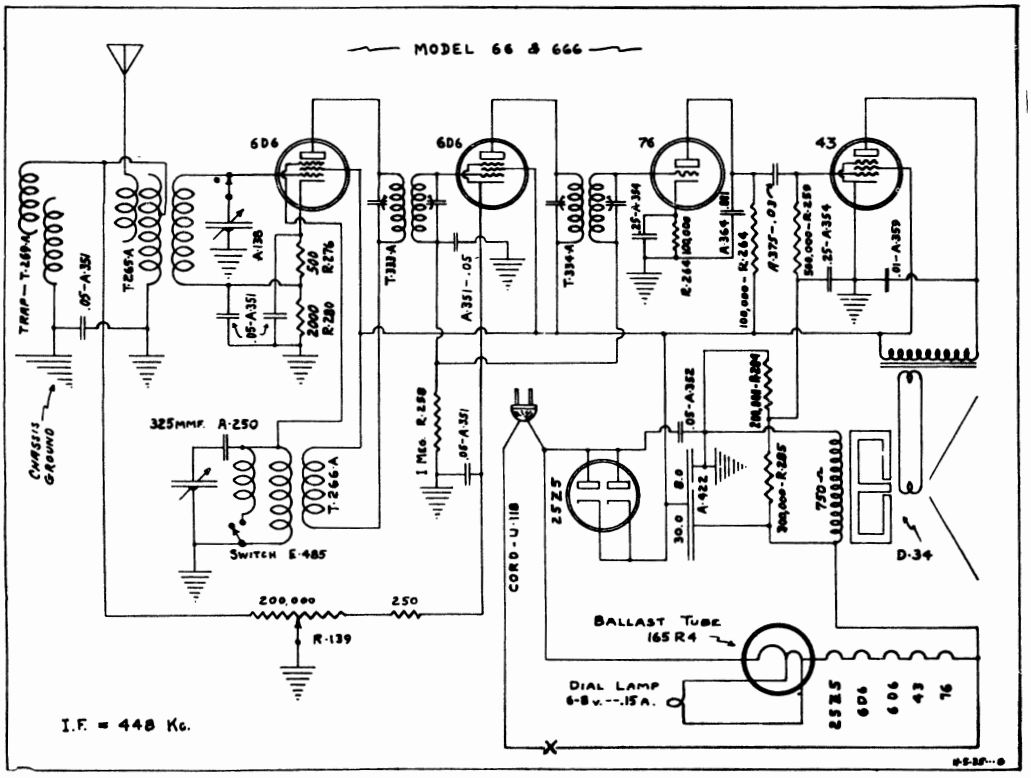
INTERNATIONAL RADIO CORP.

CHASSIS MODEL 65



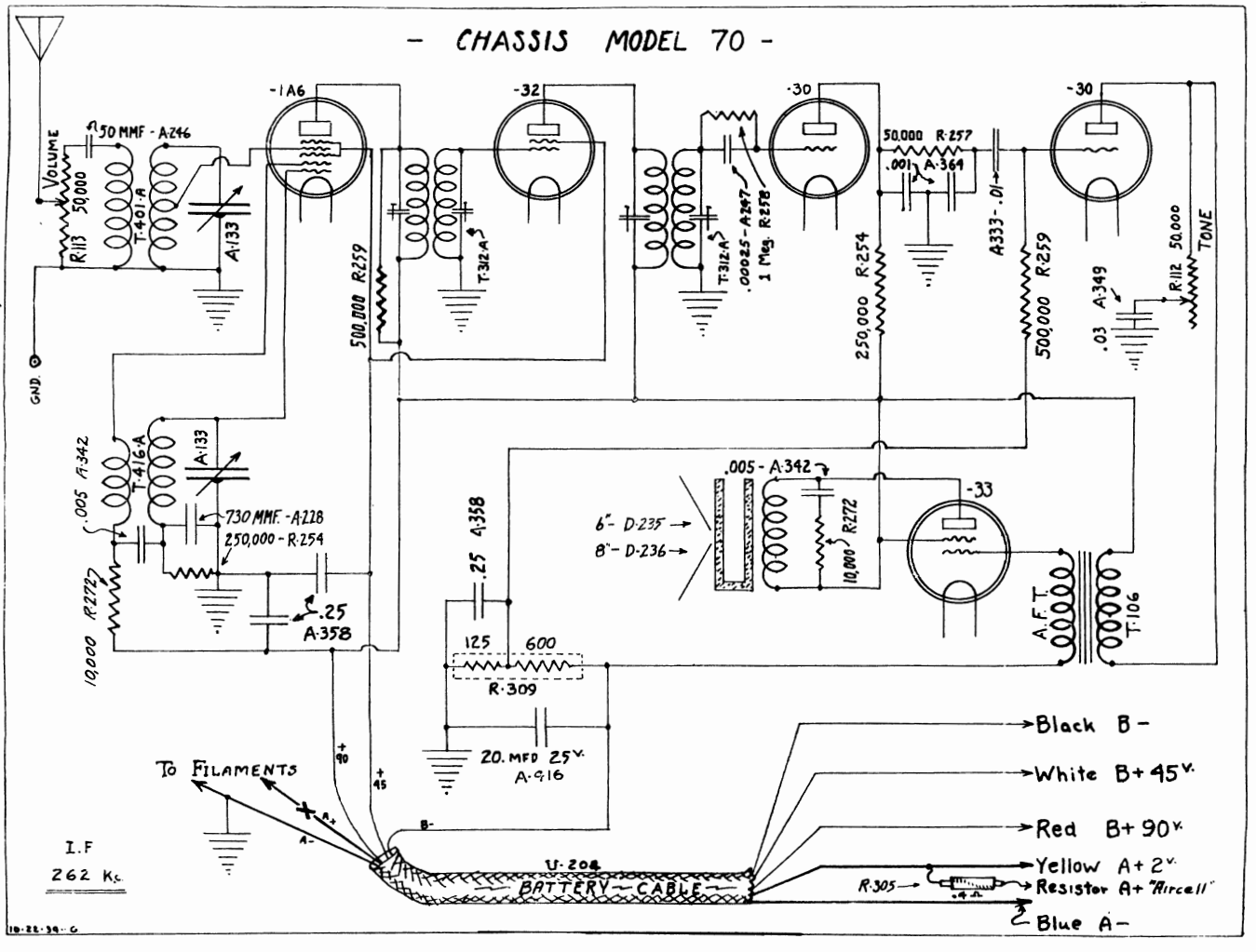
INTERNATIONAL RADIO CORP.

MODEL 66 & 666



AVERAGE SOCKET VOLTAGES

Tube	Position	E_k	E_{g3}	E_{g2}	E_p
6D6	Det.-Osc.	14	0	100	100
6D6	I.F.	1	1	100	100
76	2nd Det.	5	—	—	65
43	Output	0	—	100	87
25Z5	Rect.	100	—	—	35



ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It may be connected from plate to plate of the 19 tube or from one plate to ground.

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. On the broadcast band the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

The rear section of the two gang condenser is the oscillator section; the front section, first detector.

INTERMEDIATES: To align the I.F. Circuits, set the signal generator to 448Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I. F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result. Due to the I.F. trap in the antenna circuit a strong signal is necessary.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer for maximum reading. On most sets the detector trimmer has its adjusting screw purposely removed.

There is no adjustable padder condenser in this model so resonance on the low frequency end is accomplished by bending plates on the tuning condensers. Check the alignment at 1000 Kc. Insert a thin bakelite, celluloid or mica feeler strip between the plates of the variable condensers to determine whether the circuits are properly matched. The action is this—the dielectric constant of the celluloid feeler strip being higher than that of the air it displaces, results in an increase of capacity. Open the variable condenser just enough to indicate two or three points below maximum signal. As the feeler is inserted the meter reading should indicate increasing signal and then decreasing as the feeler is inserted farther. This procedure should be followed on both sections. Should the meter fail to show an increase in signal as the strip is inserted in one section this indicates too great a capacity for that section. This may be corrected by bending the outside rotor plates out at the point where they begin to mesh with the stator.

After checking the alignment at 1000 Kc. repeat the process at 600 Kc.

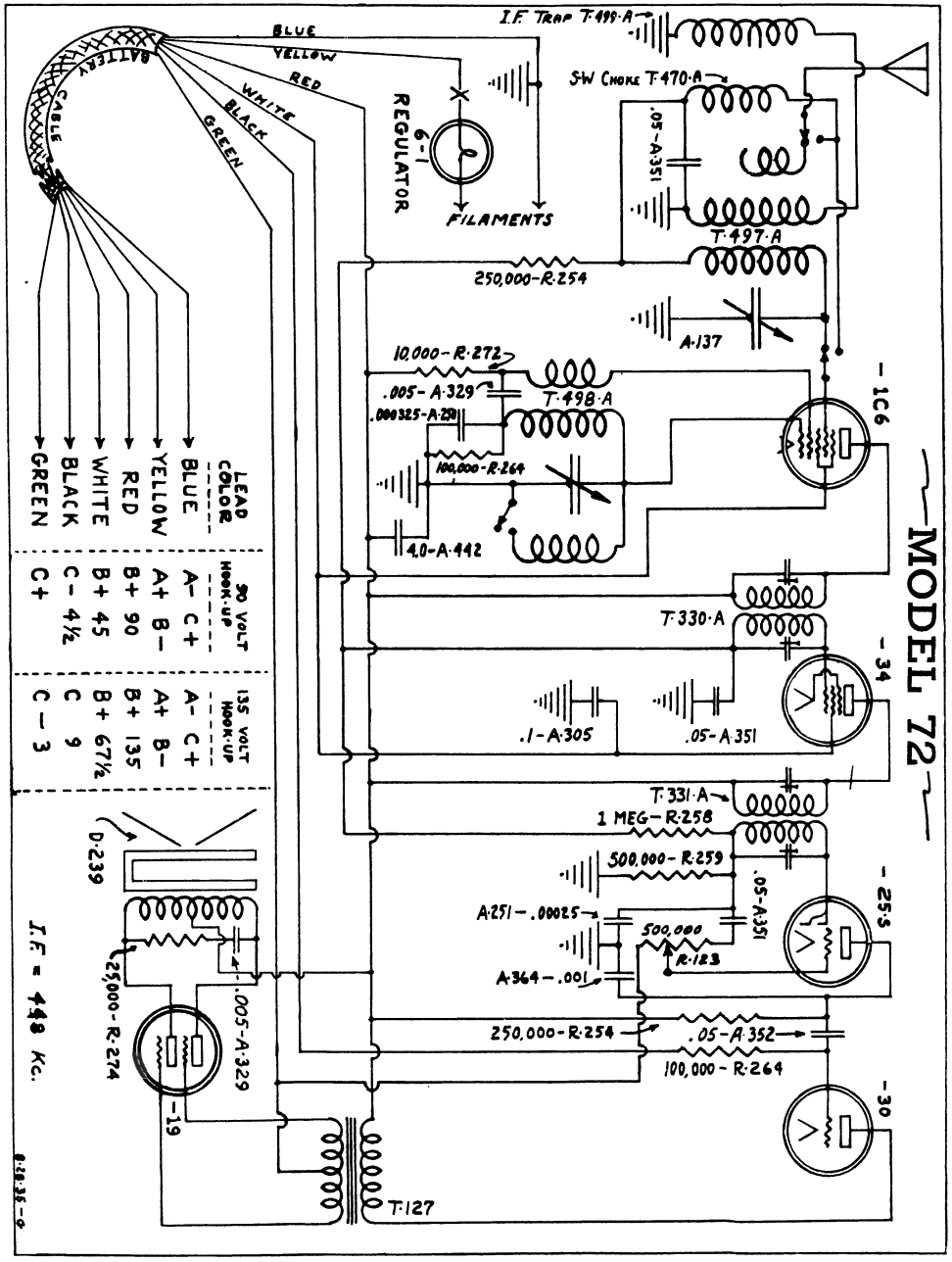
SHORTWAVE BAND: No alignment necessary due to untuned detector circuit.

OSCILLATION OR MICROPHONIC HOWL

Oscillation may be caused if the grid leads of the 1C6 and 34 tubes are not kept separated.

A microphonic condition may be caused by the 25S tube.

1C6—1st Detector—Oscillator
34—IF Amplifier
25S—2nd Detector—A.V.C.—A.F. amplifier
30—2nd A.F. Amplifier
19—Class B. Power amplifier
6-1—Filament regulator



INTERNATIONAL RADIO CORP.

Models 77-777-778-779

ALIGNMENT

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc.

The standard type of output meter should be used to indicate signal strength. It should be connected from the plates of the 43 tubes to ground.

Poor sensitivity may be an indication of incorrectly adjusted I. F. trimmers.

Aligning of Broadcast band should be done on 1400, 1000 and 600 kilocycles.

The three trimmers on the bottom of the chassis are, reading from the end of the chassis toward the center, B. C. oscillator, S. W. detector and S. W. oscillator. No trimmer is used across the B. C. detector coil.

INTERMEDIATES: To align the I. F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Adjust the first I. F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I. F. transformer. If adjustments are not made accurately, selectivity will be poor and I. F. oscillation may result.

BROADCAST BAND: Place the band change switch on the Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer for maximum reading.

There is no adjustable padder condenser in this model so resonance on lower frequencies is accomplished by bending plates on tuning condensers.

SHORT WAVE BAND: Place the band change switch on the Short Wave position. Turn the dial to 15.5 megacycles and feed a very weak 15.5 megacycle modulated signal from your signal generator to the antenna. Adjust the S. W. oscillator trimmer for maximum reading on the output meter. This trimmer should not be touched again when checking alignment on other frequencies.

Next go to 12 megacycles and adjust the S. W. detector trimmer.

Instead of bending condenser plates at 6 megacycles alignment is accomplished by spreading or crowding turns on the S. W. detector coil. If much crowding or spreading is necessary it is advisable to go back and recheck at 12 megacycles.

PRODUCTION CHANGES

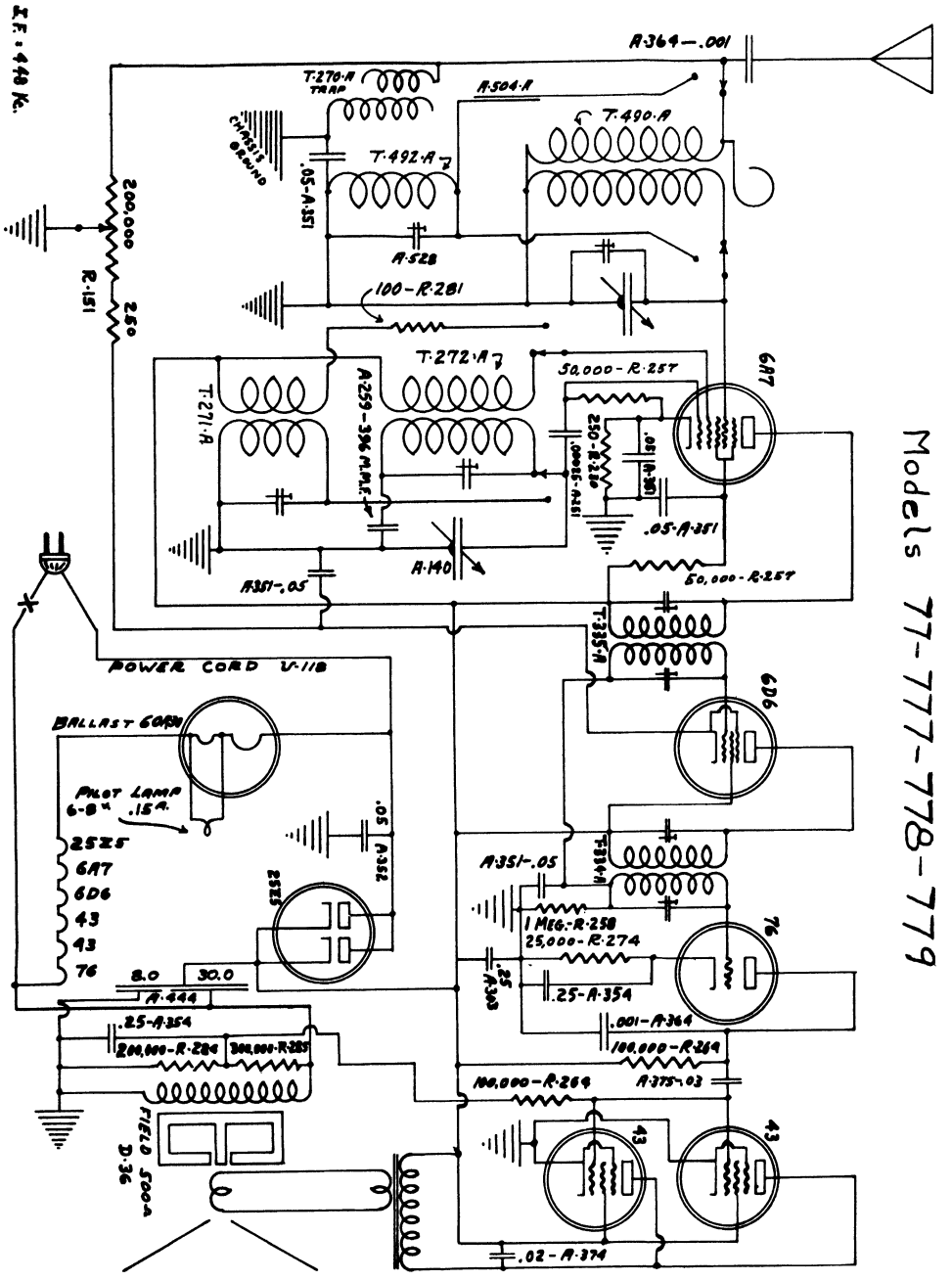
Referring to the circuit diagram, part R-281, 100 ohm resistor in S. W. oscillator coil circuit has been found unnecessary and will be omitted in future production.

In some chassis a 25,000 ohm resistor has been inserted between the 76 tube plate resistor (part R-264, 100,000 ohm) and the coupling condenser (part A-375, .03 mfd.). The 25,000 ohm resistor carries part number R-274.

AVERAGE SOCKET VOLTAGES

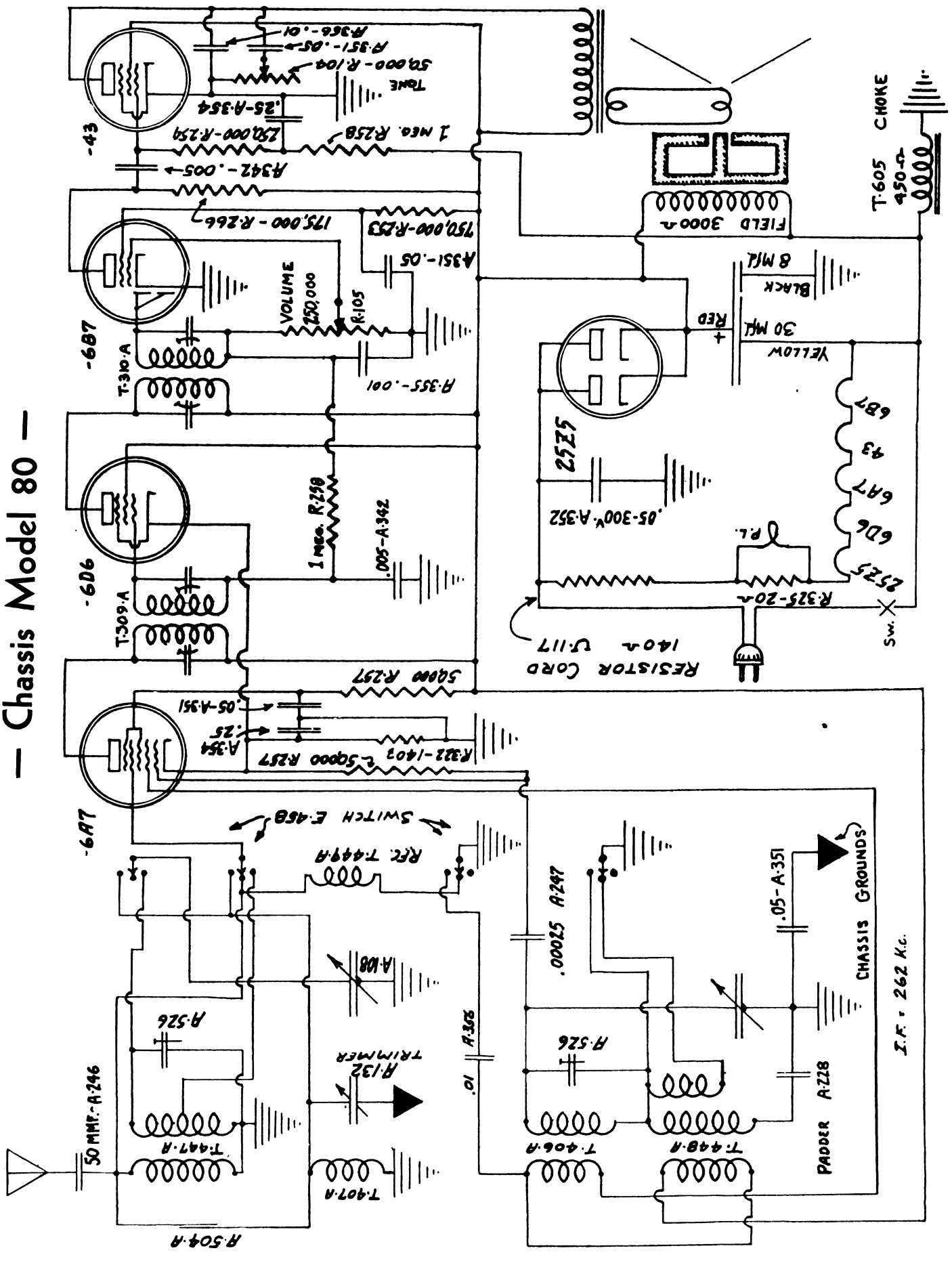
Tube	Position	E_k	E_{g3}	E_{g2}	E_p
6A7	Det-Osc.	1	5	35	97
6D6	I. F.	3	3	97	97
76	2nd Det.	6	-	-	67
43 43	Output	0	-	97	85
25Z5	Rect.	97	-	--	37

LINE 118 VOLTS. VOLUME CONTROL FULL ON. 15% VARIATION ALLOWABLE. Measurements made from tube prongs to circuit ground.



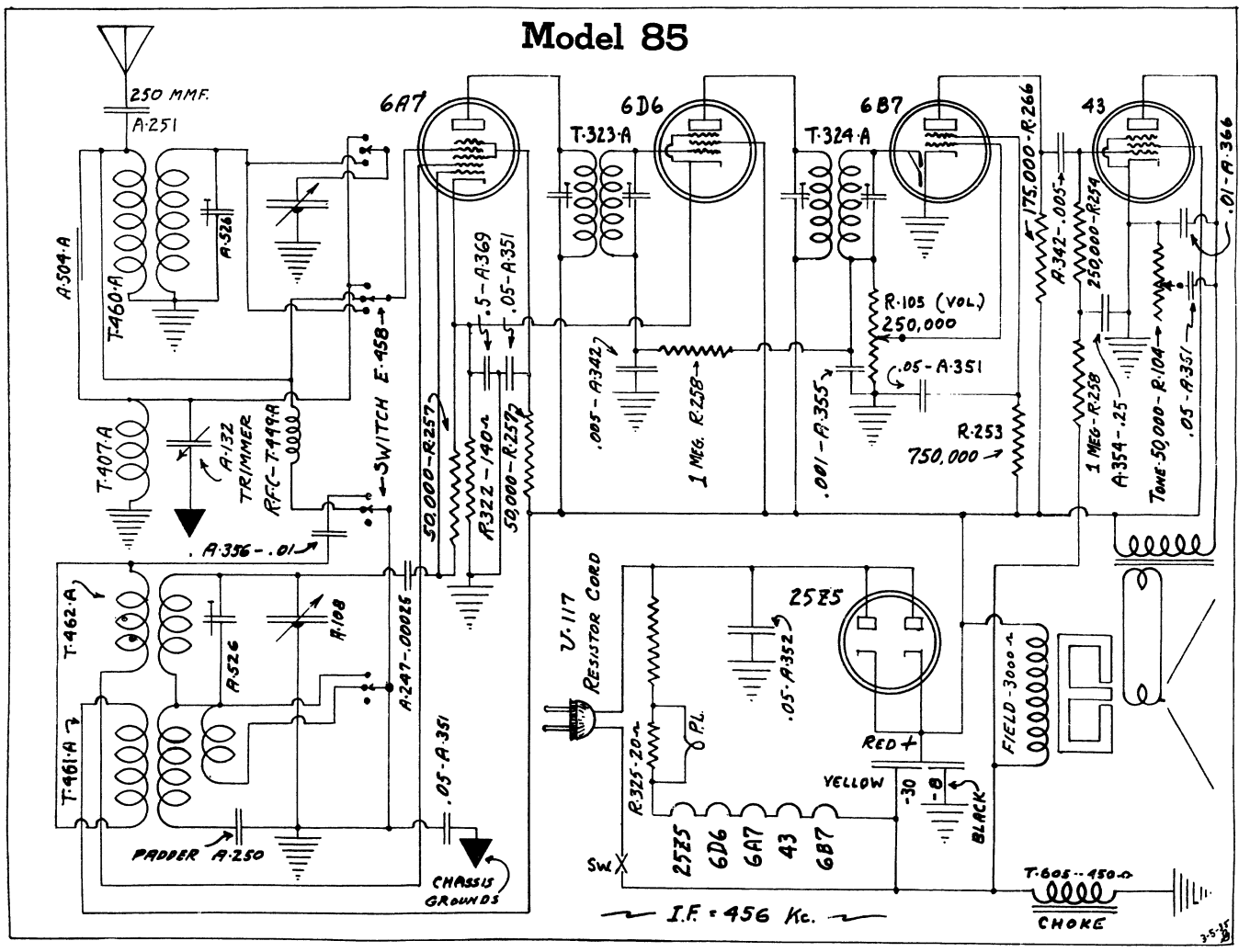
INTERNATIONAL RADIO CORP.

— Chassis Model 80 —



INTERNATIONAL RADIO CORP.

Model 85



INTERMEDIATE FREQUENCY

Sets bearing serial numbers under 185499 use an intermediate frequency of 262KC.

Sets bearing serial numbers over 185498 use an intermediate frequency of 456KC.

ALIGNMENT

The standard type of AC output meter should be used to indicate signal strength. It should be connected from the plate of the 43 tube to the circuit ground (variable condenser frame). The signal from the test oscillator must be kept at a very low level to get below the A.V.C. action.

A microammeter may be used to indicate signal strength if preferred (see Manual of General Service Information). One lead from the meter should be attached to the circuit ground and the other to the terminal of the volume control to which is connected a 1 megohm resistor.

To adjust 262KC IF circuits set the test oscillator to 262KC and couple it to the antenna wire of the set (wave band switch should be on B/C position). Short out oscillator section of 2 gang tuning condenser (rear section). Adjust IF transformers for maximum meter reading. Go over adjustments at least twice for accuracy. Use fibre screw driver.

To adjust 456KC IF circuits first remove grid clip from 6A7 tube and connect a 500M ohm resistance from the 6A7 grid (top of tube terminal) to ground. Set test oscillator to 456 KC and feed its signal direct to the grid of the 6A7. Short out oscillator section of 2 gang tuning condenser and proceed as in above paragraph.

Before aligning RF circuits see that the dial is correctly adjusted. With the 2 gang condenser all the way out of mesh the dial pointer should be on the 5000 KC mark.

Place band change switch on B/C position. The trimmer across the B/C antenna coil is located on the bottom of the chassis at the end. It should be set at approximately minimum capacity. Set the test oscillator to 1500 KC and couple to the antenna wire of the set. With the dial pointer on 1500 KC adjust the oscillator trimmer (on 2 gang condenser) for maximum signal. Shift the 2 gang condenser slightly to one side or the other of 1500 KC and continue adjustments for maximum signal. The correct balance between oscillator and antenna circuits will be found very close to the 1500 KC mark on the dial.

Check alignment at 1000 and 600KC (see Manual of General Service Information).

Turn wave band switch to extreme left and turn dial to about 19 meters, adjust test oscillator so it is producing a signal at approximately 19 meters. Turn tuning condenser slightly back and forth, at the same time adjusting the short wave oscillator trimmer (mounted beside S/W oscillator coil) for maximum signal. The two plate vernier condenser on top of the chassis should be out of mesh while this is being done.

Tune test oscillator and radio to about 49 meters and check for resonance. Do not bend condenser plates to align but spread or crowd together turns on the short wave antenna coil (see Manual of General Service Information.) The two plate vernier condenser on top of the chassis should be in mesh while this is being done.

AVERAGE TUBE OPERATING VOLTAGES

Position	Tube	Ek	Eg^1	Eg^2	Eg^3	Ep	Edp
1st Det-Osc.	6A7	.8	Det. 0 Osc. 0	50	—	Det. 110 Osc. 110	—
IF Amp.	6D6	.8	*	110	.8	110	—
2nd Det-AVC	6B7	0	.4	45	—	80	*
Power Amp.	43	0	.2	110	—	110	—
Rectifier	2525	110	—	—	—	—	—

k—Cathode; g^1—Control grid; g^2—Screen grid; g^3—Suppressor grid; p—Plate; dp—Diode plates; *—Depends on applied signal strength. All voltages measured from indicated points to circuit ground. Line voltage 115 volts.

INTERMEDIATE FREQUENCY

Sets bearing serial numbers under **6501** use an intermediate frequency of 262 K.C.

Sets bearing serial numbers over **6500** use an intermediate frequency of 456 K.C.

ALIGNMENT

The standard type of AC output meter should be used to indicate signal strength. It should be connected from the plate prong of the 12A7 amplifier section to ground. The signal from the test oscillator must be kept at a very low level to get below the A.V.C. action.

To adjust IF circuits first turn the tuning condenser to a setting approximating 600KC. Do not short out the oscillator section of the 2 gang condenser. Set test oscillator to correct intermediate frequency and attach to antenna of set. Adjust primary and secondary of 1st IF transformer for maximum reading on meter. Repeat with 2nd IF transformer and then go over all adjustments a second time. Fibre screw driver and socket wrench are necessary for accuracy.

Next set the test oscillator to 1500 KC. Turn the 2 gang condenser so the plates are just slightly meshed (about 1/8 inch). Adjust trimmers on both sections for maximum signal.

If coils have been changed it may be necessary to bend plates at 1000 KC and 550 KC. See Manual of General Service Information for instructions. Do not bend plates on the oscillator section (rear) unless absolutely necessary.

MISCELLANEOUS

Keep the green wire on antenna section of 2 gang condenser as far as possible from oscillator.

Keep antenna coil as far as possible from sockets.

Keep A.C. power cord clear at the end of chassis.

If microphonic push a piece of rubber between speaker unit and chassis base.

SPEAKER ADJUSTMENT

To adjust speaker remove cover plate from speaker unit. Two screws will be found at each end of the unit within the magnets. When adjusting either pair of screws, one is to be loosened slightly and the other tightened. You will notice this moves the armature slightly to one side. The air gap on both sides of the armature should be the same.

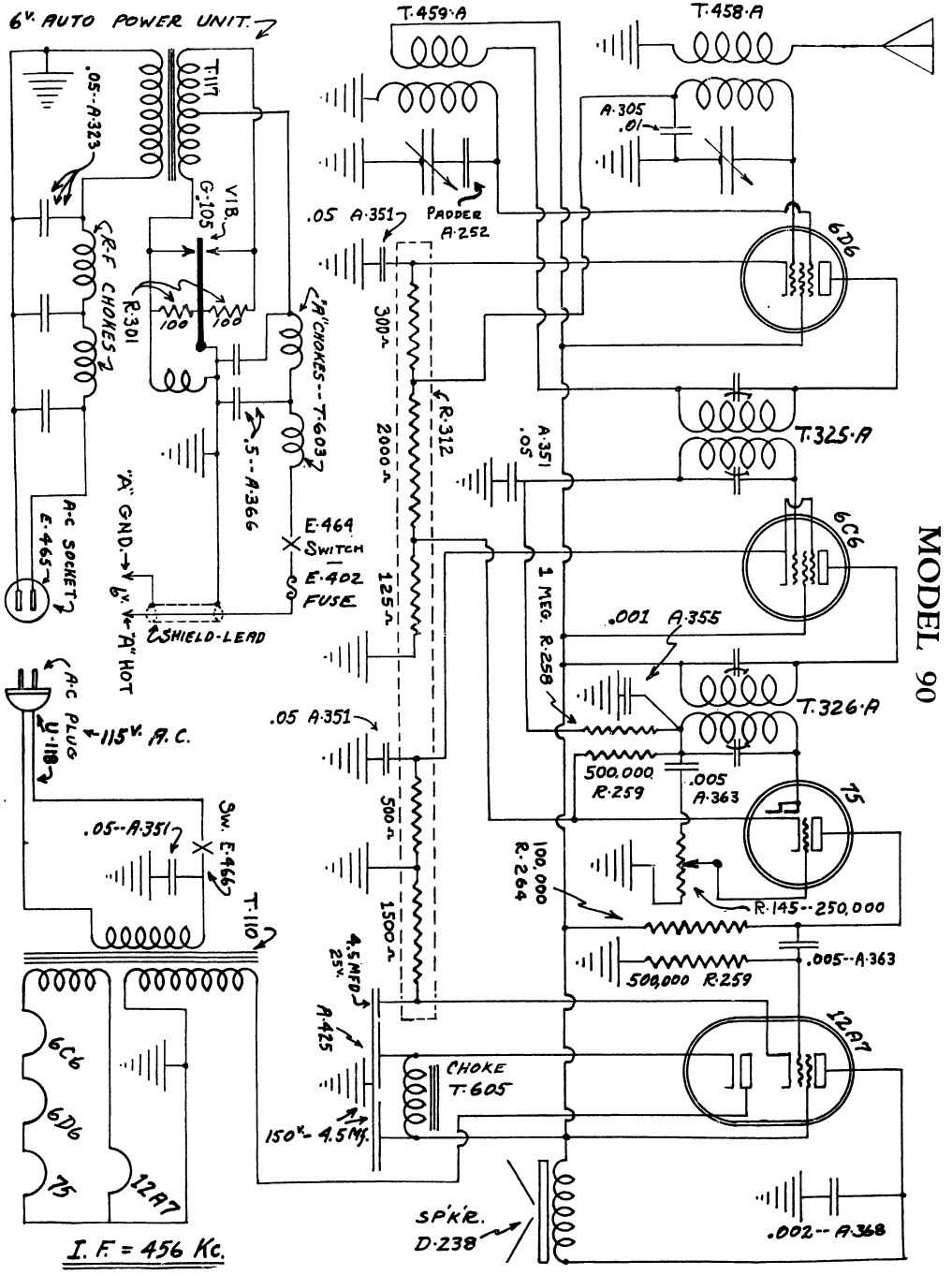
6 VOLT POWER UNIT

The power unit should deliver between 110 and 120 volts AC under the load of the set. Low output usually indicates a poor vibrator or the set may be drawing an abnormal amount of current.

AVERAGE TUBE OPERATING VOLTAGES

Position	Tube	Ek	Eg^1	Eg^2	Eg^3	Ep	Edp
1st Det-Osc.	6D6	18	15	110	0	110	—
IF amp.	6C6	2.7	*	110	2.7	110	—
2nd Det-AVC	75	1	0	—	—	75	*
Rect-Pwr. amp.	12A7	Amp. 11 Rect. 120	0	115	—	Amp. 110 Rect 120AC	—

K—Cathode; g^1—Control grid; g^2— Screen grid; g^3—Suppressor grid; p—Plate; dp—Diode plates; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Line voltage 115 volts.

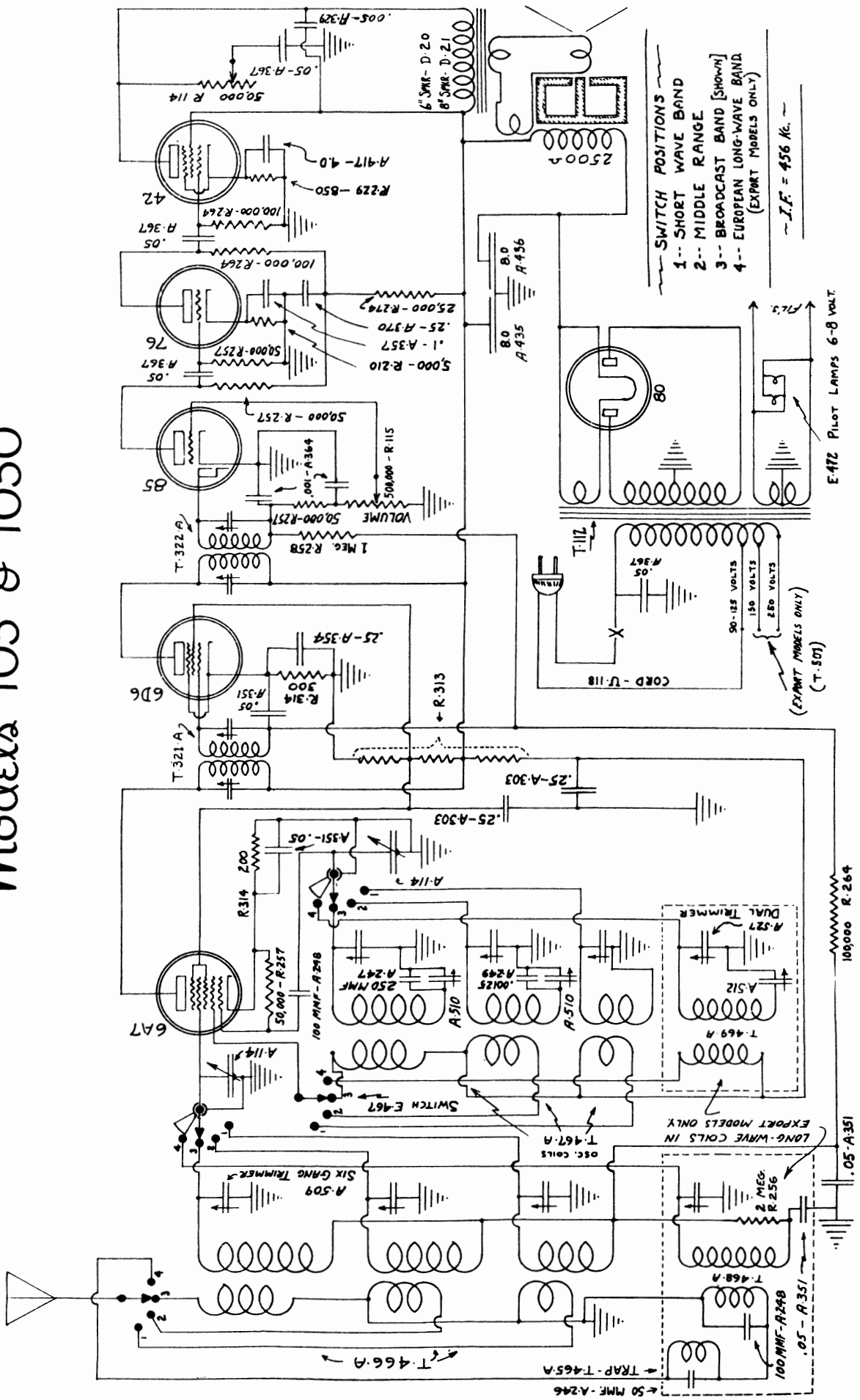


INTERNATIONAL RADIO CORP.

MODEL 90

INTERNATIONAL RADIO CORP.

Models 105 & 1050



Models 105 & 1050

ALIGNMENT — OPERATING VOLTAGES

Models 105 and 1050 are A.C. receivers designed to operate from 115 volt power lines. They tune the American broadcast band, police and airport bands, and Foreign short wave bands. The models built for export also tune the European long wave band and because of the tapped power transformer in these models they may be operated on A.C. lines up to 250 volts. (See circuit diagram. Switch is available by removing part of cover of power transformer.)

ALIGNMENT

The standasd type of AC output meter should be used to indicate signal strength. It should be connected from the plate of the 42 tube to ground. Tone control should be turned "high." The signal from the test oscillator *must be kept at a very low level.*

To align the IF circuits first remove the grid clip from the 6A7 tube and connect a 50,000 ohm resistance from the 6A7 grid (top of tube terminal) to ground. Short out both sections of the 2 gang tuning condenser. Set the test oscillator to 456KC. and feed its modulated signal direct to the grid of the 6A7. Adjust the first IF transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second IF transformer. If adjustments are not made accurately selectivity will be poor and IF may oscillate.

Before aligning RF circuits see that the dial is correctly adjusted. With the 2 gang condenser at full mesh the pointer should be on 540 Kc.

BROADCAST BAND

Place the band change switch on Broadcast position. Turn the dial to 2000 KC. and feed a *very weak* 2000 KC. modulated signal from your test oscillator to the antenna. Adjust the broadcast oscillator trimmer (see sketch) for maximum reading. Usually no trimmer is needed across the broadcast antenna coil.

Turn dial and test oscillator to 600 KC. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 KC. until an adjustment is obtained producing maximum output. Go back to 2000 KC, and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 KC.

MIDDLE BAND

Turn the band change switch to the middle position and tune radio and test oscillator to 6000 KC. Adjust the oscillator trimmer and then the antenna trimmer for maximum output.

Rock in the padder condenser at 2400 KC. Then recheck at 6000 KC. and 2400 KC.

SHORT WAVE BAND

Turn band change switch to short wave band. Tune radio and test oscillator to 16.5 megacycles and adjust trimmers. Generally the oscillator trimmer will be very loose. No padder condenser is used on the short wave band so no other adjustments are necessary.

EUROPEAN LONG WAVE BAND

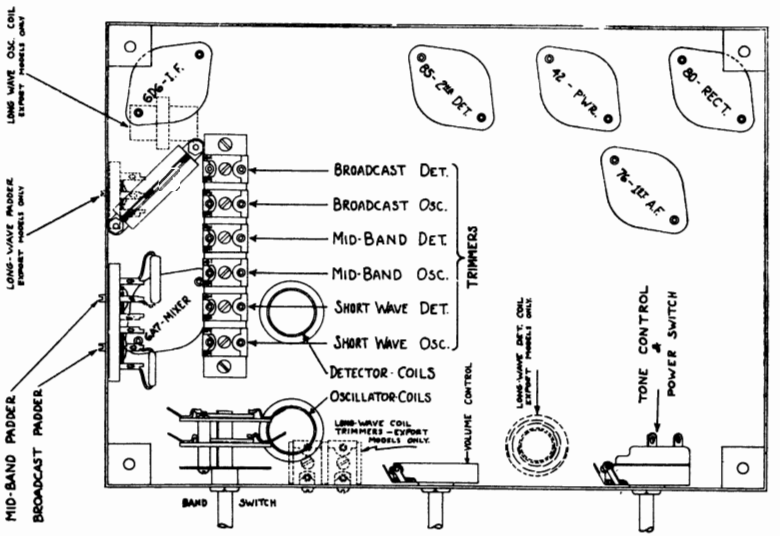
Alignment instructions are same as for broadcast band. Align at 350 and 160 KC.

MICROPHONIC HOWL

The 2 gang condenser is cushion mounted to eliminate vibration of the plates. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

PILOT LIGHTS

In sets built prior to publication of this bulletin the pilot lights were wired in series and 3.8 volt bulbs were used (our part number E-405). If they burn out in an unreasonably short time it is suggested that the sockets be rewired to parallel connection and the number E-472, 6-8 volt bulbs be used.



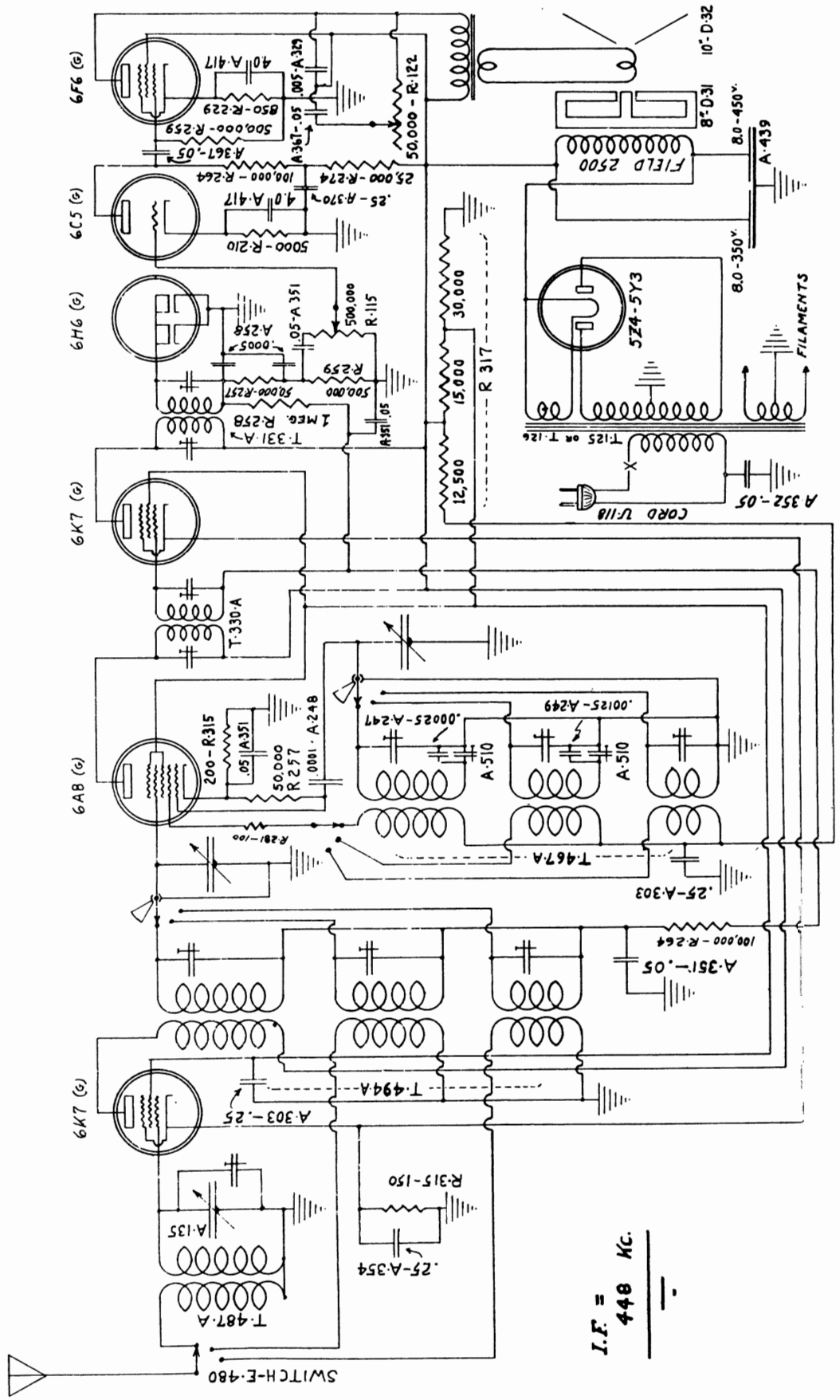
AVERAGE TUBE OPERATING VOLTAGES

Position	Tube	Ek	Eg^1	Eg^2	Eg^3	Ep	Edp
1st Det-Osc.	6A7	2	Det. * Osc.-1	100	—	Det. 230 Osc. 145	—
IF Amp.	6D6	2	*	100	2	230	—
2nd Det-AVC	85	0	0	—	—	40	*
1st AF Amp.	76	3	0	—	—	65	—
Power Amp.	42	20	0	230	—	215	—
Rectifier	80	Fil. 270	—	—	—	—	—

k—Cathode; g^1—Control grid; g^2—Screen grid; g^3—Suppressor grid; p—Plate; dp—Diode plates; *—Depends on applied signal strength. All voltages measured from indicated points to ground using 1000 ohm per volt D.C. voltmeter. Line voltage 115 volts.

INTERNATIONAL RADIO CORP.

Models 120, 1200 & *2200



I.F. = 448 Kc.

Sets having 6F5 (G) in place of 6C5 (G), use R254 (250M) instead of R264 (100M).

* LONG-WAVE EXPORT MODELS. The coils for the long-wave band are not shown in the above schematic diagram. See Alignment data.

Models 120, 1200 & 2200

This chassis is designed to operate from 115 volt, 60 cycle, alternating current power lines. It is a three band receiver covering the American broadcast, police and airport, and Foreign short wave bands.

The following tubes are employed:

6K7 (metal) or 6K7G (glass) R.F. amplifier
6A8 (metal) or 6A8G (glass) 1st Detector-Oscillator
6K7 (metal) or 6K7G (glass) I.F. amplifier
6H6 (metal) or 6H6G (glass) Diode detector
6C5 (metal) or 6C5G (glass) A.F. amplifier
6F6 (metal) or 6F6G (glass) Pentode output
5Z4 (metal) or 5Y3 (glass) Rectifier
See Footnote Under Diagram

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. Glass counterpart types should be shielded, the metal tubes need not be. Shielding provisions are provided.

ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. Tone control should be turned "high". The signal from the signal generator *must be kept at a very low level.*

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1400 and 600 Kc.; Middle band, 6000 and 2400 Kc.; Short wave band 15 megacycles.

In aligning on broadcast band it is permissible to bend plates on the *R. F. section only* of the three gang condenser. Do not bend plates when aligning the middle and short wave bands.

The front section of the three gang condenser is the oscillator section; the middle section, first detector; the rear section, R.F. amplifier. The R.F. amplifier is in circuit only on the broadcast band.

INTERMEDIATES: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the three gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) and R.F. stage trimmer (on condenser gang) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected on many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc. It is permissible to bend plates on the R.F. section only in resonating circuits.

MIDDLE BAND: Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padder condenser at 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

SHORT WAVE BAND: Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padder condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency.

MICROPHONIC HOWL

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

LONG WAVE-EXPORT MODELS

These models are also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, midband, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave padder at 160 Kc. See sketch for location of coils and condensers.

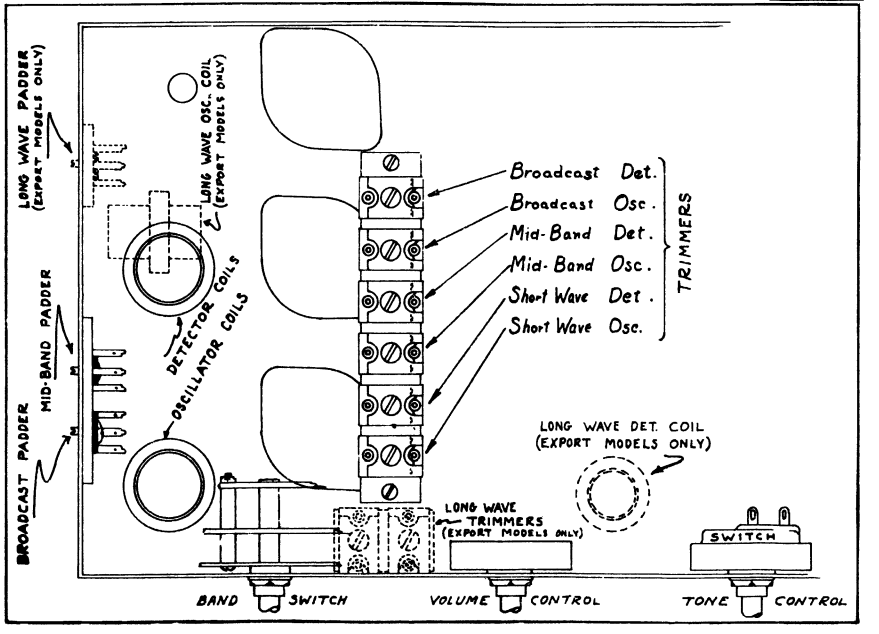
Some export sets also contain a 25 cycle power transformer (part number T-502) which has a tapped primary winding allowing operation from 125, 150 or 250 volt A.C. power lines. The tap switch is made available by removing part of the cover of the power transformer. 25 cycle sets may be used on 60 cycle although the converse is not true.

AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

POSITION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
6K7	R. F.	Shell	HTR.	210	80	1.5	—	HTR.	1.5
6A8	Det.-Osc.	Shell	HTR.	210	80	0	150	HTR.	1.5
6K7	I. F.	Shell	HTR.	210	80	1.5	—	HTR.	1.5
6H6	2nd Det.	Shell	HTR.	0	0	0	—	HTR.	0
6C5	1st A.F.	Shell	HTR.	80	—	0	—	HTR.	3
6F6	2nd A.F.	Shell	HTR.	200	210	0	—	HTR.	15
5Z4	Rect.	Shell	345	—	A.C.	—	A.C.	—	345

Line 118 Volts. Switch on Broadcast Position. Volume Control Full On. 10% Variation Allowable.



ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It may be connected from plate of the 950 tube to ground.

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc.

The rear section of the two gang condenser is the oscillator section; the front section, first detector.

INTERMEDIATES: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result. Due to the I.F. trap in the antenna circuit a strong signal is necessary.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer for maximum reading. On most sets the detector trimmer has its adjusting screw purposely removed.

There is no adjustable padder condenser in this model so resonance on the low frequency end is accomplished by bending plates on the tuning condensers. Check the alignment at 1000 Kc. Insert a thin bakelite, celluloid or mica feeler strip between the plates of the variable condensers to determine whether the circuits are properly matched. The action is this--the dielectric constant of the celluloid feeler strip being higher than that of the air it displaces, results in an increase of capacity. Open the variable condenser just enough to indicate two or three points below maximum signal. As the feeler is inserted the meter reading should indicate increasing signal and then decreasing as the feeler is inserted farther. This procedure should be followed on both sections. Should the meter fail to show an increase in signal as the strip is inserted in one section this indicates too great a capacity for that section. This may be corrected by bending the outside rotor plates out at the point where they begin to mesh with the stator.

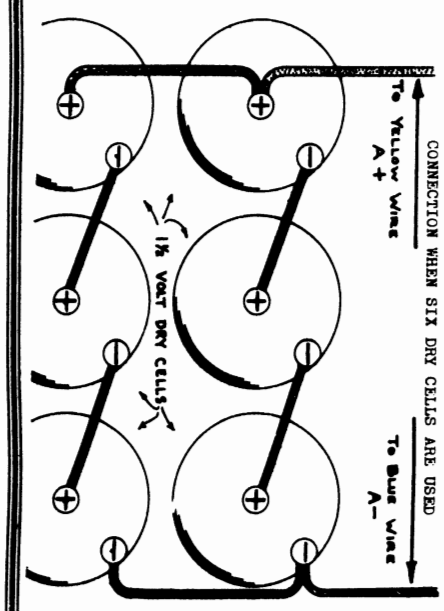
After checking the alignment at 1000 Kc. repeat the process at 600 Kc.

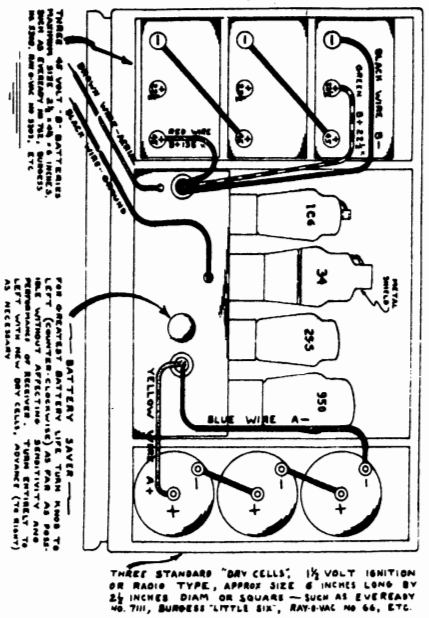
SHORTWAVE BAND: No alignment necessary due to untuned detector circuit.

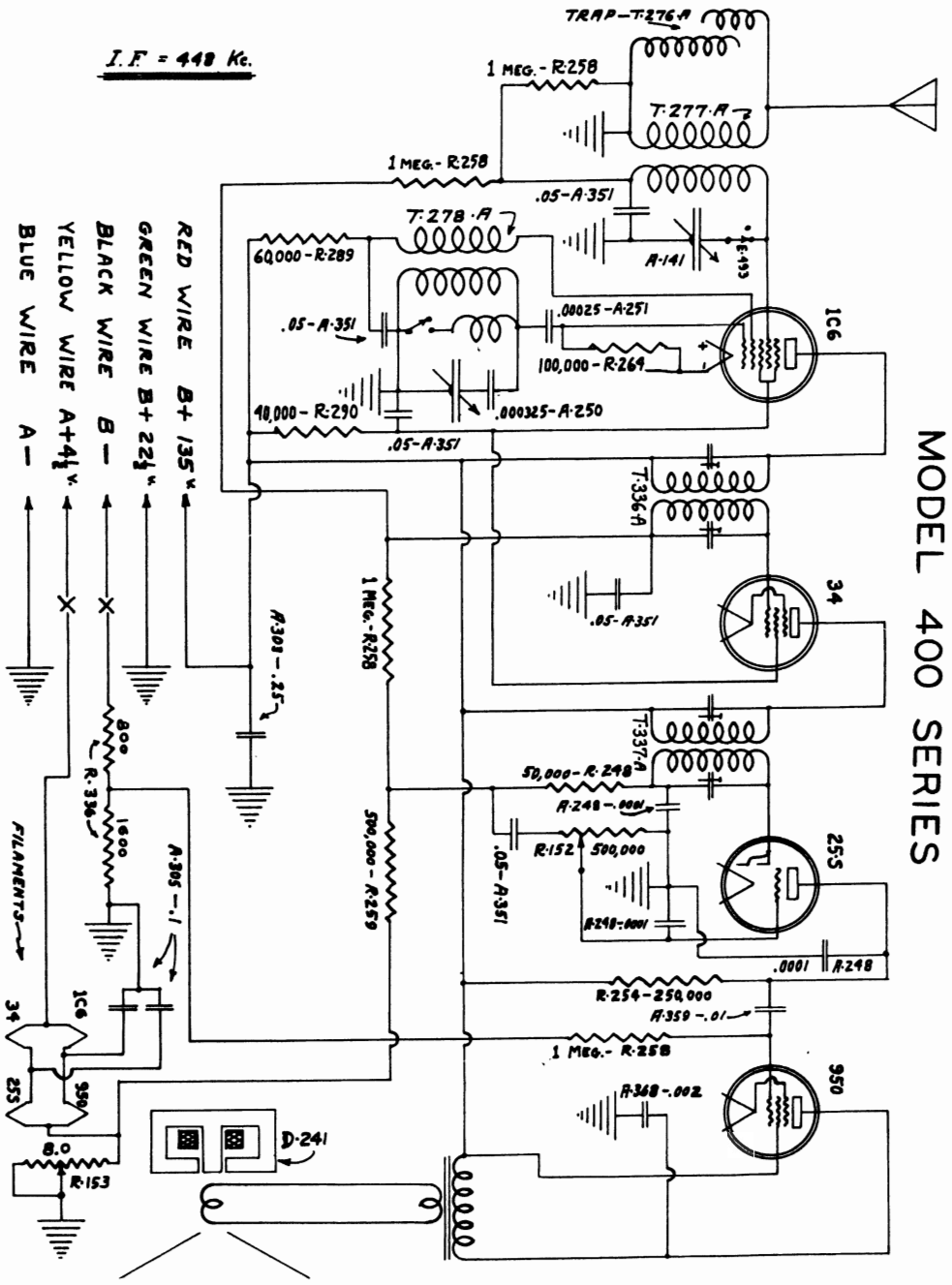
Model 400 is a two band, battery operated receiver. The right-hand knob is the wave band switch. It should be turned to the left for broadcast band reception. When turned to the right the receiver tunes the police, airplane and amateur band for 70 to 200 meters.

The following tubes are employed:

1C6 - 1st Detector-Oscillator
34 - I.F. Amplifier
25S - 2nd Detector-A.V.C.-A.F. Amplifier
950 - Power Amplifier





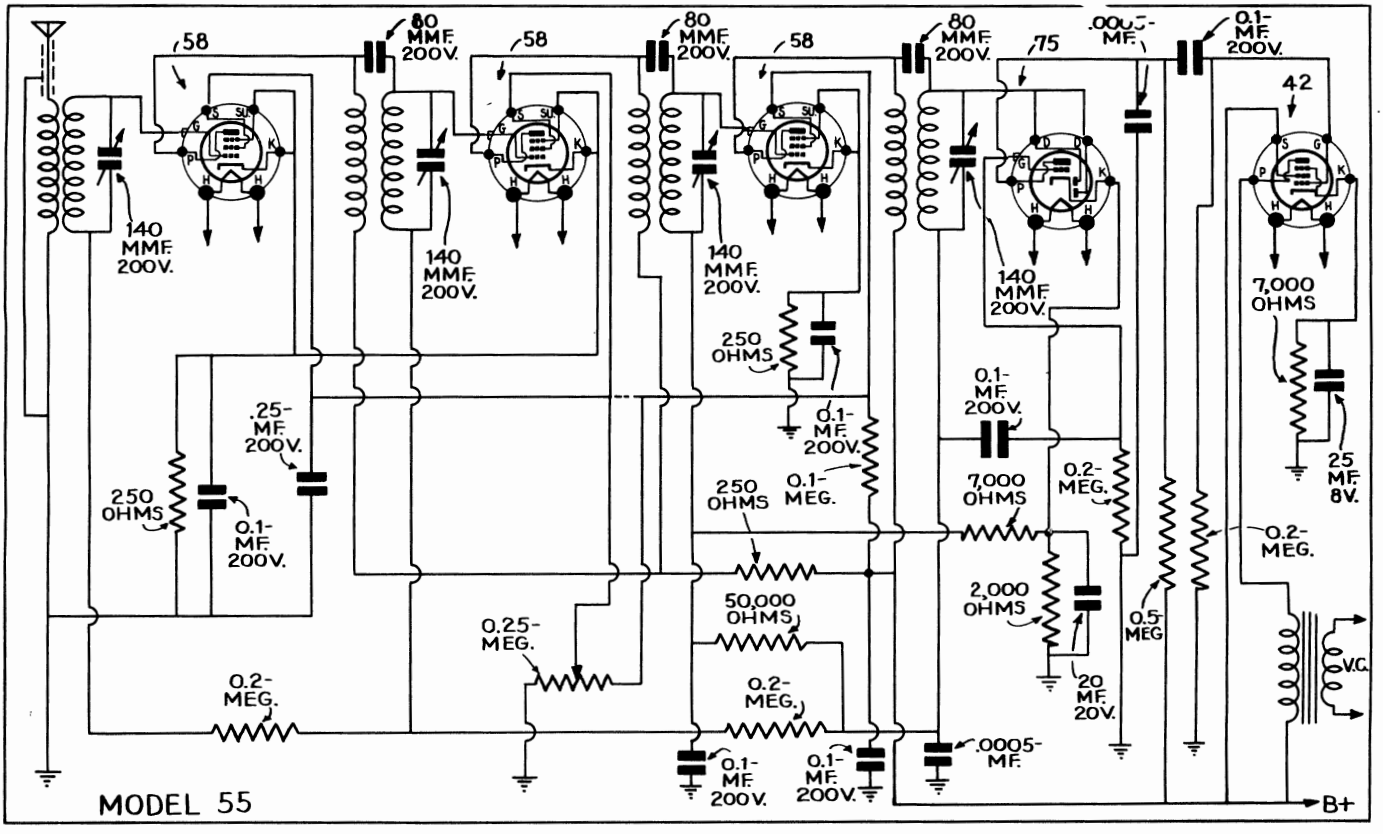


INTERNATIONAL RADIO CORP.

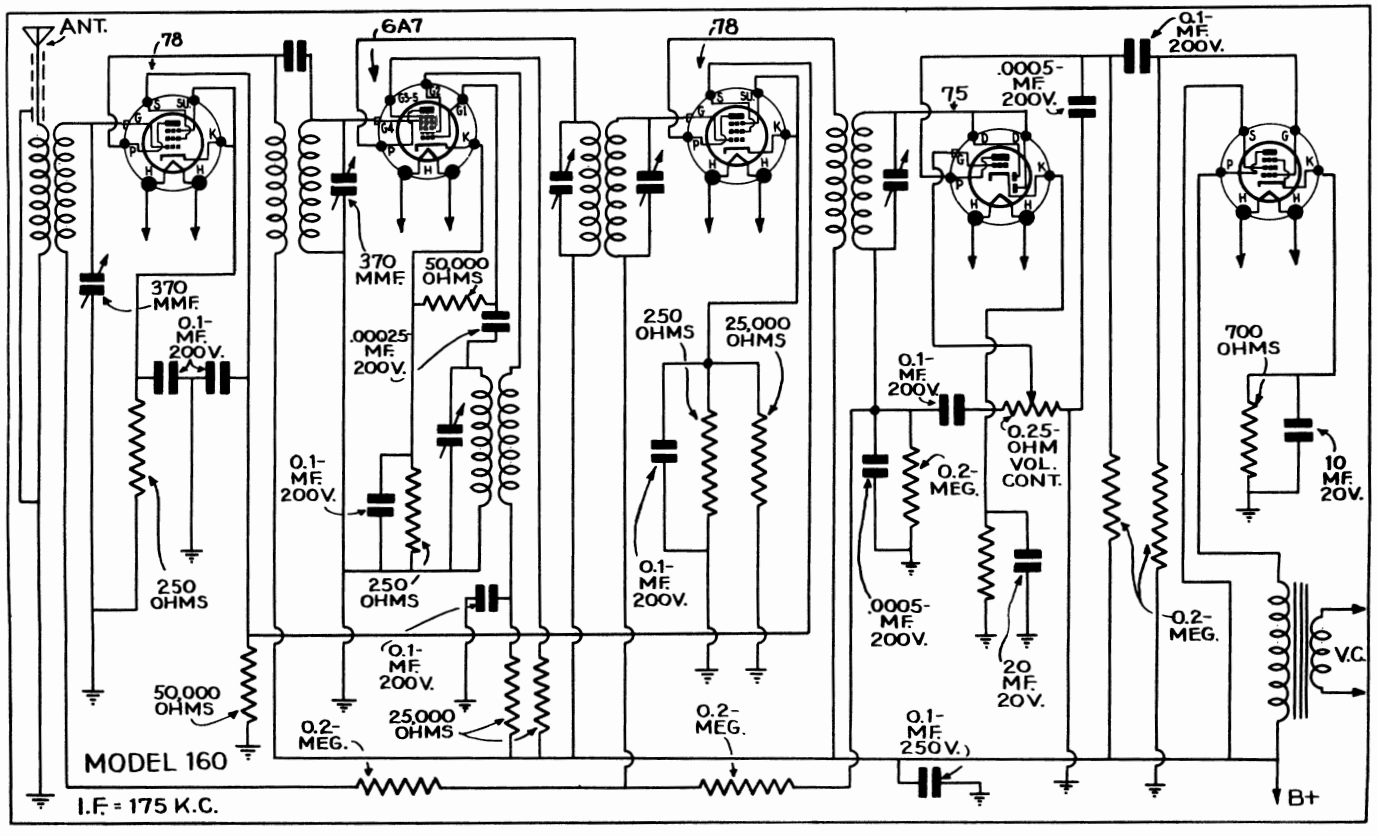
MODEL 400 SERIES

KARADIO CORP.

Model 55

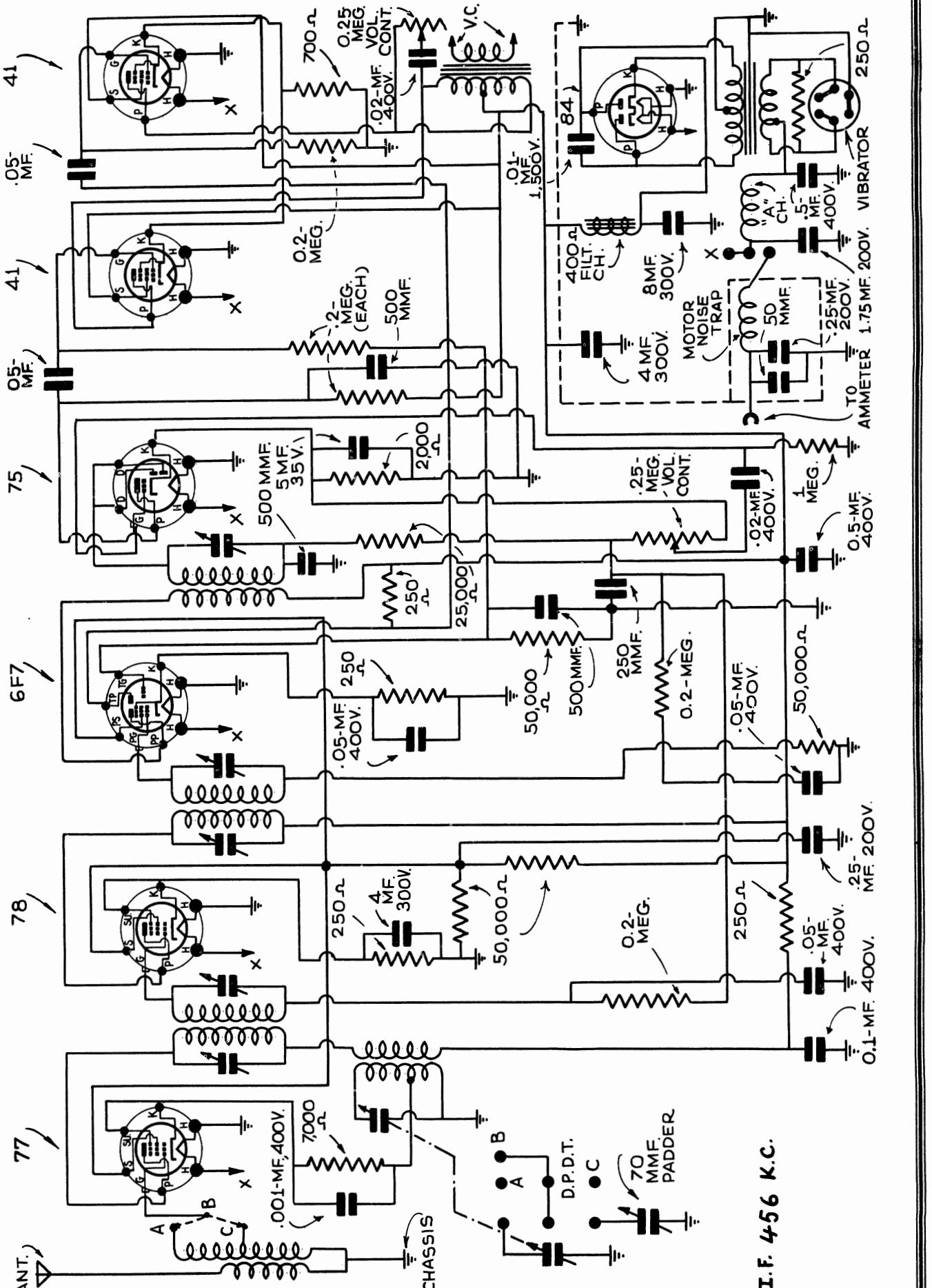


Model 160



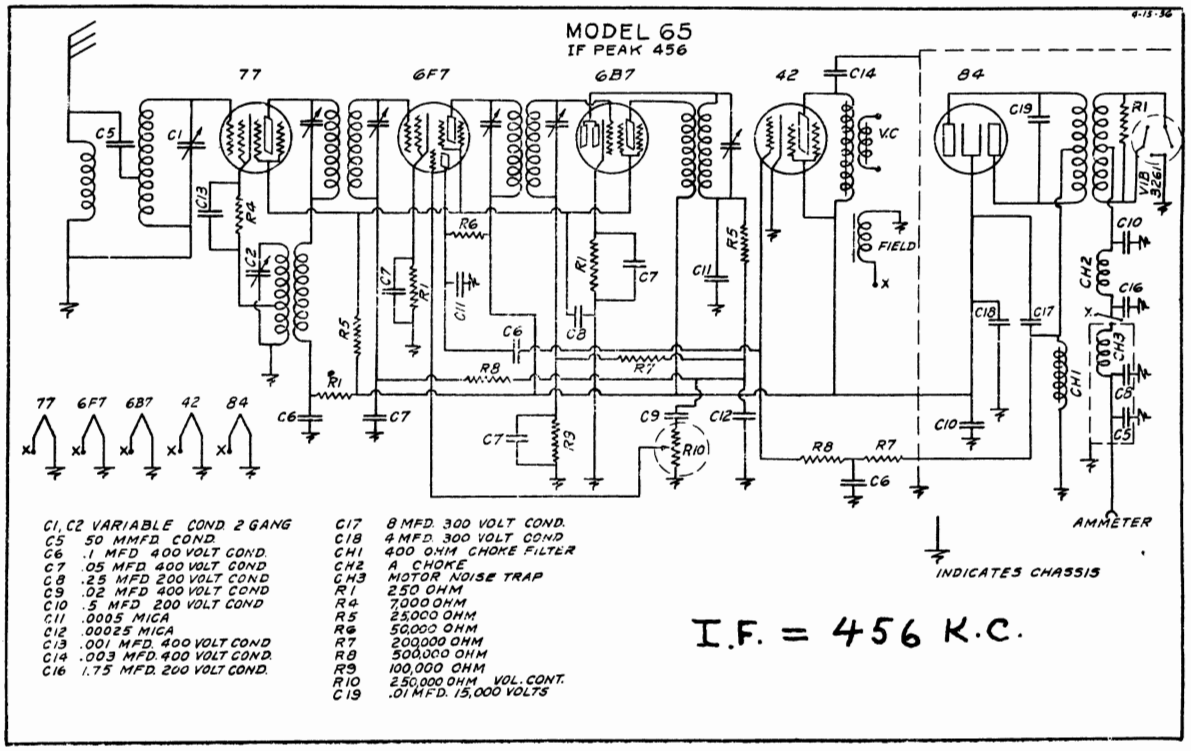
KARADIO CORP.

Model 57-B "Sheriff"



KARADIO CORP.

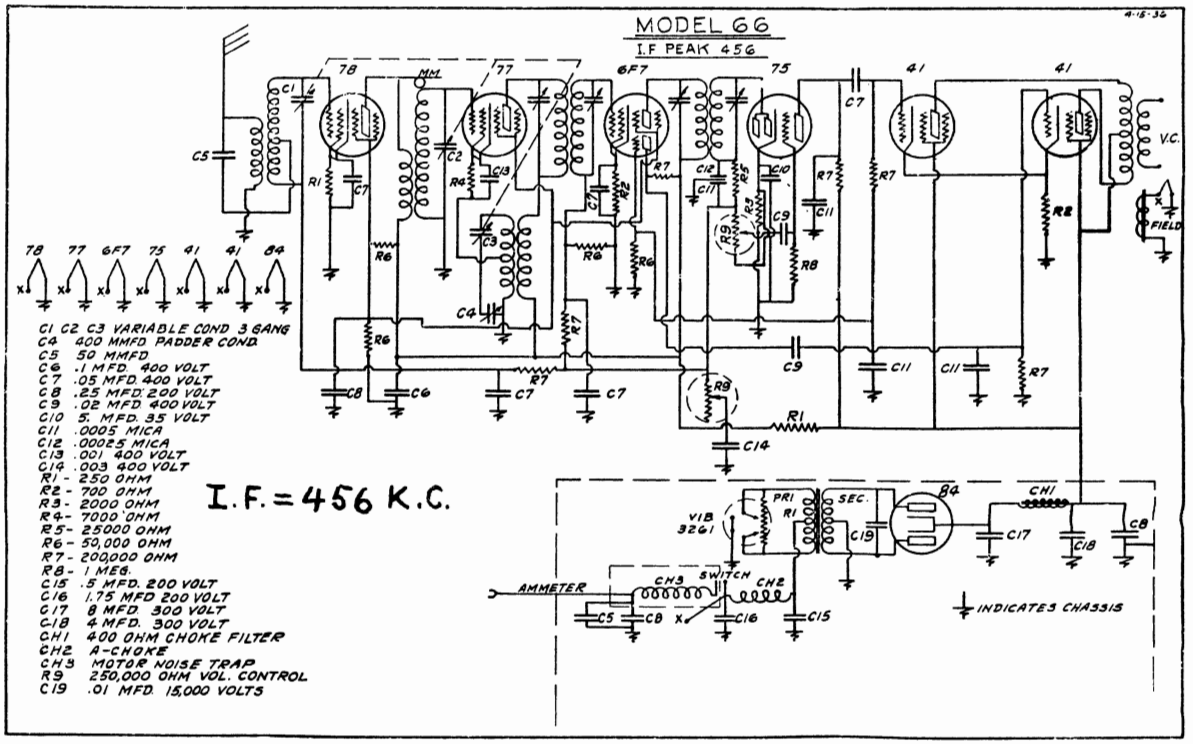
Model 65



C1, C2 VARIABLE COND. 2 GANG
C5 50 MMFD. COND.
C6 .1 MFD. 400 VOLT COND.
C7 .05 MFD. 400 VOLT COND.
C8 .25 MFD 200 VOLT COND
C9 .02 MFD 400 VOLT COND
C10 .5 MFD 200 VOLT COND
C11 .0005 MICA
C12 .00025 MICA
C13 .001 MFD. 400 VOLT COND
C14 .003 MFD. 400 VOLT COND.
C16 1.75 MFD. 200 VOLT COND.
C17 8 MFD. 300 VOLT COND.
C18 4 MFD. 300 VOLT COND.
CH1 400 OHM CHOKE FILTER
CH2 A CHOKE
CH3 MOTOR NOISE TRAP
R1 250 OHM
R4 7,000 OHM
R5 25,000 OHM
R6 50,000 OHM
R7 200,000 OHM
R8 500,000 OHM
R9 100,000 OHM
R10 250,000 OHM VOL. CONT.
C19 .01 MFD. 15,000 VOLTS

I.F. = 456 K.C.

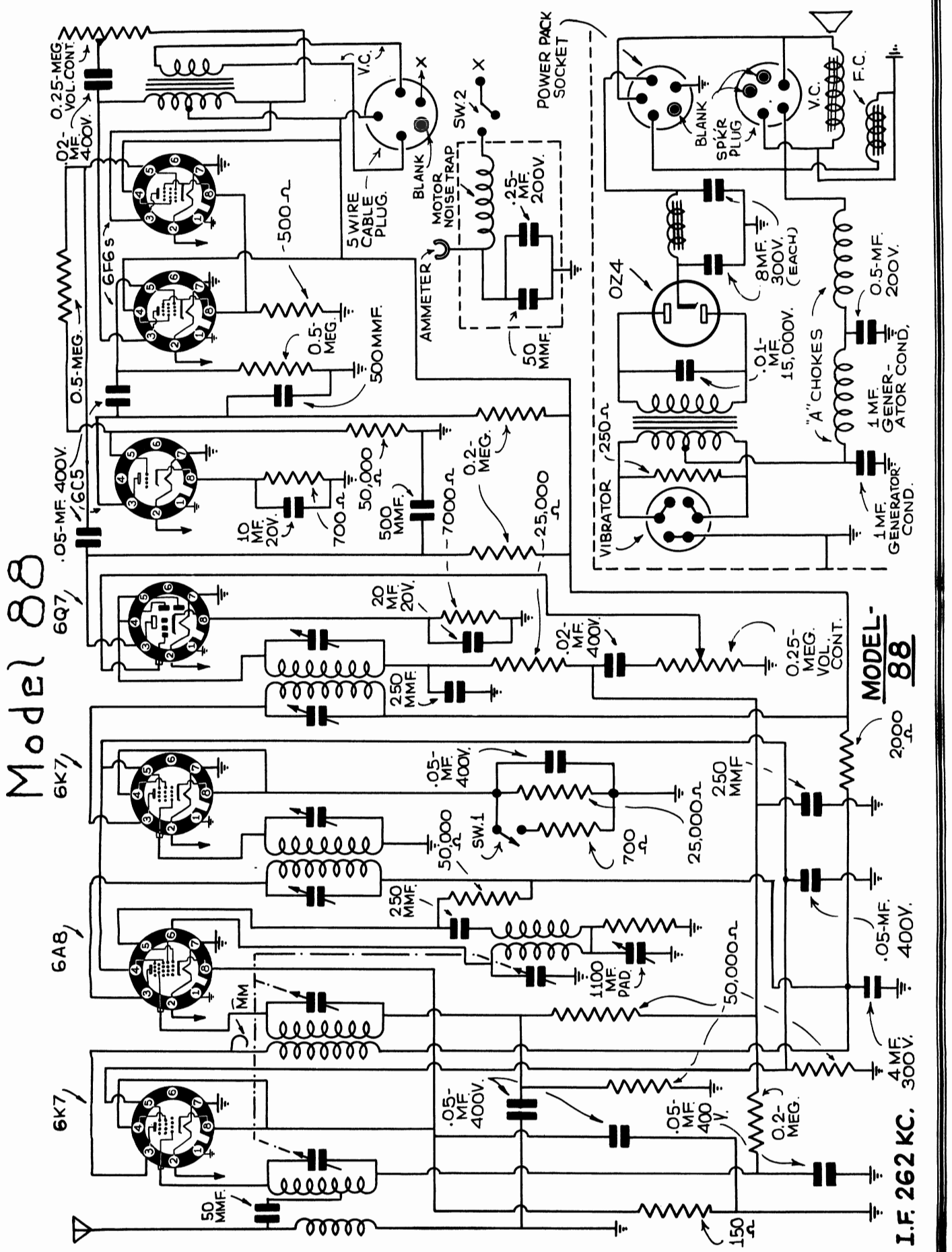
Model 66



C1 C2 C3 VARIABLE COND 3 GANG
C4 400 MMFD PADDER COND.
C5 50 MMFD.
C6 .1 MFD. 400 VOLT
C7 .05 MFD. 400 VOLT
C8 .25 MFD. 200 VOLT
C9 .02 MFD 400 VOLT
C10 5. MFD. 35 VOLT
C11 .0005 MICA
C12 .00025 MICA
C13 .001 400 VOLT
C14 .003 400 VOLT
R1 - 250 OHM
R2 - 700 OHM
R3 - 2000 OHM
R4 - 7000 OHM
R5 - 25000 OHM
R6 - 50,000 OHM
R7 - 200,000 OHM
R8 - 1 MEG.
C15 .5 MFD. 200 VOLT
C16 1.75 MFD 200 VOLT
C17 8 MFD. 300 VOLT
C18 4 MFD. 300 VOLT
CH1 400 OHM CHOKE FILTER
CH2 A-CHOKE
CH3 MOTOR NOISE TRAP
R9 250,000 OHM VOL. CONTROL
C19 .01 MFD. 15,000 VOLTS

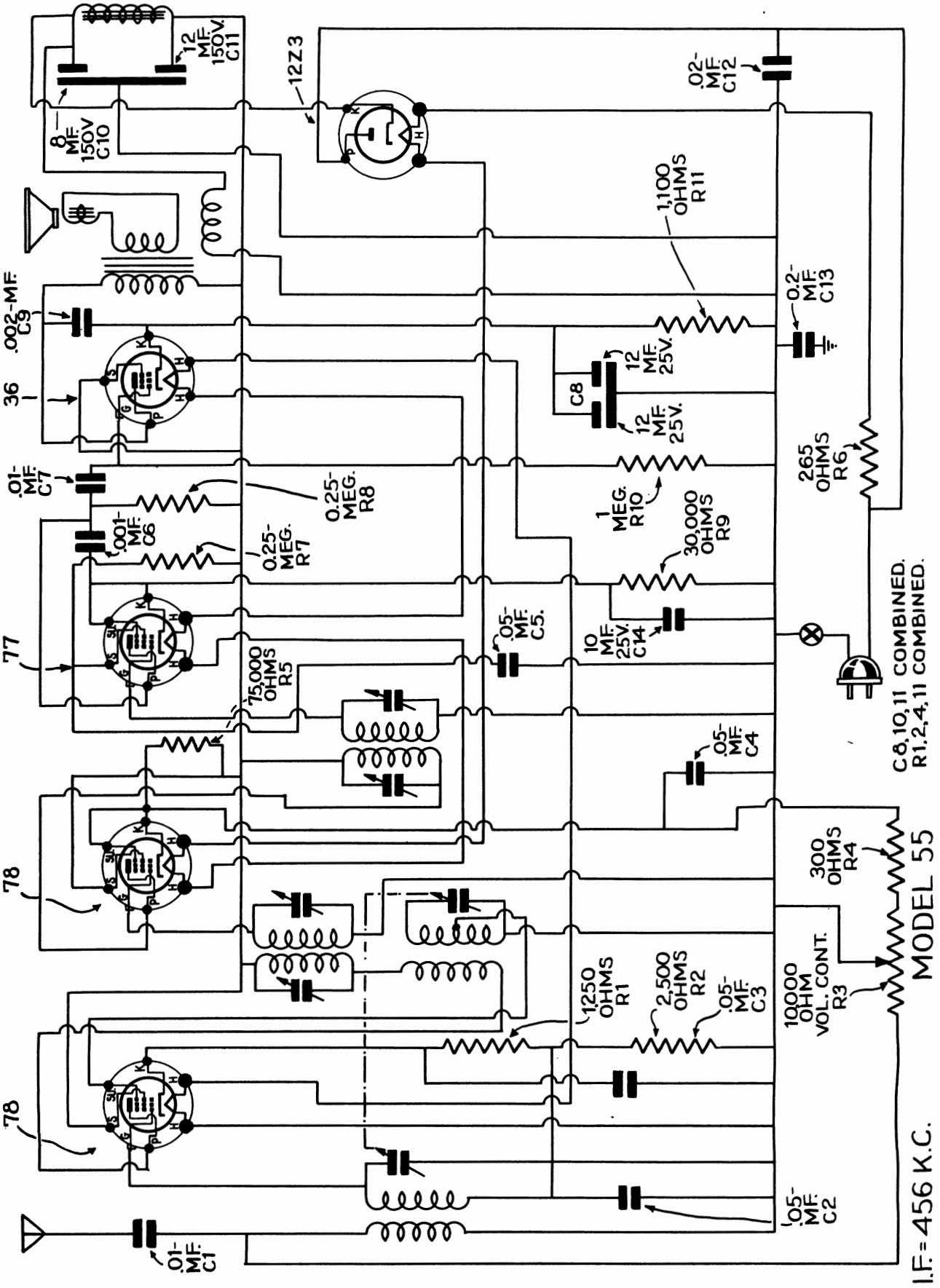
I.F. = 456 K.C.

KARADIO CORP.



KINGSTON PRODUCTS CORP.

Model 55



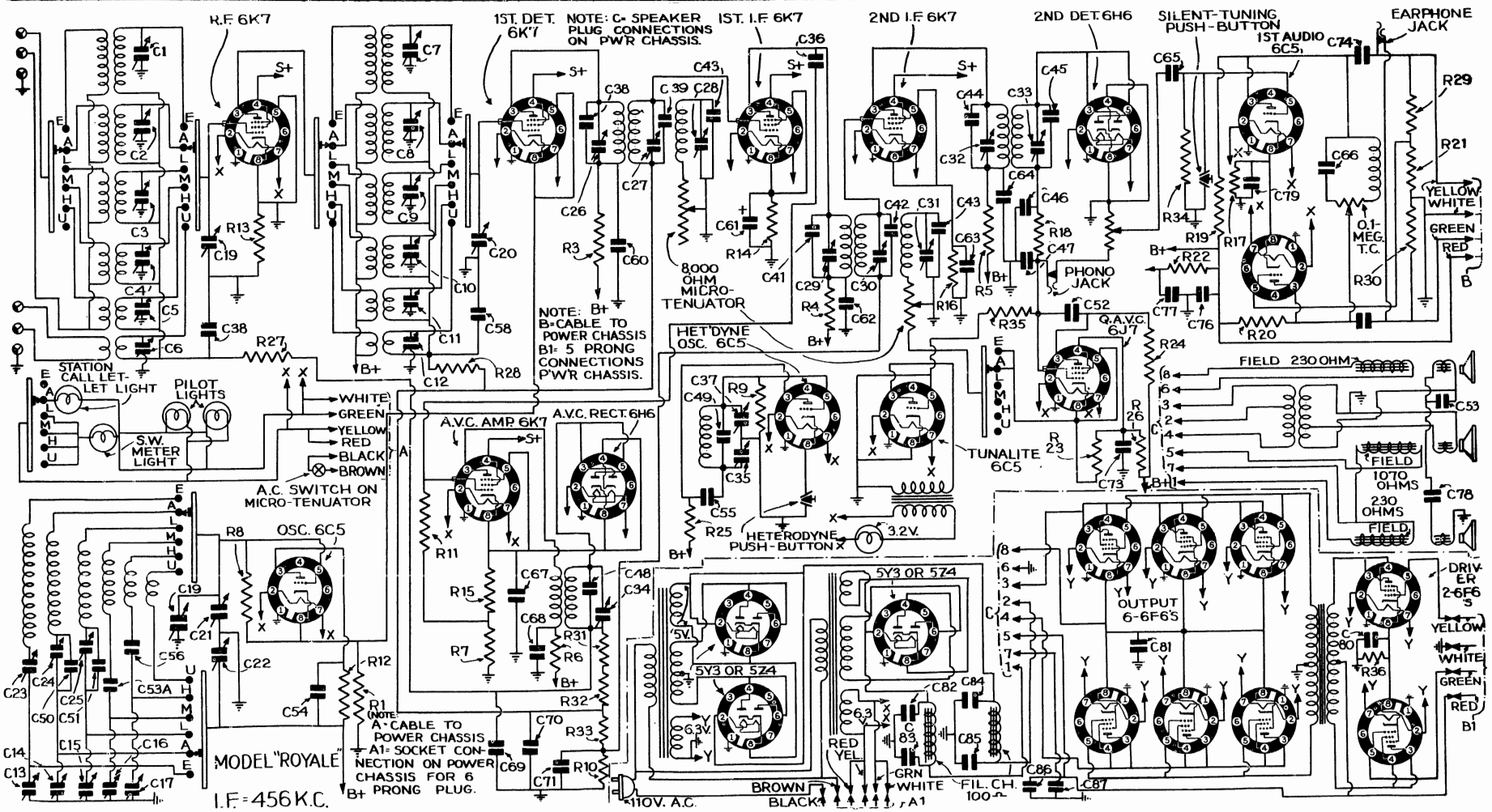
Model "Royale"

CONDENSERS

C 1 - 35 mmfd Trimmer	C16 - 35 mmfd - Trimmer	C31 - 50 mmfd Air Trimmer	C46 - 100 mmfd Mica	C60 - .05 mfd - 400 Volt	C75 - .25 mfd - 400 Volt
C 2 - 35 " "	C17 - 35 " "	C32 - 50 " " "	C47 100 "	C61 - .05 " 400 "	C76 - .25 " 400 "
C 3 - 35 " "	C18 - 35 " "	C33 - 50 " " "	C48 - 100 "	C62 - .05 " 400 "	C77 .25 " 400 "
C 4 - 35 " "	C19 - 365 mmfd "	C34 - 50 " " "	C49 - 100 "	C63 - .05 " 400 "	C78 - 2 " 200 " Paper
C 5 - 35 " "	C20 - 365 " Tuning	C35 - 50 " " "	C50 - 100 "	C64 - .05 " 400 "	C79 80 " 25 " Dry
C 6 - 35 " "	C21 - 365 " Condenser	C36 - 25 " Mica	C51 - 250 "	C65 - .05 " 400 "	C80 - 12 " 25 " "
C 7 - 35 " "	C22 - 365 "	C37 - 50 " "	C52 - 250 "	C66 - .05 " 400 "	C81 - 10 " 75 " "
C 8 - 35 " "	C23 - 70 " Padder	C38 - 100 " "	C53 - 1000 "	C67 - .05 " 400 "	C82 - 15 " 450 Volt Wet
C 9 - 35 " "	C24 - 120 " "	C39 - 100 " "	C53A - 1600 "	C68 - .05 " 400 "	C83 - 16 " 450 "
C10 - 35 " "	C25 - 365 " "	C40 - 100 " "	C54 - 2000 "	C69 - .05 " 400 "	C84 - 16 " 450 " "
C11 - 35 " "	C26 - 50 " Air Trimmer	C41 - 100 " "	C55 - 2000 "	C70 - .05 " 400 "	C85 - 16 " 450 " "
C12 - 35 " "	C27 - 50 " " "	C42 - 100 " "	C56 - .01 mfd - 200 Volt	C71 - .05 " 400 "	C86 - 16 " 450 " "
C13 - 35 " "	C28 - 50 " " "	C43 - 100 " "	C57 - .05 " 400 "	C72 - .05 " 400 "	C87 16 " 450 " "
C14 - 35 " "	C29 - 50 " " "	C44 - 100 " "	C58 - 05 " 400 "	C73 - .05 " 400 "	
C15 - 35 " "	C30 - 50 " " "	C45 - 100 " "	C59 - 05 " 400 "	C74 - .25 " 400 "	

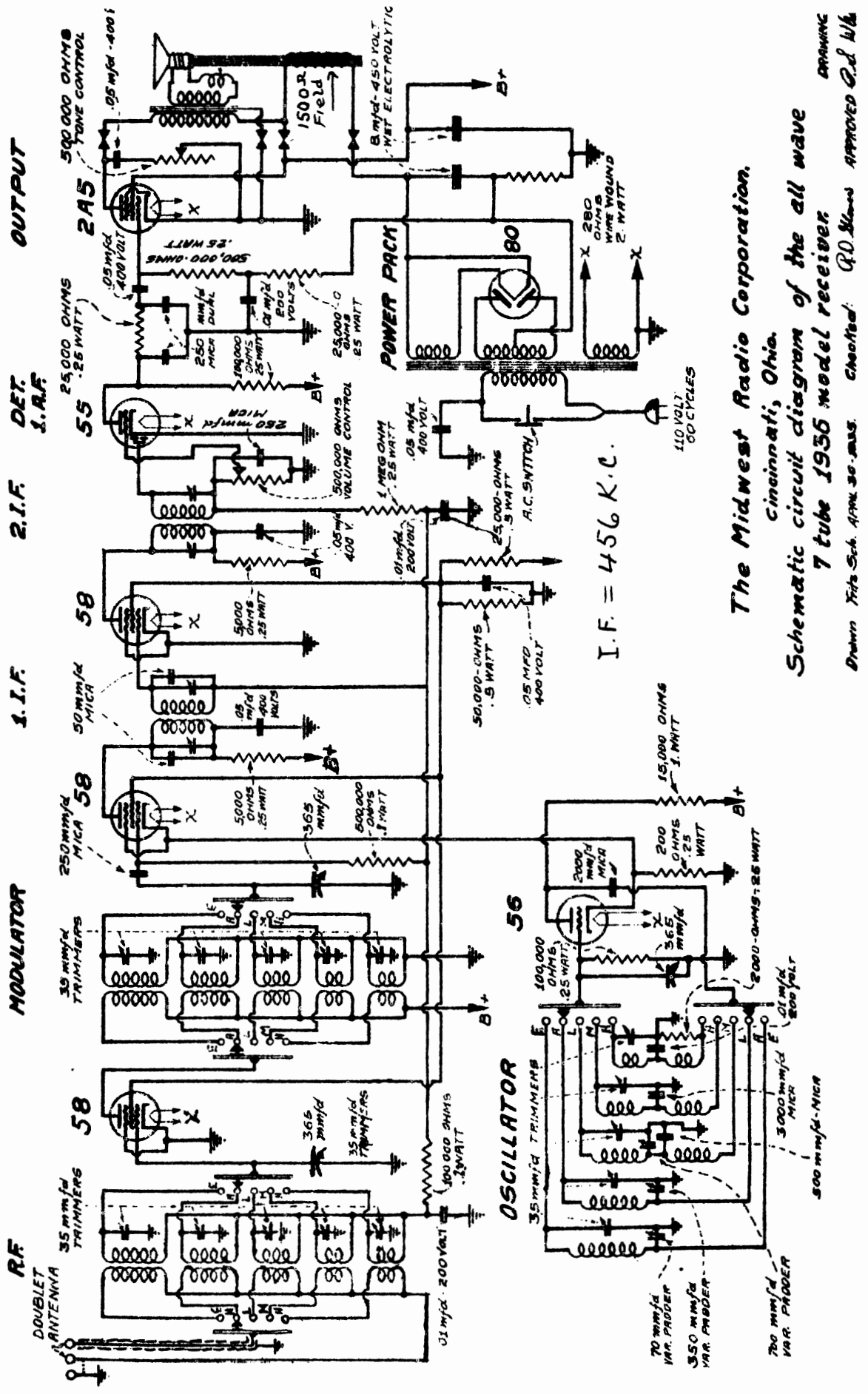
RESISTORS

R 1 500 Ohms .25 Watt	R 8 - 25000 Ohms 1 Watt	R15 - 350 Ohms 1. "	R22 - 50000 " 1 "	R29 500000 " 1 "	R36 - 350 Ohms 2 "
R 3 5000 " .25 "	R 9 - 50000 " 1 "	R16 - 2500 " 1. "	R23 - 50000 " 1 "	R30 - 0.1 Meg T.C.	
R 4 5000 " .25 "	R10 - 50000 " 1 "	R17 - 2500 " 1. "	R24 - 50000 " 1 "	R31 - 500000 A-1 "	
R 5 5000 " .25 "	R11 - 3 Meg .25 "	R18 - 25000 " 1 "	R25 - 50000 " 1 "	R32 & R33 - 500000 A-1 "	
R 6 5000 " .25 "	R12 - 50000 " .5 "	R19 - 50000 " 1 "	R26 - 50000 " 1 "	R34 & R35 - 3 Meg A-1 "	
R 7 5000 " .25 "	R13 - 350 " .1 "	R20 - 50000 " 1 "	R27 500000 " 1 "		
R 8 - 100000 " .25 "	R14 - 350 " 1. "	R21 - 50000 " 1 "	R28 500000 " 1 "		

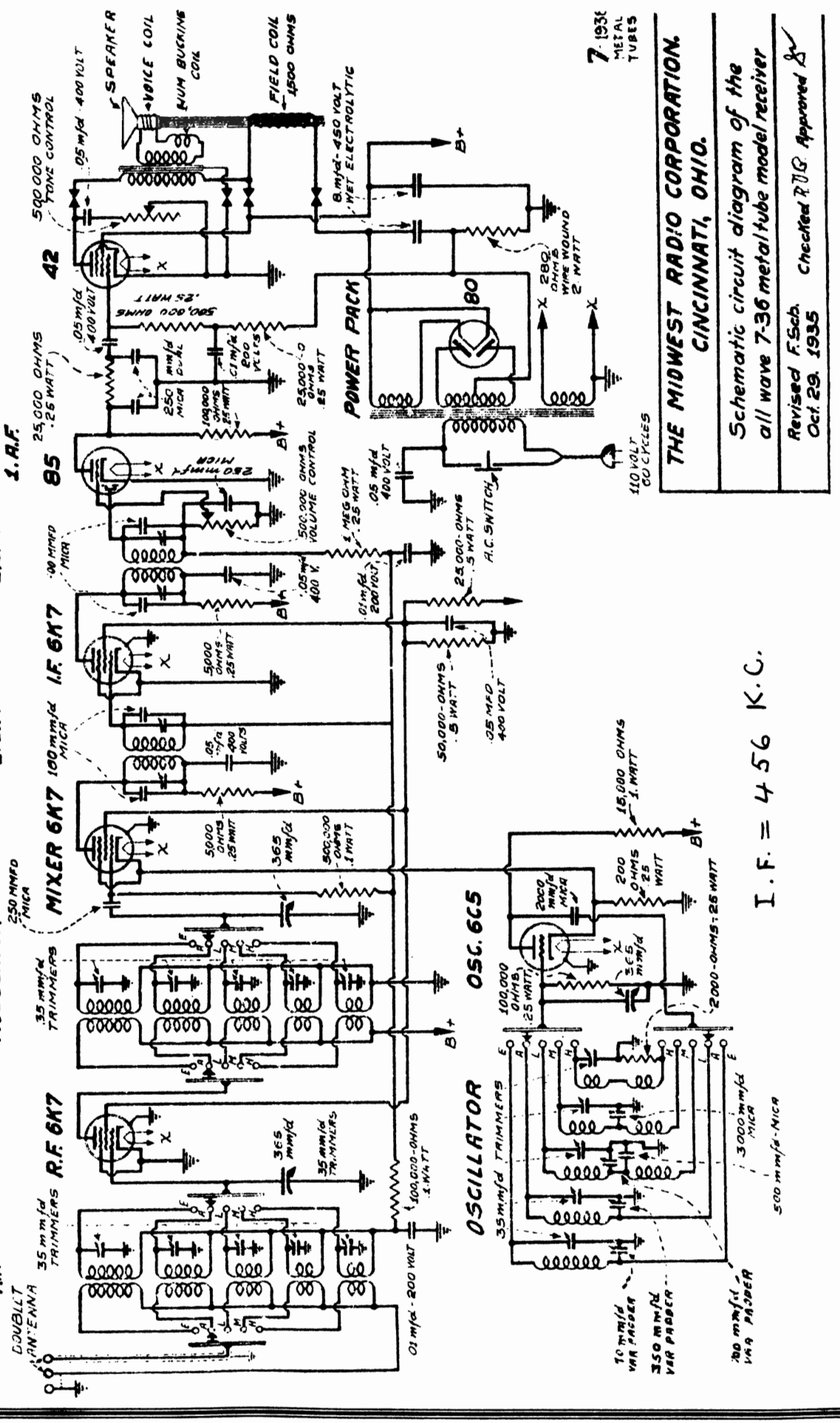


MIDWEST RADIO CORP.

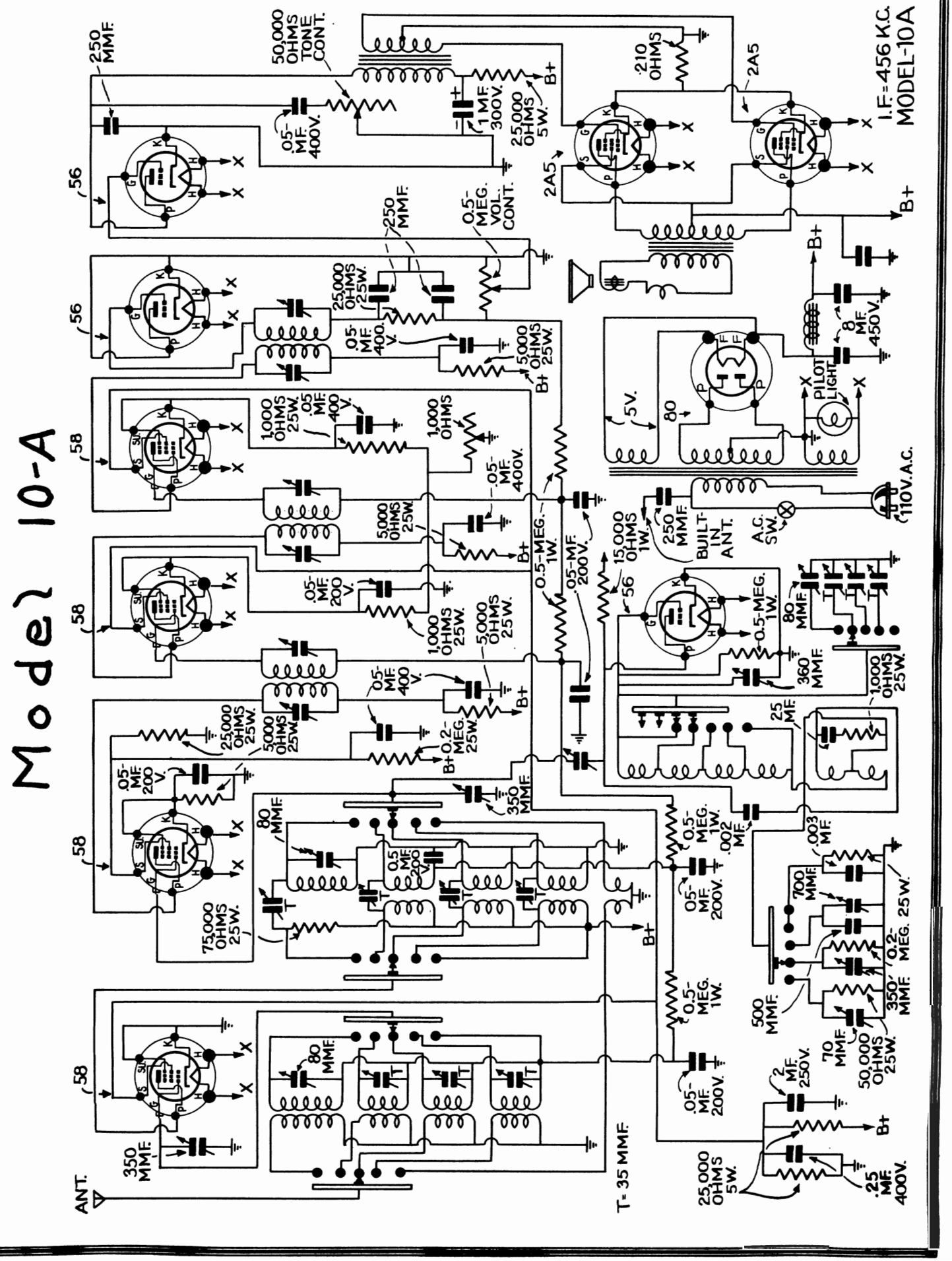
MIDWEST RADIO CORP.



MIDWEST RADIO CORP.



MIDWEST RADIO CORP.



Model 10-35

C 1 - 35	mmfd - TRIMMER	C16 - 35 mmfd	TRIMMER
C 2 - 35	" "	C17 - 35 "	"
C 3 - 35	" "	C18 - 365 "	TUNING COND.
C 4 - 35	" "	C19 - 05 mfd	200 VOLT
C 5 - 35	" "	C20 - 365 mmfd	TUNING COND.
C 6 - 365	" TUNING COND.	C21 - 01 mfd	200 V. H BAND
C 7 - 2	mfd - 150 VOLT	C22 - 3000 mmfd	MICA M "
C 8 - 35	mmfd - TRIMMER	C23 - 500 "	" L "
C 9 - 35	" "	C24 - 700 "	L "
C 10 - 35	" "	C25 - 400 "	A "
C 11 - 35	" "	C26 - 70 "	E "
C 12 - 35	" "	C27 - 01 mfd	200 VOLT
C 13 - 35	" "	C28 - 01 "	200 "
C 14 - 35	" "	C29 - 05 "	200 "
C 15 - 35	" "	C30 - 2000 mmfd	MICA

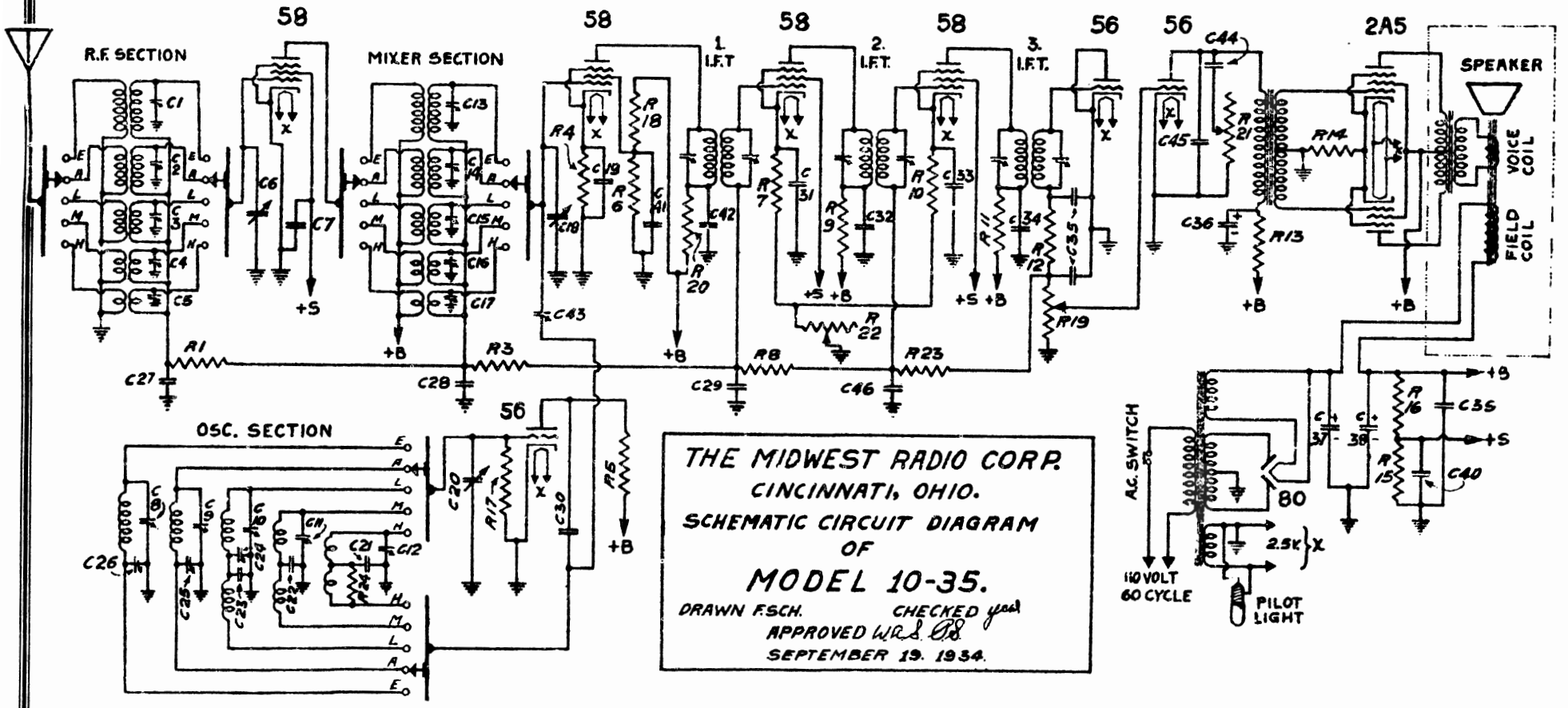
-PADDERS-

C31 - 05	mfd	200 VOLT	
C32 - 05	"	400 "	
C33 - 05	"	200 "	
C34 - 05	"	400 "	
C35 - 250	mmfd	MICA - DUAL	
C36 - 1	mfd	300 VOLT	
C37 - 8	"	450 V. ELECTRO=	
C38 - 16	"	450 V. LYTIC	
C39 - .25	"	400 VOLT	
C40 - .25	"	400 "	
C41 - 05	"	200 "	
C42 - 05	"	400 "	
C43 - 35	mmfd	COUPLER	
C44 - 05	mfd	400 VOLT	
C45 - 250	mmfd	MICA	
C46 - 05	mfd	200 VOLT	

R 1 - 100 000	Δ	.1	WATT
R 2 -			
R 3 - 100 000	Δ	.1	"
R 4 - 5 000	Δ	.25	"
R 5 - 15 000	Δ	1	"
R 6 - 25 000	Δ	.25	"
R 7 - 1 000	Δ	.25	"
R 8 - 500 000	Δ	.1	"
R 9 - 5 000	Δ	.25	"
R 10 - 1 000	Δ	.25	"
R 11 - 5 000	Δ	.25	"
R 12 - 25 000	Δ	.1	"
R 13 - 25 000	Δ	.5	"
R 14 - 210	Δ	2	" FLEXIBLE
R 15 - 25 000	Δ	.5	"

R 16 - 25 000	Δ	.5	WATT
R 17 - 100 000	Δ	.25	"
R 18 - 200 000	Δ	.25	"
R 19 - 500 000	Δ	VOLUME CONTROL	
R 20 - 5 000	Δ	.25	WATT
R 21 - 50 000	Δ	TONE CONTROL	
R 22 - 1 000	Δ	VARIABLE	
R 23 - 500 000	Δ	.1	WATT
R 24 - 1 000	Δ	.25	"

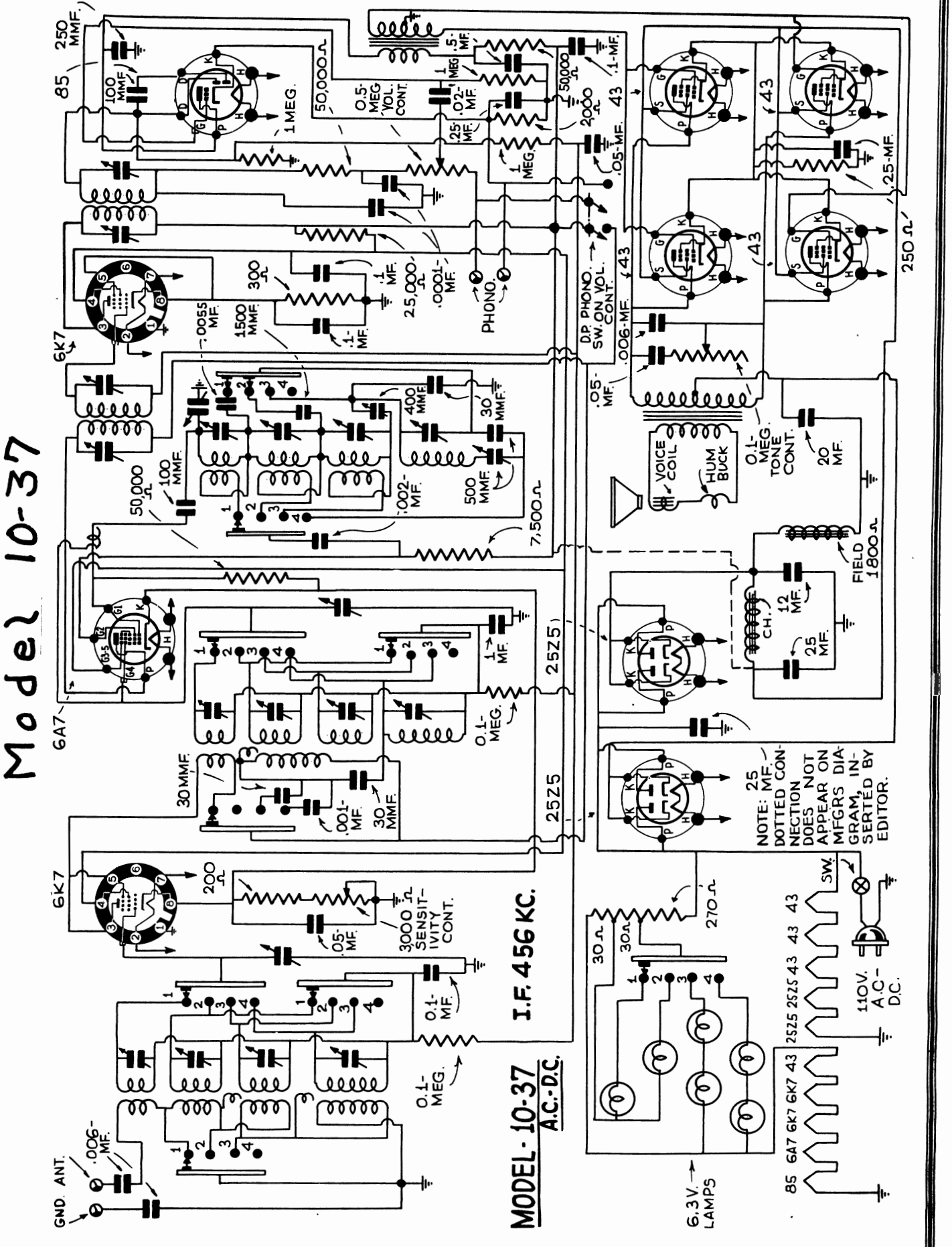
I.F. = 456 K.C.



THE MIDWEST RADIO CORP.
CINCINNATI, OHIO.
SCHEMATIC CIRCUIT DIAGRAM
OF
MODEL 10-35.
DRAWN F.SCH. CHECKED [illegible]
APPROVED W.R.S. GB
SEPTEMBER 19. 1934.

MIDWEST RADIO CORP.

MIDWEST RADIO CORP.



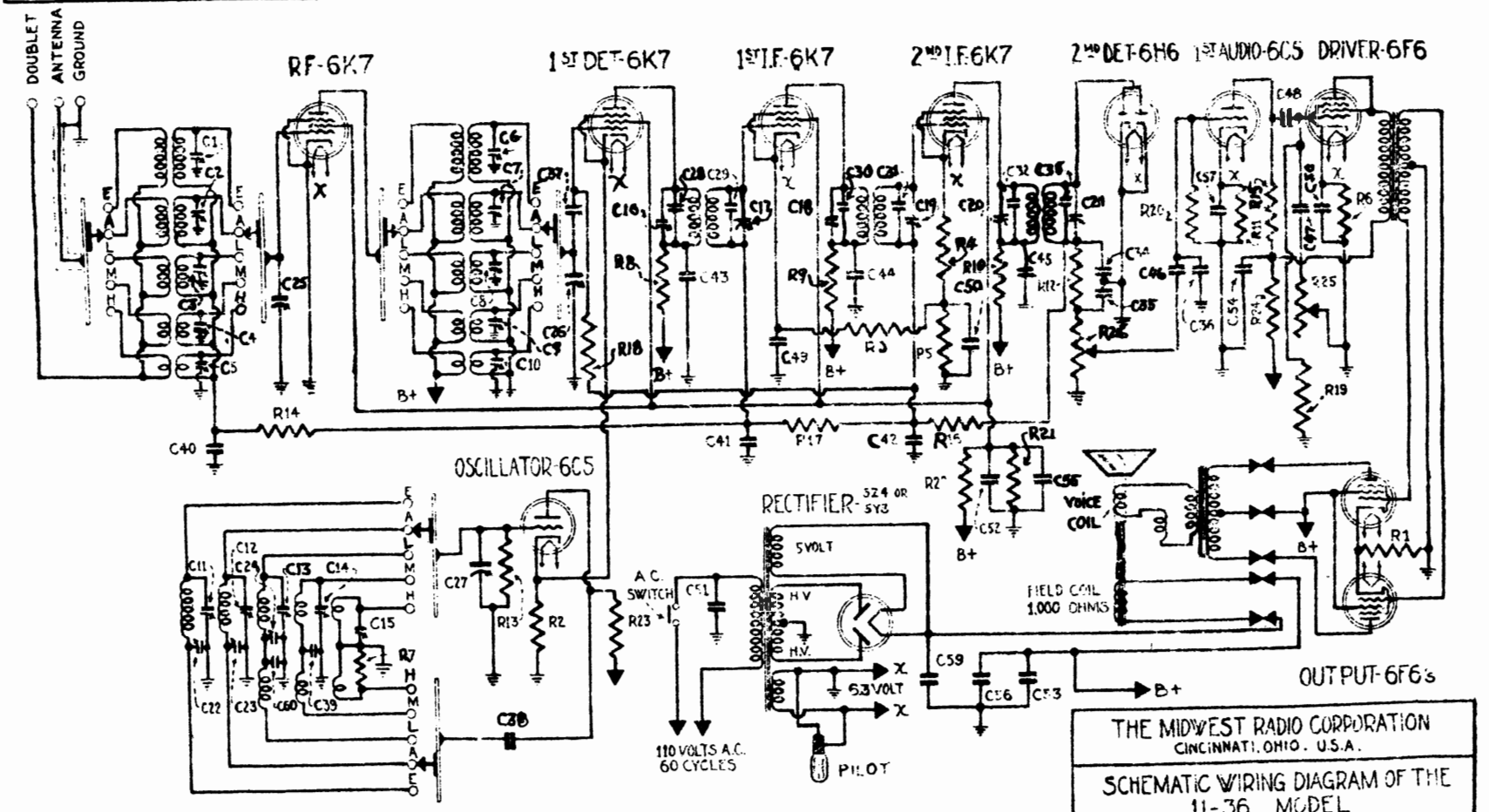
Model 1136

CONDENSERS

C 1-35 MMFD. TRIMMER	C15-35 MMFD. TRIMMER	C29-75 MMFD. MICA	C43-.05 MFD. 400 VOLT	C54-1 MFD. 250 VOLT DRY (ELECTROLYTIC)	C60-500 MMFD MICA
C 2-35 " "	C16- I.F. "	C30-75 " "	C44-.05 " 400 "	C55-2. " 150 " "	
C 3-35 " "	C17- " "	C31-75 " "	C45-.05 " 400 "	C56-8. " 450 " WET	
C 4-35 " "	C18- " "	C32-75 " "	C46-.05 " 200 "	C57-12. " 25 " DRY	
C 5-35 " "	C19- " "	C33-75 " "	C47-.05 " 200 "	C58-12. " 25 "	
C 6-35 " "	C20- " "	C34-100 " "	C48-.05 " 400 "	C59-16. " 450 " WET	
C 7-35 " "	C21- " "	C35-100 " "	C49-.05 " 200 "		
C 8-35 " "	C22-70 MMFD PADDER	C36-100 " "	C50-.05 " 200 "		
C 9-35 " "	C23-350 " "	C37-250 " "	C51-.05 " 200 "		
C10-35 " "	C24-700 " "	C38-2000 " "	C52-.25 " 400 "		
C11-35 " "	C25-365 MMFD (TUNING CONDENSOR)	C39-3000 " "	C53-.25 " 400 "		
C12-35 " "	C26-365 "	C40-.01 MFD. 200 VOLT			
C13-35 " "	C27-365 "	C41-.05 " 200 "			
C14-35 " "	C28-75 MMFD. MICA	C42-.05 " 200 "			

RESISTORS

R 1-350 OHMS-2 WATT-FLEX.	R15-100,000 OHMS .25 WATT
R 2-500 " .25 "	R16-500,000 " .25 "
R 3-1,000 " .25 "	R17-500,000 " .25 "
R 4-1,000 " .25 "	R18-300,000 " .25 "
R 5-1,000 " .25 "	R19-500,000 " .25 "
R 6-1,000 " .25 "	R20-3 MEGOHM .25 "
R 7-2,000 " .25 "	R21-31,000 OHMS .5 "
R 8-5,000 " .25 "	R22-50,000 " .5 "
R 9-5,000 " .25 "	R23-15,000 " 1. "
R10-5,000 " .25 "	R24-15,000 " 1. "
R11-5,000 " .25 "	R25-50,000 OHM TONE CONTROL
R12-25,000 " .25 "	R26-500,000 " VOLUME "
R13-100,000 " .25 "	
R14-100,000 " .25 "	



I.F. = 456 K.C.

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

SCHEMATIC WIRING DIAGRAM OF THE 11-36 MODEL

DRAWN: HAD. CHECKED: [illegible] APPROVED: [illegible] 10-12-35.

MIDWEST RADIO CORP.

Model 14-37

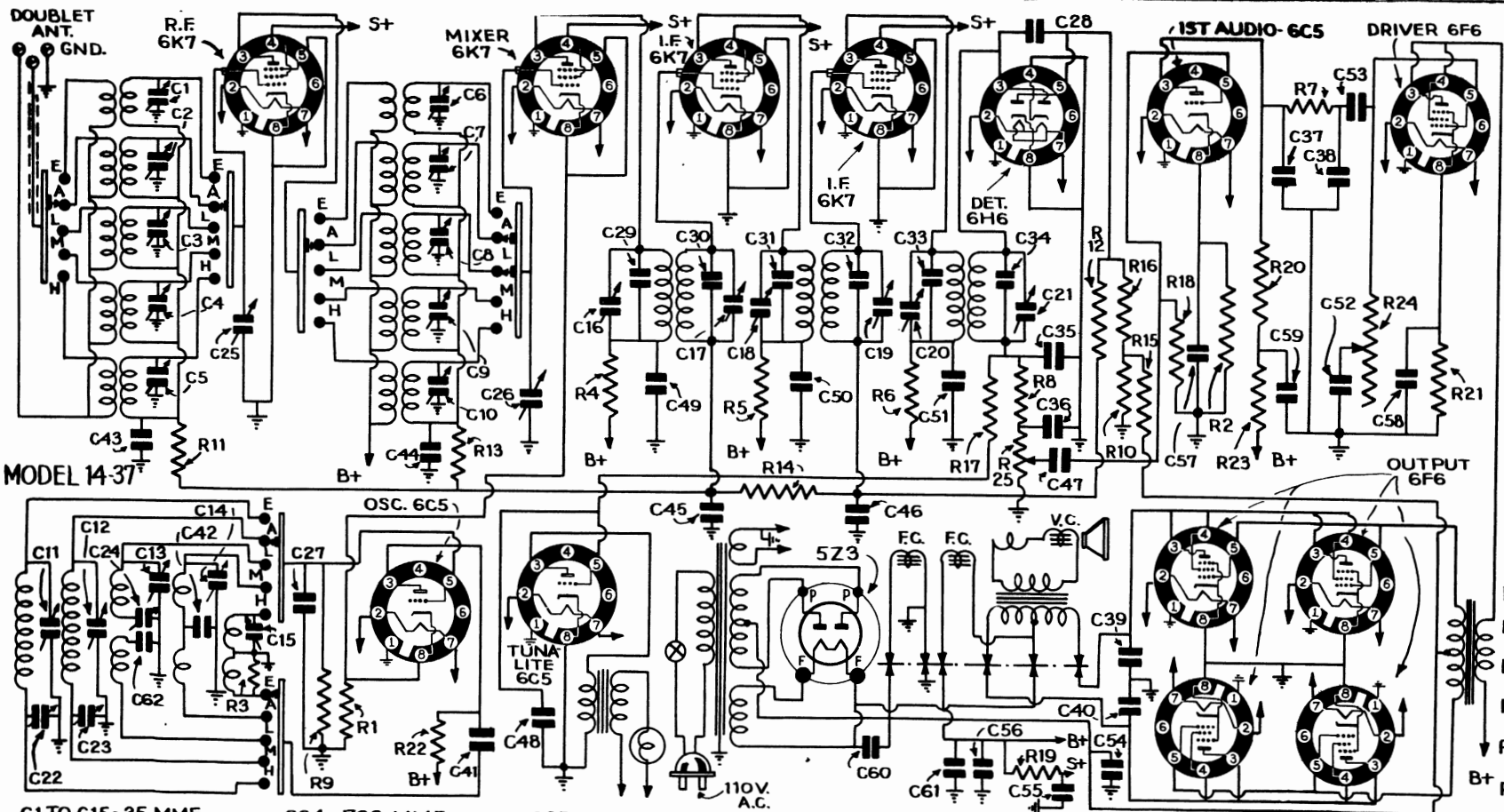
CONDENSERS

C1	35 MMFD. TRIMMER	C14	35 MMFD TRIMMERS	C27	365 MMFD. TUNING COND.	C40	250 MMFD. MICA	C53	.25 MFD 400 VOLT
C2	" "	C15	" "	C28	50 MMFD MICA	C41	2000 " "	C54	" " " "
C3	" "	C16	I. F.	C29	75 " "	C42	3000 " "	C55	" " " "
C4	" "	C17	" "	C30	" " "	C43	.05 MFD 200 VOLT	C56	" " " "
C5	" "	C18	" "	C31	" " "	C44	" " " "	C57	25 MFD. 25 VOLT DRY
C6	" "	C19	" "	C32	" " "	C45	" " " "	C58	" " " "
C7	" "	C20	" "	C33	" " "	C46	" " " "	C59	1. 300 "
C8	" "	C21	" "	C34	" " "	C47	" " " "	C60	16. 450 WET
C9	" "	C22	70 MMFD PADDER	C35	100 " "	C48	" " " "	C61	20. " "
C10	" "	C23	350 "	C36	" " "	C49	" " 400 "	C62	750 MMFD MICA
C11	" "	C24	700 "	C37	250 " "	C50	" " " "		
C12	" "	C25	365 MMFD TUNING COND	C38	" " "	C51	" " " "		
C13	" "	C26	" " "	C39	" " "	C52	" " " "		

ELECTROLYTIC CONDENSERS

RESISTORS

R1	500 OHMS	25 WATT	R14	500,000 OHMS	.25 WATT
R2	1,500 "	"	R15	1 MEGOHM	"
R3	2,000 "	"	R16	" "	"
R4	5,000 "	"	R17	3 "	"
R5	" "	"	R18	" "	"
R6	" "	"	R19	50,000 OHMS	.5 "
R7	10,000 "	"	R20	" "	"
R8	25,000 "	"	R21	2,500 "	1. "
R9	100,000 "	"	R22	15,000 "	"
R10	" "	"	R23		
R11	200,000 "	"	R24	500,000 OHM TONE CONTROL	
R12	500,000 "	"	R25	" VOLUME	"
R13					



C1 TO C15 = 35 MMF.
C16 TO C21 = I.F. TRIMMER
C22 = 70 MMF.
C23 = 350 MMF.

C24 = 700 MMF.
C25 TO C27 = 365 MMF.
C28 = 50 MMF.
C29 TO C34 = 75 MMF.

C35 & C36 = 100 MMF.
C37 TO C40 = 250 MMF.
C41 = .002 MF.
C42 = .003 MF.

C43 TO C48 = .05 MF. 200 V.
C49 TO C52 = .05 MF. 400 V.
C53 TO C56 = .25 MF. 400 V.
C57 & C58 = .25 MF. 25 V.

C59 = .1 MF. 300 V.
C60 = 16 MF. 450 V.
C61 = 20 MF. 450 V.
C62 = 750 MMF.

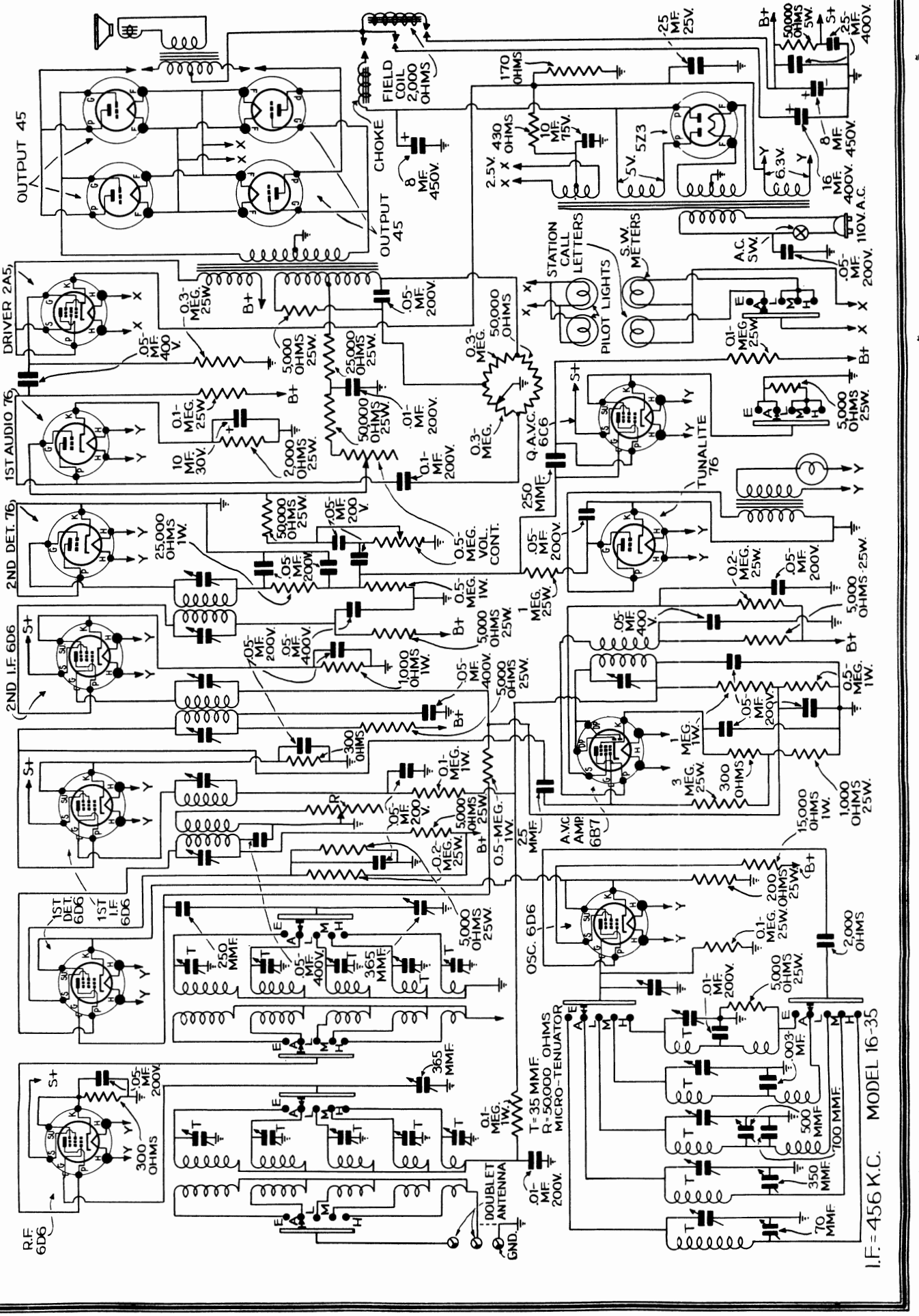
R24 = 0.5 MEG VOLUME CONT.

I.F. = 456 K.C.

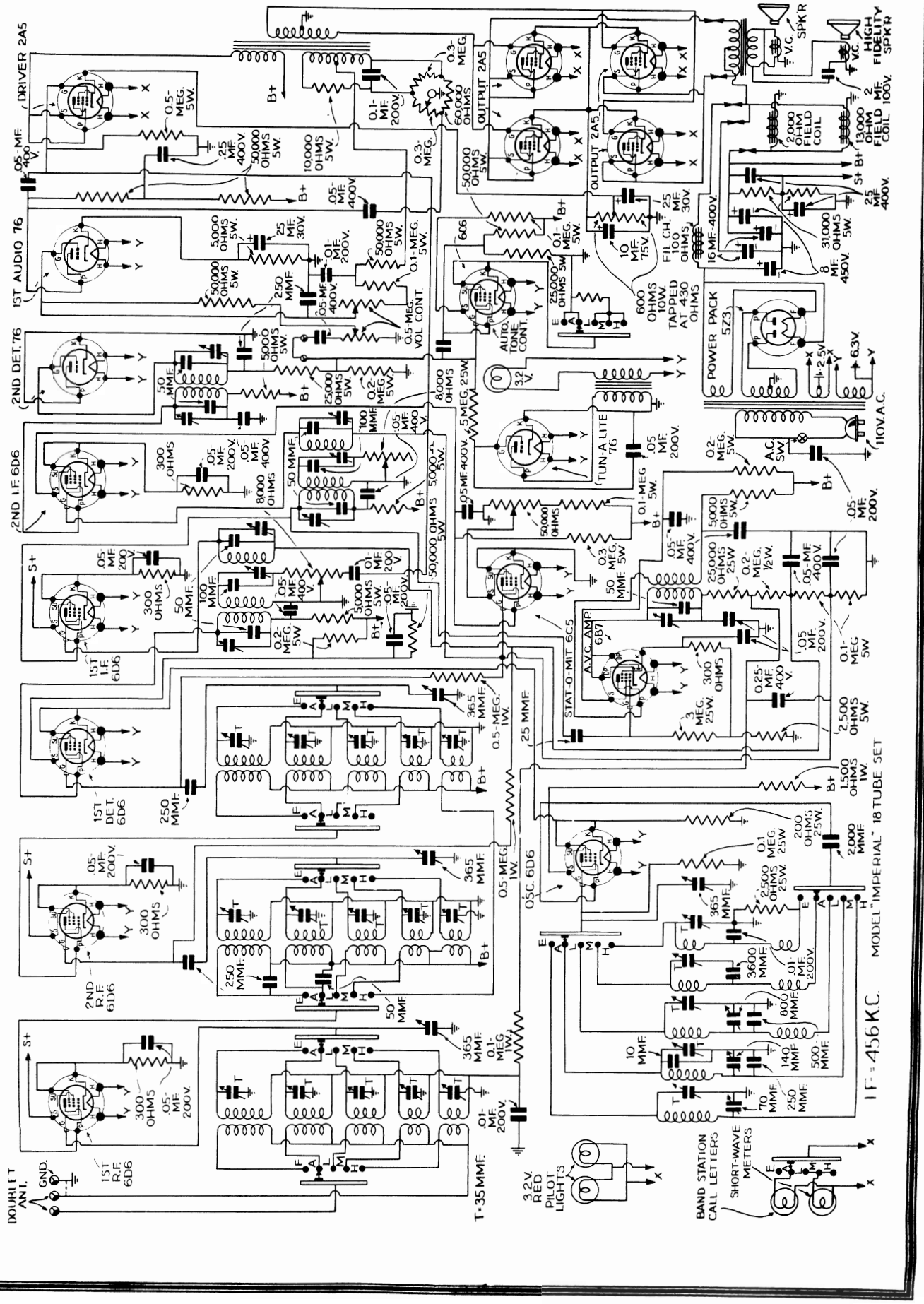
R1 = 500 OHMS 25 W.
R2 = 1,500 OHMS 25 W.
R3 = 2,000 OHMS 25 W.
R4 TO R6 = 5,000 OHMS 25 W
R7 = 10,000 OHMS 25 W.
R8 = 25,000 OHMS 25 W
R9 = 0.1-MEG. 25 W.
R10 = 0.1-MEG. 25 W.
R11 = 0.2-MEG. 25 W.
R12 = 0.5-MEG 25 W.
R13 = 0.5-MEG. 25 W.
R14 = 0.5-MEG. 25 W.
R15 = 1 MEG. 25 W.
R16 = 1 MEG. 25 W.
R17 = 3 MEG. 25 W.
R18 = 3 MEG. 25 W.
R19 = 50,000 OHMS 5 W.
R20 = 50,000 OHMS 5 W.
R21 = 2,500 OHMS 1 W
R22 = 15,000 OHMS 1 W.
R23 = 15,000 OHMS 1 W.
R24 = 0.5 MEG. TONE CONT.

MIDWEST RADIO CORP.

MIDWEST RADIO CORP.

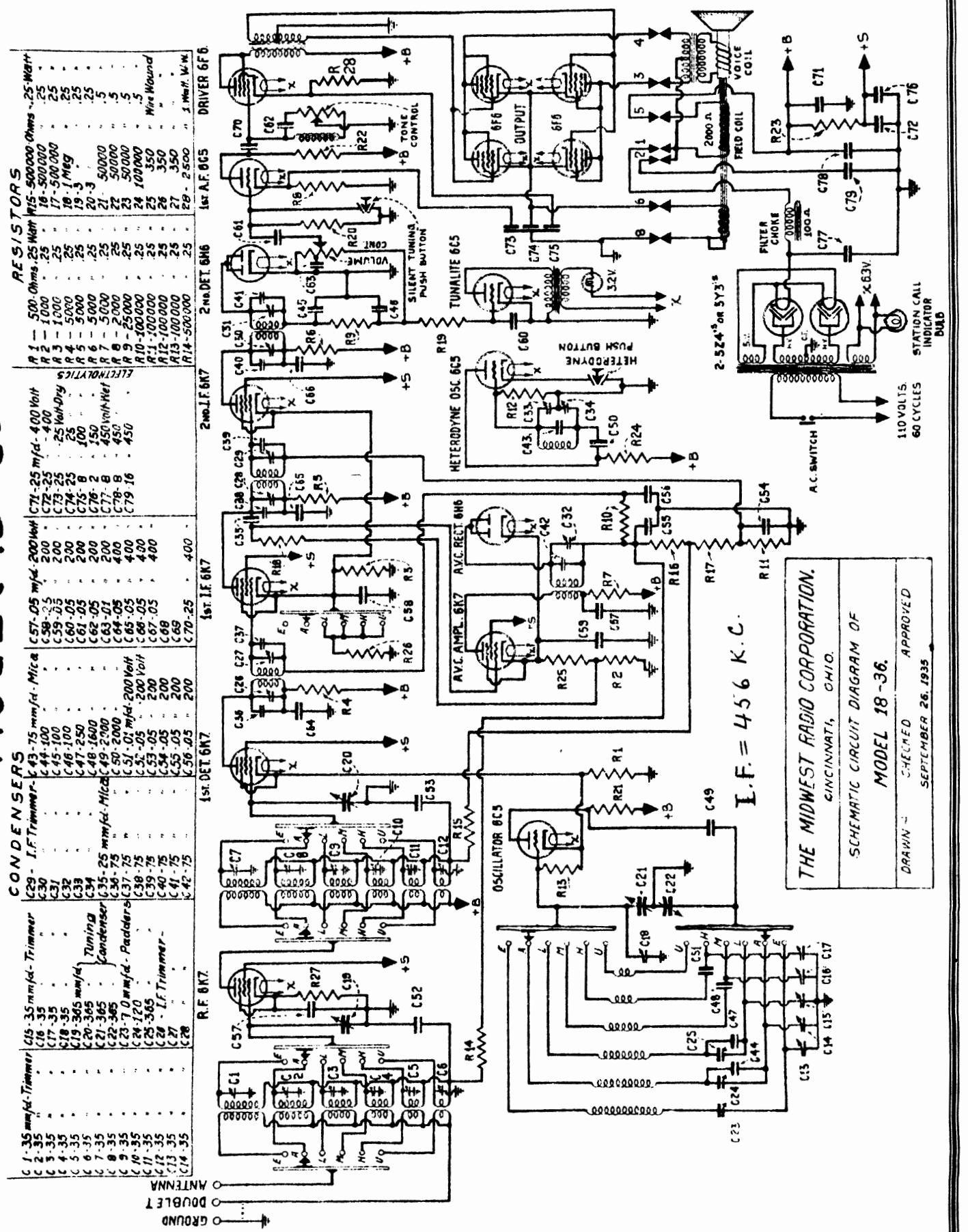


MIDWEST RADIO CORP.

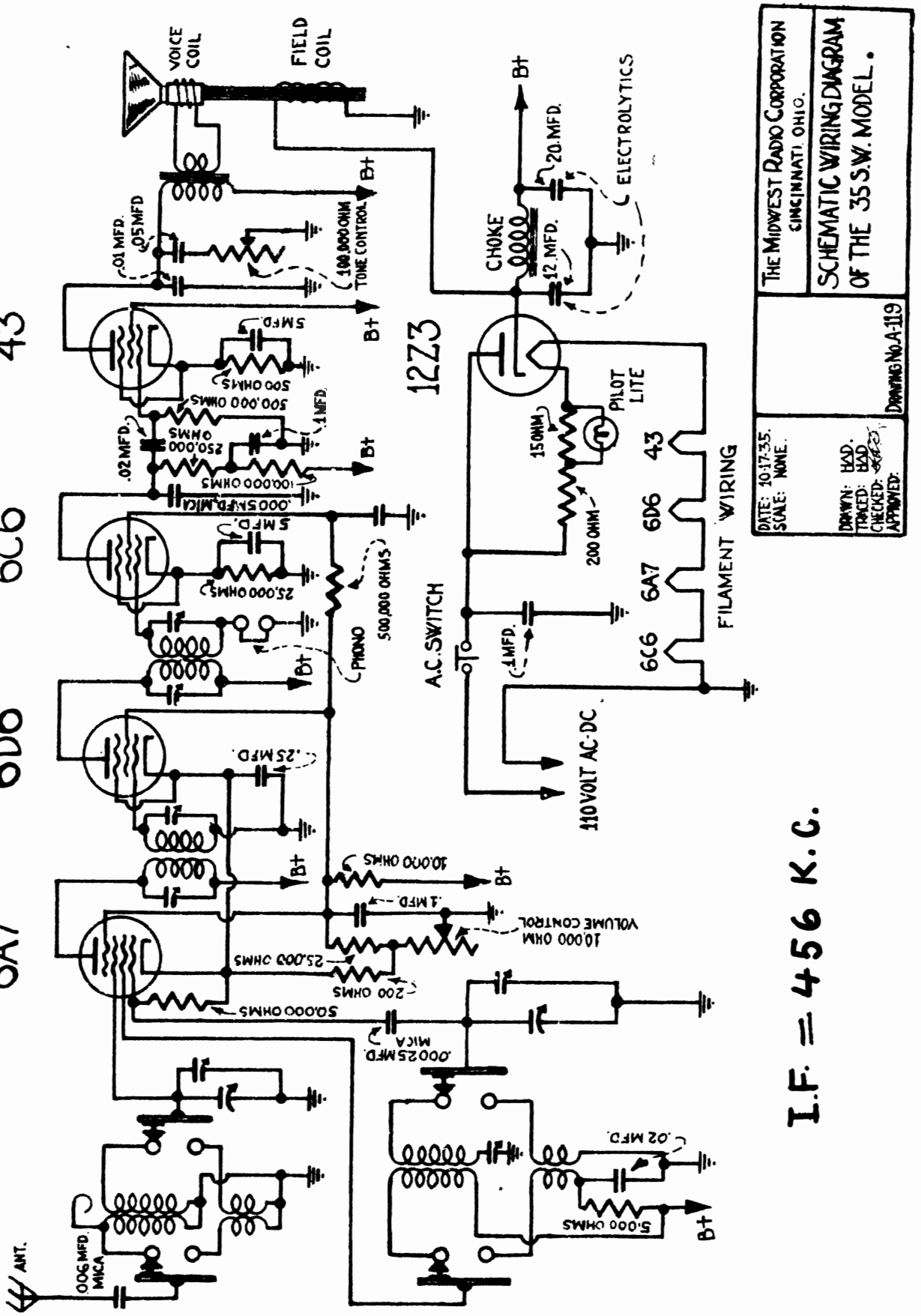


MIDWEST RADIO CORP.

Model 18-36



MIDWEST RADIO CORP.



MIDWEST RADIO CORP.

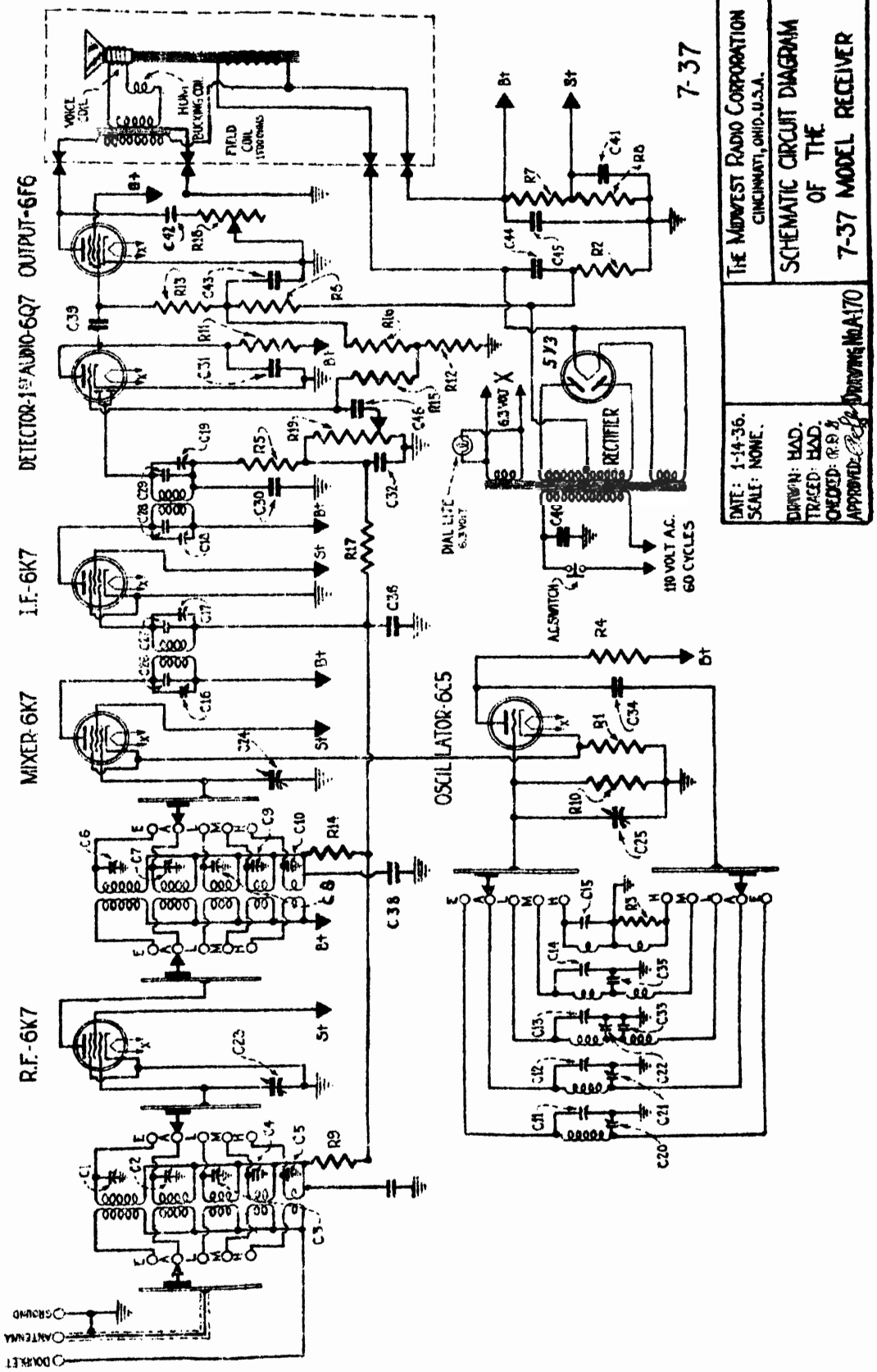
MODEL 7-37

CONDENSERS

C1	35 MMFD.	TRIMMER	C13	35 MMFD.	TRIMMER	C25	365 MMFD. TUNING COND.
C2	"	"	C14	"	"	C26	100 MMFD. MICA
C3	"	"	C15	"	"	C27	" " "
C4	"	"	C16	I.F	"	C28	" " "
C5	"	"	C17	"	"	C29	" " "
C6	"	"	C18	"	"	C30	" " "
C7	"	"	C19	"	"	C31	250 " "
C8	"	"	C20	70 MMFD.	PADDER	C32	" " "
C9	"	"	C21	350 "	"	C33	500 " "
C10	"	"	C22	700 "	"	C34	2000 " "
C11	"	"	C23	365 MMFD.	TUNING COND.	C35	3000 " "
C12	"	"	C24	"	"	C36	.01 MFD. 200 VOLT

C37	.05 MFD.	200 VOLT	R1	200 OHMS	.25 WATT
C38	"	" "	R2	280 "	FLEX. .2 WATT
C39	"	" "	R3	2000 "	.25 WATT
C40	"	" "	R4	15,000 "	1. "
C41	"	400 VOLT	R5	25,000 "	.1 "
C42	"	" "	R6	"	.25 "
C43	.1 MFD.	200 VOLT	R7	31,000 "	.5 "
C44	8 MFD.	450 VOLT WET ELECTROLYTIC	R8	50,000 "	.25 "
C45	"	" "	R9	100,000 "	" "
C46	.05 MFD.	400 VOLT	R10	"	" "
			R11	"	" "
			R12	"	" "

R13	300,000 OHMS	.25 WATT	
R14	500,000 "	" "	
R15	"	" "	
R16	"	" "	
R17	1 MEGOHM	.1 WATT	
R18	SELECTOHM TONE CONTROL		
R19	500,000 OHM VOLUME	"	



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

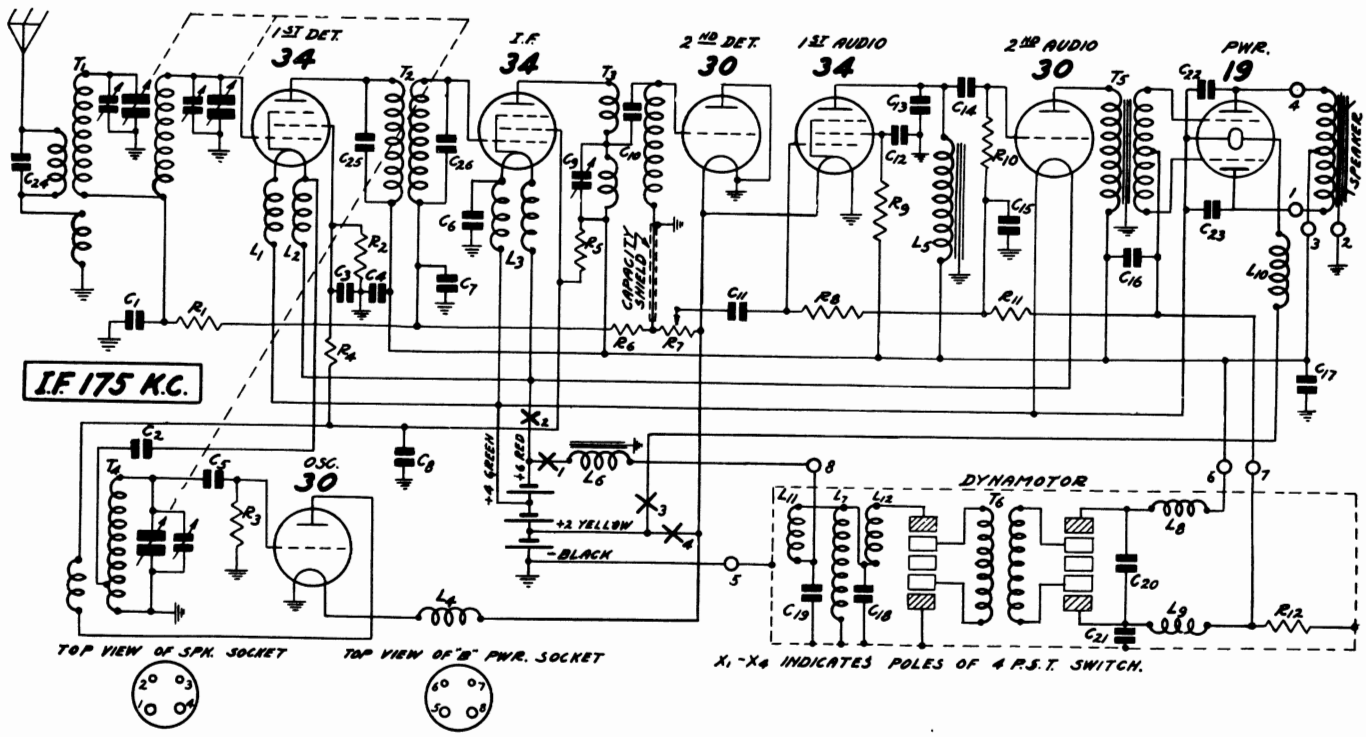
SCHEMATIC CIRCUIT DIAGRAM OF THE 7-37 MODEL RECEIVER

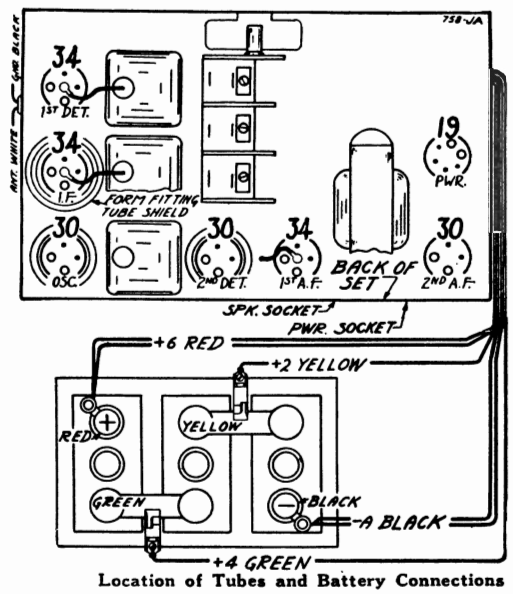
DATE: 1-14-36.
SCALE: NONE.
DRAWN: HAD.
TRACED: HAD.
CHECKED: R.B.S.
APPROVED: Ralph Burns
DRAWING NO. A170

MONTGOMERY WARD & CO.

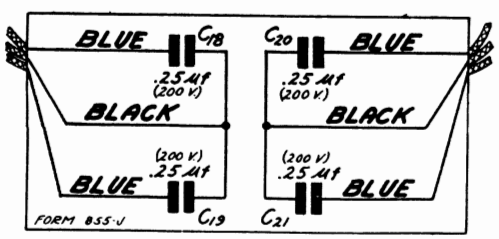
For 7 Tube, 6 Volt "B" Batteryless Receiver

Model 62-114
" 62-116





Location of Tubes and Battery Connections



Four Section Condenser in Power Unit Box

Voltages

Check the voltages at the sockets to see if correct voltages are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together.

Voltages at Sockets

ANTENNA SHORTED TO GROUND

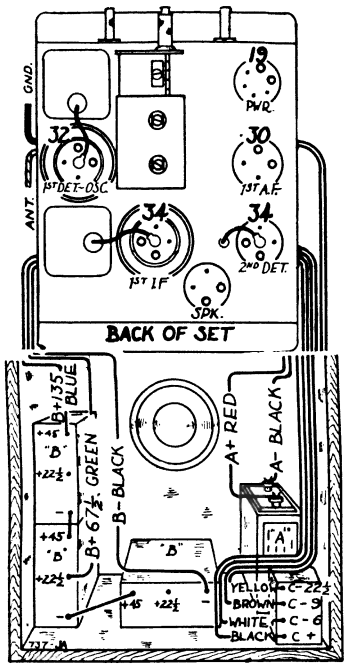
Type of Tube	Function	Filament Volt.	Plate to Neg. Filament	Screen to Neg. Filament	Grid to Neg. Filament	Normal Plate M. A.
34	1st Detector	2.0	135	55	3.0 av.	1.90
30	Oscillator	2.0	75		0.0	3.70
34	I. F.	2.0	135	70	3.0 av.	3.00
30	2nd Detector	2.0	2			
34	1st A. F.	2.0	140	65	4.0	2.30
30	2nd A. F.	2.0	135		8.0	3.10
19	Output	2.0	137		6.0	1.00 per plate

All of the D.C. voltage readings as shown on the chart are read with a 1000 ohm per volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

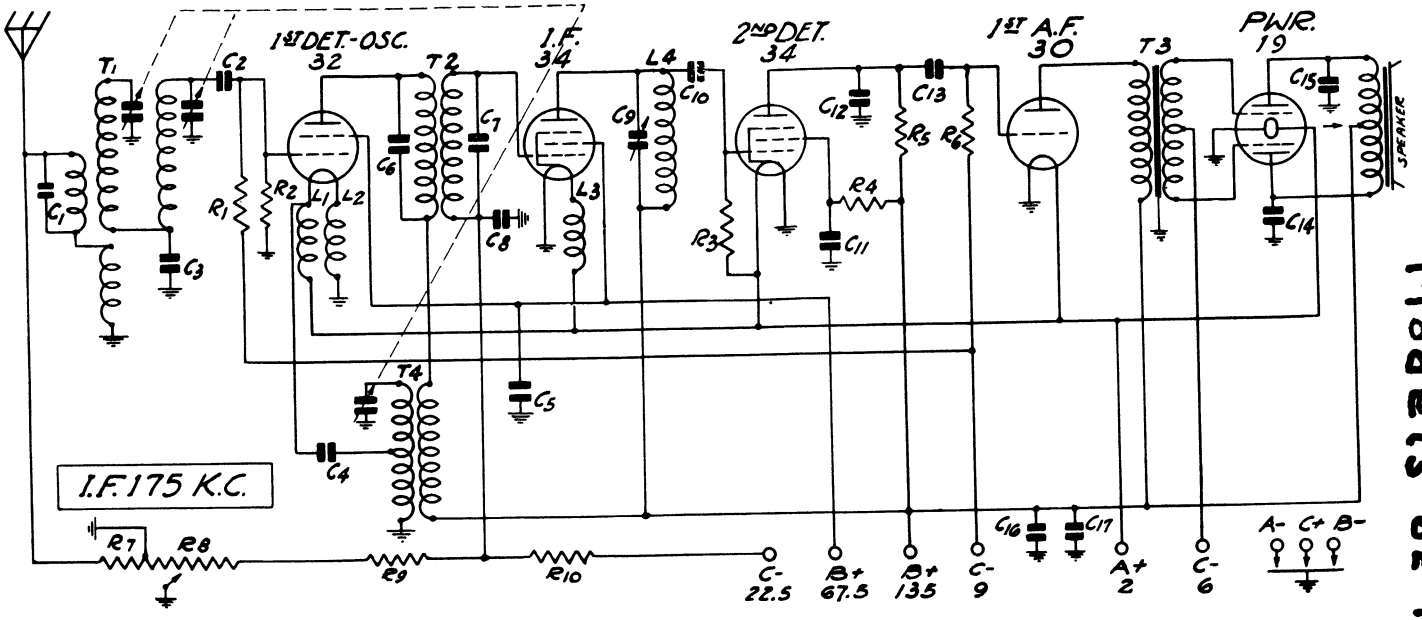
The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers and variations in tube characteristics. All voltages in the chart are taken with a battery voltage of 6. Differences in line voltage as well as differences in test equipment used will introduce other variations in the voltage readings.

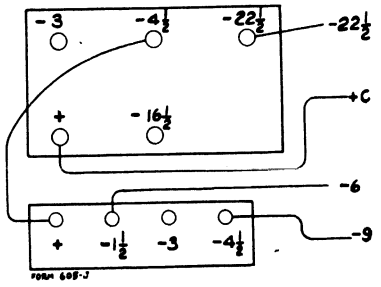
MONTGOMERY WARD & CO.

Models 62-120-122-126-128



Tube Arrangement and Battery Connections.





Optional "C" Battery Connections

D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5168	Double Tuned Ant. Coil Pri.	T1	19.2
	Double Tuned Ant. Coil Sec. (Preselector)	T1	3.2
	Double Tuned Ant. Coil Sec. (1st Det.)	T1	3.2
P-5199	1st I.F. Coil Pri.	T2	90.0
	1st I.F. Coil Sec.	T2	116.0
P-50586-D	Audio Input Trans. Pri.	T3	1010.
	Audio Input Trans. Sec. Cent. Tap to outside end	T3	648.
	Audio Input Trans. Sec. Cent. Tap to inside end	T3	588.
P-5187	Oscillator Coil, Grid Winding	T4	4.1
	Oscillator Coil, Plate Winding	T4	10.4
P-5172	Double Filament Reactor Assem.	L1	.61
	Double Filament Reactor Assem.	L2	.61
P-5189	Single Filament Reactor Assem.	L3	.61
P-5188	2nd I.F. Reactor Coil	L4	52.1
P-2124	6" Magnetic Speaker, Center Tap to outside end		272.
	6" Magnetic Speaker, Center Tap to inside end		225.
P-2125	8" Magnetic Speaker (same as P-2124)		

Tubes

The tubes used in this receiver are all of the 2 volt series. The 32 is a screen grid tube while the 34's are R. F. Pentodes with the suppressor grid tied internally to the cathode. The 30 tube is a general purpose triode. The 19 tube consists of two class "B" output tubes in one envelope. All of these tubes are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.1 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.**

VOLTAGES AT SOCKETS

Volume Control at Maximum—Antenna Shorted to Ground

B+135 Volts

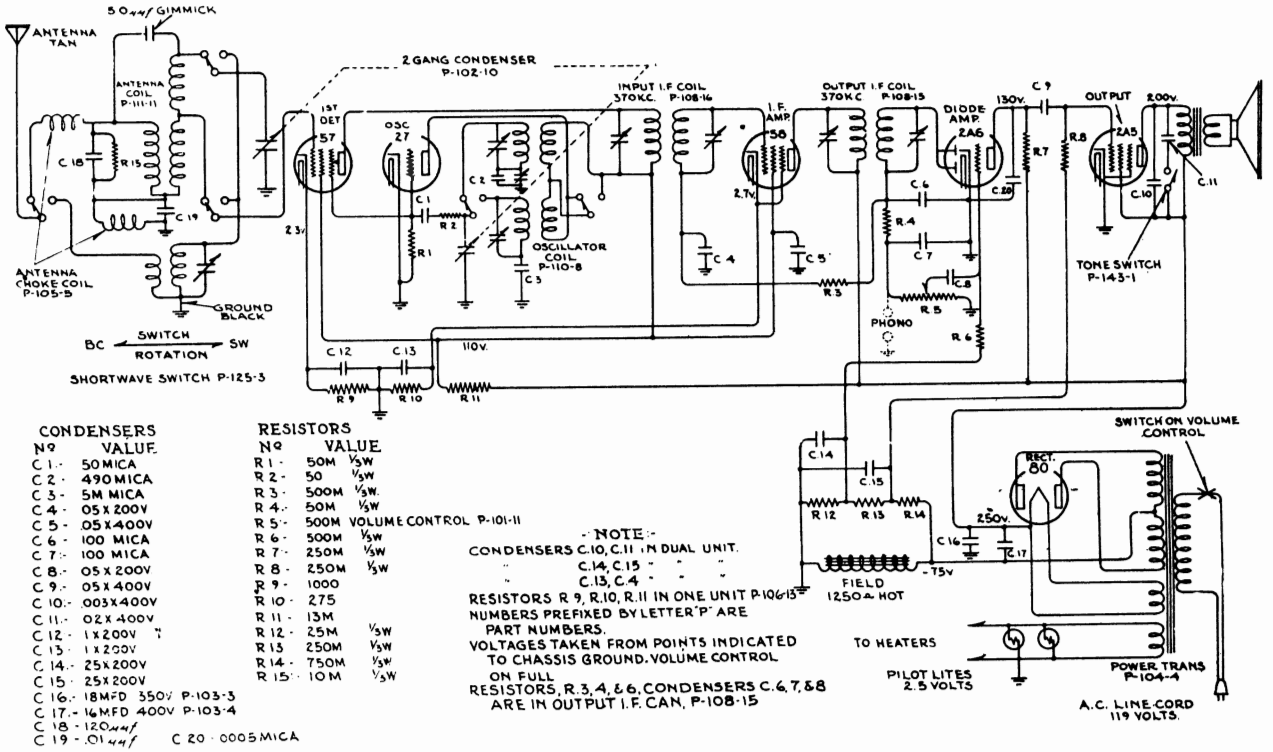
Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Cath.	Screen to Cath.	Grid to Cath.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5(1)(2)	2.5
34	I. F.	2.0	135	67.5	2.5(3)	2.8
34	2nd Det.	2.0	50	40(1)	0	1.8
30	1st Audio	2.0	135		9(4)	3.0
19	Output	2.0	135		6	1.8 Total

MONTGOMERY WARD & CO.

60 Cycle Chassis No. 62-135, No. 62-150 and 62-154

25 Cycle Chassis No. 62-135-X, No. 62-150-X and 62-154-X



CONDENSERS		RESISTORS		
No	VALUE	No	VALUE	
C 1 -	50 MICA	R 1 -	50M	1/3W
C 2 -	490 MICA	R 2 -	50	1/3W
C 3 -	5M MICA	R 3 -	500M	1/3W.
C 4 -	05 X 200V	R 4 -	50M	1/3W
C 5 -	05 X 400V	R 5 -	500M	VOLUME CONTROL P-101-11
C 6 -	100 MICA	R 6 -	500M	1/3W
C 7 -	100 MICA	R 7 -	250M	1/3W
C 8 -	05 X 200V	R 8 -	250M	1/3W
C 9 -	05 X 400V	R 9 -	1000	
C 10 -	003 X 400V	R 10 -	275	
C 11 -	02 X 400V	R 11 -	13M	
C 12 -	1 X 200V	R 12 -	25M	1/3W
C 13 -	1 X 200V	R 13 -	250M	1/3W
C 14 -	25 X 200V	R 14 -	750M	1/3W
C 15 -	25 X 200V	R 15 -	10M	1/3W
C 16 -	18 MFD 350V P-103-3			
C 17 -	16 MFD 400V P-103-4			
C 18 -	120 μμf			
C 19 -	.01 μf	C 20 - .0005 MICA		

NOTE:-
CONDENSERS C.10, C.11 IN DUAL UNIT.
" C.14, C.15 " " "
" C.13, C.4 " " "
RESISTORS R.9, R.10, R.11 IN ONE UNIT P-106-15
NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL
RESISTORS, R.3, 4, & 6, CONDENSERS C.6, 7, & 8 ARE IN OUTPUT I.F. CAN, P-108-15

Service Notes

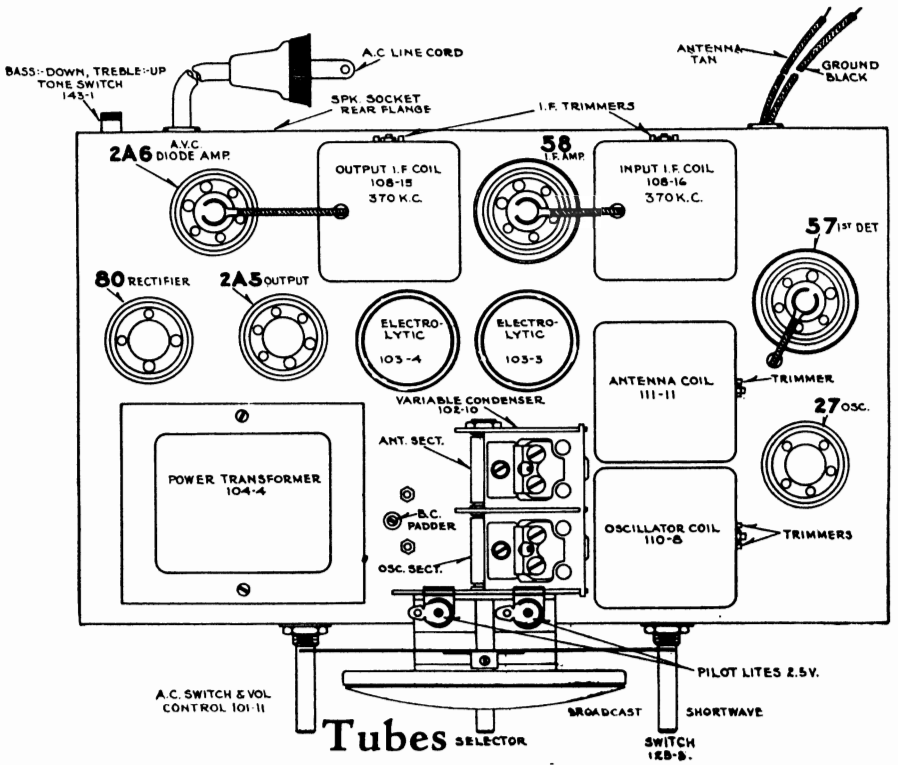
Voltages taken from different points of circuit to chassis are measured with volume control full on, right turn, with a voltmeter having a resistance of 1000 ohms per volt. These voltages are indicated on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of similar capacity, which is known to be in good condition, until the defective unit is located.

Excessive hum, low volume, stuttering and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser.

Open by-pass condensers frequently cause oscillation and distorted reproduction.

Should the planetary type vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked, broken or weak compression spring. This drive may be dis-assembled by removing the two screws which fasten it to the dial bracket. The part number of the compression spring is BE112-31. All of the other dial parts are hardened and should cause no trouble.



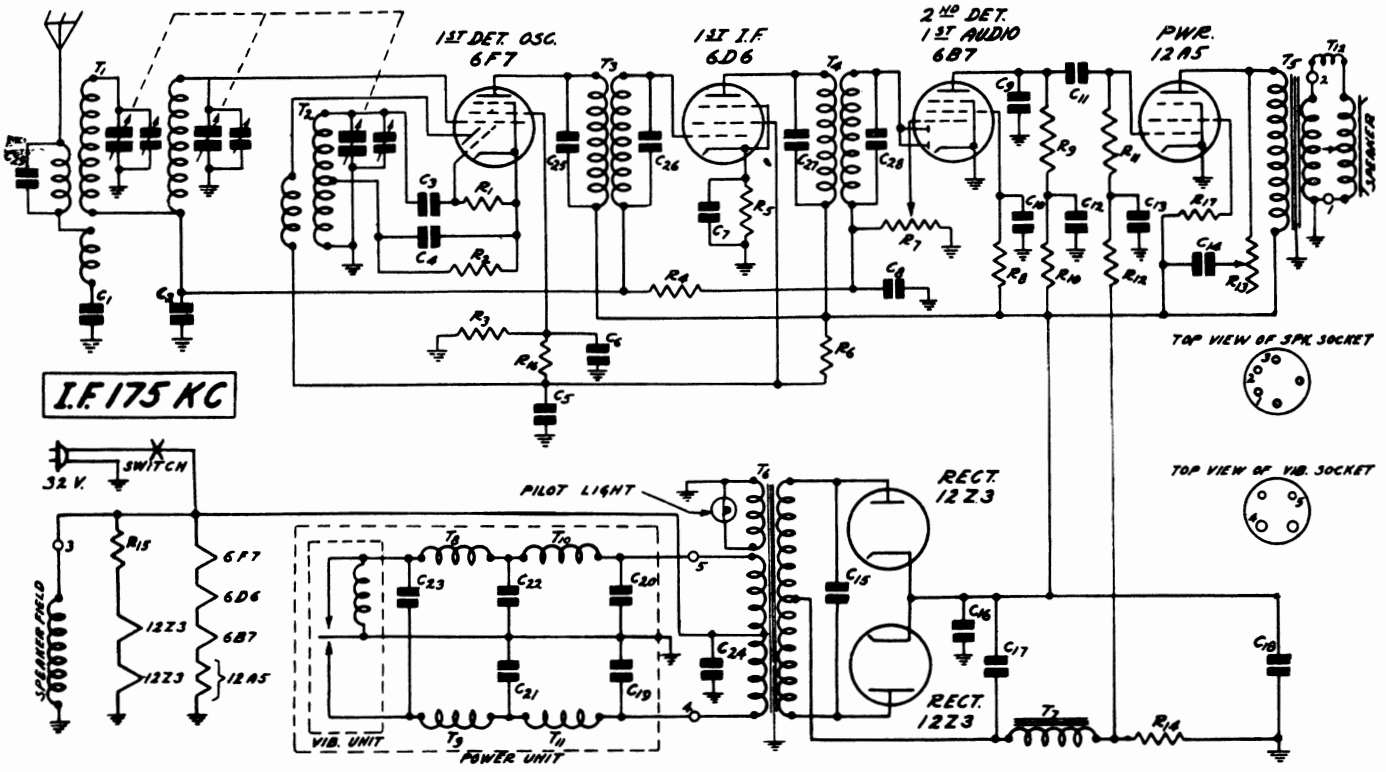
Tubes

The tube complement of this chassis is as follows:

1 Type 27 —triode oscillator.
1 Type 57 —pentode first detector.
1 Type 58 —remote cut-off pentode as an intermediate frequency amplifier (370 k.c.)
1 Type 2A6 —duplex diode triode as diode detector, A.V.C. and A.F.
1 Type 2A5 —pentode output tube.
1 Type 80 —high vacuum rectifier.

MONTGOMERY WARD & CO.

Model 62-136
" 62-138



The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown in the circuit.

Voltages

Check the voltages at the sockets to see if correct voltages are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together.

All of the D.C. voltage readings as shown on the chart are read with a 1000 ohm per volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets, but will vary slightly with variations in individual receivers and variations in tube characteristics. All voltages in the chart are taken with a line voltage of 32. Differences in line voltage as well as differences in test equipment used will introduce other variations in the voltage readings.

VOLTAGES AT SOCKETS

Input 32 Volts—Antenna Shorted to Ground

Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6F7	1st Det. & Osc.	6.3	167(1)	90	2.6	7.0(1)
			117(2)		0	2.8(2)
6D6	I. F.	6.3	172	120	3.2	8.2
6B7	2nd Det.	6.3	25	25	7.25	2.0
12A5	Output	12.6	180	180	25	32
12Z3	Rectifier	12.6	225			25

(1) Pentode Section of Tube

(2) Triode Section of Tube

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-80862	C1	.05 Mf.	200V	Tubular	$ .08
P-80862	C2	.05 Mf.	200V	"	.08
P-81801	C3	35 Mmf.		Wire Capacitor Part of Osc. Assem.	.08
P-80862	C4	.05 Mf.	200V	Tubular	.08
P-80888	C5	.25 Mf.	200V	"	.12
P-81049	C6	.05 Mf.	200V	"	.20
	C7	.05 Mf.	200V	"	
P-81811	C8	100 Mmf.		Wire Capacitor	.08
P-81051	C9	.002 Mf.	600V	Tubular	.08
P-80888	C10	.25 Mf.	200V	"	.12
P-80872	C11	.01 Mf.	600V	"	.12
P-80888	C12	.25 Mf.	200V	"	.12
P-81062	C13	.01 Mf.	140V	"	.12
P-81055	C14	.05 Mf.	400V	"	.12
P-81052	C15	.015 Mf.	1600V	"	.18
P-80887	C16	.10 Mf.	400V	"	.10
P-81016	C17	8.0 Mf.	300V	Electrolytic Block	1.10
	C18	8.0 Mf.	300V		
P-80993	C24	.5 Mf.	140V	Tubular	.18
P-81806	C25	70 Mmf.		Wire Capac. Part of 1st I. F. Assem.	.08
P-81804	C26	45 Mmf.		Wire Capac. Part of 1st I. F. Assem.	.08
P-81808	C27	90 Mmf.		Wire Capac. Part of 2nd I. F. Assem.	.08
P-81810	C28	100 Mmf.		Wire Capac. Part of 2nd I. F. Assem.	.08
P-81812	C29	200 Mmf.		Wire Capac. Part of Ant. Assem.	.08
P-81015				Three Gang Condenser	1.70

RESISTORS

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A95104	R1	100,000 Ohm	.2	Carbon	$ .08
P-A95152	R2	1,500 Ohm	.2	Carbon	.08
P-B94303	R3	30,000 Ohm	.5	Carbon	.08
P-A98205	R4	2 Megohm	.2	Carbon	.08
P- 98021	R5	400 Ohm	.2	Wire Wound	.08
P-C93702	R6	7,000 Ohm	1.0	Carbon	.10
P- 96014	R7	500,000 Ohm		Volume Control	.50
P-B94204	R8	200,000 Ohm	.5	Carbon	.08
P-B94603	R9	60,000 Ohm	.5	Carbon	.08
P-A95203	R10	20,000 Ohm	.2	Carbon	.08
P-A95504	R11	500,000 Ohm	.2	Carbon	.08
P-A94104	R12	100,000 Ohm	.2	Carbon	.10
P- 97011	R13	150,000 Ohm		Tone Control	.08
P- 98035	R14	450 Ohm	2.0	Wire Wound	.36
P- 98034	R15	25 Ohm	3.0	Wire Wound	.08
P-B95602	R16	6,000 Ohm	.5	Carbon	.08

INTERFERENCE ELIMINATION PARTS

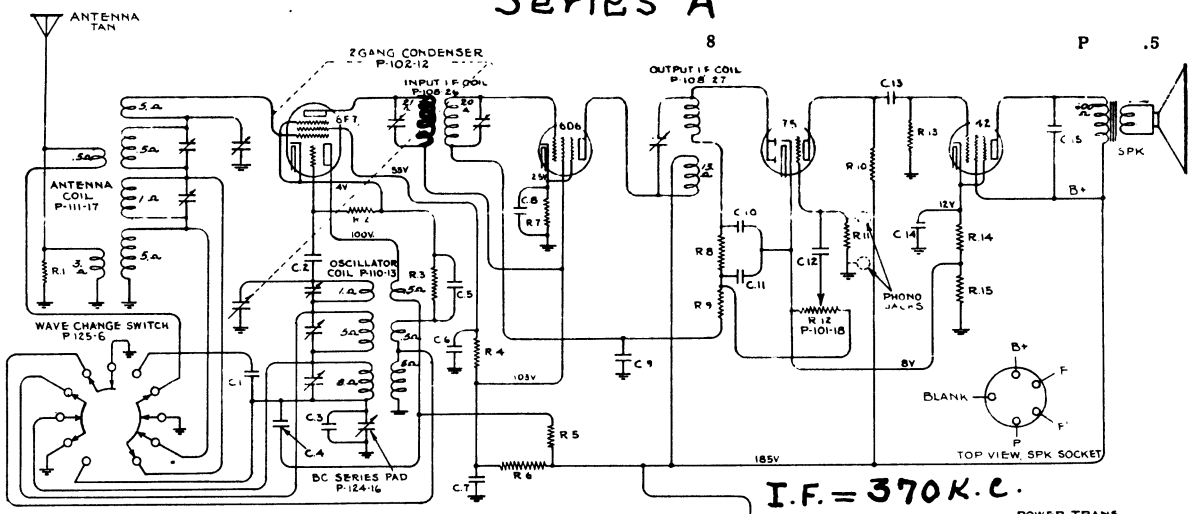
Part No.		Selling Price
P-80933	Dual .5 Mfd. Generator Condenser	.60
62-5424	Spark Plug Suppressor	.25

MONTGOMERY WARD & CO.

25 Cycle { Model 62-147X " 62-156X " 62-164X

60 Cycle { Model 62-147 " 62-156 " 62-164

Series A



I.F. = 370 K.C.

LEGEND

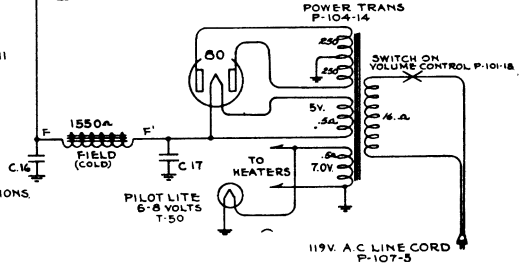
CONDENSERS		RESISTORS	
Nº	VALUE	Nº	VALUE
C.1:-	2870 mmf MICA	R.1:-	800Ω 1/3W.
C.2:-	100 " "	R.2:-	50MΩ "
C.3:-	475 "	R.3:-	700Ω "
C.4:-	.1 X 200V	R.4:-	100MΩ "
C.5:-	1 X 200V.	R.5:-	20MΩ 1/2W.
C.6:-	.1 X 200V	R.6:-	19MΩ 1/2W.
C.7:-	.1 X 200V	R.7:-	200Ω "
C.8:-	.1 X 200V	R.8:-	50MΩ 1/3W
C.9:-	.1 X 200V.	R.9:-	1 MEG "
C.10:-	500 mmf MICA	R.10:-	250MΩ "
C.11:-	500 mmf MICA	R.11:-	2 MEG. "
C.12:-	.05 X 200V	R.12:-	500MΩ VOL. CONTROL
C.13:-	.01 X 400V	R.13:-	500MΩ 1/3W.
C.14:-	4 0 MFD. X 25V	R.14:-	500Ω "
C.15:-	.015 X 400V.	R.15:-	35Ω "
C.16:-	3.0 MFD. X 250V		
C.17:-	4 0 MFD. X 300V		

NOTE:
C. 7, C. 9 ARE IN ONE UNIT P-118-1
C 14, C.16, C.17, ONE UNIT LYTIC P-119-11
R 7, R.14, R.15, ONE UNIT P-106-18

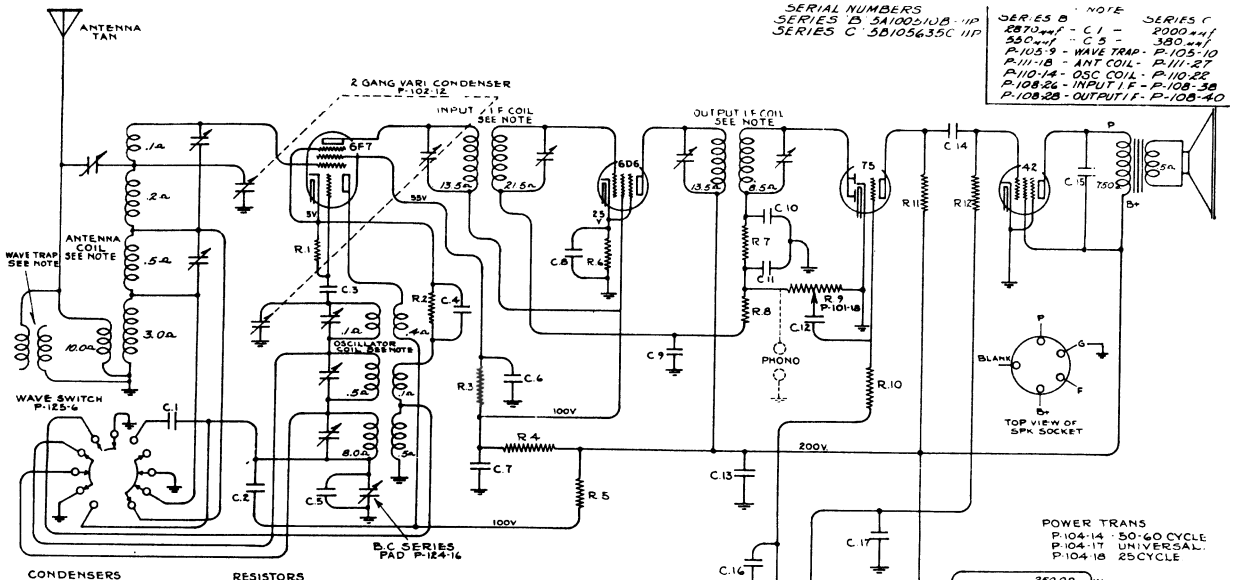
NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND, VOLUME CONTROL ON FULL

WAVE CHANGE SWITCH P-125-6 - 3 POSITIONS, ROTATING CLKWISE -
1ST POSITION - BC 1720 - 540 KC
2ND " - MW. 7.6 - 2.3 MC
3RD " - SW 23.0 - 7.5 MC
SWITCH SHOWN AT SW POSITION



Series B and C



CONDENSERS		RESISTORS	
Nº	VALUE	Nº	VALUE
C.1:-	SEE NOTE	R.1 -	50M 1/3W.
C.2:-	1X200V	R.2:-	700 "
C.3:-	100 mmf MICA	R.3 -	100M "
C.4:-	1X200V	R.4:-	25M 1/2W
C.5:-	SEE NOTE	R.5:-	20M "
C.6:-	1X200V	R.6:-	250 1/3W
C.7:-	1X200V	R.7:-	50M "
C.8:-	1X200V	R.8:-	500M "
C.9:-	1X200V.	R.9 -	500M VOL CONTL
C.10:-	100 mmf MICA	R.10:-	1MEG 1/3W
C.11:-	100 mmf MICA	R.11:-	250M "
C.12:-	.05X200V.	R.12:-	" "
C.13:-	8.0MFD.X 300V P-103-7	R.13 -	15M "
C.14:-	.01X400V	R.14 -	150M "
C.15:-	.015 X 600V	R.15 -	800M "
C.16:-	1X200V.		
C.17:-	1X200V.		
C.18:-	8.0MFD.X 350V. P-103-6		

C.6, C.8 IN DUAL UNIT P-118-1
C 7, C.9 " " " "
C.14, C.17 " " " "

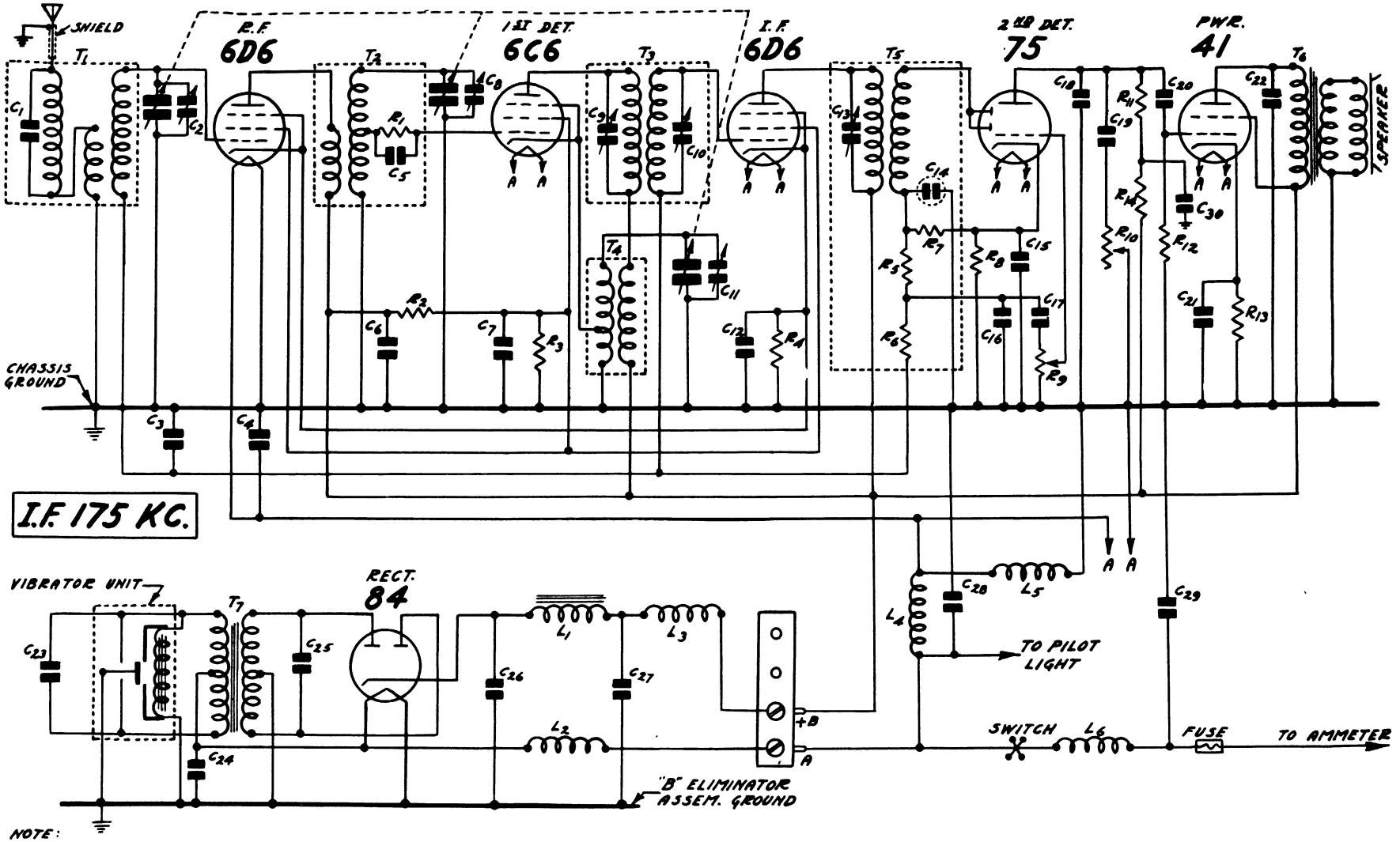
NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL

WAVE SWITCH P-125-6, 3 POSITIONS ROTATING CLKWISE:-
1ST POSITION - BC. 1720-530 KC
2ND " - MW. 7.7 - 2.35 MC
3RD " - SW. 19.0 - 7.6 MC
SWITCH SHOWN AT SW POSITION

I.F. = Series B 370 K.C.; Series C. 465 K.C.

Model 62-166



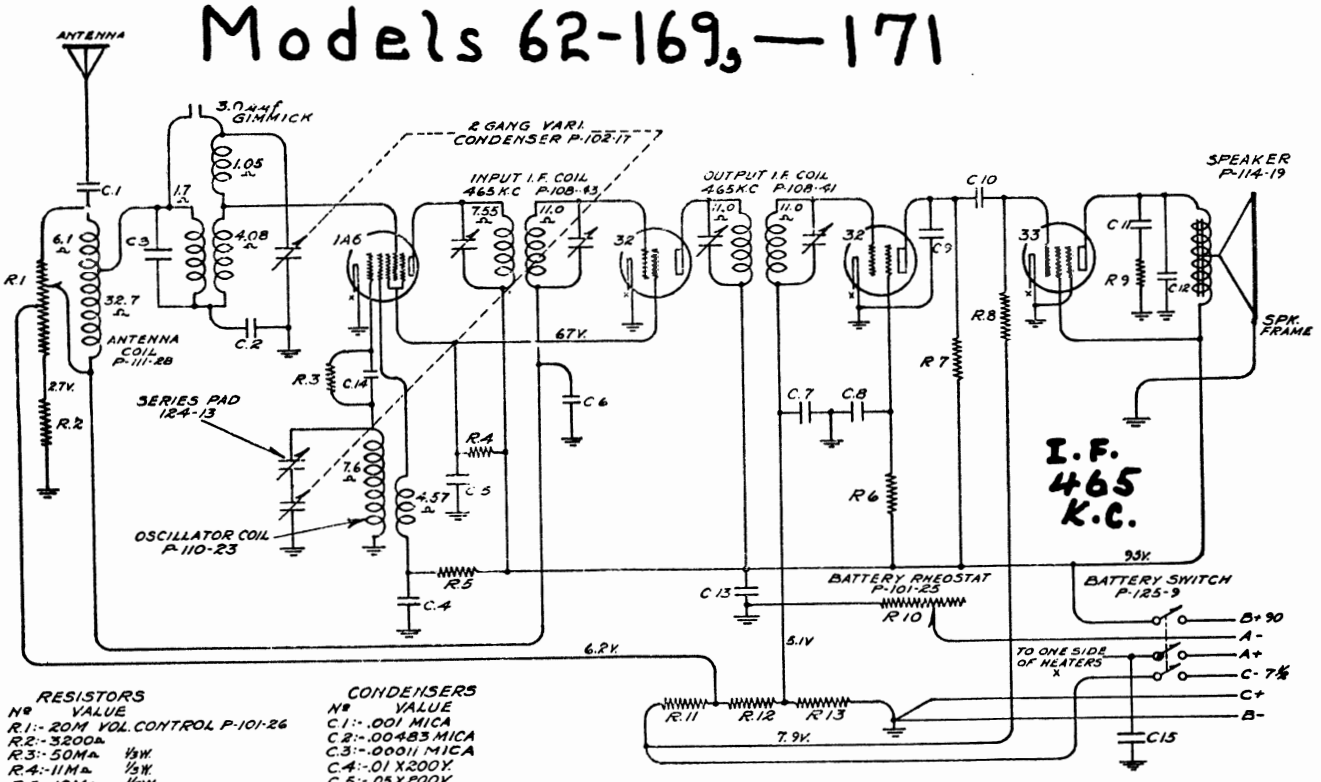
NOTE:
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

C1	500 MMF. MOULDED	C9	130-300 MMF. } ONE	C17	.01 MF. 180 V.	C29	.003 MF. MOULDED	R5	50000 OHM .2 W.
C2	GANG TRIMMER	C10	130-300 MMF. } ASSEMBLY	C18	.00025 MF. MOULDED	C26	6.0 MF. 350 V. } ELECTRO-	R6	1.0 MEGOHM .2 W.
C3	.05 MF. 180 V.	C11	GANG TRIMMER	C19	.006 MF. 600 V.	C27	8.0 MF. 350 V. } LYTIC	R7	500000 OHM .2 W.
C4	.003 MF. MOULDED	C12	.10 MF. 180 V.	C20	.01 MF. 400 V.	C30	.25 MF. 300 V.	R8	7500 OHM .2 W.
C5	35. MMF. MOULDED	C13	70-140 MMF.	C22	.002 MF. 600 V.	R1	1.0 MEGOHM .2 W.	R9	2.0 MEGOHM VOL. CONTROL
C6	.10 MF. 400 V.	C14	250. MMF. MOULDED	C23	.50 MF. 180 V.	R2	15000 OHM .5 W.	R10	150000 OHM TONE CONTROL
C7	.10 MF. 180 V.	C15	12.0 MF. 25 V. } ELECTRO-	C24	1.65 MF. 180 V.	R3	20000 OHM .5 W.	R11	150000 OHM .2 W.
C8	GANG TRIMMER	C21	12.0 MF. 25 V. } LYTIC	C25	.01 MF. 1800 V.	R4	450 OHM .2 W. } ONE	R12	500000 OHM .2 W.
		C16	.00025 MF. MOULDED	C28	.50 MF. 180 V.	R13	800 OHM .5 W. } ASSEMBLY	R14	50000 OHM .2 W.

MONTGOMERY WARD & CO.

MONTGOMERY WARD & CO.

Models 62-169, —171



RESISTORS

No	VALUE
R.1	20M VOL. CONTROL P-101-26
R.2	3200Ω
R.3	50MΩ 1/3W.
R.4	11MΩ 1/3W.
R.5	10MΩ 1/3W.
R.6	3 MEGΩ 1/3W.
R.7	750MΩ 1/3W.
R.8	500MΩ 1/3W.
R.9	35MΩ 1/3W.
R.10	4Ω BAT. RHEOSTAT P-101-25
R.11	1300Ω
R.12	1920Ω
R.13	9800Ω 1/3W

CONDENSERS

No	VALUE
C.1	.001 MICA
C.2	.00483 MICA
C.3	.00011 MICA
C.4	.01 X 200V.
C.5	.05 X 200V.
C.6	.25 X 200V.
C.7	.05 X 200V
C.8	.01 X 200V.
C.9	.00025 MICA
C.10	.01 X 400V.
C.11	.01 X 400V.
C.12	.0005 MICA
C.13	.25 X 200V.
C.14	.00025 MICA
C.15	1 MFD. x 120V

-: NOTE :-
R. 2, R. 11, R. 12 ARE IN ONE UNIT P-106-21
C. 4, C. 5 ARE IN ONE UNIT P-118-11
C. 6, C. 13 " " " " P-118-5
C. 7, C. 8 " " " " P-118-11
NUMBERS PREFIXED BY LETTER 'P' ARE PART Nos.
ALL VOLTAGES INDICATED ARE WITH NEW BATTERIES, VOLUME CONTROL ON FULL.

011

SERVICE DATA FOR PROFESSIONAL SERVICE MEN

DESCRIPTION

TUBES:

The tube complement of this chassis is as follows:

1 Type 1A6—first detector oscillator.
1 Type 32—I.F. amplifier.
1 Type 32—second detector.
1 Type 33—output.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram, are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

ALIGNING INSTRUCTIONS

CAUTION: No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as run down batteries, defective tubes, poor installations, open or grounded antenna systems, defective condensers and resistors. In order to properly align this chassis, an oscillator (generator) is necessary.

All adjustments should be made with a non-metallic screw driver.

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-41 and 108-43, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 33 output tube. Maximum deflection of the volt meter indicates resonance.

Use only enough signal to get a readily readable output.

A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.

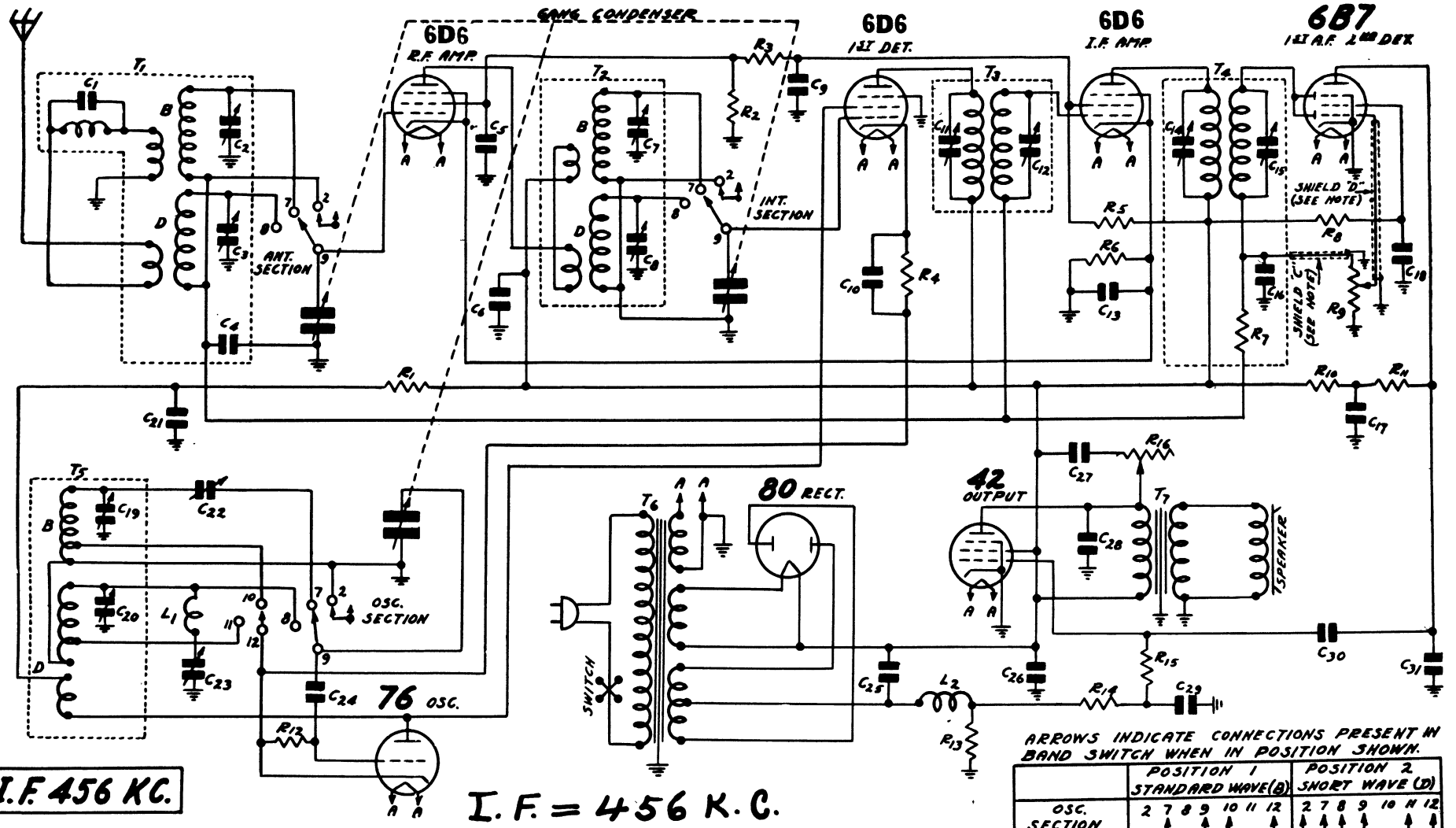
(a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.

(b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.

(c) Re-set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-13 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.

(d) Check for sensitivity at 800, 1000, 1200 K.C. DO NOT BEND PLATES.

Models 62-173, —175 —176 —177 —188 —193



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (D)
OSC. SECTION	2 7 8 9 10 11 12	2 7 8 9 10 N 12
ANT. & INT. SECTION	2 7 8 9	2 7 8 9

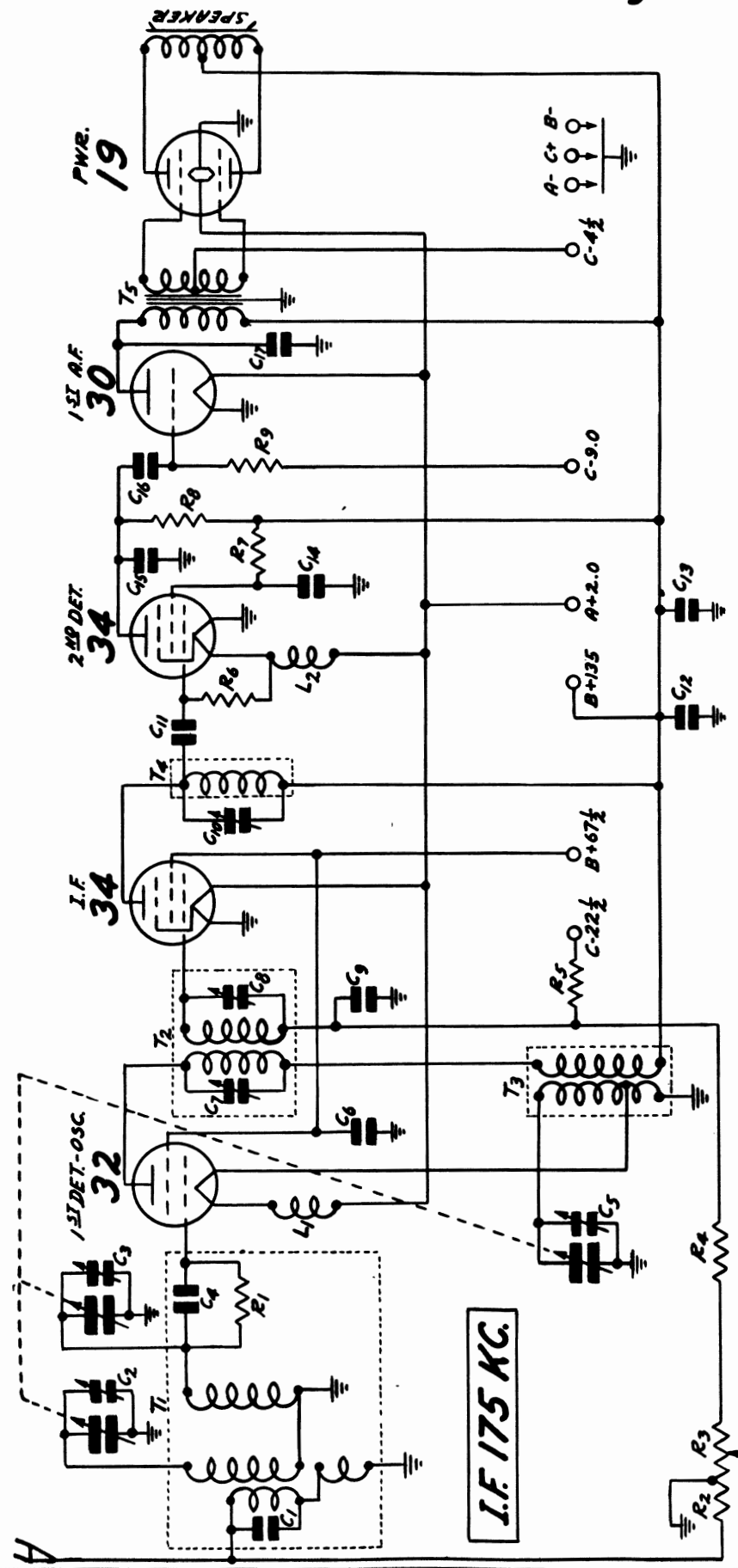
CONTACT LOCATIONS NOT NUMBERED ARE BLANK.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
THE CAPACITY OF SHIELD "C" AND "D" IS 50 MMF EACH.

C 1 250 mmf. Moulded
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 .05 mf. 180 V.
C 5 .05 mf. 240 V.
C 6 .10 mf. 360 V.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 .25 mf. 240 V.
C10 .05 mf. 180 V.
C11 70-150 mmf. } One
C12 70-150 mmf. } Assembly
C13 .25 mf. 180 V.
C14 70-150 mmf. } One
C15 150-250 mmf. } Assembly
C16 50 mmf. Moulded
C17 .25 mf. 360 V.
C18 .25 mf. 360 V.
C19 2-25 mmf.
C20 2-25 mmf.
C21 .10 mf. 360 V.
C22 300-600 mmf. } One
C23 40-100 mmf. } Assembly
C24 35 mmf. Moulded
C25 14 mf. 400 V. Electrolytic
C26 18 mf. 300 V. Electrolytic
C27 .05 mf. 600 V.
C28 .002 mf. 600 V.
C29 .03 mf. 180 V.
C30 .01 mf. 480 V.
C31 .002 mf. 600 V.
R 1 25000 ohm 1.0 W.
R 2 30000 ohm .5 W.
R 3 6000 ohm .5 W.
R 4 2500 ohm .2 W.
R 5 16000 ohm 2.0 W.
R 6 150 ohm .2 W.
R 7 2.0 Megohm .2 W.
R 8 300000 ohm .5 W.
R 9 500000 ohm Volume Control
R10 20000 ohm .2 W.
R11 60000 ohm .5 W.
R12 80000 ohm .2 W.
R13 235 ohm Armored Wire Wound
R14 100000 ohm .2 W.
R15 500000 ohm .2 W.
R16 150000 ohm Tone Control
T 1 Antenna R. F. Trans.
T 2 Interstage R. F. Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 Osc. Inductors
T 6 Power Trans.
T 7 Output Trans.
L 1 Osc. Tracking Coil
L 2 Speaker Field (1050 ohms)

MONTGOMERY WARD & CO.

Models 62-178,-181-189-211



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C1 150 MMF MOULDED
C2 GANG TRIMMER
C3 GANG TRIMMER
C4 35 MMF MOULDED
C5 GANG TRIMMER
C6 .25 MF 180 V.
C7 40-100 MMF } DUAL
C8 20-70 MMF } (P-17937)
C9 .05 MF 180 V.
C10 40-100 MMF (P-17938)
C11 50 MMF MOULDED
C12 .10 MF 180 V.
C13 4.0 MF 150 V. ELECTROLYTIC (P-45X28)
C14 .10 MF 180 V.
C15 .002 MF 300 V.
C16 .006 MF 300 V.
C17 .002 MF 300 V.

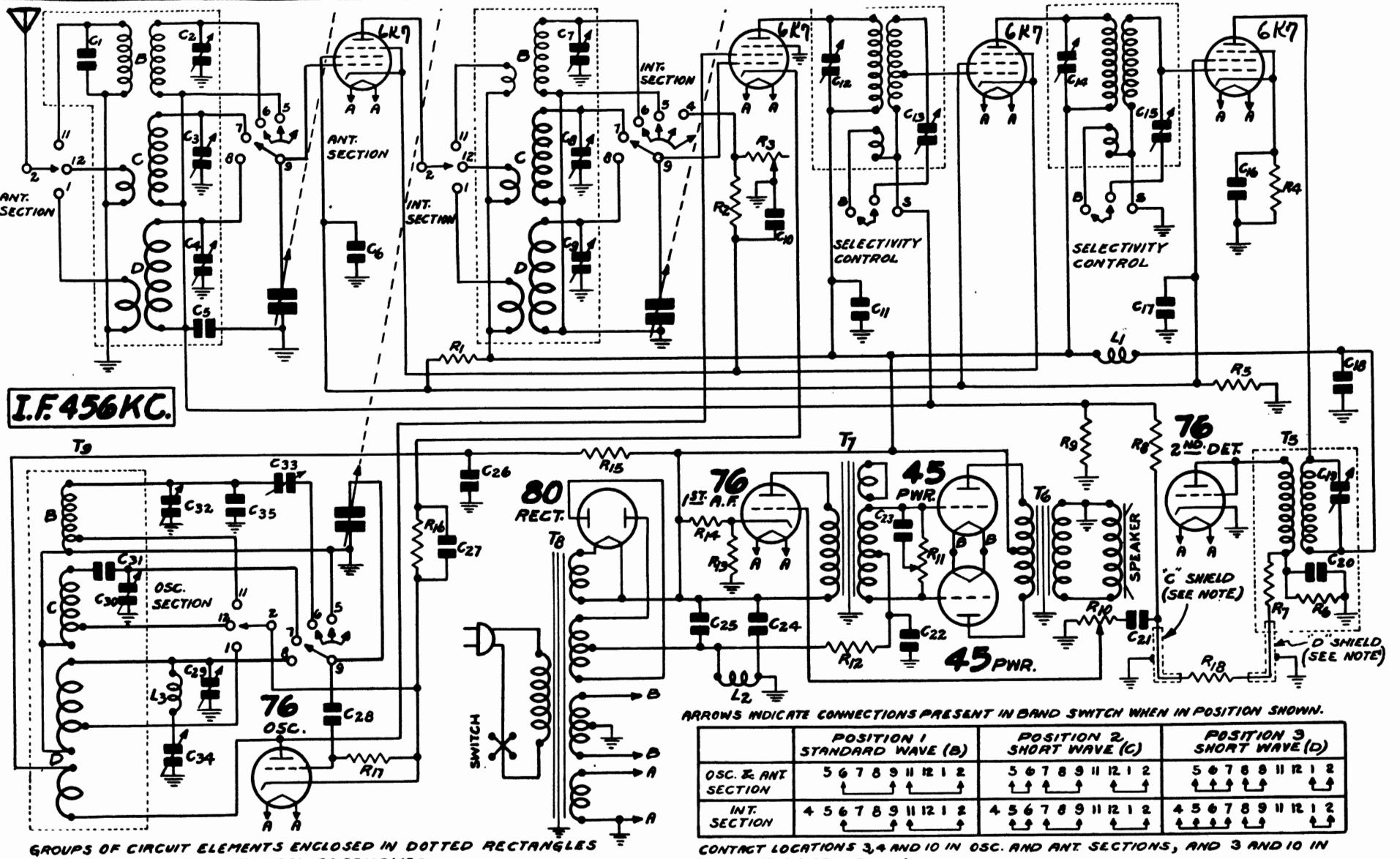
R1 1.0 MEGOHM .2 W.
R2 10 000 OHM } VOLUME CONTROL (P-36X20)
R3 60 000 OHM }
R4 900 OHM .2 W.
R5 6 500 OHM .2 W.
R6 2.0 MEGOHM .2 W.
R7 100 000 OHM .5 W.
R8 40 000 OHM .5 W.
R9 1.0 MEGOHM .2 W.

L1 SINGLE FILAMENT REACTOR (P-9A281)
L2 SINGLE FILAMENT REACTOR (P-9A281)

T1 DOUBLE TUNED ANTENNA COIL (P-9A381)
T2 1ST I.F. COIL (P-9A383)
T3 OSC. COIL (P-9A382)
T4 2ND I.F. COIL (P-9A384)
T5 AUDIO INPUT TRANS. (P-50XW)

MONTGOMERY WARD & CO.

Model 62-179
" 62-194
" 62-206
" 62-216
" 62-218



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. & ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

CONTACT LOCATIONS 3, 4 AND 10 IN OSC. AND ANT. SECTIONS, AND 3 AND 10 IN INT. SECTION ARE BLANK.

"B" AND "S" ON SELECTIVITY CONTROL DENOTES "BROAD" AND "SHARP" RESPECTIVELY.

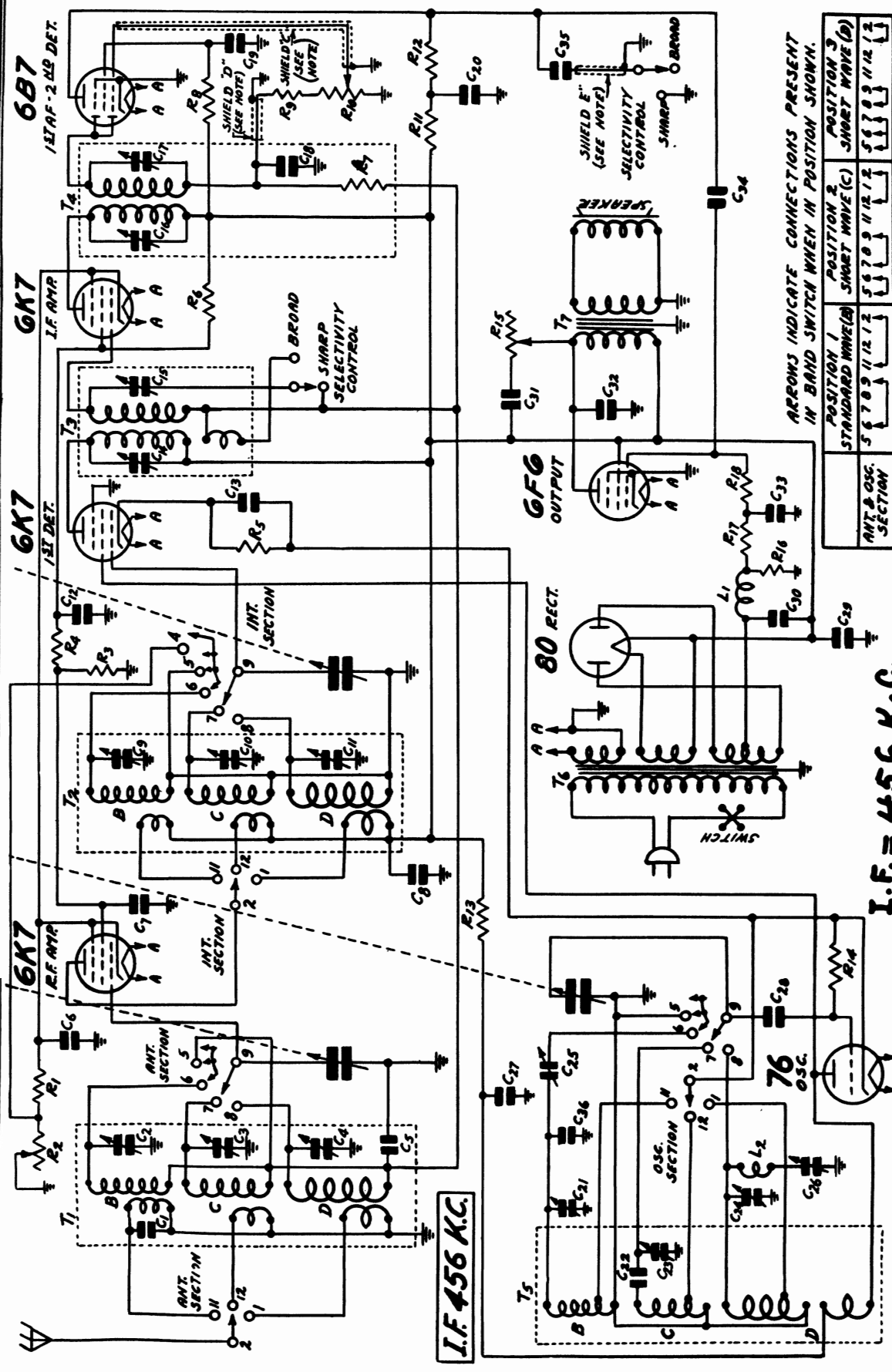
THE CAPACITY OF THE "C" SHIELD IS 55 μμf. THE CAPACITY OF THE "D" SHIELD IS 20 μμf.

C 1	250 mmf.	C11	.25 mf. 360 V.	C21	.01 mf. 360 V.	C31	1400 mmf.	R 5	30,000 ohm 1.0 W.
C 2	2-25 mmf.	C12	150-250 mmf. ONE	C22	.50 mf. 180 V.	C32	2-25 mmf.	R 6	300,000 ohm .2 W.
C 3	2-25 mmf.	C13	150-250 mmf. UNIT	C23	.004 mf. 600 V.	C33	300-600 mmf. ONE	R 7	100,000 ohm .2 W.
C 4	2-25 mmf.	C14	150-250 mmf. ONE	C24	18.0 mf. 290 V.	C34	40-100 mmf. UNIT	R 8	2.0 megohm .2 W.
C 5	.05 mf. 180 V.	C15	150-250 mmf. UNIT	C25	14.0 mf. 400 V.			R 9	1.0 megohm .2 W.
C 6	.25 mf. 240 V.	C16	.05 mf. 180 V.	C26	.05 mf. 360 V.	R 1	16,000 ohm 2.0 W.	R11	3.0 megohm Tone Cont.
C 7	2-25 mmf.	C17	4.0 mf. 150 V.	C27	.05 mf. 180 V.	R 2	150 ohm .2 W.	R12	100,000 ohm .2 W.
C 8	2-25 mmf.	C18	.10 mf. 360 V.	C28	35 mmf.	R 3	2,500 ohm Dual Volume	R13	1,000 ohm .5 W.
C 9	2-25 mmf.	C19	70-150 mmf.	C29	2-25 mmf.	R10	2.0 megohm Control	R14	25,000 ohm 3.0 W.
C10	.25 mf. 180 V.	C20	50 mmf.	C30	2-25 mmf.	R 4	400 ohm .2 W.	R15	25,000 ohm 1.0 W.
								R16	2,500 ohm .2 W.
								R17	80,000 ohm .2 W.

T 1	Ant. R.F. Trans.
T 2	Interstage R.F. Trans.
T 3	1st I.F. Trans.
T 4	2nd I. F. Trans.
T 5	Diode Input Trans.
T 6	Audio Output Trans.
T 7	Audio Input Trans.
T 8	Power Trans.
T 9	Osc. Inductors
L 1	Isolating Reactor
L 2	Speaker Field (570 Ohm)
L 3	Osc. Tracking Coil

MONTGOMERY WARD & CO.

Models 62-185,-187-190-196



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
ANT. & OSC. SECTION	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2
INT. SECTION	4 5 6 7 8 9 10 11 12 1 2	4 5 6 7 8 9 10 11 12 1 2	4 5 6 7 8 9 10 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN ANT. AND OSC. SECTIONS AND 3 AND 10 IN INT. SECTION ARE BLANK.

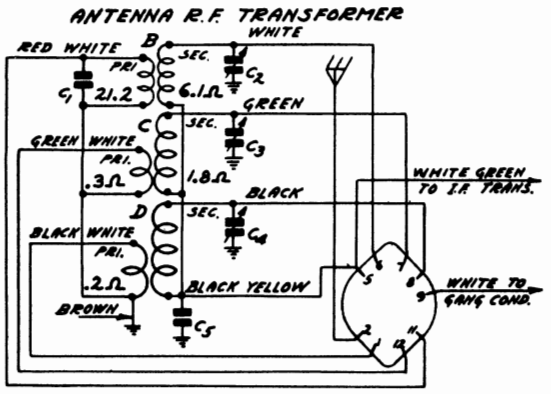
C1	250 mmf.	C12	.25 mf. 240 V.	C22	1400 mmf.	R 6	16000 ohm 2.0 W.
C2	2-25 mmf.	C13	.05 mf. 180 V.	C23	2-25 mmf.	R 7	2.0 Megohm .2 W.
C3	2-25 mmf.	C14	70-150 mmf. } ONE	C24	2-25 mmf.	R 8	30000 ohm .5 W.
C4	2-25 mmf.	C15	70-150 mmf. } UNIT	C25	300-600 mmf. } ONE	R 9	50000 ohm .2 W.
C5	.05 mf. 180 V.	C16	70-150 mmf. } ONE	C26	40-100 mmf. } UNIT	R11	20000 ohm .2 W.
C6	.25 mf. 180 V.	C17	150-250 mmf. } UNIT	C27	.10 mf. 360 V.	R12	60000 ohm .5 W.
C7	.10 mf. 360 V.	C18	50 mmf.	C28	35 mmf.	R13	25000 ohm 1.0 W.
C8	.25 mf. 360 V.	C19	.25 mf. 360 V.	C29	18 mf. 300 V.	R14	80000 ohm .2 W.
C9	2-25 mmf.	C20	.25 mf. 360 V.	C30	14 mf. 400 V.	R15	150000 Tone Cont.
C10	2-25 mmf.	C21	2-25 mmf.	C31	.05 mf. 600 V.	R16	235 ohm 2.0 W.
				C32	.002 mf. 600 V.	R17	100000 ohm .2 W.
				C33	.03 mf. 180 V.	R18	500000 ohm .2 W.
				C34	.01 mf. 480 V.	T 1	Antenna R.F. Trans.
				C35	.004 mf. 600 V.	T 2	Interstage R.F. Trans.
				R 1	150 ohm .2 W.	T 3	1st. I.F. Trans.
				R 2	2500 ohm } Dual Vol.	T 4	2nd I.F. Trans.
				R10	500000 ohm } Control	T 5	Osc. Inductors
				R 3	30000 ohm .5 W.	T 6	Power Trans.
				R 4	6000 ohm .5 W.	T 7	Output Trans.
				R 5	2500 ohm .2 W.	L 1	Speaker Field
						L 2	Osc. Tracking Coil

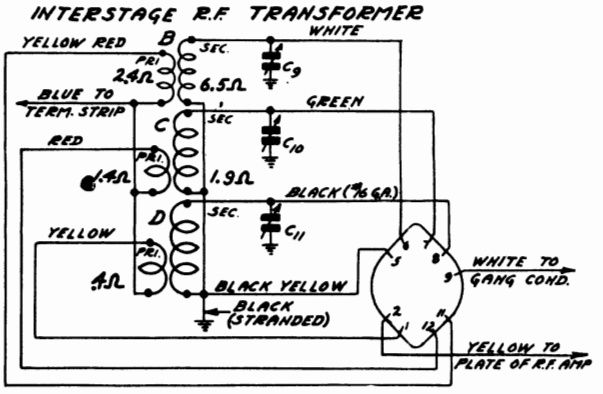
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

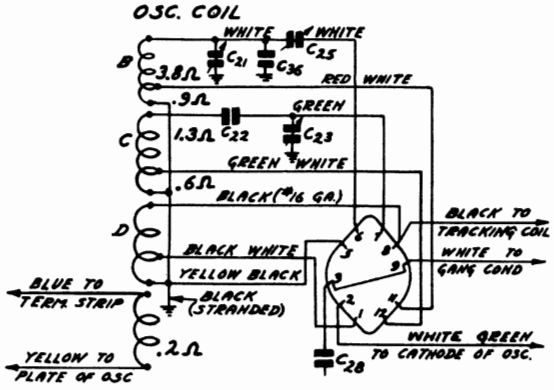
THE CAPACITY OF SHIELD "C" AND "D" IS 50 MMF. EACH.

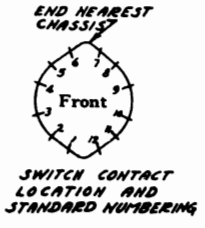
MONTGOMERY WARD & CO.

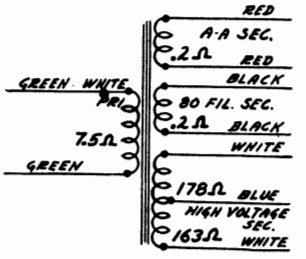
Models 62-185,—187—190—196





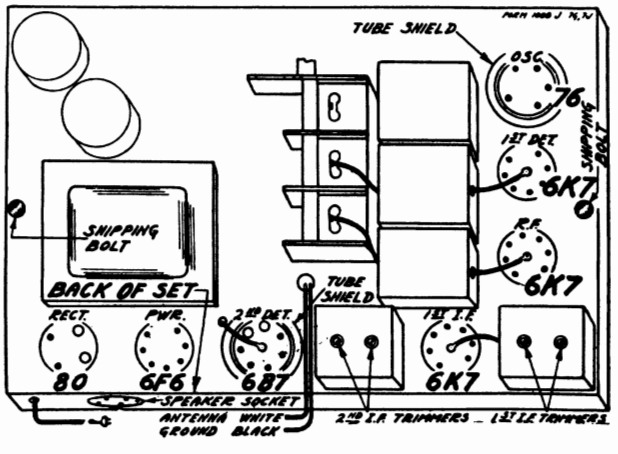






Color Coding of Coil Wires and D. C. Resistance of Windings

(Also see complete D. C. Resistance List in this Manual)

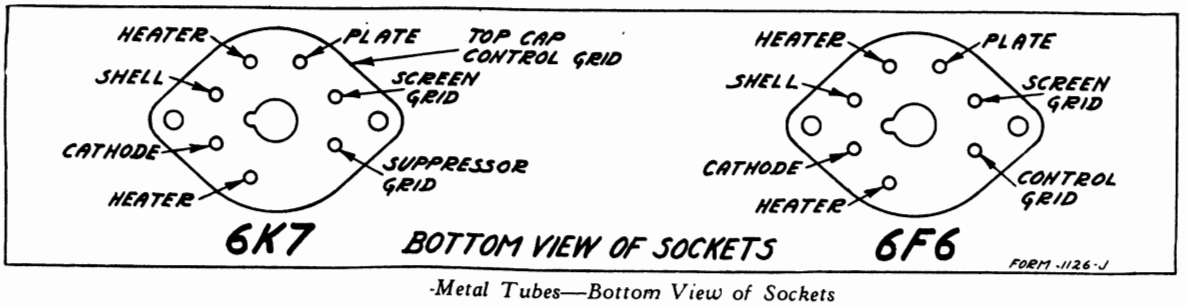


VOLTAGES AT SOCKETS

Line Voltage, 115 - Volume Control at Maximum Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6K7 (6D6)	R. F.	6.1	230	95	3.0	6.4
6K7 (6D6)	1st Det.	6.1	230	100	9.0	3.2
76	Osc.	6.1	100			5.2
6K7 (6D6)	I. F.	6.1	230	120	3.0	9.
6B7	2nd Det.	6.1	55(1)	40		2.3
6F6 (42)	Power	6.1	215	230	17(2)	30.0
80	Rectifier	4.7				34. per plate

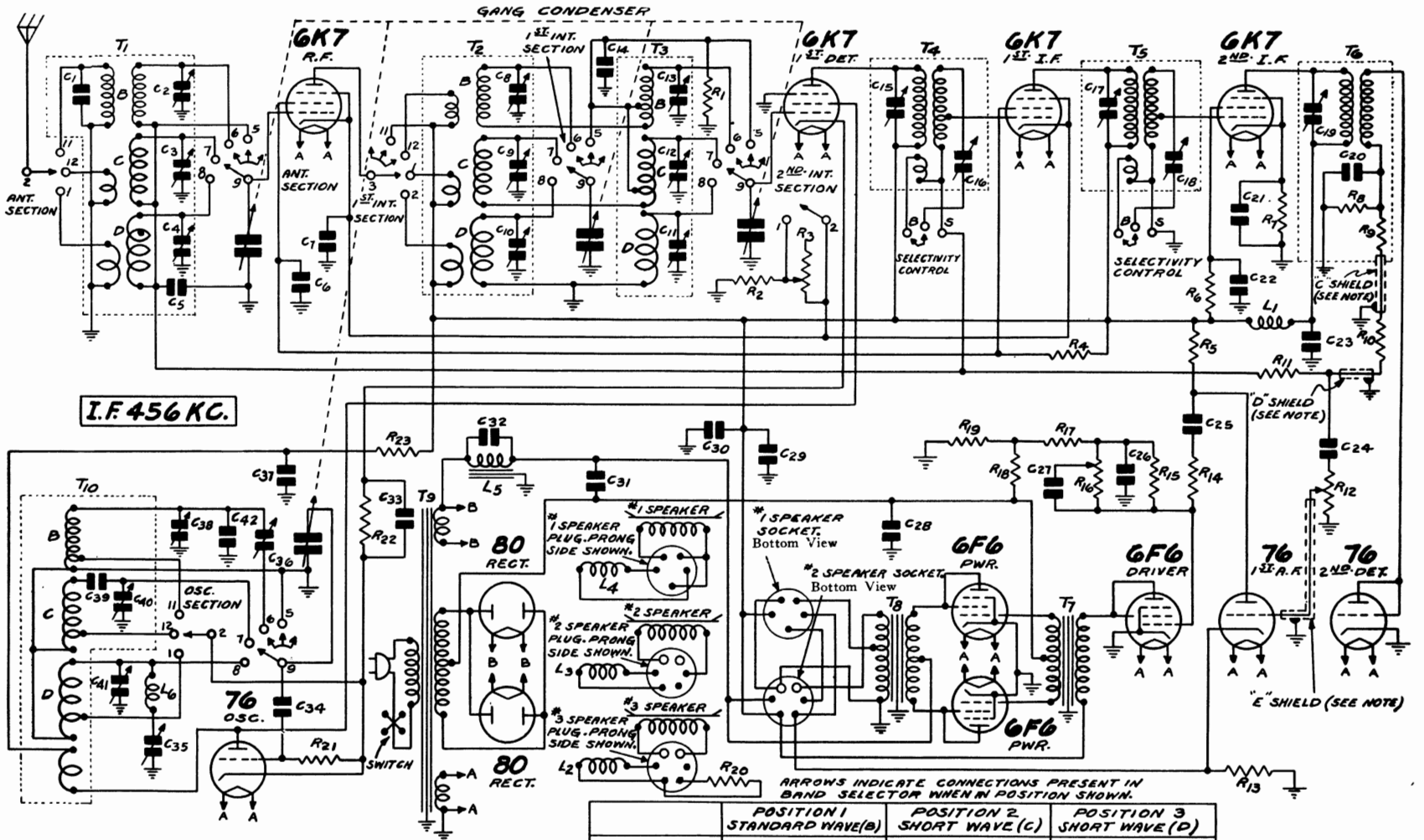
(1) As read with 500,000 ohm meter
(2) As read across R16



Metal Tubes—Bottom View of Sockets

MONTGOMERY WARD & CO.

Models 62-192,—195



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SELECTOR WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. AND ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9
2ND INT. SECTION	1 2 5 6 7 8 9	1 2 5 6 7 8 9	1 2 5 6 7 8 9
1ST INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9

CONTACT LOCATIONS 3,4 AND 10 IN OSC. AND ANT. SECTIONS, 3,4,10, 11 AND 12 IN 2ND INT. SECTION AND 4 AND 10 IN 1ST INT. SECTION ARE BLANK.

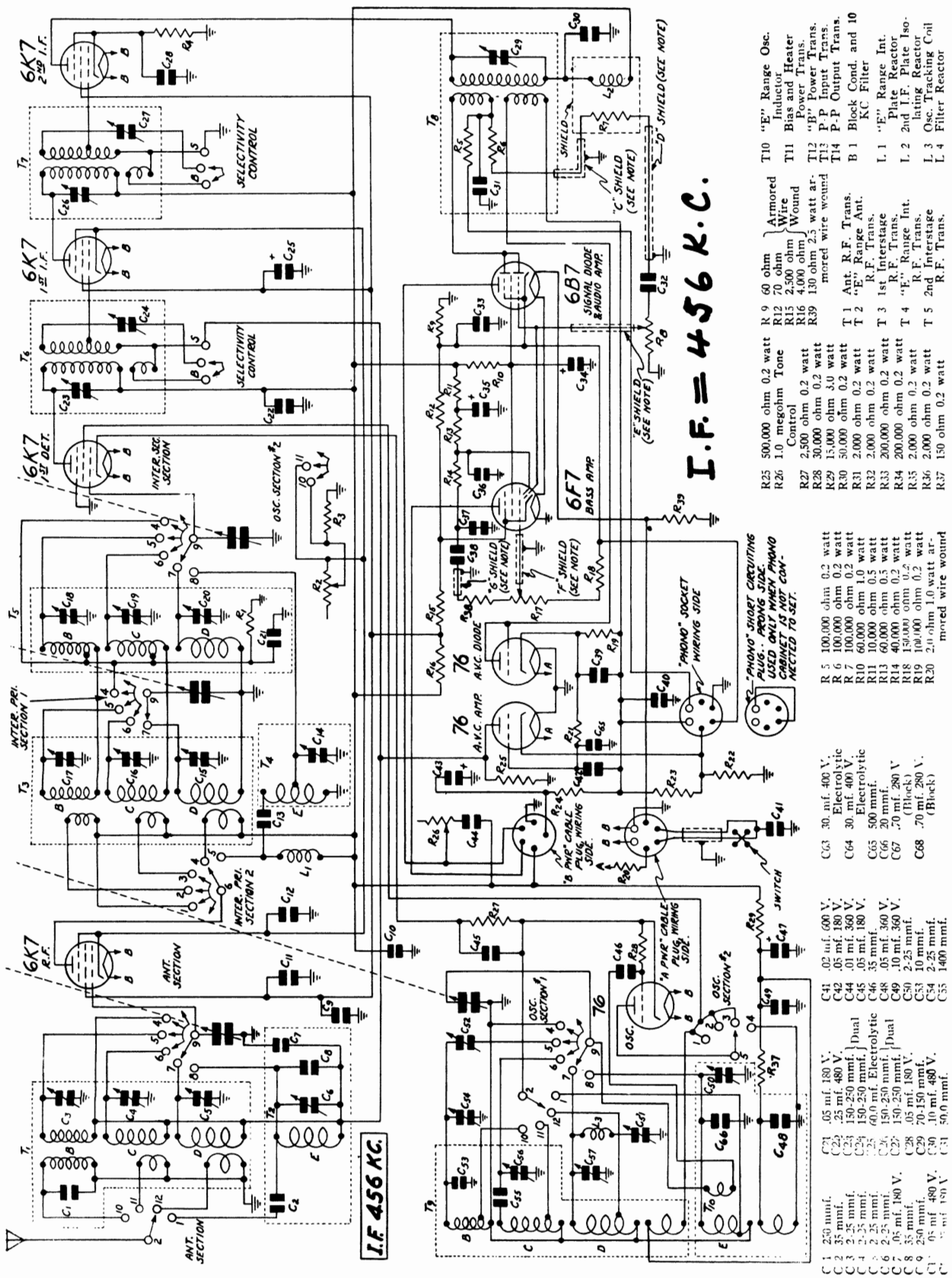
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON SELECTIVITY CONTROL DENOTES BROAD AND SHARP RESPECTIVELY.
THE CAPACITY OF THE "C" SHIELD IS 20 m m f.
THE CAPACITY OF THE "D" SHIELD IS 70 m m f.
THE CAPACITY OF THE "E" SHIELD IS 16 m m f.
ON SETS USING ONE SPEAKER THE #3 SPEAKER IS FURNISHED.
ON SETS USING TWO SPEAKERS THE #1 AND #2 SPEAKERS ARE FURNISHED.

C 1	250 mmf.	C13	2-25 mmf.	C25	.05 mf. 360 V.	C37	.25 mf. 360 V.	R 5	60,000 ohm 0.5 watt	R18	128 ohm 2.5 watt } Armored
C 2	2-25 mmf.	C14	.05 mf. 180 V.	C26	.25 mf. 180 V.	C38	2-25 mmf.	R 6	100,000 ohm 0.5 watt	R19	145 ohm 3.0 watt } Wire-Wound
C 3	2-25 mmf.	C15	150-250 mmf. } One	C27	.004 mf. 600 V.	C39	1400 mmf.	R 7	500 ohm 0.2 watt	R20	7800 ohm 12.0 watt
C 4	2-25 mmf.	C16	150-250 mmf. } Unit	C28	125.0 mf. 45 V. Electrolytic	C40	2-25 mmf.	R 8	200,000 ohm 0.5 watt	R21	80,000 ohm 0.2 watt
C 5	.05 mf. 180 V.	C17	150-250 mmf. } One	C29	18.0 mf. 290 V. Electrolytic	C41	2-25 mmf.	R 9	100,000 ohm 0.2 watt	R22	2,500 ohm 0.2 watt
C 6	.70 mf. 360 V.	C18	150-250 mmf. } Unit	C30	.25 mf. 360 V.	C42	10 mmf.	R10	100,000 ohm 0.2 watt	R23	27,000 ohm 1.0 watt
C 7	.25 mf. 180 V.	C19	70-150 mmf.	C31	30.0 mf. 450 V. Electrolytic			R11	2.0 megohm 0.2 watt		
C 8	2-25 mmf.	C20	50 mmf.	C32	.15 mf. 280 V. A. C.	R 1	25,000 ohm 0.2 watt	R13	200 ohm 0.5 watt	T 1	Ant. R.F. Trans.
C 9	2-25 mmf.	C21	.05 mf. 180 V.	C33	.05 mf. 180 V.	R 2	150 ohm 0.2 watt	R14	250,000 ohm 0.2 watt	T 2	1st Interstage R.F. Trans.
C10	2-25 mmf.	C22	.05 mf. 360 V.	C34	35 mmf.	R 3	2500 ohm } Dual Volume	R15	250,000 ohm 0.2 watt	T 3	2nd Interstage R.F. Trans.
C11	2-25 mmf.	C23	.10 mf. 360 V.	C35	40-100 mmf. } One	R12	2.0 megohm } Control	R16	3.0 megohm Tone Control	T 4	1st I.F. Trans.
C12	2-25 mmf.	C24	.01 mf. 480 V.	C36	300-600 mmf. } Unit	R 4	50,000 ohm 1.0 watt	R17	100,000 ohm 0.2 watt	T 5	2nd I.F. Trans.

T 6	3rd I.F. Trans.	L 1	2nd I. F. Plate Isolating Resistor
T 7	Push-Pull Input Trans.	L 2	No. 3 Speaker Field (1000 ohm)
T 8	Push-Pull Output Trans.	L 3	No. 2 Speaker Field (1000 ohm)
T 9	Power Trans.	L 4	No. 1 Speaker Field (6400 ohm)
T10	Osc. Inductors	L 5	Choke Coil
		L 6	Osc. Tracking Coil

MONTGOMERY WARD & CO.

Model 62-197



R25	500,000 ohm 0.2 watt	R 9	60 ohm	} Armored Wire	T10	"E" Range Osc. Inductor
R26	1.0 megohm Tone Control	R12	70 ohm		T11	Bias and Heater Power Trans.
R27	2,500 ohm 0.2 watt	R15	2,500 ohm	} Wound	T12	"B" Power Trans.
R28	30,000 ohm 0.2 watt	R16	4,000 ohm		T13	P-P Input Trans.
R29	15,000 ohm 3.0 watt	R39	130 ohm 2.5 watt armored wire wound		T14	P-P Output Trans.
R30	50,000 ohm 0.2 watt	T 1	Ant. R.F. Trans.		B 1	Block Cond. and 10 KC Filter
R31	2,000 ohm 0.2 watt	T 2	"E" Range Ant. R.F. Trans.			
R32	2,000 ohm 0.2 watt	T 3	1st. Interstage R.F. Trans.		L 1	"E" Range Int. Plate Reactor
R33	200,000 ohm 0.2 watt	T 4	"E" Range Int. R.F. Trans.		L 2	2nd I.F. Plate Isolating Reactor
R34	200,000 ohm 0.2 watt	T 5	2nd Interstage R.F. Trans.		L 3	Osc. Tracking Coil
R35	2,000 ohm 0.2 watt				L 4	Filter Reactor
R36	2,000 ohm 0.2 watt					
R37	150 ohm 0.2 watt					

R 5	100,000 ohm 0.2 watt	C63	.30 mf. 400 V. Electrolytic	C41	.02 mf. 600 V.	C 1	250 mmf.
R 6	100,000 ohm 0.2 watt	C64	.30 mf. 400 V. Electrolytic	C42	.05 mf. 180 V.	C 2	35 mmf.
R 7	100,000 ohm 0.2 watt	C65	500 mmf.	C44	.01 mf. 360 V.	C 3	2.25 mmf.
R10	60,000 ohm 1.0 watt	C66	20 mmf.	C45	.05 mf. 180 V.	C 4	2.25 mmf.
R11	10,000 ohm 0.5 watt	C67	.70 mf. 280 V (Block)	C46	.35 mmf.	C 5	2.25 mmf.
R13	60,000 ohm 0.5 watt	C68	.70 mf. 280 V. (Block)	C48	.05 mf. 360 V.	C 6	2.25 mmf.
R14	40,000 ohm 0.2 watt			C49	.10 mf. 360 V.	C 7	.05 mf. 180 V.
R18	150,000 ohm 0.2 watt			C50	2-25 mmf.	C 8	35 mmf.
R19	100,000 ohm 0.2 watt			C53	10 mmf.	C 9	250 mmf.
R20	20 ohm 1.0 watt armored wire wound			C54	2-25 mmf.	C10	.05 mf. 480 V.
				C55	1400 mmf.	C11	.05 mf. 480 V.

Diagram Continued On Next Page

MONTGOMERY WARD & CO.

Model 62-197

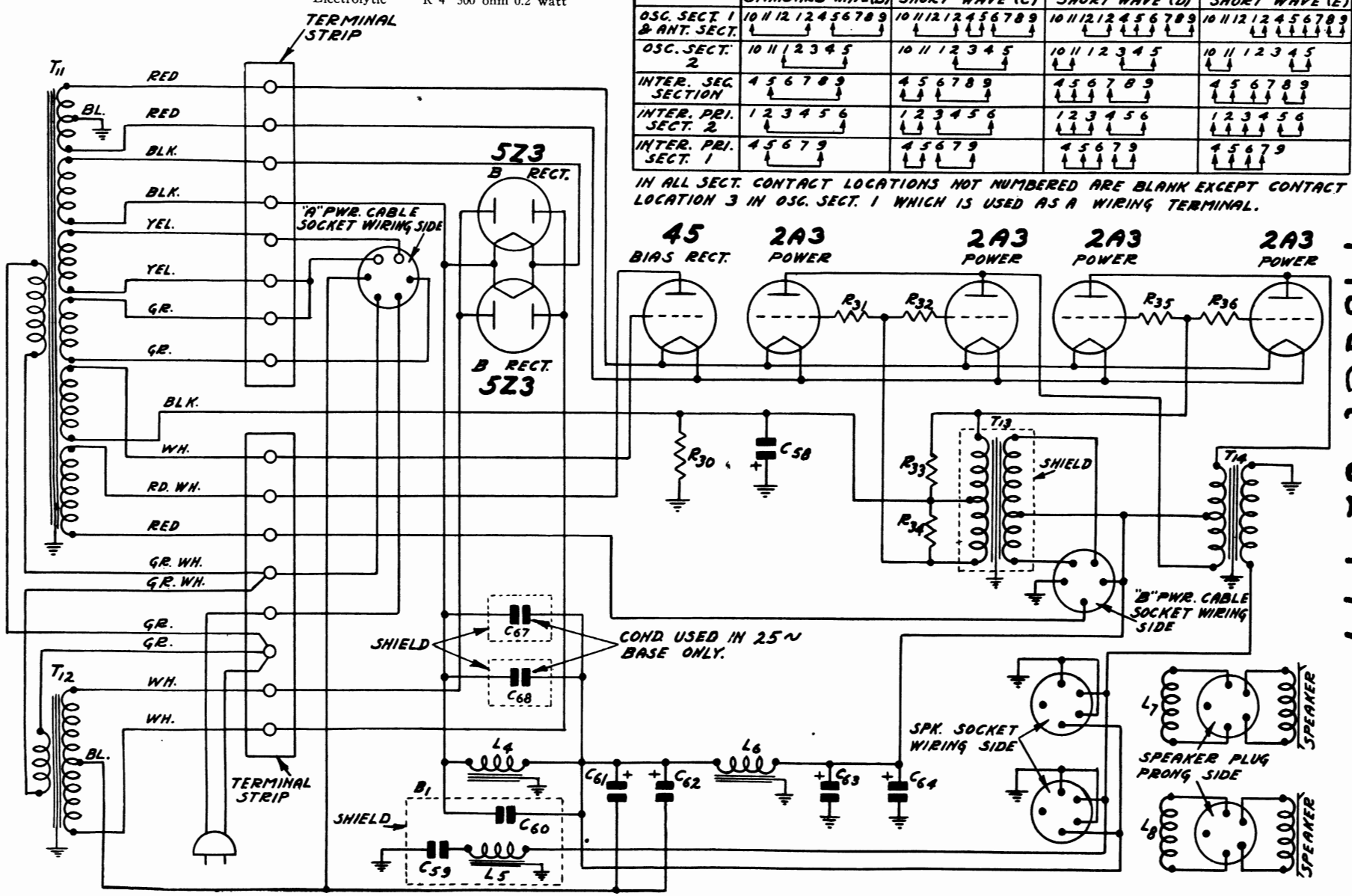
C12	.25 mf. 180 V.	C32	.01 mf. 360 V.	C56	2-25 mmf.	C34	4.0 mf. 250 V. } Dry Electrolytic Block
C13	.05 mf. 480 V.	C33	.05 mf. 180 V.	C57	2-25 mmf.	C43	16.0 mf. 150 V. }
C14	2-25 mmf.	C35	12.0 mf. 300 V. Electrolytic	C58	60 mf. 150 V. Electrolytic	C47	4.0 mf. 250 V. }
C15	2-25 mmf.			C59	.63 mf. 180 V.	C52	300-600 mmf. } Dual
C16	2-25 mmf.	C36	.10 mf. 360 V.	C60	.35 mf. 280 V.	C51	40-100 mmf. }
C17	2-25 mmf.	C37	.02 mf. 360 V.	C61	30. mf. 400 V. Electrolytic		
C18	2-25 mmf.	C38	.005 mf. 360 V.	C62	30. mf. 400 V. Electrolytic	R 1	25,000 ohm 0.2 watt
C19	2-25 mmf.	C39	100 mmf.			R 3	150 ohm 0.2 watt
C20	2-25 mmf.	C40	.50 mf. 180 V.			R 4	500 ohm 0.2 watt

R21	2.0 megohm 0.2 watt	R38	500.000 ohm 0.2 watt	T 6	1st I.F. Trans.	L 5	Filter Reactor
R22	160,000 ohm 0.2 watt	R 2	2,500 ohm } Volume Control	T 7	2nd I.F. Trans.	L 6	Filter Reactor
R23	25,000 ohm 0.2 watt	R 8	2.0 megohm }	T 8	3rd I.F. Trans.	L 7	Speaker Field 4500 ohm
R24	25,000 ohm 0.2 watt	R17	1.0 megohm }	T 9	Osc. Inductors	L 8	Speaker Field 4500 ohm

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SW. WHEN IN POS. SHOWN.

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)	POSITION 4 SHORT WAVE (E)
OSC. SECT. 1 & ANT. SECT.	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9
OSC. SECT. 2	10 11 1 2 3 4 5	10 11 1 2 3 4 5	10 11 1 2 3 4 5	10 11 1 2 3 4 5
INTER. SEC. SECTION	4 5 6 7 8 9	4 5 6 7 8 9	4 5 6 7 8 9	4 5 6 7 8 9
INTER. PRI. SECT. 2	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
INTER. PRI. SECT. 1	4 5 6 7 9	4 5 6 7 9	4 5 6 7 9	4 5 6 7 9

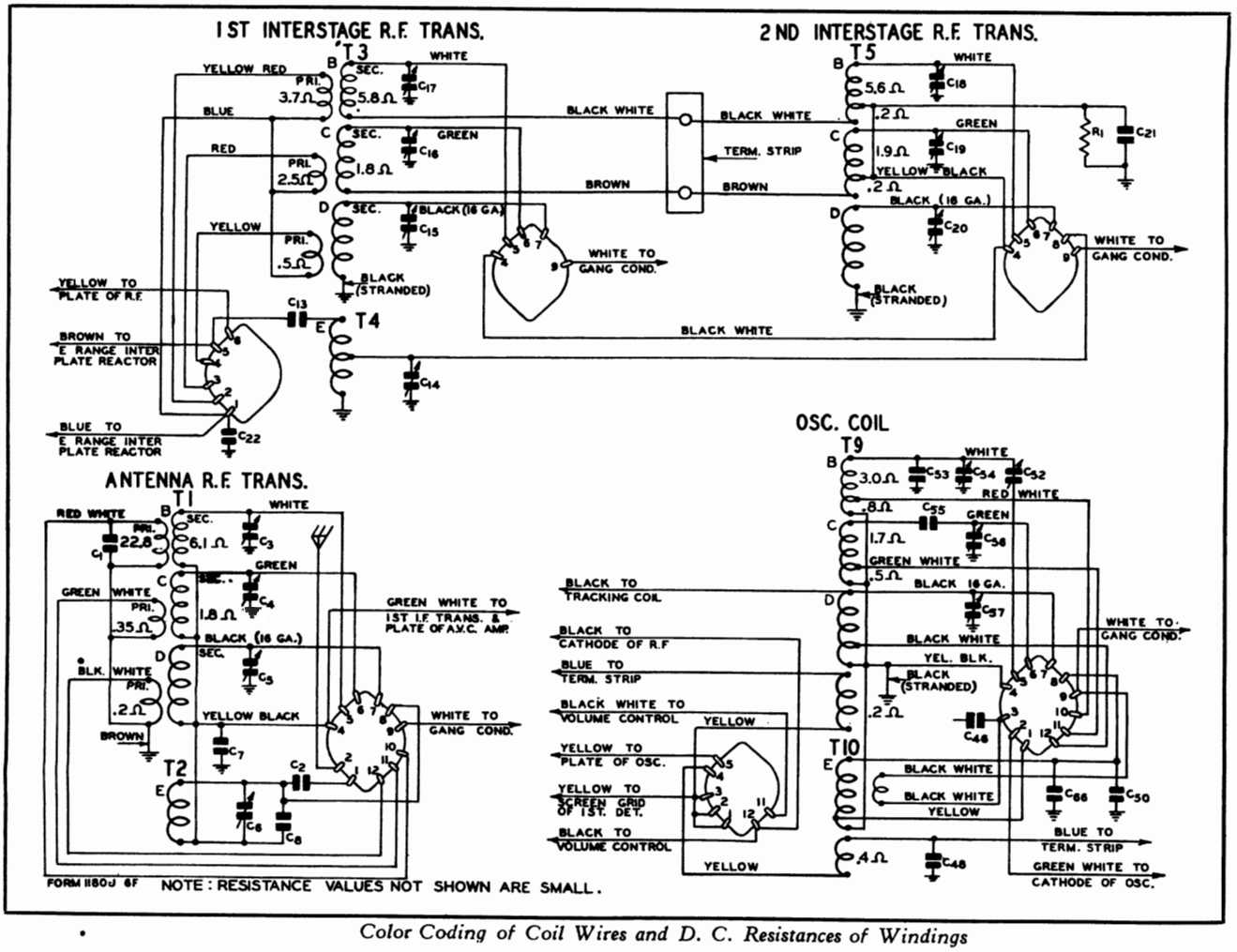
IN ALL SECT. CONTACT LOCATIONS NOT NUMBERED ARE BLANK EXCEPT CONTACT LOCATION 3 IN OSC. SECT. 1 WHICH IS USED AS A WIRING TERMINAL.



See preceding page

MONTGOMERY WARD & CO.

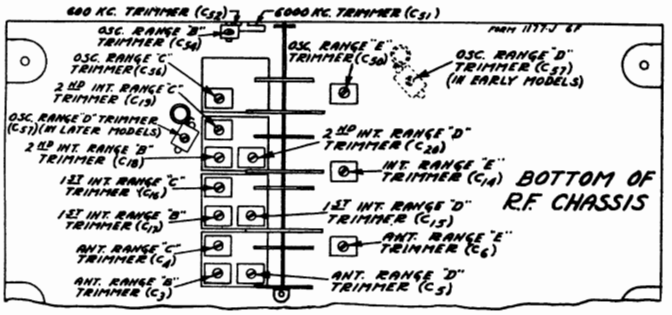
Model 62-197



Color Coding of Coil Wires and D. C. Resistances of Windings

Tuning Frequency Range

B Range	535 to 1730 KC
C Range	1715 to 5800 KC
D Range	5750 to 18300 KC
E Range	17500 to 48000 KC



Trimmer Location

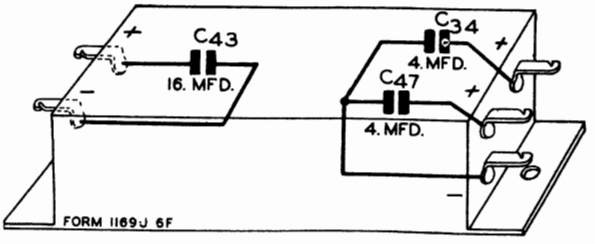


Fig. 8—Condenser Block Internal Wiring

VOLTAGES AT SOCKETS

Antenna Shorted to Ground - Line Voltage 110
Volume Control Maximum

Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode M. A.
6K7	R. F.	5.8	300	110	4.1	10.5
6K7	1st Det.	5.8	300	142	10.0	3.5
76	Osc.	5.8	142			10.0
6K7	1st I. F.	5.8	300	110	4.1	10.5
6K7	2nd I. F.	5.8	300	110	3.7	10.0
6B7	Sig. Diode & Audio Amp.	5.8(1) 5.6(2)	300	115	3.6	4.5
6F7	Bass Amp.	5.8(1) 5.6(2)	275(3) 125(4)	115	7.2	9.0
76	A.V.C. Diode	4.9				
76	A.V.C. Amp.	4.9	0		-62.0	
2A3	Power	2.35	300		60(5)	60.0(6)
5Z3	'B' Rect.	4.8				375.0(7)
45	Bias Rect.	2.4				

(1) Measured with A. C. Voltmeter—early models with letter "A" under chassis.
(2) Measured with D. C. Voltmeter—later models with letter "B" under chassis.
(3) Pentode Plate
(4) Triode Plate
(5) Control Grid to ground.
(6) Each Side of push-pull Circuit—120 Ma. total for 4 tubes.
(7) Total for both tubes—Milliameter in series with 1st Choke.

MONTGOMERY WARD & CO.

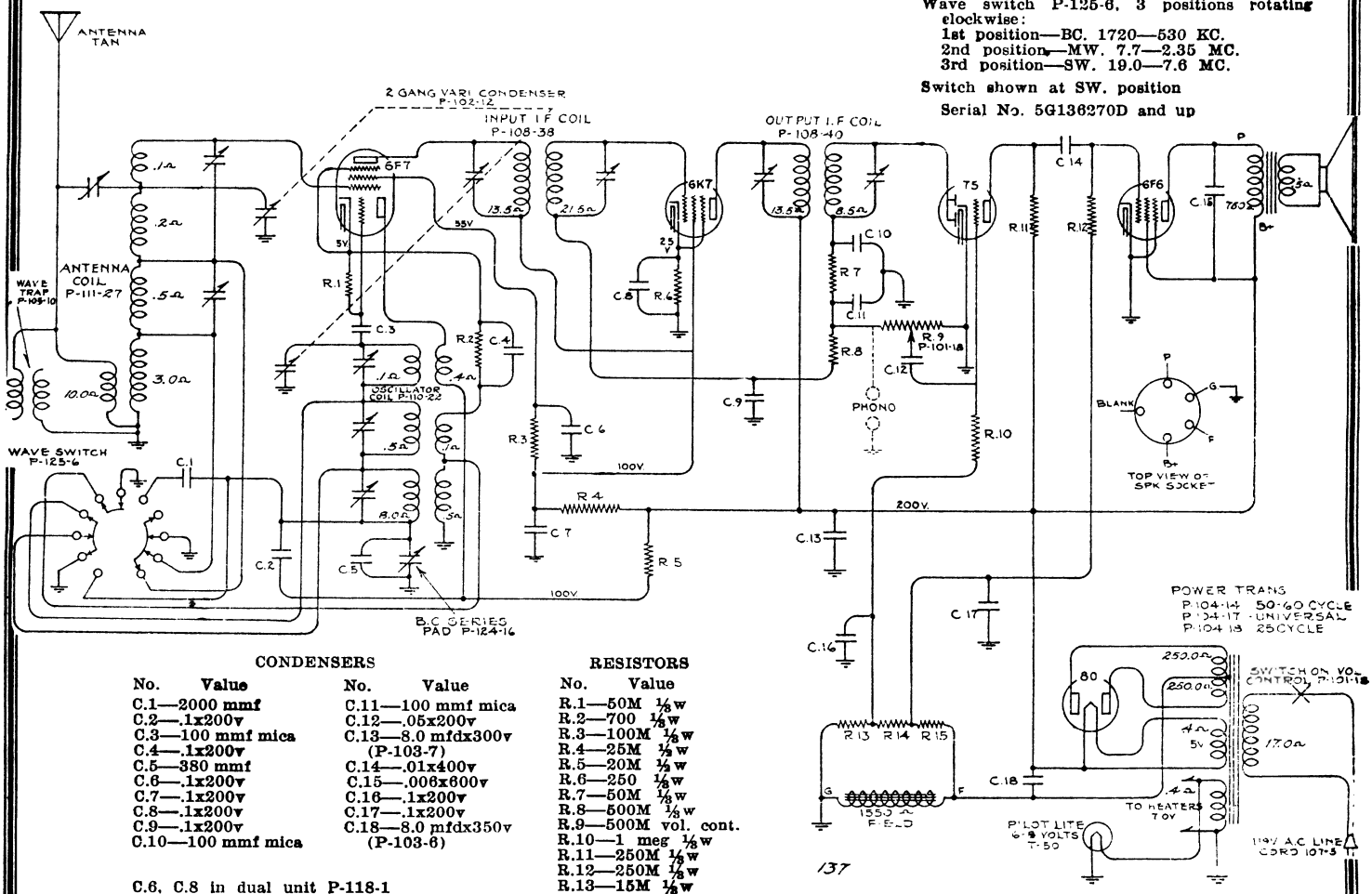
MODEL 62-198

Voltages taken from points indicated to chassis ground. Volume control on full.

Wave switch P-125-6, 3 positions rotating clockwise:
1st position—BC. 1720—530 KC.
2nd position—MW. 7.7—2.35 MC.
3rd position—SW. 19.0—7.6 MC.

Switch shown at SW. position

Serial No. 5G136270D and up



CONDENSERS

No.	Value
C.1	2000 mmf
C.2	.1x200v
C.3	100 mmf mica
C.4	.1x200v
C.5	380 mmf
C.6	.1x200v
C.7	.1x200v
C.8	.1x200v
C.9	.1x200v
C.10	100 mmf mica
C.11	100 mmf mica
C.12	.05x200v
C.13	8.0 mfdx300v (P-103-7)
C.14	.01x400v
C.15	.006x600v
C.16	.1x200v
C.17	.1x200v
C.18	8.0 mfdx350v (P-103-6)

C.6, C.8 in dual unit P-118-1
C.7, C.9 in dual unit P-118-1
C. 16, C. 17 in dual unit P-118-1

RESISTORS

No.	Value
R.1	50M 1/2 w
R.2	700 1/2 w
R.3	100M 1/2 w
R.4	25M 1/2 w
R.5	20M 1/2 w
R.6	250 1/2 w
R.7	50M 1/2 w
R.8	500M 1/2 w
R.9	500M vol. cont.
R.10	1 meg 1/2 w
R.11	250M 1/2 w
R.12	250M 1/2 w
R.13	15M 1/2 w
R.14	180M 1/2 w
R.15	800M 1/2 w

Service Data for Professional Service Men

DESCRIPTION

TUBES:

The Tube complement of this chassis is as follows:

1 Type 6F7—triode pentode as oscillator and first detector.
1 Type 6K7—remote cut-off pentode I.F. amplifier.
1 Type 75—duplex diode triode as diode detector, A.V.C. and A.F.
1 Type 6F6—pentode output tube.
1 Type 80—high vacuum rectifier.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

All voltages are measured with 119 volts on the primary of the power transformer.

Resistance of coils and transformer windings are indicated in ohms on schematic circuit diagram.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see illustrations) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

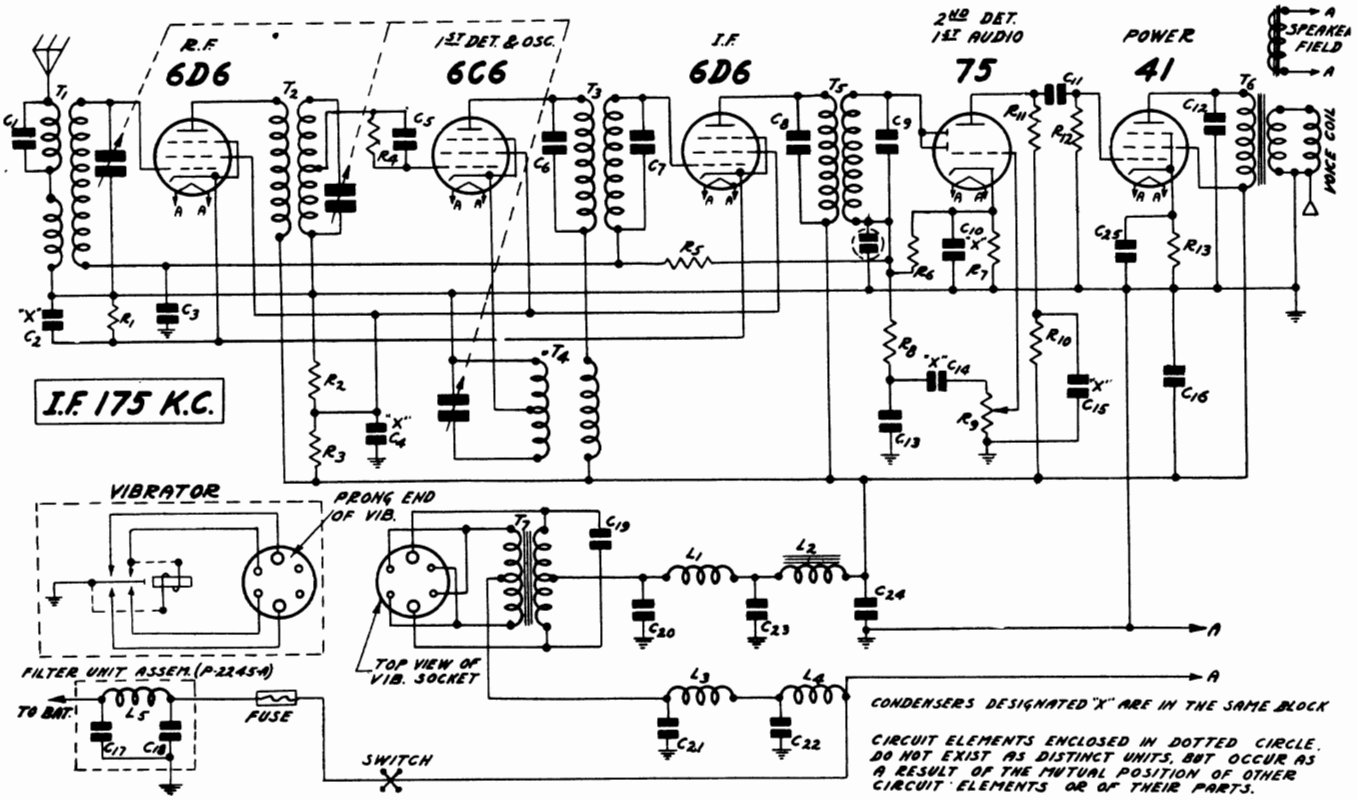
To check for open by-pass condensers, shunt each condenser with another of similar capacity and of the same voltage rating, which is known to be good, until the defective unit is located. Open by-pass condensers frequently cause oscillation and distorted tone. Defective and shorted electrolytic filter condensers cause excessive hum, motor-boating, low volume and a reduction in all D.C. voltages. Open or shorted electrolytic and by-pass condensers (across bias resistor of type 6F6 tube) will cause low volume and distorted tone.

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. The drive may be disassembled to replace the compression spring (part number 112-31) by removing the two screws which fasten it to the dial bracket. Before re-assembling all parts should be carefully cleaned and a small amount of vaseline applied to the ball bearings. All other dial parts are hardened and should cause no trouble.

I.F. = 465 K.C.

MONTGOMERY WARD & CO.

Model 62-199



VOLTAGES AT SOCKETS

Input 6.3 Volts—Antenna Disconnected at Connector

Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

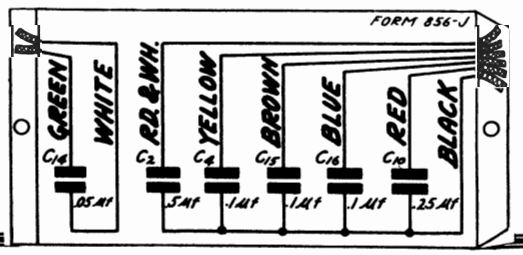
Part No.	Item	Code	D.C. Resistance in Ohms
P-5247	Antenna Trans. Pri in Series	T1	17.50
	Antenna Trans. Sec.	T1	5.25
P-5248	R. F. Interstage Trans. Pri.	T2	2.31
	R. F. Interstage Trans. Sec. (Center Tap to Inside)	T2	3.23
	R. F. Interstage Trans. Sec. (Center Tap to Outside)	T2	3.98
P-5249	1st I. F. Trans. Primary	T3	100.00
	1st I. F. Trans. Secondary	T3	100.00
	Oscillator Cathode Coil (Total)	T4	4.50
	Oscillator Plate Coil	T4	9.00
P-5250	2nd I. F. Trans. Pri.	T5	100.00
	2nd I. F. Trans. Sec.	T5	100.00
P-50656	Power Trans. Pri.	T7	0.36
	Power Trans. Sec.	T7	860.00
P-5174	"B" R. F. Choke	L1	1.65
P-50657	Power Choke	L2	390.00
P-5251	"A" Choke	L3	Small
P-5253	Line Choke	L4	Small
P-5252	Choke Coil	L5	Small
P-2228	Output Trans. Pri.	T6	690.00
	Output Trans. Sec. and Voice Coil in Par.		0.80
	Speaker Field		6.00

CONDENSERS

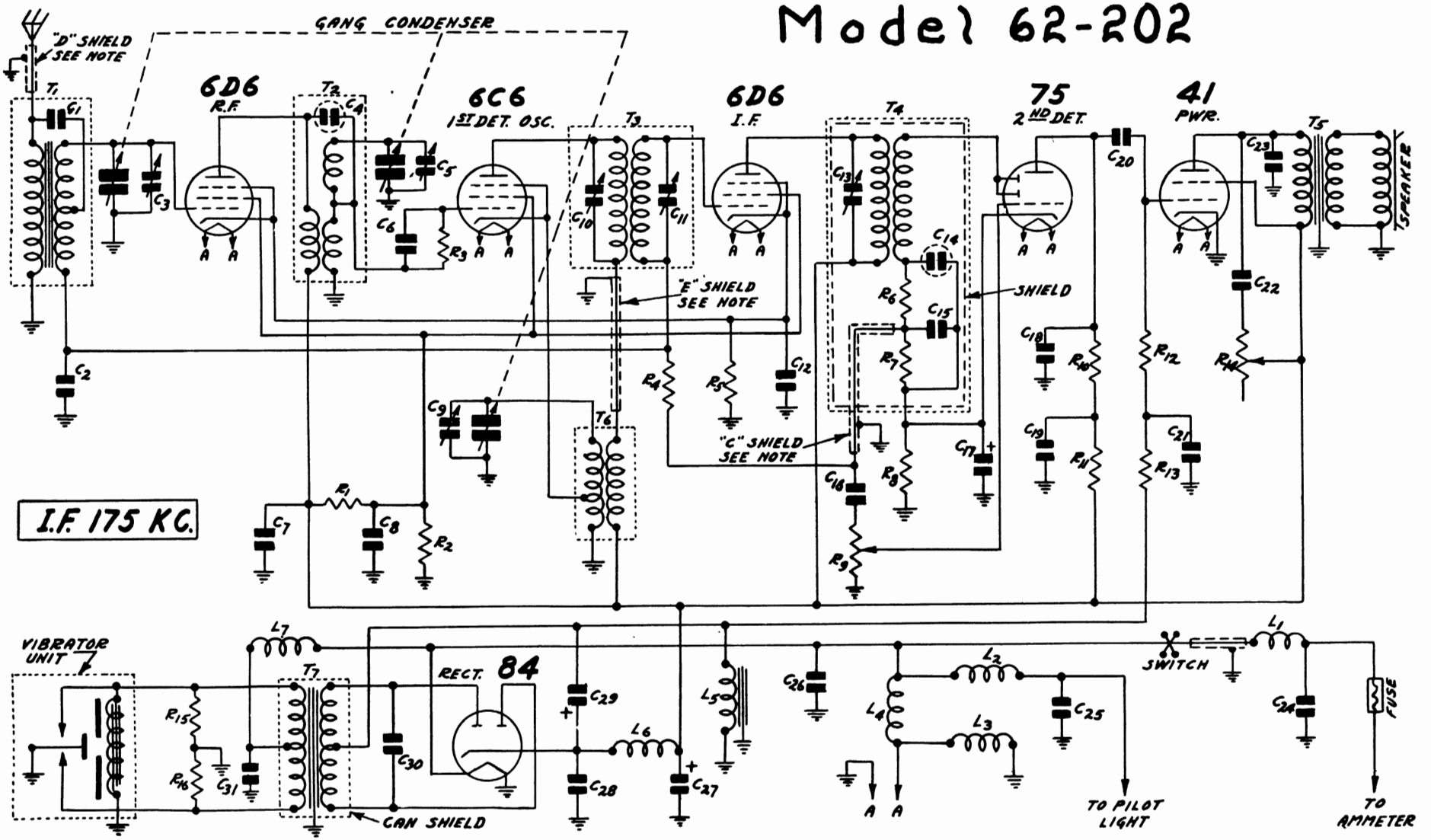
Part No.	Code	Capacity	Voltage	Type	Selling Price
P-81814	C1	250 mmf.	(Part of	Antenna Coil Assembly)	$ .08
P-82600D	C2	.50 mf.	200V.	Bypass Block	.64
	C4	.10 mf.	140V.		
	C10	.25 mf.	140V.		
	C14	.05 mf.	300V.		
	C15	.10 mf.	200V.		
P-81116	C3	.05 mf.	Tubular		.10
P-81815	C5	35 mmf.	Part of Grid Leak Assembly		.08
P-81806	C6	70 mmf.	Part of 1st I. F. & Osc. Coil Assembly		.08
	C7	70 mmf.			
P-81806	C8	70 mmf.	Part of 2nd I. F. Coil Assembly		.08
	C9	70 mmf.			
P-81115	C11	.05 mf.	300V	Tubular	.10
P-81114	C12	.006 mf.	600V.	Tubular	.08
P-81814	C13	250 mmf.		Moulded	.08
P-81132	C16	.10 mf.	300V.	Tubular	.12
	C17	.01 mf.	120V.	[In Choke Condenser Unit]	
	C18	.01 mf.	120V.		
P-81120	C19	.007 mf.	1600V.	Tubular	.12
P-81122	C20	.10 mf.	300V.	Tubular	.12
P-81121	C21	.50 mf.	140V.	Tubular	.16
P-81816	C22	.002 mf.		Moulded	.12
P-82002	C23	4.0 mf.	250V.	Dry Electrolytic Block	.86
	C24	2.0 mf.	250V.		
	C25	4.0 mf.	25V.		
P-82500	Gang Condenser				1.82

RESISTORS

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-B94351ww	R1	350 Ohm	.5	Flexible Wire Wound	$ .08
P-B95253	R2	25,000 Ohm	.5	Carbon	.08
P-B95103	R3	10,000 Ohm	.5	Carbon	.08
P-A95105	R4	1 Megohm	.2	Carbon	.08
P-A95105	R5	1 Megohm	.2	Carbon	.08
P-A95504	R6	500,000 Ohm	.2	Carbon	.08
P-A94752	R7	7,500 Ohm	.2	Carbon	.08
P-A95104	R8	100,000 Ohm	.2	Carbon	.08
P- 96017	R9	2 Megohm		Volume Control and Switch	.56
P-A95503	R10	50,000 Ohm	.2	Carbon	.08
P-A95204	R11	200,000 Ohm	.2	Carbon	.08
P-A95504	R12	500,000 Ohm	.2	Carbon	.08
P-B94801ww	R13	800 Ohm	.5	Flexible Wire Wound	.08



Model 62-202



MONTGOMERY WARD & CO.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 mmf. THE CAPACITY OF "D" SHIELD IS 85 mmf AND THE CAPACITY OF "E" SHIELD IS 15 mmf.

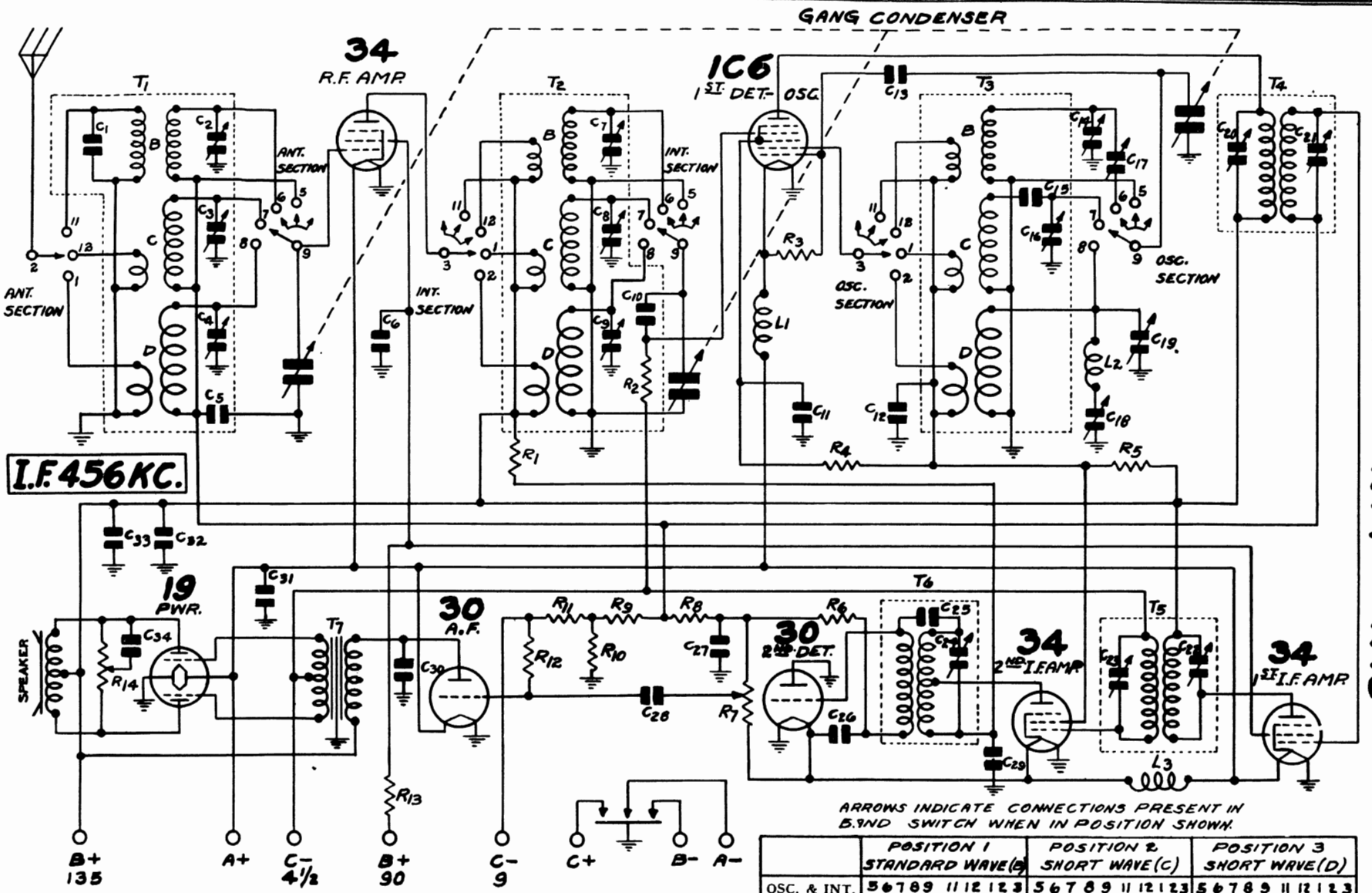
C 1 21 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } One
C11 70-150 mmf. } Unit
C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.
C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C24 .50 mf. 180 V.
C25 2000 mmf.
C26 2000 mmf.
C28 .01 mf. 360 V.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C17 4.0 mf. 25 V. } Electrolytic Block
C27 5.0 mf. 350 V } Electrolytic Block
C29 8.0 mf. 350 V } Electrolytic Block

R 1 17000 ohm 1.0 W.
R 2 20000 ohm ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Volume Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.
R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

T 1 Antenna Trans.
T 2 R. F. Interstage Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 2 Pilot Light Reactor
L 3 Speaker Field 5.3
L 4 Filament Reactor
L 5 Filter Choke
L 6 "B" Reactor
L 7 Vibrator Reactor

MONTGOMERY WARD & CO.
Models 62-203, -205, -208 -212 — 217 — 219



ARROWS INDICATE CONNECTIONS PRESENT IN B.ND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE(C)	POSITION 3 SHORT WAVE(D)
OSC. & INT. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

Contact Locations 4 and 10 in Osc. & Int. Sections and 3, 4 and 10 in Ant. Section are Blank.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

I. F. = 456 K. C.

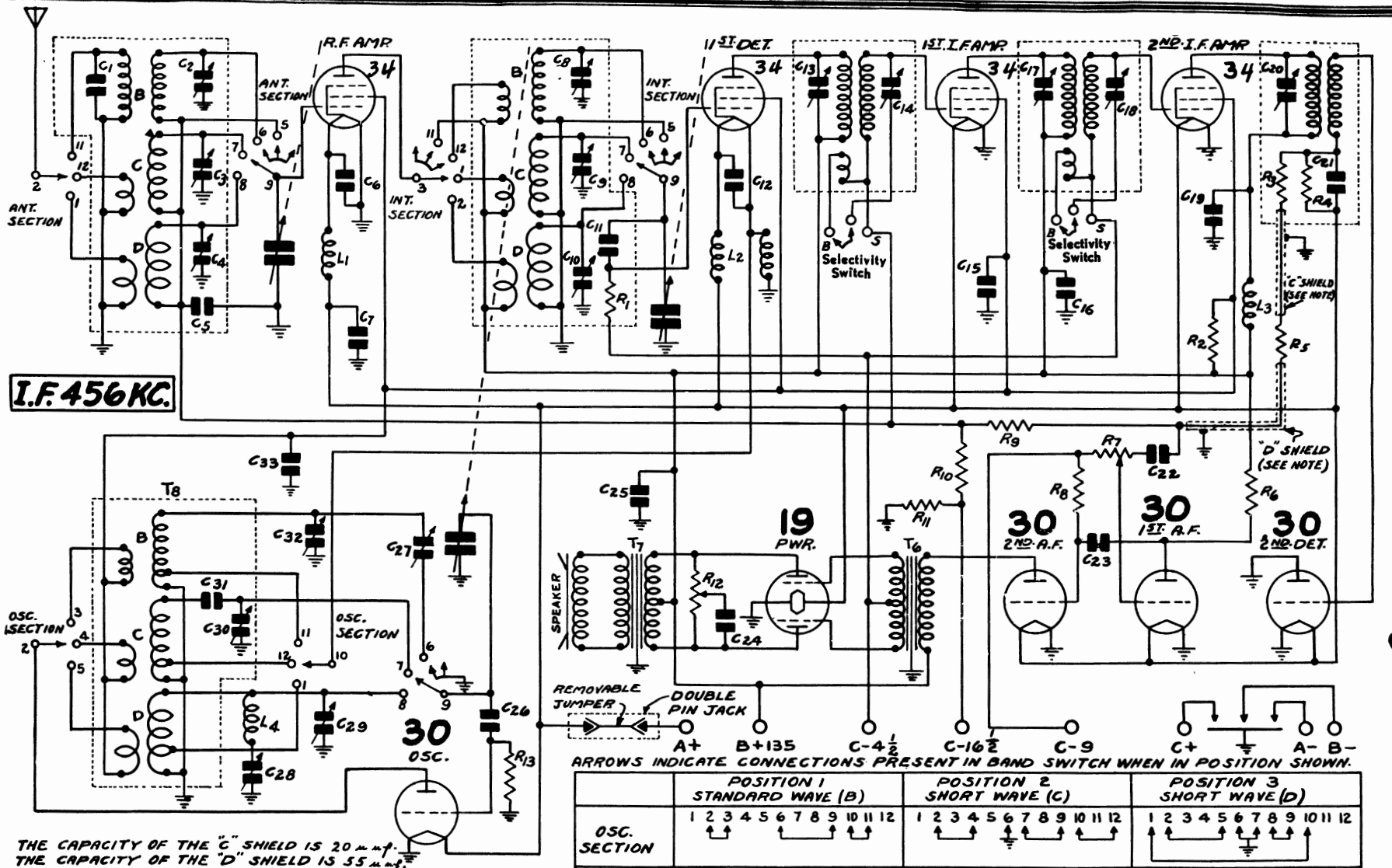
C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 .25 mf. 180 V.
C11 .05 mf. 180 V.
C12 .25 mf. 180 V.
C13 35 mmf.
C14 2-25 mmf.
C15 1400 mmf.
C16 2-25 mmf.
C17 300-600 mmf. } ONE
C18 40-100 mmf. } ASSEMBLY
C22 70-150 mmf. } ONE
C23 70-150 mmf. } ASSEMBLY
C24 40-100 mmf.
C25 50 mmf.
C26 100 mmf.
C27 50 mmf.
C28 .002 mf. 600 V.
C29 .05 mf. 180 V.
C33 20.0 mf. 150 V. Electrolytic
C34 .05 mf. 240 V.

R 1 1,000 Ohm .2 W.
R 2 1.0 Megohm .2 W.
R 3 100,000 Ohm .2 W.
R 4 5.000 Ohm .2 W.
R 8 3.0 Megohm .2 W.
R 9 1.0 Megohm .2 W.
R10 2,000 Ohm .2 W.
R11 7,000 Ohm .2 W.
R12 3.0 Megohm .2 W.
R13 30,000 Ohm .2 W.
R14 150,000 Ohm Tone Control

T 3 Osc. Inductors
T 4 1st. I.F. Trans.
T 5 2nd. I.F. Trans.
T 6 3rd. I.F. Trans.
T 7 Push-Pull Input Trans.

MONTGOMERY WARD & CO.

Models 62-207, -209 - 221



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. SECTION	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9
ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9

CONTACT LOCATIONS 4 AND 10 IN INT. SECTION, AND 3, 4 AND 10 IN ANT. SECTION ARE BLANK.

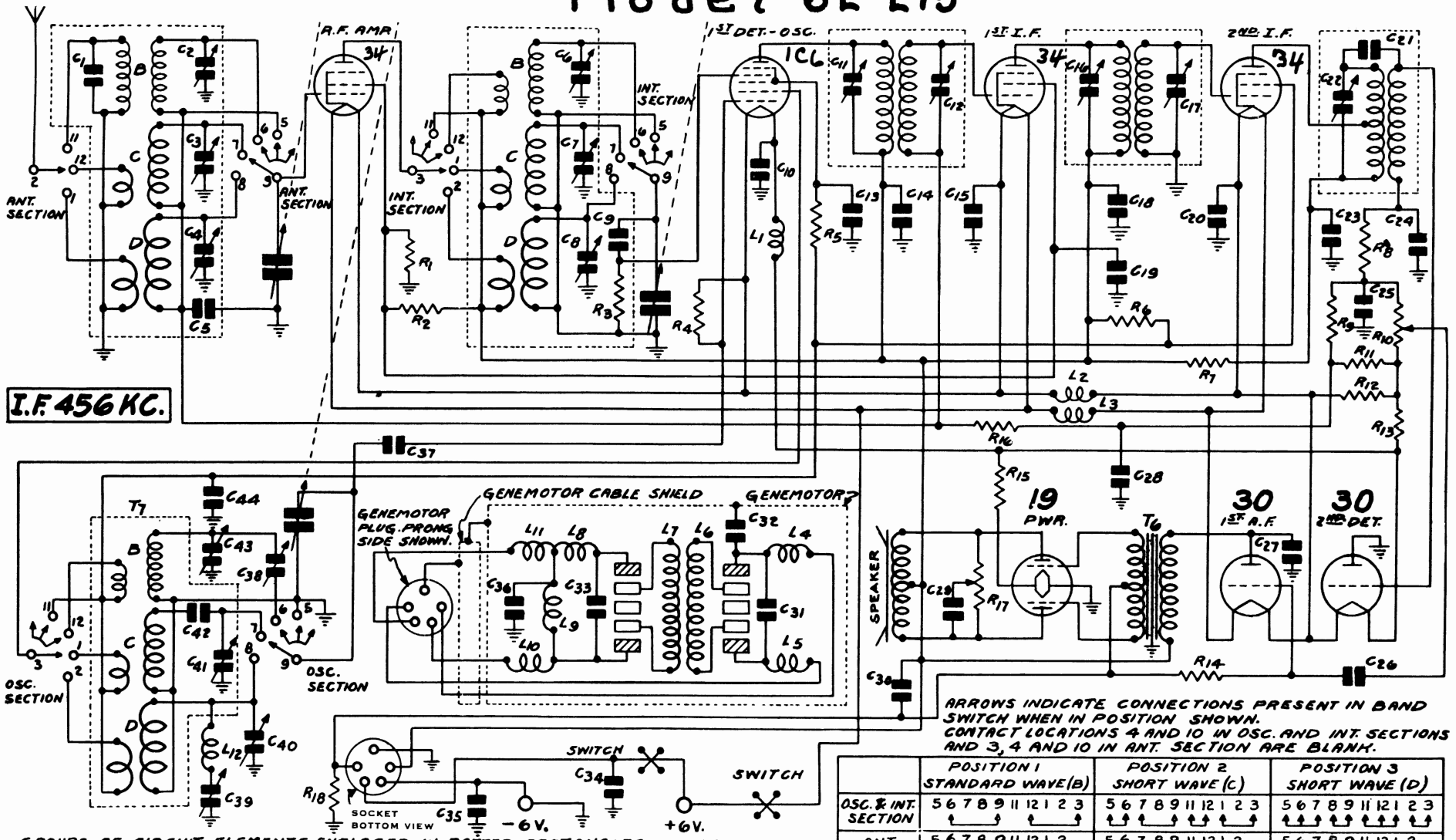
THE CAPACITY OF THE "C" SHIELD IS 20 mmf.
THE CAPACITY OF THE "D" SHIELD IS 55 mmf.
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON Selectivity SWITCH SECTIONS DENOTES "BROAD" AND "SHARP" RESPECTIVELY.

I.F. = 456 K.C.

C 1	250 mmf.	C11	35 mmf.	C21	70 mmf.	C31	1400 mmf.
C 2	2-25 mmf.	C12	.05 mf. 180 V.	C22	.01 mf. 360 V.	C32	2-25 mmf.
C 3	2-25 mmf.	C13	150-250 mmf. ONE	C23	.006 mf. 600 V.	C33	.25 mf. 180 V.
C 4	2-25 mmf.	C14	150-250 mmf. UNIT	C24	.05 mf. 240 V.		
C 5	.05 mf. 180 V.	C15	4.0 mf. 150 V. ELECTRO-	C25	.25 mf. 180 V.	R 1	1.0 Megohm .2 W.
C 6	.05 mf. 180 V.	C16	8.0 mf. 150 V. LYTIC	C26	35 mmf.	R 2	9,000 Ohm .5 W.
C 7	.25 mf. 180 V.	C17	150-250 mmf. ONE	C27	300-600 mmf. ONE	R 3	100,000 Ohm .2 W.
C 8	2-25 mmf.	C18	150-250 mmf. UNIT	C28	40-100 mmf. UNIT	R 4	300,000 Ohm .2 W.
C 9	2-25 mmf.	C19	.05 mf. 180 V.	C29	2-25 mmf.	R 5	100,000 Ohm .2 W.
C10	2-25 mmf.	C20	70-150 mmf.	C30	2-25 mmf.	R 6	100,000 Ohm .2 W.

R 7	2.0 Megohm Vol. Cont.	T 3	1st. I.F. Trans.
R 8	1.0 Megohm .2 W.	T 4	2nd. I.F. Trans.
R 9	2.0 Megohm .2 W.	T 5	3rd. I.F. Trans.
R10	5.0 Megohm .2 W.	T 6	Push-Pull Input Trans.
R11	15,000 Ohm .2 W.	T 7	Audio Output Trans.
R12	150,000 Ohm Tone Cont.	T 8	Osc. Inductors
R13	100,000 Ohm .2 W.	L 1	Single Filament Reactor
		L 2	Double Filament Reactor
T 1	Ant. R.F. Trans.	L 3	2nd. I.F. Plate Reactor
T 2	Int. R.F. Trans.	L 4	Osc. Tracking Coil

Model 62-215



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.
CONTACT LOCATIONS 4 AND 10 IN OSC. AND INT. SECTIONS AND 3, 4 AND 10 IN ANT. SECTION ARE BLANK.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. & INT. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

I.F. = 456 K.C.

C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 2-25 mmf.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 35 mmf.
C10 .25 mf. 180 V.
C11 70-150 mmf. } ONE
C12 70-150 mmf. } UNIT
C13 .05 mf. 180 V.
C14 20.0 mf. 150 V. Electrolytic
C15 .25 mf. 180 V.
C16 70-150 mmf. } ONE
C17 70-150 mmf. } UNIT
C18 .50 mf. 180 V.
C19 .85 mf. 180 V.
C20 .05 mf. 180 V.
C21 50 mmf.
C22 40-100 mmf.
C23 .05 mf. 180 V.
C24 100 mmf.
C25 50 mmf.
C26 .002 mf. 600 V.
C27 250 mmf.
C28 .01 mf. 180 V.
C29 .05 mf. 240 V.
C30 20.0 mf. 150 V. Electrolytic
C31 .25 mf. 180 V.
C32 .05 mf. 180 V.
C33 .25 mf. 180 V.
C34 .25 mf. 180 V.
C35 .25 mf. 180 V.
C36 .50 mf. 180 V.
C37 35 mmf.
C38 300-600 mmf. } ONE
C39 40-100 mmf. } UNIT
C40 2-25 mmf.
C41 2-25 mmf.
C42 1400 mmf.
C43 2-25 mmf.
C44 .25 mf. 18 V.

R 1 100,000 ohm .2 W.
R 2 60,000 ohm .2 W.
R 3 1 megohm .2 W.
R 4 100,000 ohm .2 W.
R 5 5,000 ohm .2 W.
R 6 10,000 ohm .5 W.
R 7 1,000 ohm .2 W.
R 8 60,000 ohm .2 W.
R 9 3 megohm .2 W.
R10 1 megohm Vol. Control
R11 1 megohm .2 W.
R14 3 megohm .2 W.
R16 500,000 ohm .2 W.
R17 150,000 ohm Tone Control
R12 12.5 ohm 1.0 W. } ARMORED
R13 12.5 ohm 1.0 W. } WIRE-WOUND
R15 .70 ohm .50 W. } RESISTOR
R18 150 ohm 2.0 W. } RESISTOR

T 1 Ant. R. F. Trans.
T 2 Interstage R. F. Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 3rd I. F. Trans.
T 6 Push Pull Input Trans.
T 7 Osc. Inductors

L 1 Single Filament Reactor
L 2 } Double Filament
L 3 } Reactor
L 4 "B" Choke
L 5 "B" Choke
L6, L7, L8 & L9 Genemotor Windings
L10 "A" Choke
L11 "A" Choke
L12 Osc. Tracking Coil

MONTGOMERY WARD & CO.

MONTGOMERY WARD & CO.

MODEL 62-225

Service Data for Professional Service Men

DESCRIPTION

TUBES:

The Tube complement of this chassis is as follows:

1 Type 6F7—triode pentode as oscillator and first detector.
1 Type 6K7—remote cut-off pentode I.F. amplifier.
1 Type 75—duplex diode triode as diode detector, A.V.C. and A.F.
1 Type 6F6—pentode output tube.
1 Type 80—high vacuum rectifier.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

All voltages are measured with 119 volts on the primary of the power transformer.

Resistance of coils and transformer windings are indicated in ohms on schematic circuit diagram.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see illustrations) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

To check for open by-pass condensers, shunt each condenser with another of similar capacity and of the same voltage rating, which is known to be good, until the defective unit is located. Open by-pass condensers frequently cause oscillation and distorted tone. Defective and shorted electrolytic filter condensers cause excessive hum, motor-boating, low volume and a reduction in all D.C. voltages. Open or shorted electrolytic and by-pass condensers (across bias resistor of type 6F6 tube) will cause low volume and distorted tone.

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. The drive may be disassembled to replace the compression spring (part number 112-31) by removing the two screws which fasten it to the dial bracket. Before re-assembling all parts should be carefully cleaned and a small amount of vaseline applied to the ball bearings. All other dial parts are hardened and should cause no trouble.

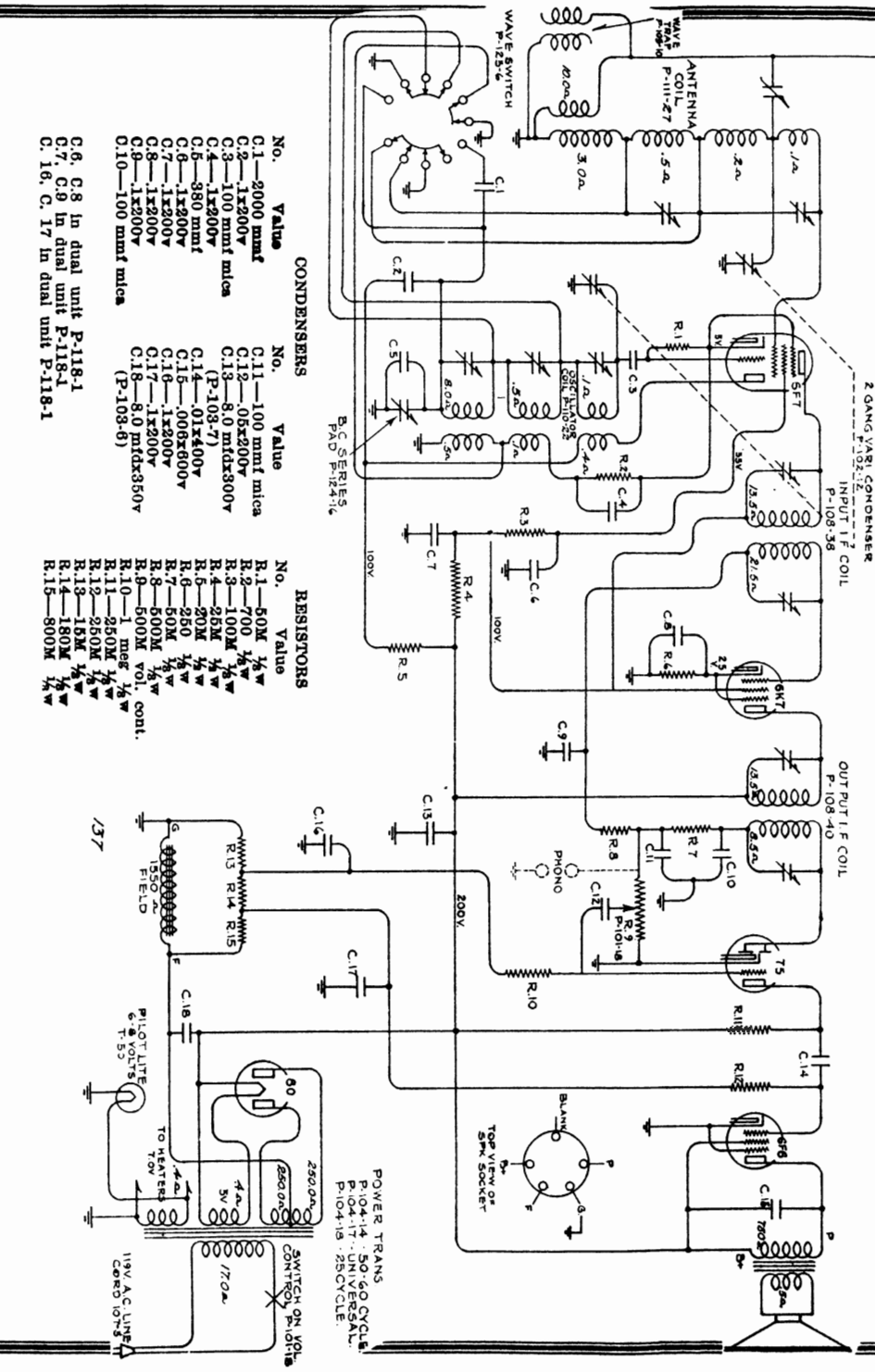
I.F. = 465 K.C.

CONDENSERS

No.	Value
C.1	2000 mmf
C.2	1x200v
C.3	100 mmf mica
C.4	1x200v
C.5	380 mmf
C.6	1x200v
C.7	1x200v
C.8	1x200v
C.9	1x200v
C.10	100 mmf mica
C.11	100 mmf mica
C.12	.05x200v
C.13	8.0 mfdx300v (P-103-7)
C.14	.01x400v
C.15	.006x600v
C.16	1x200v
C.17	1x200v
C.18	8.0 mfdx350v (P-103-8)
C.6, C.8 in dual unit P-118-1	
C.7, C.9 in dual unit P-118-1	
C. 16, C. 17 in dual unit P-118-1	

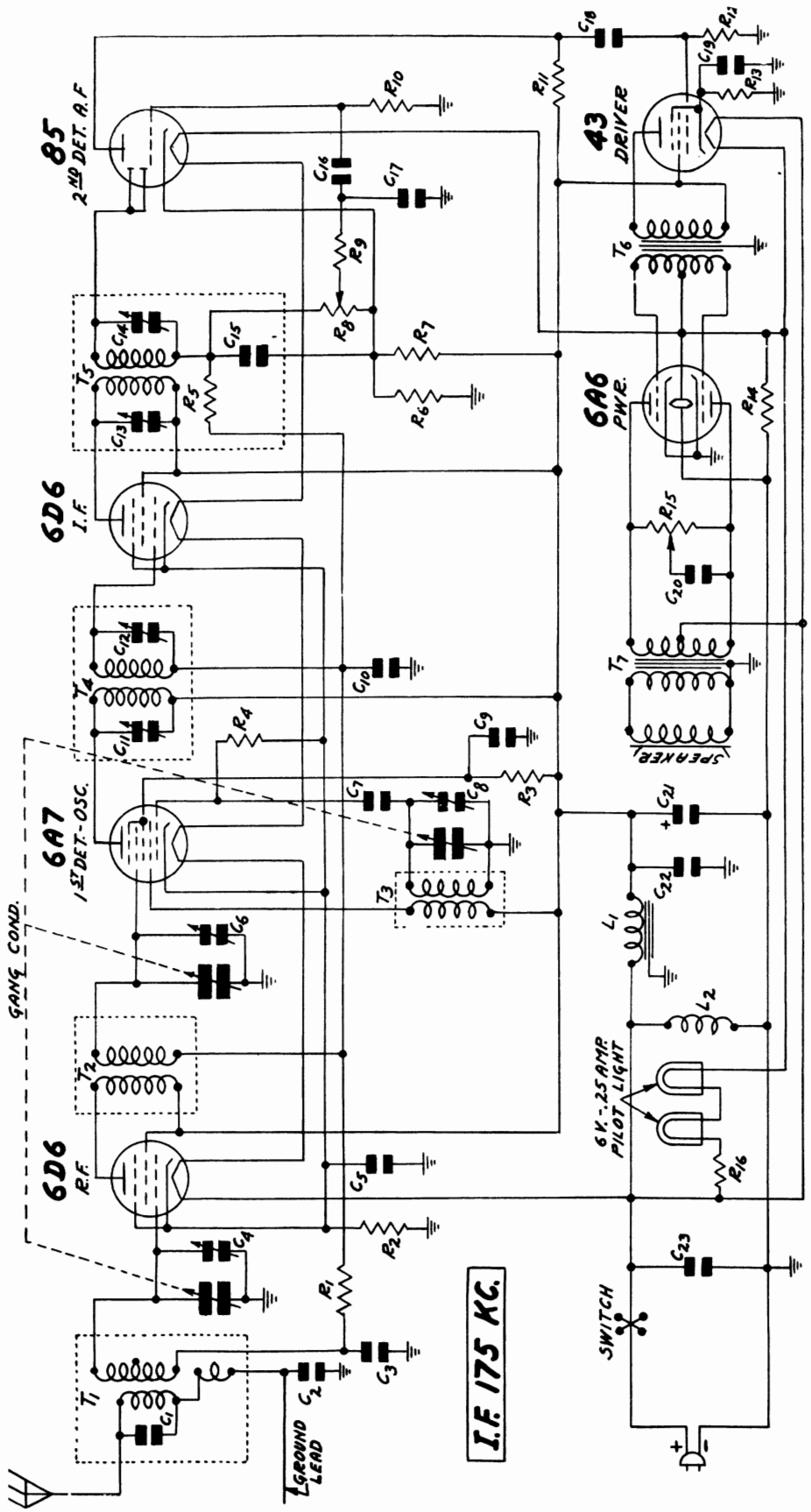
RESISTORS

No.	Value
R.1	50M ⅛w
R.2	700 ⅛w
R.3	100M ⅛w
R.4	25M ⅛w
R.5	20M ⅛w
R.6	250 ⅛w
R.7	50M ⅛w
R.8	500M ⅛w
R.9	500M vol. cont.
R.10	1 meg ⅛w
R.11	250M ⅛w
R.12	250M ⅛w
R.13	15M ⅛w
R.14	180M ⅛w
R.15	800M ⅛w



MONTGOMERY WARD & CO.

Model 62-229



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

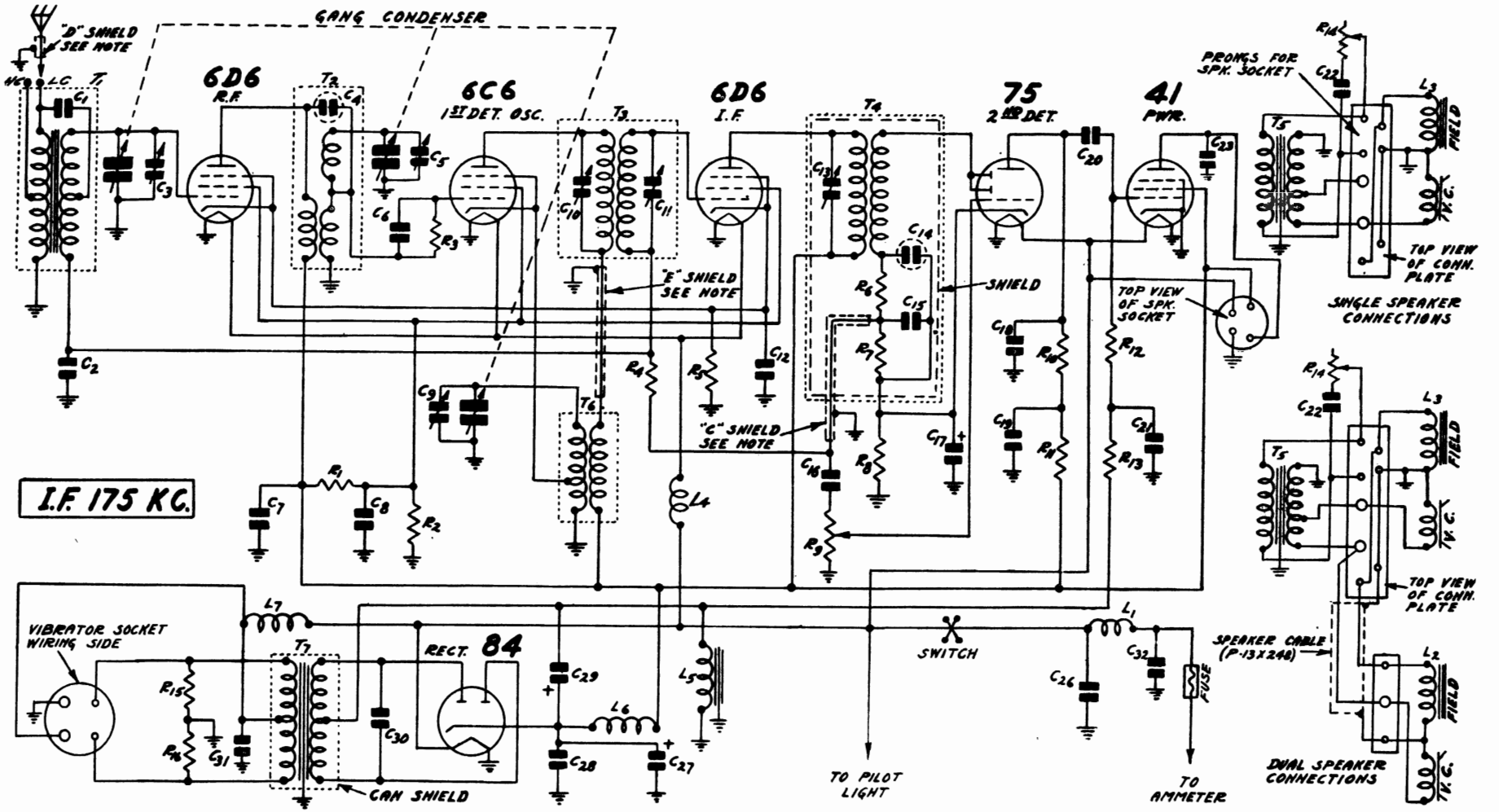
C1 .250 MMF MOULDED
C2 .05 MF 180 V.
C3 .05 MF 180 V.
C4 GANG TRIMMER
C5 .05 MF 180 V.
C6 GANG TRIMMER
C7 35 MMF MOULDED
C8 GANG TRIMMER
C9 .05 MF 180 V.
C10 .05 MF 180 V.
C11 40-100 MMF } DUAL
C12 40-100 MMF } P-17839
C13 40-100 MMF } DUAL
C14 40-100 MMF } P-17839
C15 100 MMF MOULDED
C16 .01 MF 180 V.
C17 50 MMF MOULDED
C18 .01 MF 180 V.
C19 12. MF 25 V. DRY ELECTROLYTIC P-45X207
C20 .10 MF 180 V.
C21 30 MF 50 V. WET ELECTROLYTIC P-44X25
C22 25 MF 180 V.
C23 25 MF 180 V.

R1 100 000 OHM .2 W.
R2 450 OHM .2 W.
R3 30 000 OHM .2 W.
R4 100 000 OHM .2 W.
R5 1.0 MEGOHM .2 W.
R6 350 OHM .2 W.
R7 6 000 OHM .2 W.
R8 .50 MEGOHM VOL. CONTROL P-36X2/3
R9 50 000 OHM .2 W.
R10 2.0 MEGOHM .2 W.
R11 80 000 OHM .2 W.
R12 1.0 MEGOHM .2 W.
R13 400 OHM 2 W.
R14 180 OHM 1.0 W.
R15 75000 OHM TONE CONTROL
R16 67 OHM 4.0 W ARMORED WIRE WOUND

T1 ANTENNA INTERSTAGE TRANS. P-9A452.
T2 INTERSTAGE R.F. TRANS P-9A453
T3 OSC. INDUCTORS
T4 1ST I.F. TRANS.
T5 2ND I.F. TRANS.
T6 INPUT TRANS.
T7 OUTPUT TRANS.

L1 FILTER REACTOR P-52X33
L2 SPEAKER FIELD 100. OHM.

Model 62-242



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 mmf, THE CAPACITY OF "D" SHIELD IS 85 mmf AND THE CAPACITY OF "E" SHIELD IS 15 mmf.

C 1 10 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } Dual
C11 70-150 mmf. }
C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.
C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C26 2000 mmf.
C28 2000 mmf.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C32 2000 mmf.
C17 4.0 mf. 25 V. } Electrolytic
C27 5.0 mf. 350 V. } Block
C29 8.0 mf. 350 V. }

R 1 17000 ohm 1.0 W.
R 2 20000 ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Vol. Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.
R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

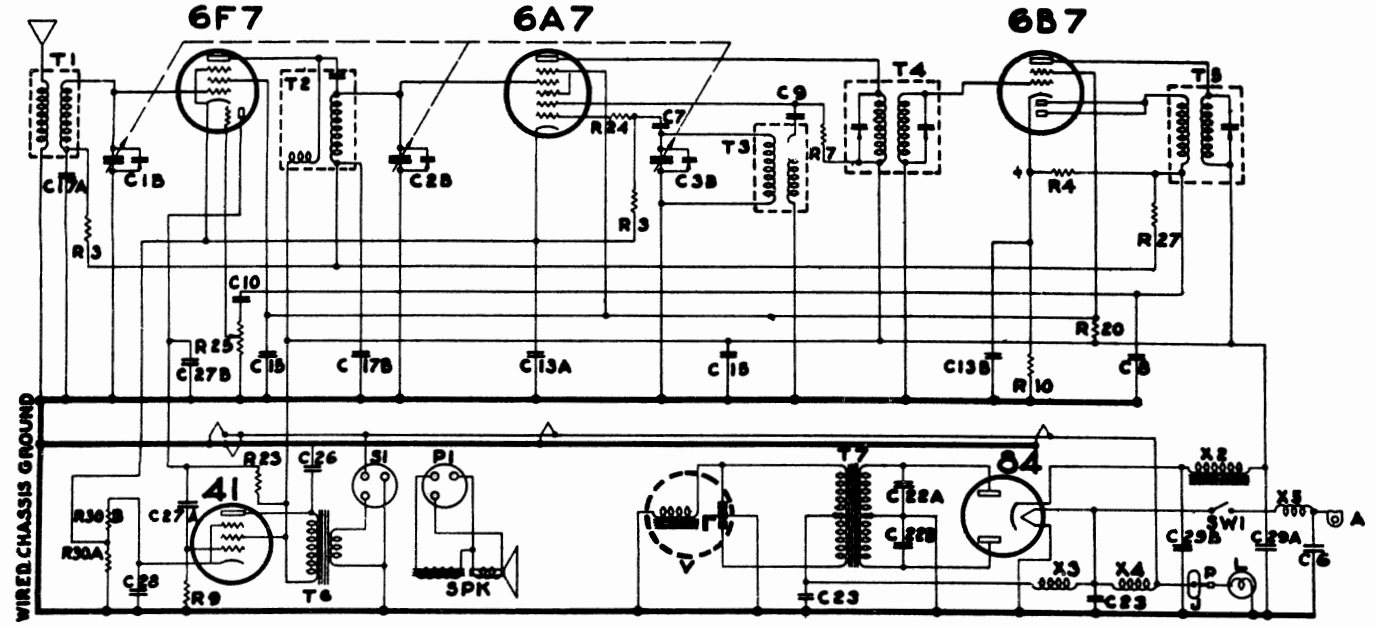
T 1 Antenna Trans.
T 2 R.F. Inter. Trans.
T 3 1st I.F. Trans.
T 4 2nd I.F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 2 Speaker Field 4.9 ohm
L 3 Speaker Field 5.3 ohm
L 4 Filament Reactor
L 5 Filter Reactor
L 6 "B" Reactor
L 7 Vibrator Reactor

MONTGOMERY WARD & CO.

NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO ~ MODEL 7



RESISTORS

R	OHMS	W	PART Nº	PRICE
1				
2				
3	100 M	½	17-2068	.20
4	200 M	½	17-2069	.20
5			VOL. CONT.	17-4183-3	1.00
6				
7	20 M	½	17-2072	.20
8				
9	1 MEG	½	17-2060	.20
10	6 800	½	17-2056	.20
11				
12				
13				
14				
15				
16				
17				
18				
19	250 OHM	½	17-4788	.25
21				
22				
23	250 M	½	17-3011	.20
24	1 M	½	17-2065	.20
25				
26				
27	2 MEG	½	17-4788	.20
28				
29	25 OHM		17-3031	.35
30	2000-40 000 OHM			

* MAY BE VARIED FROM 200 Ω TO 500 Ω TO CONTROL SENSITIVITY.

MAY BE VARIED FROM 20,000 Ω TO 50,000 Ω TO CONTROL SENSITIVITY.

CONDENSERS

C	CAPACITY	VOLT	PART Nº	PRICE
1B	3 GANG — TUNING		17-4788	4.00
2B				
3B				
4				
5				
6	.002 MICA	600	17-2063	.20
7	.0001 MICA	600	17-2064	.20
8	.0005 MICA	600	17-2511	.20
9	.001 MICA	600	17-4292	.20
10	.05	160	17-4702	.30
11				
12				
13A	.1 } TWIN	18	17-4712	.75
13B	.1 }			
14A				
14B				
15	.15	400	17-4714	.35
16				
17A	.05 } TWIN	160	17-4731	.35
17B	.05 }			
18A				
18B				
19A				
19B				
20A				
20B				
21A				
21B				
22A	.05 } TWIN	1000	17-4193	.60
22B	.05 }			
23	.5	15	17-4708	.45
24				
25				
26	.005 MICA	600	17-4759	.25
27A	.01 } DUAL	600	17-4765	.50
27B	.006 }			
28	.15 ELECT.	25	17-4786	1.00
29A	.1 } DUAL —	500	17-4787	1.25
29B	.1 } ELECT.			

CHOKES & TRANSFORMERS

T#	TYPE	PART Nº	PRICE
T	TRANSFORMERS		
1	ANTENNA	00-4791	.90
2	RADIO FREQUENCY	00-4792	1.00
3	OSCILLATOR	00-4793	.85
4	FIRST I. F.	00-4794	1.75
5	SECOND I. F.	00-4795	1.75
6	OUTPUT	00-4797	1.50
7	POWER	00-4796	3.00
X	CHOKES		
1			
2			
3	FILTER	00-4784	1.30
3A	FILTER	00-4516	.40
4	FILAMENT	00-4818	.40
5	SUPPRESSION	00-4782	.25

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART Nº	PRICE
SPK	DYNAMIC SPEAKER	20-4231	4.00
V	VIBRATOR	17-4732	.60
SWI	VOLUME CONTROL SWITCH- SEE RES		
J	DIAL LIGHT JACK	17-4797	
P	DIAL LIGHT CONNECTING PIN	20-4018	
S1	SPEAKER SOCKET	17-4761	.15
P1	SPEAKER PLUG	17-4760	.15
L	DIAL LIGHT 6-8 VOLT	17-2145	.15
A	AMMETER CONNECTION		

I.F. PEAK=170 K.C.

◆ NOTE: FOR SILENT TUNING DISCONNECT R4 HERE AND RECONNECT TO GROUND.

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Triode Plate	Anode Grid 1500 KC	Osc. Grid 1500 KC
6F7	6	220	100	2.3'	50	—	—
6A7	6	220	100	2.3	—	175	5 to 10
6B7	6	220	100	3.5	—	—	—
41	6	205	220	18	—	—	—
84	6	230 (A. C.)	—	230	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

6F7

+ Heater	Inf.
— Heater	0
Plate to B+	100
Screen to B+	25,000
Cathode	52
Control Grid	2,300,500
Triode Grid	500,000
Triode Plate to B+	250,000

6A7

+ Heater	Inf.
— Heater	0
Plate to B+	82
Screen to B+	25,000
Anode Grid to B+	20,000
Oscillator Grid to	101,052
Cathode	52
Control Grid	2,200,500

6B7

+ Heater	Inf.
— Heater	0
Plate to B+	120
Screen to B+	25,000
Cathode	500
Control Grid	82
Diodes	200,620

41

+ Heater	Inf.
— Heater	0
Plate to B+	625
Screen to B+	0
Cathode	692
Control Grid	1,000,000

84

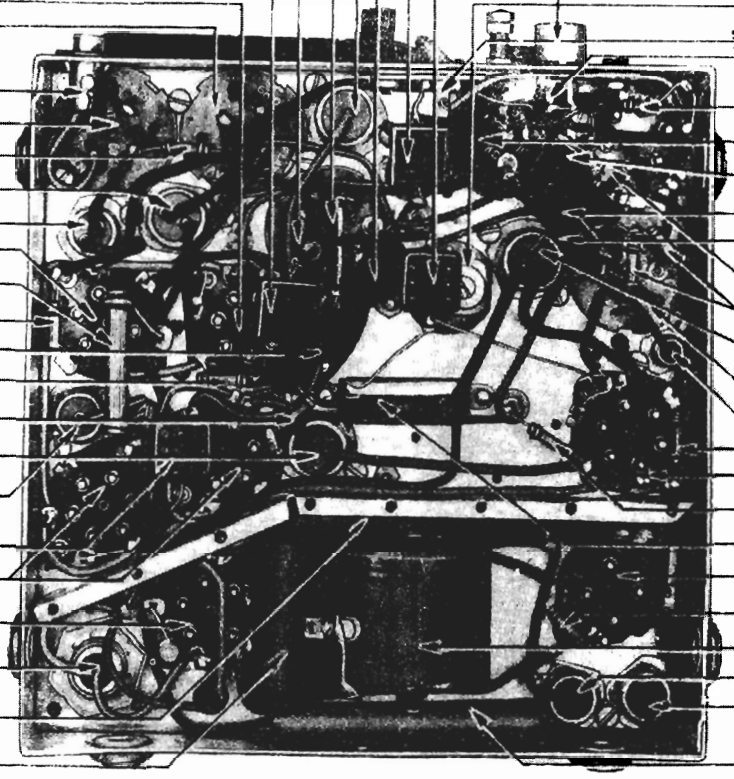
+ Heater	Inf.
— Heater	0
Plate	196
Plate	165
Plate to Plate	361
Cathode to B+	165

COIL RESISTANCES

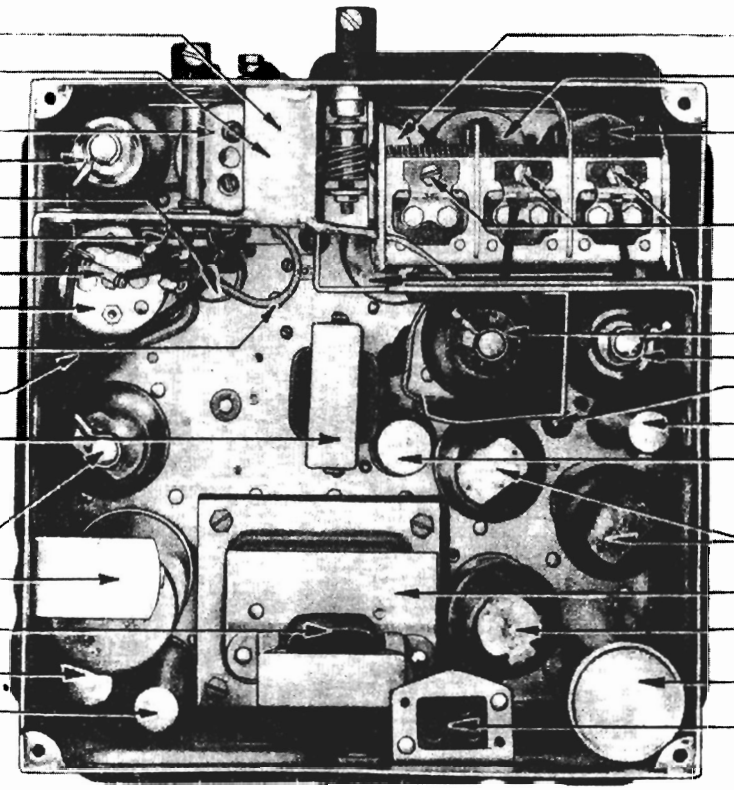
Ant. Primary ...	13	Oscillator Primary	2
Ant. Secondary	5	Oscillator Secondary	4
R. F. Primary	100	First I. F. Primary	82
R. F. Secondary	5	First I. F. Secondary	82
		Second I. F. Primary	120
		Second I. F. Secondary	120
		Output Trans. Primary	625
		Output Trans. Secondary	0.5
		Power Trans. Secondary CT 165 & 196, Total	361
		Speaker Field Coil	5.5
		Speaker Voice Coil	3
		"B" Filter Choke	165

NOBLITT SPARKS INDUSTRIES INC.

Model 7

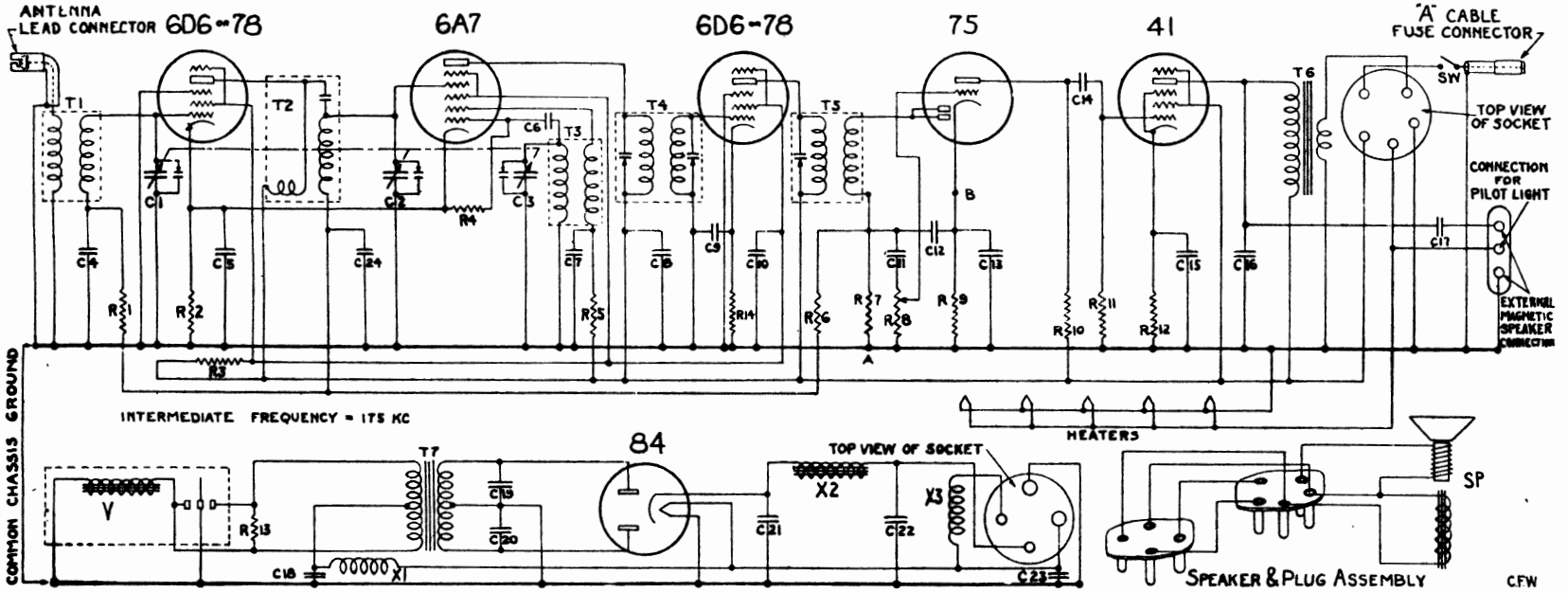


C15 #17-471.
15 MFD. 400V
C7 #17-2064
100MMFD. 600V.
T3 #00-4512
OSCILLATOR COIL
C9 #17-4292
.001 MFD. 600V.
6A7 TUBE
T2 #00-4511
RADIO FREQUENCY COIL
ANTENNA CONNECTOR
T1 #00-4510
ANTENNA COIL
R3 #17-2068
100MΩ 1/4 WATT
C13A-C13B #17-4712
.1-.1 MFD. 15V.
C17A-C17B #17-4731
.05-.05 MFD. 160V.
78 TUBE
R16 #17-4763
50MΩ 1 WATT
R26 #17-4781
600Ω 1/4 WATT
R24 #17-2065
1000Ω 1/4 WATT
R3 #17-2068
100MΩ 1/4 WATT
R23 #17-3011
250MΩ 1/4 WATT
C16 #17-4715
0.1 MFD. 600V.
C12 #17-4711
25 MFD. 400V.
C26 #17-4759
.006 MFD 600V
41 TUBES
84 TUBE
C20A-C20B #17-4703
4-12 MFD. ELECT 500V.
X3 #00-4516
"A" INPUT CHOKE
C22A-C22B #17-4193
.02-.02 MFD 1000V.
R7 #17-2072
20MΩ 1/4 WATT
P3 LOCAL-DISTANCE CONTROL PLUG
C25 #17-4741
.003MFD 600V.
C5 #17-4700
.0011MFD. 600V
C4 #17-4726
.00022 MFD PADDER
S2 TONE-PILOT
S3 LOCAL-DISTANCE #17-4375
R11 #17-4702
2000Ω 1/4 WATT
T4 #00-4517
1 ST IF TRANS.
C6 #17-2063
.002 MFD. 600V.
C8 #17-2211
.0005 MFD. 600V.
R9 #17-2080
1 MEG 1/4 WATT
78 TUBE
R13 #17-2067
75MΩ 1/4 WATT
C18A-C18B #17-4707
12-12 MFD. ELECT. 25V.
T5 #00-4514
2ND. IF TRANS
C10 #17-4702
.05 MFD. 160V.
R6 #17-2071
5000Ω 1/4 WATT
75 TUBE
R4 #17-2069
200MΩ 1/4 WATT
R17 #17-4719
250Ω 2 WATT
V #17 4732
VIBRATOR
R14 #17-4287
200Ω 1/4 WATT
T7 #00-4746
POWER TRANSFORMER
C24 #17-4709
1.0 MFD. 15V
C23 #17-4708
.5 MFD. 15V
X4 #00-4515
FILAMENT CHOKE



C6 #17-2063
.002 MFD. 600V
X5 #00-4782
SUPPRESSION CHOKE
T4 #00-4517
1ST IF TRANS.
78 TUBE
C18A-C18B #17-4707
12-12 MFD. ELECT. 25V.
R25 #17-4152-3
500MΩ VOL. CONT.
R5 #17-2070
500MΩ 1/4 WATT
T5 #00-4514
2ND. IF TRANS.
C4 #17-4726
.00022 MFD. PAD.
C10 #17-4702
.05 MFD. 160V.
T6 #00-4756
OUTPUT TRANS.
75 TUBE
V #17-4732
VIBRATOR
X2 #00-4754
"B" FILTER CHOKE
C23 #17-4708
.5 MFD. 15V.
C24 #17-4709
1.0 MFD. 15V.
C15 #17-4714
.15 MFD. 400V.
T2 #00-4511
RADIO FREQUENCY COIL
T1 #00-4510
ANTENNA COIL
C1-C2-C3 #17-4725
3 GANG TUNING COND.
T3 #00-4512
OSCILLATOR COIL
6A7 TUBE
78 TUBE
TEST +B HERE.
C12 #17-4711
.25 MFD. 400V.
C16 #17-4715
1 MFD 600V
41 TUBES
T7 #00-4746
POWER TRANSFORMER
84 TUBE
C20A-C20B #17-4703
4-12 MFD. ELECT. 500V
S1 #17-4761
SPEAKER SOCKET

ARVIN Model 16
CAR RADIO



CAPACITORS

	Description		Part No.
C 1, C 2, C 3	3 Gang Variable		19-2248
C 4	.05 *uf*	160 V.	17-4329
C 5	.1 *uf*	100 V.	17-4393
C 6	100 *uuf*	600 V.	17-2064
C 7	.001 *uf*	600 V.	17-4292
C 8	.25 *uf*	300 V.	29-4188
C 9	.02 *uf*	100 V.	17-4394
C10	.1 *uf*	200 V.	17-2097
C11	.05 *uf*	160 V.	17-4329
C12	500 *uuf*	600 V.	17-2211
C13	.5 *uf*	10 V.	29-2224
C14	.05 *uf*	300 V.	17-3006
C15	12. *uf*	25 V.	17-2082
C16	.007 *uf*	600 V.	17-4392
C17	.02 *uf*	400 V.	17-2214
C18	1. *uf*	10 V.	17-4395
C19, C20	.02 *uf* Twin	1000 V	29-4193

CAPACITORS

	Description		Part No.
C21, C22	12. *uf* 4. *uf* Twin	450 V.	17-4201
C23	.5 *uf*	10 V.	29-2224
C24	.05 *uf*	160 V.	17-4329

MISCELLANEOUS

SP—Dynamic Speaker	17-4226
SW—Switch, Part of R8	17-4152-1
V—Vibrator Unit	29-2169C

In districts where signal strength is abnormally low, a slight increase in sensitivity may be obtained by removing the inter-channel noise suppression feature. Disconnect R7 at A and reconnect at B.

RESISTORS

	Description		Part No.
R 1	100,000 Ω	¼ W.	17-2068
R 2	260 Ω	¼ W.	17-2066
R 3	30,000 Ω	¼ W.	17-4276
R 4	100,000 Ω	¼ W.	17-2068
R 5	20,000 Ω	¼ W.	17-2072
R 6	1 Megohm	¼ W.	17-2080
R 7	150,000 Ω	¼ W.	17-4283
R 8	250,000 Ω	Pot.	17-4152-1
R 9	5,000 Ω	¼ W.	17-2071
R10	250,000 Ω	¼ W.	17-3011
R11	500,000 Ω	¼ W.	17-2070
R12	800 Ω	½ W.	17-4273
R13	200 Ω	¼ W.	17-4287
R14	2,000 Ω	¼ W.	17-4202

R14 NOTE: This resistor may be varied to control sensitivity.

TRANSFORMERS

	Description	Part No.
T1	Antenna	00-3020-1
T2	Radio Frequency	00-3017-1
T3	Oscillator	00-4482-1
T4	First I F	00-2258A
T5	Second I F	00-4476
T6	Output	00-4111
T7	Power	00-4102-2

CHOKES

X1	C T Primary	00-2178E
X2	Filter	00-4141
X3	Filament	00-2178F

NOTE: On orders for replacement parts, state part number and quantity desired.

MODEL 16 SOCKET VOLTAGES

Make voltage tests with 1666 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltages. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	6.0	230	100	4.5	0	—	—
6A7	6.0	240	100	4.5	—	180	5-10
78	6.0	240	100	7.0	0	—	—
75	6.0	85	—	1.5	—	—	—
41	6.0	235	240	18.5	—	—	—
84	6.0	235 (AC)	—	235	—	—	—

MODEL 16 POINT TO POINT RESISTANCE CHECK

All readings to ground unless otherwise specified. Readings taken with all tubes removed from set and R. F. chassis and speaker disconnected from power pack unit and R. F. chassis.

1st 6D6 78
+ Heater ..... Inf.
— Heater 0
Plate to B— 100
Screen Grid to B— 30,000
Suppressor Grid 0
Cathode 260
Control Grid 1,250,000

6A7
+ Heater ..... Inf.
— Heater 0
Plate to B— 82
Screen Grid to B— 30,000
Anode Grid to B— 20,000
Oscillator Grid 100,260
Cathode 260
Control Grid 1,150,000

2nd 6D6
+ Heater ..... Inf.
— Heater 0
Plate to B— 90
Screen Grid to B— 30,000
Suppressor Grid 0
Cathode 2,000
Control Grid 82

75
+ Heater ..... Inf.
— Heater 0
Plate to B— 250,000
Diodes 150,000
Cathode 5,000
Control Grid ..... 0 to 250,000

41
+ Heater ..... Inf.
— Heater 0
Plate to B— 650
Screen Grid to B— 0
Control Grid 500,000
Cathode 800

84
+ Heater 0
— Heater 0
Plate 190
Plate 220
Plate to Plate 410
Cathode ..... Inf.*

*Reads leakage of electrolytic condenser.

Coil Resistances Model 16

Ant. Primary ..... 13 ohms
Ant. Secondary ..... 5 ohms

R. F. Primary ..... 100 ohms
R. F. Secondary ..... 5 ohms

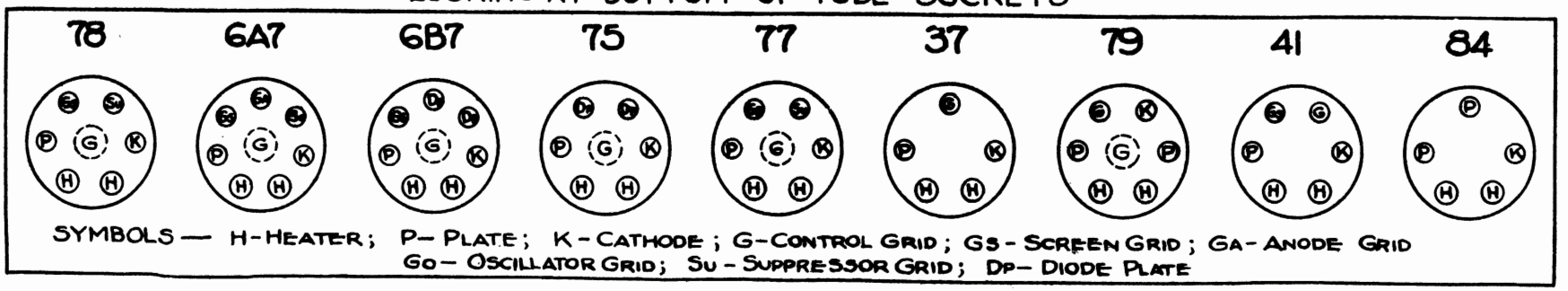
Oscillator Primary ..... 2 ohms
Oscillator Secondary ..... 3 ohms

First I. F. Primary ..... 82 ohms
First I. F. Secondary ..... 82 ohms

Second I. F. Primary ..... 90 ohms
Second I. F. Secondary ..... 90 ohms

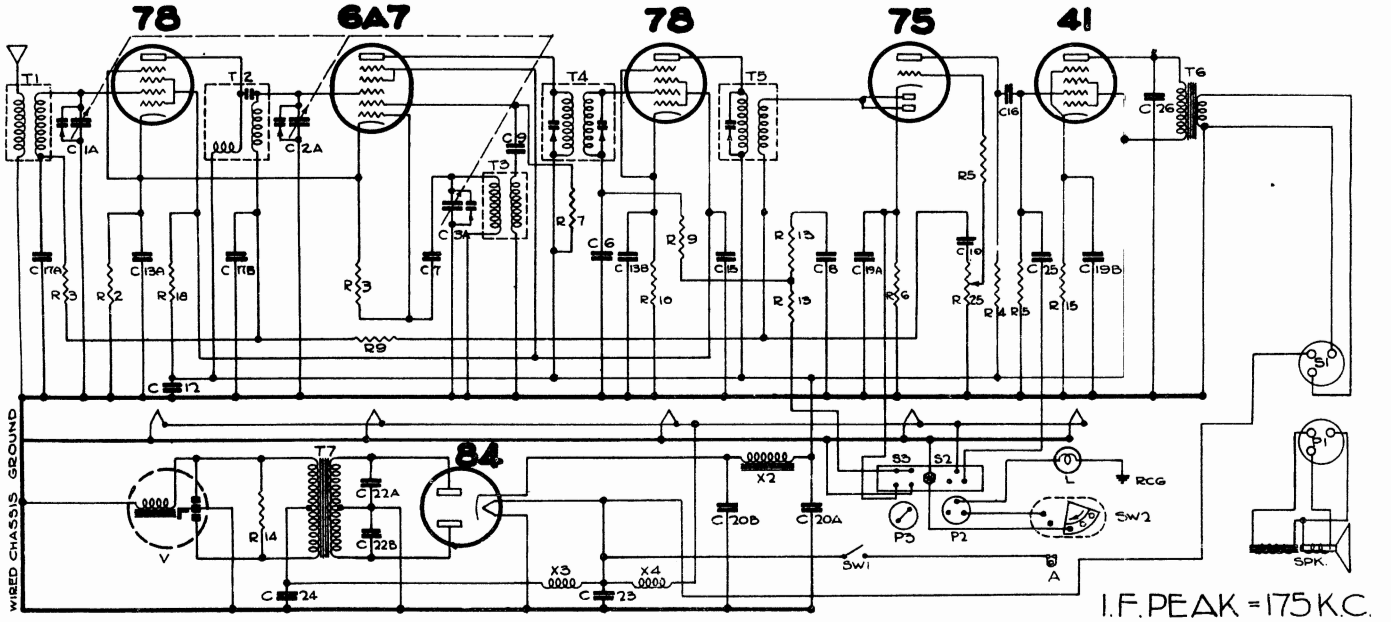
Primary Output Transformer .. 650 ohms

LOOKING AT BOTTOM OF TUBE SOCKETS



NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO—MODEL 17



I.F. PEAK = 175 K.C.

RESISTORS

R	OHMS	W	PART NO.	PRICE
1				
2	‡ 400	¼	17-4762	.20
3	100M	¼	17-2068	.20
4	200M	¼	17-2069	.20
5	500M	¼	17-2070	.20
6	5000	¼	17-2071	.20
7	20M	¼	17-2072	.20
8				
9	1MEG	¼	17-2080	.20
10	500	¼	17-2088	.20
11				
12				
13	75M	¼	17-2067	.20
14	200	¼	17-4287	.20
15	500	½	17-4717	.25
16				
17				
18	5 OHM	½	17-4720	.25
19				
20				
21				
22				
23				
24				
25	500M V.C.		17-4152-B	1.00
26				
27				

‡ MAY BE VARIED FROM 200Ω TO 600Ω TO CONTROL SENSITIVITY

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1A	5 GANG TUNING		17-4745	4.50
2A				
3A				
4				
5				
6	.002	600	17-2035	.20
7	.0001	600	17-2064	.20
8	.0005	600	17-2211	.20
9	.001	600	17-4292	.20
10	.05	180	17-4702	.50
11				
12	.25	400	17-4711	.55
13A	.10 TWIN	15	17-4712	.15
13B	.10 TWIN	15	17-4712	.15
14A				
14B				
15	.15	400	17-4714	.55
16	.10	600	17-4715	.40
17A	.05 TWIN	160	17-4731	.35
17B	.05 TWIN	160	17-4731	.35
18A				
18B				
19A	12.0 TWIN	25	17-4707	1.50
19B	12.0 TWIN	25	17-4707	1.50
20A	4.0 DUAL	300	17-4708	2.40
20B	12.0 DUAL	300	17-4708	2.40
21A				
21B				
22A	.02 TWIN	1000	17-4193	.60
22B	.02 TWIN	1000	17-4193	.60
23	.50	15	17-4708	.45
24	1.0	15	17-4709	.55
25	.002	600	17-4741	.25
26	.006	600	17-4759	.25

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
1	ANTENNA	00-4510	.80
2	RADIO FREQUENCY	00-4511	1.00
3	OSCILLATOR	00-4516	.85
4	FIRST I.F.	00-4517	1.75
5	SECOND I.F.	00-4514	1.75
6	OUTPUT	00-4737	1.50
7	POWER	00-4746	3.00
X-1			
X-2	'B' FILTER CHOKE	00-4754	1.30
X-3	'A' FILTER CHOKE	00-4516	.40
X-4	FILAMENT CHOKE	00-4515	.40

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK	SPEAKER	17-4232	4.50
V	VIBRATOR	17-4792	4.00
RCG	REMOTE CONTROL GROUND		
SW1	VOLUME CONTROL SWITCH	SEE P25	
SW2	TONE CONTROL SWITCH		
S1	SPEAKER SOCKET	17-4761	.15
S2	DIAL LITE - TONE SOCKET	17-4375	.30
S3	LOC: DIST. CONTROL SOCKET	17-4515	
P1	SPEAKER PLUG	17-4760	.15
P2	DIAL - LITE - TONE PLUG	17-4377	.15
P3	LOC: DIST. CONTROL PLUG	17-4740	.15
L	DIAL LITE 6-8 VOLT	17-2145	.15
A	AMMETER CONNECTION		

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	220	70	3.3	3.3	—	—
6A7	5.8	220	70	3.3	—	175	5-10
78	5.8	220	70	2.5	2.5	—	—
75	5.8	115	—	1.5	—	—	—
41	5.8	208	220	14.0	—	—	—
84	5.8	230 (AC)	—	225	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

78 (R. F.)

+ Heater	Inf.
— Heater	0
Plate to B+	113
Screen to B+	50,000
Suppressor Grid	400
Cathode	400
‡Control Grid	1,250,000

6A7

+ Heater	Inf.
— Heater	0
Plate to B+	115
Screen to B+	50,000
Anode Grid to B+	20,000
Oscillator Grid	100,400
Cathode	400
‡Control Grid	1,150,000

78 (I. F.)

+ Heater	Inf.
— Heater	0
Plate to B+	85
Screen to B+	50,000
Suppressor Grid	500
Cathode	500
‡Control Grid	1,075,000

41

+ Heater	Inf.
— Heater	0
Plate to B+	625
Screen to B+	0
Cathode	500
Control Grid	500,000

75

+ Heater	Inf.
— Heater	0
Plate to B+	200,000
Cathode	5,000
‡Diodes	150,000
Control Grid V. C. on	1,000,000
Control Grid V. C. off	500,000

84

+ Heater	Inf.
— Heater	0
Plate	196
Plate	165
Plate to Plate	361
Cathode to B+	165

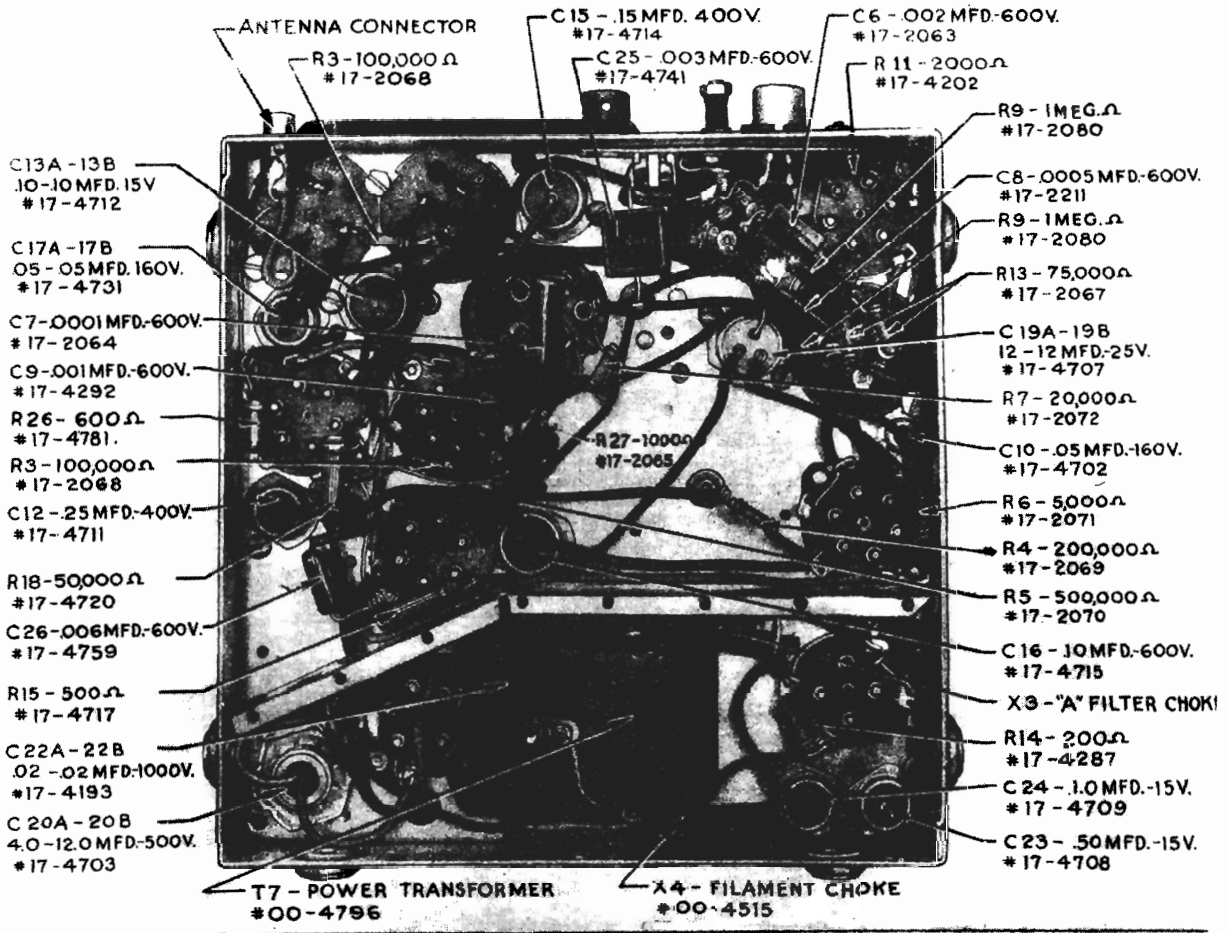
COIL RESISTANCES

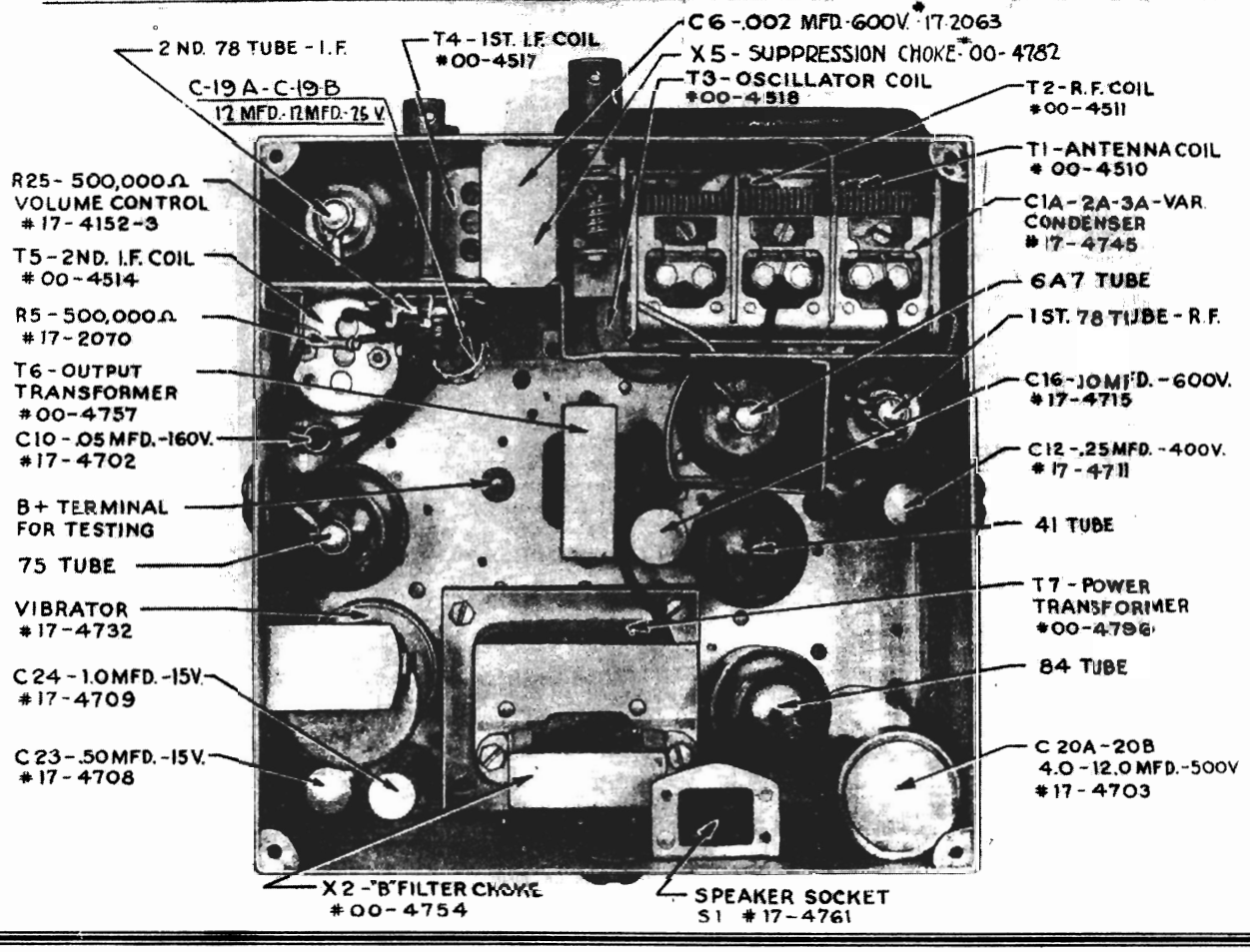
Ant. Primary	12.0
Ant. Secondary	4.0
R. F. Primary	113.0
R. F. Secondary	4.0
Oscillator Primary	3.0
Oscillator Secondary	1.5
First I. F. Primary	115.0
First I. F. Secondary	115.0
Second I. F. Primary	85.0
Second I. F. Secondary	85.0
Output Transformer Primary	625
Output Transformer Secondary	0.5
Power Transformer Secondary {165 / 196}	361
Speaker Field Coil	5.0
Speaker Voice Coil	3.0
"B" Filter Choke	165

‡ Readings given for sensitivity switch in "Local" position, for "Distance" add 5000 ohms.

NOBLITT SPARKS INDUSTRIES INC.

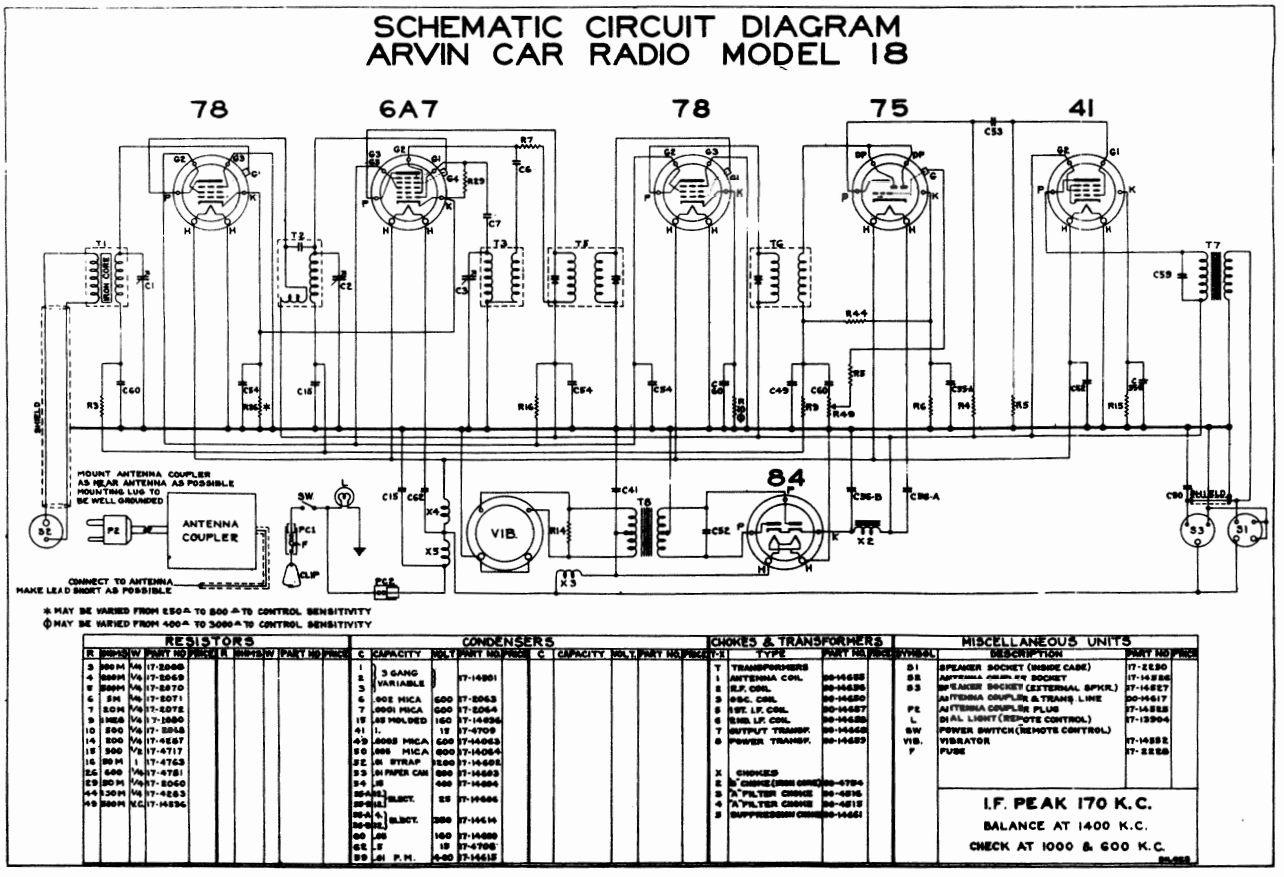
Model 17





NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM ARVIN CAR RADIO MODEL 18



MODEL 18 SOCKET VOLTAGES

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	†Oscillator * Grid	Anode Grid	*Diode Plates
78	6.3	3.5	0	90	195	.....	.....	.....
6A7	6.3	3.5	.....	90	195	2-5	120	.....
78	6.3	2.3	0	90	195	.....	.....	.....
75	6.3	1.6	.....	.....	110	.....	.....	1.9
41	6.3	14.5	.....	195	192	.....	.....	.....
84	6.3	200.0	.....	.....	215	.....	.....	.....

†Measured at 1500 K. C.
*Measured with Vacuum Tube Voltmeter

POINT TO POINT RESISTANCES

78—R. F. Amplifier

Heater 0
Heater ..... ∞
Cathode ..... 600 Ω
Suppressor 0
Screen to B+ ..... 50,000 Ω
Plate to B+ ..... 35 Ω
Control Grid ..... 1,250,000 Ω

6A7—1st Det. Oscillator

Heater 0
Heater ..... ∞
Cathode ..... 600 Ω
Osc. Grid ..... 50,600 Ω
Anode Grid to B+ ..... 20,000 Ω
Screen Grid to B+ ..... 50,000 Ω
Plate to B+ ..... 115 Ω
Control Grid ..... 1,150,000 Ω

78—I. F. Amplifier

Heater 0
Heater ..... ∞
Cathode ..... 500 Ω
Suppressor 0
Screen to B+ ..... 50,000 Ω
Plate to B+ ..... 85 Ω
Control Grid ..... 115 Ω

75—2nd Det.; 1st Audio

Heater 0
Heater ..... ∞
Cathode ..... 5,000 Ω
Diode ..... 150,000 Ω
Diode ..... 150,000 Ω
Plate to B+ ..... 200,000 Ω
Control Grid V.C. on ..... 1,000,000 Ω
V.C. off ..... 500,000 Ω

41—Power Output

Heater 0
Heater ..... ∞
Cathode ..... 500 Ω
Control Grid ..... 500,000 Ω
Screen to B+ 0
Plate to B+ ..... 625 Ω

84—Rectifier

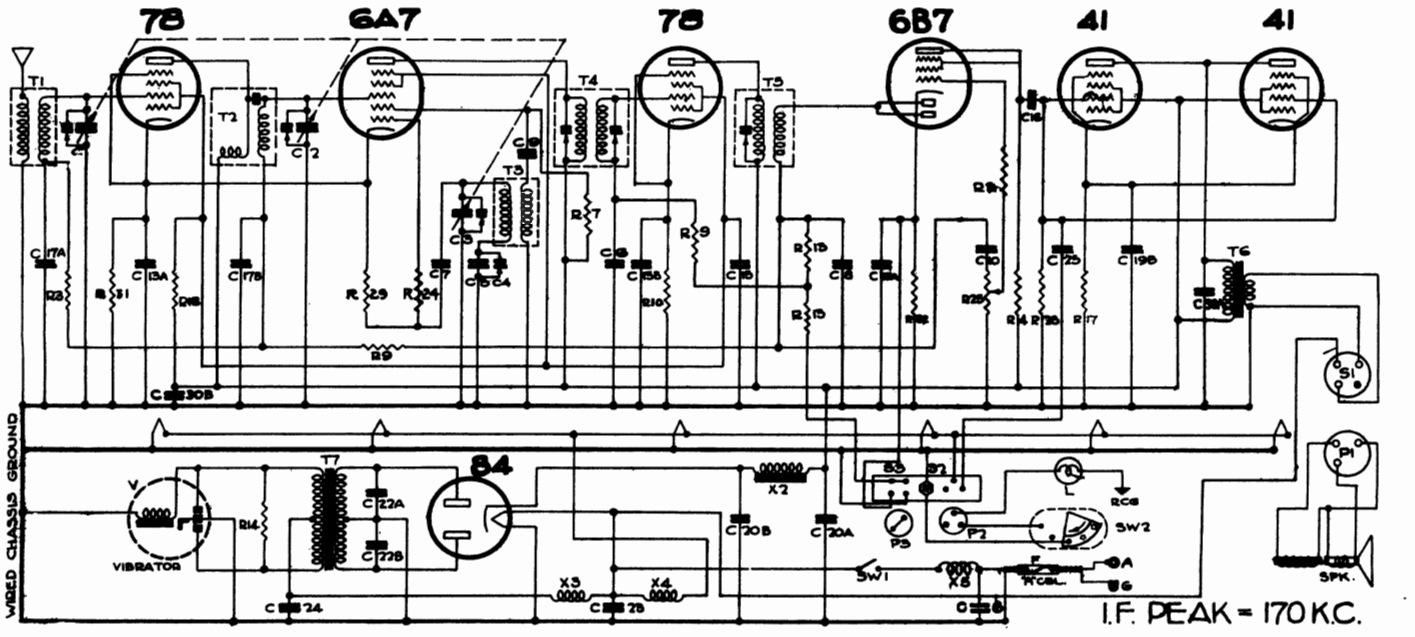
Heater 0
Heater ..... ∞
Cathode to B+ ..... 165 Ω
Plate ..... 250 Ω
Plate ..... 270 Ω
Plate to Plate ..... 520 Ω

COIL AND TRANSFORMER RESISTANCES

Antenna Pri. ..... .72
Antenna Sec. 2.80
R. F. Coil Pri. 113.00
R. F. Coil Sec 4.00
Oscillator Pri. 1.60
Oscillator Sec. 2.60
First I. F. Pri. 115.00
First I. F. Sec. 115.00
Second I. F. Pri. 85.00
Second I. F. Sec. 85.00
Output Tr. Pri. 625.00
Output Tr. Sec. 0.40
Power Tr. Pri. ..... .07
Power Tr. Sec. ..... 250-270—520
"B" Choke 165.00
Antenna Coupler Pri. 6.20
Antenna Coupler Sec. ..... .50

NOBLITT SPARKS INDUSTRIES INC.

ARVIN CAR RADIO — MODEL 27



RESISTORS									CONDENSERS								CHOKES AND TRANSFORMERS				MISCELLANEOUS UNITS			
R.	OHMS	W.	PART NO.	PRICE	R.	OHMS	W.	PART NO.	PRICE	C.	CAPACITY	VOLT.	PART NO.	PRICE	C.	CAPACITY	VOLT.	PART NO.	PRICE	T-X	TYPE	PART NO.	PRICE	SYMBOL	DESCRIPTION	PART NO.	PRICE
1					18					1					16	.10	600	17-4715	.40	1	ANTENNA	00-4810	.80	SPK	SPEAKER	17-4738	8.50
2					19					2	3 GANG TUNING		17-4725	4.50	17A	.05 TWIN	160	17-4731	.95	2	RADIO FREQUENCY	00-4811	1.00	V	VIBRATOR	17-4792	2.00
3	100M	½	17-3068	.20	20					3					17B	.05				3	OSCILLATOR	00-4813	.85	RCG	REMOTE CONTROL GROUND		
4	250M	½	17-3069	.20	21					4	.00022	PAD.	17-4726	.40	18A					4	FIRST I. F.	00-4817	1.75	SW1	VOLUME CONTROL SWITCH	881 225	
5	500M	½	17-3070	.20	22					5	.0011	680	17-4700	.50	18B					5	SECOND I. F.	00-4814	1.75	SW2	TONE CONTROL SWITCH		
6					23	250M	½	17-3011	.20	6	.002	600	17-2065	.20	19A	12.0 TWIN	25	17-4707	1.80	6	OUTPUT	00-4756	1.80	S1	SPEAKER SOCKET (4 PRONG)	17-4447	.15
7	20M	½	17-3072	.20	24	Rejo	½	17-3065		7	.0001	600	17-2064	.20	19B	12.0				7	POWER	00-4749	3.00	S2	DIAL LITE - TONE SOCKET	17-4918	.30
8					25	500M	VC	17-4912-S	1.00	8	.0005	600	17-2211	.20	20A	4.0 DUAL	500	17-4705	2.40					S3	LOC-DIST. CONTROL SOCKET	17-4918	
9	1MEG.	½	17-3080	.20	26					9	.001	600	17-4282	.20	20B	12.0								P1	SPEAKER PLUG	17-4764	.15
10	500	½	17-3068	.20	27					10	.05	160	17-4702	.30	21A									P2	DIAL LITE - TONE PLUG	17-4917	.15
11					28	1500		17-4885	.20	11					21B					X-1				P3	LOC-DIST CONTROL PLUG	17-4740	.15
12					29	250		17-3880	.20	12					22A	.05 TWIN	1000	17-4193	.60	X-2	'B' FILTER CHOKE	00-4734	1.30	L	DIAL LITE 6-8 VOLT	17-4897	.15
13	70M	½	17-3071	.20		V-MAY BE VARIED FROM 500 Ω TO 1000 Ω TO CONTROL SENSITIVITY				13A	.10 TWIN	15	17-4712	.75	22B	.01				X-3	'A' INPUT CHOKE	00-4816	.40	A	AMMETER CONNECTION		
14	200	½	17-4987	.20						13B					23	.50	15	17-4708	.45	X-4	FILAMENT CHOKE	00-4815	.40	⊕	AMMETER CABLE SHIELD GROUND LUG		
15										14A					24	1.0	15	17-4709	.55	X-5	SUPPRESSION CHOKE	00-4782	.25	'K CBL	AMMETER CABLE	00-4789	.70
16	50M	1	17-4988	.20	31	260	½	17-2864	.20	14B					25	.003	600	17-4741	.75					F	FUSE 2.0 AMP.	17-5218	.05
17	35Ω	5	17-4978	.15		3000	½	17-2090	.20	15	.15	400	17-4714	.50	26												

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	235	75	4.2	4.2	—	—
6A7	5.8	235	75	4.2	—	170	5-10
78	5.8	235	75	3.3	3.3	—	—
6B7	5.8	120	—	1.7	—	—	—
41	5.8	220	235	13.0	—	—	—
41	5.8	220	235	13.0	—	—	—
84	5.8	260 (AC)	—	245	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

78 (R. F.)

+ Heater	Inf.
— Heater	0
Plate to B+	113
Screen to B+	50,000
Suppressor Grid	400
Cathode	400
‡Control Grid	1,250,000

6A7

+ Heater	Inf.
— Heater	0
Plate to B+	115
Screen to B+	50,000
Anode to B+	20,000
Oscillator Grid	100,400
Cathode	400
‡Control Grid	1,150,000

78 (I. F.)

+ Heater	Inf.
— Heater	0
Plate to B+	85
Screen to B+	50,000
Suppressor Grid	500
Cathode	500
‡Control Grid	1,075,000

6B7

+ Heater	Inf.
— Heater	0
Plate to B+	200,000
‡Diodes	150,000
Cathode	3000
Control Grid V. C. on	1,000,000
Control Grid V. C. off	500,000

41

+ Heater	Inf.
— Heater	0
Plate to B+	330
Screen to B+	0
Cathode	250
Control Grid	250,000

41

+ Heater	Inf.
— Heater	0
Plate to B+	330
Screen to B+	0
Cathode	250
Control Grid	250,000

84

+ Heater	Inf.
— Heater	0
Plate	240
Plate	210
Plate to Plate	450
Cathode to B+	165

‡ Add 3000 Ω to these readings when sensitivity switch is on "Distance" position.

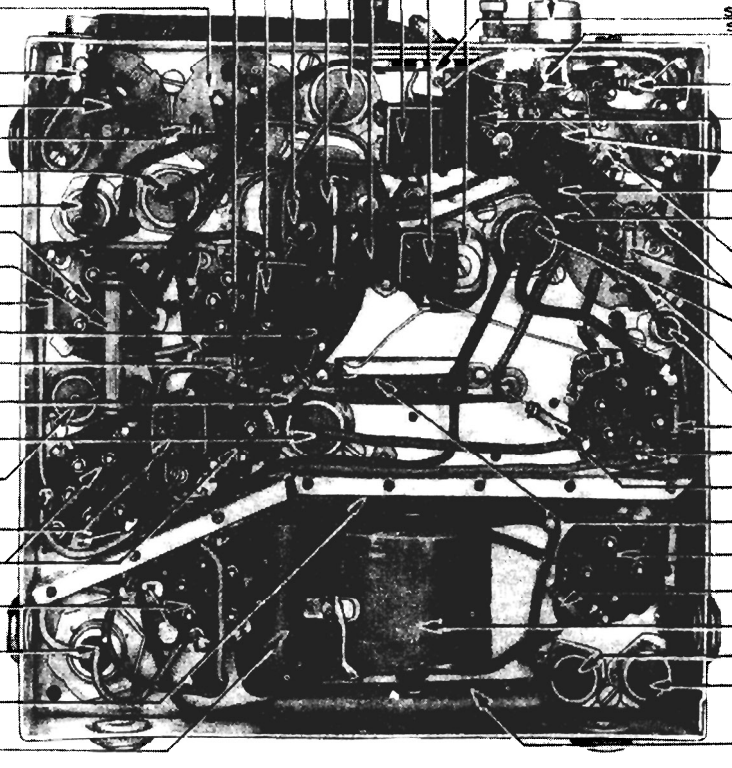
COIL RESISTANCES

Ant. Primary	12.0	Oscillator Primary	3.0	Second I. F. Primary	85.0	Power Transformer Secondary	
Ant. Secondary	4.0	Oscillator Secondary	1.5	Second I. F. Secondary	85.0		240-CT-210=450
R. F. Primary	113.0	First I. F. Primary	115.0	Output Transformer Primary	330	"B" Filter Choke	165
R. F. Secondary	4.0	First I. F. Secondary	115.0	Output Transformer Secondary	.05	Speaker Field Coil	4.0
						Speaker Voice Coil	3.0

NOTE: The above circuit diagram is effective for all Model 27 Arvin Car Radios beginning with and including serial No. D44011H.

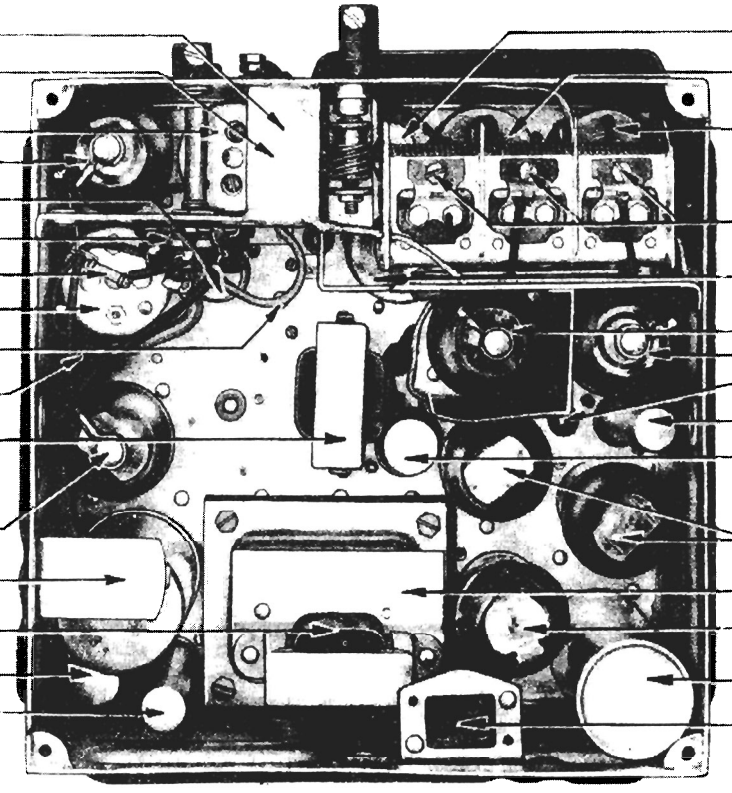
NOBLITT SPARKS INDUSTRIES INC.

Model 27



C15 #17-4714
15 MFD. 400V.
C7 #17-4264
100 MMFD 600V
T3 #00-4512
OSCILLATOR COIL
C9 #17-4292
.001 MFD 600V.
6A7 TUBE
T2 #00-4511
RADIO FREQUENCY COIL
ANTENNA CONNECTOR
T1 #00-4510
ANTENNA COIL
R3 #17-2068
100 MΩ 1/4 WATT
C13A-C13B #17-4712
1-1 MFD 15V
C17A-C17B #17-4731
.05-.05 MFD. 160V
78 TUBE
R16 #17-4763
50 MΩ 1 WATT
R26 #17-4781
600Ω 1/4 WATT
R24 #17-2065
1000Ω 1/4 WATT
R3 #17-2068
100 MΩ 1/4 WATT
R23 #17-3011
250 MΩ 1/4 WATT
C16 #17-4715
0.1 MFD. 600V.
C12 #17-4711
.25 MFD. 400V.
C26 #17-4759
.006 MFD 600V
41 TUBES
84 TUBE
C20A-C20B #17-4703
4-12 MFD. ELECT 500V.
X3 #00-4516
"A" INPUT CHOKE
C22A-C22B #17-4193
.02-.02 MFD 1000V.

R7 #17-2072
20 MΩ 1/4 WATT
P3 LOCAL-DISTANCE CONTROL PLUG
C25 #17-4741
.003 MFD 600V
C5 #17-4700
.0011 MFD 600V
C4 #17-4726
.00022 MFD. PADDER
S2 TONE-PILOT
S3 LOCAL-DISTANCE #17-4375
R11 #17-4202
2000Ω 1/4 WATT
T4 #00-4517
1ST I.F. TRANS
C6 #17-2063
.002 MFD. 600V
C8 #17-2211
.0005 MFD 600V
R9 #17-2080
1 MEG 1/4 WATT
78 TUBE
R13 #17-2067
75 MΩ 1/4 WATT
C18A-C18B #17-4707
12-12 MFD. ELECT 25V.
T5 #00-4514
2ND I.F. TRANS.
C10 #17-4702
.05 MFD. 160V.
R6 #17-2071
5000Ω 1/4 WATT
75 TUBE
R4 #17-2069
200 MΩ 1/4 WATT
R17 #17-4719
250Ω 2 WATT
V #17-4732
VIBRATOR
R14 #17-4287
200Ω 1/4 WATT
T7 #00-4746
POWER TRANSFORMER
C24 #17-4709
1.0 MFD. 15V
C23 #17-4708
.5 MFD. 15V
X4 #00-4515
FILAMENT CHOKE

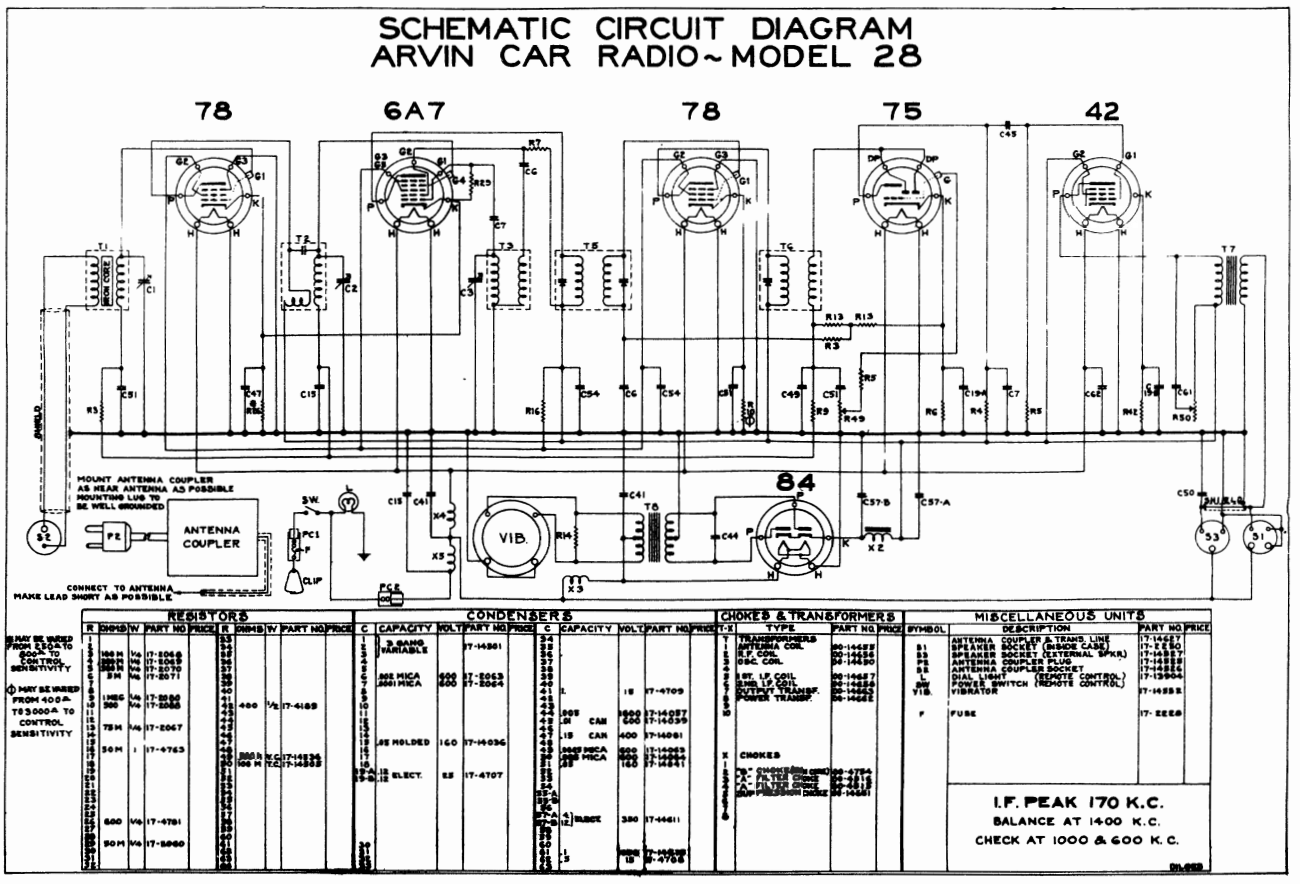


C6 #17-2063
.002 MFD 600V.
X5 #00-4782
SUPPRESSION CHOKE
T4 #00-4517
1ST I.F. TRANS
78 TUBE
C19A-C19B #17-4707
12-12 MFD. ELECT 25V
R25 #17-4152-3
500 MΩ VOL. CONT.
R5 #17-2070
500 MΩ 1/4 WATT
T5 #00-4514
2ND. I.F. TRANS.
C4 #17-4726
.00022 MFD PAD
C10 #17-4702
.05 MFD. 160V
T6 #00-4756
OUTPUT TRANS.
75 TUBE
V #17-4732
VIBRATOR
X2 #00-4754
"B" FILTER CHOKE
C23 #17-4708
.5 MFD. 15V.
C24 #17-4709
1.0 MFD 15V

C15 #17-4714
15 MFD 400V.
T2 #00-4511
RADIO FREQUENCY COIL
T1 #00-4510
ANTENNA COIL
C1-C2-C3 #17-4725
3 GANG TUNING COND
T3 #00-4512
OSCILLATOR COIL
6A7 TUBE
78 TUBE
TEST +8 HERE
C12 #17-4711
.25 MFD. 400V.
C16 #17-4715
1 MFD 600V.
41 TUBES
T7 #00-4746
POWER TRANSFORMER
84 TUBE
C20A-C20B #17-4703
4-12 MFD ELECT 500V
S1 #17-4761
SPEAKER SOCKET

NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO ~ MODEL 28



MODEL 28 SOCKET VOLTAGES

Tube	Heater	Plate	Screen	Cathode	Anode Grid	†Oscillator * Grid	*Diode Plates
78	6.3	235	90	4.0	.....	.....	.....
6A7	6.3	235	90	4.0	160	3-5V	.....
78	6.3	235	90	2.3	.....	.....	.....
75	6.3	120	.....	1.6	.....	.....	2.0
41	6.3	230	235	16.0	.....	.....	.....
84	6.3	275	.....	240	.....	.....	.....

*Measured with Vacuum Tube Voltmeter
†Reading taken at 1500 K. C.

POINT TO POINT RESISTANCES

78—R. F. Amplifier
Heater 0
Heater ..... ∞
Cathode ..... 600 Ω
Suppressor 0
Screen to B+ ..... 50,000 Ω
Plate to B+ ..... 35 Ω
Control Grid ..... 1,255,000 Ω

6A7—1st Det. Oscillator
Heater 0
Heater ..... ∞
Cathode ..... 600 Ω
Osc. Grid ..... 50,600 Ω
Anode Grid to B+ ..... 20,000 Ω
Screen to B+ ..... 50,000 Ω
Plate to B+ ..... 115 Ω
Control Grid ..... 1,155,000 Ω

78—1. F. Amplifier
Heater 0
Heater ..... ∞
Cathode ..... 500 Ω
Suppressor 0
Screen to B+ ..... 50,000 Ω
Plate to B+ ..... 85 Ω
Control Grid ..... 185,000 Ω

75—Det. 1st Audio
Heater 0
Heater ..... ∞
Cathode ..... 5,000 Ω
Diode ..... 155,000 Ω
Diode ..... 155,000 Ω
Plate to B+ ..... 200,000 Ω
Control Grid V.C. on ..... 1,000,000 Ω
V.C. off ..... 500,000 Ω

41—Power Output
Heater 0
Heater ..... ∞
Cathode ..... 500 Ω
Control Grid ..... 500 000 Ω
Screen to B+ 0
Plate to B+ ..... 625 Ω

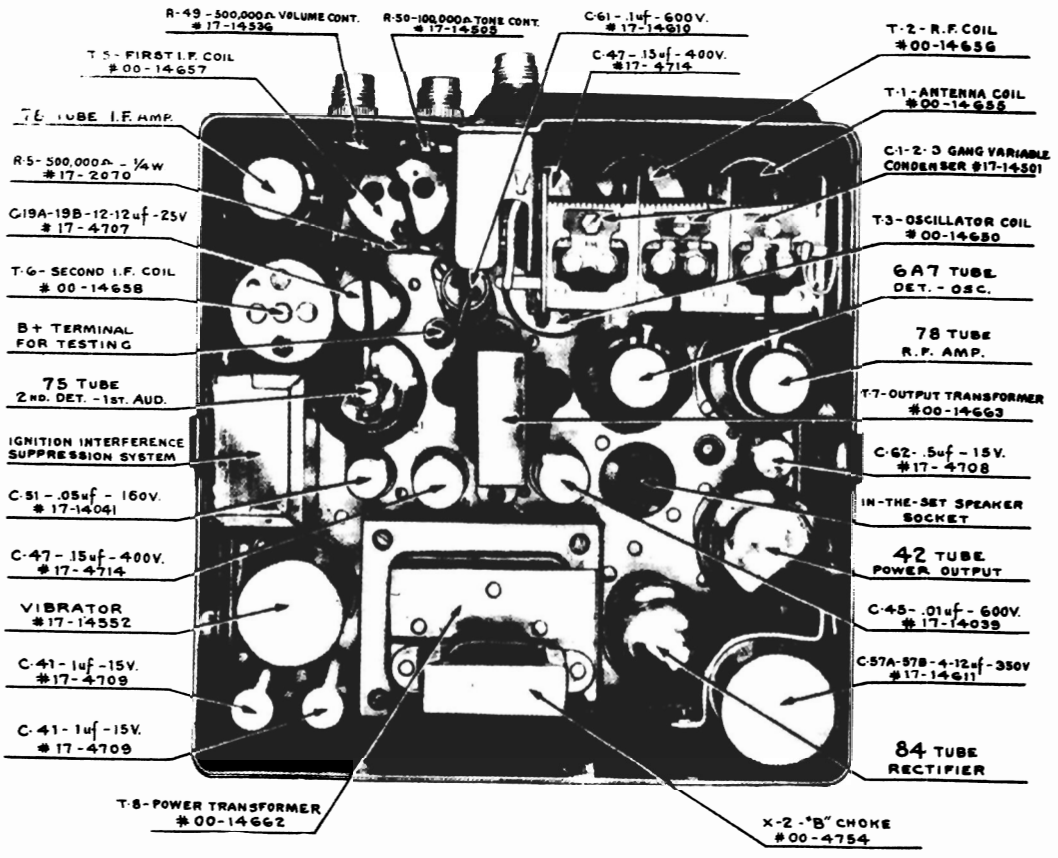
84—Rectifier
Heater 0
Heater ..... ∞
Cathode to B+ ..... 165 Ω
Plate ..... 175 Ω
Plate ..... 150 Ω
Plate to Plate ..... 325 Ω

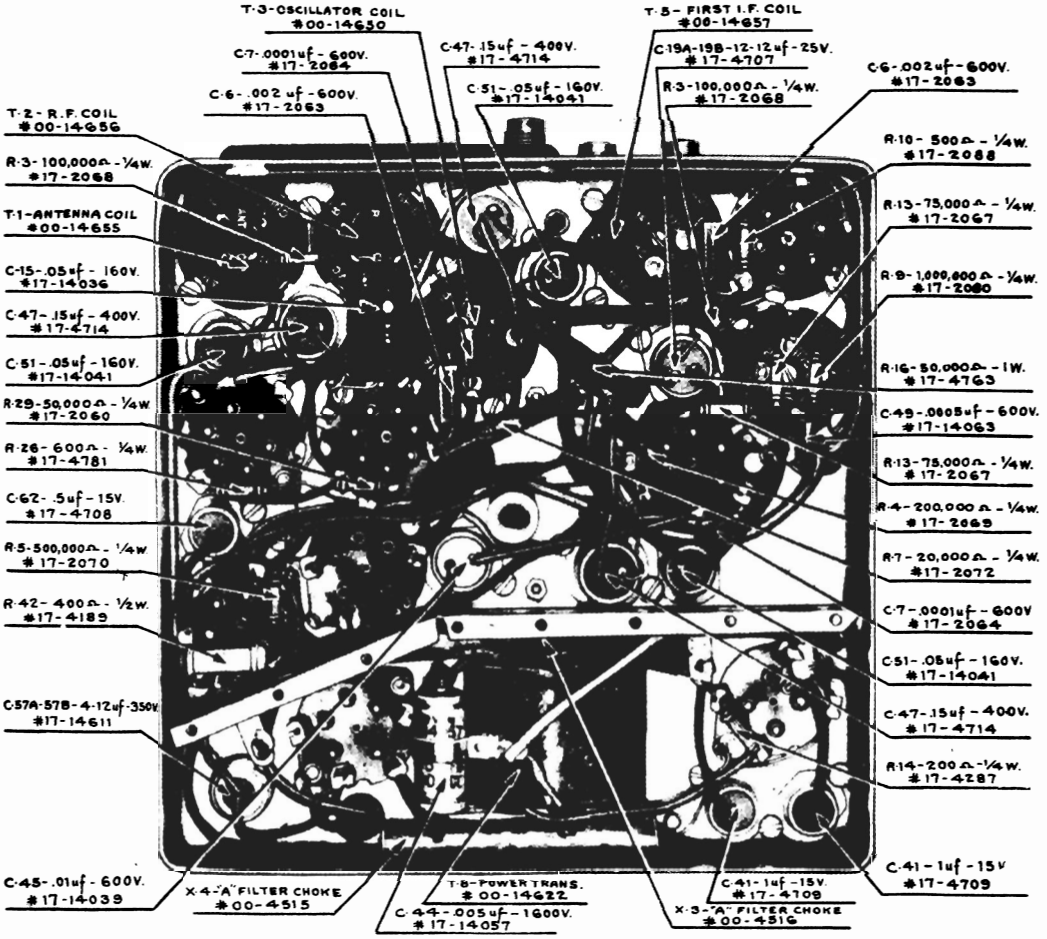
COIL AND TRANSFORMER RESISTANCES

Antenna Pri. ..... .72
Antenna Sec. 2.80
R. F. Coil Pri. 113.00
R. F. Coil Sec. 4.0
Oscillator Pri. 1.60
Oscillator Sec 2.60
First I. F. Pri. 115.00
First I. F. Sec. 115.00
Second I. F. Pri. 85.00
Second I. F. Sec. 85.00
Output Tr. Pri. 625.00
Output Tr. Sec. 0.40
Power Tr. Pri. ..... .07
Power Tr. Sec. ..... 175-150—325
"B" Choke 165.00
Antenna Matching Tr. Pri. 6.20
Antenna Matching Tr. Sec. ..... .50

NOBLITT SPARKS INDUSTRIES INC.

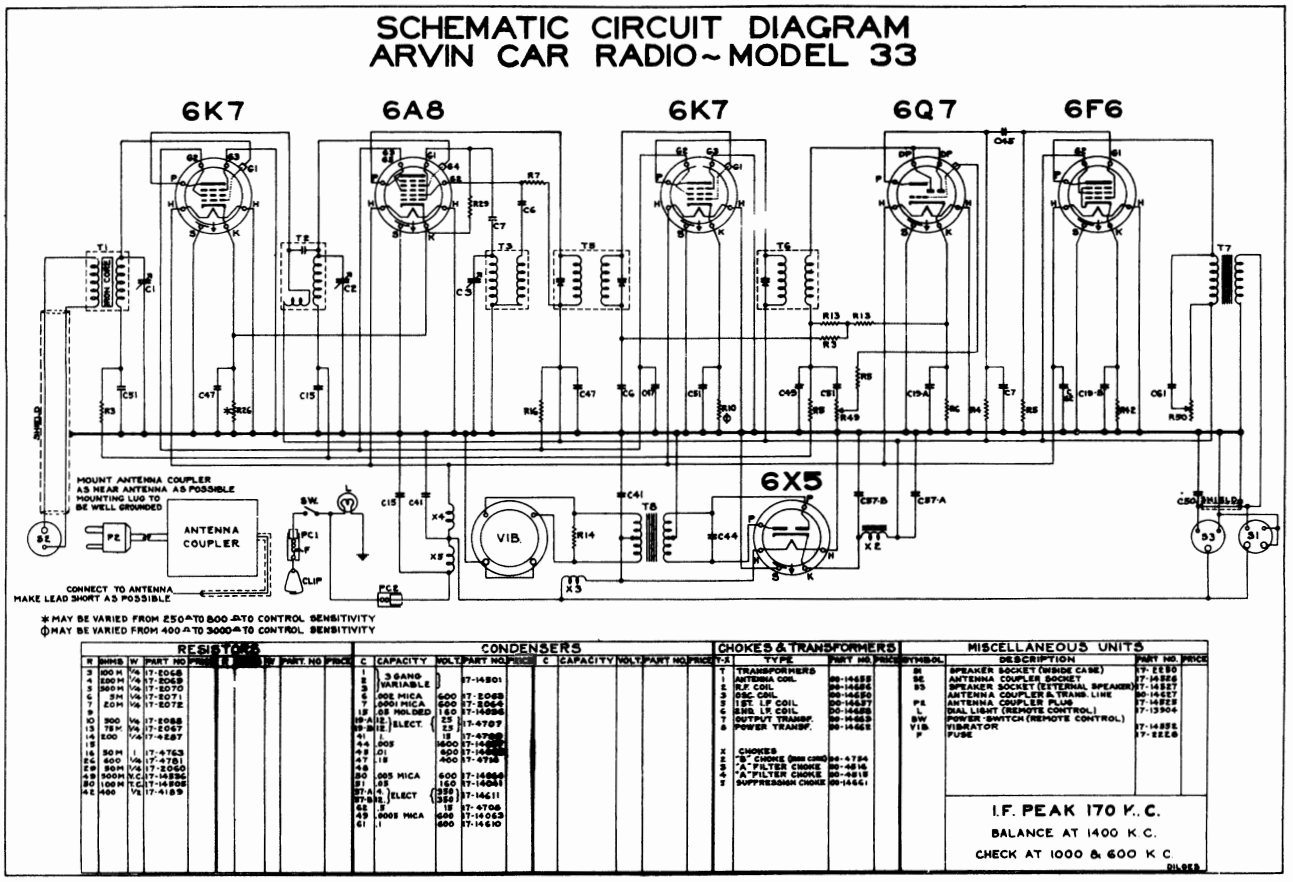
Model 28





NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO ~ MODEL 33



MODEL 33 SOCKET VOLTAGES

Tube	Heaters	Cathode	Plate	Screen	Anode Grid	*Oscillator Grid—1500 K. C.	†*Diodes
6K7	6.3	4.0	235	90	.....	.....	.....
6A8	6.3	4.0	235	90	140	2-5	.....
6K7	6.3	2.7	235	90	.....	.....	.....
6Q7	6.3	2.3	120	.....	.....	.....	2.8
6F6	6.3	16:0	230	235	.....	.....	.....
6X5	6.3	240	265 A. C.	.....	.....	.....	.....

*Measured with Vacuum Tube Voltmeter
†No Signal

POINT TO POINT RESISTANCES

6K7—R. F. Amplifier

Heater	0
Shell	0
Heater	∞
Cathode	600 Ω
Suppressor Grid	0
Screen to B+	50,000 Ω
Plate to B+	35 Ω
Control Grid	1,255,000 Ω

6A8—1st Det. Oscillator

Heater	0
Shell	0
Heater	∞
Cathode	600 Ω
Oscillator Grid	50,600 Ω
Anode to B+	20,000 Ω
Screen to B+	50,000 Ω
Plate to B+	115 Ω
Control Grid	1,155,000 Ω

6K7—I. F. Amplifier

Heater	0
Shell	0
Heater	∞
Cathode	500 Ω
Suppressor Grid	0
Screen to B+	50,000 Ω
Plate to B+	85 Ω
Control Grid	180,000 Ω

6Q7—2nd Det. 1st Aud. Amp.

Heater	0
Shell	0
Heater	∞
Cathode	5,000 Ω
Diode Plate	155,000 Ω
Diode Plate	155,000 Ω
Plate to B+	200,000 Ω
Control Grid—V. C. On	1,000,000 Ω
V. C. Off	500,000 Ω

6F6—Power Output

Heater	0
Shell	0
Heater	∞
Cathode	500 Ω
Screen to B+	0
Plate to B+	625 Ω
Control Grid	500,000 Ω

6X5—Rectifier

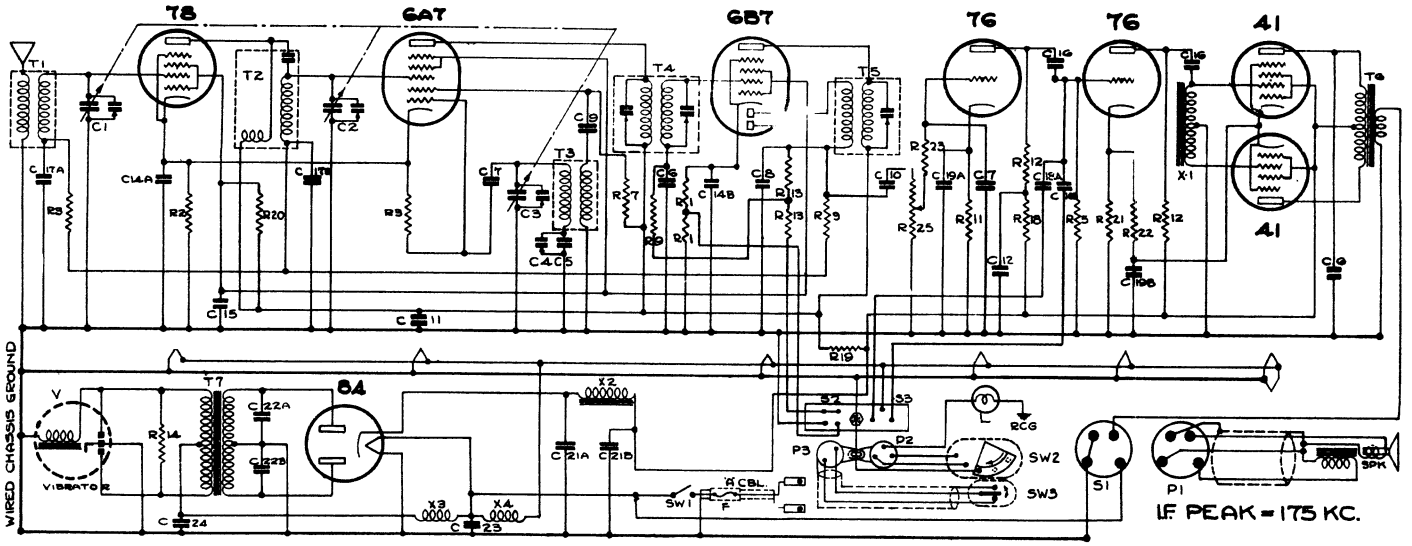
Heater	0
Shell	0
Heater	∞
Plate	175 Ω
Plate	150 Ω
Plate to Plate	325 Ω
Cathode to B+	165 Ω

COIL AND TRANSFORMER RESISTANCES

Antenna Primary	.72
Antenna Secondary	2.8
R. F. Primary	113
R. F. Secondary	4.0
Oscillator Primary	1.6
Oscillator Secondary	2.6
First I. F. Primary	115
First I. F. Secondary	115
Second I. F. Primary	85
Second I. F. Secondary	85
Output Transformer Primary	625
Output Transformer Secondary	.4
Power Transformer Primary	.07
Power Transformer Secondary 175-150—325	
Audio Input Choke	2400-2700—5000
"B" Filter Choke	165
Antenna Coupler Primary	6.2
Antenna Coupler Secondary	.5

NOBLITT SPARKS INDUSTRIES INC.

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO MODEL-37



R	OHMS	W	PART NO.	PRICE
1	2200	1/2	1T-4167	.20
2	8400	1/2	1T-4762	.20
3	100M	1/2	1T-2066	.20
4				
5	500M	1/2	1T-2070	.20
6				
7	20M	1/2	1T-2072	.20
8				
9	1MEG	1/2	1T-2080	.20
10	500	1/2	1T-2065	.20
11	2M	1/2	1T-4202	.20
12	10M	1/2	1T-4275	.20
13	75M	1/2	1T-2087	.20
14	200	1/2	1T-4257	.20
15				
16				
17				

R	OHMS	W	PART NO.	PRICE
18	50M	1/2	1T-4720	.25
19	5M	2	1T-4721	.35
20	25M	1/2	1T-4722	.25
21	100	1/2	1T-4723	.25
22	300	1	1T-4724	.30
23	250M	1/2	1T-3011	.20
24				
25	500M	1/2	1T-4624	1.00
26				
27				
28				
29				
30	? MAY BE VARIED FROM 200Ω TO 500Ω TO CONTROL SENSITIVITY			
31				
32				
33				
34				

C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		1T-4725	4.50
2				
3				
4	.00022	PAD	1T-4726	.40
5	.0011	600	1T-4700	.30
6	.002	600	1T-2063	.20
7	.0001	600	1T-2064	.20
8	.0005	600	1T-2211	.20
9	.001	600	1T-4252	.20
10	.05	160	1T-4702	.30
11	.40	400	1T-4710	1.25
12	.25	400	1T-4711	.55
13				
14A	.10 DUAL	15	1T-4713	.95
14B	.25 DUAL			
15	.15	400	1T-4714	.55

C	CAPACITY	VOLT	PART NO.	PRICE
16	.10	600	1T-4715	.40
17A	.05 TWIN	160	1T-4731	.35
17B	.05			
18A	.05 TWIN	200	1T-4735	.45
18B	12.0			
19A	12.0 TWIN	25	1T-4707	1.50
19B	12.0			
20				
21A	12.0 TWIN	500	1T-4716	2.75
21B	12.0			
22A	.02 TWIN	1000	1T-4193	.60
22B	.02			
23	.50	15	1T-4708	.45
24	1.0	15	1T-4709	.55
25				
26				

T-X	TYPE	PART NO.	PRICE
1	ANTENNA	00-4510	.90
2	RADIO FREQUENCY	00-4511	1.00
3	OSCILLATOR	00-4512	.85
4	FIRST IF	00-4515	1.75
5	SECOND IF	00-4514	1.15
6	OUTPUT	00-4750	1.85
7	POWER	00-4747	3.00
X-1	AUDIO INPUT	00-4758	1.60
X-2	'B' FILTER CHOKE	00-4784	1.30
X-3	'A' INPUT CHOKE	00-4546	.40
X-4	FILAMENT CHOKE	00-4545	.40

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK	SPEAKER	1T-4284	8.50
V	VIBRATOR	1T-4752	4.00
RCG	REMOTE CONTROL GROUND		
SW 1	VOLUME CONTROL SWITCH	SEE R25	
SW 2	TONE CONTROL SWITCH		
SW 3	LOCAL-DISTANCE SWITCH		
S-1	SPEAKER SOCKET	1T-4447	.15
S-2	DIAL LITE - TONE SOCKET	1T-4275	.30
S-3	LOC-DIST. CONTROL SOCKET	1T-4578	
P-1	SPEAKER PLUG	1T-4448	.15
P-2	DIAL LITE-TONE PLUG	1T-4577	.15
P-3	LOC-DIST. CONTROL PLUG	1T-4740	.15
L	DIAL LITE 6-8 VOLT	1T-2145	.15
F	FUSE - 20 AMPERE	1T-2228	.05
'A' CBL.	'A' CABLE	00-4200-2	1.25

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	170	75	4.0	4.2	—	—
6A7	5.8	170	75	4.0	—	135	5-10
6B7	5.8	170	75	2.0	—	—	—
1st 76	5.8	100	—	4.7	—	—	—
2nd 76	5.8	165	—	5.3	—	—	—
41	5.8	230	235	18.0	—	—	—
41	5.8	230	235	18.0	—	—	—
84	5.8	260 (AC)	—	245	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

78

+ Heater	Inf.
— Heater	0
Plate to B+	5,113
Screen to B+	30,000
Suppressor Grid	400
Cathode	400
‡Control Grid	1,250,250

2nd 76

+ Heater	Inf.
— Heater	0
Plate to B+	10,000
Cathode	100
Control Grid	500,000

6A7

+ Heater	Inf.
— Heater	0
Plate to B+	5,093
Screen to B+	30,000
Anode Grid to B+	25,000
Oscillator Grid	100,400
Cathode	400
‡Control Grid	1,150,250

41

+ Heater	Inf.
— Heater	0
Plate to B+	250
Screen to B+	0
Cathode	400
Control Grid	750

6B7

+ Heater	Inf.
— Heater	0
Plate to B+	5,085
Screen to B+	30,000
‡Diodes	150,250
Cathode	500
‡Control Grid	1,075,250

41

+ Heater	Inf.
— Heater	0
Plate to B+	220
Screen to B+	0
Cathode	400
Control Grid	680

1st 76

+ Heater	Inf.
— Heater	0
Plate to B+	60,000
Cathode	2,000
Control Grid V. C. on	750,000
Control Grid V. C. off	500,000

84

+ Heater	Inf.
— Heater	0
Plate	240
Plate	210
Plate to Plate	450
Cathode to B+	165

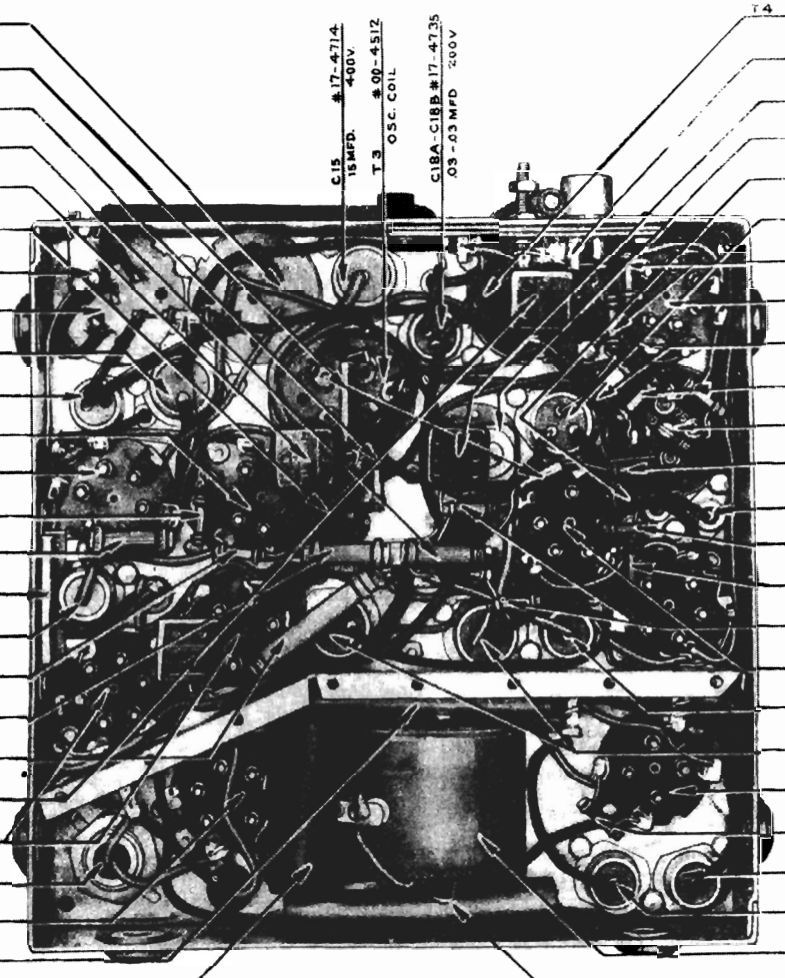
‡ Add 250 Ω to these readings when sensitivity switch is on "Distance" position.

COIL RESISTANCES

Ant. Primary	12.0
Ant. Secondary	4.0
R. F. Primary	113.0
R. F. Secondary	4.0
Oscillator Primary	3.0
Oscillator Secondary	1.5
First I. F. Primary	93.0
First I. F. Secondary	93.0
Second I. F. Primary	85.0
Second I. F. Secondary	85.0
Output Transformer Primary	250-CT-220=470
Output Transformer Secondary	0.4
Power Transformer Secondary	240-CT-210=450
"B" Filter Choke	165
Audio Input Choke	750-CT-680=1430
Speaker Field Coil	4.0
Speaker Voice Coil	2.5

NOBLITT SPARKS INDUSTRIES INC.

Model 37



T2 #00-4511
R.F. COIL

C7 #17-2 ,4
100 M MFD. 600V

R7 #17-2072
20 M Ω ¼ WATT

R18 #17-4720
50 M Ω ½ WATT

C9 #17-4292
.001 MFD. 600V

R24 #17-2065
1000 Ω ¼ WATT

ANTENNA CONNECTOR

T1 #00-4510
ANT. COIL

C14A-C14B #17-4713
1-.25 MFD. 15 V.

C17A-C17B #17-4731
.05-.05 MFD 160V.

6A7 TUBE
MIXER

78 TUBE
R.F. AMPLIFIER

R2 #17-4762
400 Ω ¼ WATT

R20 #17-4722
25 M Ω ½ WATT

R19 #17-4721
5 M Ω 2 WATT

C11 #17-4710
4.0 MFD. 400V.

R3 #17-2068
100 M Ω ¼ WATT

R21 #17-4723
100 Ω ½ WATT

R22 #17-4724
300 Ω 1 WATT

C6 #17-2063
.002 MFD. 600V.

41 TUBES
POWER AMPLIFIER

C21A-C21B #17-4716
12-12 MFD. 500V.

84 TUBE
RECTIFIER

X3 #00-4516
"A" INPUT CHOKE

C22A-C22B #17-4193
.02-.02 MFD. 1000V.

T4 #00-4513
1ST I.F. TRANS.

S2-S-3 #17-4375
LOCAL-DISTANCE-TONE-PILOT

C5 #17-4700
1100 M MFD 600V.

C4 #17-4726
220 MMFD. PADDER

C8 #17-2211
500 MMFD. 600V

C19A-C19B #17-4707
12-12 MFD 25V

R1 #17-4767
250 Ω ¼ WATT

6B7 TUBE
2ND I.F. AMP.-DET.

R9 #17-2080
1 MEG. ¼ WATT

R13 #17-2067
75 M Ω ¼ WATT

T5 #00-4514
2ND. I.F. TRANS

R23 #17-3011
250 M Ω ¼ WATT

C10 #17-4702
.05 MFD. 160V

R11 #17-4202
2 M Ω ¼ WATT

R5 #17-2070
.5 MEG. ¼ WATT

R12 #17-4275
10,000 Ω ¼ WATT

76 TUBES
1ST. AND 2ND. A.F.

C12 #17-4711
.25 MFD. 400V.

C16 #17-4715
.1 MFD. 600V.

V #17-4732
VIBRATOR

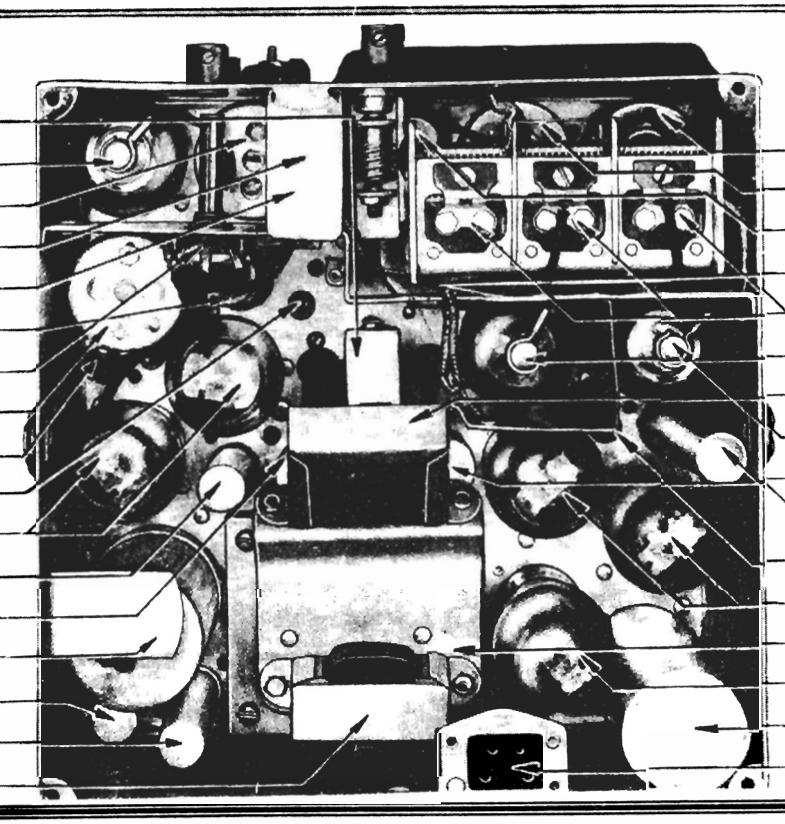
R14 #17-4287
200 Ω ¼ WATT

C23 #17-4708
.5 MFD. 15 V.

C24 #17-4709
1.0 MFD 15 V

T7 #00-4747
POWER TRANS.

X4 #00-4515
FILAMENT CHOKE.



T6 #00-4755
OUTPUT TRANS

6B7 TUBE
I.F. AMP.-DET.

T4 #00-4513
1ST. I.F. TRANS.

C6 #17-2063
.002 MFD. 600V.

X5 #00-4782
SUPPRESSION CHOKE

C19A-C19B #17-4707
12-12 MFD. 25V

R25 #17-4152-3
500 M Ω VOL. CONT.

T5 #00-4514
2ND I.F. TRANS.

C10 #17-4702
.05 MFD 160V

C4 #17-4726
OSC SER. PAD

76 TUBES
1ST. AND 2ND A.F.

C12 #17-4711
.25 MFD. 400V.

C16 #17-4715
.1 MFD. 600V

V #17-4732
VIBRATOR

C23 #17-4708
.5 MFD 15 V.

C24 #17-4709
1.0 MFD. 15 V.

X2 #00-4754
"B" FILTER CHOKE

T1 #00-4510
ANT. COIL

T2 #00-4511
R.F. COIL

C15 #17-4714
.15 MFD 400V.

T3 #00-4512
OSCILLATOR COIL

C1-C2-C3 #17-4725
3 GANG VARIABLE

6A7 TUBE
MIXER

X1 #00-4758
AUDIO INPUT CHOKE

78 TUBE
R.F. AMPLIFIER

C16 #17-4715
.1 MFD. 600V

C11 #17-4710
4.0 MFD. 400V

TEST +B HERE

41 TUBES
POWER AMPLIFIER

T7 #00-4747
POWER TRANS.

84 TUBE
RECTIFIER

C21A-C21B #17-4716
12-12 MFD 500V.

S1 #17-4447
SPEAKER SOCKET

NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODEL 41

RESISTORS

R	OHMS	W	PART NO.	PRICE
1				
2	100 M	½	17-2068	
3				
4	500 M	½	17-2070	
5				
6	20 M	½	17-2072	
7				
8				
9	1 MEG.	½	17-2080	
10				
11				
12				
13				
14	250	½	17-4287	
15	1200	½	17-4717	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33	250 M	½	17-13906	
34				
35				
36				
37				
38				
39				
40				
41	100	60	17-14040	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1A	2 GANG		17-13600	
2A	TUNING			
3A				
4				
5	.05 TINY	150	17-14015	
6	.002 MICA	600	17-2063	
7	.0001 MICA	600	17-2064	
8	.01	600	17-14016	
9	.001 MICA	600	17-4292	
10				
11	16 ELECT.	475	17-14002	
12	8 ELECT.	475	17-14001	
13	.1	400	17-14046	
14	12 DRY ELECT.	25	17-14003	

C	CAPACITY	VOLT	PART NO.	PRICE
16A				
16B				
19A				
19B				
20A				
20B				
21A				
21B				
22A				
23				
24	.5 PAPER	150	17-14040	
25				
27A				
27B				
28				
29A				
29B				

CHOKES & TRANSFORMERS

T/X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1	ANTENNA COIL	29-13617	
2			
3	OSCILLATOR	29-13618	
4			
5	FIRST I.F. COIL	80-13600	
6	SECOND I.F. COIL	80-13601	
7	OUTPUT TRANSF.	80-13602	
8	POWER TRANSF.	80-13600	
9			
X	CHOKES		
1			
2			
3			
4			
5			
6			

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK	DYNAMIC SPEAKER	17-13605	
SW 1	VOLUME CONTROL SWITCH (SEE R 33)	17-13906	
S1	SPEAKER SOCKET	— —	
P1	SPEAKER PLUG (FURNISHED WITH SPK.)	— —	
L	DIAL LIGHT	17-13904	
P2	POWER CORD PLUG	17-13613	

I.F. PEAK 456 K.C.
BALANCE 1500 K.C.

MODEL 41 SOCKET VOLTAGES

(INPUT VOLTAGE 115 RMS)

Tube	Heater	Plate	Screen	Cathode	Triode Plate	Anode Grid	Oscillator Grid 1500 KC
6A7	6.3 AC	265	90	3.0*	.....	155	3-5
6F7	6.3 AC	265	90	4.0*	40	.....	.....
41	6.3 AC	250	265	17.0	.....	.....	.....
80	5.0 AC	330 AC	.....	.....	.....	.....	.....

*Volume control full on

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Tubes removed and speaker connected.

6A7

Heater	.1
Heater	.1
Anode Grid to B+	20,000
Plate to B+	17.0
Screen to B+	50,000
Cathode	200*
Control Grid	2.6
Oscillator Grid	50,200

6F7

Heater	.1
Heater	.1
Plate to B+	17.0

*Volume control in full on position

Screen to B+	50,000
Cathode	300*
Control Grid	1,100,000
Triode Grid	1,000,000
Triode Plate to B+	550,000

80

Filament to B+	1750
Filament to B+	1750
Plate	143
Plate	132
Plate to Plate	275
Filament to Filament	.1

41

Heater	.1
Heater	.1
Plate to B+	390
Screen to B+	0
Cathode	500
Control Grid	1,000,000

COIL, TRANSFORMER AND SPEAKER RESISTANCES

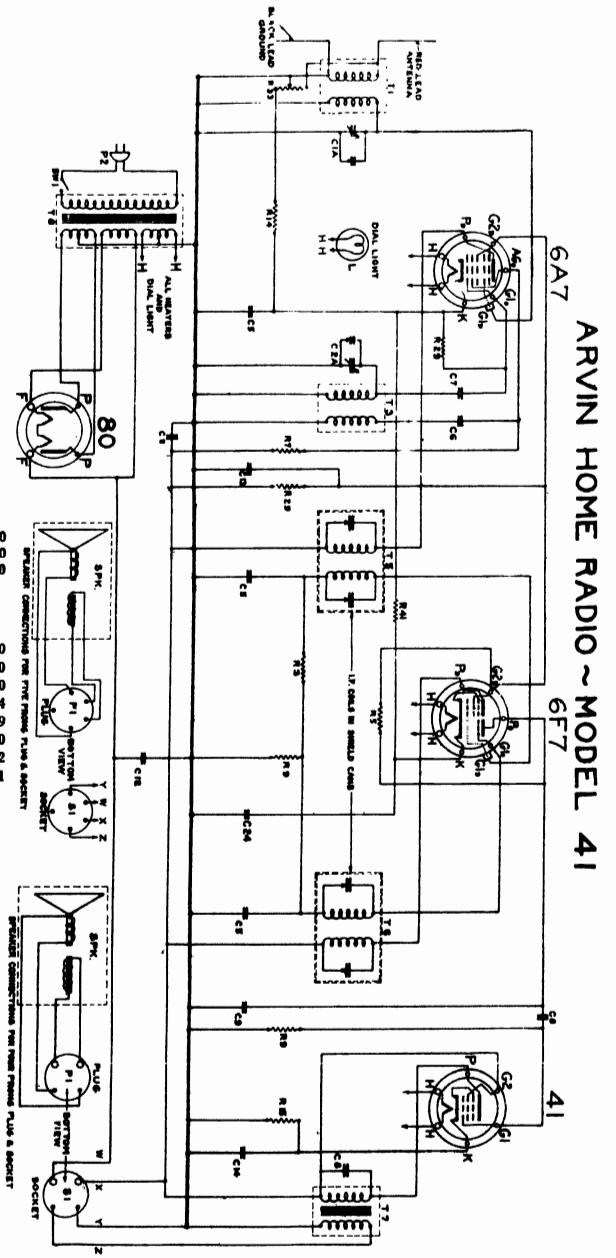
Speaker Field (Hot)	1750	T6 2nd IF Primary	17.0
Speaker Voice Coil	3.0	T6 2nd IF Secondary	17.0
T1 Ant. Primary	14.5	T7 Output Primary	390.0
T1 Ant. Secondary	2.6	T7 Output Secondary	.4
T3 Osc. Primary	2.6	T8 Power Primary	5.9
T3 Osc. Secondary	1.4	T8 Power Secondary (Hi Volt)	275.0
T5 1st IF Primary	17.0	T8 Power Secondary 6V	.2
T5 1st IF Secondary	17.0	T8 Power Secondary 5V	.1

BALANCING INSTRUCTIONS

ARVIN HOME RADIO—MODEL 41

Adjust padders only in order shown

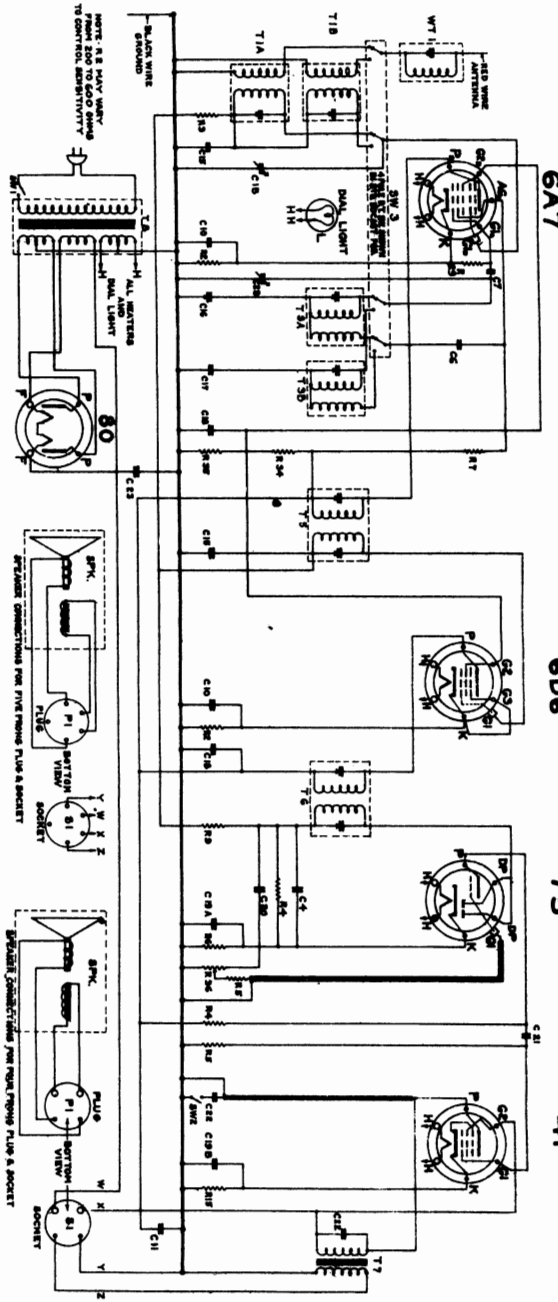
Padder No.	Connect Balancing Oscillator to	Balancing Osc. Freq.	Adjust Radio Dial to
1	6A7 Grid Cap	456 K. C.	———
2	6A7 Grid Cap	456 K. C.	———
3	6A7 Grid Cap	456 K. C.	———
4	6A7 Grid Cap	456 K. C.	———
5	(Red) Antenna Wire	1500 K. C.	1500 K.C.
6	(Black) Ground Wire	1500 K. C.	1500 K.C.



NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODEL 51 75 41

6A7 6D6



RESISTORS										CONDENSERS										CHOKES & TRANSFORMERS				MISCELLANEOUS UNITS			
R	OHMS	W	PART NO.	PRICE	R	OHMS	W	PART NO.	PRICE	C	CAPACITY	VOLT	PART NO.	PRICE	C	CAPACITY	VOL. T	PART NO.	PRICE	TX	TYPE	PART NO.	PRICE	SYMBOL	DESCRIPTION	PART NO.	PRICE
1					21					1-B	2 GANG TUNING				20	.00005-.00045	200	17-14057		T	TRANSFORMERS			W.T. 1	WAVE TRAP	00-13903	
2	400	1/10	17-4762		22					2-B					E1	.00005 CER TC	600	17-14066		1-A	1ST DIGHT. ANT. COIL	00-13919		SPK	DYNAMIC SPEAKER	17-13603	
3	800 M	1/10	17-2068		23					3-B					E2	.01	600	17-14043		1-B	O.W. " ANT. COIL	00-13921		SR. 1	VOLUME CONTROL SWITCH (SEE P. 34)	17-13508	
4	200 M	1/10	17-2069		24					4	.0005 MICA	1000	17-2211		E3	.05 MET. ELECT.	475	17-14060		2				S 1	SPEAKER SOCKET	—	—
5	600 M	1/10	17-2070		25					5										P 1	SPEAKER PLUG (FURNISHED WITH SPK.)	—	—				
6	5M	1/10	17-2071		26					6	.00005 MICA	600	17-2063							3				L	DIAL LIGHT	17-13904	
7	20M	1/10	17-2072		27					7	.0001	600	17-2064							1-A	1ST DIGHT. OSCILLATOR	00-13920		P.X.	POWER CORD PLUG	17-13615	
8					28					8										2-B	O.W. "	00-13922		SW 2	TONE CONTROL SWITCH	17-13513	
9	1 MEG.	1/10	17-2080		29	50 M	1/10	17-2060		9										4				SW 3	BAND SWITCH	17-13511	
10					30					10	.1 CAN	400	17-14036							5	FIRST I.F. COIL	00-13909					
11					31					11	MI. ELECT.	475	17-14052							6	SECOND I.F. COIL	00-13901					
12					32					12										7	INTPUT. TRANSF.	00-13315					
13					33					13										8	POWER TRANSF.	00-13600					
14					34					14																	
15	500	1/2	17-4717		35	15 M	1	17-14032		15	.05 MICA PAPER	200	17-14034							X	CHOKES						
16					36	50 M	1/2	17-14043		16	PADDER		17-14024							1							
17					37	800 M	.5C	17-13508		17	.005 MICA	600	17-14029							2							
18										18	.05 MFD. CER. W.	400	17-14009							3							
19										19-A	TWIN	25	17-4707							4							
20										19-B	ELECT.	25								5							
																				6							

I.F. PEAK 456 K.C.
BALANCE 1500 K.C.

MODEL 51 SOCKET VOLTAGES

Tube	Heaters	Plate	Screen	Cathode	Oscillator Grid 1500 KC	Anode Grid
6A7	6.3	265	100	3.0	3-5	150
6D6	6.3	265	100	3.0	.....	.....
75	6.3	135	.....	1.7	.....	.....
41	6.3	251	265	17.0	.....	.....
80	5.0	330-AC	.....	.....	.....	.....

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise stated. Tubes removed and speaker connected. Volume control in full on position.

6A7
Heater 1
Heater 1
Cathode 400
Oscillator Grid 50,000
Anode Grid to B+ 20,000
Screen Grid to B+ 15,000
Plate to B+ 17.0
Control Grid 1,305,000

6D6
Heater 1
Heater 1
Cathode 400
Suppressor Grid 400
Screen Grid to B+ 15,000
Plate to B+ 17.0
Control Grid 1,205,000

75
Heater 1
Heater 1
Cathode 5,000
Diodes 205,000
Plate to B+ 200,000
Control Grid 1,000,000

41
Heater 1
Heater 1
Cathode 500
Screen Grid to B+ 0
Plate to B+ 390
Control Grid 500,000
Screen Grid to Ground 35,000

80
Filament to B+ 1750
Plate 143
Plate 132
Plate to Plate 275

COIL, TRANSFORMER AND SPEAKER RESISTANCES

Speaker Field (Hot)	1750	T5 1st IF Primary	17.0
Voice Coil	.3	T5 1st IF Secondary	17.0
T1B Ant. Primary	14.5	T6 2nd IF Primary	17.0
T1B Ant. Secondary	2.6	T6 2nd IF Secondary	17.0
T1A	.1	T7 Output Primary	390.0
T1A	.05	T7 Output Secondary	.4
T3B Osc. Primary	2.6	T8 Power Primary	5.9
T3B Osc. Secondary	1.4	T8 Power Secondary (Hi Volt)	275.0
T3A	.1	T8 Power Secondary 6V	.2
T3A	.05	T8 Power Secondary 5V	.1

Padder No.	Connect Balancing Oscillator to	Bal. Osc. Freq.	Adjust Radio Dial to	Set Wave Switch to
1	6A7	456 K. C.	——	——
2	6A7	456 K. C.	——	——
3	6A7	456 K. C.	——	——
4	6A7	456 K. C.	——	——
5	Red Ant. Wire Black Gnd. Wire	1500 K. C.	150	Stand. B'cast
6	"	1500 K. C.	150	.55—1.75
7	"	600 K. C.	.60	.55—1.75
8§	"	15 M. C.	15.0	Short Wave
9	"	15 mga. cy.	15.0	18—5.5 M. C.
10*	"	456 K. C.	1.0	B'cast .55-1.75

*Balance for minimum signal (Wave Trap to eliminate 456 code signal).

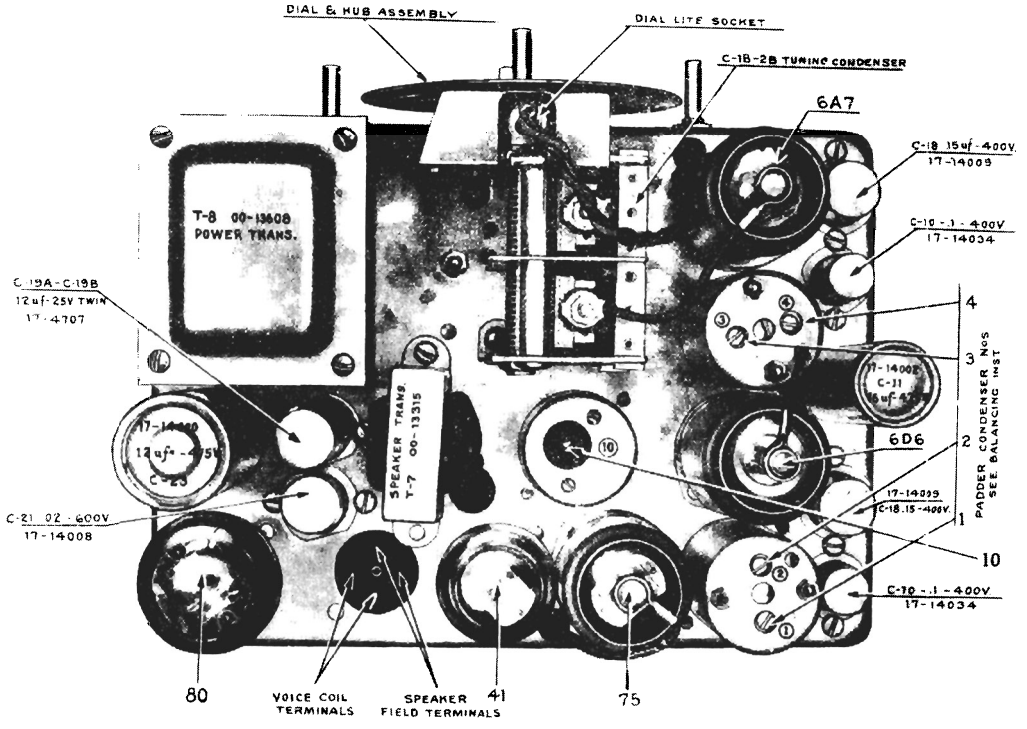
§To adjust oscillator padder on 6-18 megacycle band, unscrew padder wide open, then tighten until first signal is reached and tuned to resonance.

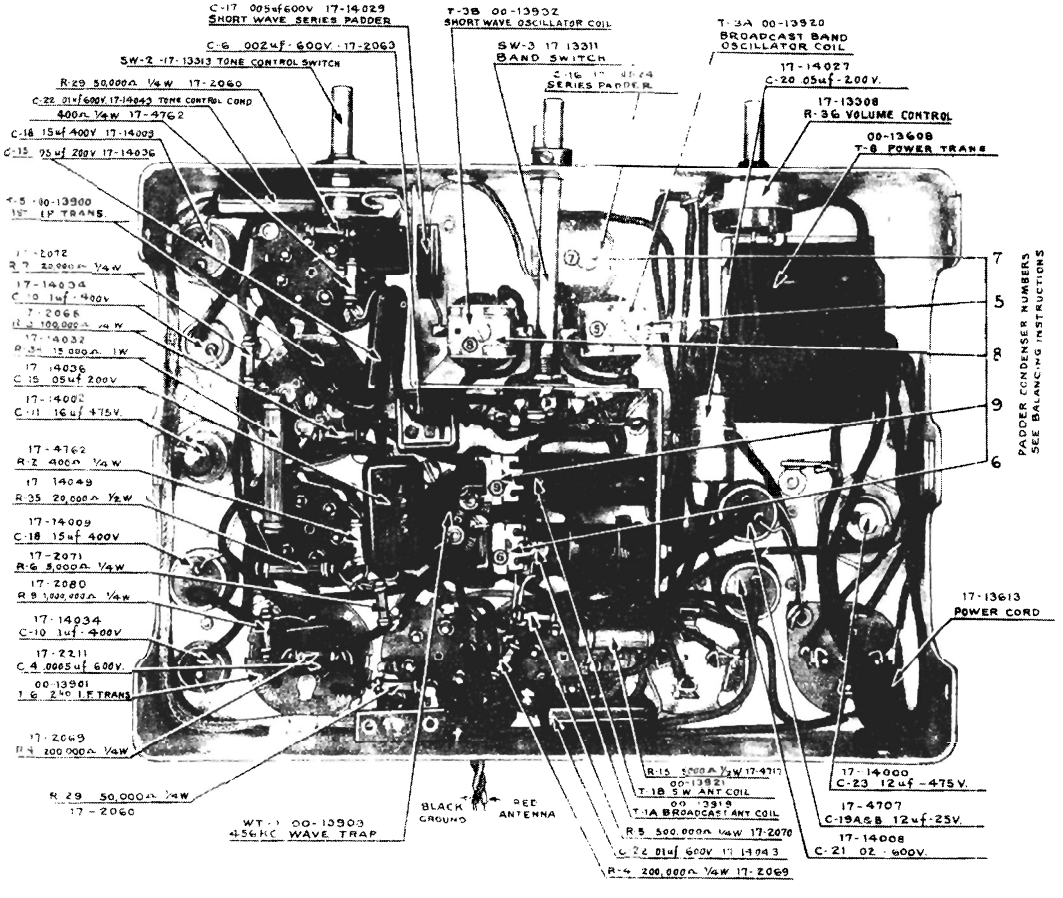
Alignment Proceedure

Adjust padders only in order shown — See pictorial diagrams for location of padders

NOBLITT SPARKS INDUSTRIES INC.

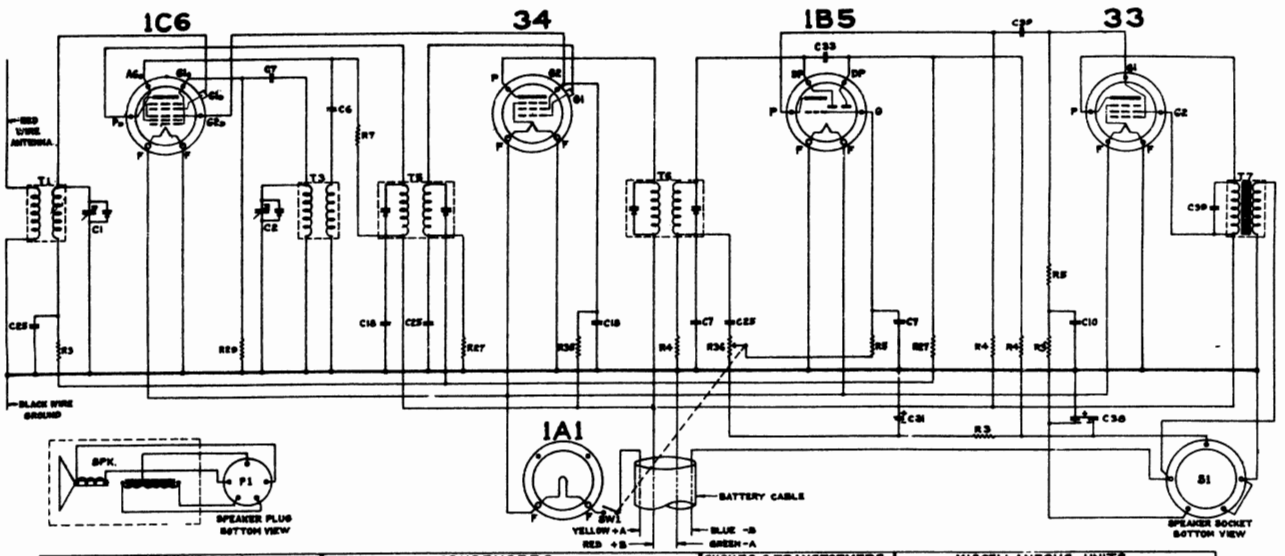
MODEL No. 51





NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO~MODEL 51B



RESISTORS

R	OHMS	W	PART NO.	PRICE
3	100 M	1/2	17-2068	
4	2000 M	1/2	17-2069	
5	250 M	1/2	17-2070	
7	20 M	1/2	17-2072	
28	2 MEG.	1/2	17-4788	
29	50 M	1/2	17-2060	
34	50 M	1/2	17-14049	
34	500 M	1/2	17-13368	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1	5 GANG TUNING		17-13680	
10	.1 CAN	400	17-14034	
17	.05 CAN	400	17-14009	
24	.05 CAN	160	17-14006	
30	.002 MICA	600	17-2063	
30	.0001 MICA	600	17-2064	
31	12 ELECT.	25	17-14004	
33	.00025 MICA	600	17-14047	
36	20-20 ELECT.	600	17-14053	
36	.05 WRAP. CAN	600	17-14052	

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1	ANTENNA COIL	29-13617	
3	OSCILLATOR	29-13618	
6	FIRST I.F. COIL	50-13800	
6	SECOND I.F. COIL	50-13801	
7	OUTPUT TRANSF.	50-13826	
X	CHOKES		

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER - MODEL 51B	17-13150	
S1	SPEAKER SOCKET	17-4153	
P1	SPEAKER PLUG FURNISHED WITH SPK.	- -	
SW. 1	BATT. SWITCH & VOLUME CONTROL (SEE R36)	17-13306	

I. F. PEAK 456 K.C.
BALANCE 1500 K.C. - CHECK 600 K.C.
"A" SOURCE 2 TO 3 VOLTS
"B" SOURCE 3-45 VOLT
BATTERIES, LARGE SIZE.

MODEL 51B SOCKET VOLTAGES

Tube	Filament	Screen Grid	Plate	*Control Grid	*Oscillator Grid 1500 KC	Anode Grid
1C6	2.2	70	117	1.5	4	80
34	2.2	70	117	3	.....	.....
1B5	2.2	.....	40	3	.....	.....
33	2.2	117	115	18	.....	.....
1A1	2.2	.....	.....	.....	.....	.....

*Measured with Vacuum Tube Voltmeter.
Socket Voltages to be taken with 135 Volts of B Battery and Eveready Air Cell.

POINT TO POINT RESISTANCES

1C6
Filament 0
Filament ..... ∞
Oscillator Grid ..... 50,000 Ω
Anode Grid to B+ ..... 20,000 Ω
Screen to B+ ..... 20,000 Ω
Plate to B+ 19.5
Control Grid 1,150,000

34
Filament 0
Filament ..... ∞
Screen to B+ 20,000
Plate to B+ 19.5
Control Grid 1,050,000

1B5
Filament 0
Filament ..... ∞
Control Grid:
V. C. on ..... 1,100,000 Ω
V. C. off ..... 600,000 Ω
Diode Plate ..... 190,000 Ω
Diode Plate ..... 200,000 Ω
Plate to B+ ..... 200,000 Ω

33
Filament 0
Filament ..... ∞
Control Grid ..... 600,000 Ω
Screen to B+ 0
Plate to B+ 385

1A1
Filament to Filament ..... .1 Ω

All resistances taken to ground unless otherwise specified.

COIL AND TRANSFORMER RESISTANCES

Antenna Primary 14.0
Antenna Secondary 4.4
Oscillator Primary 1.35
Oscillator Secondary 2.4
First I. F. Primary 19.5
First I. F. Secondary 19.5
Second I. F. Primary 19.5
Second I. F. Secondary 19.5
Output Transformer Primary 385
Output Transformer Secondary ..... .24
Speaker Field—400-100 500

BATTERY CABLE COLOR CODE

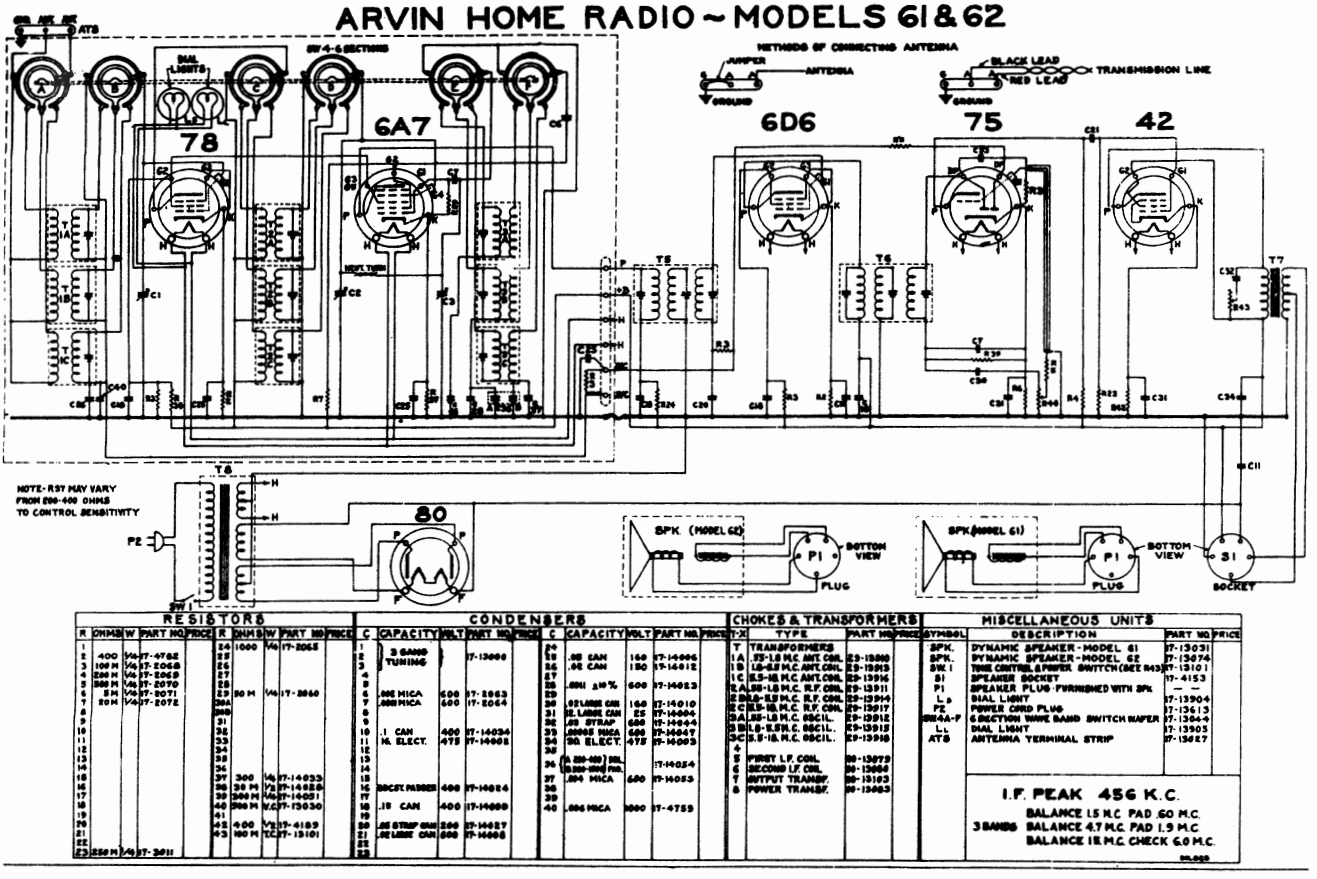
Yellow	A+
Green	A—
Blue	B—
Red	B+

CAUTION—Use only 135 volts of B Battery for testing. If these are not available a 5000 Ω Resistor in series with the B supply of an average A. C. Radio will supply sufficient voltage for testing.

I. F. = 456 K.C.

NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODELS 61 & 62



RESISTORS

R	OHMS	W	PART NO.	PRICE
1	400	1/4	17-4762	
3	100 M	1/4	17-2068	
4	250 M	1/4	17-2062	
5	300 M	1/4	17-2070	
6	5 M	1/4	17-2071	
7	10 M	1/4	17-2072	
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23	250 M	1/4	17-2011	

R	OHMS	W	PART NO.	PRICE
24	1000	1/4	17-2065	
25				
26				
27				
28				
29	30 M		17-2060	
30A				
30B				
31				
32				
33				
34				
35				
36				
37	300	1/4	17-14033	
38	250 M	1/2	17-14028	
39	500 M	1/4	17-14051	
40	200 M	V.C.	17-13030	
41				
42	400	1/2	17-4189	
43	100 M	V.C.	17-13101	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		17-13000	
2				
3				
4				
5				
6	.005 MICA	600	17-2063	
7	.0005 MICA	600	17-2064	
8				
9				
10	.1 CAN	400	17-14034	
11	ML ELECT.	475	17-14005	
12				
13				
14				
15				
16	50CPF PADDER	600	17-14014	
17				
18	.10 CAN	400	17-14000	
19				
20	.05 STRAP GAL	200	17-14027	
21	.05 LUBE CAP	600	17-14005	
22				
23				

C	CAPACITY	VOLT	PART NO.	PRICE
24				
25	.05 CAN	150	17-14005	
26	.05 CAN	150	17-14012	
27				
28	.004 ±10 %	600	17-14023	
29				
30	.02 LARGE CAN	150	17-14010	
31	.02 LARGE CAN	25	17-14004	
32	.02 STRAP	600	17-14044	
33	.0005 MICA	600	17-14047	
34	.1 ELECT.	475	17-14003	
35				
36	(.05-.05-.02) DBL. (.1-.05-.05) DBL.		17-14054	
37	.004 MICA	600	17-14053	
38				
39				
40	.006 MICA	1000	17-4755	

CHOKES & TRANSFORMERS

T	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1A	.93-1.8 M.C. ANT. COIL	29-13910	
1B	1.8-3.8 M.C. ANT. COIL	29-13913	
1C	3.5-16 M.C. ANT. COIL	29-13916	
2A	.93-1.8 M.C. R.F. COIL	29-13911	
2B	1.8-3.8 M.C. R.F. COIL	29-13914	
2C	3.5-16 M.C. R.F. COIL	29-13917	
3A	.93-1.8 M.C. OSC'IL.	29-13912	
3B	1.8-3.5 M.C. OSC'IL.	29-13915	
3C	3.5-16 M.C. OSC'IL.	29-13918	
4			
5	FIRST I.F. COIL	30-13079	
6	SECOND I.F. COIL	30-13080	
7	OUTPUT TRANSF.	30-13103	
8	POWER TRANSF.	30-13083	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER - MODEL 61	17-13051	
SPK.	DYNAMIC SPEAKER - MODEL 62	17-13074	
SW. 1	TONE CONTROL & POWER SWITCH (SEE R43)	17-13101	
S1	SPEAKER SOCKET	17-4153	
P1	SPEAKER PLUG - FURNISHED WITH SPK.	— —	
L a	DIAL LIGHT	17-13904	
PZ	POWER CORD PLUG	17-13613	
SW 4A-F	6 SECTION WAVE BAND SWITCH WAFER	17-13644	
L1	DIAL LIGHT	17-13905	
ATB	ANTENNA TERMINAL STRIP	17-13627	

I.F. PEAK 456 K.C.
BALANCE 1.5 M.C. PAD .60 M.C.
3 BANDS BALANCE 4.7 M.C. PAD 1.9 M.C.
BALANCE 18 M.C. CHECK 6.0 M.C.

MODEL 61-62 SOCKET VOLTAGES

Tube	Heaters	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid 1500 KC	*Anode Grid	Diode Plates
78-6D6	6.3	3.0	3.0	90	250	.....	.....	.....
6A7	6.3	3.0	.....	90	250	3-10	180	.....
6D6	6.3	3.0	3.0	90	250	.....	.....	.....
75	6.3	1.5	.....	.....	120	.....	.....	†2.9
42	6.3	18.0	.....	250	240	.....	.....	.....
80	5.0	3.0	.....	.....	300 A.C.	.....	.....	.....

DROP ACROSS SPEAKER FIELD—60 V.
*—Measured with Vacuum Tube Voltmeter
†—No Signal

POINT TO POINT RESISTANCES

6D6-78
Heater ..... .01 ohm
Heater ..... .01 ohm
Cathode ..... 300 ohms
Suppressor ..... 300 ohms
Screen to B+ ..... 30,000 ohms
Plate to B+ ..... .9 Ω .72 Ω .5 Ω
Control Grid 705,000
Screen to GND 100,000

6A7
Heater ..... .01 ohm
Heater ..... .01 ohm
Cathode ..... 400 ohms
Osc. Grid ..... 50,300 ohms
Osc. Anode to B+ ..... 20,000 ohms
Screen to B+ ..... 30,000 ohms
Plate to B+ ..... 1000 Ω
Control Grid ..... 5.5 Ω .50 Ω .05 Ω
Screen to GND ..... 100,000 Ω

6D6
Heater ..... .01 ohm
Heater ..... .01 ohm
Cathode ..... 400 ohms
Suppressor ..... 400 ohms
Screen to B+ ..... 100,000 ohms
Plate to B+ ..... .9 Ω
Control Grid ..... 705,000 ohms

75
Heater ..... .01 Ω
Heater ..... .01 Ω
Cathode ..... 5000 Ω
Diode Plate ..... 105,000 Ω
Diode Plate ..... 305,000 Ω
Plate to B+ ..... 200,000 Ω
Control Grid:
..... V. C. on 1,000,000; V. C. off 500,000

42
Heater ..... .01 Ω
Heater ..... .01 Ω
Cathode ..... 400 Ω
Control Grid ..... 250,000 Ω
Screen Grid to B+ 0
Plate to B+ ..... 310 Ω

80
Filament to B+ ..... 1400 Ω
Filament to B+ ..... 1400 Ω
Plate ..... 135 Ω
Plate ..... 145 Ω

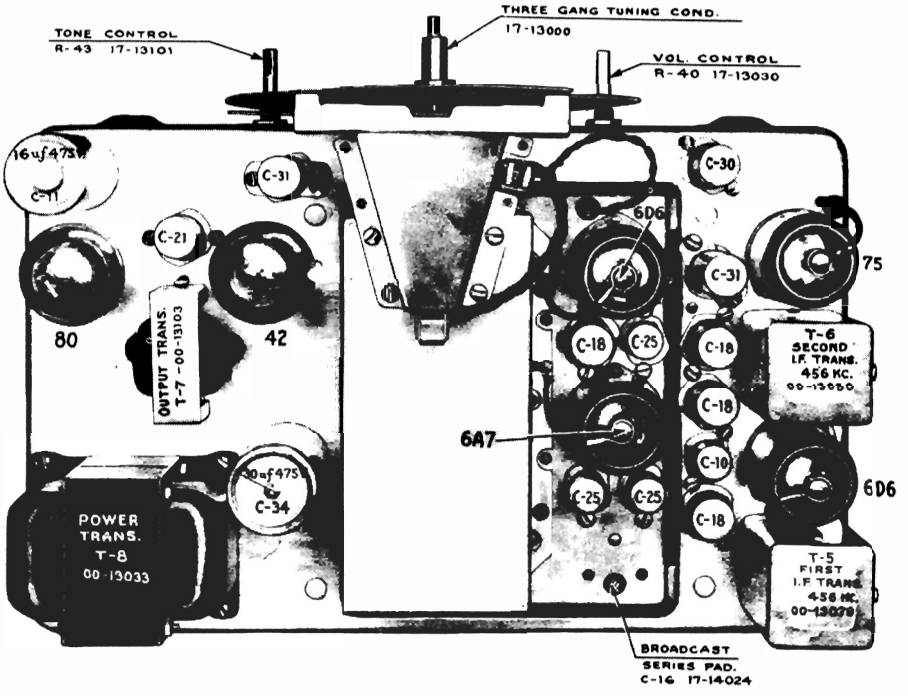
All resistances taken to ground unless otherwise specified.
Three readings following control grid of 6A7 and plate of 6D6 signify A, B, and C wave band position resistances.

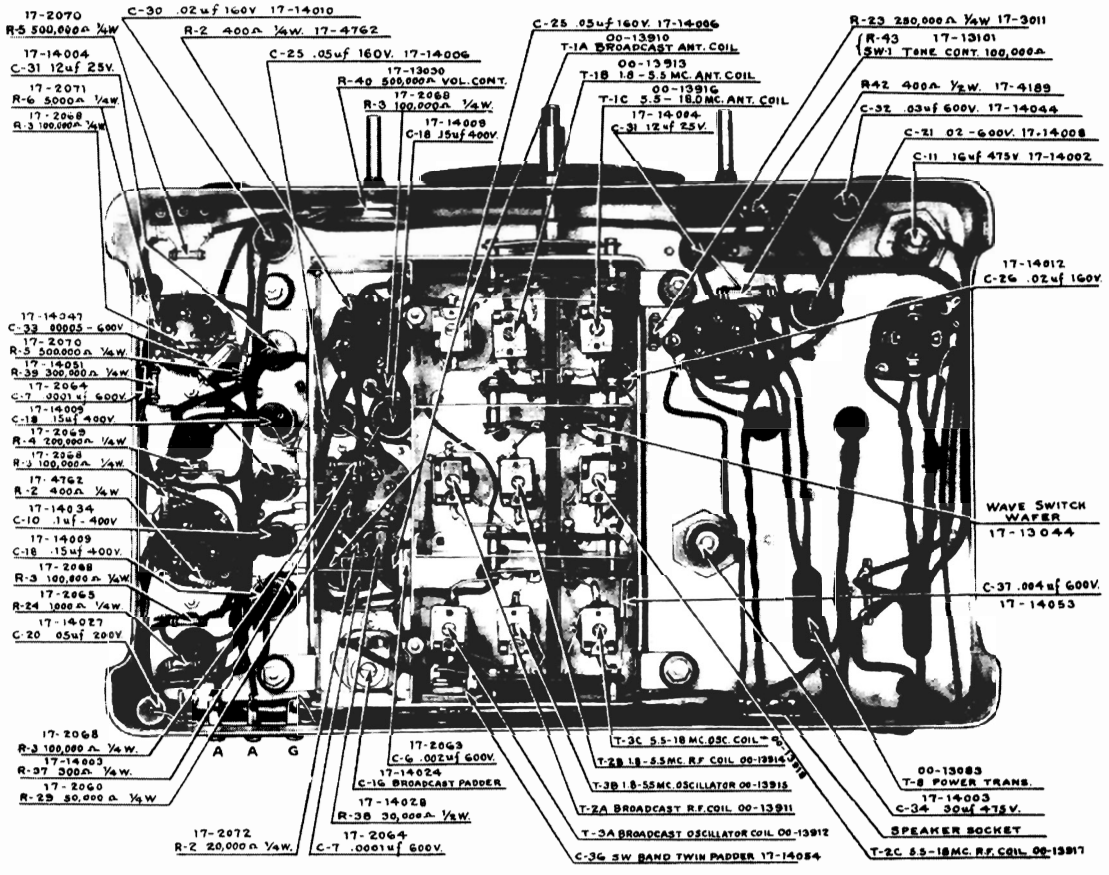
COIL AND TRANSFORMER RESISTANCES

A Band Ant. Pri. 19.0
A Band Ant. Sec. 4.7
A Band R. F. Pri. 9
A Band R. F. Sec. 5.5
A Band Osc. Pri. 8.2
A Band Osc. Sec. ..... .67
B Band Ant. Pri. ..... .43
B Band Ant. Sec. ..... .55
B Band R. F. Pri. ..... .72
B Band R. F. Sec. ..... .50
B Band Osc. Pri. ..... .58
B Band Osc. Sec. ..... .47
C Band Ant. Pri. ..... .26
C Band Ant. Sec. ..... .05
C Band R. F. Pri. ..... .50
C Band R. F. Sec. ..... .85
C Band Osc. Pri. ..... .50
C Band Osc. Sec. ..... .05
1st I. F. Pri. 9.0
1st I. F. Sec. 13.5
2nd I. F. Pri. 9.0
2nd I. F. Sec. 13.5
Power Trans. Pri. 6.5
Power Trans. 5 V. Sec. ..... .01
Power Trans. 6 V. Sec. ..... .01
Power Trans. HI. V. Sec. 135-145-280
Output Transformer Pri. 310
Output Transformer Sec. 4
Speaker Field 1400
Speaker Voice Coil ..... .47
Speaker Field Used As B Filter Choke.

NOBLITT SPARKS INDUSTRIES INC.

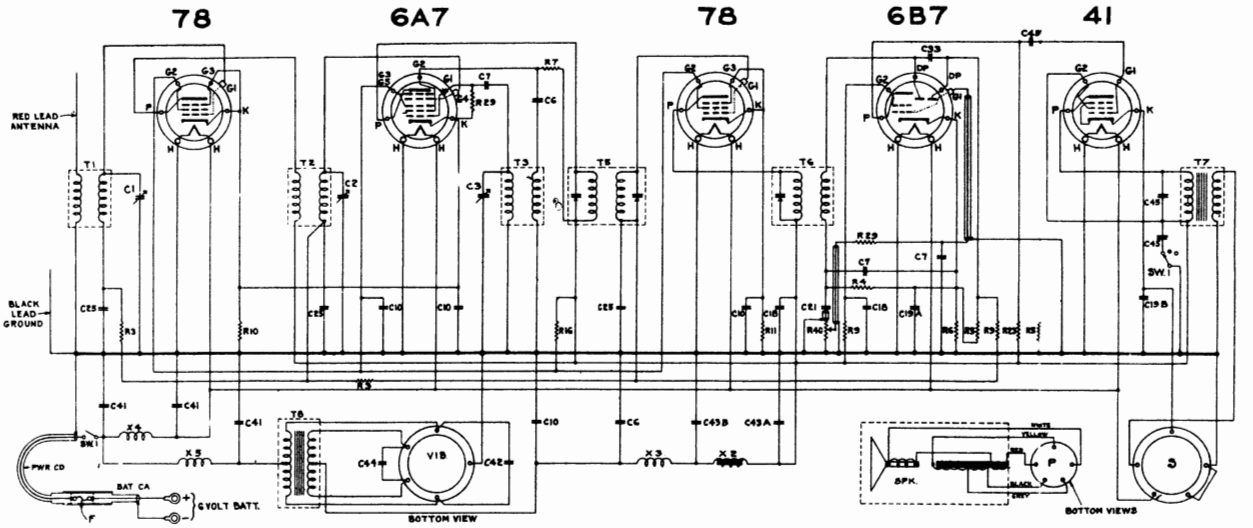
Models 61 and 62





NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODEL 61B & 62B



RESISTORS

R	OHMS	W	PART NO.	PRICE	R	OHMS	W	PART NO.	PRICE
1					24				
2					25				
3	100 M	1/4	17-2068		26				
4	250 M	1/4	17-2069		27				
5	3500 M	1/4	17-2070		28				
6	5 M	1/4	17-2071		29	50 M	1/4	17-2060	
7	20 M	1/4	17-2072		30A				
8					30B				
9	1 MEG	1/4	17-2080		31				
10	500	1/4	17-2088		32				
11	2 M	1/4	17-4202		33				
12					34				
13					35				
14					36				
15					37				
16	80 M	1	17-4763		38				
17					39				
18					40	500 M	V.C.	17-15030	
19					41				
20					42				
21					43A				
22					43B				
23	250 M	1/4	17-3011		44				

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE	C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		17-13192		24				
2					25	.05 CAN	160	17-14006	
3					26				
4					27				
5					28				
6	.002 MICA		17-2063		29				
7	.0001 MICA	600	17-2064		30				
8					31				
9					32				
10	.1 CAN	400	17-14034		33	.00005 MICA	600	17-18047	
11					34				
12					35				
13					36				
14					37				
15					38				
16					39				
17					40				
18	.12 CAN	400	17-14009		41	1 SMALL CAN	15	17-4709	
19A	.12 TWIN		17-4707		42	.006 MH MICA	600	17-14098	
19B	.12 ELECT.	25			43A	ELECT	500	17-4703	
20					43B				
21	.02 L.G. CAN	600	17-14008		44				
22					45				
23					46				

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1	ANTENNA COIL	00-13930	
2	R. F. COIL	00-13931	
3	OSCILATOR COIL	00-13932	
4			
5	1 ST. I.F. COIL	00-13933	
6	2 ND. I.F. COIL	00-13934	
7	OUT PUT TRANSF.	00-13935	
8	POWER TRANSF	00-13937	
X	CHOKES		
1			
2	"B" FILTER	00-13936	
3	"B" R.F.	00-E181-1	
4	"A" FILAMENT-SHORT	00-13938	
5	"A" TRANSFORMER-LONG	00-13940	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER	17-13151	
P	SPEAKER PLUG (FURNISHED WITH SPK.)		
S	SPEAKER SOCKET	17-4193	
SW 1	POWER SWITCH & TONE CONTROL	17-13190	
V1B.	SYNCHRONOUS VIBRATOR	17-13187	
F	FUSE	17-2228	
PWR. CD.	POWER CORD & PLUG ASSEMBLY	00-13193	
BAT. CA.	BATTERY CABLE ASSEMBLY	00-4778-E	

I.F. PEAK 175 K.C.
BALANCE 1500 K.C.
CHECK 600 K.C.

DIL-O-SER

MODELS 61B AND 62B SOCKET VOLTAGES

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	Anode Grid	Oscillator Grid
78	6.3	3.0	3.0	85	225	.....	.....
6A7	6.3	3.0	.....	85	225	140	*2-8
78	6.3	3.6	3.6	85	225	.....	.....
6B7	6.3	2.1	.....	20	35	.....	.....
41	6.3	15.0	.....	225	222	.....	.....

*Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES

78

Heater 0
Heater ..... ∞
Cathode .....500 Ω
Suppressor Grid .....500 Ω
Screen to B+ .....50,000 Ω
Plate to B+ .....1.3 Ω
Control Grid .....1,700,000 Ω

6A7

Heater 0
Heater .....∞
Cathode .....500 Ω
Osc. Grid .....50,500 Ω
Anode Grid to B+ .....20,000 Ω
Screen Grid to B+ .....50,000 Ω
Plate to B+ .....65 Ω
Control Grid .....1,600,000 Ω

78

Heater 0
Heater .....∞
Cathode .....2,000 Ω
Suppressor .....2,000 Ω
Screen to B+ .....50,000 Ω
Plate to B+ .....100 Ω
Control Grid .....1,500,000 Ω

6B7

Heater 0
Heater .....∞
Cathode .....5,000 Ω
Diode .....205,000 Ω
Diode .....500,000 Ω
Screen to B+ .....1,000,000 Ω
Plate to B+ .....250,000 Ω
Control Grid
Vol. Control On .....550,000 Ω
Vol. Control Off .....50,000 Ω

41

Heater 0
Heater .....∞
Cathode .....540 Ω
Control Grid .....500,000 Ω
Screen to B+ 0
Plate to B+ .....500 Ω

Vibrator

Heater to B+ .....160 Ω
Heater to B+ .....175 Ω
Cathode to "A" Lead .....02 Ω
Grid 0
Plate to "A" Lead .....02 Ω
(Pin arrangement same as 37 tube)

All readings taken to ground unless otherwise specified.
Vibrator should be removed but speaker connected to socket on rear of chassis.
Heater readings are taken with all tubes and dial light bulb removed.

COIL AND TRANSFORMER RESISTANCES

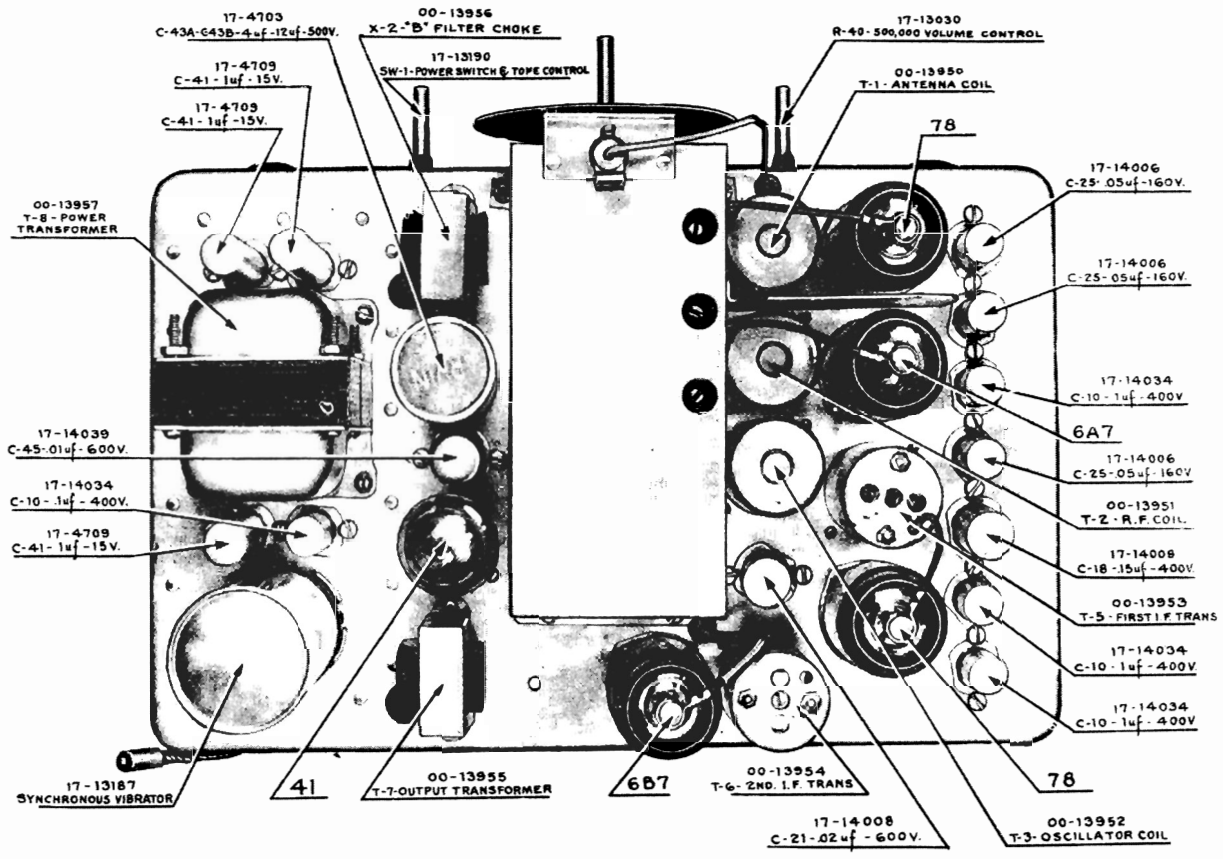
Antenna Pri. .....19.5 Ω
Antenna Sec. .....5.0 Ω
R. F. Pri. .....1.3 Ω
R. F. Sec. .....5.0 Ω
Oscillator Pri. .....1.7 Ω
Oscillator Sec. .....8.2 Ω
1st I. F. Trans. Pri. .....65.0 Ω
1st I. F. Trans. Sec. .....65.0 Ω
2nd I. F. Trans. Pri. .....100.0 Ω
2nd I. F. Trans. Sec. .....100.0 Ω
Output Trans. Pri. .....490.0 Ω
Output Trans. Sec. .....1.25 Ω
Power Trans. Pri. .....05 Ω
Power Trans. Sec. .....160-175—335 Ω
Speaker Field .....540-8—548 Ω
Speaker Voice Coil .....65 Ω
Filter Choke .....145 Ω

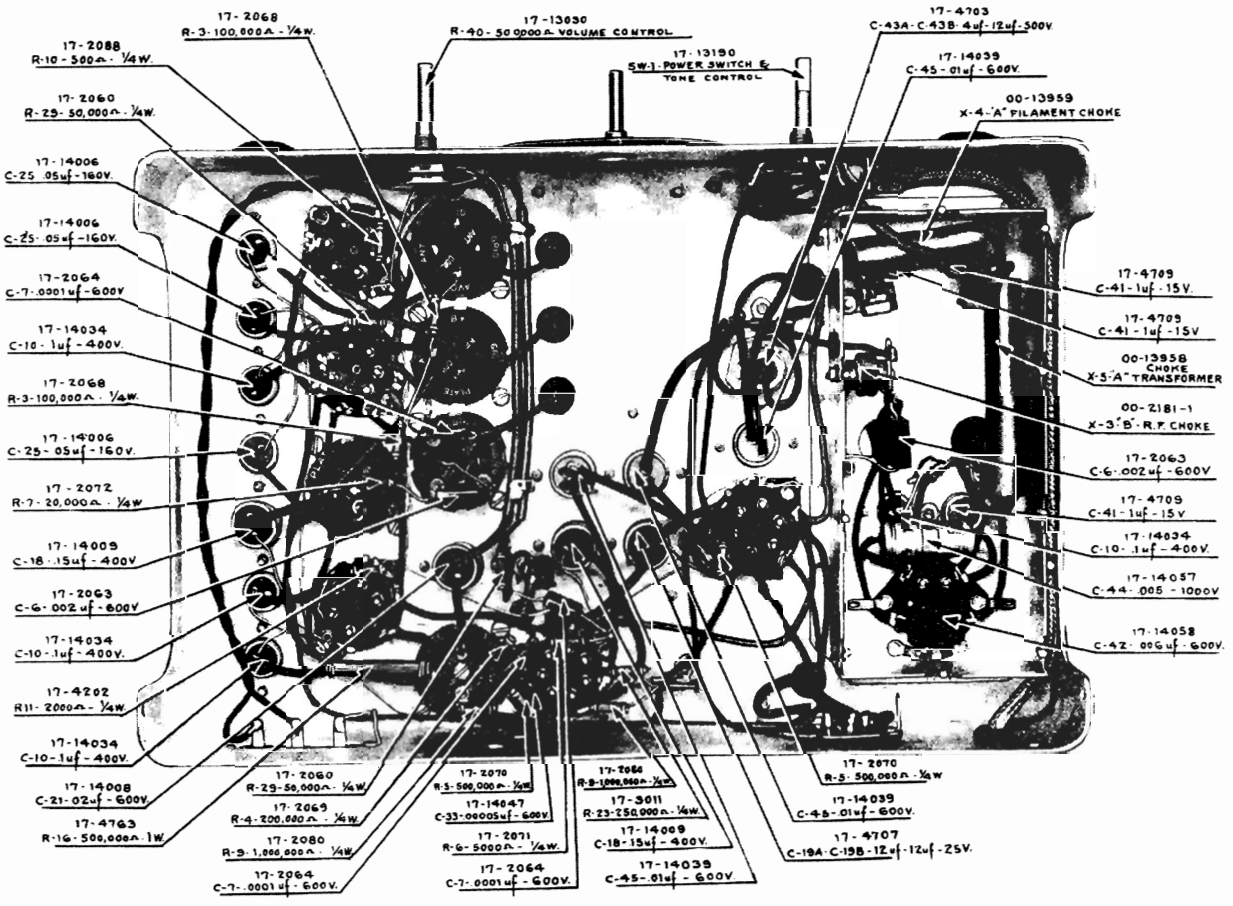
CAUTION—This radio is polarized and will operate only when the chassis (cable shield) is connected to the negative pole and the yellow A lead wire connected to the positive pole of a six volt storage battery.

I.F. = 175 K.C.

NOBLITT SPARKS INDUSTRIES INC.

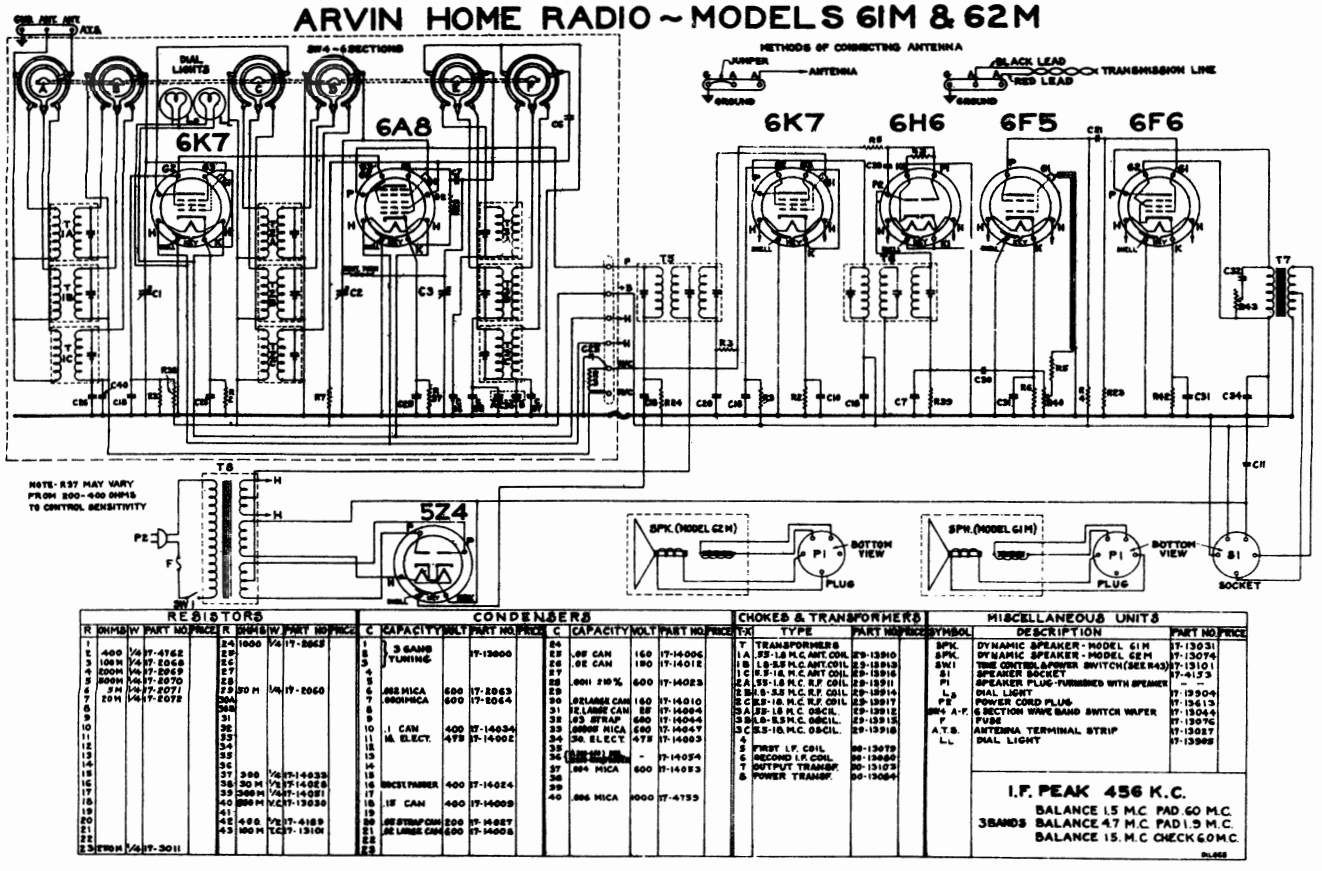
ARVIN HOME RADIO—MODEL 61B-62B





NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODELS 61M & 62M



RESISTORS

R	OHMS	W	PART NO.	PRICE
1	400	1/4	17-4762	
2	100 M	1/4	17-2068	
3	2000 M	1/4	17-2069	
4	8000 M	1/4	17-2070	
5	.5 M	1/4	17-2071	
6	2.0 M	1/4	17-2072	
24	1000	1/4	17-2069	
29				
26				
27				
28				
29	50 M	1/4	19-2060	
30A				
30B				
31				
32				
34				
35				
36				
37	300	1/2	17-14033	
38	30 M	1/2	17-14028	
39	2500 M	1/2	17-14021	
40	250 M	1/2	17-13030	
41				
42	450	1/2	17-4189	
43	100 M	1/2	17-13101	
44	270 M	1/4	17-3011	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		17-13000	
2				
3				
4				
5				
6	.002 MICA	600	17-2063	
7	.0001 MICA	600	17-2064	
8				
9				
10	.1 CAN	400	17-14034	
11	MI. ELECT.	475	17-14002	
12				
13				
14				
15				
16	OSCILLATOR	400	17-14024	
17				
18	.1F CAN	400	17-14009	
19				
20	.05 STRAPPON	200	17-14027	
21	.05 LARGE CAN	600	17-14008	
22				
23				
24				
25				
26	.05 CAN	150	17-14001	
27				
28	.0011 ±10%	600	17-14023	
29				
30	.02 LARGE CAN	150	17-14010	
31	.1 LARGE CAN	25	17-14004	
32	.03 STRAP	600	17-14044	
33	.0005 MICA	600	17-14047	
34	.250 ELECT.	475	17-14003	
35				
36			-	17-14054
37	.004 MICA	600	17-14013	
38				
39				
40	.006 MICA	1000	17-4155	

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1A	PT-1.8 M.C. ANT. COIL	29-13910	
1B	L.8-5.5 M.C. ANT. COIL	29-13913	
1C	R.F.-1.8 M.C. ANT. COIL	29-13916	
2A	OS-1.8 M.C. R.F. COIL	29-13911	
2B	L.8-5.5 M.C. R.F. COIL	29-13914	
2C	R.F.-1.8 M.C. R.F. COIL	29-13917	
3A	OS-1.8 M.C. OSCIL.	29-13912	
3B	L.8-5.5 M.C. OSCIL.	29-13915	
3C	R.F.-1.8 M.C. OSCIL.	29-13918	
4			
5	FIRST I.F. COIL	20-13079	
6	SECOND I.F. COIL	20-13080	
7	OUTPUT TRANSF.	20-13078	
8	POWER TRANSF.	20-13084	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER - MODEL 61M	17-13031	
SPK.	DYNAMIC SPEAKER - MODEL 62M	17-13096	
SW1	TONE CONTROL & POWER SWITCH (SEE R43)	17-13101	
SI	SPEAKER SOCKET	17-4173	
PI	SPEAKER PLUG-FURNISHED WITH SPEAKER	-	
L.P.	DIAL LIGHT	17-13904	
P.B.	POWER CORD PLUG	17-13613	
SW4 A-F	6 SECTION WAVE BAND SWITCH WAFER	17-13044	
F	FUSE	17-13076	
A.T.S.	ANTENNA TERMINAL STRIP	17-13027	
L.L.	DIAL LIGHT	17-13908	

I.F. PEAK 456 K.C.
BALANCE 1.5 M.C. PAD .60 M.C.
3 BANDS BALANCE 4.7 M.C. PAD 1.9 M.C.
BALANCE 15. M.C. CHECK 6.0 M.C.

MODEL 61M-62M SOCKET VOLTAGES

Tube	Heaters	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid 1500 KC	*Anode Grid	Diode Plates
6K7	6.3	3.0	3.0	90	250	.....	.....	.....
6A8	6.3	3.0	.....	90	250	3-10	180	.....
6K7	6.3	3.0	3.0	90	250	.....	.....	.....
6H6	6.3	.....	.....	.....	.....	.....	.....	†2.9
6F5	6.3	1.5	.....	.....	120	.....	.....	.....
6F6	6.3	18.0	.....	250	240	.....	.....	.....
5Z4	5.0	310	.....	.....	.....	.....	.....	.....

DROP ACROSS SPEAKER FIELD—65 V.
*—Measured with Vacuum Tube Voltmeter
†—No Signal

POINT TO POINT RESISTANCES

6K7

Heater	.01
Shell	0
Heater	.01
Cathode	400
Suppressor	400
Screen to B+	30,000
Screen to GND.	100,000
Plate to B+	.9 .72 .50
Control Grid	705,000

6A8

Heater	.01
Shell	0
Heater	.01
Cathode	300
Osc. Grid	50,300
Anode to B+	20,000
Screen to B+	30,000
Screen to GND.	100,000
Plate to B+	1000
Control Grid	5.5 .50 .05

6K7

Heater	.01
Shell	0
Heater	.01
Cathode	400
Suppressor	400
Screen to B+	100,000
Plate to B+	9
Control Grid	700,000

6H6

Heater	.01
Shell	0
Heater	.01
Cathode	0
Cathode	0
Plate	100,000
Plate	300,000

6F5

Heater	.01
Shell	0
Heater	.01
Cathode	5000
Plate to B+	200,000
Control Grid:	
V. C. on 1,000,000; V. C. off 500,000	

6F6

Heater	.01
Shell	0
Heater	.01
Cathode	400
Screen to B+	0
Plate to B+	310
Control Grid	250,000

5Z4

Heater to B+	1400
Shell	0
Heater to B+	1400
Plate	115
Plate	125
Cathode to B+	1400

All resistances taken to ground unless otherwise specified.

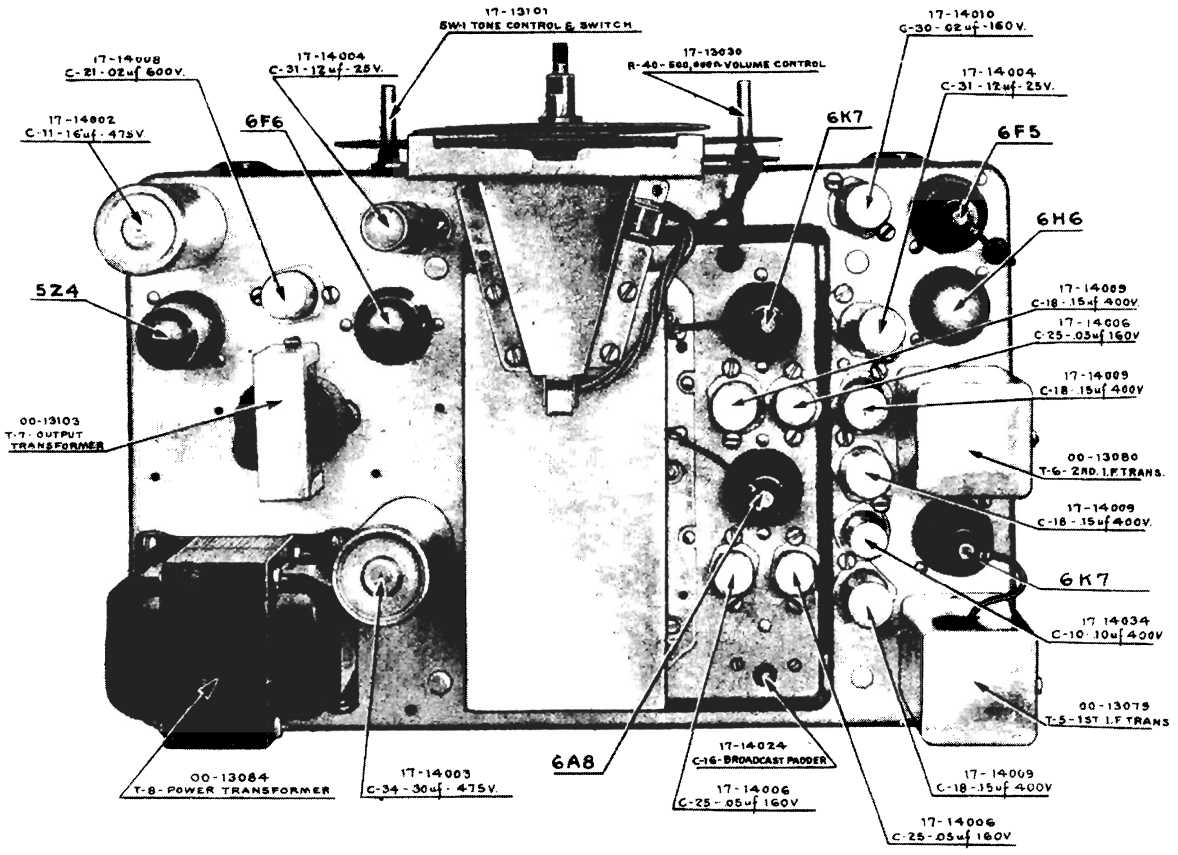
Three readings following grid of 6A8 and plate of 6K7 signify A, B, and C, wave band positions.

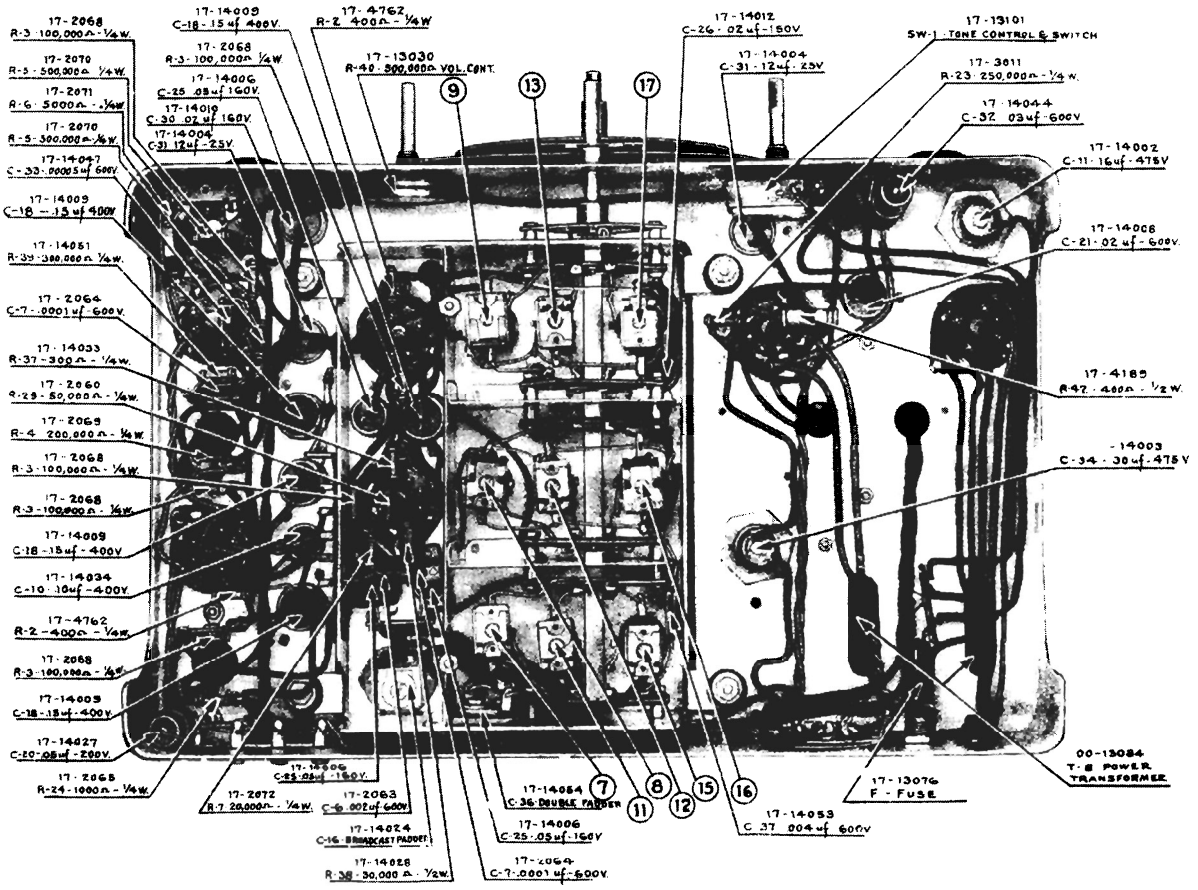
COIL AND TRANSFORMER RESISTANCES

A Band Ant. Pri.	19.0
A Band Ant. Sec.	4.7
A Band R. F. Pri.	.9
A Band R. F. Sec.	5.5
A Band Osc. Pri.	8.2
A Band Osc. Sec.	.67
B Band Ant. Pri.	.43
B Band Ant. Sec.	.55
B Band R. F. Pri.	.72
B Band R. F. Sec.	.50
B Band Osc. Pri.	.58
B Band Osc. Sec.	.47
C Band Ant. Pri.	.26
C Band Ant. Sec.	.05
C Band R. F. Pri.	.50
C Band R. F. Sec.	.05
C Band Osc. Pri.	.50
C Band Osc. Sec.	.05
1st I. F. Pri.	9.0
1st I. F. Sec.	13.5
2nd I. F. Pri.	9.0
2nd I. F. Sec.	13.5
Power Trans. Pri.	6.5
Power Trans. 5 V. Sec.	.01
Power Trans. 6 V. Sec.	.01
Power Trans. HI. V. Sec.	125-135—260
Output Transformer Pri.	310
Output Transformer Sec.	.4
Speaker Field	1400
Speaker Voice Coil	.47
Speaker Field Used As B Filter Choke.	

NOBLITT SPARKS INDUSTRIES INC.

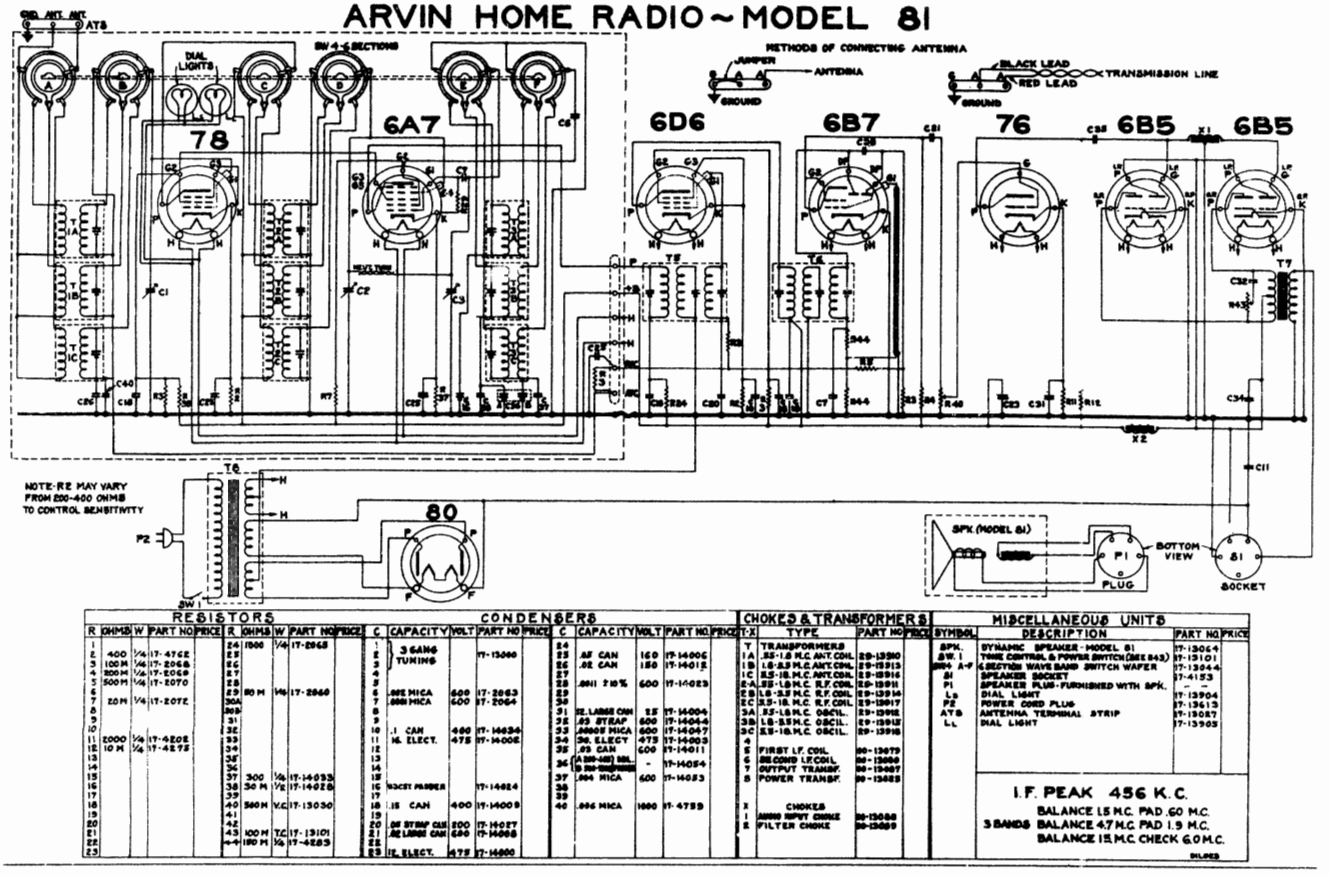
Models 61M and 62M





NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO ~ MODEL 81



RESISTORS

R	OHMS	W	PART NO.	PRICE
1	400	1/4	17-4762	
2	100 M	1/4	17-2068	
3	800 M	1/4	17-2069	
4	500 M	1/4	17-2070	
5	20 M	1/4	17-2072	
6				
7				
8				
9				
10				
11	2000	1/2	17-4202	
12	10 M	1/2	17-4272	
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24	1000	1/4	17-2068	
25				
26				
27				
28				
29	80 M	1/4	17-2060	
30A				
30B				
31				
32				
33				
34				
35				
36	300	1/2	17-14033	
37	50 M	1/2	17-14028	
38				
39				
40	560 M	V.C.	17-13030	
41				
42				
43	100 M	T.C.	17-13101	
44	100 M	1/4	17-4283	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		17-13060	
2				
3				
4				
5				
6	.005 MICA	600	17-2063	
7	.0025 MICA	600	17-2064	
8				
9				
10	.1 CAN	400	17-14034	
11	MI. ELECT.	475	17-14002	
12				
13				
14				
15				
16	MIDGET PADDER		17-14024	
17				
18	.15 CAN	400	17-14009	
19				
20	.04 STRAP CAN	200	17-14027	
21	.02 LARGE CAN	600	17-14068	
22				
23	12 ELECT.	475	17-14000	
24				
25	.02 CAN	150	17-14012	
26				
27				
28	.0001 2 1/2%	600	17-14023	
29				
30				
31	12 LARGE CAN	25	17-14004	
32	.03 STRAP	600	17-14044	
33	.00005 MICA	600	17-14047	
34	30, ELECT	475	17-14003	
35	.01 CAN	600	17-14011	
36	(A 200-400) 100, (B 200-400) 100	-	17-14054	
37	.004 MICA	600	17-14033	
38				
39				
40	.006 MICA	1000	17-4755	

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1A	.55-1.8 M.C. ANT. COIL	29-13310	
1B	1.6-3.3 M.C. ANT. COIL	29-13313	
1C	3.3-16 M.C. ANT. COIL	29-13314	
2A	.55-1.8 M.C. R.F. COIL	29-13911	
2B	1.8-3.3 M.C. R.F. COIL	29-13914	
2C	3.3-16 M.C. R.F. COIL	29-13917	
3A	.55-1.8 M.C. OSCIL.	29-13912	
3B	1.8-3.5 M.C. OSCIL.	29-13915	
3C	3.5-16 M.C. OSCIL.	29-13918	
4			
5	FIRST I.F. COIL	30-13079	
6	SECOND I.F. COIL	30-13080	
7	OUTPUT TRANSF.	30-13407	
8	POWER TRANSF.	30-13689	
	CHOKES		
X	ANTENNA INPUT CHOKE	28-13088	
Z	FILTER CHOKE	28-13689	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER - MODEL 81	17-13064	
SW 1	TONE CONTROL & POWER SWITCH (SEE 843)	17-13101	
6D6 A-F	4 SECTION WAVE BAND SWITCH WAFER	17-13044	
81	SPEAKER SOCKET	17-4153	
P1	SPEAKER PLUG - FURNISHED WITH SPK.	-	
L3	DIAL LIGHT	17-13904	
PZ	POWER CORD PLUG	17-13613	
ATS	ANTENNA TERMINAL STRIP	17-13087	
LL	DIAL LIGHT	17-13905	

I.F. PEAK 456 K.C.
BALANCE 1.5 M.C. PAD .60 M.C.
3 BANDS BALANCE 4.7 M.C. PAD 1.9 M.C.
BALANCE 15 M.C. CHECK 6.0 M.C.

MODEL 81 SOCKET VOLTAGES

Tube	Heaters	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid 1500 KC	*Anode Grid
6D6-78	6.3	3.0	3.0	90	250	.....	.....
6A7	6.3	3.0	.....	90	250	4-12	180
6D6	6.3	3.0	3.0	90	250	.....	.....
6B7	6.3	1.5	.....	15	15	.....	.....
76	6.3	8.0	.....	.....	195	.....	.....
6B5	6.3	0	.....	250	240	.....	.....
6B5	6.3	0	.....	250	240	.....	.....
80	5.0	310	.....	.....	300 A.C.	.....	.....

*Measured with V. T. Voltmeter Only.

POINT TO POINT RESISTANCES

6D6

Heater	.01 ohm
Heater	.01 ohm
Cathode	400 ohms
Suppressor	400 ohms
Screen to B+	30,000 ohms
Screen to Ground	100,000 ohms
Plate to B+	.9 Ω .72 Ω .5 Ω
Control Grid	700,000 Ω

6A7

Heater	.01 Ω
Heater	.01 Ω
Cathode	300 Ω
Osc. Grid	50,300 Ω
Osc. Anode to B+	20,000 Ω
Screen to B+	30,000 Ω
Screen to GND	100,000 Ω
Plate to B+	1000 Ω
Control Grid	5.5 Ω .50 Ω .05 Ω

6D6

Heater	.01 Ω
Heater	.01 Ω
Cathode	400 Ω
Suppressor	400 Ω
Screen to B+	100,000 Ω
Plate to B+	9 Ω
Control Grid	700,000 Ω

6B7

Heater	.01 Ω
Heater	.01 Ω
Cathode	0
Diode	100,000 Ω
Diode	300,000 Ω
Screen to B+	200,000 Ω
Plate to B+	200,000 Ω
Control Grid	150,000 Ω

76

Heater	.01 Ω
Heater	.01 Ω
Cathode	2000 Ω
Grid	V. C. on 500,000 Ω; V. C. off 0
Plate to B+	10,000 Ω

6B5

Heater	.01 Ω
Heater	.01 Ω
Cathode	0
Control Grid	2700 Ω
Plate No. 1 to B+	120 Ω
Output Plate	340 Ω

6B5

Heater	.01 Ω
Heater	.01 Ω
Cathode	0
Control Grid	2300 Ω
Plate No. 1	120 Ω
Output Plate	320 Ω

80

Filament to B+	1020 Ω
Filament to B+	1020 Ω
Plate	130 Ω
Plate	140 Ω

ALL READINGS TAKEN TO GROUND UNLESS OTHERWISE SPECIFIED.
SPEAKER SHOULD BE LEFT CONNECTED.

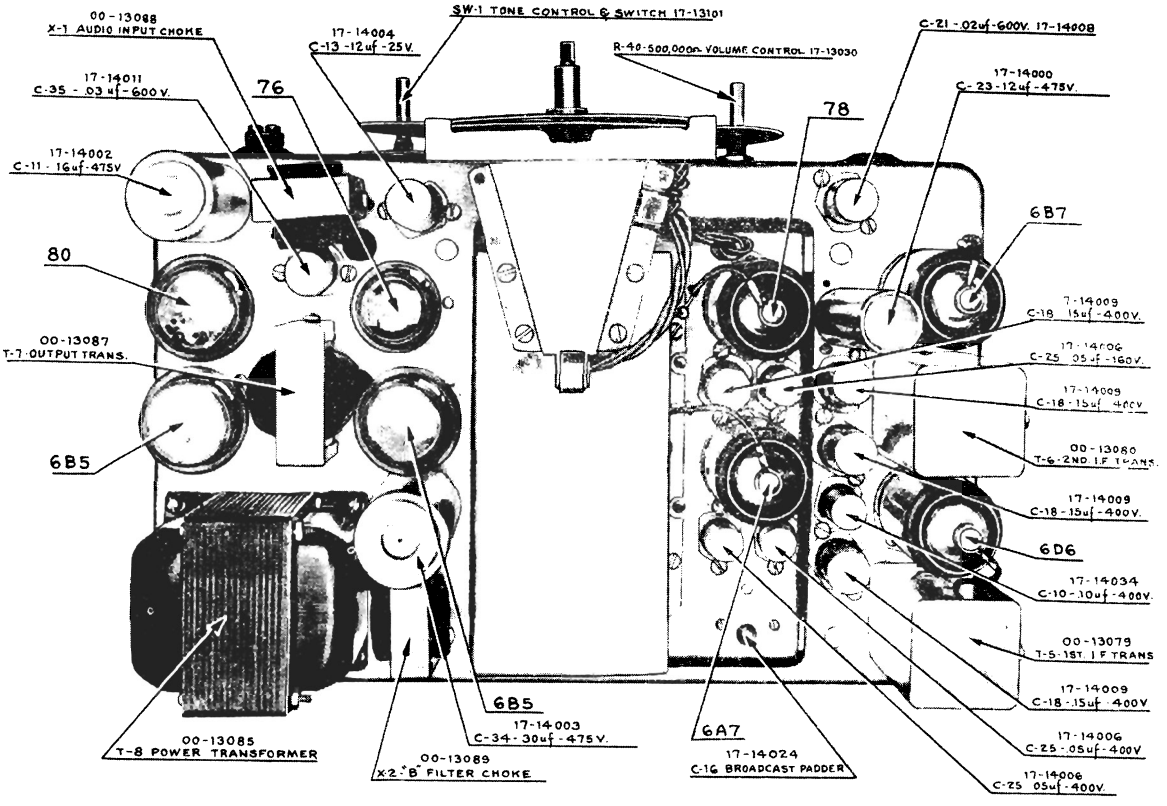
Three readings following control grid of 6A7 and plate of 6D6 signify A, B, and C, wave band position resistances.

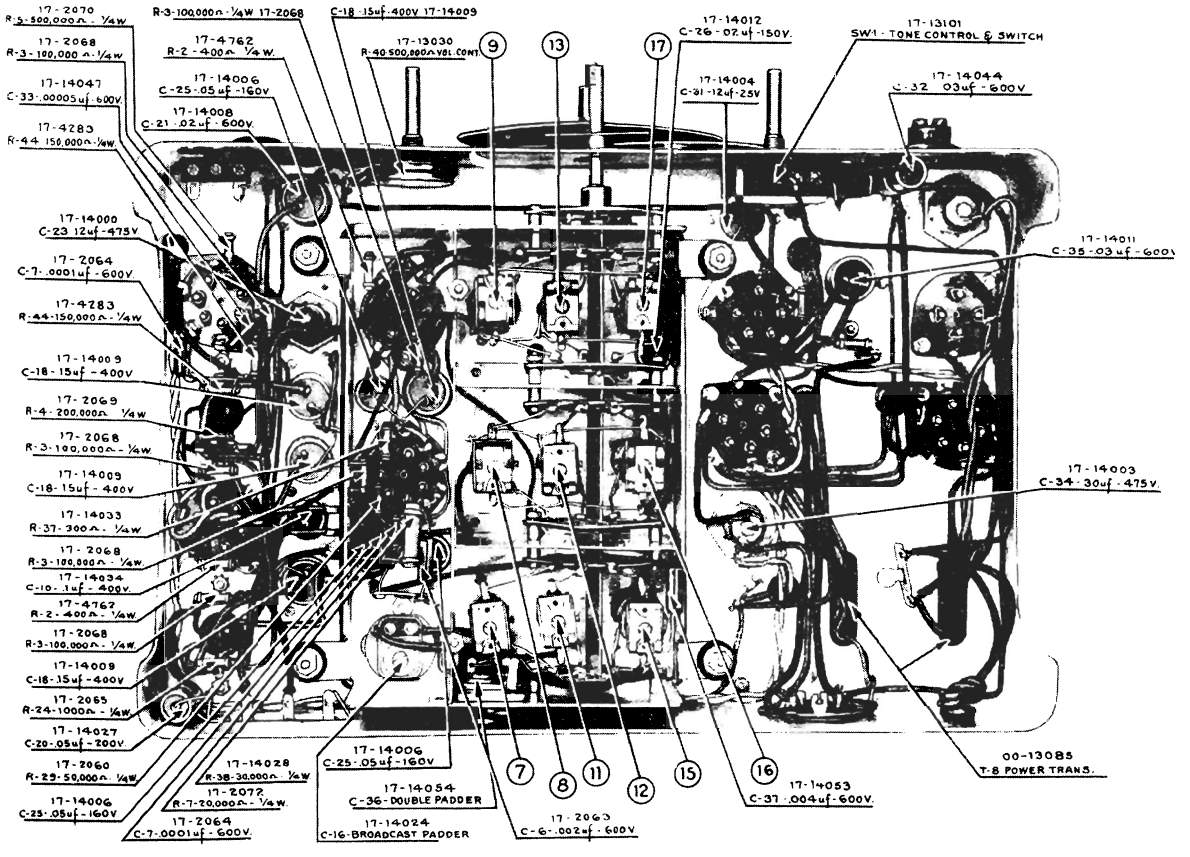
COIL AND TRANSFORMER RESISTANCES

A Band Ant. Pri.	19.0
A Band Ant. Sec.	4.7
A Band R. F. Pri.	.9
A Band R. F. Sec.	5.5
A Band Osc. Pri.	8.2
A Band Osc. Sec.	.67
B Band Ant. Pri.	.43
B Band Ant. Sec.	.55
B Band R. F. Pri.	.72
B Band R. F. Sec.	.50
B Band Osc. Pri.	.58
B Band Osc. Sec.	.47
C Band Ant. Pri.	.26
C Band Ant. Sec.	.05
C Band R. F. Pri.	.50
C Band R. F. Sec.	.05
C Band Osc. Pri.	.50
C Band Osc. Sec.	.05
1st I. F. Pri.	9.0
1st I. F. Sec.	13.5
2nd I. F. Pri.	9.0
2nd I. F. Sec.	13.5
Power Trans. Pri.	3.65
Power Trans. 5 V. Sec.	.01
Power Trans. 6 V. Sec.	.01
Power Trans. HI. V. Sec.	140-130—270
Output Trans. Pri.	220-200—420
Output Trans. Sec.	.08
B Filter Choke	120
Speaker Field	900
Speaker Voice Coil	.2
Audio Input Trans.	2300-2700—5000

NOBLITT SPARKS INDUSTRIES INC.

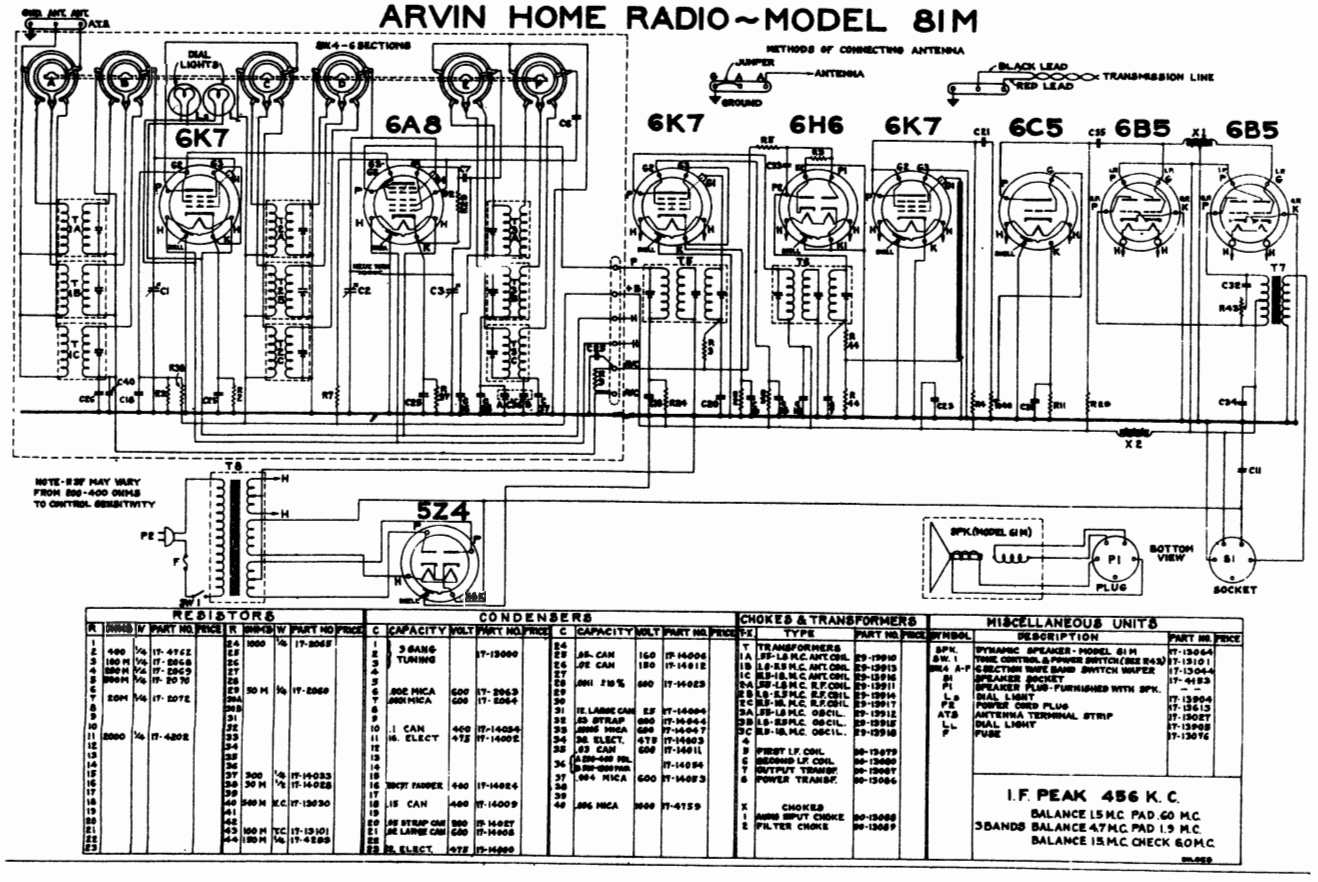
Model 81





NOBLITT SPARKS INDUSTRIES INC.

ARVIN HOME RADIO—MODEL 81M



RESISTORS

R	OHMS	W	PART NO.	PRICE	R	OHMS	W	PART NO.	PRICE
2	400	1/4	17-4762		24	1000	1/4	17-2068	
3	100 M	1/4	17-2068		25				
4	2000 M	1/4	17-2059		26				
5	2000 M	1/4	17-2070		27				
6					28				
7	2.0M	1/4	17-2072		29	50 M	1/4	17-2069	
8					30A				
9					30B				
10					31				
11	2000	1/4	17-4202		32				
12					33				
13					34				
14					35				
15					36				
16					37	300	1/4	17-14023	
17					38	30 M	1/2	17-14028	
18					39				
19					40	560 M	K.C.	17-13030	
20					41				
21					42				
22					43	100 M	T.C.	17-13101	
23					44	150 M	1/4	17-4288	

CONDENSERS

C	CAPACITY	VOLT	PART NO.	PRICE	C	CAPACITY	VOLT	PART NO.	PRICE
1	3 GANG TUNING		17-13000		24				
2					25				
3					26	.05 CAN	150	17-14604	
4					27	.02 CAN	150	17-14612	
5					28				
6	.002 MICA	600	17-2063		29	.0001 ±10%	600	17-14025	
7	.0001 MICA	600	17-2064		30				
8					31	.12 LARGE CAN	25	17-14604	
9					32	.03 STRAP	600	17-14644	
10	.1 CAN	400	17-14024		33	.0005 MICA	600	17-14047	
11	16. ELECT.	475	17-14002		34	DBL. ELECT.	475	17-14003	
12					35	.03 CAN	600	17-14611	
13					36	(A) 250-600 FBL. (B) 250-2000 MM		17-14054	
14					37	.004 MICA	600	17-14023	
15					38				
16	TRIPLE TRIMMER	400	17-14024		39				
17					40	.006 MICA	1000	17-4759	
18	.15 CAN	400	17-14009						
19									
20	.05 STRAP CAN	250	17-14027						
21	.05 LARGE CAN	600	17-14605						
22									
23	25. ELECT.	475	17-14000						

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.	PRICE
T	TRANSFORMERS		
1A	SP-1.5 M.C. ANT. COIL	29-13910	
1B	1.0-2.5 M.C. ANT. COIL	29-13913	
1C	2.5-15 M.C. ANT. COIL	29-13916	
2A	SP-1.5 M.C. R.F. COIL	29-13911	
2B	1.0-2.5 M.C. R.F. COIL	29-13914	
2C	2.5-15 M.C. R.F. COIL	29-13917	
3A	SP-1.5 M.C. OSCIL.	29-13912	
3B	1.0-2.5 M.C. OSCIL.	29-13915	
3C	2.5-15 M.C. OSCIL.	29-13918	
4			
5	FIRST I.F. COIL	30-13879	
6	SECOND I.F. COIL	30-13880	
7	OUTPUT TRANSF.	30-13881	
8	POWER TRANSF.	30-13886	
X	CHOKES		
1	AUDIO INPUT CHOKE	30-13888	
2	FILTER CHOKE	30-13889	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.	PRICE
SPK.	DYNAMIC SPEAKER - MODEL 81M	17-13064	
SW. 1	TONE CONTROL & POWER SWITCH (SEE R43)	17-13101	
SW. 4 A-F	6 SECTION WAVE BAND SWITCH WAFER	17-13044	
S1	SPEAKER SOCKET	17-4183	
P1	SPEAKER PLUG - FURNISHED WITH SPK.	— —	
L.P.	DIAL LIGHT	17-13054	
P.E.	POWER CORD PLUG	17-13043	
ANT.	ANTENNA TERMINAL STRIP	17-13057	
L.L.	DIAL LIGHT	17-13058	
F	FUSE	17-13076	

I.F. PEAK 456 K.C.
3 BANDS BALANCE 1.5 M.C. PAD .60 M.C.
BALANCE 4.7 M.C. PAD 1.9 M.C.
BALANCE 15 M.C. CHECK 6.0 M.C.

MODEL 81M SOCKET VOLTAGES

Tube	Heaters	Cathode	Suppressor Grid	Screen Grid	Plate	Oscillator Grid 1500 KC	Anode Grid	Shell
6K7	6.3	3.0	3.0	90	250	.....	.....	0
6A8	6.3	3.0	.....	90	250	4-12	150	0
6K7	6.3	3.0	3.0	90	250	.....	.....	0
6H6	6.3	0	.....	.....	.....	.....	.....	0
6K7	6.3	0	0	13	13	.....	.....	0
6C5	6.3	6.0	.....	.....	110	.....	.....	0
6B5	6.3	0	.....	250	240	.....	.....	0
6B5	6.3	0	.....	250	240	.....	.....	0
5Z4	5.0	310	.....	.....	300 A.C.	.....	.....	0

POINT TO POINT RESISTANCES

6K7

Heater	.01
Heater	.01
Shell	0
Cathode	400
Suppressor	400
Screen	100,000
Plate to B+	.9 .72 .50
Control Grid	700,000
Screen to B+	30,000

6A8

Heater	.01
Heater	.01
Shell	0
Osc. Grid	50,300
Anode Grid to B+	20,000
Screen	100,000
Plate to B+	1000
Control Grid	5.5 .50 .05
Cathode	300
Screen to B+	30,000

6K7

Heater	.01
Heater	.01
Shell	0
Cathode	400
Suppressor	400
Screen to B+	100,000
Plate to B+	9
Control Grid	700,000

6H6

Heater	.01
Heater	.01
Shell	0
Cathode	0
Cathode	0
Plate	100,000
Plate	300,000

6K7

Heater	.01
Heater	.01
Shell	0
Cathode	0
Suppressor	0
Screen to B+	200,000
Plate	200,000
Control Grid	150,000

6C5

Heater	.01
Heater	.01
Shell	0
Cathode	2000
Control Grid:	
	V. C. on 500,000; V. C. off 0
Plate to B+	50,000

6B5

Heater	.01
Heater	.01
Cathode	0
Plate to B+	0
Output Plate to B+	220
Control Grid	2300

6B5

Heater	.01
Heater	.01
Cathode	0
Plate to B+	0
Output Plate to B+	200
Control Grid	2700

5Z4

Heater to B+	900
Heater to B+	900
Shell	0
Cathode to B+	900
Plate	110
Plate	110

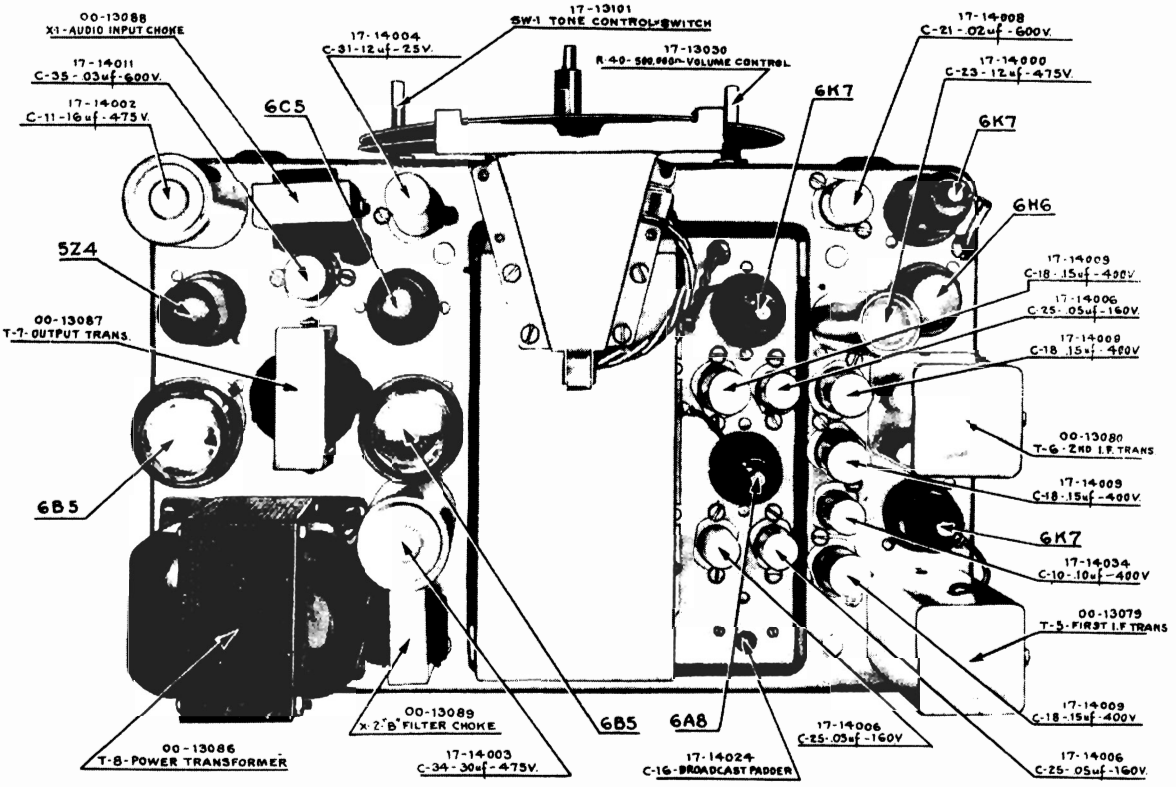
All readings taken to ground unless otherwise specified. Speaker should be left connected.
Three readings following control grid of 6A8 and plate of 6K7 signify A, B, and C wave band position resistances.

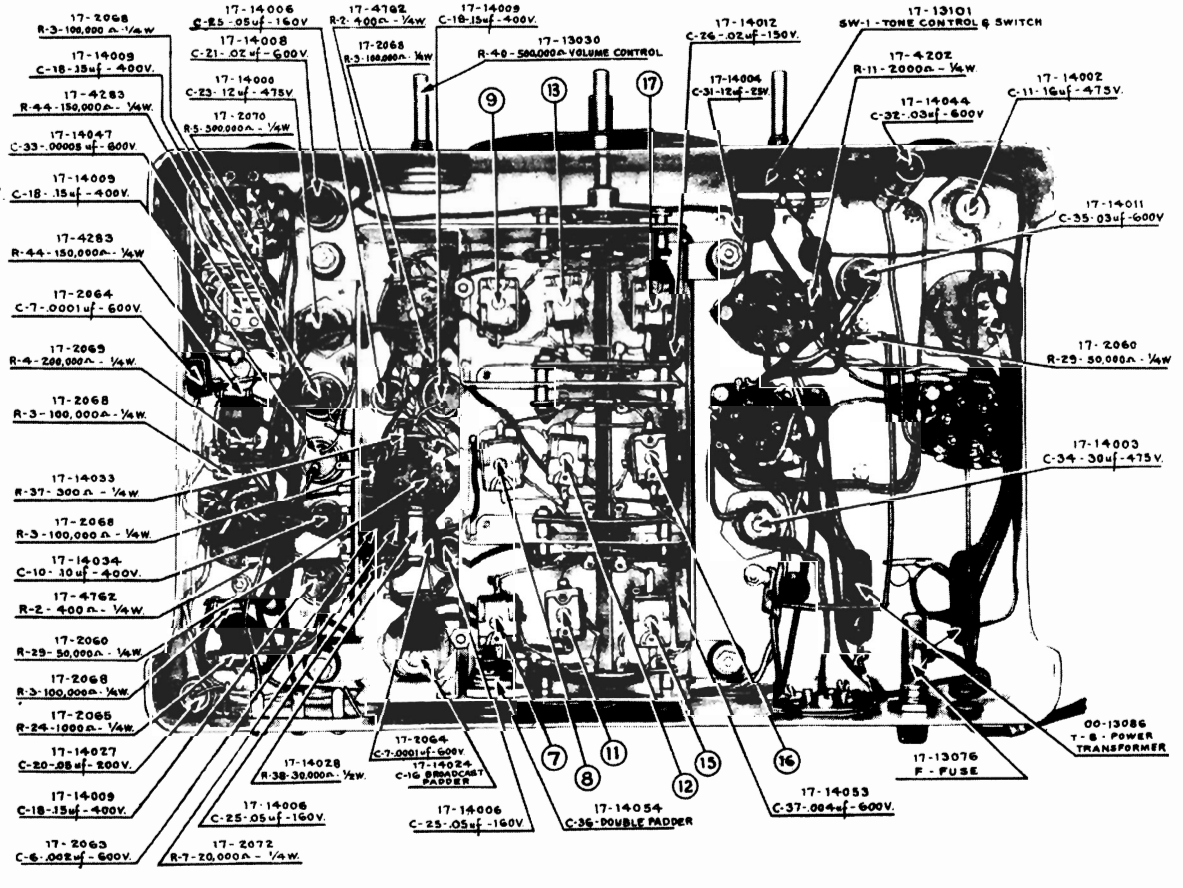
COIL AND TRANSFORMER RESISTANCES

A Band Ant. Pri.	19.0
A Band Ant. Sec.	4.7
A Band R. F. Pri.	.9
A Band R. F. Sec.	5.5
A Band Osc. Pri.	8.2
A Band Osc. Sec.	.67
B Band Ant. Pri.	.43
B Band Ant. Sec.	.55
B Band R. F. Pri.	.72
B Band R. F. Sec.	.50
B Band Osc. Pri.	.58
B Band Osc. Sec.	.47
C Band Ant. Pri.	.26
C Band Ant. Sec.	.05
C Band R. F. Pri.	.50
C Band R. F. Sec.	.05
C Band Osc. Pri.	.50
C Band Osc. Sec.	.05
1st I. F. Pri.	9.0
1st I. F. Sec.	13.5
2nd I. F. Pri.	9.0
2nd I. F. Sec.	13.5
Power Trans. Pri.	3.65
Power Trans. 5 V. Sec.	.01
Power Trans. 6 V. Sec.	.01
Power Trans. HI. V. Sec.	110-120—230
Output Trans. Pri.	220-200—420
Output Trans. Sec.	.08
Audio Input Trans.	2300-2700—5000
B Filter Choke	120
Speaker Field	900
Speaker Voice Coil	.2
A Band Designates St. Bdcst.	.55-1.8 M.C.
B Band Designates Commercial	1.8-5.5 M.C.
C Band Designates Foreign Bcst.	5.5-18 M.C.

NOBLITT SPARKS INDUSTRIES INC.

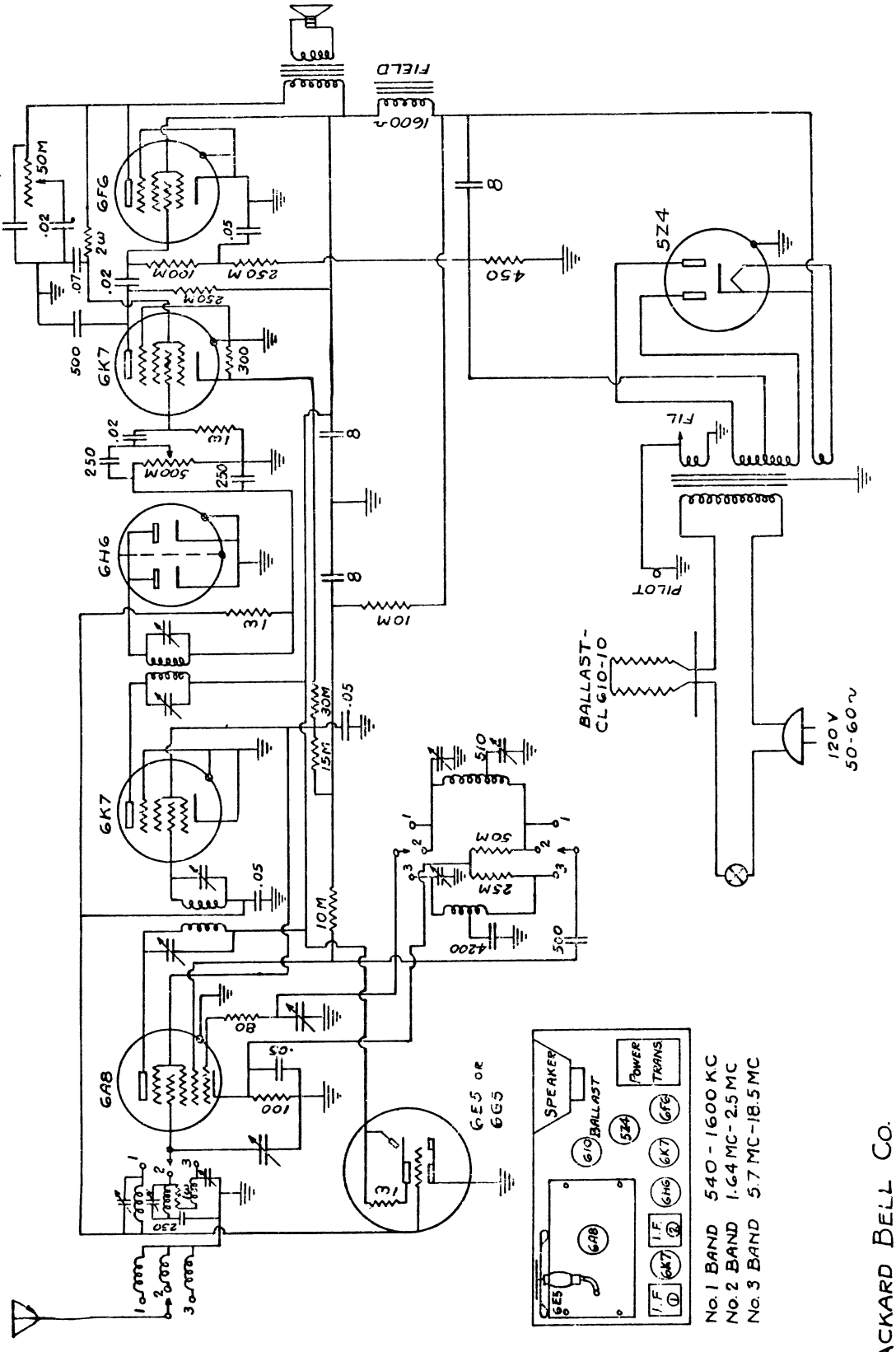
Model 81M





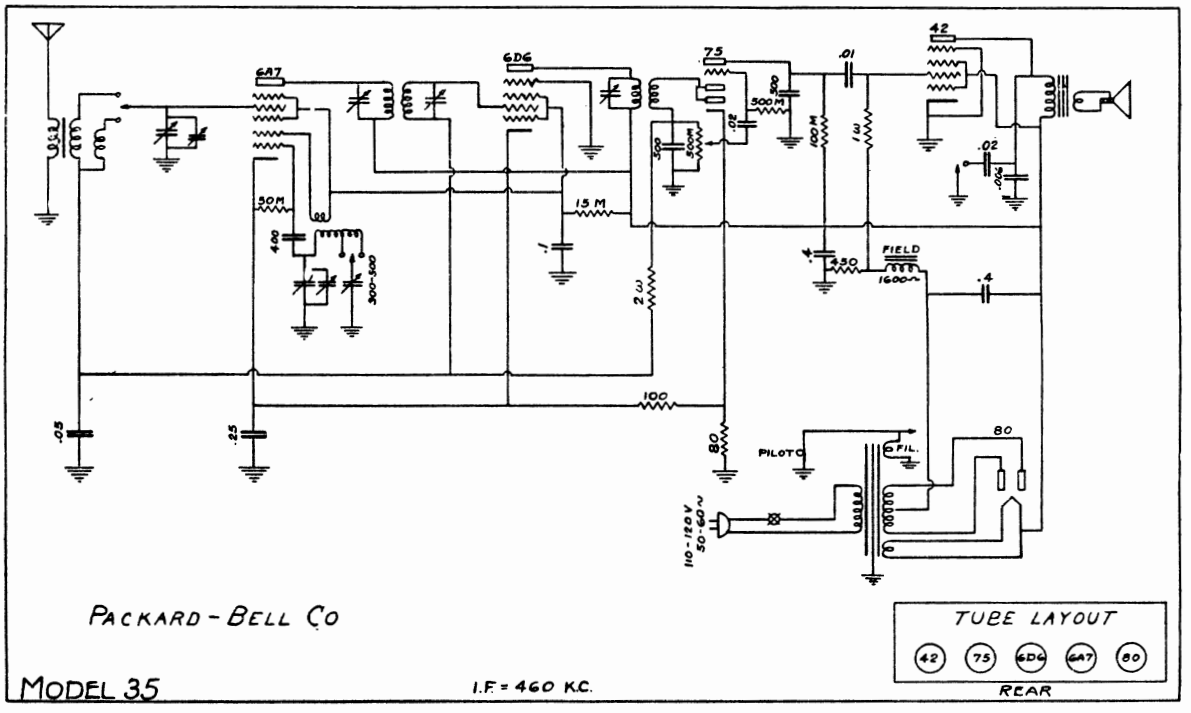
PACKARD BELL CO.

Model 48

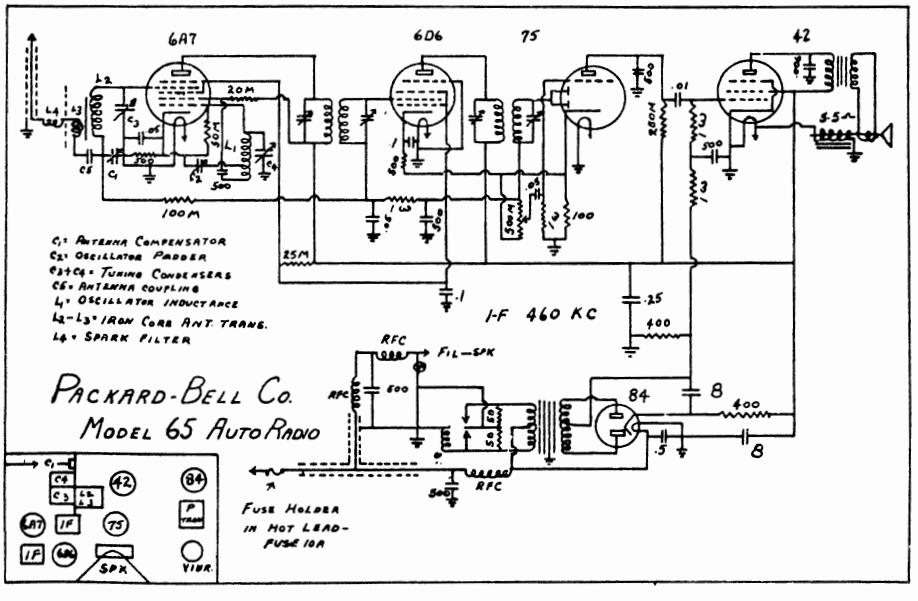


PACKARD BELL CO.

Model 35

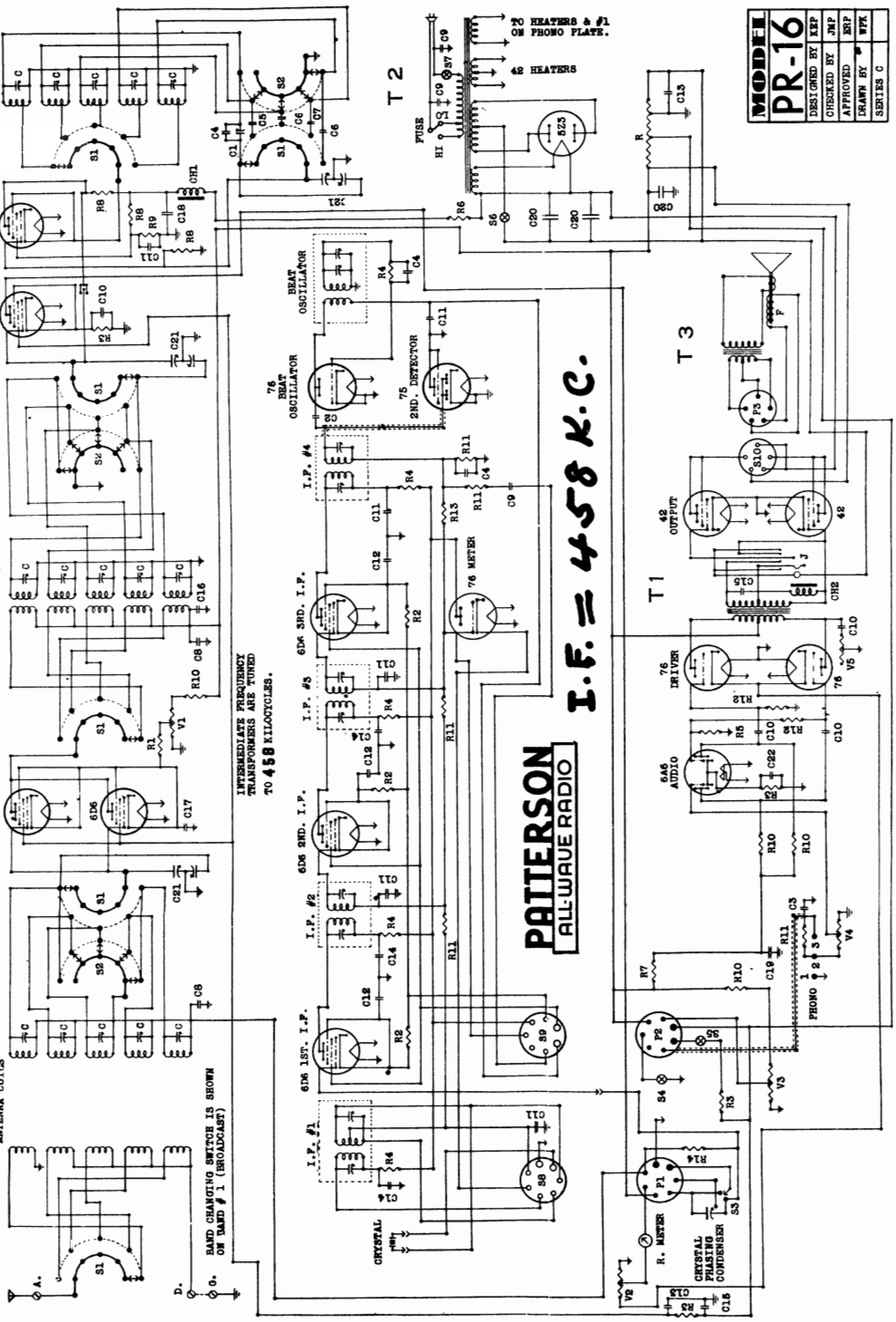


Model 65 Auto Set



PATTERSON RADIO CO.

Model PR-16



R11	250,000 OHM ⅛ Watt
R12	300,000 OHM ⅛ Watt
R13	500,000 OHM ½ Watt
R14	2 MEG OHM ½ Watt
S1	Band Change Switch
S2	Short Out Section
S3	Crystal—Series Parallel Switch
S4	A.V.C. Short Out Switch
S5	Beat Oscillator Switch
S6	Communication Switch
S7	A.C. Switch—Located on Volume Control
S8	Connector Socket No. 1
S9	Connector Socket No. 2
S10	Speaker Socket
T1	Audio Transformer
T2	Power Transformer
T3	Out-put Transformer
P1	Connector Plug No. 1
P2	Connector Plug No. 2
P3	Speaker Plug
F	Field 1500 OHM

C21	3 Gang, 160-220 MMFD Tun. Condenser
C22	.10 MFD—25 Volt
J	Phone Jack
CH1	OSC Filter Choke
CH2	High Pass Audio Choke
V1	R.F. Gain Control— 25,000 OHM
V2	Meter Adjustment— 1,000 OHM
V3	I.F. Gain Control— 25,000 OHM
V4	Volume Control—500,000 OHM
V5	Tone Control—100,000 OHM
R	8000 OHM Voltage Divider
R1	200 OHM ½ Watt
R2	300 OHM ½ Watt
R3	5,000 OHM ½ Watt
R4	10,000 OHM ½ Watt
R5	15,000 OHM ½ Watt
R6	15,000 OHM 1 Watt
R7	25,000 OHM ½ Watt
R8	50,000 OHM ⅛ Watt
R9	100,000 OHM ⅛ Watt
R10	100,000 OHM ½ Watt

C	30 MMFD Trimmer
C1	300 MMFD Padder
C2	.00001 Mica 10%
C3	.0001 Mica 10%
C4	.00025 Mica 10%
C5	.001 Mica 3%
C6	.0022 Mica 3%
C7	.004 Mica 3%
C8	.004 Mica 10%
C9	.006—600 Volt
C10	.02—600 Volt
C11	.05—600 Volt
C12	.1—200 Volt
C13	.1—400 Volt
C14	.1—600 Volt
C15	.25—400 Volt
C16	.25—600 Volt
C17	.5—200 Volt
C18	4 MFD—450 Volt
C19	8 MFD—450 Volt
C20	16 MFD—450 Volt

Fuse on 110 V Tap.....Line Voltage, 110 V—50-60 Cycles
Fuse on 120 V Tap.....Line Voltage, 120 V—50-60 Cycles
Fuse on 220 V Tap.....Line Voltage, 220 V—50-60 Cycles
Fuse on 240 V Tap.....Line Voltage, 240 V—50-60 Cycles

I.F. TUBES, 1 and 2, Type 6D6
Grid 0 Volts Plates 250 Volts+ Screens 100 Volts+
Suppressors and Cathodes
1 Volt+.....R. F. Gain Control, maximum position
38 Volt+.....R. F. Gain Control, minimum position*

HETERODYNE OSC. TUBE, Type 6C6
Grid 0 Volts Plate 75 Volts+ Screen 130 Volts+
Suppressor and Cathode
0 Volts

MODULATOR TUBE, Type 6C6
Grid 0 Volts Plate 230 Volts+ Screen 100 Volts+
Suppressor and Cathode
5 Volts+

I.F. TUBES, 1, 2 and 3, Type 6D6
Grids 0 Volts Plates 180 Volts+ Screens 115 Volts+
Suppressors and Cathodes
1 Volt+.....Manual Control, maximum position
30 Volts+.....Manual Control, minimum position*

BEAT OSCILLATOR TUBE, Type 76†
Grid 0 Volts Plate 70 Volts+ Cathode 0 Volts

V.T.V.M. METER CONTROL TUBE, Type 76
Grid 0 Volts Plate 250 Volts+ Cathode 8 Volts+ (Approx.)

PATTERSON RADIO CO.

Model PR-16

Alignment Procedure

I. F. ALIGNMENT

As explained below, the "R" meter will be found invaluable, and extremely flexible, in all line-up procedure, making it unnecessary to use any other external resonance indicating device. On all sets equipped with crystal filters it is extremely important that the intermediate be aligned *exactly* to the crystal's fundamental frequency, if satisfactory crystal performance is to be accomplished.

Few service men are equipped with a proper service oscillator designed for use with the crystal in the PR-16, and therefore, the method described below will undoubtedly be the most practical, and if carefully followed, will prove most satisfactory.

Production crystals vary as much as 2 K.C. plus or minus 458 K.C., so it is inadvisable to attempt alignment by merely setting the service oscillator at 458 K.C., without making the final adjustment described below. The variation mentioned above, while less than 1%, is sufficient to cause very poor crystal performance unless great care is exercised, and all instructions are followed exactly.

If the intermediate trimmers have been tampered with, or are badly out of line, the service oscillator should just be set at 458 K.C., and with all controls on radio set for broadcast or phone reception, as described under heading "Operation" on page 2, namely, manual control extreme clockwise position, phasing control extreme clockwise position, band switch on any band, crystal switch off (right hand toggle-switch handle pointing up), A.V.C. in action (left hand toggle-switch handle pointing down), R.F. gain control in maximum position (extreme clockwise position facing back of radio), communication switch in clockwise position, "on", beat oscillator switch in counter-clockwise position, "off", volume control about midpoint of its range (optional).

With service oscillator in operation at 458 K.C., remove the grid cap from the third I.F. tube (tube and I.F. transformer positions indicated in Fig. 4), connect output lead from test oscillator to grid cap of this tube; if no signal is heard or if no reading is indicated, the output attenuator on service oscillator should be increased until a reading of "R6" or "R7" is indicated on "R" meter. The trimmer screws on I.F. transformer No. 4 may now be adjusted for maximum reading on "R" meter reducing service oscillator output attenuator when necessary to keep "R" meter within a readable range.

A standard bakelite or fibre screw driver should be used. After maximum setting of trimmer screws has been reached, the grid cap may be replaced on third I.F. tube, and removing grid cap on second I.F. tube, connect service oscillator to the grid of this tube and continue as above, this time making adjustment of trimmer screws on I.F. transformer No. 3, continually reducing service oscillator attenuator when necessary to keep "R" meter within a readable range (about "R" 6 or 7).

The same procedure may now be followed out on first I.F. tube, replacing grid cap on second I.F. tube, removing grid cap on first I.F. tube and connecting service oscillator output lead to grid on this tube, and this time making trimmer adjustments on I.F. transformer No. 2, reducing service oscillator attenuator as neccesary. If difficulty is experienced at this point, or any point hereafter, in getting a low enough output from service oscillator to obtain a reading on "R" meter below "R" 7 or 8.

First make sure you have a good ground connection between service oscillator and radio chassis. (The usual ground or shielding on output lead from service oscillator is usually sufficient). If the ground is good and meter still reads high, you may now reduce the manual control on radio counter-clockwise until "R" meter again reads "R" 6 or 7. The trimmers on I.F. transformer No. 2 should now be adjusted for maximum reading on "R" meter, reducing manual control when necessary in line of service oscillator attenuator to obtain readable indication on "R" meter, if above difficulties are experienced; otherwise, you may continue to reduce service oscillator attenuator as necessary.

The grid cap may now be replaced on first I.F. tube, and service oscillator out-put lead moved to grid of modulator tube, removing cap before making connection. Then adjust trimmers on I.F. transformer No. 1 for maximum reading on "R" meter as before, reducing service oscillator attenuator or manual control for readable indication on "R" meter. When this is done you may now re-check all trimmers carefully for maximum reading on "R" meter, leaving service oscillator connected to modulator tube grid. If the radio is not equipped with crystal filter, the above procedure will complete the I.F. alignment.

If the set is equipped with crystal filter the instructions below should be followed closely.

If the selectivity and I.F. gain is good when set is tried, before alignment is attempted the above instructions may be omitted, following only instructions given below.

Leave service oscillator connected to grid of modulator tube in the position last described above. Service oscillator out-put attenuator set for quite low out-put and, if necessary, manual control reduced; "R" meter reading about "R" 6 or 7.

Next turn phasing control toward counter-clockwise position to about midpoint of its tuning range (crystal toggle switch handle up). Now very slowly and carefully tune the service oscillator through resonance until the maximum peak is found as indicated on maximum reading on "R" meter. This peak will be very sharp, and extreme care must be exercised to tune the service oscillator to exact peak and keep it there. This should be checked several times during the following procedure.

Now start at No. 4 I.F. transformer and carefully tune trimmers for maximum peak on "R" meter and proceed up to, and including, No. 3 and No. 2 I.F. transformers, checking and then re-checking all I.F. trimmers, except trimmers on No. 1 I.F. transformer; these should never be touched while the crystal is in series position, as indicated above. When the maximum peak has been reached the phasing control may be returned to its original extreme clockwise position, (crystal toggle switch handle up), and without touching the service oscillator tuning, the trimmers on No. 1 I.F. transformer may now be re-set for maximum peak on "R" meter.

The above completes the I.F. alignment; the crystal filter may be further checked by throwing the right hand toggle switch down, (parallel position) and tuning the radio through a broadcast station, or un-modulated signal from service oscillator set somewhere in the broadcast band; as the radio is tuned through *exact* resonance, a sharp dip in the "R" meter reading will be noticed, or if the dial is tuned fast through resonance, a decided "plop" will be heard in the speaker at exact center of resonance peak.

If it should be necessary at any time to remove the crystal from its holder for inspection, do not handle the crystal or its associate mounting plates any more than absolutely necessary. Wash all parts thoroughly with alcohol or carbon tetra chloride (carbona) and wipe with a clean dry rag before replacing in holder, using care not to handle parts with your bare hands after they are washed.

BROADCAST AND SHORT-WAVE ALIGNMENT

Make sure that adjustments are necessary before proceeding.

Before attempting further alignment, the diagram in Fig. 3 should be studied, particularly in reference to trimmer and padder, or locations and functions.

It is highly improbable that any adjustments will be necessary other than a slight touch-up of the various oscillator coil trimmers and broadcast padding condenser, and possibly a check on all other trimmers for alignment, although this latter is usually unnecessary because the coil design is such that resonance is reached with very little capacity in affect on all R.F. and ant, coils, so that a large change in the mechanical setting would have to take place before any noticeable capacity change or impaired performance could result, particularly so since all trimmer adjustments are sealed at the factory.

The broadcast band can be easily checked for calibration by tuning in stations of known frequency at various points on the dial, and corrections can be made without use of service oscillator, if desired, by using "R" meter to indicate exact peak, reducing manual control, (I.F. gain) where necessary to obtain a readable peak on meter. If discrepancies appear near the high frequency, end of B.C. band or all over the scale, they may be corrected, first with main tuning dial set to a frequency near 1400 K.C. where a local station of known frequency should appear, being sure first that the desired station is in operation at the time. Turn trimmer screw 01 very slowly and carefully, until the desired station is tuned to exact peak, as indicated by maximum reading of "R" meter.

Now set tuning dial to a frequency near 600 K.C., where a local station of known frequency is in operation. If the desired station appears at the proper setting no further adjustment will be necessary, but if it does not appear on exact setting, as indicated by maximum reading of "R" meter as tuning dial is tuned through the signal, it may be brought into place by setting tuning dial on exact

(See next page)

PATTERSON RADIO CO.

Model PR16

Alignment Procedure (continued)

all trimmers carefully for maximum reading on "R" meter, leaving service oscillator connected to modulator tube grid. If the radio is not equipped with crystal filter, the above procedure will complete the I.F. alignment.

If the set is equipped with crystal filter the instructions below should be followed closely.

If the selectivity and I.F. gain is good when set is tried, before alignment is attempted the above instructions may be omitted, following only instructions given below.

Leave service oscillator connected to grid of modulator tube in the position last described above. Service oscillator out-put attenuator set for quite low out-put and, if necessary, manual control reduced; "R" meter reading about "R" 6 or 7.

Next turn phasing control toward counter-clockwise position to about midpoint of its tuning range (crystal toggle switch handle up). Now very slowly and carefully tune the service oscillator through resonance until the maximum peak is found as indicated on maximum reading on "R" meter. This peak will be very sharp, and extreme care must be exercised to tune the service oscillator to exact peak and keep it there. This should be checked several times during the following procedure.

Now start at No. 4 I.F. transformer and carefully tune trimmers for maximum peak on "R" meter and proceed up to, and including, No. 3 and No. 2 I.F. transformers, checking and then re-checking all I.F. trimmers, except trimmers on No. 1 I.F. transformer; these should never be touched while the crystal is in series position, as indicated above. When the maximum peak has been reached the phasing control may be returned to its original extreme clockwise position, (crystal toggle switch handle up), and without touching the service oscillator tuning, the trimmers on No. 1 I.F. transformer may now be re-set for maximum peak on "R" meter.

In the event that no station of 1000 K.C. is within range, or on the air, and if the service oscillator is known to have an accurate calibration, merely setting the service oscillator at 1000 K.C. should be accurate enough for all practical purposes. This can be easily checked, of course, by checking service oscillator calibration against various stations near to 1000 K.C., using the method of antenna connected to set and tuning for zero beat, as described above.

The band change switch should now be changed to No. 2 short-wave band. Next set tuning dial near 3 M.C. and tune back and forth until the 3rd harmonic of service oscillator is found; it should appear exactly on the 3 M.C. point. If it does not, it may be brought into place by carefully adjusting trimmer condenser 02. The rest of this band will then be automatically in calibration.

Next change the band switch to No. 3 short-wave band, and set tuning near 7 M.C. and tune back and forth slowly until the 7th harmonic of service oscillator is located. It should appear exactly on the 7 M. C. point; if it does not, it may be brought into place by careful adjustment of trimmer screw "03." If the signal from the service oscillator is very strong at this point, a second peak slightly higher in frequency may also be found, but it will be much weaker than the lower frequency peak on the 7 M.C. point on dial. The second weak peak is the image of the 8th harmonic and should be disregarded. This band now is automatically in line all over; it may now be checked all across, a harmonic from the service oscillator appearing on 7 M.C., 6 M.C., 5 M.C., 4 M.C.

If this is not the case, an error has been made in adjusting trimmer "03," and should be checked again until a harmonic falls on each successive 1 M.C. point on tuning dial.

However, some of the points may be weaker than others, particularly the odd harmonics. This is perfectly natural, and should cause no concern.

It would be well, at this point, to replace antenna on radio, set band switch on broadcast at 1000 K.C. and check again for zero beat with station at this frequency before continuing to No. 4 band for check. Be sure to remove antenna again, and set service oscillator out-put attenuator back to maximum position after zero beat has been checked. Then change band switch to No. 4 band and tune for the 14th harmonic at 14 M.C. point on tuning scale; if the calibration is off at this point it may now be corrected with trimmer ".04." Extreme care should be used in making this adjustment, as it is quite possible to get the 13th harmonic where the 14th should be at 14 M.C., thereby throwing the whole dial off. However, it is easy to check this by tuning over the whole scale; if the adjustment has been made properly, there will be a harmonic from service oscillator on each 1 M.C. point, namely, 14 M.C., 13 M.C., 12 M.C., 11 M.C., 10 M.C., 9 M.C., 8 M.C. As in the case of the No. 3 band, care should be used in respect to the image of 15 M. C. when making adjustments at 14 M.C., the image being weaker and higher in frequency than the desired fundamental.

In checking the 5th band the procedure should be changed somewhat, as the harmonics come so very close together on this band as to be very confusing. However, before continuing, a check may be made on this band by the present method to determine if adjustment is necessary. If a harmonic from service oscillator appears on each M.C. point throughout its range, no further adjustment or check will be necessary.

If adjustment is necessary, the following procedure should be followed:

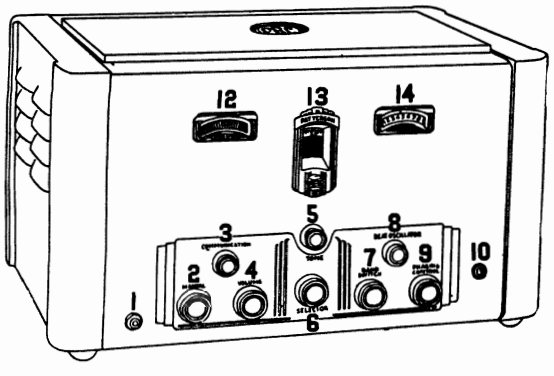
Set the band switch to No. 3 band, and set tuning dial at exactly 7 M.C. Since this band has just been checked, or adjusted, this will be quite accurate.

Now change service oscillator to 7 M.C. band and true to 7 M.C. position; leaving radio dial set at 7 M.C. as described above, turn service oscillator slowly past 7 M.C., watching "R" meter and tuning for maximum peak. When peak has been accurately reached, the service oscillator should be left at that setting and radio band switch changed to No. 5 band. Then set the radio tuning dial to, or near, 28 M.C. and tune for the harmonic at this point from service oscillator. When it has been located, it should appear on 28 M.C. If it does not it may be brought into place by very careful adjustment of trimmer screw "05", taking care to avoid the higher frequency image as in the case of No. 3 and No. 4 band.

When this adjustment has been made properly, set the main tuning dial to 21 M.C. A service oscillator harmonic will also appear at this point.

A further check may now be made on No. 4 band, if desired, by changing radio band switch to No. 4 band and tuning the radio dial to 14 M.C., where the 7 M.C. service oscillator second harmonic should be found. If it does not appear, it is probable that an error has been made in the original adjustment. Trimmer screw "04" may be adjusted again to bring this point into line at 14 M.C.

The original adjustment can, of course, be made in this way also, and in the case of where the service oscillator harmonics are weak in this region when set at 1000 K.C., will prove the most practical method.

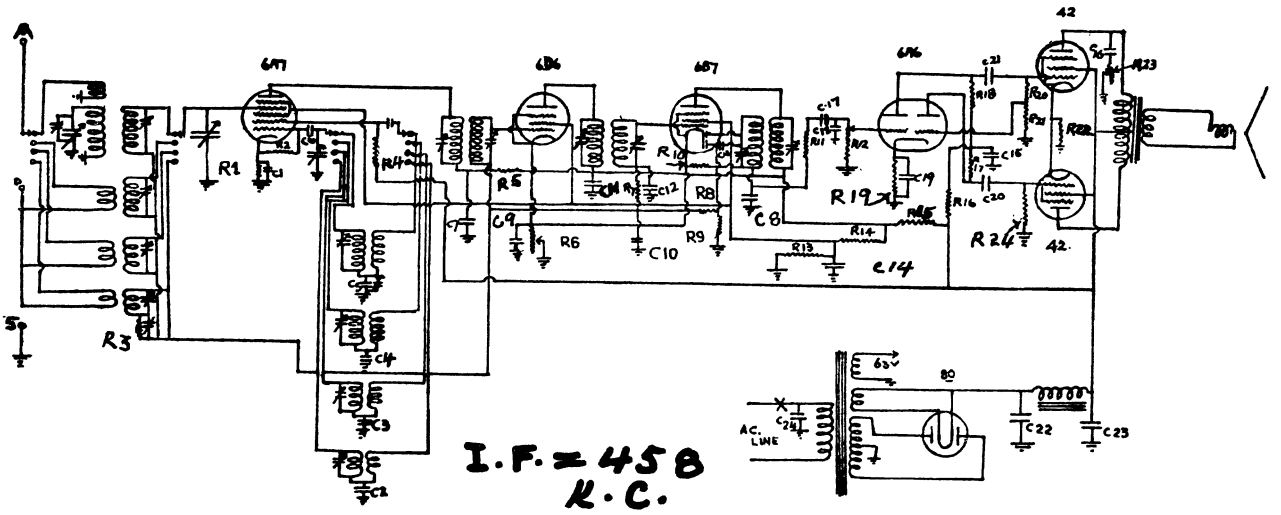


KEY TO CONTROLS

1—A. V. C. Switch
2—Manual Volume Control
3—Communication Switch
4—Volume Control and AC Switch
5—Tone Control
6—Station Selector, 2 Speeds
7—Wave Band Switch
8—Beat Oscillator Switch
9—Crystal Phasing Control
10—Crystal Filter Series Parallel Switch
12—360-degree Illuminated Band Spread
13—Camera Shutter, Illuminated Dial, 5 Bands
14—Illuminated Meter Showing the Carrier in R's

PATTERSON RADIO CO.

75-AW, 175-AW, 275-AW, 375-AW



PART	VALUE	PART	VALUE
R 1	300 OHMS	C 1	.05 MFD 200v.
R 2	50,000 "	C 2	.0004 "
R 3	250,000 "	C 3	.006 "
R 4	25,000 "	C 4	.00026 "
R 5	5,000 "	C 5	.00025 "
R 6	SENSITIVITY CONTROL	C 6	.0001 "
R 7	50,000 OHMS	C 7	.1 " 400v.
R 8	1 MEGOHM	C 8	.00025 "
R 9	250,000 OHMS	C 9	.5 " 200v.
R 10	250,000 "	C 10	.1 " 400v.
R 11	100,000 "	C 11	.25 " 400v.
R 12	VOLUME CONTROL 1 MEG.	C 12	.05 " 200v.
R 13	20,000 OHMS	C 13	.0005 "
R 14	15,000 "	C 14	.25 " 200v.
R 15	5,000 "		
R 16	50,000 "	C 16	.1 " 400v.
R 17	100,000 "	C 17	.05 " 200v.
R 18	100,000 "	C 18	.0001 "
R 19	5,000 "	C 19	10 " 25v.
R 20	250,000 "	C 20	.05 " 600v.
R 21	15,000 "	C 21	.05 " 600v.
R 22	350 "	C 22	16 " 475v.
R 23	250,000 "	C 23	8 " 450v.
R 24	250,000 "	C 24	.008 " 400v.

DRAWN BY F.A.D.

CHECKED BY E.B.M.

Models
75AW
175AW
275AW
375AW

Apply output of oscillator to grid of 6B7 and adjust trimmers on I.F. transformer at right of 6B7 until loudest sound is heard in speaker and meter on vacuum tube voltmeter swings farthest toward "O." Replace cap and shield on 6B7 and apply oscillator signal to grid of 6D6. Adjust trimmers on I.F. transformer to left of 6D6 as described above, reducing oscillator output if nesessary to obtain a good readable swing on meter. Alignment of 1st I.F. being completed replace clip and shield on 6D6. Apply oscillator output to grid of 6A7 and adjust trimmers on I.F. transformer, located at right of 6A7 for maximum swing towards zero of vacuum tube voltmeter. If these instructions have been carefully followed, the intermediate frequency amplifier will be properly aligned.

CALIBRATION OF BROADCAST BAND—Turn switch to broadcast position. With vacuum tube voltmeter connected to AVC bus as described under Intermediate Amplifier alignment, place service oscillator in operation at 1400 KC. Turn set dial to 1400 KC and adjust oscillator trimmer for resonance as indicated by farthest swing toward "0" of vacuum tube voltmeter. Now adjust service oscillator to 600 KC. Turn set dial to 600 KC and adjust low frequency pad for resonance as indicated by vacuum tube voltmeter. Set service oscillator again at 1400 KC and turn set dial to 1400 KC. Readjust oscillator trimmer for resonance as indicated by vacuum tube voltmeter. Without moving dial setting, adjust detector and R.F. trimmers for maximum swing toward "0."

CALIBRATION OF 2ND BAND (1.6-4.5 Megacycles)—Turn switch to second band position. Turn set dial to 4.0 megacycles, place service oscillator in operation at 4.0 megacycles and adjust set oscillator and detector trimmers to resonance as described under 1400 KC adjustment of broadcast band. (Note—On some models detector trimmer is unnecessary and is omitted from chassis assembly.)

CALIBRATION OF 3RD BAND (4.5-12 Megacycles)—Turn switch to third band position. Place service oscillator in operation at 12 megacycles. Turn set dial to 12 megacycles. Adjust oscillator trimmer until signal is heard loudest and then adjust detector trimmer for greatest vacuum tube voltmeter swing toward "0".

CALIBRATION OF 4TH BAND (11-20 Megacycles)—Before attempting any calibration of this band it will be necessary to determine the oscillator tracking. Some models were produced in which the oscillator beats SLOWER than the incoming signal. This is not the usual mode of operation but was used for more uniform tracking. In other production series the oscillator beats faster than the incoming signal, which is the usual method of operation.

To determine which model your set is, proceed as follows: Place service oscillator in operation at 15 megacycles. Tune signal in on set. If oscillator BEATS SLOWER, the real signal will come in at 15 megacycles and the image will come in at 15.916, i.e. The image will be almost 1 megacycle faster than the true signal. If oscillator BEATS FASTER, the real signal will come in at 15 megacycles and the image will come in at 14.084 megacycles, i.e., almost 1 megacycle slower than the incoming signal. After having determined which oscillator tracking is used in your set be sure to keep this setting, i.e., either faster or slower, as determined, throughout the entire band.

Place service oscillator in operation at 20 megacycles. Turn set dial to 20 megacycles. Adjust oscillator to a point faster or slower, as determined from above, where signal comes in loudest. Now adjust high frequency trimmer until vacuum tube voltmeter shows greatest swing toward "0". Now, place oscillator in operation at 12 megacycles. Turn dial slowly toward 12 megacycles until TRUE SIGNAL is heard. Adjust low frequency pad (the one on the end of the chassis which has ¼ megohm resistor across it) until the vacuum tube voltmeter shows greatest swing toward zero.

1st Band—Broadcast 1500-550 K.C.
2nd Band—1.6-4.5 Megacycles
3rd Band—4.5-12 Megacycles
4th Band—11 -20 Megacycles

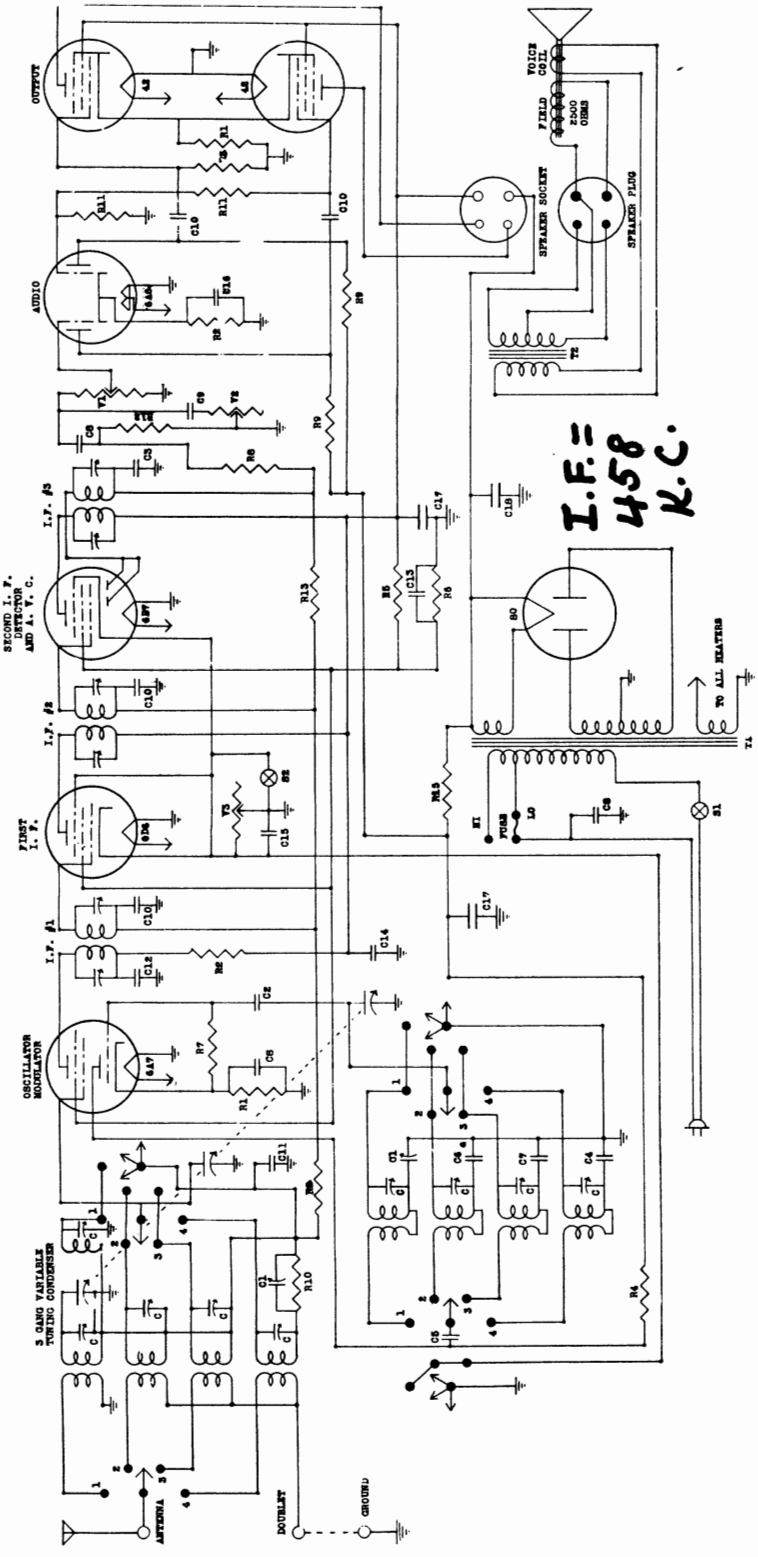
PATTERSON RADIO CO.

Models 75-AW-A 175-AW-A 275-AW-A 375-AW-A

C - 3-30 MMFD. TRIMMER
C1 - 500 MMFD. "
C2 - .0001 MICA ①
C3 - .00025 "
C4 - .00035 " 3%
C5 - .0004 " "
C6 - .001 " 3%
C7 - .006 " 3%
C8 - .006
C9 - .01
C10 - .02
C11 - .05
C12 - .1 - 400 VOLT
C13 - .25 - 200 "
C14 - .25 - 400 "
C15 - .5 - 200 "
C16 - 10. MFD. 25 VOLT
C17 - 8. " 450 "
C18 - 16. " 475 "

R1 - 300 OHM 1/2 WATT
R2 - 5000 " 1/2 "
R3 - 15000 " 1/3 "
R4 - 15000 " 1/2 "
R5 - 15000 " 2 "
R6 - 20000 " 1/2 "
R7 - 50000 " 1/3 "
R8 - 100000 " 1/3 "
R9 - 100000 " 1/2 "
R10 - 250000 " 1/3 "
R11 - 300000 " 1/3 "
R12 - 500000 " 1/3 "
R13 - 1 MEG. " 1/3 "
T1 - POWER TRANSFORMER
T2 - OUTPUT - ON SPEAKER
BAND SWITCH - 1 - 530 TO 1500 K.C.
2 - 1.5 TO 4.5 M.C.
3 - 4.7 TO 12. M.C.
4 -11.5 TO 20. M.C.

INTERMEDIATE FREQUENCY TRANSFORMERS ARE TUNED TO 456 KILOCYCLES.
V1 - VOLUME CONTROL 500000 OHMS. V2 - TONE CONTROL 50000 OHMS.
V3 - SILENT TUNING CONTROL 1000 OHMS.
S1 - A. C. SWITCH - LOCATED ON VOLUME CONTROL.
S2 - SILENT TUNING SWITCH. R15 - 25000 OHM 1 WATT

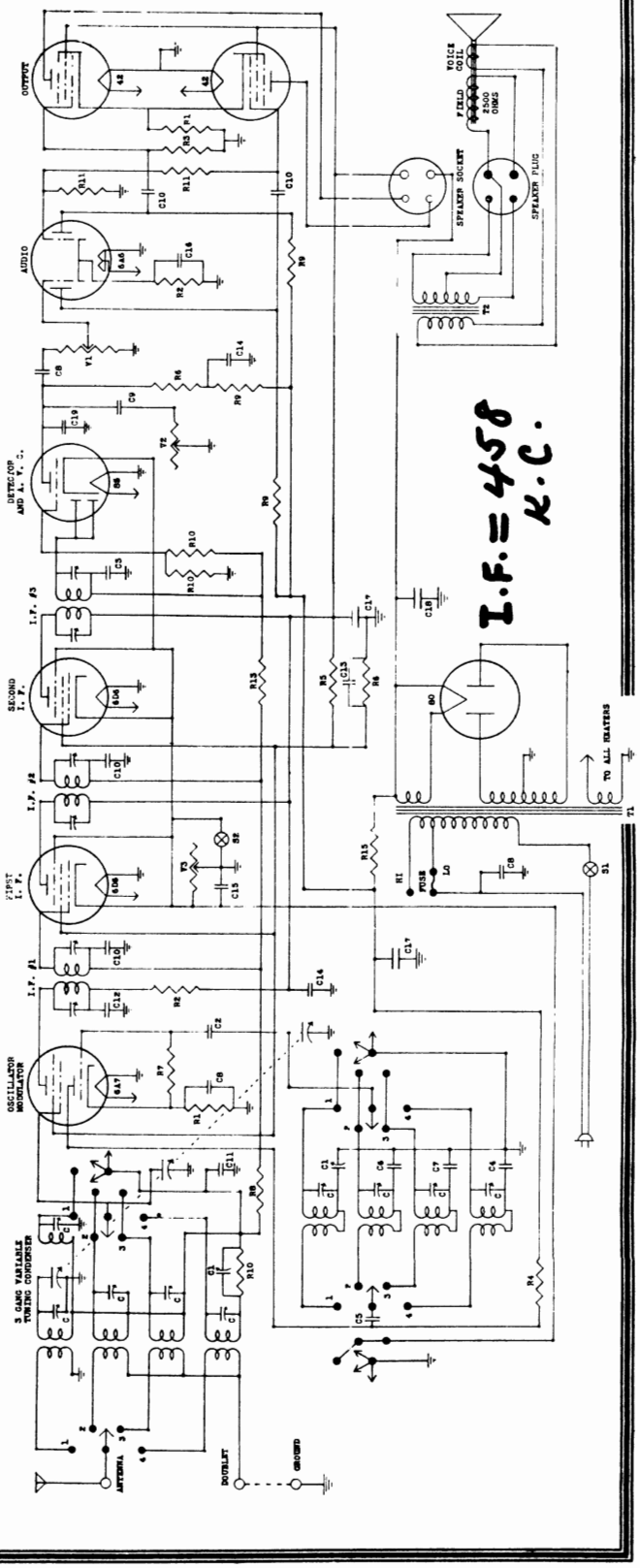


Models 85-AW-A 185-AW-A 285-AW-A 385-AW-A

C - 3-30 MMFD. TRIMMER
C1 - 500 " "
C2 - .0001 MICA
C3 - .00025 "
C4 - .00035 " 3%
C5 - .0004 " "
C6 - .001 " 3%
C7 - .006 " 3%
C8 - .006
C9 - .01
C10 - .02
C11 - .05
C12 - .1 - 400 VOLT
C13 - .25 - 200 "
C14 - .25 - 400 "
C15 - .5 - 200 "
C16 - 10 MFD. 25 VOLT
C17 - 8 " 450 "
C18 - 16 " 475 "
C19 - .008

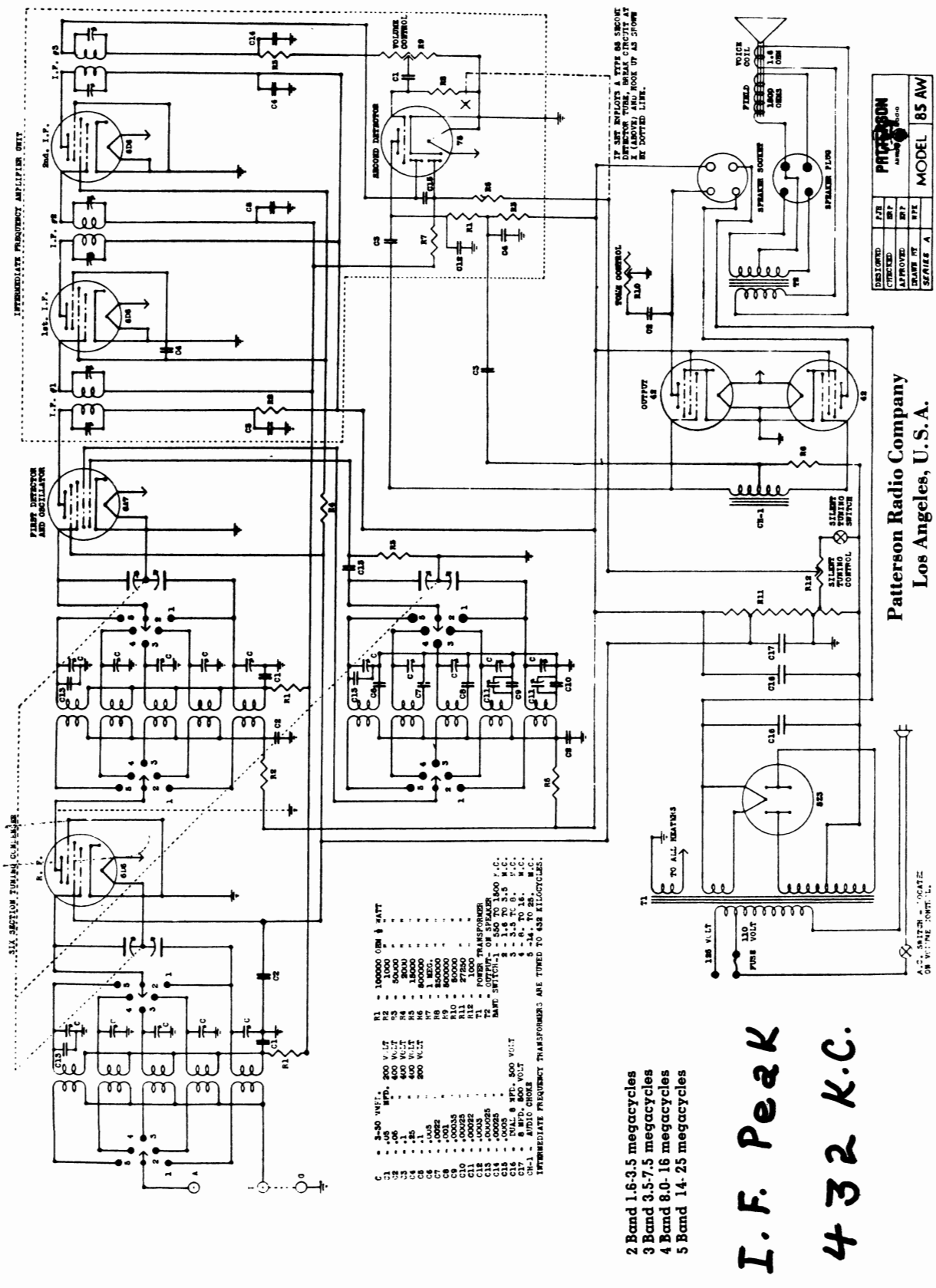
R1 - 300 OHM 1/2 WATT
R2 - 5000 " 1/2 "
R3 - 15000 " 1/3 "
R4 - 15000 " 1/2 "
R5 - 15000 " 2 "
R6 - 20000 " 1/2 "
R7 - 50000 " 1/3 "
R8 - 100000 " 1/3 "
R9 - 100000 " 1/2 "
R10 - 250000 " 1/3 "
R11 - 300000 " 1/3 "
R12 - 500000 " 1/3 "
R13 - 1 MEG. " 1/3 "
R14 - 500000 " 1/2 "
T1 - POWER TRANSFORMER
T2 - OUTPUT - ON SPEAKER
BAND SWITCH - 1 - 530 TO 1500 K.C.
2 - 1.5 TO 4.5 M.C.
3 - 4.7 TO 12. M.C.
4 - 11.5 TO 20. M.C.

INTERMEDIATE FREQUENCY TRANSFORMERS ARE TUNED TO 456 KILOCYCLES.
V1 - VOLUME CONTROL 500000 OHMS. V2 - TONE CONTROL 50000 OHMS.
V3 - SILENT TUNING CONTROL 1000 OHMS.
S1 - A. C. SWITCH - LOCATED ON VOLUME CONTROL.
S2 - SILENT TUNING SWITCH R15 - 25000 OHM 1 WATT



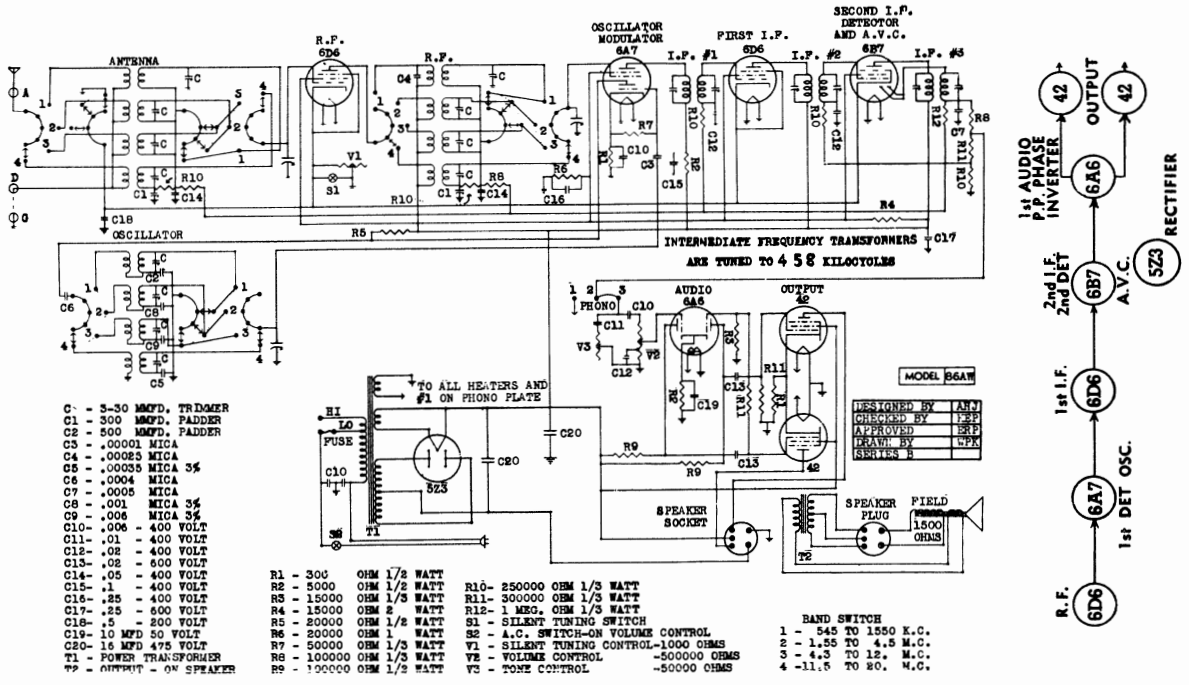
PATTERSON RADIO CO.

Models 85AW, 185AW, 285AW, 385AW,



PATTERSON RADIO CO.

86-AW, 186-AW, 286AW, 386AW



C - 3-30 MMFD. TRIMMER
C1 - 300 MMFD. PADDER
C2 - 500 MMFD. PADDER
C3 - .00001 MICA
C4 - .00025 MICA
C5 - .00035 MICA 3%
C6 - .0004 MICA
C7 - .0005 MICA
C8 - .001 MICA 3%
C9 - .006 MICA 3%
C10 - .006 - 400 VOLT
C11 - .01 - 400 VOLT
C12 - .02 - 400 VOLT
C13 - .02 - 600 VOLT
C14 - .05 - 400 VOLT
C15 - .1 - 400 VOLT
C16 - .25 - 400 VOLT
C17 - .25 - 600 VOLT
C18 - .5 - 200 VOLT
C19 - 10 MFD 50 VOLT
C20 - 16 MFD 475 VOLT
T1 - POWER TRANSFORMER
T2 - OUTPUT - ON SPEAKER

R1 - 300 OHM 1/2 WATT
R2 - 5000 OHM 1/2 WATT
R3 - 15000 OHM 1/3 WATT
R4 - 15000 OHM 2 WATT
R5 - 20000 OHM 1/2 WATT
R6 - 20000 OHM 1 WATT
R7 - 50000 OHM 1/3 WATT
R8 - 100000 OHM 1/3 WATT
R9 - 100000 OHM 1/2 WATT
R10 - 250000 OHM 1/3 WATT
R11 - 300000 OHM 1/3 WATT
R12 - 1 MEG. OHM 1/3 WATT
S1 - SILENT TUNING SWITCH
S2 - A.C. SWITCH-ON VOLUME CONTROL
V1 - SILENT TUNING CONTROL-1000 OHMS
V2 - VOLUME CONTROL -500000 OHMS
V3 - TONE CONTROL -50000 OHMS

BAND SWITCH
1 - 545 TO 1550 K.C.
2 - 1.55 TO 4.5 M.C.
3 - 4.3 TO 12. M.C.
4 - 11.5 TO 20. M.C.

VOLTAGES

The following tables show representative voltages at various points in normal sets:

All Voltages Measured Under The Following Conditions:

No signal-fuse on 110-115 V. side. Line volts 115, 60 cycles. Band Change Switch in B.C. Band Position — Silent Tuning. Control Inoperative. All voltages from various points to chassis ground measured with voltmeter 1000 ohms per volt.

8 TUBE SET

		Plate	Screen	Cathode	Suppressor	
RF*	6D6	+250	+80	0	Tied to Cathode	Osc. Plate +140
Mod. Osc.	6A7	+215	+80	+2.4		
1 IF	6D6	+230	+80	0	Tied to Cathode	
2 IF	6B7	+230	+80	0		
1 Audio	6A6	+150*		+4.0		
2 Audio	42	+230	+235	+16.5		
	42	+230	+235	+16.5		

**Each plate measured through 100,000 ohm plate resistor.*

ELECTROLYTIC CONDENSERS

	Center to Ground	Can to Ground
Grounded	+240	0
Insulated	+240	—165 or 120
Speaker Field	Hot Side to Ground	—165 or 120

ALIGNMENT OF I. F. AMPLIFIER

NOTE: *Frequency bands referred to in the following instructions are:*

1st Band—Broadcast 1500-550 K.C. *3rd Band—12- 4.5 megacycles*
2nd Band—4.6-1.6 megacycles *4th Band—20.-12. megacycle*

In these and the following instructions for alignment the term "voltmeter" shall be understood to mean "vacuum tube voltmeter" and the term "voltmeter indicates resonance" shall be understood to mean that the vacuum tube voltmeter shows greatest swing toward zero.

MODELS 86AW-186AW-286AW-386AW (8 TUBES)

Turn band selector switch to 2nd band position. Place service oscillator in operation on 458 K.C. Connect grid of voltmeter to A.V.C. Bus and ground of voltmeter to chassis ground. A convenient place to connect the A.V.C. Bus is at the junction of the ¼ megohm resistor and the by-pass condenser located at the bottom of the chassis directly below 4th band antenna coil. Remove grid clips from 6B7, 6D6—1st I.F. and 6A7. Apply output oscillator to grid of 6B7 and adjust trimmers on rear I.F. transformer until voltmeter indicates resonance. Replace grid clip and shield cap on 6B7 and apply oscillator output to grid of 6D6 and adjust trimmers on center I.F. transformer until voltmeter indicates resonance decreasing the oscillator output, if necessary, in order to obtain a good readable indication on voltmeter. Replace grid clip and shield cap on 6D6 and apply oscillator output to grid of 6A7. Adjust trimmers on front I.F. transformer until voltmeter indicates resonance. Now reduce oscillator output and with oscillator input still applied to grid of 6A7 carefully recheck all adjustments in the same order in which they were initially made. This completes the alignment of the I.F. amplifier.

CALIBRATION OF VARIOUS BANDS—ALL MODELS

Broadcast Band—1500 - 550 K.C. Connect voltmeter to A.V.C. bus and chassis ground as described under Intermediate Amplifier Alignment. Turn band selector switch to broadcast position. Throw switch for silent tuning to the downward position. Place service oscillator in operation at 1400 K.C. Turn set dial to 1400 K.C. and adjust oscillator trimmer until voltmeter indicates resonance. Now adjust modulator and antenna trimmers, in turn, until voltmeter indicates resonance in each case. Turn set dial to 600 K.C. and set service oscillator at 600 K.C. Adjust oscillator low frequency pad for resonance. Now turn set dial back to 1400 K.C. and set service oscillator at 1400 K.C. Carefully correct oscillator trimmer setting and without moving the dial setting verify and correct the setting of the modulator and R.F. trimmers.

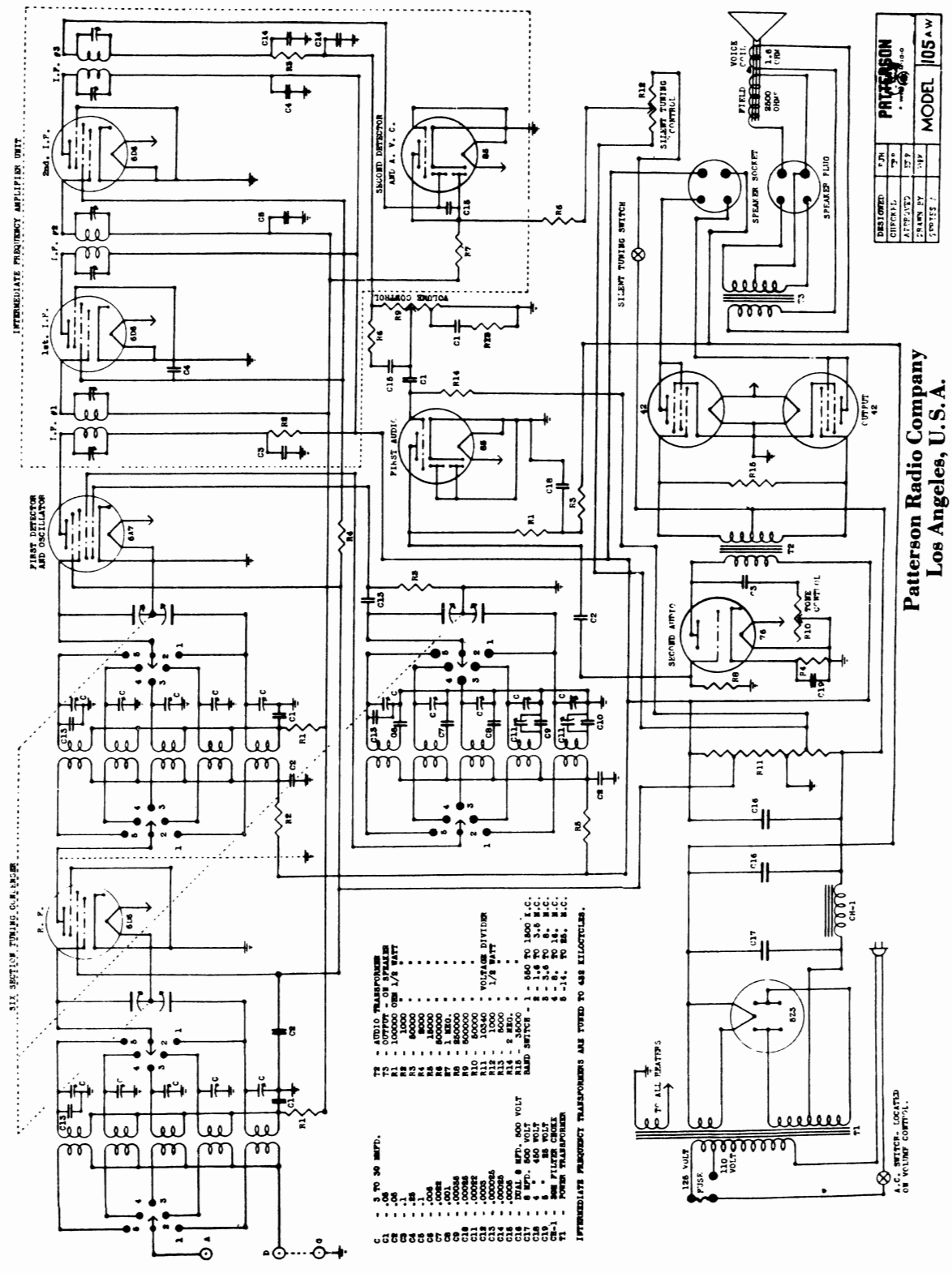
Second Band—4.6-1.6 megacycles. Turn band selector switch to second band position. Place high frequency oscillator in operation at 4 megacycles. Turn set dial to 4 megacycles. Turn modulator trimmer full in. Adjust oscillator trimmer until resonance with H.F. oscillator signal is indicated. Without moving dial, open the modulator trimmer until voltmeter indicates resonance and then in the same manner adjust antenna trimmer for resonance. Verify dial setting and carefully readjust modulator and R.F. trimmers.

Third Band—12 - 4.5 megacycles. Turn band selector switch to 3rd band position. Place H.F. oscillator in operation at 12 megacycles. Turn dial to 12 megacycles. Adjust trimmers in exactly the same manner as described for 2nd band.

Fourth Band—20 - 12. megacycles. Turn band selector switch to 4th band position. Place H.F. oscillator in operation at 20 megacycles. Turn set dial to 20 megacycles. Turn modulator trimmer full in and tighten screw on modulator L.F. pad. Adjust oscillator trimmer until voltmeter indicates resonance with H.F. oscillator signal. Without moving dial setting adjust modulator and R.F. trimmers for resonance. Now place H.F. oscillator in operation at 12 megacycles. Turn set dial to 12 megacycles and adjust oscillator L.F. pad until voltmeter indicates resonance with H.F. oscillator signal. Without moving dial setting adjust modulator and antenna low frequency pads for resonance. Reset dial and H.F. oscillator to 20 megacycles and verify setting of modulator and antenna trimmers.

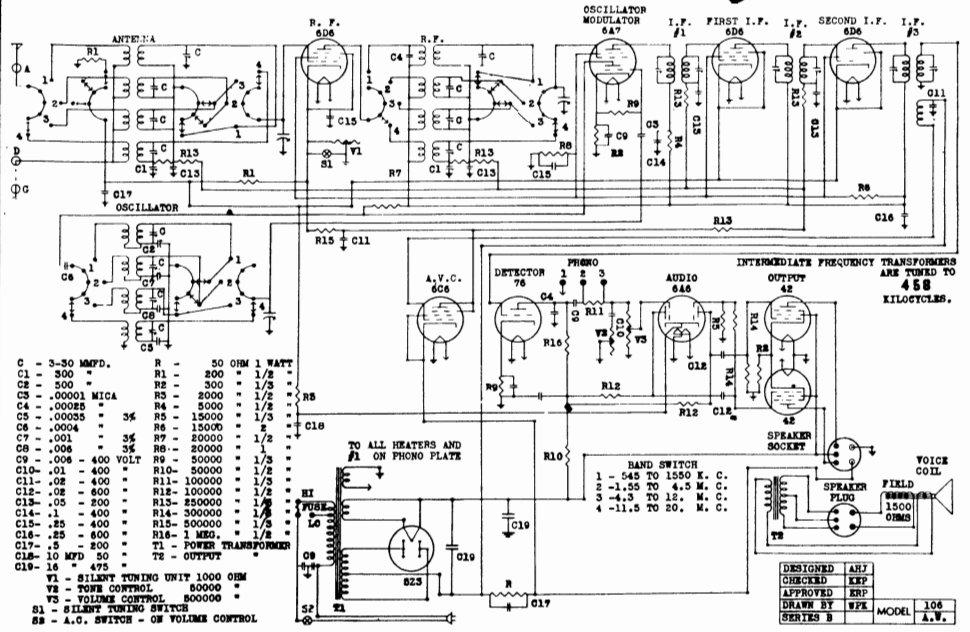
PATTERSON RADIO CO.

105AW, 1105AW, 2105AW, 3105AW

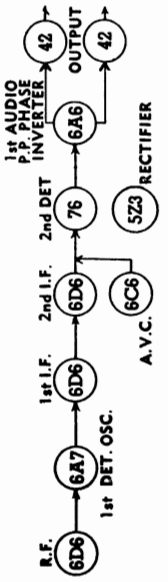


PATTERSON RADIO CO.

Models 106-AW, 1106-AW, 2106-AW, 3106-AW



C - 3-30 MMFD.
C1 - 300 "
C2 - 500 "
C3 - .00001 MICA
C4 - .00025 "
C5 - .00035 " 3%
C6 - .0004 "
C7 - .001 " 3%
C8 - .006 " 3%
C9 - .006 - 400 VOLT
C10- .01 - 400 "
C11- .02 - 400 "
C12- .02 - 600 "
C13- .05 - 200 "
C14- .1 - 400 "
C15- .25 - 400 "
C16- .25 - 600 "
C17- .5 - 200 "
C18- 10 MFD 50 "
C19- 16 " 475 "
R - 50 OHM 1 WATT
R1 - 200 " 1/2 "
R2 - 300 " 1/3 "
R3 - 2000 " 1/2 "
R4 - 5000 " 1/2 "
R5 - 15000 " 1/3 "
R6 - 15000 " 2 "
R7 - 20000 " 1/2 "
R8 - 20000 " 1 "
R9 - 50000 " 1/3 "
R10- 50000 " 1/2 "
R11- 100000 " 1/3 "
R12- 100000 " 1/2 "
R13- 250000 " 1/3 "
R14- 300000 " 1/3 "
R15- 500000 " 1/3 "
R16- 1 MEG. " 1/2 "
T1 - POWER TRANSFORMER
T2 - OUTPUT "
V1 - SILENT TUNING UNIT 1000 OHM
V2 - TONE CONTROL 50000 "
V3 - VOLUME CONTROL 500000 "
S1 - SILENT TUNING SWITCH
S2 - A.C. SWITCH - ON VOLUME CONTROL



10 TUBE SET

		Plate	Screen	Cathode	Suppressor	
RF	6D6	+240	+78	0	Tied to Cathode	Osc. Plate +160
Mod. Osc.	6A7	+220	+78	+2.4		
1 IF	6D6	+240	+78	+2.6	Tied to Cathode	
2 IF	6D6	+240	+78	+2.6	Tied to Cathode	
2 Det.	76	+30*		+1.5*		
Inverter	6A6	+120†		+3.6		
Output	42	+240	+245	+16		
Output	42	+240	+245	+16		
AVC	6C6	0	—170 or —120	Tied to Screen	Tied to Plate	Control Grid —175 or —125

Voltages not accurately measurable due to 1 Meg. plate resistor.
†Each plate measured through 100,000 ohm plate resistor.

ELECTROLYTIC CONDENSERS

	Center to Ground	Can to Ground
Grounded	+245	0
Insulated	+245	—175 or 125
Speaker Field	Hot Side to Ground	—175 or 125

Models 126-AW, 1126-AW, 2126-AW, 3126-AW

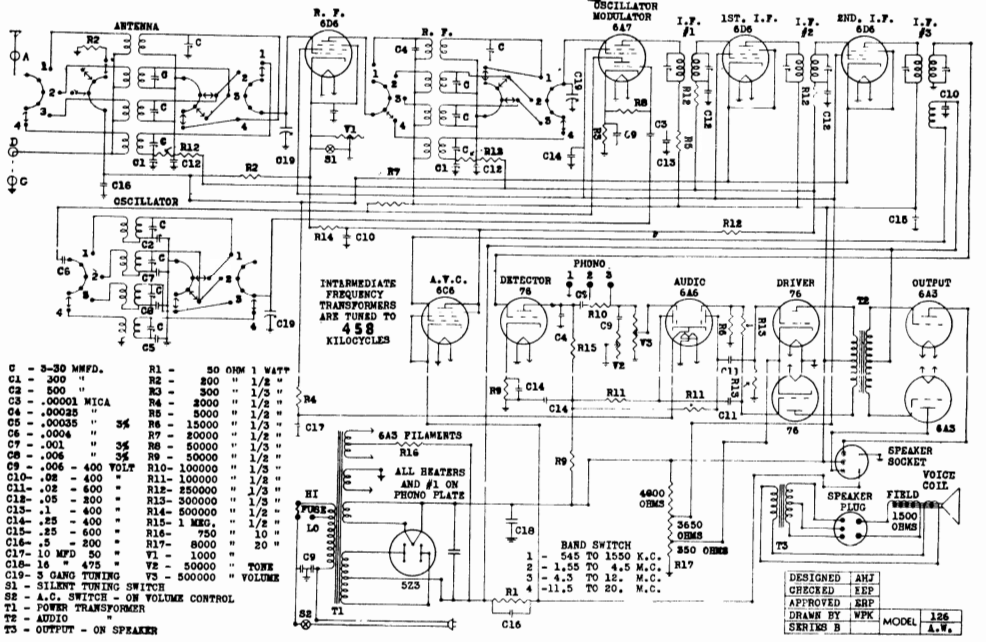
12 TUBE SET

		Plate	Screen	Cathode	Suppressor	Osc. Plate
RF	6D6	+250	+100	0	Tied to Cathode	+170
Mod. Osc.	6A7	+230	+100	+3.3		
1 IF	6D6	+250	+100	+3.25	Tied to Cathode	
2 IF	6D6	+250	+100	+3.25	Tied to Cathode	
2 Det	76	+40*		+1.75*		
Inverter	6A6	+135†		+4.2		
Driver	76	+245		+11.5		
Driver	76	+245		+11.5		
Output	2A3	+245		—75 C.T.Fil.		Control Grids —150
Output	2A3	+245		—75 C.T.Fil.		—150
AVC	6C6	0	—150	Tied to Screen	Tied to Plate	—155

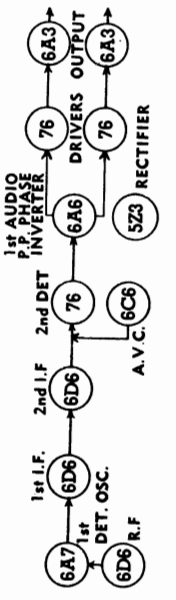
Voltages not accurately measurable due to 1 Meg. plate resistor.
†Each plate measured through 100,000 ohm plate resistor.

ELECTROLYTIC CONDENSERS

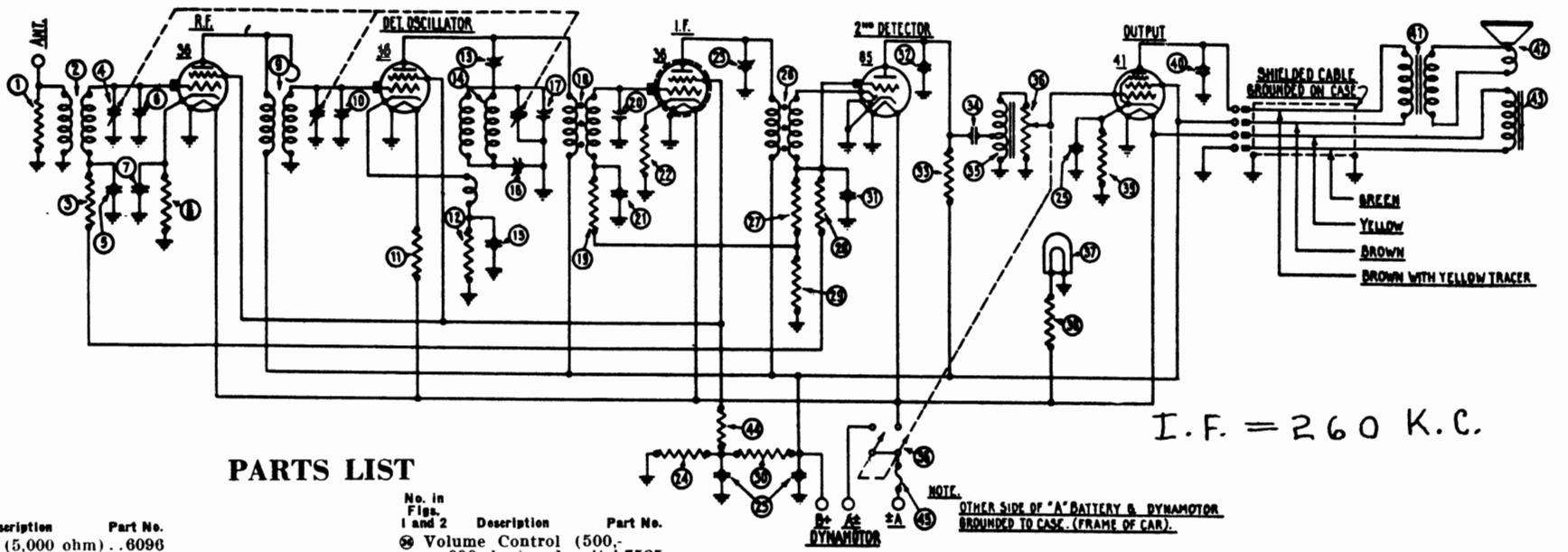
	Center to Ground	Can to Ground
Grounded	+250	0
Insulated	+250	—155
Speaker Field	Hot Side to Ground	—155



C - 3-30 MMFD.
C1 - 300 "
C2 - 500 "
C3 - .00001 MICA
C4 - .00025 "
C5 - .00035 " 3%
C6 - .0004 "
C7 - .001 " 3%
C8 - .006 " 3%
C9 - .006 - 400 VOLT
C10- .02 - 400 "
C11- .02 - 600 "
C12- .05 - 200 "
C13- .1 - 400 "
C14- .25 - 400 "
C15- .25 - 600 "
C16- .5 - 200 "
C17- 10 MFD 50 "
C18- 16 " 475 "
C19- 3 GANG TUNING
S1 - SILENT TUNING SWITCH
S2 - A.C. SWITCH - ON VOLUME CONTROL
T1 - POWER TRANSFORMER
T2 - AUDIO "
T3 - OUTPUT - ON SPEAKER
R1 - 50 OHM 1 WATT
R2 - 200 " 1/2 "
R3 - 300 " 1/3 "
R4 - 2000 " 1/2 "
R5 - 5000 " 1/2 "
R6 - 15000 " 1/3 "
R7 - 20000 " 1/2 "
R8 - 50000 " 1/3 "
R9 - 50000 " 1/2 "
R10- 100000 " 1/3 "
R11- 100000 " 1/2 "
R12- 250000 " 1/3 "
R13- 300000 " 1/3 "
R14- 500000 " 1/2 "
R15- 1 MEG. " 1/2 "
R16- 750 " 10 "
R17- 8000 " 20 "
V1 - 1000 "
V2 - 50000 " TONE
V3 - 500000 " VOLUME



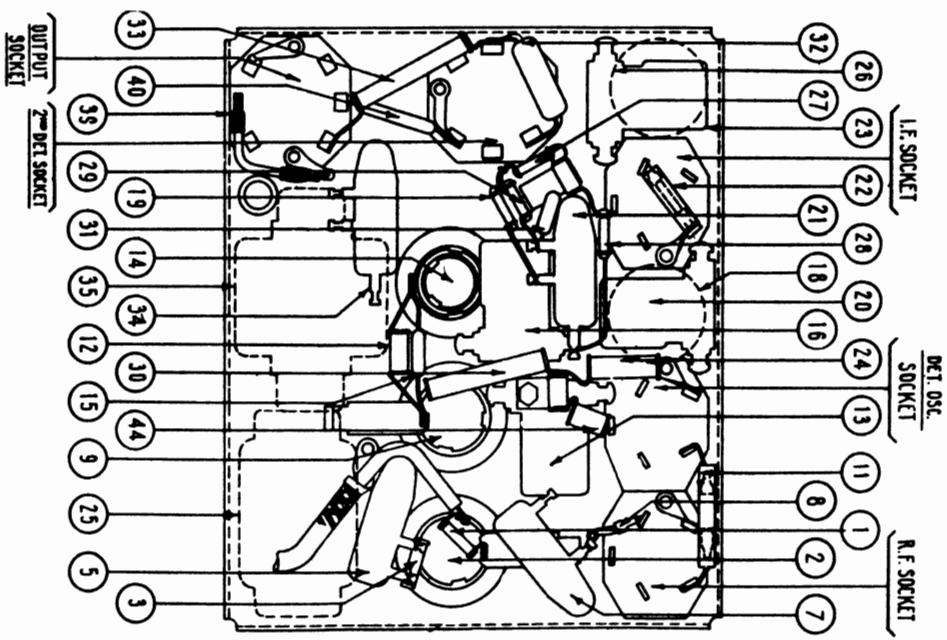
MODEL 6



PARTS LIST

No. in Figs. 1 and 2	Description	Part No.
①	Resistor (5,000 ohm)	6096
②	Antenna Coil	05903
③	Resistor (100,000 ohm)	6099
④	Tuning Condenser	04308
⑤	By-pass Condenser (.05 mfd.)	3615-AN
⑥	Compensator section on tuning condenser	
⑦	By-pass Condenser (.05 mfd.)	3615-AT
⑧	Resistor (500 ohm)	6977
⑨	Detector Coil	05902
⑩	Compensator section on tuning condenser	
⑪	Resistor (2.7 ohm)	6511
⑫	Resistor (8,000 ohm)	5838
⑬	Compensating Cond.	04000A
⑭	Oscillator Coil	05975
⑮	Condenser (.007 mfd.)	4520
⑯	Compensating Cond.	04000S
⑰	Compensator section on tuning condenser	
⑱	First I. F. Transformer	05970
⑲	Resistor (500,000 ohm)	6097
⑳	Compensating Cond.	04000D
㉑	Condenser (.05 mfd.)	3615-AK
㉒	Resistor (500 ohm)	6977
㉓	Compensating Cond.	04000D
㉔	Resistor (20,000 ohm)	6650
㉕	Condenser (.25 mfd., .5 mfd., 8 mfd.)	04354
㉖	Second I. F. Transformer	05901
㉗	Resistor (100,000 ohm)	6099
㉘	Resistor (500,000 ohm)	6097
㉙	Resistor (100,000 ohm)	6099
㉚	Resistor (20,000 ohm)	6649
㉛	Condenser (.00025 mfd.)	3082
㉜	Condenser (.0002 mfd.)	4059
㉝	Resistor (50,000 ohm)	4237
㉞	Condenser (.09 mfd.)	4989-Y
㉟	Audio Transformer	7535

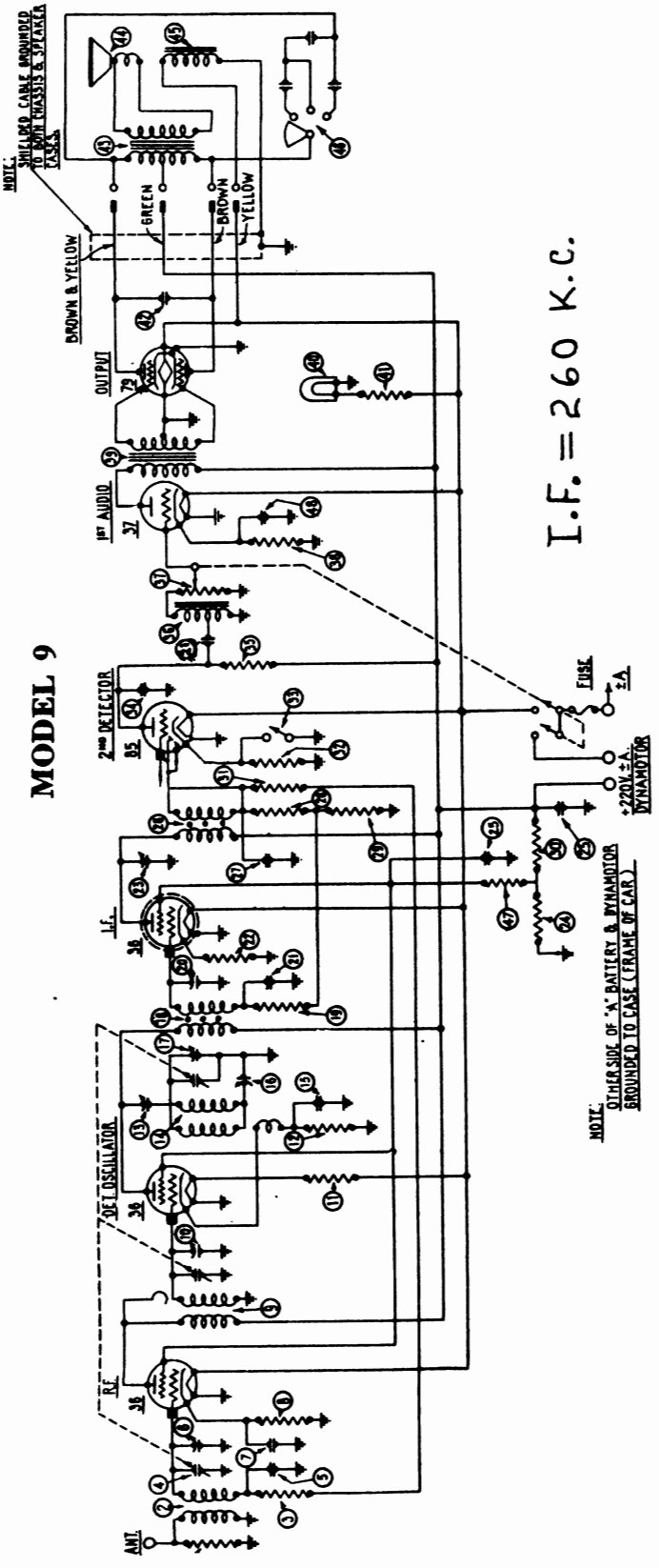
No. in Figs. 1 and 2	Description	Part No.
㊱	Volume Control (500,000 ohm) and switch	7525
㊲	Pilot Lamp	4567
㊳	Resistor (7 ohm)	5110
㊴	Resistor (700 ohm)	6443
㊵	Condenser (.002 mfd.)	6853
㊶	Output Transformer	2598
㊷	Cone and Coil	02823
㊸	Field Coil	02794
㊹	Resistor (25,000 ohm)	4516
	Interstage Shield	05910
	Dynamotor EB	05389
	Dynamotor EA (for battery replacements)	05388
	Receiver Studs	6122
	Shielded Loom (18" high tension shield)	L1387
	Shielded Loom (30" high tension shield)	L1386
	Spark Plug Resistor	4531
	Distributor Resistor	4546
	Screw Type Resistors	4851
	Interference Condensers	4522
	Knobs	5166
	Speaker Extension Cable	02984
	Dynamotor Filter Choke	6658
	Dynamotor Filter Condenser (large unit)	0538
	Dynamotor Filter Condenser (small unit)	05724
	Dynamotor RF Choke (small unit only)	05746
	18" Volume Control Shaft	6351
	18" Tuning Control Shaft	6352
	32" Volume Control Shaft	6128
	32" Tuning Control Shaft	6129
	48" Volume Control Shaft	6298
	48" Tuning Control Shaft	6299
	120" Volume Control Shaft	6355
	120" Tuning Control Shaft	6356
	Philco Oscillator (for adjusting Models 3, 7, 8, 6)	Model 095
	Fibre Wrench	3164



PHILCO RADIO & TELEVISION CORP.

PHILCO RADIO & TELEVISION CORP.

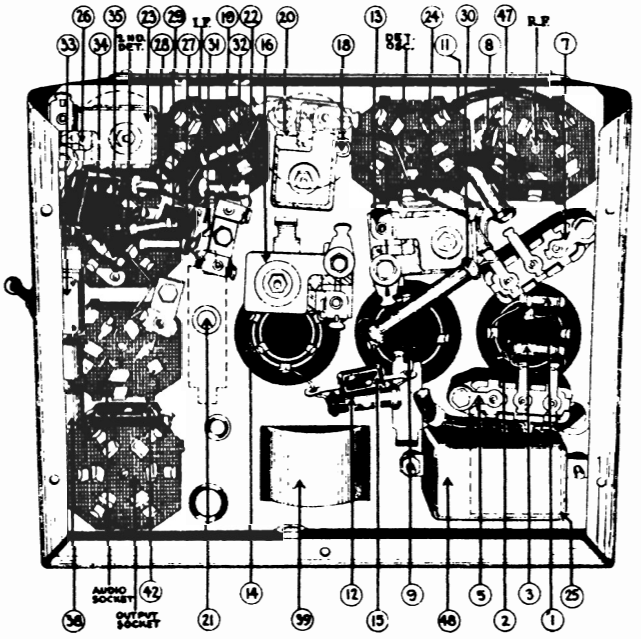
MODEL 9



PARTS LIST

No. in Figs. 1 and 2	Description	Part No.
1	Resistor (5,000 ohm)	6096
2	Antenna Coil	06574
3	Resistor (100,000 ohm)	6099
4	Tuning Condenser	04308
5	By-pass Condenser (.05 mfd.)	3615-AN
6	Compensator section on tuning condenser	
7	By-pass Condenser	3615-AY
8	Resistor (500 ohm)	6977
9	R. F. Transformer	05902
10	Compensator section on tuning condenser	
11	Resistor (2.7 ohm)	6511
12	Resistor (6,000 ohm)	7352
13	Compensator	04000-A
14	Oscillator Coil	05975
15	Condenser (.0007 mfd.)	4520
16	Compensating Cond.	04000-S
17	Compensator section on tuning condenser	
18	First I. F. Transformer	05970
19	Resistor (500,000 ohm)	6097
20	Compensating Cond.	04000-D
21	Condenser (.05 mfd., .15 mfd.)	06091
22	Resistor (500 ohm)	6977
23	Compensating Cond.	04000-D
24	Resistor (20,000 ohm)	6650
25	Condenser (.5 mfd., .25 mfd.)	06088
26	Second I. F. Transformer	05901
27	Condenser (.00025 mfd.)	3082
28	Resistor (100,000 ohm)	6099
29	Resistor (100,000 ohm)	6099
30	Resistor (20,000 ohm)	6649
31	Resistor (500,000 ohm)	6097
32	Resistor (5,000 ohm)	6096
33	Switch	5462
34	Condenser (.00125 mfd.)	5886
35	Resistor (50,000 ohm)	4518
36	Audio Transformer	7552
37	Volume Control	7525
38	Resistor (2,500 ohm)	7775
39	Input Transformer	7652
40	Pilot Lamp	4567
41	Resistor (7 ohm)	5110
42	Condenser (.06 mfd.)	6359
43	Output Transformer	2515

No. in Figs. 1 and 2	Description	Part No.
44	Speaker Coil and Cone	02823
45	Speaker Field Pot.	02795
46	Tone Control	05366
47	Resistor (25,000 ohm)	4516
48	Condenser	7774
	Complete Speaker Assembly (Model 6)	A-4
	Complete Speaker Assembly (Model 7)	A-4
	Complete Speaker Assembly (Model 8)	A-5
	Complete Speaker Assembly (Model 9)	A-7
	Complete Speaker Assembly (Model 12)	A-6
	Complete Speaker Assembly (Model B-6)	A-8
	Interstage Shield	05910
	Dynamotor ED	06084
	Dynamotor EA (for battery replacements)	05388
	Receiver Studs	6122
	Shielded Loom (18" high tension shield)	L-1387
	Shielded Loom (30" high tension shield)	L-1386
	Spark Plug Resistor	4531
	Distributor Resistor	4546
	Screw Type Resistor	4851
	Interference Condensers	4522
	Knobs	5166
	Speaker Extension Cables	02984
	Dynamotor Filter Choke	6658
	Dynamotor Filter Condenser (large unit)	05386
	Dynamotor Filter Condenser (small unit)	05724
	Dynamotor RF Choke	05723
	Battery Cable	05419-D
	18" Volume Control Shaft	6351
	18" Tuning Control Shaft	6352
	32" Volume Control Shaft	6128
	32" Tuning Control Shaft	6129
	48" Volume Control Shaft	6298
	48" Tuning Control Shaft	6299
	120" Volume Control Shaft	6355
	120" Tuning Control Shaft	6356
	Philco Oscillator (for adjusting Models 3, 6, 7, 8, 9)	095
	Fibre Wrench	3164

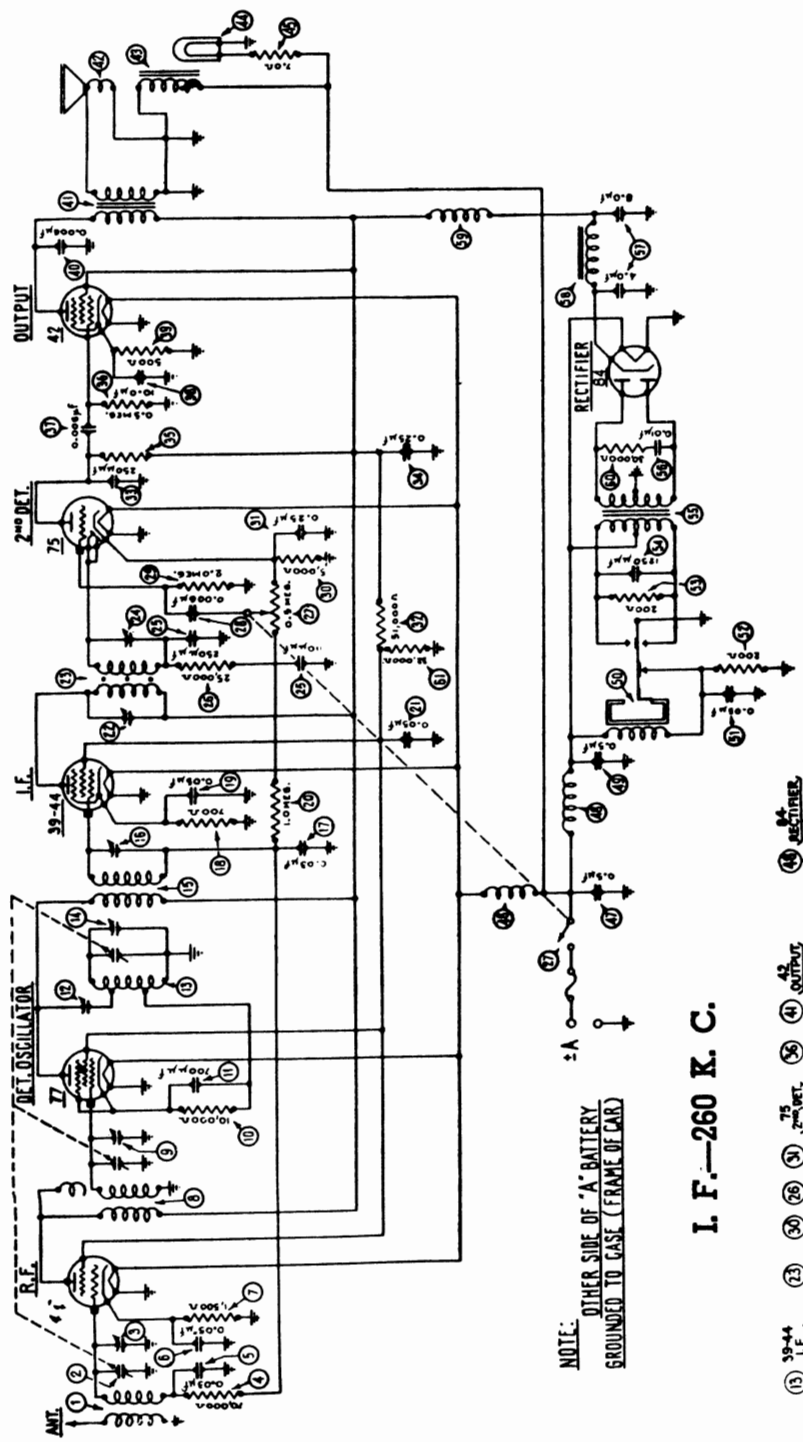


PHILCO RADIO & TELEVISION CORP.

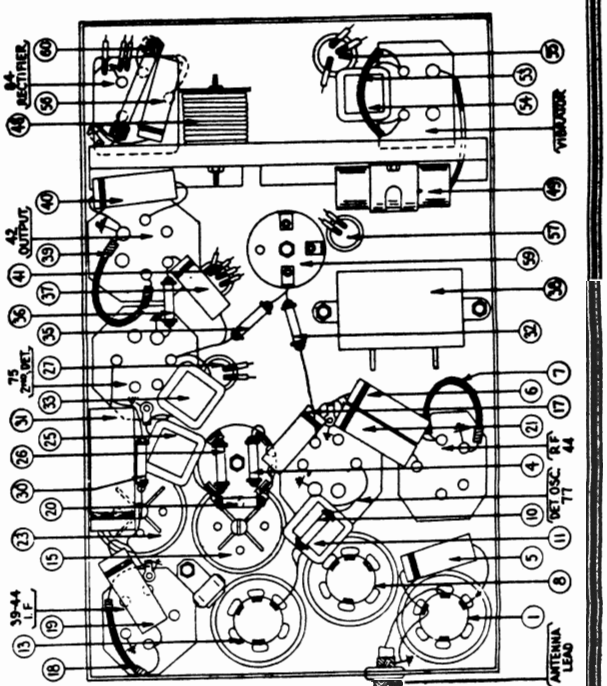
MODEL 11
(Auto Radio)

PARTS LIST

1	Antenna Transformer	32–1331
2	Tuning Condenser	31–1149
3	1st Padder (on tun. cond.)	
4	Resistor (70,000 ohms)	33–1115
5	Condenser (.03 mfd.)	30–4025
6	Condenser (.05 mfd.)	30–4020
7	Resistor (1500 ohms)	33–3047
8	R. F. Transformer	32–1332
9	2nd Padder (on tun. cond.)	
10	Resistor (10,000 ohms)	33–1000
11	Condenser (.0007 mfd.)	5863
12	Padder (Prim. 1st I. F. Tran.)	
13	Oscillator Transformer	32–1333
14	3rd Padder (on tun. cond.)	
15	1st I. F. Transformer	32–1329
16	Padder (Sec. 1st I. F. Tran.)	
17	Condenser (.03 mfd.)	30–4025
18	Resistor (700 ohms)	6443
19	Condenser (.05 mfd.)	30–4020
20	Resistor (1,000,000 ohms)	33–1096
21	Condenser (.05 mfd.)	30–4020
22	Padders (Prim. 2nd I. F.)	
23	2nd I. F. Transformer	32–1237
24	Padder (Sec. 2nd I. F. Tran.)	
25	Cond. (.00011–.00025 mfd.)	30–1020
26	Resistor (25,000 ohms)	33–1013
27	Vol. Con. and Switch Assm.	33–5058
28	Condenser (.006 mfd.)	30–4125
29	Resistor (2,000,000 ohms)	33–1025
30	Resistor (5000 ohms)	6096
31	Condenser (.25 mfd.)	30–4146
32	Resistor (51,000 ohms)	5868
33	Condenser (.00025 mfd.)	3062
34	Condenser (.25 mfd.)	04360
35	Resistor (100,000 ohms)	6099
36	Resistor (500,000 ohms)	6097
37	Condenser (.006 mfd.)	30–4125
38	Condenser (10 mfd.)	7440
39	Resistor (500 ohms)	33–3031
40	Condenser (.006 mfd.)	30–4024
41	Output Transformer	32–7214
42	Cone and Voice Coil	02861
43	Field Coil Assembly	36–3097
44	Pilot Light	6608
45	Resistor (7 ohms)	33–3035
46	"A" Choke	32–1286
47	Condenser (.5 mfd.)	30–4047
48	Vibrator Choke	32–1235
49	Condenser (.5 mfd.)	30–4147
50	Vibrator Unit	38–5036
51	Condenser (.05 mfd.)	30–4039
52	Resistor (200 ohms)	7217
53	Resistor (200 ohms)	7217
54	Condenser (.00125 mfd.)	5886
55	Power Transformer	32–7216
56	Condenser (.01 mfd.)	30–4051
57	Condenser (4.–8. mfd.)	30–2072
58	"B" Choke	32–7215
59	R. F. Choke	32–1281
60	Resistor (30,000 ohms)	7836
61	Resistor (32,000 ohms)	3525
	Spark Plug Resistor	33–1015
	Distributor Resistor	4546
	Screw Type Resistor	4851
	Interference Condenser	30–4007
	Dial	27–5038
	Studs	28–6036
	Nuts (mounting)	W55A
	Knobs (tuning)	03334
	Knobs (volume)	06886
	Battery Cable	38–5296
	Acorn Nut	W821
	Key	6091
	Fuse	7227
	Fuse Insulator	27–7131
	4-Prong Socket	27–6006
	5-Prong Socket	27–6014
	6-Prong Socket	6417
	Cont. Unit Assm. (Dir. Dr.)	42–5150
	Shafts—Tuning	28–8139
	Volume	28–8141
	Cont. Unit Assm. (Gr. Dr.)	42–5157
	Shafts—Tuning	28–8217
	Volume	28–8217

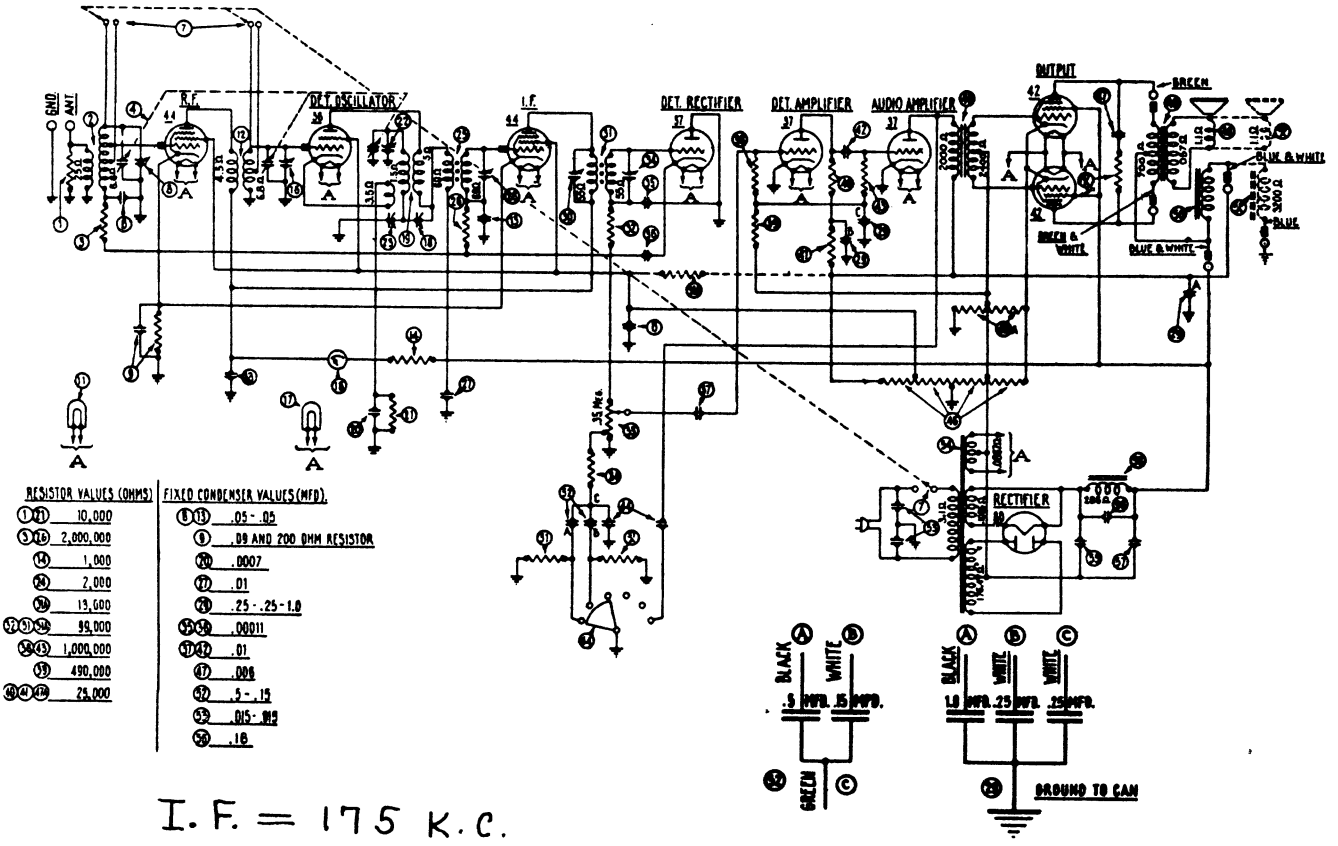


I. F.—260 K. C.



PHILCO RADIO & TELEVISION CORP.

MODELS 14 AND 91



I. F. = 175 K.C.

REPLACEMENT PARTS

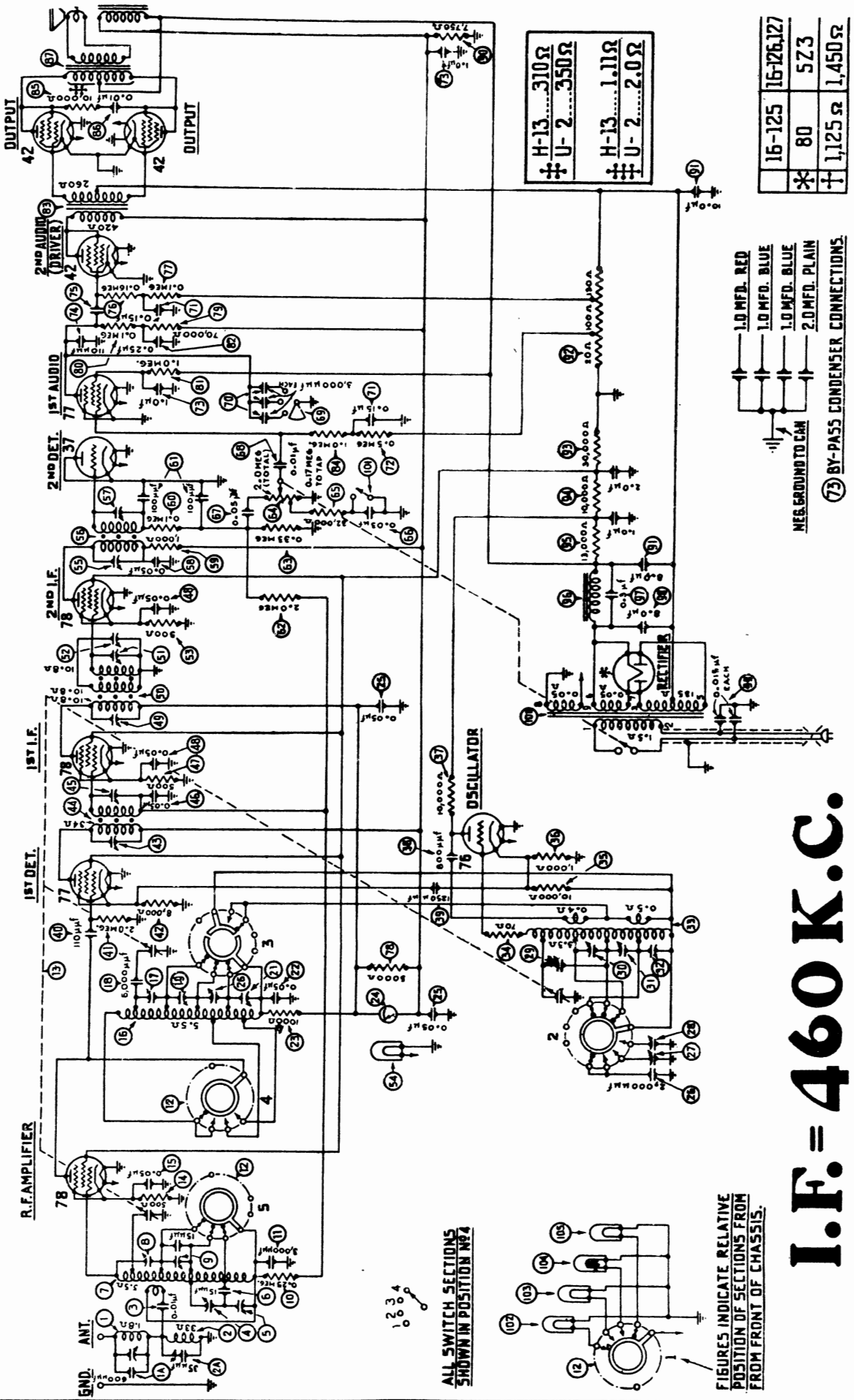
No. on Figs.	Description	Part No.
1	Resistor (Brown-Black-Orange)	4412
2	R.F. Transformer	32-1069
3	Resistor (Red-Black-Green)	5872
4	Tuning Condenser Assembly	04790
5	Compensating Cond. (R.F.) Part of 4	
6	Condenser	3615-AM
7	"On-Off" and Frequency Switch	42-1002
9	Condenser (and Resistor)	6287-C
11	Pilot Lamp (Philco Scale)	6608
12	Detector Transformer	32-1070
13	Condenser	3615-AJ
14	Resistor (Brown-Black-Red)	5837
15	Compensating Cond. (Detector) Part of 4	
16	Tuning Meter	6497
17	Pilot Lamp (Tuning Meter)	6608
18	Compensating Cond. (1st I.F. Primary)	04000-M
19	Oscillator Coil	05985
20	Condenser (White and Yellow)	4520
21	Resistor (Brown-Black-Orange)	4412
22	Comp. Cond. (High Freq.) Part of 4	
23	Compensating Condenser (Low Freq.)	04000-B
24	Resistor (Red-Black-Red)	6984
25	First I.F. Transformer	04319
26	Resistor (Red-Black-Green)	5872
27	Condenser	3903-AE
28	Comp. Cond. (1st I.F. Secondary)	04000-M
29	Filter Condenser Bank	04830
30	Comp. Cond. (2d I.F. Primary)	04000-M
31	Second I.F. Transformer	04320
32	Resistor (White-White-Orange)	4411
33	Volume Control	8054
34	Comp. Cond. (2nd I.F. Secondary)	04000-M
35	Condenser (Blue and Golden Yellow)	4519
36	Condenser (Blue and Golden Yellow)	4519
37	Condenser	3903-P
38	Resistor (Brown-Black-Green)	4409
39	Resistor (Yellow-White-Yellow)	4517
40	Resistor (Red-Green-Orange)	4516
41	Resistor (Red-Green-Orange)	4516
42	Condenser	3903-P

No. on Figs.	Description	Part No.
43	Resistor (Brown-Black-Green)	4409
44	Tone Control	06698
45	Push-Pull Input Transformer	6064
46	B.C. Resistor (Wire Wound)	6702
46a	B.C. Resist. (Wire Wound) Twin Speaker	6808
47	Condenser	7625-B
47a	Resistor (Red-Green-Orange)	4516
48	Push-Pull Output Trans. (Sing. Speaker)	2585
	Push-Pull Output Trans. (Twin Speaker)	2565
49	Voice Coil and Cone Assembly (K-6 and K-12)	02823
49a	Voice Coil and Cone Assembly (H-7) Twin Speaker Model	02807
50	Speaker Field Assembled with Pot (K-6 and K-12)	02803
50a	Speaker Field Assembled with Pot (H-7) Twin Speaker Model	02803
51	Resistor (White-White-Orange)	4411
51a	Resistor (White-White-Orange)	4411
52	Condenser Bank	06713
53	Condenser (Double)	3793-E
54	Power Trans. (50-60 cycles) Sing. Speak'r	6554
	Power Trans. (25-40 cycles) Sing. Speak'r	6555
	Power Trans. (50-60 cycles) Twin Speak'r	6804
	Power Trans. (25-40 cycles) Twin Speak'r	6805
55	Electrolytic Cond. (6 MFD) Sing. Sp'ker	4916
	Electrolytic Cond. (8 MFD) Twin Sp'ker	7464
56	Condenser	4989-T
57	Electrolytic Cond. (6 MFD) Sing. Sp'ker	4916
	Electrolytic Cond. (8 MFD) Twin Sp'ker	7464
58	Filter Choke	4819
	Tube Shields	8005
	Knob (Large)	03063
	Knob (Medium)	03064
	Knob (Small)	03437
	Four Prong Socket	5026
	Five Prong Socket	4956
	Six Prong Socket	6417
	Dial, Complete	04832
	Bezel	6418

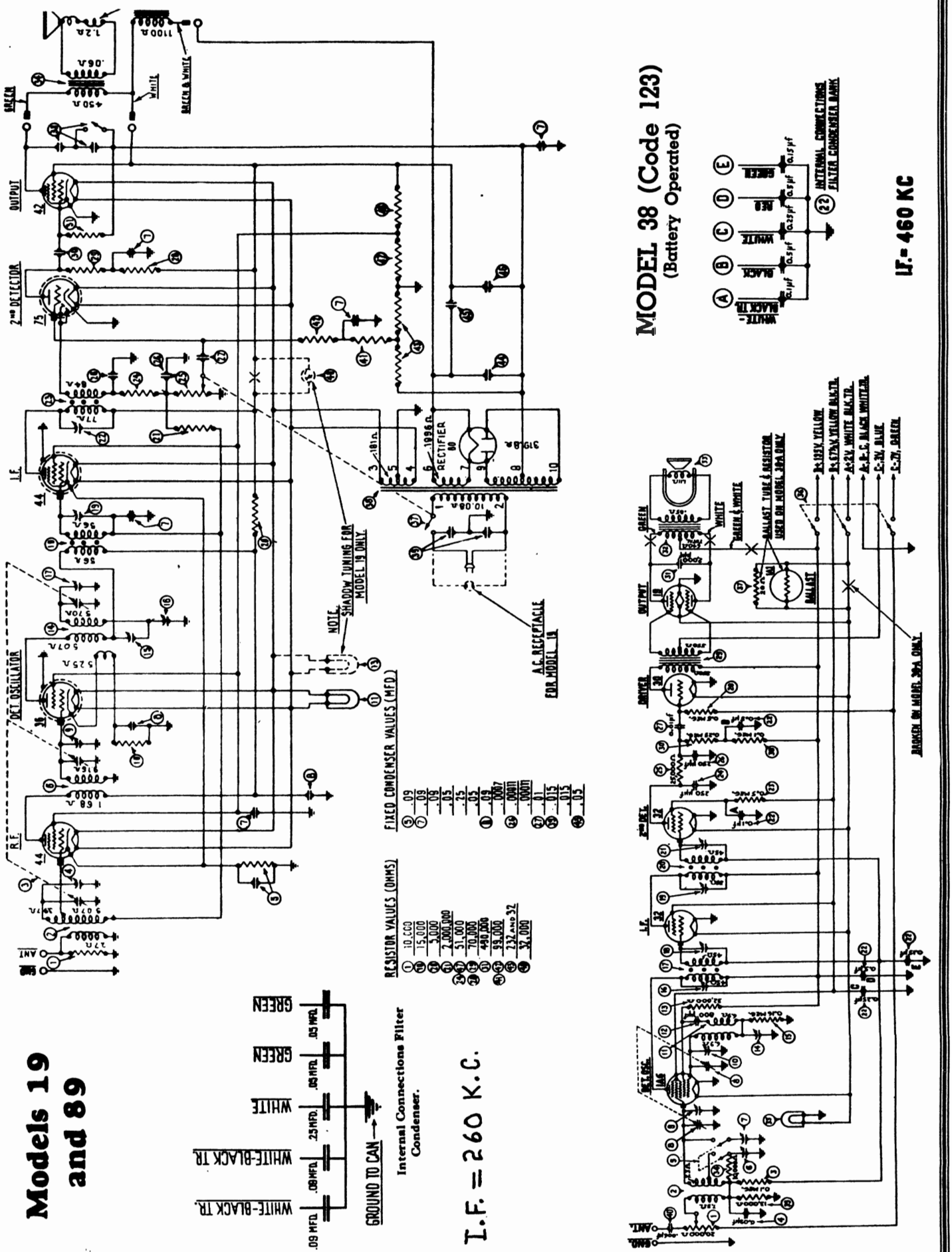
PHILCO RADIO & TELEVISION CORP.

MODEL 16

(Codes 125, 126, 127)

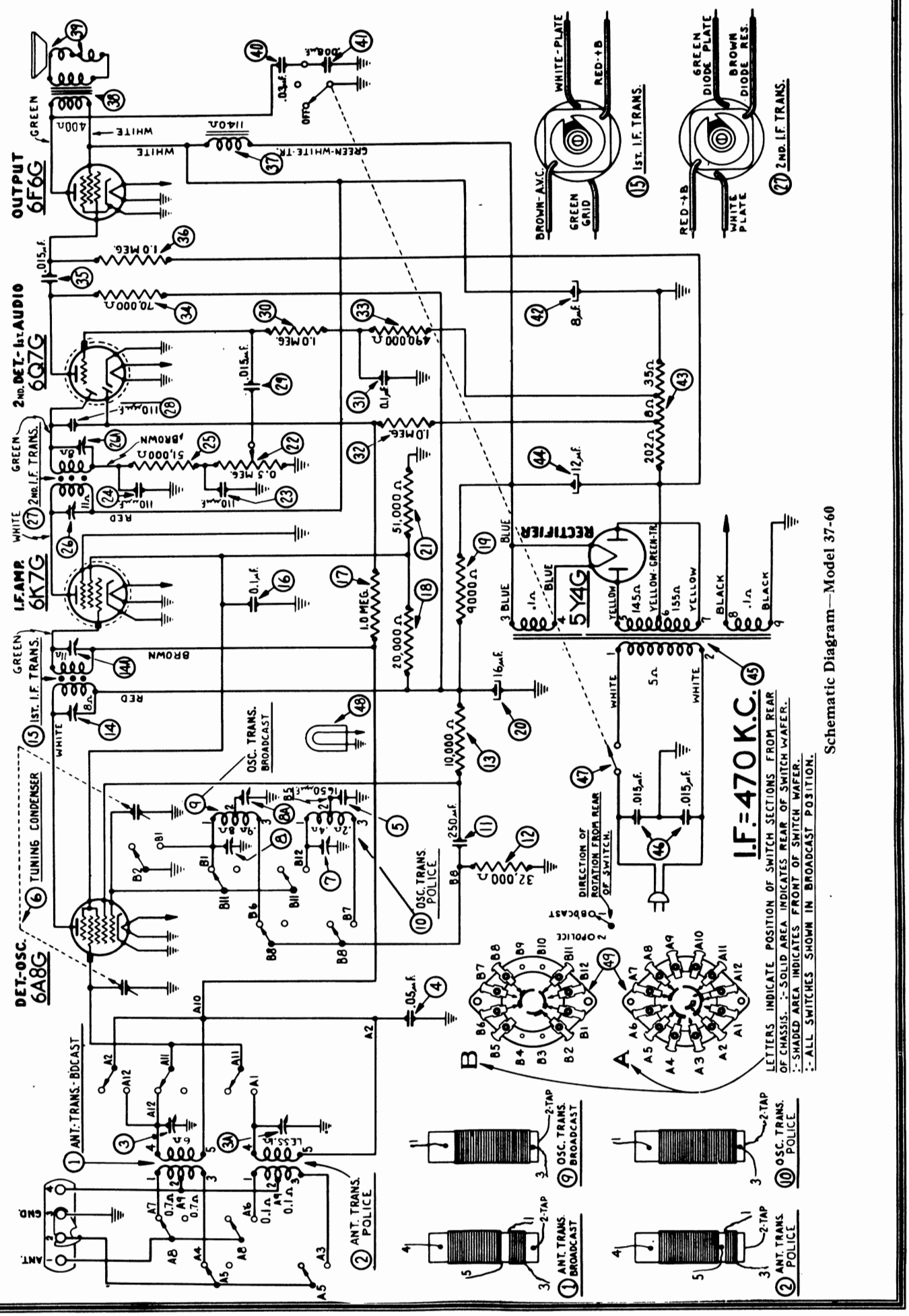


PHILCO RADIO & TELEVISION CORP.



PHILCO RADIO & TELEVISION CORP.

Model 37-60



Schematic Diagram—Model 37-60

PHILCO RADIO & TELEVISION CORP.

Model 37-60

Adjustment of Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit, three in the Oscillator Circuit, and two in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20,000 K. C. is recommended to adjust the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a very sensitive output meter and is recommended for these adjustments.

Philco Fibre Wrench No. 3164 and Fibre Handle Screw-driver No. 27-7059 complete the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 3 and 4.

The following procedure must be observed in adjusting the compensators:

DIAL ADJUSTMENT—The Tuning condenser is set at the maximum capacity position, by turning the tuning knob counter-clockwise. Loosen the set screw of dial hub and set dial, (see Fig. 2) with Glowing Indicator centered between the index lines at the low frequency end of scale.

OUTPUT METER—The Output Meter is attached to the Plate and Cathode terminals of the (6F6G tube) and adjusted to use the (0-30) volt scale. When adjusting each circuit, care should be taken to have the signal generator attenuator set to give approximately ¼ scale reading on output meter.

INTERMEDIATE FREQUENCY CIRCUIT

1 Turn wave band switch to Range 1. Rotate the tuning control to approximately 600 K. C. Connect the 088 Signal Generator output lead through a .1 mfd. condenser to the grid of the 6A8G tube, and the ground lead of Signal Generator to the chassis.

2 Set Signal Generator indicator for 470 K. C., adjust attenuator for approximately ¼ scale reading on output meter. Then adjust compensators ㉖a 2nd I. F. Sec., ㉖ 2nd I. F. Pri., ⑭a 1st I. F. Sec., ⑭ 1st I. F. Pri., for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT—Range 2: 2.3 to 7.4 M. C.

1 Turn Range switch to Range 2. Remove signal generator output lead from the grid of 6A8G tube.

2 Attach signal generator output lead through a 0.1 mfd. condenser to the ANT. TERMINAL No. 1, on aerial panel, and the generator ground to chassis. Connect TERMINAL No. 2, to GROUND TERMINAL No. 3, with connector link provided on the panel.

3 Set Signal Generator and receiver dials for 7.0 M. C. Now adjust compensator ⑦ for maximum reading on output meter. Then turn Signal Generator and Receiver to 6.0 M. C., and adjust compensator ③a for maximum output.

RANGE 1: 530 to 1720 K. C.

1 Turn range switch to Range 1. Turn the Receiver dial to 1600 K. C. Then adjust compensators ⑧ and ③ for maximum reading on output meter.

The 088 Signal Generator dial is set at 800 K. C. and the second harmonic of this frequency (1600 K. C.) is used in making the above adjustment.

2 The low frequency end of the band is now tuned by turning Signal Generator and Receiver dials to 600 K. C. and adjusting compensator ⑧a—see note (a) below—for maximum output.

(a) When compensator ⑧a osc. series is being adjusted, the Tuning Condenser must be rolled for maximum output. This is accomplished as follows: First tune compensator ⑧a for maximum output. Then vary the Tuning Condenser for maximum output at 600 K. C. Now retune Compensator ⑧a, and again vary the tuning condenser back and forth about 600 K. C., for maximum output. This operation of first tuning the Compensator, then the Tuning Condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3 Set the Signal Generator and Receiver dials for 1600 K. C. and re-adjust Compensator ⑧ for maximum output. Then turn the dials to 1500 K. C. and re-adjust compensator ③ for maximum reading on output meter.

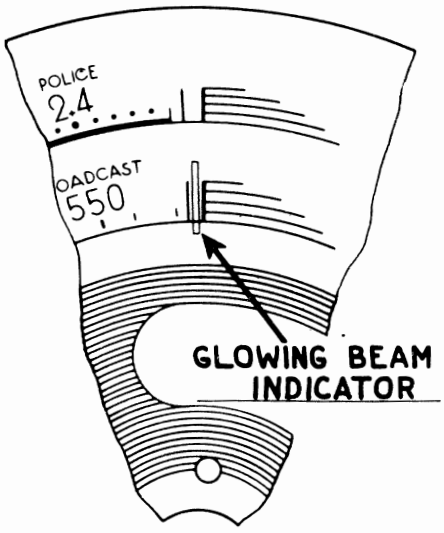


Fig. 2—Dial Calibration

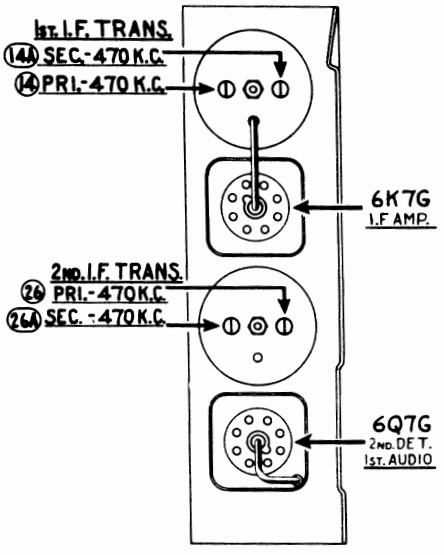


Fig. 3—Locations of I. F. Compensators Top of Chassis

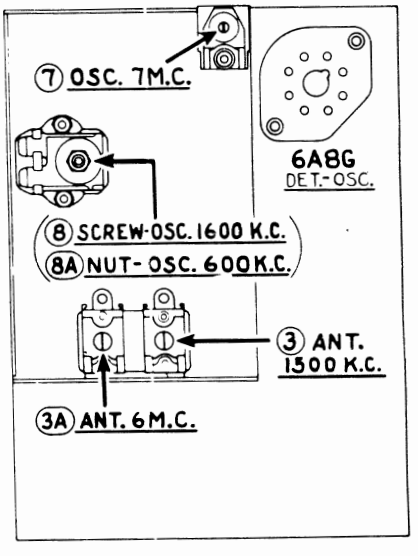
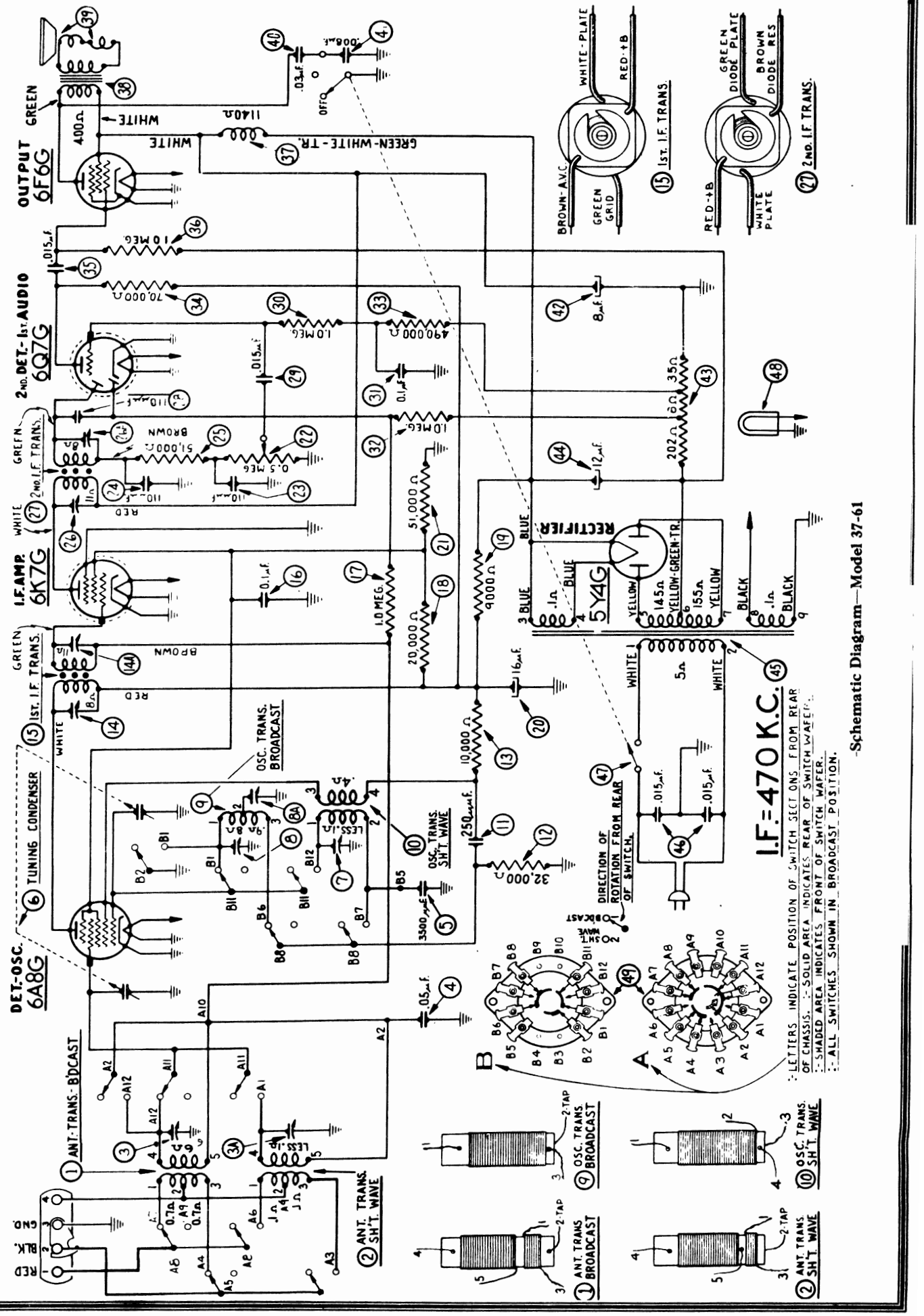


Fig. 4—Locations of R. F. Compensators Underside of Chassis

PHILCO RADIO & TELEVISION CORP.

Model 37-61



Schematic Diagram—Model 37-61

PHILCO RADIO & TELEVISION CORP.

Model 37-61

Adjustment of Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit; three in the Oscillator Circuit; and two in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20000 K. C. is recommended to adjust the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a very sensitive output meter and is recommended for these adjustments.

Philco Fibre Wrench No. 3164 and Fibre Handle Screw-driver No. 27-7059 complete the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 3 and 4.

The following procedure must be observed in adjusting the compensators:—

DIAL ADJUSTMENT—The Tuning Condenser is set at the maximum capacity position, by turning the tuning knob counter-clockwise. Loosen the set screw of dial hub and set dial, (see Fig. 2) with Glowing Indicator centered between the index lines at the low frequency end of scale.

OUTPUT METER—The Output Meter is connected to the Plate and Cathode terminals of the (6F6G) tube and adjusted to use the (0-30) Volt scale. When adjusting each circuit, care should be taken to have the Signal Generator attenuator set to give approximately ¼ scale reading on output meter.

INTERMEDIATE FREQUENCY CIRCUIT

1 Turn range switch to Range 1. Rotate the tuning control to approximately 600 K. C. Connect the 088 Signal Generator output lead through a .1 mfd. condenser to the grid of the 6A8G tube.

2 Set Signal Generator indicator for 470 K. C. adjust attenuator for approximately ¼ scale reading on output meter. Then adjust compensators (26)a 2nd I. F. Sec., (26) 2nd I. F. Pri., (14)a 1st I. F. Sec., (14) 1st I. F. Pri., for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT

Range 2.—5.7 to 18 M. C.

1 Remove the signal generator output lead and series condenser from the 6A8G tube and connect them to the ANT. TERMINAL No. 1, on aerial input panel (rear of chassis) and the generator ground lead to GND. TERMINAL No. 3, rear of chassis. Connect TERMINAL No. 2 to GROUND TERMINAL No. 3 with connector link provided on the panel.

2 Set range switch in position No. 2 (S. W.). Turn signal generator and receiver dials to 18 M. C. and adjust compensator (7) Osc. for maximum output.

3 The adjustment of the antenna compensator on the high frequency range causes a slight detuning of the oscillator circuit. In order to overcome this detuning effect, connect a variable condenser of approximately 350 mfd., having a good vernier drive, across the oscillator section of the tuning condenser. Leaving the signal generator and receiver dials at 18 M. C., tune the added condenser so that the second harmonic of the receiver oscillator will beat against the signal from the signal generator. The antenna compensator (3)a should then be adjusted to give maximum output.

4 Now remove the external condenser from the tuning condenser of receiver and turn compensator (7) osc. to the maximum capacity position (clockwise), then without moving signal generator or receiver tuning condenser, turn compensator (7) (counter-clockwise) until a second peak is reached on the output meter. The first peak is caused by tuning to the image frequency signal and must be neglected. Compensator (7) is adjusted on the second peak to give maximum output.

RANGE 1: 530 to 1720 K. C.

Turn range switch to Range No. 1. Turn the Receiver dial to 1600 K. C. Then adjust compensators (8) and (3) for maximum reading on output meter.

The 088 Signal Generator dial is set at 800 K. C. and the second harmonic of this frequency (1600 K. C.) is used in making the above adjustment.

2 The low frequency end of the band is now tuned by turning Signal Generator and Receiver dials to 600 K. C. and adjusting compensator (8)a—see note (a) below—for maximum output.

(a) When compensator (8)a osc. series is being adjusted, the Tuning Condenser must be rolled for maximum output. This is accomplished as follows: First tune compensator (8)a for maximum output. Then vary the Tuning Condenser for maximum output at 600 K. C. Now retune Compensator (8)a and again vary the tuning condenser back and forth at 600 K. C., for maximum output. This operation of first tuning the Compensator, then the Tuning Condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3 Set the Signal Generator and Receiver Dials for 1600 K. C. and re-adjust Compensator (8) for maximum output. Then turn the dials to 1500 K. C. and re-adjust compensator (3) for maximum reading on output meter.

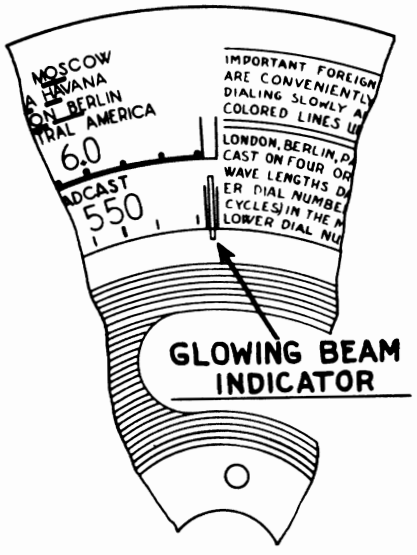


Fig. 2—Dial Calibration

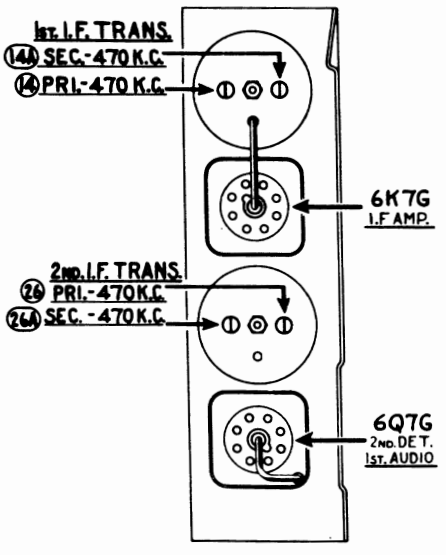


Fig. 3—Locations of I. F. Compensators Top of Chassis

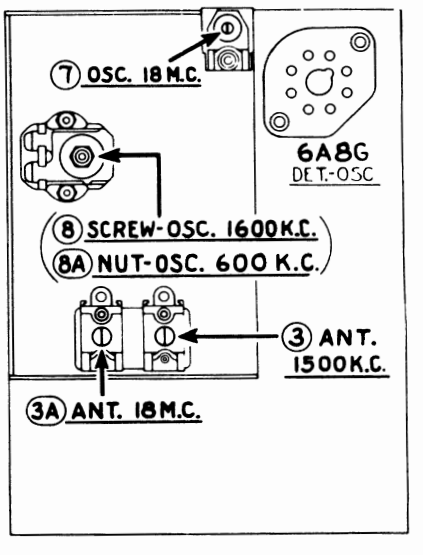
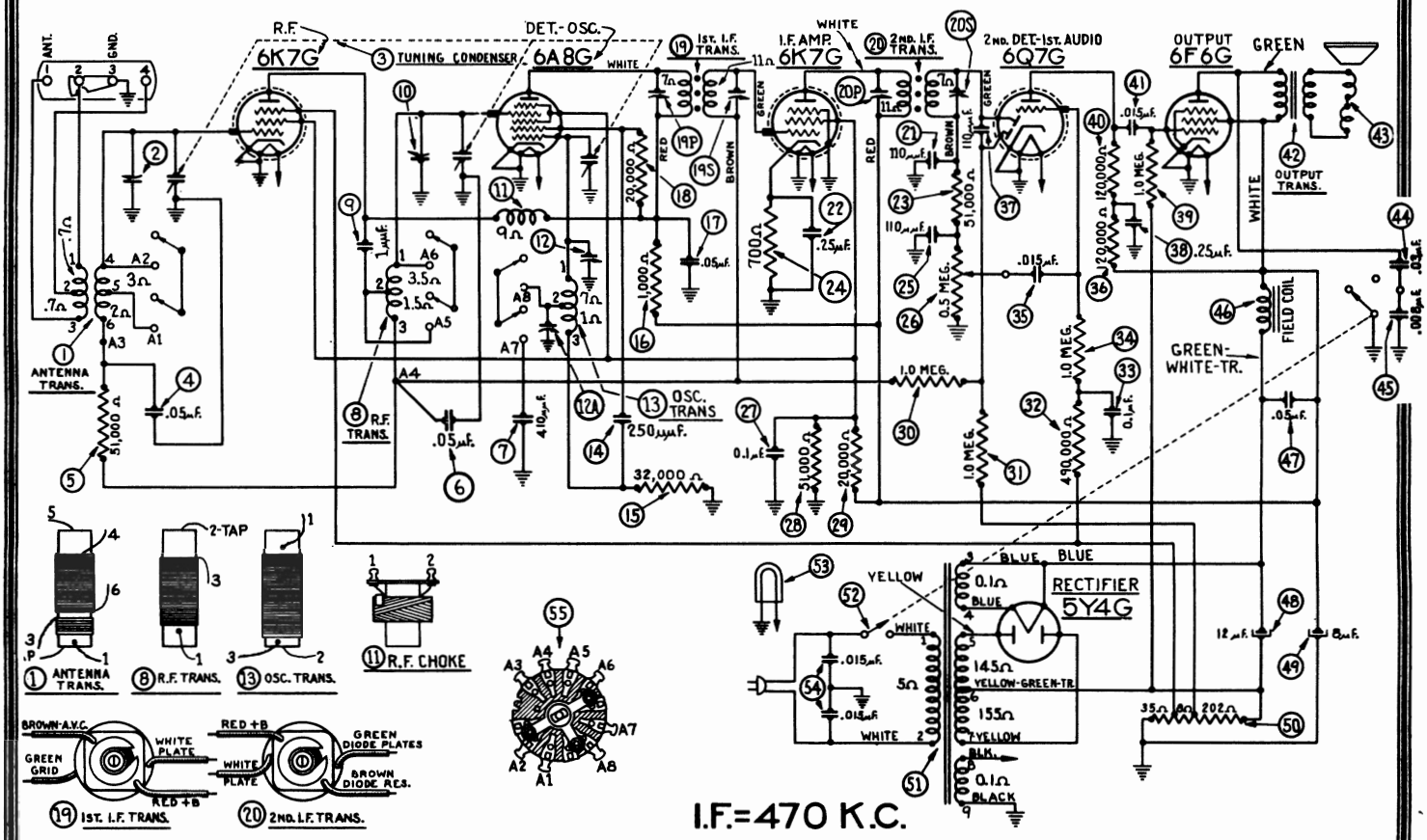


Fig. 4—Locations of R. F. Compensators Underside of Chassis

PHILCO RADIO & TELEVISION CORP.

Model 37-89



Replacement Parts — Model 37-89

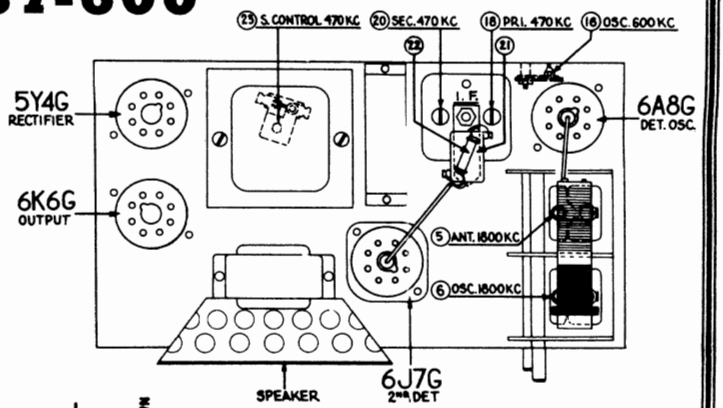
Schem. No.	Description	Part No.	List Price
1	Antenna Transformer	32-2127	$0.80
2	Compensator	31-6100	.40
3	Tuning Condenser	31-1833	4.00
4	Condenser (.05 mfd. tubular)	30-4020	.20
5	Resistor (51000 ohms ½ watt)	33-351339	.20
6	Condenser (.05 mfd. tubular)	30-4020	.20
7	Condenser (410 mmfd.)	30-1000	.25
8	R. F. Transformer	32-2128	.60
9	Condenser Two Wires Twisted		
10	Compensator	31-6100	.40
11	Choke	32-2139	.35
12	Compensator	31-6101	.20
13	Osc. Transformer	32-2120	.65
14	Condenser (250 mmfd. mica)	30-1032	
15	Resistor (32,000 ohms ½ watt)	33-351339	.20
16	Resistor (1000 ohms, ½ watt)	33-210339	.20
17	Condenser (.05 mfd. tubular)	30-4123	.20
18	Resistor (20000 ohms, ½ watt)	33-320339	.20
19	1st I. F. Transformer	32-2100	1.50
20	2nd I. F. Transformer	32-2102	1.50
21	Condenser (110 mmfd. mica)	30-1031	.20
22	Condenser (.25 mfd. tubular)	30-4446	.20
23	Resistor (51000 ohms, ½ watt)	33-351334	.20
24	Resistor (700 ohm, ½ watt)	33-1220	20
25	Condenser (110 mmfd. mica)	30-1031	.20
26	Volume Control	33-5157	1.00
27	Condenser (0.1 mfd. tubular)	30-4455	.25
28	Resistor (51000 ohms, 1 watt)	33-351439	.20
29	Resistor (20000 ohms, 2 watt)	33-320539	.30
30	Resistor (1 meg. ½ watt)	33-510339	20
31	Resistor (1 meg. ½ watt)	33-510339	.20
32	Resistor (490000 ohms ½ watt)	33-449339	.20
33	Condenser (0.1 mfd. tubular)	30-4122	.20
34	Resistor (1 megohm, ½ watt)	33-510339	.20
35	Condenser (.015 mfd. tubular)	30-4358	$0.20
36	Resistor (120000 ohms, ½ watt)	33-412339	.20
37	Condenser (110 mmfd. mica)	30-1031	.20
38	Condenser (.25 mfd. tubular)	30-4134	.35
39	Resistor (1 megohm, ½ watt)	33-510339	.20
40	Resistor (120000 ohms, ½ watt)	33-412339	.20
41	Condenser (.015 mfd. tubular)	30-4226	.20
42	Output Transformer	32-7019	.85
43	Cone & Voice Coil	36-3157	.80
44	Condenser (.03 mfd. bakelite)	8318-SU	.35
45	Condenser (.008 mfd. tubular)	30-4112	.20
46	Field Coil & Pot Assembly	36-3664	
47	Condenser (.05 mfd. tubular)	30-4020	.20
48	Electrolytic Condenser (12 mfd.)	30-2117	1.20
49	Electrolytic Condenser (8 mfd.)	30-2024	1.10
50	Bias Resistor (245 ohms, Taps 35 and 43 ohms)	33-3277	.20
51	Power Transformer (115 volt, 50 to 60 cycle)	32-7583	4.25
52	Tone Control & A. C. Switch	42-1180	.75
53	Pilot Lamp	34-2039	.15
54	Condenser (.015, 015 mfd. bakelite)	3793-DG	.40
55	Wave Switch	42-1194	.60
	Dial	27-5204	.35
	Dial Hub	28-7152	.10
	Dial Clamp	28-2837	.10
	Screen Bracket & Screen Assembly	31-1878	.25
	Screw	W-650	Per C .40
	Vernier Drive	31-1844	
	Pilot Lamp Assembly	38-7706	.35
	Insulator Tone Control	27-8320	Per C .40
	Nut Tone Control	W-684	Per C 1.25
	Lock Washer	W-1624	Per C .50
	Volume Control Shaft	28-6498	.10
	Shaft Spring	28-4117	
	Washer	6717	
	Washer	4436	
	Shaft Retaining Clip	28-8610	
	Mtg. Grommet	27-4317	
	Mtg. Washer Sleeve	28-2257	
	Mtg. Sleeve Bushing	27-8339	
	Mtg. Screw	W-729	
	Mtg. Washer	28-3927	
	R. F. Unit Support	28-3856	
	Support Locking Plate	28-3975	
	Support Locking Plate	28-3889	
	Screw	W-644	
	Knobs Tuning	27-4321	
	Knob Volume, Waveswitch, Tone	27-4332	
	Baffle Silk Assembly B, Cabinet	40-5935	
	Baffle Silk Assembly F, Cabinet	40-5933	
	Speaker S-16	36-1225	
	Screw Speaker Mtg.	W-1604	
	Lockwasher Speaker Mtg.	W-291	
	Washer Speaker Mtg.	W-410	
	Nut Speaker Mtg.	W-124	
	Screw Chassis Mtg.		
	Washer Chassis Mtg.	28-2089	
	Bezel Frame & Plate	40-5938	
	Bezel Gasket	27-8311	
	Bezel Glass	27-8298	
	Bezel Ring	28-3967	
	Bezel Screw	W-1644	
	Bottom Shield Plate F, Cabinet		
	I. F. Coil Shield	38-7763	
	Speaker S16 B, F Cabinets	36-1225	

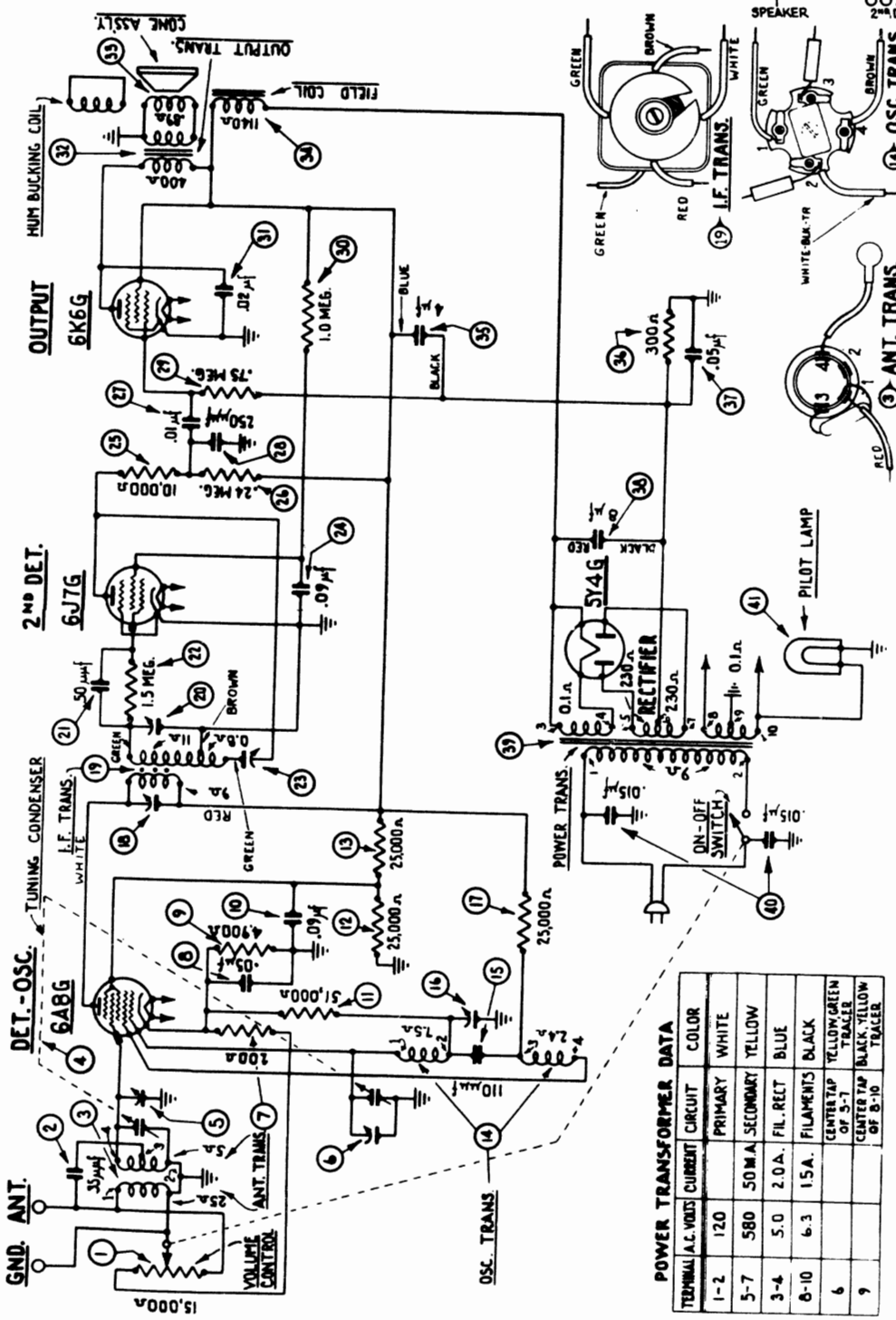
PHILCO RADIO & TELEVISION CORP.

Model 37-600

Specifications

TYPE CIRCUIT: Superheterodyne with pentode output.
POWER SUPPLY: 115 V., 60 cycle A.C.
TUBES USED: 1 type 6A8G, Det. Osc., 1 type 6J7G, 2nd Det., type 6K6G, Output, 1 type 5Y4G Rectifier.
FREQUENCY RANGE: 530-1800 K.C.
INTERMEDIATE FREQUENCY: 470 K.C.
CURRENT CONSUMPTION: 45 watts.
SPEAKER: B-6.
POWER OUTPUT: ½ watt.





I. F. = 470 K. C.

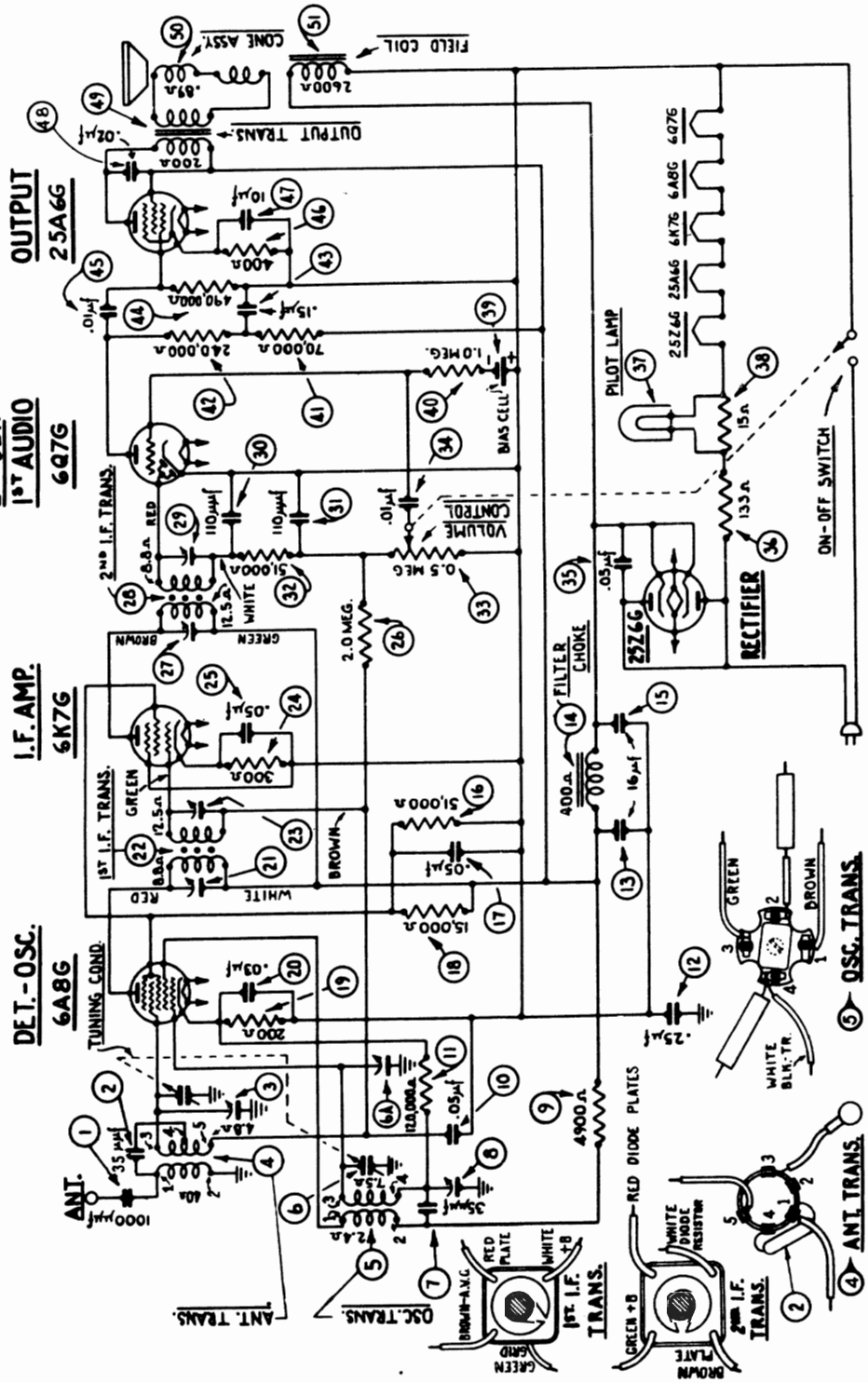
POWER TRANSFORMER DATA

TERMINAL	A.C. VOLTS	CURRENT	CIRCUIT	COLOR
1-2	120		PRIMARY	WHITE
5-7	580	50 M.A.	SECONDARY	YELLOW
3-4	5.0	2.0 A.	FIL. RECT	BLUE
8-10	6.3	1.5 A.	FILAMENTS	BLACK
6			CENTER TAP OF 5-7	YELLOW, GREEN TRACER
9			CENTER TAP OF 8-10	BLACK, YELLOW TRACER

PHILCO RADIO & TELEVISION CORP.

MODEL 37-602

I.F. = 470 K.C.



Schematic Number	Part and Description	Part No.	Price List
①	Condenser (.001 Mf. Tubular)	30-4201	$.20
②	Condenser (35 mmf. Mica)	30-1044	.20
③	Compensator (Ant. 1800 KC.)		
④	Ant. Transformer	32-2140	1.40
⑤	Osc. Transformer	32-2041	1.20
⑥	Tuning Condenser	31-1794	3.00
⑥a	Compensator (Osc. 1800 KC.)		
⑦	Condenser (35 mmf. Mica)	30-1044	.20
⑧	Compensator (Osc. Series) (600 Kc.)	04000S	.35
⑨	Resistor (4900 ohm, ½ watt)	33-249339	.20
⑩	Condenser (.05 Mf. Bakelite)	3615-OSU	.35
⑪	Resistor (120,000, ½ watt)	33-412339	.20
⑫	Condenser (.25-.05-.05-.05-.15-.01 mf.)	30-4410	1.00
⑬	Elec. Condenser (16-16-10 mf.)	30-2148	3.20
⑭	Filter Choke	32-7544	.95
⑮	Elec. Condenser (16 mf.)	Part of ⑬	...
⑯	Resistor (51,000 ohm, ¼ watt)	33-351339	.20
⑰	Condenser (.05 mf.)	Part of ⑫	...
⑱	Resistor (15,000 ohm, ¼ watt)	33-315339	.20
⑲	Resistor (300 ohm wirewound)	33-3010	.20
⑳	Condenser (.03 mf. Bakelite)	8318-OSU	.35
㉑	Compensator (1st I.F. Pri.)	Part of ㉒	...
㉒	1st I.F. Transformer	32-2005	1.50
㉓	Compensator (1st I.F. Sec.)	Part of ㉒	...
㉔	Resistor (300 ohm wirewound)	33-3010	.20

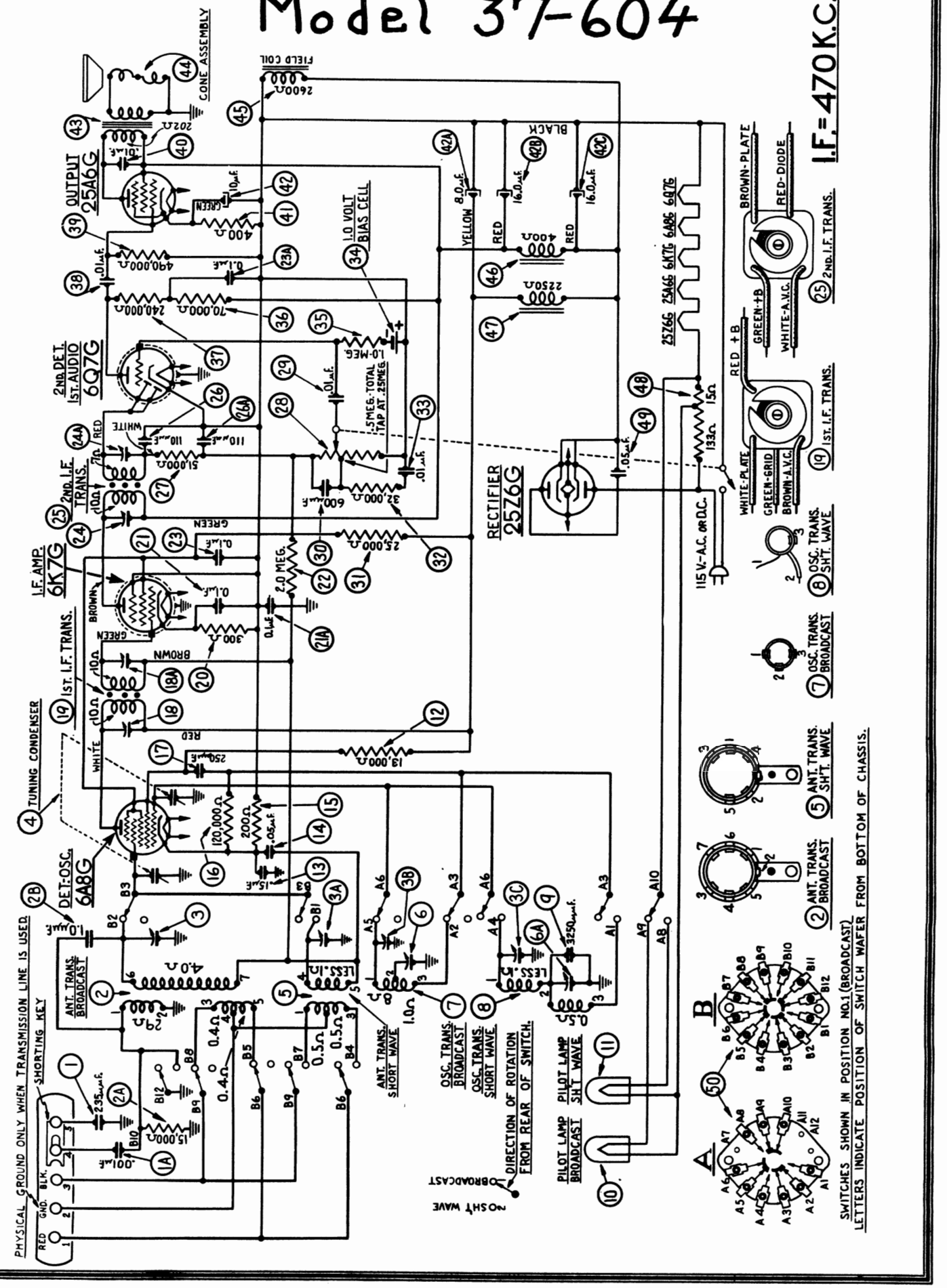
Schematic Number	Part and Description	Part No.	Price List
㉕	Condenser (.05 mf.)	Part of ⑫	...
㉖	Resistor (2.0 meg., ¼ watt)	33-520339	.20
㉗	Compensator (2nd I.F. Pri.)	Part of ㉘	...
㉘	2nd I.F. Transformer	32-2006	1.50
㉙	Compensator (2nd I.F. Sec.)	Part of ㉘	...
㉚	Condenser (.00011 mf. twin)	8035-ODU	.25
㉛	Condenser (.00011 mf.)	Part of ㉚	...
㉜	Resistor (51,000 ohm, ¼ watt)	33-351339	.20
㉝	Volume Control (0.5 meg.)	33-5145	1.45
㉞	Condenser (.01 mf. Tubular)	30-4145	.20
㉟	Condenser (.05 mf.)	Part of ⑫	...
㊱	Resistor (133-15 ohm)	33-3235	.55
㊲	Pilot Lamp	34-2068	.16
㊳	Resistor (15 ohm)	Part of ㊱	...
㊴	Bias Cell	41-8009	.20
㊵	Resistor (1.0 meg., ¼ watt)	33-510339	.20
㊶	Resistor (70,000 ohm, ¼ watt)	33-370339	.20
㊷	Resistor (240,000 ohm, ¼ watt)	33-424339	.20
㊸	Condenser (.15 mf.)	Part of ⑫	...
㊹	Resitor (490,000 ohm, ¼ watt)	33-449339	.20
㊺	Condenser (.01 mf.)	Part of ⑫	...
㊻	Resistor (400 ohm wirewound) (Flexible)	33-3122	.25
㊼	Elec. Condenser (10 mf.)	Part of ⑬	...
㊽	Condenser (.02 mf. Tubular)	30-4113	.20
㊾	Output Transformer	32-7566	1.10
㊿	Voice Coil Cone Assy.	36-3029	.60

Schematic Number	Part and Description	Part No.	Price List
(51)	Field Coil Assy.	36-3040	2.40
	Volume Control Mtg. Nut	W-684-A	1.25C
	B.C. Resistor Mtg. Screw	W-650-A	.40C
	B.C. Resistor Mtg. Nut	W-95-A	.30C
	Tube Shield Base	28-3898	.03
	Tube Shield Body	28-2726	.10
	Chassis Mtg. Screw	W-1656-A	.75C
	Chassis Mtg. Nut	W-124-A	.35C
	Chassis Mtg. Washer	W-151-A	.15C
	Chassis Mtg. Washer	W-291-A	.40C
	Speaker Baffle	40-5951	...
	Dial	27-5193	...
	Pointer	28-3789	...
	Shield Bottom Assy.	38-7765	...
	Shield Bottom Insulator	27-8182	.02
	Tube Socket (7-prong)	27-6057	.11
	Tube Socket (5-prong)	27-6053	.11
	Knob (Volume, On-Off)	27-4309	.10
	Knob (Station Selector)	27-4308	.10
	Elec. Condenser Support	6440	.05
	Elec. Condenser Insulator	27-7836	.06
	Pilot Lamp Bracket Assy.	38-7513	.50
	Ant. Coil Bracket	28-3546	.03
	Bias Cell Assy.	38-7436	.15
	Speaker B4	36-1194	6.00
	A.C. Cord Assem.	L-2183	.40
	Aerial Lead Assem.	38-5144	.30

PHILCO RADIO & TELEVISION CORP.

Model 37-604

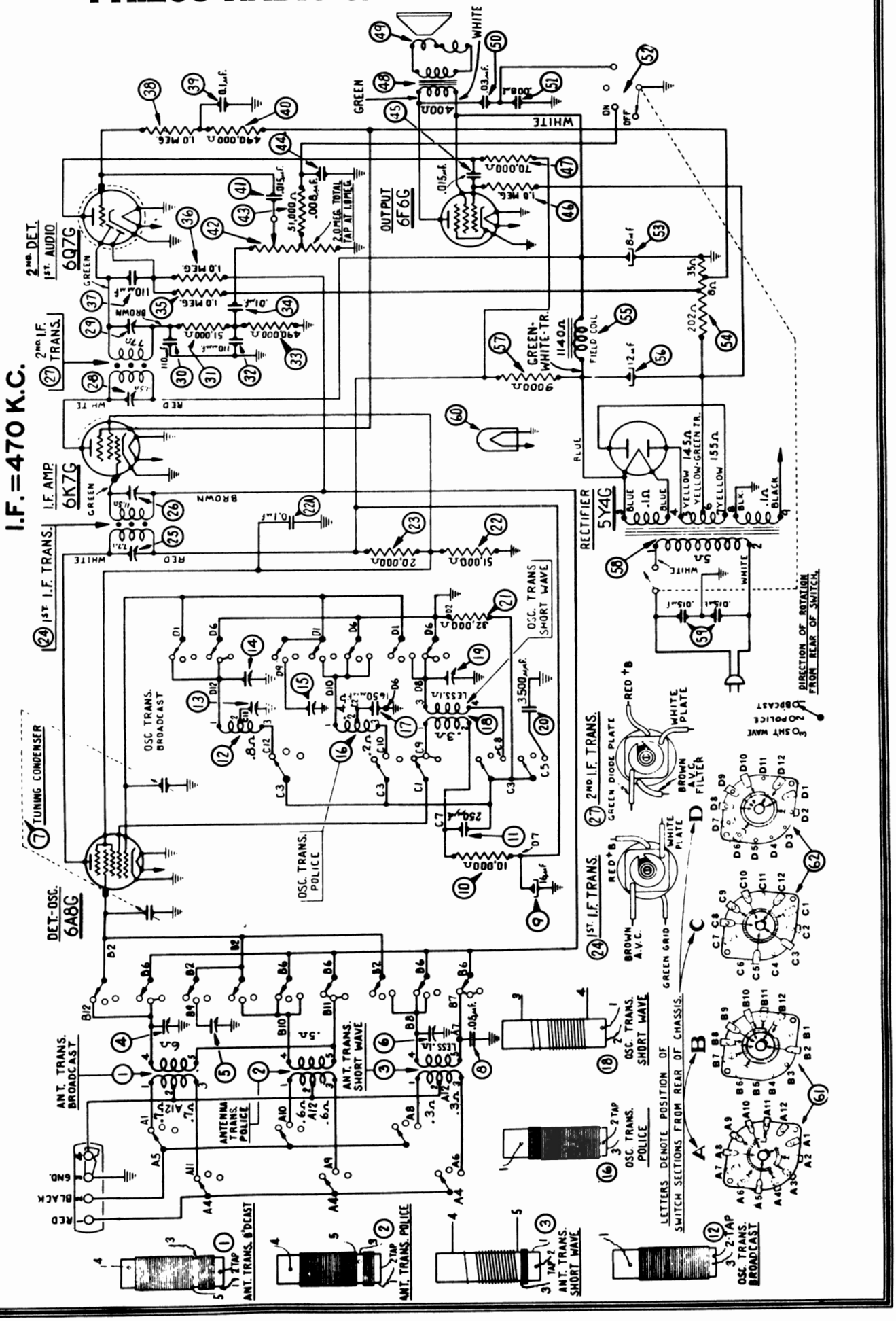
I.F. = 470 K.C.



PHILCO RADIO & TELEVISION CORP.

Model 37-610

I.F. = 470 K.C.



PHILCO RADIO & TELEVISION CORP.

Model 37-610

Alignment of Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit, four in the Oscillator Circuit, and three in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20000 K. C. is recommended to adjust the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a sensitive output meter and is recommended for these adjustments.

Philco Fibre Wrench No. 3164 and Fibre Handle Screw-driver No. 27-7059 complete the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 3 and 4.

The following procedure must be observed in adjusting the compensators:—

DIAL ADJUSTMENT—In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, rotate the tuning condenser control to the extreme counter-clockwise position (maximum capacity). Loosen the set screw of dial hub, then turn dial until the glowing indicator is centered between the index lines of dial scale (see Fig. 2). Now tighten the dial hub set screw in this position.

OUTPUT METER—The 025 Output Meter is connected to the plate and cathode terminals of the (6F6G) tube. Adjust the meter to use the (0-30) volt scale.

Before adjusting the compensators of each circuit, the signal generator attenuator should be set to give approximately ¼ scale reading on output meter.

INTERMEDIATE FREQUENCY CIRCUIT

Frequency 470 K. C.

1 Connect the 088 signal generator output lead through a .1 mfd. condenser to the control grid of the 6A8G and the ground connection of output lead to the chassis.

2 The tuning range switch is set in position No. 1 (Broadcast). Rotate the tuning condenser of receiver to the maximum capacity position (counter-clockwise), and adjust the signal generator for 470 K. C.

3 Adjust compensators ㉙ 2nd I. F. Sec., ㉘ 2nd I. F. Pri., ㉖ 1st I. F. Sec. and ㉕ 1st I. F. Pri. for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT

Tuning Range—7.3 to 22.0 M. C.

1 Remove the signal generator output lead from grid of 6A8G tube and connect it through a 0.1 mf. condenser to terminal No. 1 on aerial input panel, rear of chassis. Connect generator ground lead to chassis. Terminals 2 and 3 of aerial input panel must be connected with connector link provided on the panel.

2 Set tuning range switch in position No. 3. Turn signal generator and receiver dial to 18.0 M. C. and adjust compensators ⑲ osc., and ⑥ ant. for maximum output.

The adjustment of the antenna compensator on the high frequency range causes a slight detuning of the oscillator circuit. In order to overcome this detuning effect, connect a variable condenser of approximately 350 mmf., having a good vernier drive, across the oscillator section of the tuning condenser. Leaving the signal generator and receiver dials at 18.0 M.C., tune the added condenser so that the second harmonic of the receiver oscillator will beat against the signal from the 088 signal generator. The antenna compensator ⑥ should then be adjusted to give maximum output. Now remove the external condenser and turn compensator ⑲ to maximum capacity (clockwise) then without moving signal generator or receiver tuning condenser, back off compensator ⑲ (counter-clockwise) until a second peak is reached on the output meter. Note:—The first peak is caused by tuning to the imag signal and must be neglected.

Tuning Range: 2.3 to 7.4 Megacycles.

1 Turn range switch to position No. 2 (Police). Rotate signal generator and receiver dials to 7.0 M.C. Then adjust compensator ⑮ for maximum output. Now turn signal generator and receiver dials to 6.0 M.C. and adjust compensator ⑤ for maximum reading on output meter.

Tuning Range: 530 to 1720 Kilocycles.

1 Set range switch in position No. 1 (standard broadcast). The 088 signal indicator is set at 800 K. C. and the receiver dial at 1600 K. C.

(a) In adjusting the receiver at 1600 K. C., the second harmonic of 800 K. C., to which the signal generator is tuned, is used.

Now adjust compensator ⑭ osc., ④ ant. for maximum output.

2 The low frequency end of the band is now tuned by turning signal generator and receiver dials to 600 K. C. and adjust compensator ⑬ for maximum output. When compensator ⑬ osc. series is being adjusted, the tuning condenser must be rolled for maximum output. This is accomplished as follows: First tune compensator ⑬ for maximum output. Then vary the tuning condenser for maximum output about 600 K. C. Now retune compensator ⑬, and again vary the tuning condenser back and forth at 600 K. C. for maximum output. This operation of first tuning the compensator, then the tuning condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3 After the low frequency (600 K. C.) end of range 1 is adjusted, the 1600 K. C. end is re-adjusted, as given in Paragraph 1 above, to correct any variation that the low frequency series compensator may have caused in the alignment of the high frequency end.

4 Now turn signal generator and receiver dial to 1500 K. C. and re-adjust compensator ④ for maximum output.

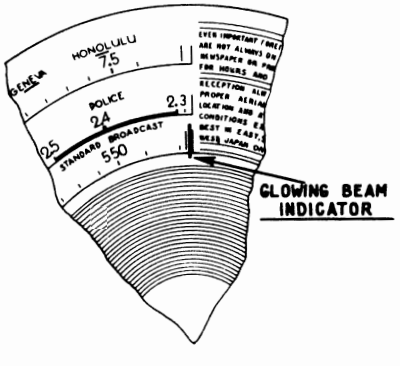


Fig. 2—Dial Calibration

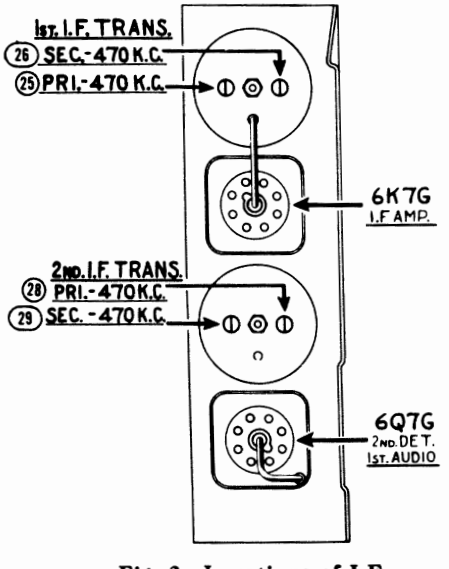


Fig. 3—Locations of I.F. Compensators Top of Chassis

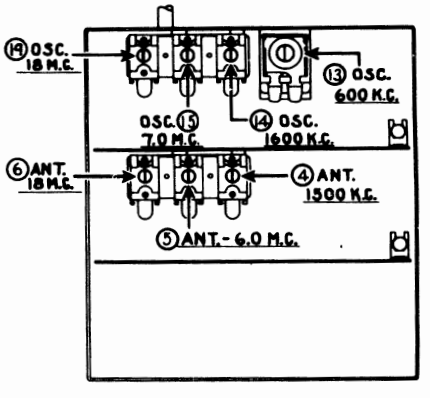
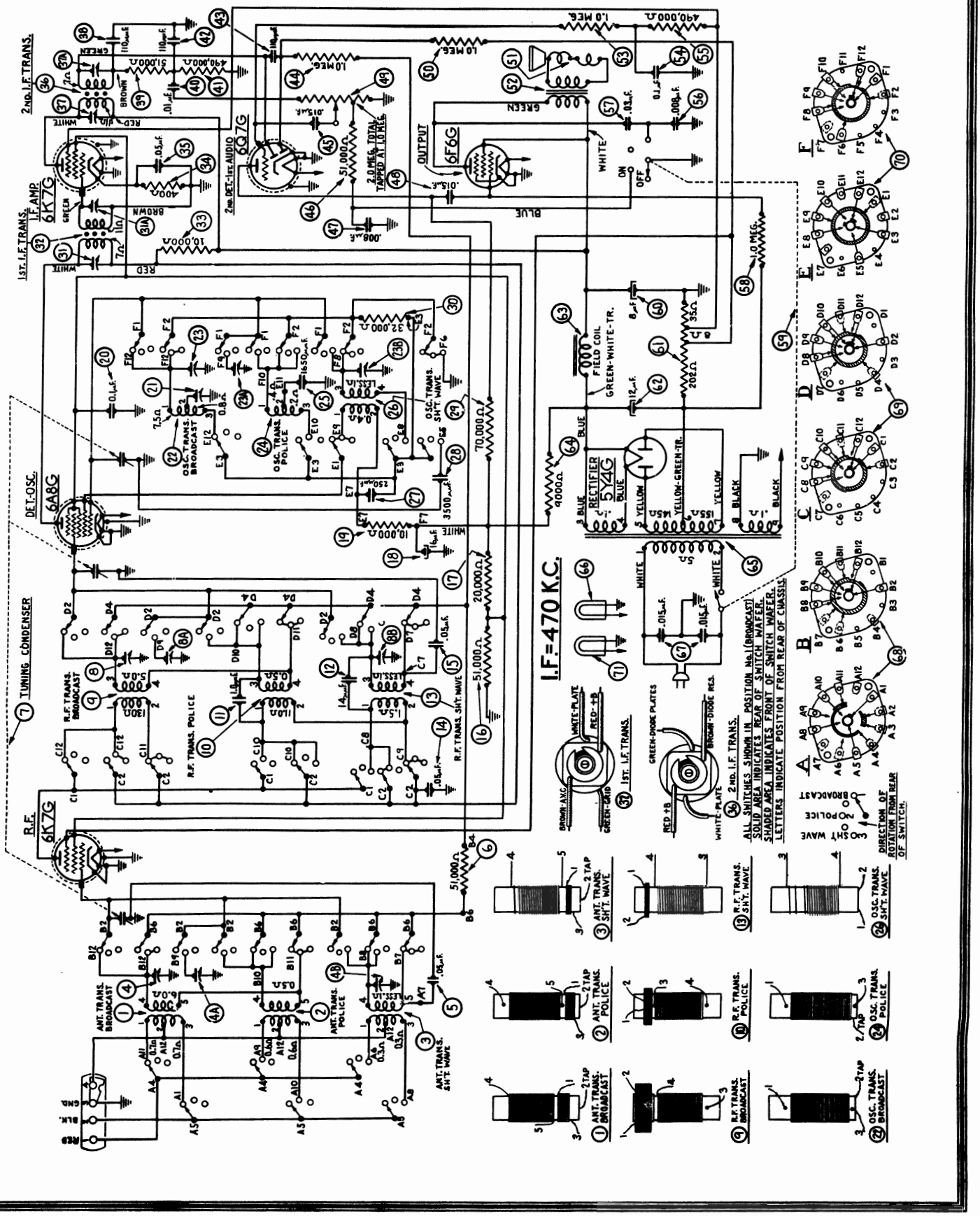


Fig. 4—Locations of R.F. Compensators Underside of Chassis

PHILCO RADIO & TELEVISION CORP.

Model 37-620



PHILCO RADIO & TELEVISION CORP.

Model 37-620

Adjustment of Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit, four in the Oscillator Circuit, three in the R. F. Amplifier Circuit and three in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20,000 K. C. is recommended for adjusting the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a sensitive output meter and is recommended for these adjustments.

Philco Fibre Handle Screw-driver No. 27-7059 completes the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 3 and 4.

The following procedure must be observed in adjusting the compensators:—

DIAL CALIBRATION—In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, rotate the tuning condenser control to the extreme counter-clockwise position (maximum capacity). Loosen the screw of dial hub, then turn dial until the glowing indicator is centered on the first index line of dial scale (see Fig. 2). Now tighten the dial hub set screw in this position.

OUTPUT METER—The 025 Output Meter is connected to the plate and cathode terminals of the (6F6G) tube. Adjust the meter to use the (0-30) Volt Scale.

During the I. F. and R. F. adjustments, the signal generator output should be maintained at the lowest possible level that will give indication on the output meter.

INTERMEDIATE FREQUENCY CIRCUIT

Frequency 470 K. C.

1 Connect the 088 Signal Generator output lead, through a .1 mfd. condenser, to the control grid of the 6A8G tube; and the ground connection of the output lead to the chassis.

2 Set the range switch in position No. 1 (Broadcast), then rotate the tuning condenser of the receiver to the maximum capacity position (counter-clockwise), and adjust the signal generator for 470 K. C.

3 Adjust compensators ㊲a 2nd I. F. Sec., ㊲ 2nd I. F. Pri., ㉛a 1st I. F. Sec., and ㉛ 1st I. F. Pri. for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT

Tuning Range—7.3 to 22.0 M. C.

1 Remove the signal generator output lead from the grid of 6A8G tube, and connect it through a .1 mfd. condenser to terminal No. 1 on aerial input panel, and the generator ground lead to terminal No. 3, rear of chassis.

(a) Terminals 2 and 3 of aerial input panel must be connected with connector link provided on the panel, during these adjustments.

2 Set the tuning range switch in position No. 3 (Short Wave). Turn the signal generator and receiver dials to 18. M. C. and adjust compensators ㉘b Osc., ⑧b R. F. and ④b Ant. for maximum output. (See Note (a) below).

(a) The adjustment of the Radio Frequency compensator on the high frequency range causes a slight detuning of the oscillator circuit. In order to overcome this detuning effect, connect a variable condenser of approximately 350 mmfd., having a good vernier drive, across the oscillator section of the tuning condenser. Leaving the signal generator and receiver dials at 18 M. C., tune the added condenser so that the second harmonic of the receiver oscillator will beat against the signal from the 088 signal generator bringing in the signal. The antenna and R. F. compensator ④b and ⑧b should then be adjusted to give maximum output. Now remove the external condenser and turn compensator ㉘b to maximum capacity (clockwise) then without moving signal generator or receiver tuning condenser, back off compensator ㉘b (counter-clockwise) until a second peak is reached on the output meter. The first peak is caused by tuning to the image frequency signal and must not be used.

Tuning Range 2.3 to 7.4 M. C.

1 Turn the range switch to position No. 2 (police). Rotate the signal generator and receiver dials to 7.0 M. C. Then adjust compensator ㉘a for maximum output. Now turn the signal generator and receiver dials to 6.0 M. C. and adjust compensators ⑧a R. F. and ④a Ant. for maximum reading on the output meter.

Tuning Range 530 to 1720 K. C.

1 Set the range switch in position No. 1 (Broadcast). Set the 088 Signal Generator indicator at 800 K. C. and the receiver dial at 1600 K. C.

(a) In adjusting the receiver at 1600 K. C. the second harmonic of 800 K. C., to which the signal generator is tuned, is used. The second harmonic of 800 K. C. is 1600 K. C. Now adjust compensators ㉘ Osc., ⑧ R. F. and ④ Ant. for maximum reading on output meter.

2 The low frequency end of the range is now tuned by turning the signal generator and receiver dials to 600 K. C. and adjusting compensator ㉑ Osc. Series—(see Note (a) below)—for maximum reading on output meter.

(a) While compensator ㉑ is being adjusted, the tuning condenser must be rolled for maximum output. This is accomplished as follows:—First tune compensator ㉑ for maximum output. Then vary the tuning condenser for maximum output at 600 K. C. Now retune compensator ㉑, and again vary the tuning condenser back and forth at 600 K. C. for maximum output. This operation of first turning the compensator then the tuning condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3 After the low frequency (600 K. C.) end of the range is adjusted, the 1600 K. C. end is readjusted, as given in Paragraph (1) above, to correct any variation that the low frequency series compensator may have caused in the alignment of the high frequency end.

4 Now turn the signal generator and receiver dials to 1500 K. C. and readjust compensators ④ ant., and ⑧ R. F., for maximum output.

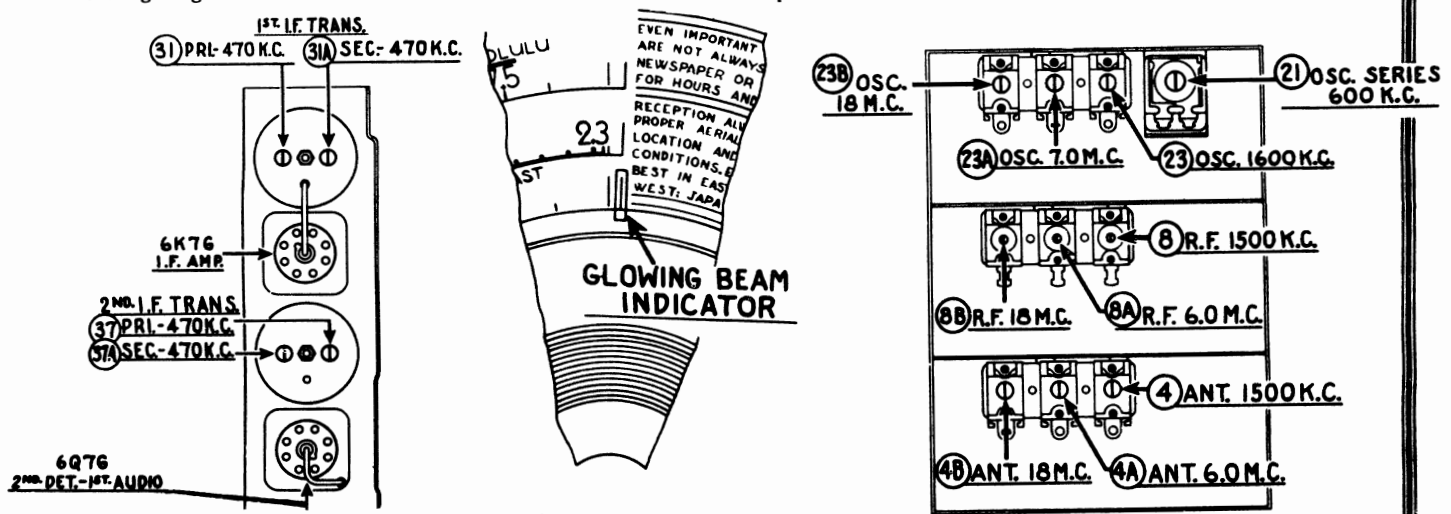
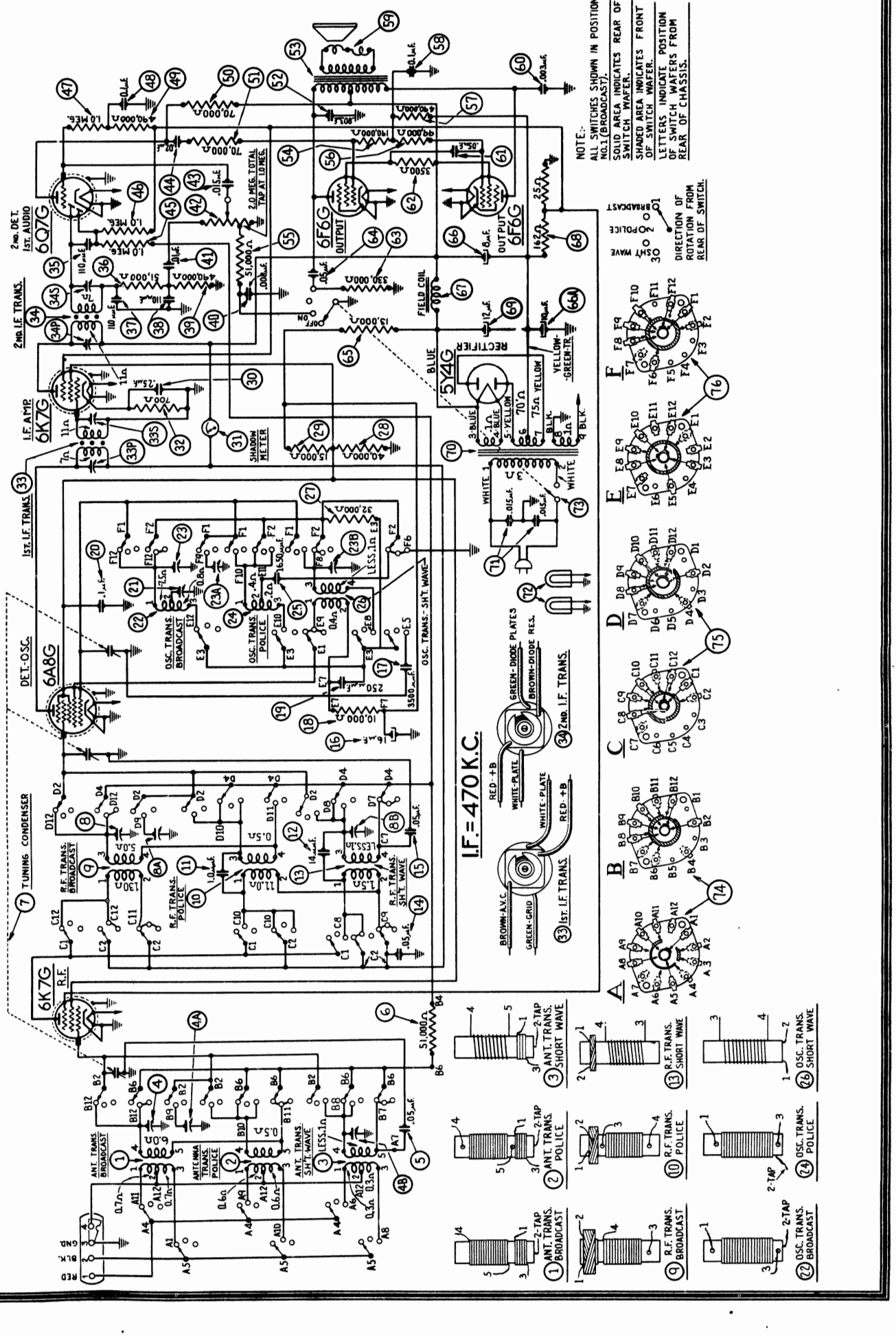


Fig. 2—Dial Calibration

PHILCO RADIO & TELEVISION CORP.

Model 37-640



PHILCO RADIO & TELEVISION CORP.

Model 37-640

Alignment of Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit, four in the Oscillator Circuit, three in the R. F. Amplifier Circuit and three in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20,000 K. C. is recommended for adjusting the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a sensitive output meter and is recommended for these adjustments.

Philco Fibre Handle Screw-driver No. 27-7059 completes the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 6 and 7.

The following procedure must be observed in adjusting the compensators:

DIAL CALIBRATION—In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, rotate the tuning condenser control to the extreme counter-clockwise position (maximum capacity). Loosen the screw of dial hub, then turn dial until the glowing indicator is centered on the first index line of dial scale (see Fig. 5). Now tighten the dial hub set screw in this position.

SHADOW METER ADJUSTMENT—Remove aerial and allow tubes to warm up. Then adjust shadow meter as follows:

1—Move the Shadow meter coil backwards and forwards, until the shadow is within one-eighth of an inch of each side of the screen.

2—Remove the Rectifier tube from its socket, and rotate the shadow meter coil for minimum shadow width.

3—Replace the Rectifier tube. The shadow should then return to maximum width or within one-eighth of an inch of each side of the screen. If the shadow does not return to maximum width, operations 1 and 2 should be continued until it does.

OUTPUT METER—The 025 Output Meter is connected to the plate and cathode terminals of one (6F6G) tube. Adjust the meter to use the (0-30) Volt Scale.

During the I. F. and R. F. adjustments, the signal generator output should be maintained at the lowest possible level that will give an indication on the output meter.

INTERMEDIATE FREQUENCY CIRCUIT

Frequency 470 K. C.

1—Connect the 088 Signal Generator output lead, through a .1 mfd. condenser, to the control grid of the 6A8G tube; and the ground connection of the output lead to the chassis.

2—Set the range switch in position No. 1 (Broadcast), then rotate the tuning condenser of the receiver to the maximum capacity position (counter-clockwise), and adjust the signal generator for 470 K. C.

3—Adjust compensators ㉝s 2nd I. F. Sec., ㉞p 2nd I. F. Pri., ㉟s 1st I. F. Sec., and ㊱p 1st I. F. Pri. for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT

Tuning Range—7.3 to 22.0 M. C.

1—Remove the signal generator output lead from the grid of 6A8G tube, and connect it through the .1 mfd. condenser to terminal No. 1 on aerial input panel, and the generator ground lead to terminal No. 3, rear of chassis.
(a) Terminals 2 and 3 of aerial input panel must be connected with connector link provided on the panel, during these adjustments.

2—Set the tuning range switch in position No. 3 (Short Wave). Turn the signal generator and receiver dials to 18 M. C. and adjust compensators ㉓b Osc., ⑧b R. F. and ④b Ant. for maximum output (see note (a) below).
(a) The adjustment of the Radio Frequency compensator on the high frequency range causes a slight detuning of the oscillator circuit. In order to overcome this detuning effect, connect a variable condenser of approximately 350 mmfd., having a good vernier drive, across the oscillator section of the tuning condenser. Leaving the signal generator and receiver dials at 18 M. C., tune the added condenser so that the second harmonic of the receiver oscillator will beat against the signal from the 088 signal generator bringing in the signal. The antenna and R. F. compensator ④b and ⑧b should then be adjusted to give maximum output. Now remove the external condenser and turn compensator ㉓b to maximum capacity (clockwise) then without moving signal generator or receiver tuning condenser, back off compensator ㉓b (counter-clockwise) until a second peak is reached on the output meter. The first peak is caused by tuning to the image frequency signal and must not be used.

Tuning Range—2.3 to 7.4 M. C.

1—Turn the range switch to position No. 2 (police). Rotate the signal generator and receiver dials to 7.0 M. C. Then adjust compensator ㉓a for maximum output. Now turn the signal generator and receiver dials to 6.0 M. C. and adjust compensators ⑧a R. F. and ④a Ant. for maximum reading on the output meter.

Tuning Range—530 to 1720 K. C.

1—Set the range switch in position No. 1 (Broadcast). Set the 088 Signal Generator indicator at 800 K. C. and the receiver dial at 1600 K. C.
(a) In adjusting the receiver at 1600 K. C. the second harmonic of 800 K. C., to which the signal generator is tuned, is used. The second harmonic of 800 K. C. is 1600 K. C. Now adjust compensators ㉓ Osc., ⑧ R. F. and ④ Ant. for maximum reading on output meter.

2—The low frequency end of the range is now tuned by turning the signal generator and receiver dials to 600 K. C. and adjusting compensator ㉑ Osc. series (see Note (a) below) for maximum reading on output meter.
(a) While compensator ㉑ is being adjusted, the tuning condenser must be rolled for maximum output. This is accomplished as follows: First tune compensator ㉑ for maximum output. Then vary the tuning condenser for maximum output at 600 K. C. Now retune compensator ㉑ and again vary the tuning condenser back and forth at 600 K. C. for maximum output. This operation of first turning the compensator then the tuning condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3—After the low frequency (600 K. C.) end of the range is adjusted, the 1600 K. C. end is readjusted, as given in Paragraph (1) above, to correct any variation that the low frequency series compensator may have caused in the alignment of the high frequency end.

4—Now turn the signal generator and receiver dials to 1500 K. C. and readjust compensators ④ Ant., and ⑧ R. F., for maximum output.

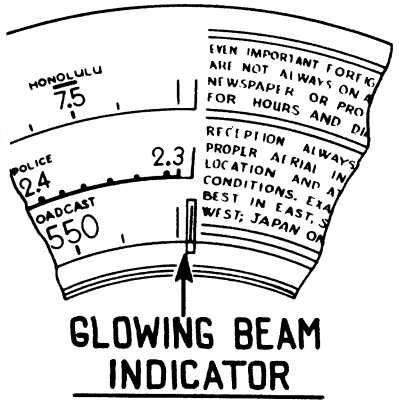


Fig. 5—Dial Calibration

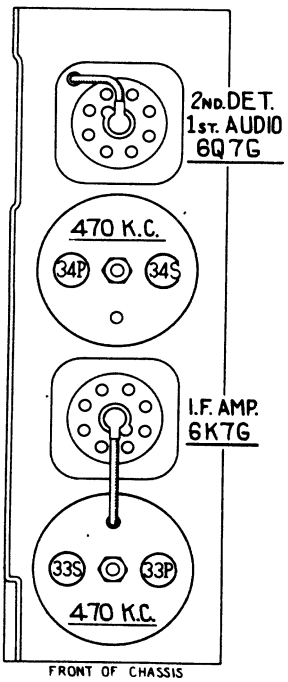


Fig. 6—Location of I. F. Compensators

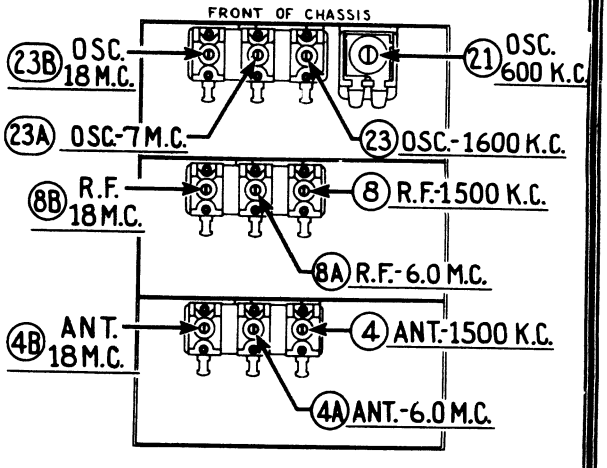
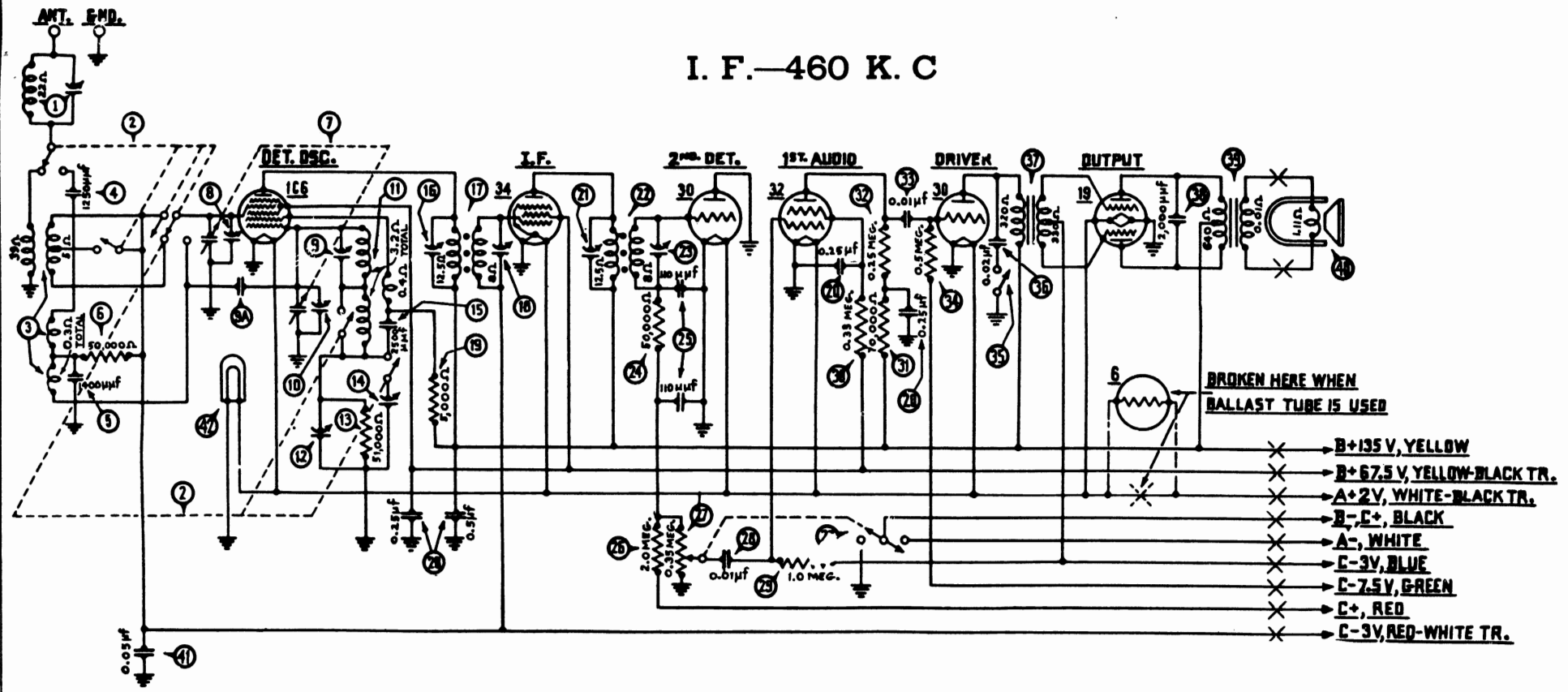


Fig. 7—Locations of R. F. Compensators

MODEL 39
(Battery Operated)

I. F.—460 K. C



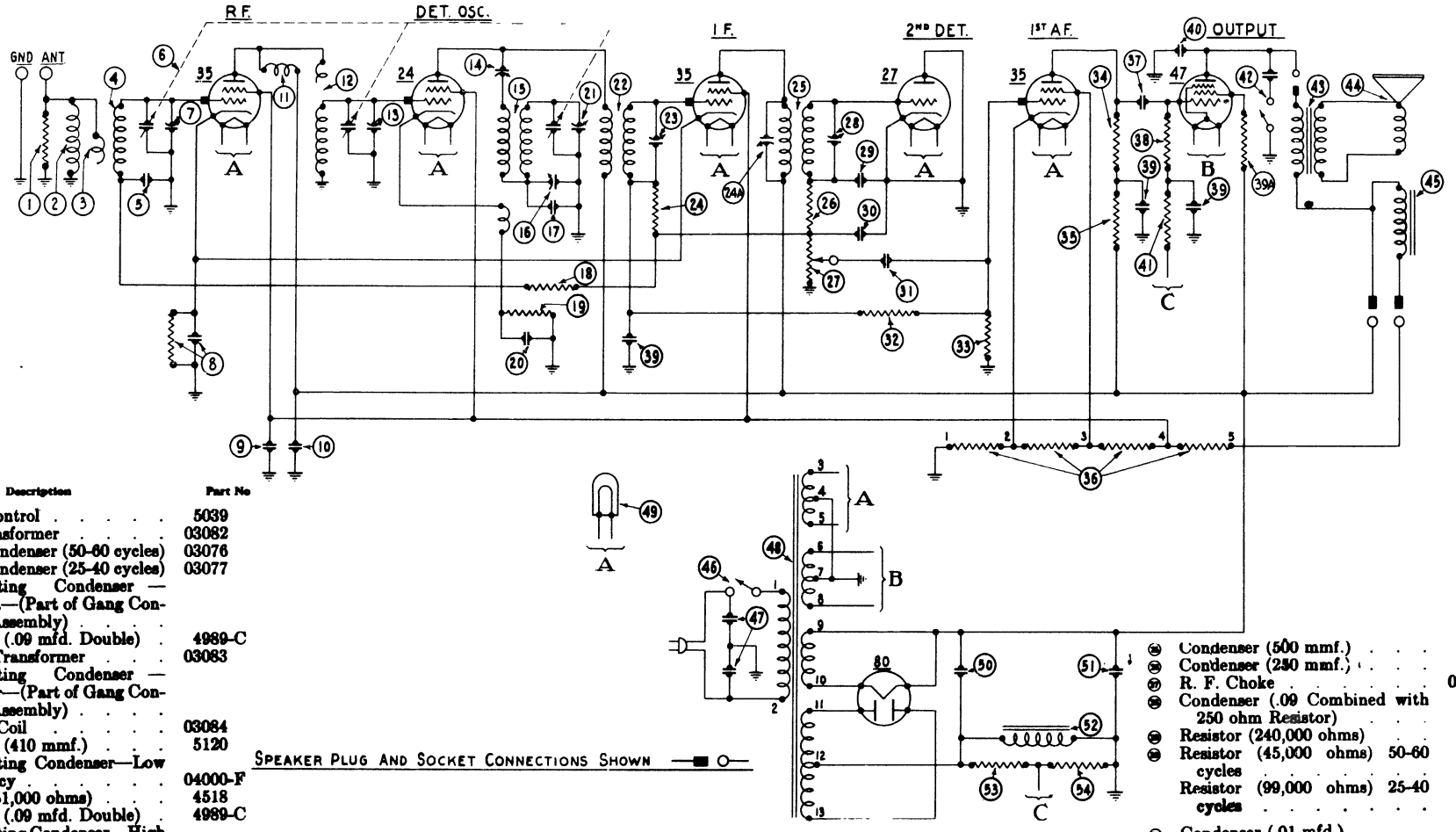
39 (Battery Operated) Two-Band: 550–1720 K.C. 5.5–16.0 M.C.	Fil. Cur. 670 M.A. Plate Cur. 19 M.A.	I.F. 460 K.C.	1–1C6, 1–34, 2–30, 1–32, 1–19 (Model 39-A uses also 1 type 6 ballast)

Tube Voltages

	1C6	34	30	32	30	19
Plate	130	130		45	130	130
Screen Grid	66	66		30		130
Osc. Plate	112					

MODELS 70 AND 70-A

(A. V. C.)



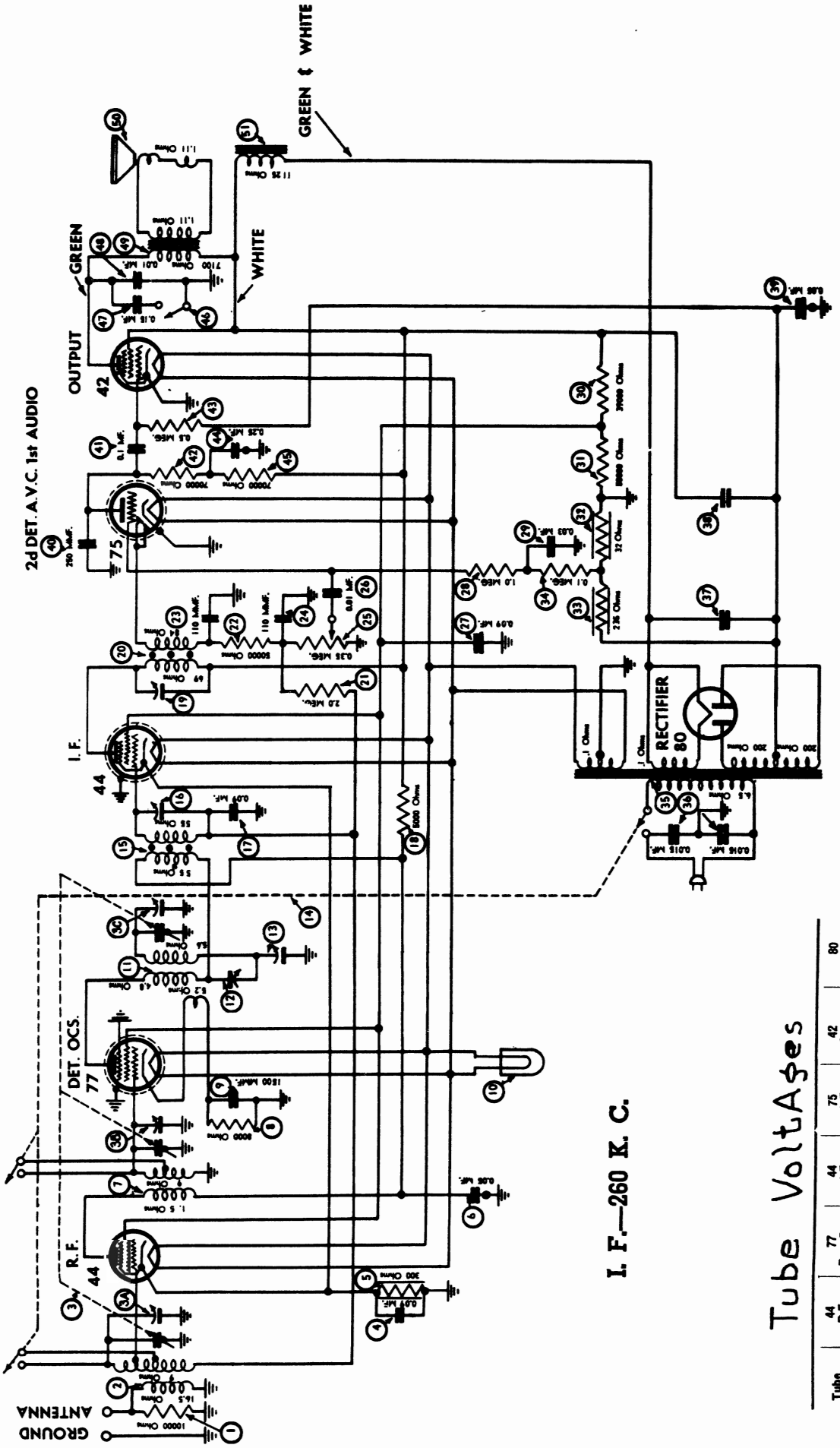
No. on Figs. 3 and 4	Description	Part No
1	Volume Control	5039
2	R. F. Transformer	03082
3	Tuning Condenser (50-60 cycles)	03076
	Tuning Condenser (25-40 cycles)	03077
4	Compensating Condenser — Antenna—(Part of Gang Condenser Assembly)	
5	Condenser (.09 mfd. Double)	4989-C
6	Detector Transformer	03083
7	Compensating Condenser — Detector—(Part of Gang Condenser Assembly)	
8	Oscillator Coil	03084
9	Condenser (410 mmf.)	5120
10	Compensating Condenser—Low Frequency	04000-F
11	Resistor (51,000 ohms)	4518
12	Condenser (.09 mfd. Double)	4989-C
13	Compensating Condenser—High Frequency — (Part of Gang Condenser Assembly)	
14	Resistor (5,000 ohms)	5310
15	Condenser (110 mmf.)	4519
16	Resistor (13,000 ohms)	3766
17	Compensating Condenser—1st I. F. Primary	04000-J
18	First I. F. Transformer	03091
19	Compensating Condenser—1st I. F. Secondary	04000-H
20	Second I. F. Transformer	03092
21	Condenser (.05 mfd.)	3615-L
22	Compensating Condenser—2nd I. F. Secondary	04000-K
23	Condenser (.5 mfd.)	3583
24	Resistor (51,000 ohms)	4518
24A	Condenser (500 mmf.)	3910
25	Condenser (250 mmf.)	3082
26	R. F. Choke	03086
27	Condenser (.09 Combined with 250 ohm Resistor)	4989-E
28	Resistor (240,000 ohms)	4410
29	Resistor (45,000 ohms) 50-60 cycles	5256
	Resistor (99,000 ohms) 25-40 cycles	4411
30	Condenser (.01 mfd.)	3903-L
31	Resistor (240,000 ohms)	4410
32	Condenser (.25 mfd.)	4284
33	Output Transformer	2673
34	Voice Coil and Cone Assembly	02996
35	Field Coil (Assembled with Pot)	02966
36	B. C. Resistor	03079
37	Electrolytic Condenser (6 mfd.) 50-60 cycles	4916
	Electrolytic Condenser (10 mfd.) 25-40 cycles	5142
38	Choke	4319
39	Condenser (.09 mfd.) 50-60 cycles	4989-J
39A	Condenser (.18 mfd.) 25-40 cycles	4989-K

I.F. = 260 K.C.

Tube		Filament Volts	Plate Volts	Control Grid Volts	Screen Grid Volts	Cathode Volts
Type	Circuit					
35	R.F.	2.25	250	5	70	6
24	Osc. & 1st Det.	2.25	250	8	12	8
35	I.F.	2.25	250	20	70	0
27	Rectifier Detector	2.25	...	0	0	0
35	Audio Amplifier	2.25	50	0	60	0
47	Output	2.25	240	4	255	.
80	Rectifier	4.70	260/Plate	..	...	.

PHILCO RADIO & TELEVISION CORP.

MODEL 89
(Code 123)



I. F.—260 K. C.

Tube Voltages

Tube	44 R.F.	77 Det. Osc.	44 I.F.	75 A.F.	42 Output	80
Point P	235	230	240	175	235	350 A.C.
SG	90	90	90	0	245	
K	3.5	7.8	3.5		0	

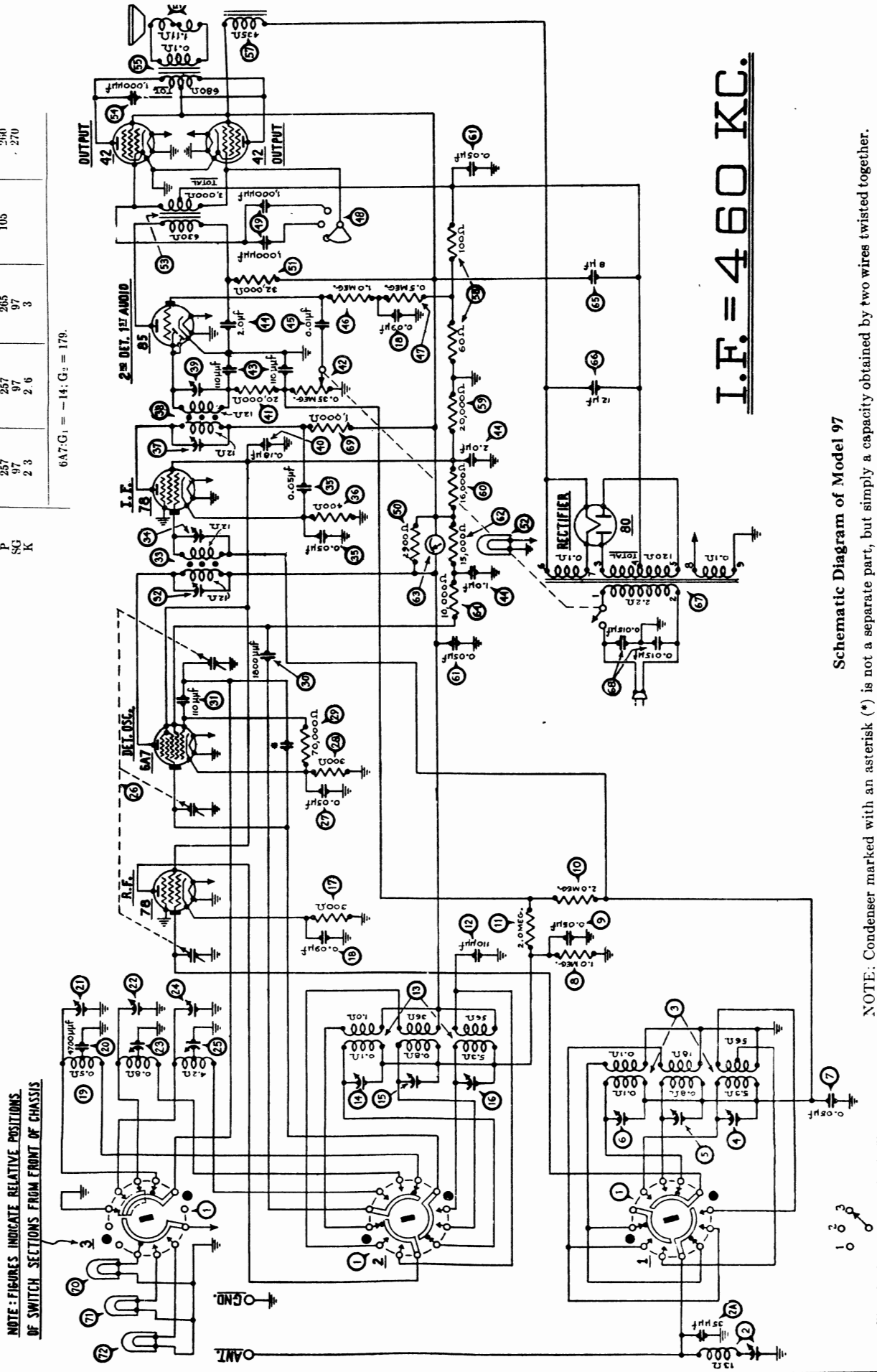
PHILCO RADIO & TELEVISION CORP.

MODEL 97

I.F. = 460 KC.

Tube	78 R.F.	6A7 Det. Osc.	78 I.F.	85 2nd Det.	42 Output
Point					
P	257	257	265	105	260
SG	97	97	97		270
K	2.3	2.6	3		

6A7: $G_1 = -14$; $G_2 = 179$.

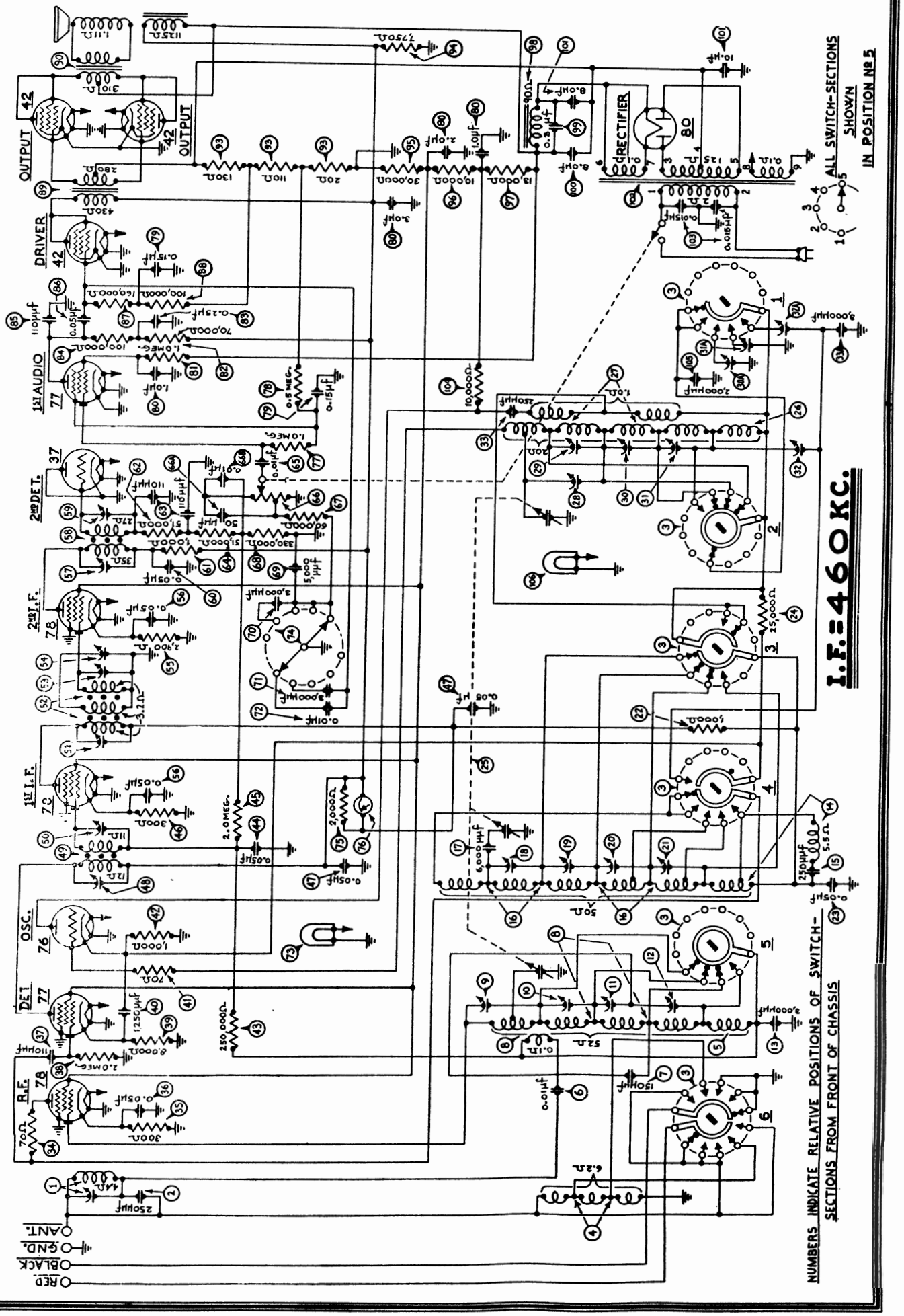


Schematic Diagram of Model 97

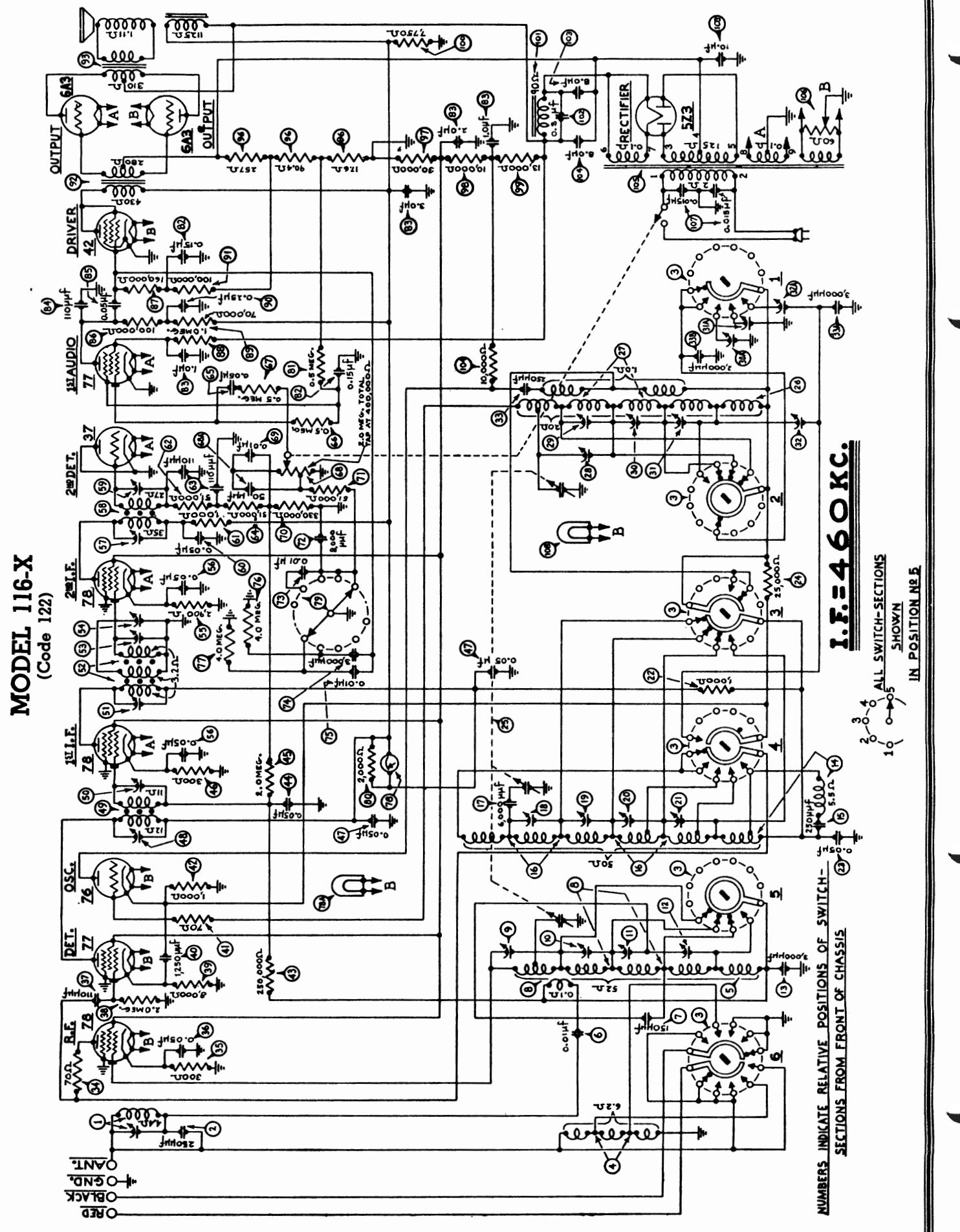
NOTE: Condenser marked with an asterisk (*) is not a separate part, but simply a capacity obtained by two wires twisted together.

PHILCO RADIO & TELEVISION CORP.

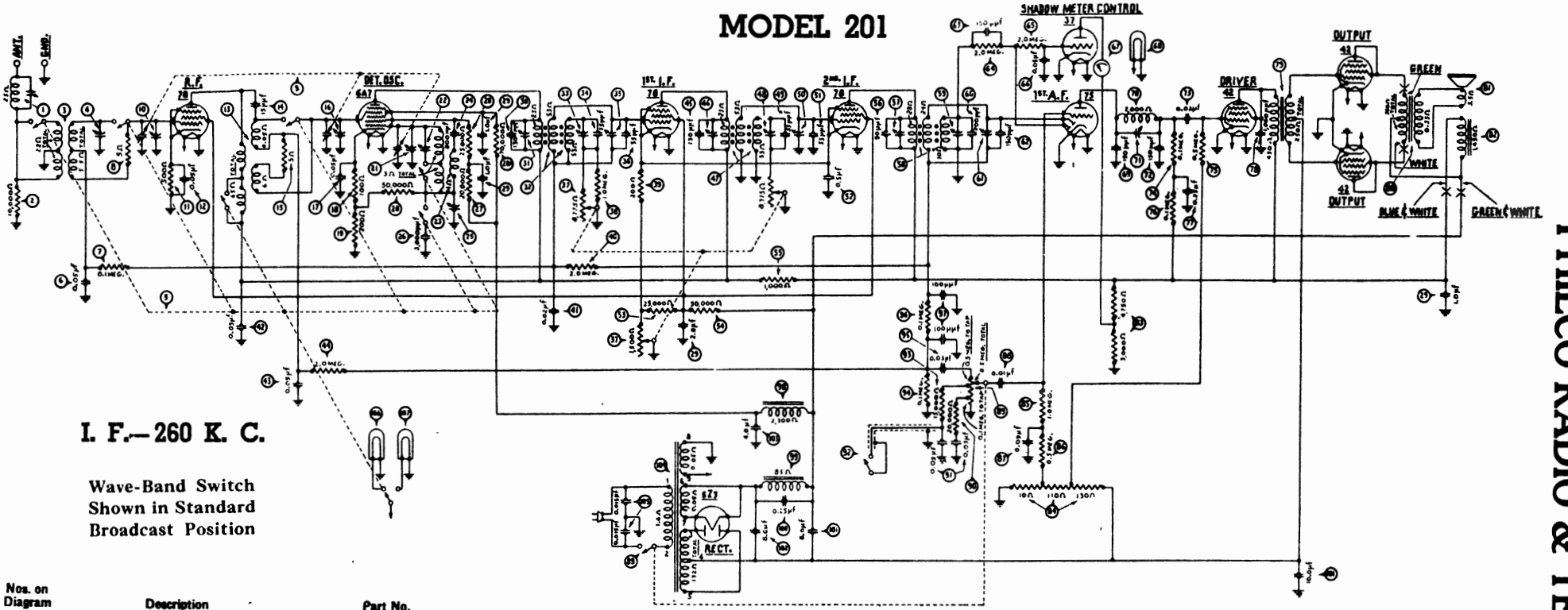
MODEL 116-B
(Code 121)



PHILCO RADIO & TELEVISION CORP.



MODEL 201



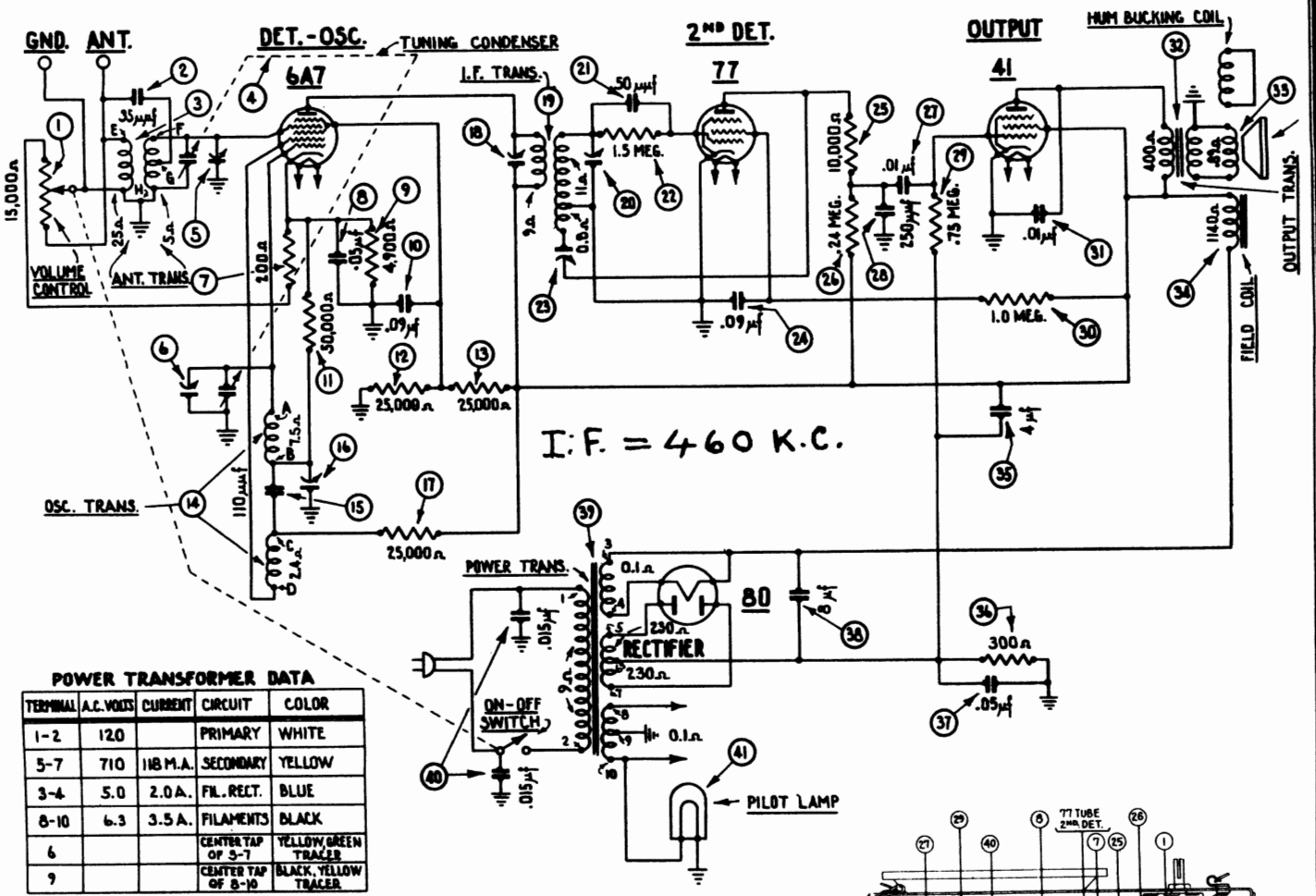
I. F.—260 K. C.

Wave-Band Switch Shown in Standard Broadcast Position

Nos. on Diagram	Description	Part No.
①	Wave Trap	38-6248
②	Resistor (10000 ohms) (Brown-Black-Orange)	33-1000
③	Antenna Transformer	32-1481
④	Compensating Condenser (ANT. S. W.)	04000D
⑤	Waveband Switch	42-1093
⑥	Condenser (05 Mfd. Tubular)	30-4020
⑦	Resistor (.1 Meg.) (White-White-Yellow)	6099
⑧	Resistor (5 ohms Flexible Wire-wound)	33-3186
⑨	Tuning Condenser Assembly	31-1379
⑩	Compensating Condenser (ANT.)	Part of ①
⑪	Resistor (500 ohms Flexible Wire-wound)	6977
⑫	Condenser (.05 Mfd. Tubular)	30-4020
⑬	Detector Transformer	32-1482
⑭	Condenser (.003015 Mica)	30-1030
⑮	Resistor (5 Ohms Flexible Wire-wound)	33-3186
⑯	Compensating Condenser (DET.)	Part of ⑮
⑰	Condenser (.05 Mfd. Tubular)	30-4020
⑱	Resistor (100 ohms Flexible Wire-wound)	33-3187
⑲	Resistor (200 ohms Flexible Wire-wound)	7217
⑳	Resistor (50000 ohms) (Green-Black-Orange)	6098
㉑	Compensating Condenser (OSC. H. F. Bdcst.)	Part of ⑨
㉒	Compensating Condenser (OSC. S. W.)	31-6016
㉓	Oscillator Transformer	32-1504
㉔	Condenser (.0008 Mfd. Mica)	5878
㉕	Compensating Condenser (OSC. L. F.)	04000R
㉖	Condenser (.003 Mfd. Mica)	30-1028
㉗	Resistor (20000 ohms) (Red-Black-Orange)	6649
㉘	Resistor (25000 ohms) (Red-Green-Orange)	4516
㉙	Resistor (70000 ohms) (Violet-Black-Orange)	3542
㉚	Condenser (Electrolytic—1, 1, 1 and 2 Mfd.)	30-2080
㉛	Condenser (.00013 Mfd. Mica)	30-1035
㉜	Compensating Condenser (1st I. F. Pri.)	Part of ㉝
㉝	1st I. F. Transformer	32-1483
㉞	Compensating Condenser (1st I. F. Tertiary)	04000A
㉟	Condenser (.002055 Mfd. Mica)	30-1045
㊱	Compensating Condenser (1st I. F. Sec.)	Part of ㉝
㊲	Condenser (.000055 Mfd. Mica)	30-1045
㊳	Resistor (1 Meg.) (Brown-Black-Green)	33-1096
㊴	Resistor (200 ohms Flexible Wire-wound)	7217
㊵	Resistor (2 Megs.) (Red-Black-Green)	33-1025
㊶	Condenser (.02 Mfd. Tubular)	30-4113
㊷	Condenser (.05 Mfd. Tubular)	30-4020
㊸	Condenser (.05 Mfd. Tubular)	30-4020
㊹	Resistor (2 Megs.) (Red-Black-Green)	33-1025
㊺	Condenser (.00013 Mfd. Mica)	30-1036
㊻	Compensating Condenser (2nd I. F. Pri.)	Part of ㊼
㊼	2nd I. F. Transformer	32-1483
㊽	Compensating Condenser (2nd I. F. Tertiary)	04000A
㊾	Condenser (.000055 Mfd. Mica)	30-1045
㊿	Compensating Condenser (2nd I. F. Sec.)	Part of ㊼
(51)	Condenser (.000055 Mfd. Mica)	30-1045
(52)	Condenser (.5 & .25 Mfd. Metal Case) (Includes (77))	30-4229
(53)	Resistor (25000 ohms) (Red-Green-Orange)	4516
(54)	Resistor (30000 ohms) (3 watt) (Orange-Black-Orange)	33-1018
(55)	Resistor (1000 ohms) (Brown-Black-Red)	5837
(56)	Condenser (.00009 Mfd. Mica)	30-1046
(57)	Compensating Condenser (3rd I.F. pri.)	Part of (59)
(58)	3rd I. F. Transformer	32-1484
(59)	Compensating Condenser (3rd I. F. Tertiary)	04000X
(60)	Condenser (.0002 Mfd Mica)	30-1047
(61)	Compensating Condenser (3rd I. F. Sec.)	Part of (58)
(62)	Condenser (.00015 Mfd. Mica)	30-1041
(63)	Condenser (.00015 Mfd. Mica)	30-1033
(64)	Resistor (2 Meg.) (Red-Black-Green)	33-1025
(65)	Resistor (2 Meg.) (Red-Black-Green)	33-1025
(66)	Condenser (.03 Mfd. Tubular)	30-4025
(67)	Shadowmeter	45-2028
(68)	Pilot Lamp (Shadowmeter)	Part of (67)
(69)	Condenser (.00015 Mfd. Mica)	30-1046
(70)	Filter Trap Coil (10 K.C. Trap)	32-7261
(71)	Compensating Condenser (10 K.C. Trap)	04000B
(72)	Condenser (.00015 Mfd. Mica)	30-1041
(73)	Condenser (.02 Mfd. Tubular)	30-4113
(74)	Resistor (.1 Meg.) (White-White-Yellow)	6099
(75)	Resistor (.5 Meg.) (Yellow-White-Yellow)	6097
(76)	Resistor (.1 Meg.) (White-White-Yellow)	6099
(77)	Condenser (.25 Mfd. Metal Case)	Part of (52)
(78)	Condenser (.001 Mfd. Tubular)	30-4201
(79)	Audio Transformer	32-7057
(80)	Output Transformer (On Speaker)	32-7247
(81)	Voice Coil & Cone Assembly (U-7)	36-3381
(82)	Field Coil & Pot Assembly (U-7)	36-3088
(83)	B. C. Wire-wound Resistor (3000, 4750 ohms)	33-3182
(84)	Resistor (Wire-wound) (10, 110, 130 ohms)	33-3137
(85)	Resistor (1 Meg) (Brown-Black-Green)	33-1096
(86)	Resistor (.5 Meg.) (Yellow-White-Yellow)	6097
(87)	Condenser (.09 Mfd. Bakelite Block)	4989D
(88)	Condenser (.01 Mfd. Bakelite Block)	3903G
(89)	Volume Control & On-Off Switch	33-5071
(90)	Resistor (20000 ohms) (Red-Black-Orange)	33-1130
(91)	Condenser (Bass Compensator)	8323B
(92)	Bass Compensation Switch	3253
(93)	Resistor (15000 ohms) (Brown-Green-Orange)	6208
(94)	Resistor (.1 Meg.) (White-White-Orange)	6099
(95)	Condenser (.03 Mfd. Tubular)	30-4025
(96)	Resistor (.1 Meg.) (White-White-Orange)	6099
(97)	Condenser (.0001 Mfd. Twin Bakelite Block)	8035P
(98)	Filter Choke	32-7018
(99)	Filter Choke	32-7056
(100)	Condenser (.25 Mfd. Bakelite Block)	6287S
(101)	Condenser (Electrolytic 8 & 10 Mfd.)	30-2046
(102)	Condenser (Electrolytic 8 Mfd.)	30-2011
(103)	Condenser (Electrolytic 4 Mfd.)	30-2104
(104)	Power Transformer (60 Cycle 115 Volts)	32-7258
	Power Transformer (25 Cycle 115 Volts)	32-7259
(105)	Condenser (.015 Mfd. Twin Bakelite Block)	3793K
(106)	Dial Lamp (Standard Band)	34-2040
(107)	Dial Lamp (Short-wave Band)	34-2040

PHILCO RADIO & TELEVISION CORP.

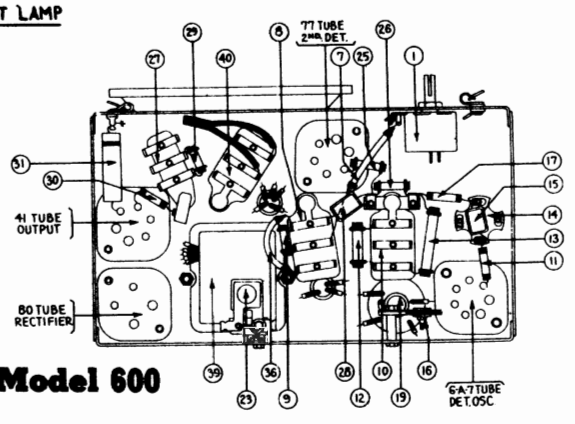
MODEL 600



POWER TRANSFORMER DATA

TERMINAL	A.C. VOLTS	CURRENT	CIRCUIT	COLOR
1-2	120		PRIMARY	WHITE
5-7	710	118 M.A.	SECONDARY	YELLOW
3-4	5.0	2.0 A.	FIL. RECT.	BLUE
8-10	6.3	3.5 A.	FILAMENTS	BLACK
6			CENTER TAP OF 5-7	YELLOW, GREEN TRACER
9			CENTER TAP OF 8-10	BLACK, YELLOW TRACER

Point — Tube→	6A7	77	41	80
F	6.3	6.3	6.3	5.0
P	222	47	210	...
SG	76	25	222	...
K	1.4	...	...	...
G_2	157	...	...	...

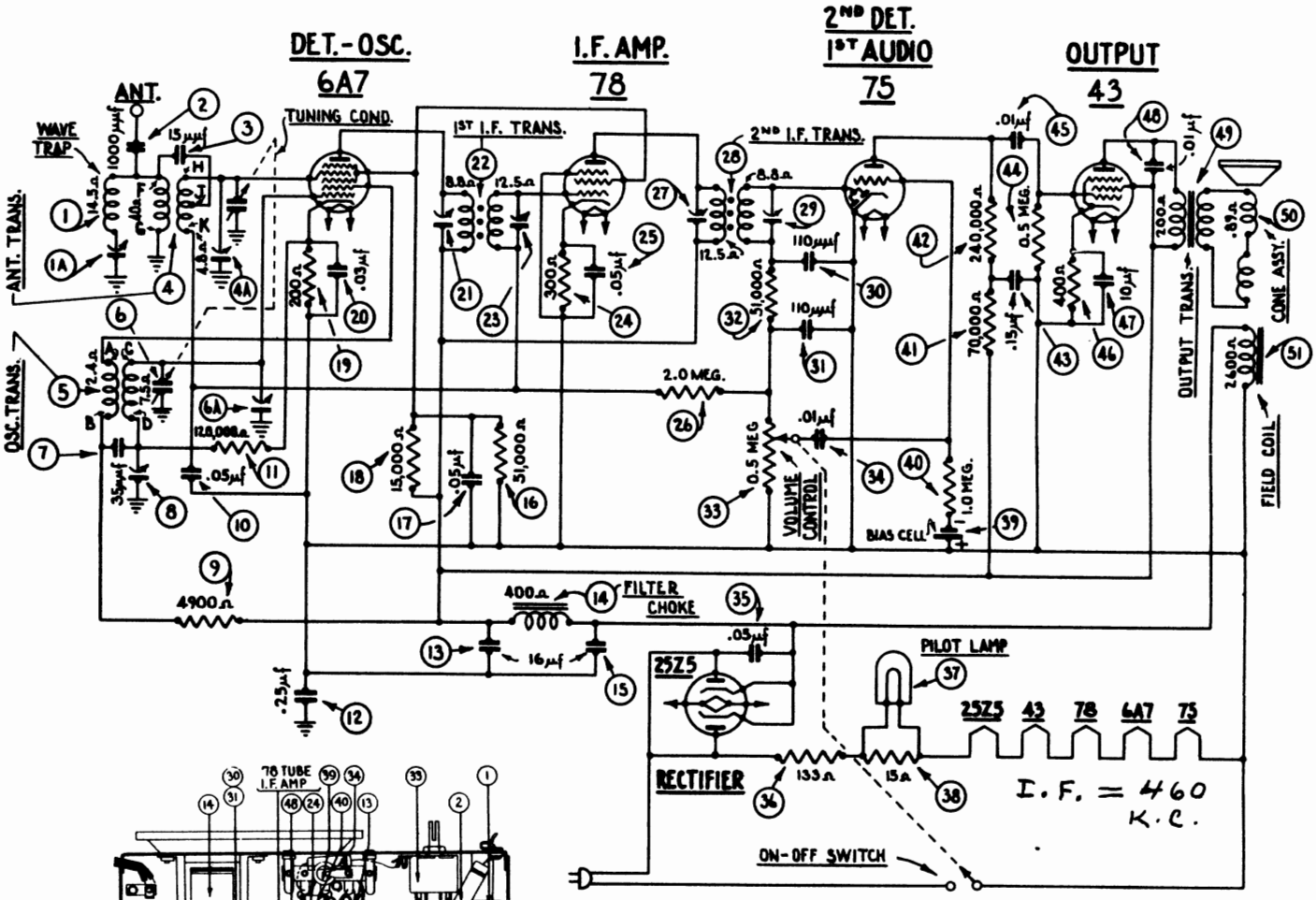


Replacement Parts for Model 600

Schematic Number	Part and Description	Part No.
①	Volume Control	33-5152
②	Condenser (35 Mmf. Mica)	30-1044
③	Ant. Transformer	32-2030
④	Tuning Condenser	31-1755
⑤	Compensater (Det. 1500 K.C.)	Part of ④
⑥	Compensater (Osc. 1500 K.C.)	Part of ④
⑦	Resistor (200 ohm)	7217
⑧	Condenser (.05 mf. Twin Bakelite)	3615-DG
⑨	Resistor (4900 ohm, ½ watt)	33-249334
⑩	Condenser (.09 mf. Twin Bakelite)	4989-DG
⑪	Resistor (51,000 ohm, ¼ watt)	33-351143
⑫	Resistor (25,000 ohm, ½ watt)	33-325343
⑬	Resistor (25,000 ohm, 1 watt)	33-325443
⑭	Osc. Transformer	32-2043
⑮	Condenser (110 mmf. Mica)	30-1031
⑯	Compensater (Osc. Series) (600 K. C.)	04000 S
⑰	Resistor (25,000 ohm, ½ watt)	33-325343
⑱	Compensater (I.F. Pri) (460 KC.)	Part of ⑲
⑲	I.F. Transformer	32-2031
⑳	Compensater (I.F. Sec.) (460 KC.)	Part of ⑲
㉑	Condenser (50 mmf. Mica)	30-1029
㉒	Resistor (1.5 meg., ¼ watt)	33-515133
㉓	Sensitivity Control	31-6086
㉔	Condenser (.09 mf.)	Part of ⑩
㉕	Resistor (10,000 ohm, ¼ watt)	33-310133
㉖	Resistor (240,000 ohm, ¼ watt)	33-424143
㉗	Condenser (.01 mf. Bakelite)	3903-SU
㉘	Condenser (.00025 mf.) (Mica)	30-1032
㉙	Resistor (750,000 ohm, ¼ watt)	33-475133
㉚	Resistor (1.0 meg., ¼ watt)	33-510143
㉛	Condenser (.01 mf.) (Tubular)	30-4124
㉜	Output Transformer	32-7041
㉝	Voice Coil Cone Assy.	36-3029
㉞	Field Coil Assy.	36-3593
㉟	Elec. Condenser (4.-8. mf.)	30-2149
㊱	Resistor (300 ohm)	33-3121
㊲	Condenser (.05 mf.)	Part of ⑧
㊳	Elec. Condenser (8.0 mf.)	Part of ㊱
㊴	Power Transformer (110 V., 60 Cycle)	32-7552
㊵	Condenser (.015 mf. Twin)	3793-DG
㊶	Pilot Lamp (6.3 Volt)	34-2064
	Power Transformer (230 V., 50-60 Cycle)	32-7554
	Power Transformer (110 V., 25 Cycle)	32-7553
	Tube Shield Body	28-2726
	Tube Shield Base	28-2725
	Tube Socket (6-prong)	27-6036
	Tube Socket (7-prong)	27-6037
	Tube Socket (4-prong)	27-6044
	Volume Control Mtg. Nut	W-648-A
	Chassis Mtg. Screw	W-1587-A
	Chassis Mtg. Nut	W-124-A
	Chassis Mtg. Washer	W-410-A
	Chassis Mtg. Washer	W-291-A
	Baffle	27-8232
	Dial	27-5179
	Knob (Station Selector)	27-4302
	Knob (Volume, On-Off)	27-4273
	Bottom Shield Assy.	29-3795
	Bottom Shield Ins.	27-8122
	Pointer	27-7933
	Pilot Lamp Bracket Assy.	38-7581
	Coupling (For Tuning Knob)	28-6426

PHILCO RADIO & TELEVISION CORP.

MODEL 602

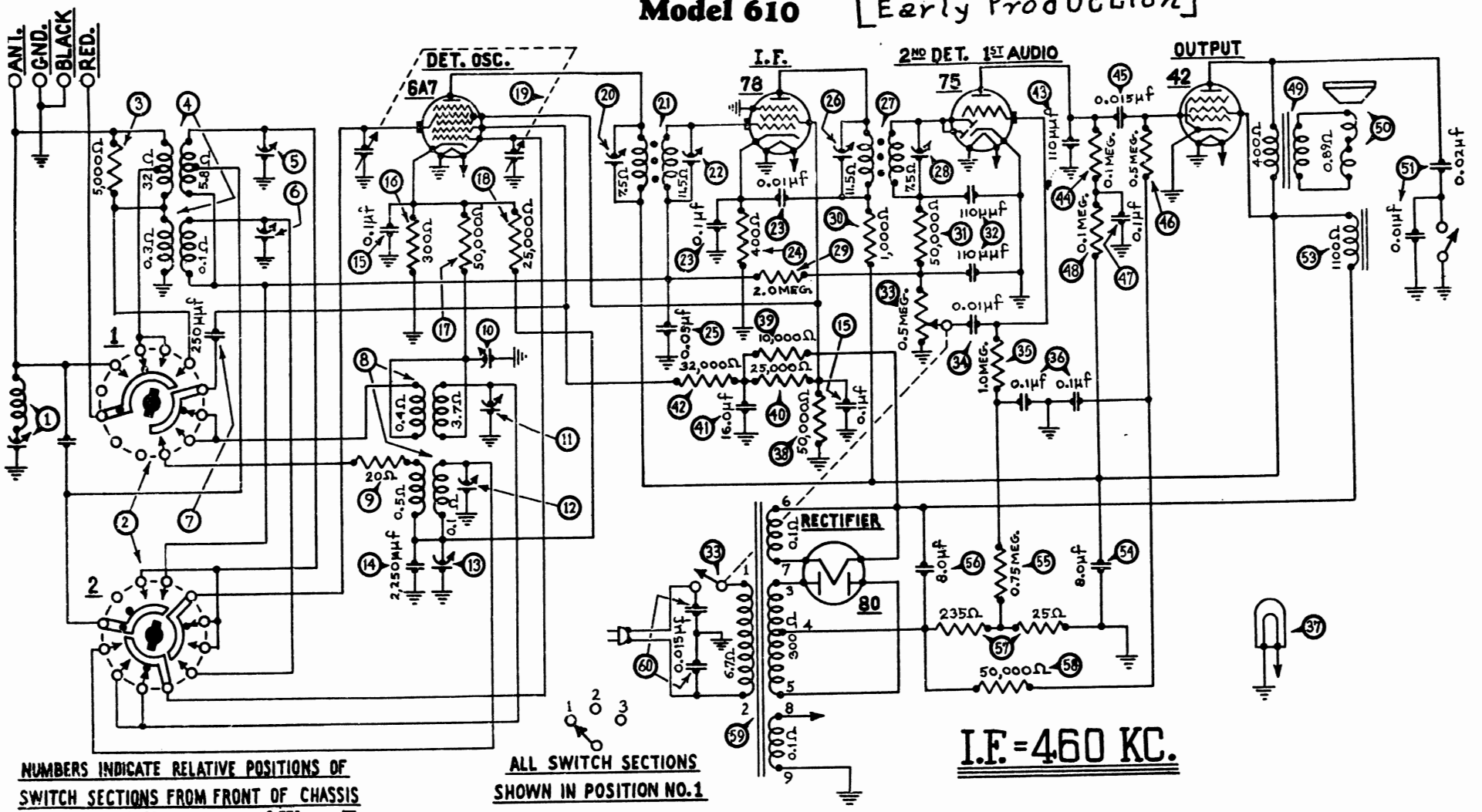


Point — Tube →	6A7	78	75	43	25Z5
F	6.3	6.3	6.3	25	25
P	102	102	40	97	...
SG	47	47	...	102	...
K	0.7	0.9	...	12.5	...
G_2	94	...	...	...	...

Replacement Parts for Model 602

Schematic Number	Part and Description	Part No.
①	Wave Trap Coil	32-2007
①a	Wave Trap Compensator	040001D
②	Condenser (.001 Mf. Tubular)	30-4201
③	Condenser (15 mmf. Mica)	30-1030
④	Ant. Transformer	32-2003
④a	Compensater (Osc. 1800 KC.)	
⑤	Osc. Transformer	32-2041
⑥	Tuning Condenser	31-1794
⑥a	Compensater (Ant. 1800 KC.)	
⑦	Condenser (35 mmf. Mica)	30-1044
⑧	Compensator (Osc. Series) (600 Kc.)	04000S
⑨	Resistor (4900 ohm, ½ watt)	33-249333
⑩	Condenser (.05 Mf. Bakelite)	3615-OSU
⑪	Resistor (120,000, ½ watt)	33-412334
⑫	Condenser (.25-.05-.05-.05-.15-.01 mf)	30-4410
⑬	Elec. Condenser (16-16-10 mf.)	30-2148
⑭	Filter Choke	32-7544
⑮	Elec. Condenser (16 mf.)	Part of ⑬
⑯	Resistor (51,000 ohm, ¼ watt)	33-351143
⑰	Condenser (.05 mf.)	Part of ⑫
⑱	Resistor (15,000 ohm, ¼ watt)	33-315133
⑲	Resistor (200 ohm wirewound)	7217
⑳	Condenser (.03 mf. Bakelite)	8318-OSU
㉑	Compensator (1st I.F. Pri.)	Part of ㉒
㉒	1st I.F. Transformer	32-2005
㉓	Compensater (1st I.F. Sec.)	Part of ㉒
㉔	Resistor (300 ohm wirewound)	33-3010
㉕	Condenser (.05 mf.)	Part of ㉓
㉖	Resistor (2.0 meg., ¼ watt)	33-520143
㉗	Compensater (2nd I.F. Pri.)	Part of ㉘
㉘	2nd I.F. Transformer	32-2006
㉙	Compensator (2nd I.F. Sec.)	Part of ㉘
㉚	Condenser (.00011 mf. twin)	8035-ODU
㉛	Condenser (.00011 mf.)	Part of ㉚
㉜	Resistor (51,000 ohm, ¼ watt)	33-351143
㉝	Volume Control (0.5 meg.)	33-5145
㉞	Condenser (.01 mf. Tubular)	30-4145
㉟	Condenser (.05 mf.)	Part of ⑫
㊱	B. C. Resistor (133-15 ohm)	33-3225
㊲	Pilot Lamp	34-2068
㊳	Resistor (15 ohm)	Part of ㊱
㊴	Bias Cell	41-8009
㊵	Resistor (1.0 meg., ¼ watt)	33-510144
㊶	Resistor (70,000 ohm, ¼ watt)	33-370133
㊷	Resistor (240,000 ohm, ¼ watt)	33-424143
㊸	Condenser (.15 mf.)	Part of ⑫
㊹	Resistor (490,000 ohm, ¼ watt)	33-449143
㊺	Condenser (.01 mf.)	Part of ⑫
㊻	Resistor (400 ohm wirewound) (Flexible)	33-3122
㊼	Elec. Condenser (10 mf.)	Part of ⑬
㊽	Condenser (.01 mf. Tubular)	30-4169
㊾	Output Transformer	32-7566
㊿	Voice Coil Cone Assy.	36-3029
(51)	Field Coil Assy.	36-3040
	Volume Control Mtg. Nut	W-684-A
	B.C. Resistor Mtg. Screw	W-650-A
	B.C. Resistor Mtg. Nut	W-95-A
	Tube Shield Base	28-2725
	Tube Shield Body	28-2726
	Chassis Mtg. Screw	W-1587-A
	Chassis Mtg. Nut	W-124-A
	Chassis Mtg. Washer	W-410-A
	Chassis Mtg. Washer	W-291-A
	Speaker Baffle	40-5840
	Dial	27-5188
	Pointer	27-8236
	Shield Bottom Assy.	29-3605
	Shield Bottom Insulator	27-8182
	Tube Socket (6-prong)	27-6036
	Tube Socket (7-prong)	27-6037
	Knob (Volume, On-Off)	27-4273
	Knob (Station Selector)	27-4302
	Elec. Condenser Support	6440
	Elec. Condenser Insulator	27-7836
	Pilot Lamp Bracket Assy.	38-7513
	Ant. Coil Mfg. Bracket	28-3546
	Bias Cell Assy.	38-7436
	Coupling (For Tuning Knob)	28-6426

Model 610 [Early Production]



NUMBERS INDICATE RELATIVE POSITIONS OF SWITCH SECTIONS FROM FRONT OF CHASSIS

ALL SWITCH SECTIONS SHOWN IN POSITION NO. 1

I.F. = 460 KC.

Adjustment of Wave-Trap

1. Connect the signal generator leads to the antenna and ground terminals of the receiver. Replace the grid clip on the 6A7 grid cap.

2. With the wave-band switch of the receiver still in the extreme left (broadcast position), turn the station selector to 550 K.C.

3. With the signal generator in operation at 460 K.C., adjust the wave-trap ① condenser until a MINIMUM reading is obtained on the output meter. The Philco fibre wrench, part No. 3164, is used for this adjustment. The wave-trap compensator is reached from rear of chassis.

The I.F. compensating condensers are located at the tops of the I.F. coil shields and adjusted by turning the two screws in top. Adjust condensers ㉘ and ㉘ (2d I.F. primary and secondary) for maximum reading in the output meter, and then condensers ⑳ and ㉒ (1st I.F. primary and secondary).

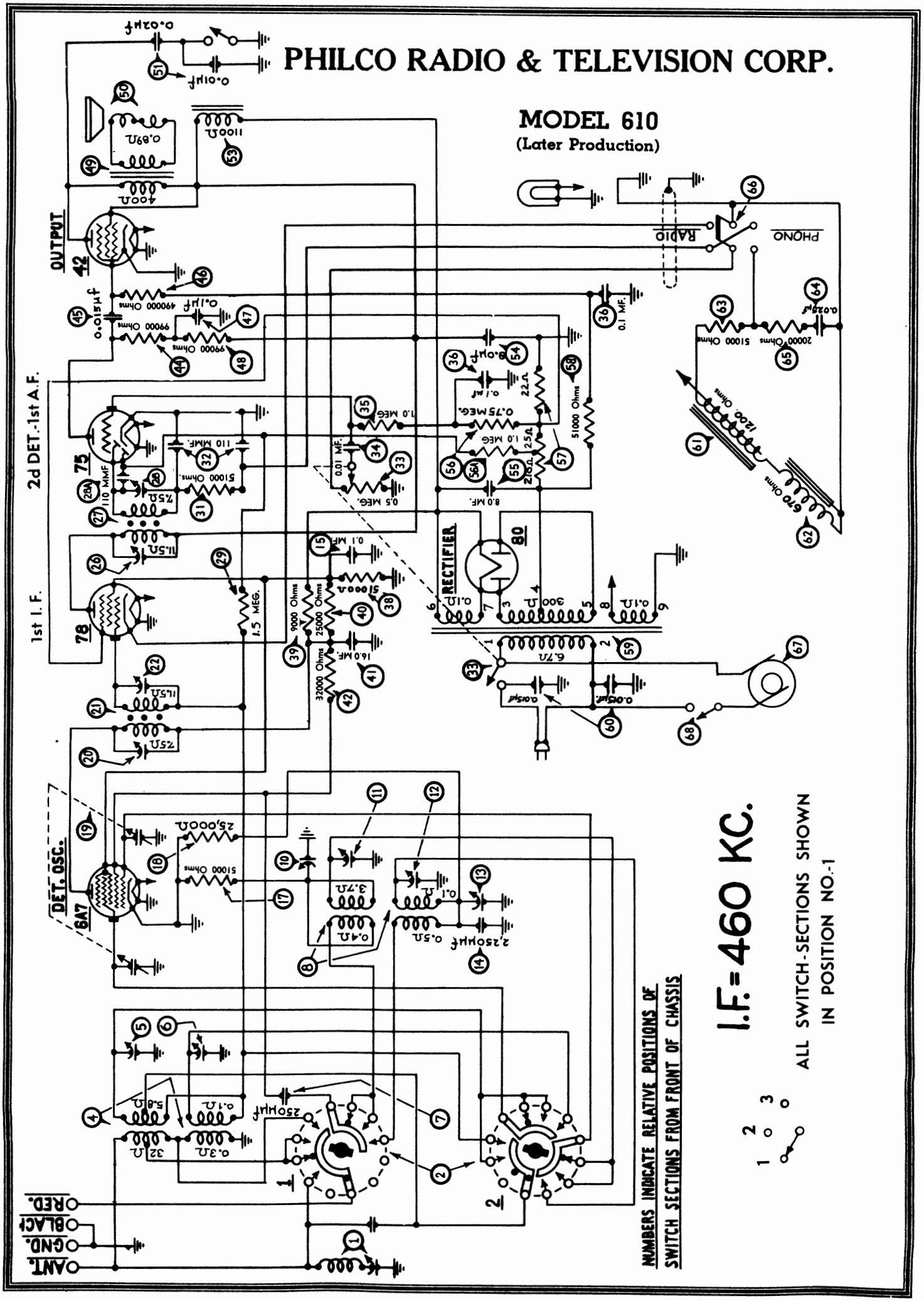
I.F. = 460 K.C.

Tube Socket Voltages

Tube	6A7 Det. Osc.	78 I.F.	75 2nd Det.	42 Output
Point	255	250	145	238
SG	**	85		255
K		2.5		

6A7: G_2 = 147

PHILCO RADIO & TELEVISION CORP.


PHILCO RADIO & TELEVISION CORP.
MODEL 610
(Later Production)
I.F. = 460 KC.
ALL SWITCH-SECTIONS SHOWN IN POSITION NO. 1
NUMBERS INDICATE RELATIVE POSITIONS OF SWITCH SECTIONS FROM FRONT OF CHASSIS
OUTPUT
42
2d DET.-1st A.F.
75
1st I.F.
78
DET. OSC.
6A7
RECTIFIER
80
RADIO
PHONO
ANT.
GND.
BLACK
RED.

PHILCO RADIO & TELEVISION CORP.

MODEL 611
(A.C. - D.C.)

Tube	6A7 Det. Osc.	78 I.F.	75 2nd Det. A.F.	43 Output	25Z5 Rect.
Point					
P	106	102.	41	101	
SG	55	55	0	106	
K	0 8	1 1		12.5	121

I.F. = 460 K.C.

All Switch Sections Shown in Position No. 3

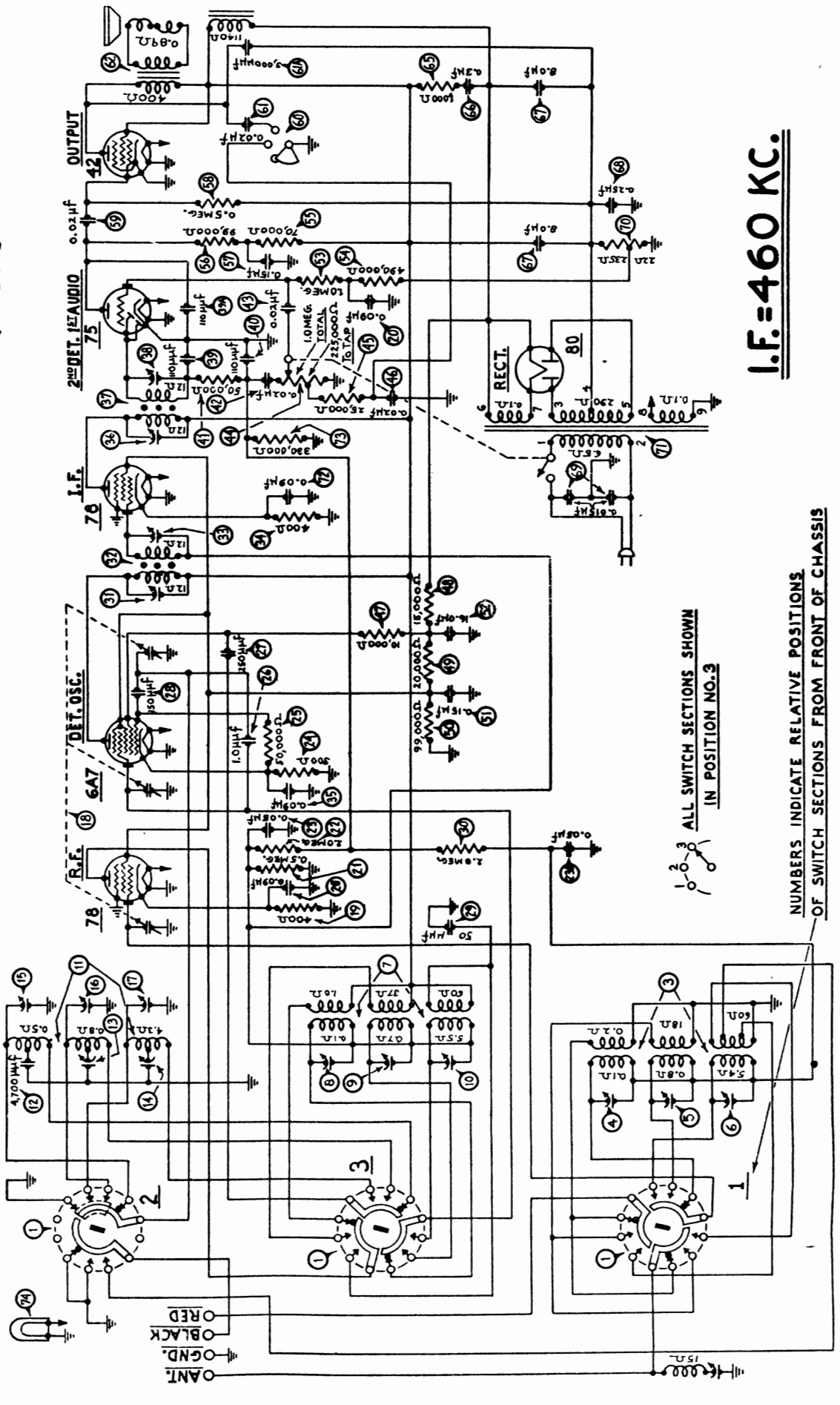
Numbers Indicate Relative Positions of Switch Sections as Seen from Front of Chassis

PHILCO RADIO & TELEVISION CORP.

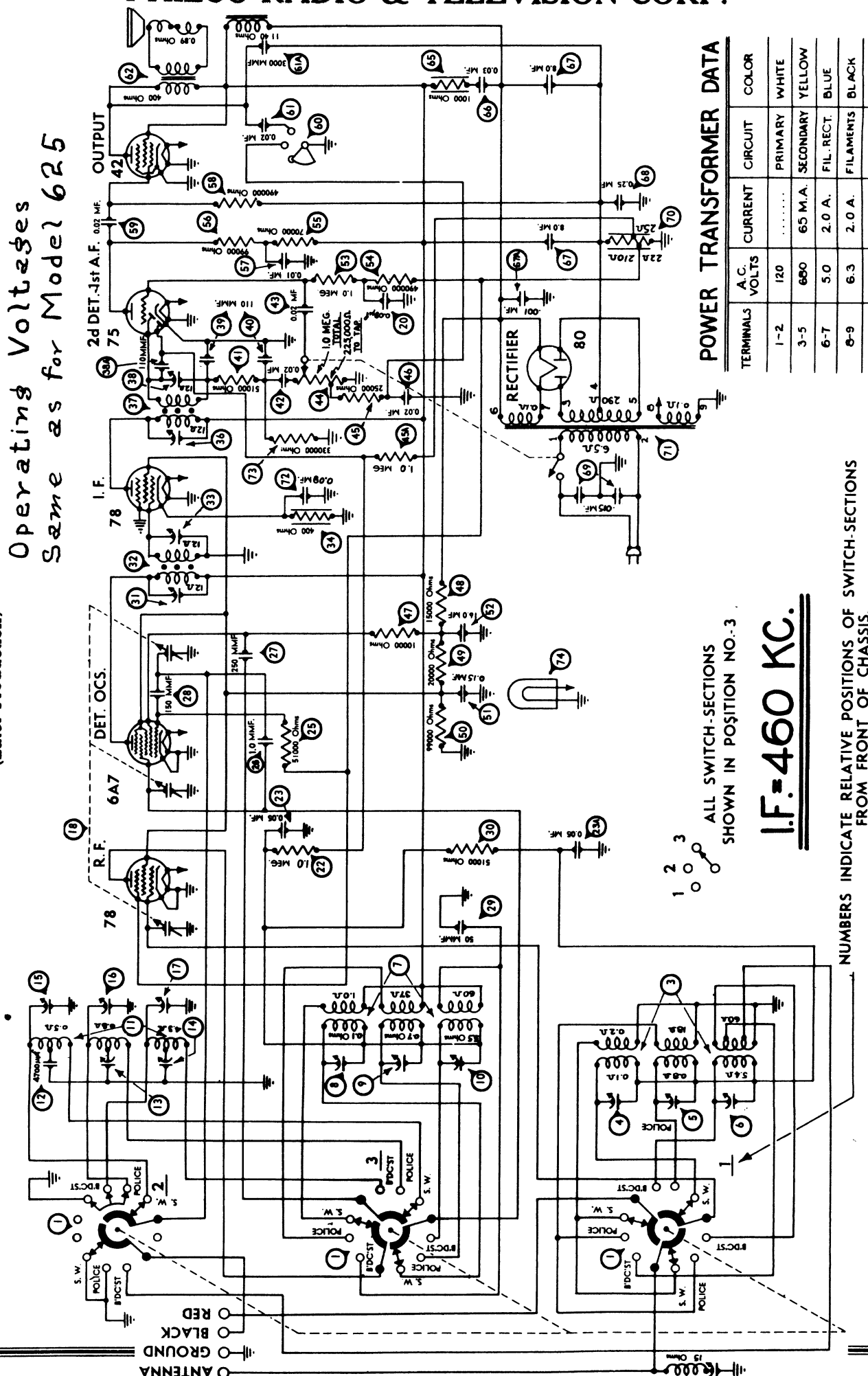
MODEL 620
[Early Production]

Operating tube Voltages
Same as Model 625

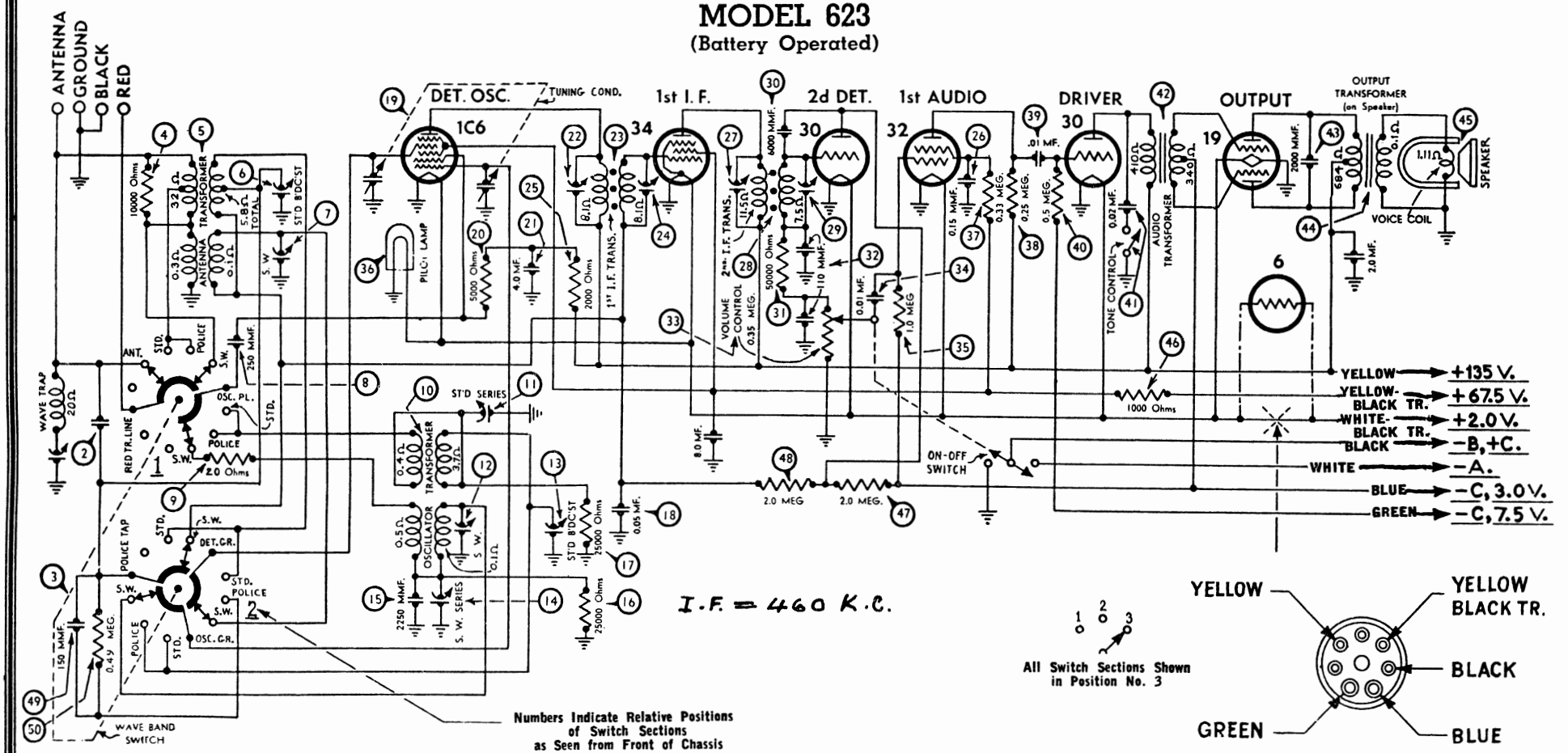
I.F.=460 KC.



PHILCO RADIO & TELEVISION CORP.



MODEL 623
(Battery Operated)



Production Changes

The Oscillator Circuit was changed to series feed.

Part	Remove Old Part No.	Schematic	Add New Part No.
Condenser	30-1033 (.00015 mf.)	49	30-1049 (.0006 mf.)
Resistor	6097 (490,000 ohm)	50	
Resistor	33-1013 (25,000 ohm)	16	
Oscillator Trans.	32-1831	10	32-1973
Resistor	33-1206 (20 ohm)	9	
Condenser	6359 (.006 mf.)	24	30-1031 (.00011 mf.)

S. W. SECTION OF OSC. TRANSFORMER

Condenser 49 and Resistor 50 were removed and the wires connected to the ends of these parts were connected together. The wires between the police tap at the left of Switch Section No. 2 and the joint in the wire just above that was broken and Condenser No. 30-1049 inserted.

The connection between the bottom (S. W.) primary and secondary of the Oscillator Transformer was broken and condensers 14 and 15 connected between the bottom of the secondary and ground. Resistor 16 removed. The lead connected to the top of the primary disconnected and brought down to the bottom of the secondary. Resistor 9 also removed.

A lead from the bottom of the primary was connected to the lead running from Condenser 8 to Resistor 20. The oscillator plate wire was disconnected from this lead and brought down to the top of the primary.

BROADCAST AND POLICE SECTION OF OSC. TRANSFORMER

Resistor 17 was disconnected from the bottom of the upper section of the Osc. Transformer and connected to the switch side of the Condenser 8

Tube	1C6 Det.-Osc.	34 I. F.	30 2nd Det.-A.V.C.	32 1st A.F.	30 Driver	19 Output
Point						
P	135	135	0	52	133	134
SG	64	64	...	24	...	...
G	...	0.2	0.1	..	0.18	3.0 ea.
Osc. Pl.	106	...	...	..	...	...

10,000 ohm Resistor, part 4, Part No. 33-1000, no longer necessary.

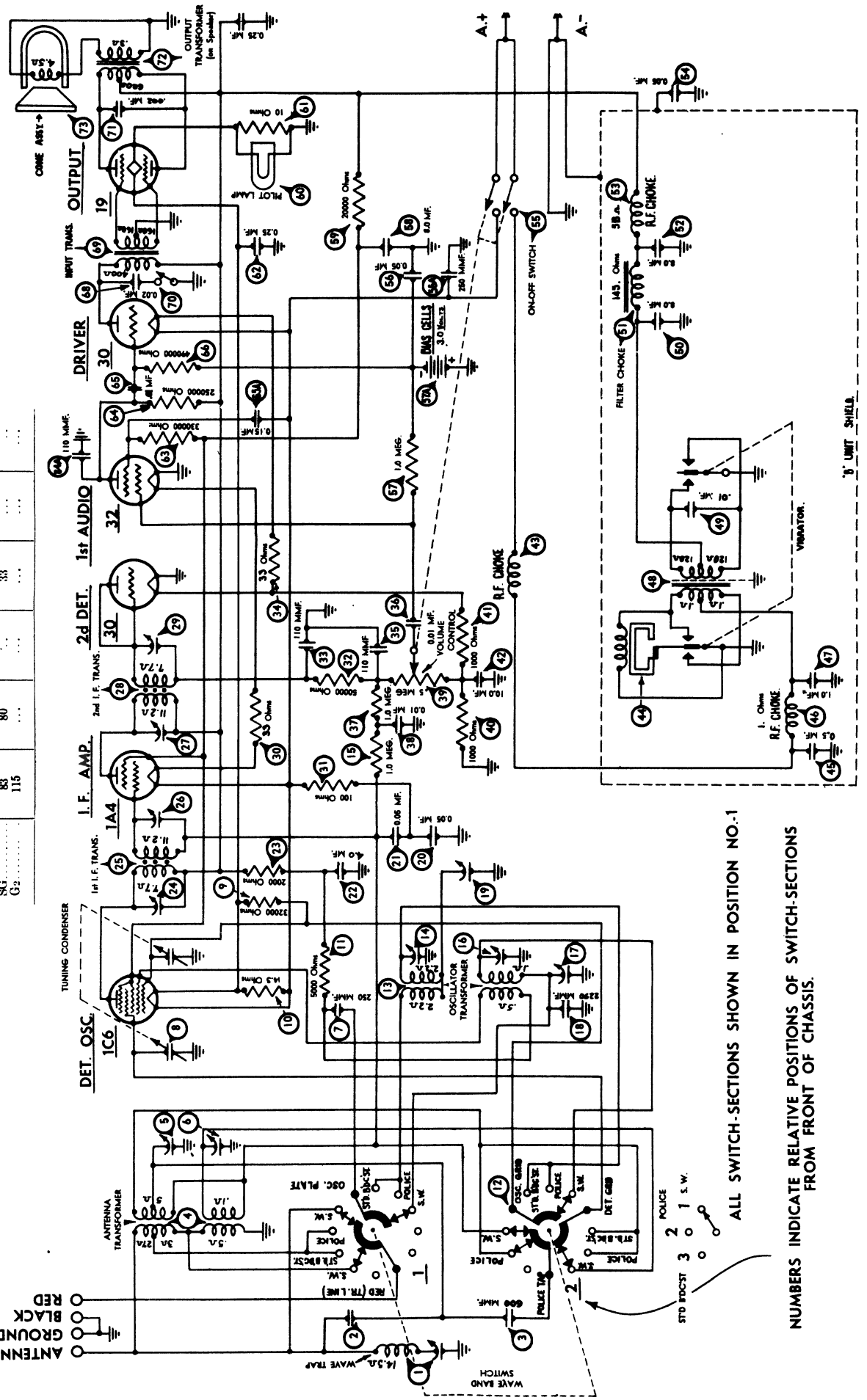
PHILCO RADIO & TELEVISION CORP.

MODEL 624

(6-Volt Battery Operated)

624
(6-volt battery)
530–1720 K.C.
2.3–2.5 M.C.
5.7–18.0 M.C.

Point \ Tube→	1C6	1A4	30 2nd Det.	32	30 2nd A.F.	19
F	2	2	2	2	2	2
P	150	150	...	50	150	150
SG	83	80	...	33	...	...
G_2	115	...	...	...	...	...

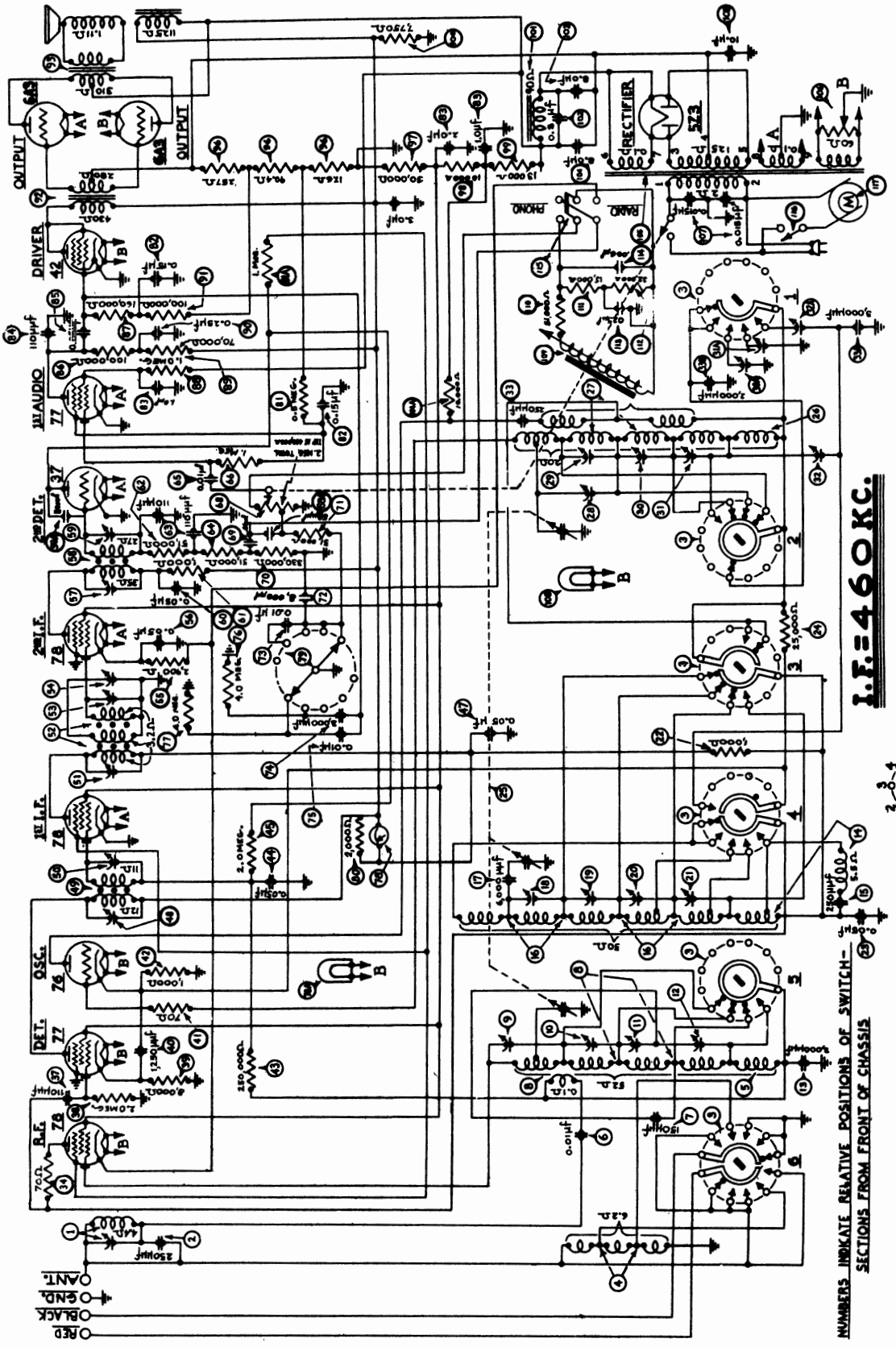


PHILCO RADIO & TELEVISION CORP.

MODEL 625

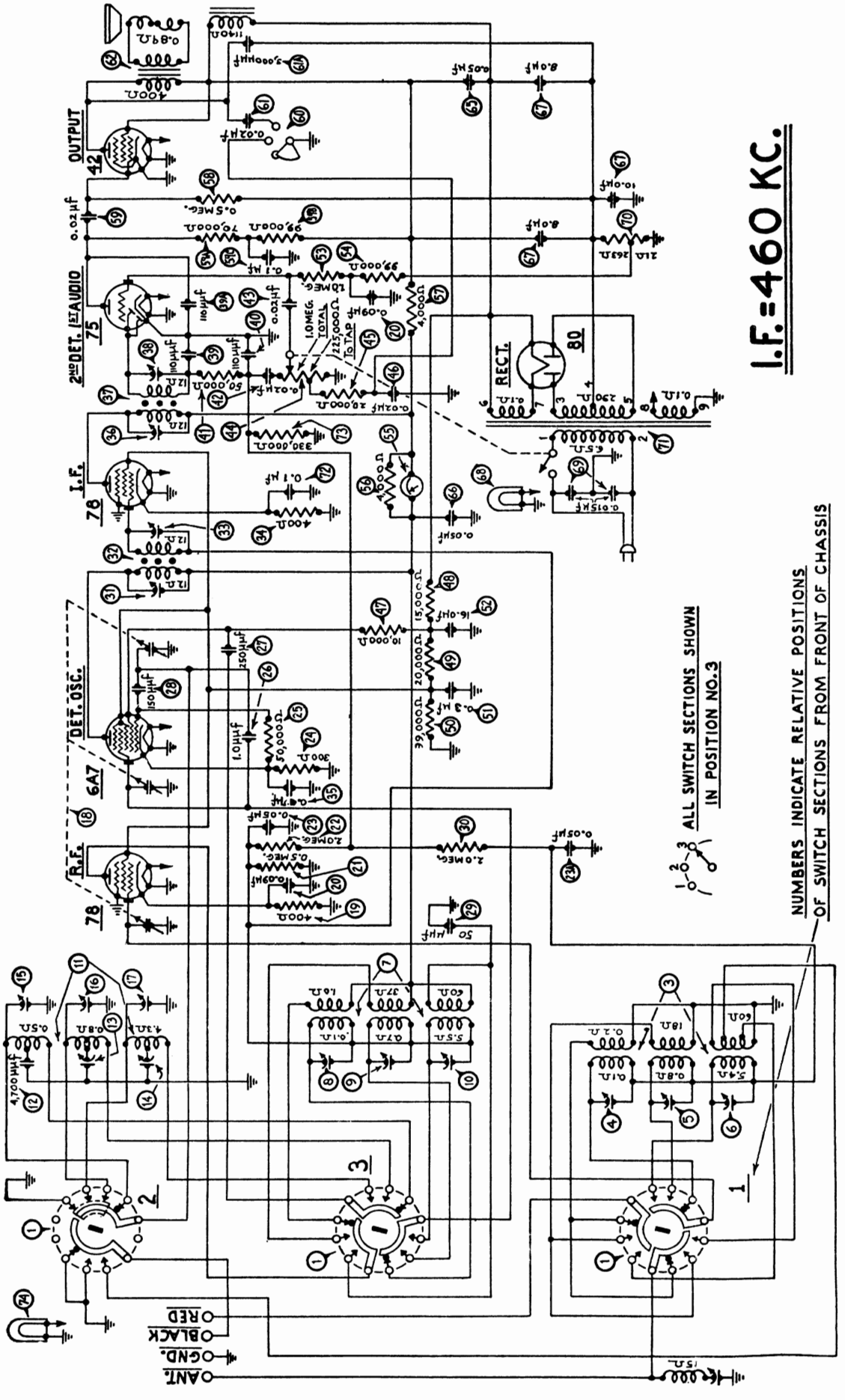
Tube	78 R.F.	6A7 Det. Osc.	78 I.F.	75 2nd Det.	42 Output
Point					
P	258	258	258	153	243
NG	95	95	95	...	238
K	2.65	2.5	2.85	...	...

6A7-G_1 = 173



PHILCO RADIO & TELEVISION CORP.

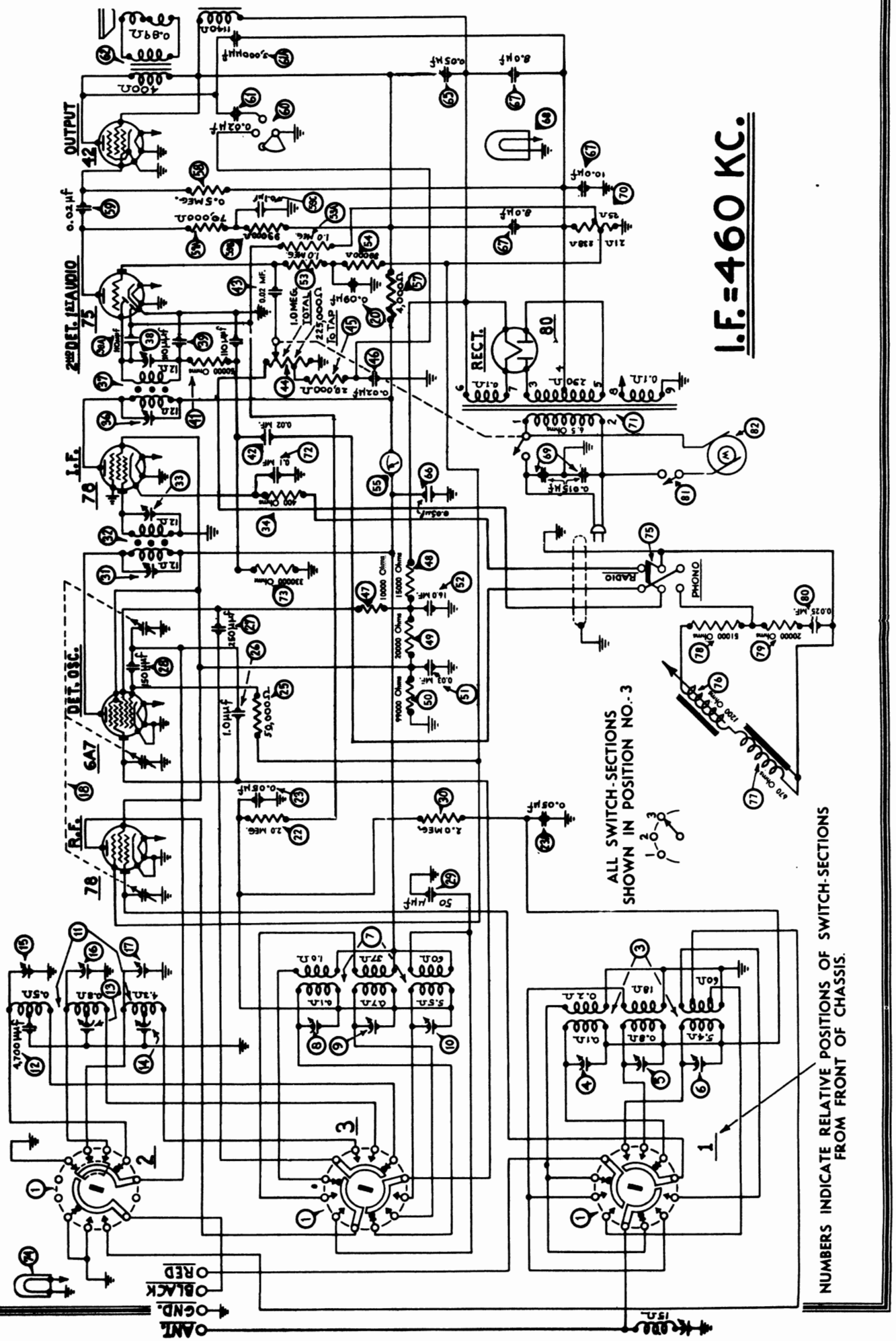
MODEL 630 [Early Production]



PHILCO RADIO & TELEVISION CORP.

MODEL 630
(Later Production)

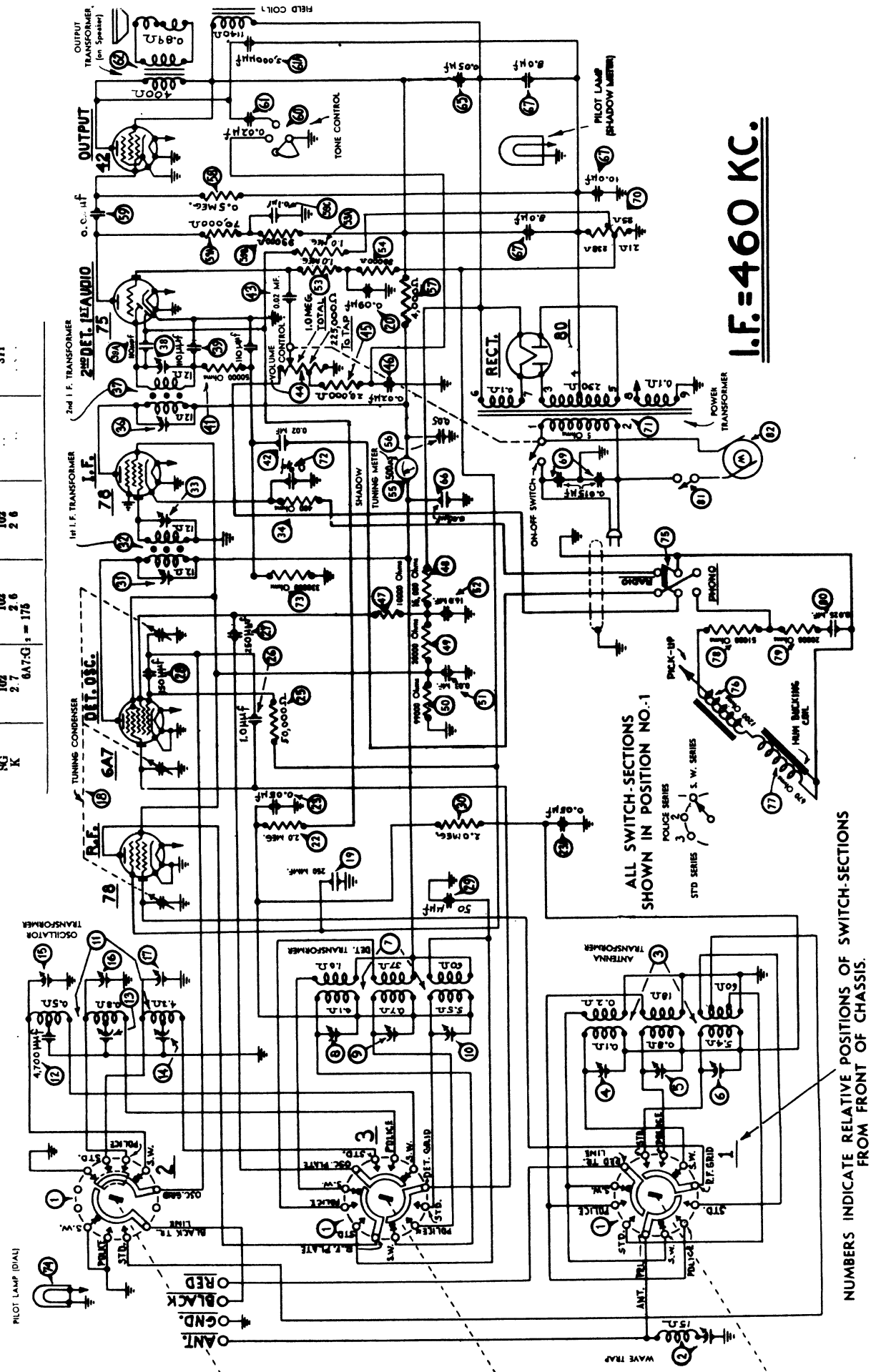
I.F.=460 KC.



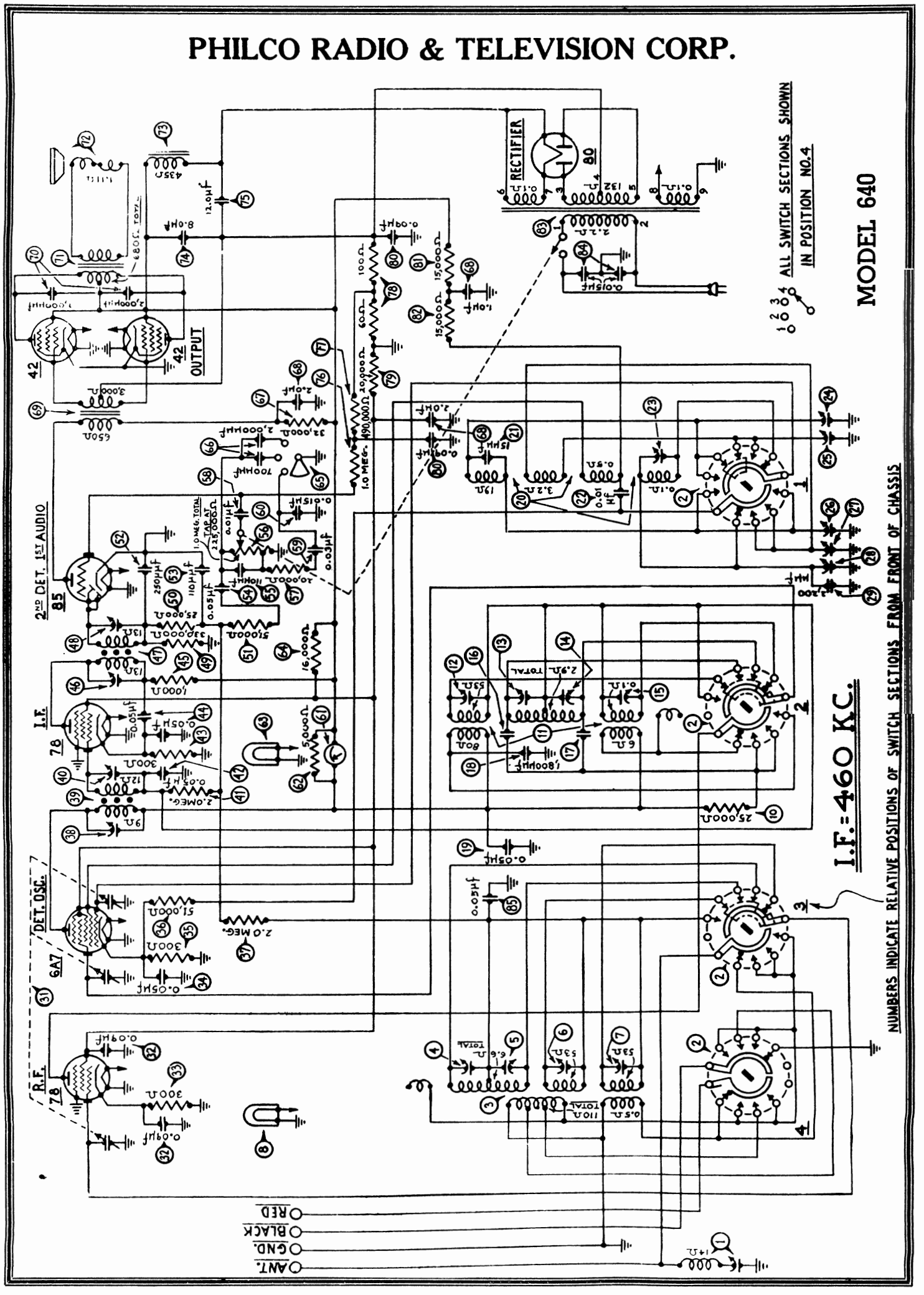
PHILCO RADIO & TELEVISION CORP.

MODEL 635

Tube	78 R.F.	6A7 Det. Osc.	78 I.F.	75 2nd Det.	42 Output
Point P	245	245	245	188	298
SG	102	102	102	...	311
K	2.7	2.6	2.6	...	...
	6A7-G's = 175				



PHILCO RADIO & TELEVISION CORP.

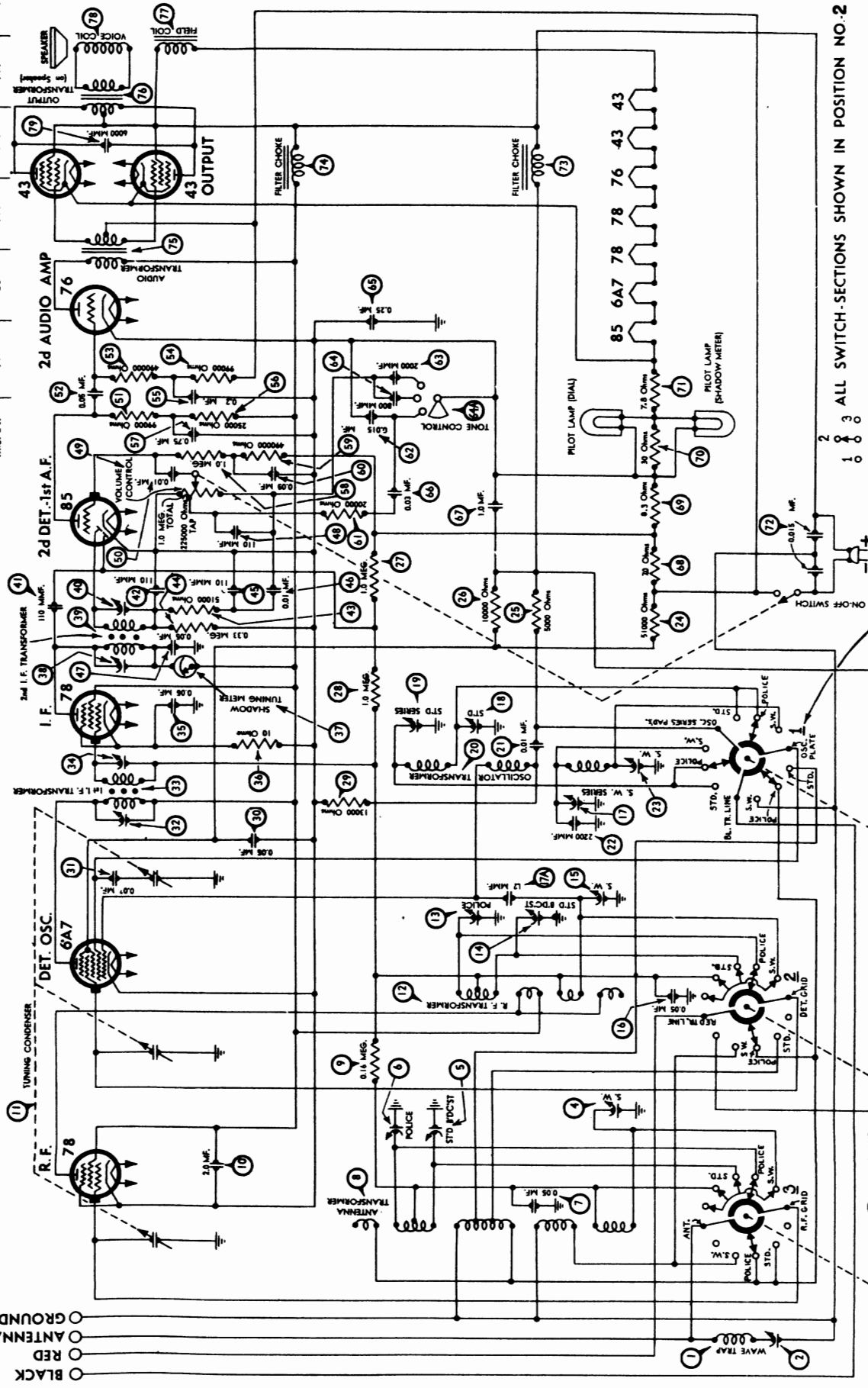


PHILCO RADIO & TELEVISION CORP.

MODEL 641
(D. C.)

I. F.—460 K. C.

Tube	78 R.F.	6A7 Det.-Osc.	78 I.F.	85 2nd Det.	78 A.F.	43 Output
Print	102	102	93	31	102	110
P	102	56	102	0	0	112
SG	0	0	1	0	0	37
K		86				
Osc. Pl.						

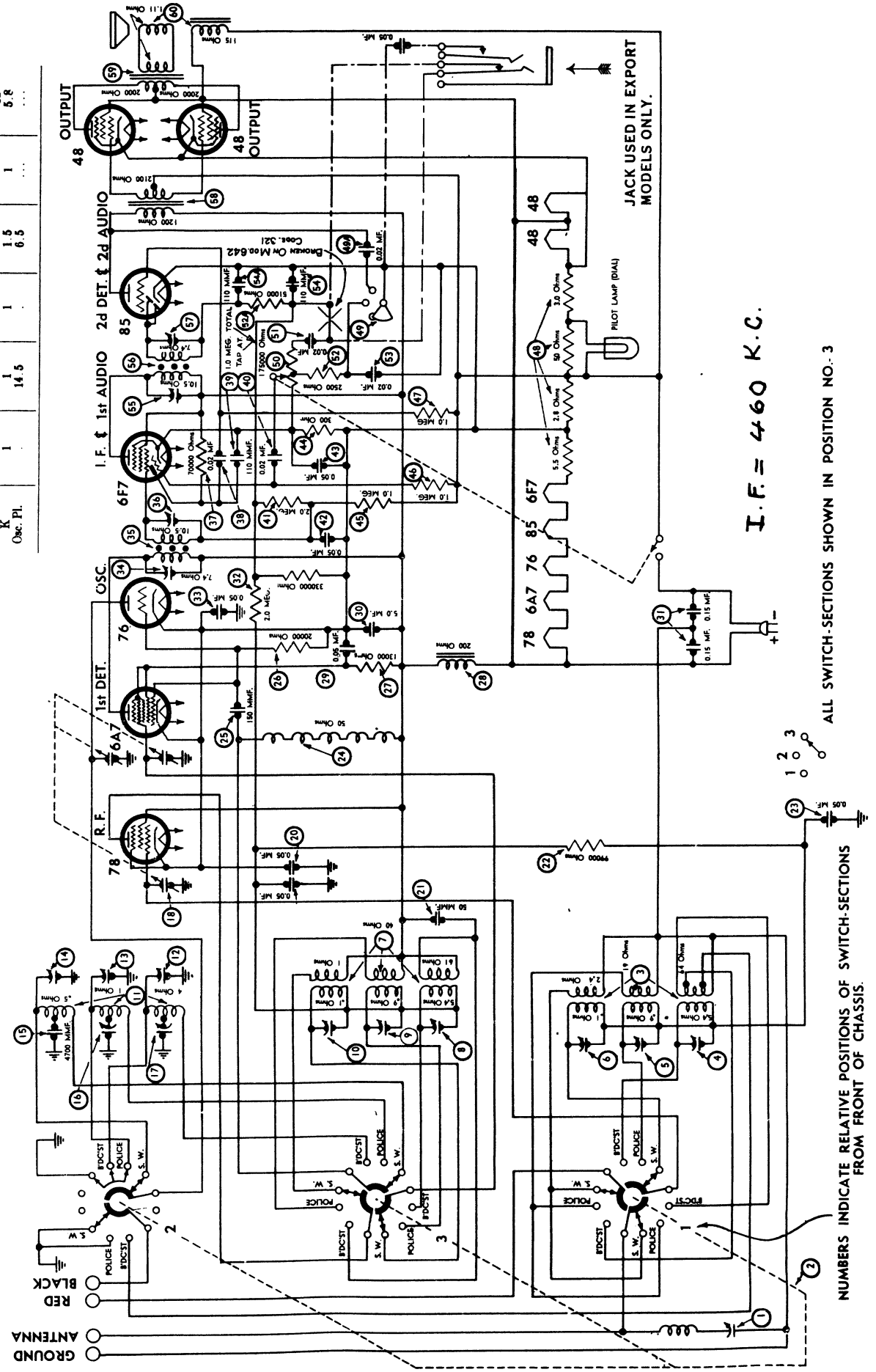


PHILCO RADIO & TELEVISION CORP.

MODEL 642
(32-Volt D.C.)

Tube Voltages

Tube	78 R.F.	6A7 1st Det.	76 Osc.	6F7 I.F. 1st A.F.	85 2nd Det. 2nd A.F.	48 Output
Point	32	32	32	32	29	32
SG	32	14.5	.	32	.	32
K	1	1	1	1.5	1	5.8
Osc. Pl.		14.5	.	6.5	.	.

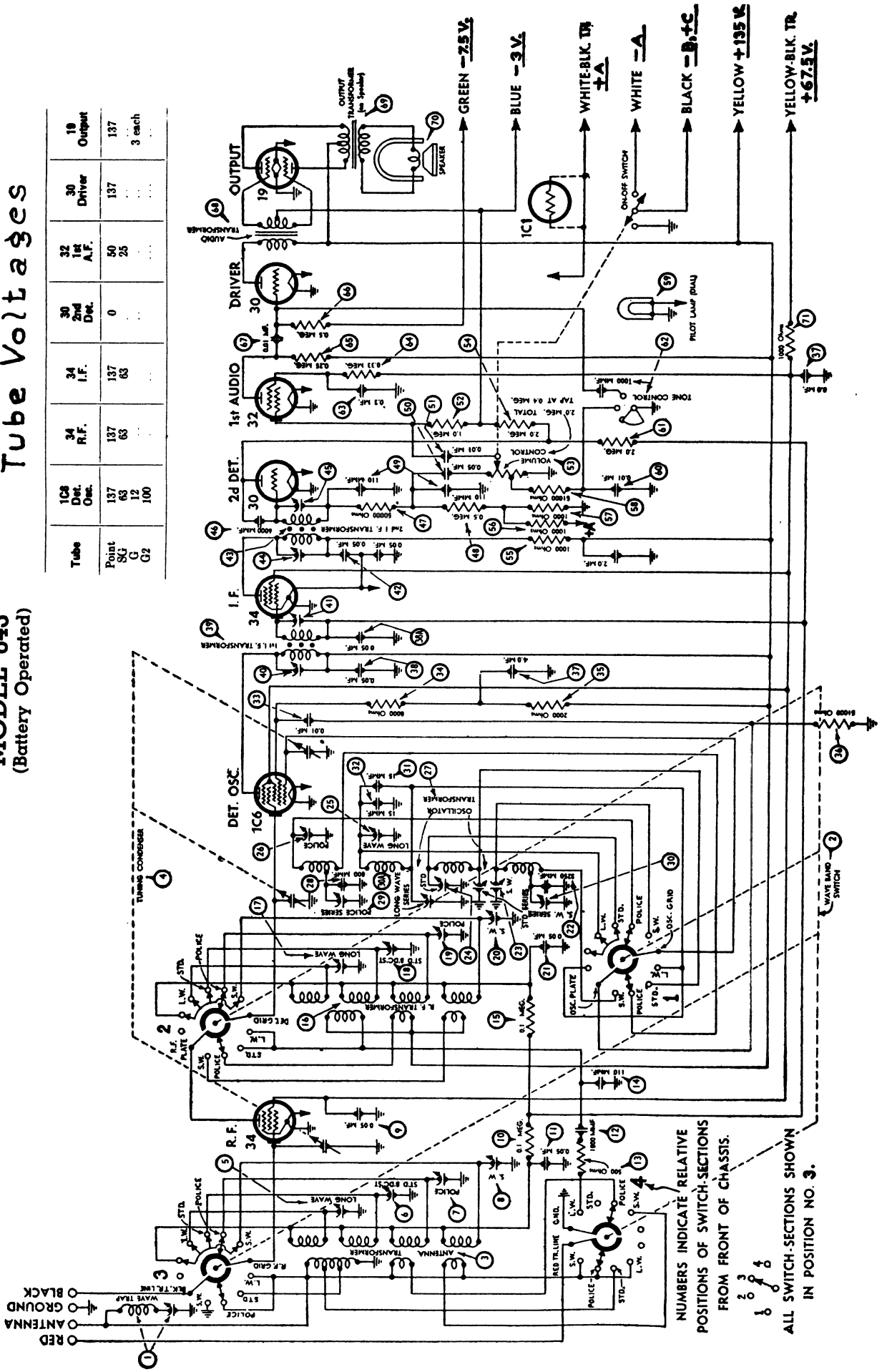


PHILCO RADIO & TELEVISION CORP.

MODEL 643
(Battery Operated)

Tube Voltages

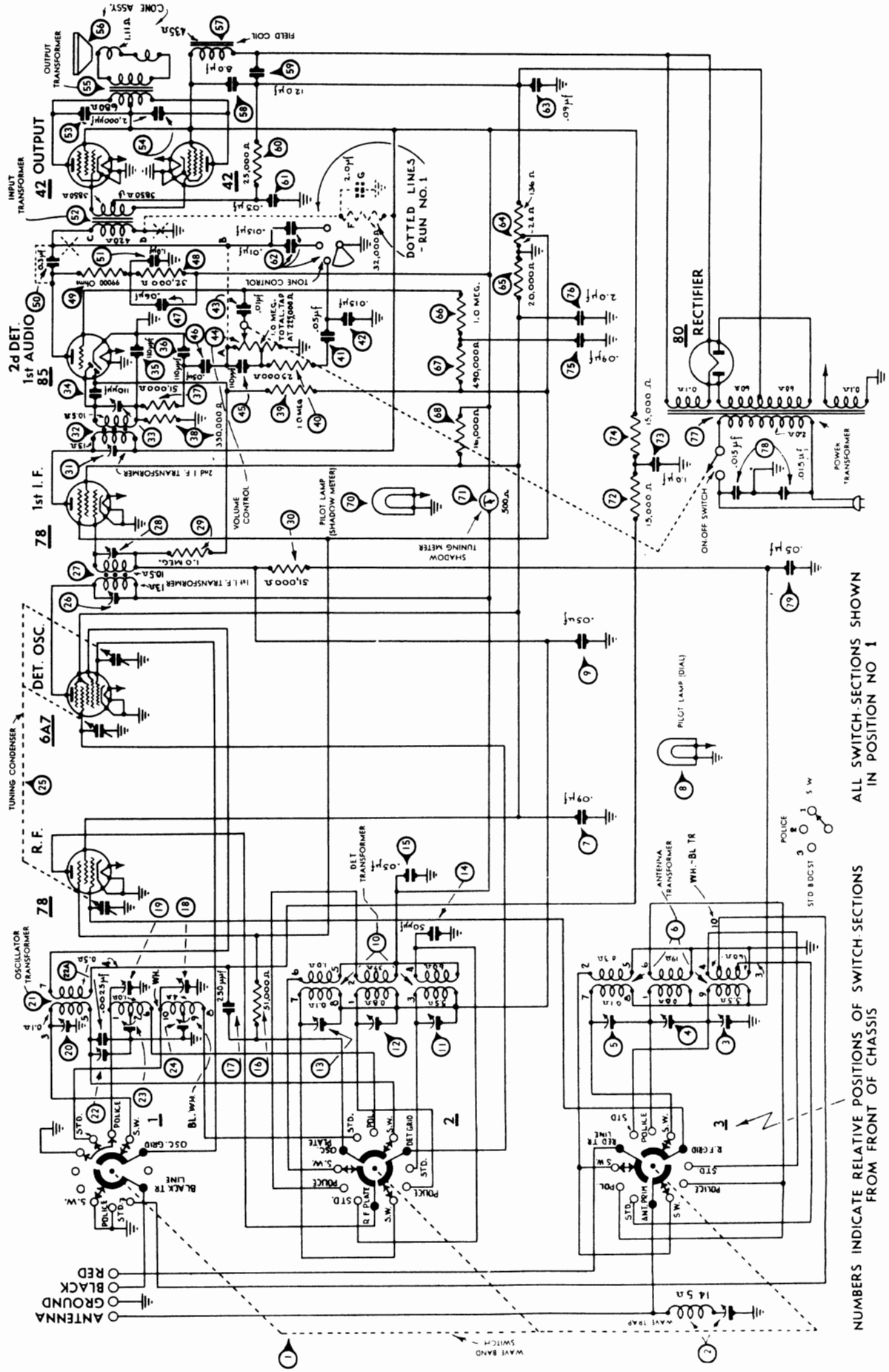
Tube	1C6 Det. Osc.	34 R.F.	34 I.F.	30 2nd Det.	32 1st A.F.	30 Driver	19 Output
Point							
SG	137	137	137	0	50	137	137
G	63	63	63	. . .	25	. . .	. . .
G2	12	. . .	. . .	. . .	. . .	. . .	3 each
	100						. . .



PHILCO RADIO & TELEVISION CORP.

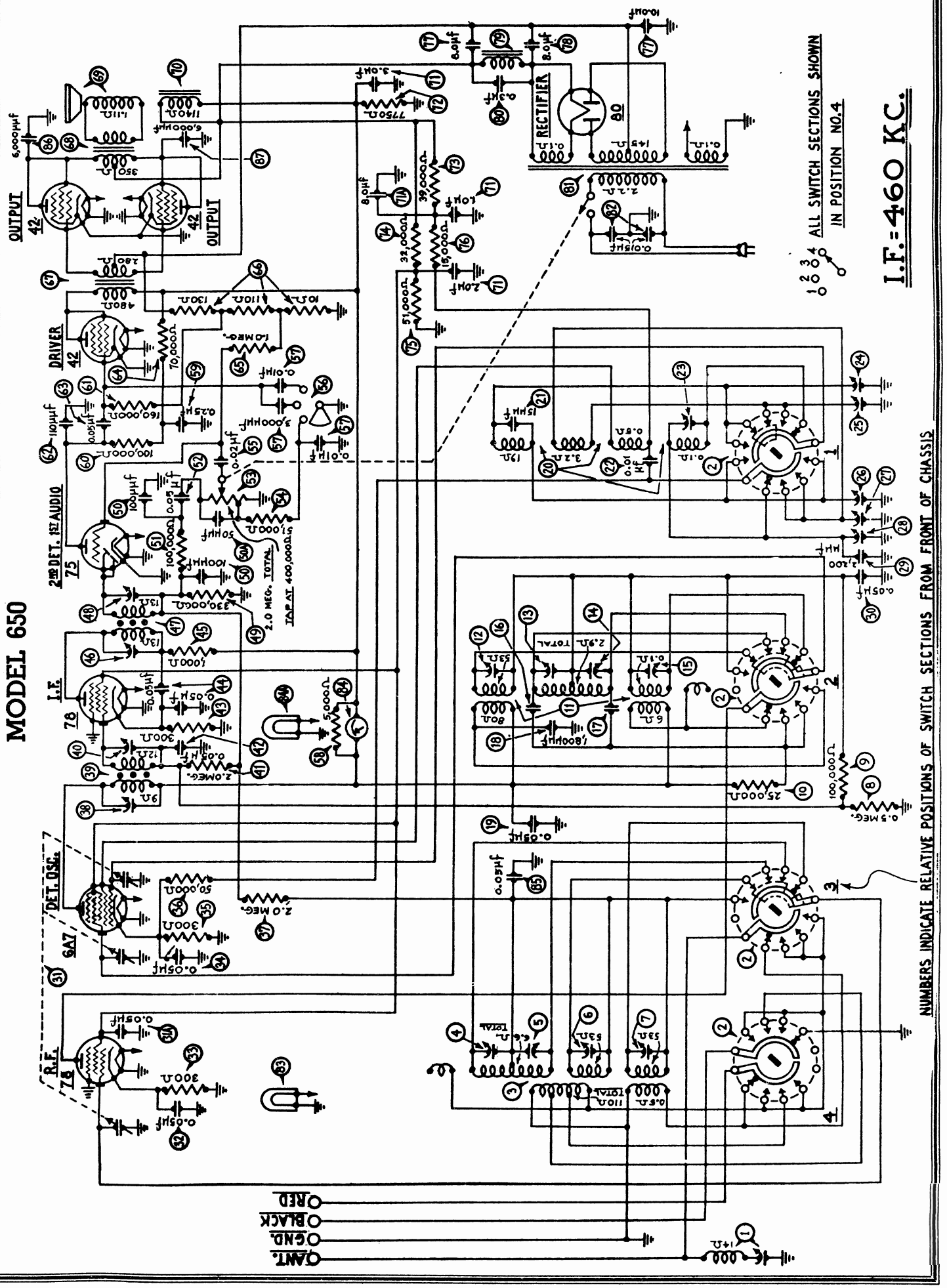
MODEL 645

I.F. = 460 K.C.



Point	Tube →	78	6A7	78	85	42	80
F		6.3	6.3	6.3	6.3	6.3	5.0
P		245	245	258	82	240	...
SG		90	90	90	...	256	...
K		(Sp=2.5)	...	(Sp=2.5)	...	...	...
G2		...	158	...	...	...	...
G1							(G1=5.3V)

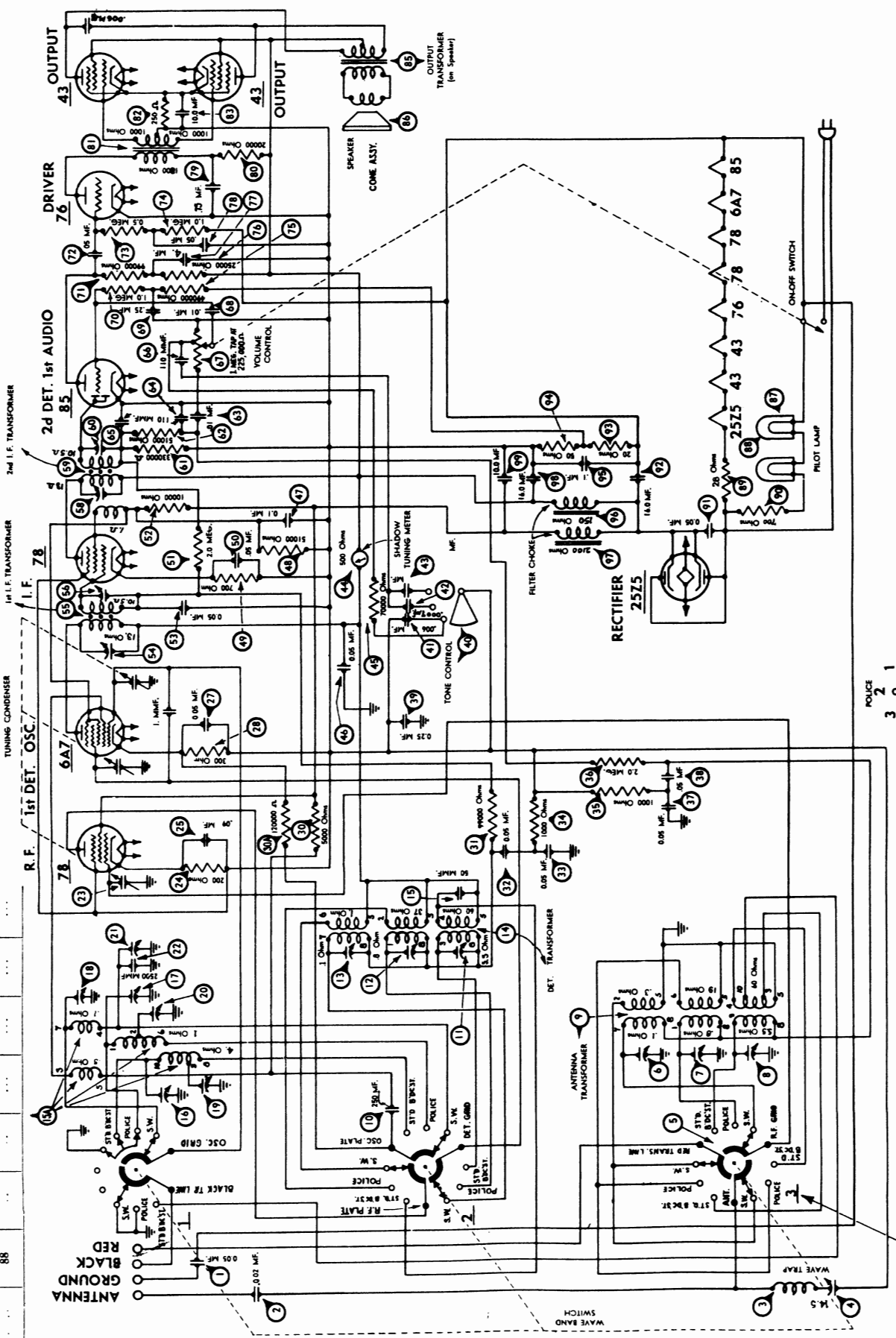
PHILCO RADIO & TELEVISION CORP.



PHILCO RADIO & TELEVISION CORP.

MODEL 651
(A.C.—D.C.)

I. F. = 460 K.C.



Point — Tube →	6A7	78 R.F.	78 I.F.	85	76	43	2525
F.....	6.3	6.3	6.3	6.3	6.3	6.3	—25
P.....	98	98	105	35	86	102	.
SG.....	57	98	57	. . .	. . .	104	.
K.....	1.4	1.5	1.8	. . .	. . .	17.5	113
G2.....	88	. .	. .	. . .	. . .	. . .	. . .

ALL SWITCH-SECTIONS SHOWN IN POSITION NO. 1

NUMBERS INDICATE RELATIVE POSITIONS OF SWITCH-SECTIONS FROM FRONT OF CHASSIS.

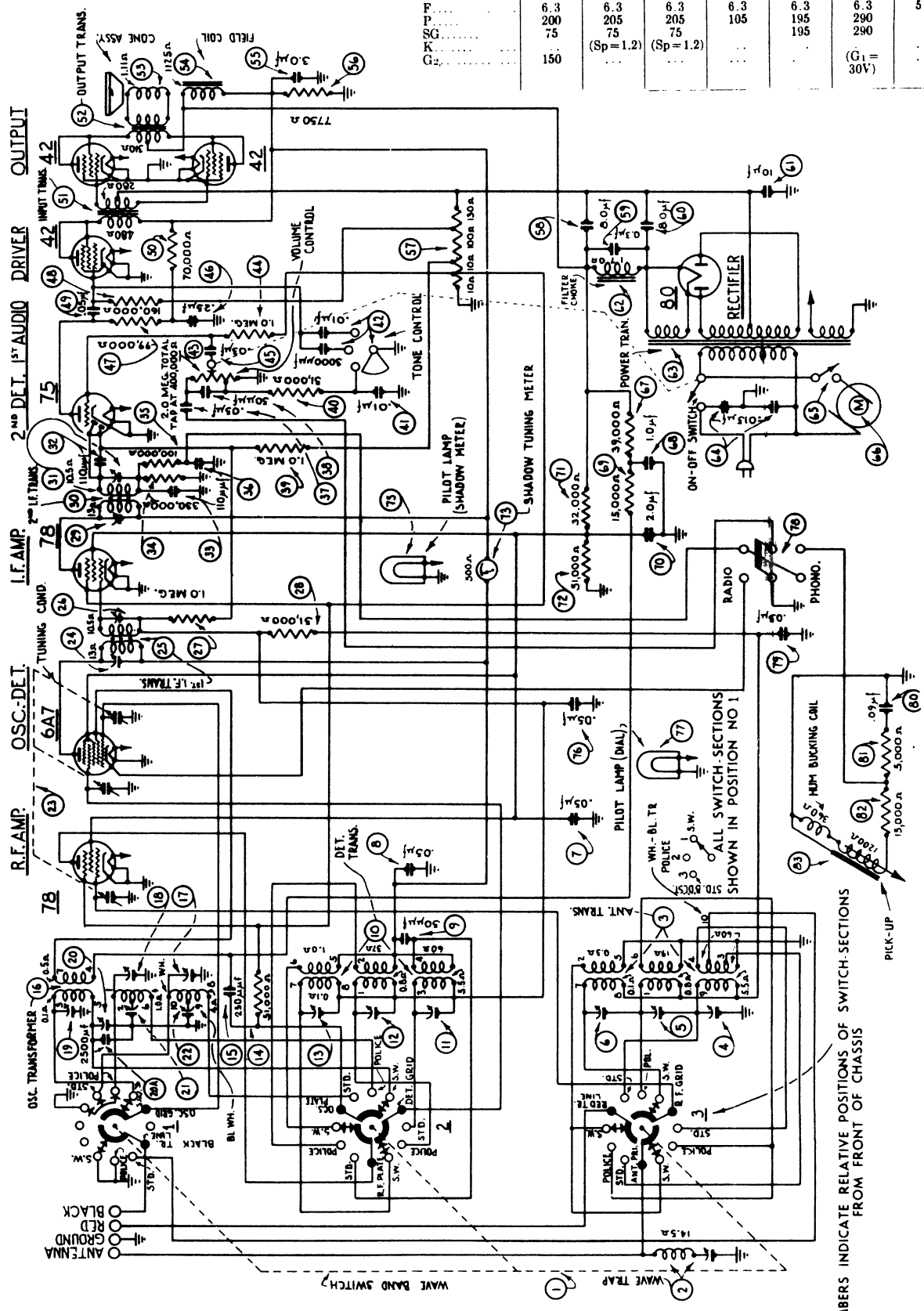
PHILCO RADIO & TELEVISION CORP.

MODEL 655

I.F. = 460 K.C.

Tube Voltages

Point — Tube→	6A7	78 R.F.	78 I.F.	75	42 Driver	42 Output	80
F.....	6.3	6.3	6.3	6.3	6.3	6.3	5 0
P.....	200	205	205	105	195	290	.
SG.....	75	75	75		195	290	.
K.....	.	(Sp = 1.2)	(Sp = 1.2)	.	.	.	.
G_2.....	150	.	.	.	.	(G_1 = 30V)	.

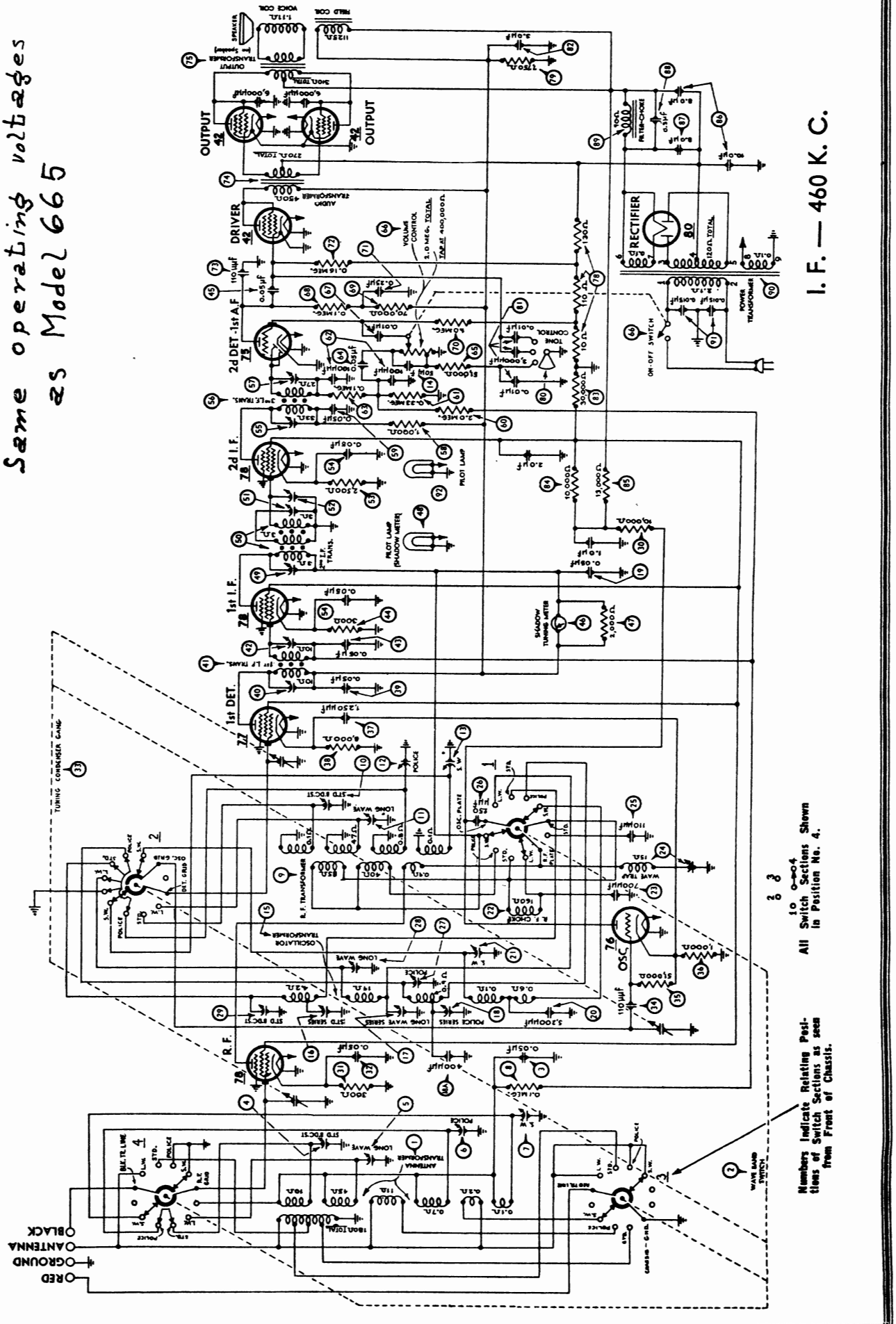


PHILCO RADIO & TELEVISION CORP.

MODEL 660

Same operating voltages as Model 665

I. F. — 460 K. C.



PHILCO RADIO & TELEVISION CORP.

MODEL 665

Tube Voltages

Tube	78 R.F.	77 1st Det.	76 Osc.	78 1st I.F.	78 2nd I.F.	75 1st A.F.	42 Driver	42 P.P.
Point								
P	200	200	100	200	205	118	200	290
SG	85	85		85	85		200	290
K	2.0	5.3	3.7	2.0	5.7	0	0	0

I.F. = 460 K.C.

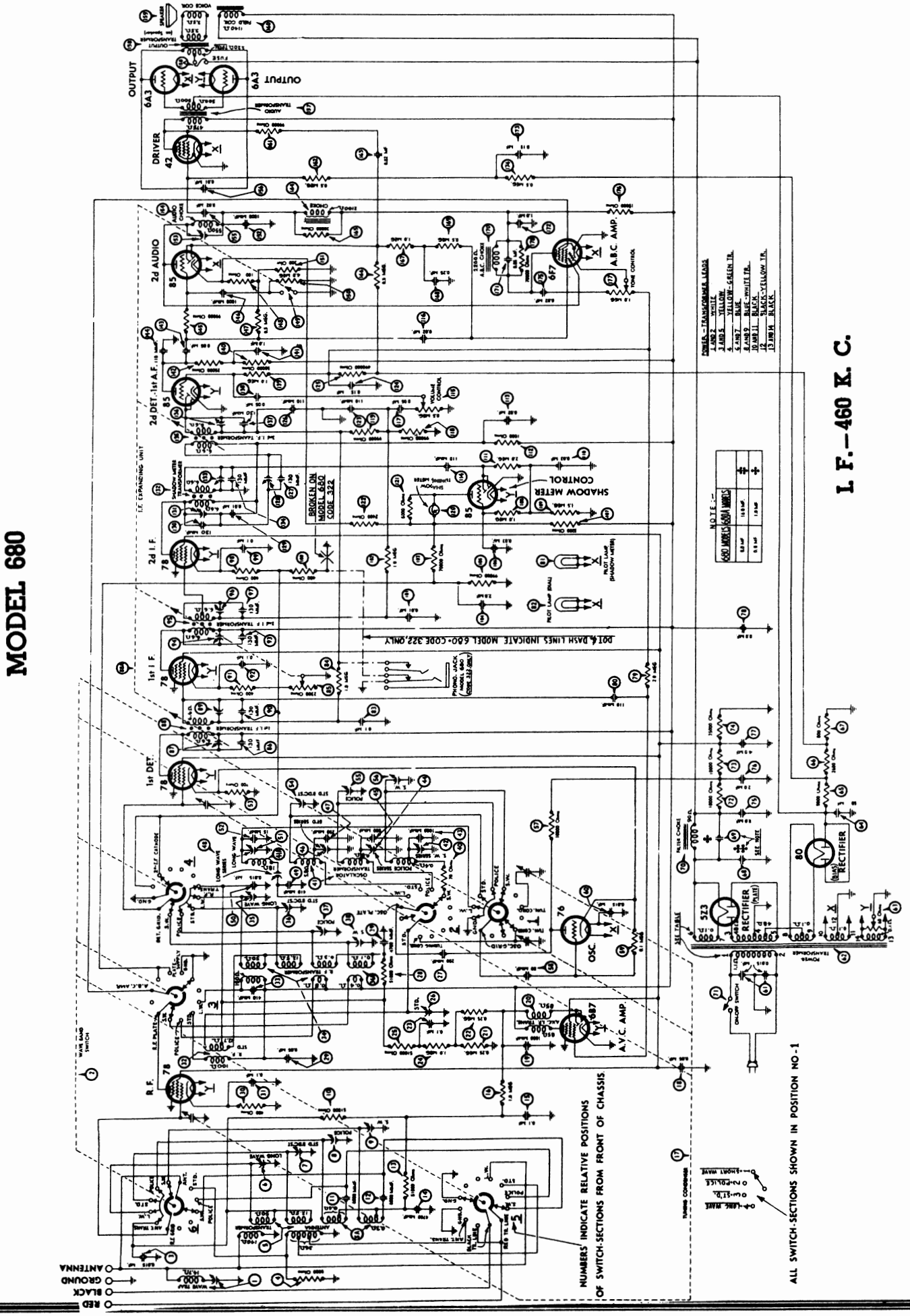
ALL SWITCH-SECTIONS SHOWN IN POSITION NO. 1

NUMBERS INDICATE RELATIVE POSITIONS OF SWITCH-SECTIONS FROM FRONT OF CHASSIS.

BLACK
ANTENNA
GROUND
RED

PHILCO RADIO & TELEVISION CORP.

MODEL 680



PHILCO RADIO & TELEVISION CORP.

Model 680

Adjusting Compensating Condensers

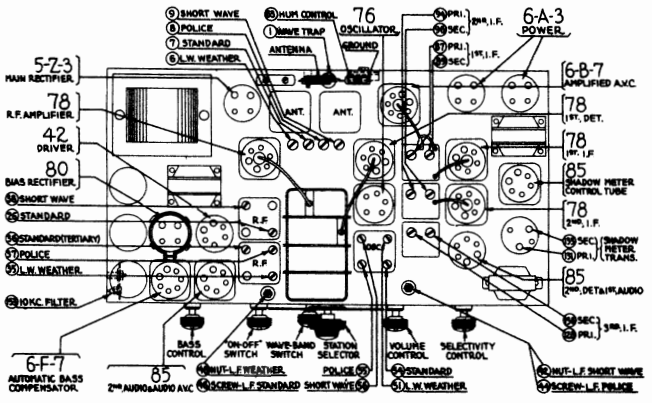


FIG. 2. Location of Compensating Condensers

Adjustment of compensating condensers in Model 680 requires an accurate signal generator covering long-wave, standard wave, police, and short-wave frequencies. The **PHILCO Model 088 All-Wave Signal Generator,** having a continuous range of from 100 to 20,000 K.C. (all fundamental frequencies) will be ideal for this purpose.

An output meter is also needed. **PHILCO Model 025 Circuit Tester** includes a high-grade output meter.

PHILCO No. 3164 Fibre Wrench and **No. 27-7059 Fibre Handled Screwdriver** complete the equipment needed for making these adjustments. The locations of the various compensating condensers are shown in Fig. 2. Connect the output meter to the plate contacts of the output tubes (using the adapters provided with the "025") and set it at the 0-30 volt range.

Under no conditions attempt to adjust this receiver without these instruments.

Before attempting to adjust the I.F. stages, turn the condenser gang all the way in. The glowing arrow should then be between the two vertical lines at the extreme left of the low frequency calibrations. The Bass Control should be turned off (turn to left). The fidelity control in selective position (turn to left). Adjust the hum control (back of set) for minimum hum.

Attach the signal generator antenna lead to the grid of the 2nd I.F. 78 tube, and the ground lead to the ground post on set. Adjust the volume control of set to maximum (turn to right), tune the signal generator to 460 K.C., and adjust the attenuator of the signal generator for approximately ¼ scale output meter reading.

Turn condenser (132) (shadow meter compensator) approximately four turns to the left. Adjust condensers (130), (129), and (131) for maximum output meter reading. Adjust condenser (132) for minimum output meter reading.

Remove the signal generator antenna lead from the grid of the 2nd I.F., 78 tube and place it on the grid of the 1st I.F., 78 tube, again adjust the signal generator attenuator for approximately ¼ scale output meter reading and adjust condensers (66) and (64) for maximum output meter reading.

Remove the signal generator antenna lead from the grid of the 1st I.F., 78 tube and place it on the grid of the 1st detector, 78 tube. Regulate the signal generator attenuator as before for ¼ scale output meter reading. Adjust condensers (61) and (67) for maximum output meter reading.

Turn down the volume control of set and advance the signal generator attenuator until the shadow meter width decreases approximately fifty percent. Adjust condenser (132) for minimum shadow meter width.

Remove the signal generator antenna lead from the grid of 1st detector, 78 tube and couple it to the aerial post on the set through a 125 mmf. condenser. Turn the volume control of the set back to maximum (to right) and adjust the signal generator attenuator for approximately ½ scale output meter reading. Adjust the wave trap (condenser (1)) for minimum output meter reading.

Reconnect the signal generator antenna lead to the grid of the first detector 78 tube and adjust the signal generator attenuator for approximately ¼ scale output meter reading.

If the fidelity selectivity control is turned to the extreme right hand position, it will be found, upon varying the frequency of the signal generator, that two definite peaks will appear in the output meter reading—one at 452 K.C. and another at 468 K.C. These peaks in the output meter reading indicate peaks in the tuning curve. The amplitude of these peaks should be equal; that is, the same output meter reading should be obtained at both 452 K.C. and 468 K.C. Any variations in these two readings can be corrected by a slight readjustment of the shadow meter I.F. primary padder (131). If the peak at 452 K.C. is higher than the one at 468 K.C., the primary padder will have to be turned out. If the reverse is true, the capacity of this padder must be increased. In any case, the voltmeter readings must be made equal by dividing the differences through readjustment.

R. F. and Oscillator Adjustments

SHORT WAVE

Turn the fidelity control back to the extreme left and the wave band switch to the extreme right (band 1). Connect the signal generator antenna lead to the aerial post on set through a two-meg resistor. Tune the set and signal generator to 18 mc. Turn the signal generator attenuator to maximum and adjust the volume control of set for ¼ scale reading on the output meter. Adjust condenser (56) for maximum output meter reading. Turn the dial of the set to approximately 17.1 mc. and check the image frequency.

Turn the dial of the set back to 18 mc. and connect a variable condenser (approximately 250 mmf.) across the oscillator section of the gang (2nd from front of chassis). Turn the variable shunt condenser in until the 18 mc. signal gives a reading on the output meter. Adjust condensers (9) and (24) for maximum output meter reading.

Removing the shunt condenser, turn the dial of the set and signal generator to 8 mc. and adjust condenser (42) for maximum output meter reading. Readjust condenser (56) with the set and signal generator tuned to 18 mc.

POLICE

Turn the wave band switch to position 2 and tune the set and signal generator to 6 mc. Adjust condensers (8), (57) and (53) for maximum output meter reading.

Turn the dial of the set and signal generator to 2.4 mc. and adjust condenser (44) for maximum output meter reading. Turn the dial of the set and signal generator back to 6 mc. and readjust condenser (55).

STANDARD

Turn the wave band switch to position 3 and tune the set and signal generator to 1500 K.C. and adjust condensers (7), (28), (36) and (54) for maximum output meter reading.

Turn the dial of the set and signal generator to 580 K.C., and remove the two meg. resistor from the antenna lead. Turn the volume control to maximum and adjust the signal generator attenuator for approximately ¼ scale output meter reading. Adjust condenser (44) for maximum output meter reading.

WEATHER

Turn the wave band switch to position 4, and tune the set and signal generator to 340 K.C. Adjust condensers (6), (29) and (51) for maximum output meter reading.

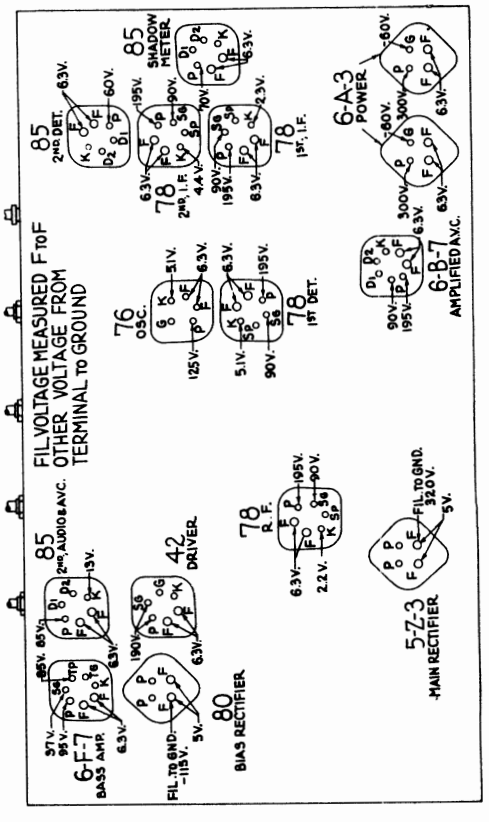
Turn the dial of the set and signal generator to 175 K.C. and adjust condenser (48) for maximum output meter reading. Readjust condenser (51) at 340 K.C.

Turn the wave band switch back to position (3) and tune the set and signal generator to 580 K.C. Adjust condenser (44) for maximum output meter reading. Tune the set and signal generator to 1500 K.C. and adjust condenser (54) for maximum output meter reading. Turn down (to left) the volume control and turn up (to right) the signal generator attenuator. Then adjust condenser (30) for maximum output meter reading.

Adjustment of 10 K. C. Filter

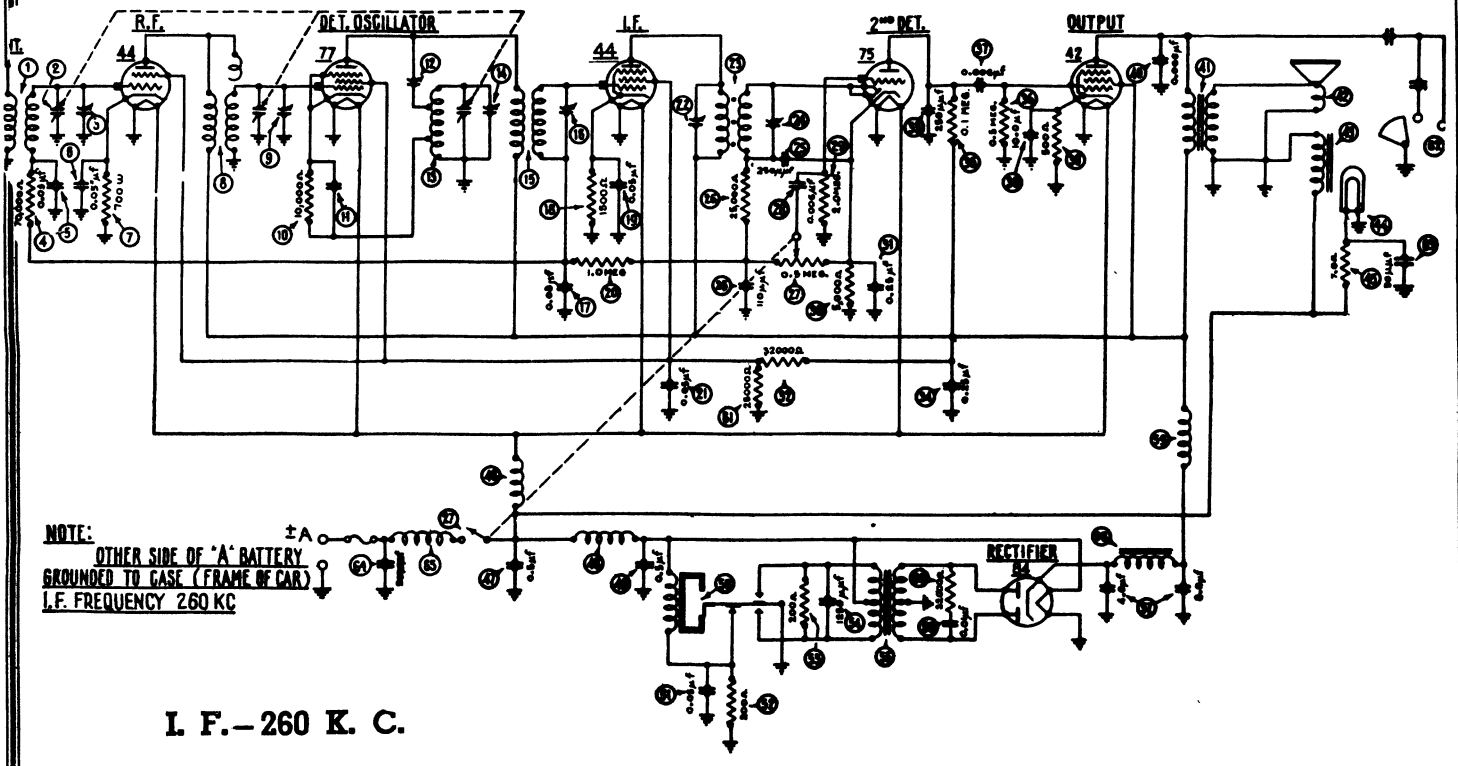
The 10 K.C. filter in the audio circuit will rarely require readjustment. As the proper adjustment of this padder (130 on diagram) requires an accurately calibrated audio oscillator, it should be reset only in the event that it has been tampered with or in cases where it has become necessary to replace one of the elements of this filter.

Instructions covering an emergency adjustment of this filter can be obtained from your Philco distributor.

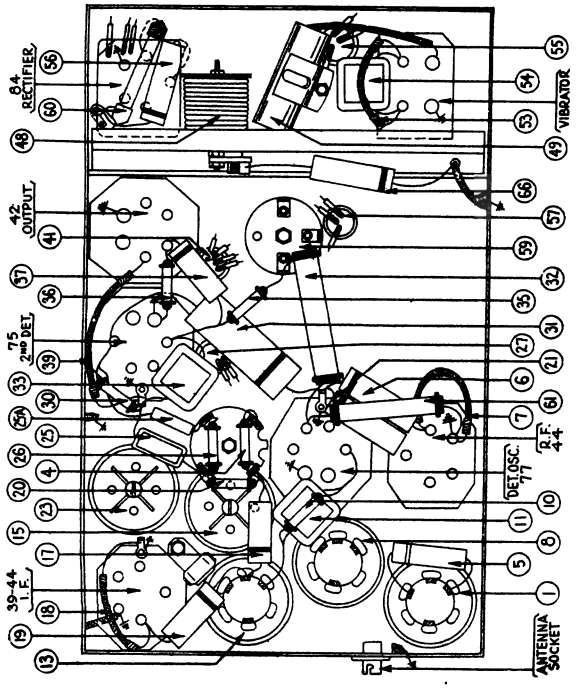


PHILCO RADIO & TELEVISION CORP.

MODEL 700
(Auto Radio)



I. F.—260 K. C.



MODEL 700 PARTS LIST

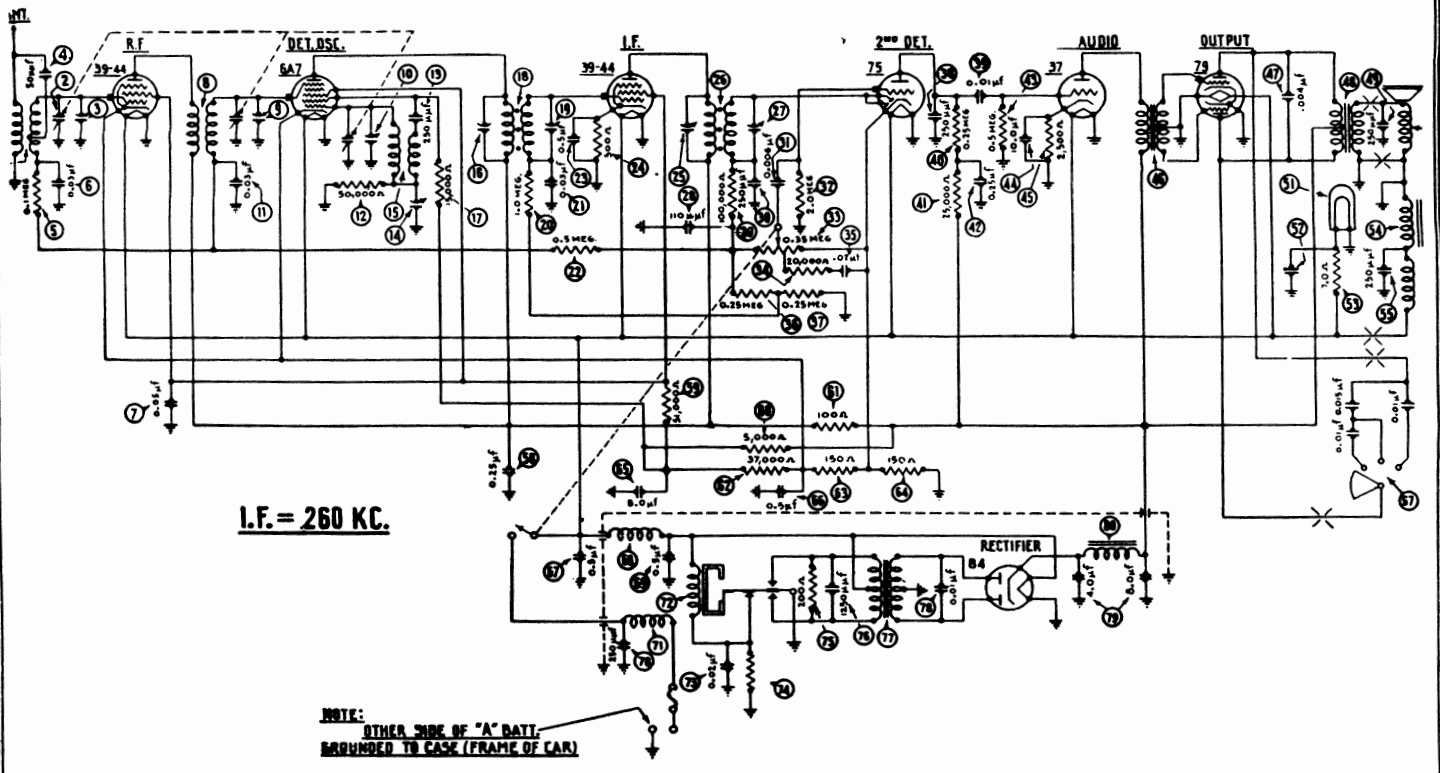
(1)	Antenna Transformer	32-1331	
(2)	Tuning Condenser	31-1199	
(3)	1st Padder (in tun. cond.)		
(4)	Resistor (70,000 ohms)	33-1115	
(5)	Condenser (.03 mfd.)	30-4025	
(6)	Condenser (.05 mfd.)	30-4020	
(7)	Resistor (700 ohms)	6443	
(8)	R. F. Transformer	32-1332	
(9)	2nd Padder (in tun. cond.)		
(10)	Resistor (10,000 ohms)	33-1000	
(11)	Condenser (.00025 mfd.)	30-1032	
(12)	Padder (Pri. 1st I. F. Tran.)		
(13)	Oscillator Transformer	32-1333	
(14)	3rd Padder (in tun. cond.)		
(15)	1st I. F. Transformer	32-1329	
(16)	Padder (Sec. 1st I. F. Tran.)		
(17)	Condenser (.03 mfd.)	30-4025	
(18)	Resistor (1500 ohms)	33-3047	
(19)	Condenser (.05 mfd.)	30-4020	
(20)	Resistor (1,000,000 ohms)	33-1096	
(21)	Condenser (.05 mfd.)	30-4020	
(22)	Padder (Pri. 2nd I. F. Tran.)		
(23)	2nd I. F. Transformer	32-1237	
(24)	Padder (Sec. 2nd I. F. Tran.)		
(25)	Condenser (.00025 mfd.)	30-1032	
(26)	Condenser (.00011 mfd.)	30-1031	
(26)	Resistor (25,000 ohms)	33-1013	
(27)	Vol. Con. & Switch Assm.	38-5534	
(28)	Condenser (.006 mfd.)	30-4125	
(29)	Resistor (2,000,000 ohms)	33-1025	
(30)	Resistor (5000 ohms)	6096	
(31)	Condenser (.25 mfd.)	30-4146	
(32)	Resistor (32,000 ohms)	3525	
(33)	Condenser (.00025 mfd.)	3082	
(34)	Condenser (.25 mfd.)	04360	
(35)	Resistor (100,000 ohms)	6099	
(36)	Resistor (500,000 ohms)	6097	
(37)	Condenser (.006 mfd.)	30-4125	
(38)	Condenser (10 mfd.)	30-2072	
(39)	Resistor (500 ohms)	33-3031	
(40)	Condenser (.006 mfd.)	30-4024	
(41)	Output Transformer	32-7214	
(42)	Cone & Voice Coil	36-3157	
(43)	Field Coil Assembly	36-3046	
(44)	Pilot Lamp	34-2031	
(45)	Resistor (7 ohms)	33-3035	
(46)	"A" Choke	32-1402	
(47)	Condenser (.5 mfd.)	30-4184	
(48)	Vibrator Choke	32-1235	
(49)	Condenser (.5 mfd.)	30-4015	
(50)	Vibrator	38-5036	
(51)	Condenser (.05 mfd.)	30-4039	
(52)	Resistor (200 ohms)	7217	
(53)	Resistor (200 ohms)	7217	
(54)	Condenser (.00125 mfd.)	5886	
(55)	Power Transformer	32-7216	
(56)	Condenser (.01 mfd.)	30-4051	
(57)	Condenser (4-8 mfd.)	30-2072	
(58)	"B" Choke	32-7215	
(59)	R. F. Choke	32-1281	
(60)	Resistor (32,000 ohms)	3525	
(61)	Resistor (25,000 ohms)	33-1013	
(62)	Tone Control	30-4180	
(63)	Condenser (.00005 mfd.)	30-1029	
(64)	Condenser (.00025 mfd.)	30-1032	
(65)	"A" Choke	32-1374	

Spark Plug Resistor	33-1015
Distributor Resistor	33-1113E
Interference Condenser	30-4007
Nuts (mounting)	W55A
Battery Cable	38-5296
Acorn Nut	W821
Fuse	7227
Fuse Insulator	27-7131
Studs	28-6036
Bracket	6035
Strap	04344
Strap Pad	6206
Knob	27-4058
Glass	27-7325
Gasket (for glass)	27-7509
Pointer	28-1957
Face Assembly	42-5189
Control Housing Cover	29-7064
Control Unit Assembly	42-5184
Shaft	28-8206
Antenna Lead	38-5771
4-Prong Socket	4955
5-Prong Socket	27-6014
6-Prong Socket	6417C

PHILCO RADIO & TELEVISION CORP.

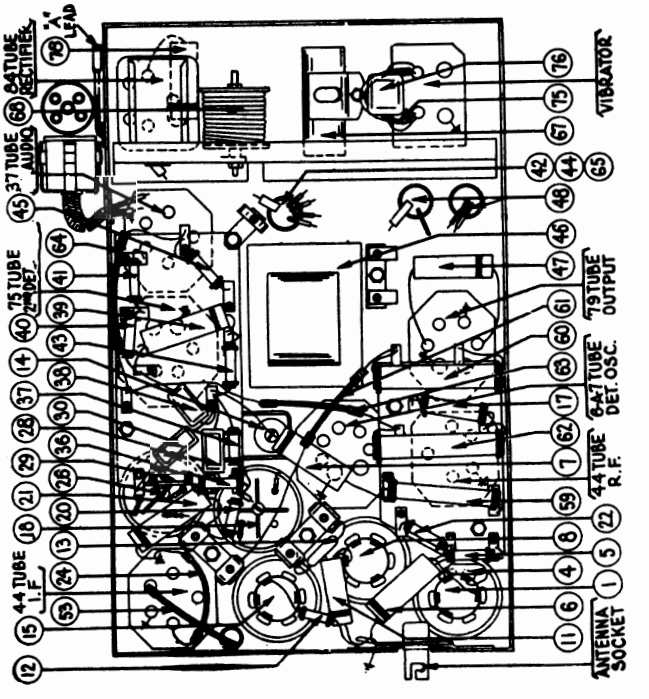
MODEL 802

(Auto Radio)



PARTS LIST

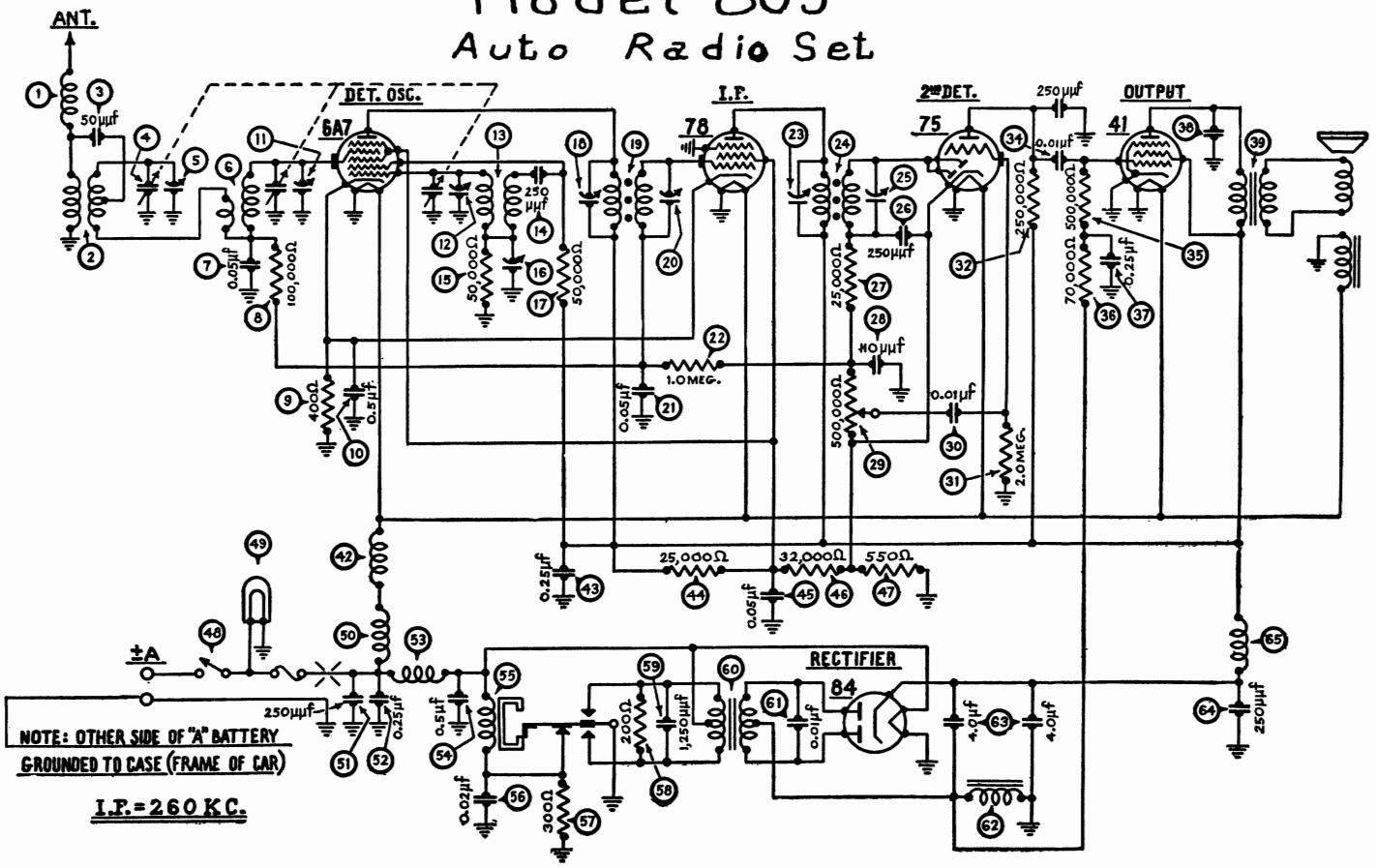
No.	Description	Part No.
1	Antenna Transformer	32-1462
2	Tuning Condenser	31-1202
3	First Padder (on tun. cond.)	
4	Condenser (50 mmfd.)	30-1029
5	Resister (100,000 ohms)	6099
6	Condenser (.03 mfd.)	30-4025
7	Condenser (.05 mfd.)	30-4020
8	R. F. Transformer	32-1463
9	Second Padder (on tun. cond.)	
10	Third Padder (on tun. cond.)	
11	Condenser (.03 mfd.)	30-4025
12	Resistor (50,000 ohms)	6098
13	Condensers (250 mmfd.)	3082
14	Padder	31-6012
15	Oscillator Transformer	32-1222
16	Padder (Pri. 1st I. F. Trans.)	
17	Resistor (15,000 ohms)	6208
18	First I. F. Transformer	32-1471
19	Padder (Sec. 1st I. F. Trans.)	
20	Resistor (1,000,000 ohms)	33-1096
21	Condenser (.03 mfd.)	30-4025
22	Resistor (500,000 ohms)	6097
23	Condenser (.5 mfd.)	30-4058
24	Resistor (500 ohms)	6977
25	Padder (Pri. 2nd I. F. Trans.)	
26	Second I. F. Transformer	32-1449
27	Padder (Sec. 2nd I. F. Trans.)	
28	Condenser (110 mmfd.)	30-1031
29	Resistor (100,000 ohms)	6099
30	Condenser (250 mmfd.)	30-1032
31	Condenser (6000 mmfd.)	30-4125
32	Resistor (2,000,000 ohms)	33-1025
33	Vol. Cont. & Sw. Assembly	38-5851
34	Resistor (20,000 ohms)	33-1130
35	Condenser (.02 mfd.)	30-4215
36	Resistor (250,000 ohms)	33-1097
37	Resistor (250,000 ohms)	33-1097
38	Condenser (250 mmfd.)	30-1032
39	Condenser (.01 mfd.)	30-4145
40	Resistor (250,000 ohms)	33-1097
41	Resistor (25,000 ohms)	33-1013
42	Condenser (.25 mfd.)	30-4135
43	Resistor (500,000 ohms)	6097
44	Padder	31-6012
45	Resistor (2500 ohms)	33-1100
46	Input Transformer	32-7206
47	Condenser (4000 mmfd.)	30-4185
48	Output Transformer	32-7205
49	Condenser (250 mmfd.)	30-1032
50	Cone & Voice Coil	36-3159
51	Pilot Lamp	34-2040
52	Condenser (50 mmfd.)	30-1029
53	Resistor (7 ohms)	33-3130
54	Field Coil Assembly	02795
55	Condenser (250 mmfd.)	30-1032
56	Choke	32-1464
57	Tone Control	30-4208
58	Condenser (.25 mfd.)	30-4134
59	Resistor (51,000 ohms)	4237
60	Resistor (5000 ohms)	33-1070
61	Resistor (100 ohms)	33-3023
62	Resister (37,000 ohms)	33-1098
63	Resistor (150 ohms)	33-3045
64	Resistor (150 ohms)	33-3045
65	Condenser (8 mfd.)	30-4135
66	Condenser (.5 mfd.)	30-4018
67	Condenser (.5 mfd.)	30-4015
68	Vibrator Choke	32-1474
69	Condenser (.5 mfd.)	30-4047
70	Interference Filter	32-1466
71	Interference Filter	32-1466
72	Vibrator	38-5036
73	Condenser (.02 mfd.)	30-4039
74	Resistor (300 ohms)	33-3010
75	Resistor (200 ohms)	7217
76	Condenser (1250 mmfd.)	5886
77	Power Transformer	32-7098
78	Condenser (.01 mfd.)	30-4051
79	Filter Condenser (4-8 mfd.)	30-2015
80	"B" Choke	32-7104
	Control Assembly	42-5256
	Flexible Shafts	28-8206
	Glass	27-7325
	Face Assembly	42-5255
	Pointer	28-1957
	Knob	27-4058
	Fuse	7227
	Fuse Insulator	27-7131
	"A" Lead	38-5296
	Antenna Lead	38-5131
	Speaker Cable	41-3112
	Studs (set mtg.)	28-6036
	Nuts (set mtg.)	W55A
	Bracket (Control mtg.)	6035
	Strap (control mtg.)	04344
	Radio Lock Switch	42-1076

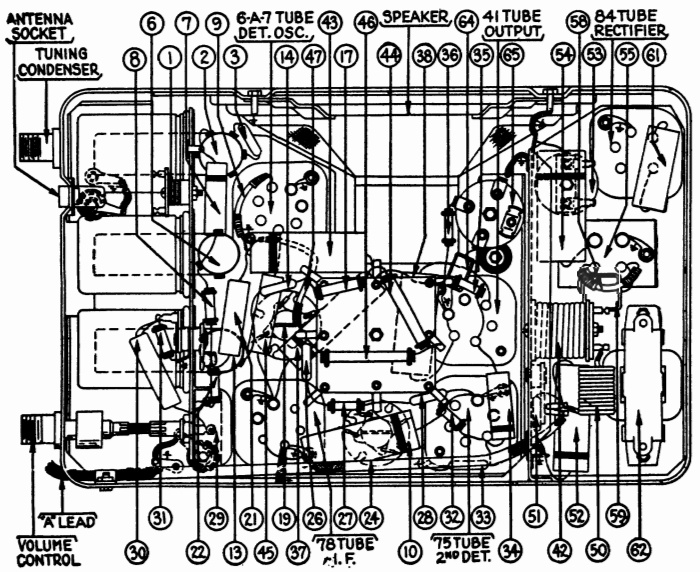


PHILCO RADIO & TELEVISION CORP.

Model 805

Auto Radio Set



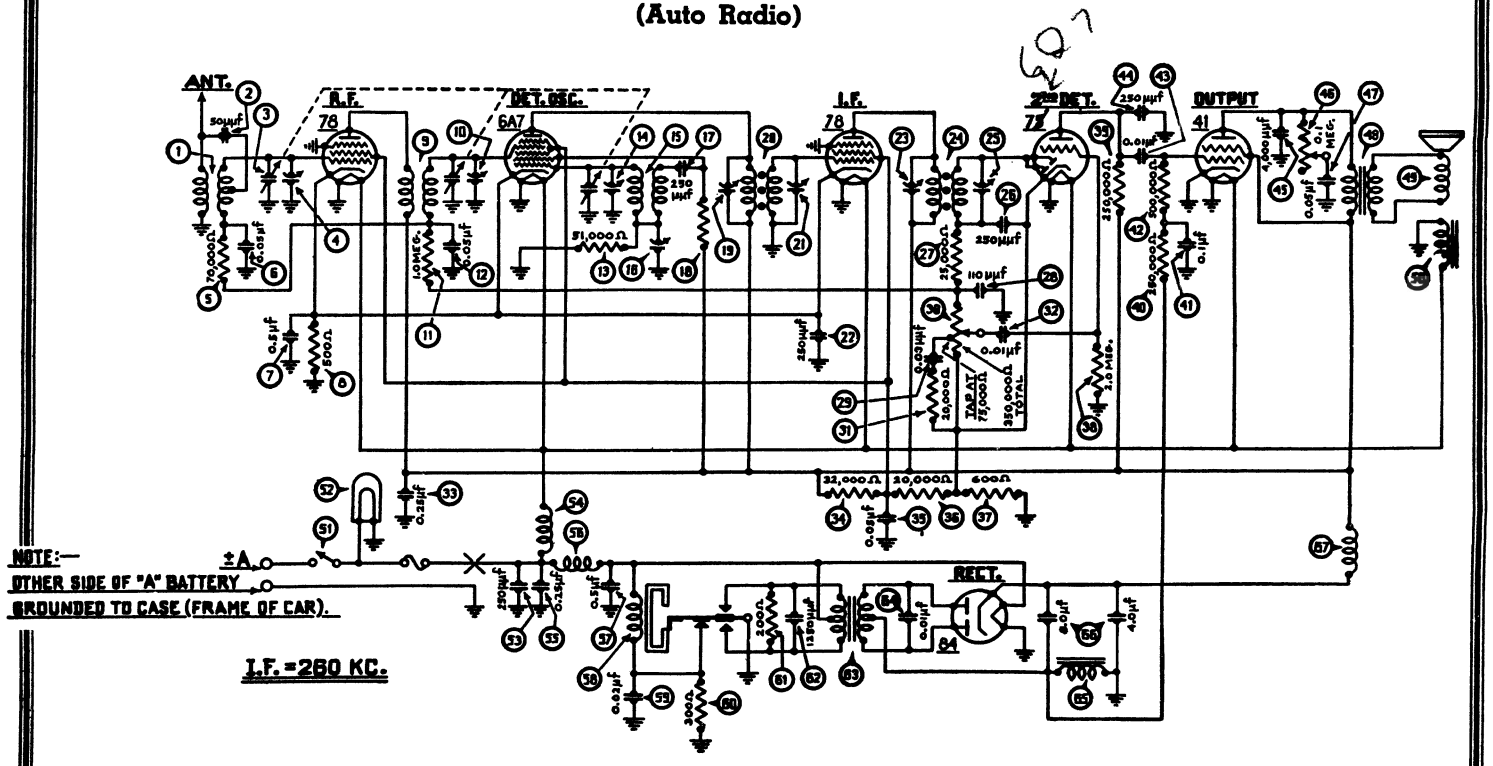


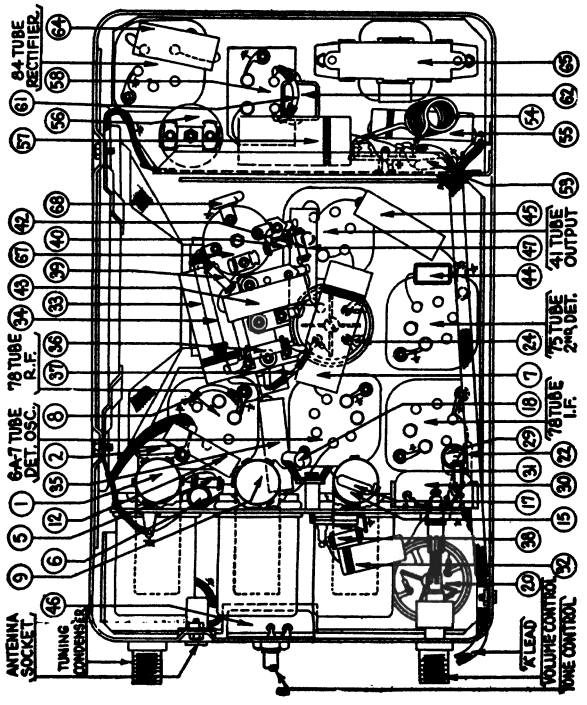
PARTS LIST

No.	Description	Part No.
(1)	Antenna Choke	32-1372
(2)	Antenna Transformer	32-1655
(3)	Condenser (50 mmfd.)	4587
(4)	Tuning Condenser	31-1483
(5)	First Padder (on tun. cond.)	
(6)	R. F. Transformer	32-1656
(7)	Condenser (.05 mfd.)	30-4020
(8)	Resistor (100,000 ohms)	6099
(9)	Resistor (400 ohms)	33-3016
(10)	Condenser (.5 mfd.)	30-4227
(11)	Second Padder (on tun. cond.)	
(12)	Third Padder (on tun. cond.)	
(13)	Oscillator Transformer	32-1657
(14)	Condenser (250 mmfd.)	30-1032
(15)	Resistor (50,000 ohms)	33-1163
(16)	Fourth Padder (on tun. cond.)	
(17)	Resistor (50,000 ohms)	6098
(18)	Padder (Pri. 1st I. F. Transf.)	
(19)	First I. F. Transformer	32-1650
(20)	Padder (Sec. 1st I. F. Transf.)	
(21)	Condenser (.05 mfd.)	30-4020
(22)	Resistor (1,000,000 ohms)	33-1096
(23)	Padder (Pri. 2nd I. F. Transf.)	
(24)	Second I. F. Transformer	32-1651
(25)	Padder (Sec. 2nd I. F. Transf.)	
(26)	Condenser (250 mmfd.)	30-1032
(27)	Resistor (25,000 ohms)	33-1013
(28)	Condenser (110 mmfd.)	30-1031
(29)	Volume Control — (500,000 ohms)	38-6635
(30)	Condenser (.01 mfd.)	30-4124
(31)	Resistor (2,000,000 ohms)	33-1025
(32)	Resistor (250,000 ohms)	33-1097
(33)	Condenser (250 mmfd.)	30-1032
(34)	Condenser (.01 mfd.)	30-4169
(35)	Resistor (500,000 ohms)	6097
(36)	Resistor (70,000 ohms)	33-1115
(37)	Condenser (.25 mfd.)	30-4146
(38)	Condenser (8000 mmfd.)	30-4317
(39)	Output Transformer	32-7019
(40)	Cone and Voice Coil	36-3406
(41)	Field Coil Assembly	36-3405
(42)	"A" Choke	32-1377
(43)	Condenser (.25 mfd.)	30-4134
(44)	Resistor (25,000 ohms)	3656
(45)	Condenser (.05 mfd.)	30-4020
(46)	Resistor (32,000 ohms)	3525
(47)	Resistor (550 ohms)	33-3031
(48)	On-Off Switch Assembly	42-5336
(49)	Pilot Lamp	34-2039
(50)	"A" Choke	32-1644
(51)	Condenser (250 mmfd.)	30-1032
(52)	Condenser (.25 mfd.)	30-4146
(53)	Vibrator Choke	32-1625
(54)	Condenser (.5 mfd.)	30-4227
(55)	Vibrator	38-5036
(56)	Condenser (.02 mfd.)	30-4039
(57)	Resistor (300 ohms)	33-3010
(58)	Resistor (200 ohms)	7217
(59)	Condenser (1250 mmfd.)	5886
(60)	Power Transformer	32-7352
(61)	Condenser (.01 mfd.)	30-4051
(62)	Filter Choke	32-7351
(63)	Filter Condenser (4-4 mfd.)	30-2115
(64)	Condenser (250 mmfd.)	30-1032
(65)	"B" Choke	32-1281
	Control Assembly	42-5331
	Glass and Dial Assembly	27-7835
	Pointer Assembly	42-5335
	Bezel Plate	28-7108
	Knobs	27-4187
	Keys	28-2782
	Control Mtg. Bracket (dash)	29-2773
	Control Mtg. Bracket (steering)	6035
	Steering Mtg. Kit (28")	45-1133
	Studs (Set Mtg.)	28-6272
	Nuts (Set Mtg.)	W98A
	Spark Plug Resistor	33-1195
	Distributor Resistor	33-1196
	Interference Condenser	30-4007
	Fuse	7227
	Fuse Insulator	27-7729
	Antenna Lead	38-5131
	Flexible Shaft (21")	28-8354
	Flexible Shaft (28")	28-8355
	Lock Cylinder Assembly	42-5337

PHILCO RADIO & TELEVISION CORP.

MODEL 806
(Auto Radio)





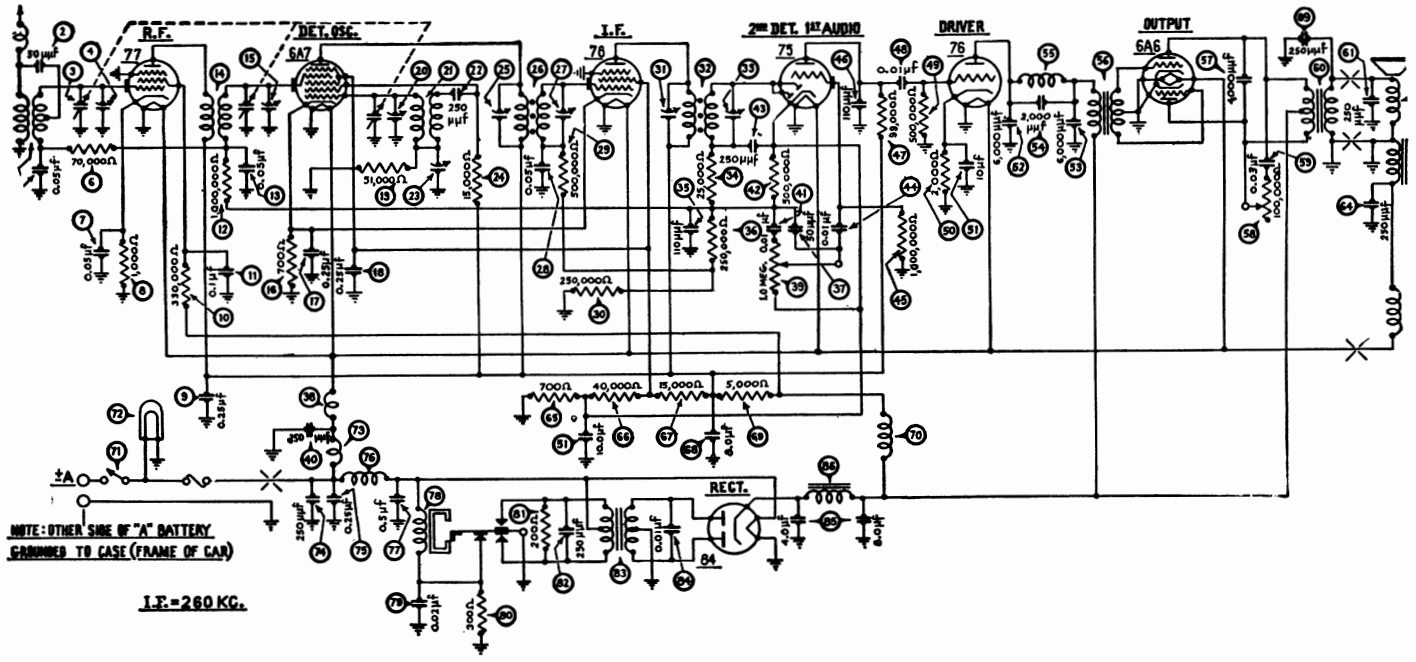
MODEL 806 PARTS LIST

No. Shown on Schematic	Description	Part No.
(1)	Antenna Transformer	32-1618
(2)	Condenser (50 mmfd.)	4587
(3)	Tuning Condenser	31-1483
(4)	First Padder (on tun. cond.)	
(5)	Resistor (70,000 ohms)	33-1115
(6)	Condenser (.05 mfd.)	30-4020
(7)	Condenser (.5 mfd.)	30-4227
(8)	Resistor (600 ohms)	33-3209
(9)	R. F. Transformer	32-1619
(10)	Second Padder (on tun. cond.)	
(11)	Resistor (1,000,000 ohms)	33-1096
(12)	Condenser (.05 mfd.)	30-4020
(13)	Resistor (51,000 ohms)	6098
(14)	Third Padder (on tun. cond.)	
(15)	Oscillator Transformer	32-1620
(16)	Fourth Padder (on tun. cond.)	
(17)	Condenser (250 mmfd.)	30-1032
(18)	Resistor (51,000 ohms)	33-1163
(19)	Padder (Pri. 1st I. F. Tran.)	
(20)	First I. F. Transformer	32-1621
(21)	Padder (Sec. 1st I. F. Tran.)	
(22)	Condenser (250 mmfd.)	30-1032
(23)	Padder (Pri. 2nd I. F. Tran.)	
(24)	Second I. F. Transformer	32-1622
(25)	Padder (Sec. 2nd I. F. Tran.)	
(26)	Condenser (250 mmfd.)	30-1032
(27)	Resistor (25,000 ohms)	33-1013
(28)	Condenser (110 mmfd.)	30-1031
(29)	Condenser (.03 mfd.)	30-4025
(30)	Vol. Con. & Coupling Assm.	38-6605
(31)	Resistor (20,000 ohms)	33-1178
(32)	Condenser (.01 mfd.)	30-4169
(33)	Condenser (.25 mfd.)	30-4134
(34)	Resistor (32,000 ohms)	3525
(35)	Condenser (.05 mfd.)	30-4020
(36)	Resistor (20,000 ohms)	6650
(37)	Resistor (600 ohms)	33-3207
(38)	Resistor (2,000,000 ohms)	33-1025
(39)	Resistor (250,000 ohms)	33-1097
(40)	Resistor (250,000 ohms)	33-1097
(41)	Condenser (.1 mfd.)	30-4122
(42)	Resistor (500,000 ohms)	6097
(43)	Condenser (.01 mfd.)	30-4145
(44)	Condenser (250 mmfd.)	30-1032

No. Shown on Schematic	Description	Part No.
(45)	Condenser (4000 mmfd.)	30-4185
(46)	Tone Control	33-5101
(47)	Condenser (.05 mfd.)	30-4012
(48)	Output Transformer	32-7019
(49)	Cone & Voice Coil	36-3406
(50)	Field-coil Assembly	36-3405
(51)	"On" & "Off" Switch Assm.	42-5336
(52)	Pilot Lamp	34-2039
(53)	Condenser (250 mmfd.)	30-1032
(54)	"A" Choke	32-1644
(55)	Condenser (.25 mfd.)	30-4146
(56)	Vibrator Choke	32-1625
(57)	Condenser (.5 mfd.)	30-4227
(58)	Vibrator	38-5036
(59)	Condenser (.02 mfd.)	30-4039
(60)	Resistor (300 ohms)	33-3010
(61)	Resistor (200 ohms)	7217
(62)	Condenser (1250 mmfd.)	5886
(63)	Power Transformers	32-7352
(64)	Condenser (.01 mfd.)	30-4051
(65)	Filter Choke	32-7351
(66)	Filter Condenser	30-2109
(67)	R. F. Choke	32-1348
(68)	Condenser (250 mmfd.)	30-1032
	Control Assembly	42-5331
	Glass and Dial	27-7835
	Pointer Assembly	42-5335
	Bezel Plate	28-7108
	Knobs	27-4187
	Control Mounting Bracket	29-2773
	Keys	28-2782
	Studs (Set Mtg.)	28-6272
	Nuts (Set Mtg.)	W98A
	Spark Plug Resistors	33-1195
	Distributor Resistor	33-1196
	Interference Condensers	30-4007
	Fuse	7227
	Fuse Insulator	27-7729
	Antenna Lead	38-5131
	Flexible Shaft (21")	28-8354
	Flexible Shaft (28")	28-8355
	Lock Cylinder Assembly	42-5337
	28" Shaft Kit	45-1133

PHILCO RADIO & TELEVISION CORP.

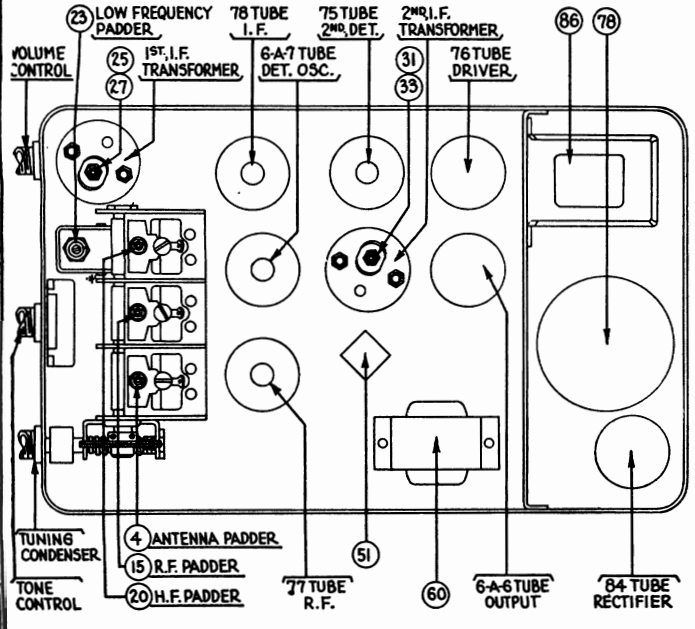
MODEL 808



All adjustments have been carefully checked at the factory. If, however, it is found necessary to readjust the padding condensers, this procedure must be followed carefully. Do not attempt to make any adjustments until the procedure is clearly understood or without the use of a good oscillator or signal generator and output meter. The PHILCO SET TESTER 048 is highly recommended for this procedure and for all service work.

The Receiver must be connected to a six-volt storage battery and set up for operation. It is assumed that tubes have been checked and that the Receiver is in good condition except for the padding adjustments.

Remove the cover from the Receiver and disconnect the grid clip from the 78 tube, I. F. stage.



Set up the signal generator and adjust it to exactly 260 K. C. Connect the generator lead to the grid cap of the 78 tube, and ground the shield to the Receiver housing.

Connect one lead from the output meter to the plate of the output tube and the other lead to the Receiver housing. The Receiver volume control must be turned to approximately full volume, and the attenuator in the generator set for a half-scale reading of the output meter.

1. The secondary nut padder (33) must be adjusted for maximum reading in the output meter. Then adjust the primary screw padder (31) for maximum reading.

2. Remove the generator lead from the 78 tube and reconnect the grid clip.

3. Disconnect the grid clip from the 6A7 tube and connect the generator lead to the grid cap of this tube. The secondary nut padder (27) must be adjusted for maximum reading in the output meter. Then adjust the primary screw padder (25) for maximum reading.

4. After padding the first I. F. stage remove the generator lead from the 6A7 tube and reconnect the grid clip. Adjust the generator to 1600 K. C. and then connect the generator lead to the antenna lead, using a 150 mmfd. condenser in series between the two leads, ground the shield to the Receiver housing.

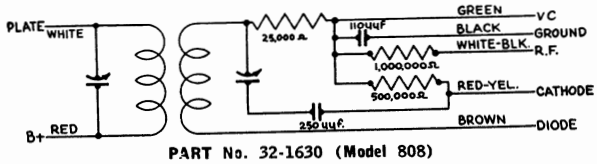
5. Turn the tuning condenser out of mesh as far as it will go. With the tuning condenser in this position adjust the high frequency padder (20) until the maximum reading is obtained in the output meter. This is the true setting for 1600 K. C. 160 on the dial scale. Adjust the padders (15) and (4) in the same manner.

6. Turn the tuning condenser plates in mesh to approximately 580 on the dial scale and adjust the signal generator to 580 K. C. Roll the tuning condenser and adjust the series padder (23) for maximum reading.

7. Readjust padder (20) at 1600 K. C.

8. Turn the condenser to 1400 K. C. and adjust the padders (15) and (4) for maximum reading.

If this procedure has been carefully followed and an accurately calibrated oscillator or signal generator has been used, the Receiver will be adjusted properly.



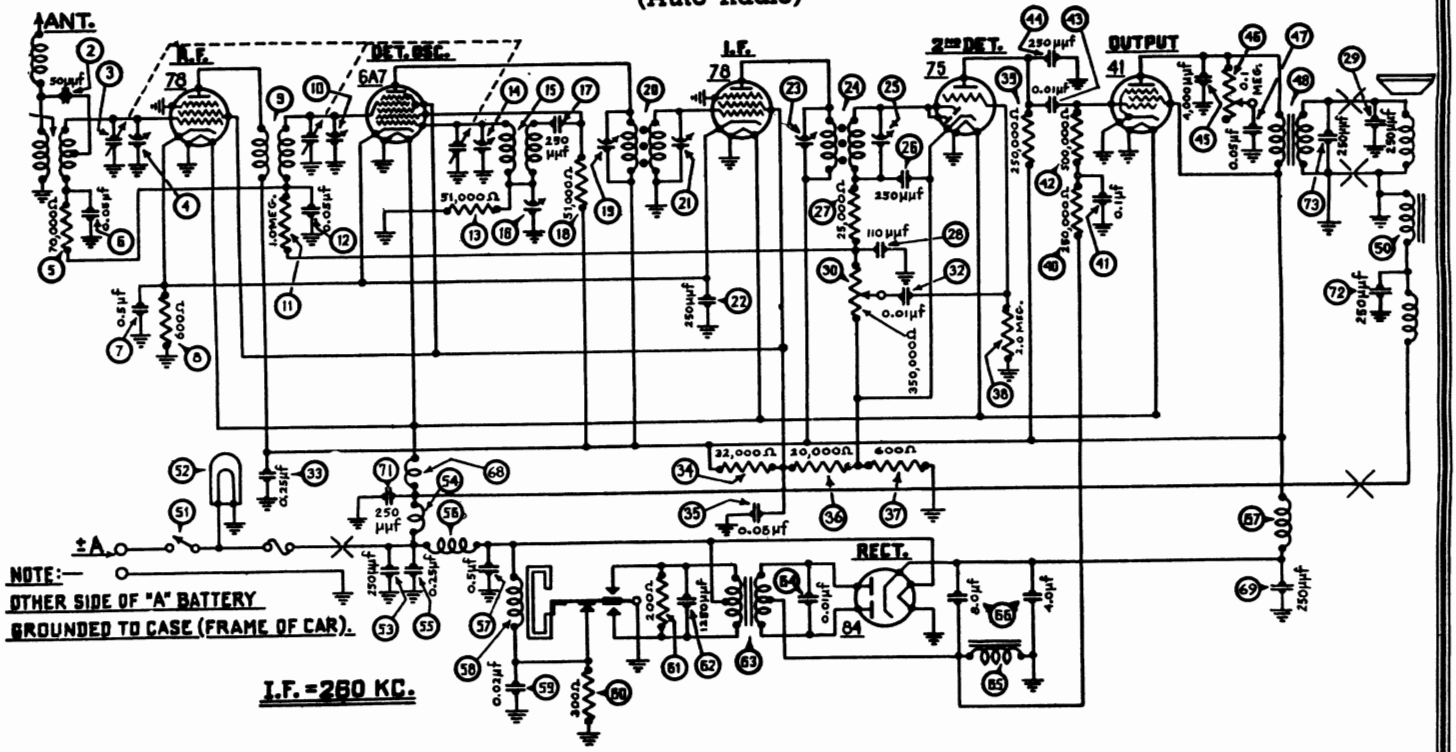
PART No. 32-1630 (Model 808)

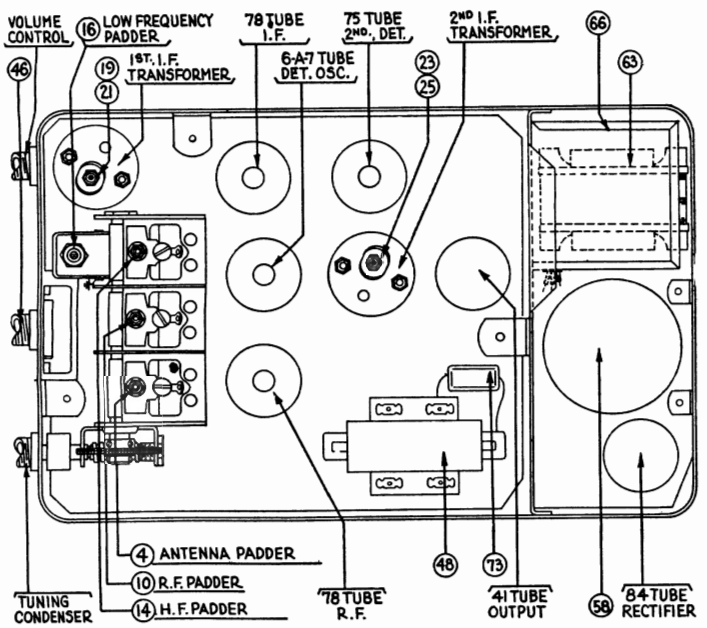
2nd I. F. Transformer

PHILCO RADIO & TELEVISION CORP.

MODEL 809

(Auto Radio)





Adjustments for the Model 809 are practically the same as for the Model 808.

In step 1 — adjust the secondary nut padder (25) and the primary screw padder (23)

In step 3 — adjust the secondary nut padders (21) and the primary screw padder (19)

In step 5 — adjust padders (14), (10) and (4)

In step 6 — adjust padder (16)

In step 7 — adjust padder (14)

In step 8 — adjust padders (10) and (4).

PARTS LIST

(1)	Antenna Transformer	32-1618	
(2)	Condenser (50 mmfd.)	4587	
(3)	Tuning Condenser	31-1483	
(4)	First Padder (on tun. cond.)		
(5)	Resistor (70,000 ohms)	33-1115	
(6)	Condenser (.05 mfd.)	30-4020	
(7)	Condenser (.5 mfd.)	30-4227	
(8)	Resistor (600 ohms)	33-3209	
(9)	R. F. Transformer	32-1619	
(10)	Second Padder (on tun. cond.)		
(11)	Resistor (1,000,000 ohms)	33-1096	
(12)	Condenser (.05 mfd.)	30-4020	
(13)	Resistor (51,000 ohms)	6098	
(14)	Third Padder (on tun. cond.)		
(15)	Oscillator Transformer	32-1620	
(16)	Fourth Padder (on tun. cond.)		
(17)	Condenser (250 mmfd.)	30-1032	
(18)	Resistor (51,000 ohms)	33-1163	
(19)	Padder (Pri. 1st I. F. Tran.)		
(20)	First I. F. Transformer	32-1621	
(21)	Padder (Sec. 1st I. F. Tran.)		
(22)	Condenser (250 mmfd.)	30-1032	
(23)	Padder (Pri. 2nd I. F. Tran.)		
(24)	Second I. F. Transformer	32-1622	
(25)	Padder (Sec. 2nd I. F. Tran.)		
(26)	Condenser (250 mmfd.)	30-1032	
(27)	Resistor (25,000 ohms)	33-1013	
(28)	Condenser (110 mmfd.)	30-1031	
(29)	Condenser (250 mmfd.)	30-1032	
(30)	Vol. Con. & Coupling Assm.	38-6605	
(31)	Choke	32-1464	
(32)	Condenser (.01 mfd.)	30-4169	
(33)	Condenser (.25 mfd.)	30-4134	
(34)	Resistor (32,000 ohms)	3525	
(35)	Condenser (.05 mfd.)	30-4020	
(36)	Resistor (20,000 ohms)	6650	
(37)	Resistor (600 ohms)	33-3207	
(38)	Resistor (2,000,000 ohms)	33-1025	
(39)	Resistor (250,000 ohms)	33-1097	
(40)	Resistor (250,000 ohms)	33-1097	
(41)	Condenser (.1 mfd.)	30-4122	
(42)	Resistor (500,000 ohms)	6097	
(43)	Condenser (.01 mfd.)	30-4145	
(44)	Condenser (250 mmfd.)	30-1032	
(45)	Condenser (4000 mmfd.)	30-4185	
(46)	Tone Control	33-5101	
(47)	Condenser (.05 mfd.)	30-4012	
(48)	Output Transformer	2598	
(49)	Cone & Voice Coil	36-3159	
(50)	Field-coil Assembly	02795	
(51)	"On"&"Off" Switch Assm.	42-5336	
(52)	Pilot Lamp	34-2039	
(53)	Condenser (250 mmfd.)	30-1032	
(54)	"A" Choke	32-1644	
(55)	Condenser (.25 mfd.)	30-4146	
(56)	Vibrator Choke	32-1377	
(57)	Condenser (.5 mfd.)	30-4227	
(58)	Vibrator	38-5036	
(59)	Condenser (.02 mfd.)	30-4039	
(60)	Resistor (300 ohms)	33-3010	
(61)	Resistor (200 ohms)	7217	
(62)	Condenser (1250 mmfd.)	5886	
(63)	Power Transformer	32-7352	
(64)	Condenser (.01 mfd.)	30-4051	
(65)	Filter Choke	32-7351	
(66)	Filter Condenser	30-2109	
(67)	R. F. Choke	32-1348	
(68)	"A" Choke	32-1438	
(69)	Condenser (250 mmfd.)	30-1032	
(70)	Antenna Choke	32-1637	
(71)	Condenser (250 mmfd.)	30-1032	
(72)	Condenser (250 mmfd.)	30-1032	
(73)	Condenser (250 mmfd.)	30-1032	
	Control Assembly	42-5332	
	Glass and Dial	27-7835	
	Pointer Assembly	42-5335	
	Bezel Plate	28-7108	
	Knobs (Tuning-Volume)	27-4187	
	Knob (Tone Control)	27-4052	
	Stud (Spker Mtg.)	6122	
	Control Mounting Bracket	29-2773	
	Keys	28-2782	
	Studs (Set Mtg.)	28-6298	
	Nuts (Set Mtg.)	W98A	
	Spark Plug Resistors	33-1195	
	Distributor Resistor	33-1196	
	Interference Condensers	30-4007	
	Fuse	7217	
	Fuse Insulator	27-7729	
	Antenna Lead	38-5131	
	Flexible Shaft (21")	28-8354	
	Flexible Shaft (28")	28-8355	
	Tone Control Shaft (21")	28-8356	
	Tone Control Shaft (28")	28-8358	
	Lock Cylinder Assembly	42-5337	
	28" Shaft Kit	45-1133	

PHILCO RADIO & TELEVISION CORP.

MODEL 816 RECEIVER

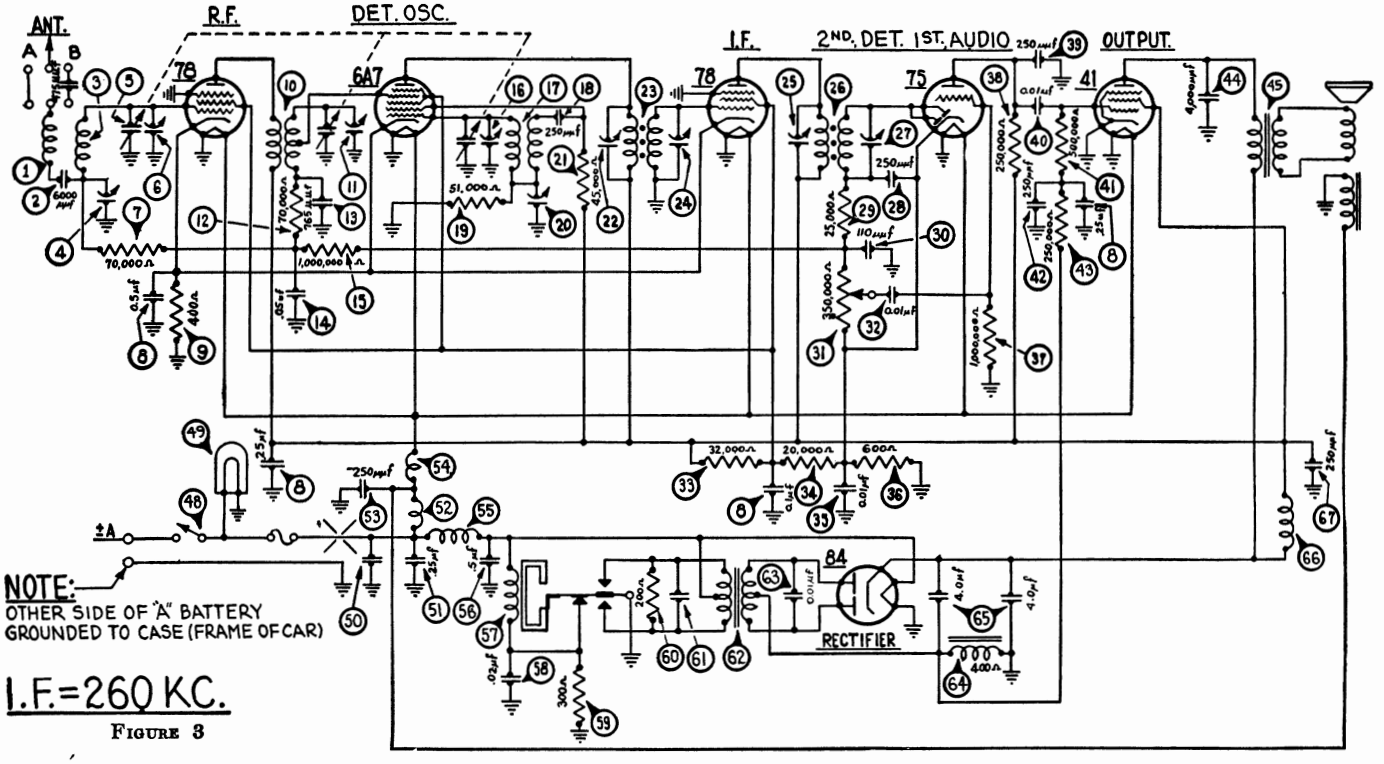


FIGURE 3

ADJUSTMENTS

I. F.—Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube (without removing the grid cap) in series with a .1 mfd. condenser.

Adjust the secondary screw padder (27) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (25) for maximum reading. (See Figure 2 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube (without removing the grid cap) in series with a .1 mfd. condenser. Adjust the secondary screw padder (24) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (22) for maximum reading. (See Figure 2 for location of padders).

HIGH FREQUENCY AND R. F.—After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube (without removing the grid cap) in series with a .1 mfd. condenser.

Turn the tuning condenser plates out of mesh as far as they will go. With the tuning condenser in this position, adjust the high frequency padder (16) and the R. F. padder (11) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

LOW FREQUENCY—Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw (20) for maximum reading on the output meter.

HIGH FREQUENCY RE-ADJUSTMENT—Turn the tuning condenser plates out of mesh as far as they will go and set the signal generator at 1550 K. C. Then adjust the high frequency padder (16) again for maximum reading on the output meter.

ANTENNA—Connect the generator lead to the antenna cable assembly (made up of Part No. L1915 loom, 1-27-7133 terminal and 40 inches of 16 strand No. 30 wire), using a 200 mmfd. condenser in series between the two leads. Place the connector plug in the antenna socket on the Receiver. Plug the cable into the antenna socket.

Turn the tuning condenser in mesh to 580 K. C., and adjust the signal generator for 580 K. C. Adjust the Antenna coupling condenser (4) for maximum reading.

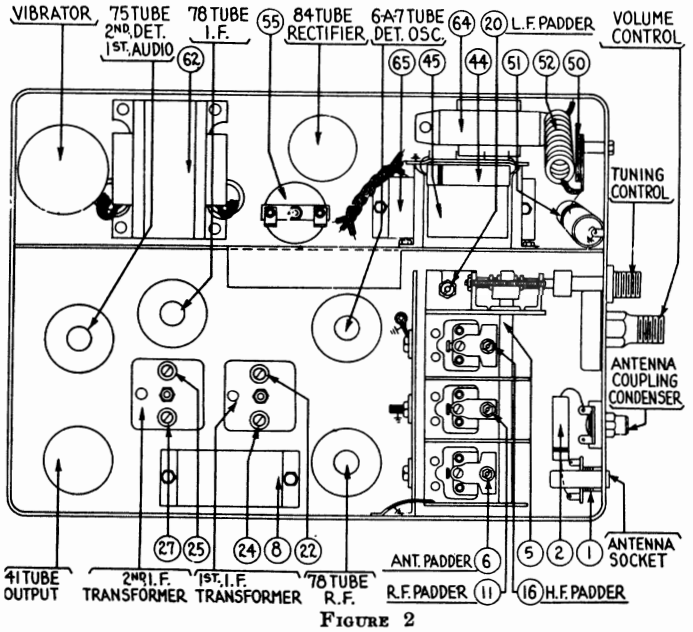
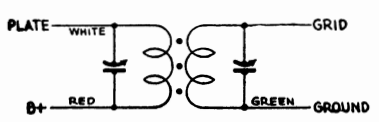


FIGURE 2

Turn the tuning condenser to 1400 K. C. and set the generator for 1400 K. C. Adjust the padders (11) and (6) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. The signal generator output lead should be connected to a wire placed near the car antenna but not connected to it.

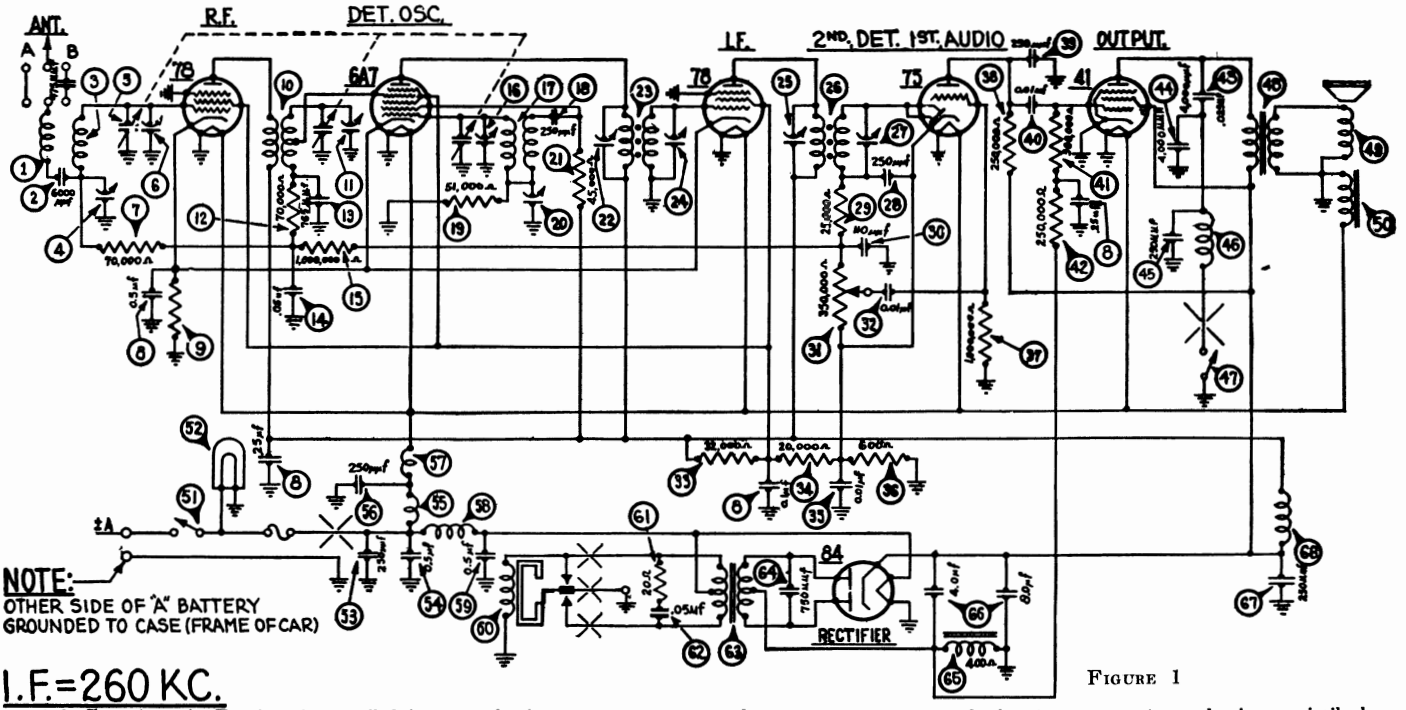
When installing the radio in a car, follow the installation instructions carefully. The correct connector must be used in the antenna lead connector in the Receiver and the antenna coupling condenser must be adjusted to the car antenna.



Color Code of I. F. Transformers

PHILCO RADIO & TELEVISION CORP.

MODEL 817 RECEIVER



I.F.=260 KC.

FIGURE 1

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similarly low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A."

When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B."

MODEL 817 — PARTS LIST

No.	Description	Part No.
①	Antenna Choke	38-7516
②	Condenser (6,000 mmfd.)	30-4125
③	Antenna Transformer	32-1984
④	Antenna Coupling Condenser	31-6082
⑤	Tuning Condenser	31-1769
⑥	First Padder (on tun. cond.)	
⑦	Resistor (70,000 ohms)	33-370334
⑧	Condenser (.1-.25-.25-.5 mfd.)	30-4415
⑨	Resistor (450 ohms)	33-1218
⑩	R. F. Transformer	32-1985
⑪	Second Padder (on tun. cond.)	
⑫	Resistor (70,000 ohms)	33-370334
⑬	Condenser (765 mmfd.)	30-1069
⑭	Condenser (.05 mfd.)	3615-OSG
⑮	Resistor (1,000,000 ohms)	33-510344
⑯	Third Padder (on tun. cond.)	
⑰	Oscillator Transformer	32-1986
⑱	Condenser (250 mmfd.)	30-1032
⑲	Resistor (51,000 ohms)	33-351344
⑳	Low Frequency Padder	31-6083
㉑	Resistor (45,000 ohms)	33-345344
㉒	Padder (Pri. 1st I. F. Trans.)	
㉓	First I. F. Transformer	32-2026
㉔	Padder (Sec. 1st I. F. Trans.)	
㉕	Padder (Pri. 2nd I. F. Trans.)	
㉖	Second I. F. Transformer	32-2027
㉗	Padder (Sec. 2nd I. F. Trans.)	
㉘	Condenser (250 mmfd.)	30-1032
㉙	Resistor (25,000 ohms)	33-325344
㉚	Condenser (110 mmfd.)	30-1031
㉛	Volume Control (350,000 ohms)	33-5148
㉜	Condenser (.01 mfd.)	3903-OSU
㉝	Resistor (32,000 ohms)	33-332434
㉞	Resistor (20,000 ohms)	33-320334
㉟	Condenser (.01 mfd.)	3903-OSG
㊱	Resistor (600 ohms)	33-1212
㊲	Resistor (1,000,000 ohms)	33-510344
㊳	Resistor (250,000 ohms)	33-424344
㊴	Condenser (250 mmfd.)	30-1032
㊵	Condenser (.01 mfd.)	3903-OSU
㊶	Resistor (500,000 ohms)	33-449344
㊷	Resistor (250,000 ohms)	33-424344
㊸	Condenser (.025 mfd.)	7653-OSU
㊹	Condenser (4000 mmfd.)	30-4185
㊺	Condenser (250 mmfd.)	30-1032
㊻	Choke	32-2063
㊼	Tone Control Switch	42-1160
㊽	Output Transformer	32-7495
㊾	Cone and Voice Coil	36-3586
㊿	Field Coil Assembly	36-3597
(51)	"On and Off Switch"	42-1160
(52)	Pilot Lamp	34-2039
(53)	Condenser (250 mmfd.)	30-1032
(54)	Condenser (.5 mfd.)	30-4015
(55)	"A" Choke	32-1432
(56)	Condenser (250 mmfd.)	30-1032
(57)	Filament Choke	32-2038
(58)	Vibrator Choke	32-2039
(59)	Condenser (.5 mfd.)	30-4015
(60)	Vibrator	41-3170D
(61)	Resistor (20 ohms)	33-020133
(62)	Condenser (.05 mfd.)	30-4020S
(63)	Power Transformer	32-7550
(64)	Condenser (750 mmfd.)	30-4420
(65)	Filter Choke	32-7545
(66)	Filter Condenser (4-8 mfd.)	30-2150
(67)	Condenser (250 mmfd.)	30-1032
(68)	"B" Choke	32-1281
	Four Prong Socket	27-6044
	Five Prong Socket	27-6035
	Six Prong Socket	27-6036
	Seven Prong Socket	27-6037
	Control Assembly (817)	42-5536
	Bracket (Control Mtg.)	29-3711
	Knob	27-4288
	Condenser Connector	30-4412
	Connector Plug	29-6423
	Insulator	27-8199
	Fuse	7227
	Fuse Insulator	27-7729
	"Tee" Bolt (Rec. Mtg.)	28-6161
	Nut (Rec. Mtg.)	W518A
	Speaker (Model CB)	36-1203
	Pilot Lamp Assembly	38-7213
	Dial Assembly	42-5539
	Tuning and Volume Shaft	28-8495
	Distributor Resistor	33-1196
	Interference Condenser	30-4007

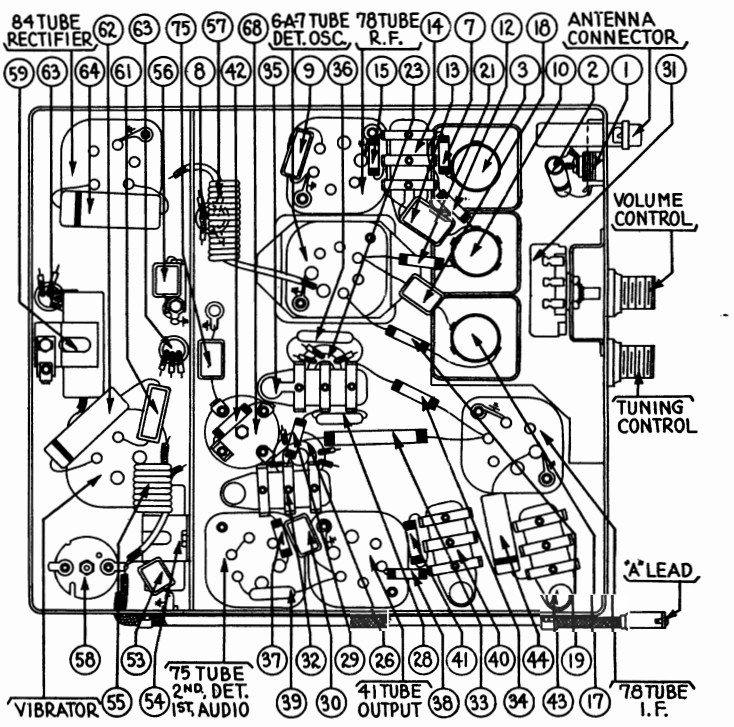


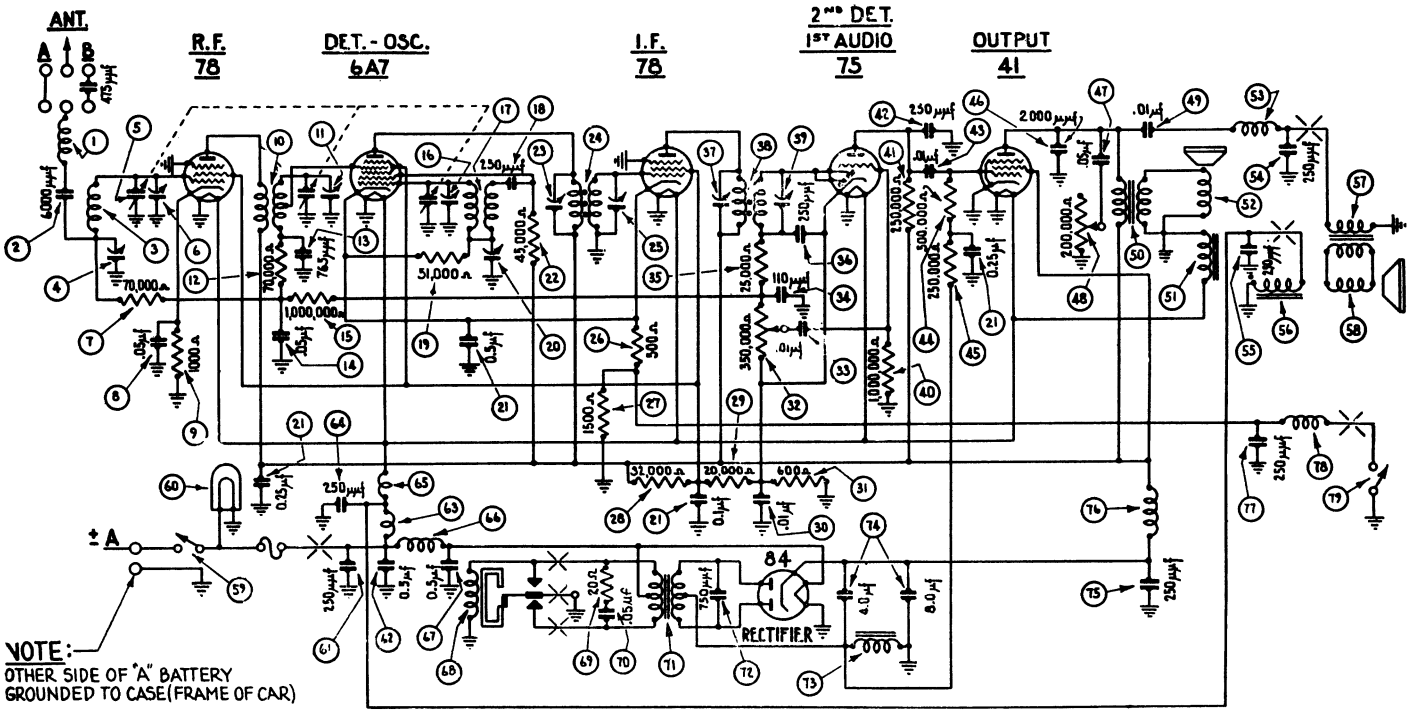
FIGURE 2

Antenna Loom Assembly	41-3191	Knob (817P)	27-4299
Scale Assembly (817B-C)	42-5570	Knob (817B-C)	27-4288
Scale Assembly (817P)	42-5540	Knob Base	28-3698

The Model 817 Receiver is furnished with the new streamline "wide vision" control which can be installed on the edge of the instrument board. This control unit is exceptionally attractive and is designed to blend harmoniously with the instrument boards of practically all cars. The circuit and layout of the Models 817B-817C and 817P Receivers are the same as the Model 817. However, these Receivers are equipped with a special "customed" control unit which matches the instrument board fittings, and is designed for installation in the space provided for radio control in the instrument board of the 1936 Buick, Chevrolet and Pontiac cars.

PHILCO RADIO & TELEVISION CORP.

MODEL 818 RECEIVER



I F = 260 K.C.

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similarly low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".

When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

MODEL 818 — PARTS LIST

No.	Description	Part No.
①	Antenna Choke	38-7516
②	Condenser (6000 mmfd.)	30-4125S
③	Antenna Transformer	32-1984
④	Antenna Coupling Condenser	31-6082
⑤	Tuning Condenser	31-1769
⑥	First Padder (on tun. cond.)	
⑦	Resistor (70,000 ohms)	33-370334
⑧	Condenser (.05 mfd.)	30-4020
⑨	Resistor (1000 ohms)	33-3017
⑩	R. F. Transformer	32-1985
⑪	Second Padder (on tun. cond.)	
⑫	Resistor (70,000 ohms)	33-370334
⑬	Condenser (765 mmfd.)	30-1069
⑭	Condenser (.05 mfd.)	3615-OSG
⑮	Resistor (1,000,000 ohms)	33-510344
⑯	Third Padder (on tun. cond.)	
⑰	Oscillator Transformer	32-1986
⑱	Condenser (250 mmfd.)	30-1032
⑲	Resistor (51,000 ohms)	33-351344
⑳	Low Frequency Padder	31-6083
㉑	Condenser (.1-.25-.25-.5 mfd.)	30-4415
㉒	Resistor (45,000 ohms)	33-345344
㉓	Padder (Pri. 1st I. F. Trans.)	
㉔	First I. F. Transformer	32-2026
㉕	Padder (Sec. 1st I. F. Trans.)	
㉖	Resistor (500 ohms)	33-1213
㉗	Resistor (1500 ohms)	33-215334
㉘	Resistor (32,000 ohms)	33-332434
㉙	Resistor (20,000 ohms)	33-320334
㉚	Condenser (.01 mfd.)	3903-OSG
㉛	Resistor (600 ohms)	33-1212
㉜	Volume Control (350,000 ohms)	33-5149
㉝	Condenser (.01 mfd.)	3903-OSU
㉞	Condenser (110 mmfd.)	30-1031
㉟	Resistor (25,000 ohms)	33-325344
㊱	Condenser (250 mmfd.)	30-1032
㊲	Padder (Pri. 2nd I. F. Trans.)	
㊳	Second I. F. Transformer	32-2027
㊴	Padder (Sec. 2nd I. F. Trans.)	
㊵	Resistor (1,000,000 ohms)	33-510344
㊶	Resistor (250,000 ohms)	33-424344
㊷	Condenser (250 mmfd.)	30-1032
㊸	Condenser (.01 mfd.)	3903-OSU
㊹	Resistor (500,000 ohms)	33-449344
㊺	Resistor (250,000 ohms)	33-424344
㊻	Condenser (2000 mmfd.)	30-4177
㊼	Condenser (.05 mfd.)	8326-OSU
㊽	Tone Control (200,000 ohms)	33-5150
㊾	Condenser (.01 mfd.)	30-4381
㊿	Output Transformer	32-7495
(51)	Field Coil Assembly	36-3597
(52)	Cone and Voice Coil	36-3586
(53)	Choke	32-1930
(54)	Condenser (250 mmfd.)	30-1032
(55)	Condenser (250 mmfd.)	30-1032
(56)	Field Coil Assembly (overhead speaker)	32-9236
(57)	Output Transformer (overhead speaker)	32-7507
(58)	Cone and Voice Coil (overhead speaker)	36-3526
(59)	"On-Off" Switch	42-1160
(60)	Pilot Lamp	34-2039
(61)	Condenser (250 mmfd.)	30-1032
(62)	Condenser (.5 mfd.)	30-4015
(63)	"A" Choke	32-1432
(64)	Condenser (250 mmfd.)	30-1032
(65)	Filament Choke	32-2038
(66)	Vibrator Choke	32-2039
(67)	Condenser (.5 mfd.)	30-4015
(68)	Vibrator	41-3170D
(69)	Resistor (20 ohms)	33-020133
(70)	Condenser (.05 mfd.)	30-4020
(71)	Power Transformer	32-7550
(72)	Condenser (750 mmfd.)	30-4420
(73)	Filter Choke	32-7545
(74)	Filter Condenser (4-8 mfd.)	30-2150
(75)	Condenser (250 mmfd.)	30-1032
(76)	"B" Choke	32-1281
(77)	Condenser (250 mmfd.)	30-1032
(78)	Choke	32-2063
(79)	Local-Distance Switch	42-1160
	Four Prong Socket	27-6044
	Five Prong Socket	27-6035
	Six Prong Socket	27-6036
	Seven Prong Socket	27-6037
	CB Speaker	36-1203
	Idler Gear	28-7176
	Pinion Gear	28-7178
	Control Assembly	42-5537
	Tuning Control Shaft	28-8495
	Volume Control Shaft	28-8499
	Pilot Lamp Assembly	38-7213
	Tuning and Volume Knob	27-4288

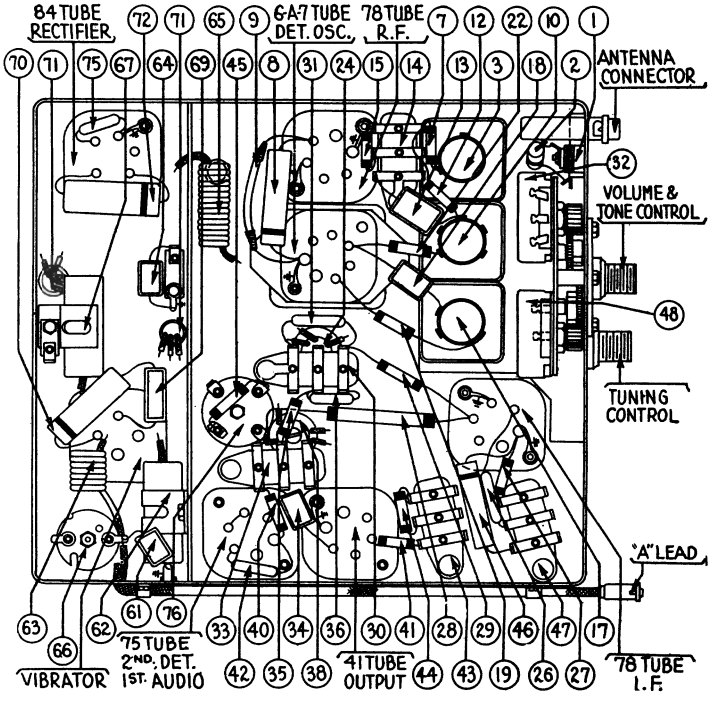
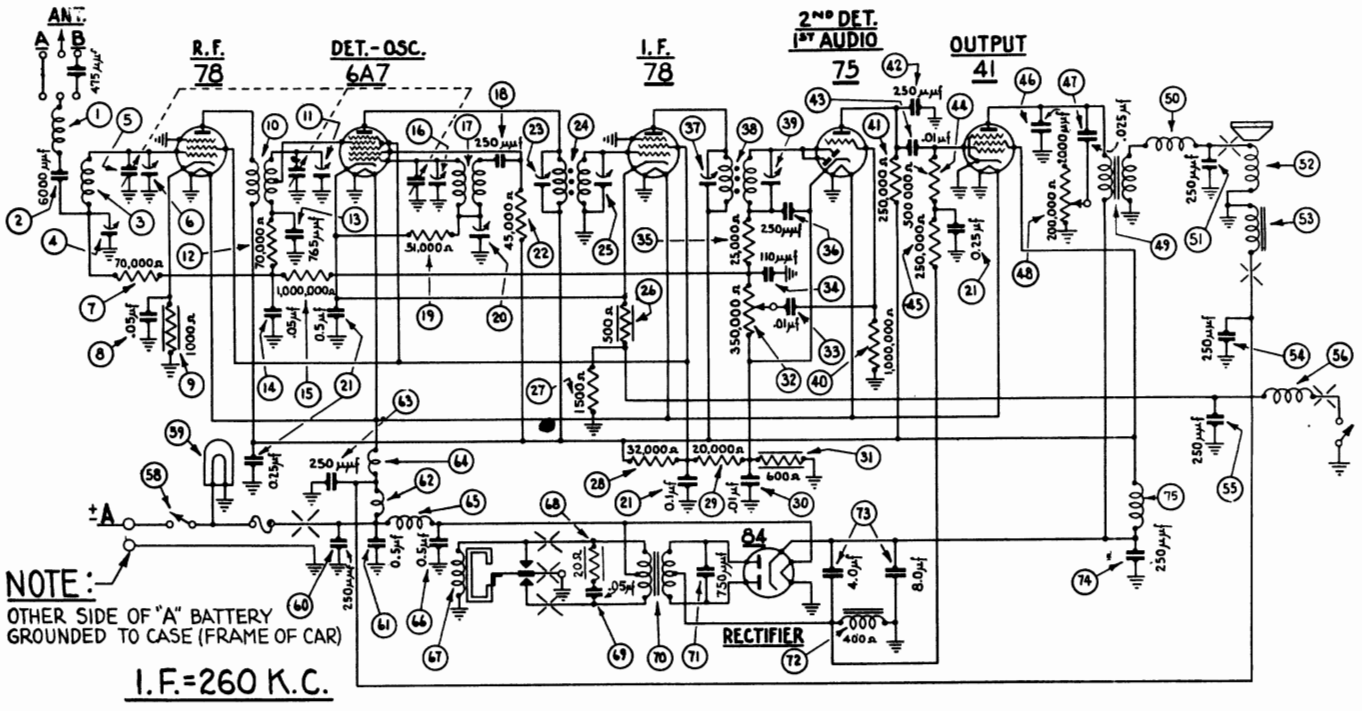


FIGURE 2

No.	Description	Part No.
	Speaker Cable Assembly (overhead speaker)	41-3189
	Distributor Resistor	33-1196
	Interference Cond. (.5 mfd.)	30-4007
	Condenser Connector	30-4412
	Connector Plug	29-6423
	Fuse	7227
	Fuse Insulator	27-7729
	"Tee" Bolt (Rec. Mtg.)	28-6161
	Nut (Rec. Mtg.)	W518A

PHILCO RADIO & TELEVISION CORP.

MODEL 818K RECEIVER



NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similarly low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".

When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B"

MODEL 818K — PARTS LIST

No.	Description	Part No.
1	Antenna Shoke	38-7516
2	Condenser (6000 mmfd.)	30-4125S
3	Antenna Transformer	32-1984
4	Antenna Coupling Condenser	31-6082
5	Tuning Condenser	31-1769
6	First Padder (on tun. cond.)	
7	Resistor (70,000 ohms)	33-370334
8	Condenser (.05 mfd.)	30-4020
9	Resistor (1000 ohms)	33-3017
10	R. F. Transformer	32-1985
11	Second Padder (on tun. cond.)	
12	Resistor (70,000 ohms)	33-370334
13	Condenser (765 mmfd.)	30-1069
14	Condenser (.05 mfd.)	3615-0SG
15	Resistor (1,000,000 ohms)	33-510344
16	Third Padder (on tun. cond.)	
17	Oscillator Transformer	32-1986
18	Condenser (250 mmfd.)	30-1032
19	Resistor (51,000 ohms)	33-351344
20	Low Frequency Padder	31-6083
21	Condenser (.1-.25-.25-.5 mfd.)	30-4415
22	Resistor (45,000 ohms)	33-345344
23	Padder (Pri. 1st I. F. Trans.)	
24	First I. F. Transformer	32-2026
25	Padder (Sec. 1st I. F. Trans.)	
26	Resistor (500 ohms)	33-1213
27	Resistor (1500 ohms)	33-215334
28	Resistor (32,000 ohms)	33-332434
29	Resistor (20,000 ohms)	33-320334
30	Condenser (.01 mfd.)	3903-0SG
31	Resistor (600 ohms)	33-1212
32	Volume Control (350,000 ohms)	33-5149
33	Condenser (.01 mfd.)	3903-0SU
34	Condenser (110 mmfd.)	30-1031
35	Resistor (25,000 ohms)	33-325344
36	Condenser (250 mmfd.)	30-1032
37	Padder (Pri. 2nd I. F. Trans.)	
38	Second I. F. Transformer	32-2027
39	Padder (Sec. 2nd I. F. Trans.)	
40	Resistor (1,000,000 ohms)	33-510344
41	Resistor (250,000 ohms)	33-424344
42	Condenser (250 mmfd.)	30-1032
43	Condenser (.01 mfd.)	3903-0SU
44	Resistor (500,000 ohms)	33-449344
45	Resistor (250,000 ohms)	33-424344
46	Condenser (2000 mmfd.)	30-4177
47	Condenser (.025 mfd.)	7653-0SU
48	Tone Control (200,000 ohms)	33-5150
49	Output Transformer	32-7562
50	Choke	32-2038
51	Condenser (250 mmfd.)	30-1032
52	Cone and Voice Coil	36-3159
53	Field Coil Assembly	02795
54	Condenser (250 mmfd.)	30-1032
55	Condenser (250 mmfd.)	30-1032
56	Choke	32-2063
57	Local-Distance Switch	42-1160
58	On and Off Switch	42-1160
59	Pilot Lamp	34-2039
60	Condenser (250 mmfd.)	30-1032
61	Condenser (.5 mfd.)	30-4015
62	"A" Choke	32-1432
63	Condenser (250 mmfd.)	30-1032
64	Filament Choke	32-2038
65	Vibrator Choke	32-2039
66	Condenser (.5 mfd.)	30-4015
67	Vibrator	41-3170D
68	Resistor (20 ohms)	33-020133
69	Condenser (.05 mfd.)	30-4020
70	Power Transformer	32-7550
71	Condenser (750 mmfd.)	30-4420
72	"B" Choke	32-7545P
73	Filter Choke (4-8 mfd.)	30-2150
74	Condenser (250 mmfd.)	30-1032
75	"B" Choke	32-1281
	Four Prong Socket	27-6044
	Five Prong Socket	27-6035
	Six Prong Socket	27-6036
	Seven Prong Socket	27-6037
	Control Assembly	42-5537
	Pilot Lamp Assembly	38-7213
	Tun. and Vol. Knob	27-4288
	Tuning Control Shaft	28-8495
	Volume Control Shaft	28-8499
	Scale Assembly	42-5539
	Distributor Resistor	33-1196
	Intereference Condenser (.5 mfd.)	30-4007
	Condenser Connector	30-4412
	Connector Plug	29-6423
	Fuse	7227
	Fuse Insulator	27-7729
	"Tee" Bolt (Rec. Mtg.)	28-6161
	Nut (Rec. Mtg.)	W518A
	Stud (Speaker Mtg.)	6122

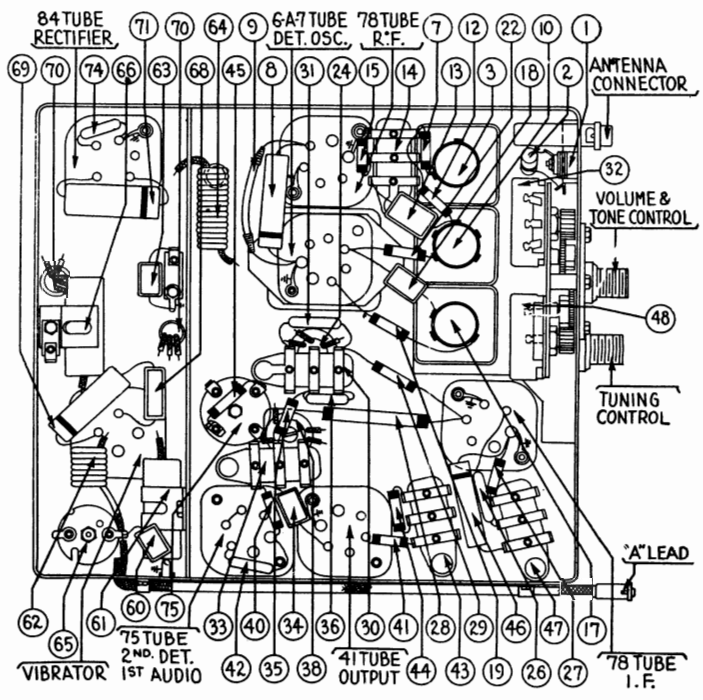
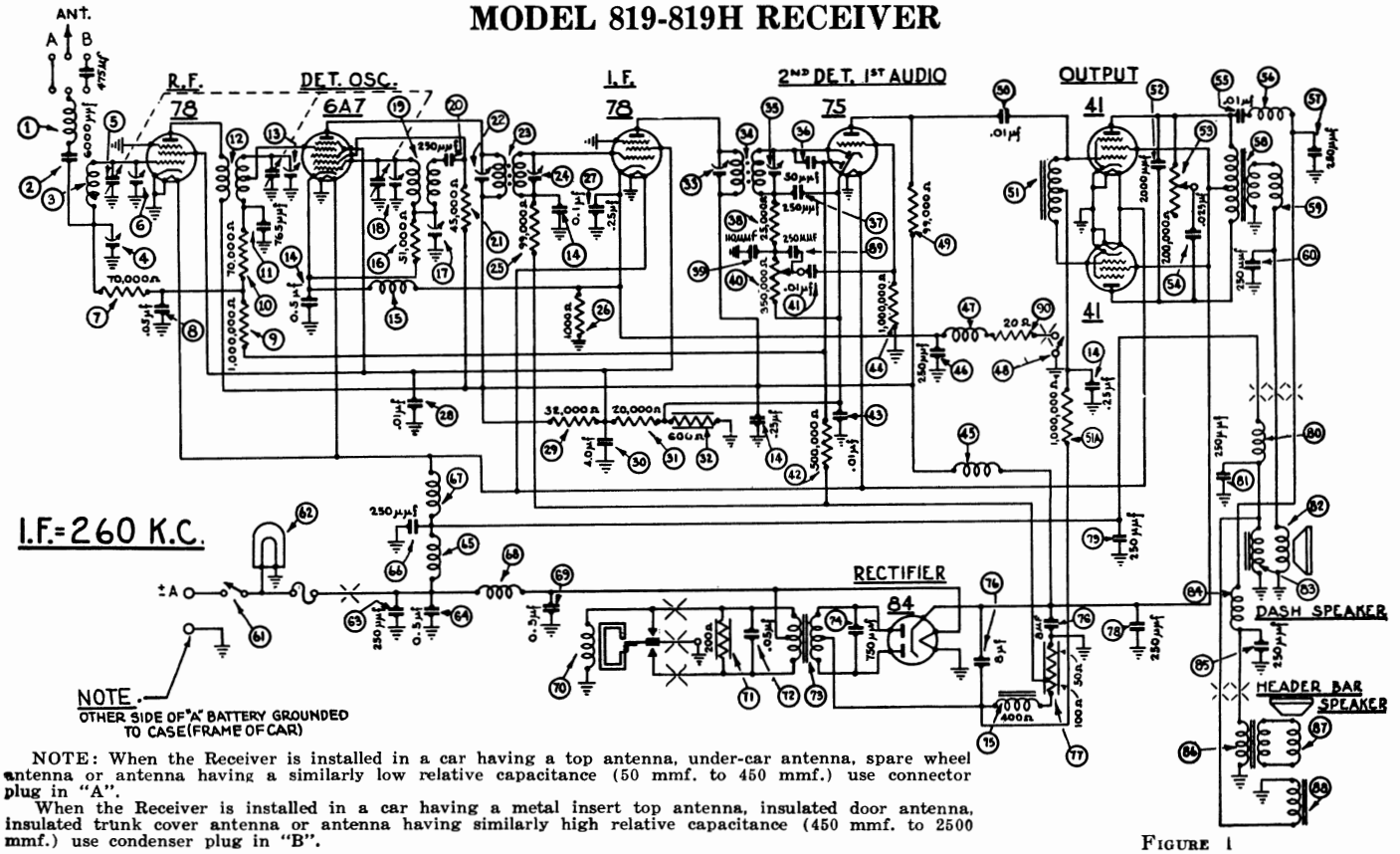


FIGURE 4

No.	Description	Part No.	No.	Description	Part No.
	Nut (Speaker Mtg.)	W55A		Pinion Gear	28-7178
	Idler Gear	28-7176		Complete Speaker A36	36-1206

PHILCO RADIO & TELEVISION CORP.

MODEL 819-819H RECEIVER



NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similarly low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".

When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

FIGURE 1

MODELS 819 AND 819H — PARTS LIST

No.	Description	Part No.
1	Antenna Choke	38-7516
2	Condenser (6000 mmfd.)	30-4125
3	Antenna Transformer	32-1984
4	Antenna Coupling Condenser	31-6082
5	Tuning Condenser	31-1769
6	First Padder (on tun. cond.)	
7	Resistor (70,000 ohms)	33-370334
8	Condenser (.05 mfd.)	3615-0SG
9	Resistor (1,000,000 ohms)	33-510344
10	Resistor (70,000 ohms)	33-370334
11	Condenser (765 mmfd.)	30-1069
12	R. F. Transformer	32-1985
13	Second Padder (on tun. cond.)	
14	Condenser (.1-.25-.25-.5 mfd.)	30-4415
15	Choke	32-2063
16	Resistor (51,000 ohms)	33-351344
17	Low Frequency Padder	31-6083
18	Third Padder (on tun. cond.)	
19	Oscillator Transformer	32-1986
20	Condenser (250 mmfd.)	30-1032
21	Resistor (45,000 ohms)	33-345344
22	Padder (Pri. 1st I. F. Trans.)	
23	First I. F. Transformer	32-2050
24	Padder (Sec. 1st I. F. Trans.)	
25	Resistor (99,000 ohms)	33-399344
26	Resistor (1,000 ohms)	33-210334
27	Condenser (.25 mfd.)	30-4146
28	Condenser (.01 mfd.)	30-4124
29	Resistor (32,000 ohms)	33-332434
30	Condenser (4 mfd.)	30-2151
31	Resistor (20,000 ohms)	33-320334
32	Resistor (600 ohms)	33-1212
33	Padder (Pri. 2nd I. F. Trans.)	
34	Second I. F. Transformer	32-2034
35	Padder (Sec. 2nd I. F. Trans.)	
36	Condenser (50 mmfd.)	30-1029
37	Condenser (250 mmfd.)	30-1032
38	Resistor (25,000 ohms)	33-325344
39	Condenser (110 mmfd.)	30-1031
40	Volume Control (350,000 ohms)	33-5149
41	Condenser (.01 mfd.)	3903-0SU
42	Resistor (500,000 ohms)	33-449344
43	Condenser (.01 mfd.)	3903-0SG
44	Resistor (1,000,000 ohms)	33-510344
45	"B" Choke	32-1281
46	Condenser (250 mmfd.)	30-1032
47	Choke	32-2063
48	Local-Distance Switch	42-1160
49	Resistor (99,000 ohms)	33-399344
50	Condenser (.01 mfd.)	3903-0SU
51	Audio Choke	32-7547
51a	Resistor (1,000,000 ohms)	33-510344
52	Condenser (2000 mmfd.)	30-4177
53	Tone Control (200,000 ohms)	33-5150
54	Condenser (.025 mfd.)	7653-0SU
55	Condenser (.01 mfd.)	30-4381
56	Choke	32-1930
57	Condenser (250 mmfd.)	30-1032
58	Output Transformer	32-7551
59	Choke	32-1930
60	Condenser (250 mmfd.)	30-1032
61	On-Off Switch Assembly	42-1160
62	Pilot Lamp	34-2039
63	Condenser (250 mmfd.)	30-1032
64	Condenser (.5 mfd.)	30-4015
65	"A" Choke	32-1432
66	Condenser (250 mmfd.)	30-1032
67	Filament Choke	32-2038
68	Vibrator Choke	32-2039
69	Condenser (.5 mfd.)	30-4015
70	Vibrator	41-3170D
71	Resistor (200 ohms)	33-1210
72	Condenser (.05 mfd.)	30-4020
73	Power Transformer	32-7550
74	Condenser (750 mmfd.)	30-4420
75	Filter Choke	32-7545
76	Filter Condenser (8-8 mfd.)	30-2152
77	Resistor (100-50 ohms)	33-3238
78	Condenser (250 mmfd.)	30-1032
79	Condenser (250 mmfd.)	30-1032
80	Choke	32-1644
81	Condenser (250 mmfd.)	30-1032
82	Cone and Voice Coil	36-3159
83	Field Coil Assembly	36-3513
84	Choke	32-2038
85	Condenser (250 mmfd.)	30-1032
86	Output Transformer (overhead speaker)	32-7507
87	Cone and Voice Coil (overhead speaker)	36-3526
88	Field Coil Assembly (Overhead Speaker)	32-9236
89	Condenser (250 mmfd.)	30-1032
90	Resistor (20 ohms)	33-020133
	Four Prong Socket	27-6044
	Five Prong Socket	27-6035
	Six Prong Socket	27-6036
	Seven Prong Socket	27-6037
	Idler Gear	28-7176

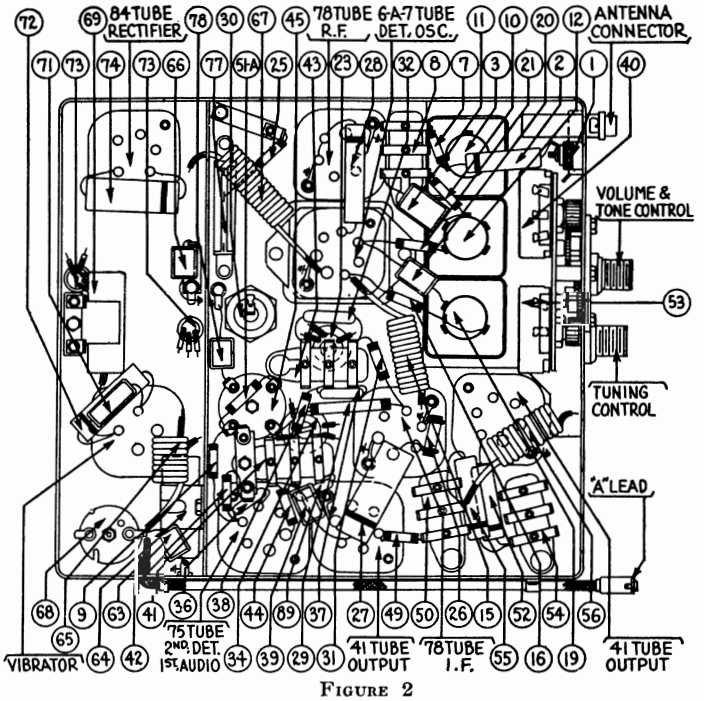
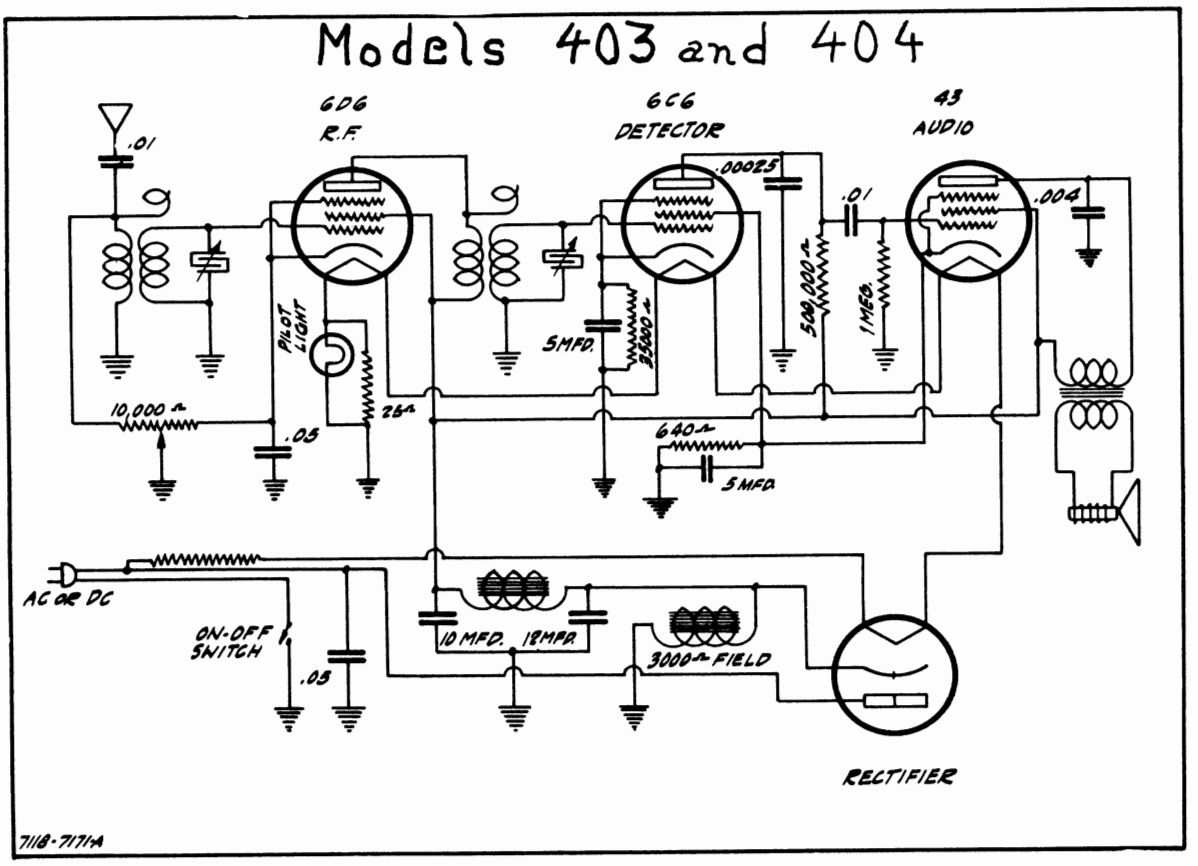


FIGURE 2

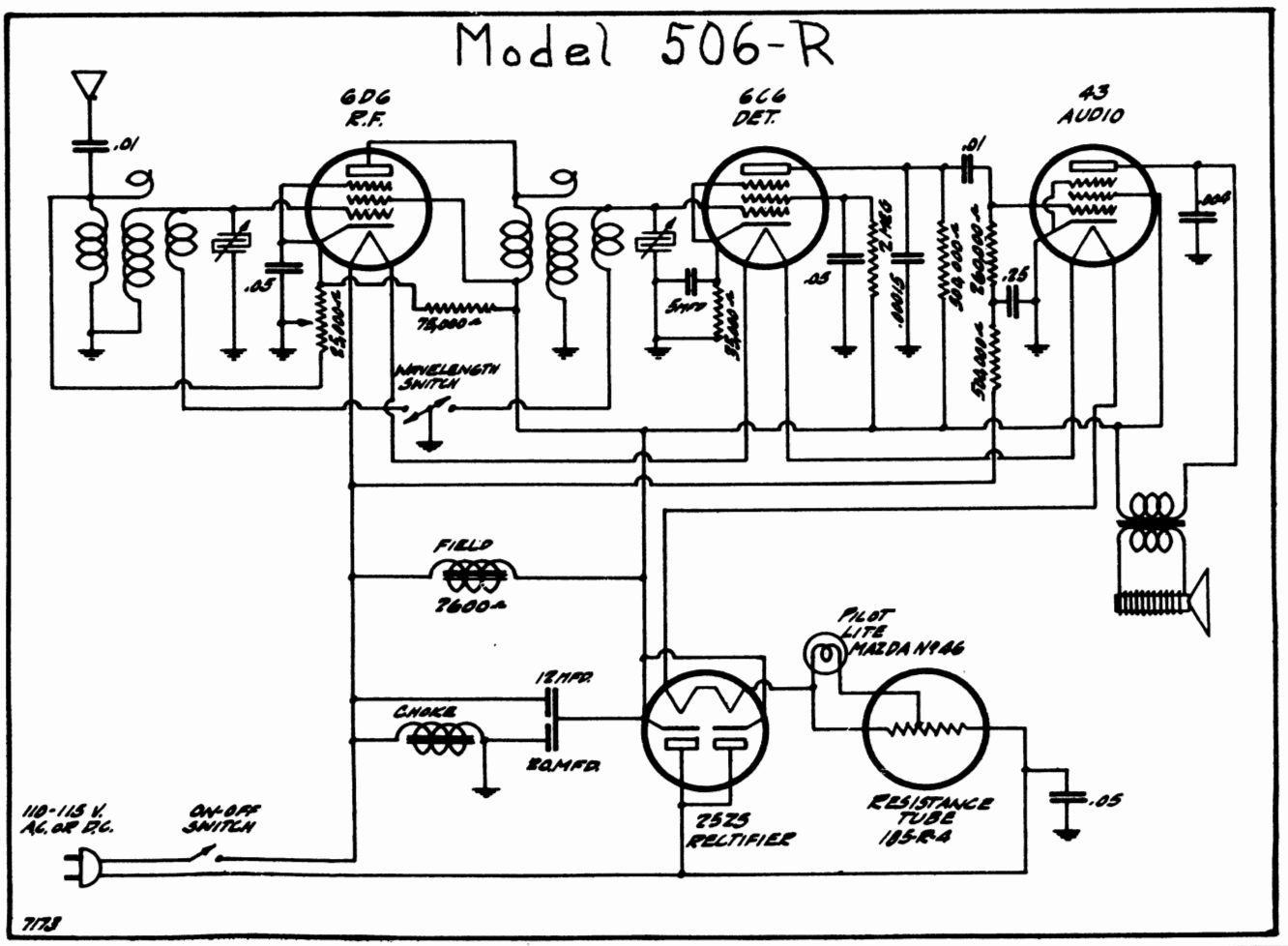
No.	Description	Part No.
	Pinion Gear	28-7178
	Dash Speaker Complete (A37)	36-1207
	Dash Speaker Only	36-1212
	Overhead Speaker (AD)	36-1211
	Control	42-5537
	Pilot Lamp Assembly	38-7213
	Tuning and Volume Knob	27-4288
	Tuning Shaft	28-8495
	Volume Shaft	28-8499
	Scale Assembly	42-5539
	Distributor Resistor	33-1196
	Interference Condenser (.5 mfd.)	30-4007
	Condenser Connector	30-4412
	Connector Plug	29-6423
	Fuse	7227
	Fuse Insulator	27-7729
	"Tee" Bolt (Rec. Mtg.)	28-6161
	Nut (Rec. Mtg.)	W518A
	Stud (Speaker Mtg.)	6122
	Nut (Speaker Mtg.)	W55A

PIERCE AIRO CORP.

Models 403 and 404

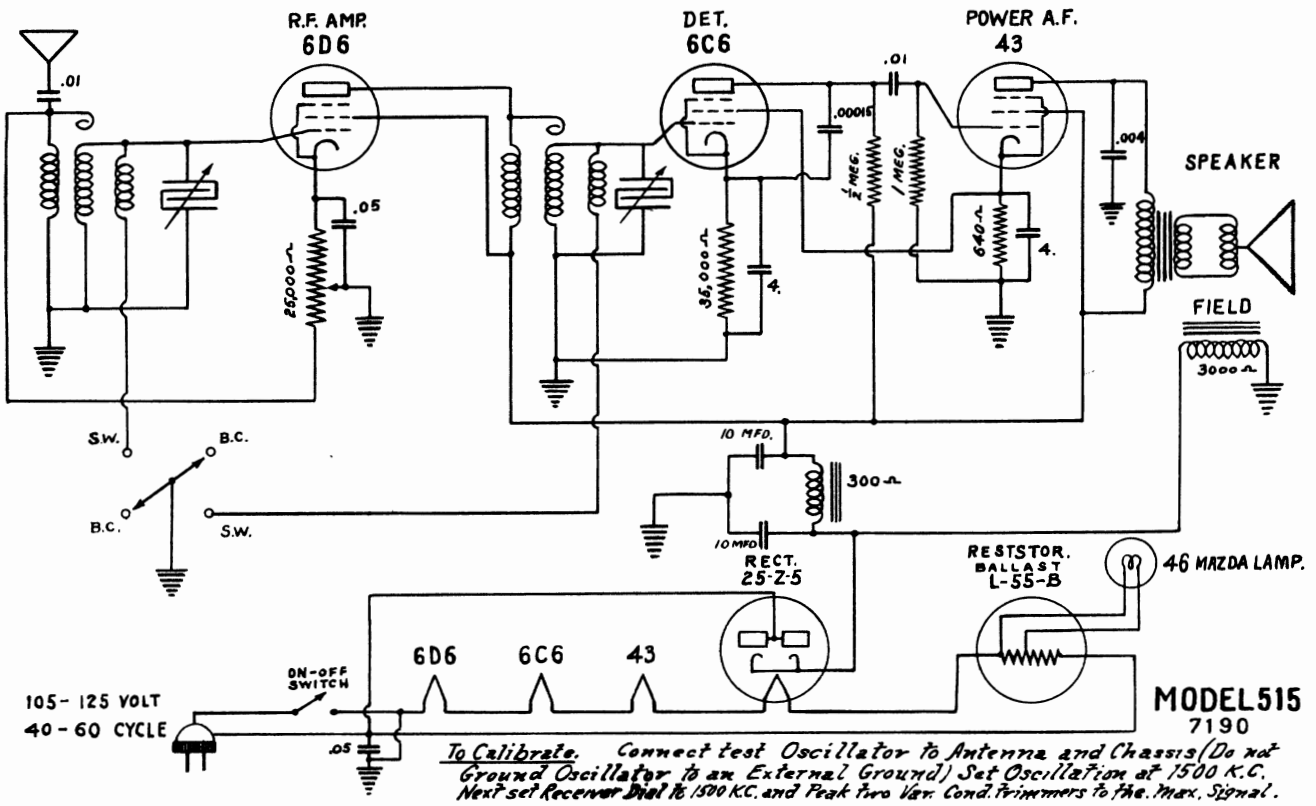


Model 506-R



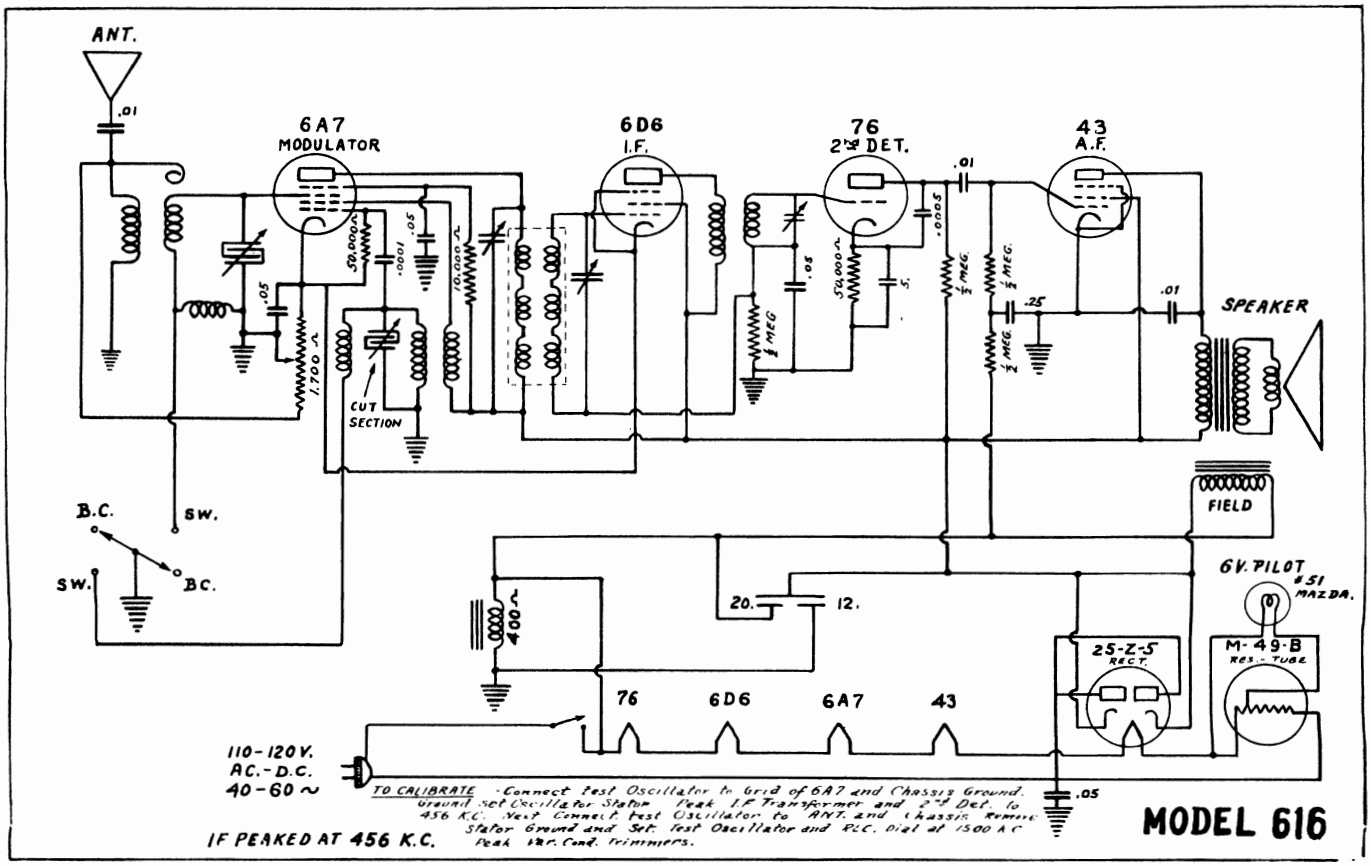
PIERCE AIRO CORP.

Model 515



To Calibrate. Connect test Oscillator to Antenna and Chassis (Do not Ground Oscillator to an External Ground) Set Oscillation at 1500 K.C. Next set Receiver Dial to 1500 K.C. and Peak two Var. Cond. Trimmers to the Max. Signal.

Model 616

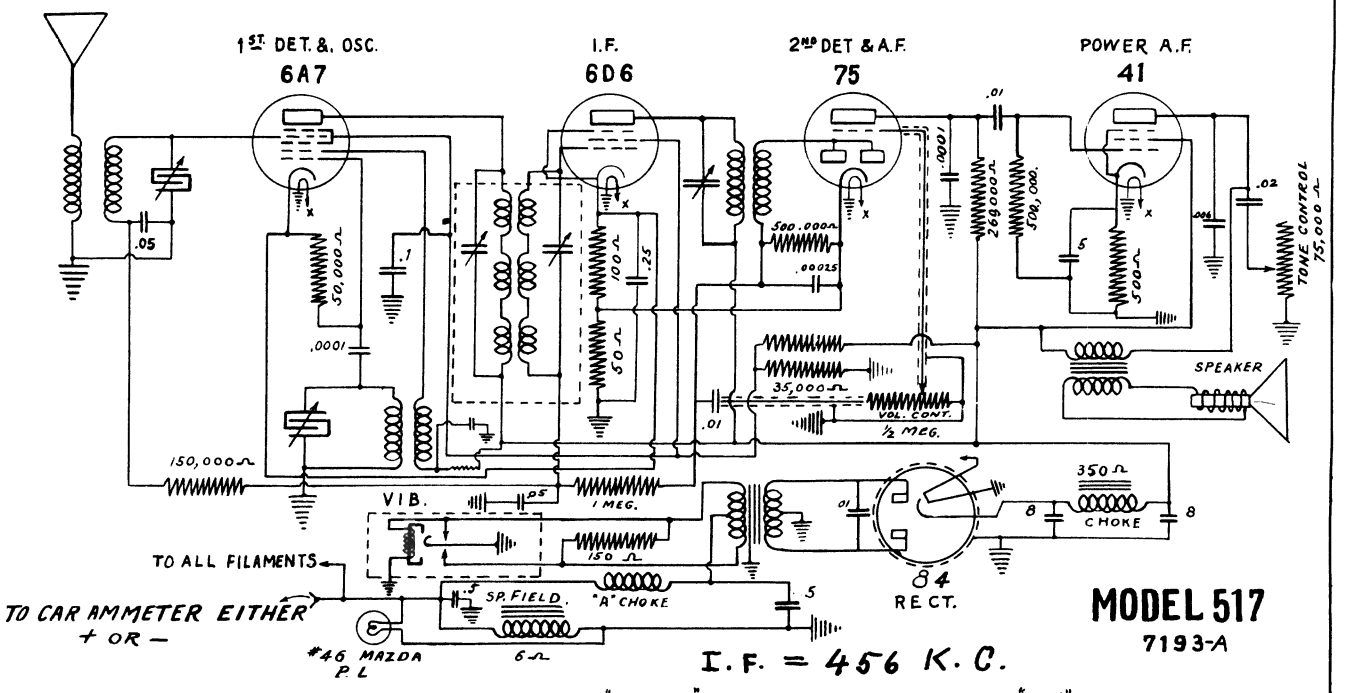


TO CALIBRATE - Connect test Oscillator to Grid of 6A7 and Chassis Ground. Ground set Oscillator Stator. Peak I.F. Transformer and 2nd Det. to 456 K.C. Next Connect test Oscillator to ANT. and Chassis. Remove Stator Ground and Set test Oscillator and R.C. Dial at 1500 K.C. Peak Var. Cond. trimmers.

IF PEAKED AT 456 K.C.

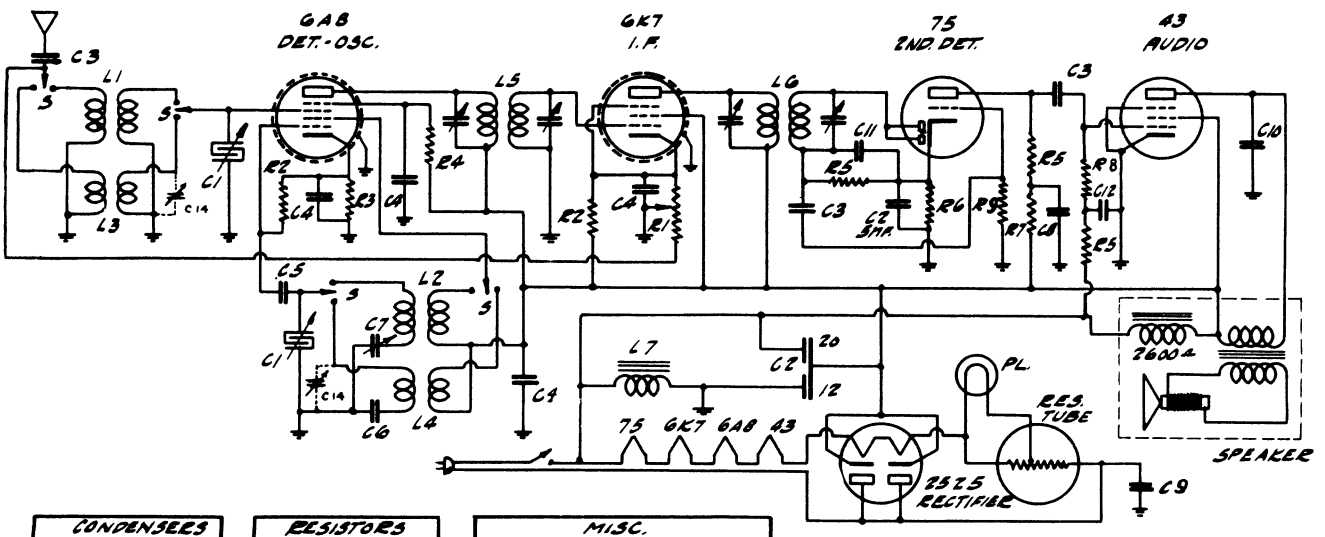
PIERCE AIRO CORP.

MODEL 517



CALIBRATION INSTRUCTIONS Connect test Oscillator, "Hot lead" to the grid of the 6-A-7 tube and the "Cold" lead to the receiver chassis, short circuit the Receiver's variable condenser cut Oscillator section. Peak - I.F. two trimmers in the top of the aluminom shield and trimmer in rear of speaker to 456-K.C. - After the I.F. has been Peaked, remove short from the variable condenser stator and connect test Oscillator "Hot lead" to the antenna Lead-in of the Receiver. Set test Oscillator and Receiver to 1500 K.C. and adjust variable condenser trimmers for max. signal.

612-615, 612 LW-615 LW



CONDENSERS		
SYM.	MFD.	NO.
C1	VAR. C.	2280
C2	20-12-5	2201
C3	.02	2191
C4	.05	2046
C5	.0001	2123
C6	.00028	2253
C7	PADDER	2229
C8	.1-200V.	2022
C9	1-400V.	2188
C10	.006	2007
C11	.00035	2233
C12	.25	2053
C13	L.W. PAD.	2277
C14	L.W. TR.	2230

RESISTORS		
SYM	OHMS	NO.
R1	VOL. CON.	8474
R2	50,000	3269
R3	240	3252
R4	25,000	3228
R5	.5 MEG.	3161
R6	6,500	3319
R7	67,000	3321
R8	260,000	3362
R9	100,000	3182

MISC.		
SYM.	NAME	NO.
L1	B.C. ANT. COIL	1363
L2	B.C. OSC. COIL	1357
L3	S.W. ANT. COIL	1250
L4	S.W. OSC. COIL	1249
L5	DUAL TUNED I.F.	1355
L6	2ND DET. I.F.	1356
L7	B CHOKE 400Δ	1328
L8	L.W. ANT. COIL	1351
L9	L.W. OSC. COIL	1352
PL	PILOT LITE 6-8 V	8019
R1	VOL. CONT. & SWITH	8474
	SPEAKER	7172
S1	WAVE BAND SW.	8475
	LINE CORD	8496

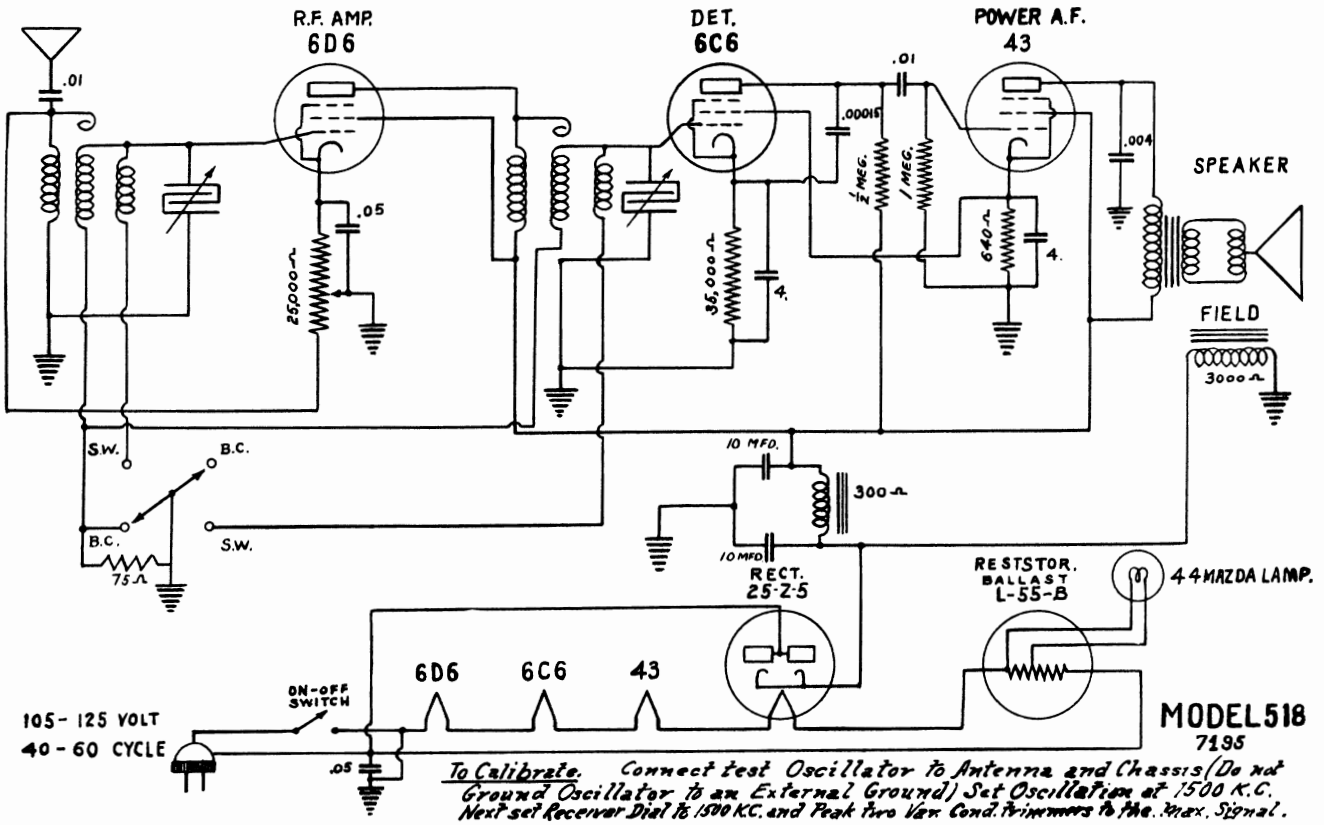
MODELS - 612-615, - 612 L.W.-615 L.W.

ON MODELS - 612 L.W. - 615 L.W. - TRIMMERS #2230 ARE USED. PADDER C6. IS REPLACED BY C13. COIL L3. REPLACED BY L8. AND COIL L4 BY L9 -

I.F = 456 K.C.

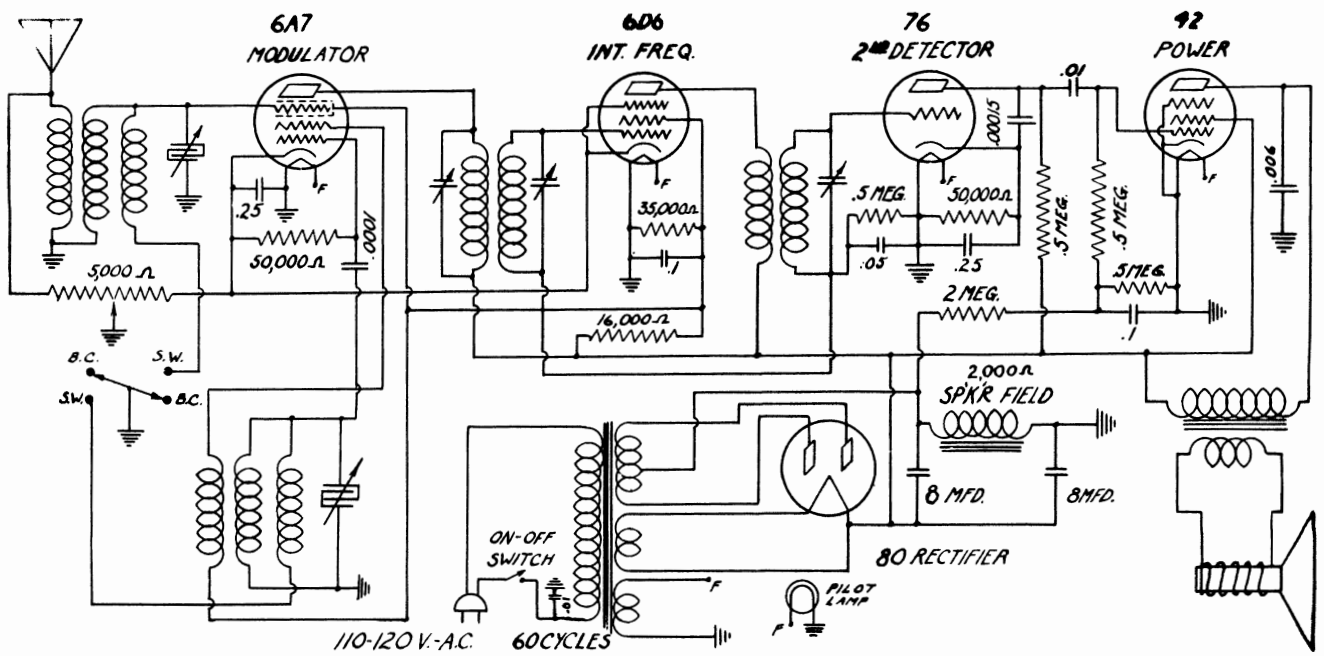
PIERCE AIRO CORP.

Model 518



To Calibrate. Connect test Oscillator to Antenna and Chassis (Do not Ground Oscillator to an External Ground) Set Oscillation at 1500 K.C. Next set Receiver Dial to 1500 K.C. and Peak two Var. Cond. Trimmers to the Max. Signal.

Model 520

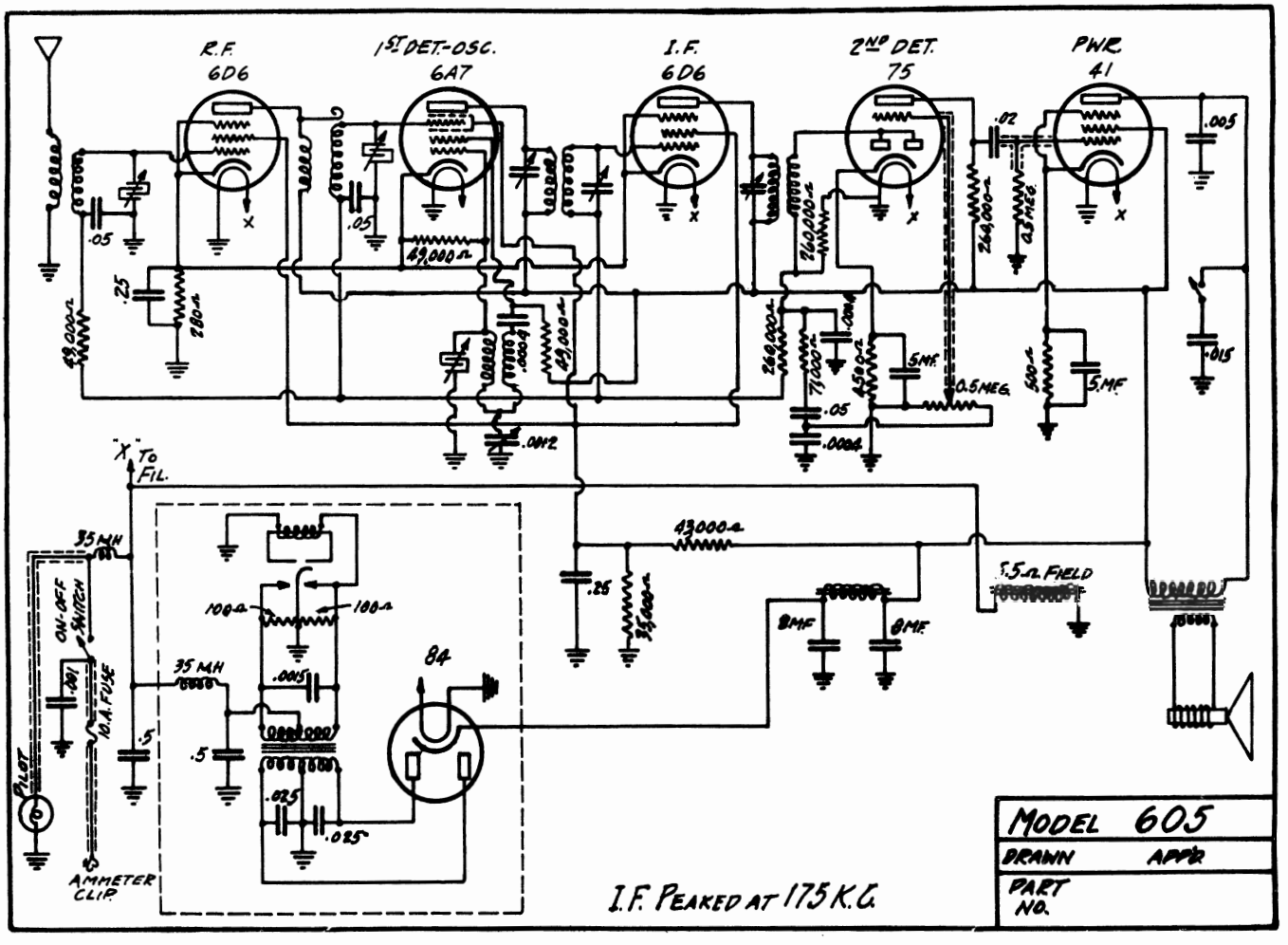


TO CALIBRATE- SET SERVICE OSCILLATOR TO 456 K.C. AND CONNECT 'HOT' LEAD TO GRID OF 6A7 TUBE GROUND STATOR OF REAR (OSCILLATOR) SECTION OF VARIABLE CONDENSER. TURN VOLUME CONTROL FOR MAXIMUM OUTPUT AND PEAK INTERMEDIATE FREQUENCY TRIMMERS FOR MAXIMUM GAIN REMOVE "HORT FROM VARIABLE CONDENSER. REMOVE SERVICE OSCILLATOR LEAD FROM GRID OF 6A7 TUBE AND CON "CT SAME TO RED LEAD ON REAR OF SET. ADJUST SERVICE OSCILLATOR AND THE RECEIVER TO 1500 K.C. AND PEAK TRIMMERS ON VARIABLE CONDENSER FOR MAXIMUM GAIN. ALL THE OTHER FREQUENCIES ARE AUTOMATICALLY CALIBRATED WHEN RECEIVER IS PEAKED AT 1500 K.C. DUE TO THE CONSTRUCTION OF THE CUT SECTION OF VARIABLE CONDENSER.

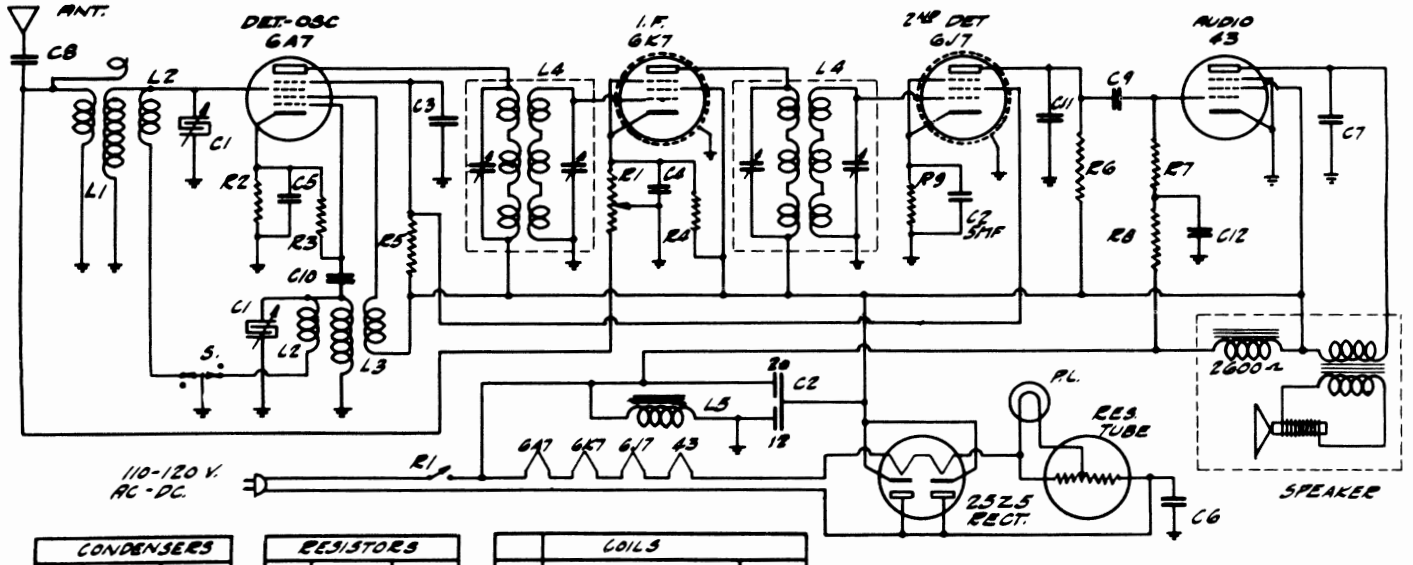
MODEL 520
7196

PIERCE AIRO CORP.

Model 605



MODEL 609



CONDENSERS		
SYM	MFD.	NO.
C1	VAR.	2295
C2	20-12-5	2294
C3	.05	2046
C4	.05	2046
C5	.05	2046
C6	.05	2046
C7	.004	2054
C8	.02	2191
C9	.02	2191
C10	.0001	2123
C11	.0001	2123
C12	1	2022

RESISTORS		
SYM	OHMS.	NO
R1	VOL. CONT.	8474
R2	300	3346
R3	50,000	3292
R4	50,000	3292
R5	35,000	3180
R6	.5 MEG.	3161
R7	.25 MEG.	3145
R8	1. MEG	3190
R9	95,000	3180

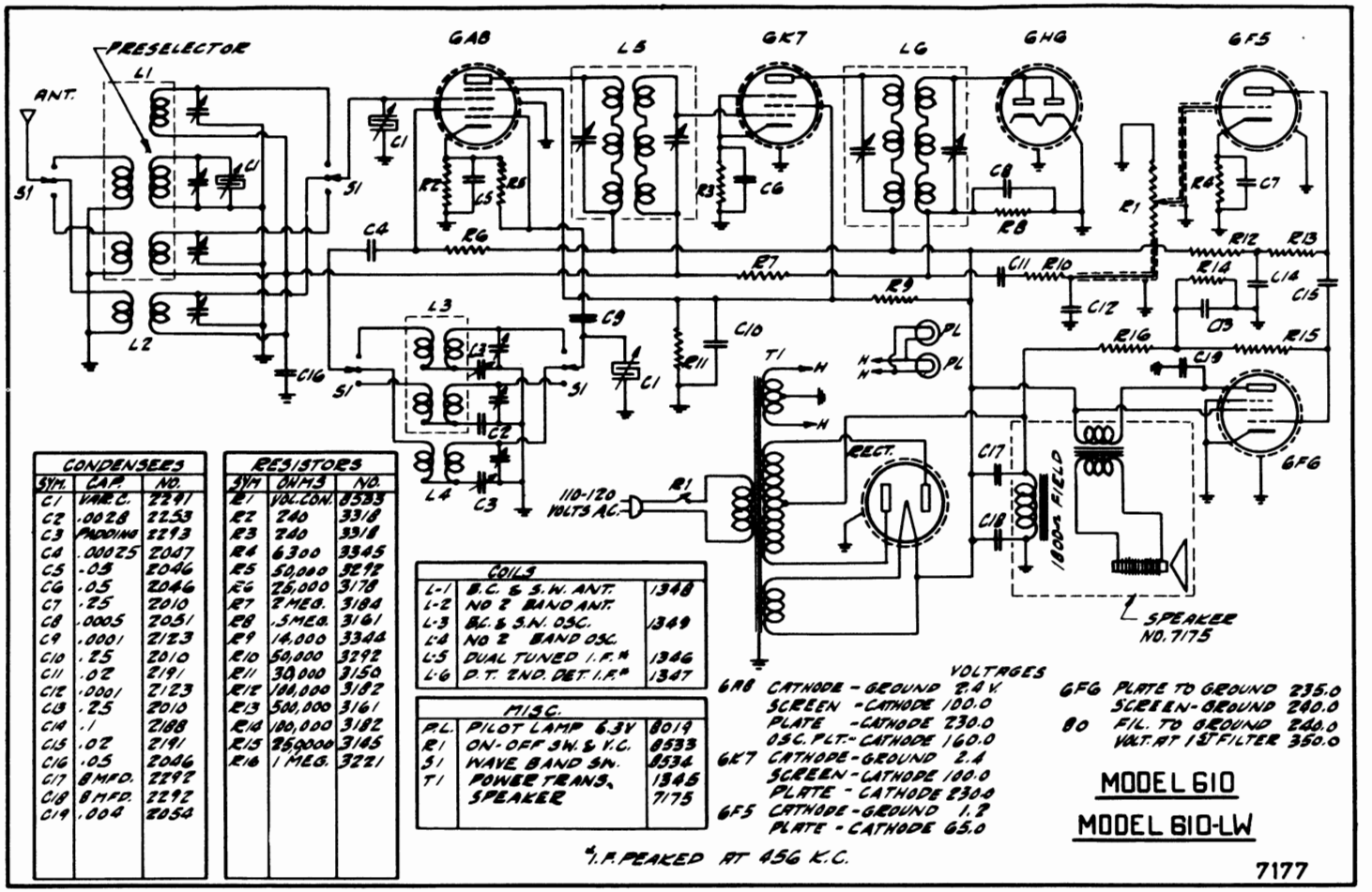
	COILS	
SYM	NAME	NO.
L1	ANT. COIL	1331
L2	SHUNT COIL	1353
L3	OSC. COIL	1354
L4	I.F. TRANSFORMER	1355
L5	CHOKE 400Ω	1348
	MISC.	
PL.	PILOT LAMP 6.3V.	8019
R1	VOL. CONT. & SWITCH	8474
S	WAVE BAND SWITCH	8521
	SPEAKER	7172
	LINE CORD	8496

Insert line cord plug into receptacle. On direct current if no reception is heard one minute after switch has been turned on, reverse line plug in receptacle.

DO NOT TOUCH GROUND WIRE TO CHASSIS.

Models 610 and 610-LW

PIERCE AIRO CORP.



MODEL 610
NUMBERS AND LIST PRICES OF REPLACEMENT PARTS

1345	Power Transformer	$4.00
1348	Comb. Antenna Coil	2.15
1350	Comb. Police Coil	1.50
1349	" Oscillator Coil	1.40
1346	Dual I.F. Transformer	1.50
1347	Second Detector Coil	1.50
2054	.004 Mfd. Cub Condenser	.35
2191	.02 Mfd. Cub Condenser	.35
2046	.02 " " "	.35
2188	.1 " " "	.35
2123	.0001 Mfd. Mica "	.40
2253	.0028 Mica Condenser	.45
2047	.00025 " "	.35
2293	Padding Condenser	.85
2051	Mica Condenser .0005	.35
2291	3 Gang Variable Cond.	4.05
2292	Comb. Electrolytic Cond.	1.60
2230	Dual Trimmer Cond.	.35
2010	.25 Mfd. Cub "	.65
8512	Knobs	.20
7175	Speaker	5.75
8496	Line Cord	.35
8533	Volume Control	1.05
8534	Wave Band Switch	.65

F - 44 - M 8-35

SERVICE NOTES

INTERMEDIATE FREQUENCY ALIGNMENT Intermediate frequency peaked at 456 K.C. Connect test oscillator to grid of 6A8 and Chassis. Ground stator of front section of Variable Condenser during this operation.

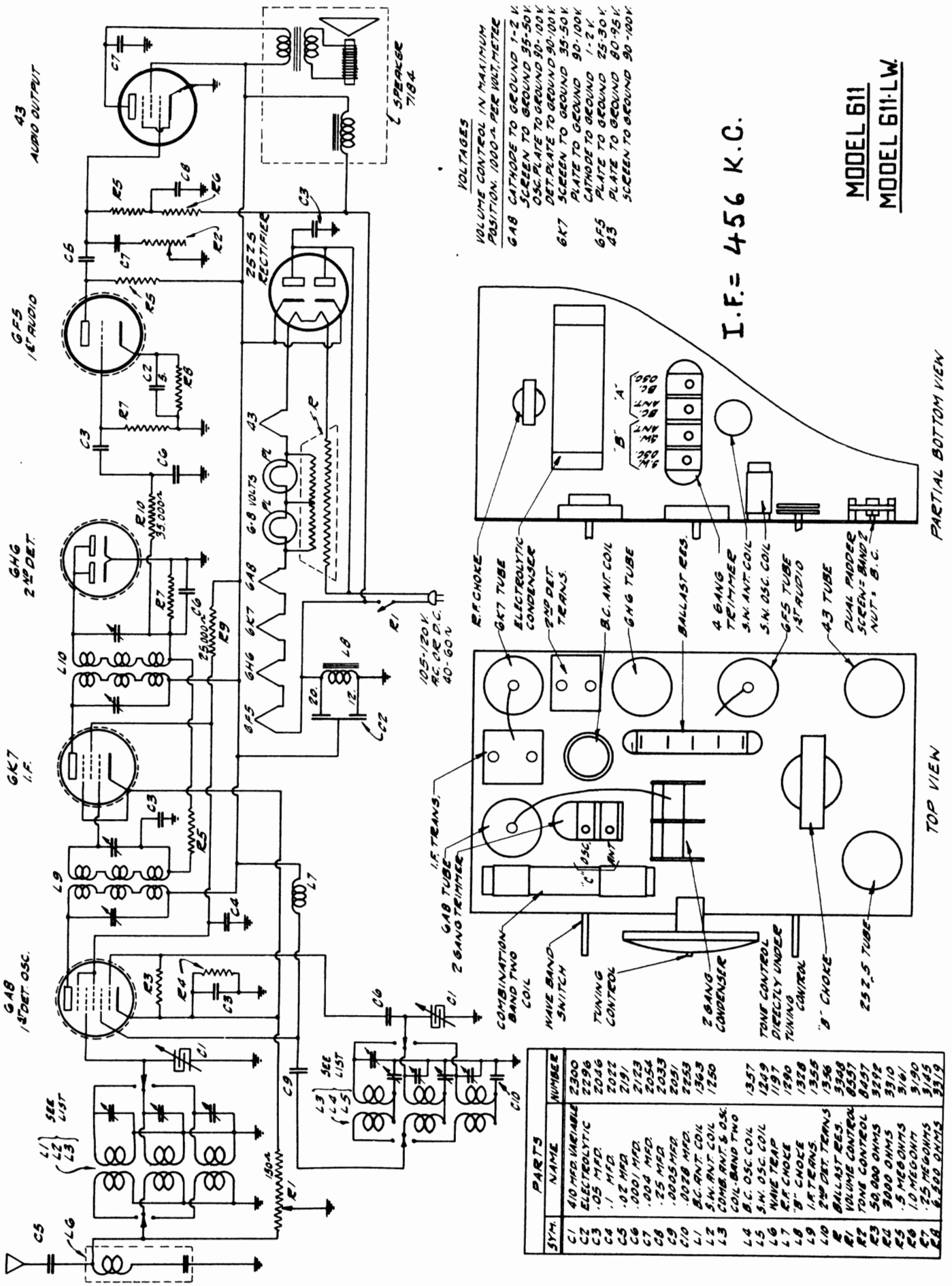
RF. ALIGNMENT Connect test oscillator to antenna and ground connections and set dial to 1500 K.C. and peak trimmers "A" for maximum signal. For low frequency adjustment, set dial at 600 K.C. and repeak padding condenser (Nut on front of chassis). Next readjust at 1500 K.C.

BAND 2 ALIGNMENT Police band adjustments for 610 only. Set test oscillator at 4000 K.C. Repeak the two trimmers located underneath chassis for maximum gain. Next set Variable Condenser at 1600 K.C. and repeak padder (screw) on front panel of Chassis. Next readjust trimmers underneath the chassis at 4000 Kilocycles.

Long Wave adjustment for 610 LW only. These adjustments same as police except low frequency setting is 170 K.C. and high frequency setting is 350 K.C.

SHORT WAVE ALIGNMENT Set Variable Condenser to 15 Megacycles and connect test oscillator to Antenna and ground and repeak trimmers "B" for maximum gain. The low frequency setting is automatically taken care of. The Short Wave coils are carefully matched for this setting and a fixed caliprated padder peaks the short waves for the low frequency setting.

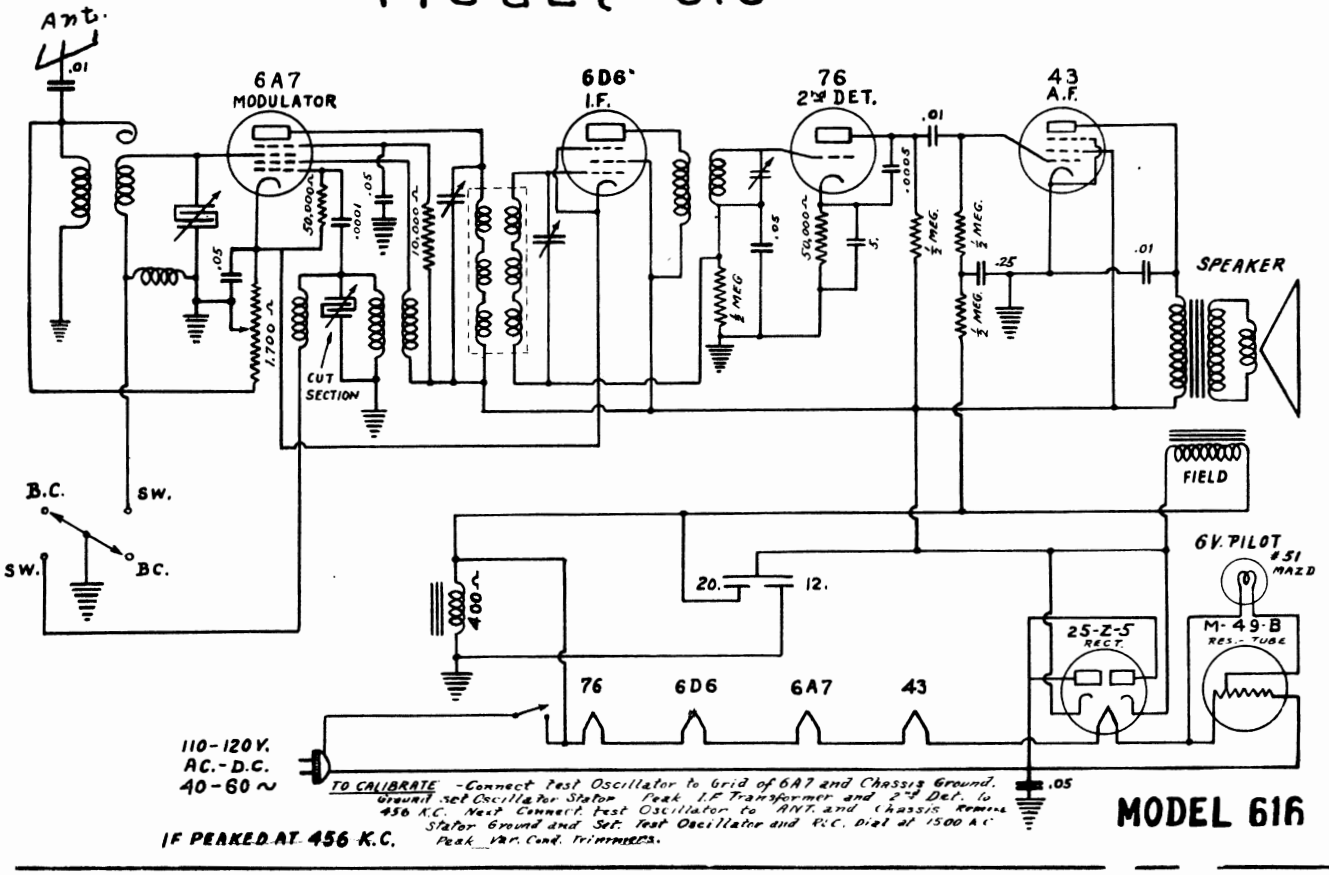
PIERCE AIRO CORP.



PARTS		
SYM.	NAME	NUMBER
C1	410 MFD VARIABLE	2300
C2	ELECTROLYTIC	2296
C3	.05 MFD.	2046
C4	.1 MFD.	2022
C5	.02 MFD	2191
C6	.0001 MFD.	2123
C7	.004 MFD.	2054
C8	.25 MFD.	2033
C9	.0005 MFD.	2051
C10	.0028 MFD.	2253
L1	B.C. ANT. COIL	1363
L2	S.W. ANT. COIL	1250
L3	COMB. ANT. & OSC. COIL-BAND TWO	1357
L4	B.C. OSC. COIL	1249
L5	S.W. OSC. COIL	1197
L6	WAVE TRAP	1290
L7	R.F. CHOKE	1378
L8	"B" CHOKE	1355
L9	I.F. TRANS.	1356
L10	2ND DET. TRANS.	3348
R1	BALLAST RES.	8551
R2	VOLUME CONTROL	8451
R3	TONE CONTROL	3292
R4	50,000 OHMS	3310
R5	3000 OHMS	3161
R6	.5 MEGOHMS	3190
R7	1.0 MEGOHM	3145
R8	.25 MEGOHMS	3319
R9	6,500 OHMS	
R10	35,000 Ω	
R11	150 Ω	
R12	25,000 Ω	
R13	20	
R14	12	

PIERCE AIRO CORP.

Model 616

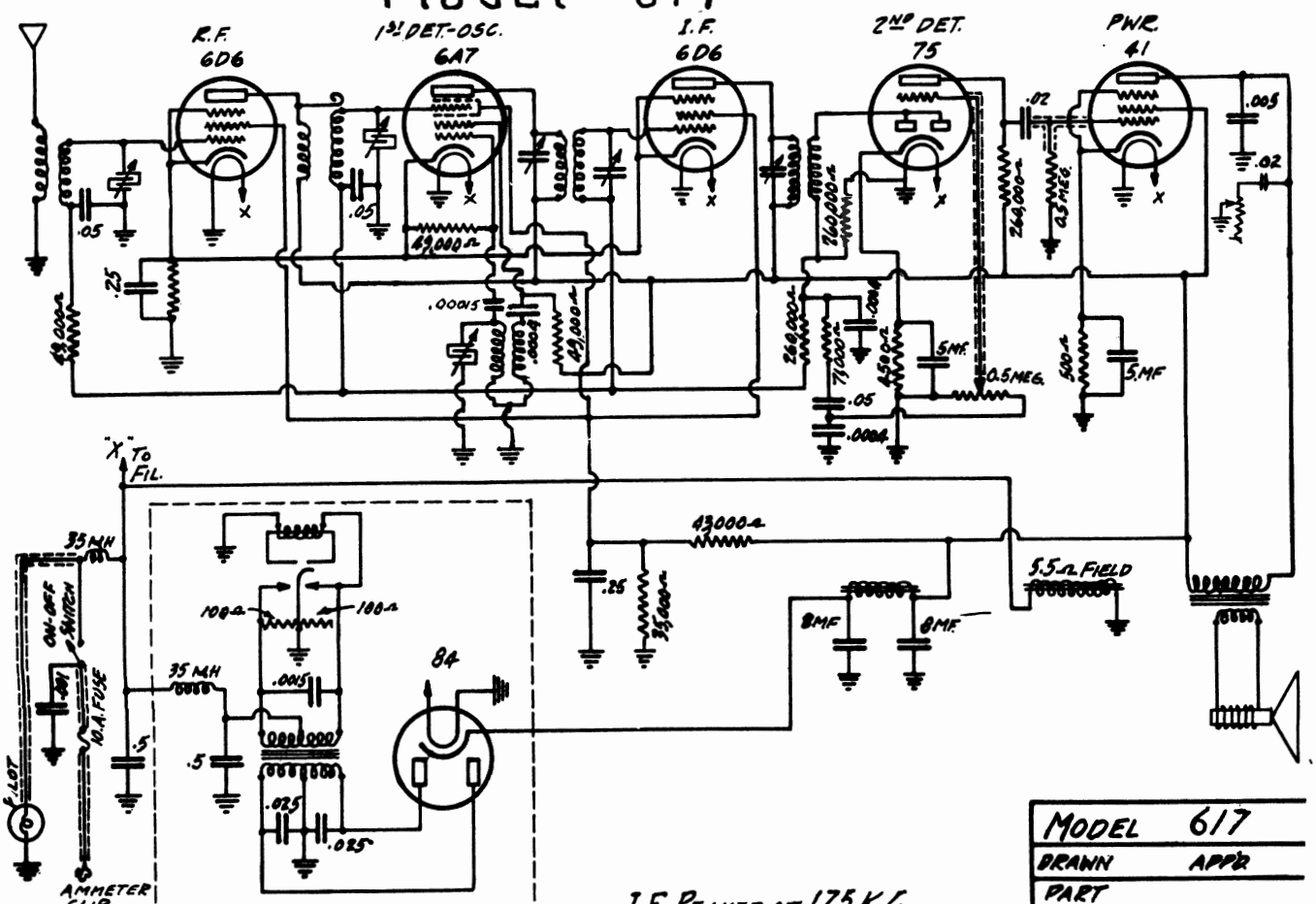


TO CALIBRATE -Connect Test Oscillator to Grid of 6A7 and Chassis Ground. Ground set Oscillator Stator. Peak I.F. Transformer and 2nd Det. to 456 K.C. Next Connect Test Oscillator to ANT. and Chassis. Remove Stator Ground and Set Test Oscillator and R.C. Dial at 1500 K.C. Peak Var. Cond. Trimmers.

IF PEAKED AT 456 K.C.

MODEL 616

Model 617

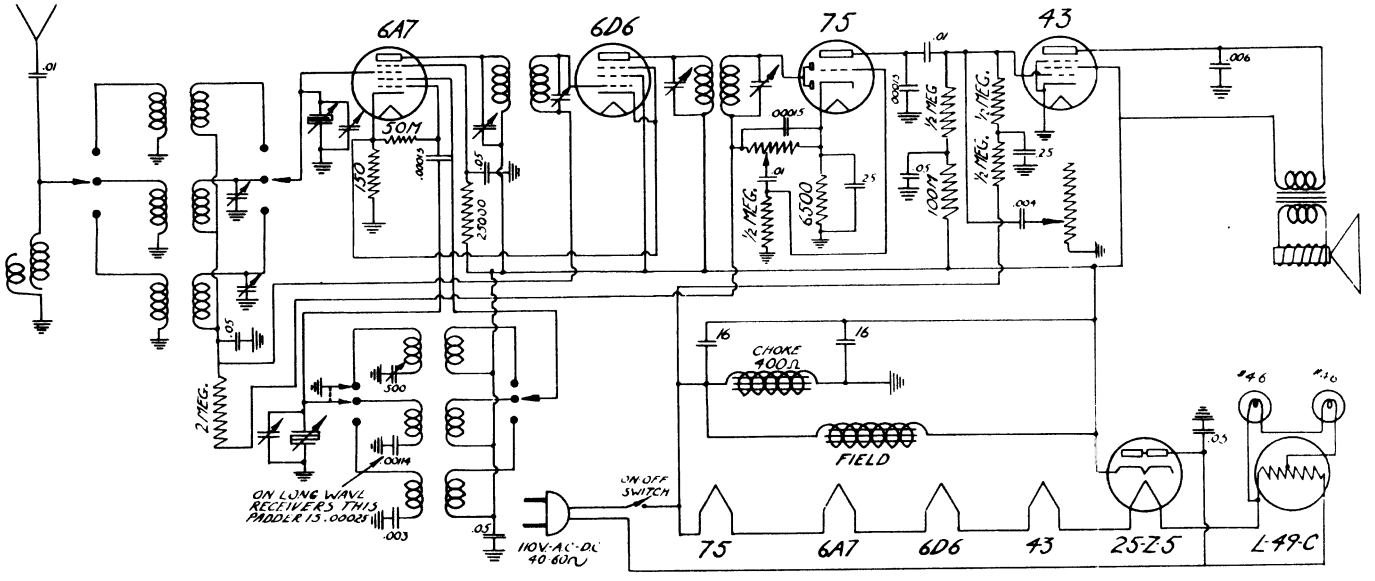


I.F. PEAKED AT 175 K.C.

MODEL	617
DRAWN	APP'D
PART NO	

PIERCE AIRO CORP.

Model 618



SERVICE NOTES

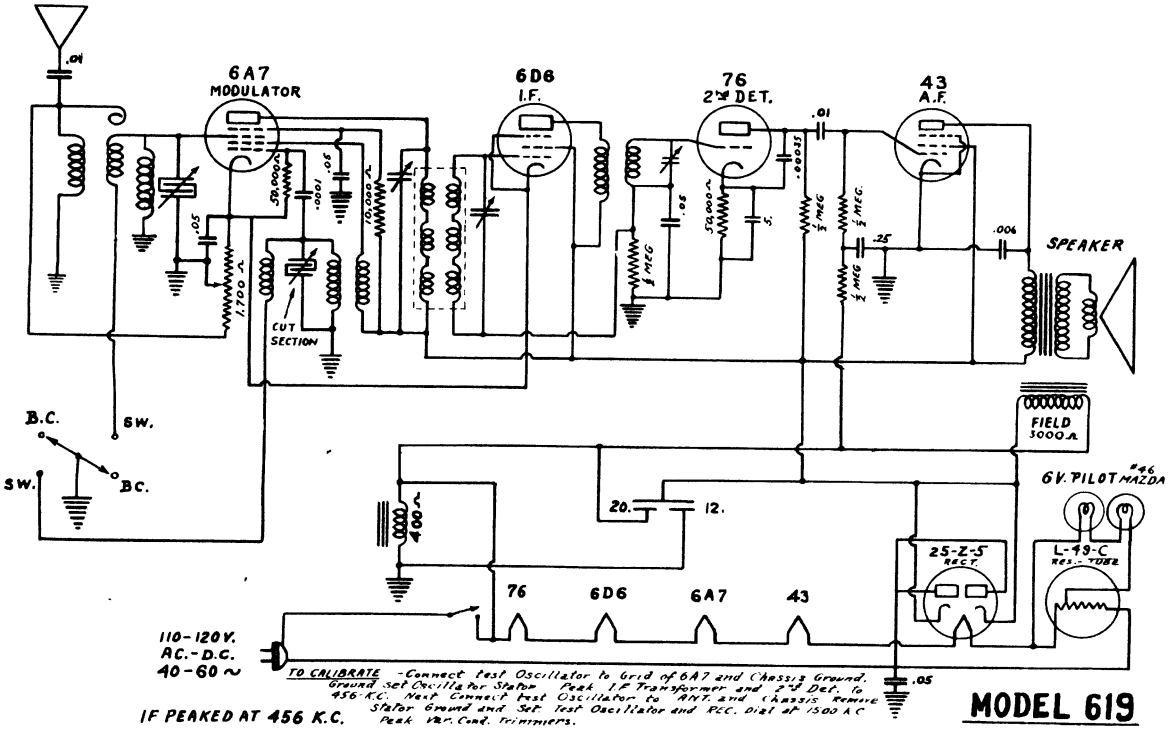
I.F. ALIGNMENT - Intermediate Frequency Peaked At 456 K.C. Connect Test Oscillator To Grid of 6A7 And Chassis. Short Circuit Stator of Front Section of Variable Condenser During This Operation. Then Peak I.F. Trimmers For Maximum Signal.

R.F. ALIGNMENT - Remove Short From Stator of Variable Condenser. Turn Wave Band Switch To Broadcast. Connect Test Oscillator To Antenna And Chassis. Set Test Oscillator And Radio Dial To 1500 K.C. And Peak Var. Cond. Trimmers For Maximum Signal. Set Test Oscil. At 600 K.C. And Adjust Padder Condenser In Front of Chassis For Max. Signal. During This Operation The Var. Cond. Must Be Turned Rear. - 1500 K.C.

POLICE BAND ALIGNMENT - Turn Wave Band Switch To Police Band Set Test Osc. And Radio Dial To 4000 K.C. And Peak 2 Trimmers Near Front Of Chassis For Max. Sig. The Low Freq. Setting Is Automatically Adjusted By A Fixed Calibrated Padder. If Receiver Has Long Waves Instead of Police Band Calibrate Same Trimming Cond. As On Police Band But Set Oscillator And Receiver At 300 K.C. For Alignment.

SHORT WAVE ALIGNMENT - Turn W.B. Switch To Short Wave. Set Test Osc. And Radio Dial To 15 Megacycles And Peak Trimmers Near Center of Chassis For Max. Sig. Low Freq. Setting Is Automatically Taken Care Of By Short Wave Coils Which Are Carefully Matched For This Setting By A Fixed Calibrated Padder.

Model 619

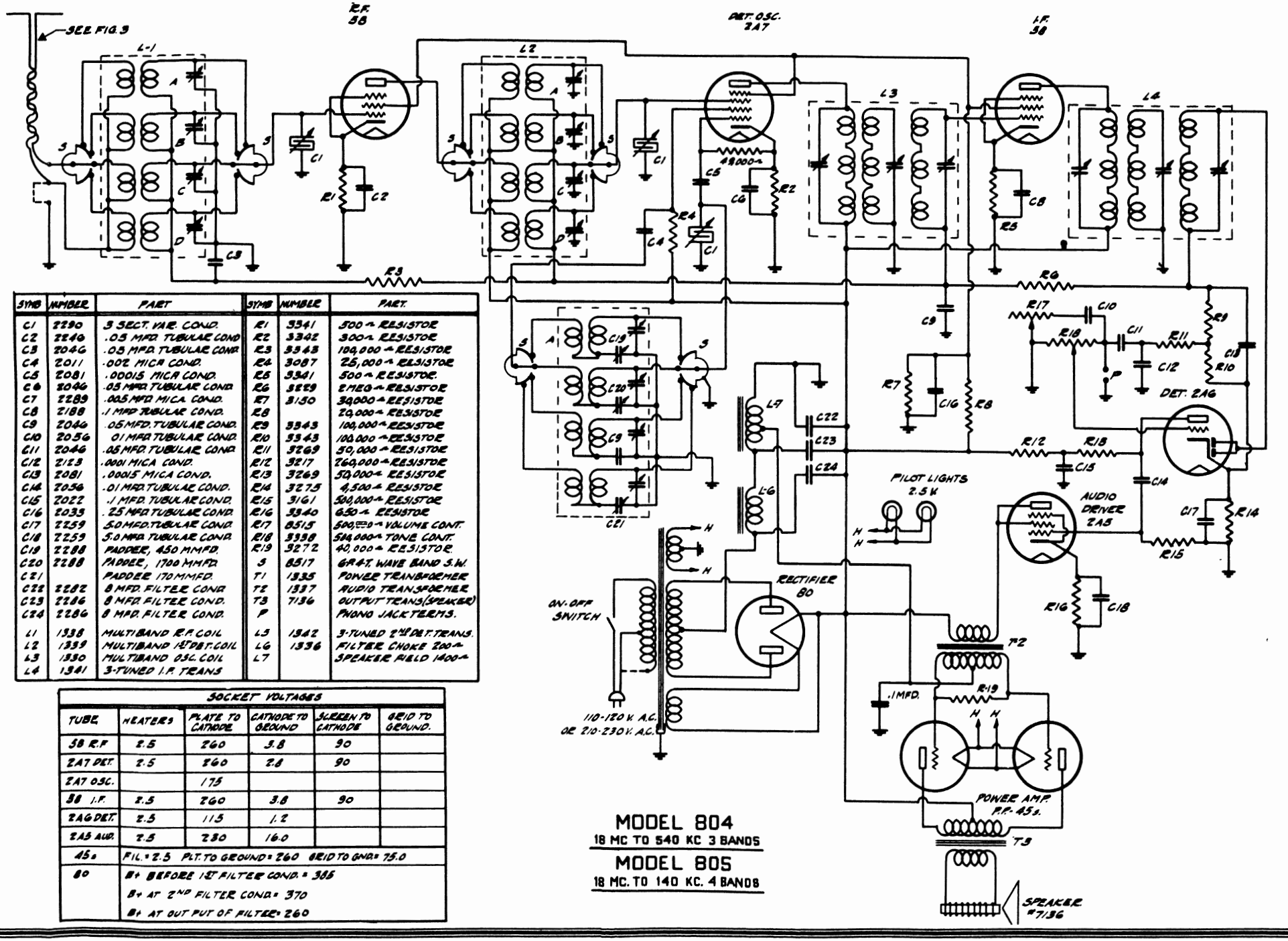


TO CALIBRATE - Connect test Oscillator to Grid of 6A7 and Chassis Ground. Ground set Oscillator Stator. Peak I.F. Transformers and 2nd Det. to 456 K.C. Next Connect test Oscillator to ANT. and Chassis Remove Stator Ground and Set test Oscillator and REC. Dial at 1500 K.C. Peak Var. Cond. trimmers.

IF PEAKED AT 456 K.C.

MODEL 619

Models 804 and 805



SYMB	NUMBER	PART	SYMB	NUMBER	PART
C1	2290	3 SECT. VAR. COND.	R1	3341	500 Ω RESISTOR
C2	2246	.05 MFD. TUBULAR COND	R2	3342	300 Ω RESISTOR
C3	2046	.05 MFD. TUBULAR COND.	R3	3343	100,000 Ω RESISTOR
C4	2011	.002 MICA COND.	R4	3087	25,000 Ω RESISTOR
C5	2081	.00015 MICA COND.	R5	3341	500 Ω RESISTOR.
C6	2046	.05 MFD TUBULAR COND.	R6	3229	2 MEG Ω RESISTOR
C7	2289	.005 MFD. MICA. COND.	R7	3150	30000 Ω RESISTOR
C8	2188	.1 MFD TUBULAR COND.	R8		20,000 Ω RESISTOR
C9	2046	.05 MFD. TUBULAR COND.	R9	3343	100,000 Ω RESISTOR
C10	2056	.01 MFD. TUBULAR COND.	R10	3343	100,000 Ω RESISTOR
C11	2046	.05 MFD. TUBULAR COND.	R11	3269	50,000 Ω RESISTOR
C12	2123	.0001 MICA COND.	R12	3217	760,000 Ω RESISTOR
C13	2081	.00015 MICA COND.	R13	3269	50,000 Ω RESISTOR
C14	2056	.01 MFD. TUBULAR COND.	R14	3275	4,500 Ω RESISTOR
C15	2022	.1 MFD. TUBULAR COND.	R15	3161	500,000 Ω RESISTOR
C16	2033	.25 MFD. TUBULAR COND.	R16	3340	650 Ω RESISTOR
C17	2259	5.0 MFD. TUBULAR COND.	R17	8515	500,000 Ω VOLUME CONT.
C18	2259	5.0 MFD. TUBULAR COND.	R18	3338	500,000 Ω TONE CONT.
C19	2288	PADDER, 450 MMFD.	R19	3272	40,000 Ω RESISTOR
C20	2288	PADDER, 1700 MMFD.	S	8517	6 P.S.T. WAVE BAND S.W.
C21		PADDER 170 MMFD.	T1	1335	POWER TRANSFORMER
C22	2282	8 MFD. FILTER COND.	T2	1337	AUDIO TRANSFORMER
C23	2286	8 MFD. FILTER COND.	T3	7136	OUTPUT TRANS. (SPEAKER)
C24	2286	8 MFD. FILTER COND.	P		PHONO JACK TERMS.
L1	1338	MULTIBAND R.F. COIL	L5	1342	3-TUNED 2ND DET. TRANS.
L2	1339	MULTIBAND 1ST DET. COIL	L6	1336	FILTER CHOKE 200 Ω
L3	1330	MULTIBAND OSC. COIL	L7		SPEAKER FIELD 1400 Ω
L4	1341	3-TUNED I.F. TRANS			

SOCKET VOLTAGES					
TUBE	HEATERS	PLATE TO CATHODE	CATHODE TO GROUND	SCREEN TO CATHODE	GRID TO GROUND.
38 R.F.	2.5	260	3.8	90	
2A7 DET.	2.5	260	2.8	90	
2A7 OSC.		175			
38 I.F.	2.5	260	3.8	90	
2A6 DET.	2.5	115	1.2		
2A5 AUD.	2.5	230	16.0		
45s	FIL. = 2.5 PLT. TO GROUND = 260 GRID TO GND = 75.0				
80	B+ BEFORE 1ST FILTER COND. = 385 B+ AT 2ND FILTER COND. = 370 B+ AT OUT PUT OF FILTER = 260				

MODEL 804
18 MC TO 540 KC 3 BANDS

MODEL 805
18 MC. TO 140 KC. 4 BANDS

PIERCE AIRO CORP.

PIERCE AIRO CORP.

OPERATING INSTRUCTIONS
MODEL 804-805

The Models 804 and 805 are all wave superheterodyne receivers designed to operate on 110-120 or 210-230 volts, alternating current, 50-60 cycles only. The primary tap on top of the power transformer must be connected properly for the voltage to be used.

Before plugging into the power line, make sure that the line voltage and current frequency agree with the above. If doubt exists regarding the exact power line conditions, cosult your local power Company.

Check the tubes to be certain that they are securely pushed into their respective sockets, and that the grid clips on top of the tubes are firmly in place. Also check the speaker plug to see that it is securely pushed into its socket at the rear of the Chassis.

TUBES 2-58s, 1-2A7, 1-2A6, 1-2A5, 2-45s, 1-80

INSTALLATION This receiver is arranged for a "Doublet" Antenna system, or an ordinary single wire system. For connections of either type see Fig. #3a & 3B. A good Antenna is essential for the correct operation of this receiver, especially where distant reception is expected. The flat top portion of the Antenna should be placed as high as possible above the ground and surrounding objects. No. 14 solid or stranded wire may be used for the flat top portion and well insulated semi-flexible wire for the lead-in section. The Antenna should be equipped with good insulators wherever they are required. Meterial such as pyrex, glass, Bakelite, and high grade porcelain are well suited for radio installations. The lead-in wire should be kept away from all nearby wires and should be run at right angles to power or trolley lines wherever possible. It should be brought into the house at the nearest point convenient to the receiver in order to avoid picking up noise from home electrical devices. The ground wire should be as short as possible and must be a good connection to water or other grounded pipe.

VOLUME CONTROL AND ON-OFF SWITCH To place receiver in operation turn the "Volume Control Knob" to the right. To increase volume rotate to the right; to decrease rotate to the left. The receiver is also equipped with an automatic volume control feature which tends to maintain all reception at a constant level, thereby reducing fading effects and blasting of strong signals.

TONE CONTROL The Tone Control Knob is located directly below the main Tuning Knob. By adjusting this knob the user may select any tone shading desired from mellow to brilliant. The Tone Control may also be used to reduce background noise on signals that are accompanied by excessive disturbances such as static and local electrical noise.

BAND SWITCH This switch is located on the left side of front panel and its position is indicated by the letters engraved into the knob. (A-B-C-D)

BAND "A" Standard Domestic Broadcast band. Frequency range from 540 to 1800 K.C.

BAND "B" Intermediate Short wave Band. Broadcast Frequency range from 1600 K.C. to 5500 K.C. Services operating on this band are: Police, Aeroplane, Television, and Amateur. Reception on this band is relaiable for moderate distances during both day and night, but for distances greater than 1000 miles the area must be in darkness.

BAND "C" Short Wave Band. Frequency range 5.4 to 18 megacycles. Services operating on this band include: Domestic and Foreign Short wave Broadcasting, Aeroplane, Amateur, Commercial Code and Telephone, and Experimental. Stations in the vicinity of 18 to 12 Megacycles are best received when the distance between transmitter and receiver is greater than 1500 miles and the area between is in Daylight. This same holds true for stations about 10 to 12 Megacycles except that signals are often heard in the early hours of darkness. Stations operating on frequencies between 10 and 7 megacycles offer reliable reception both day and night, especially when the distance is greater than 700 miles. Reliable reception on frequencies below 7 megacycles, when the distance exceeds 1500 miles, may be expected when the area between receiver and transmitter is in darkness.

BAND "D" Long Wave Band. Frequency range 140 K.C. to 400 K. C. (Model 805 only) This band includes the European long wave Broadcast band, (Heard in Europe only) Domestic Aviation Beacons, weather Reports and Commercial Code.

BAND SPREAD DIAL This receiver is provided with a dual station selector drive, to permit micrometer tuning which is especially valuable on the short waves where band spreading or its equivalent, high ratio tuning, becomes necessary for easy and rapid registering of foreign programs.
The large knob of the main selector drive is the low ratio control with a normal ratio of 24 to 1 in 360°. The small knob on the same shaft controls the high ratio control with a tuning ratio of 125 to 1 in 360°. Bands "A" and "B" are calibrated in kilocycles and Band "C" in megacycles. The Small Band Spread Indicator may be used to make fine adjustments not obtainable from the larger scale.

PHONOGRAPH PICKUP It is also possible to use this receiver with an electric phono pickup attachment for the reproduction of disc. recordings. For this purpose, a Phono Jack is located at the rear of the Chassis. The volume Control will control the strength of signals for phonograph reproduction (any high impedance pickup of high quality may be used with this receiver.)

SERVICE NOTES

REALIGNMENT The procedure outlined below should be followed should the receiver require realignment. For location aligning trimmers and padders, see Fig. 2.

I. F. ALIGNMENT To align the Intermediate Frequency stages, first place the wave Band Switch in Pos. "A" and Short Circuit the Oscillator Section of the Variable Condenser. Set the test Oscillator to 456 K.C. and connect its output through A .00025 MFD fixed Condenser to the grid cap of the 2A7 Tube and chassis ground. Adjust the six I. F. Compensators (Three on each I.F. Transformer) for Max Signal. (Volume Control must be in maximum position during all adjustments. Use the least possibe input to the receiver to prevent broadening of the resonance peaks.)

BAND "A" (BROADCAST) ALIGNMENT After the Intermediate Frequency stages have been completely aligned, connect external test oscillator to the Antenna and Ground binding posts of the set. See Fig. 3-A. Set the band switch to "A" position. Set test Oscillator to 1500 K.C. and adjust the three band A Compensators for maximum gain. Next, set dial at 600 K.C. and adjust Band "A" Paddler for maximum signal, rocking Variable Condenser at the same time. Now repeat repeaking operation at 1500 K. C.

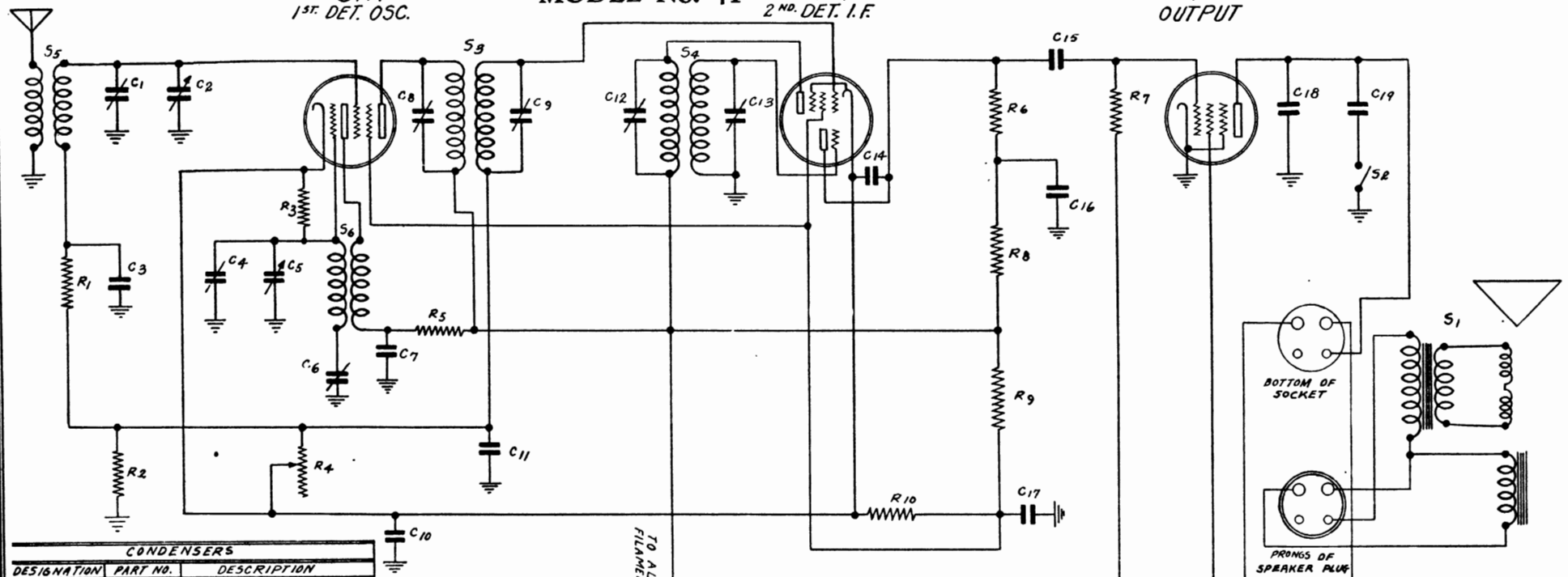
BAND "B" ALIGNMENT Turn Wave Band Switch to "B" Position and set Variable Condenser to 5000 K. C. Adjust test oscillator to this frequency and adjust 3 Band "B" Trimmers for maximum gain. Next set dial at 1900 K. C. and adjust band "B" Paddler for maximum signal. Now repeat repeaking operation at 5000 K. C.

BAND "C" (SHORT WAVE) ALIGNMENT Turn Wave Band Switch to "C" position and set Variable Condenser to 16 megacycles. Adjust test oscillator to this frequency and adjust three band "C" Trimmers.

BAND "D" (LONG WAVE) ALIGNMENT Turn wave Band Switch to "D" position and align Trimmers on long wave coils at 375 K.C. Adjust Band "D" Padder at 160 K. C.

MODEL No. 41

6A7 1ST. DET. OSC. — 6F7 2ND. DET. I.F. — 42 OUTPUT



CONDENSERS

DESIGNATION	PART NO.	DESCRIPTION
C1, C4		TRIMMERS ON GANG COND.
C2, C5	71646	2 GANG COND.
C3 C11 C17	22055-M	.1-200 V. PAPER TUBULAR
C6	71503-A	250-500 MMFD. PADDER
C7 C15	22055-C	.05-600V. PAPER TUBULAR
C8 C9		TRIMMERS IN 1ST. I.F. TRANS.
C12 C13		TRIMMERS IN 2ND. I.F. TRANS.
C10	22055-F	.25-200V. PAPER TUBULAR
C14	27726	.0002 MFD. MICA
C16	22055-AB	.1-600V. PAPER TUBULAR
C18	22055-U	.01-1000 V. PAPER TUBULAR
C19	22055-V	.03-1000 V. PAPER TUBULAR
C20-C21	71647	4-8 MFD. 450V. ELEC. COND.
C22	22055-S	.5-200V. PAPER TUBULAR

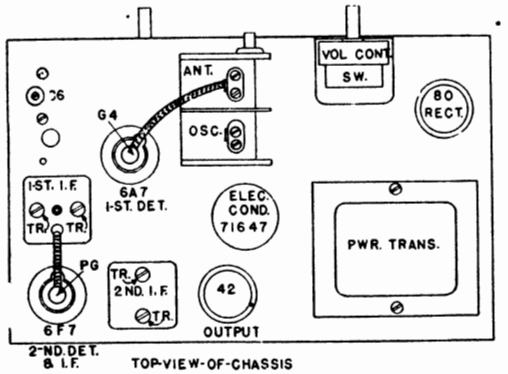
RESISTORS

DESIGNATION	PART NO.	DESCRIPTION
R1	13031	100,000. .25 WATT
R2	13028	1,000-OHMS . 25 WATT
R3 R8	13164	50,000 OHMS . 25 WATT
R4	71656	VOL. CONTROL & SW. 2000 WIRE 150 W MIN.
R5 R10	13074	20,000-OHMS . 25 WATT
R6	13171	250,000-OHMS . 25 WATT
R7	13072	750,000-OHMS . 25 WATT
R9	13126	25,000-OHMS . 5 WATT
R11	13059	250-OHMS 1 WATT

MISC.

DESIGNATION	PART NO.	DESCRIPTION
S1	40775	SPEAKER 1400 OHM FIELD
S2	71657	TONE CONTROL SWITCH
S3	70936-4	1ST I.F. TRANS
S4	70937-4	2ND. I.F. TRANS.
S5	71685	ANT. COIL
S6	71701	OSC. COIL

INTERMEDIATE FREQUENCY 456 KC.
ALIGNING FREQUENCIES 1500 KC & 600 KC.



PILOT RADIO CORP.

Model 43 Short-Wave Broadcast Receiver

Range: 16-52.6 M. and 178-550 M. (18,800-5700 kc. and 1680-545 kc.)

HOW TO OPERATE THE PILOT 43

1. Examine the label on the rear of the chassis to make sure that the voltage and frequency are correct for the power supply in your home
2. Connect the blue wire at the rear of the chassis to your antenna. For best results use an antenna of the type described in the PILOT antenna instruction sheet. If you are not experienced in erecting antennas, we strongly advise having this done by your radio service man. Good results can be obtained from a single wire about fifty feet long, and as high above surrounding objects as possible.
3. Connect the clip at the rear of the chassis to the ground. This lead should be as short as possible, connected to the nearest water pipe.
4. When the connections have been made, switch on the set by turning the left-hand knob clockwise. This is the volume control knob as well as the line switch. On the right is the tuning knob for the compass dial, and at the center, the Band Switch.
5. When tuning in a station, be very careful to adjust the dial to the center of the response with the volume control set at the lowest position that will give sufficient volume. Unless that is done, the tone will be distorted.
6. If signals from local stations are loud enough to overload the speaker, reducing the volume slightly will clear up the tone.
7. The tone control is a small switch at the rear of the chassis. The upper position is for brilliant tone; the lower position is for mellow tone.

NOTE: This PILOT set, in design, the quality of the materials, and the workmanship, is a fine musical instrument. It deserves careful treatment. Protect it from excessive dampness and from dry heat. Have it inspected and have the tubes checked twice a year by your radio dealer, to assure the maintenance of its fine musical quality.

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the slip-on knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The tuning condenser should be set at maximum capacity. Connect the antenna lead of the external oscillator to the control grid of the type 6F7 tube in the I. F. Amplifier stage through a 0.1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the receiver ground clip. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6F7 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. Amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads, this time with a .0002 mfd. condenser in the antenna lead. Adjust the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

SHORT-WAVE ALIGNMENT: The procedure in aligning the short-wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. A 400 ohm resistor should be inserted in the antenna lead. The alignment frequency is 16.8 Meters—(17,800 kc.)

Turn the Band Switch to the right. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

VOLTAGES MEASURED AT TUBE SOCKETS

	Det. Osc.	Amp. Det.	Audio Output
	6A7	6F7	42
PLATE	220	220	210
SCREEN	66	66	237
CATHODE	18	18	*16
FILAMENT	6.3	6.3	6.3

Speaker field volts—85 volts.
Anode grid of 6A7—150 volts.
Triode plate of 6F7—95 volts.

Plate and screen voltages measured to cathode.
Cathode voltages measured to chassis frame.

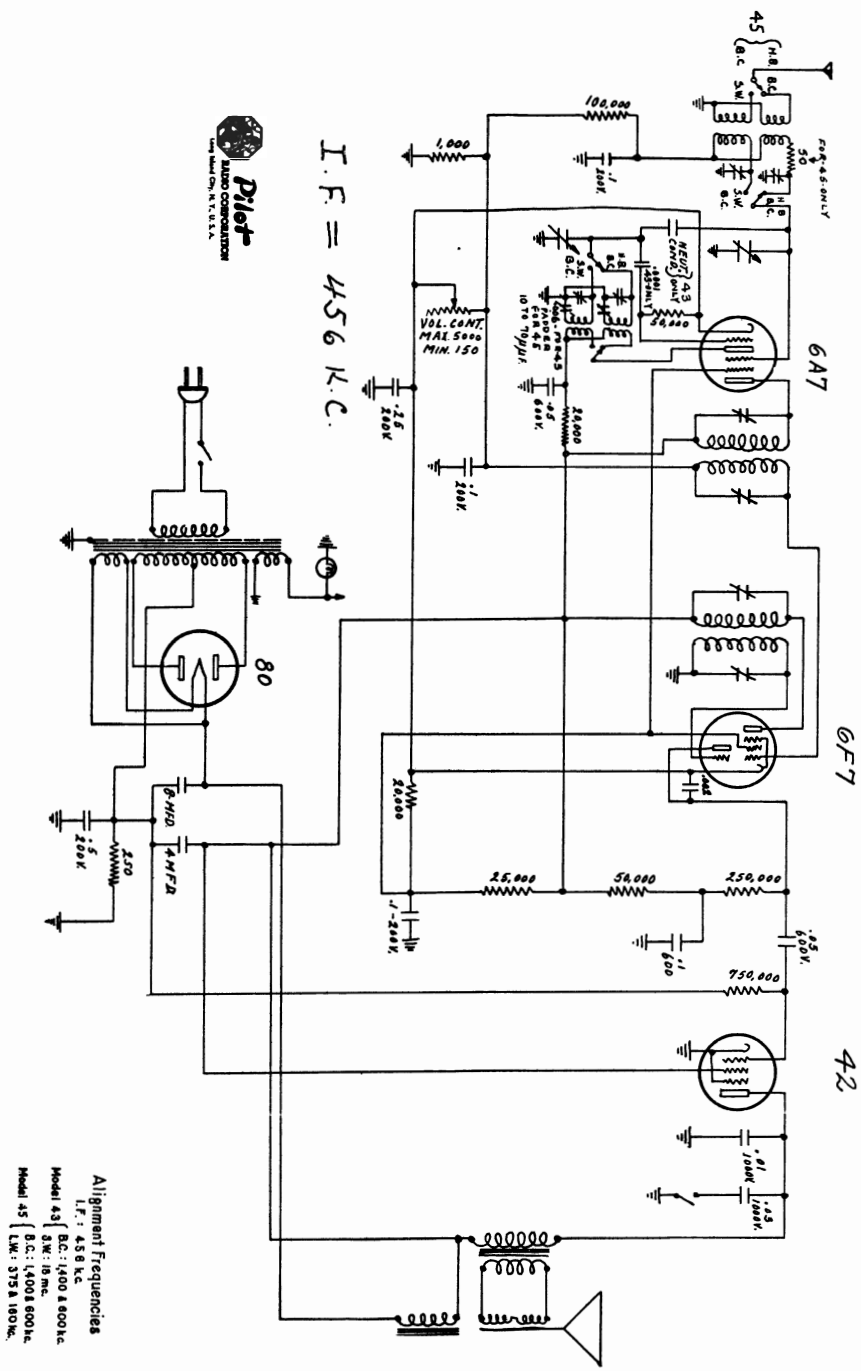
Rectifier

80

335 Volts D.C. from Filament to transformer center tap.

4.9

*Measured across 250 ohm resistor, R-11.
Measurements made with voltmeter of 1,000 ohms per volt.

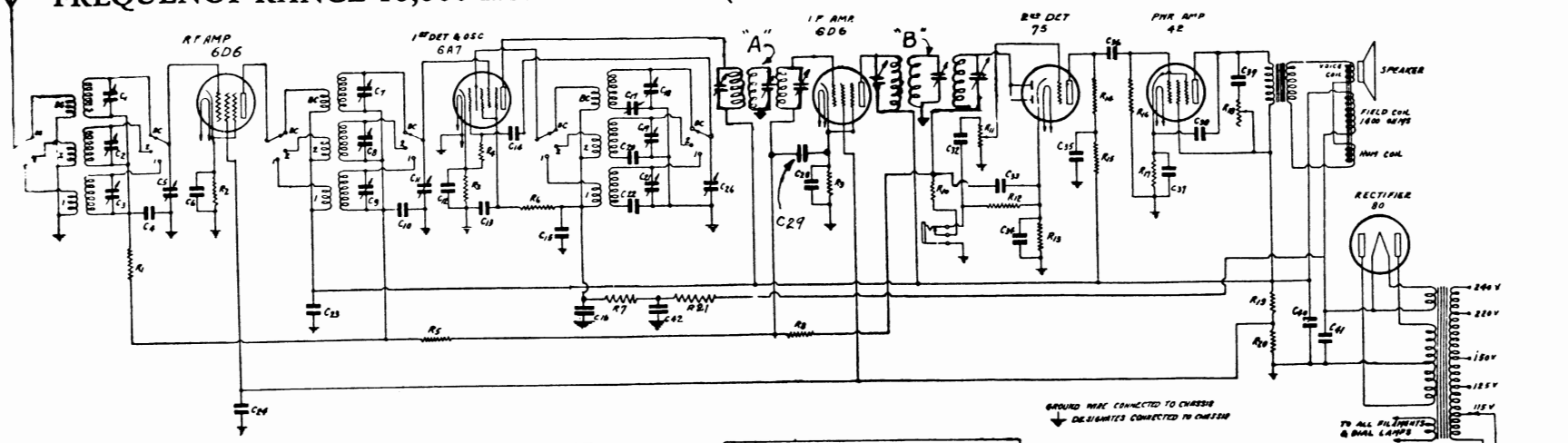


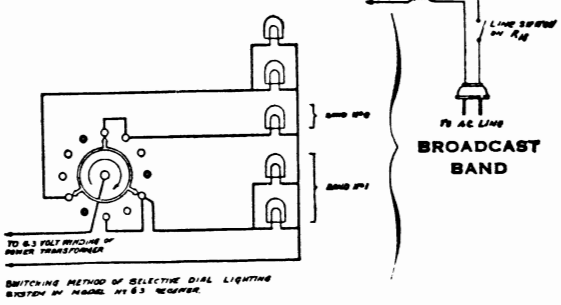
PILOT RADIO CORP.

ALL WAVE SUPERHETERODYNE RECEIVER

FREQUENCY RANGE 18,800 KC. TO 545 KC. (16 Meters to 550 Meters)

Model No. 63-65





SWITCHING METHOD OF SELECTIVE DIAL LIGHTING SYSTEM ON MODEL NO 63 RECEIVER.

Note. In Model 63 receivers where the serial number is lower than 20000 the I. F. amplifiar is designed with double tuned transformers. Coils "A" and "B" do not appear in those chassis.

CONDENSERS		
DESIGNATION	PART NO	DESCRIPTION
C1, C8, C9	70969-A	TRIMMER STRIP ON BAND SW UNIT
C4, C10, C24	22055-I	.05 MFDS 200V TUBULAR PAPER
C5, C11, C26	70937	406 MMFDS 3 GANG VARIABLE
C7, C8, C9	70969-A	TRIMMER STRIP ON BAND SW UNIT
C12, C16, C28	22055-M	.10 MFDS 200V TUBULAR PAPER
C13, C15	22055-P	.05 MFDS .400V TUBULAR PAPER
C14	27723	.00005 MFD MICA
C16, C42	71106	2 MFDS 475V ELECTROLYTIC
C17	16052-A	450 MMFD PADDER
C18, C19, C21	70969-A	TRIMMER STRIP ON BAND SW UNIT
C20	27717	.0028 MFD MICA
C22	27732	.0016 MFD MICA
C 23,24,33,45	22055-L	.10 MFDS .400V TUBULAR PAPER
C25, C27, C43	70936	TRIMMERS IN 1ST I.F. TRANS CAN
C30, C31, C44	70937	TRIMMERS IN 2ND I.F. TRANS CAN
C32, C36	22055-A	.01 MFD 600V TUBULAR PAPER
C35	27712	.0005 MFD MICA
C38, C37	70171	DUAL 8 MFD-25V TUBULAR ELECTRO
C38	22056-Q	.005 MFD .600V TUBULAR PAPER
C39	22055-C	.05 MFD-600V TUBULAR PAPER
C40, C41	71106	2-8MFDS-475V ELECTROLYTIC BLOCK

RESISTORS		
DESIGNATION	PART NO	DESCRIPTION
R1, R5, R15	13031	100,000 OHMS .5 WATT CARBON
R2, R3, R9	13115	400 OHMS .25 WATT CARBON
R4, R10, R20	13164	50,000 OHMS .25 WATT CARBON
R6	13068	30,000 OHMS .5 WATT CARBON
R7	13053	10000 OHM 1 WATT CARBON
R8	13001	1-MEGOHM .25 WATT CARBON
R11	70955	75,000 OHMS VOLUME CONTROL
R12	13167	300,000 OHMS .25 WATT CARBON
R13	13169	6000 OHMS .25 WATT CARBON
R14	13171	25,000 OHMS .25 WATT CARBON
R16	13024	500,000 OHMS .25 WATT CARBON
R17	13108	410 OHMS 1 WATT CARBON
R18	70984	100,000 OHMS TONE CONTROL & SWITCH
R19	13092	30,000 OHMS 1 WATT CARBON
R21	13053	10,000 OHMS 1 WATT CARBON

I.F. = 456 K.C.

RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
Frequency Rating —50 to 60 cycles.
Power Consumption—70 Watts.

Tubes
1 type 6A7
2 type 6D6
1 type 75
1 type 42
1 type 80

Circuit —One stage of Tuned Radio Frequency amplification for all frequencies, electron-coupled oscillator-modulator, diode detector, class "A" pentode output stage, automatic volume control.

Wavelength Range —From 550 meters to 16 meters (545 kc to 18,800 kc).
Undistorted power output—3 watts.
Intermediate Frequency — 456 kc.

Tube Functions —Type 6D6: R. F. amplifier for all bands.
Type 6A7: Electron emission control oscillator-detector.
Type 6D6: I. F. amplifier.
Type 75: Duo-diode detector-amplifier.
Type 42: Class "A" power pentode.
Type 80: Full-wave rectifier for power supply.

VOLTAGES

The D. C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	R. F. Type 6D6	OSC. DET. Type 6A7	I. F. Type 6D6	DIODE DET. Type 75	POWER PENTODE Type 42	RECTIFIER Type 80
Plate	235	235	235	120*	210	
Cathode	4.	4.5	4.	1.5	14.	
Screen	90	90	90		230	
Filament	6.3	6.3	6.3	6.3	6.3	

*Voltages measured through 250,000 ohm plate resistor.

Speaker field voltage 110 volts. All plate voltages measured to cathode. All screen voltages measured to cathode. All cathode voltages measured to chassis frame.

Models 63-65

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .002 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6D6 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer (See illustration on Service Information Sheet) to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS:—The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequencies are as follows:

Band 2: 49 Meters (6,100 kc.)

Band 1: 16.8 Meters—(17,800 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2." Set the tuning control pointer at the 49 meter mark. Set the external oscillator at 49 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Swith in the position marked "Band 1." Set the tuning control pointer at the 16.8 meter mark. Set the external oscillator at 16.8 meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output.

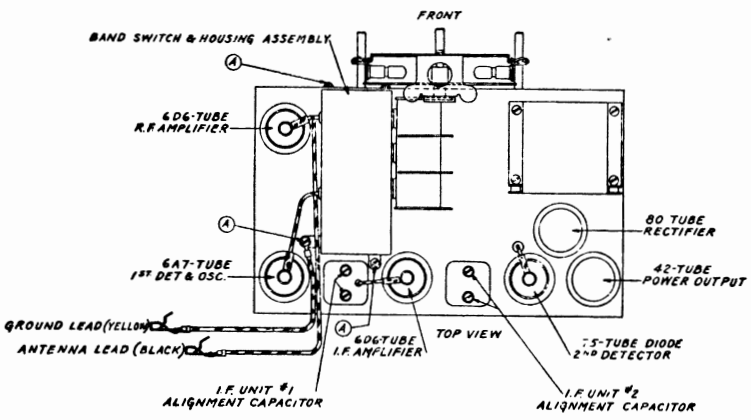
Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

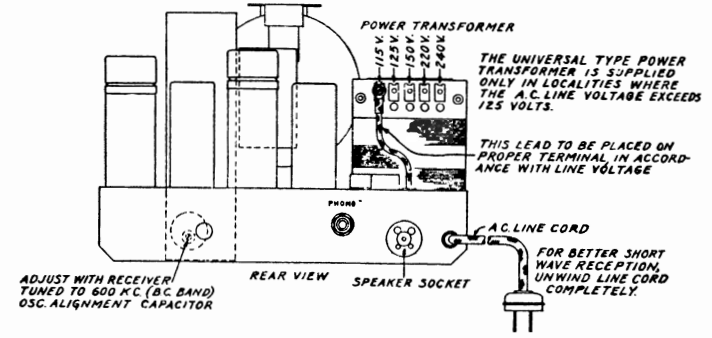
REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, this is easily done by removing the screws marked "A" on the Service Information Sheet. Before doing this, however, it is essential to unsolder the leads between the switch and the chassis. Also remove the screw beneath the Dial Drive Assembly, which secures the dial assembly to the chassis.

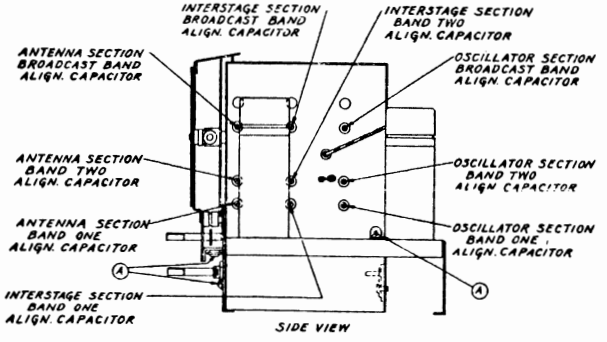
It is advisable to realign the receiver after reinstalling the switch assembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

SERVICE INFORMATION SHEET



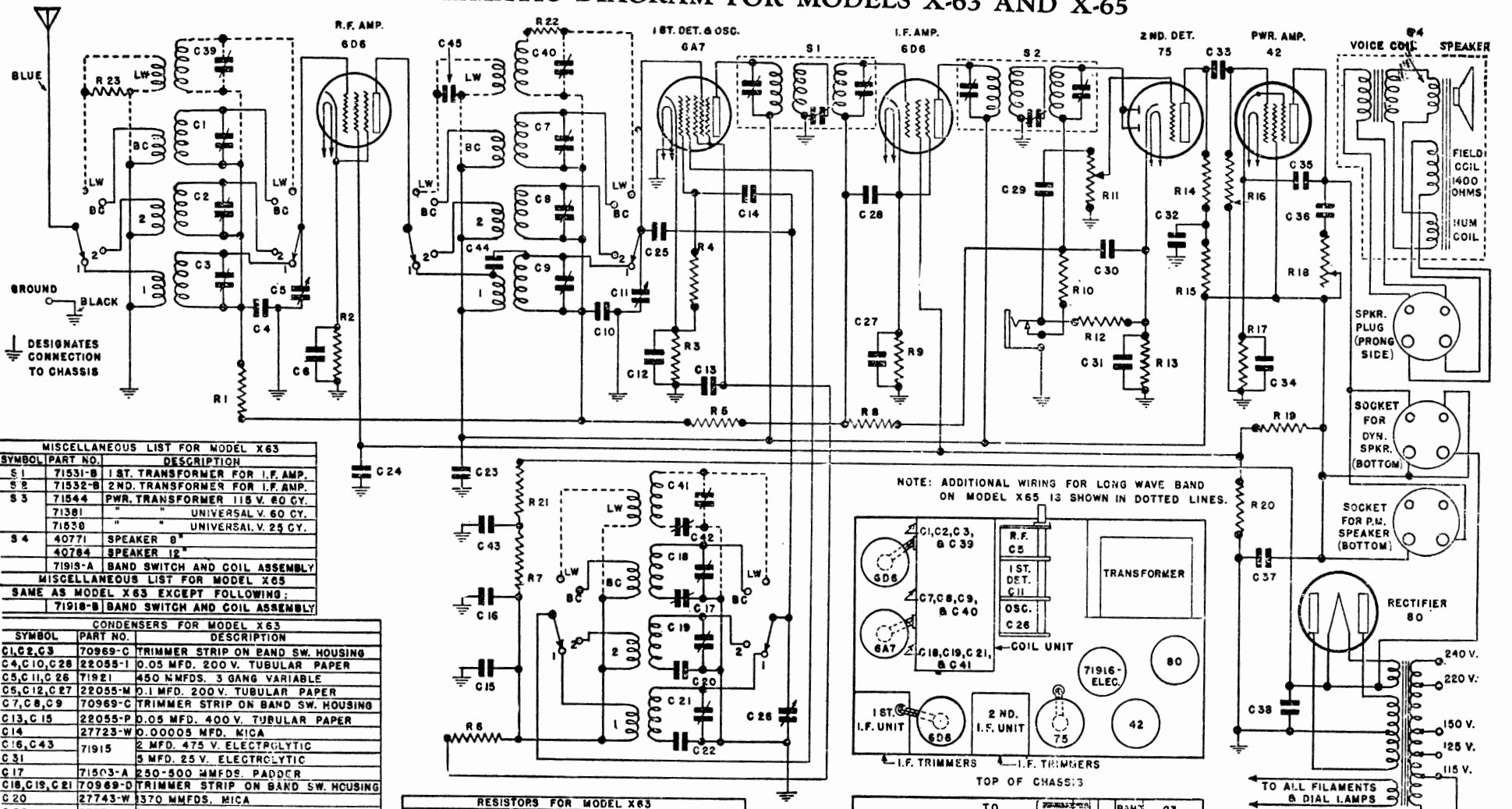




"PILOT" MODEL Nº 63 SUPERHETERODYNE RECEIVER

FREQUENCY RANGE - 18,800 K.C. TO 545 K.C. (16 METERS TO 550 METERS)

SCHEMATIC DIAGRAM FOR MODELS X-63 AND X-65



MISCELLANEOUS LIST FOR MODEL X63		
SYMBOL	PART NO.	DESCRIPTION
S1	71531-B	1 ST. TRANSFORMER FOR I.F. AMP.
S2	71532-B	2 ND. TRANSFORMER FOR I.F. AMP.
S3	71544	PWR. TRANSFORMER 115 V. 60 CY.
	71381	" " UNIVERSAL V. 60 CY.
	71530	" " UNIVERSAL V. 25 CY.
S4	40771	SPEAKER 8"
	40784	SPEAKER 12"
	71913-A	BAND SWITCH AND COIL ASSEMBLY
MISCELLANEOUS LIST FOR MODEL X65		
SAME AS MODEL X63 EXCEPT FOLLOWING:		
	71918-B	BAND SWITCH AND COIL ASSEMBLY

CONDENSERS FOR MODEL X63		
SYMBOL	PART NO.	DESCRIPTION
C1,C2,C3	70969-C	TRIMMER STRIP ON BAND SW. HOUSING
C4,C10,C28	22055-1	0.05 MFD. 200 V. TUBULAR PAPER
C5,C11,C26	71921	450 MMFDS. 3 GANG VARIABLE
C6,C12,C27	22055-M	0.1 MFD. 200 V. TUBULAR PAPER
C7,C8,C9	70969-C	TRIMMER STRIP ON BAND SW. HOUSING
C13,C15	22055-P	0.05 MFD. 400 V. TUBULAR PAPER
C14	27723-W	0.00005 MFD. MICA
C16,C43	71915	2 MFD. 475 V. ELECTROLYTIC
C31		5 MFD. 25 V. ELECTROLYTIC
C17	71503-A	250-500 MMFDS. PADDER
C18,C19,C21	70969-D	TRIMMER STRIP ON BAND SW. HOUSING
C20	27743-W	1370 MMFDS. MICA
C22	27738-W	2875 MMFDS. MICA
C23	22055-AH	0.25 MFD. 500 V. TUBULAR PAPER
C24,C32	22053-AB	0.1 MFD. 600 V. TUBULAR PAPER
C25	71523	NEUTRALIZING CONDENSER
C29,C33	22055-A	0.01 MFD. 600 V. TUBULAR PAPER
C30	27701-W	0.00025 MFD. MICA
C34	71916	10 MFDS. 25 V. ELECTROLYTIC
C37,C38		8 MFDS. 475 V. ELECTROLYTIC
C35	22055-R	0.005 MFD. 1000 V. TUBULAR PAPER
C36	22055-C	0.05 MFD. 600 V. TUBULAR PAPER
C44	27737-O	10 MMFD. MICA
CONDENSERS FOR MODEL X65		
SAME AS FOR MODEL X63 EXCEPT ONES GIVEN BELOW:		
C1,C2,C3,C39	70969-A	TRIMMER STRIP ON BAND SW. HOUSING
C7,C8,C9,C40	70969-A	TRIMMER STRIP ON BAND SW. HOUSING
C17,C42	71577-C	DUAL PADDER 250-500 & 30-150 MMFDS.
C18,C19,C21, & C41	70969-B	TRIMMER STRIP ON BAND SW. HOUSING
C45	27701-O	250 MMFDS. MICA

RESISTORS FOR MODEL X63		
SYMBOL	PART NO.	DESCRIPTION
R1,R5,R15	13031	100,000 OHMS 1/4 WATT CARBON
R2,R3,R9	13115	400 OHMS 1/4 WATT CARBON
R4,R10,R20	13164	50,000 OHMS 1/4 WATT CARBON
R6	13088	30,000 OHMS 1/2 WATT CARBON
R7,R21	13053	10,000 OHMS 1 WATT CARBON
R8	13001	1 MEGOHM 1/4 WATT CARBON
R11	71913	750,000 OHMS VOLUME CONTROL
R12	13147	300,000 OHMS 1/4 WATT CARBON
R13	13149	6,000 OHMS 1/4 WATT CARBON
R14	13171	250,000 OHMS 1/4 WATT CARBON
R16	13024	500,000 OHMS 1/4 WATT CARBON
R17	13108	410 OHMS 1 WATT CARBON
R18	71914	100,000 OHMS TONE CONTROL & SWITCH
R19	13092	30,000 OHMS 1 WATT CARBON
RESISTORS FOR MODEL X65		
SAME AS FOR MODEL X63 WITH ADDED ONES BELOW:		
R22	13029	250 OHMS 1/4 WATT CARBON
R23	13164	50,000 OHMS 1/4 WATT CARBON

PILOT RADIO CORP.

SERVICE INFORMATION Models X-63, X-65

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer condensers is on the side of the band switch. The trimmers in the lowest row are those for aligning Band 1. Those in the second row from the bottom are for Band 2. Those in the third row up are for the Broadcast. In the Model X65 there is an additional row of trimmers located immediately above those for the Broadcast.

The padder condenser is located under the rear section of the band switch. In the Model X65 an additional padder for the Highband range is located at the right of the Broadcast padder. Access to the padder condenser is made through a hole provided in the rear of the chassis frame.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6D6 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT WAVE-BANDS:—

The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequencies are as follows:

Band 2: 50 Meters (6,000 kc.)
Band 1: 16.6 Meters—(18,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2." Set the tuning control pointer at the 50 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Switch in the position marked "Band 1." Set the tuning control pointer at the 16.6 meter mark. Set the external oscillator at 16.6 meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output.

Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

NOTE.

The above alignment positions refer to the Model X-63 only, which is calibrated in frequency. The alignment points for the Model X-65, which is calibrated in meters only, is as follows:

High Band	Align at 750 meters.
	Pad at 2,000 meters.
Broadcast	Align at 200 meters.
	Pad at 500 meters.
Band 2	Align at 49 meters.
Band 1	Align at 17 meters.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, this is easily done by removing the supporting screws. Before doing this, however, it is essential to unsolder the leads between the switch and the chassis.

It is advisable to realign the receiver after reinstalling the switch assembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
Frequency Rating —50 to 60 cycles.
Power Consumption—70 Watts.
Tubes —1 type 6A7
2 type 6D6
1 type 75
1 type 42
1 type 80
Circuit —One stage of Tuned Radio Frequency amplification for all frequencies, electron-coupled oscillator-modulator, diode detector, class "A" pentode output stage, automatic volume control.
Wavelength Range —From 550 meters to 16 meters (545 kc. to 18,800 kc.).
Undistorted power output—3 watts.
Intermediate Frequency—456 kc.

Type 75: Duo-Diode detector-amplifier.
Type 42: Class "A" power pentode.
Type 80: Full-wave rectifier for power supply.

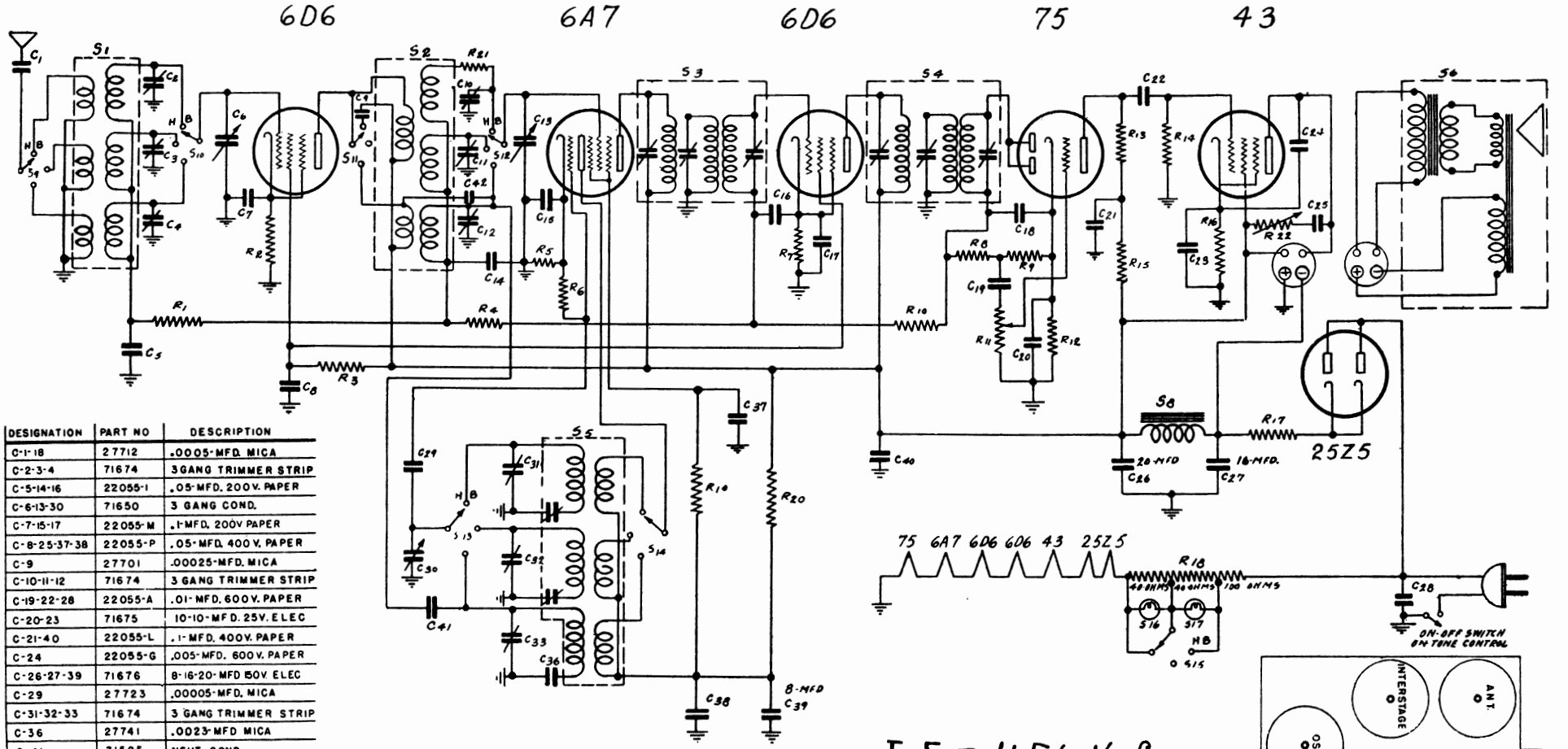
VOLTAGES

The D. C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	R. F. Type 6D6	OSC. DET. Type 6A7	I. F. Type 6D6	DIODE DET. Type 75	POWER PENT. Type 42	RECTIFIER Type 80
Plate	250	250**	250	100*	225	
Cathode	3.5	4	3.5	1.5	15	
Screen	90	90	90		250	
Filament	6.3	6.3	6.3	6.3	6.3	

*Voltages measured through 250,000 ohm plate resistor.
**Anode grid of 6A7 tube 160 volts.

SCHEMATIC DIAGRAM PILOT MODEL 68 and 69



DESIGNATION	PART NO	DESCRIPTION
C-1-18	27712	.0005-MFD. MICA
C-2-3-4	71674	3 GANG TRIMMER STRIP
C-5-14-16	22055-1	.05-MFD. 200 V. PAPER
C-6-13-30	71650	3 GANG COND.
C-7-15-17	22055-M	.1-MFD. 200V PAPER
C-8-25-37-38	22055-P	.05-MFD. 400 V. PAPER
C-9	27701	.00025-MFD. MICA
C-10-11-12	71674	3 GANG TRIMMER STRIP
C-19-22-28	22055-A	.01-MFD. 600 V. PAPER
C-20-23	71675	10-10-MFD. 25V. ELEC
C-21-40	22055-L	.1-MFD. 400V. PAPER
C-24	22055-G	.005-MFD. 600 V. PAPER
C-26-27-39	71676	8-16-20-MFD 150V. ELEC
C-29	27723	.00005-MFD. MICA
C-31-32-33	71674	3 GANG TRIMMER STRIP
C-36	27741	.0023-MFD MICA
C-41	71525	NEUT. COND.
C-42	27737-0	.00001-MFD. MICA

RESISTORS

DESIGNATION	PART NO	DESCRIPTION
R-1-4-15	13031	100,000-OHMS. 25 WATT CARBON
R-2-5-7	13115	400-OHMS 25 WATT CARBON
R-3-19	13149	6,000-OHMS 25 WATT CARBON
R-6-8	13164	50,000-OHMS 25 WATT CARBON
R-9	13147	300,000-OHMS .25 WATT CARBON
R-10	13001	1-MEG 25 WATT CARBON
R-11	71631	VOL. CONT 750000 OHMS
R-12	13116	12,000-OHMS 25 WATT CARBON
R-13-14	13024	500,000-OHMS 25 WATT CARBON
R-16	13146	600-OHMS 5 WATT CARBON
R-17	13172	30-OHMS 5 WATT CARBON
R-18	71683	180-OHMS TAPPED AT 40 & 80
R-20	13073	3,000-OHMS 5 WATT CARBON
R-21	13029	250-OHMS 25 WATT CARBON
R-22	71630	TONE CONT. & SW. 100,000-OHMS

MODEL-125-CIRCUIT HAS HIGHBAND TUNING

MODEL 123-CIRCUIT IS SIMILER EXCEPT FOR THE OMMISSION OF THE HIGHBAND TUNING

TABLE OF VOLTAGES

VOLTAGES: The D. C. voltages measured at the tube sockets of the set should be read with a meter of at least 1,000 ohms per volt.

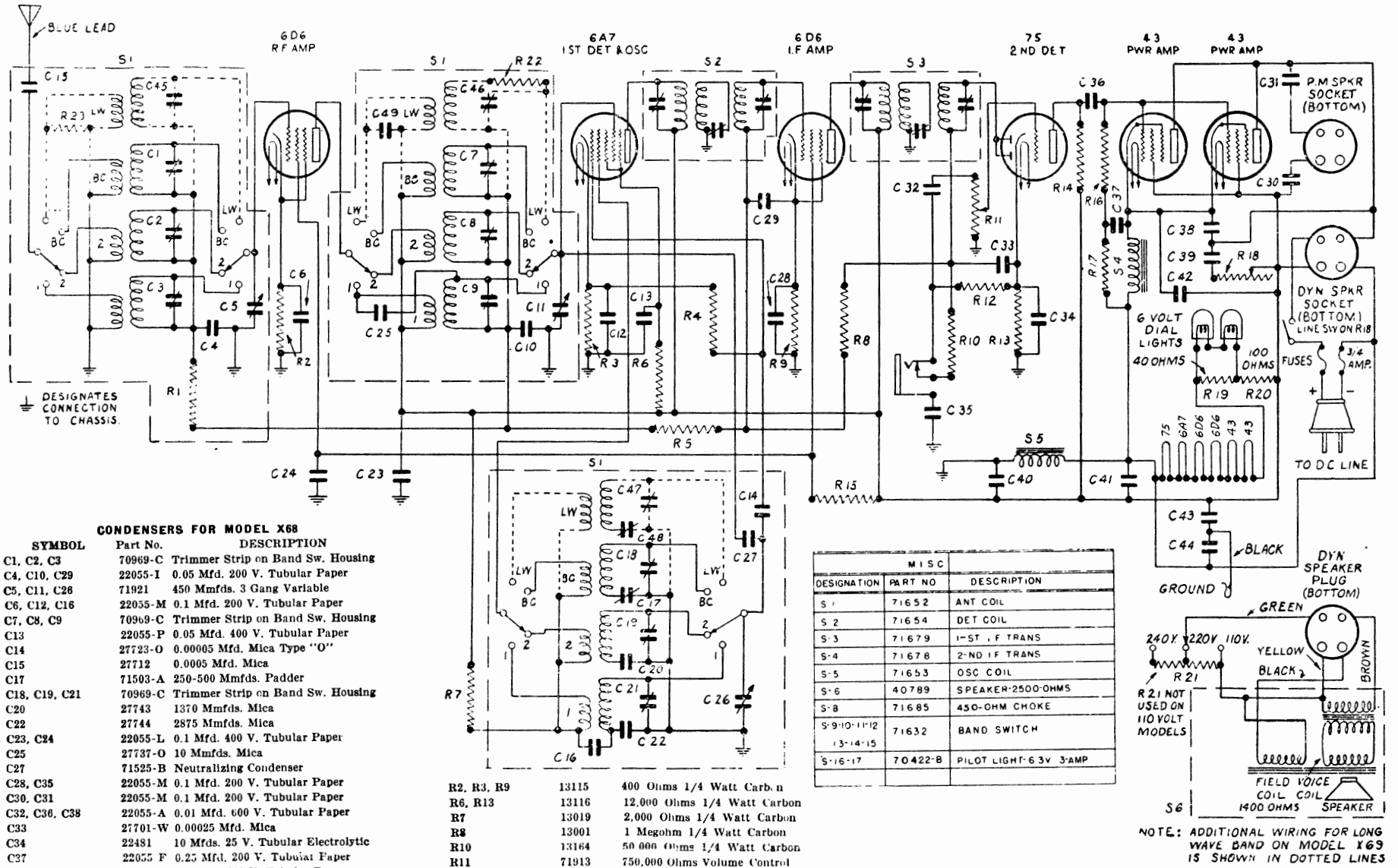
	R.F.	OSC. 1-DET.	I. F.	DIODE 2-DET.	AUDIO OUTPUT	
Tube:	6D6	6A7	6D6	75	43	43
Plate:	100	100*	100	35**	97	97
Screen:	81	60	81		103	103
Cathode:	2.7	3.	2.7	.6	15.	15.
Filament:	6.3	6.3	6.3	6.3	24.5	24.5

* Anode Grid—92 volts.
** Measured through Plate Resistor.
All voltage to chassis ground.

Dial lights 8.6 volts across both lamps in series.
Speaker Field approx. 105 volts.

PILOT RADIO CORP.

SCHEMATIC DIAGRAM FOR MODELS X-68 AND X-69



CONDENSERS FOR MODEL X68

SYMBOL	Part No.	DESCRIPTION
C1, C2, C3	70969-C	Trimmer Strip on Band Sw. Housing
C4, C10, C29	22055-I	0.05 Mfd. 200 V. Tubular Paper
C5, C11, C26	71921	450 Mmfds. 3 Gang Variable
C6, C12, C16	22055-M	0.1 Mfd. 200 V. Tubular Paper
C7, C8, C9	70969-C	Trimmer Strip on Band Sw. Housing
C13	22055-P	0.05 Mfd. 400 V. Tubular Paper
C14	27723-O	0.00005 Mfd. Mica Type "O"
C15	27712	0.0005 Mfd. Mica
C17	71503-A	250-500 Mmfds. Padder
C18, C19, C21	70969-C	Trimmer Strip on Band Sw. Housing
C20	27743	1370 Mmfds. Mica
C22	27744	2875 Mmfds. Mica
C23, C24	22055-L	0.1 Mfd. 400 V. Tubular Paper
C25	27737-O	10 Mmfds. Mica
C27	71525-B	Neutralizing Condenser
C28, C35	22055-M	0.1 Mfd. 200 V. Tubular Paper
C30, C31	22055-M	0.1 Mfd. 200 V. Tubular Paper
C32, C36, C38	22055-A	0.01 Mfd. 600 V. Tubular Paper
C33	27701-W	0.00025 Mfd. Mica
C34	22481	10 Mfds. 25 V. Tubular Electrolytic
C37	22055-F	0.25 Mfd. 200 V. Tubular Paper
C39, C43, C44	22055-L	0.1 Mfd. 400 V. Tubular Paper
C40, C41, C42	71600	Triple 4 Mfds. 150 V. Non-Polar

CONDENSERS FOR MODEL X69

SAME AS FOR MODEL X68 WITH FOLLOWING CHANGES

C1, C2, C3, C45	70969-A	Trimmer Strip on Band Sw. Housing
C7, C8, C9, C46	70969-A	Trimmer Strip on Band Sw. Housing
C17, C48	71577-C	Dual Padder 250-500 & 30-150 Mmfds.
C18, C19, C21, C47	70969-B	Trimmer Strip on Band Sw. Housing
C49	27701-W	0.00025 Mfd. Mica

RESISTORS FOR MODEL X68

SYMBOL	Part No.	DESCRIPTION
R1, R4, R5, R17	13031	100,000 Ohms 1/4 Watt Carbon
R2, R3, R9	13115	400 Ohms 1/4 Watt Carbon
R6, R13	13116	12,000 Ohms 1/4 Watt Carbon
R7	13019	2,000 Ohms 1/4 Watt Carbon
R8	13001	1 Megohm 1/4 Watt Carbon
R10	13164	50,000 Ohms 1/4 Watt Carbon
R11	71913	750,000 Ohms Volume Control
R12	13147	300,000 Ohms 1/4 Watt Carbon
R14, R16	13024	500,000 Ohms 1/4 Watt Carbon
R15	13149	6,000 Ohms 1/4 Watt Carbon
R18	72138	10,000 Ohms Tone Control and Switch
R19, R20	71101	140 Ohms, Tap at 40 Ohms 20 Watts
R21	71029	284 Ohms, Tap at 238 Ohms 75 Watts

RESISTORS FOR MODEL X69

Same as for Model X68 with Additional Ones Below

R22	13029	250 Ohms 1/4 Watt Carbon
R23	13164	50,000 Ohms 1/4 Watt Carbon

MISC

DESIGNATION	PART NO	DESCRIPTION
S-1	71652	ANT COIL
S-2	71654	DET COIL
S-3	71679	1-ST I.F TRANS
S-4	71678	2-ND I.F TRANS
S-5	71653	OSC COIL
S-6	40789	SPEAKER-2500-OHMS
S-8	71685	450-OHM CHOKE
S-9-10-11-12 13-14-15	71632	BAND SWITCH
S-16-17	70422-B	PILOT LIGHT-6.3V .3-AMP

Wavelength Range: From 550 meters to 16 meters (545 kc. to 18,800 kc.). Long Wave covers 732-2,140 meters (410-140 kc.) also.

Undistorted Power Output: 2 watts.

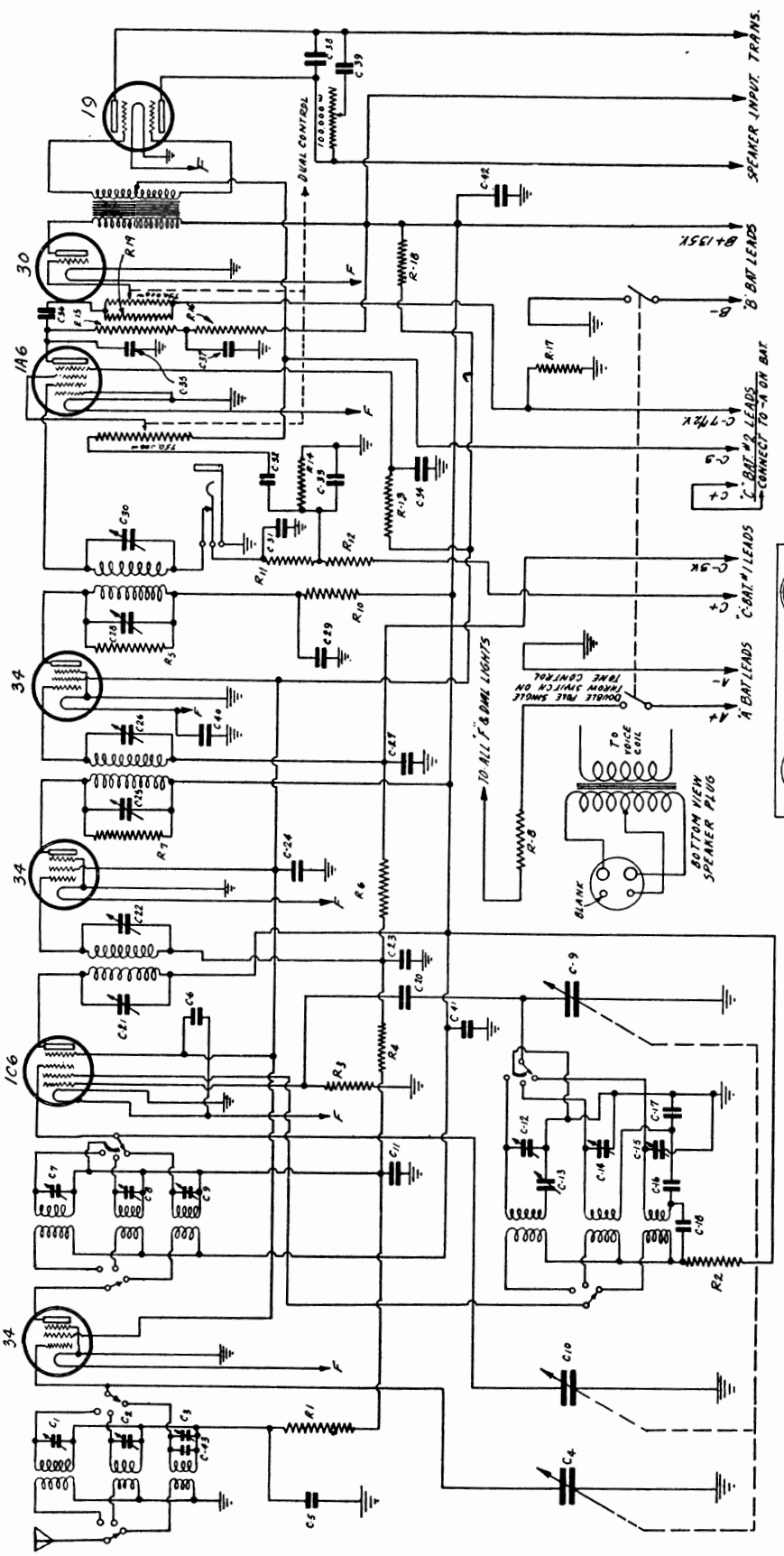
Intermediate Frequency: 456 kc.

Tube Functions: Type 6D6—R. F. amplifier for all bands. Type 6A7—Electron emission control oscillator detector; Type 6D6—I. F. amplifier; Type 75—Duo-diode detector-amplifier; Type 43—Class "A" power pentodes in parallel.

PILOT RADIO CORP.

TECHNICAL INFORMATION CHART FOR PILOT MODELS 73 AND 75

I.F. = 456 K.C.



VOLTAGE MEASUREMENTS

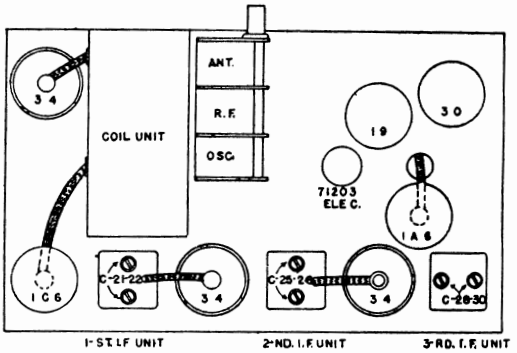
	R.F. No. 34	Osc. Det. No. 1C6	1st I. F. No. 34	2nd I. F. No. 34
Plate Volts	145	145	145	130
Screen Volts	65	65	65	65
Fil. Volts	2.2	2.2	2.2	2.2

	Det. No. 1A6	Driver No. 30	"B" Amp. No. 19
Plate Volts	50*	135	145 both plates
Screen Volts	28**		
Fil. Volts	2.2	2.2	2.2

* Measured through .25 meg. plate resistor.

** Measured through 20,000-ohm resistor.

All voltages are measured to chassis frame.



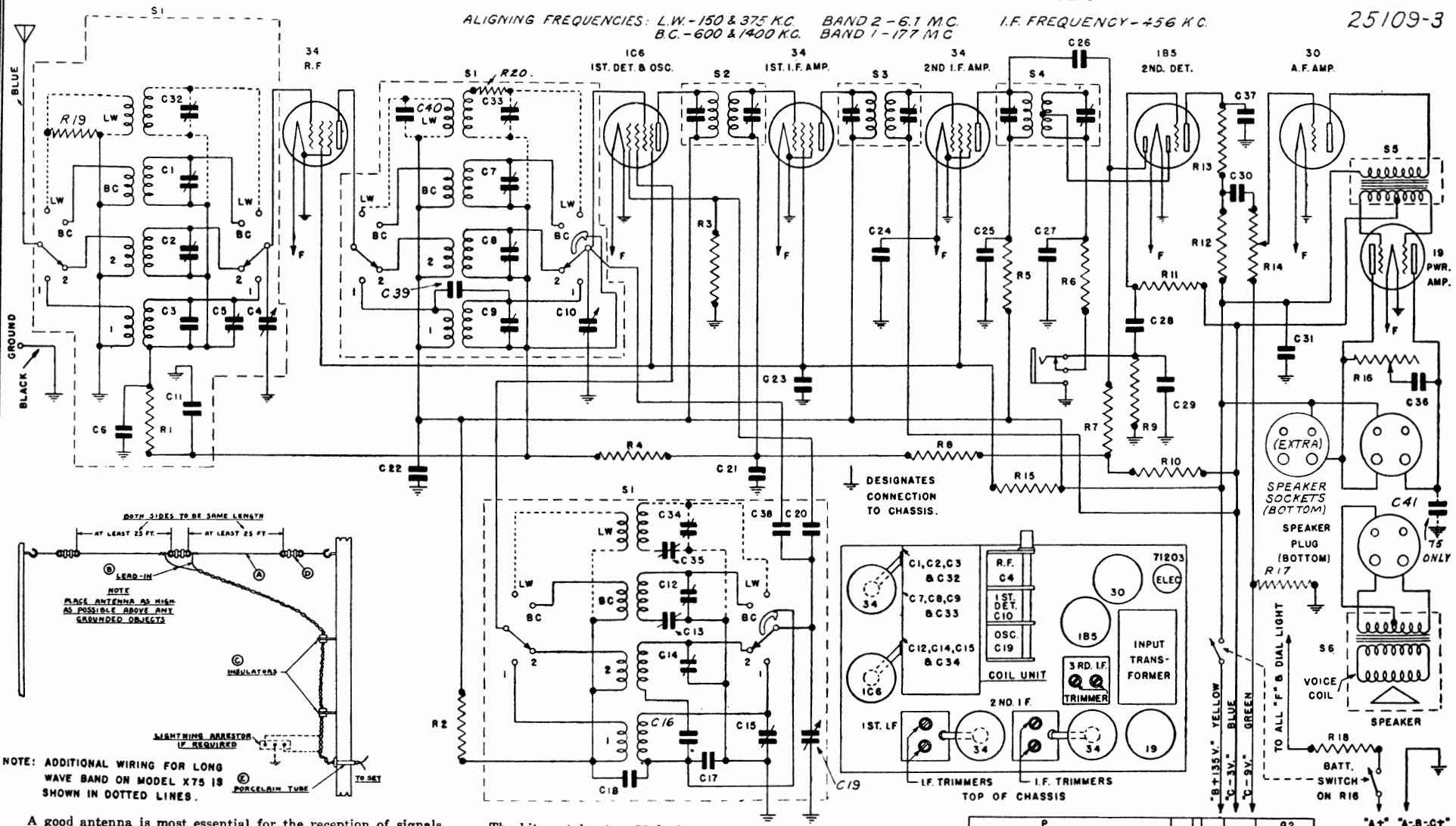
DESIGNATION	PART NO.	DESCRIPTION
C-43	27737	.0001-MFD. MICA
C-1-2-3-7-8-9-12-14-15	70969-A	BAND SW. TRIMMERS
C-4-10-19	71229	450 MFD. 3-GANG COND.
C-5-11-23-27-29	22055-1	.05-MFD. 200V. PAPER
C-13	71503-A	250-500-MMFD. PADDER
C-6-41	22055-F	.25-MFD. 200V. PAPER
C-16	27735	.005-MFD. MICA
C-17	27717	.0028-MFD. MICA
C-34-37-18	22055-M	.1-MFD. 200V. PAPER
C-20	27723-0	.00005-MFD. MICA
C-21-22	70936	TRIMMERS-1-STEL F.
C-24-40	22055-S	.5-MFD. 200V. PAPER
C-26-25	70936-A	TRIMMERS-2ND. I.F.
C-28-30	70936-B	TRIMMERS-3RD. I.F.
C-31-33	28016	.0001-MFD. MICA
C-32-39	22055-A	.01-MFD. 600 V. PAPER
C-35	27726	.0002-MFD. MICA
C-36	22055-P	.05-MFD. 400V. PAPER
C-38	27704	.002 MFD. MICA
C-42	71203	8-MFD. 200V. ELEC.

DESIGNATION	PART NO.	DESCRIPTION
R-1-4-6-19	13031	100,000-OHMS .25 WATT-CARBON
R-2	1314-9	6,000-OHMS .25 WATT-CARBON
R-3-5-7-11-16	13164	50,000-OHMS .25 WATT-CARBON
R-8	13178	.3-WATT WIRE
R-10	13113	4,000-OHMS .25 WATT CARBON
R-12	13001	1-MEG .25 WATT CARBON
R-13	13074	20,000-.25 WATT CARBON
R-14	13024	500,000-OHMS .25 WATT CARBON
R-15	13171	250,000-OHMS .25 WATT CARBON
R-17	13117	15,000-OHMS .25 WATT CARBON
R-18	13013	10,000-.5 WATT CARBON

SCHEMATIC DIAGRAM OF PILOT MODELS X73 AND X75

ALIGNING FREQUENCIES: L.W.-150 & 375 KC. BAND 2-6.1 M.C. I.F. FREQUENCY-456 K.C.
B.C.-600 & 1400 KC. BAND 1-17.7 M.C.

25109-3



A good antenna is most essential for the reception of signals from stations located thousands of miles from the receiver. The flat top portion of the antenna should be placed as high above the ground and grounded objects as possible. Both lead-in wire and antenna should be located as far from sources of man-made static as possible. Automobile ignition systems, telephone communication lines, electric oil burner installations, motor and trolley power lines are some of the more common offenders of this nature. The installation of a good antenna requires a small amount of additional labor, but the extra effort is always rewarded with improved reception with a minimum of static interference. A properly installed antenna is almost as good as an extra stage of tuned radio frequency amplification.

It is advisable to place the radio receiver close to the incoming lead-in, as frequently an extension about the interior of the house picks up a considerable amount of static along with the desired signal. The illustration shows how to install a lightning arrester if one is desired.

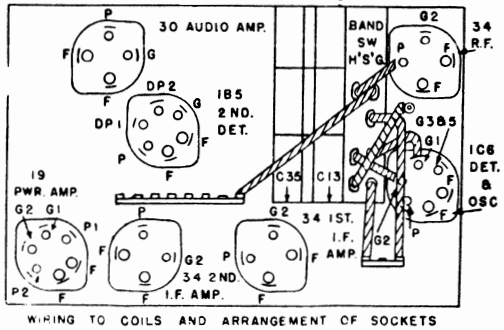
The kit contains two 75 ft. lengths of No. 14 wire. The illustration suggests the use of at least 25 ft. per section Use as much of the wire up to 75 ft. per section as your location will permit. The letters at the right form a reference to the parts as arranged in the illustration.

Method No. 1: Join the ends of both leads together and connect to antenna terminal of set.

Method No. 2: Connect one lead to antenna of set; connect the other lead to the ground. Use the method on your set which gives the best performance.

CONTENTS OF PILOT KIT

2—75 ft. lengths of No. 14 enameled, copper wire.....A
100 ft. twisted pair lead-in wire .....B
2—Insulated stand-off insulators C
6—Porcelain insulators .....D
2—Porcelain tubes .....D
6—Insulated staples



WIRING TO COILS AND ARRANGEMENT OF SOCKETS

PILOT RADIO CORP.

PARTS FOR PILOT MODELS X-73 AND X75

Symbol on Diagram	Replacement Part No.	DESCRIPTION
		TUBE SOCKETS
	70927-B	4-prong bakelite-base tube socket
	70863-B	6-prong bakelite-base tube socket
		TUBE SHIELDS
	71976	Tube shield base, 1⅝ ins. diam.
	71125-B	Tube shield base, 1⅞ ins. diam.
	71858	Small tube shield, 2⅝ ins. long
	71126	Large tube shield, 4-9/16 ins. long
		SPEAKER AND PARTS
S6	40780	8-in. permanent magnet speaker
	80000-B	Voice coil and cone assembly for above
	80001-B	Output transformer for above
S6	40782	10-in. permanent magnet speaker
	80000-C	Voice coil and cone assembly for above
	80001-C	Output transformer for above
	70509	Steel speaker mounting bushing
	70002	Rubber grommet for speaker mounting
		AUDIO TRANSFORMER
S5	72045	Input transformer assembly
		TUNING EQUIPMENT
S2	73018-A	1st I. F. transformer
S3	73018-B	2nd I. F. transformer
S4	73019	3rd I. F. transformer
C4, C10, C19	71921	* 3-gang tuning condenser
S1	71910-E	Band switch and coil assembly completely mounted in shield with 3-gang condenser, for Model X73
S1	71910-F	* Band switch and assembly as above, for Model X75
	70918	Dial escutcheon
	70910	Dial crystal
	70919	Dial crystal retaining ring
	71911-A	* 2-speed dial drive mechanism
	70998-B	Dial drive disc assembly
	71157-C	Dial scale and reflector assembly for * Model X73
	71157-D	* Above, for Model X75
	70934	Pointer
	642	Pointer holding screw
	78526	Spacing washer
	70953-B	Band switch escutcheon, Model X73
	70953-J	Above, for Model X75
	72127	Dial light, screw base, 2 volts, 60 ma.
		SWITCHES AND CONTROLS
	78629	* Tone control and switch
	71913	Volume control
	70953-A	Volume control escutcheon
	72177	Small knob without dot
	72176	Small knob with dot
	72180	Large tuning knob
	70950	Phonograph jack
		BATTERY CABLE
	78591	Battery cable, with plugs
	71981	Battery cable, without plugs
		CONDENSERS
C1	70969-C	Trimmer strip (C1, C2, C5) Model X73
	70969-A	Trim. strip (C1, C2, C5, C32) Model X75
C2	Refer to	C1
C3	27736-O	Mica, 25 mmfd.
C4	71921	3-gang condenser (C4, C10, C19)
C5	Refer to	C1
C6	22055-I	Paper, .05 mfd., 200 V.
C7	70969-C	Trimmer strip (C7, C8, C9) Model X73
	70969-A	Trim. strip (C7, C8, C9, C33) Model X75
C8	Refer to	C7
C9	Refer to	C7
C10	Refer to	C4
C11	22055-I	Paper, .05 mfd., 200 V.
C12	70969-D	Trim. strip (C12, C14, C15) Model X73
	70969-B	Trimmer strip (C12, C14, C15, C34) Model X75
C13	71503-A	Padder, Model X73
	71577-C	Padder (C13, C35) Model X75
C14	Refer to	C12
C15	Refer to	C12
C16	27745-W	Mica, 2500 mmfd.
C17	27749-W	Mica, .0028 mfd.
C18	22055-M	Paper, .1 mfd., 200 V.
C19	Refer to	C4
C20	27723-O	Mica, 50 mmfd.
C21	22055-I	Paper, .05 mfd., 200 V.
C22	22055-F	Paper, .25 mfd., 200 V.
C23	22055-S	Paper, .5 mfd., 200 V.
C24	22055-AK	Paper, 1.0 mfd., 200 V.
C25	22055-I	Paper, .05 mfd., 200 V.
C26	27723-W	Mica, 50 mmfd.
C27	28016-W	Mica, 100 mmfd.
C28	22055-A	Paper, .01 mfd., 600 V.
C29	28016-W	Mica, 100 mmfd.
C30	22055-A	Paper, .01 mfd., 600 V.
C31	71203	Electrolytic, 8 mfd., 200 V.
C32	Refer to	C1
C33	Refer to	C7
C34	Refer to	C12
C35	Refer to	C13
C36	22055-AJ	Paper, .03 mfd., 600 V.
C37	27712-W	Mica, .0005 mfd.
C38	71525-B	Neutralizing condenser
C39	27737-O	Mica, 10 mmfd.
C40	27701-O	Mica, 250 mmfd.
C41	22055-AQ	Paper, .001 mfd., 1,000 V.
		RESISTORS
R1	13031	100,000 ohms, ¼ w. carbon
R2	13149	6,000 ohms, ¼ w. carbon
R3	13164	50,000 ohms, ¼ w. carbon
R4	13031	100,000 ohms, ¼ w. carbon
R5	13149	6,000 ohms, ¼ w. carbon
R6	13164	50,000 ohms, ¼ w. carbon
R7	13024	500,000 ohms, ¼ w. carbon
R8	13001	1 megohm, ¼ w. carbon
R9	13147	300,000 ohms, ¼ w. carbon
R10	13024	500,000 ohms, ¼ w. carbon
R11	13001	1 megohm, ¼ w. carbon
R12	13164	50,000 ohms, ¼ w. carbon
R13	13074	20,000 ohms, ¼ w. carbon
R14	71913	750,000 ohms, volume control
R15	13075	15,000 ohms, ½ w. carbon
R16	71127	100,000 ohms, Tone control and switch
R17	13185	22,500 ohms, ¼ w. carbon
R18	13178	.3 ohm, 1 w. flexible
R19	13164	50,000 ohms, ¼ w. carbon
R20	13029	250 ohms, ¼ w. carbon

CHARACTERISTICS

Batteries Required: One Eveready Air Cell or 2.2-volt storage battery, three 45-volt B batteries, and two 4½-volt C batteries.

Tubes: Three 34's, one 1C6, one 1B5, one 19, and one 30.

Wavelength Range: Model X73 — 16 to 550 meters (18,800 to 545 kc.)

Model X75 — 16 to 550 meters and 750 to 2,000 meters. (18,800 to 545 kc. and 400 to 150 kc.)

Undistorted Power Output: 1.9 watts.

I. F. Alignment Frequency: 456 kc.

Circuit. All-wave superheterodyne, with one stage of R. F. on all bands.

Output: Class B amplifier.

* IMPORTANT NOTE

If the serial number at the rear of the chassis is below 4700, order replacement parts listed below.

71229	3-gang condenser
71025-E	Band switch and coil assembly completely mounted in shield with 3-gang condenser, for Model X73.
71025-F	Band switch and assembly as above, for Model X75
71028-A	2-speed dial drive mechanism
71157-A	Dial scale and reflector assembly for Model X73
71157-B	Above, for Model X75
71127	Tone control and switch

TABLE OF VOLTAGE MEASUREMENTS

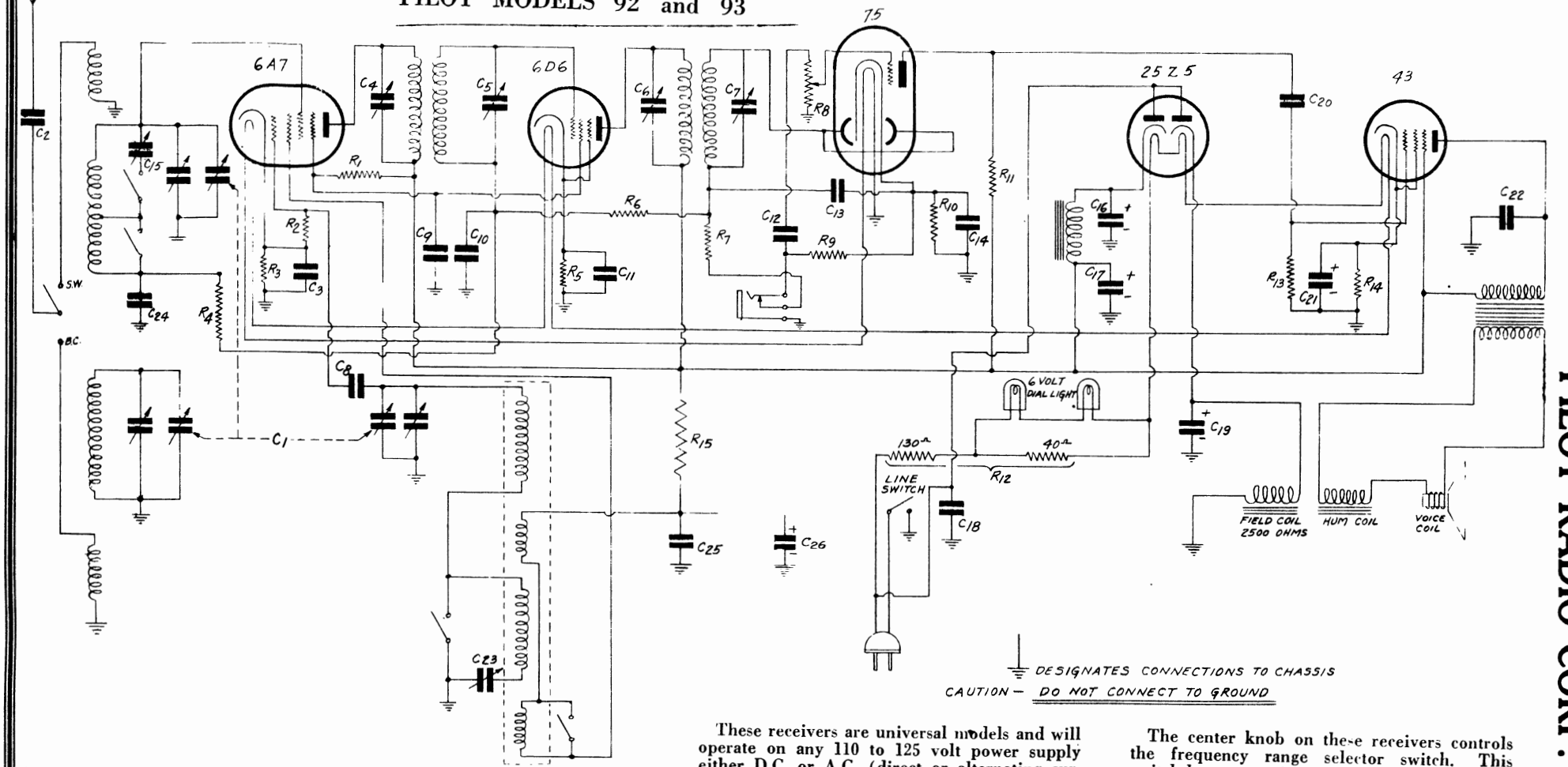
	R.F. No. 34	Osc. Det. No. 1C6	1st I. F. No. 34	2nd I. F. No. 34
Plate Volts	145	145	145	130
Screen Volts	65	65	65	65
Fil. Volts	2.2	2.2	2.2	2.2

	Det. No. 1B5	Driver No. 30	"B" Amp. No. 19
Plate Volts	50*	135	145 both plates
Fil. Volts	2.2	2.2	2.2

* Measured through .25 meg. plate resistor.

Note 1: All voltages are measured to chassis frame.

PILOT MODELS 92 and 93



CONDENSERS

DESIG	MFDS.	VOLTAGE	DESIG	MFDS	VOLTAGE
C_1	370 μμf. GANG		C_{15}	3 TO 30 μμf.	
C_2	.0005	MICA	C_{16}	80 (ELECT)	150
C_3	.02	200	C_{17}	12.0 (ELECT)	150
C_4	40 TO 200 μμf.		C_{18}	.05	300
C_5	" " " "		C_{19}	4.0 (ELECT)	150
C_6	" " " "		C_{20}	.005	600
C_7	" " " "		C_{21}	5.0 (ELECT)	25
C_8	.00005	MICA	C_{22}	.005	600
C_9	.10	200	C_{23}	800 TO 1800 μμf.	
C_{10}	.02	200	C_{24}	.05	300
C_{11}	.02	200	C_{25}	.002	MICA
C_{12}	.005	600	C_{26}	4 (ELECT)	150
C_{13}	.0005	MICA			
C_{14}	5.0 (ELECT)	25			

RESISTORS

DESIG	OHMS	WATTS	DESIG	OHMS	WATTS
R_1	12,000	.25	R_{15}	2000	.25
R_2	50,000	.25	R_{16}		
R_3	400	.25	R_{17}		
R_4	100,000	.25	R_{18}		
R_5	400	.25	R_{19}		
R_6	1 MEG	.25	R_{20}		
R_7	50,000	.25			
R_8	750,000	VOLUME CONTROL			
R_9	300,000	.25			
R_{10}	12,000	.25			
R_{11}	500,000	.25			
R_{12}	170 (TAP 40)	20			
R_{13}	500,000	.25			
R_{14}	600	.50			

These receivers are universal models and will operate on any 110 to 125 volt power supply either D.C. or A.C. (direct or alternating current) at any commercial frequency (25 to 100 cycles). For higher voltage a voltage reducer is available into which the line cord plugs.

There is a special reducer for each voltage in excess of 125 volts. Make sure you have the proper voltage reducer if your power supply exceeds 125 volts.

Because of the high sensitivity of these receivers, a short antenna is sufficient for local reception. However, a good outside antenna will usually give better reception of signals from distant stations with less extraneous noise.

After making sure that your power supply is correct, the receiver may be plugged into the nearest receptacle and the antenna connected.

The center knob on these receivers controls the frequency range selector switch. This switch has two positions, clockwise and counter-clockwise. The frequency range of these receivers with the switch in either position is as follows:

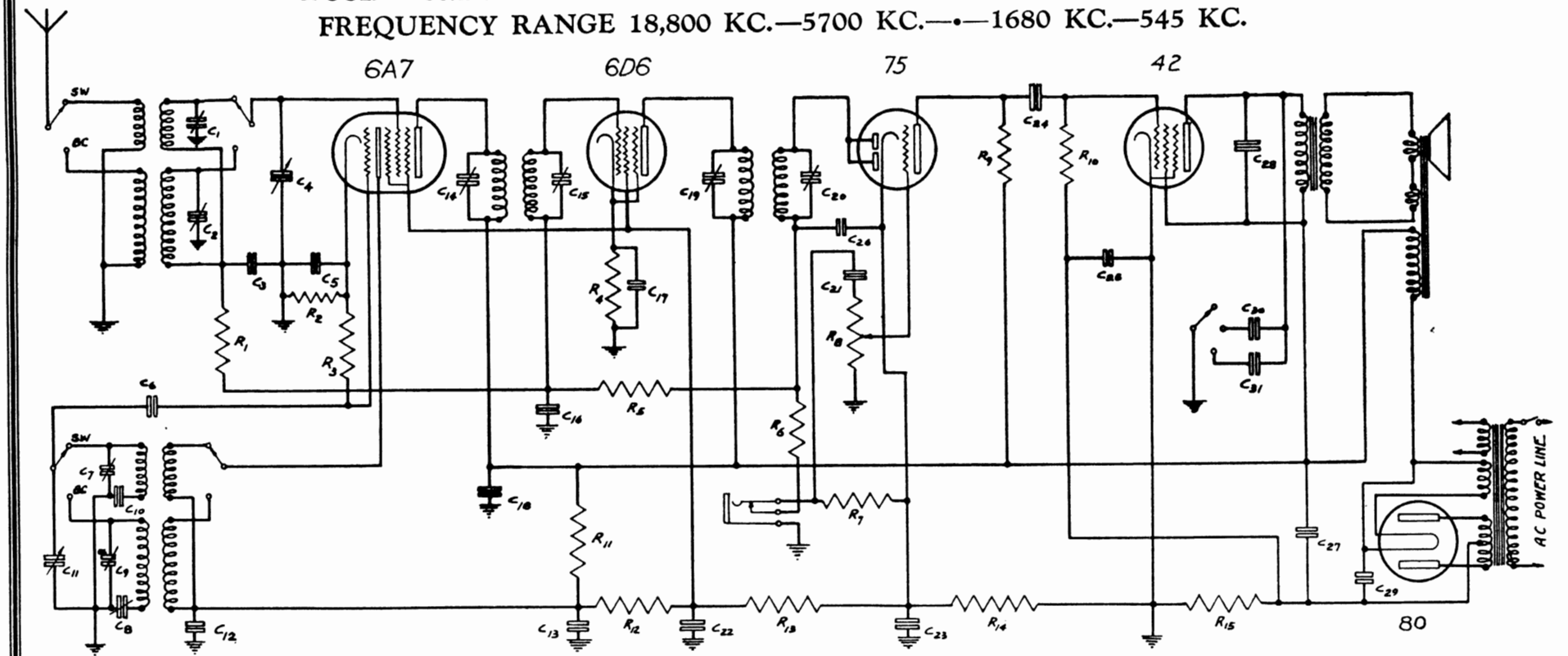
Model	Frequency Range Switch Position	
	counter-clockwise	*clockwise*
92	150 kc —320 kc 2000 mtrs—937.5 mtrs	545 kc —1500 kc 550 mtrs—200 mtrs
93	545 kc —1500 kc 550 mtrs—200 mtrs	5750 kc —15800 kc 52.1 mtrs—18.98 mtrs

The movement of the knob is approximately 30 degrees. It works very easily and should not be forced. Its position can be identified by means of the white dot on the knob and the lettering on the escutcheon just above it.

PILOT RADIO CORP.

Technical Information Chart for Pilot Model No. 103

FREQUENCY RANGE 18,800 KC.—5700 KC.—•—1680 KC.—545 KC.



CONDENSERS		
DESIGNATION	PART NO	DESCRIPTION
C_1 C_2 C_7 C_9	71168	TRIMMER ON BAND SW.
C_3 C_5 C_{16}	22055-1	.05 MFD. 200 VOLT PAPER
C_4 C_{11}	71181	2 GANG COND. 406 MMF.
C_6	27723	50 MICRO-MFD. MICA
C_8	16052-A	SINGLE PADDER
C_{10}	27734	6000 MICRO-MFD. MICA
C_{12} C_{22}	22055-P	.05 MFD. 400 V PAPER
C_{13}	71215	4 MFD. 450 V. ELEC.
C_{14} C_{15}	71166	TRIMMER 1ST I. F.
C_{17}	22055-M	.1 MFD. 200 V. PAPER
C_{19} C_{20}	70937	TRIMMER 2ND I. F.
C_{21} C_{24}	22055-A	.01 600 V. PAPER
C_{23}	22055-F	.25 MFD. 200 V PAPER
C_{25}	22055-S	.5 MFD. 200 V PAPER
C_{26}	27712	500 MICRO-MFD. MICA.
C_{27} C_{29}	71045-B	DUAL 8 MFD. 475 V. (CAN)
C_{28}	22055-R	.005 MFD. 1000 V. PAPER
C_{30}	22055-U	.01 MF. 1000 V. PAPER
C_{31}	22055-V	.03 MF. 1000 V. PAPER.
C18		.05 MFD. 600 V. PAPER

RESISTORS		
DESIGNATION	PART NO.	DESCRIPTION
R_1	13031	100.000 OHMS .25 WATT.
R_2 R_4	13115	400 OHMS 25 WATT.
R_3 R_6	13164	50,000 OHMS 25 WATT.
R_5	13001	1,000,000 OHMS .25 WATT.
R_7	13147	300,000 OHMS .25 WATT
R_8	71211	750,000 VOLUME CONTROL
R_9	13171	250,000 OHMS 25 WATT
R_{10}	13024	500,000 OHMS .25 WATT
R_{11}	13073	3000 OHMS .5 WATT
R_{12}	13129	15,000 OHMS 1 WATT
R_{13}	13148	30,000 OHMS .25 WATT.
R_{14}	13130	420 OHMS .25 WATT.
R_{15}	13059	250 OHMS 1 WATT.

Type 6A7: Electron emission control oscillator-detector.
Type 6D6: I. F. Amplifier.
Type 75: Duo-diode detector amplifier.
Type 42: Class "A" power pentode.
Type 80: Full-wave rectifier for power supply.

** Grid bias voltage for No. 42 tube obtained across R-15 (250 ohms resistor).
***Filament to chassis ground 315 Volts D. C.
Anode grid of 6A7 to cathode—175 Volts.

RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
Frequency Rating —50 to 60 cycles.
Power Consumption—60 Watts.
Tubes— —1 type 6A7, 1 type 6D6, 1 type 75, 1 type 42, 1 type 80.
Wavelength Range —16 meters to 52.6 meters—178.5 meters to 550 meters.
Undistorted power output—3 watts.
Intermediate Frequency—456 kc.

VOLTAGES

The D. C. Voltages measured at the tube sockets of the set shoud be read with a high resistance voltmeter of at least 1000 ohms per volt.

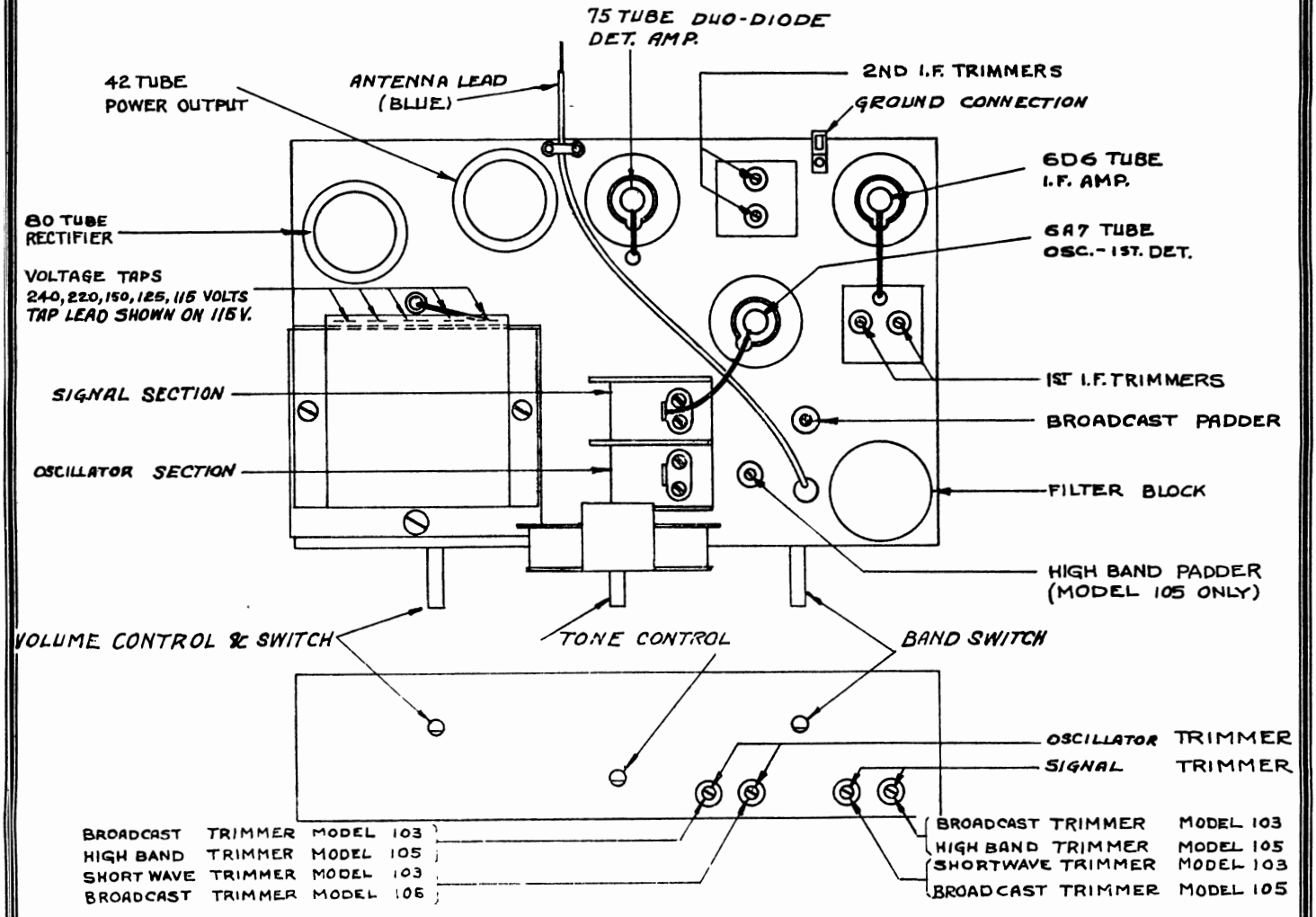
	OSC. DET. Type 6A7	I. F. Type 6D6	DIODE DET. Type 75	POWER PENTODE Type 42	RECTIFIER Type 80
Plate	230	230	105*	205	***
Cathode	4.	3.8	1.4	**	
Screen	85	85		230	
Filament	6.3	6.3	6.3	6.3	

*Voltages measured through 250,000 ohm plate resistor.
Speaker field voltage 90 volts. All plate voltages measured to cathode.

PILOT RADIO CORP.

PILOT RADIO CORP.

MODELS No. 103—105



SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .002 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS: The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequency is;

16.8 Meters—(17,800 kc.)

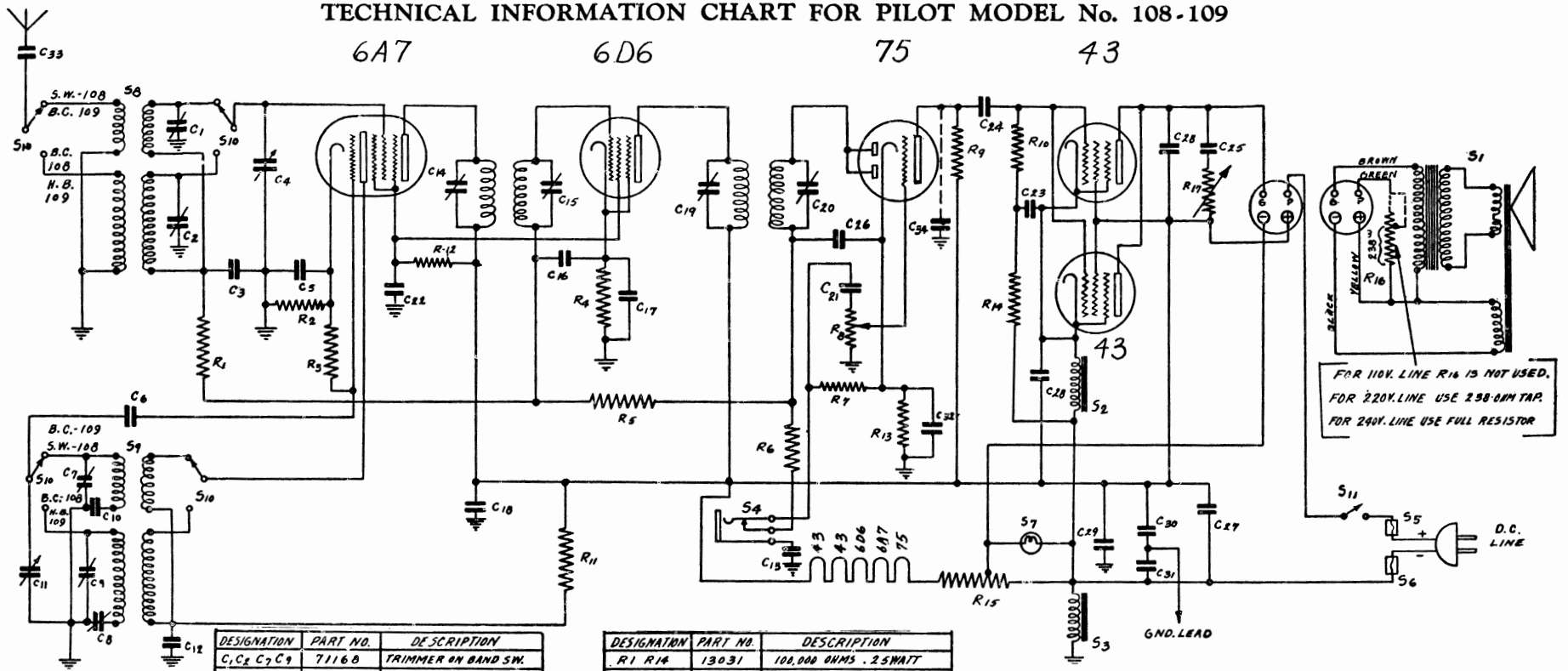
Turn the Band Switch to the right. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

THE HIGH BAND ALIGNMENT: Procedure in the Model 105 is similar to the Broadcast section of that receiver. Align at 375 k.c. Adjust the padder at 160 k.c.

Should it be necssary to remove the band switch assembly, it is advisable to realign the receiver after reinstalling.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

TECHNICAL INFORMATION CHART FOR PILOT MODEL No. 108-109



DESIGNATION	PART NO.	DESCRIPTION
C1 C2 C7 C9	71168	TRIMMER ON BAND SW.
C3 C5 C16	22055-I	.05 MFD. 200V. PAPER
C4 C11	71161	2 GANG COND. 406 MMFD.
C6	27723	50 MMFD. MICA
C8	16052-A	SINGLE PAPPER
C10	27734	6000 MMFD. MICA
C12 C18 C22	22055-P	.05 MFD. 400V. PAPER
C14 C15	71166	TRIMMER 1ST I.F.
C17 C13	22055-M	.1 MFD. 200V. PAPER
C19 C20	70937	TRIMMER 2ND I.F.
C21 C24 C28	22055-A	.01 MFD. 600V. PAPER
C23	22055-F	.25 MFD. 200V. PAPER
C25 C30 C31	22055-L	.1 MFD. 400V. PAPER
C26 C33	27712	500 MMFD. MICA
C27 C28 C29	71600	TRIPLE 4 MFD. 150V. N.P.
C32	22481	5 MFD. 25V. ELEC COND.

DESIGNATION	PART NO.	DESCRIPTION
R1 R14	13031	100,000 OHMS .25 WATT
R4	13115	400 OHMS .25 WATT
R3 R6	13164	50,000 OHMS .25 WATT
R5	13001	1,000,000 OHMS .25 WATT
R7	13147	300,000 OHMS .25 WATT
R8	71211	750,000 OHM VOLUME CONTROL
R2	13029	250 OHMS .25 WATT
R9 R10	13024	500,000 OHMS .25 WATT
R11	13073	3,000 OHMS .5 WATT
R12	13149	6,000 OHMS .25 WATT
R13	13116	12,000 OHMS .25 WATT
R15	71601	170 OHMS-TAPPED AT 40-20 WATTS
R16	71029	289 OHMS-TAPPED AT 238-55 WATTS
R17	71634	10,000 OHMS TONE CONTROL

MISC		
DESIGNATION	PART NO.	DESCRIPTION
S1	40765	SPKER. 1400 "FIELD-PAR. 43'S.
S2	71635	FILTER CHOKE 312 Ω 10 HENRIES.
S3	42007	FILTER CHOKE
S4	70950	PHONO JACK
S5,S6	70053-B	FUSES. 6 AMPS.
S7	70422-B	DIAL LAMP 6.3V. .3 AMPS.
S8	71169	ANT. COIL
S9	71170	OSC. COIL
S10	71172	BAND SWITCH
S11	ON-71211	LINE SWITCH (ON R8-71211)

RECEIVER DESCRIPTION

Line voltage	115 Volt ..... D. C.
Line current	.44 Amperes ..... D. C.
Power Consumption	50 Watts
Undistorted Power output	2 Watts
Tubes	—1 type 6A7, 1 type 6D6, 1 type 75, 2 type 43.
Wavelength Range	—16 meters to 52.6 meters—178.5 meters to 550 meters.
Intermediate Frequency	—456 kc.
Tube Functions	—Type 6A7: Electron emission control oscillator-detector.
	—Type 6D6: I. F. Amplifier.
	Type 75: Duo-diode detector amplifier.
	Type 43: Class "A" power pentodes in parallel.

VOLTAGES

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	No. 6A7 OSC. DET.	No. 6D6 I. F.	No. 75 DIODE DET.	No. 43 PWR. PENTODES
Plate	100	100	60*	85
Cathode	2.8	2.5	.6	**
Screen	65	65	.....	95
Filament	6.3	6.3	6.3	25.

*Voltages measured through 500,000 ohm plate resistor.

**Grid bias voltage for No. 43 tube 15 volts, (obtained across S-2 Filter choke).

Anode grid of 6A7 to cathode—90 volts.

All plate voltages measured to cathode.

All screen voltages measured to cathode. All cathode voltages measured to chassis frame. Speaker field voltage 105 volts.

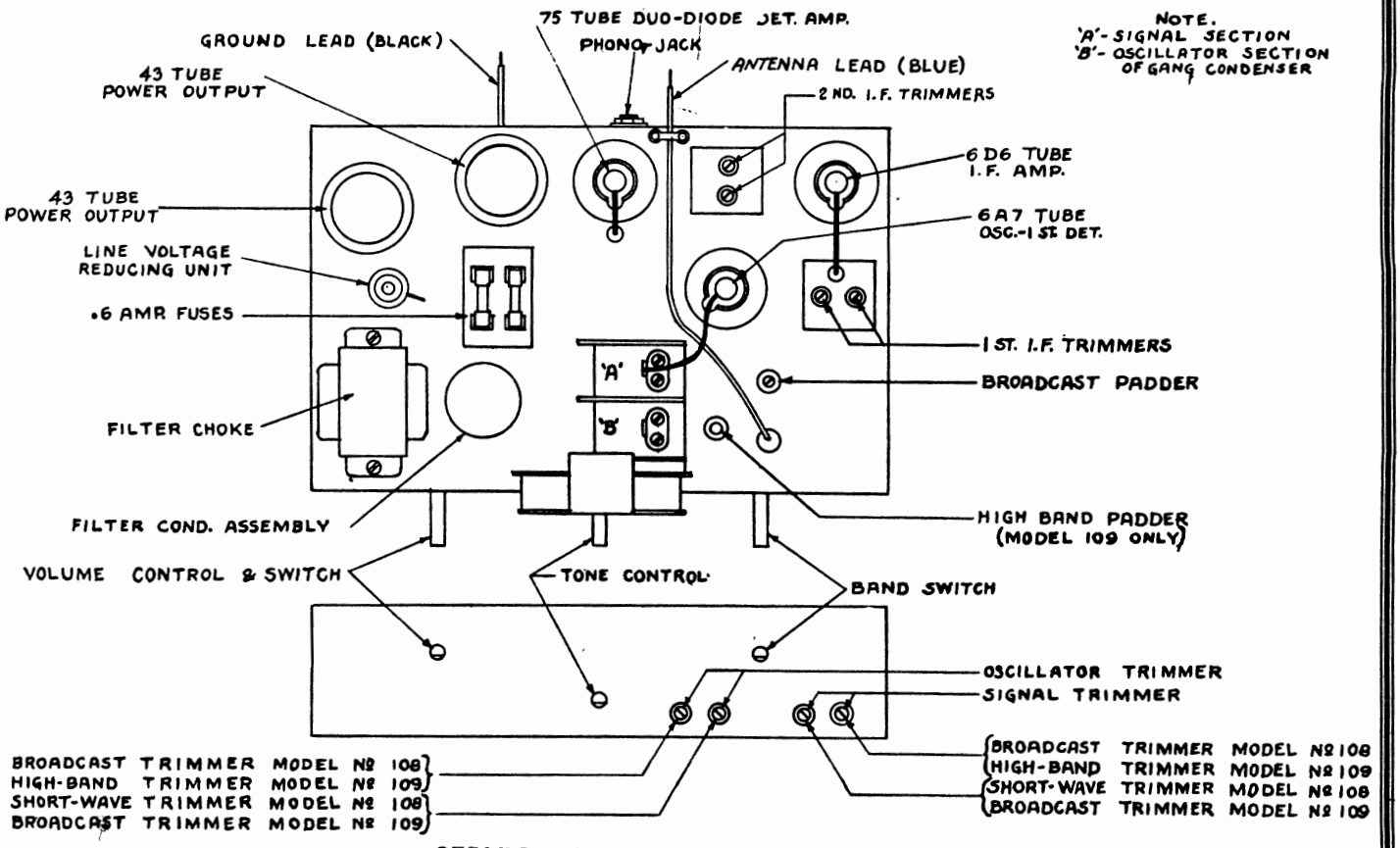
REVISIONS FOR MAKING 109 REC.		
R 2	13131	600 OHMS .25 WATT
S 8	71173	ANT. COIL
S 9	71174	OSC. COIL
Co. C10	71577-C	DUAL C8-250-800 MMFD. PADDER C10-30-150 MMFD.
C 34	27712	500 MMFD. MICA (FOR 109 ONLY)

PILOT RADIO CORP.

OFFICIAL RADIO SERVICE MANUAL

PILOT RADIO CORP.

TOP VIEW OF CHASSIS MODELS No. 108-109



SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .002 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS: The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequency is;

16.8 Meters—(17,800 kc.)

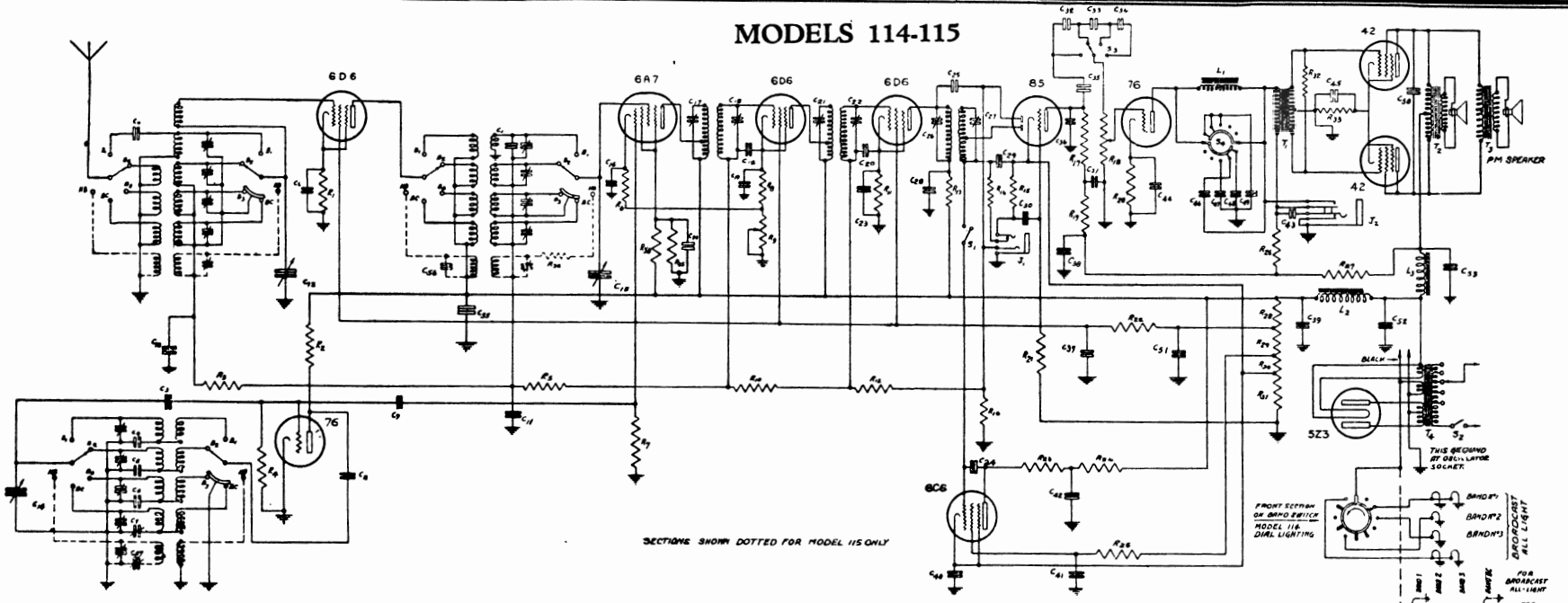
Turn the Band Switch to the short wave position. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

THE HIGH BAND ALIGNMENT: Procedure in the Model 105 is similar to the Broadcast section of that receiver. Align at 375 k.c. Adjust the padder at 160 k.c.

Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after reinstalling.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

MODELS 114-115



CONDENSERS

DESIGNATION	PART NO	DESCRIPTION
C_{36} C_{43}	22055-C	.05 MFD 600 VOLT PAPER
C_{36}	27720	200 MICRO-MFD. MICA
C_{38}	71589	2 MFD 450 VOLT ELECTRO-LYTIC IN ONE
C_{39}		8 MFD 450 VOLT
C_{40}		10 MFD 25 VOLT CAN
C_{41}	22055-M	.1 MFD 200 VOLT PAPER
C_{44}	71590	10 MFD 25 VOLT IN ONE
C_{45}		10 MFD 50 VOLT CAN
C_{46} C_{47} C_{48}	22055-R	.005 MFD. 1800 VOLT
C_{49}	22055-AD	.02 MFD. 1000 VOLT
C_{50}	22055-KA	.095 MFD 1500 VOLT
C_{51}	71586	.2 MFD 200 VOLT IN ONE
C_{52} C_{53}		.8 MFD 475 VOLT CAN
C_{54}	22055-P	.05 MFD 400 VOLT PAPER
C_{55}	71577-C	33-181 MMFD PADDER
C_{56}	71577-C	250-300 MMFD (115 ONLY)

CONDENSERS

DESIGNATION	PART NO	DESCRIPTION
C_1	27736	88 MICRO-MFD. MICA
C_2	27740-0	35 MICRO-MFD MICA
C_3 C_5 C_6 C_{34} C_{35}	22055-1	.03 MFD 200 VOLT PAPER
C_4 C_{28} C_{31} C_{10}	- - -	- - -
C_7 C_9 C_{32}	27783-0	50 MICRO MFD MICA
C_8	27738	2870 MICRO-MFD MICA
C_{12}	28018	1480 - -
C_{13}	27781	1160 - -
C_{14}	71503-D	300-700 MMF (116 ONLY)
C_{15}	28055-W	.01 MFD 400 VOLT PAPER
C_{16} C_{17} C_{18}	71585	3 GANG TUNING COND
C_{19} C_{20}	71261	TRIMMER CONDS 1ST I.F TRANS
C_{21} C_{22}	71343	TRIMMER CONDS 2ND I.F TRANS
C_{24} C_{27}	71262	TRIMMER CONDS 3RD I.F TRANS
C_{24} C_{29} C_{33}	27712	500 MICRO-MFD MICA
C_{28} C_{31} C_{42} C_{55}	22055-AB	1 MFD 600 VOLT PAPER
C_{58}	27711	1000 MICRO-MFD MICA
C_{30} C_{56}	27701-0	250 MICRO-MFD MICA

RESISTORS

DESIGNATION	PART NO	DESCRIPTION
R_1 R_{36}	13089	250 OHM 25 WATT
R_2	13179	18000 OHM 2 WATT
R_3 R_5 R_{11} R_{19} R_{24} R_{25}	13031	100 000 OHM 25 WATT
R_{32}	13031	100 000 OHM 25 WATT
R_4 R_7 R_{15} R_{38}	13104	50 000 OHM 25 WATT
R_6 R_8 R_{16}	13115	400 OHM 25 WATT
R_9	71667	5000 OHM VARIABLE WIRE WOUND
R_{10}	13101	1 000 000 OHM 25 WATT
R_{13}	13149	6000 OHM 25 WATT
R_{14}	13147	300 000 OHM 25 WATT
R_{17}	13171	250 000 OHM 25 WATT
R_{18}	13156	750 000 OHM VARIABLE
R_{20}	13133	3000 OHM 25 WATT
R_{21}	13072	750 000 OHM 25 WATT
R_{22}	13058	6000 OHM 5 WATT
R_{26}	13030	10 000 OHM 25 WATT
R_{27}	13126	25 000 OHM 5 WATT

RESISTORS

DESIGNATION	PART NO	DESCRIPTION
R_{28}	71256	8900 OHM
R_{29}		2090 OHM
R_{30}		470 OHM
R_{31}		570 OHM
R_{33}	13132	710 OHM 3 WATT WIRE WOUND
R_{34}	13092	30,000 OHM 1 WATT

MISC

DESIGNATION	PART NO	DESCRIPTION
S_1	71567	BAND-STATION CLARIFIER SW. ON R_3
S_2	71564	POWER SUPPLY SWITCH ON C_{56}
S_3	71592	BASE REGENERATOR SWITCH
S_4	71238	TONE CONTROL SWITCH
T_1	71272	PHONO JACK
J_1	71273	HEAD PHONE JACK
L_1	71271	TONE CONTROL CHOKE
L_2	71315	SPEAKER FIELD WINDING (460 OHMS)
L_3	71315	POWER FILTER CHOKE
T	71271	AUDIO PUSH PULL INPUT TRANS
T_1	71271	SPEAKER-R P INPUT TRANSFORMER
T_2	71271	P M SPEAKER-IN OUT TRANSFORMER
T_3	71274	POWER SUPPLY TRANSFORMER

RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 Volts—Alternating Current 50-60 Cycles.

Power Consumption—120 Watts.

Tubes 1—6A7 1—6C6 2— 76 1—5Z3
3—6D6 1— 85 2— 42

Wavelength range—From 12.7 to 550 meters (23,560 kc. to 545 kc.)

Undistorted power output—12 Watts.

I. F. —456 kc.

Type of circuit —All wave Superhetrodyne with TRF stage on all bands, A. V. C., Class "A" Prime push pull power output stage.

Line Volts=115

*Voltages measured through plate resistor.

**Measured on 100V Scale.

***A. C. Voltage plate to chassis.

Speaker field voltage-volts. All plate voltages measure to cathode. All screen voltage measure to cathode. All cathode voltages measure to chassis frame.

VOLTAGES

The D. C. Voltages measure at the tube sockets of the set should be read with a high resistance voltmeter of at least 1,000 ohms per volt.

	R.F. Amp. 6D6	1st. Det. 6A7	Oscillator 76	1st. I. F. Amp. 6D6	2nd. I. F. Amp. 6D6
Plate	253	252	145	252	210
Cathode	2.5	2.65	0	3.2	3.2
Screen	90	74	.....	89	89
Filament	6.3	6.3	6.3	6.3	6.3

	Diode Detector 85	Audio Driver 76	Class "A Prime Audio Output" 42 42	Inter Channel Clarifier	6C6 Rectifier 5Z3
Plate	105*	210	330	20	375***
Cathode	22**	10.5	33	21.5	375***
Screen	.....	.....	.....	8.7	.....
Filament	6.3	6.3	6.3	6.3	5

Models 114, 115

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Unfasten the base accentuator switch on the side of the cabinet.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control and the tone control should be turned to the maximum clockwise position. The inter-channel clarifier should be turned off. (Knob in maximum counter-clockwise position.) Connect the antenna lead of the external oscillator to the control grid of the 6D6 tube in the 2nd I. F. Amplifier through .002 mfd. fixed condenser. Connect the ground lead of the external oscillator to the receiver ground lead. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 3 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the 6D6 2nd. I. F. amplifier tube and connect it in the same manner to the control grid of the 6D6 1st I. F. amplifier tube. Now rotate each adjustment screw on I. F. Unit No. 2 for maximum output. Following this, connect the external oscillator leads to the control grid of the 6A7 tube. Adjust each trimmer on the I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Tune the external oscillator to 1500 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance position, and at the same time adjust the padder condenser for the highest peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

The alignment frequencies are as follows:

Band 3—67.38 meters— 4,450 kc.
Band 2—30.04 meters— 9,980 kc.
Band 1—13. meters—23,000 kc.

When aligning Band 3, set the Band Switch in the position marked Band 3. Rotate the tuning condenser to the extreme high frequency end of the range. Set the external oscillator at 4450 kc. Adjust the Band 3 oscillator trimmer for maximum sensitivity. Next adjust the interstage and antenna trimmer condensers for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

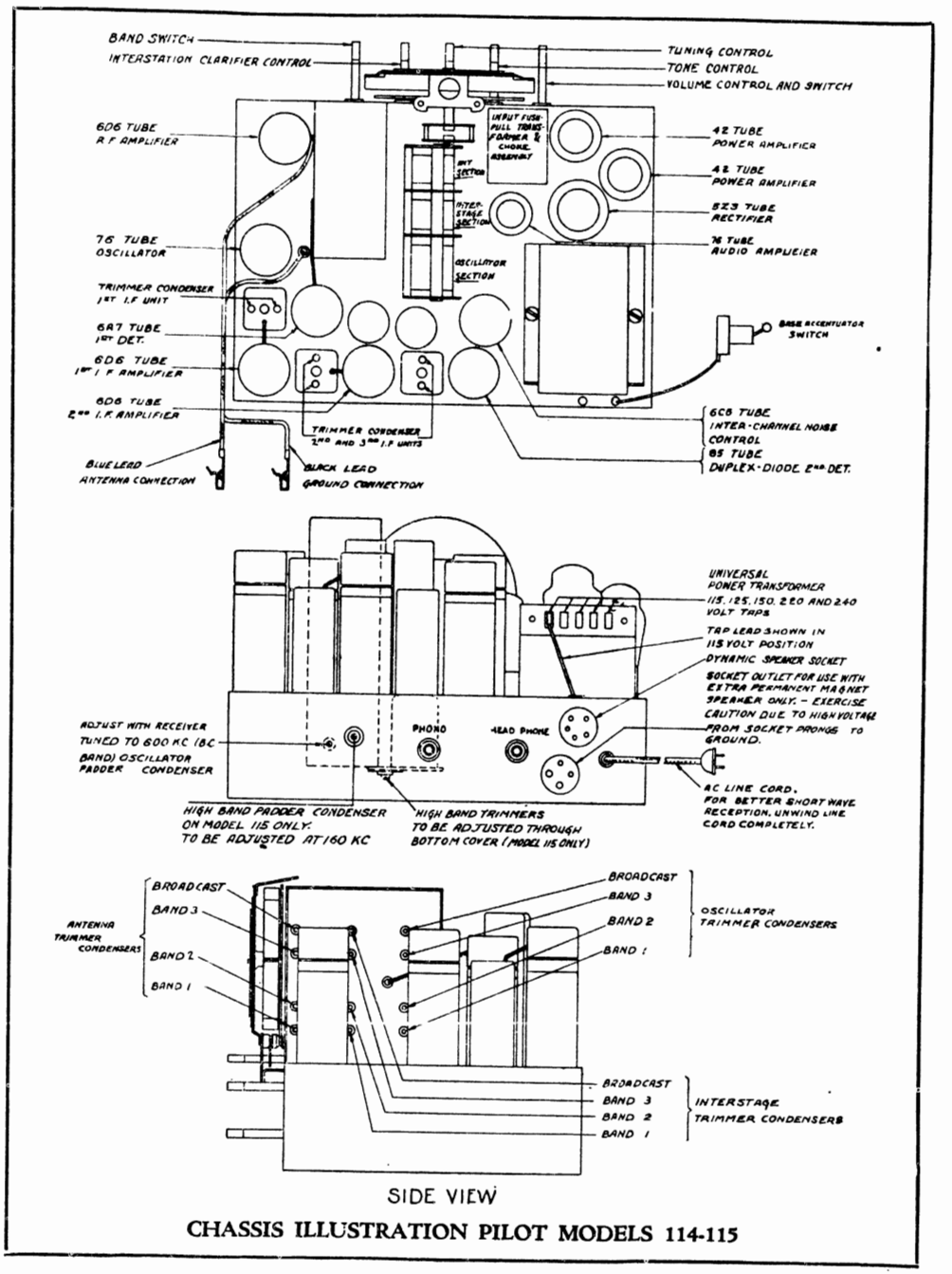
Align Band 2 in a similar manner. The alignment frequency is 9980 kc. (30.04 meters).

The alignment of Band 1 requires greater care due to the higher frequencies covered by this band. The alignment frequency is 23000 kc. or 13 meters. Set the external oscillator at 13 meters. Rotate the tuning condenser of the receiver until the dial pointer is co-incidental with the 13 meter indication on the dial scale. Adjust the oscillator trimmer condenser for maximum sensitivity. Proceed next to align the interstage section. In doing this it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonant peak. Next align the antenna section for maximum sensitivity.

THE HIGHBAND ALIGNMENT procedure in the Model 115 is similar to that of the broadcast. Turn the Band Switch to the High Band position. The alignment frequency is 375 kc. Adjust the padder condenser at 160 kc.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, it is advisable to realign the receiver after reinstalling it.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

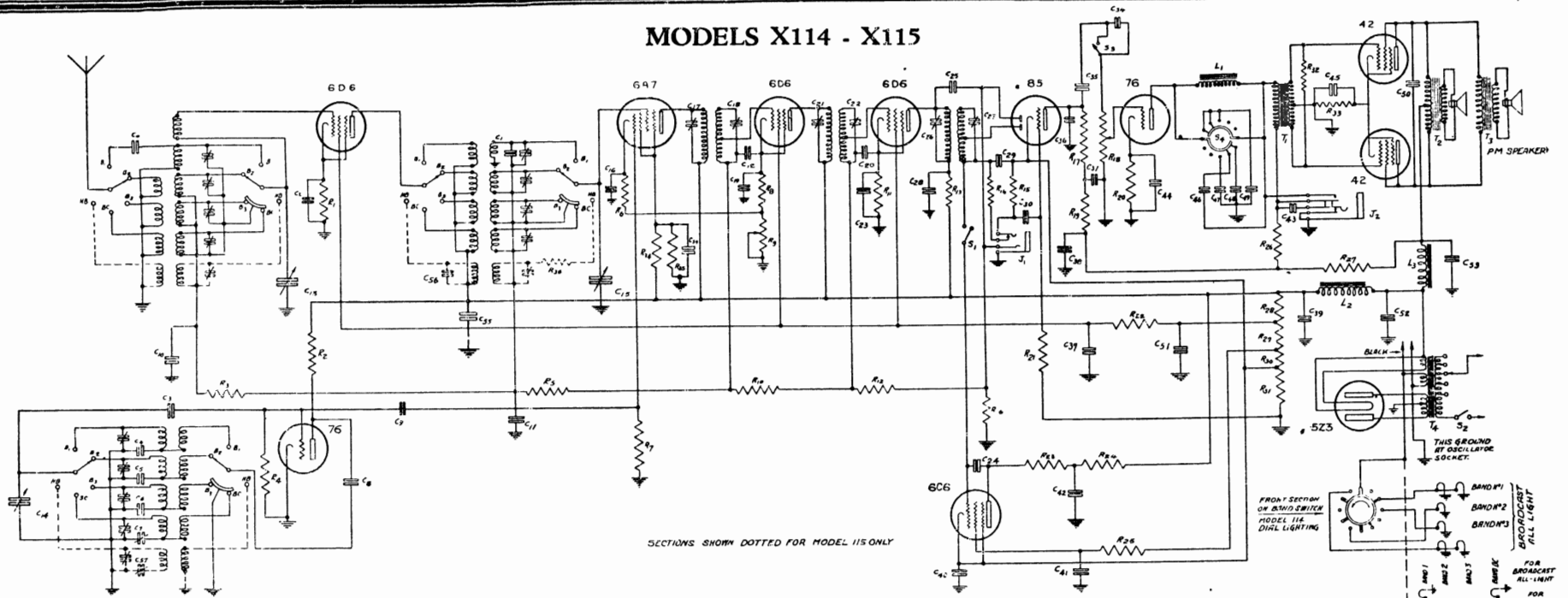


SIDE VIEW

CHASSIS ILLUSTRATION PILOT MODELS 114-115

PILOT RADIO CORP.

MODELS X114 - X115



CONDENSERS

DESIGNATION	PART NO	DESCRIPTION
C_{34} C_{35}	27736	25 MICRO-MFD MICA
C_2 C_3 C_5 C_6 C_{24} C_{26}	22055-1	.05 MFD 200 VOLT PAPER
C_{31} C_{32} C_{37} C_{10}	"	" " "
C_1 C_9 C_{25}	27723-0	50 MICRO MFD MICA
C_4	27738	2870 MICRO MFD MICA
C_5	28018	1400 " "
C_8	27781	1150 " "
C_7	71593-A	356 .000 MMF (1 ea ONLY)
C_{12}	22055-W	.01 MFD 400 VOLT PAPER
C_{13} C_{14} C_{15}	71585	3 GANG TUNING COND
C_{17} C_{18}	73008	TRIMMER CONDS 1ST I.F. TRANS
C_{21} C_{22}	73009	TRIMMER CONDS 2ND I.F. TRANS
C_{26} C_{27}	73010	TRIMMER CONDS 3RD I.F. TRANS
C_{28} C_{29}	27712	330 MICRO-MFD MICA
C_{30} C_{31} C_{42} C_{55}	22055-AB	1 MFD 600 VOLT PAPER
C_{33}	27701-W	250 MMFDS MICA
C_{36}	27701-0	250 MICRO MFD MICA
C_{38}	71589	2 MFD 450 VOLT ELECTROLYTIC IN ONE CAN
C_{39}		8 MFD 450 VOLT
C_{40}		10 MFD 25 VOLT
C_{41}	22055-M	.1 MFD 200 VOLT PAPER
C_{44}	71590	.10 MFD 50 VOLT IN ONE
C_{45}		.10 MFD 50 VOLT CAN
C_{46} C_{47} C_{48}	22055-R	.01 MFD 1400 VOLT
C_{49}	22055-BD	.02 MFD 1000 VOLT
C_{50}	22055-AA	.005 MFD 1500 VOLT
C_{51}	71580	2 MFD 200 VOLT IN ONE
C_{52} C_{53}		8 MFD 475 VOLT CAN
C_{54}	22055-P	.05 MFD. 400 VOLT PAPER
C_{57}	71577-C	30-180 MICRO MFD. PADDER
C_7	71577-C	250-540 M MFD. (1 ea ONLY)

RESISTORS

DESIGNATION	PART NO	DESCRIPTION
R_1 R_{38}	13069	250 OHM 25 WATT
R_2	13179	18000 OHM 2 WATT
R_3 R_4 R_{10} R_{13} R_{14} R_{25}	13031	100 000 OHM 25 WATT
R_{12}	13031	100 000 OHM 25 WATT
R_{15} R_{17} R_{35}	13164	50.000 OHM 25 WATT
R_6 R_8 R_{16}	13115	400 OHM 25 WATT
R_9	71567	5000 OHM VARIABLE WIRE WOUND
R_{11} R_{18} R_{23}	13081	1,000,000 OHM 25 WATT
R_{19} R_{24}	13149	6000 OHM .25 WATT
R_{20}	13147	300,000 OHM 25 WATT
R_{21}	13171	250,000 OHM 25 WATT
R_{22}	71566	750,000 OHM VARIABLE
R_{26}	13133	3,000 OHM .25 WATT
R_{27}	13172	750,000 OHM 25 WATT
R_{28}	13052	6000 OHM 5 WATT
R_{29}	13113	10,000 OHM .5 WATT

RESISTORS

DESIGNATION	PART NO	DESCRIPTION
R_{30}	71256	2090 OHM
R_{31}		470 OHM
R_{32}		370 OHM
R_{33}	13132	730 OHM 3 WATT WIRE WOUND
R_{34}	13092	30,000 OHM 1 WATT

MISC

DESIGNATION	PART NO	DESCRIPTION
S_1	71567	BAND SELECTOR SWITCH ON R_9
S_2	71566	POWER SUPPLY SWITCH ON R_{38}
S_3	71319	BASE ELIMINATOR SWITCH
S_4	71238	TONE CONTROL SWITCH
J_1	71272	PHONO JACK
J_2	71273	HEAD PHONE JACK
L_1	71271	TONE CONTROL CHOKE
L_2	71270	SPEAKER FIELD WINDING 1400Ω
L_3	71315	POWER FILTER CHOKE
T_1	71271	AUDIO PUSH PULL INPUT TRANS.
T_2	71270	SPEAKER-P P INPUT TRANSFORMER
T_3	71274	P M SPEAKER-IN PUT TRANSFORMER
T_4	71274	POWER SUPPLY TRANSFORMER

Operating Voltages—115, 125, 150, 220, 240 Volts—Alternating Current 50-60 Cycles.

Power Consumption—120 Watts.

Tubes 1—6A7 1—6C6 2— 76 1—5Z3
3—6D6 1— 85 2— 42

Wavelength range—From 12.7 to 550 meters (23,560 kc. to 545 kc.)

Undistorted power output—12 Watts.

I. F. —456 kc.

Type of circuit —All wave Superhetrodyne with TRF stage on all bands, A. V. C., Class "A" Prime push pull power output stage.

Line Volts=115

*Voltages measured through plate resistor.

**Measured on 100V Scale.

***A. C. Voltage plate to chassis.

Speaker field voltage-volts. All plate voltages measure to cathode. All screen voltage measure to cathode. All cathode voltages measure to chassis frame.

VOLTAGES

The D. C. Voltages measure at the tube sockets of the set should be read with a high resistance voltmeter of at least 1,000 ohms per volt.

	R.F. Amp. 6D6	1st. Det. 6A7	Oscillator 76	1st. I. F. Amp. 6D6	2nd. I. F. Amp. 6D6
Plate	253	252	145	252	210
Cathode	2.5	2.65	0	3.2	3.2
Screen	90	74	.....	89	89
Filament	6.3	6.3	6.3	6.3	6.3

	Diode Detector 85	Audio Driver 76	Class "A Prime Audio Output" 42 42	Inter Channel Clarifier 6C6	Rectifier 5Z3
Plate	105*	210	330	20	375***
Cathode	22**	10.5	33	21.5	375***
Screen	.....	.....	.....	8.7	.....
Filament	6.3	6.3	6.3	6.3	5

Models X-114, X-115

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Unfasten the base accentuator switch on the side of the cabinet.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control and the tone control should be turned to the maximum clockwise position. The inter-channel clarifier should be turned off. (Knob in maximum counter-clockwise position.) Connect the antenna lead of the external oscillator to the control grid of the 6D6 tube in the 2nd I. F. Amplifier through .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the receiver ground lead. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 3 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the 6D6 2nd. I. F. amplifier tube and connect it in the same manner to the control grid of the 6D6 1st I. F. amplifier tube. Now rotate each adjustment screw on I. F. Unit No. 2 for maximum output. Following this, connect the external oscillator leads to the control grid of the 6A7 tube. Adjust each trimmer on the I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads through a .002 mfd. condenser. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Tune the external oscillator to 1500 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance position, and at the same time adjust the padder condenser for the highest peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

The alignment frequencies are as follows:

Band 3—67.38 meters— 4,450 kc.

Band 2—30.04 meters— 9,980 kc.

Band 1—13. meters—23,000 kc.

When aligning Band 3, set the Band Switch in the position marked Band 3. Rotate the tuning condenser to the extreme high frequency end of the range. Set the external oscillator at 4450 kc. Adjust the Band 3 oscillator trimmer for maximum sensitivity. Next adjust the interstage and antenna trimmer condensers for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

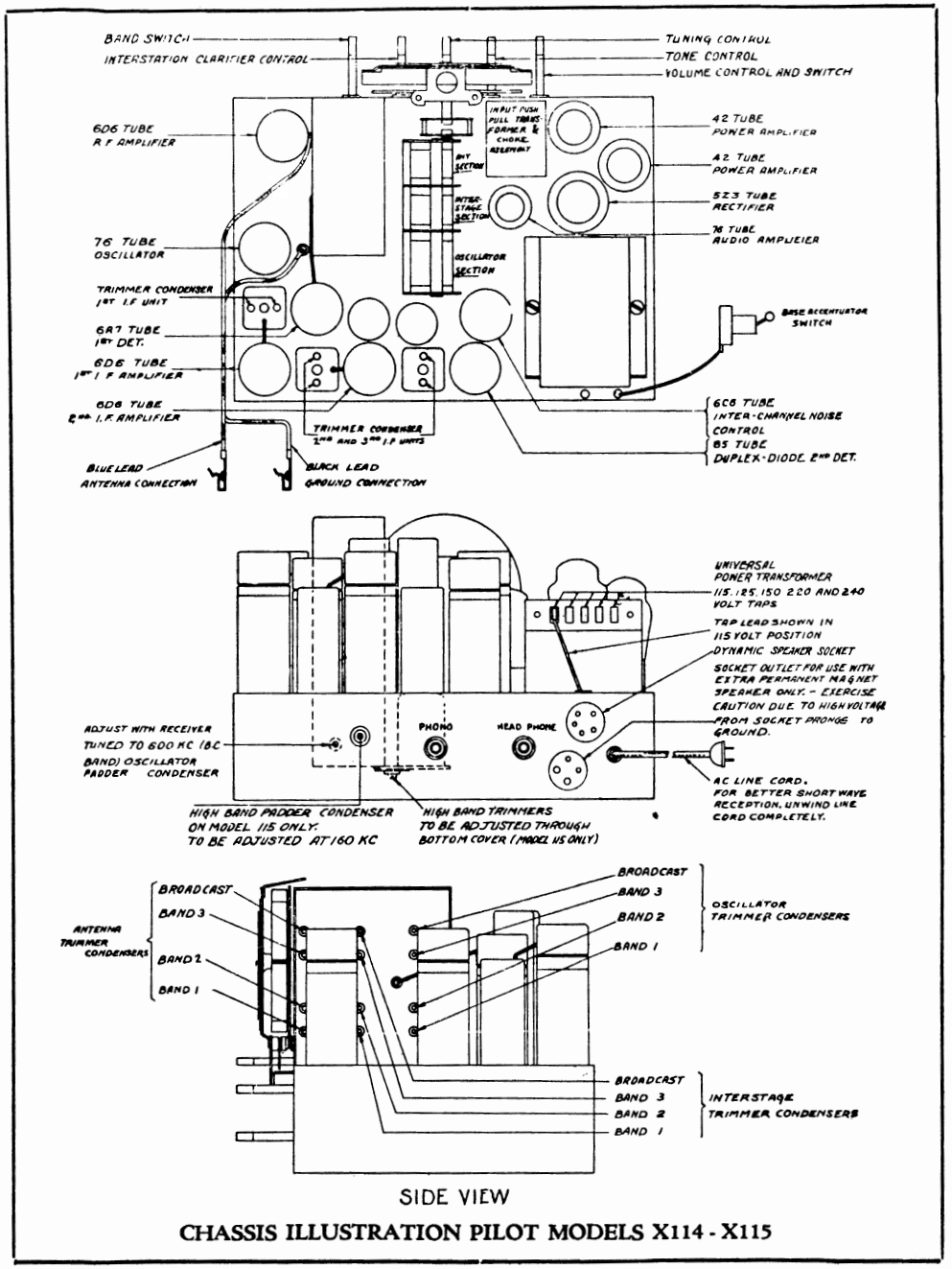
Align Band 2 in a similar manner using a 400-ohm non-inductive resistor in place of the .002 mfd. condenser. The alignment frequency is 9980 kc. (30.04 meters).

The alignment of Band 1 requires greater care due to the higher frequencies covered by this band. The alignment frequency is 23000 kc. or 13 meters. Set the external oscillator at 13 meters. Rotate the tuning condenser of the receiver until the dial pointer is co-incidental with the 13 meter indication on the dial scale. Adjust the oscillator trimmer condenser for maximum sensitivity. Proceed next to align the interstage section. In doing this it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonant peak. Next align the antenna section for maximum sensitivity.

THE LONG WAVE ALIGNMENT procedure in the Model X115 is similar to that of the broadcast. Turn the Band Switch to the High Band position. The alignment frequency is 375 kc. Adjust the padder condenser at 160 kc. Use a .002 mfd. condenser in the antenna lead from the external oscillator.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, it is advisable to realign the receiver after reinstalling it.

CAUTION: When making repairs on the receiver, use only **ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.**

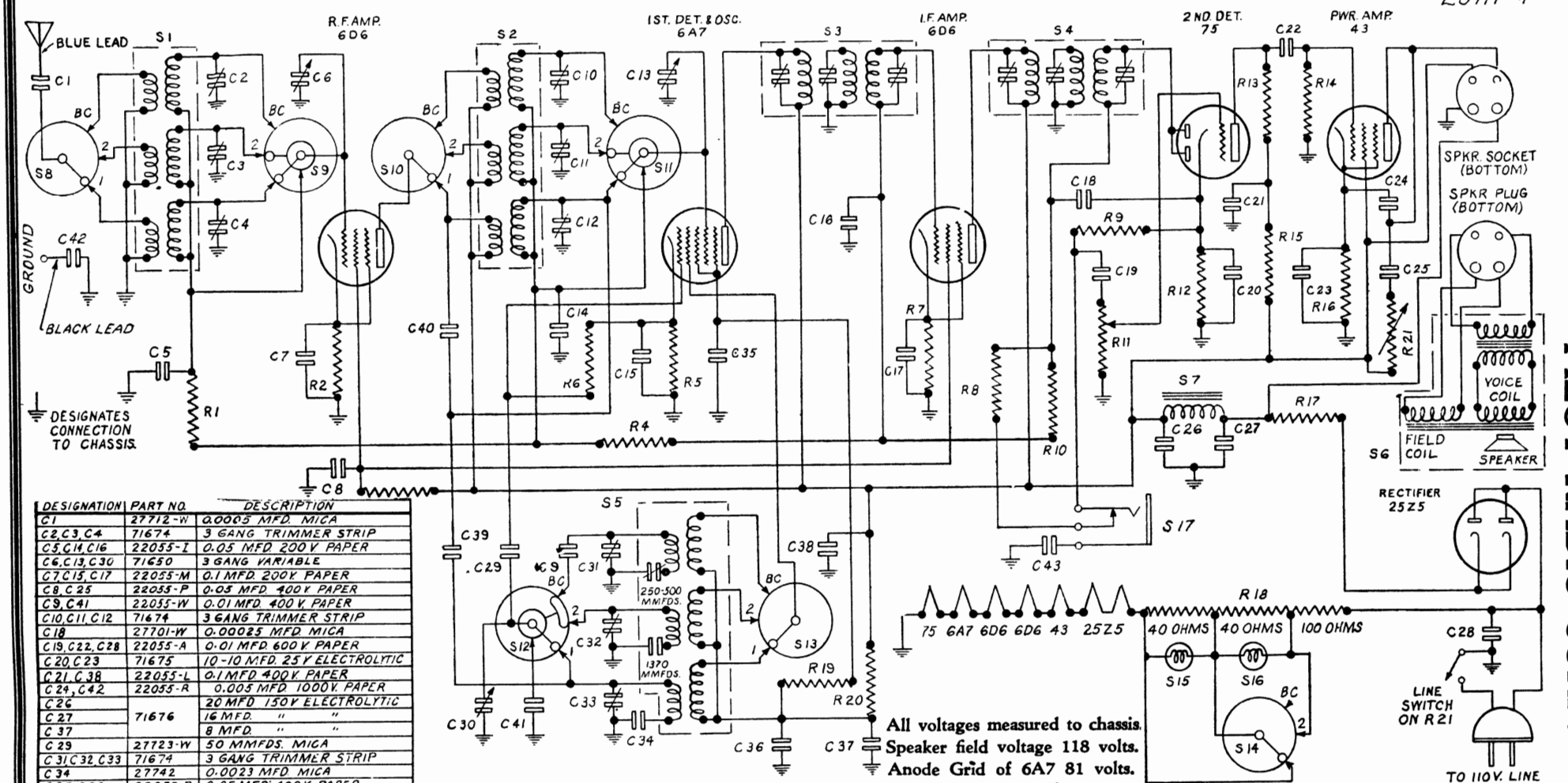


CHASSIS ILLUSTRATION PILOT MODELS X114 - X115

PILOT RADIO CORP.

SCHEMATIC DIAGRAM PILOT MODEL 123

25111-4



DESIGNATION	PART NO.	DESCRIPTION
C1	27712-W	0.0005 MFD. MICA
C2,C3,C4	71674	3 GANG TRIMMER STRIP
C5,C14,C16	22055-I	0.05 MFD 200 V. PAPER
C6,C13,C30	71650	3 GANG VARIABLE
C7,C15,C17	22055-M	0.1 MFD. 200V. PAPER
C8,C25	22055-P	0.05 MFD. 400 V. PAPER
C9,C41	22055-W	0.01 MFD. 400 V. PAPER
C10,C11,C12	71674	3 GANG TRIMMER STRIP
C18	27701-W	0.00025 MFD. MICA
C19,C22,C28	22055-A	0.01 MFD. 600 V. PAPER
C20,C23	71675	10-10 MFD. 25 V ELECTROLYTIC
C21,C38	22055-L	0.1 MFD. 400 V. PAPER
C24,C42	22055-R	0.005 MFD. 1000 V. PAPER
C26		20 MFD 150 V ELECTROLYTIC
C27	71676	16 MFD. " "
C37		8 MFD. " "
C29	27723-W	50 MMFDS. MICA
C31,C32,C33	71674	3 GANG TRIMMER STRIP
C34	27742	0.0023 MFD. MICA
C35,C36	22055-P	0.05 MFD. 400 V. PAPER
C39	71525-A	NEUTRALIZING
C40	27737-0	10 MMFDS. MICA
C43	22055-M	0.1 MFD. 200 V. PAPER

RESISTORS

DESIGNATION	PART NO.	DESCRIPTION
R1, R4	13031	100,000 OHMS 1/4 WATT CARBON
R2,R5 R7	13115	400 OHMS 1/4 WATT CARBON
R3, R19	13143	6,000 OHMS 1/4 WATT CARBON
R6, R8, R15	13164	50,000 OHMS 1/4 WATT CARBON
R9	13147	300,000 OHMS 1/4 WATT CARBON
R10	13001	1 MEGOHM 1/4 WATT CARBON
R11	70955	750,000 OHMS VOLUME CONTROL
R12	13116	12,000 OHMS 1/4 WATT CARBON
R13, R14	13024	500,000 OHMS 1/4 WATT CARBON
R16	13146.	600 OHMS 1/2 WATT CARBON
R17	13172	30 OHMS 1/2 WATT CARBON
R18	71683	180 OHMS. TAPPED-100 OHMS, 15 WATTS, 40 OHMS, 6 WATTS, 40 OHMS, 6 WATTS. WIRE WOUND
R20	13073	3,000 OHMS 1/2 WATT CARBON
R21	70954	100,000 OHMS TONE CONTROL AND SWITCH

All voltages measured to chassis.
Speaker field voltage 118 volts.
Anode Grid of 6A7 81 volts.

* Measured through Plate Resistor.

** Cathode to chassis.

NOTE: These measurements should be made with the volume control turned to the right, and with the tuning adjusted at "No signal" position on dial.

INTERMEDIATE FREQUENCY-456
ALIGNING FREQUENCIES:
BROADCAST-1500 & 600 K.C.
BAND 1 - 17.8 MEGACYCLES
BAND 2 - 6 "

	R.F. AMP.	OSC.-1st DET.	I.F. AMP.	2nd DET. DIODE	AUDIO OUTPUT	DUAL RECTIFIER
	6D6	6A7	6D6	75	43	25Z5
PLATE	96	96	96	45*	91	——
SCREEN	80	65	80	——	95	——
CATHODE	2.6	2.25	2.6	.5	12.5	120**
FILAMENT	6.3	6.3	6.3	6.3	25	25

NOTE: The D.C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1,000 ohms per volt.

PILOT RADIO CORP.

PILOT RADIO CORP.

MODEL 153 SUPERHETERODYNE
Range: 178-550 Meters (1,680-545 kc.)
16-52 Meters (18,800-5,700 kc.)

MODEL 155 SUPERHETERODYNE
Range: 178-550 Meters (1,680-545 kc.)
789-2,142 Meters (380-140 kc.)
(Sold in European area only)

Connect the battery cable completely to the batteries before turning the battery switch to the ON position. Note that there is a fuse in the battery cable, to protect the tubes. The battery diagram is illustrated on the reverse side of this sheet.

Connect the blue wire at the rear of the chassis to your antenna. For best results, use an antenna of the type described in the Pilot antenna instruction sheet. If you are not experienced in erecting antennas, we strongly advise having this done by your radio service man. If you use an ordinary single-wire antenna, put up a single wire 50 to 100 ft. long, and as high above surrounding objects as possible, bringing a lead from the nearer end down to your set. Connect your ground lead to the black wire at the rear of the chassis.

CHARACTERISTICS

Batteries Required: One Eveready Air Cell or 2.2-volt storage battery, three 45-volt B batteries, one 22½-volt C battery, and one 4½-volt C battery.

Tubes: Two 34's, one 1C6, one 33, one 1B5.

Wavelength Range: 16-52 m. and 178-550 m. or 18,800-5,700 kc. and 1,680-545 kc.

Undistorted Power Output: .7 watt.

I. F. Alignment Frequency: 456 kc.

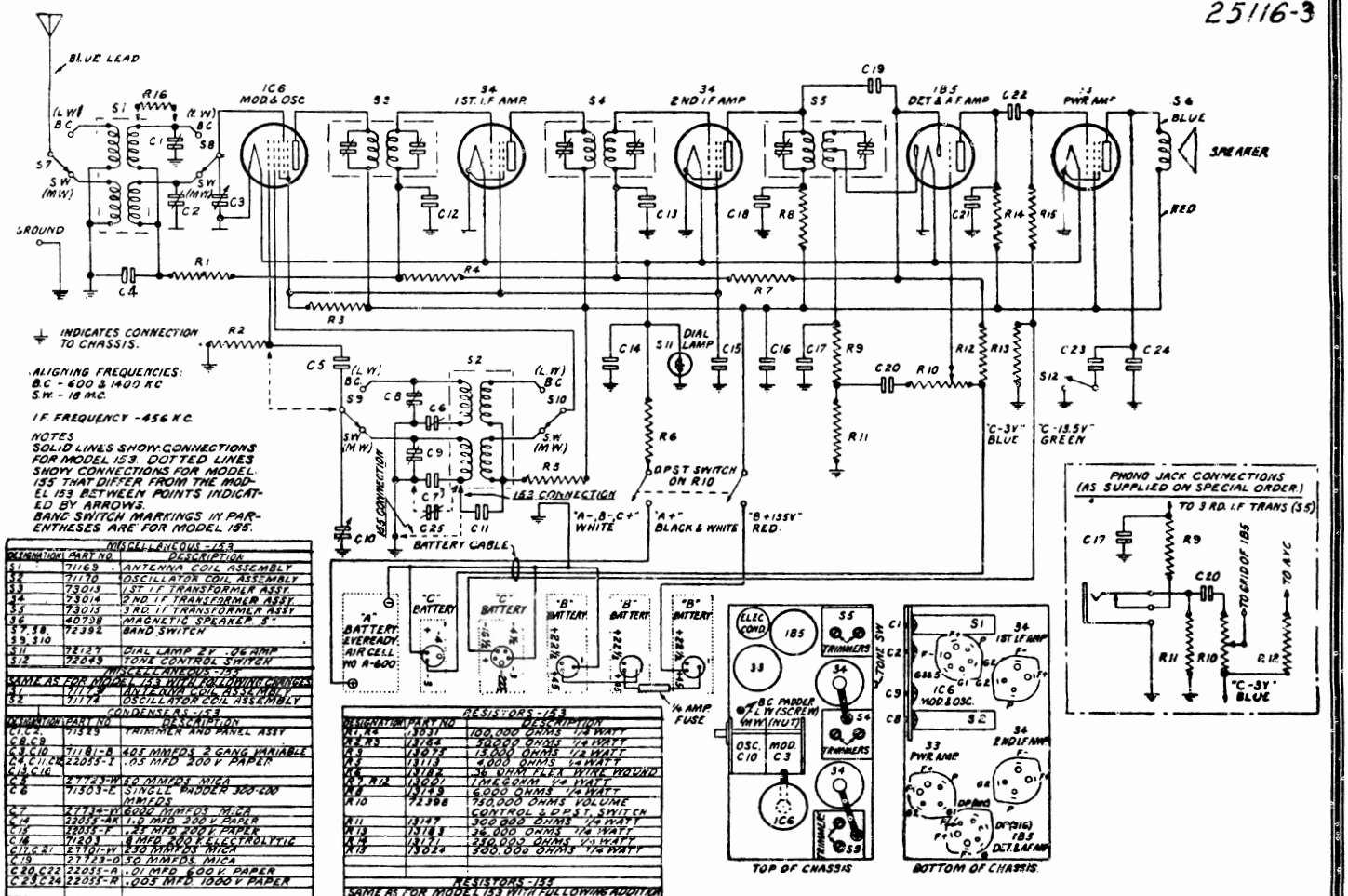
Circuit: Short wave and broadcast superheterodyne.

Output: Class A pentode amplifier.

Air Cell Life: When operating a Pilot 153, the No. A-600 Air Cell will have a total operating life of approximately 1,000 hours.

I.F = 456 K.C.

25116-3



MISCELLANEOUS - 153

DESIGNATION	PART NO.	DESCRIPTION
S1	71169	ANTENNA COIL ASSEMBLY
S2	71170	OSCILLATOR COIL ASSEMBLY
S3	73013	1ST. I.F. TRANSFORMER ASST.
S4	73014	2ND I.F. TRANSFORMER ASST.
S5	73015	3 RD. I.F. TRANSFORMER ASSY
S6	40738	MAGNETIC SPEAKER 5"
S7,S8, S9,S10	72392	BAND SWITCH
S11	72127	DIAL LAMP 2V .06 AMP
S12	72049	TONE CONTROL SWITCH

MISCELLANEOUS - 155

SAME AS FOR MODEL 153 WITH FOLLOWING CHANGES		
S1	71149	ANTENNA COIL ASSEMBLY
S2	71172	OSCILLATOR COIL ASSEMBLY

CONDENSERS - 153

DESIGNATION	PART NO.	DESCRIPTION
C1,C2, C8,C9	71349	TRIMMER MICA AND PANEL ASSY
C3,C10	71181-A	40 E MMFDS, 2 GANG VARIABLE
C4,C11,C26	22033-J	.05 MFD 200 V PAPER
C12,C16		
C5	27723-W	50 MMFDS MICA
C6	71303-E	SINGLE PADDER 300-620 KILOCYCLES
C7	27734-W	6000 MMFDS MICA
C14	22035-AR	1.0 MFD 200 V PAPER
C15	22035-F	.25 MFD 200 V PAPER
C18	71803	8 MFD 500 V ELECTROLYTIC
C17,C21	27701-W	250 MMFDS MICA
C19	27723-O	50 MMFDS. MICA
C20,C22	22035-A	.01 MFD 600 V PAPER
C23,C24	22035-R	.005 MFD 1000 V PAPER

CONDENSERS - 155

SAME AS FOR MODEL 153 WITH FOLLOWING CHANGES		
C6,C7		NOT USED IN MODEL 155
C6,C25	72355-H	DUAL PADDER 300-600 KILOCYCLES

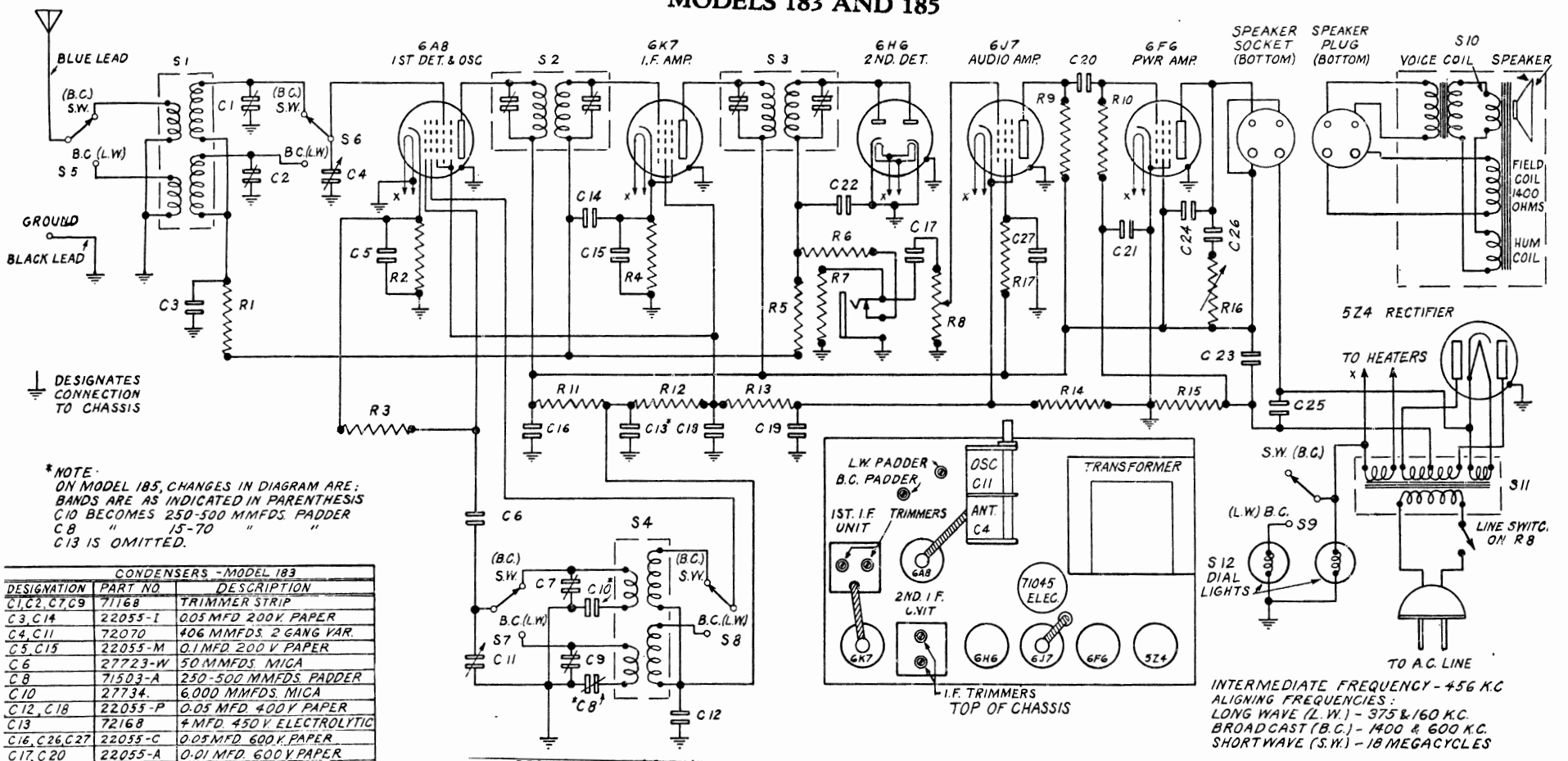
RESISTORS - 153

DESIGNATION	PART NO.	DESCRIPTION
R1, R4	73031	100,000 OHMS 1/4 WATT
R2,R3	73184	50,000 OHMS 1/4 WATT
R5	73073	15,000 OHMS 1/2 WATT
R6	73113	4,000 OHMS 1/4 WATT
R7	73122	36 OHM FLAT WIRE WOUND
R9, R12	73001	1 MEGOHM 1/4 WATT
R8	73143	6,000 OHMS 1/4 WATT
R10	72398	750,000 OHMS VOLUME CONTROL & DPST SWITCH
R11	73147	300,000 OHMS 1/4 WATT
R13	73183	26,000 OHMS 1/4 WATT
R14	73151	250,000 OHMS 1/4 WATT
R15	73024	500,000 OHMS 1/4 WATT

RESISTORS - 155

SAME AS FOR MODEL 153 WITH FOLLOWING ADDITION		
R16	73080	50 OHMS 1/4 WATT

MODELS 183 AND 185



*NOTE.
ON MODEL 185, CHANGES IN DIAGRAM ARE; BANDS ARE AS INDICATED IN PARENTHESIS
C10 BECOMES 250-500 MMFDS. PADDER
C 8 " 15-70 " "
C13 IS OMITTED.

INTERMEDIATE FREQUENCY - 456 K.C
ALIGNING FREQUENCIES:
LONG WAVE (L.W.) - 375 & 160 K.C.
BROADCAST (B.C.) - 1400 & 600 K.C.
SHORT WAVE (S.W.) - 18 MEGACYCLES

CONDENSERS - MODEL 183		
DESIGNATION	PART NO.	DESCRIPTION
C1, C2, C7, C9	71168	TRIMMER STRIP
C3, C14	22055-I	.005 MFD 200 V. PAPER
C4, C11	72070	406 MMFDS. 2 GANG VAR.
C5, C15	22055-M	0.1 MFD. 200 V PAPER
C6	27723-W	50 MMFDS. MICA
C8	71503-A	250-500 MMFDS. PADDER
C10	27734.	6,000 MMFDS. MICA
C12, C18	22055-P	0.05 MFD. 400 V. PAPER
C13	72168	4 MFD. 450 V. ELECTROLYTIC
C16, C26, C27	22055-C	0.05 MFD. 600 V. PAPER
C17, C20	22055-A	0.01 MFD. 600 V. PAPER
C19	22481	10 MFD. 25 V. ELECTROLYTIC
C21	22055-S	0.5 MFD. 200 V. PAPER
C22	27701-W	250 MMFDS. MICA
C23, C25	71045	DUAL 8 MFD. 475 V. ELECTROLYTIC
C24	22055-R	0.005 MFD. 1000 V. PAPER
*CONDENSERS - MODEL 185		
SAME AS FOR MODEL 183 WITH FOLLOWING CHANGES:		
C8, C10	71577-F.	DUAL PADDER (250/500 & 15/70)

RESISTORS - MODELS 183 & 185		
DESIGNATION	PART NO.	DESCRIPTION
R1	13031	100,000 OHMS 1/4 WATT
R2	13003	300 OHMS 1/4 WATT
R3, R6	13164	50,000 OHMS 1/4 WATT
R4	13115	400 OHMS 1/4 WATT
R5, R17	13001	1 MEGOHM 1/4 WATT
R7	13147	300,000 OHMS 1/4 WATT
R8	71211	750,000 OHMS VOLUME CONTROL & SWITCH
R9	13171	250,000 OHMS 1/4 WATT
R10	13024	500,000 OHMS 1/4 WATT
R11	13073	3,000 OHMS 1/2 WATT
R12	13129	15,000 OHMS 1 WATT
R13	13148	30,000 OHMS 1/4 WATT
R14	13028	1,000 OHMS 1/4 WATT
R15	13059	250 OHMS 1 WATT
R16	71615	100,000 OHMS TONE CONTROL

Wavelength Range

Model 183—16.2 meters to 52.6 meters.
178 meters to 550 meters.
Model 185—178 meters to 550 meters.
789 meters to 2142 meters.

Type 6A8: Electron emission control oscillator-detector.
Type 6K7: I. F. amplifier.
Type 6H6: Duo-diode detector and automatic volume control.
Type 6J7: Audio amplifier.
Type 6F6: Class "A" power pentode.
Type 5Z4: Full-wave rectifier for power supply.

VOLTAGES

The D. C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	Osc.-Det. Type 6A8	I. F. Type 6K7	Diode Det. Type 6H6	Audio Amp. Type 6J7	Power Pentode Type 6F6	Rectifier Type 5Z4
Plate	250**	250	.....	70*	225	.....
Cathode	3.5	3.5	.....	4.5	16***	.....
Screen	95	95	.....	60*	250	.....
Filament	6.3	6.3	6.3	6.3	6.3	5.0

*Voltages measused through resistor.
**Anode grid of 6A8 tube, 210 volts.
***Measured across 250 ohm resistor.

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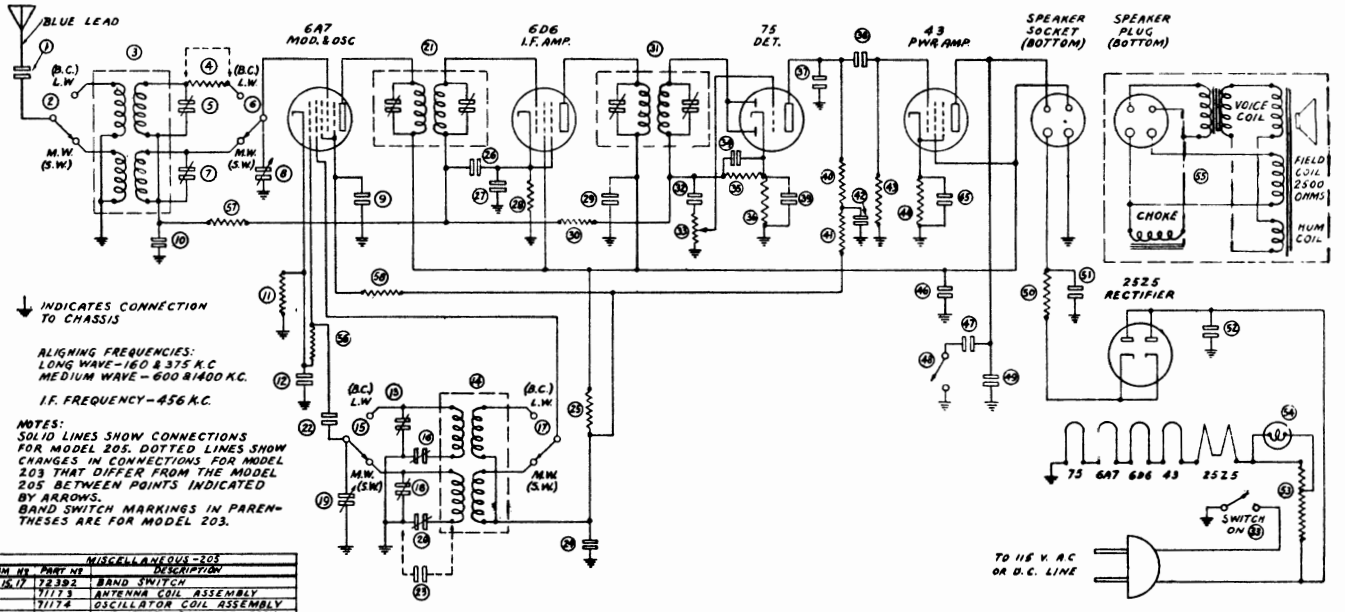
MODEL 203 SUPERHETERODYNE
Range: 16-52 Meters (18,800-5,700 kc.)
178-550 Meters (1,680-545 kc.)

MODEL 205 SUPERHETERODYNE
Range: 178-550 Meters (1,680-545 kc.)
789-2,142 Meters (380-140 kc.)



MISCELLANEOUS - 205		
DIAGRAM NO	PART NO	DESCRIPTION
2, 6, 15, 17	72392	BAND SWITCH
3	71173	ANTENNA COIL ASSEMBLY
14	71174	OSCILLATOR COIL ASSEMBLY
21	73016	1ST. I.F. TRANSFORMER ASSY.
31	75010	2 ND I.F. TRANSFORMER ASSY.
55	40797	5" SPEAKER & CHOKE ASSY.
44	72048	TONE CONTROL SWITCH
54	72151	DIAL LAMP 6.3 V. .15 AMP.

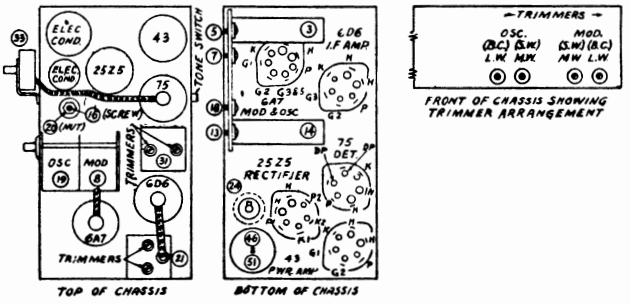
MISCELLANEOUS - 203		
SAME AS FOR MODEL 205 WITH FOLLOWING CHANGES:		
3	71169	ANTENNA COIL ASSEMBLY
14	71170	OSCILLATOR COIL ASSY.

CONDENSERS - 205		
DIAGRAM NO	PART NO	DESCRIPTION
1	22712-W	500 MMFDS. MICA
5, 7, 13, 18	71529	TRIMMER & PANEL ASSY.
8, 19	71181-C	365 MMFDS. 2 GANG VARIABLE
9	22055-P	.05 MFD. 400 V. PAPER
27	22056-M	.1 MFD. 200 V. PAPER
10, 26	22055-H	.02 MFD. 200 V. PAPER
16	72355-H	DUAL PADDER (320-380 MMFDS. 300-500 MMFDS.
20		
12	22055-T	.05 MFD. 200 V. PAPER
29	22055-AE	.25 MFD. 400 V. PAPER
32, 35, 49	22055-A	.01 MFD. 600 V. PAPER
42	22055-L	.1 MFD. 400 V. PAPER
47	22055-AG	.03 MFD. 600 V. PAPER
52	22055-G	.01 MFD. 1000 V. PAPER
46	72382	16 MFDS 150 V. ELECTROLYTIC
61		16 MFDS 150 V. ELECTROLYTIC
39, 43	72481	10 MFDS 25 V. ELECTROLYTIC
24	71704	4 MFDS. 150 V. ELECTROLYTIC
34, 37	22701-W	350 MMFDS. MICA
22	22723-G	50 MMFDS. MICA

CONDENSERS - 203		
SAME AS FOR MODEL 205 WITH FOLLOWING CHANGES		
DIAGRAM NO	PART NO	DESCRIPTION
16	71603-E	SINGLE PADDER 300-600 MMFDS.
23	22734-W	8000 MMFDS. MICA (REPLACES "20")

RESISTORS - 205		
50	13172	30 OHMS 1/2 WATT
4	13089	50 OHMS 1/2 WATT
38	13164	50,000 OHMS 1/4 WATT
30	13097	1 MEGOHM 1/4 WATT
40, 45	13134	500,000 OHMS 1/4 WATT
44	13146	600 OHMS 1/2 WATT
11, 28	13113	400 OHMS 1/4 WATT
25	13139	3,000 OHMS 1/4 WATT
58	13149	6,000 OHMS 1/4 WATT
36	13118	15,000 OHMS 1/4 WATT
41, 53	13031	100,000 OHMS 1/4 WATT
35	13147	300,000 OHMS 1/4 WATT
23	78553	130" WIRE WOUND TAPPED AT 90"
33	78693	2 MEGOHM VOL. CONTROL & SW.

RESISTORS - 203
SAME AS FOR MODEL 205 EXCEPT "4" IS NOT USED



TUBE VOLTAGES

	6A7	6D6	75	43	25Z5
Plate	95 V	95V	30*	90V	---
Cathode	2.8	2.8	2.5	13	116
Screen	50	95	--	95	---
Heater	6.3	6.3	6.3	25	25

* voltage measured through plate resis.

Speaker field--- 115 volts.

anode grid of 6A7, 95 volts

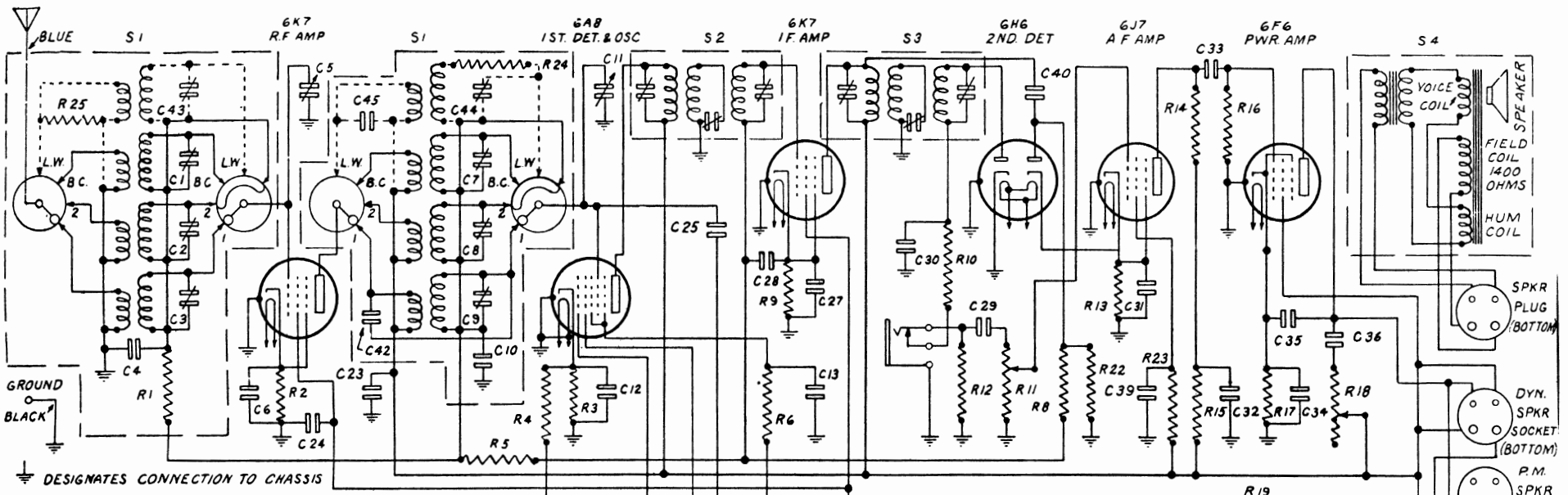
SERVICE DATA

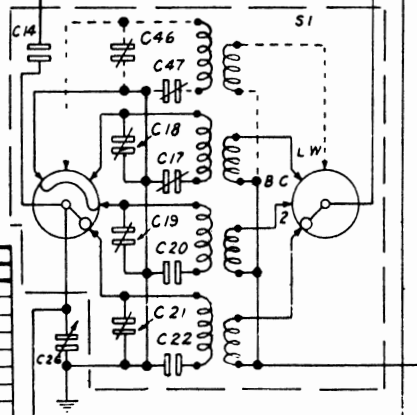
Line Voltage: 115-125 volts, A.C. or D.C.
Power Consumption: 45 watts.
Undistorted Power Output: 1 watt.
Intermediate Frequency: 456 kc.
Tube Functions: 6A7 electron emission control, oscillator-detector.
6D6 I.F. amplifier.
75 amplifier — detector.
43 Class A power pentode.
25Z5 rectifier

Voltages: Read tube socket voltages with meter having resistance of at least 1,000 ohms per volt. All voltages measured to chassis.

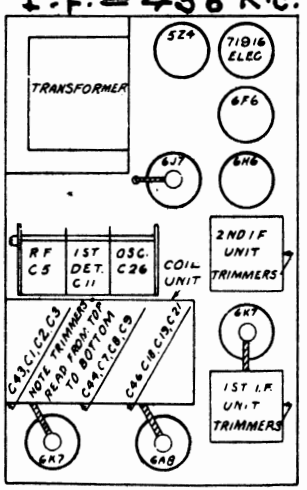
I.F. = 456 K.C.

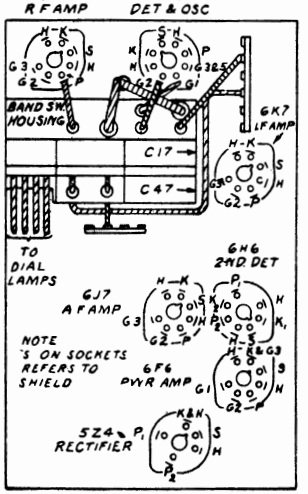
SCHEMATIC DIAGRAM FOR MODELS 213 AND 215

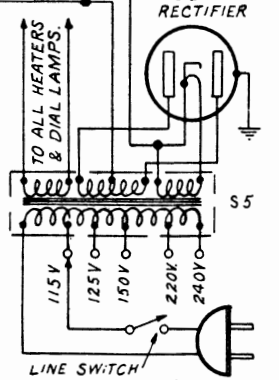




I.F. = 456 K.C.







NOTE ADDITIONAL WIRING FOR LONG WAVE BAND ON MODEL 215 IS SHOWN IN DOTTED LINES

INTERMEDIATE FREQUENCY - 456 K.C
ALIGNING FREQUENCIES
BROADCAST - 1500 & 600 K.C
BAND 2 - 6 MEGACYCLES
BAND 1 - 18 "
LONG WAVE - 400 & 160 K.C

TOP OF CHASSIS

WIRES TO BAND SW & SOCKET

CONDENSERS FOR MODEL 215 ARRANGEMENT

MISCELLANEOUS LIST FOR MODEL 213		
DESIGNATION	PART NO.	DESCRIPTION
S1	72221-A	BAND SWITCH AND COIL ASSEMBLY
S2	72110	1ST I.F. TRANSFORMER
S3	72111	2ND I.F. TRANSFORMER
S4	40793	SPEAKER 8 INCH DIA
	40784	SPEAKER 12 INCH DIA
S5	71544	PWR TRANSFORMER 115 V 60 CYC
	71381	" " UNIV 60 CYC
	71538	UNIV V 25 CYC.
	71282	DIAL LAMPS 6.3 V 0.25 AMP
MISCELLANEOUS LIST FOR MODEL 215		
SAME AS FOR MODEL 213 WITH FOLLOWING CHANGE.		
S1	72221-B	BAND SWITCH & COIL ASSEMBLY

CONDENSERS FOR MODEL 213		
DESIGNATION	PART NO.	DESCRIPTION
C1, C2, C3	70969-C	TRIMMER STRIP
C4, C10, C28	22055-I	0.05 MFD 200 V PAPER
C5, C11, C26	71321	460 MMFDS 3 GANG VARIABLE
C6, C12, C27	22055-M	0.1 MFD 200 V PAPER
C7, C8, C9	70969-C	TRIMMER STRIP
C13, C15	22055-P	0.05 MFD 400 V PAPER
C14, C40	27723-W	50 MMFDS MICA
C16, C41	72252	2 MFD 475 V ELECTROLYTIC
C17	71503-A	250-500 MMFDS PADDER
C18, C19, C21	70369-D	TRIMMER STRIP
C20	27743-W	1370 MMFDS MICA
C22	27739-W	2875 MMFDS MICA
C23	22055-AH	0.25 MFD 500 V PAPER
C24, C32	22055-AB	0.1 MFD 600 V PAPER
C25	71525-B	NEUTRALIZING
C29, C33	22055-A	0.01 MFD 600 V PAPER
C30	27701-W	250 MMFDS MICA
C31, C34	70971	10 MFDS 25 V ELECTROLYTIC
C37, C38	71045	8 MFDS 475 V ELECTROLYTIC
C35	22055-R	0.0005 MFD 1000 V PAPER
C36, C39	22055-C	0.05 MFD 600 V PAPER
C42	27737-0	10 MMFDS MICA

RESISTORS FOR MODEL 213		
DESIGNATION	PART NO.	DESCRIPTION
R1, R5	13031	100,000 OHMS 1/4 WATT
R2, R3, R9	13115	400 OHMS 1/4 WATT
R4, R10 R15, R20	13164	50,000 OHMS 1/4 WATT
R6	13068	30,000 OHMS 1/2 WATT
R7, R21	13053	10,000 OHMS 1 WATT
R8, R22, R23	13001	1 MEGOHM 1/4 WATT
R11	72119	750000 OHMS VOLUME CONTROL
R12	13147	300,000 OHMS 1/4 WATT
R13	13118	4,000 OHMS 1/4 WATT
R14	13171	250,000 OHMS 1/4 WATT
R16	13024	500,000 OHMS 1/4 WATT
R17	13108	410 OHMS 1 WATT
R18	72120	100,000 OHMS TONE CONTROL & SWITCH
R19	13092	30,000 OHMS 1 WATT

CONDENSERS FOR MODEL 215		
SAME AS FOR MODEL 213 WITH FOLLOWING CHANGES		
C1, C2, C3 C43	70969-A	TRIMMER STRIP
C7, C8, C9 C44	70969-A	TRIMMER STRIP
C17, C47	71577-C	DUAL PADDER (250-500 & 30-150)
C18 C13, C21 & C46	70969-B	TRIMMER STRIP
C45	27701-0	250 MMFDS MICA

RESISTORS FOR MODEL 215		
SAME AS FOR MODEL 213 WITH ADDITIONS BELOW		
R24	13029	250 OHMS 1/4 WATT
R25	13164	50 000 OHMS 1/4 WATT

SERVICE INFORMATION

Models 213 and 215

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls on the front panel.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer condensers is on the side of the band switch. The trimmers in the lowest row are those for aligning Band 1. Those in the second row from the bottom are for Band 2. Those in the third row up are for the Broadcast. In the Model 215 there is an additional row of trimmers located immediately above those for the Broadcast.

The padder condenser is located under the rear section of the band switch. In the Model 215 an additional padder for the Longwave range is located at the right of the Broadcast padder. Access to the padder condenser is made through a hole provided in the rear of the chassis frame.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6K7 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT WAVE-BANDS: The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequencies are as follows:

Band 2: 50 Meters (6,000 kc.)
Band 1: 16.6 Meters—(18,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2". Set the tuning control pointer at the 50 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Switch in the position marked "Band 1". Set the tuning control pointer at the 16.6 meter mark. Set the external oscillator at 16.6 meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output.

Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

NOTE.

The above alignment positions refer to the Model 213 only, which is calibrated in frequency. The alignment points for the Model 215, which is calibrated in meters only, is as follows:

Longwave	Align at 750 meters.
	Pad at 2,000 meters.
Broadcast	Align at 200 meters.
	Pad at 500 meters.
Band 2	Align at 49 meters.
Band 1	Align at 17 meters.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, this is easily done by removing the supporting screws. Before doing this, however, it is essential to unsolder the leads between the switch and the chassis.

It is advisable to realign the receiver after reinstalling the switch assembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

PILOT RADIO CORP.

RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
Frequency Rating —50 to 60 cycles.
Circuit —One stage of Tuned Radio Frequency amplification for all frequencies, electron-coupled oscillator-modulator, diode detector, class "A" pentode output stage, automatic volume control.
Wavelength Range —From 550 meters to 16 meters (545 kc. to 18,800 kc.).
Undistorted power output—3 watts.
Intermediate Frequency—456 kc.
Tube Functions —Type 6K7: R. F. amplifier for all bands.
Type 6A8: Electron emission control oscillator-detector.
Type 6K7: I. F. amplifier.
Type 6H6: Duo-Diode detector.
Type 6J7: Audio Driver.
Type 6F6: Class "A" power pentode.
Type 5Z4: Full-wave rectifier for power supply.

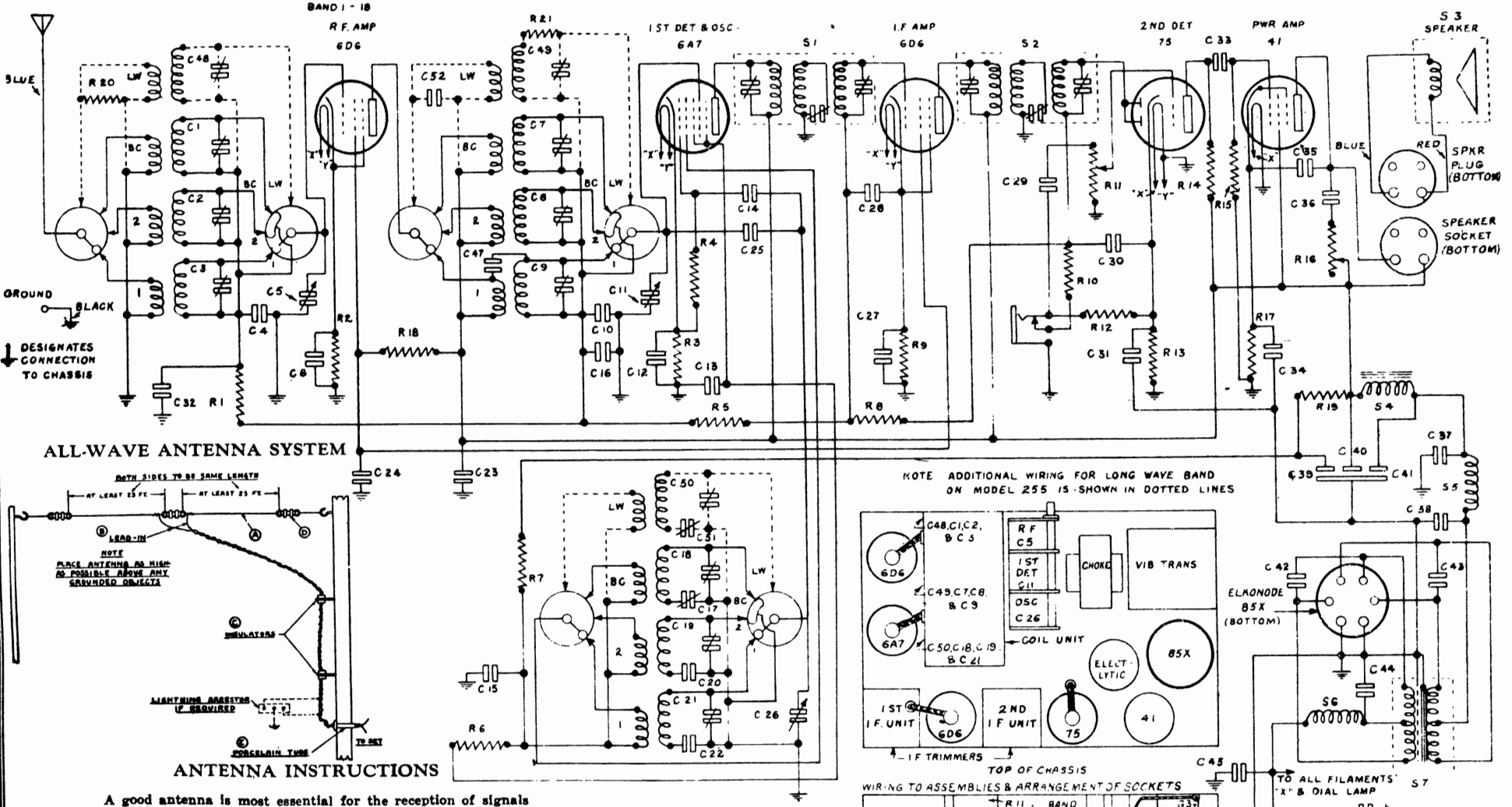
VOLTAGES

The D. C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	R. F. Type 6K7	Osc. Det. Type 6A8	I. F. Type 6K7	Diode Det. Type 6H6	Aud. Driv. Type 6J7	Pow. Pent. Type 6F6	Rectifier Type 5Z4
Plate	260.	260*	260	.....	60**	235	.....
Cathode	3.5	5.	3.5	.....	3	15	.....
Screen	90	90	90	.....	70**	260	.....
Filament	6.3	6.3	6.3	6.3	6.3	6.3	5.

Speaker field—100 volts.
* Anode Grid—190 volts.
** Measured through resistor.
All plate, screen and cathode voltages measured to ground.

Models 253 and 255



ALL-WAVE ANTENNA SYSTEM

ANTENNA INSTRUCTIONS

A good antenna is most essential for the reception of signals from stations located thousands of miles from the receiver. The flat top portion of the antenna should be placed as high above the ground and grounded objects as possible. Both lead-in wire and antenna should be located as far from sources of man-made static as possible. Automobile ignition systems, telephone communication lines, electric oil burner installations, motor and trolley power lines are some of the more common offenders of this nature. The installation of a good antenna requires a small amount of additional labor, but the extra effort is always rewarded with improved reception with a minimum of static interference. A properly installed antenna is almost as good as an extra stage of tuned radio frequency amplification.

It is advisable to place the radio receiver close to the incoming lead-in, as frequently an extension about the interior of the house picks up a considerable amount of static along with the desired signal. The illustration shows how to install a lightning arrester if one is desired.

PILOT RADIO CORP.

Models 253 and 255

DIAGRAM SYMBOLS AND REPLACEMENT PARTS LIST

FOR MODELS 253 AND 255

Diagram Symbol	Part Number	DESCRIPTION
		TUBE SOCKETS
	70864-B	7-prong Bakelite-base
	70863-B	6-prong Bakelite-base
	70927-B	4-prong Bakelite-base
		SHIELDS
	71857	3-in. tube shield
	71858	2 5/8-in. tube shield
	78649	Vibrator filter shield can
		CHOKES AND VIBRATOR TRANSFORMER
S4	71635	Filter choke, 8.5 henries
S5	73024	R. F. choke
S6	73023	A choke
S7	78630	Vibrator transformer assembly
		TUNING EQUIPMENT
S1	71531-B	1st I. F. transformer
S2	71532-B	2nd I. F. transformer
C5,C11,C26	71921	3-gang tuning condenser
	71910-G	Band switch and coil assembly completely mounted in shield, with 3-gang condenser, for Model 253
	71910-H	Band switch and assembly as above, for Model 255
	70918	Dial escutcheon
	70910	Dial crystal
	70919	Dial crystal retaining ring
	72118	2-speed dial drive mechanism
	70998	Dial drive disc assembly
	72163-A	Dial scale, without station calls. for Model 253
	78563	Dial scale logged for South Africa, for Model 253
	72163-3	Dial scale logged for U. S. A., for Model 253
	72165-3	Dial scale logged for Europe, for Model 255
	70934	Pointer
	642	Pointer holding screw
	78526	Spacing washer
	70953-B	Band switch escutcheon, Model 253
	70953-J	Band switch escutcheon, Model 255
	71282	Dial light, bayonnet base
R11	78647-B	Volume control and switch
R16	78648-B	Tone control
	70953-A	Volume control escutcheon
	72177	Small knob
	72176	Small knob with dot
	72180	Large tuning knob
	70950	Phonograph jack
		LOUDSPEAKER PARTS
	40803	Complete loudspeaker
	80000-S	Cone only
	80003-A	Drive motor assembly only
		CONDENSERS
C1,C2,C3	70969-C	Trimmer strip, Model 253
	70969-A	Trimmer strip, Model 255 (C1,C2,C3,C48)
C4	22055-I	Paper, .05 mfd., 200 V.
C5	71921	Tuning condenser (C5,C11,C26)
C6	22055-M	Paper, .1 mfd., 200 V.
C7,C8,C9	70969-C	Trimmer strip, Model 253
	70969-A	Trimmer strip, Model 255 (C7,C8,C9,C49)
C10	22055-I	Paper, .05 mfd., 200 V.
C11	See C5	
C12	22055-M	Paper, .1 mfd., 200 V.
C13	22055-I	Paper, .05 mfd., 200 V.
C14	27723-O	Mica, .00005 mfd.
C15	22055-I	Paper, .05 mfd., 200 V.
C16	27711-W	Mica, .001 mfd.
C17	71503-A	Padder, Model 253
	71577-C	Dual padder, Model 255 (C17,C51)
C18,C19	70969-D	Trimmer strip, Model 253 (C18, C19,C21)
	70969-B	Trimmer strip, Model 255 (C18,C19,C21,C50)
C20	27743-W	Mica, 1370 mmfd.
C21	See C18	
C22	27744-W	Mica, 2870 mmfd.
C23	22055-S	Paper, .5 mfd., 200 V.
C24	22055-M	Paper, .1 mfd., 200 V.
C25	71525-B	Neutralizing condenser
C26	See C5	
C27	22055-M	Paper, .1 mfd., 200 V.
C28	22055-I	Paper, .05 mfd., 200 V.
C29	22055-A	Paper, .01 mfd., 600 V.
C30	27701-W	Mica, 250 mmfd.
C31	22481	Electrolytic, 10. mfd., 25 V.
C32	22055-M	Paper, .1 mfd., 200 V.
C33	22055-A	Paper, .01 mfd., 600 V.
C34	22481	Electrolytic, 10. mfd., 25 V.
C35	22055-R	Paper, .005 mfd., 1000 V.
C36	22055-C	Paper, .05 mfd., 600 V.
C37	22055-F	Paper, .25 mfd., 200 V.
C38	22055-M	Paper, .1 mfd., 200 V.
C39	78623	Electrolytic, C39 has 4. mfd. - C40 has 8. mfd. - C41 has 8. mfd., all 200 V.
C40	See C39	
C41	See C39	
C42	22490-A	H. F. Paper, .5 mfd., 200 V.
C43	22490-C	H. F. Paper, .01 mfd., 1600 V.
C44	22490-A	H. F. Paper, .5 mfd., 200 V.
C45	27712-W	Mica, 500 mmfd.
C46	22490-B	H. F. Paper, .01 mfd., 200 V.
C47	27737-O	Mica, 10 mmfd.
C48	See C1	
C49	See C7	
C50	See C18	
C51	See C17	
C52	27701-O	Mica, 250 mmfd., Model 255 only
		RESISTORS
R1	13031	Carbon, 100,000 ohms, 1/4 w.
R2,R3	13115	Carbon, 400 ohms, 1/4 w.
R4	13164	Carbon, 50,000 ohms, 1/4 w.
R5	13031	Carbon, 100,000 ohms, 1/4 w.
R6	13068	Carbon, 30,000 ohms, 1/2 w.
R7	13086	Carbon, 2,000 ohms, 1/2 w.
R8	13001	Carbon, 1 megohm, 1/4 w.
R9	13115	Carbon, 400 ohms, 1/4 w.
R10	13164	Carbon, 50,000 ohms, 1/4 w.
R11	78647-B	Volume control, 750,000 ohms, and switch
R12	13147	Carbon, 300,000 ohms, 1/4 w.
R13	13116	Carbon, 12,000 ohms, 1/4 w.
R14	13171	Carbon, 250,000 ohms, 1/4 w.
R15	13024	Carbon, 500,000 ohms, 1/4 w.
R16	78648-B	Tone control, 100,000 ohms
R17	13187	Carbon, 1,000 ohms, 1 w.
R18,R19	13052	Carbon, 6,000 ohms, 1/2 w.
R20	13164	Carbon, 50,000 ohms, 1/4 w., Model 255 only
R21	13029	Carbon, 250 ohms, 1/4 w. Model 255 only

RECEIVER DESCRIPTION

Power Supply: 6-volt storage battery, 100 A.H. or more

Charger: —— De Luxe Wincharger

Circuit: —— One stage of tuned R.F. amplification for all frequencies, electron-coupled oscillator-modulator, diode detector, class A pentode output, automatic volume control

Output: —— .75 watt undistorted output

I. F.: —— Intermediate frequency, 456 kc.

Tubes: ——
6D6, R.F. amplifier
6A7, Electron emission control oscillator-detector
6D6, I.F. amplifier
75, Duo-diode detector-amplifier
41, Class A power pentode

VOLTAGES

D. C. voltages measured at the tube sockets of the set should be read with a high-resistance voltmeter of at least 1,000 ohms per volt.

	R.F. 6D6	Osc.Det. 6A7	I.F. 6D6	Diode 75	Pent. 41
Plate	135	135	135	60	118
Cath.	4	1.8	4	1	10
Screen	100	50	100	--	125
Fil.	6	6	6	6	6

PILOT RADIO CORP.

SCHEMATIC DIAGRAM FOR MODELS 364 AND 365

ALIGNING FREQUENCIES: L.W. – 150 & 380 K.C., M.W. – 570 & 1500 K.C., BAND 3 – 4.3 M.C., BAND 2 – 12 M.C., BAND 1 – 23 M.C. REQUENCY – 456 K.C.

25114-3

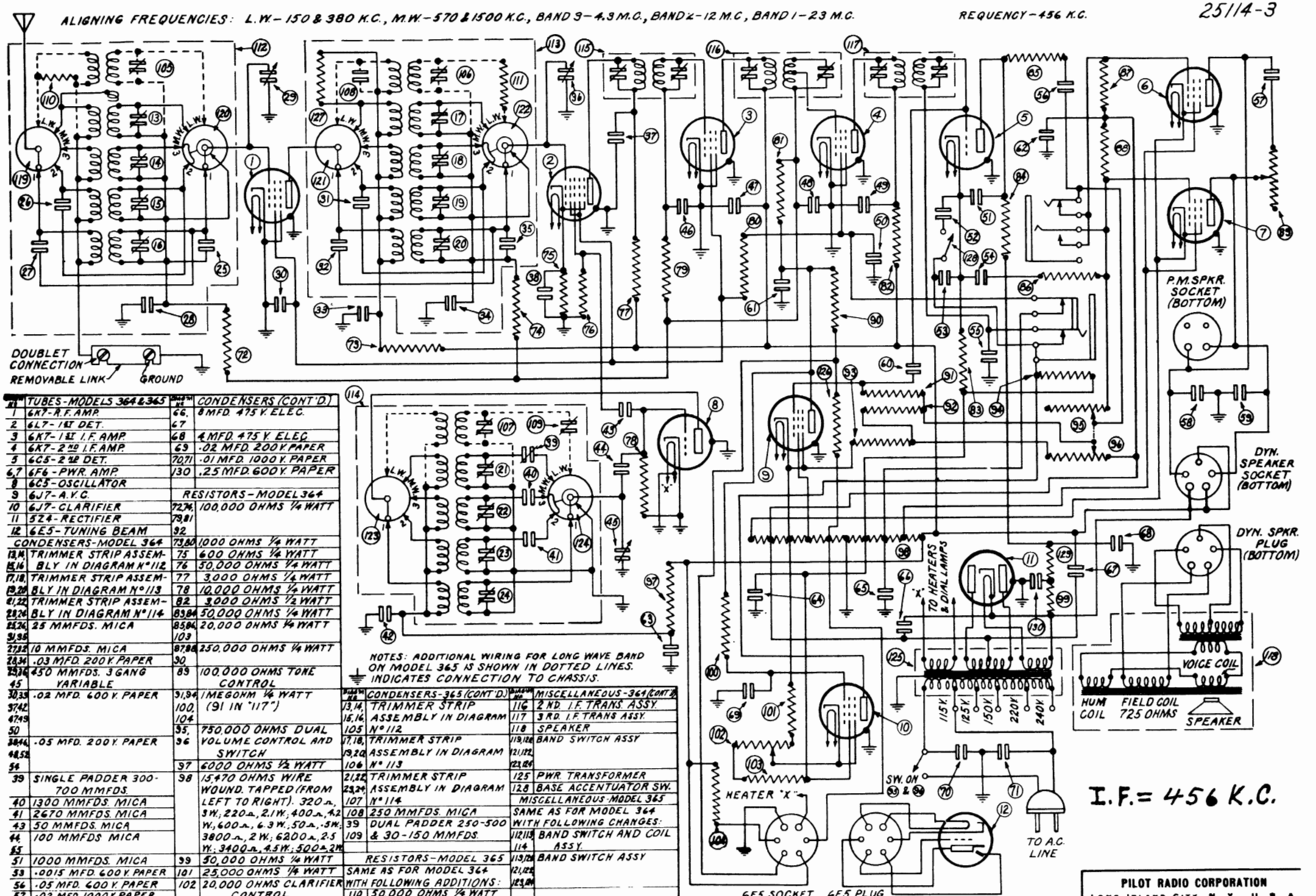


Diagram No.	TUBES – MODELS 364 & 365
1	6K7 – R.F. AMP.
2	6L7 – 1ST DET.
3	6K7 – 1ST I.F. AMP.
4	6K7 – 2ND I.F. AMP.
5	6C5 – 2ND DET.
6,7	6F6 – PWR. AMP.
8	6C5 – OSCILLATOR
9	6J7 – A.V.C.
10	6J7 – CLARIFIER
11	524 – RECTIFIER
12	6E5 – TUNING BEAM
	CONDENSERS – MODEL 364
13,14	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 112
15,16	
17,18	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 113
19,20	
21,22	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 114
23,24	
25,26	25 MMFDS. MICA
31,32	
27,28	10 MMFDS. MICA
28,34	.03 MFD. 200 V. PAPER
29,30	
45	450 MMFDS. 3 GANG VARIABLE
30,33	.02 MFD. 400 V. PAPER
37,42	
47,49	
50	
38,44	.05 MFD. 200 V. PAPER
48,52	
54	
39	SINGLE PADDER 300-700 MMFDS.
40	1300 MMFDS. MICA
41	2670 MMFDS. MICA
43	50 MMFDS. MICA
44	100 MMFDS MICA
55	
51	1000 MMFDS. MICA
53	.0015 MFD. 400 V. PAPER
56	.05 MFD. 400 V. PAPER
57	.02 MFD. 1000 V. PAPER
58,59	.002 MFD. 1000 V. PAPER
60	25 MMFDS. MICA (IN "117")
61	.25 MFD. 200 V. PAPER
62	8 MFD. 150 V. ELEC.
63	2 MFD 475 V. ELEC.
64	2 MFD 475 V. ELEC.
65	4 MFD. 475 V. ELEC

Diagram No.	CONDENSERS (CONT'D.)
66	8 MFD. 475 V. ELEC.
67	
68	4 MFD. 475 V. ELEC.
69	.02 MFD. 200 V. PAPER
70,71	.01 MFD. 1000 V. PAPER
130	.25 MFD. 600 V. PAPER
73,80	1000 OHMS ¼ WATT
75	600 OHMS ¼ WATT
76	50,000 OHMS ¼ WATT
77	3,000 OHMS ¼ WATT
78	10,000 OHMS ¼ WATT
82	3,000 OHMS ½ WATT
83,84	50,000 OHMS ¼ WATT
85,86	20,000 OHMS ¼ WATT
103	
87,88	250,000 OHMS ¼ WATT
90	
89	100,000 OHMS TONE CONTROL
91,94	1 MEGOHM ¼ WATT
100, 104	(91 IN "117")
95, 96	750,000 OHMS DUAL VOLUME CONTROL AND SWITCH
97	6000 OHMS ½ WATT
98	15,470 OHMS WIRE WOUND. TAPPED (FROM LEFT TO RIGHT). 320 Ω, 3 W.; 220 Ω, 2.1 W.; 400 Ω, 4.2 W.; 600 Ω, 6.3 W.; 50 Ω, .5 W.; 3800 Ω, 2 W.; 6200 Ω, 2.5 W.; 3400 Ω, 4.5 W.; 500 Ω, 2 W.
99	50,000 OHMS ¼ WATT
101	25,000 OHMS ¼ WATT
102	20,000 OHMS CLARIFIER CONTROL
126	170,000 OHMS ¼ WATT
127	4,000 OHMS ¼ WATT
93	500,000 OHMS ¼ WATT
129	50,000 OHMS ¼ WATT
	CONDENSERS – MODEL 365
	SAME AS FOR MODEL 364
	WITH FOLLOWING CHANGES

Diagram No.	CONDENSERS – 365 (CONT'D.)
13,14, 15,16	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 112
105	
17,18, 19,20	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 113
106	
21,22 23,24	TRIMMER STRIP ASSEMBLY IN DIAGRAM N° 114
107	
108	250 MMFDS. MICA
39	DUAL PADDER 250-500
109	& 30-150 MMFDS.
	RESISTORS – MODEL 365
	SAME AS FOR MODEL 364
	WITH FOLLOWING ADDITIONS:
110	30,000 OHMS ¼ WATT
111	250 OHMS ¼ WATT
	MISCELLANEOUS – MODEL 364
112,113	BAND SWITCH AND
114	COIL ASSEMBLY
115	1ST I.F. TRANS. ASSY.

Diagram No.	MISCELLANEOUS – 364 (CONT'D.)
116	2ND I.F. TRANS. ASSY.
117	3RD I.F. TRANS. ASSY.
118	SPEAKER
119,120 121,122 123,124	BAND SWITCH ASSY
125	PWR. TRANSFORMER
128	BASE ACCENTUATOR SW.
	MISCELLANEOUS – MODEL 365
	SAME AS FOR MODEL 364
	WITH FOLLOWING CHANGES:
112,113	BAND SWITCH AND COIL
114	ASSY.
115,120 121,122 123,124	BAND SWITCH ASSY

NOTES: ADDITIONAL WIRING FOR LONG WAVE BAND ON MODEL 365 IS SHOWN IN DOTTED LINES.
⏚ INDICATES CONNECTION TO CHASSIS.

I.F. = 456 K.C.

ALTERATIONS ② REVISED CIRCUIT J.P.H. 12/11/35 J.P.H. 1/6/36 ③ REVISED CIRCUIT '93 WAS 250,000 OHMS '95 & 10,000 OHMS 34,000 OHMS

FINISH

CLASSIFICATION: 360 SERIES

THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]

DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY, N.Y. U.S.A.

SCHEMATIC CIRCUIT DIAGRAM FOR MODELS 364 & 365

MATERIAL

SCALE DATE NOV. 5, 1935

DRAWN BY J.P.H.

CHECKED BY AT

APPROVED BY

DRWG. NO. 25114-3

PILOT RADIO CORP.

PILOT RADIO CORP.

MODELS 364 and 365

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET: To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Unfasten the base accentuator switch on the side of the cabinet.

Remove the knobs and felt washers from the controls on the front panel.

Remove the tuning beam connector cable from the socket at the front of the chassis.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require alignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis, and reinsert the tuning beam cable plug in the socket at the front of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control and the tone control should be turned to the maximum clockwise position. Connect the antenna lead of the external oscillator to the control grid of the 6K7 tube in the 2nd I. F. Amplifier through a .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the receiver ground lead. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 3 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the 6K7 2nd I. F. amplifier tube and connect it in the same manner to the control grid of the 6K7 1st I. F. amplifier tube. Now rotate each adjustment screw on I. F. Unit No. 2 for maximum output. Following this, connect the external oscillator leads to the control grid of the 6L7 tube. Adjust each trimmer on the I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected across the control grid of the 6L7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads through a .0002 mfd. condenser. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Tune the external oscillator to 1500 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 570 kc. padder condenser, located in the lower rear section of the band switch, under the chassis. Set the external oscillator at 570 kc. Rotate the receiver tuning control to the resonance position, and at the same time adjust the padder condenser for the highest peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

The alignment frequencies are as follows:

Band 3—69.73 meters—4,300 kc.
Band 2—26.07 meters—11,500 kc.
Band 1—13. meters—23,000 kc.

When aligning Band 3, set the Band Switch in the position marked Band 3. Rotate the tuning condenser to the 4300 kc. indication on the dial scale. Set the external oscillator at 4300 kc. Adjust the Band 3 oscillator trimmer for maximum sensitivity. Next adjust the interstage and antenna trimmer condensers for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

Align Band 2 in a similar manner using a 400-ohm non-inductive resistor in place of the .0002 mfd. condenser. The alignment frequency is 11,500 kc. (26.07 meters).

The alignment of Band 1 requires greater care due to the higher frequencies covered by this band. The tracking characteristic of Band 1 of this receiver differs from that of the other bands, in that the 1st detector and T.R.F. circuits resonate on the high frequency side of the oscillator. This condition applies only to Band 1. The alignment frequency is 23000 kc. or 13 meters. Set the external oscillator at 13 meters. Rotate the tuning condenser of the receiver until the dial pointer is co-incidental with the 13 meter indication on the dial scale. Adjust the oscillator trimmer condenser for maximum sensitivity. Proceed next to align the interstage section. In doing this it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonant peak. Next align the antenna section for maximum sensitivity.

THE LONG WAVE ALIGNMENT procedure in the Model 365 is similar to that of the broadcast. Turn the Band Switch to the Long Wave position. The alignment frequency is 380 kc. Adjust the padder condenser at 150 kc. Use a .0002 mfd. condenser in the antenna lead from the external oscillator.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY: Should it be necessary to remove the switch assembly, it is advisable to realign the receiver after reinstalling it.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

WIRING TO BAND SWITCH & ARRANGEMENT OF SOCKET TERMINALS.

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1,000 ohms per volt.

	R.F. 6K7	Osc. 6C5	1st Det. 6L7	1st I.F. 6K7	2nd I.F. 6K7	2nd Det. 6C5	6F6 Pwr. Pent.	Pwr. Pent. 6F6	A.V.C. 6J7	Clar. 6J7	Rect. 5Z4	T.B. 6E5
Plate	185	130	187	190	170	235	190	190	—1	20	.....	10
Screen	100	.....	100	100	108	.....	182	182	—38	40	.....	.....
Cathode	.....	.....	3.3	.....	.....	52	—58	—58	—64	9	300	—3
Filament	6.5	6.5	6.5	6.5	5.	6.5	6.5	6.5	6.5	6.5	6.5	6.5

Volume Control—Turn to right during measurements. Speaker field—104 Volts. Tuning Beam—Target 200 Volts to ground.

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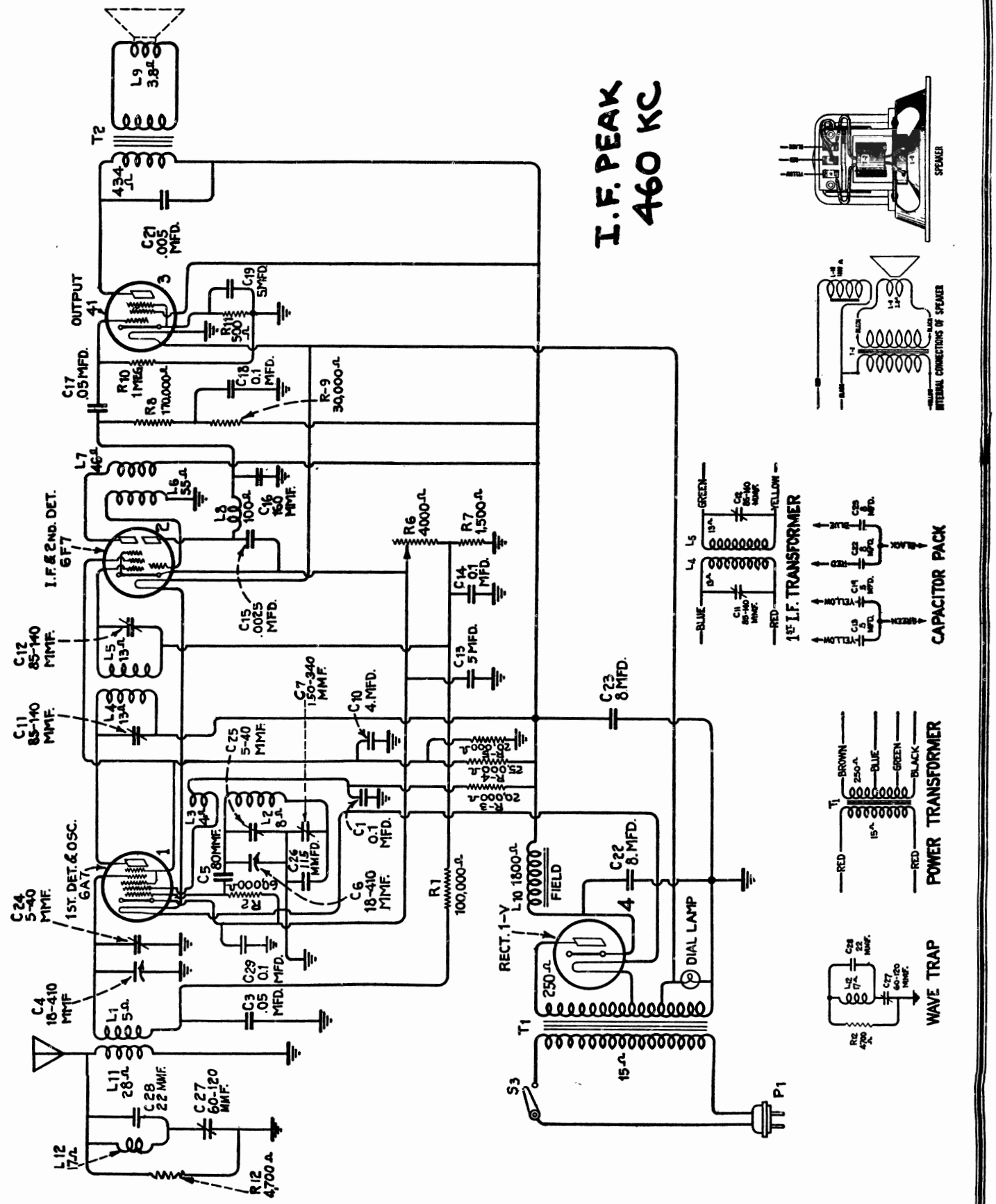
MODELS T4-8 and T4-9

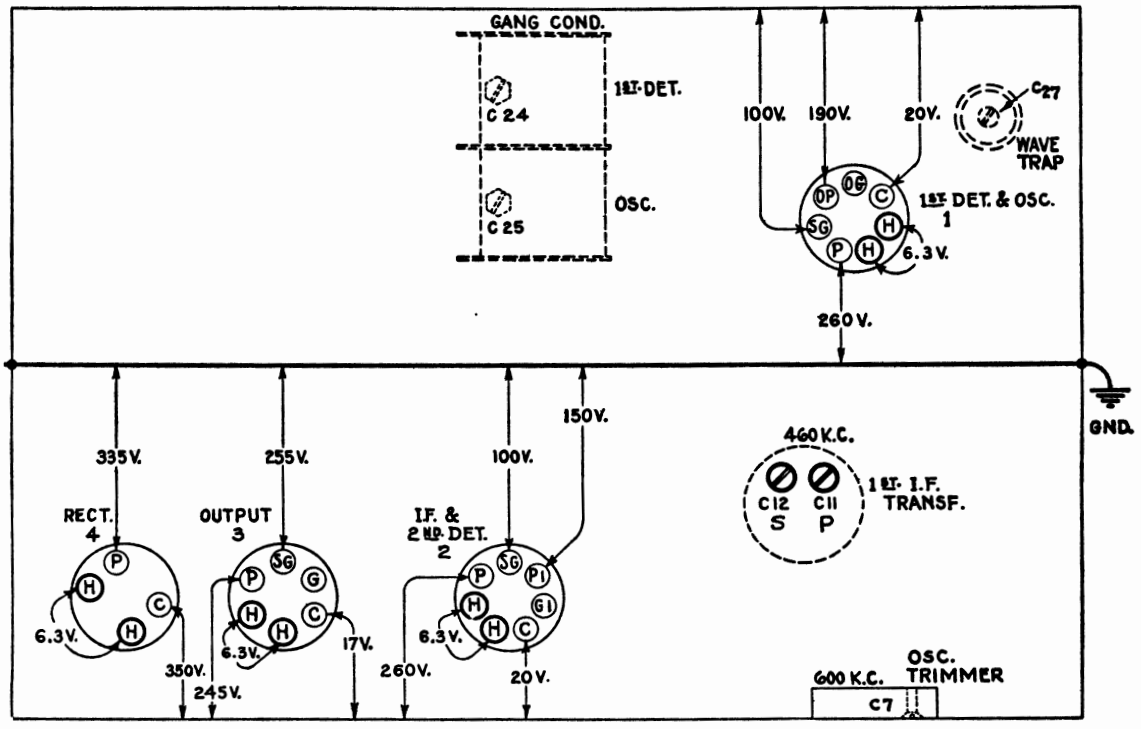


RCA MANUFACTURING CO., Inc.

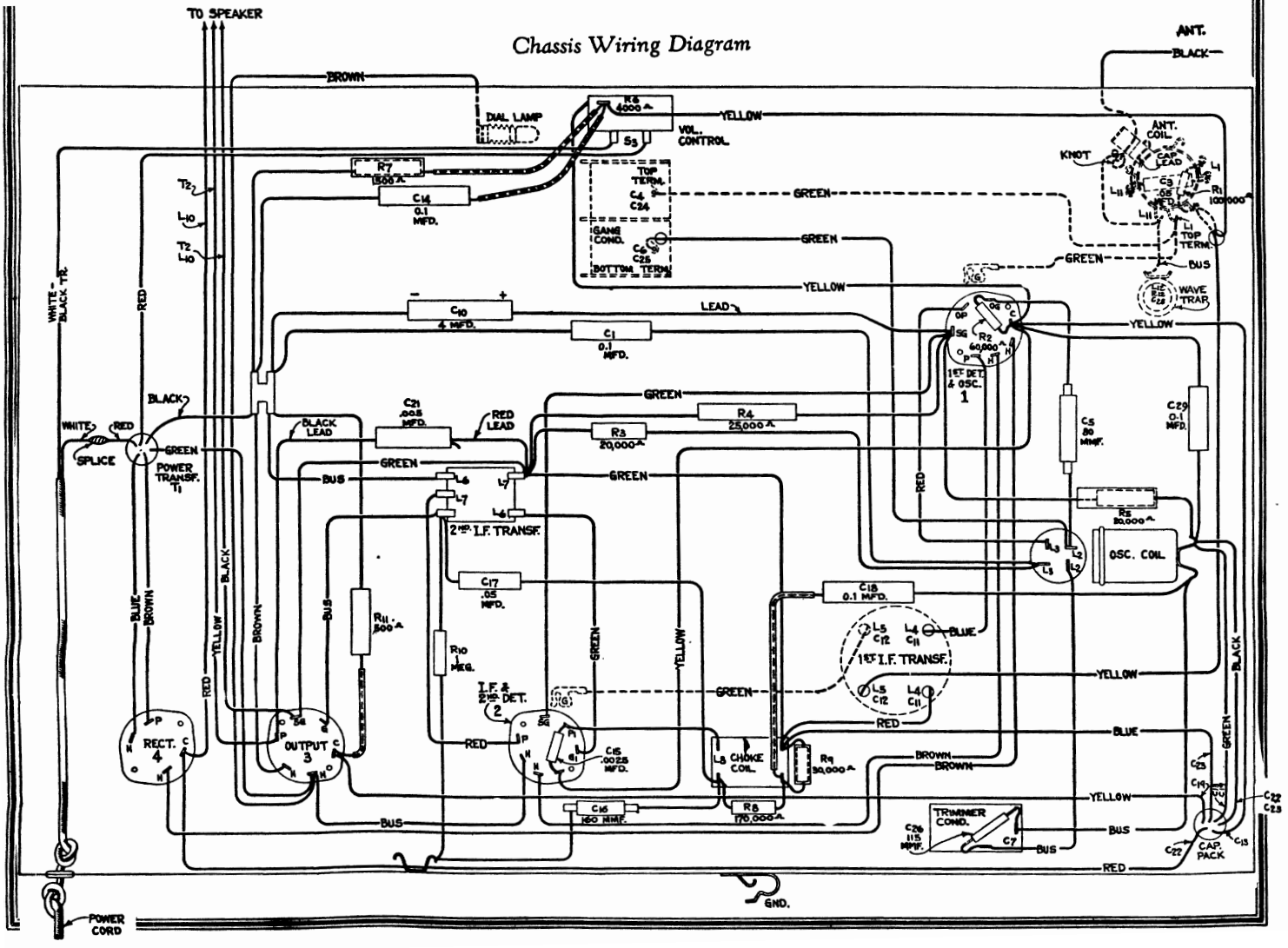
MODELS T4-8 and T4-9

Trimmer Locations and Radiotron Socket Voltages to Chassis

Measured at 120 volts A-C Supply—No Signal — Volume Control Maximum

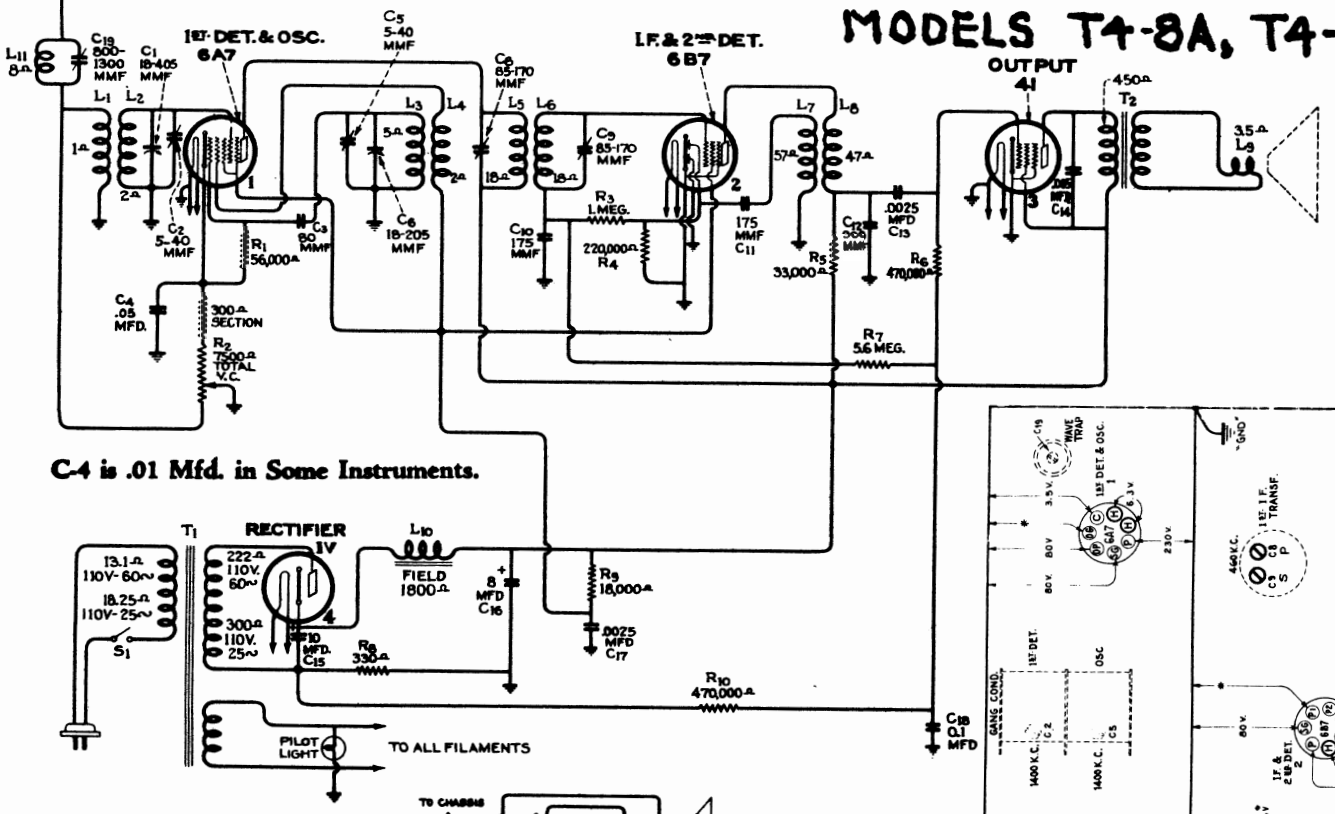


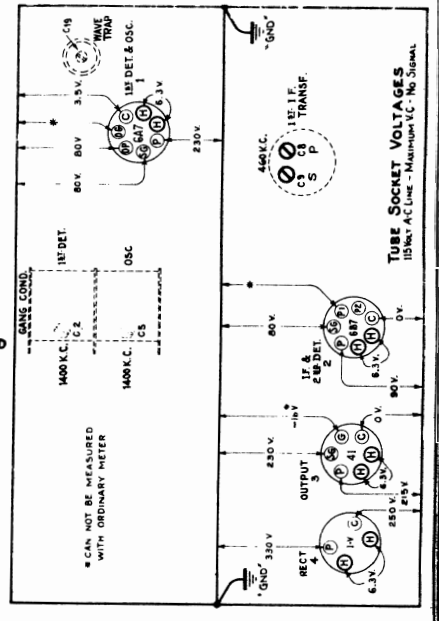
Chassis Wiring Diagram



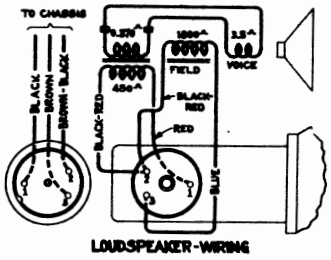
RCA MANUFACTURING CO., Inc.

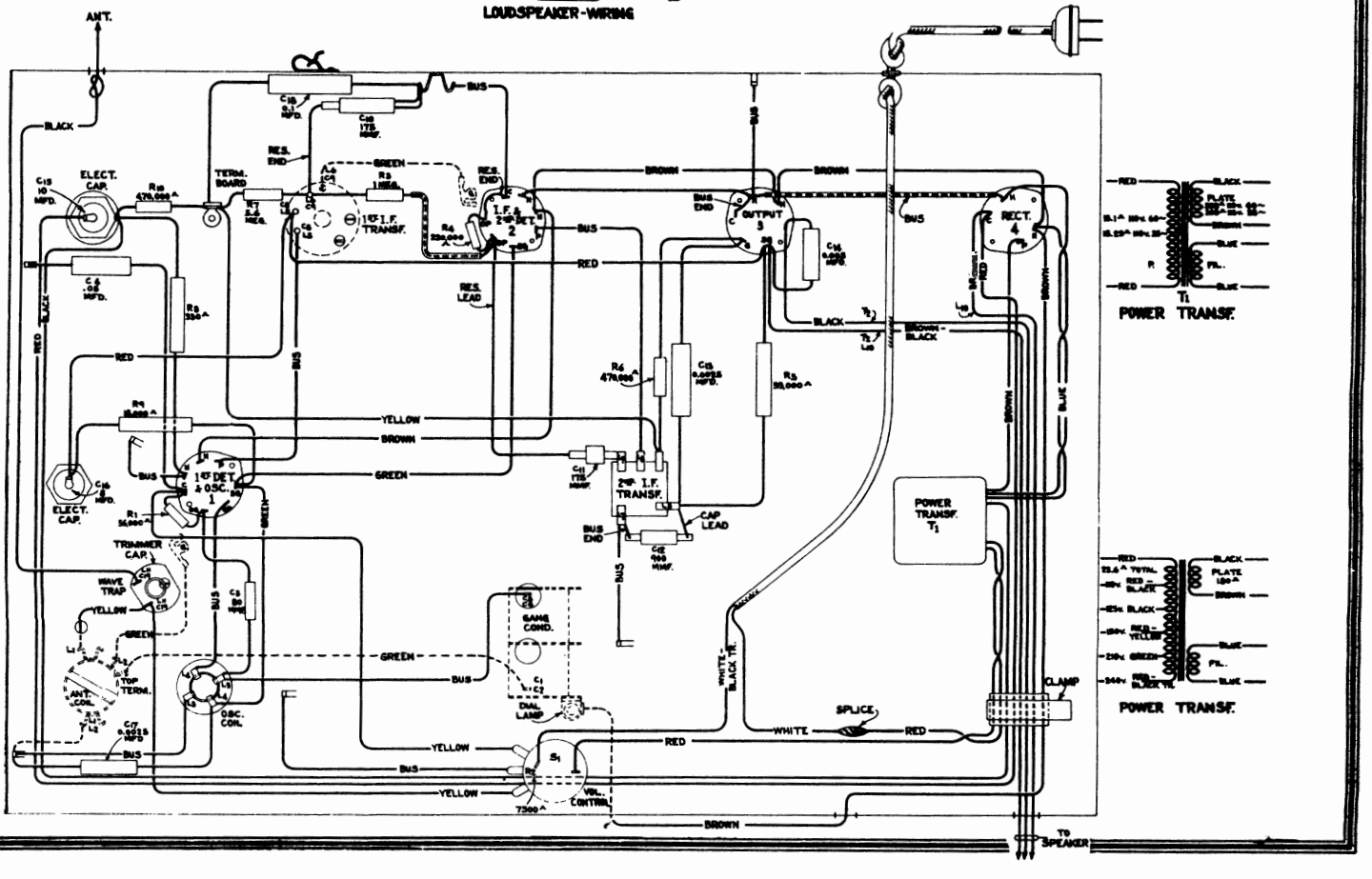
MODELS T4-8A, T4-9A





I.F. PEAK 460 KC





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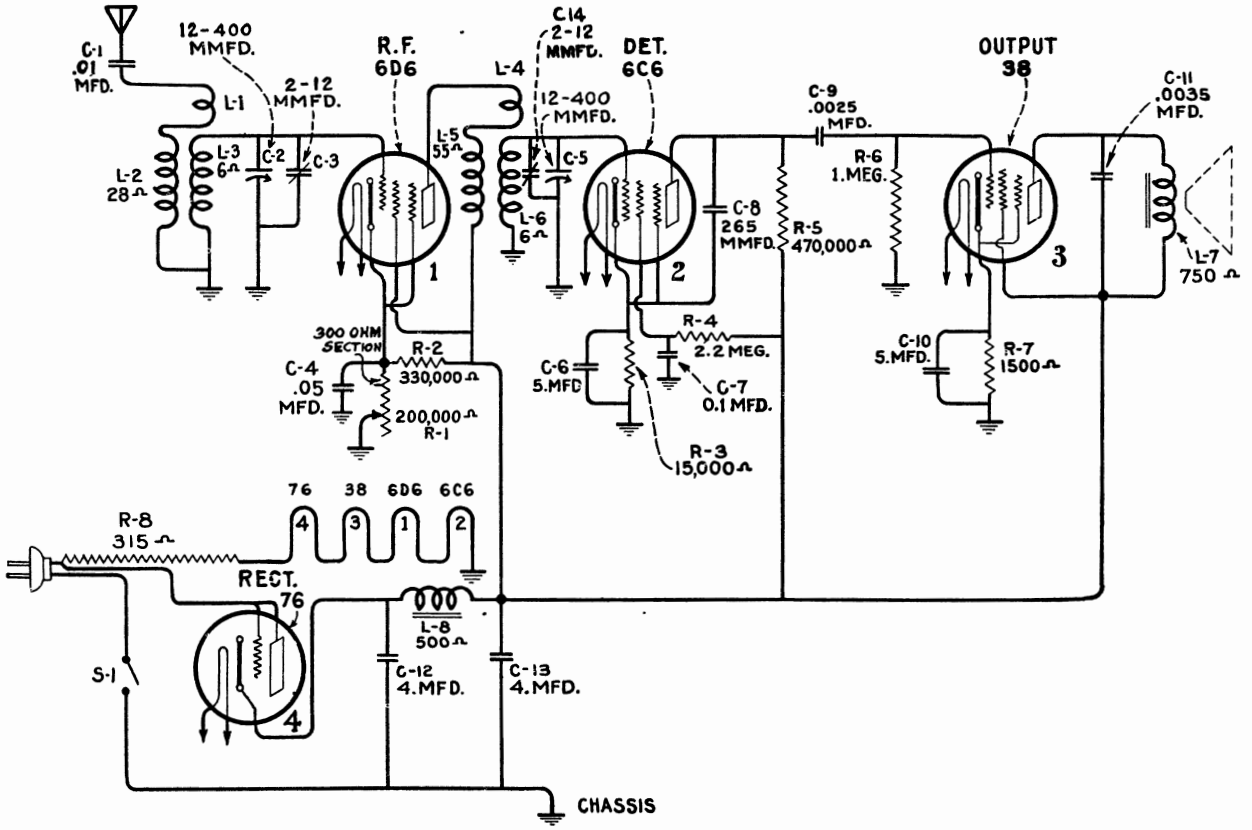
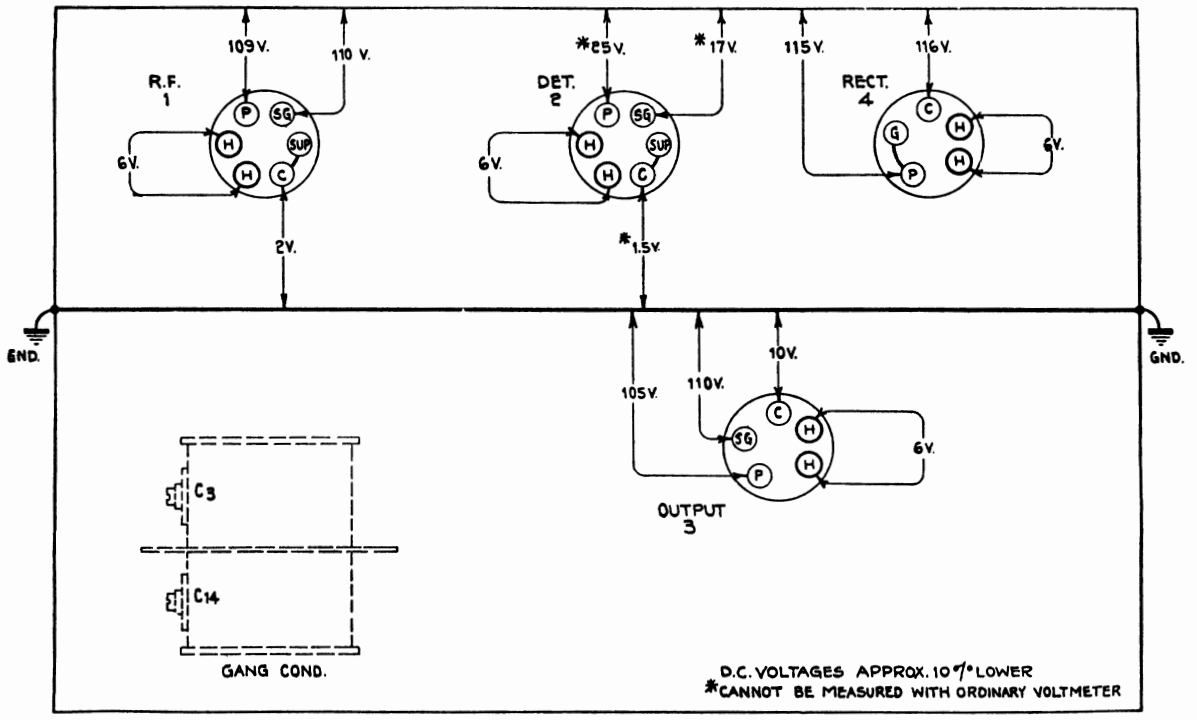
MODEL T4-10



Schematic Circuit Diagram

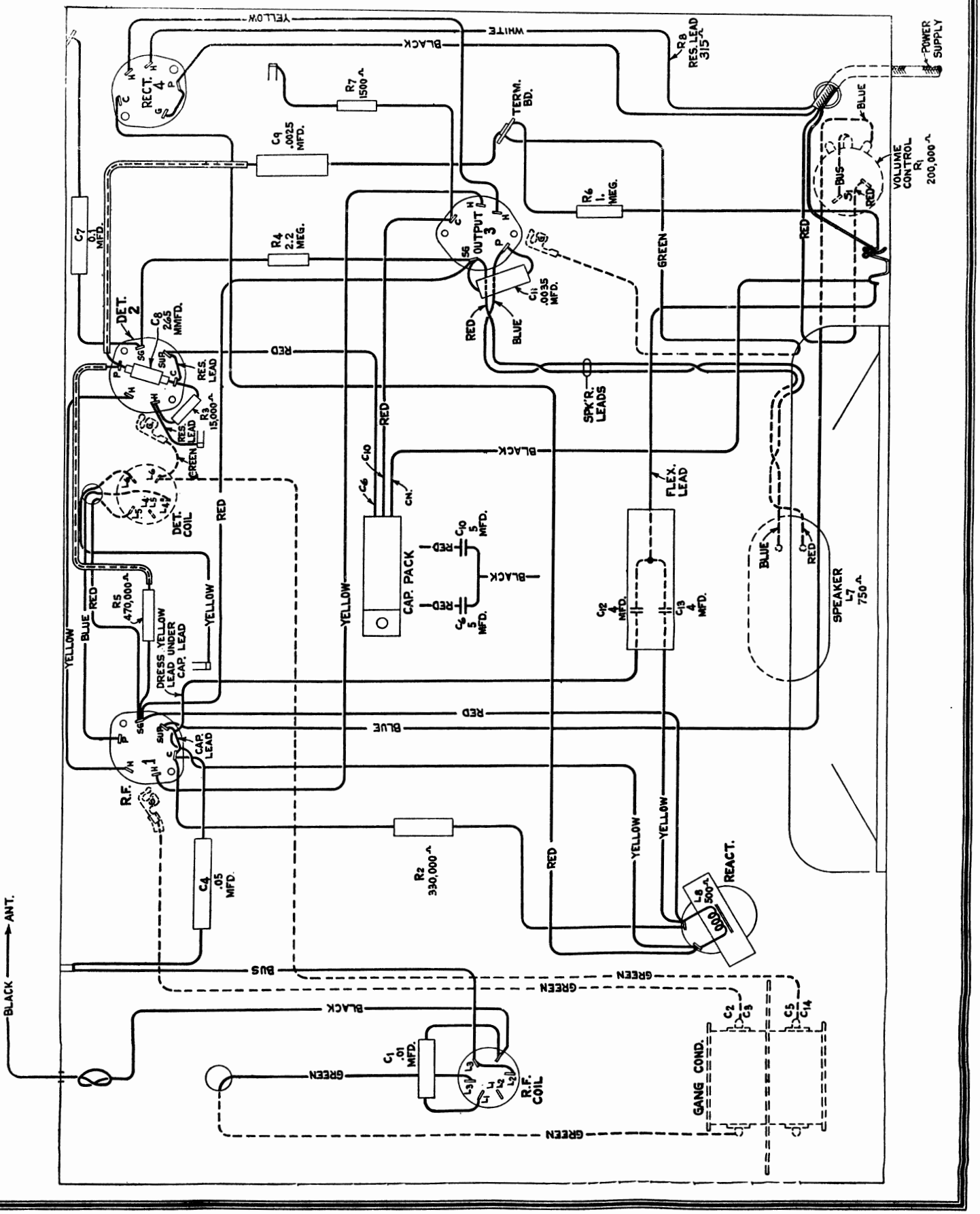


Trimmer Locations and Radiotron Socket Voltages

RCA MANUFACTURING CO., Inc.

MODEL T4-10

Chassis and Speaker Wiring



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MODELS 4X, 4X3, and 4X4

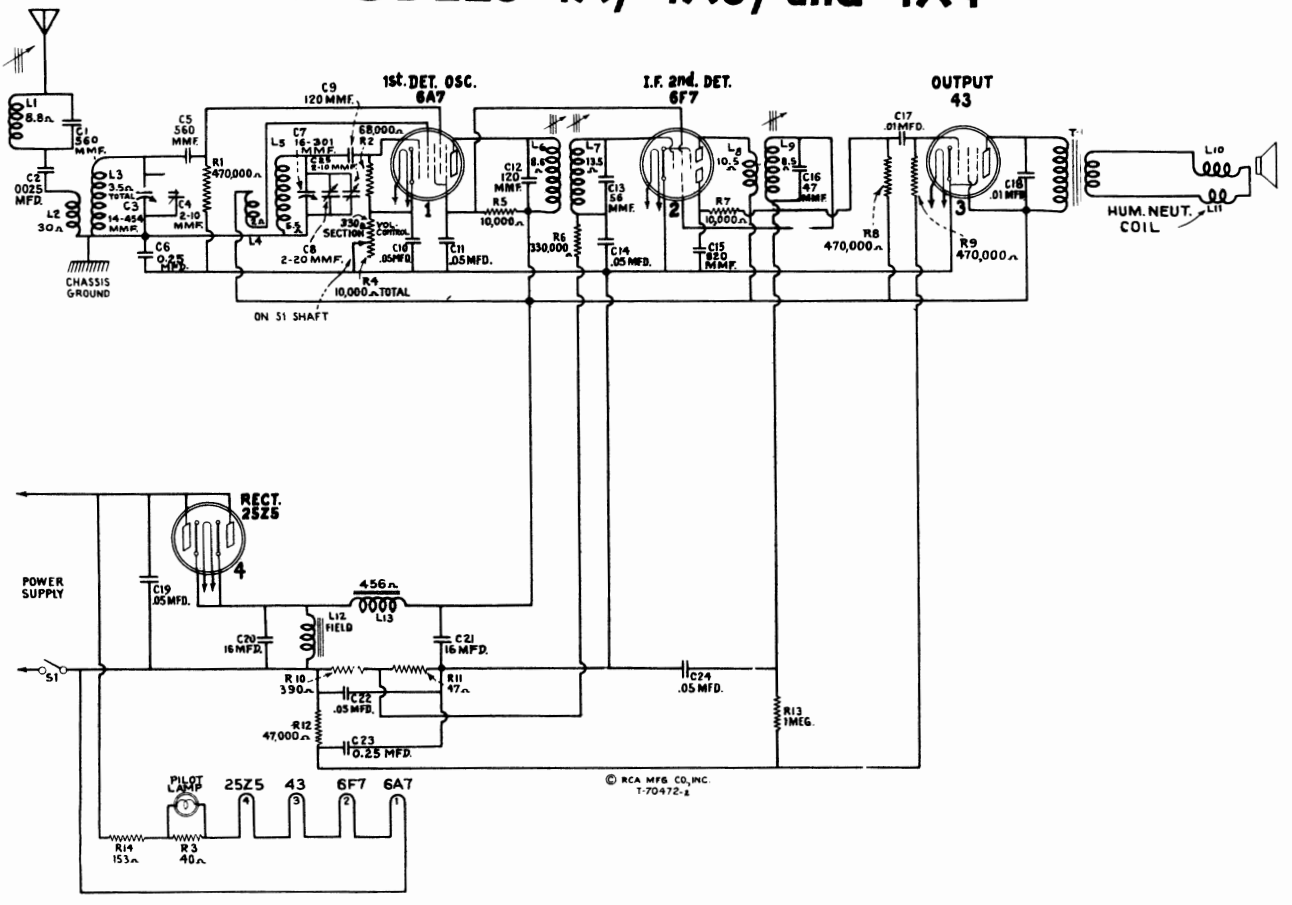


Figure 1—Schematic Circuit Diagram

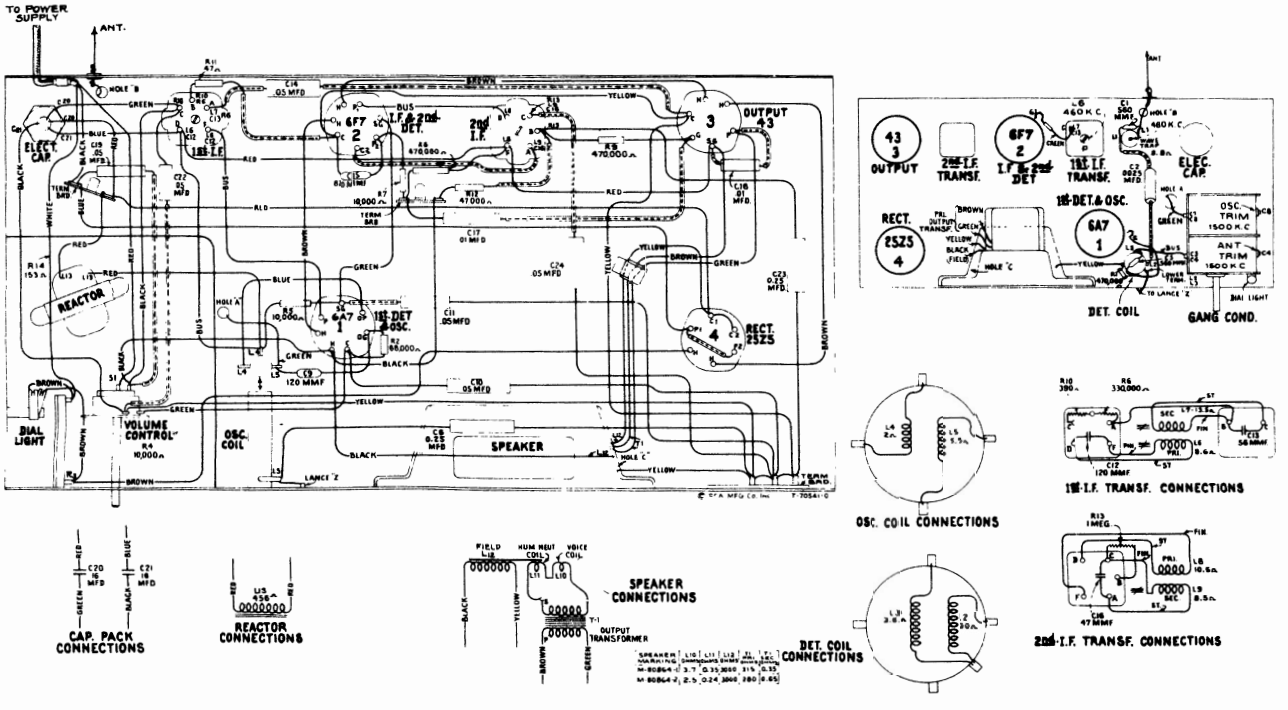


Figure 2—Chassis Wiring Diagram, Radiotron, Coil, and Trimmer Locations

RCA MANUFACTURING CO., Inc.
MODELS 4X, 4X3, and 4X4

Alignment Procedure

There are two alignment trimmers provided in the antenna-coil and oscillator-coil tuned circuits. The i-f transformer adjustments are made by means of three screws attached to molded magnetite cores. The wave-trap is likewise adjusted by a screw attached to its molded core. Re-adjustment may occasionally occur from continued extremes of climate, tampering, purported alteration for services, or after repairs have been made to the r-f or i-f tuned circuits. Improper alignment usually causes the impairment of sensitivity, selectivity, and tone quality. Such conditions will usually exist simultaneously.

In re-adjusting the tuned circuits, it is important to apply a definite procedure and to use adequate and reliable test equipment. A standard test oscillator, such as the **RCA Stock No. 9595,** will be required as the source of the signal at the specified alignment frequencies. Visual indication of the receiver output during alignment is also necessary to accurately show when the correct point of adjustment is reached. The **RCA Stock No. 4317 Neon Output Indicator** is especially suitable for this use.

The procedure outlined below should be followed in adjusting the various trimming capacitors and molded magnetite cores:

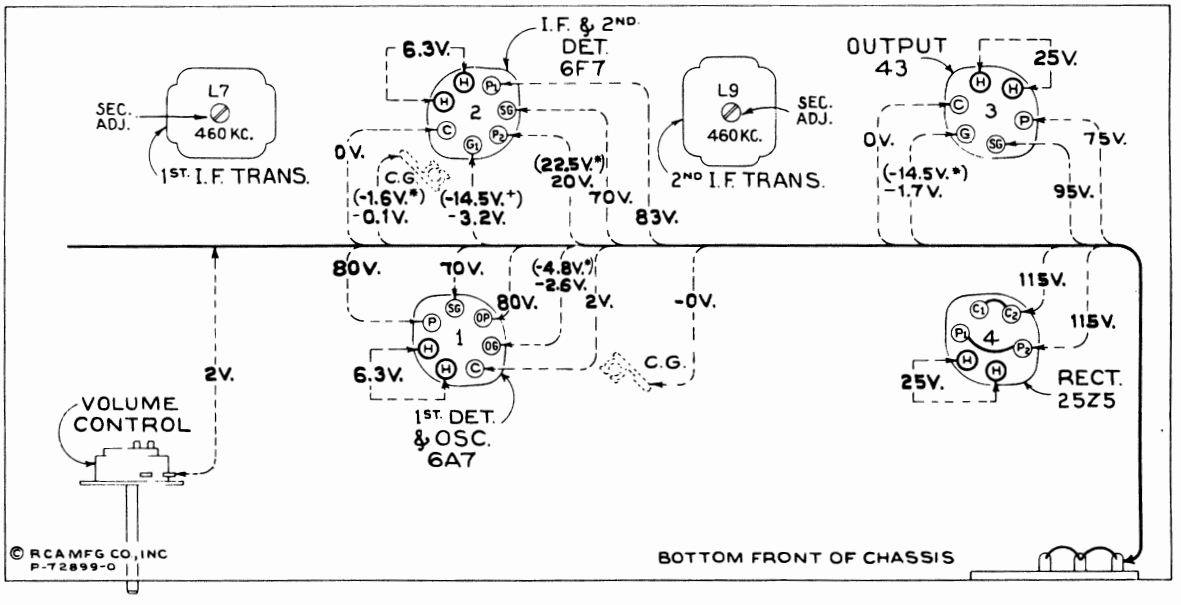


Figure 4—Radiotron Socket Voltages and Trimmer Locations

Measured at 115 volts, 60-cycle supply—For 115-volt d-c supply approximately 10% lower
Tuned to approximately 550 kc—No signal being received—
Volume control maximum

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts, grid caps, resistors, and terminals to receiver chassis ground, on figure 4, will assist in locating cause for faulty operation. Each value as specified should hold within ±20% when the receiver is normally operative at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. These voltages were measured with set tuned to approximately 550 kc, no signal being received, and volume control set to maximum. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, and 250 volts. Use nearest range above voltage to be measured. A-c voltages were measured with a corresponding a-c meter.

I-F Core Adjustments

The three adjustment screws (one on top and one on bottom of first i-f transformer and one on bottom of second i-f transformer) are located as shown by figures 2 and 4. Each circuit must be aligned to a basic frequency of **460 kc.** To do this, attach the output indicator across the loudspeaker voice coil. Connect the output of the test oscillator through a **.05-mfd.** capacitor to the RCA-6A7 control grid, the ground of the test oscillator being connected to the receiver chassis. Set the test oscillator to **460 kc.** Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point within its range where no interference is encountered either from broadcast stations or the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is apparent on the output indicator.

Adjust the bottom core screw of the second i-f transformer to produce maximum (peak) indicated receiver output. Then adjust the two core screws of the first i-f transformer for maximum (peak) receiver

(See next page)

RCA MANUFACTURING CO., Inc.

MODELS 4X - 4X3 - 4X4

output as shown by the indicating device.

It is advisable to repeat the adjustment of all i-f core screws to assure that the inter-action between them has not disturbed the original adjustment.

Wave-Trap Adjustment

Attach the output of the test oscillator to the "Antenna terminal" (see wave-trap, top view chassis, figure 2) through an **80-mmfd.** capacitor, the ground connection of the test oscillator and receiver chassis being connected as before. **Receiver "Antenna wire" should be reeled up for this and the following r-f adjustments.**

Leave the test oscillator adjusted to **460 kc** as before. Then adjust the wave-trap trimmer to the point which causes **maximum suppression** of the **460 kc** signal.

R-F Trimmer Adjustments

Since the dial is mounted on the cabinet, it will be necessary to perform the operations, in sequence, as follows:

Place the receiver in its cabinet. Set the gang tuning condenser to its maximum capacity (full-mesh) position and place the tuning knob on the gang tuning condenser shaft. Tighten the knob set screw with the dial pointer set to the low-frequency calibration line beyond **550 kc** (beyond "55" on the dial). Turn the tuning knob until the dial pointer indicates **1,500 kc.** Remove the tuning knob from shaft and receiver from cabinet, being careful not to disturb the setting of the gang condenser.

With the test oscillator and output indicator connected as specified under "Wave-trap adjustment" and receiver volume control in its maximum position, tune the test oscillator to **1,500 kc** and regulate its output to produce a suitable indication on the output indicator. Adjust the oscillator and antenna trimmers **C8** and **C4** for maximum (peak) output.

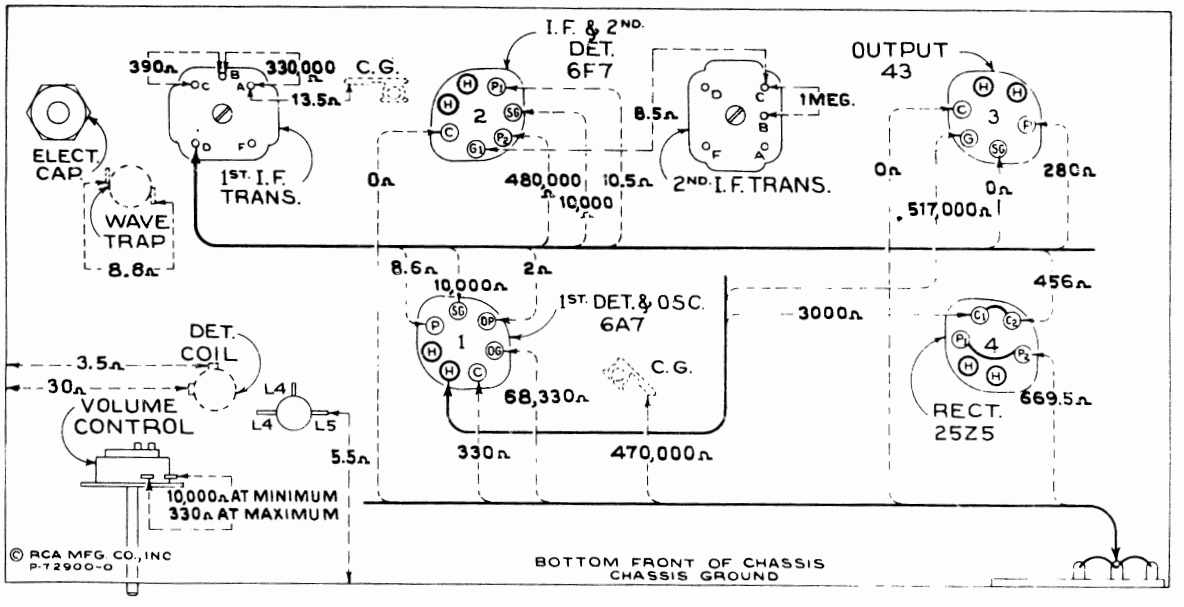


Figure 3—Resistance Diagram

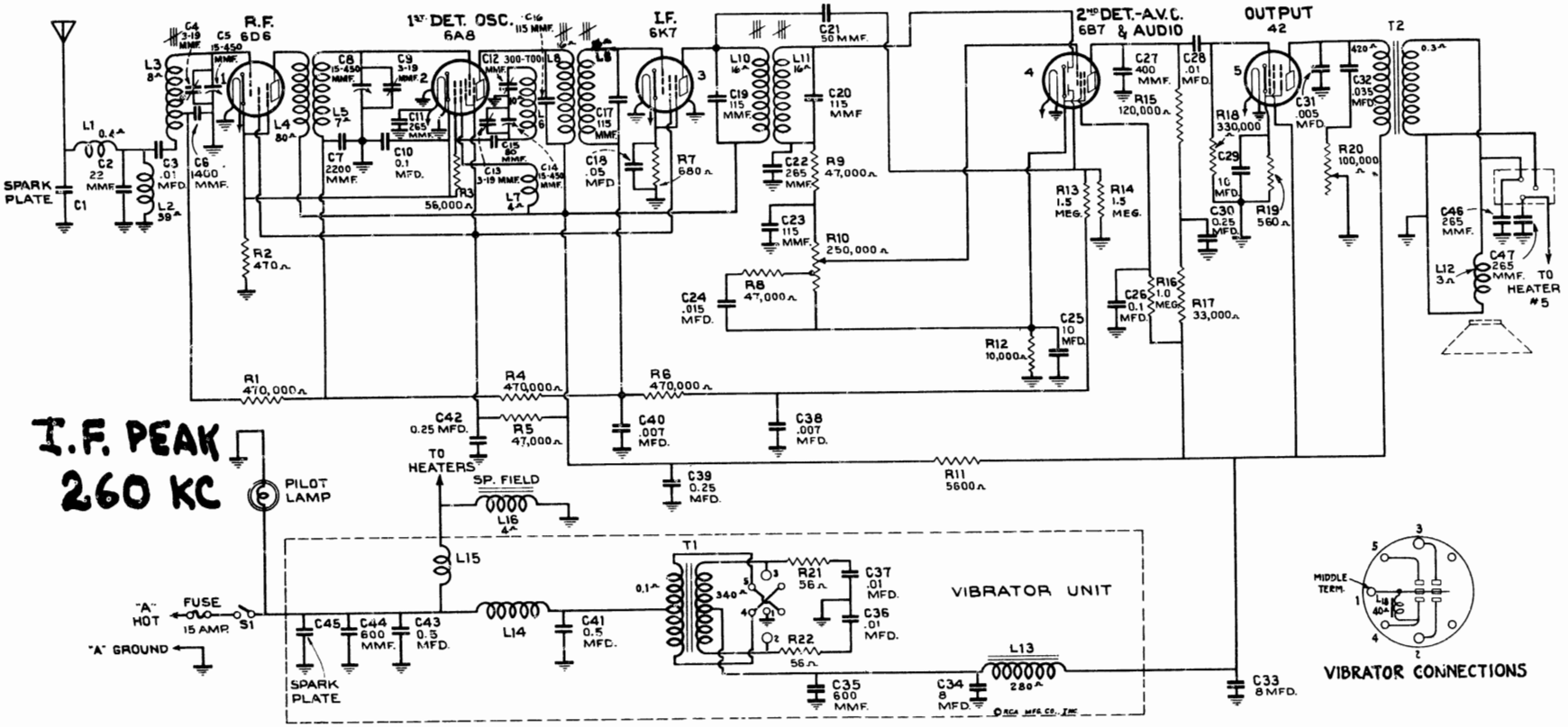
Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh
Volume control maximum

Resistance Measurements

The resistance values shown between Radiotron socket contacts, grid caps, resistors, terminals, and receiver chassis ground, on figure 3, have been carefully selected so as to facilitate a rapid check of the circuit for defective parts, bad joints, etc. The use of this diagram in conjunction with the Schematic Circuit Diagram, figure 1, and the Chassis Wiring Diagram, figure 2, will permit the location of certain troubles which would otherwise be difficult to ascertain. Each value as specified should hold within ±20%. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. Resistance values were measured with the Radiotrons in sockets, power supply disconnected, tuning condenser in full-mesh, and volume control set at maximum except where otherwise noted. In all cases of measuring the resistance between points of the circuit and ground, it will be necessary to connect the negative (−) terminal of the resistance meter to the chassis ground. If the polarity of the resistance meter is not known, it may be readily ascertained by connecting a d-c voltmeter of indicated polarity across the terminals of the device.

RCA MANUFACTURING CO., Inc.

MODEL 5M (AUTO SET)

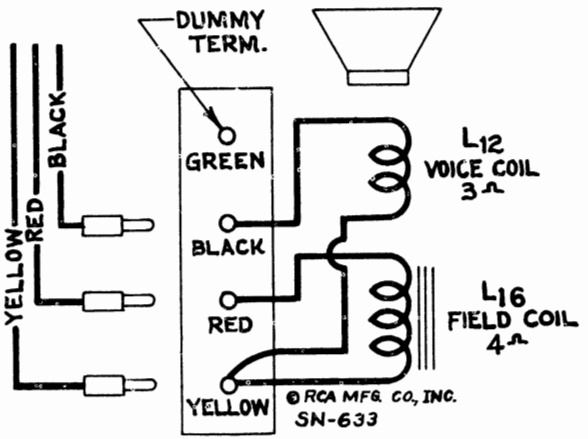


Certain automobile installations require change of value of capacitor C-3. See note

NOTE: Certain models of **1936** *automobiles are equipped with* **"high-capacitance type"** *(***400 mmfd.** *or greater) built-in antennas. The* **1936** *models of Dodge, De Soto, and Chrysler are examples of automobiles so equipped. Installation of receiver in automobiles with such* **"high-capacity"** *antennas necessitates the following modification of the antenna circuit of the receiver to suit the characteristics of the antenna installation:*

Remove the tubular paper-covered capacitor **C-3** *(***.01 mfd.***), (schematic) and replace with the small molded type capacitor (***500 mmfd.***) furnished with Escutcheon Kit for respective model of automobile.*

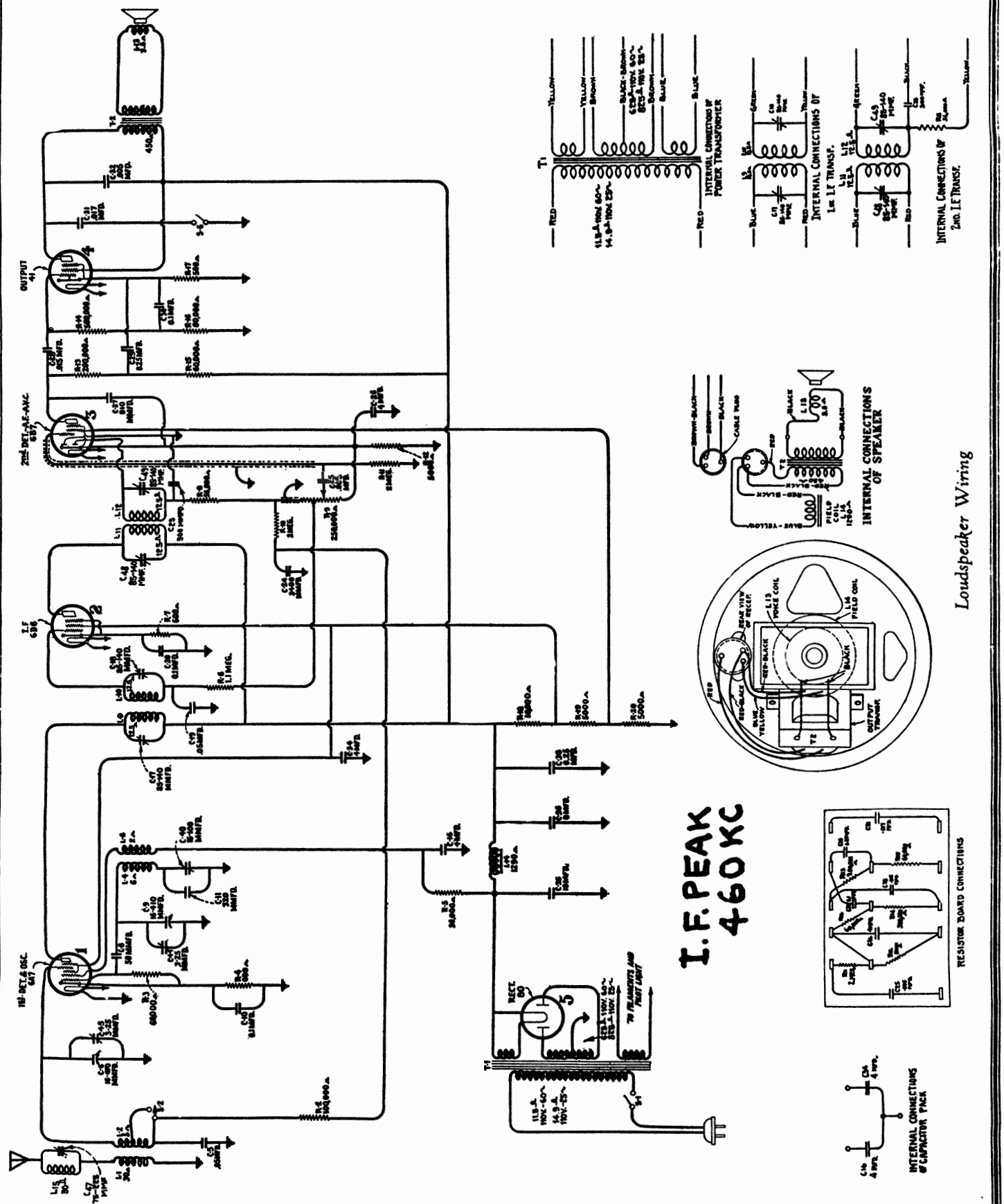
NOTE: *The antenna coil has a molded core which is adjusted at the factory for the correct inductance.* **This adjustment should not be disturbed.**



Loudspeaker Schematic and Wiring

RCA MANUFACTURING CO., Inc.

MODEL T5-2



RCA MANUFACTURING CO., Inc.

MODEL T5-2

SERVICE DATA

ALIGNMENT PROCEDURE

This receiver must be in correct electrical alignment in order to obtain maximum efficiency and best quality of performance. The circuits should be realigned after each major service or repair operation, and whenever there are positive indications that the adjustments have deviated from normal by ordinary usage. These indications will be present together and will have the nature of: low sensitivity, poor tone quality and irregular double-peaked tuning.

A definite procedure must be applied in readjusting the line-up trimmers. The proper oscillator and indication equipment must also be used. A number of standard service instruments, which are useful for receiver adjustments, have been designed and made available by the manufacturer of this receiver. These are illustrated and described on a separate page.

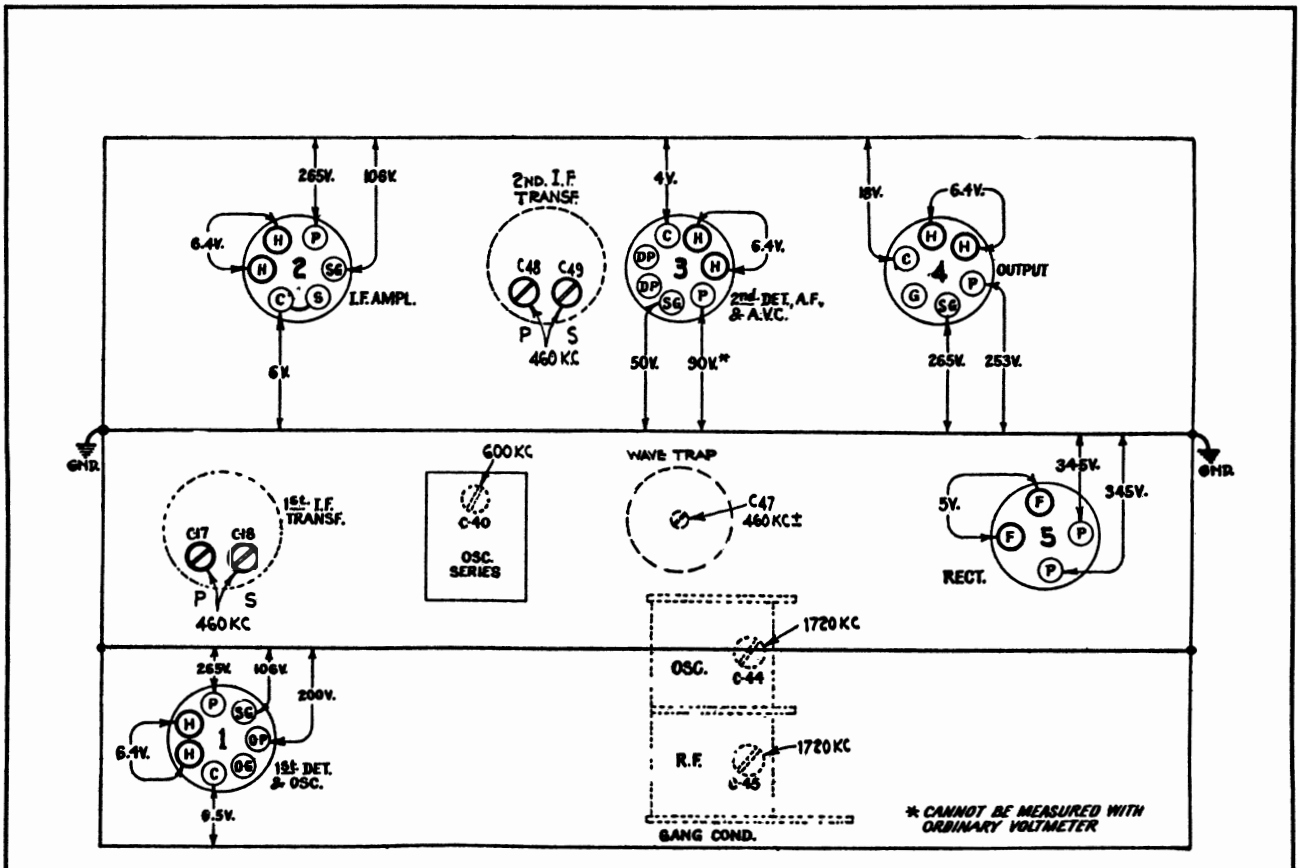
I-F Tuning Adjustments

There are two i-f transformers associated in the intermediate amplifier system. They are both tuned by accessible trimmers. To obtain the correct alignment proceed as follows:

(a) Short circuit the antenna and ground terminals and tune the receiver so that no signal is received. Set the volume control to its maximum position. Ground the receiver.

(b) Connect the output of the test oscillator between the first detector control grid and chassis ground. Attach an indicating meter, such as is illustrated, to the speaker circuit.

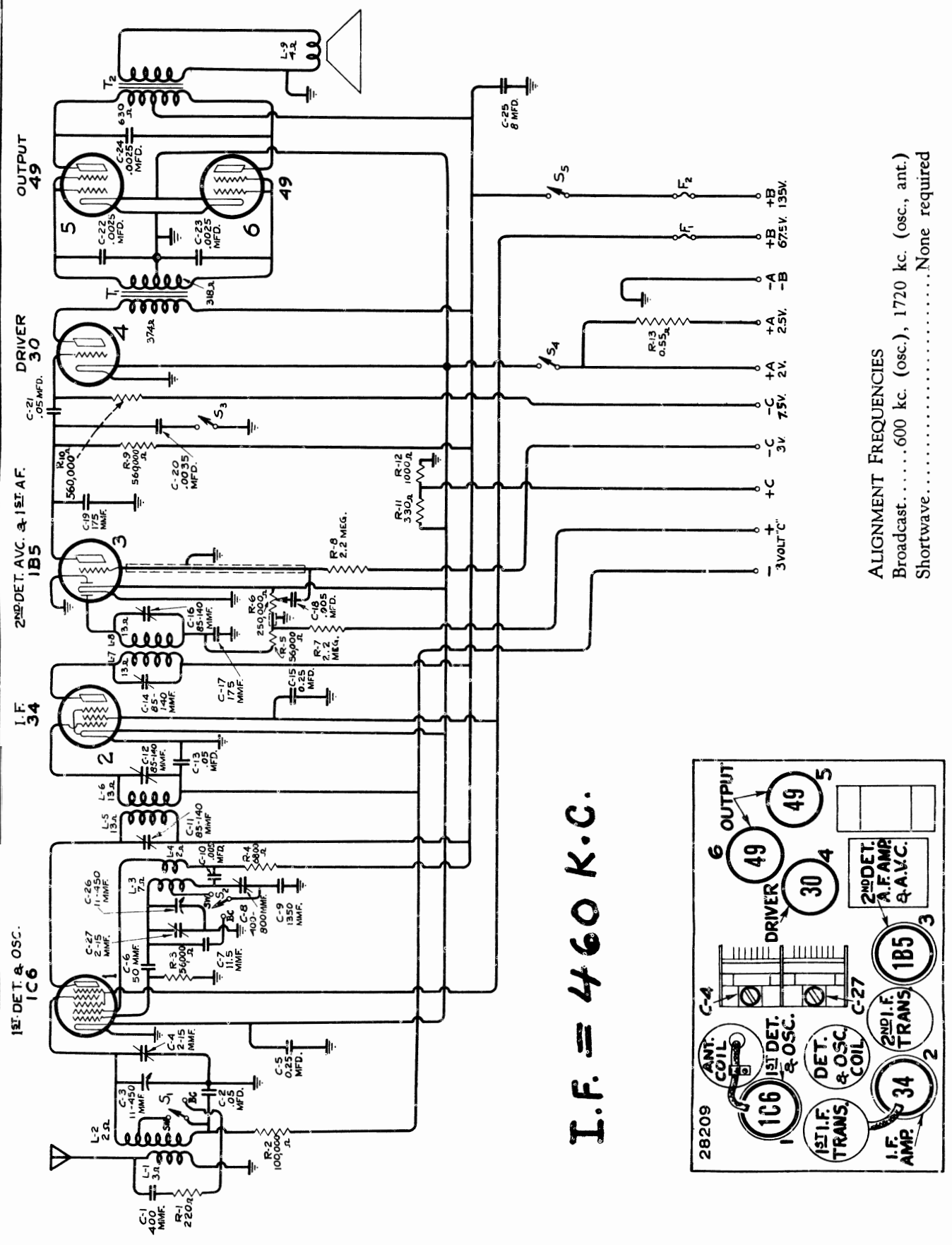
(c) Place the external oscillator into operation at 460 kc. Adjust the output so that a slight registration occurs on the output indicator. The output should be set at as low a value as will give a convenient indication during adjustment; this requirement is important in that the a.v.c. action is voided by such a method. Adjust the trimmers, C-49, C-48, C-18 and C-17 in order, for maximum receiver output.



-Trimmer Locations and Radiotron Socket Voltages (Measured at 115 volts A. C. Supply—Maximum Volume Control—No Signal)

RCA MANUFACTURING CO., Inc.

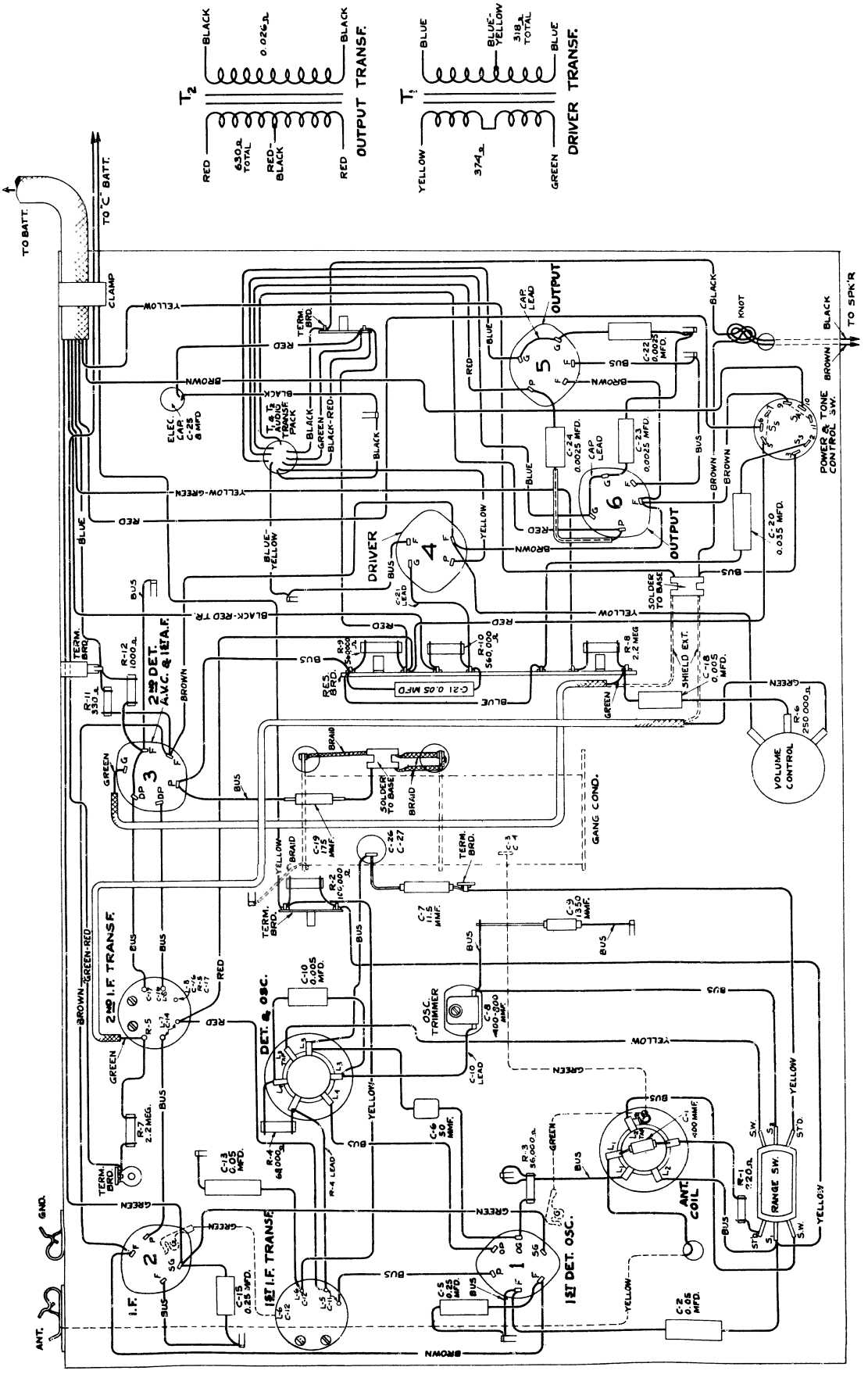
Models BT6-3, BC6-4, BT6-10



Radiotron and Coil Locations

RCA MANUFACTURING CO., Inc.

Models BT6-3, BC6-4, BT6-10



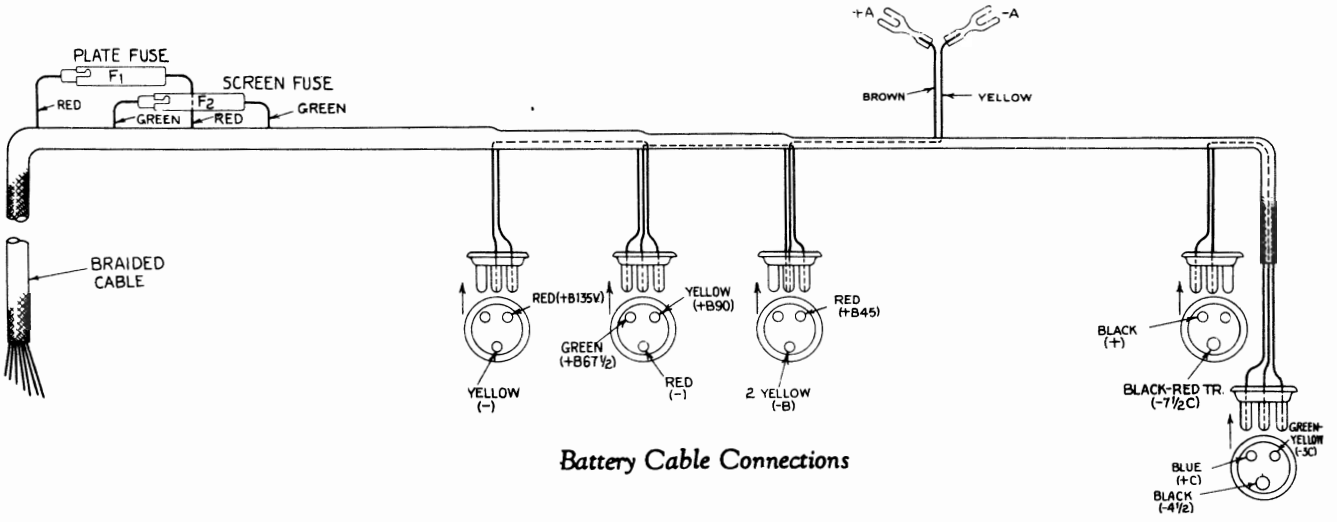
Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

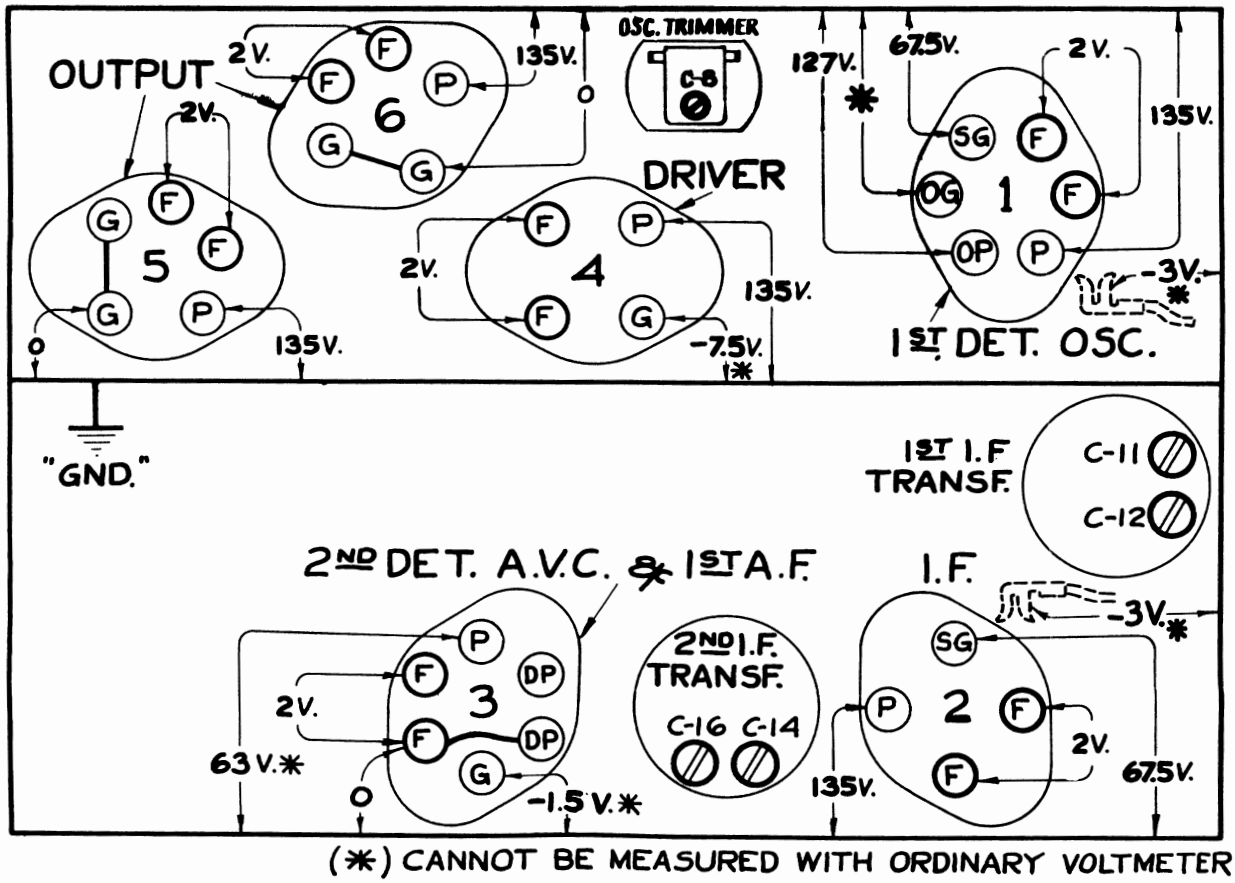
Models BT6-3, BC6-4, BT6-10

BATTERIES REQUIRED

"A" Supply.....Eveready Aircell or 2 volt storage cell
"B" Supply.....3—45 volt, heavy or medium duty, plug-in type
"C" Supply.....3—4½ volt (with 3 volt tap), plug-in type



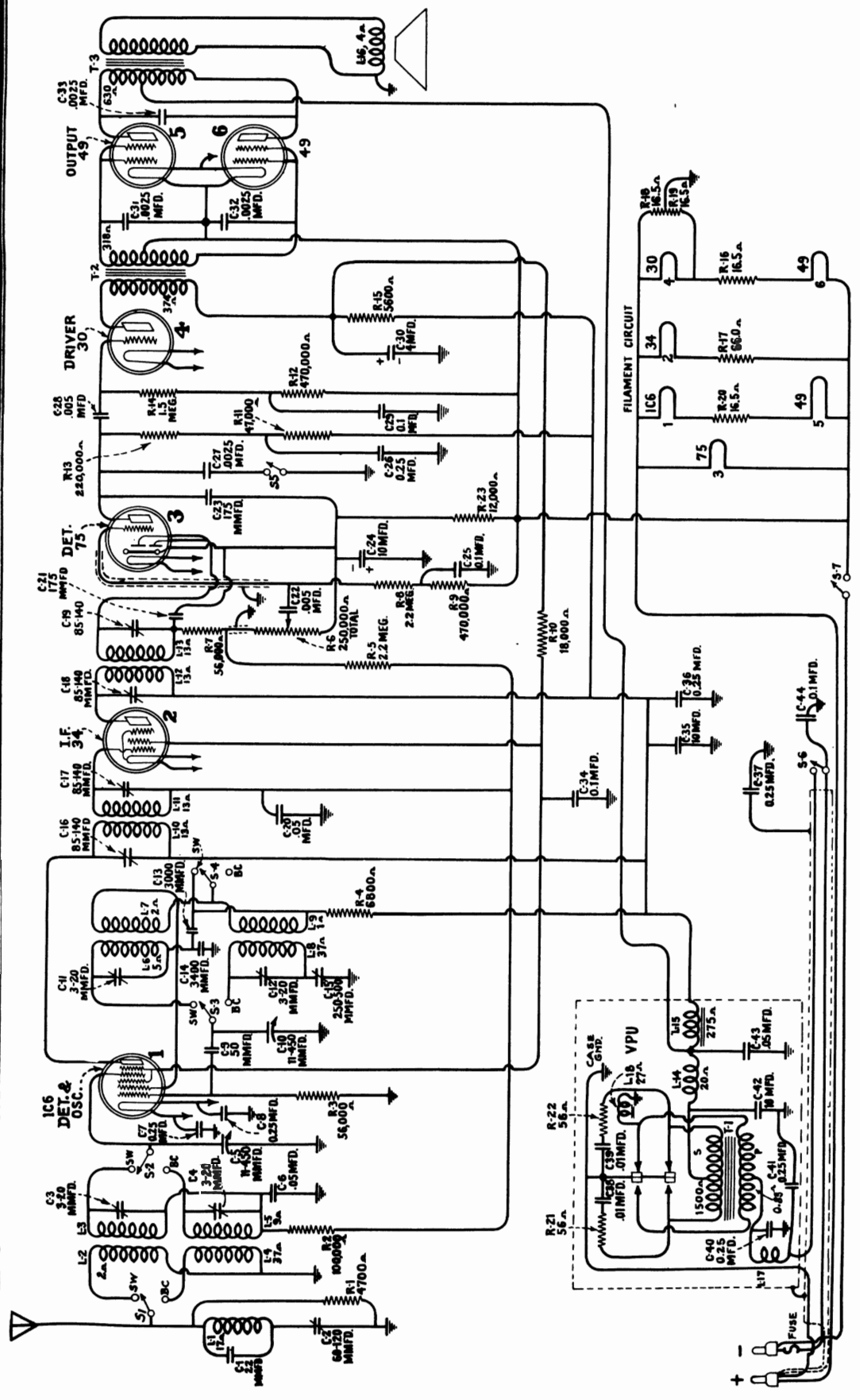
Battery Cable Connections



Radiotron Socket Voltages and Trimmer Locations
Measured at Normal Battery Voltages—No Signal Being Received

RCA MANUFACTURING CO., Inc.

Models BT6-5, BC6-6



Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.

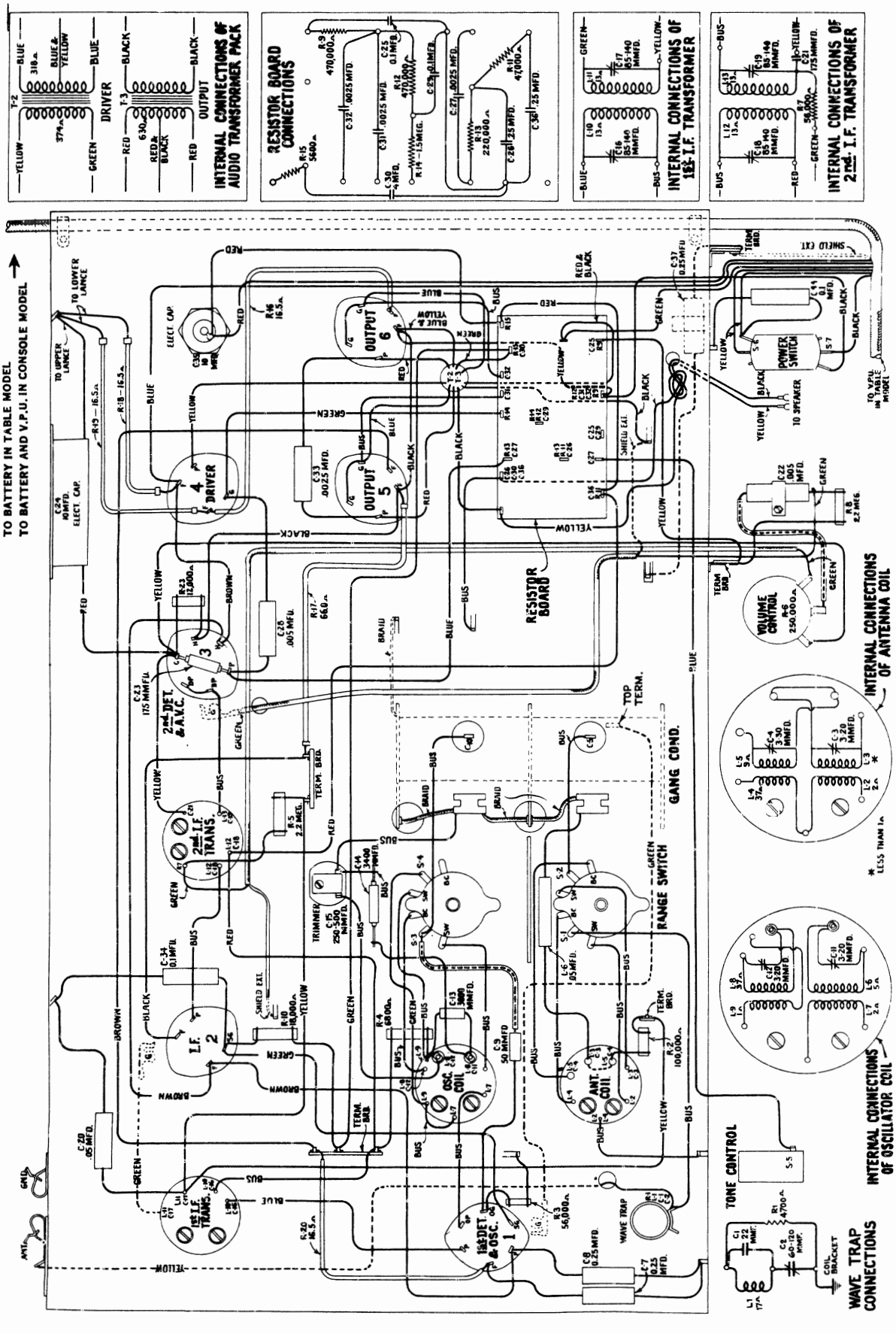
ALIGNMENT FREQUENCIES

Band A.....600 kc. (osc.); 1,720 kc. (osc., ant.)
Band C.....18,000 kc. (osc., ant.)

I.F Peak 460 K.C.

RCA MANUFACTURING CO., Inc.

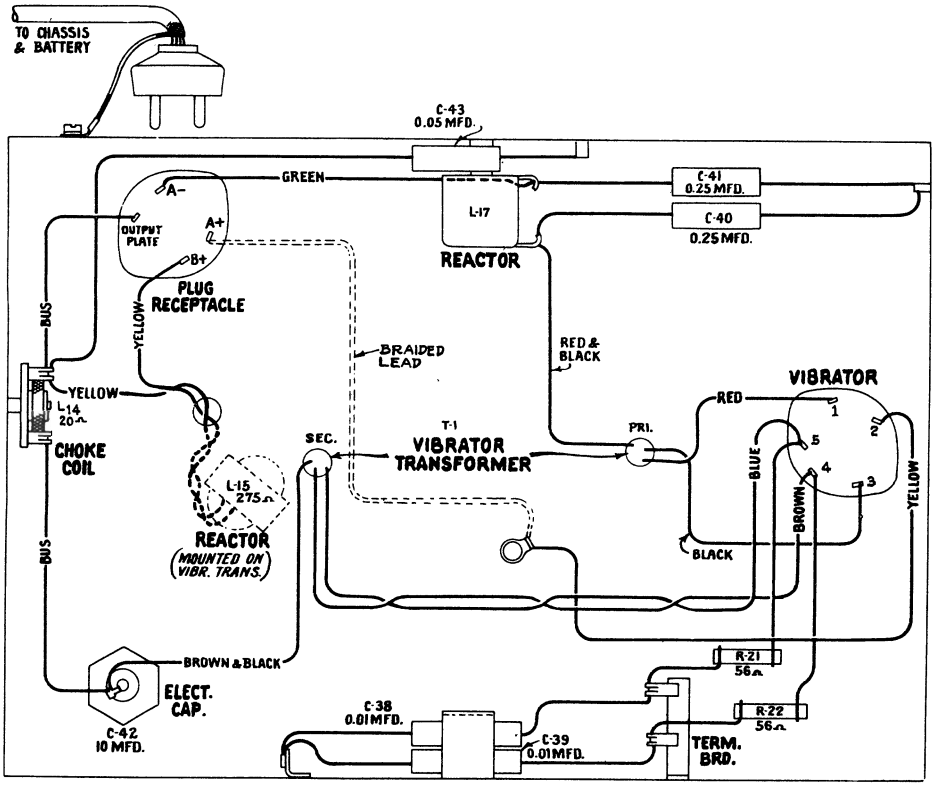
Models BT6-5, BC6-6

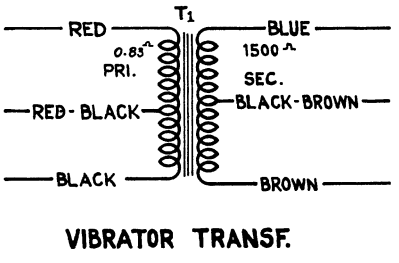


Chassis Wiring Diagram

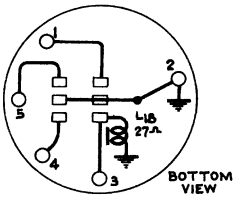
RCA MANUFACTURING CO., Inc.

Models BT6-5, BC6-6



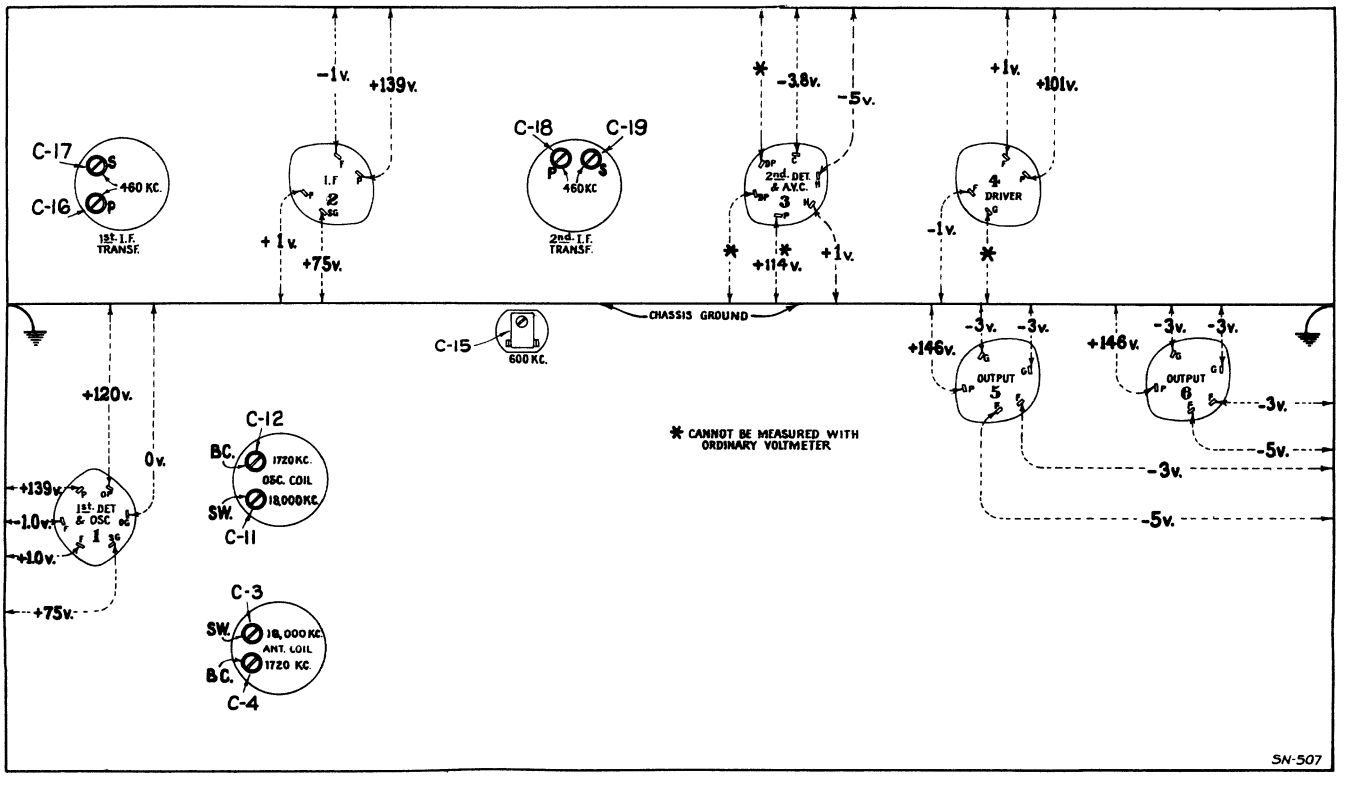


VIBRATOR TRANSF.



INTERNAL CONNECTIONS OF VIBRATOR

Vibrator Power Unit Wiring



Radiotron Socket Voltages and Trimmer Locations

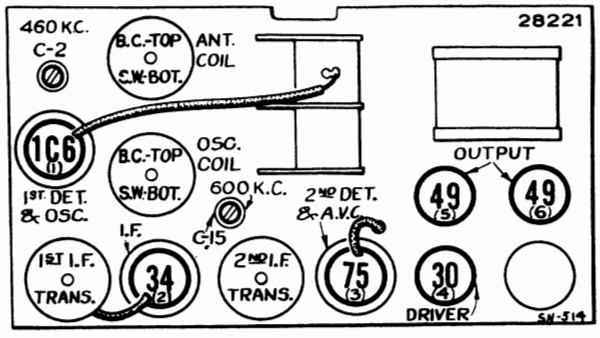
Measured at Normal Battery Voltage —No Signal Being Received

RCA MANUFACTURING CO., Inc.

Models BT6-5, BC6-6

Alignment Procedure

Four adjusting trimmers are provided for the i-f coils and five for the antenna and oscillator coils. They are precisely adjusted during manufacture to give correct performance. Their settings should remain intact indefinitely when the receiver is used under ordinary conditions. Necessity for readjustment may occasionally occur from continued extremes of climate, tampering, purported alteration for service purposes, or after repairs have been made to the r-f or i-f tuned circuits.



Radiotron and Coil Locations

In readjusting the trimmers to their normal settings, it is quite important to apply a definite procedure and to use adequate and reliable test equipment. A standard source of the specified alignment frequencies is required. It is recommended that such a source consist of an **RCA Stock No. 9595 Full-Range Test Oscillator.** Means for indication of the receiver output during alignment is also necessary to accurately show when the correct point of adjustment is reached. This indication should be obtained by means of such an instrument as the **RCA Stock No. 4317 Neon Glow Indicator.** Proceed with the alignment as follows:

Place the receiver in operation where it will be easily accessible. Attach the output indicator across the loudspeaker voice coil circuit, or across the output transformer primary. Advance the receiver volume control to its maximum position, letting it remain in such position for ***all*** adjustments. For each trimming operation, regulate the test oscillator output control so that the signal level is as low as possible and still observable at the receiver output. Use of such a small signal will avoid broadness of tuning which would otherwise result from A.V.C. action on a stronger one.

I-F Adjustments

(a) Connect the output of the test oscillator between the control-grid cap of the first detector tube (RCA-1C6) and chassis-ground. Adjust the frequency of the oscillator to **460 kc.** Tune the receiver to a point where no interference is received from the heterodyne oscillator or local station.

(b) Adjust the trimmers, **C-19** and **C-18,** of the second i-f transformer, and **C-17** and **C-16** of the first i-f transformer, so that each produces maximum (peak) receiver output as shown by the indicating device. This completes the i-f trimmer adjustments.

R-F Adjustments

(a) Check the calibration of the dial scale by rotating the tuning control until the variable condenser plates are in full mesh. (Maximum capacity.) Then adjust the dial pointer until it points to the ***horizontal*** line at the low frequency end of the broadcast band scale.

(b) Connect the output of test oscillator to the antenna-ground terminals of the receiver. Adjust the receiver range switch to its Band A (broadcast) position. Tune the oscillator to **1,720 kc.** Allow the output indicator to remain attached to the receiver output.

(c) Tune the receiver so that the dial reading is **1,720 kc.** Then adjust the oscillator and antenna coil trimmers, **C-12** and **C-4** respectively, tuning each to the point producing maximum indicated receiver output.

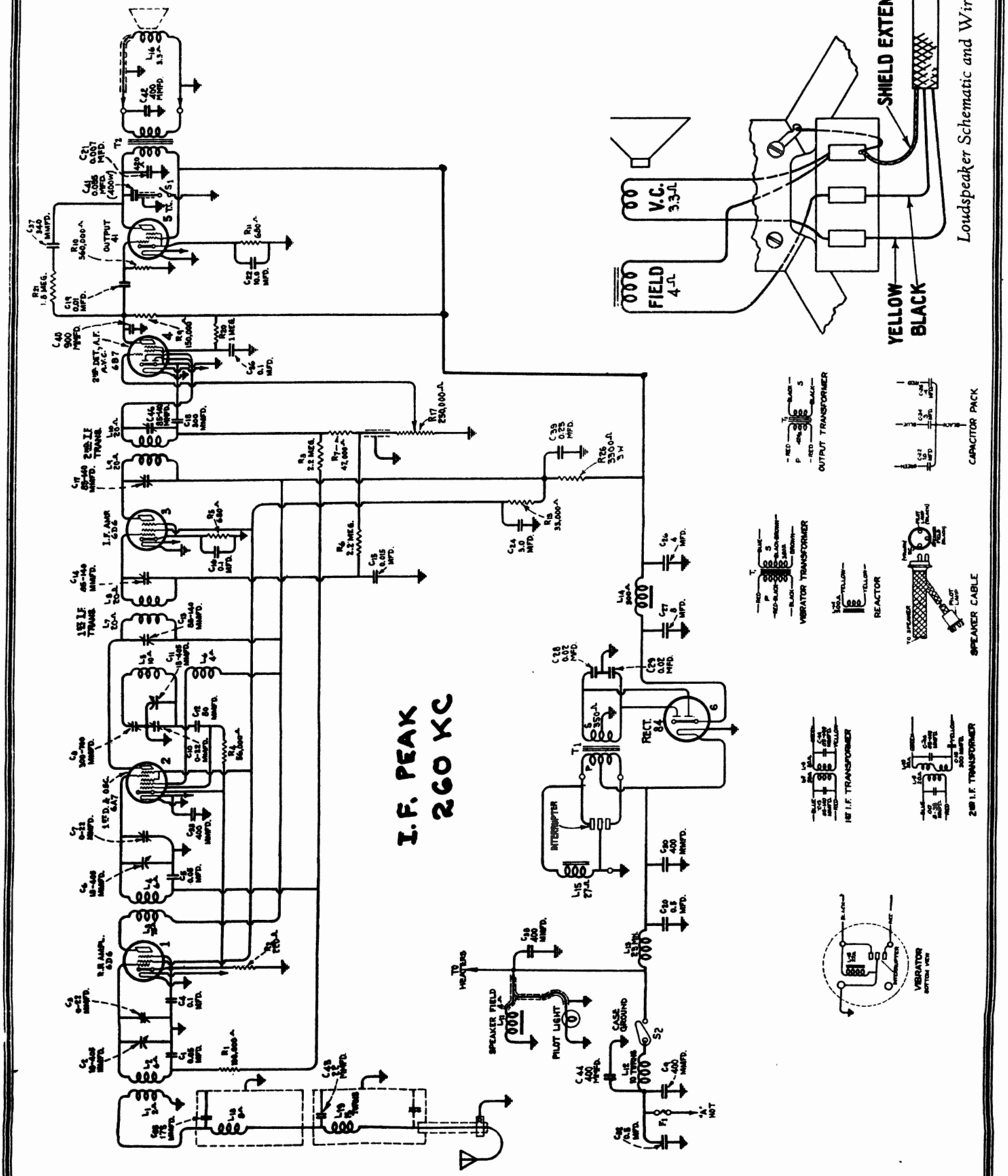
(d) Shift the oscillator frequency to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. The oscillator series trimmer, **C-15,** should then be adjusted, simultaneously rocking the receiver tuning control backward and forward through the signal until maximum receiver output results from the combined operations. The adjustment of **C-12** should be repeated as in (c) to correct for any changes in its alignment due to the adjustment of **C-15.**

(e) Shift the oscillator frequency to **18,000 kc.** Adjust the receiver range switch to its Band C (shortwave) position, and set the receiver dial to a reading of **18,000 kc.** The oscillator and antenna trimmers, **C-11** and **C-3,** should then be adjusted for maximum indicated receiver output.

Retune receiver to **17,080 kc.** and check for image signal. If **C-11** has been correctly aligned, the **18,000 kc.** signal will be received. It may be necessary to increase the oscillator output for this indication of the "image." ***No adjustments should be made during this check.***

RCA MANUFACTURING CO., Inc.

MODEL H-6 (AUTO SET)

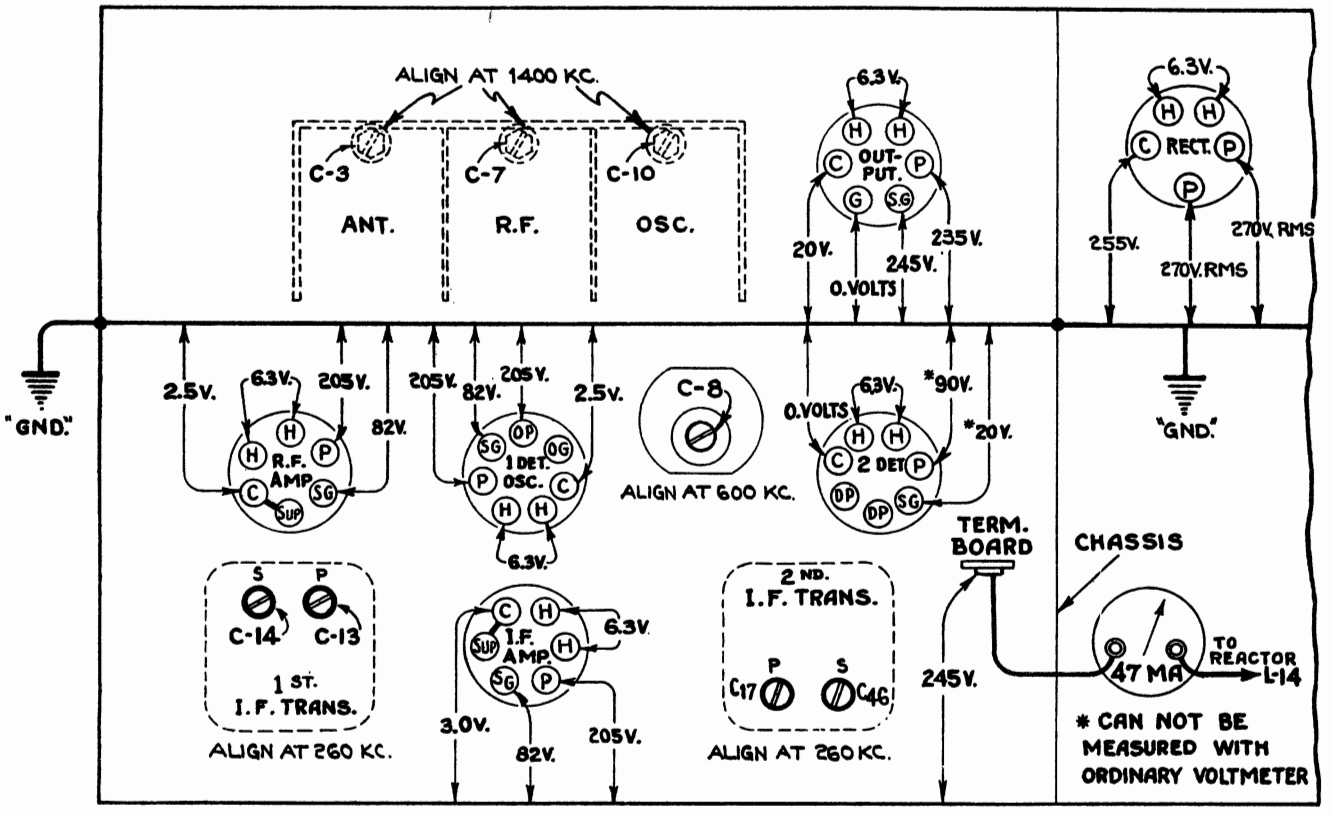


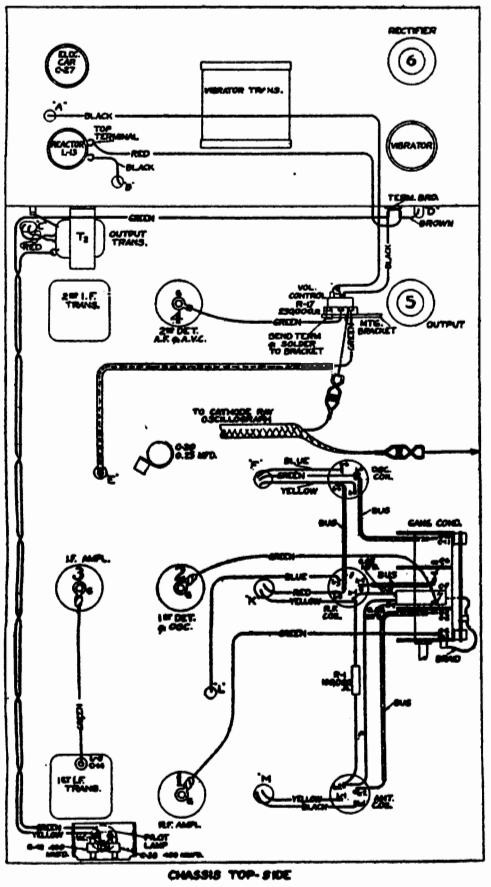
RCA MANUFACTURING CO., Inc.

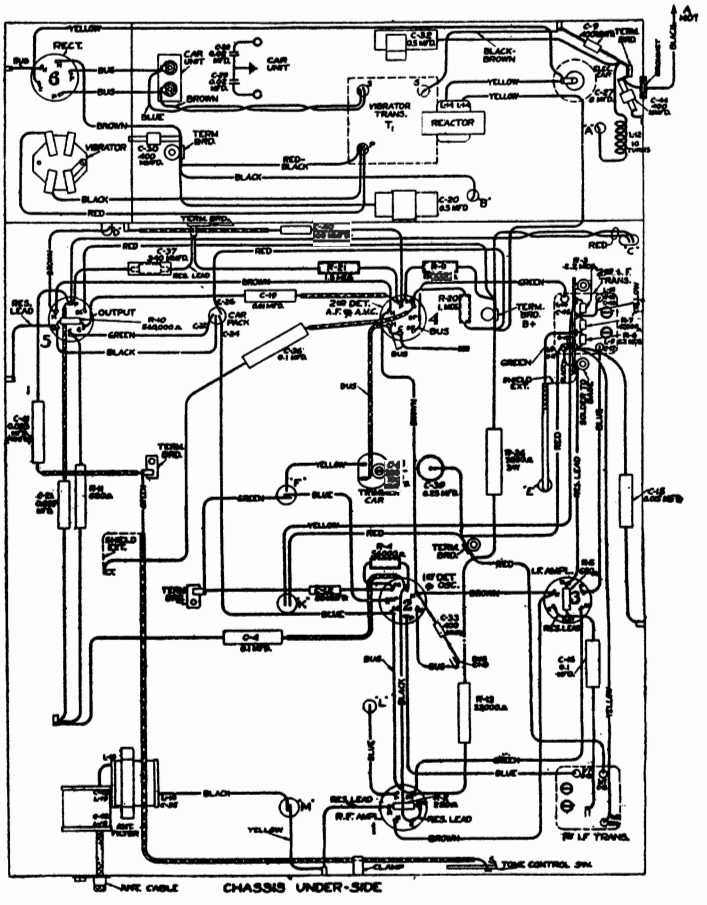
MODEL H-6 (HUDSON) AUTO SET

—Radiotron Socket Voltages to Chassis

(Measured at 6.3 volts battery supply—Volume Control Maximum—No Signal)



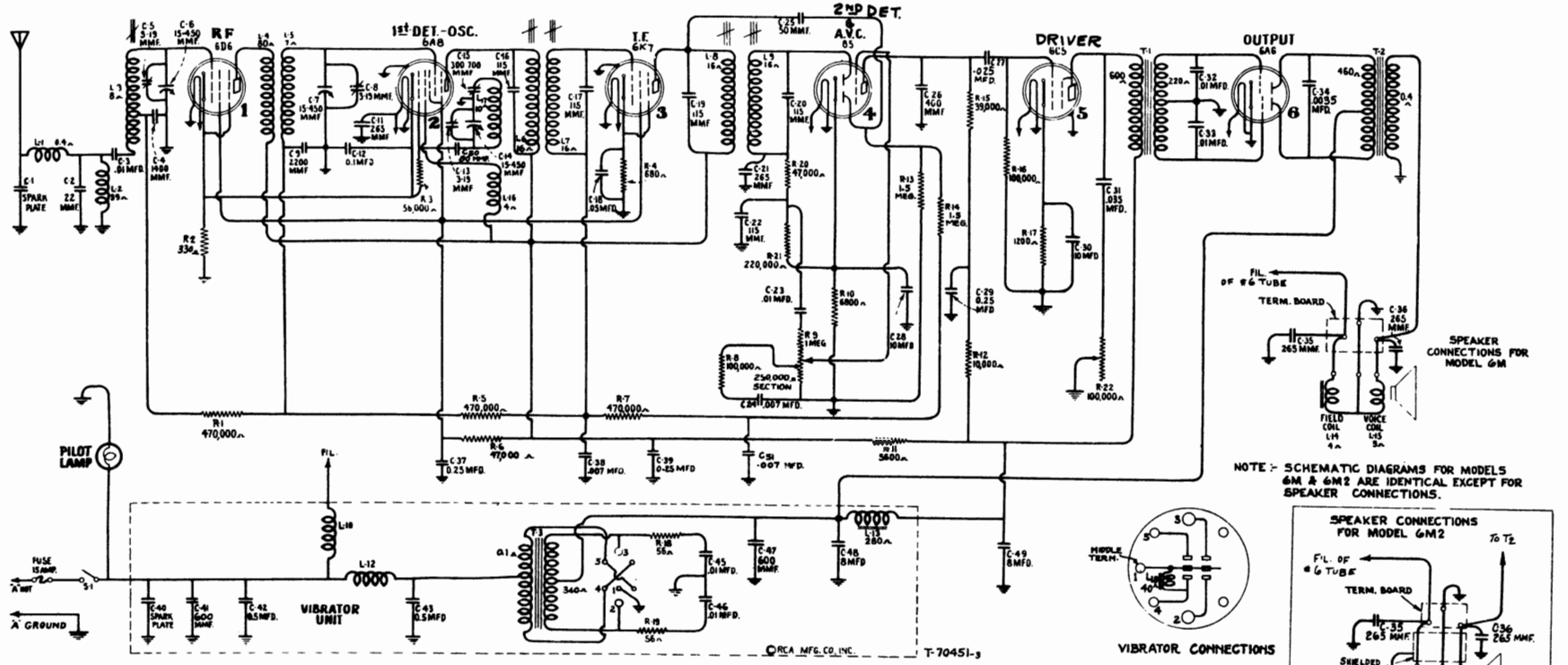




Chassis Wiring Diagram

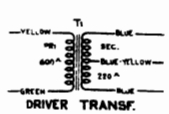
RCA MANUFACTURING CO., Inc.

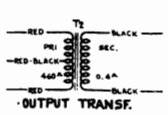
MODELS 6M and 6M-2

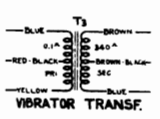


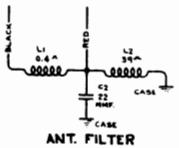
Certain automobile installations require change of value of capacitor C-3. See note

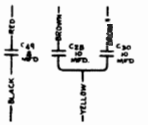
I. F. PEAK 260 KC

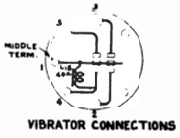


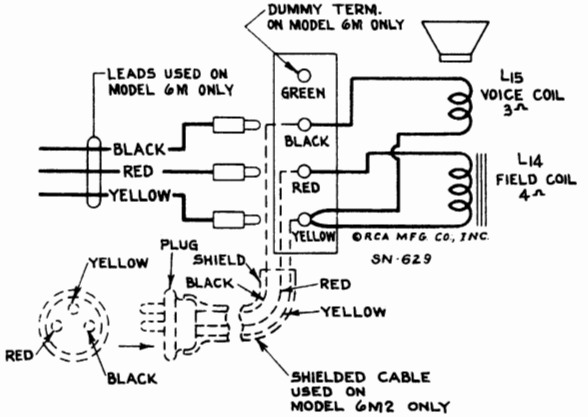












Loudspeaker Schematic and Wiring

RCA MANUFACTURING CO., Inc.
MODELS 6M and 6M-2

SERVICE DATA

NOTE: Certain models of 1936 *automobiles are equipped with "high-capacitance type" (*400 *mmfd. or greater) built-in antennas. The* 1936 *models of Dodge, De Soto, and Chrysler are examples of automobiles so equipped. Installation of receiver in automobiles with such "high-capacity" antennas necessitates the following modification of the antenna circuit of the receiver to suit the characteristics of the antenna installation:*

Remove the tubular paper-covered capacitor C-3 *(*.01 *mfd.), (schematic) and replace with the small molded type capacitor (*500 *mmfd.) furnished with Escutcheon Kit for respective model of automobile*

R-F Adjustments

***NOTE:** Before making r-f adjustments, it may be advisable to replace the bottom cover to eliminate vibrator interference.*

(a) Adjust the dial pointer on the remote control head by the following procedure. Rotate tuning knob to its extreme clockwise position irrespective of location of pointer on dial. Now turn the pointer adjusting screw in the center of the back of the control unit until the pointer is at the end calibration mark below the 55 on dial scale.

(b) Connect the output of the test oscillator to the antenna-ground terminals of the receiver with a 175 mmfd. capacitor in series with the antenna lead.

NOTE: For r-f alignment of receivers in which the tubular paper condenser C-3 *(*.01 *mfd.) has been replaced by the small molded condenser* 500 *mmfd. (change easily identified by reference to Figure* 2 *and bottom of chassis), use a* .001 *mfd. capacitor instead of the* 175 *mmfd. capacitor in series with the antenna lead and test oscillator.*

There should be a shunt capacitor of 50 or 60 mmfd from the antenna lead at the receiver to ground Tune the oscillator to 1,400 kc. Allow the output indicator to remain attached to the receiver output.

(c) Tune the receiver so that the dial reading is 1,400 kc. Then adjust the oscillator, detector, and antenna coil trimmers, C-13, C-8, and C-5 respectively, tuning each to the point producing maximum indicated receiver output.

(d) Shift the oscillator frequency to 600 kc. and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. The oscillator series trimmer, C-15, should then be adjusted, simultaneously rocking the receiver tuning control backward and forward through the signal until maximum (peak) receiver output results from the combined operations. The adjustment of C-13, C-8 and C-5 should be repeated as in (c) to correct for any change in its alignment due to the adjustment of C-15.

Final Tuning Dial Adjustment

Final adjustment of the dial pointer may be made during operation after the receiver is installed in automobile. To do this, tune in a station of known frequency (say 760 kc.—approximately 76 on dial) as accurately as possible. Now reset the dial pointer to exactly 76 on the dial by means of the adjusting screw at center rear of operating head.

Volume Control and Power Switch

This adjustment is made by turning the small control knob fully clockwise and then fully counterclockwise. This places the friction clutch mechanism on the volume control in proper alignment.

Tuning Condenser Drive

Smooth control should be obtained over the entire tuning range of the variable condenser. If irregularity is present, check the action of the gear mechanism for binding or backlash at every point within the tuning range. A bind may be due to improper mesh between the worm gear and the large gears on the condenser shaft. To correct such a condition, loosen the three screws holding the gear plate and adjust the mesh of the gears to a position which gives smooth operation. Gear backlash is prevented by the small compression spring between the two large gears on the rotor shaft.

Interrupter

The mechanical interrupter used in the power system is constructed with a plug-in base, so as to be easily removed from the receiver. Its adjustments have been correctly set during manufacture by means of special equipment. In cases of faulty operation of the interrupter, a renewal should be made.

The symmetrical plug-in base on this device permits the unit to be placed in its socket so as to give correct output voltage polarity on an automobile with either a positive or negative "A" ground. For installation with positive "A" ground, insert vibrator so positive (+) symbol is nearest label on vibrator compartment partition; for negative "A" ground, insert with negative (–) symbol nearest label.

Radiotrons

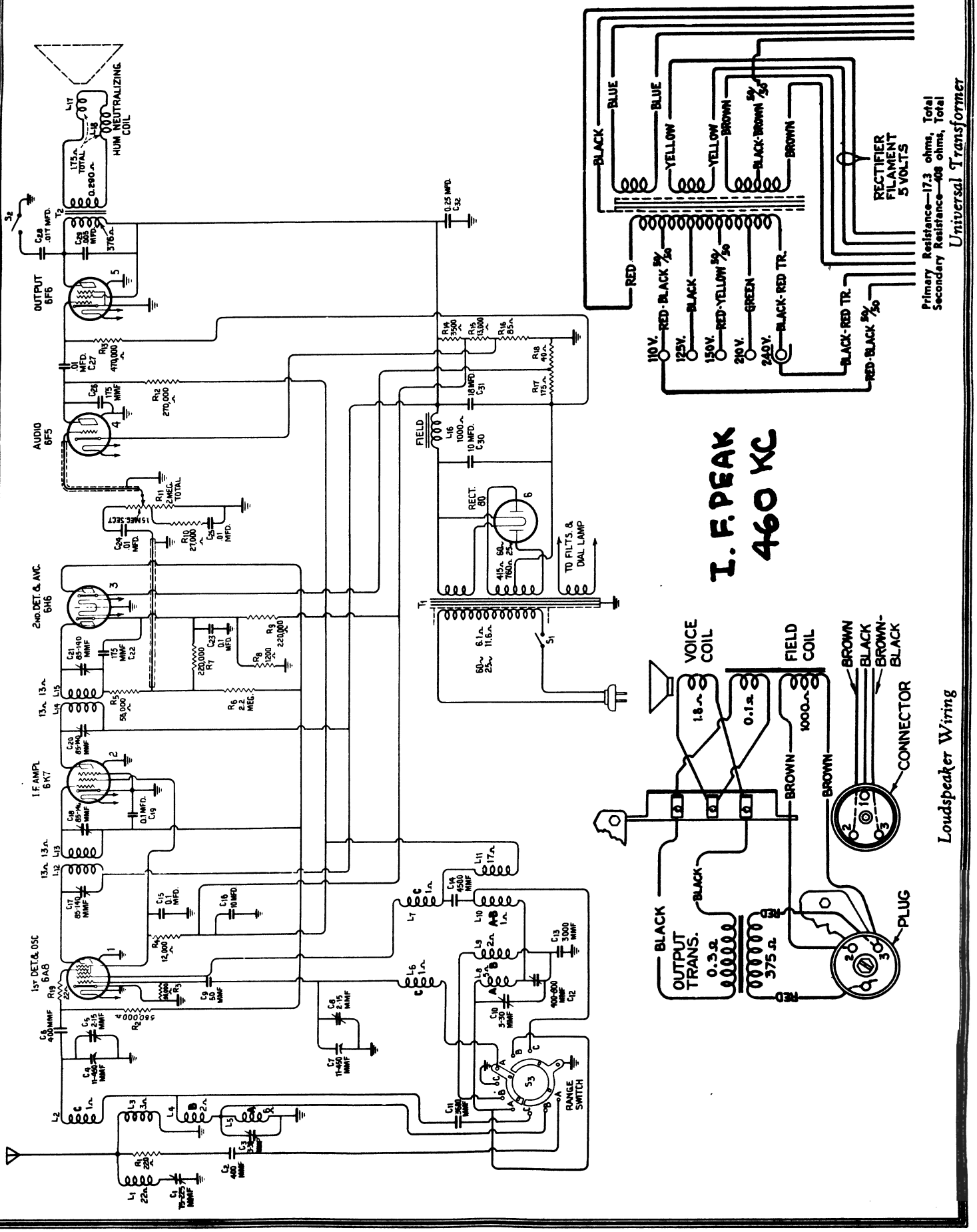
Deterioration of tubes and their approach to failure is usually evidenced by noisy or intermittent operation, loss of sensitivity, and distorted tone quality. When suspected as faulty, the tubes should be removed from the receiver and checked with standard tube testing apparatus. It is not feasible to test the tubes while in the receiver, due to measurement inaccuracies which would result from the effects of the circuits.

Receiver Housing

The screws holding the receiver chassis to the case must all be in place and tightly installed, inasmuch as they appreciably affect the ground resistance of the assembly and will consequently have a bearing on the amount of ignition noise received.

RCA MANUFACTURING CO., Inc.

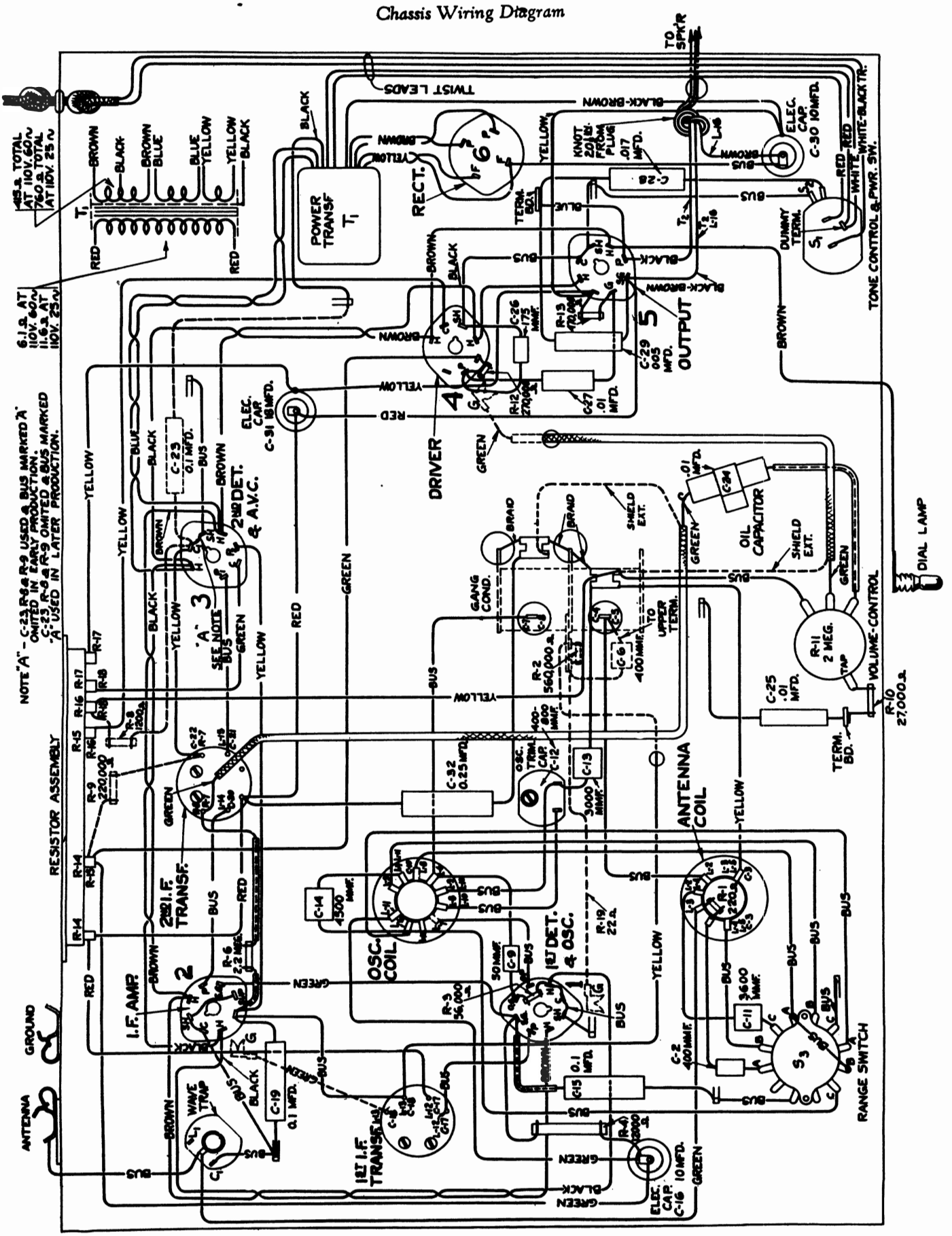
MODELS T6-1 and C6-2



RCA MANUFACTURING CO., Inc.

MODELS T6-1 and C6-2

Chassis Wiring Diagram



RCA MANUFACTURING CO., Inc.

MODELS T6-1 and C6-2

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to chassis on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.

Radiotron Complement

(1) RCA-6A8.....First Detector-Oscillator
(2) RCA-6K7.....Intermediate Amplifier
(3) RCA-6H6.....Second Detector-A.V.C.
(4) RCA-6F5.....Audio Voltage Amplifier
(5) RCA-6F6.....Audio Power Amplifier
(6) RCA-80.....Full Wave Rectifier

Alignment Frequencies

Band A.....600 kc. (osc.), 1400 kc. (osc., ant.)
Band B.....None required
Band C.....18000 kc. (osc., ant.)

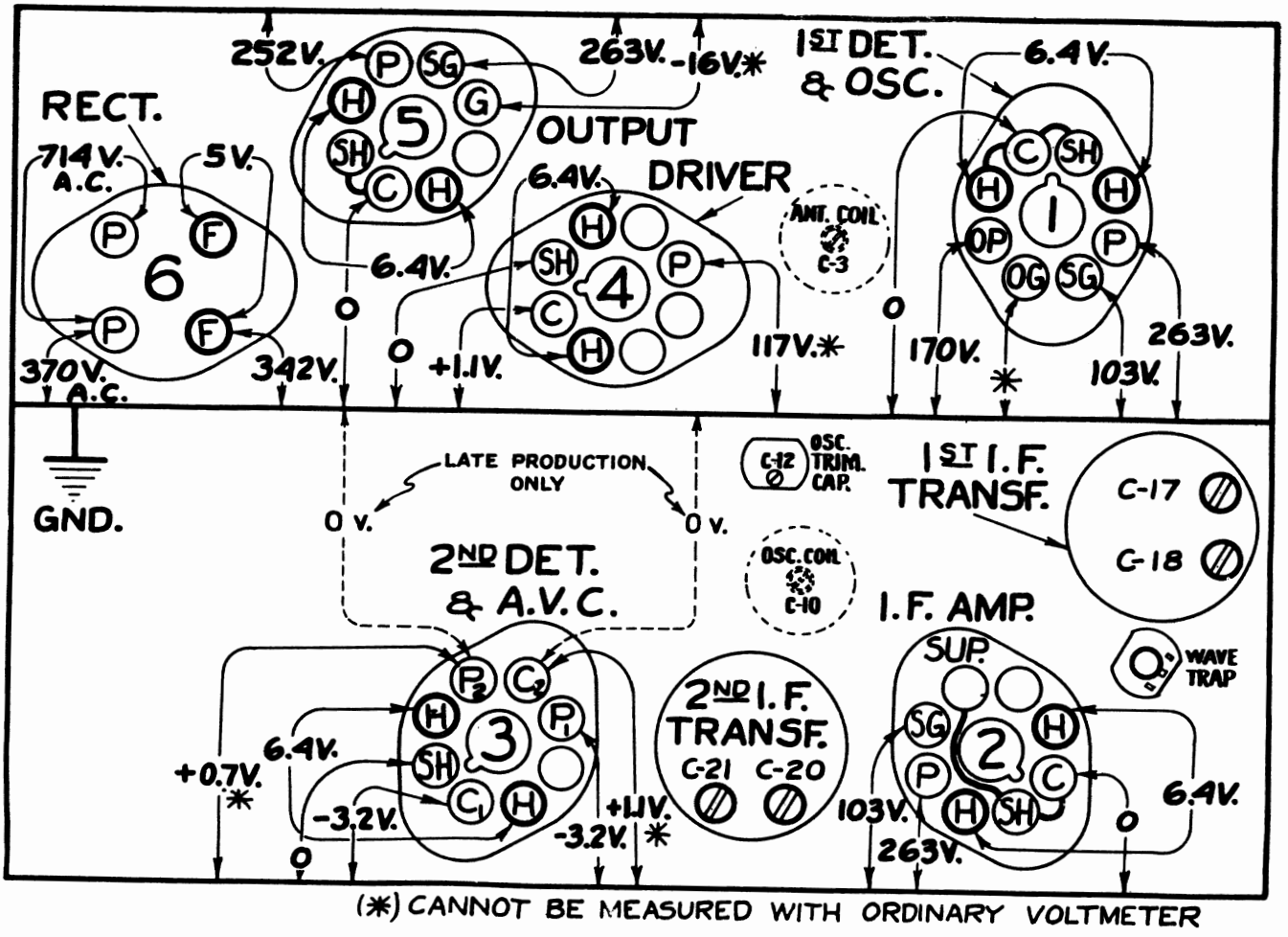
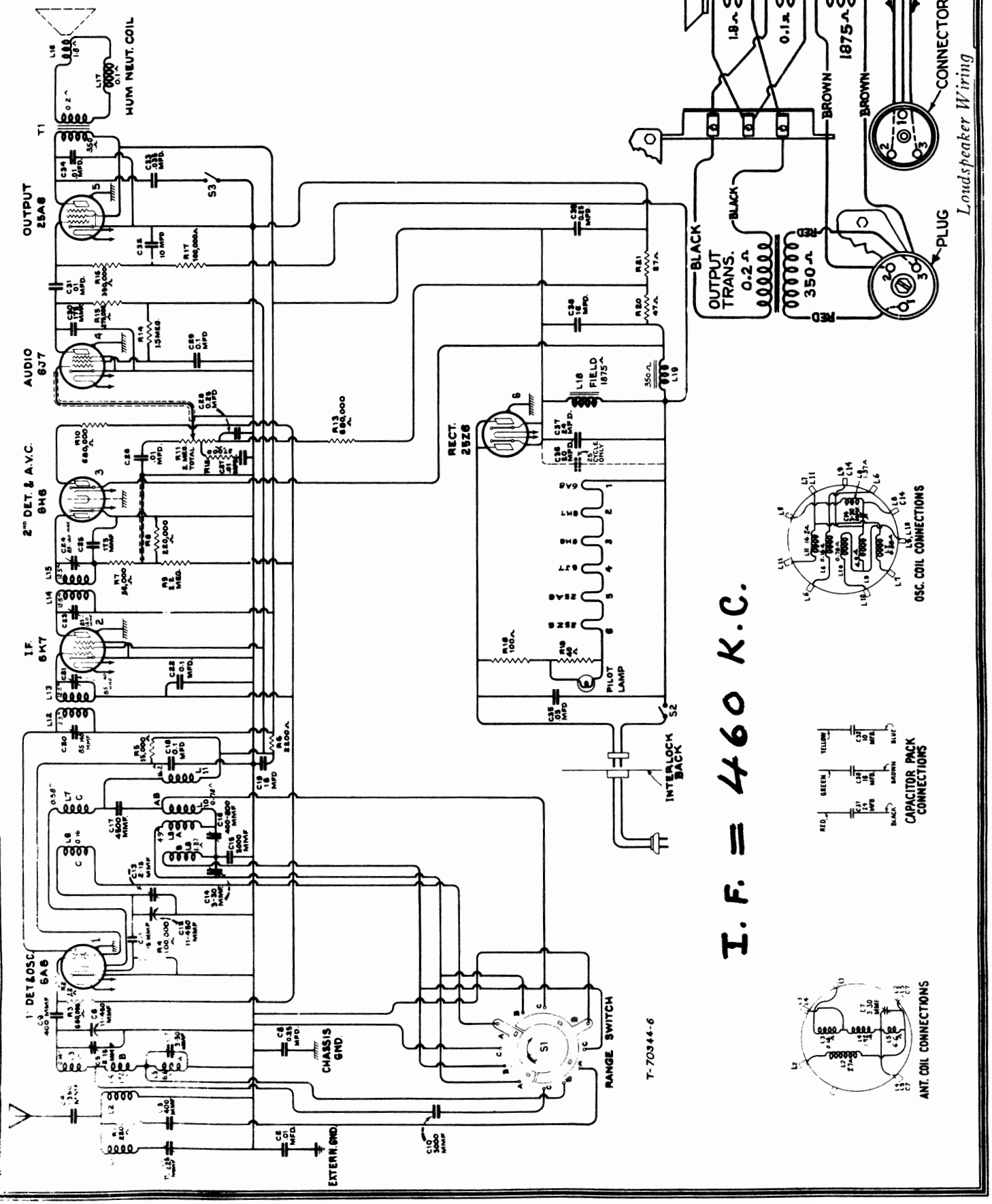


Figure 4—Radiotron Socket Voltages
Measured at 115 volts, 60 cycle supply—No signal being received

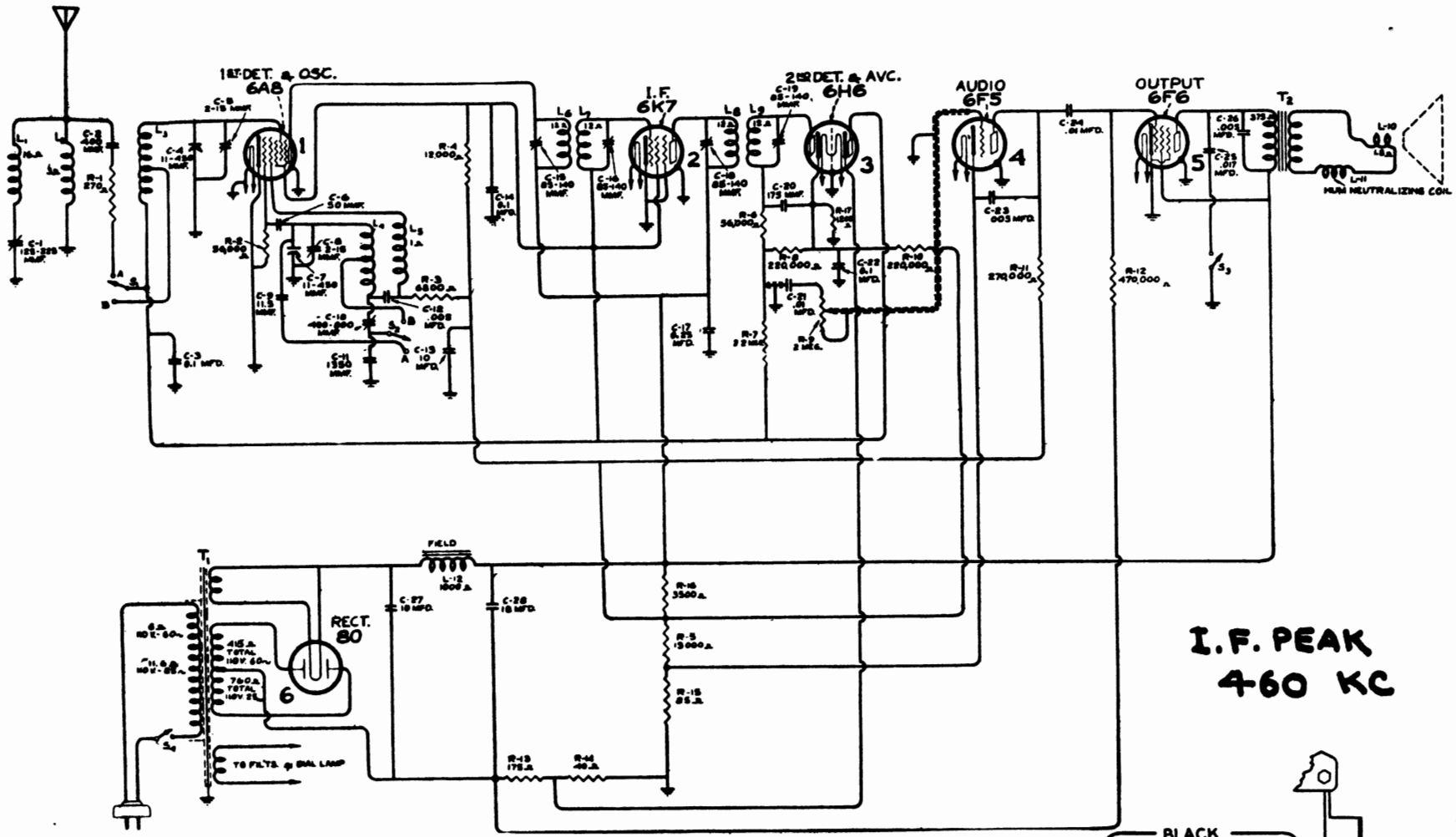
RCA MANUFACTURING CO., Inc.

Models T6-7, C6-8



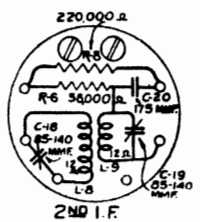
RCA MANUFACTURING CO., Inc.

MODEL T6-9

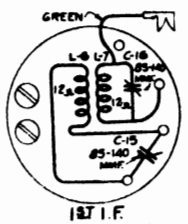


I.F. PEAK
460 KC

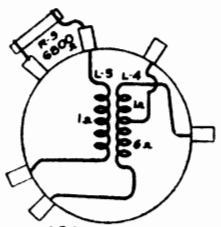
On some Instruments, R-10, R-17 and C-22 are omitted and the RCA-6H6 first Cathode is directly grounded.



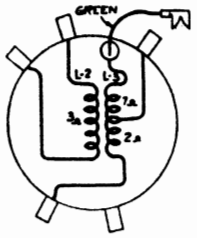
2ND I.F. TRANSFORMER



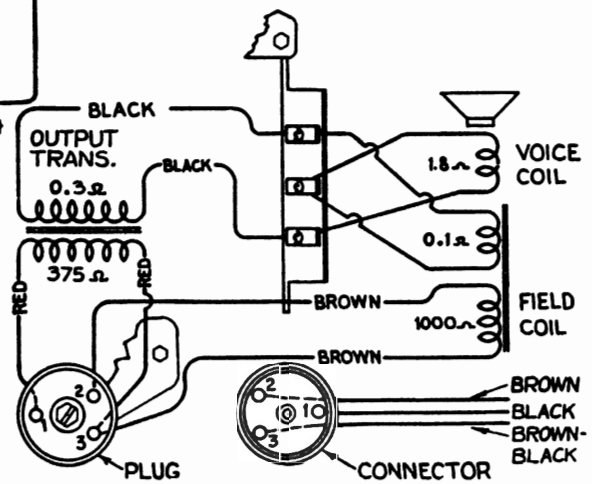
1ST I.F. TRANSFORMER



OSCILLATOR COIL



ANTENNA COIL



Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

MODEL T6-9

Wave-Trap Adjustment

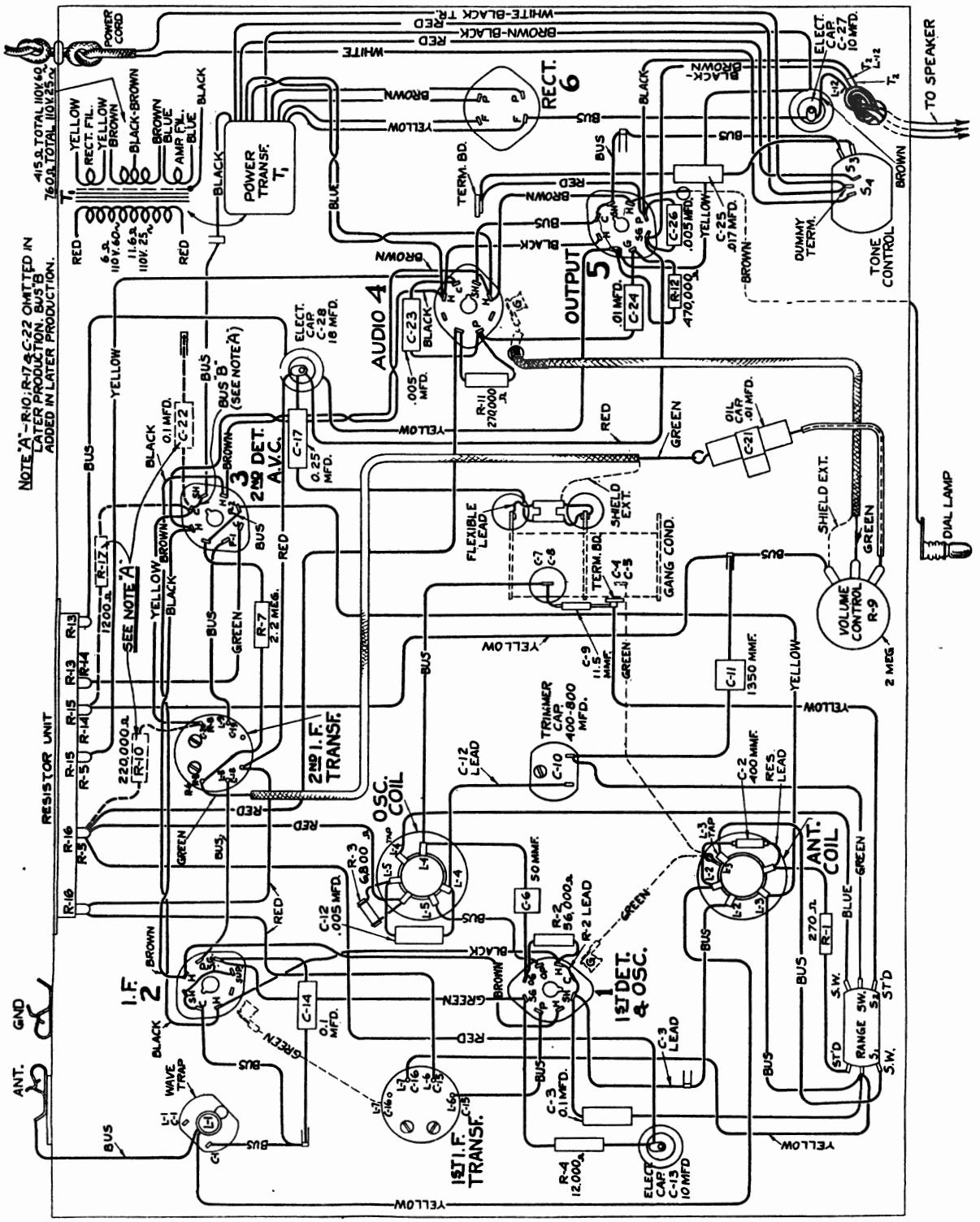
With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.

Alignment Frequencies

Broadcast Band (A) .....600 kc. and 1720 kc.
Shortwave Band (B) .....No Adjustments Required

Radiotron Complement

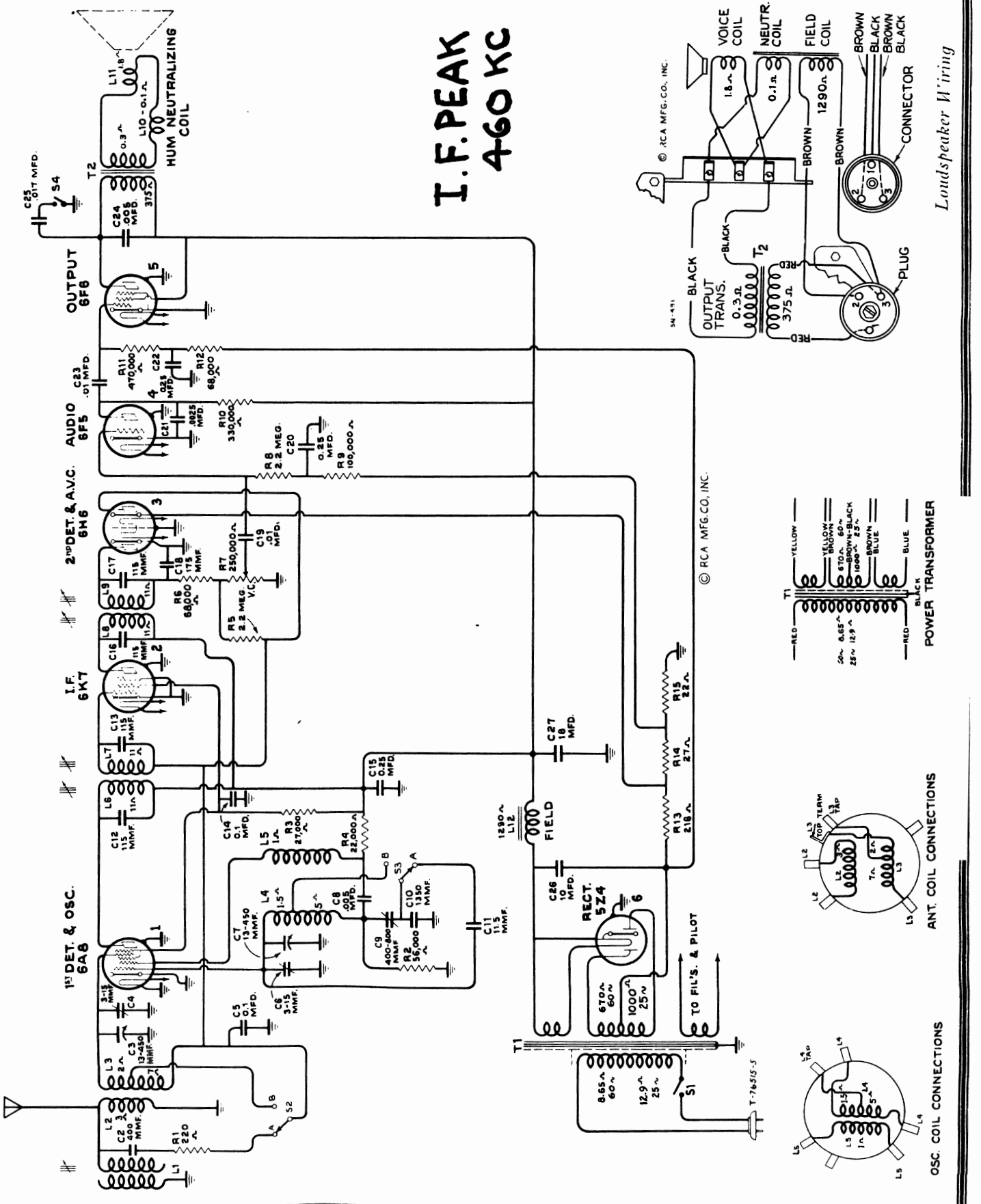
(1) RCA-6A8 .....First Detector-Oscillator
(2) RCA-6K7 .....Intermediate Amplifier
(3) RCA-6H6 .....Second Detector-A.V.C.
(4) RCA-6F5 .....Audio Voltage Amplifier
(5) RCA-6F6 .....Audio Power Amplifier
(6) RCA-80 .....Full Wave Rectifier



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

MODELS T6-11 and C6-12



RCA MANUFACTURING CO., Inc.

MODELS T6-11 and C6-12

Wave-Trap Adjustment

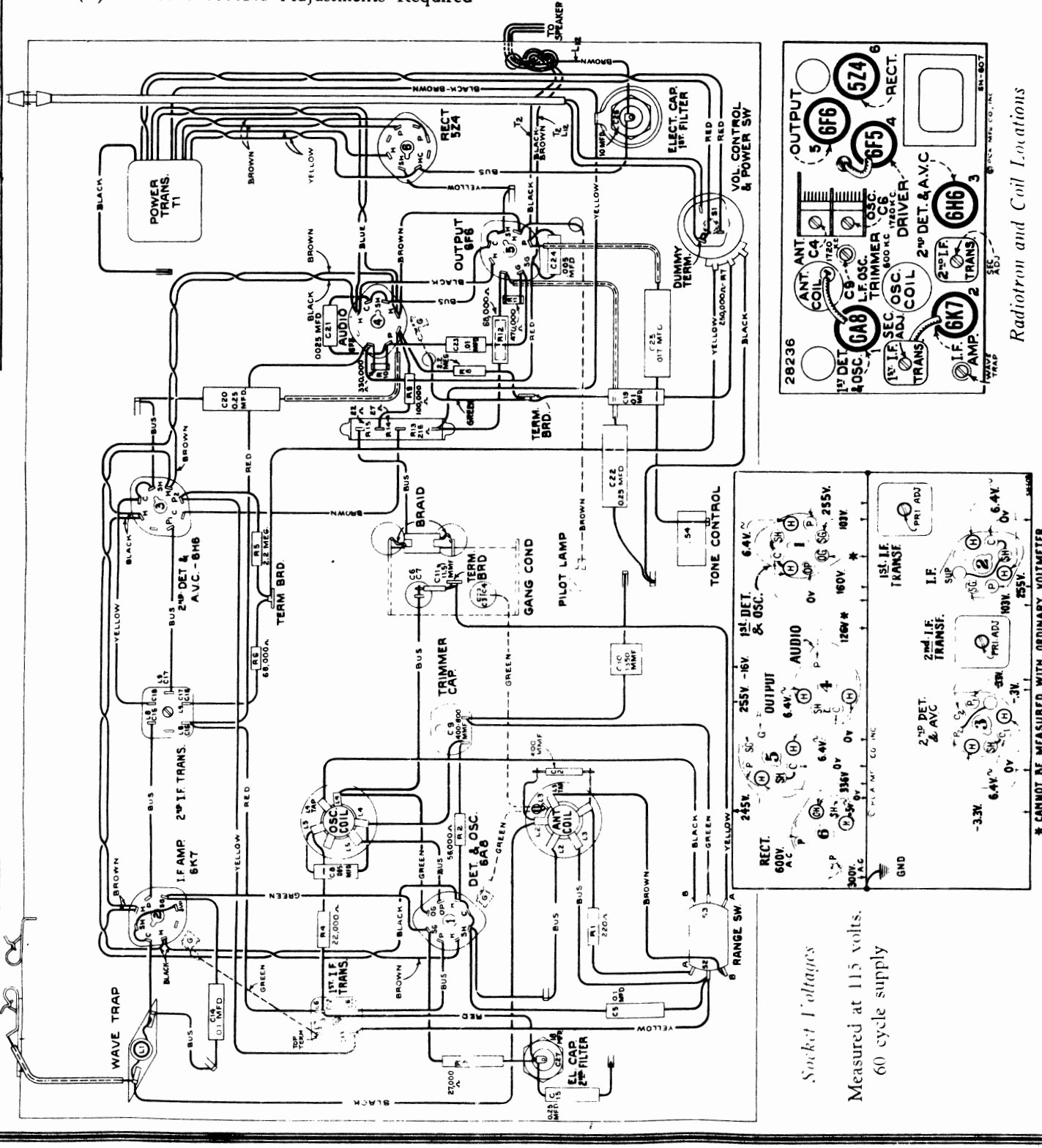
With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap screw (core) to the point which causes maximum suppression of the interference.

ALIGNMENT FREQUENCIES

Band (A).....600 kc. (osc.), 1,720 kc. (osc., ant.)
Band (B).....No Adjustments Required

RADIOTRON COMPLEMENT

(1) RCA-6A8.....First Detector-Oscillator
(2) RCA-6K7.....Intermediate Amplifier
(3) RCA-6H6.....Second Detector-A.V.C.
(4) RCA-6F5.....Audio Voltage Amplifier
(5) RCA-6F6.....Audio Power Amplifier
(6) RCA-5Z4.....Full-wave Rectifier



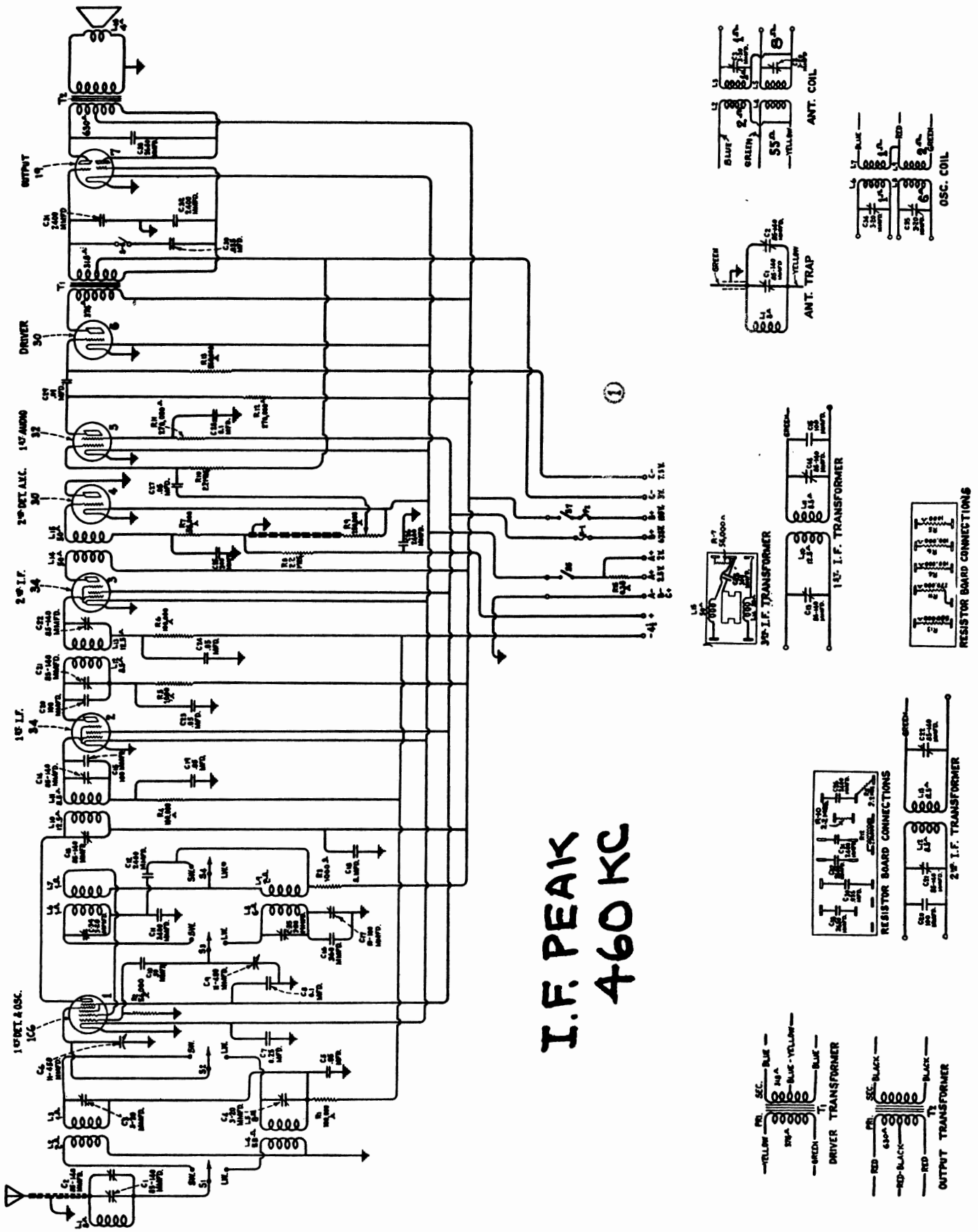
Radiotron and Coil Locations

Socket Voltages

Measured at 115 volts, 60 cycle supply

RCA MANUFACTURING CO., Inc.

MODELS BT 7-8 and BT7-9
(BATTERY RECEIVER)



RCA MANUFACTURING CO., Inc.

MODELS BT7-8 and BT7-9

Radiotron Socket Voltages

Voltage and current values indicated at the Radiotron socket contacts on Figure 4 form a reference basis for test of the receiver. It is to be noted that all voltages are given with respect to chassis-ground, excepting those appearing across the filaments (F-F). The values shown are obtainable when the receiver is in normal operating condition. They do not take into account inaccuracies caused by current consumed in the voltmeter used for the tests; the lower the voltmeter resistance, the lower the degree of accuracy. Allowances must therefore be made, dependent upon the type of test instrument used, for the loading effect of the voltmeter on the circuit.

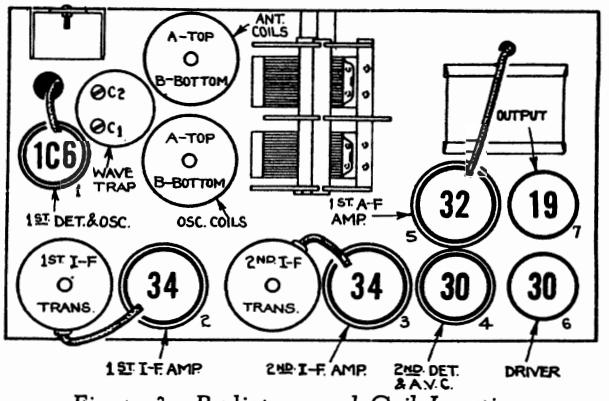


Figure 3—Radiotron and Coil Locations

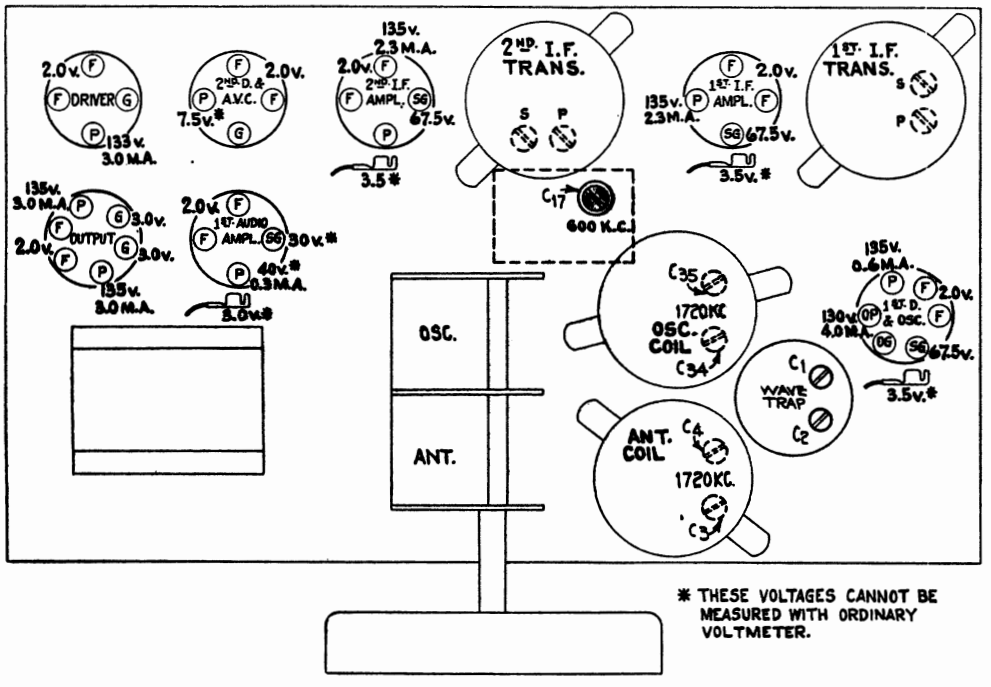
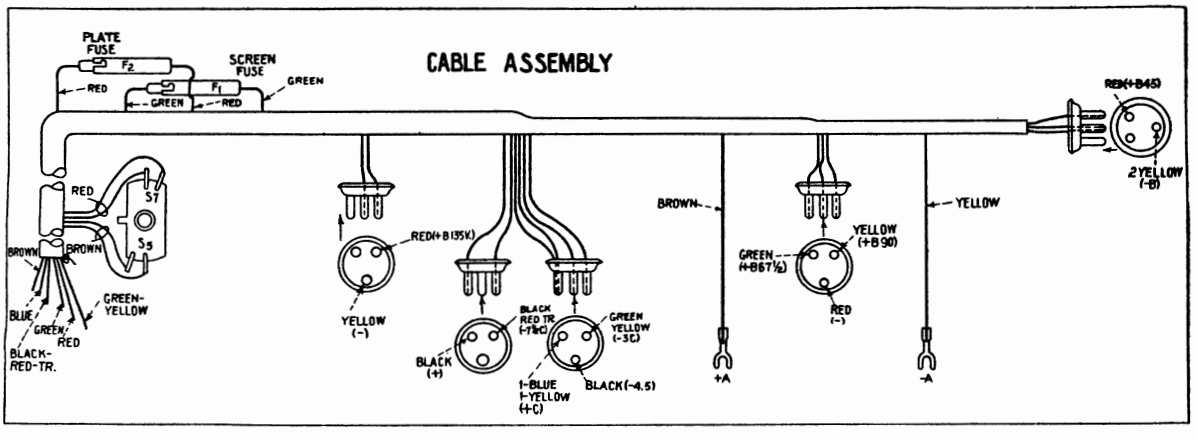


Figure 4—Line-Up Capacitor Locations and Voltage Values at Socket Contacts

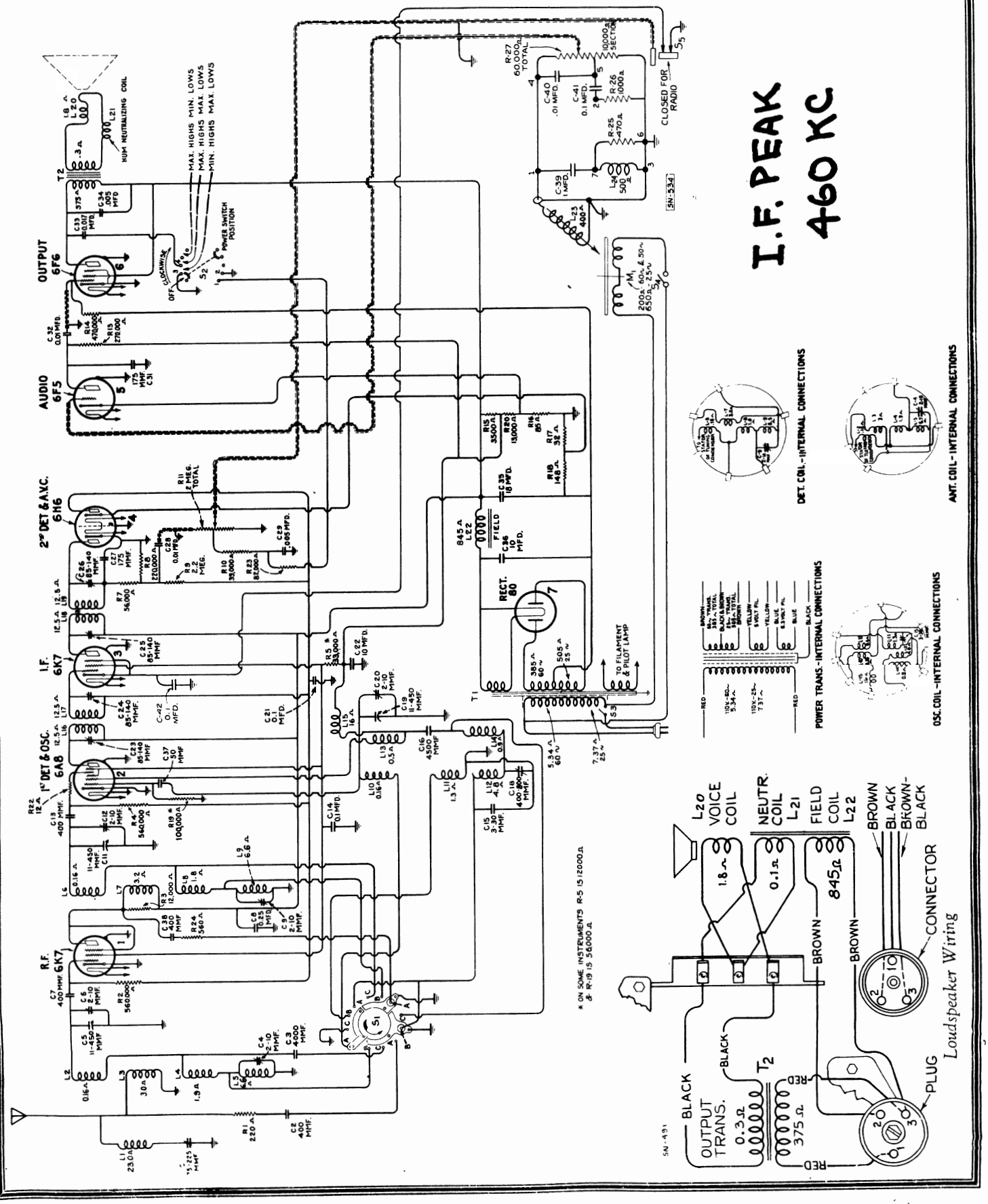
Volume Control at Maximum—No Signal—135 Volt "B" Battery—
4.5 and 7.5-Volt Bias Batteries



Battery Cable Connections

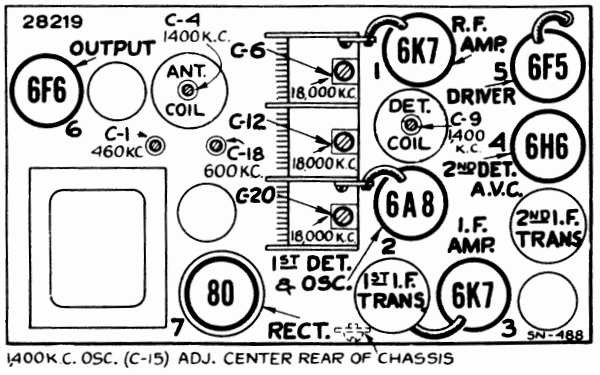
RCA MANUFACTURING CO., Inc.

MODEL D7-7



RCA MANUFACTURING CO., Inc.

MODEL D7-7



1400 K.C. OSC. (C-15) ADJ. CENTER REAR OF CHASSIS

Figure 1—Radiotron and Coil Locations

ALIGNMENT FREQUENCIES

Band A....600 kc. (osc.), 1,400 kc. (osc., det., ant.)
Band B.....None required
Band C.....18,000 kc. (osc., det., ant.)

RADIOTRON COMPLEMENT

(1) RCA-6K7.....Radio-Frequency Amplifier
(2) RCA-6A8.....First Detector-Oscillator
(3) RCA-6K7.....Intermediate Amplifier
(4) RCA-6H6.....Second Detector-A.V.C.
(5) RCA-6F5.....Audio Voltage Amplifier
(6) RCA-6F6.....Audio Power Amplifier
(7) RCA-80.....Full-Wave Rectifier

Wave-Trap Adjustment

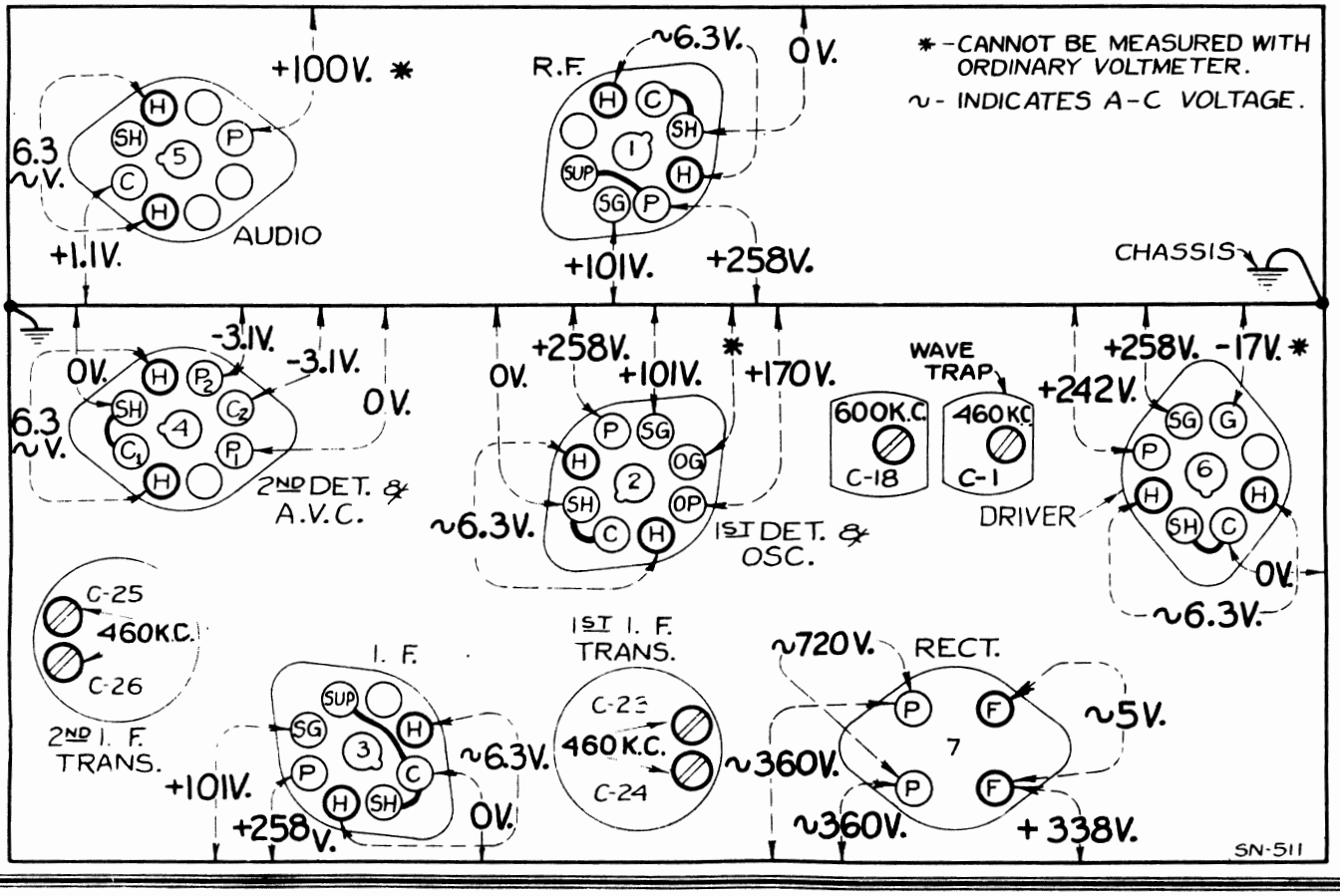
With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference. This trimmer is adjusted to 460 kc. during manufacture, however, local conditions may require a readjustment, depending upon the interfering frequency.

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to chassis on Figure 6 will assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

Figure 6—Radiotron Socket Voltages

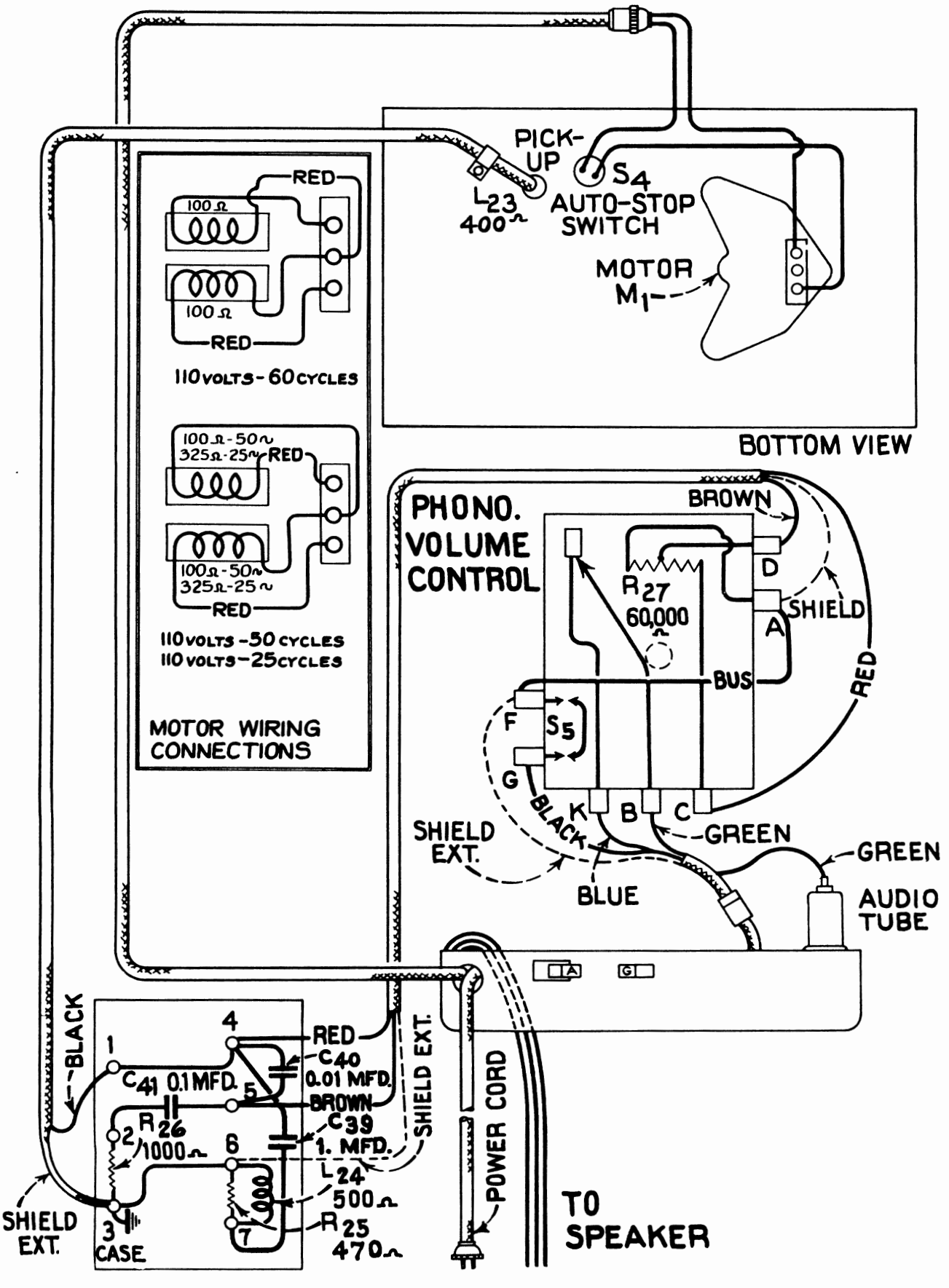
Measured at 115 volts, 60 cycles—No signal input



RCA MANUFACTURING CO., Inc.

MODEL D7-7

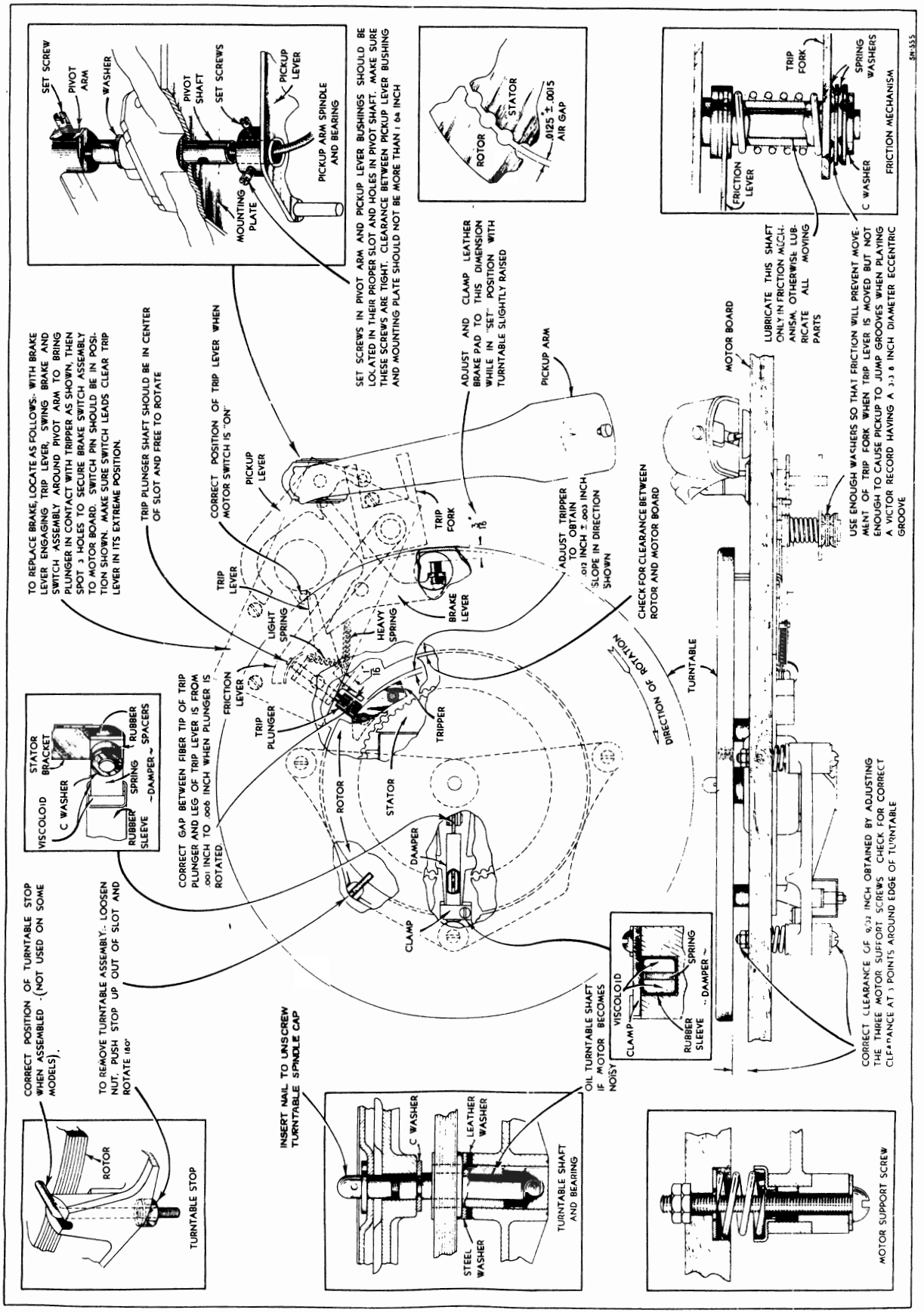
Assembly Wiring



RCA MANUFACTURING CO., Inc.

MODEL D7-7

Motor Board Adjustments



RCA MANUFACTURING CO., Inc.

MODEL D7-7

Alignment Procedure

Precise alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the i-f system, three in the oscillator coil system, two in the detector coil system, and two in the antenna coil system. Each of these trimmers has been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate or have been altered for service purposes. Incorrect alignment is usually evidenced by loss of sensitivity, improper tone quality, and poor selectivity. These indications will generally be present together.

The correct performance of the receiver can only be obtained when the alignment is performed with adequate and reliable test apparatus. The manufacturer of this instrument has a complete assortment of such service equipment available. This equipment, illustrated and described on a separate page of this booklet, may be purchased from authorized distributors and dealers.

An oscillator (signal generator) is required as a source of the specified alignment frequencies. Visual indication of the receiver output during the adjustments is necessary to enable the serviceman to obtain an accuracy of alignment which is not possible by listening to the signal. **The RCA Victor Stock No. 9595 Full-Range Oscillator and the RCA Victor Stock No. 4317 Neon Output Indicator are especially suitable and fulfill the above requirements.**

The following procedure should be followed in adjusting the various trimmer capacitors:

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 6. Each must be aligned to a basic frequency of **460 kc.** To do this, attach the Output Indicator across the voice coil circuit or across the output transformer primary. Connect the output of the test oscillator between the control-grid of the RCA-6A8 first detector tube and chassis-ground. Tune the oscillator to **460 kc.** Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point within its range where no interference is encountered either from local broadcast stations or the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is apparent on the output indicator. Then adjust the two trimmers, **C-25** and **C-26,** of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, **C-23** and **C-24,** of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the inter-action between them has not disturbed the original adjustment.

R-F Trimmer Adjustments

The seven trimmers associated with the r-f, first detector, and oscillator tuned circuits have their locations shown by Figure 1. The three trimmers which are at all times directly in shunt with the variable tuning condenser necessitate that the high-frequency range (Band C) be aligned first. The range selector switch should, therefore, be turned to its Band C position for the first adjustment. The Output Indicator should be left connected to the output system. Attach the output terminals of the test oscillator to the antenna and ground terminals of the receiver.

Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full mesh (maximum capacity) position and adjusting the dial pointer so that its end points to the ***horizontal*** graduation (530 kc.) at the low frequency end of the Band A scale.

Proceed further as follows:

(a) Adjust the test oscillator to **18,000 kc.** and set the receiver tuning control to a dial reading of **18,000 kc.**

(b) Regulate the output of the test oscillator until a slight indication is perceptible at the receiver output. Then adjust the trimmer, **C-20,** on the oscillator section of the variable condenser to the point at which it produces maximum indicated receiver output. Two points may be found, each of which produces such a maximum. The one of ***maximum trimmer capacitance*** is correct and should be used. (The oscillator will be 460 kc. below the signal frequency at this adjustment point.)

(c) Adjust the trimmer, **C-12,** of the detector section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the **18,000 kc.** input signal, until maximum receiver output results from these combined operations. Rocking of the variable condenser will prevent inaccurate adjustment which would otherwise be caused by the inter-action between the heterodyne oscillator circuit and the detector tuned circuit.

(d) With the receiver tuning control set to **18,000 kc.** adjust the trimmer, **C-6,** on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.

(e) Change the receiver range selector to its Band A position and set the receiver tuning control to a dial reading of **1,400 kc.** Tune the test oscillator to **1,400 kc.** and regulate its output to produce a slight indication on the receiver output indicating device.

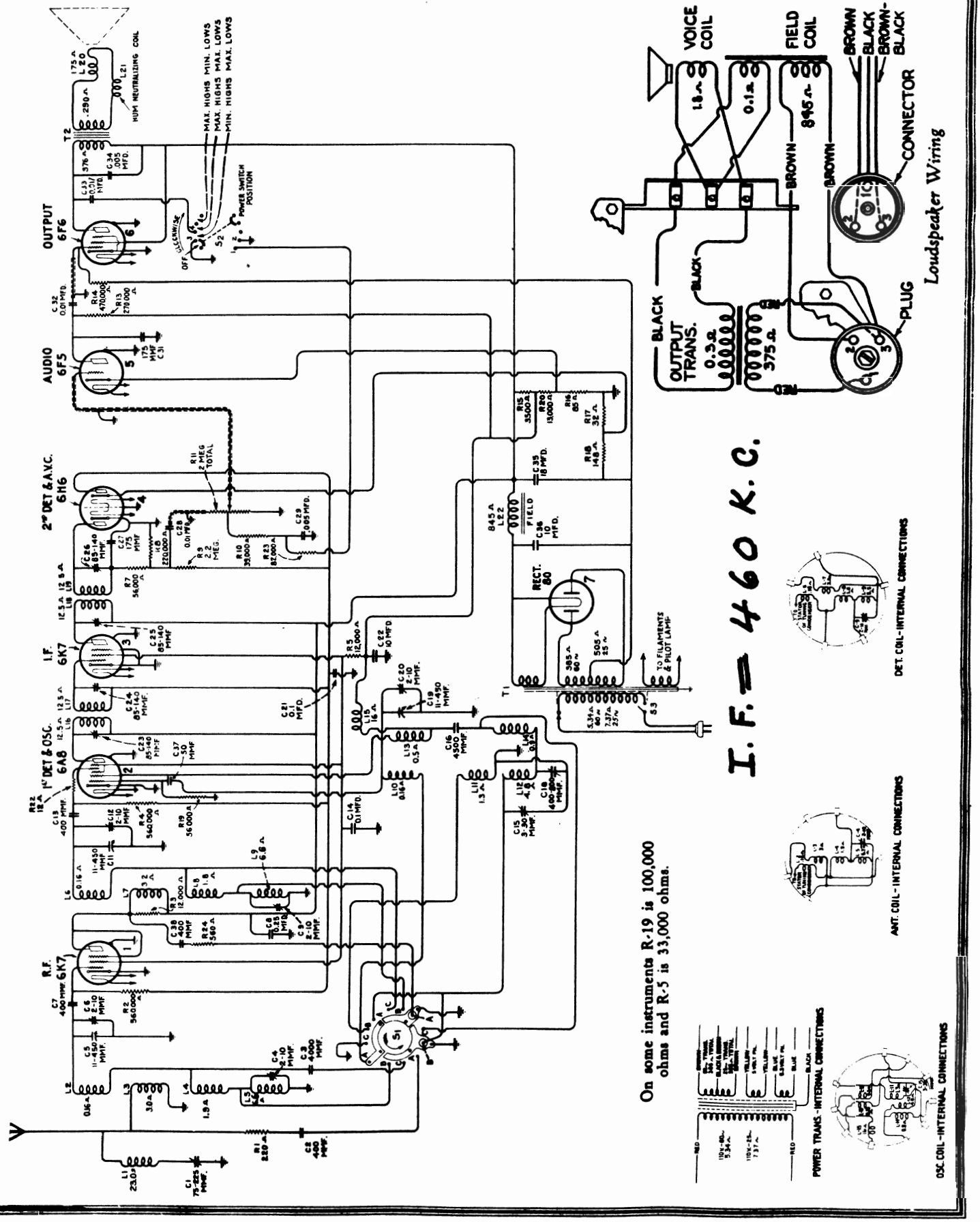
(f) Adjust the high frequency trimmers of the Band A oscillator, detector, and antenna coils, **C-15, C-9,** and **C-4** respectively, to the points at which each produces maximum indicated receiver output.

(g) Shift the test oscillator frequency to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received.

(h) Tune the low frequency trimmer, **C-18,** of the oscillator Band A coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations. The adjustment of **C-20, C-12,** and **C-6** should be corrected at **18,000 kc.** as in (b), (c), and (d); also **C-15, C-9,** and **C-4** should be corrected at **1,400 kc.** as in (f) to compensate for any changes caused by the adjustment of the low frequency oscillator coil trimmer.

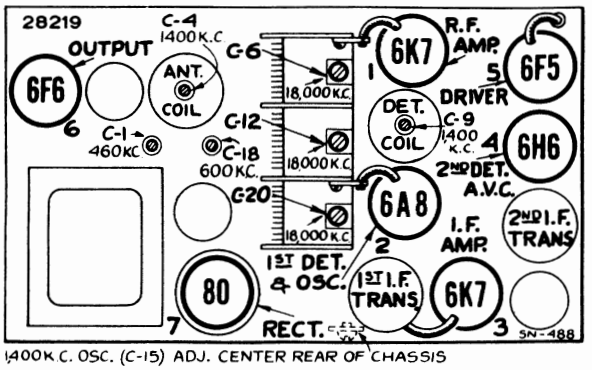
RCA MANUFACTURING CO., Inc.

Models T7-5, C7-6



RCA MANUFACTURING CO., Inc.

MODELS T7-5 and C7-6



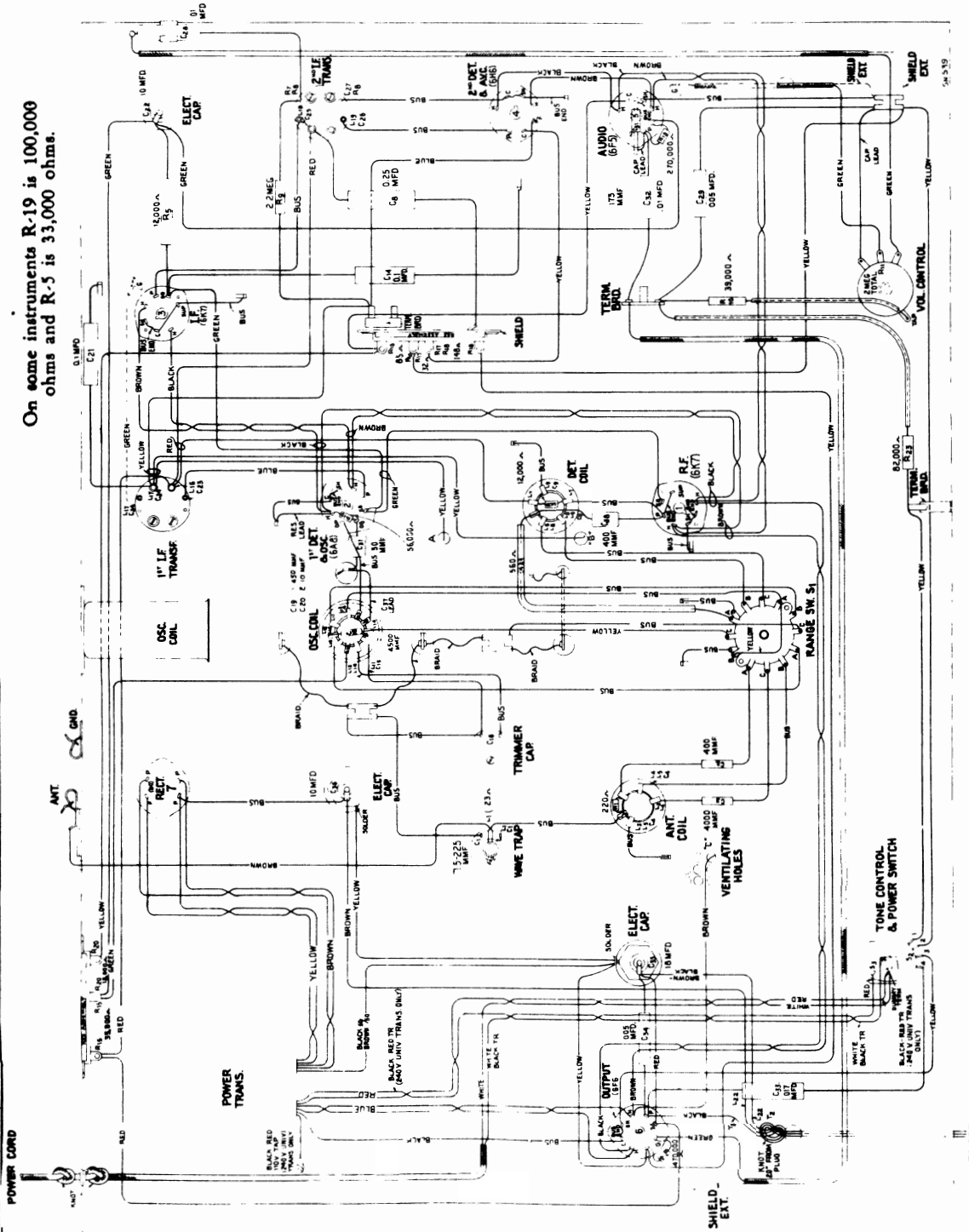
1400 K.C. OSC. (C-15) ADJ. CENTER REAR OF CHASSIS

Radiotron and Coil Locations

Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference. This trimmer is adjusted to 460 kc. during manufacture, however, local conditions may require a readjustment, depending upon the interfering frequency.

On some instruments R-19 is 100,000 ohms and R-5 is 33,000 ohms.



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Models T7-5, C7-6

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to chassis on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter re-

Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference. This trimmer is adjusted to 460 kc. during manufacture, however, local conditions may require a readjustment, depending upon the interfering frequency.

Tuned Circuits

The antenna coil system and the detector coil system each consist of a single primary and three series-connected secondary windings to provide the three ranges of tuning. The oscillator coil system is similarly wound on a single form. A range selector switch (S-1) is used for connecting the various sections of these three coil systems into the circuit to provide operation on the band desired. The coils are tuned by a variable three-section gang condenser having trimmer capacitors in shunt with each section. There are additional trimmer capacitors across the section of each coil used for Band "A." A series trimmer is also associated with the Band "A" oscillator coil.

The intermediate frequency amplifier system consists of an RCA-6K7 in a transformer-coupled circuit. This stage operates at a basic frequency of 460 kc. Each winding of both i-f transformers (input and output) is tuned by an adjustable trimmer.

ALIGNMENT FREQUENCIES

Band A....600 kc. (osc.), 1,400 kc. (osc., det., ant.)
Band B.....None required
Band C.....18,000 kc. (osc., det., ant.)

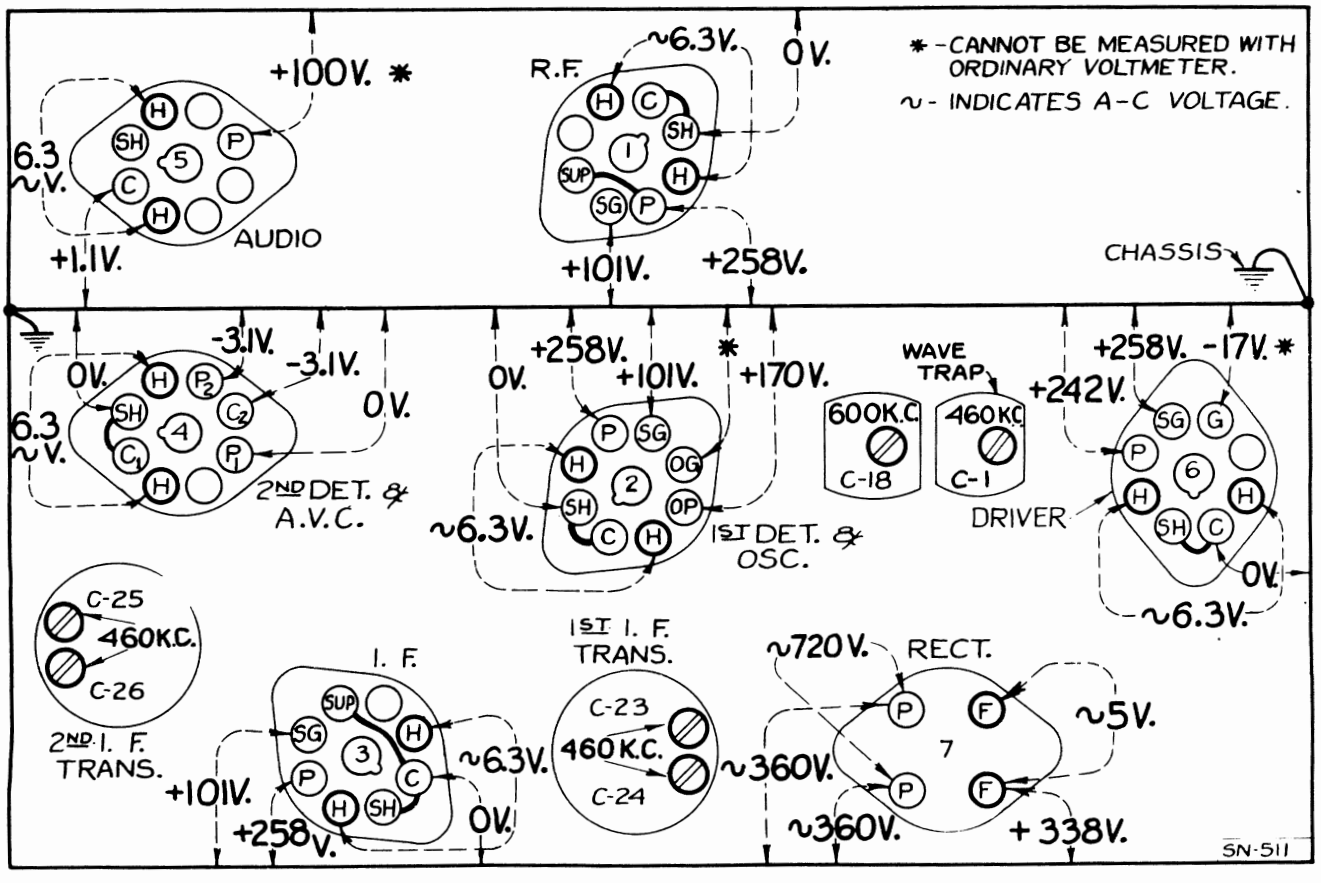
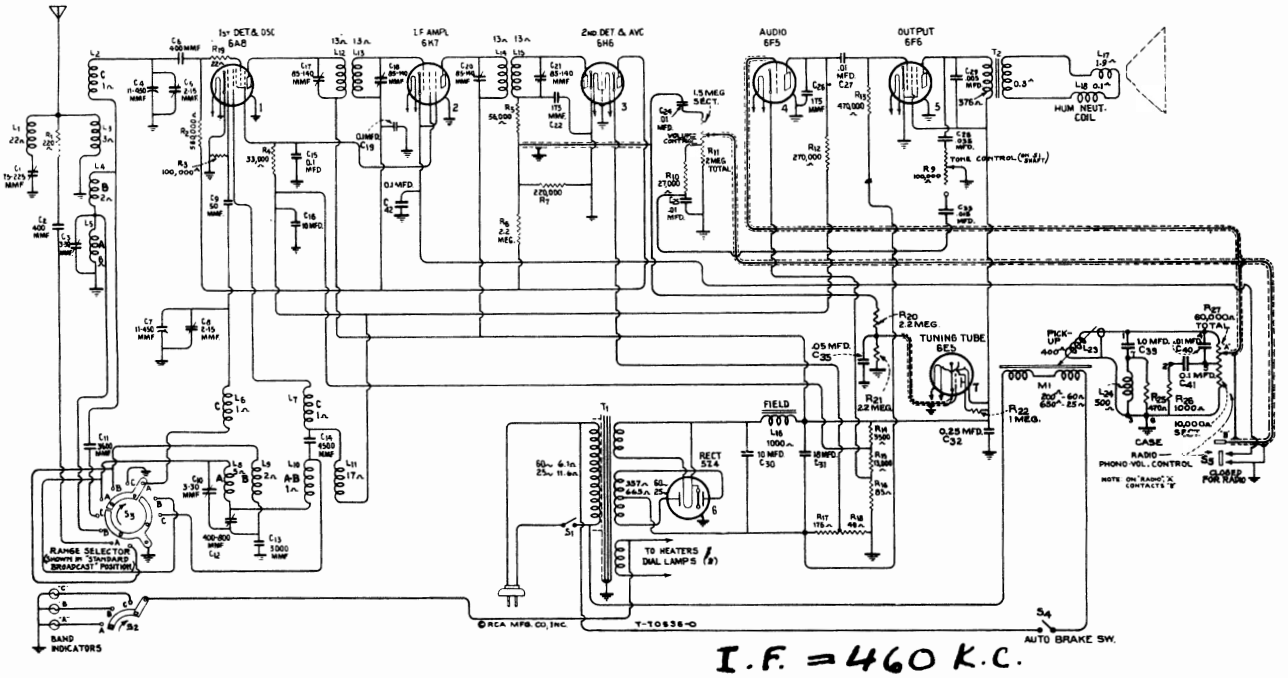


Figure 4—Radiotron Socket Voltages

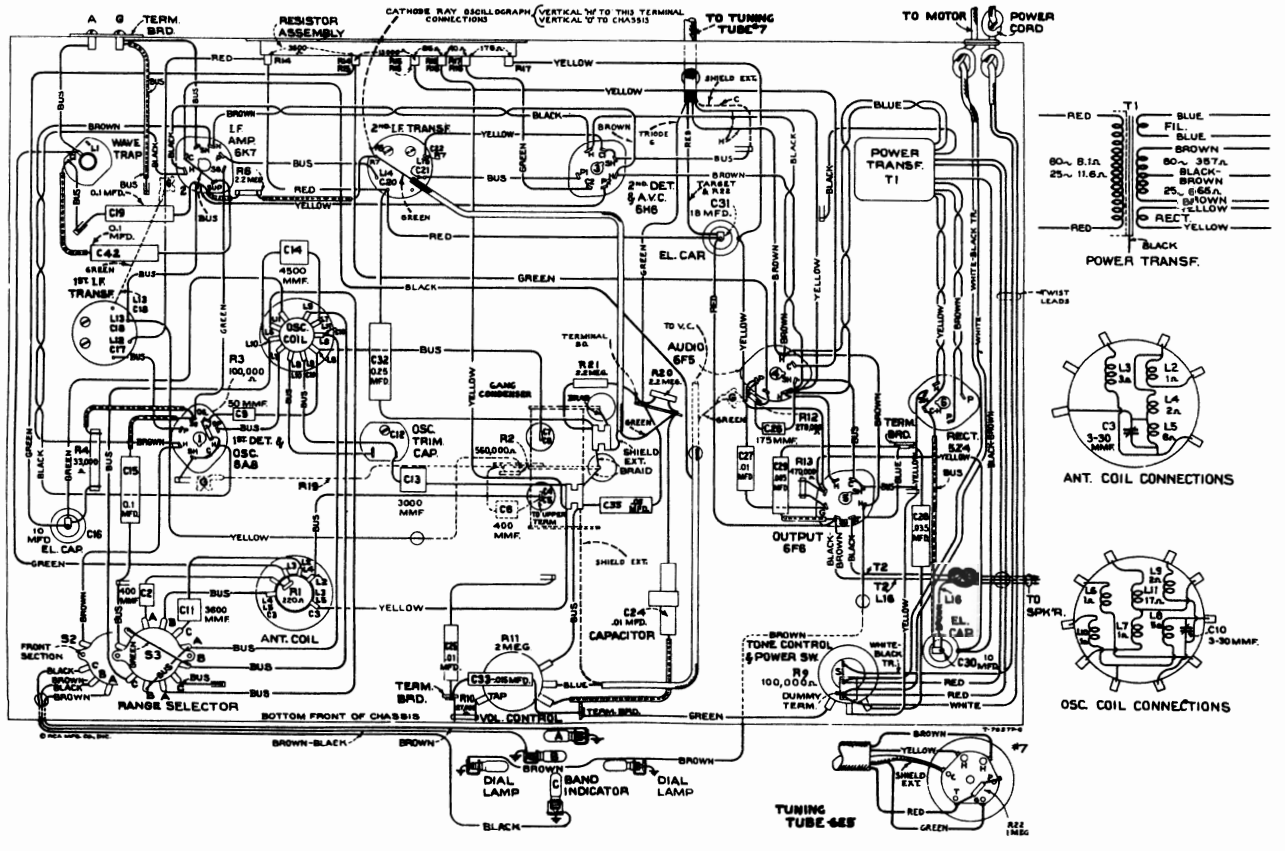
Measured at 115 volts, 60 cycles—No signal input

RCA MANUFACTURING CO., Inc.

MODEL 7U

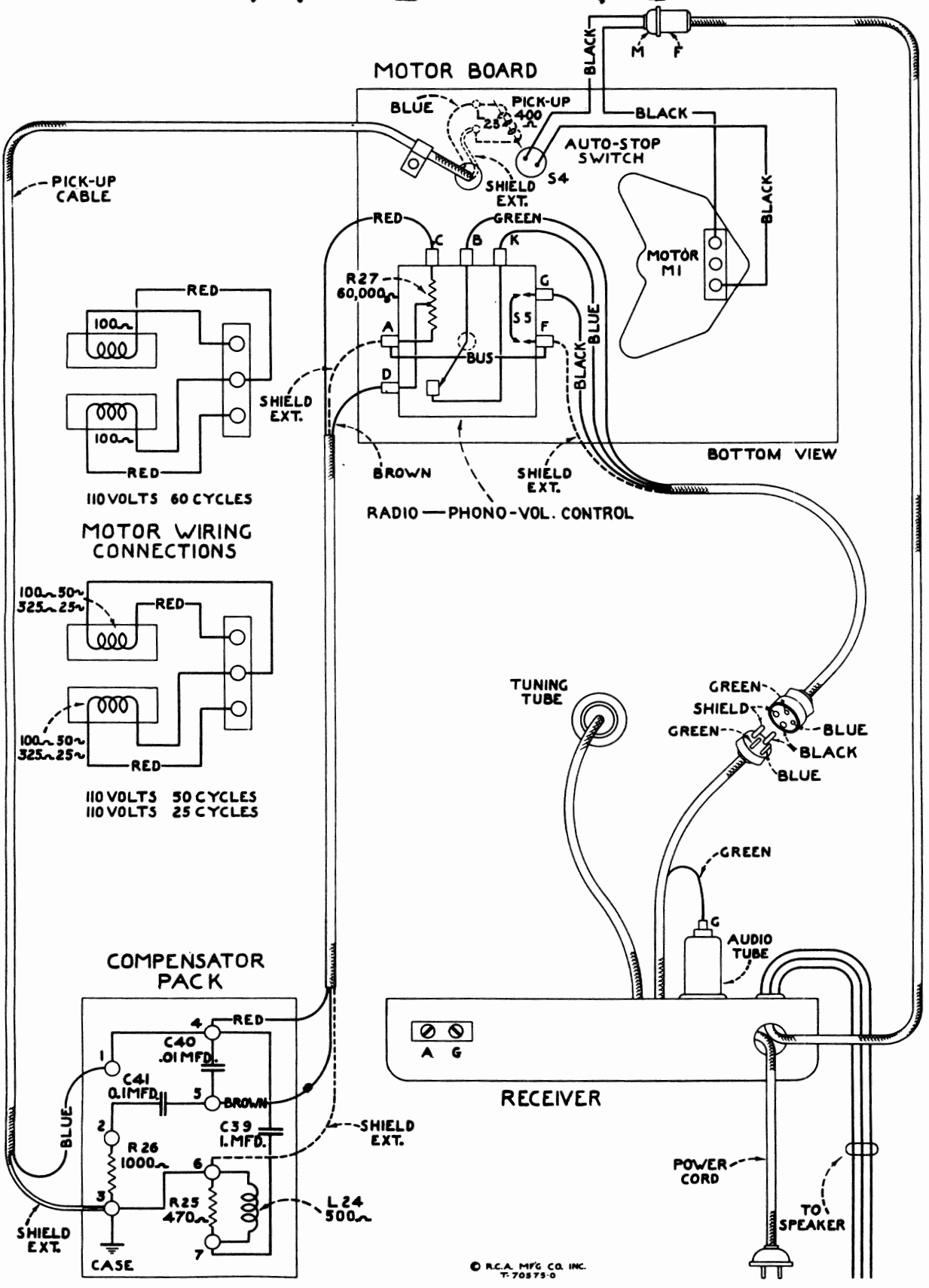


Schematic Circuit Diagram



RCA MANUFACTURING CO., Inc.

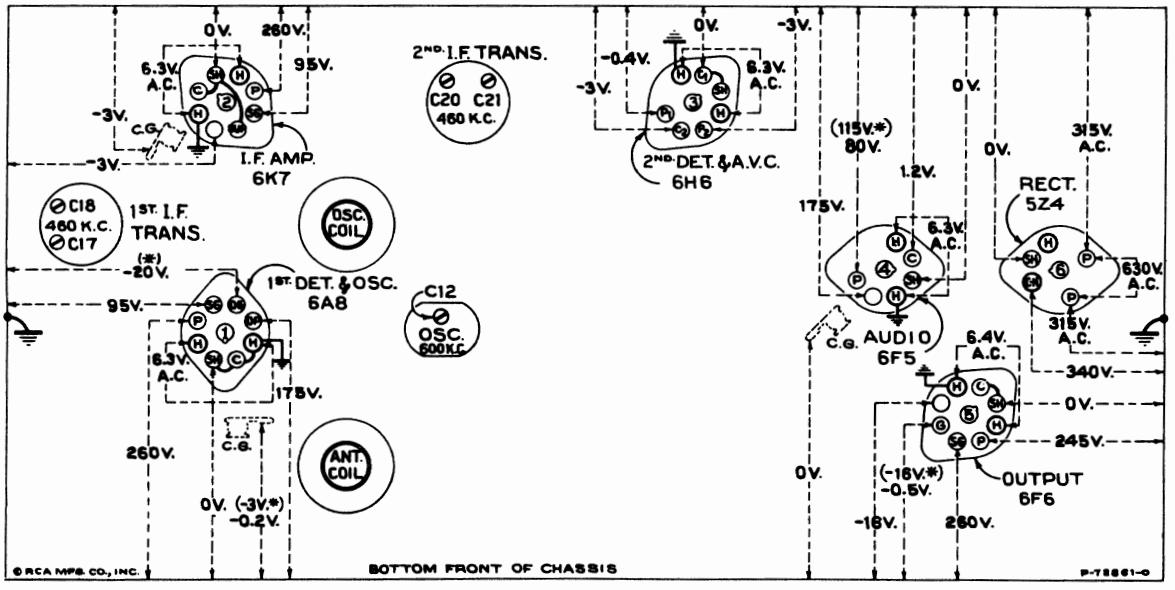
Model 7U



Assembly Wiring

RCA MANUFACTURING CO., Inc.

MODEL 7U

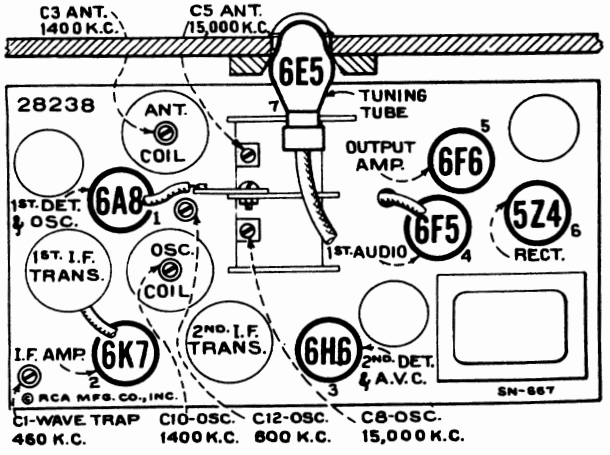


Radiotron Socket Voltages, Coil, and Trimmer Locations

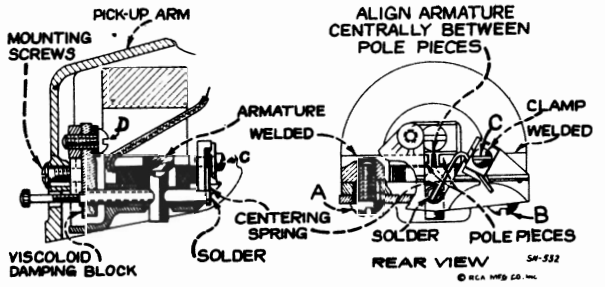
Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc "Standard broadcast" Radio–Phono-volume "Radio"—No signal being received—Volume control minimum

Note: *Two voltage values are shown for some readings. The higher value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The lower value is the actual measured voltage and differs from the higher value because of the additional loading of the voltmeter through the high series circuit resistance.*

The voltage values indicated from the Radiotron socket contacts, grid caps, resistors, and terminals to receiver chassis ground on figure 7 will assist in locating cause of faulty operation. Each value as specified should hold within ±20% when the receiver is normally operative at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. These voltages were measured with receiver tuned to approximately 1,000 kc, no signal being received, and volume control set at minimum. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, 500, and 1,000 volts. Use the nearest range above the voltage to be measured. A-c voltages were measured with a corresponding a-c meter.



Radiotron, Coil, and Trimmer Locations



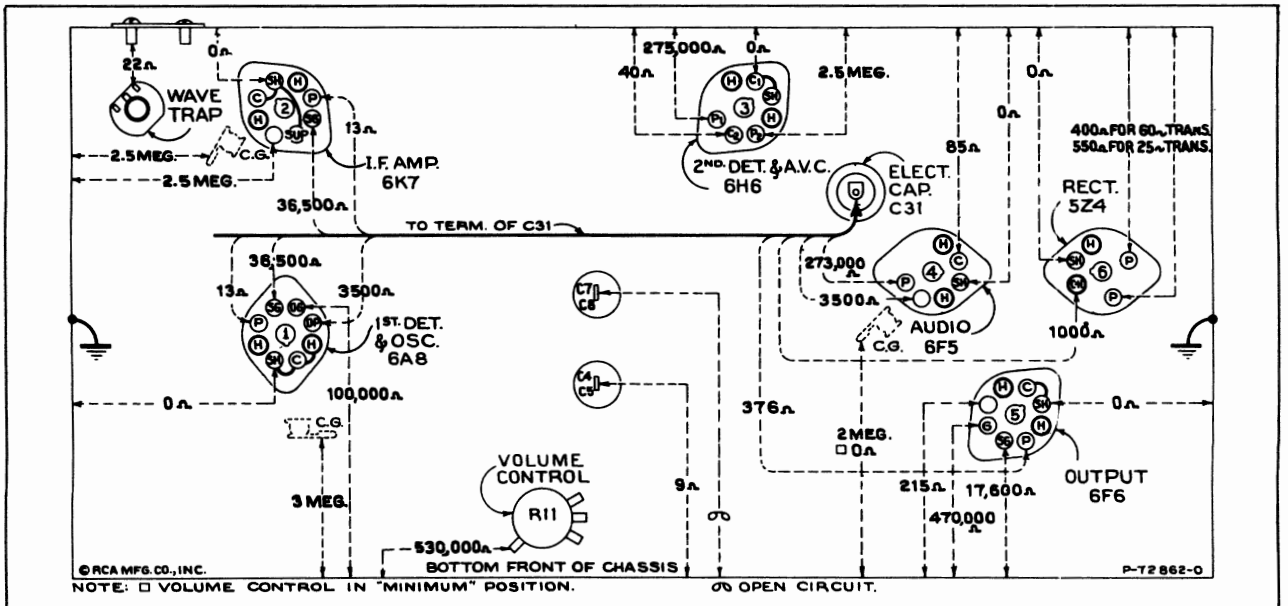
Details of Pickup

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the **RCA Stock No. 9549 Pickup Magnetizer** and charging the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

RCA MANUFACTURING CO., Inc.

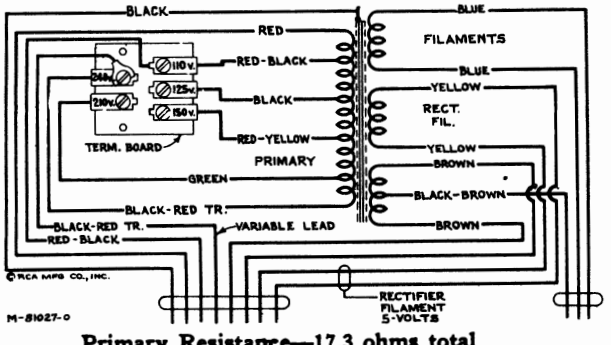
MODEL 7U



Resistance Diagram

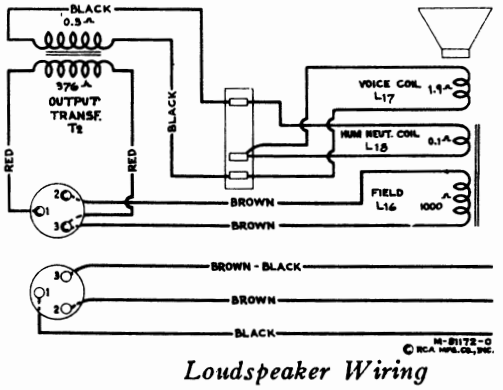
Power supply disconnected—Radiotrons in sockets—Tuning condenser in full mesh
Range selector "Standard broadcast"—Radio–Phono-volume "Radio"—Radio volume control maximum

The resistance values shown between Radiotron socket contacts, grid caps, resistors, terminals, and receiver chassis ground, on figure 4, have been carefully selected so as to facilitate a rapid continuity check of the circuits. The use of this diagram in conjunction with the Schematic Circuit Diagram, figure 1, and Chassis Wiring Diagram, figure 2, will permit the location of certain troubles which might otherwise be difficult to ascertain. Each value as specified should hold within ±20%. Variations in excess of this limit will usually be indicative of trouble in circuit under test. Resistance values were measured with Radiotrons in sockets, tuning condenser in full mesh, and volume control set at maximum except where otherwise noted. In all cases of measuring the resistance between points of the circuit and ground, it will be necessary to connect the negative terminal of the resistance meter to chassis-ground. If the polarity of the resistance meter is not known, it may be readily ascertained by connecting a d-c voltmeter of indicated polarity across the terminals of the device.



Primary Resistance—17.3 ohms total
Secondary Resistance—355 ohms total

Universal Transformer



Loudspeaker Wiring

Electrical Specifications

FREQUENCY RANGES

"Standard broadcast" (A) ..... 540- 1,625 kc.
"Medium wave" (B) .....1,625- 5,700 kc.
"Short wave" (C) .....5,700-18,000 kc.

ALIGNMENT FREQUENCIES

"Standard broadcast" (A)...600 kc. (osc.), 1,400 kc. (osc. and ant.)
"Medium wave" (B) .....None required
"Short wave" (C).....15,000 kc. (osc. and ant.)

Intermediate Frequency .....460 kc

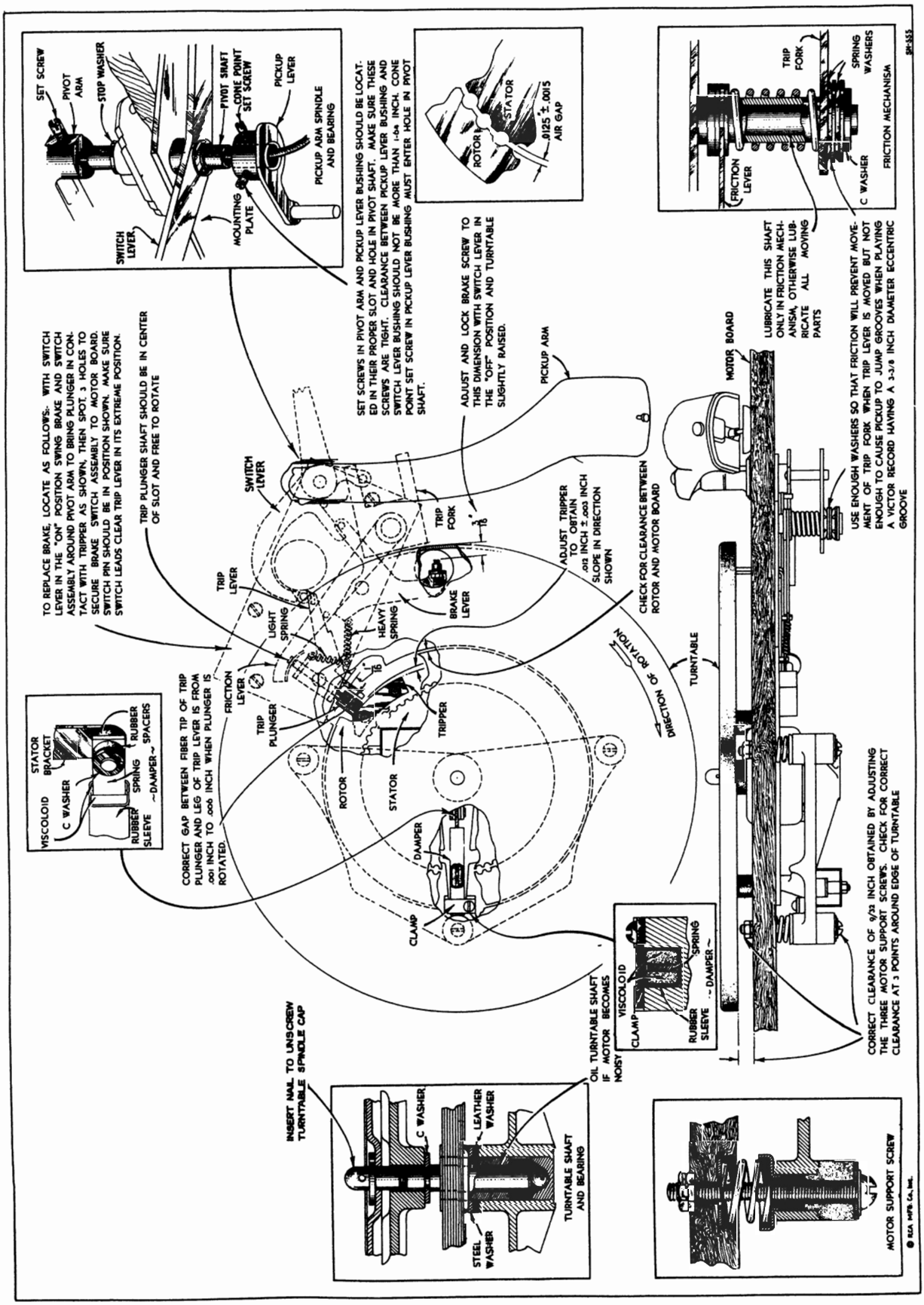
RADIOTRON COMPLEMENT

(1) RCA-6A8 .....First-detector–oscillator
(2) RCA-6K7 .....Intermediate amplifier
(3) RCA-6H6 .....Second-detector–a.v.c.
(4) RCA-6F5 .....Audio voltage amplifier
(5) RCA-6F6 .....Audio power amplifier
(6) RCA-5Z4 .....Full-wave rectifier
(7) RCA-6E5 .....Tuning tube

Pilot Lamps (5) .....Mazda No. 46, 6.3 volts, 0.25 amperes

RCA MANUFACTURING CO., Inc.

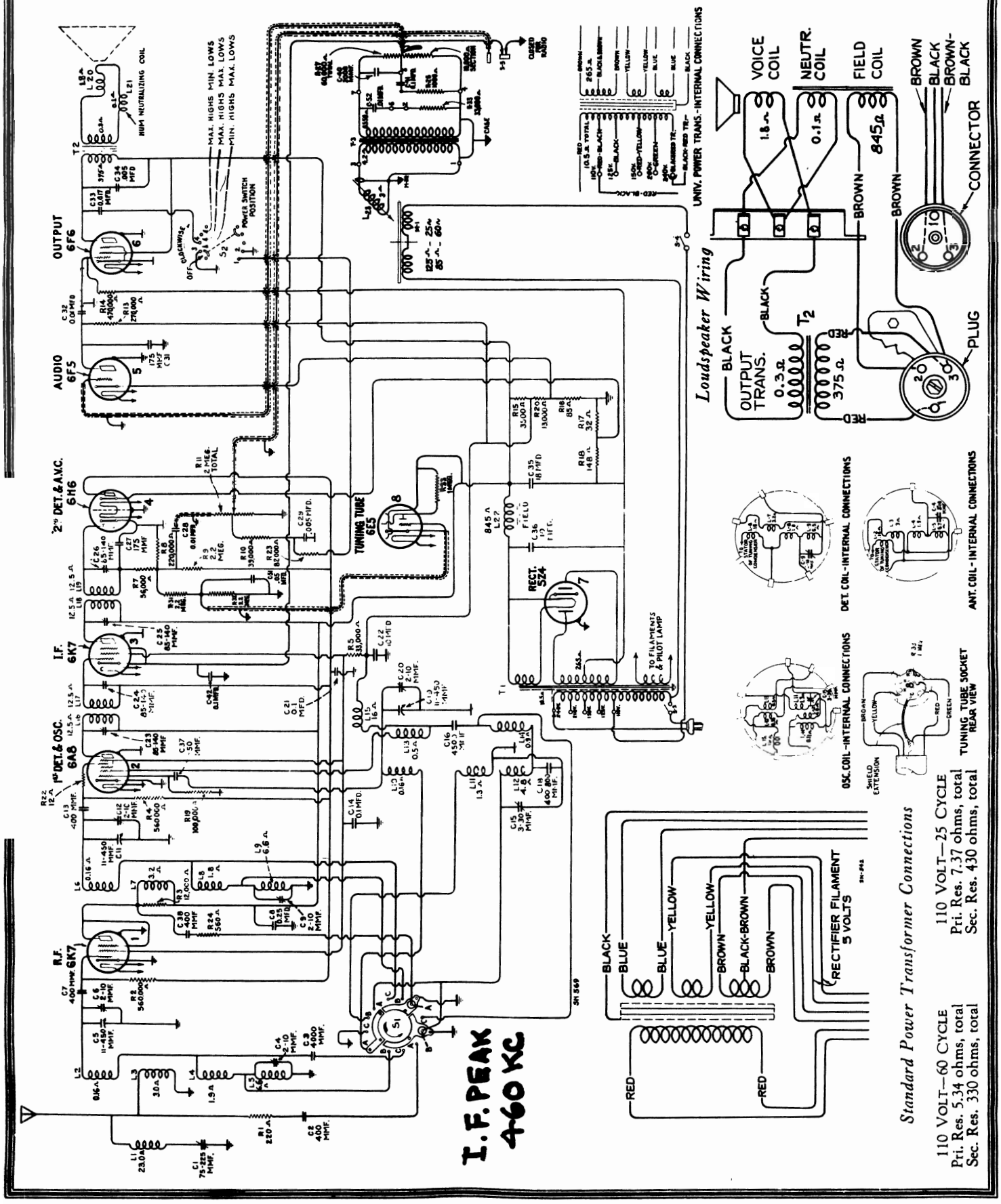
Model 7U



–Motor Board Adjustments

RCA MANUFACTURING CO., Inc.

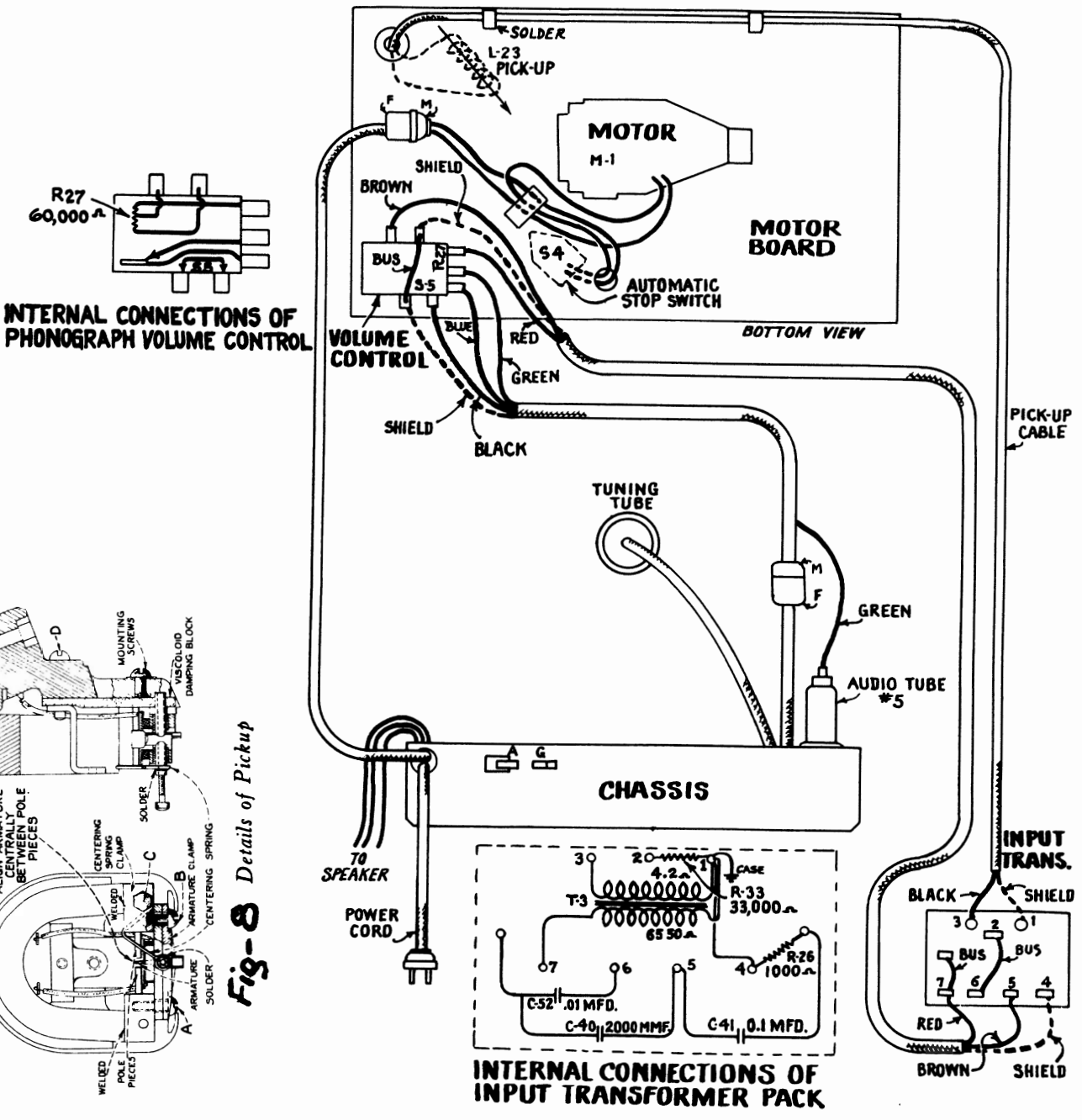
MODEL D8-28



RCA MANUFACTURING CO., Inc.

MODEL D8-28

Assembly Wiring



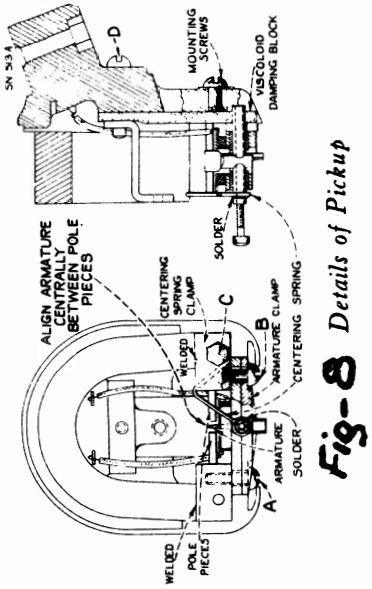


Fig. 8 *Details of Pickup*

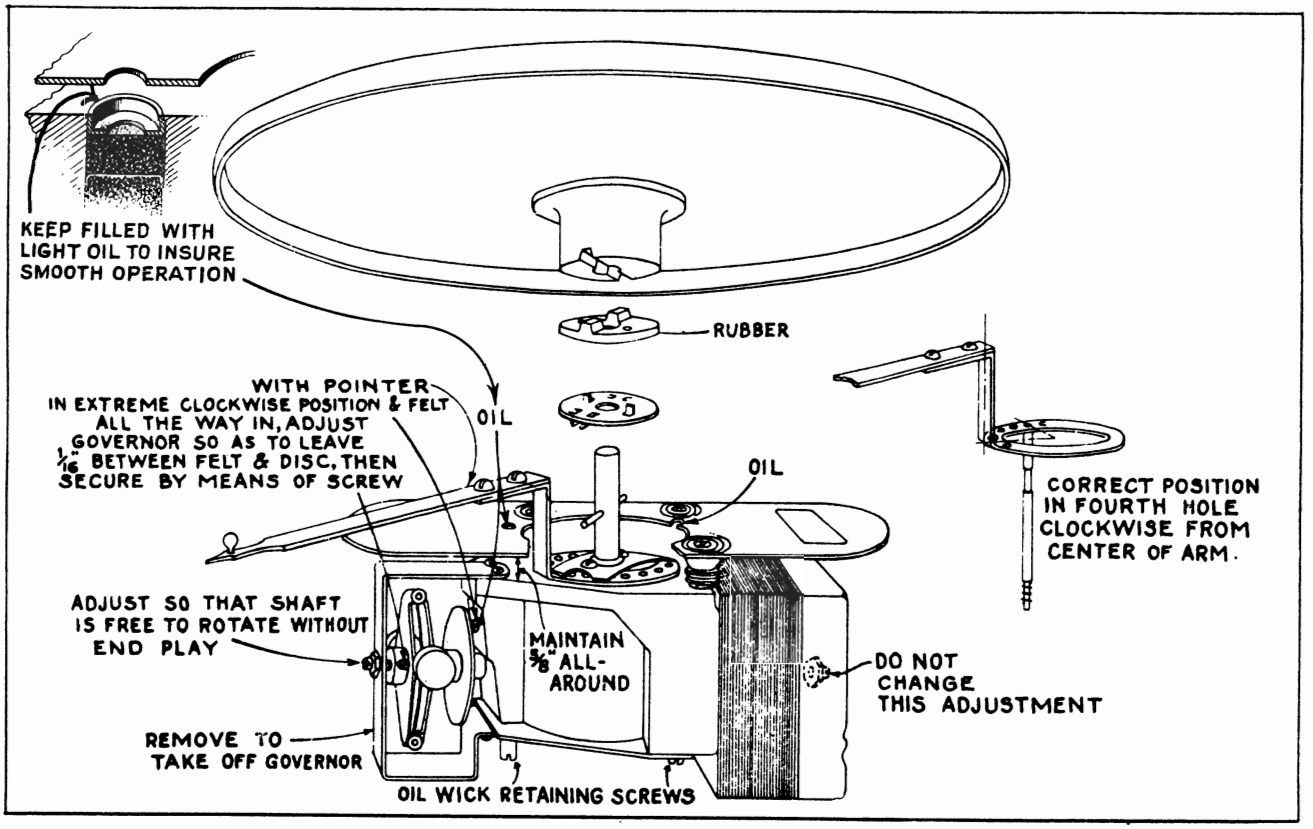
Centering Armature

Refer to Figure 8 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed, the screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

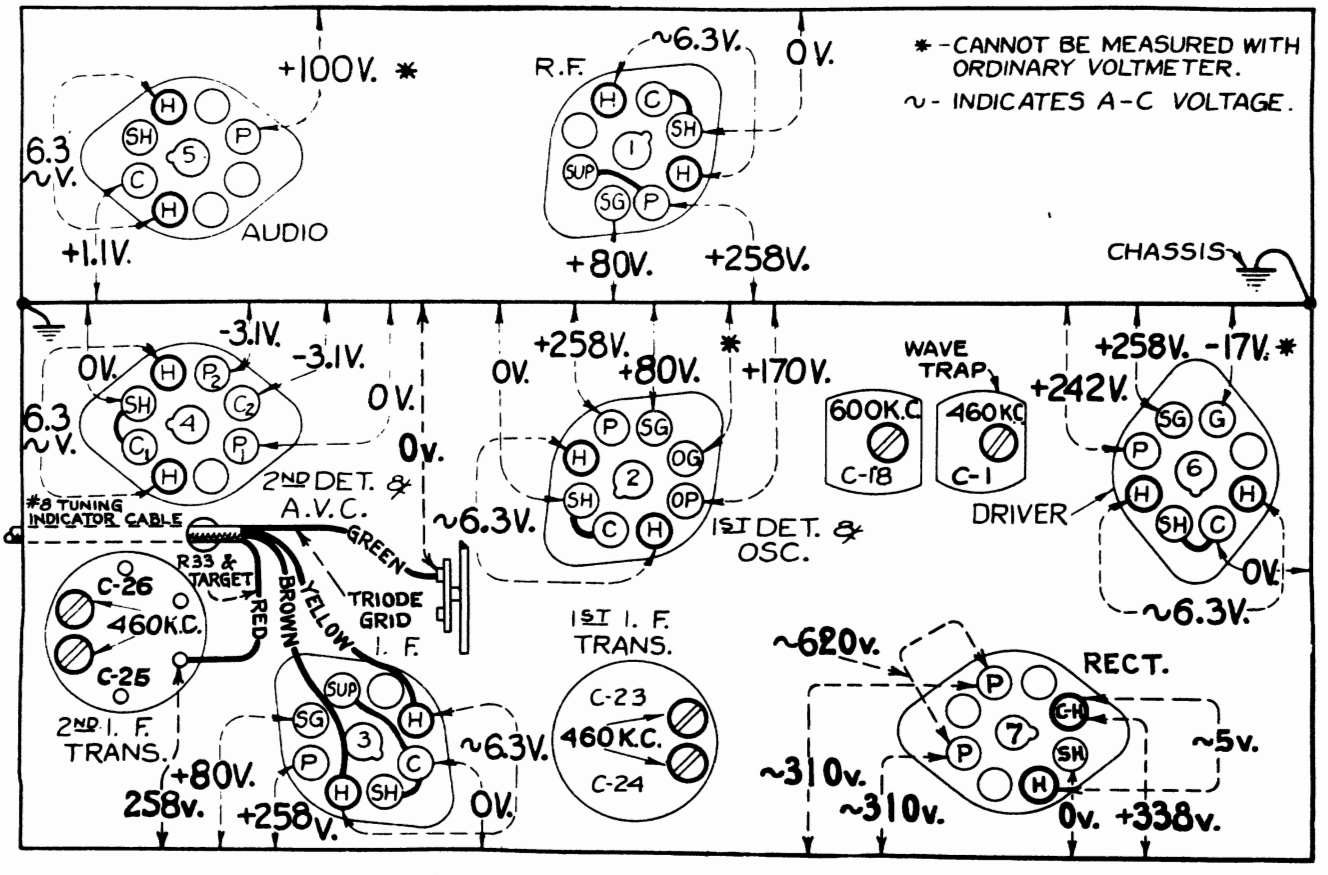
RCA MANUFACTURING CO., Inc.

MODEL D8-28

Motor Details



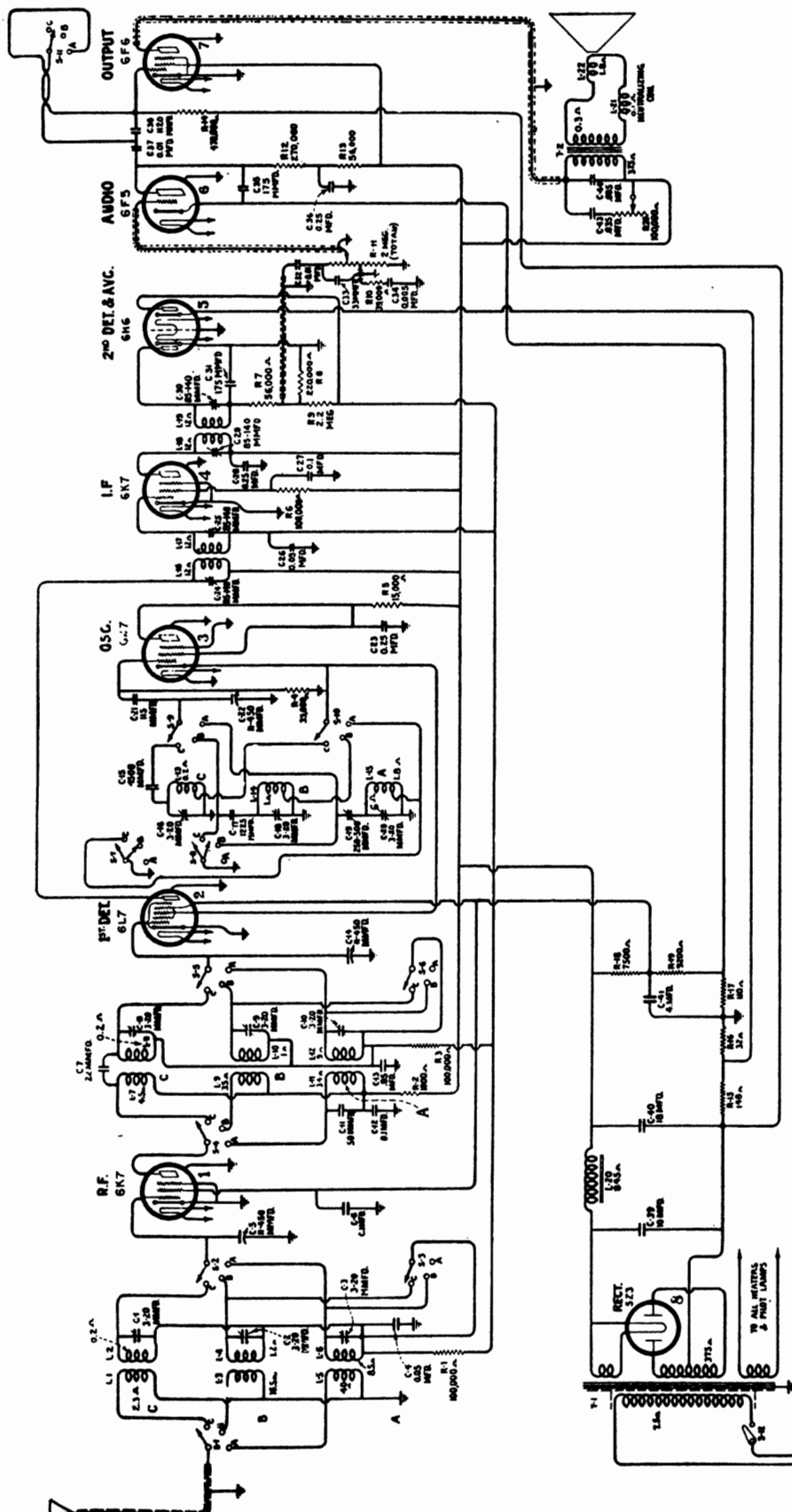
Socket Voltages

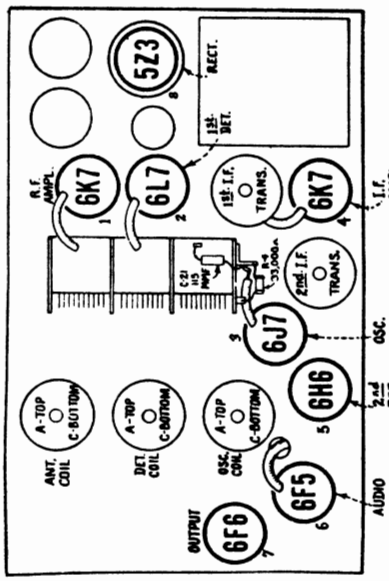


Measured at 115 volts, 60 cycles—No signal input

RCA MANUFACTURING CO., Inc.

MODELS T8-14 and C8-15

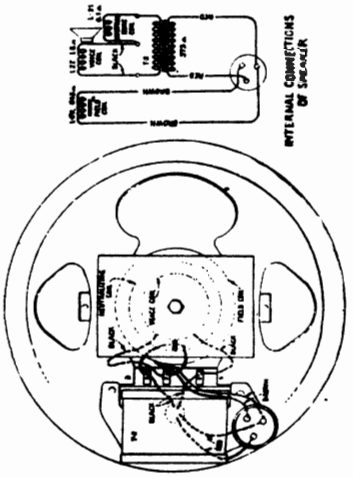




Coil and Radiotron Locations

NOTE: CAPACITOR C-33 IS CONNECTED TO TAP ON VOLUME CONTROL AND NOT TO GROUND AS INDICATED.

I.F. PEAK 460 KC



–Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

MODELS T8-14 and C8-15

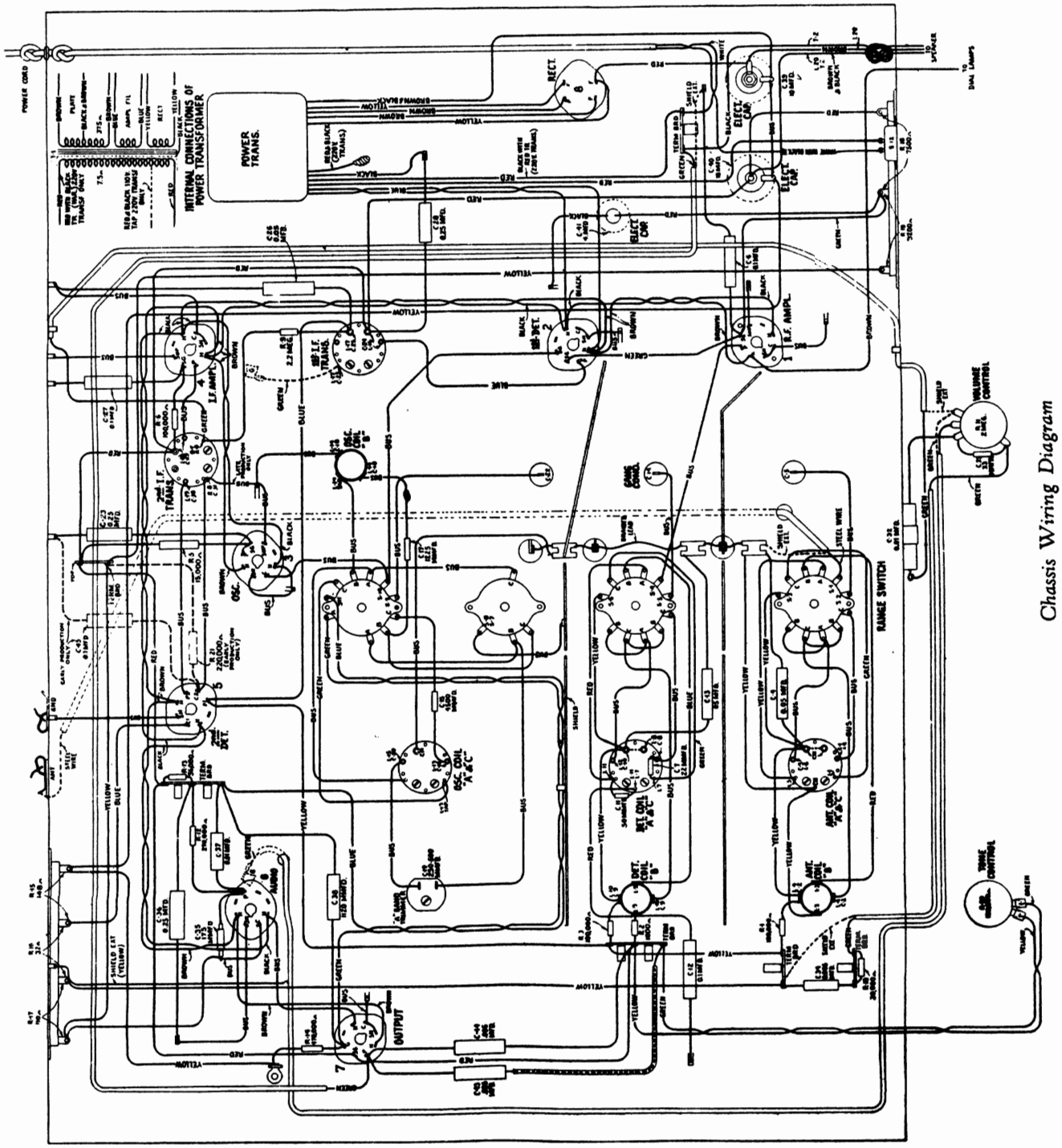
I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc**, and align the trimmers C-29 and C-30 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control grid circuit of the RCA-6L7 first detector. Then tune the first i-f transformer trimmers C-24 and C-25 for maximum receiver output.

R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control kept at its maximum position. For each adjustment the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal. **Band A** should be aligned by supplying a **1720 kc.** signal to the receiver, tuning the station selector to a dial reading of **1720** and ad-

(cont.- next page).



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Models T8-14 and C8-15

Alignment Procedure (Cont.)

justing the trimmers C-20, C-10 and C-3 to produce maximum receiver output. The Oscillator should then be shifted to **600 kc.** and the receiver tuned to resonate this signal, disregarding the reading at which it is best received. Trimmer C-19 must then be adjusted, simultaneously while rocking the station selector backward and forward through the signal until the maximum output results from the combined operations. C-20 should be rechecked to assure that its adjustment has not changed because of the trimming of C-19. **Band B** must be aligned at **6132 kc.** by tuning the test Oscillator to such a frequency and turning the station selector to the same dial reading. Tune the trimmer C-18 to produce maximum receiver output, using the setting of least capacitance which causes same. The presence of the proper "image" may be checked by tuning the receiver to **5212 kc.** at which point the **6132 kc.** signal will be heard if the trimmer C-18 has been properly set to the position of least capacitance for maximum (peak) output. It may be necessary to increase the Oscillator output for this check. *No adjustments are to be made.* Return the station selector to the **6132 kc.** dial marking and trim capacitors C-9 and C-2 for maximum receiver output. No other adjustments are necessary on Band B. Change the receiver so that it is operative and the dial reads **18,000 kc.** on the **"C" Band.** Tune the test Oscillator to this same frequency. Then adjust the oscillator trimmer C-16 to produce maximum (peak) output. Two positions of this trimmer will be found which conform with this requirement. The one of least capacitance is correct. Check for the presence of "image" response at **17,080 kc.** by shifting the receiver tuning. If it is received at such a point, the trimmer C-16 has been correctly adjusted to the right peak. *No adjustments are to be made during this check.* Tune the receiver back to the **18,000 kc.** dial marking, re-adjust C-16 if necessary, and then tune the detector and antenna capacitors C-1 and C-8 for maximum receiver output. No further adjustments are necessary.

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to chassis on Figure 6 will serve to assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

Alignment Frequencies

Band A.....600 kc. (osc), 1720 kc. (osc, ant, det)
Band B.....6132 kc. (osc, ant, det)
Band C.....18000 kc. (osc, ant, det)

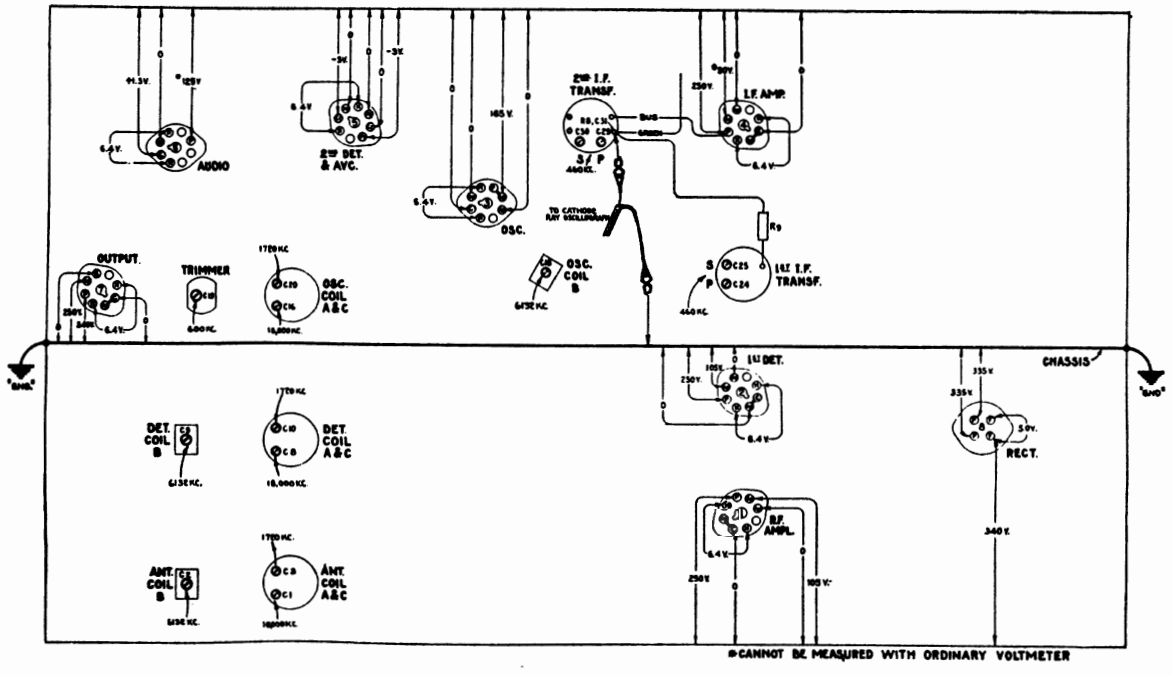
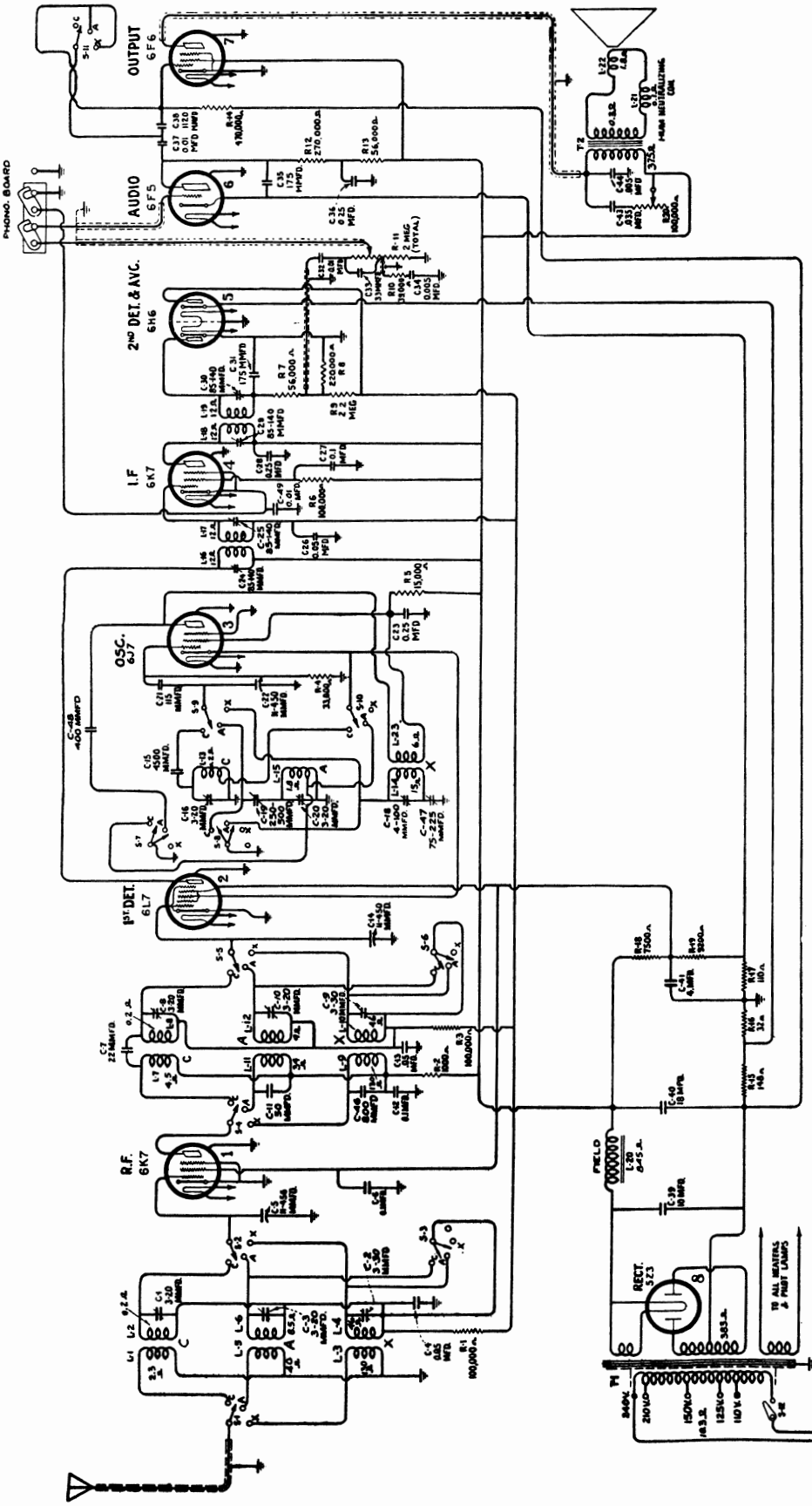
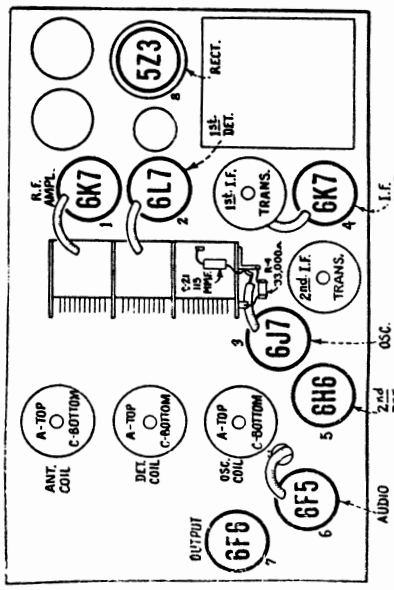


Figure 6—Trimmer Locations and Radiotron Socket Voltages
Measured at 115 volts A.C.—No Signal—Volume Control Maximum

RCA MANUFACTURING CO., Inc.

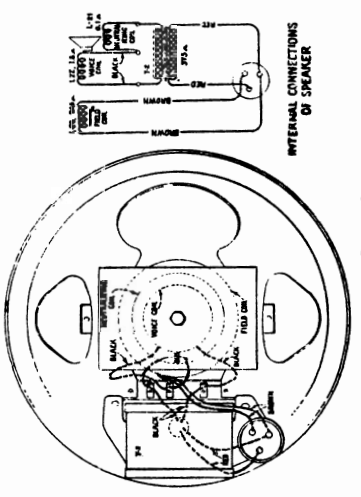
MODELS T8-16 and C8-17





Coil and Radiotron Locations

I.F. PEAK 460 KC



Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

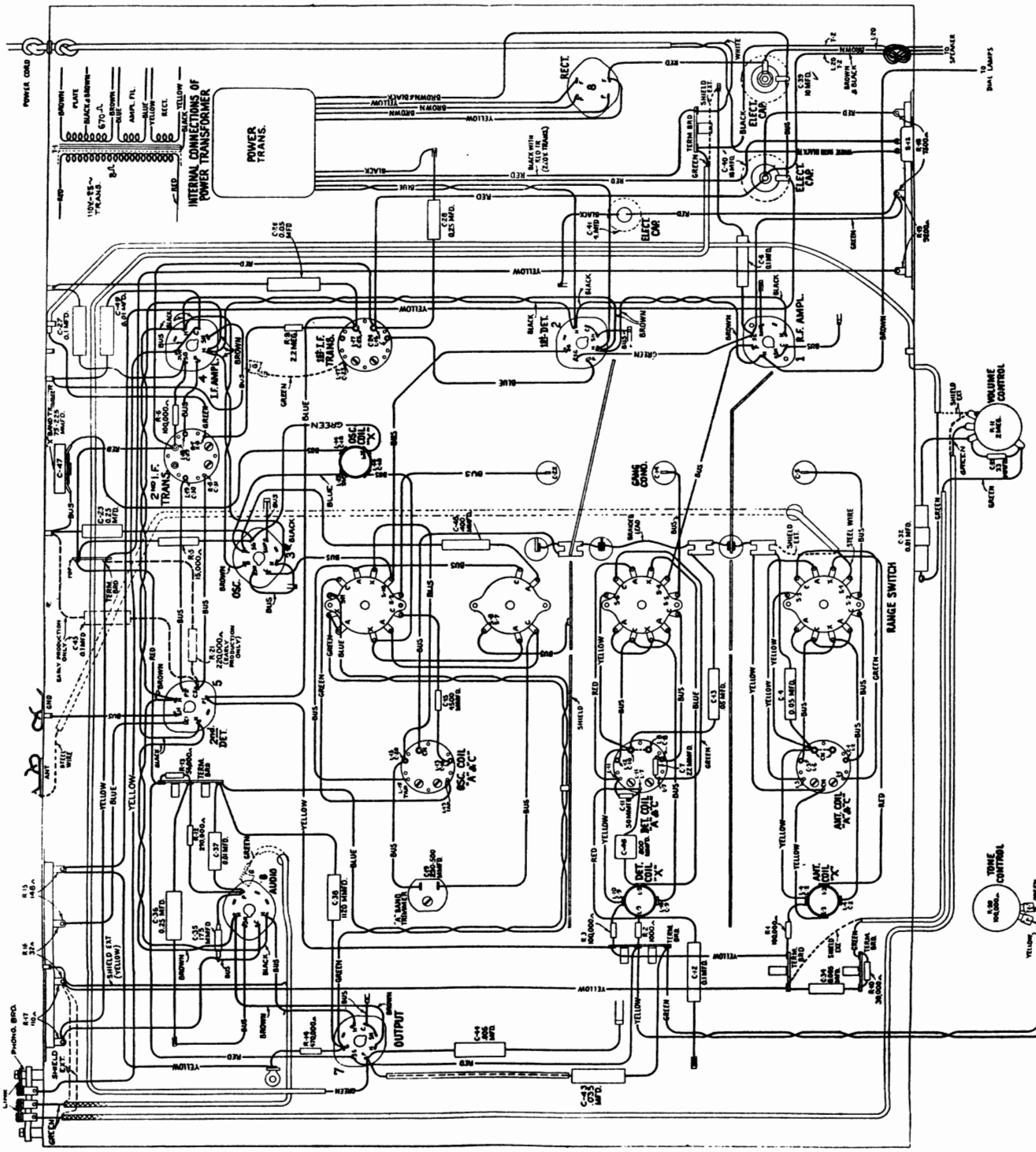
MODELS T8-16 and C8-17

Detection and A.V.C.

The modulated signal as obtained from the output of the i-f system is detected by an RCA-6H6 double diode tube. The audio frequency secured by this process is passed on to the a-f system for amplification and final reproduction. The d-c voltage which results from detection of the signal is used for automatic volume control. This voltage, which develops across resistor R-8, is applied as automatic control grid bias to the r-f, first detector and i-f tubes through suitable resistance-capacitance filter circuits. The second diode of the RCA-6H6 is used to supply residual bias for these controlled tubes under conditions of little or no signal. This diode, under such conditions, draws current, which flows through R-9 and R-8, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary bias diode ceases to draw current and the a.v.c. diode takes over the biasing function.

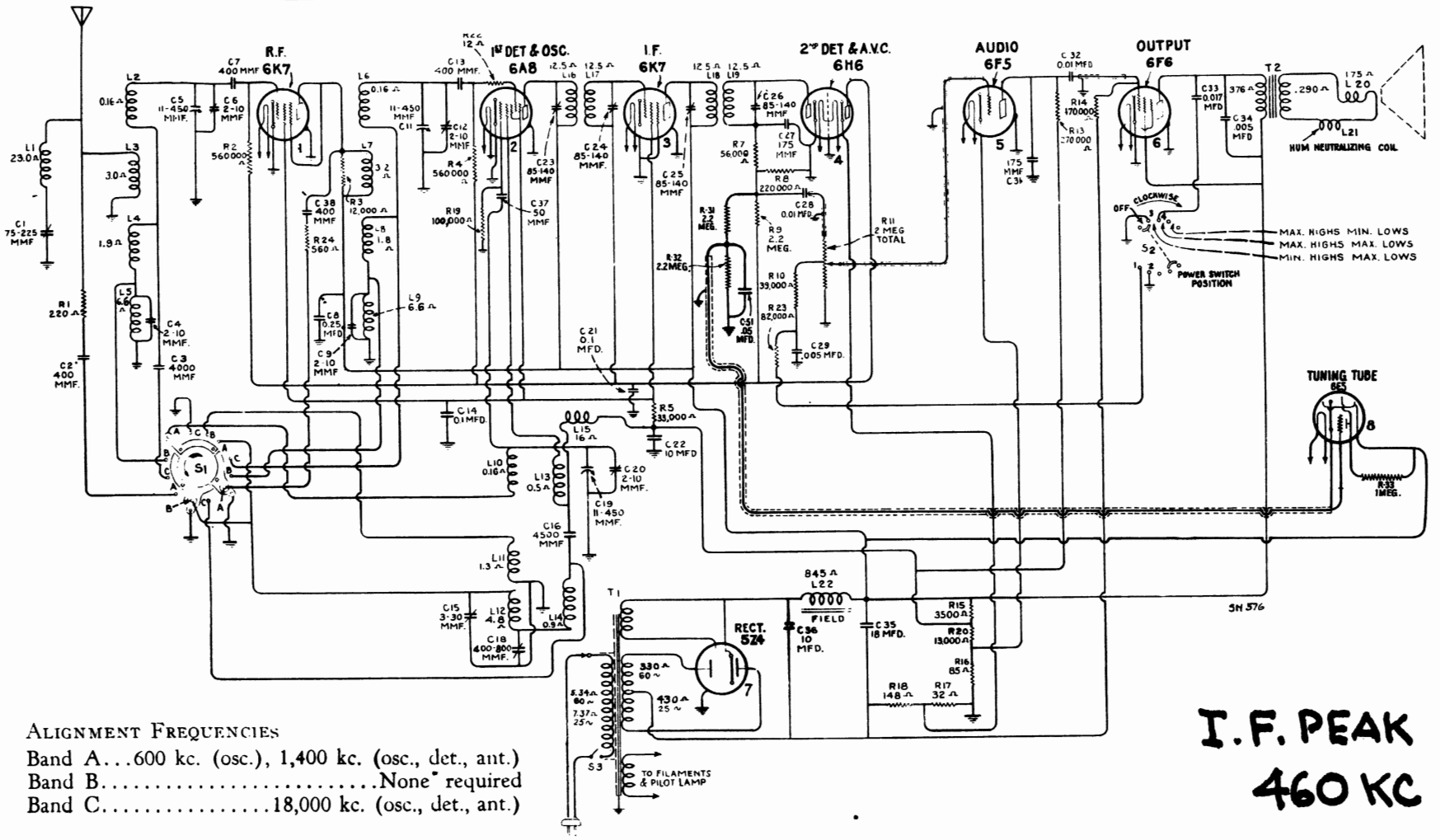
Alignment Frequencies

Band X . . . . .150 kc. (osc), 400 kc. (osc, det, ant)
Band A. . . . .600 kc. (osc), 1720 kc. (osc, ant, det)
Band C. . . . . .18000 kc. (osc, ant, det)



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.
MODELS T8-18, C8-19 and C8-20



I.F. PEAK
460 KC

ALIGNMENT FREQUENCIES

Band A...600 kc. (osc.), 1,400 kc. (osc., det., ant.)
Band B.....None required
Band C.....18,000 kc. (osc., det., ant.)

General Description

These three models are similar to RCA Victor Models T7-5 and C7-6, except for the addition of an RCA-6E5 Tuning Indicator; and an RCA-5Z4 All-Metal Rectifier used in place of the RCA-80 An 8-inch dynamic speaker is used in the Table Model (T8-18), while the two Console Models (C8-19 and C8-20) each use a 12-inch dynamic speaker. The two Console Models differ only in cabinet design.

Service Data

All information contained in the Service Notes for RCA Victor Models T7-5 and C7-6 is directly applicable to these instruments except the Schematic Diagram, Wiring Diagram, and Replacement Parts. Other differences are as follows:

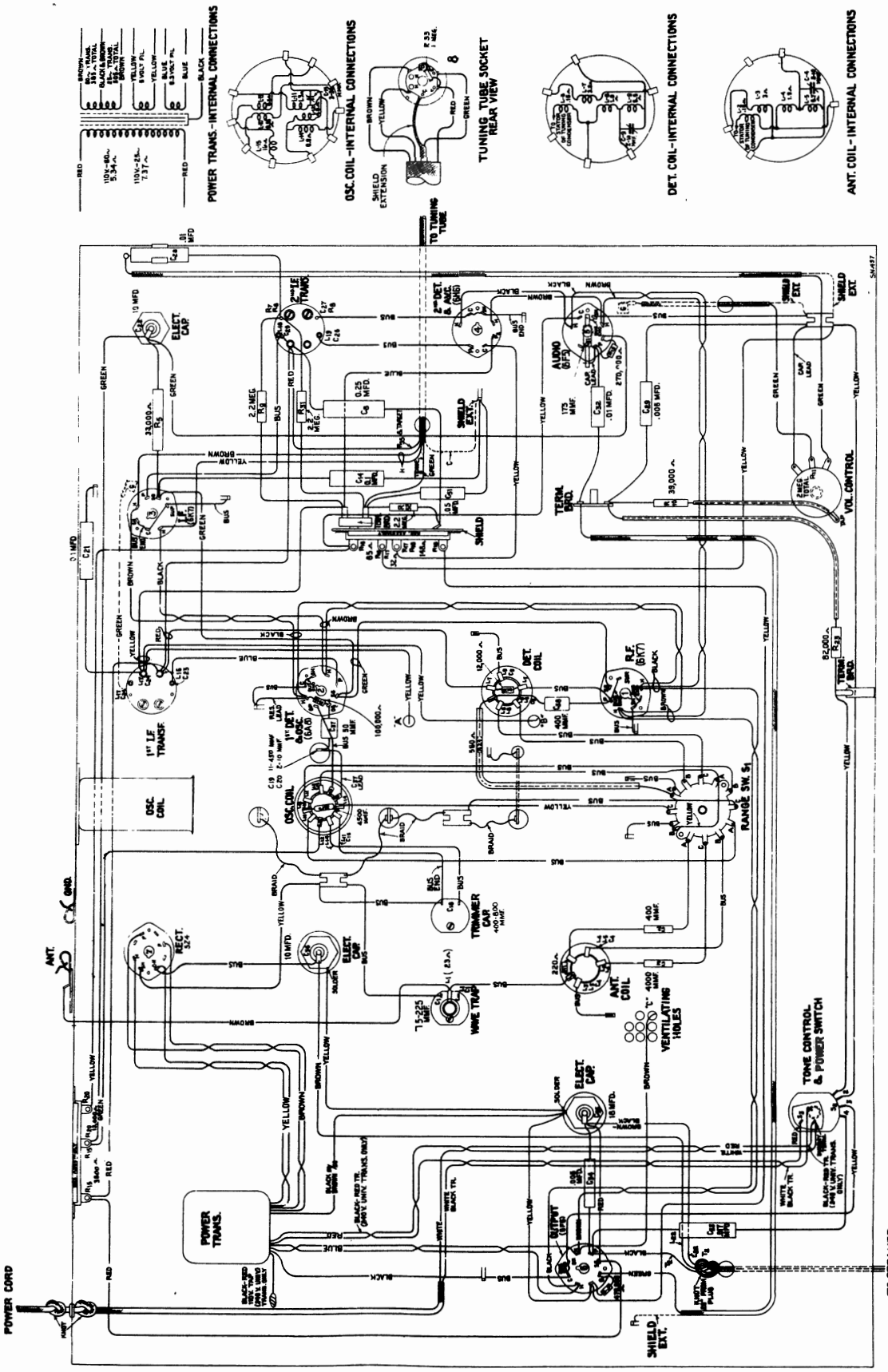
Secondary resistance of universal transformer, 265 ohms total.

Tuning tube cable voltages:

Yellow	Brown	Red	Green
0 v.	6.3 v. a-c	258 v.	0 v.

RCA MANUFACTURING CO., Inc.

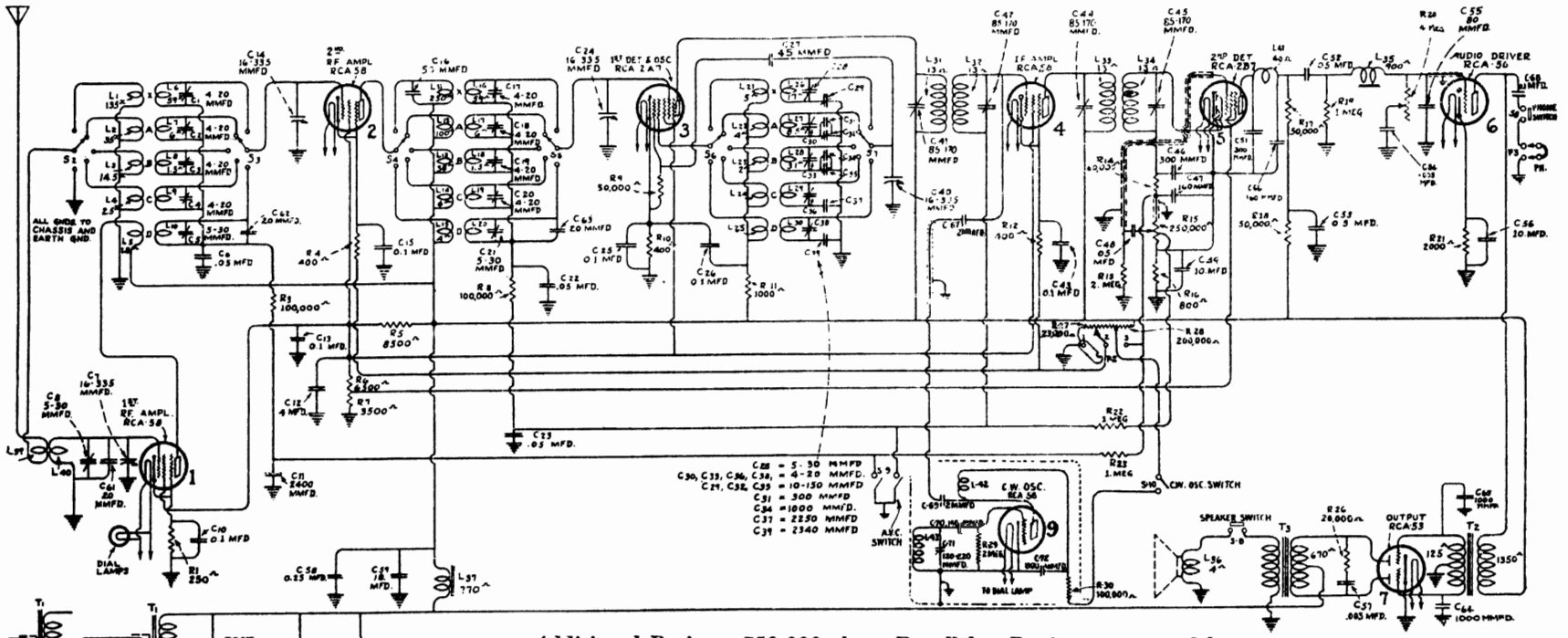
MODELS T8-18, C8-19 and C8-20



Chassis Wiring Diagram

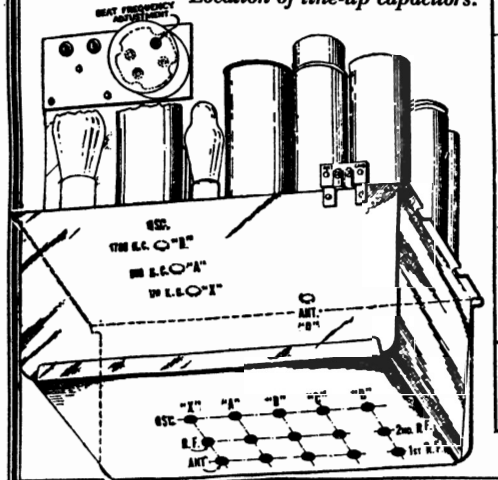
RCA MANUFACTURING CO., Inc.

9-Tube General Purpose All-Wave Set



Additional Resistor–750,000 ohms–Parallel to R-28 on some models

I.F. = 445 K.C.



Location of line-up capacitors.

External Oscillator Frequency	Dial Setting	Location of Line-Up Capacitors	Position of Selector Switch	Adjust for	Number of Adjustments To Be Made
445 K. C.	Any setting that does not bring in station.	Top of chassis.	Any position that does not bring in station.	Maximum output.	4
370 K. C.	370 K. C.	Bottom of chassis.	X	Maximum output.	3
175 K. C.	Set for signal.	Top of chassis.	X	Maximum output while rocking dial back and forth.	1
1400 K. C.	1400 K. C.	Bottom of chassis.	A	Maximum output.	3
600 K. C.	Set for signal.	Top of chassis.	A	Maximum output while rocking dial back and forth.	1
3900 K. C.	3900 K. C.	Bottom of chassis.	B	Maximum output.	3
1710 K. C.	Set for signal.	Top of chassis.	B	Maximum output while rocking dial back and forth.	1
10 M. C.	10 M. C.	Bottom of chassis.	C	Maximum output. (See Note)	3
15 or 18 M. C.	15 or 18 M. C.	Bottom and top.	D	Maximum output. (See Note)	4

NOTE—It is important to note, when aligning bands C and D, that two peaks will be observed on the trimmers for the oscillator and for the first detector. The correct oscillator peak is the one obtained using the lower trimmer capacitance, whereas the correct detector peak is the one obtained with the greater capacitance. It is essential that the proper peak be chosen, as otherwise tracking and sensitivity will be very poor at other frequencies. When adjusting the detector trimmer, the tuning capacitor should be rocked, since there is reaction on the oscillator tuning.

RCA MANUFACTURING CO., Inc.

MODELS C9-4 and T9-10

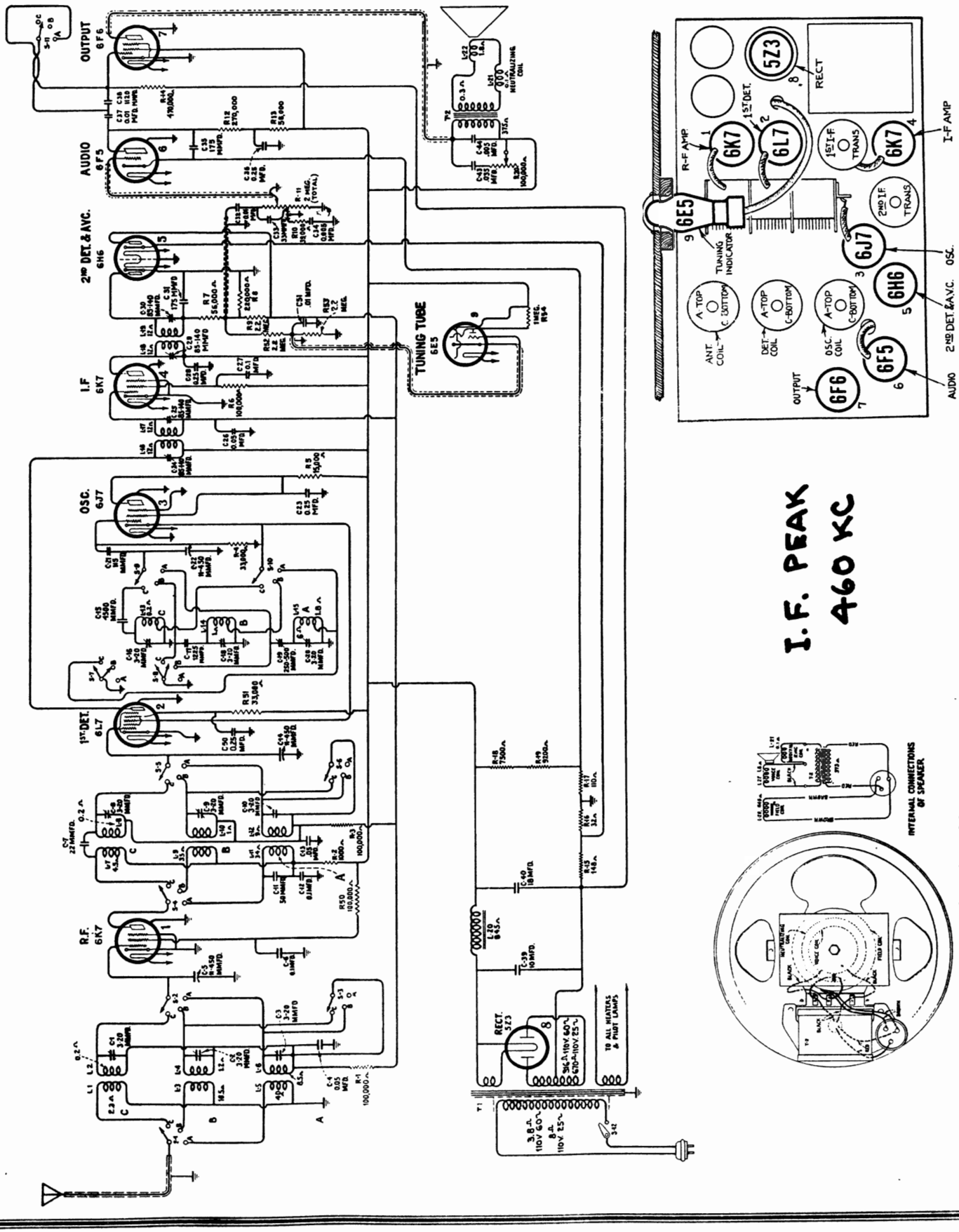


Figure 4—Coil and Radiotron Locations

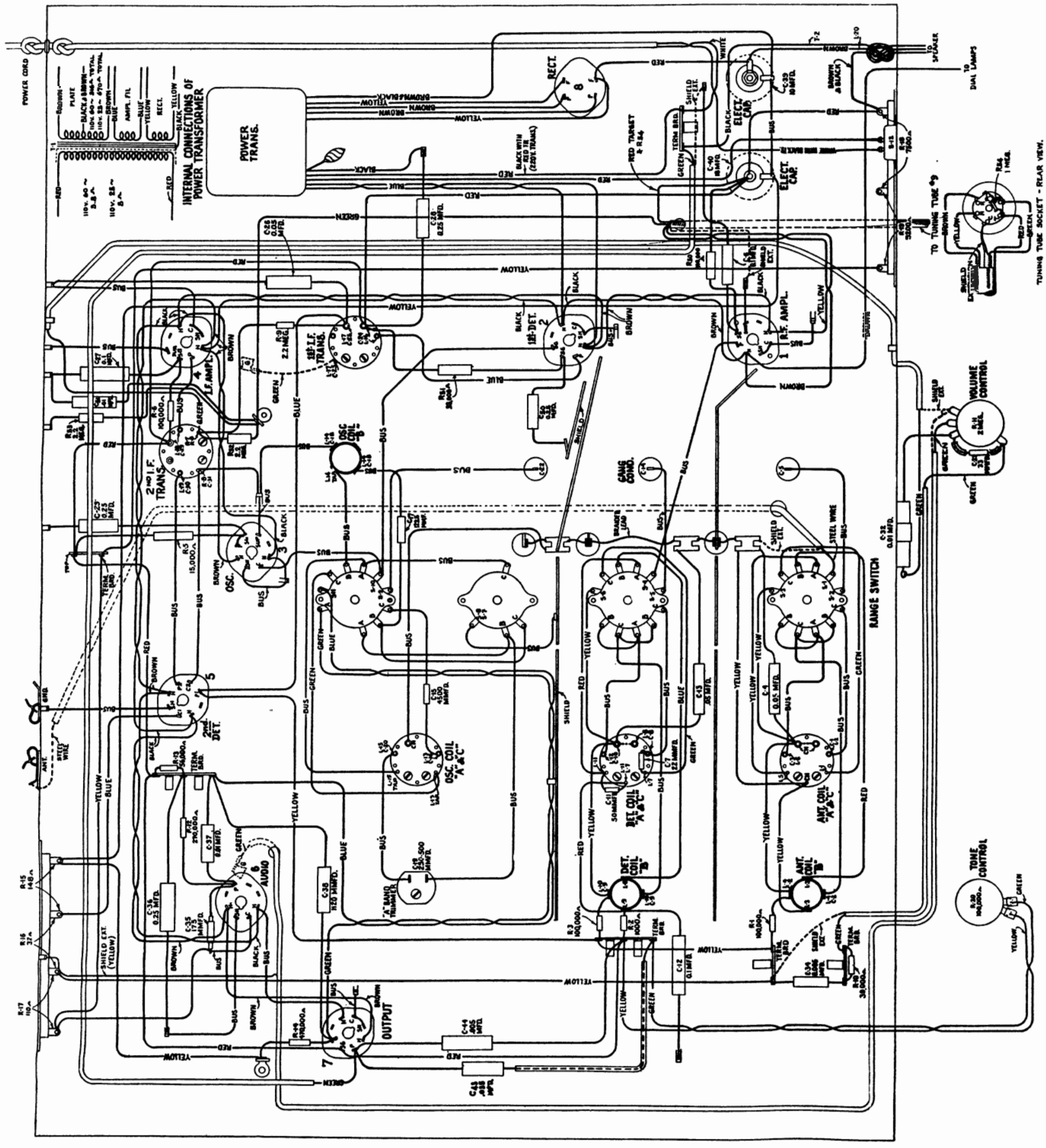
Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

MODELS C9-4 and T9-10

Alignment Frequencies

Band A.....600 kc. (osc), 1720 kc. (osc, ant, det)
Band B.....6132 kc. (osc, ant, det)
Band C.....18000 kc. (osc, ant, det)



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

MODELS C9-4 and T9-10

Alignment Procedure

There are a total of fourteen adjustments necessary for obtaining proper alignment when such a process becomes necessary. Four of these are involved with the i-f system and the remainder are associated with the antenna, first detector and oscillator coils.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for this particular instrument is illustrated and described on a separate page of this booklet.

Two methods of alignment are applicable. One utilizes a Cathode-Ray Oscillograph as a means of output indication and the other follows former procedure where a glow type indicator or meter is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural method, but each adjustment can be made with excellent precision. Both methods are hereinafter outlined so that alignment operations may be made according to the equipment available.

It is wise to determine the necessity for alignment as well as the direction of misalignment before making adjustments. The RCA Tuning Wand is an instrument designed particularly for such a purpose.

The Tuning Wand consists of a bakelite rod having a small brass cylinder at one end and a core of finely divided iron at the other. It may be inserted into a tuned coil while a signal of the normal resonant frequency is being supplied to such coil to obtain an indication of the tuning. Holes are provided at the top of the r-f shield cans for entrance of the Wand. The presence of either end of the Wand will cause a change in tuning which will be indicated at the receiver output as an increase or decrease in signal level. If there is a decrease of output when either end is inserted, the tuning is correct and will require no adjustment. However, should there be an increase of output due to the iron core and decrease with the brass cylinder, an increase in inductance or capacitance is indicated as necessary to bring the circuit into line. The trimmer involved should therefore be increased accordingly. If the brass cylinder end causes an increase in output while the iron end causes a decrease, reduction of inductance will be necessary to place the circuit in alignment. This is equivalent to decreasing the trimmer concerned. The following tabulation gives the various changes and the adjustments required:—

WAND	SIGNAL	TRIMMER
Brass	Decrease	None
Iron	Decrease	
Brass	Increase	Decrease
Iron	Decrease	
Brass	Decrease	Increase
Iron	Increase	

(1) CATHODE-RAY ALIGNMENT

Equipment

A standard source of the specified alignment frequencies is required. Such a source should consist of an RCA Full Range Oscillator, Stock No. 9595. Output indication should be by means of an RCA Stock No. 9545 Cathode-Ray Oscillograph. An RCA Stock No. 9558 Frequency Modulator will be needed to sweep the generated signal and synchronize it with the Oscillograph in order to make possible the visual representation of the resonant characteristic of the circuit being tuned on the cathode-ray fluorescent screen.

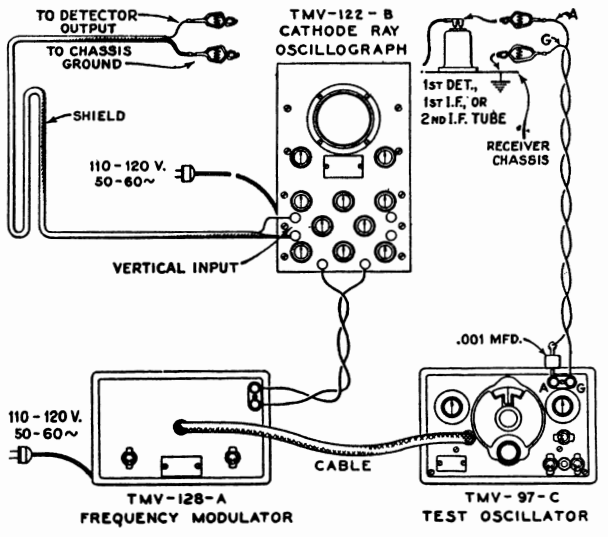


Figure 5—Alignment Apparatus Connections

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 6. Each must be aligned to a basic frequency of 460 kc. The last transformer must be aligned firstly and the first transformer aligned secondly. For such a process, it is necessary to feed the output of the Full Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each transformer and observing the effect at the second detector output on the Cathode-Ray Oscillograph. The proper point of connection of the Oscillograph is with its vertical "high" input terminal attached to the juncture of R-7, R-8 and R-9 as illustrated in Figure 6, and with the "0" or ground terminal to the chassis. The "Ext. Sync." terminals of the Oscillograph should be connected to the Frequency Modulator as shown by Figure 5. A .001 mfd. capacitor installed in series with the Oscillator "Ant." lead will prevent the voltages of the stage under alignment from becoming upset. The vertical "A" amplifier should be "On" for the ensuing adjustments and the gain control kept at its maximum position. For each adjustment, the Oscillator output need be regulated so that the image obtained on the Oscillograph screen will be of sufficient size as to be accurately observable. Proceed further as follows:—

(a) Place the receiver, Oscillograph and test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be picked up, shorting the antenna and ground terminals if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of the spot.

RCA MANUFACTURING CO., Inc.

C9-4 and T9-10

(b) Attach the output of the test Oscillator between the control grid cap of the RCA-6K7 i-f tube and chassis ground as shown typically by Figure 5. Tune the Oscillator to **460 kc.** and set its modulation switch to "On". Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give the desired number of cycles. Cause the image to stand still on the screen by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-29 and C-30 of the second i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.

(c) The Frequency Modulator should then be placed in operation and interconnected with the Full Range Oscillator by means of the special shielded patch cord. Figure 5 shows the proper arrangement. Set the Frequency Modulator sweep range switch to its "Lo" position and turn the Oscillator modulation switch to "Off". Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly coincident at their highest points. These curves will be found to occur at an Oscillator setting of *approximately 540 kc.* They will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirements and to make them remain motionless on the screen. This will require a setting of approximately ½ clockwise rotation of the frequency control. The trimmers C-29 and C-30 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.

(d) Leaving the equipment connected and adjusted as in (c), change the Oscillator output to the control grid cap of the RCA-6L7 first detector tube. Then adjust the first i-f transformer trimmers C-24 and C-25 so that the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the overall tuning characteristic of the i-f system. Each trimmer of the entire group should then be checked to assure that it is in correct alignment as indicated by the degree of coincidence and relative amplitude of the image on the Oscillograph screen.

R-F Trimmer Adjustments

Locations of the various antenna, detector and oscillator coil trimmers are shown by Figure 6. The test Oscillator should be removed from connection with the i-f system and its output connected to the antenna-ground terminals of the receiver. No changes are to be made in the connections of the Oscillograph at the second detector. During the following adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to such a procedure will obviate the broadness of tuning that would result from a.v.c. action on a stronger signal. Proceed with the adjustments as follows:—

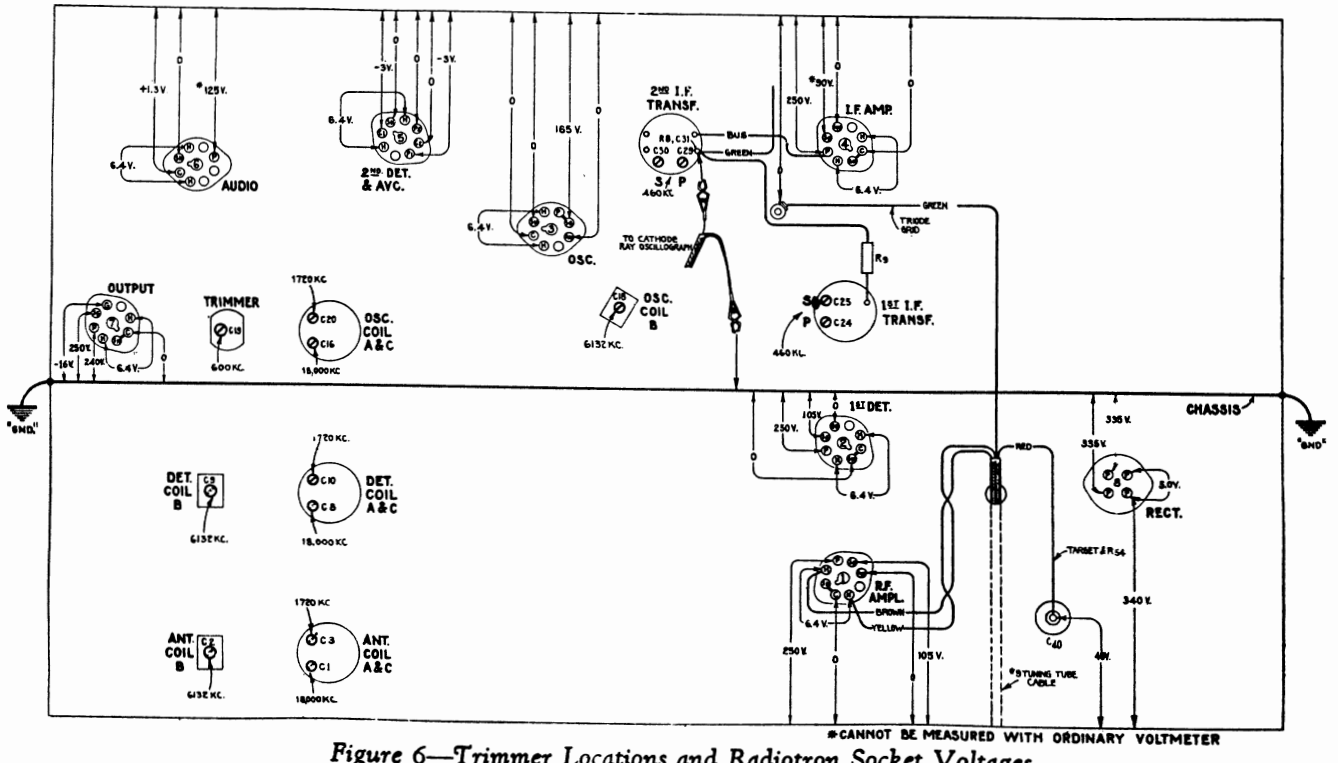


Figure 6—Trimmer Locations and Radiotron Socket Voltages
Measured at 115 volts A.C —No Signal—Volume Control Maximum

RCA MANUFACTURING CO., Inc.

MODELS C9-6 and T9-9

I.F. PEAK 460 KC

Radiotron and Coil Locations

Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

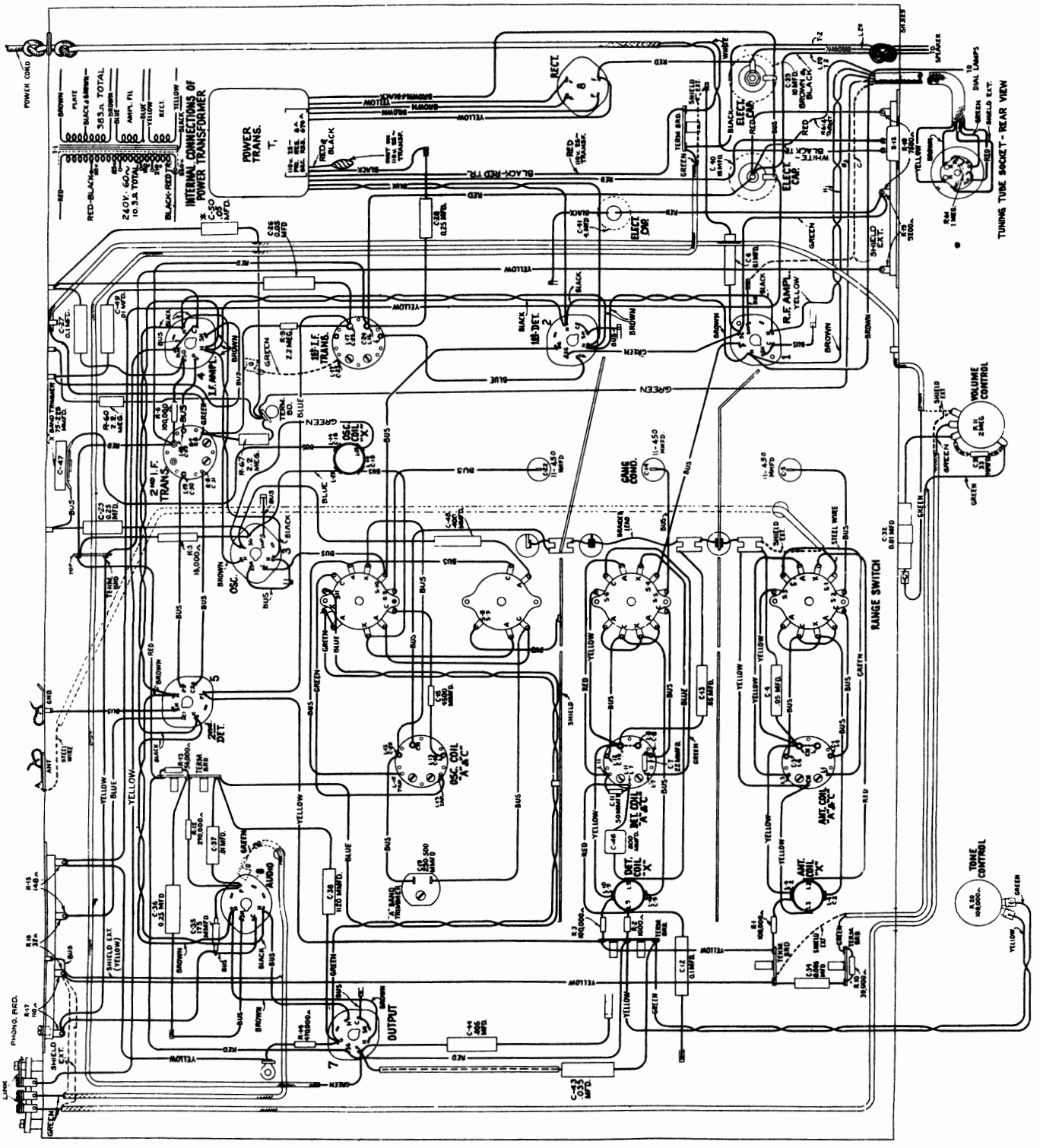
MODELS C9-6 and T9-9

Chassis Wiring Diagram

These two models each employ the same nine-tube chassis. The table model (T 9-9) uses an 8-inch dynamic speaker and the console model (C 9-6) uses an improved 12-inch dynamic speaker.

ALIGNMENT FREQUENCIES

Band X .....150 kc. (osc.), 400 kc. (osc., ant., det.)
Band A ....600 kc. (osc.), 1,720 kc. (osc., ant., det.)
Band C .....18,000 kc. (osc., ant., det.)



RCA MANUFACTURING CO., Inc.

Model T9-7

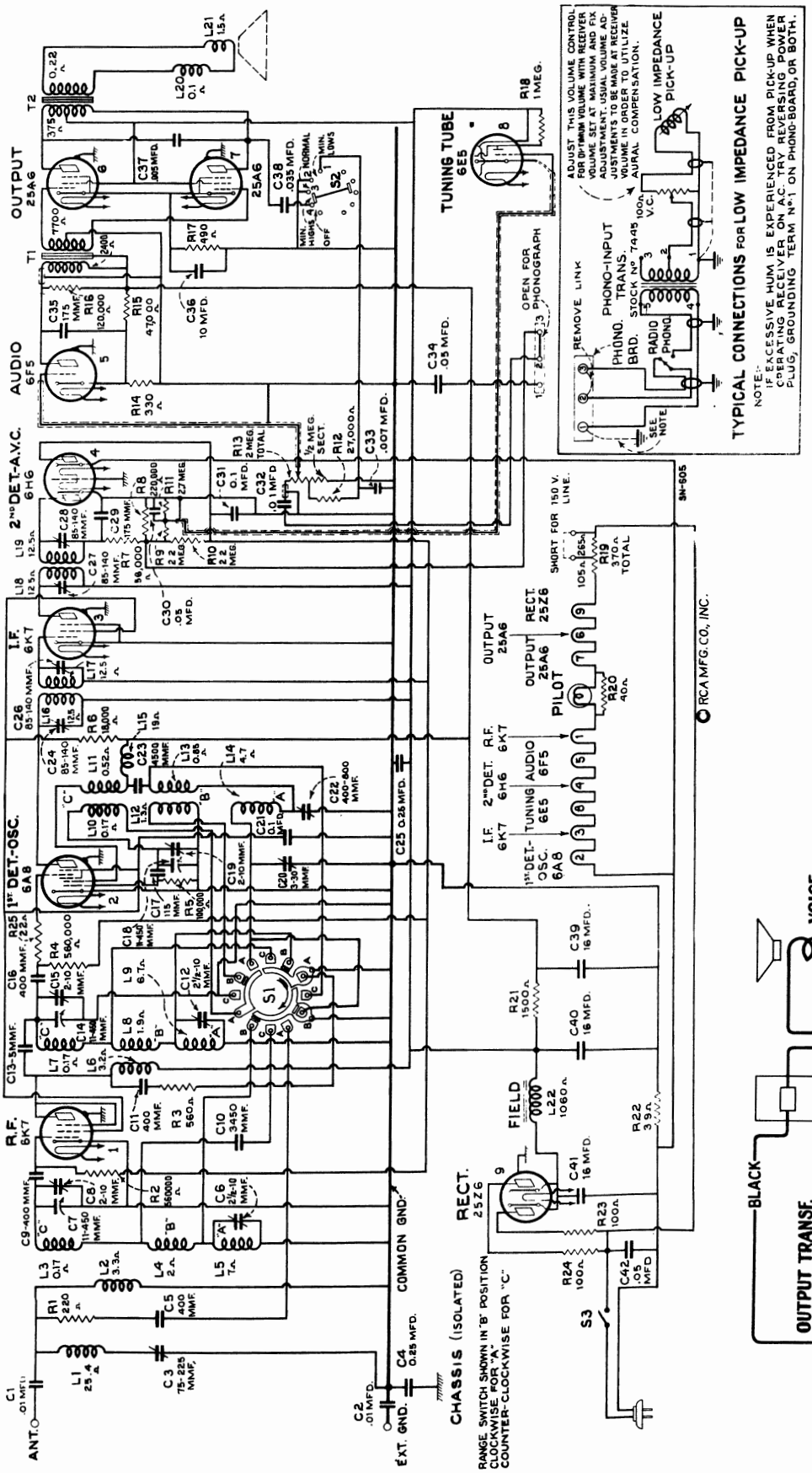


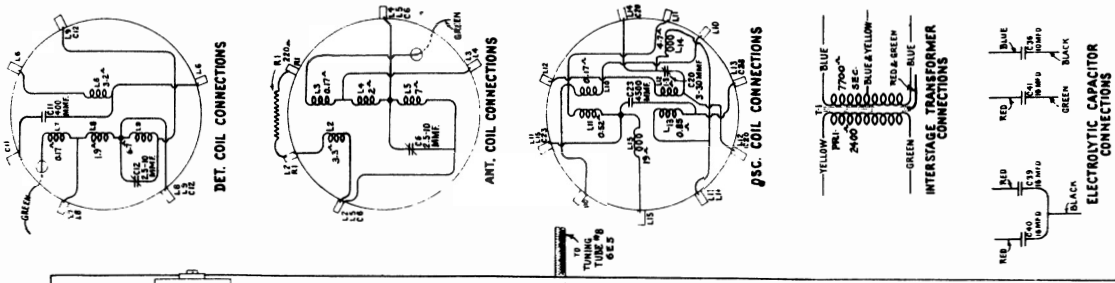
Figure 5—Loudspeaker Wiring

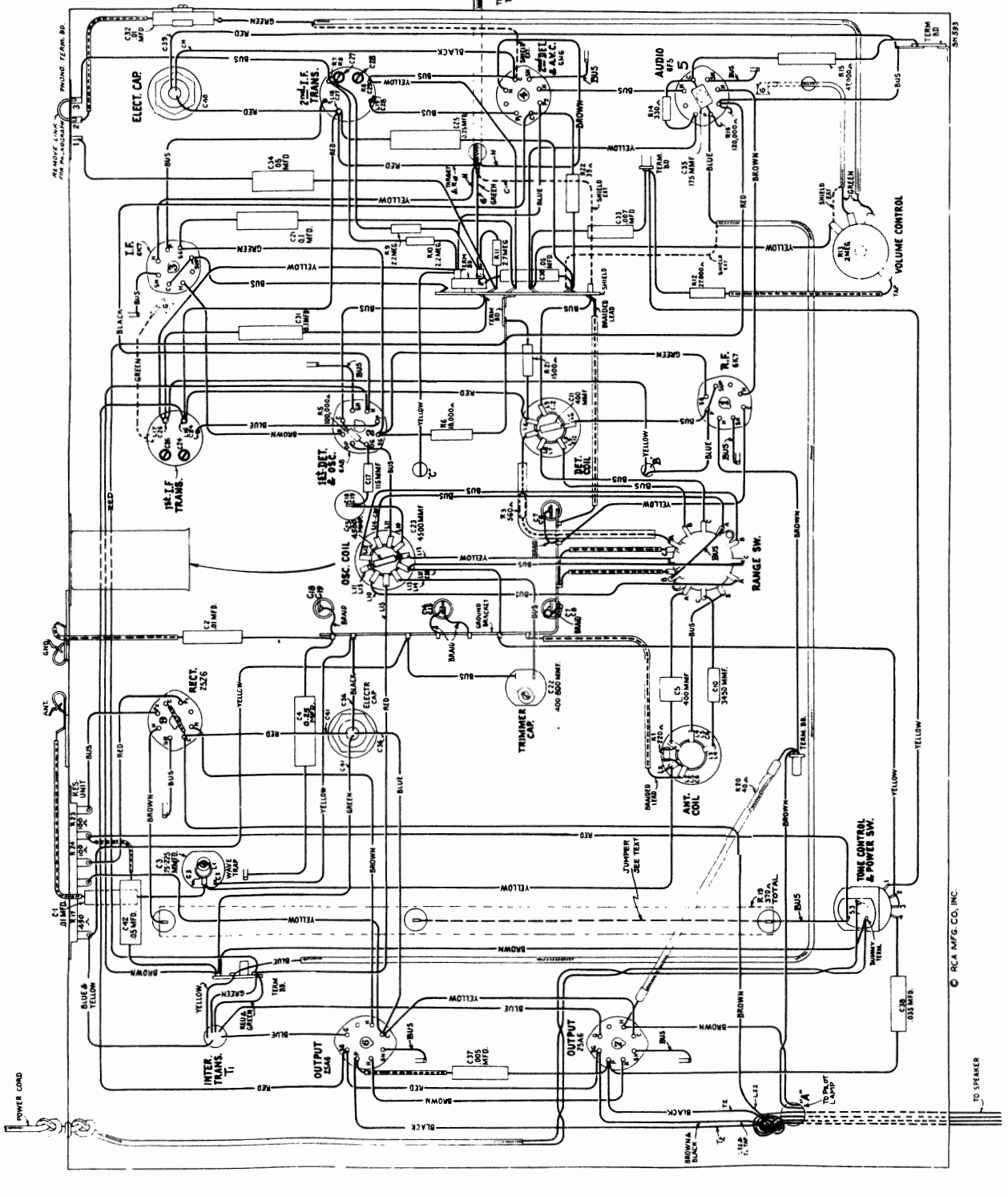
Wave Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.

RCA MANUFACTURING CO., Inc.

Model T9-7





Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model T9-7

NOTES

Beat notes or heterodyning (whistles) may be encountered in some instances on these receivers due to excessive antenna capacitance. This condition may be corrected by reducing the size of the antenna or by inserting a 150 mmfd. capacitor in series with the antenna lead at the antenna terminal. Interference in the form of "beats" from a combination of local stations may frequently be remedied by tuning the wave trap to one of the interfering stations. The wave trap will tune from approximately 375 kc. to 700 kc.

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts, grid caps, resistors, and terminals to –B ground bracket on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. These voltages were measured with set tuned to approximately 900 kc. (Band A); no signal being received, and volume control setting optional. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, and 250 volts. Voltages below 10 read on 10-volt scale, between 10 and 50 on 50-volt scale, and between 50 and 250 on 250-volt scale. A-C voltages were measured with a corresponding a-c meter.

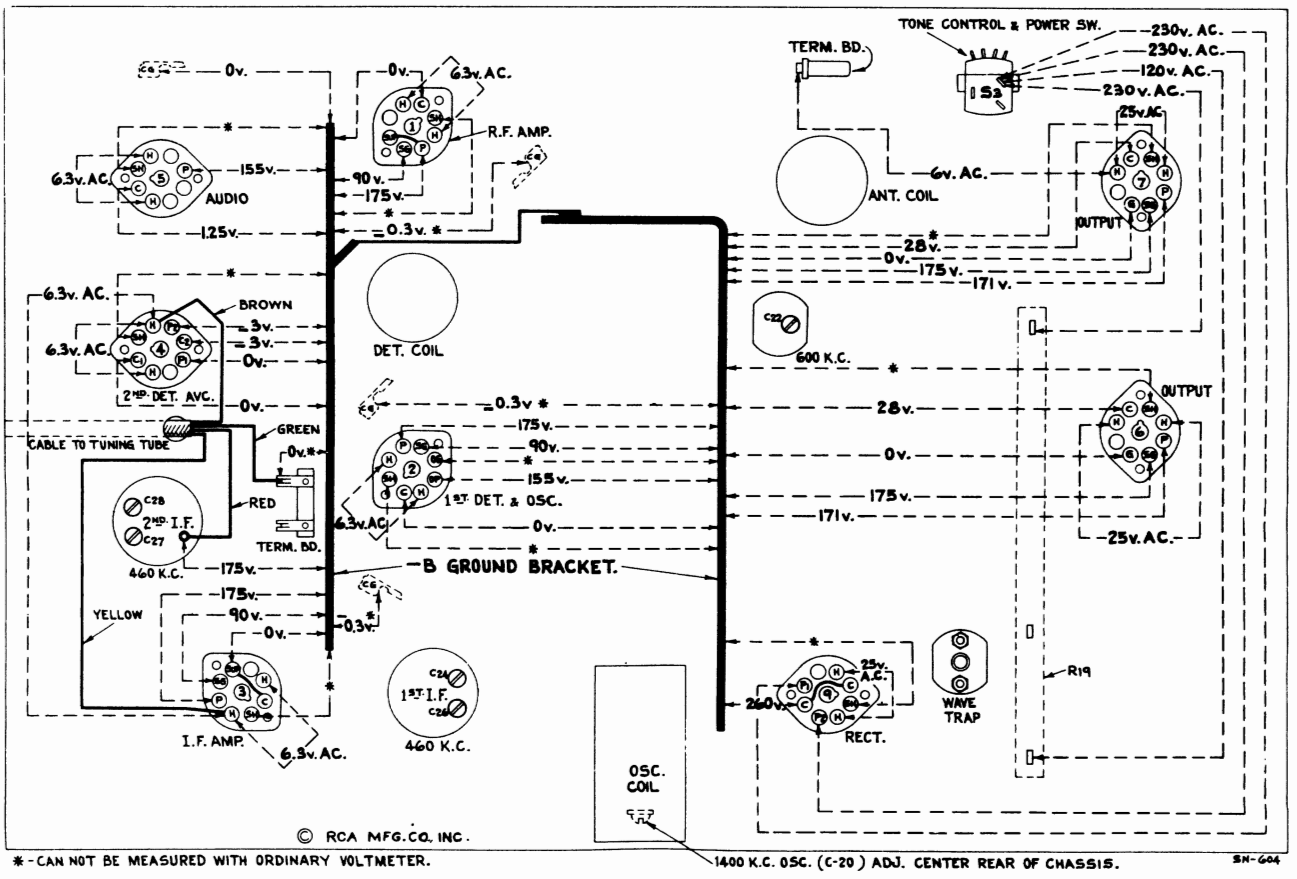


Figure 4—Radiotron Socket Voltages

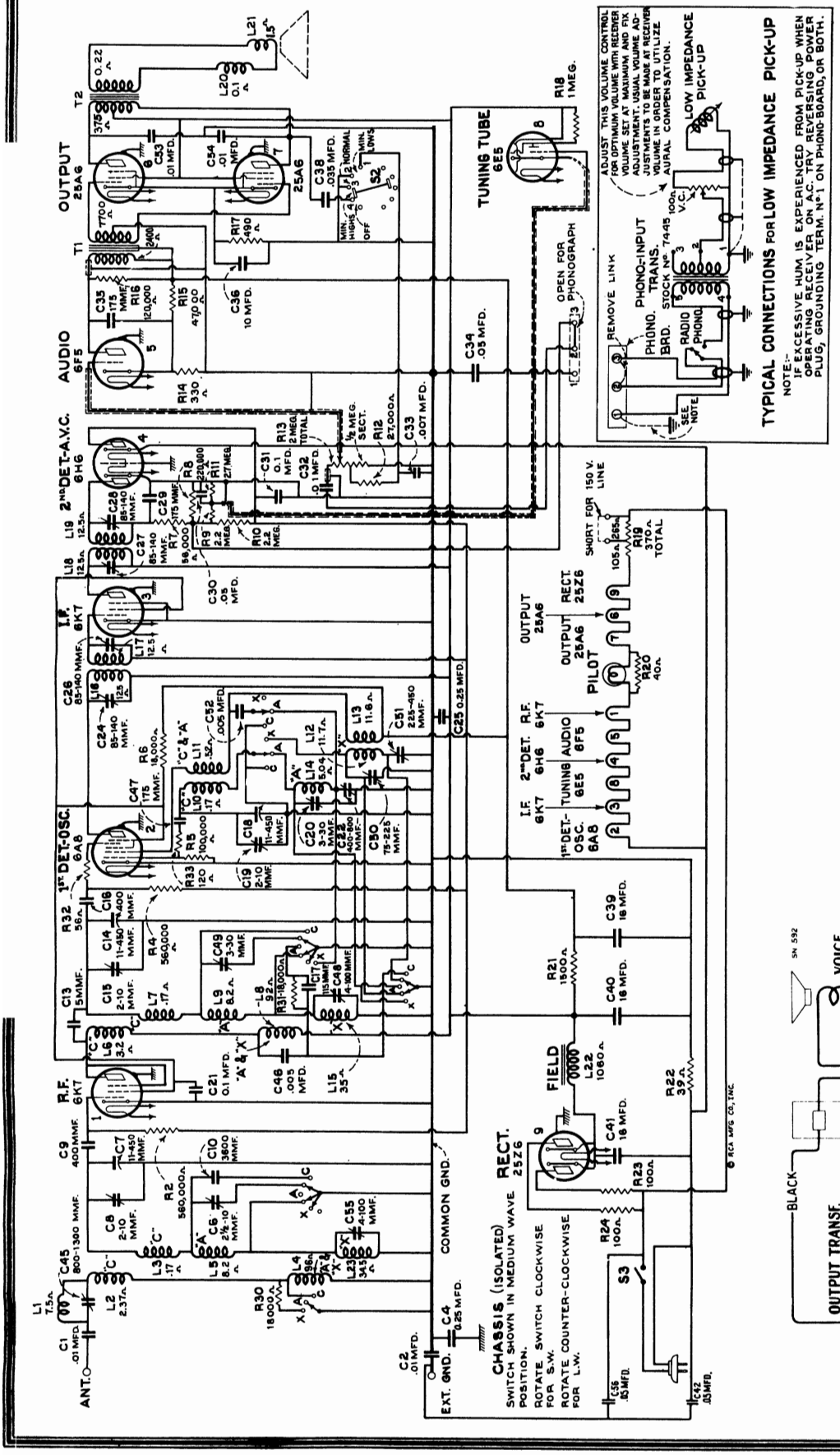
Measured at 230 volts, 60-cycle supply

Tuned to approximately 900 kc. (Band A)—No signal being received—Volume control setting optional

For 160-volt, 60-cycle supply, 30% lower; for 230-volt d-c supply, 13% lower; for 160-volt d-c supply, 35% lower

RCA MANUFACTURING CO., Inc.

Model T9-8



Loudspeaker Wiring

Wave-Trap Adjustment

With the receiver in operation using its normal antenna, tune station selector to the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference.

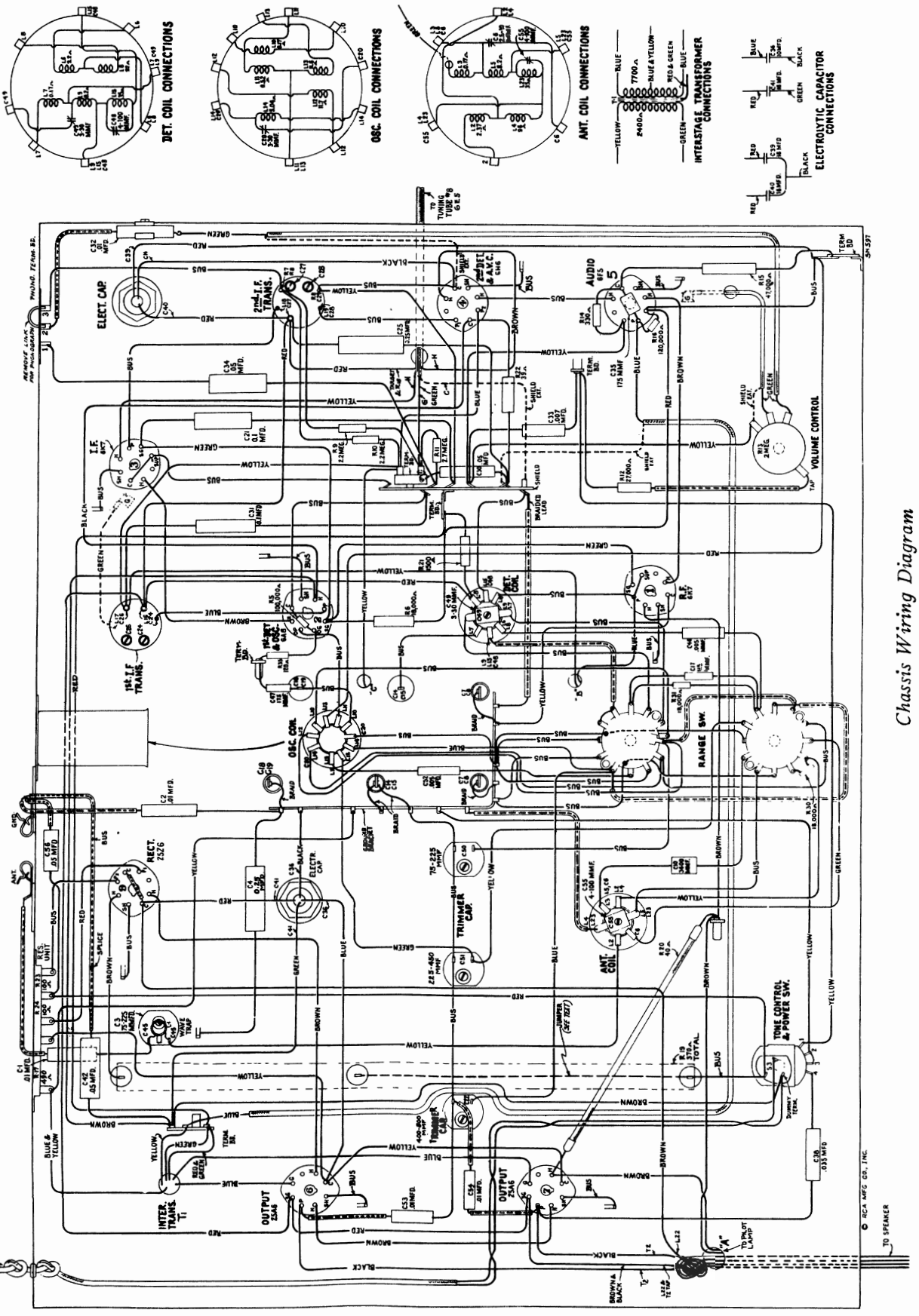
ALIGNMENT FREQUENCIES

Band X....180 kc. (osc.), 300 kc. (osc., det., ant.)
Band A.....600 kc. (osc.), 1,400 kc. (osc., det., ant.)
Band C.....18,000 kc. (osc., det., ant.)

I.F. Peak
460 K.C.

RCA MANUFACTURING CO., Inc.

Model T9-8



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model T9-8

NOTE: (Power Supply Rating) As shipped from the factory, all instruments are connected for operation on a 200-250-volt supply line. They may be converted for operation at 140-160 volts by connecting a jumper between points shown by dotted line on resistor R-19, Figures 2 and 3.

NOTE: On a-c and d-c circuits of 160 volts or less, the action of the "Magic Eye" will be limited.

CAUTION: Grid caps, tuning condenser, and resistor on top of chassis may be "hot" with respect to external ground, and should be avoided when servicing, unless due precautions are taken.

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts, grid caps, resistors, and terminals to –B ground bracket on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within ±20% when the receiver is normally operative at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. These voltages were measured with set tuned to approximately 900 kc. (Band A); no signal being received, and volume control setting optional. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, and 250 volts. Voltages below 10 read on 10-volt scale, between 10 and 50 on 50-volt scale, and between 50 and 250 on 250-volt scale. A-C voltages were measured with a corresponding a-c meter.

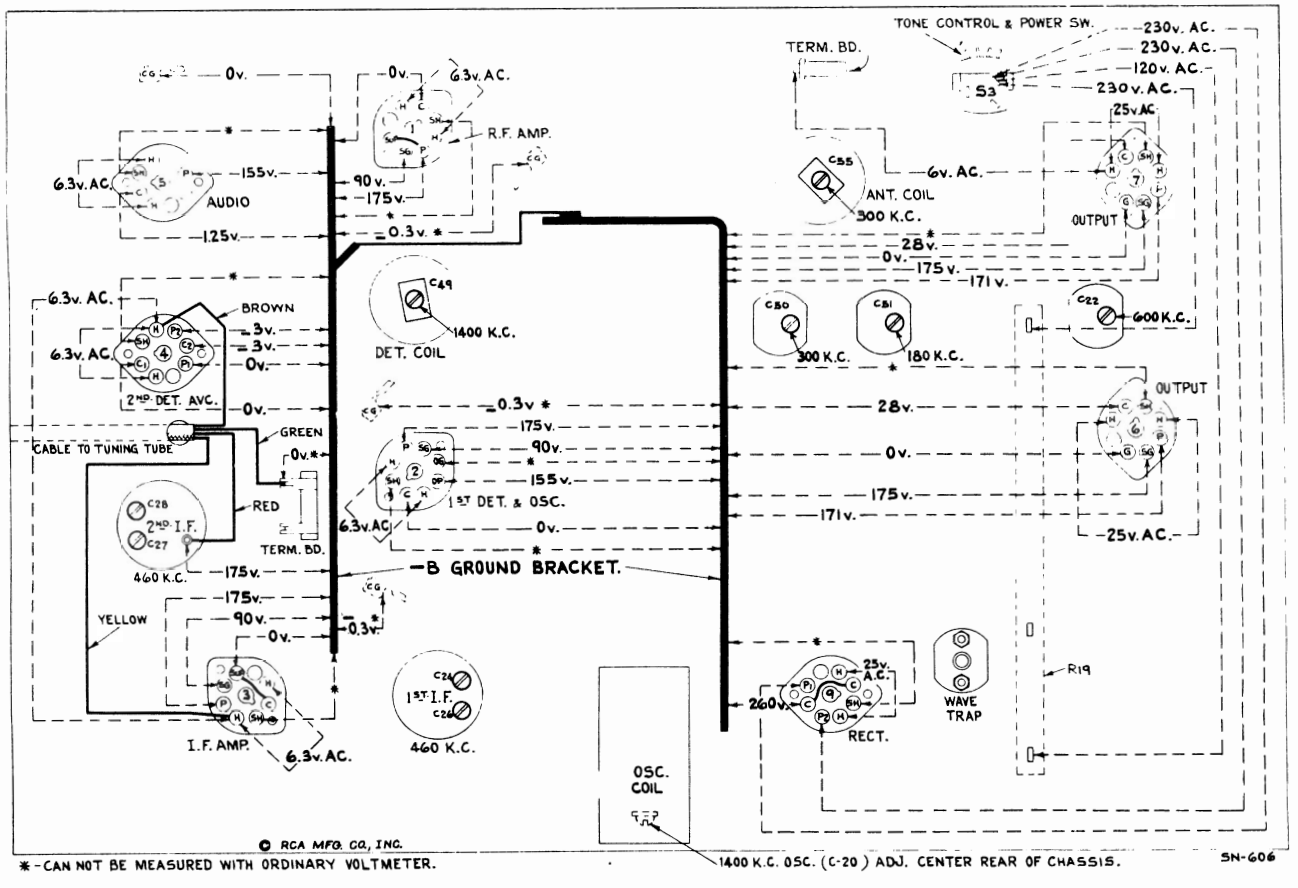


Figure 4—Radiotron Socket Voltages

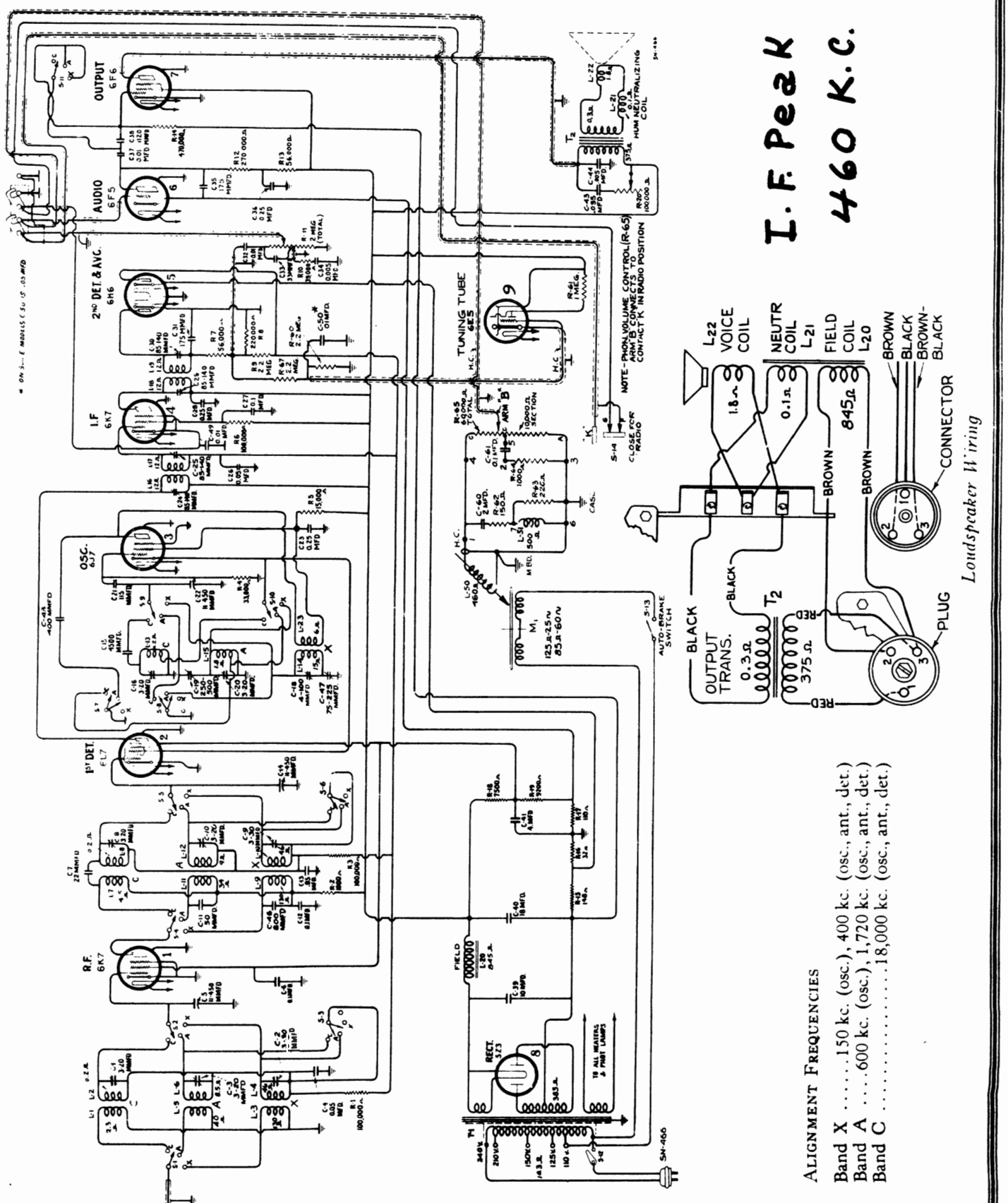
Measured at 230 volts, 60-cycle supply

Tuned to approximately 900 kc. (Band A)—No signal being received—Volume control setting optional

For 160-volt, 60-cycle supply, 30% lower; 230-volt d-c supply, 13% lower; 160-volt d-c supply, 35% lower.

RCA MANUFACTURING CO., Inc.

Model D9-19



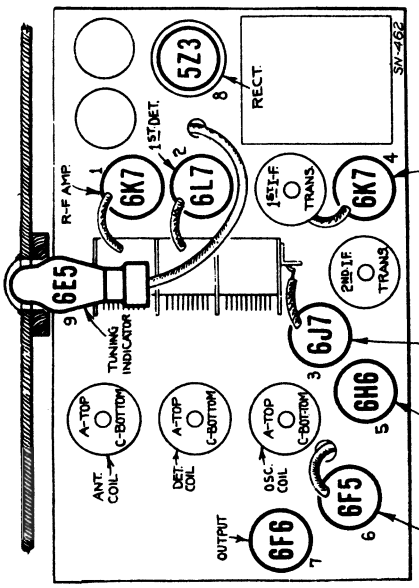
Loudspeaker Wiring

ALIGNMENT FREQUENCIES

Band X .....150 kc. (osc.), 400 kc. (osc., ant., det.)
Band A .....600 kc. (osc.), 1,720 kc. (osc., ant., det.)
Band C .....18,000 kc. (osc., ant., det.)

RCA MANUFACTURING CO., Inc.

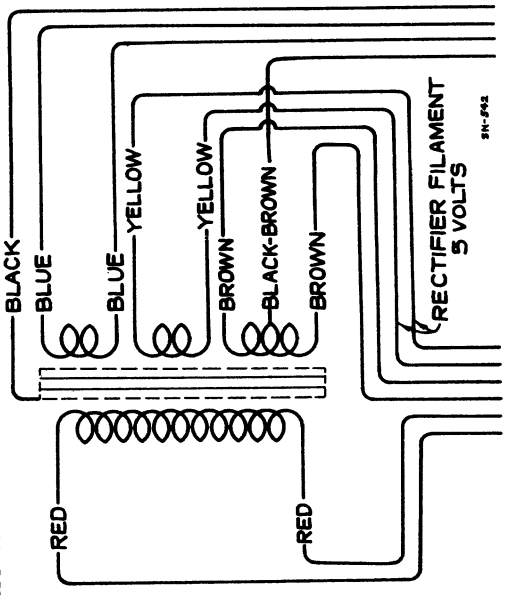
Model 19-19



Radiotron and Coil Locations

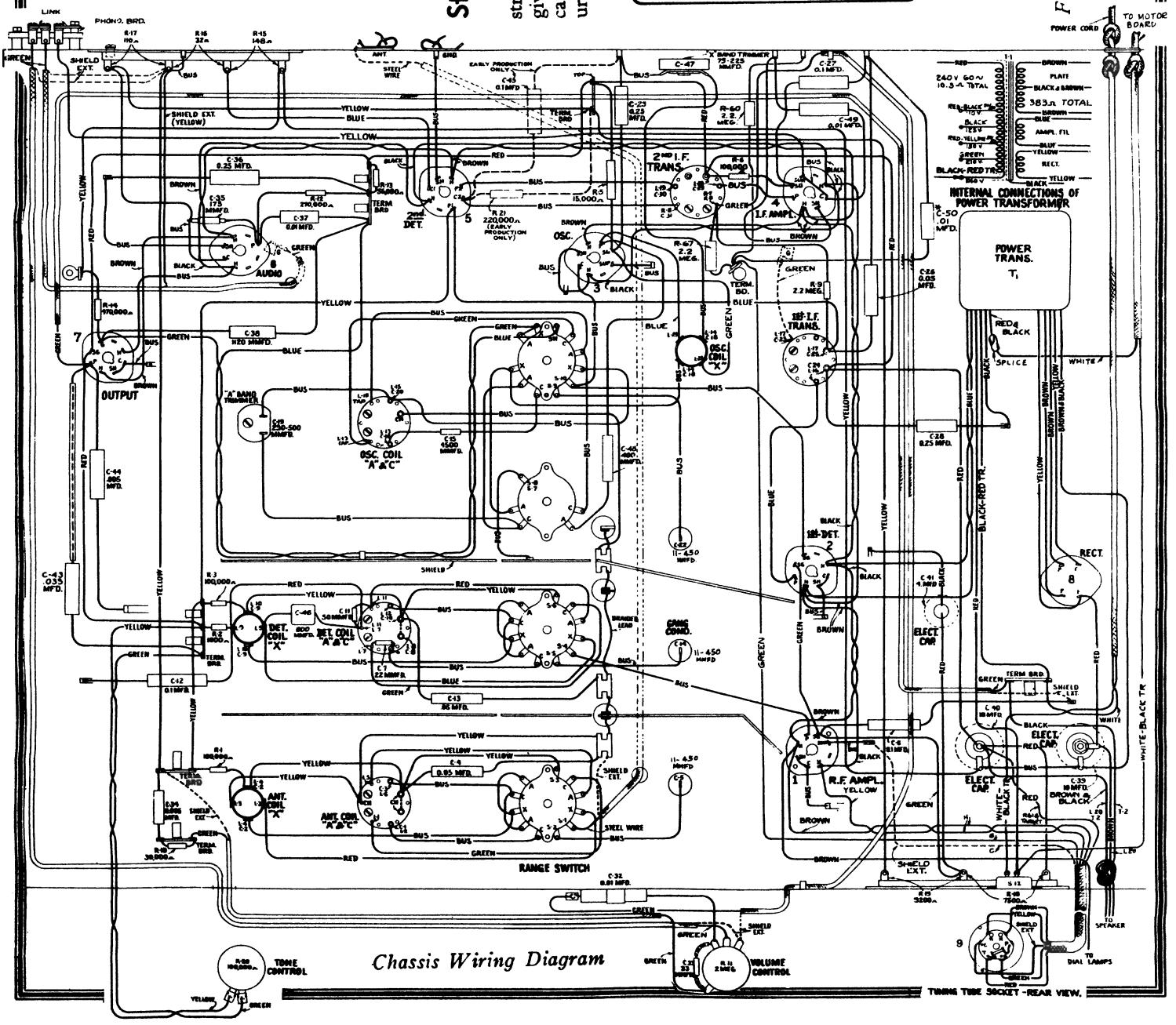
Standard Transformer

The transformer used on some models of this instrument is adaptable for voltages and frequencies as given under Ratings A and B of Electrical Specifications. Its schematic and wiring are shown by Figure 7.



Prl. Res.—8.0 ohms, total
Sec. Res.—4170 ohms, total

Figure 7—Standard Power Transformer Connections



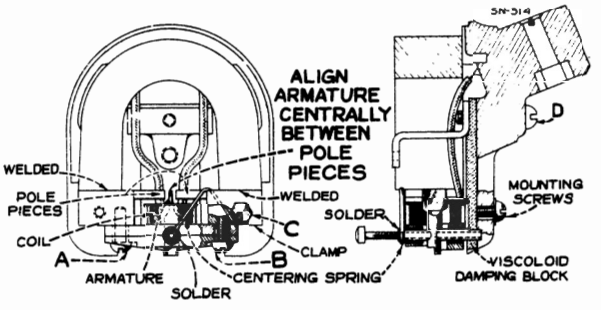
Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

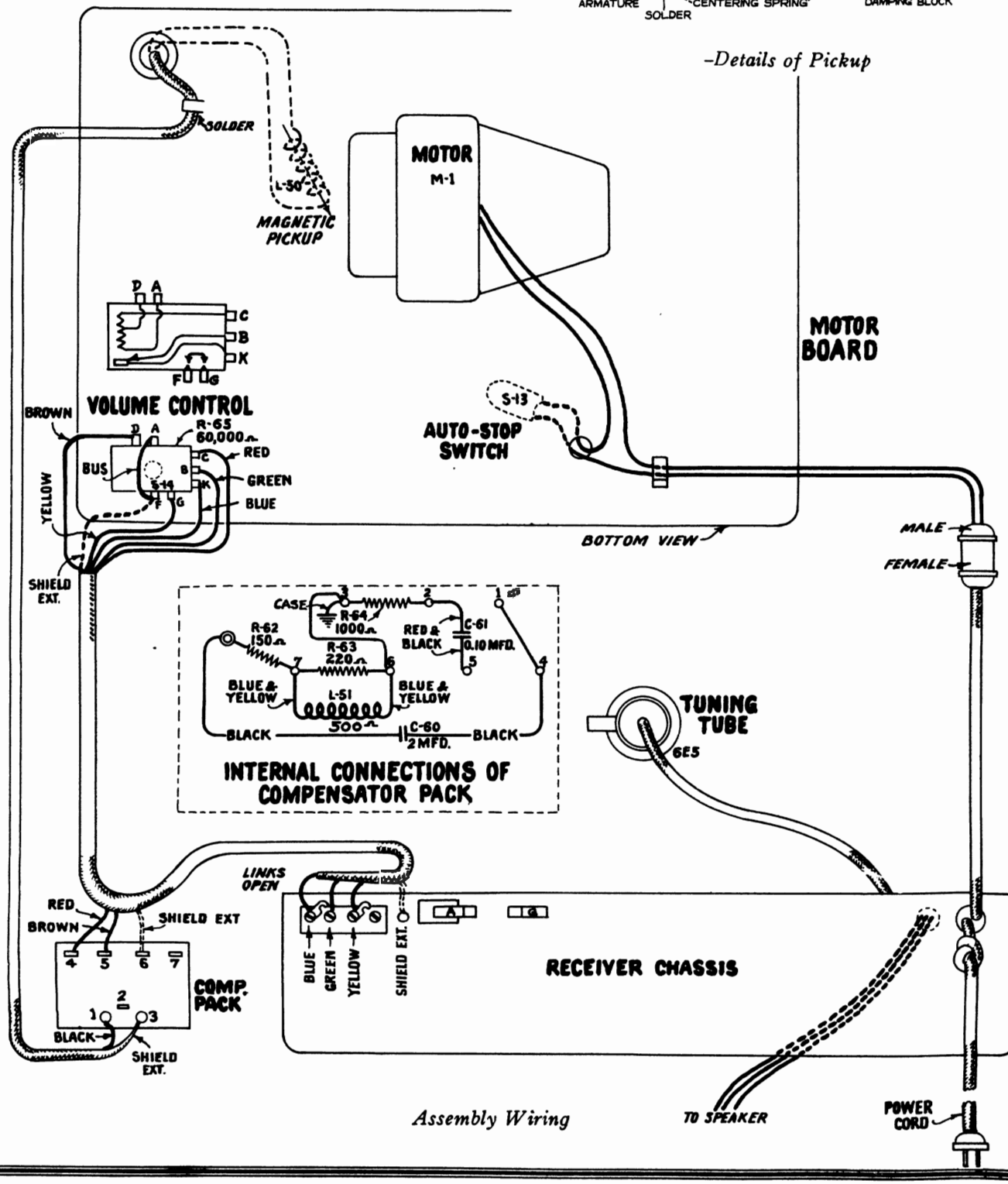
Model D9-19

Centering Armature

Refer to Figure 10 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed, the screws **A**, **B**, and **C** should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them.



-Details of Pickup



Assembly Wiring

RCA MANUFACTURING CO., Inc.

Model D9-19

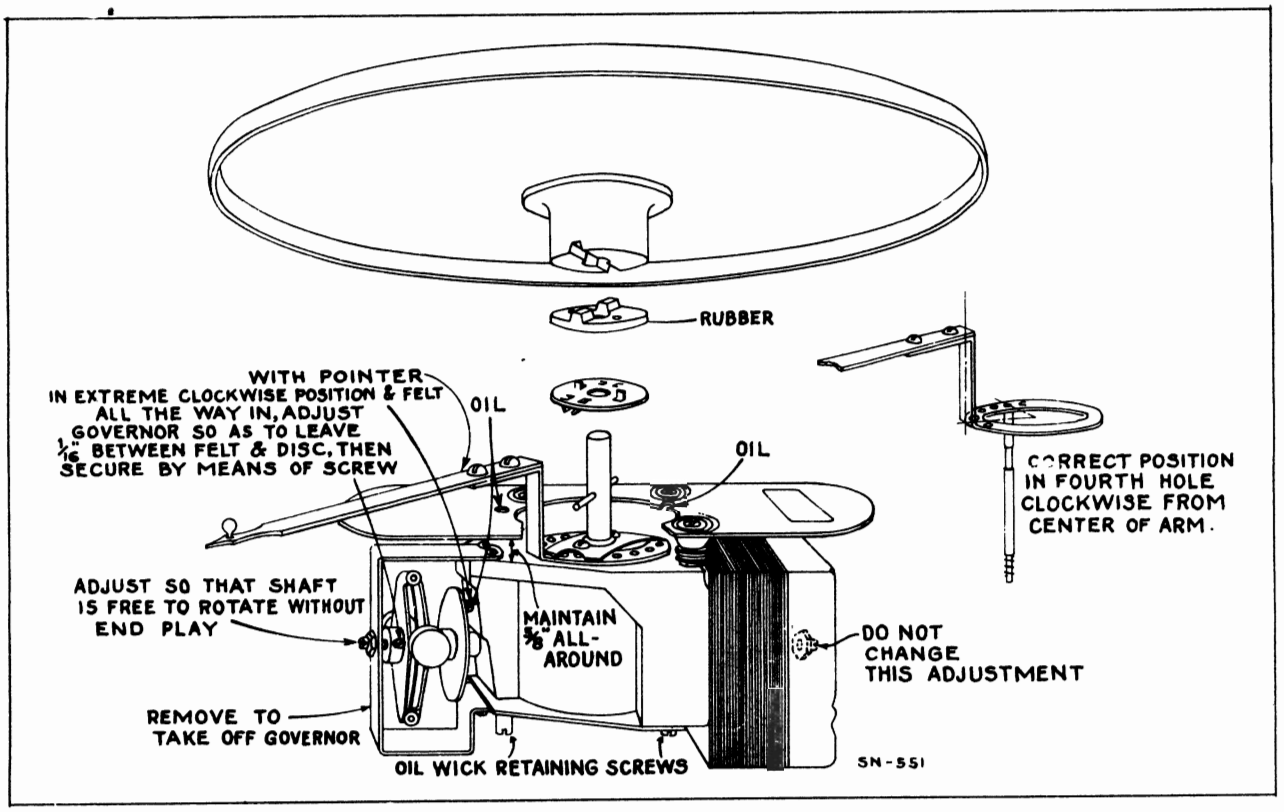
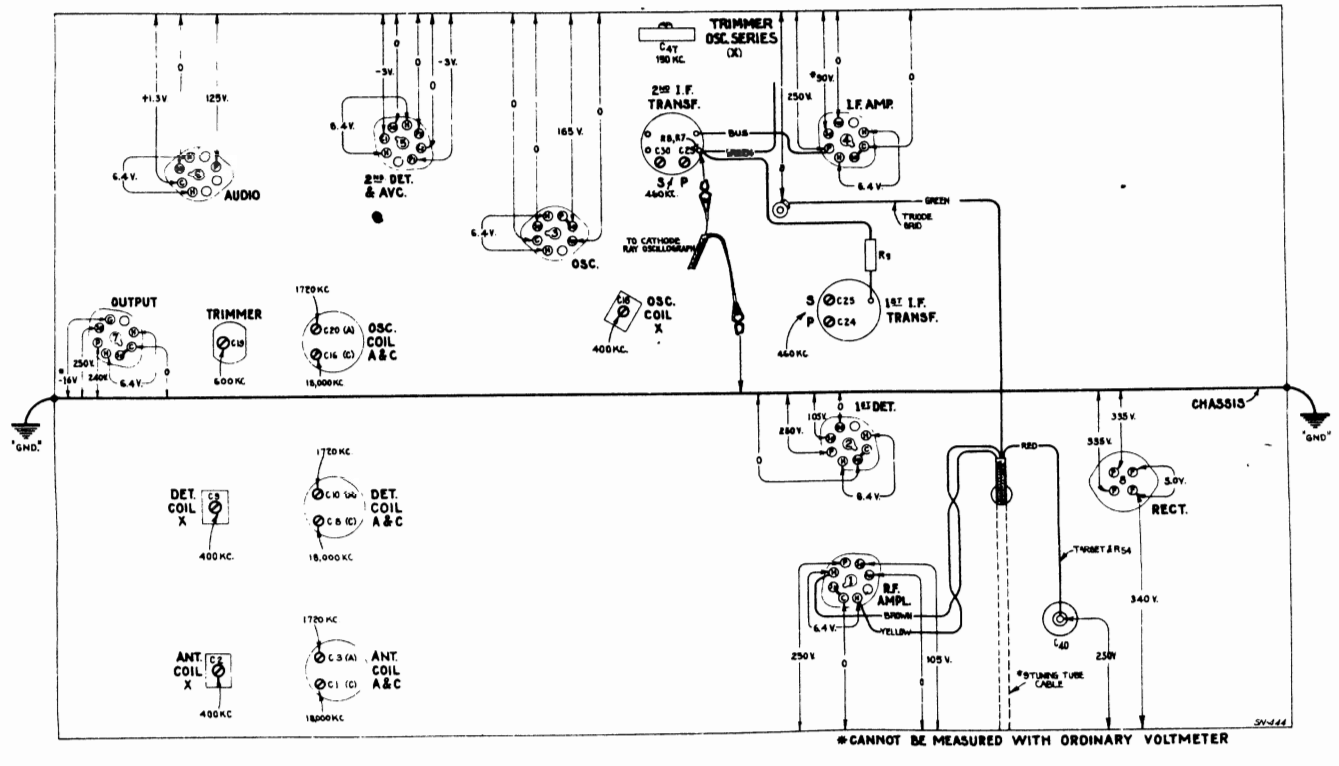


Figure 9—Motor Details

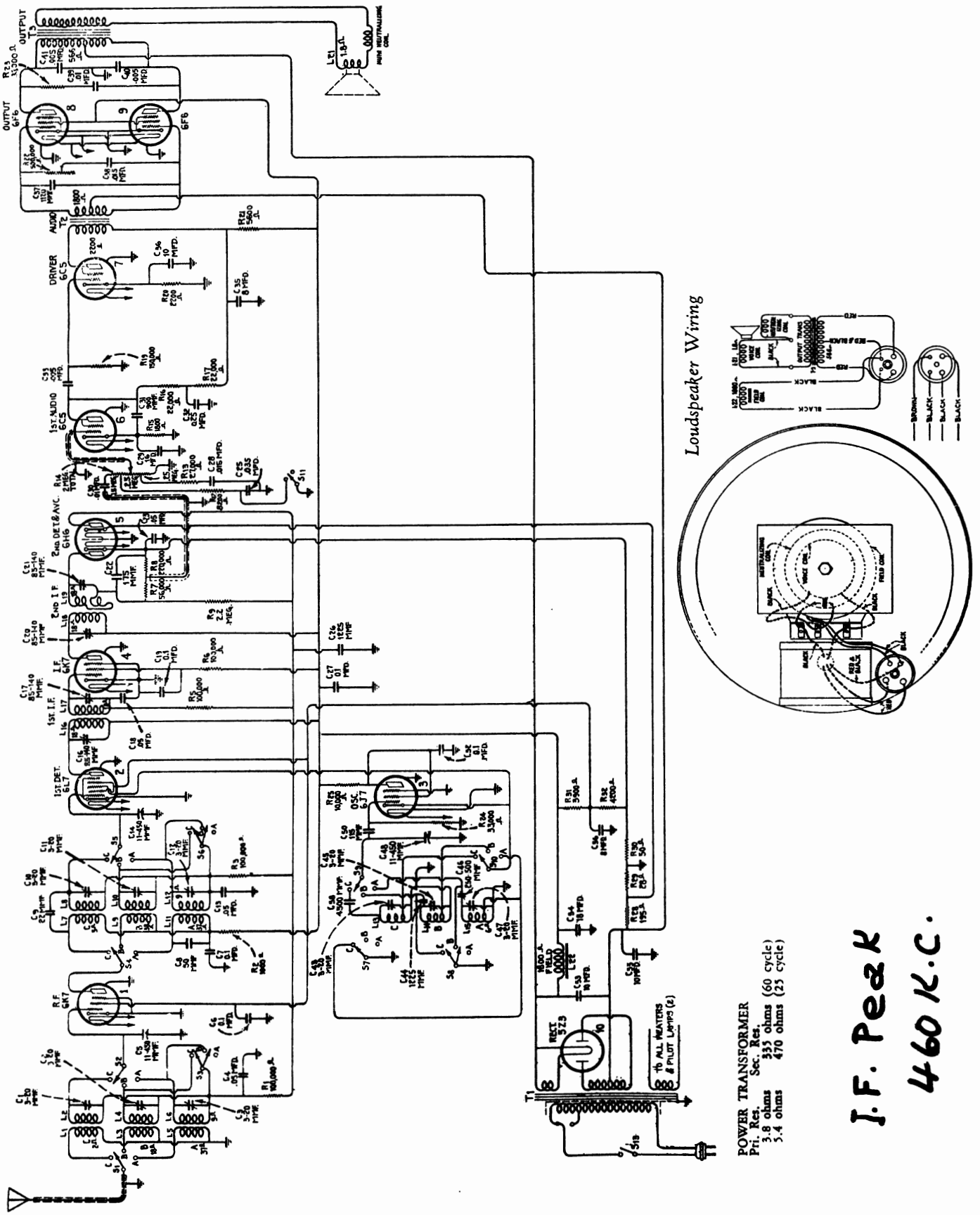


Radiotron Socket Voltages

Measured at 115 volts, 60 cycle supply—No signal being received

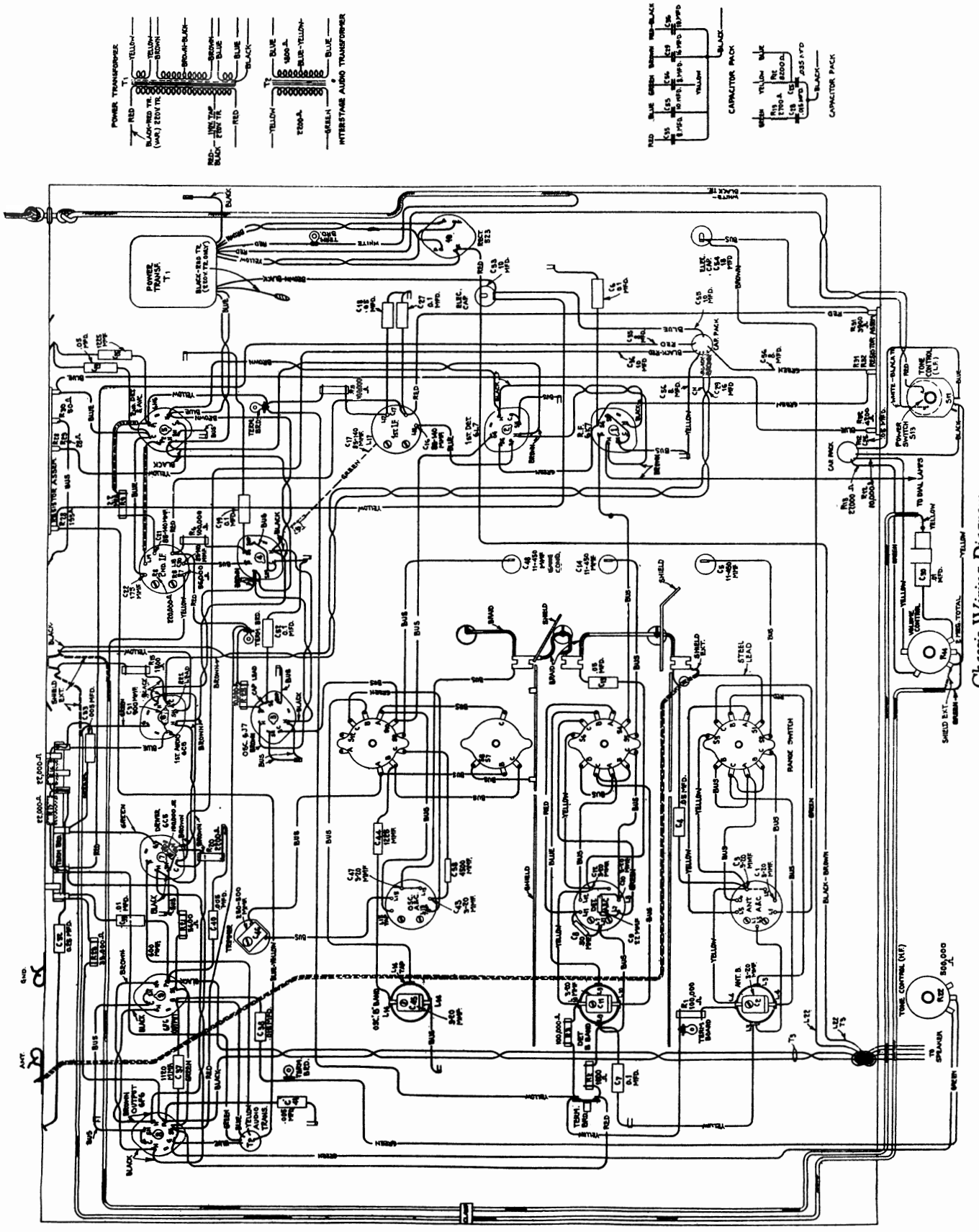
RCA MANUFACTURING CO., Inc.

Model T10-1



RCA MANUFACTURING CO., Inc.

Model T10-1


POWER TRANSFORMER
INTERSTAGE AUDIO TRANSFORMER
CAPACITOR PACK
CAPACITOR PACK
POWER TRANSF. T1
CAR PACK
TONE CONTROL (L.F.)
POWER SWITCH S15
VOLUME CONTROL
TONE CONTROL (H.F.)
TO SPEAKER
TO DIAL LAMPS
RANGE SWITCH
STEEL LEAD
SHIELD EXT.
1ST DET. 6A7
OSC. 6J7
1ST I.F.
2ND I.F.
DET. & 1ST A.F. 6Q7
OUTPUT 6F6
ANT. & A.A.C.
OSC. & BAND
ANT. B.
DET. & BAND
TERM. BRD.
TERM. BRD.
TERM. BRD.

RCA MANUFACTURING CO., Inc.

Model T10-1

Universal Transformer

The transformer used on some models of this receiver is adaptable to several ranges of voltage as given under Rating C of Electrical Specifications. Its schematic and wiring are shown by Figure 7. Terminals are provided at the top of the transformer case for changing the primary connections to suit the voltage being used. Note that a 110 volt tap is brought out separately for supplying a phonograph motor.

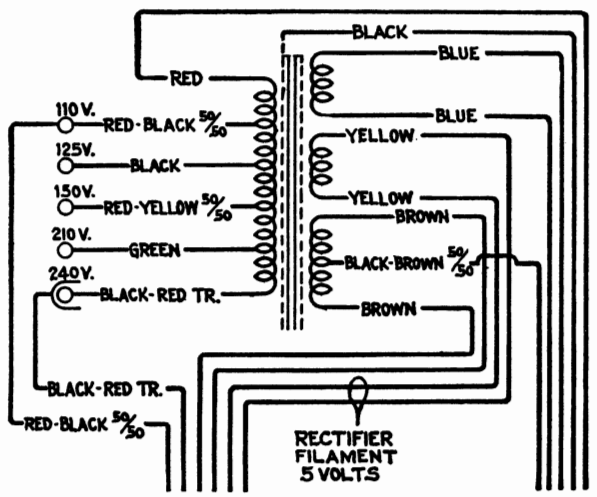


Figure 7—Universal Power Transformer Connections

Pri. Res.—7.42 ohms, total
Sec. Res.—274 ohms, total

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to chassis on Figure 6 will serve to assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

Alignment Frequencies

Band A.....600 kc. (osc.), 1720 kc. (osc., ant., det.)
Band B.....6132 kc. (osc., ant., det.)
Band C.....18,000 kc. (osc., ant., det.)

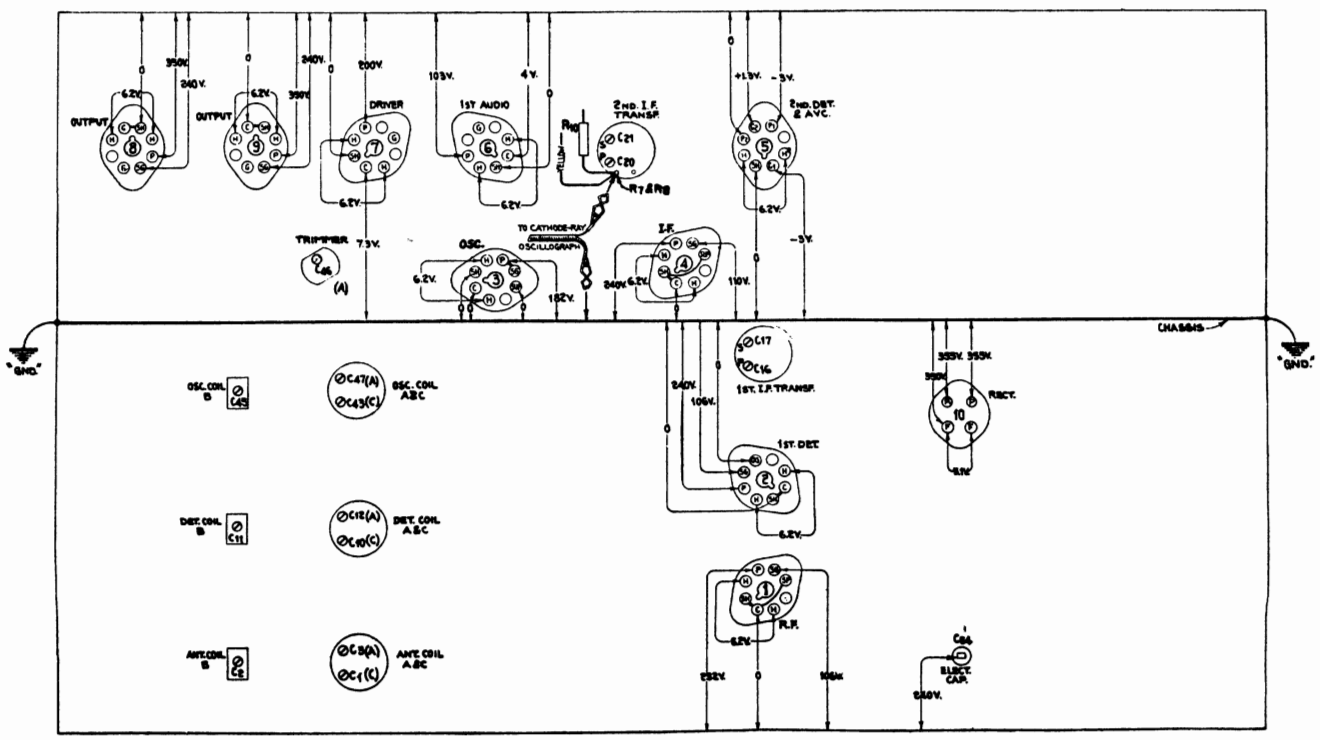


Figure 6—Trimmer Locations and Radiotron Socket Voltages
Measured at 115 Volts A.C.—No Signal—Volume Control Maximum

(Control grid bias on tubes No. 7 and 8 is —20 volts)

RCA MANUFACTURING CO., Inc.

Model T10-1

Alignment Procedure

Ten alignment trimmers are provided in the r-f, first detector and oscillator tuning system and four are used in the i-f system. All of these are accurately adjusted during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or have been altered by other means. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for alignment of this particular instrument is illustrated and described on a separate page of this booklet.

Two methods of alignment are applicable. One utilizes a Cathode-Ray Oscillograph as a means of output indication and the other follows former procedure where a glow type indicator or meter is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural method, but each adjustment can be made with definite precision. Both methods are hereinafter outlined so that alignment operations may be made according to the equipment available.

It is wise to determine the necessity for alignment as well as the direction of misalignment before making adjustments. The RCA Tuning Wand is an instrument designed particularly for such a purpose.

The Tuning Wand consists of a bakelite rod having a small brass cylinder at one end and a core of finely divided iron at the other. It may be inserted into a tuned coil while a signal of the normal resonant frequency is being supplied to such coil to obtain an indication of the tuning. Holes are provided at the top of the r-f shield cans for entrance of the Wand. The presence of either end of the Wand will cause a change in tuning which will be indicated at the receiver output as an increase or decrease in signal level. If there is a decrease of output when either end is inserted, the tuning is correct and will require no adjustment. However should there be an increase of output due to the iron core and decrease with the brass cylinder, an increase in inductance or capacitance is indicated as necessary to bring the circuit into line. The trimmer involved should therefore be increased accordingly. If the brass cylinder end causes an increase in output while the iron end causes a decrease, reduction of inductance will be necessary to place the circuit in alignment. This is equivalent to decreasing the trimmer concerned. The following tabulation gives the various changes and the adjustments required:—

WAND	SIGNAL	TRIMMER
Brass	Decrease	None
Iron	Decrease	
Brass	Increase	Decrease
Iron	Decrease	
Brass	Decrease	Increase
Iron	Increase	

CATHODE-RAY ALIGNMENT

Equipment

A standard source of alignment frequencies is required. Such a source should consist of an RCA Full Range Oscillator, Stock No. 9595. Output indication should be by means of an RCA Stock No. 9545 Cathode-Ray Oscillograph. An RCA Stock No. 9558 Frequency Modulator will be needed to sweep the generated signal and synchronize it with the Oscillograph in order to obtain visual representation of the resonant characteristic of the circuit being tuned on the cathode-ray fluorescent screen.

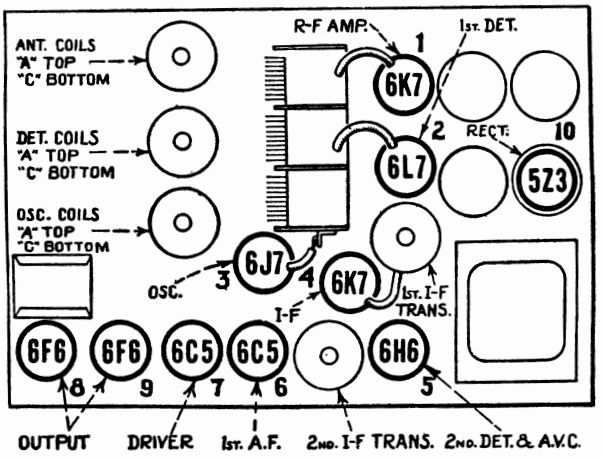


Figure 4—Coil and Radiotron Locations

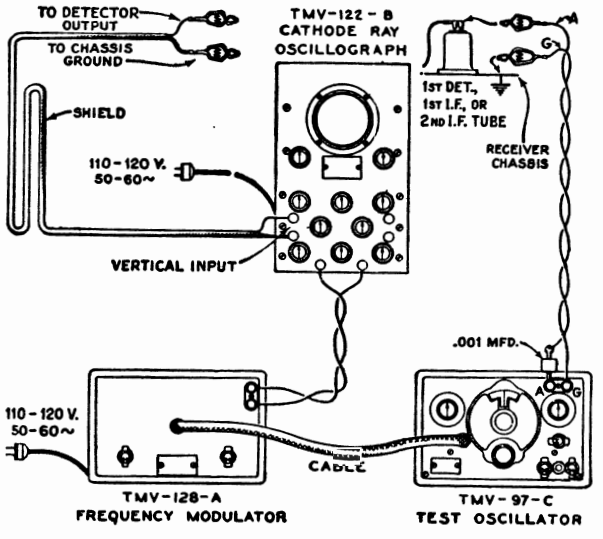


Figure 5—Alignment Apparatus Connections

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 6. Each must be aligned to a basic frequency of **460 kc.** The last transformer must be aligned firstly and the first transformer aligned secondly. For such a process, it is necessary to feed the output of the Full Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each transformer and observing the effect at the second detector output on the Cathode-Ray Oscillograph. The proper point of connection of the Oscillograph is with its vertical "high" input terminal attached to the juncture of R-7 and R-8, as illustrated in Figure 6, and with the "0" or ground terminal to the chassis. The "Ext. Sync." terminals of the Oscillograph should be

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Model T10-1
Alignment Proceedure (cont'd)

connected to the Frequency Modulator as shown by Figure 5. A .001 mfd. capacitor installed in series with the Oscillator "Ant." lead will prevent the voltages of the stage under alignment from becoming upset. The vertical "A" amplifier should be "On" for the ensuing adjustments and its gain control kept at maximum. For each adjustment, the Oscillator output must be regulated so that the image obtained on the Oscillograph screen will be of the minimum size convenient for accurate observation. Proceed further as follows:—

(a) Place the receiver, Oscillograph and test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be encountered from signal pickup or from the RCA-6J7 oscillator, removing the tube if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of spot.

(b) Attach the output of the test Oscillator between the control grid cap of the RCA-6K7 i-f tube and chassis ground as shown typically by Figure 5. Tune the Oscillator to **460 kc.** and set its modulation switch to "On." Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give a shape which is convenient for peak indications. Cause the image to stand still on the screen by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-20 and C-21 of the second i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.

(c) The Frequency Modulator should then be placed in operation and interconnected with the Full Range Oscillator by means of the special shielded patch cord. Figure 5 shows the proper arrangement. Set the Frequency Modulator sweep range switch to its "Lo" position and turn the Oscillator modulation switch to "Off." Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly coincident at their highest points. This condition will be found to occur at an Oscillator setting of *approximately 540 kc.* The curves will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirement and to make them remain motionless on the screen. This will require a setting of approximately ½ clockwise rotation of the frequency control. The trimmers C-20 and C-21 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.

(d) Leaving the equipment connected and adjusted as in (c), change the Oscillator output to the control grid cap of the RCA-6L7 first detector tube. Then adjust the first i-f transformer trimmers C-16 and C-17 so that the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the overall tuning characteristic of the i-f system.

R-F Trimmer Adjustments

Locations of the various antenna, detector and oscillator coil trimmers are shown by Figure 6. The test Oscillator should be removed from connection with the i-f system and its output connected to the antenna-ground terminals of the receiver. No changes are to be made in the connections of the Oscillograph at the second detector. During the following adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to this procedure will obviate the broadness of tuning that would result from a.v.c. action on a stronger signal. Proceed with the adjustments as follows:—

Calibration

Set the receiver range switch to Band A and rotate the station selector until the tuning condenser plates are in full mesh (maximum capacitance). Then move the main dial pointer until it points exactly to the horizontal line at the low frequency end of the Band A scale. Correct the setting of the vernier second hand pointer to read zero.

Band A

(a) With the receiver range switch in its Band A position, tune the station selector until the dial pointer is at a reading of **1720 kc.** Adjust the test Oscillator to **1720 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output to produce a registration on the Oscillograph. Carefully align the oscillator, detector and antenna trimmers, C-47, C-12 and C-3 respectively, so that each brings about maximum amplitude of output as shown by the wave on the Oscillograph. It will be necessary to have the timing control of the Oscillograph on "Int." for this operation. After each trimmer has been peaked, the Oscillograph timing control should be set to "Ext." and the Frequency Modulator placed into operation with its connections to the Oscillator and Oscillograph made in accordance with Figure 5. Turn the modulation switch of the Oscillator to "Off" and retune the Oscillator (in-

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Model T10-1

Alignment Proceedure (cont'd)

crease frequency) until the forward and reverse waves show on the Oscillograph and become coincident at their highest points. Adjust the trimmers C-47, C-12 and C-3 again, setting each to the point which produces the best coincidence and maximum amplitude of the wave images.

(b) Remove the Frequency Modulator cable from the Oscillator and shift the signal frequency to **600 kc.** Place the modulation switch to "On". Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then insert the Frequency Modulator plug and retune the Oscillator (modulation "Off") until the two similar forward and reverse waves appear on the screen. For this adjustment, it is advisable to shift the Oscillator to its 200-400 kc. range using the third harmonic of the generated signal in order to obtain the desired range of sweep. The oscillator series trimmer, C-46, should then be adjusted to produce maximum amplitude of the images. No rocking will be necessary on the station selector inasmuch as the signal frequency is being "wobbled" by the Frequency Modulator to produce the same effect. After completing this adjustment, the trimmer C-47 should be re-aligned as in (a) to correct for any change brought about by the adjustment of C-46.

Band B

(a) Advance the receiver range switch to its Band B position and tune the station selector to a dial reading of **6132 kc.** Set the test Oscillator to this same frequency (modulation "On" and Frequency Modulator disconnected) and increase its output until a suitable indication is apparent on the Oscillograph. The Oscillograph should be adjusted for "Int." timing. Then adjust the oscillator trimmer, C-45, to the point at which maximum amplitude of the image is obtained. Two positions will be found for this trimmer which gives such a maximum. The one of least capacitance is correct and should be used. This can be checked by tuning the "image" signal, which will be received at **5212 kc.** on the dial if the adjustment of C-45 has been properly made. An increase in test Oscillator output may be necessary for this test. *Its frequency should not be changed from* **6132 kc.** *nor any trimmer adjustments made on the receiver.*

(b) Return the station selector to the **6132 kc.** reading and align the detector, and antenna coil trimmers, C-11 and C-2 respectively, for maximum (peak) output as shown by the Oscillograph. No further adjustments are to be made on this band.

Band C

(a) Turn the range switch of the receiver to its Band C position and tune the station selector until the dial pointer reads **18,000 kc.** Set the test Oscillator to the same frequency (modulation "On" and Frequency Modulator (disconnected) and regulate its output to the level required for convenient observation. Adjust the trimmer C-43 to the point producing maximum output as indicated on the Oscillograph. Check for the presence of the proper "image" signal by tuning the receiver to **17,080 kc.** The **18,000 kc.** signal of the Oscillator will be received at this point if the adjustment of C-43 has been properly made by using the position of least capacitance which gives maximum receiver output. It may be necessary to increase the output of the Oscillator in order to get an indication of the "image". *No adjustments should be made during this check.*

(b) Return the receiver tuning to **18,000 kc.**, realign C-43 if necessary, and then adjust the detector and antenna trimmers, C-10 and C-1, for maximum signal output as evidenced by the oscillographic image. No further adjustments are to be made on this band.

ALIGNMENT WITH OUTPUT METER

To align the receiver by means of an output indicator other than a Cathode-Ray Oscillograph will require the use of a standard test Oscillator, such as that recommended above, for the source of signals and means of indication for the output. The RCA Neon Output Indicator, Stock No. 4317, will be found very satisfactory for such use. It should be connected across the voice coil circuit of the loudspeaker or across the output transformer primary.

I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc.** and align the trimmers C-20 and C-21 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control grid circuit of the RCA-6L7 first detector. Then tune the first i-f transformer trimmers C-16 and C-17 for maximum receiver output.

R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control turned to its maximum position. For each adjustment, the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal.

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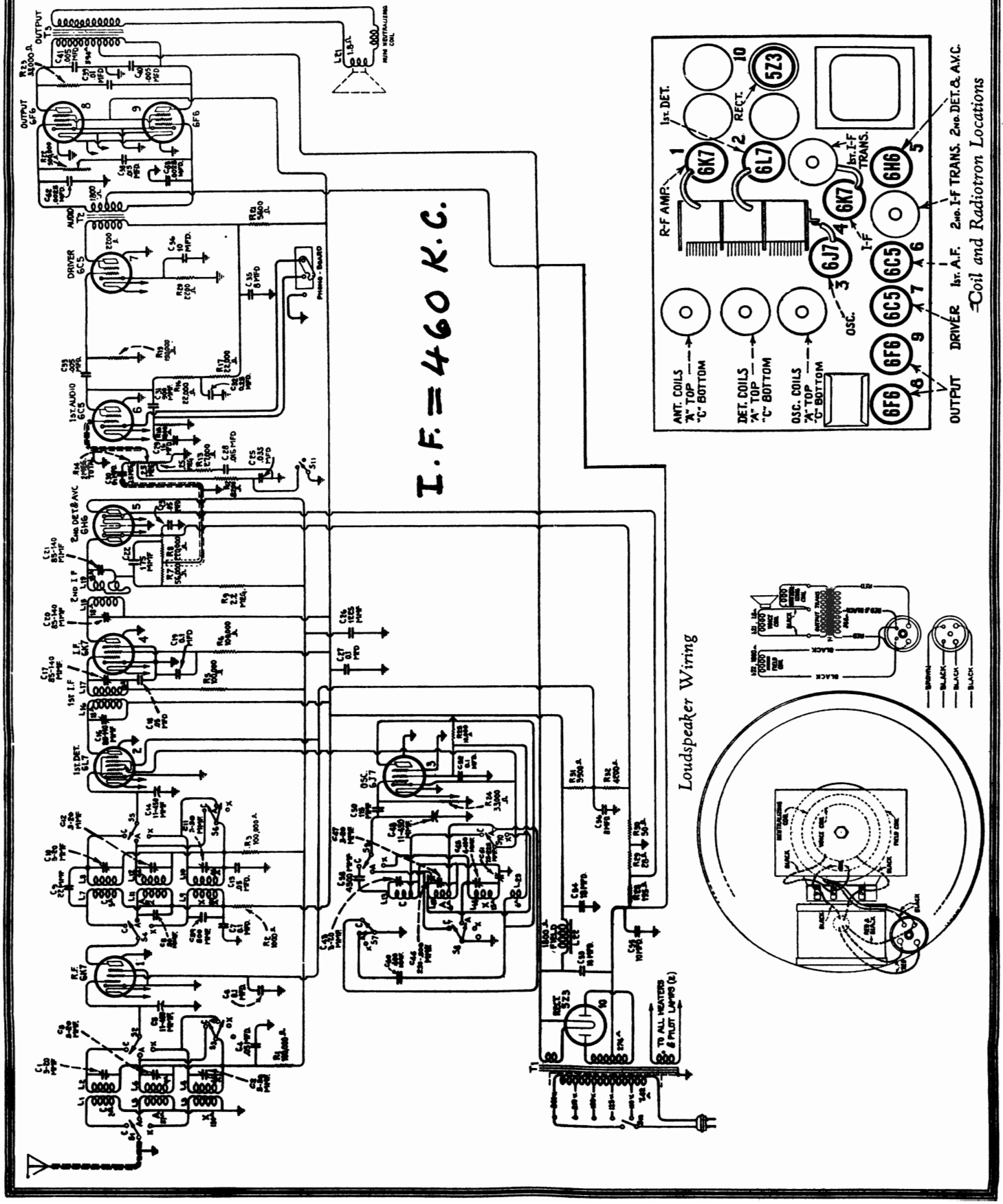
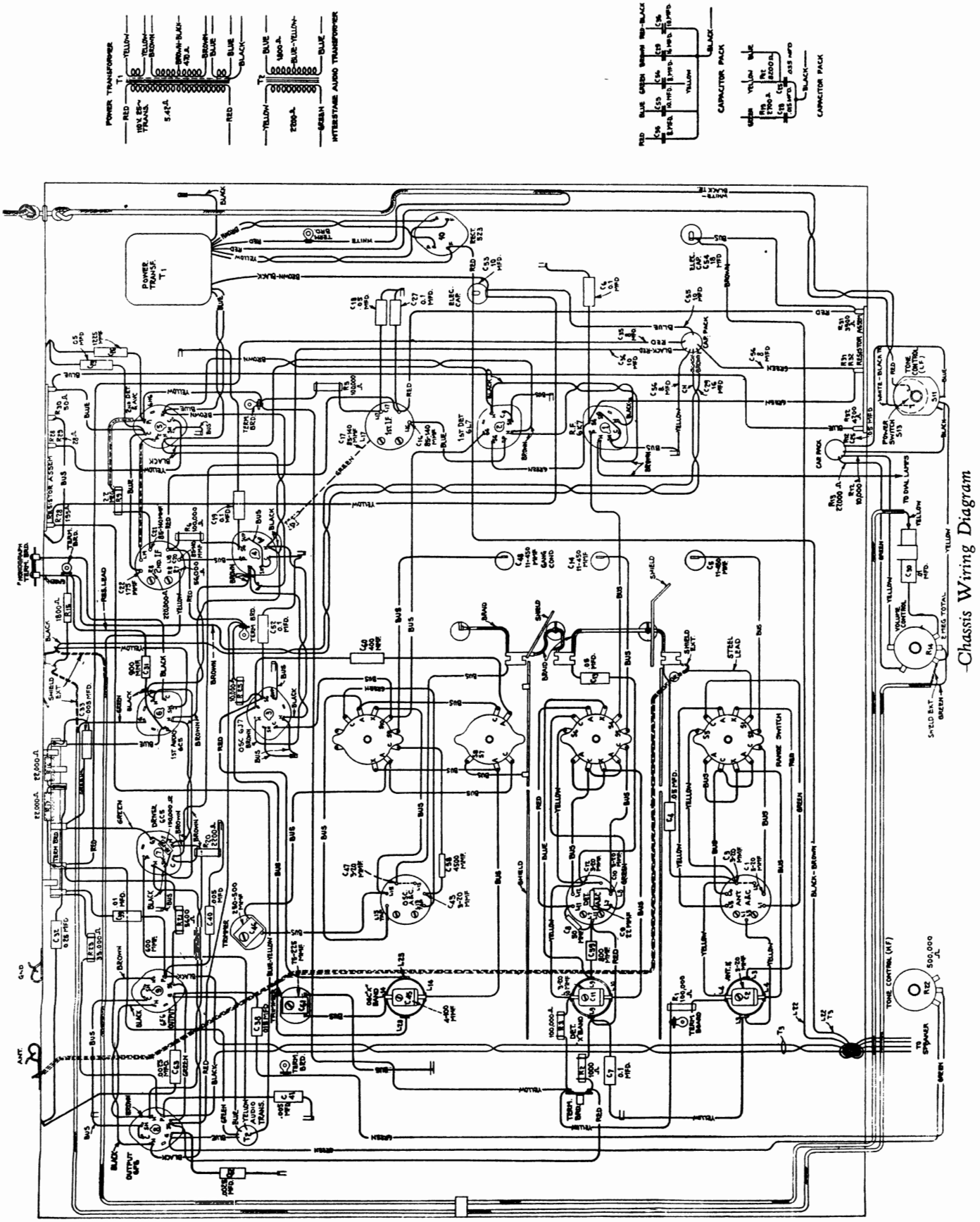
Model T10-3



RCA MANUFACTURING CO., Inc.

Model T10-3



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model T10-3

ALIGNMENT WITH OUTPUT METER

I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc.** and align the trimmers C-20 and C-21 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control grid circuit of the RCA-6L7 first detector. Then tune the first i-f transformer trimmers C-16 and C-17 for maximum receiver output.

R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control turned to its maximum position. For each adjustment, the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal.

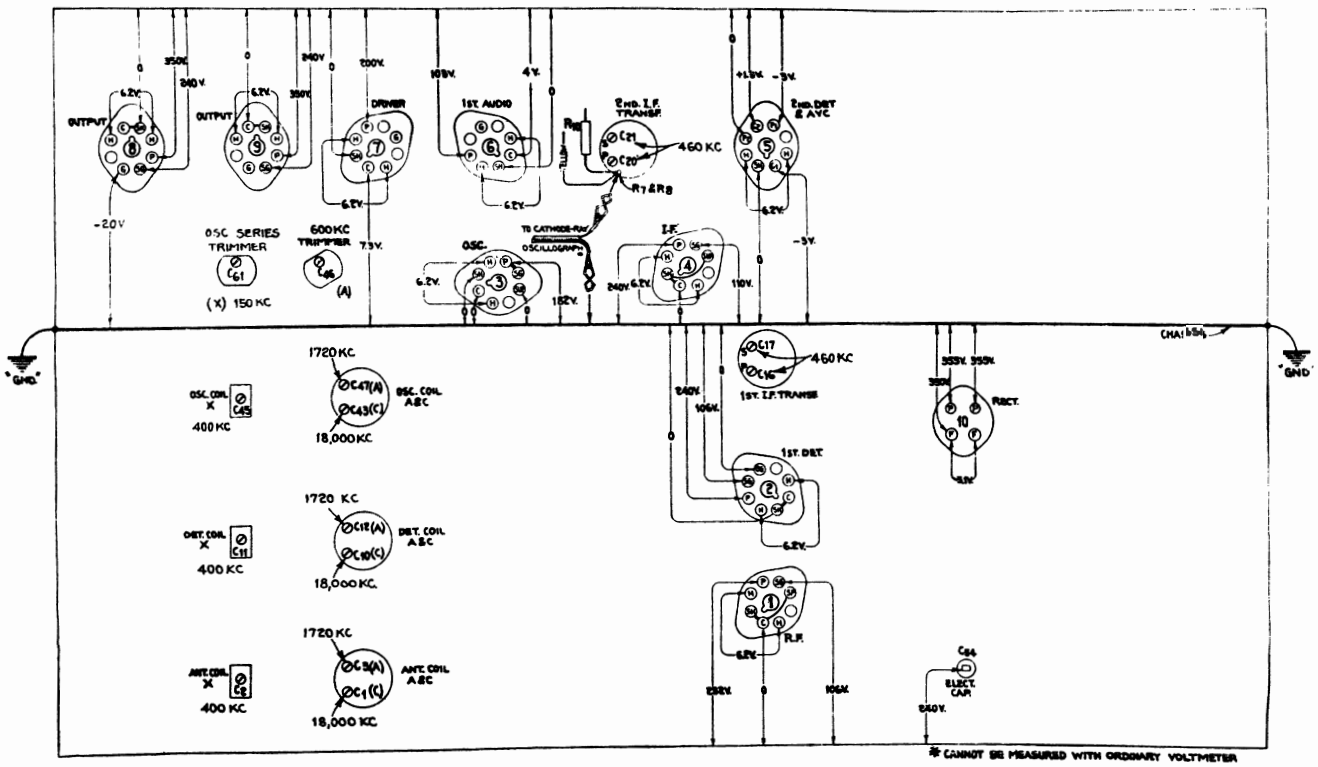
Band A—This band should be aligned by supplying a **1720 kc.** signal to the receiver, tuning the station selector to a dial reading of **1720** and adjusting the trimmers C-47, C-12 and C-3 to produce maximum receiver output. The Oscillator should then be shifted to **600 kc.** and the receiver tuned to resonate this signal, disregarding the reading at which it is best received. Trimmer C-46 must then be adjusted, simultaneously while rocking the station selector backward and forward through the signal until the maximum output results from the combined operations. C-47 should be rechecked to assure that its adjustment has not changed because of the trimming of C-46.

Band X—This band must be aligned at **400 kc.** and **150 kc.** Tune the test Oscillator to **400 kc.** and turn the receiver dial to the same reading. Adjust trimmers C-45, C-11 and C-2 for maximum (peak) receiver output. Then shift the Oscillator to **150 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Adjust trimmer C-61, simultaneously rocking the tuning condenser backward and forward through the signal, until maximum receiver output results from the combined operations. Repeat the alignment of C-45 as above to correct for any change which may have been caused by the adjustment of C-61.

Band C—Change the receiver so that it is operative and the dial reads **18,000 kc.** on the "C" Band. Tune the test Oscillator to this same frequency. Then adjust the oscillator trimmer C-43 to produce maximum (peak) output. Two positions of this trimmer will be found which conform with this requirement. The one of least capacitance is correct. Check for the presence of "image" response at **17,080 kc.** by shifting the receiver tuning. If it is received at such a point, the trimmer C-43 has been correctly adjusted to the right peak. *No adjustments are to be made during this check.* Tune the receiver back to the **18,000 kc.** dial marking, readjust C-43 if necessary, and then tune the detector and antenna capacitors C-10 and C-1 for maximum receiver output. No further adjustments are necessary.

ALIGNMENT FREQUENCIES

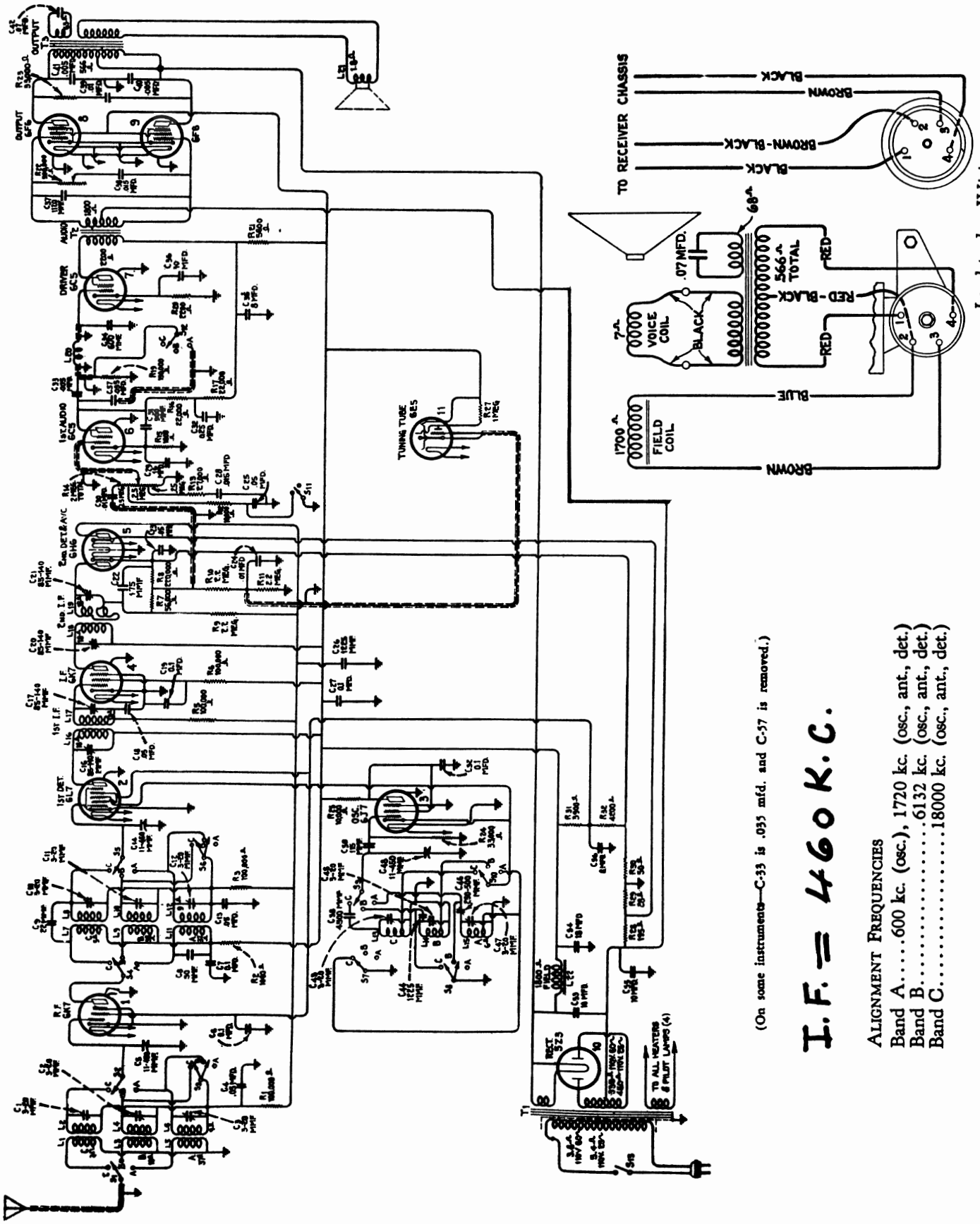
Band X.....150 kc. (osc.), 400 kc. (osc., ant., det.)
Band A.....600 kc. (osc.), 1720 kc. (osc., ant., det.)
Band C.....18000 kc. (osc., ant., det.)



Trimmer Locations and Radiotron Socket Voltages
Measured at 115 Volts A.C.—No Signal—Volume Control Maximum

RCA MANUFACTURING CO., Inc.

Model C11-1



(On some instruments—C-33 is .035 mfd. and C-57 is removed.)

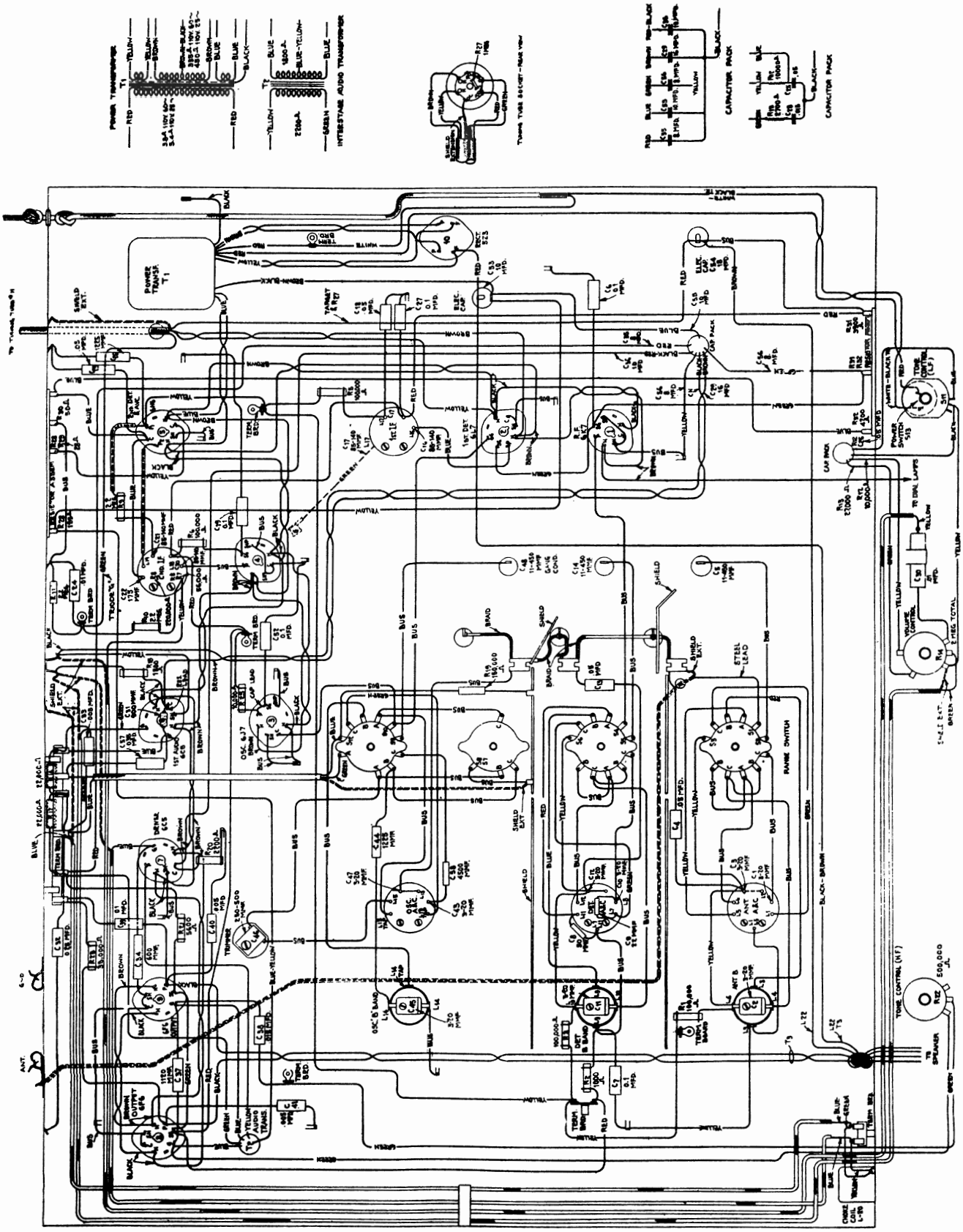
I.F. = 460 K.C.

ALIGNMENT FREQUENCIES

Band A.....600 kc. (osc.), 1720 kc. (osc., ant., det.)
Band B.....6132 kc. (osc., ant., det.)
Band C.....18000 kc. (osc., ant., det.)

RCA MANUFACTURING CO., Inc.

Model C11-1



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model C11-1

ALIGNMENT WITH OUTPUT METER

I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc.** and align the trimmers C-20 and C-21 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control grid circuit of the RCA-6L7 first detector. Then tune the first i-f transformer trimmers C-16 and C-17 for maximum receiver output.

R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control turned to its maximum position. For each adjustment, the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal.

Band A—This band should be aligned by supplying a **1720 kc.** signal to the receiver, tuning the station selector to a dial reading of **1720** and adjusting the trimmers C-47, C-12 and C-3 to produce maximum receiver output. The Oscillator should then be shifted to **600 kc.** and the receiver tuned to resonate this signal, disregarding the reading at which it is best received. Trimmer C-46 must then be adjusted, simultaneously while rocking the station selector backward and forward through the signal until the maximum output results from the combined operations. C-47 should be rechecked to assure that its adjustment has not changed because of the trimming of C-46.

Band B—This band must be aligned at **6132 kc.** by tuning the test Oscillator to such a frequency and turning the station selector to the **6132 kc.** dial reading. Then tune the trimmer C-45 to produce maximum receiver output, using the setting of least capacitance which causes same. The presence of the proper "image" may be checked by tuning the receiver to **5212 kc.** at which point the **6132 kc.** signal will be heard if the trimmer C-45 has been properly set to the position of least capacitance for maximum (peak) output. It may be necessary to increase the Oscillator output for this check. *No adjustments are to be made.* Return the station selector to the **6132 kc.** dial marking and trim capacitors C-11 and C-2 for maximum receiver output. No other adjustments are necessary on Band B.

Band C—Change the receiver so that it is operative and the dial reads **18,000 kc.** on the "C" Band. Tune the test Oscillator to this same frequency. Then adjust the oscillator trimmer C-43 to produce maximum (peak) output. Two positions of this trimmer will be found which conform with this requirement. The one of least capacitance is correct. Check for the presence of "image" response at **17,080 kc.** by shifting the receiver tuning. If it is received at such a point, the trimmer C-43 has been correctly adjusted to the right peak. *No adjustments are to be made during this check.* Tune the receiver back to the **18,000 kc.** dial marking, readjust C-43 if necessary, and then tune the detector and antenna capacitors C-10 and C-1 for maximum receiver output. No further adjustments are necessary.

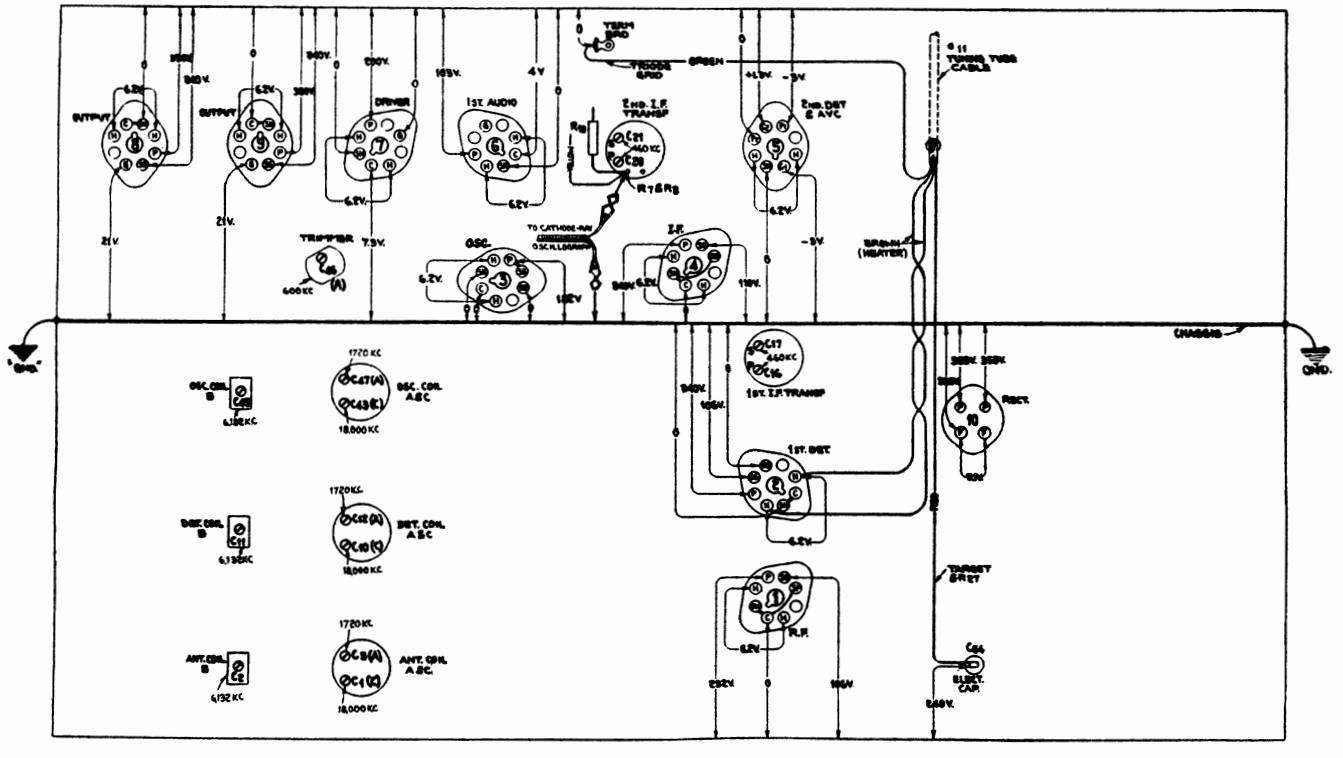


Figure 6—Trimmer Locations and Radiotron Socket Voltages
Measured at 115 Volts A.C.—No Signal—Volume Control Maximum

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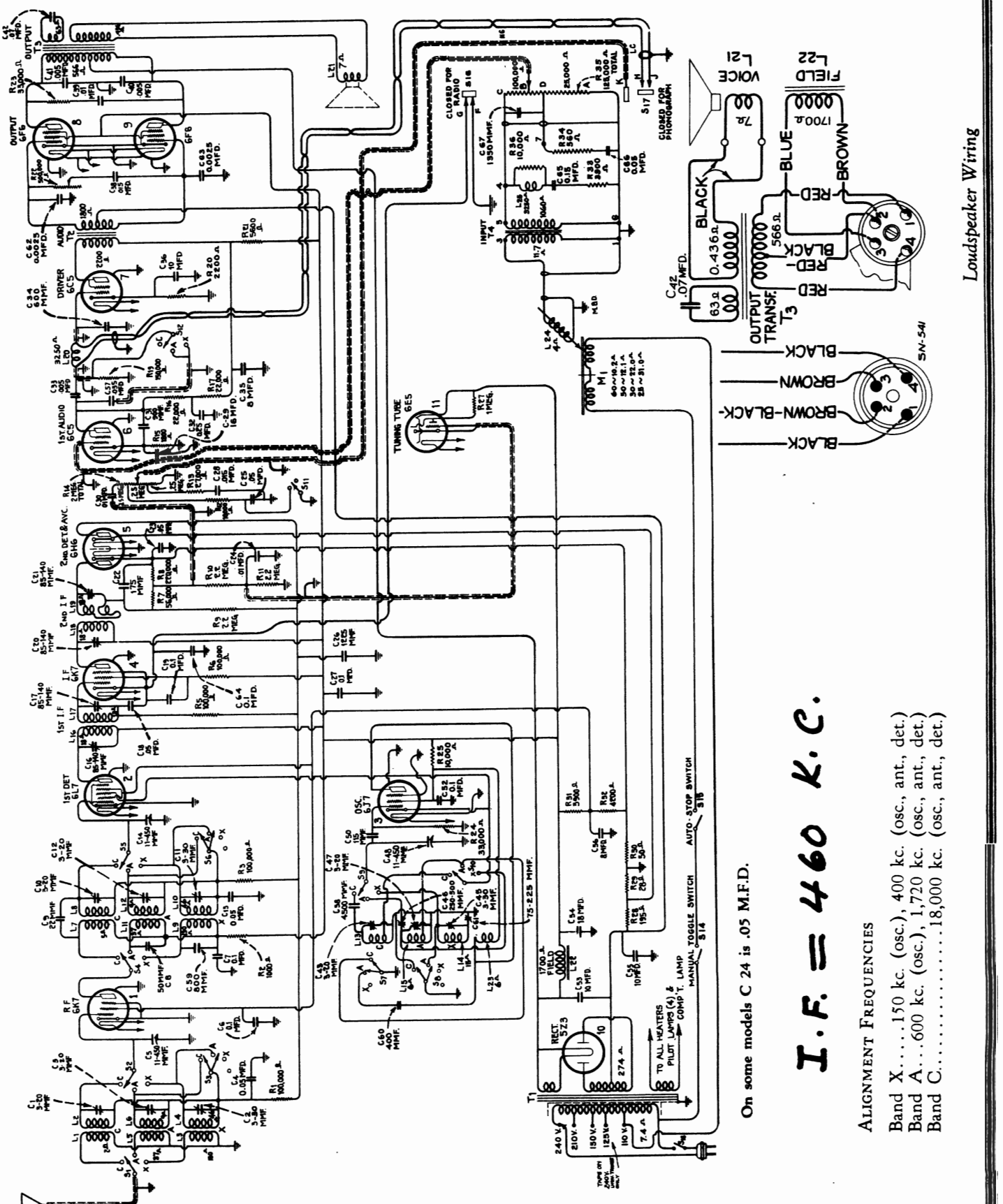
Model D11-2

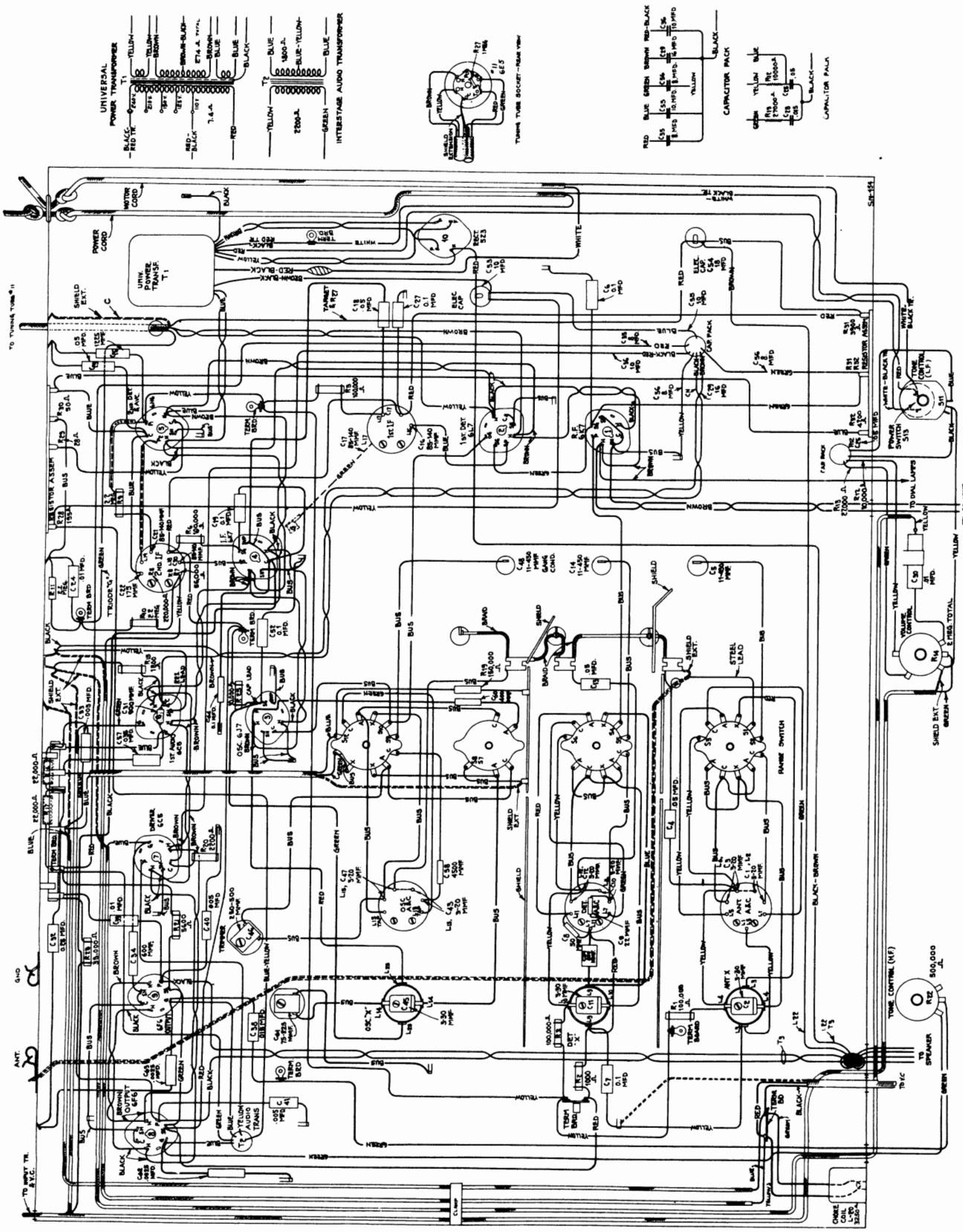


ALIGNMENT FREQUENCIES

Band X.....150 kc. (osc.), 400 kc. (osc., ant., det.)
Band A....600 kc. (osc.), 1,720 kc. (osc., ant., det.)
Band C.....18,000 kc. (osc., ant., det.)

RCA MANUFACTURING CO., Inc.

Model D11-2



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model D11-2

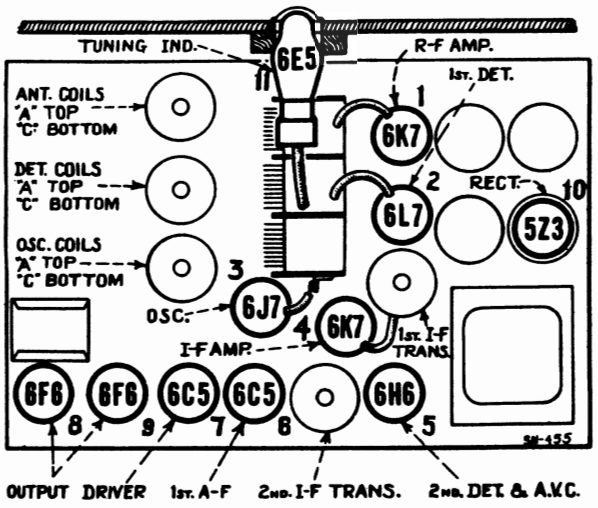
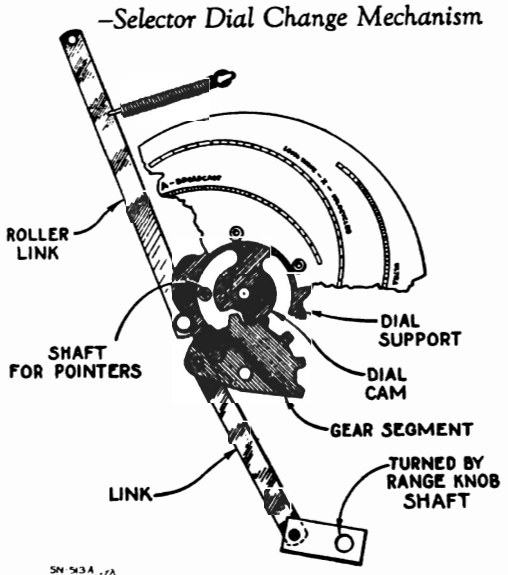
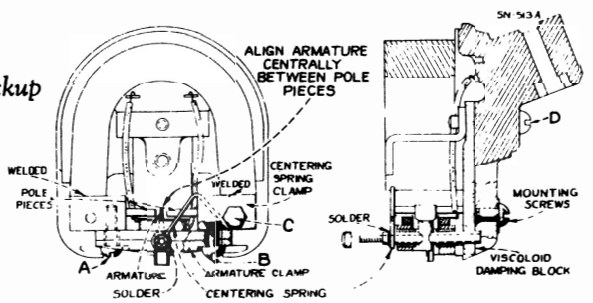


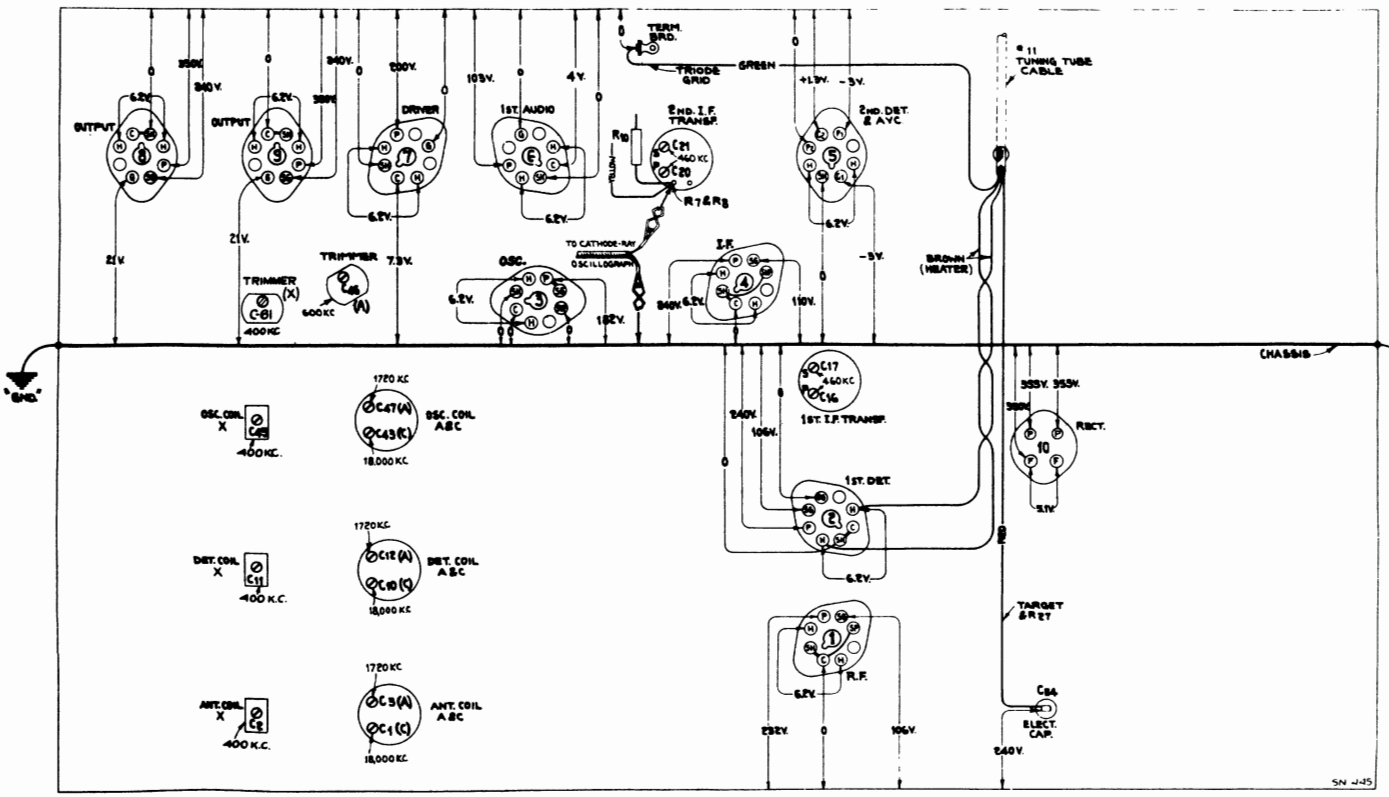
Figure 1—Radiotron and Coil Locations

—Selector Dial Change Mechanism



Details of Pickup





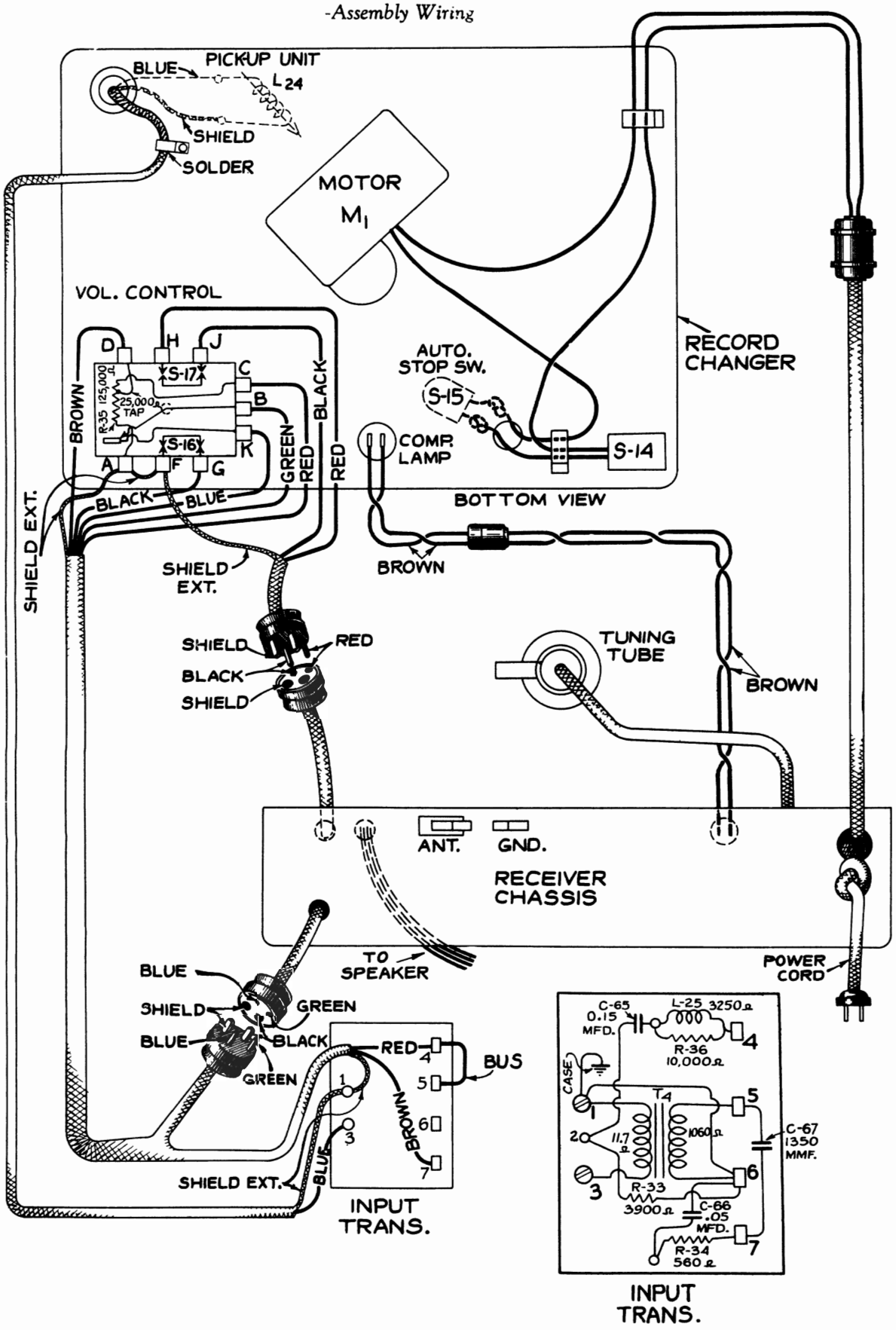
Radiotron Socket Voltages

Measured at 115 volts, 60 cycle supply—No signal being received

RCA MANUFACTURING CO., Inc.

Model D11-2

-Assembly Wiring



RCA MANUFACTURING CO., Inc.

Model D11-2

ADJUST AND TIGHTEN NUT SO AS TO PROVIDE APPROXIMATELY 1/32" BETWEEN SLOT IN LINK AND SCREW, WHEN BUMPER IS IN CONTACT WITH STOP BRACKET.

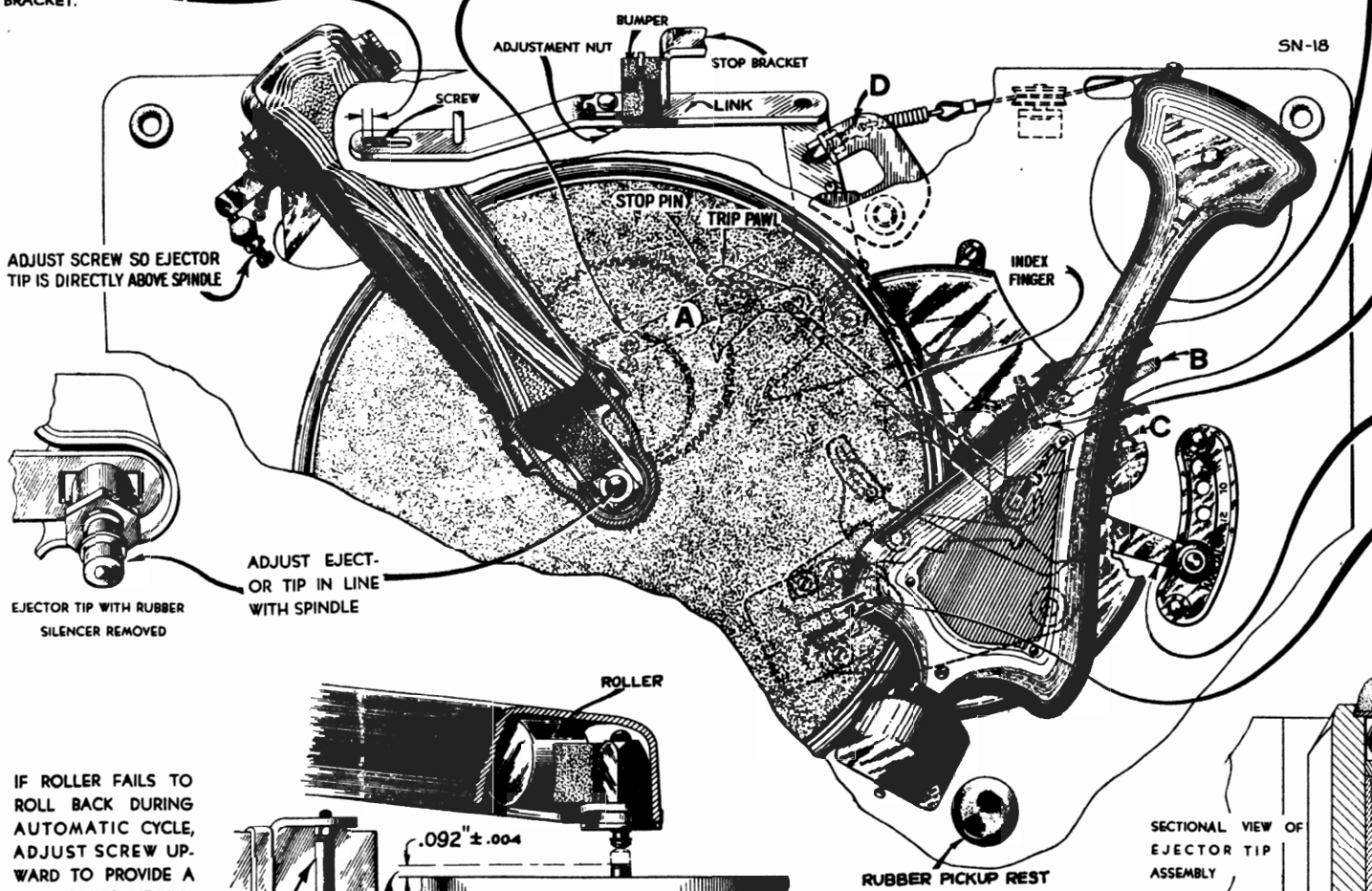
TO ADJUST RISE AND SWING OF TONE ARM:—WITH MANUAL INDEX LEVER IN 12" POSITION AND ROLLER ON MAIN LEVER **A** ENGAGED IN CAM AT HALF CYCLE POSITION AS SHOWN, AND SWITCH LEVER **B** AGAINST STOP SCREW **C**, ADJUST EYEBOLT **D** SO NEEDLE POINT (ORANGE SHANK) IS 1 1/16" + 1/32" — .000 ABOVE TURNTABLE FELT. AT THE SAME TIME ADJUST SCREW **C** SO THAT NEEDLE LANDS AT A RADIUS OF 5 13/16" + 1/16" — .000 FROM CENTER OF TURNTABLE SPINDLE. THIS ADJUSTMENT CAN BE FACILITATED BY USING 7 TWELVE-INCH RECORDS (NOT WARPED) WHICH MEASURES 11/16" TOTAL, AND ADJUSTING RISE TO 3/8" TO 13/32" ABOVE RIM OF TOP RECORD. LANDING RADIUS 5 13/16" + 1/16" — .000.

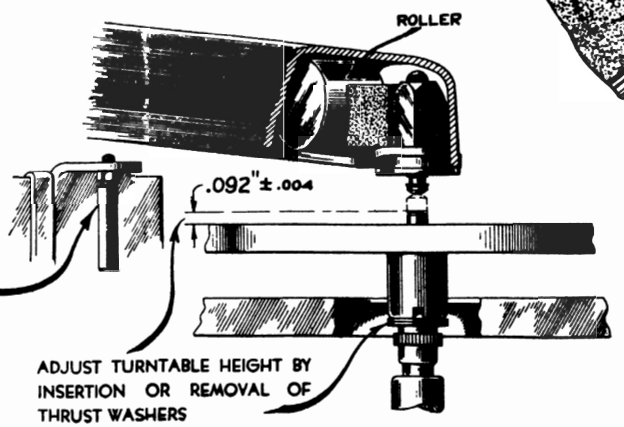
ADJUST NEEDLE HEIGHT BY MEANS OF TRIP ROD UNTIL NEEDLE POINT OF AN "ORANGE SHANK" NEEDLE IS 1/16" +.010 BELOW TOP SURFACE OF THE RUBBER PICKUP REST.

ADJUST SCREW UNTIL FRICTION WILL JUST FORCE FINGER TO MOVE TRIP PAWL. (WITH COVER REMOVED)

TO ADJUST MANUAL INDEX FINGER - PLACE MANUAL INDEX LEVER IN THE POSITION SHOWN - SET MANUAL INDEX FINGER TO FORCE TRIP PAWL AGAINST STOP PIN - TIGHTEN SET SCREW.

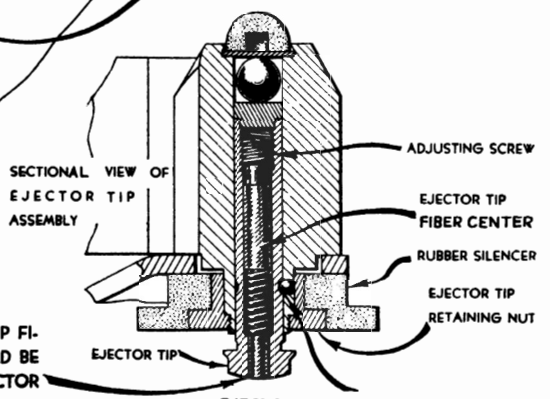
ADJUST AUTOMATIC SWITCH AS FOLLOWS - PLACE MANUAL INDEX LEVER IN POSITION SHOWN AND WITH SWITCH IN TRIPPED POSITION, ADJUST IT UNTIL THE CONTACT POINTS ARE OPENED .020" +.010 AS INDICATED (TURNTABLE REMOVED)





IF ROLLER FAILS TO ROLL BACK DURING AUTOMATIC CYCLE, ADJUST SCREW UPWARD TO PROVIDE A GREATER INCLINE DURING THE CYCLE. DO NOT ADJUST SO HIGH AS TO CAUSE EJECTOR TIP TO FAIL TO TOUCH TOP OF TURNTABLE FELT AT HIGHEST POINT.

ADJUST TURNTABLE HEIGHT BY INSERTION OR REMOVAL OF THRUST WASHERS



END OF EJECTOR TIP FIBER CENTER SHOULD BE FLUSH WITH EJECTOR TIP.

EJECTOR TIP SHOULD ROTATE FREELY

Automatic Record Changer Adjustments

RCA MANUFACTURING CO., Inc.

Model D11-2

Alignment Procedure

Eleven alignment trimmers are provided in the r-f, first detector and oscillator tuning system and four are used in the i-f system. All of these are accurately adjusted during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or have been altered by other means. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for alignment of this particular instrument is illustrated and described on a separate page of this booklet.

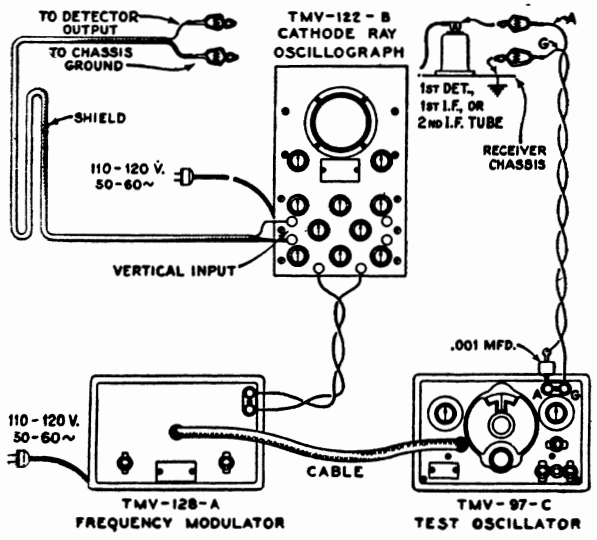


Figure 4—Alignment Apparatus Connections

Two methods of alignment are applicable. One utilizes a Cathode-Ray Oscillograph as a means of output indication and the other follows former procedure where a glow type indicator or meter is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural method, but each adjustment can be made with definite precision. Both methods are hereinafter outlined so that alignment operations may be made according to the equipment available.

It is wise to determine the necessity for alignment as well as the direction of misalignment before making adjustments. The RCA Tuning Wand is an instrument designed particularly for such a purpose.

The Tuning Wand consists of a bakelite rod having a small brass cylinder at one end and a core of finely divided iron at the other. It may be inserted into a tuned coil while a signal of the normal resonant frequency is being supplied to such coil to obtain an indication of the tuning. Holes are provided at the top of the r-f shield cans for entrance of the Wand. The presence of either end of the Wand will cause a change in tuning which will be indicated at the receiver output as an increase or decrease in signal level. If there is a decrease of output when either end is inserted, the tuning is correct and will require no adjustment. However should there be an increase of output due to the iron core and decrease with the brass cylinder, an increase in inductance or capacitance is indicated as necessary to bring the circuit into line. The trimmer involved should therefore be increased accordingly. If the brass cylinder end causes an increase in output while the iron end causes a decrease, reduction of inductance will be necessary to place the circuit in alignment. This is equivalent to decreasing the trimmer concerned. The following tabulation gives the various changes and the adjustments required:

WAND	SIGNAL	TRIMMER
Brass	Decrease	None
Iron	Decrease	
Brass	Increase	Decrease
Iron	Decrease	
Brass	Decrease	Increase
Iron	Increase	

CATHODE-RAY ALIGNMENT

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by Figure 5. Each must be aligned to a basic frequency of **460 kc.** The last transformer must be aligned firstly and the first transformer aligned secondly. For such a process, it is necessary to feed the output of the Full Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each transformer and observing the effect at the second detector output on the Cathode-Ray Oscillograph. The proper point of connection of the Oscillograph is with its vertical "high" input terminal attached to the juncture of R-7 and R-8, as illustrated in Figure 5, and with the "0" or ground terminal to the chassis. The "Ext. Sync." terminals of the Oscillograph should be connected to the Frequency Modulator as shown by Figure 4. A .001 mfd. capacitor installed in series with the Oscillator "Ant." lead will prevent the voltages of the stage under alignment from becoming upset. The vertical "A" amplifier should be "On" for the ensuing adjustments and its gain control kept at maximum. For each adjustment, the Oscillator output must be regulated so that the image obtained on the Oscillograph screen will be of the minimum size convenient for accurate observation. Proceed further as follows:

(a) Place the receiver, Oscillograph and test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be encountered from signal pickup or from the RCA-6J7 oscillator, removing the tube if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of spot.

(b) Attach the output of the test Oscillator between the control grid cap of the RCA-6K7 i-f tube and chassis ground as shown typically by Figure 4. Tune the Oscillator to **460 kc.** and set its modulation switch to "On." Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give a shape which is convenient for peak indications. Cause the image to stand still on the screen

RCA MANUFACTURING CO., Inc.

Model D11-2

ALIGNMENT

by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-20 and C-21 of the second i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.

(c) The Frequency Modulator should then be placed in operation and interconnected with the Full Range Oscillator by means of the special shielded patch cord. Figure 4 shows the proper arrangement. Set the Frequency Modulator sweep range switch to its "Lo" position and turn the Oscillator modulation switch to "Off." Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly co-incident at their highest points. This condition will be found to occur at an Oscillator setting of *approximately* **540** *kc.* The curves will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirement and to make them remain motionless on the screen. This will require a setting of approximately ½ clockwise rotation of the frequency control. The trimmers C-20 and C-21 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.

(d) Leaving the equipment connected and adjusted as in (c), change the Oscillator output to the control grid cap of the RCA-6L7 first detector tube. Then adjust the first i-f transformer trimmers C-16 and C-17 so that the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the overall tuning characteristic of the i-f system.

R-F Trimmer Adjustments

For Bands A and X, adjustments must be made at the high and low frequency ends of the range. On Band C, alignment is required only at the high frequency end.

Locations of the various antenna, detector and oscillator coil trimmers are shown by Figure 5. The test Oscillator should be removed from connection with the i-f system and its output connected to the antenna-ground terminals of the receiver. No changes are to be made in the connections of the Oscillograph at the second detector. During the following adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to this procedure will obviate the broadness of tuning that would result from a.v.c. action on a stronger signal. Proceed with the adjustments as follows:

Calibration

Set the receiver range switch to Band A and rotate the station selector until the tuning condenser plates are in full mesh (maximum capacitance). Then move the main dial pointer until it points exactly to the horizontal line at the low frequency end of the Band A scale. Correct the setting of the vernier second hand pointer to read zero.

Band A

(a) With the receiver range switch in its Band A position, tune the station selector until the dial pointer is at a reading of **1720 kc.** Adjust the test Oscillator to **1720 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output to produce a registration on the Oscillograph. Carefully align the oscillator, detector and antenna trimmers, C-47, C-12 and C-3 respectively, so that each brings about maximum amplitude of output as shown by the wave on the Oscillograph. It will be necessary to have the timing control of the Oscillograph on "Int." for this operation. After each trimmer has been peaked, the Oscillograph timing control should be set to "Ext." and the Frequency Modulator placed into operation with its connections to the Oscillator and Oscillograph made in accordance with Figure 4. Turn the modulation switch of the Oscillator to "Off" and retune the Oscillator (increase frequency) until the forward and reverse waves show on the Oscillograph and become coincident at their highest points. Adjust the trimmers C-47, C-12 and C-3 again, setting each to the point which produces the best coincidence and maximum amplitude of the wave images.

(b) Remove the Frequency Modulator cable from the Oscillator and shift the signal frequency to **600 kc.** Place the modulation switch to "On". Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then insert the Frequency Modulator plug and retune the Oscillator (modulation "Off") until the two similar forward and reverse waves appear on the screen. For this adjustment, it is advisable to shift the Oscillator to its 200-400 kc. range using the third harmonic of the generated signal in order to obtain the desired range of sweep. The oscillator series trimmer, C-46, should then be adjusted to produce maximum amplitude of the images. No rocking will be necessary on the station selector inasmuch as the signal frequency is being "wobbled" by the Frequency Modulator to produce the same effect. After completing this adjustment, the trimmer C-47 should be re-aligned as in (a) to correct for any change brought about by the adjustment of C-46.

RCA MANUFACTURING CO., Inc.

Model D11-2

BAND X

(a) Disconnect the Frequency Modulator and tune the test Oscillator to a frequency of **400 kc.** (Modulation "On"). Place the receiver range switch in its Band X position and turn the station selector until the dial pointer reads **400 kc.** Adjust the Oscillograph timing control to "Int." Then align each of the trimmers C-45, C-11 and C-2 to the point producing maximum output at the Oscillograph. Place the Frequency Modulator in operation and attach it to the Oscillator in the normal manner. Change the Oscillograph timing to "Ext." Increase the frequency of the Oscillator (modulation "Off") until the two waves appear and become coincident at their highest points, *approximately at* **462** *kc.* They may be made to remain stationary on the screen by manipulation of the Oscillograph range switch and frequency control. Readjust the three trimmers C-45, C-11 and C-2 to give maximum amplitude and complete coincidence of the waves.

(b) Change the test Oscillator so that it delivers a signal of **150 kc.** with the Frequency Modulator disconnected. Tune this signal on the receiver which has previously been set to Band X, disregarding the dial reading at which the signal is best received. Then interconnect the Frequency Modulator with the Oscillator and retune the latter to the point at which the two similar waves appear on the screen Adjust trimmer C-61, for maximum amplitude of the wave images. Rocking of the tuning condenser will not be necessary as the Frequency Modulator duplicates such an operation. Repeat the alignment of C-45 as outlined in (a) to correct for any reflective error brought about by the adjustment of C-61.

BAND C

(a) Turn the range switch of the receiver to its Band C position and tune the station selector until the dial pointer reads **18,000 kc.** Set the test Oscillator to the same frequency (modulation "On" and Frequency Modulator disconnected) and regulate its output to the level required for convenient observation. Adjust the trimmer C-43 to the point producing maximum output as indicated on the Oscillograph. Check for the presence of the proper "image" signal by tuning the receiver to **17,080 kc.** The **18,000 kc.** signal of the Oscillator will be received at this point if the adjustment of C-43 has been properly made by using the position of least capacitance which gives maximum receiver output.

(b) Return the receiver tuning to **18,000 kc.**, realign C-43 if necessary, and then adjust the detector and antenna trimmers, C-10 and C-1, for maximum signal output as evidenced by the oscillographic image. No further adjustments are to be made on this band.

OUTPUT INDICATOR ALIGNMENT

To align the receiver by means of an output indicator other than a Cathode-Ray Oscillograph will require the use of a standard test Oscillator, such as that recommended above, for the source of signals and means of indication for the output.

I-F Alignment

Connect the test Oscillator to the control grid cap of the i-f tube. Advance the volume control of the receiver to its full-on position. Tune the test Oscillator accurately to **460 kc.** and align the trimmers C-20 and C-21 to give maximum receiver output. Regulate the Oscillator output during this adjustment so that the output indication is as small as can be conveniently observed. After completing the adjustments of these trimmers, re-connect the Oscillator so that it will feed into the control-grid circuit of the RCA-6L7 first detector. Then tune the first i-f transformer trimmers C-16 and C-17 for maximum receiver output.

R-F Alignment

After completing the i-f adjustments, it is advisable to correct the line-up of the circuits ahead of the first detector. The test Oscillator should be connected to the antenna-ground terminals of the receiver and the manual volume control turned to its maximum position. For each adjustment, the Oscillator output should be maintained as low as possible in order to avoid broadness of tuning which would result from a.v.c. action on a stronger signal.

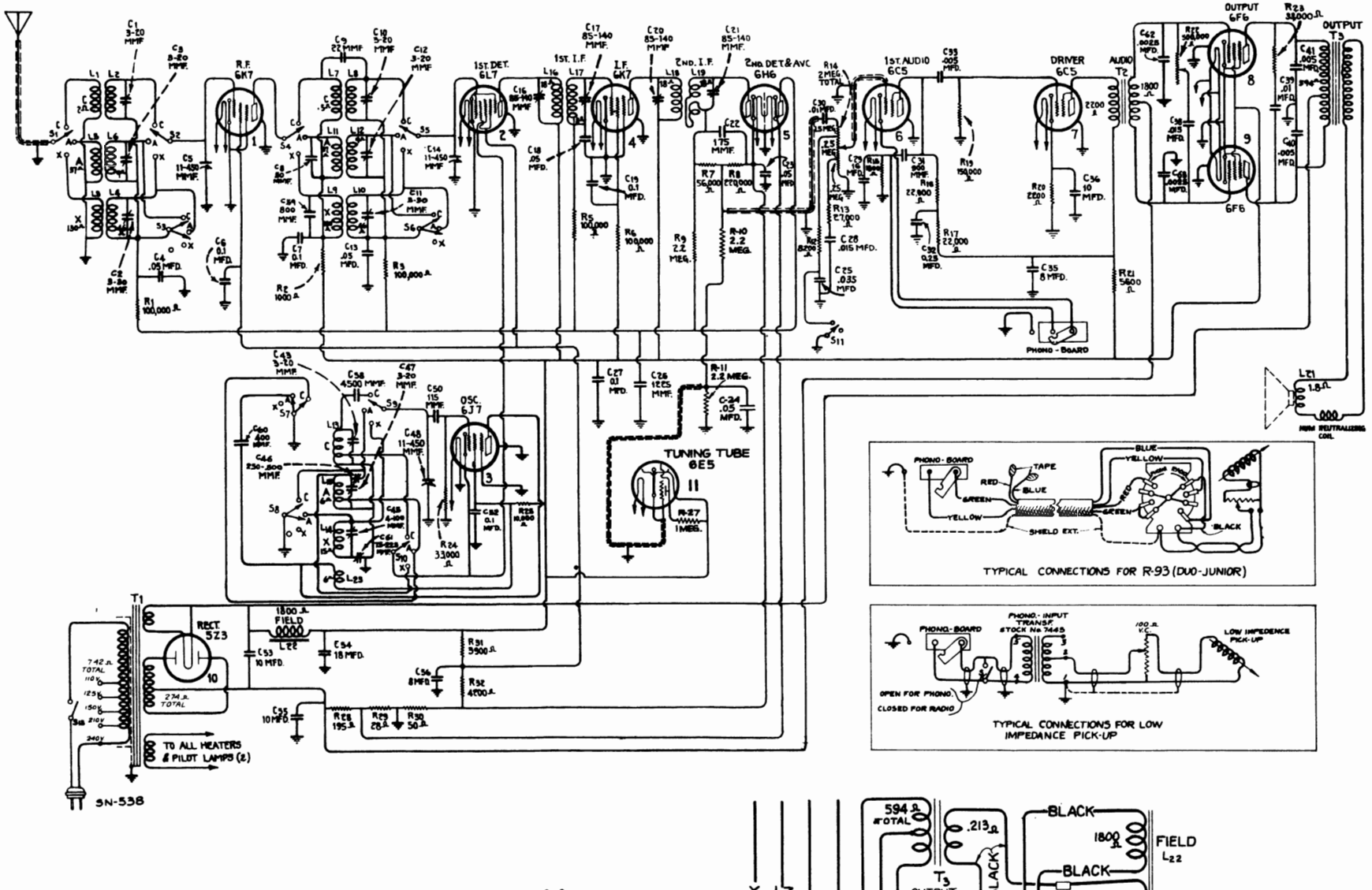
Band A—This band should be aligned by supplying a **1720 kc.** signal to the receiver, tuning the station selector to a dial reading of **1720** and adjusting the trimmers C-47, C-12. and C-3 to produce maximum receiver output. The Oscillator should then be shifted to **600 kc.** and the receiver tuned to resonate this signal, disregarding the reading at which it is best received. Trimmer C-46 must then be adjusted, simultaneously while rocking the station selector backward and forward through the signal until the maximum output results from the combined operations. C-47 should be rechecked to assure that its adjustment has not changed because of the trimming of C-46.

Band X—Change the range switch to its Band "X" position. Tune the receiver to read **400 kc.** and set the Oscillator to **400 kc.** Adjust trimmers C-45, C-11 and C-2 to produce maximum receiver output. Then shift the Oscillator frequency to **150 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then tune the oscillator series trimmer, C-61, simultaneously rocking the tuning control (receiver) backward and forward through the signal, until maximum output results from the combined operations. Repeat the alignment of C-45 as in (a) to correct for any change caused by the adjustment of C-61.

Band C—Change the receiver so that it is operative and the dial reads **18,000 kc.** on the "C" Band. Tune the test Oscillator to this same frequency. Then adjust the oscillator trimmer C-43 to produce maximum (peak) output. Two positions of this trimmer will be found which conform with this requirement. The one of least capacitance is correct. Check for the presence of "image" response at **17,080 kc.** by shifting the receiver tuning. If it is received at such a point, the trimmer C-43 has been correctly adjusted to the right peak. *No adjustments are to be made during this check.* Tune the receiver back to the **18,000 kc.** dial marking, readjust C-43 if necessary, and then tune the detector and antenna capacitors C-10 and C-1 for maximum receiver output. No further adjustments are necessary.

RCA MANUFACTURING CO., Inc.

Model T11'8



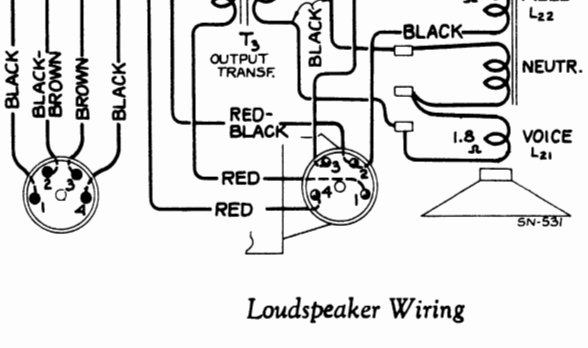
TYPICAL CONNECTIONS FOR R-93 (DUO-JUNIOR)

TYPICAL CONNECTIONS FOR LOW IMPEDANCE PICK-UP

I.F. = 460 K.C.

Alignment Frequencies

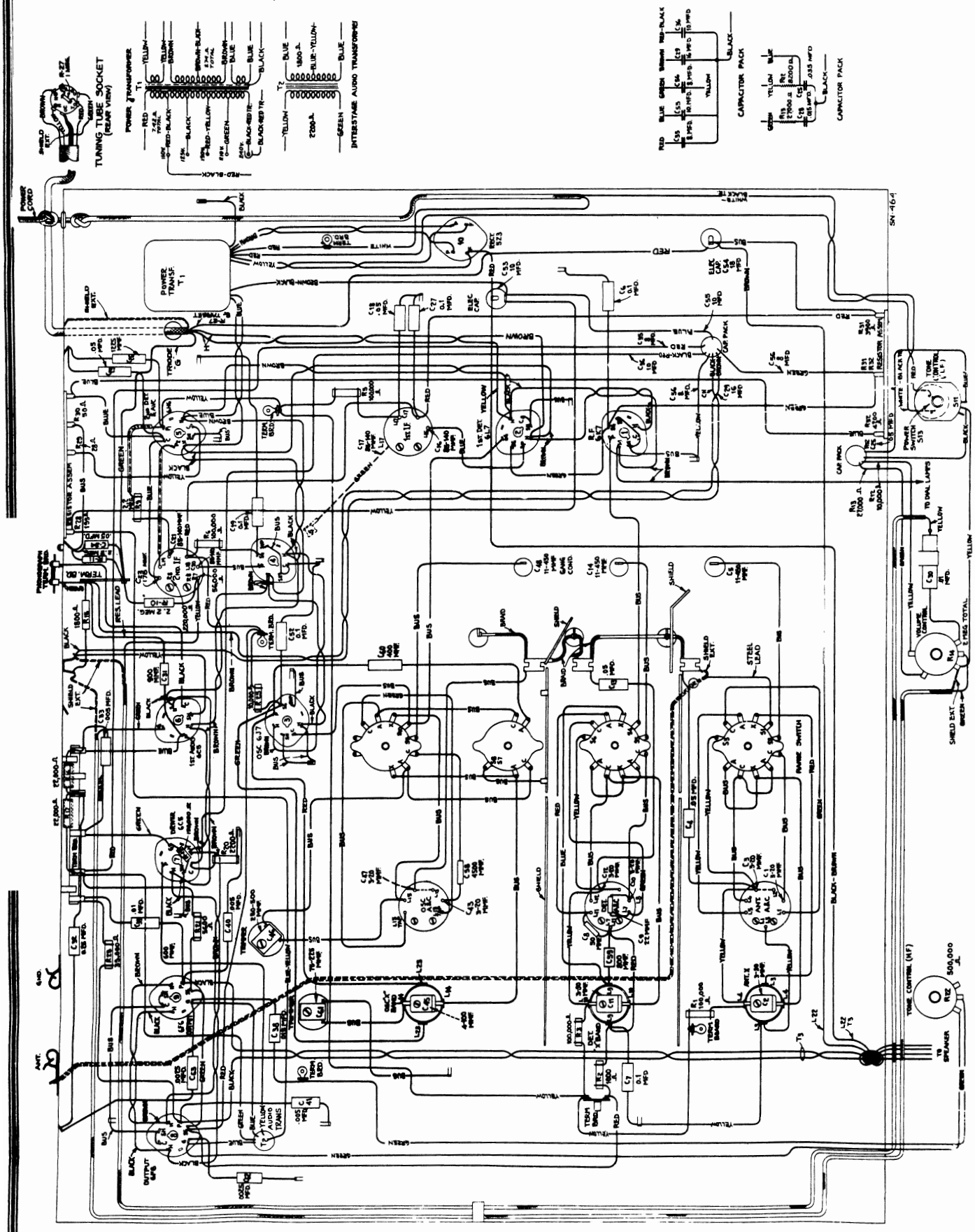
Band X.....150 kc. (osc.), 400 kc. (osc., ant., det.)
Band A...600 kc. (osc.), 1,720 kc. (osc., ant., det.)
Band C.....18,000 kc. (osc., ant., det.)



Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

Model T11-8



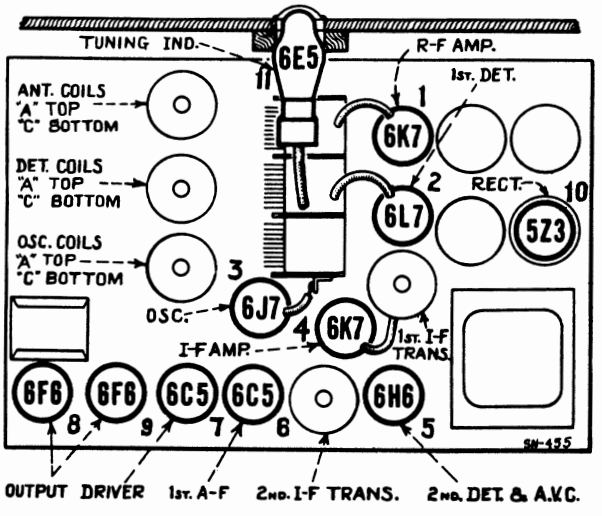
—Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model T11-8

Radiotron Socket Voltages

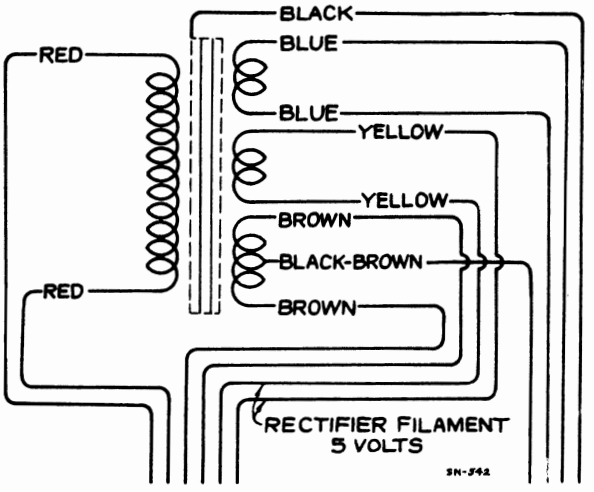
The voltage values indicated from the Radiotron socket contacts to chassis on Figure 6 will serve to assist in the location of causes for faulty operation. Each value as specified should hold within ± 20% when the receiver is normally operative at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance.



-Radiotron and Coil Locations

Standard Transformer

The transformer used on some models of this instrument is adaptable for voltages and frequencies as given under Ratings A and B of Electrical Specifications. Its schematic and wiring are shown by Figure 7.



Pri. Res.—5.42 ohms, total
Sec. Res.—470 ohms, total

Fig. 7. Standard Power Transformer Connections

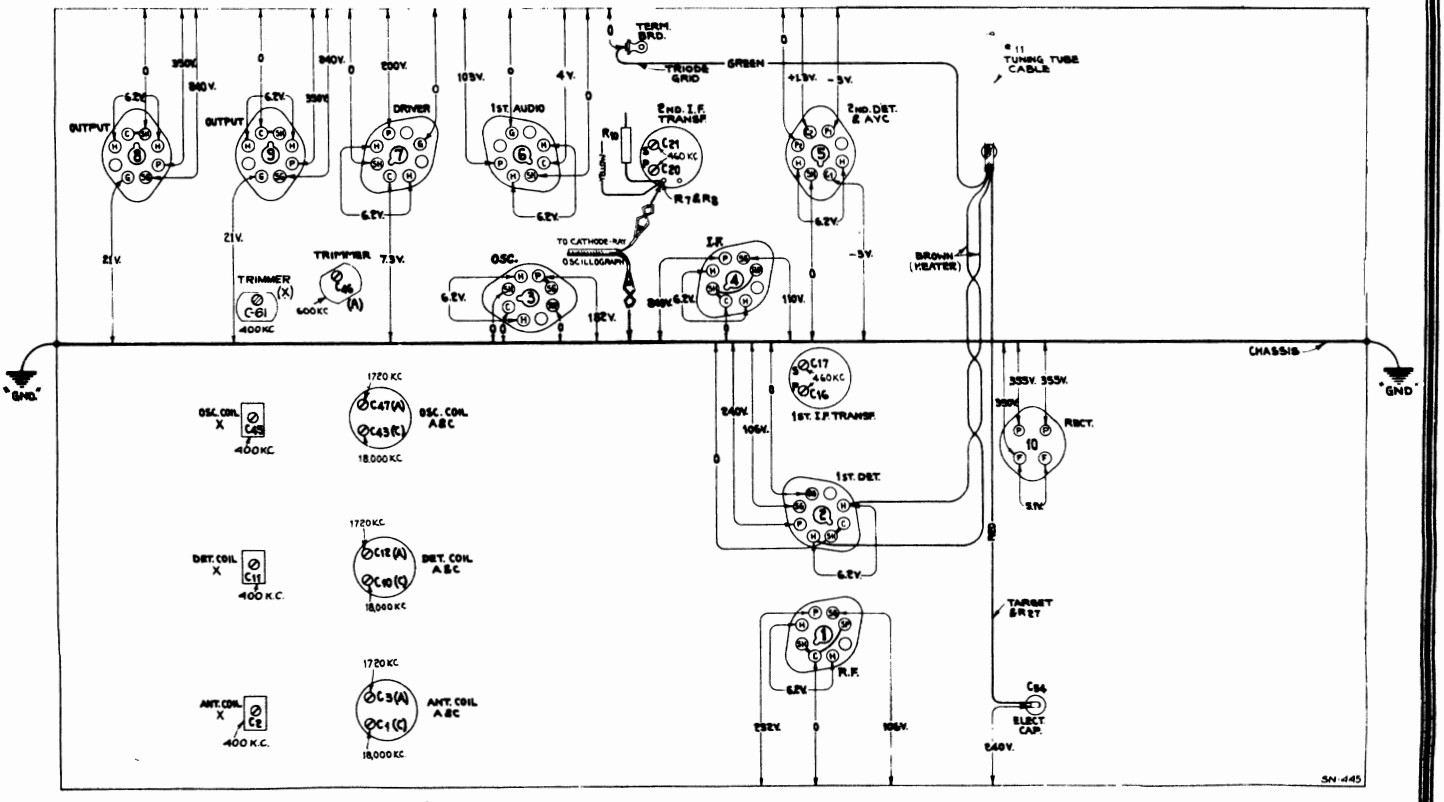
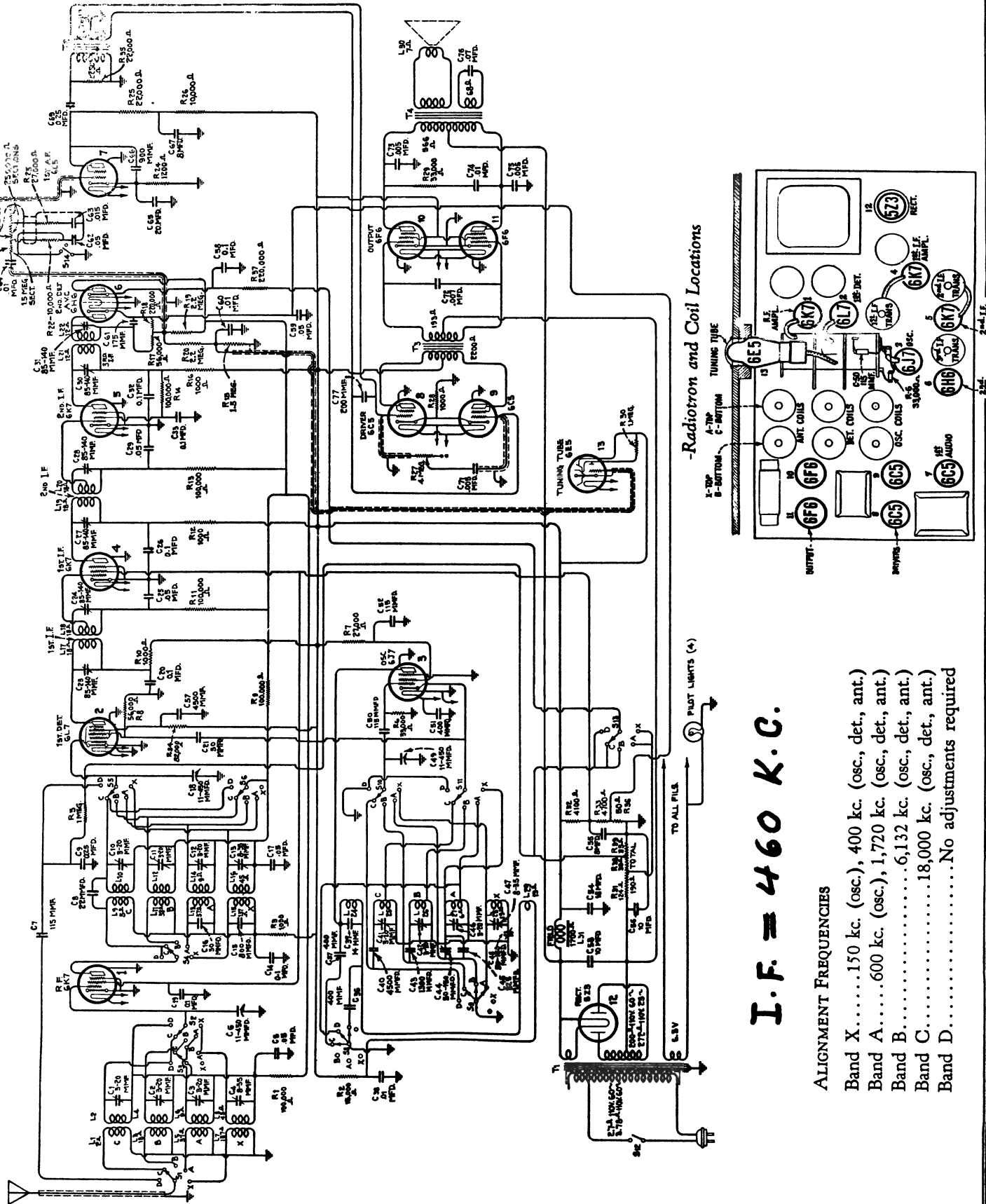


Fig. 6—Trimmer Locations and Radiotron Socket Voltages
Measured at 115 volts, 60 cycles—No signal input

RCA MANUFACTURING CO., Inc.

Model C13-2



ALIGNMENT FREQUENCIES

Band X.....150 kc. (osc.), 400 kc. (osc., det., ant.)
Band A.....600 kc. (osc.), 1,720 kc. (osc., det., ant.)
Band B.....6,132 kc. (osc., det., ant.)
Band C.....18,000 kc. (osc., det., ant.)
Band D.....No adjustments required

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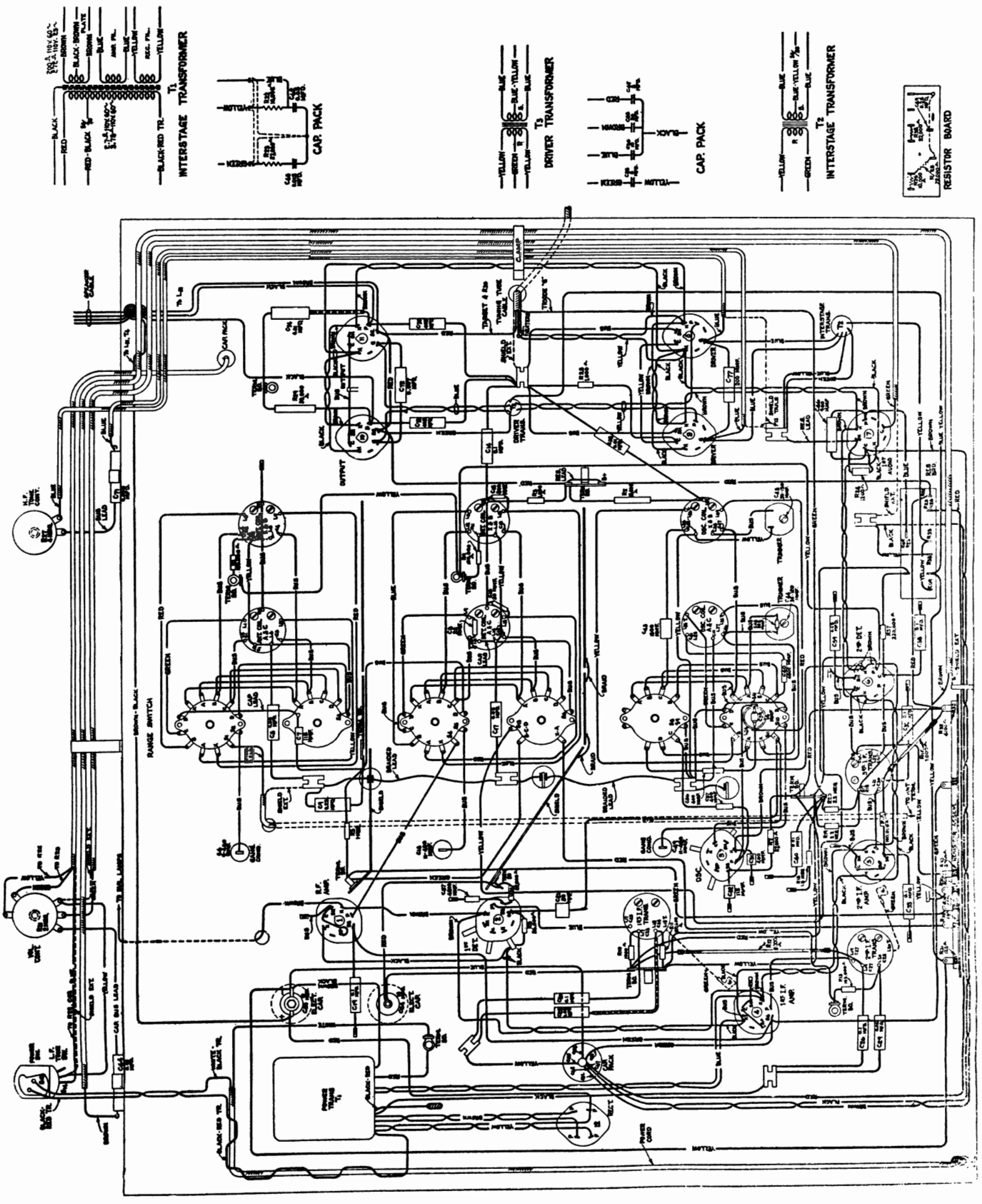
Model C13-2



Chassis Wiring Diagram

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Model C13-2

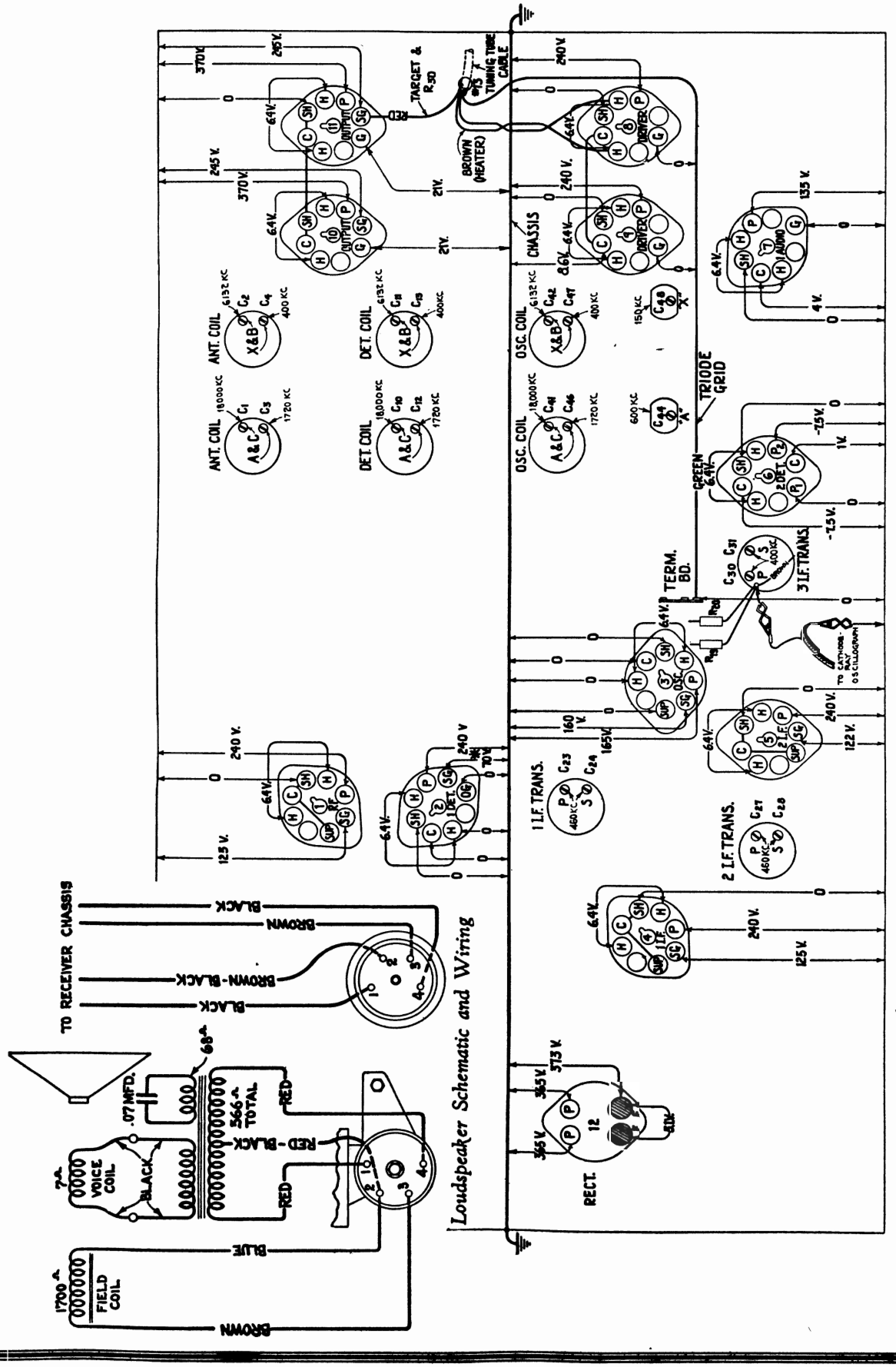

Figure 7—Trimmer Locations and Radiotron Socket Voltages

Measured at 120 volts A.C.—No Signal—All Tubes Intact—Volume Control Maximum—Band Switch on "A"

* Measured on 250 Volt Range of 1000 Ohm Per Volt Meter

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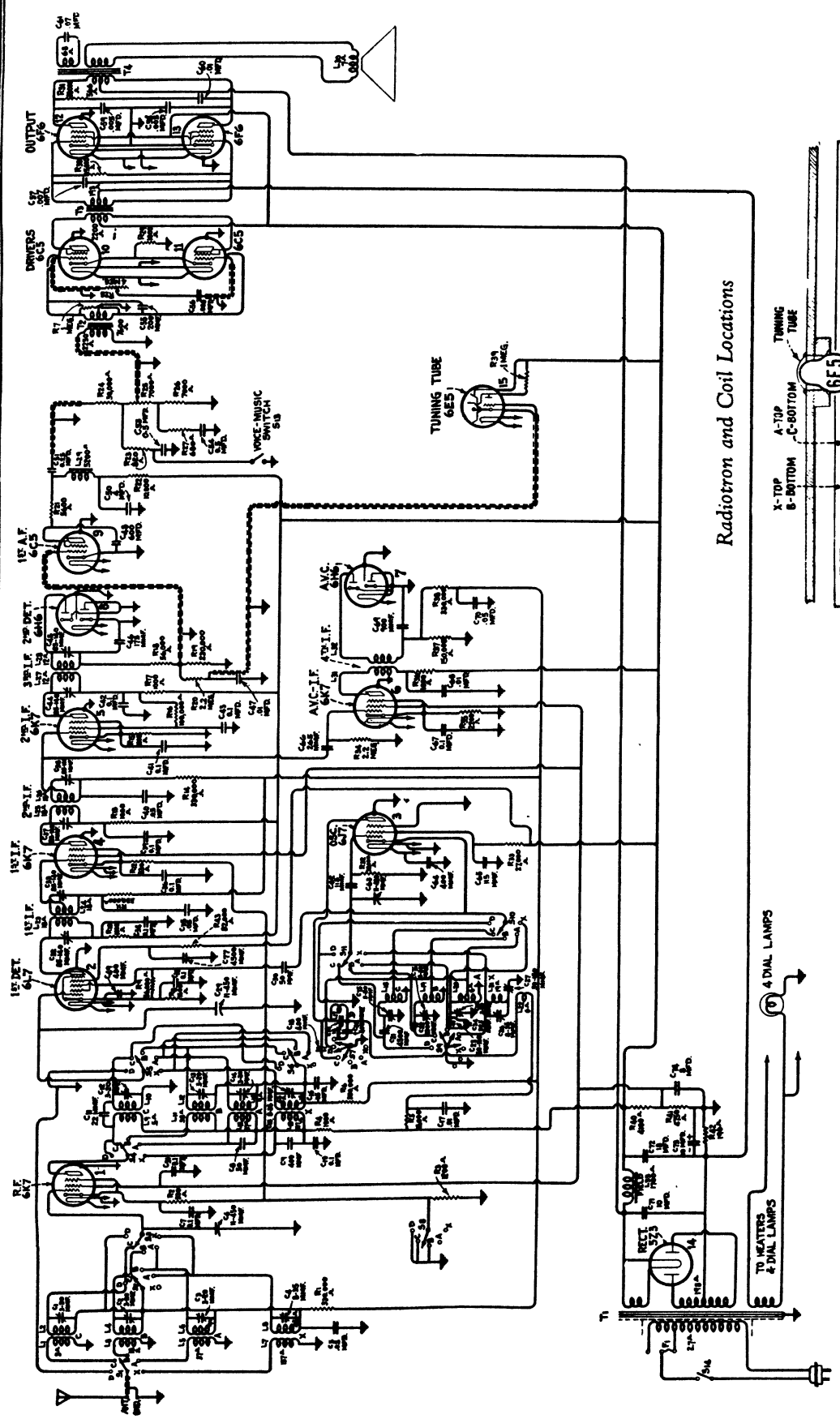
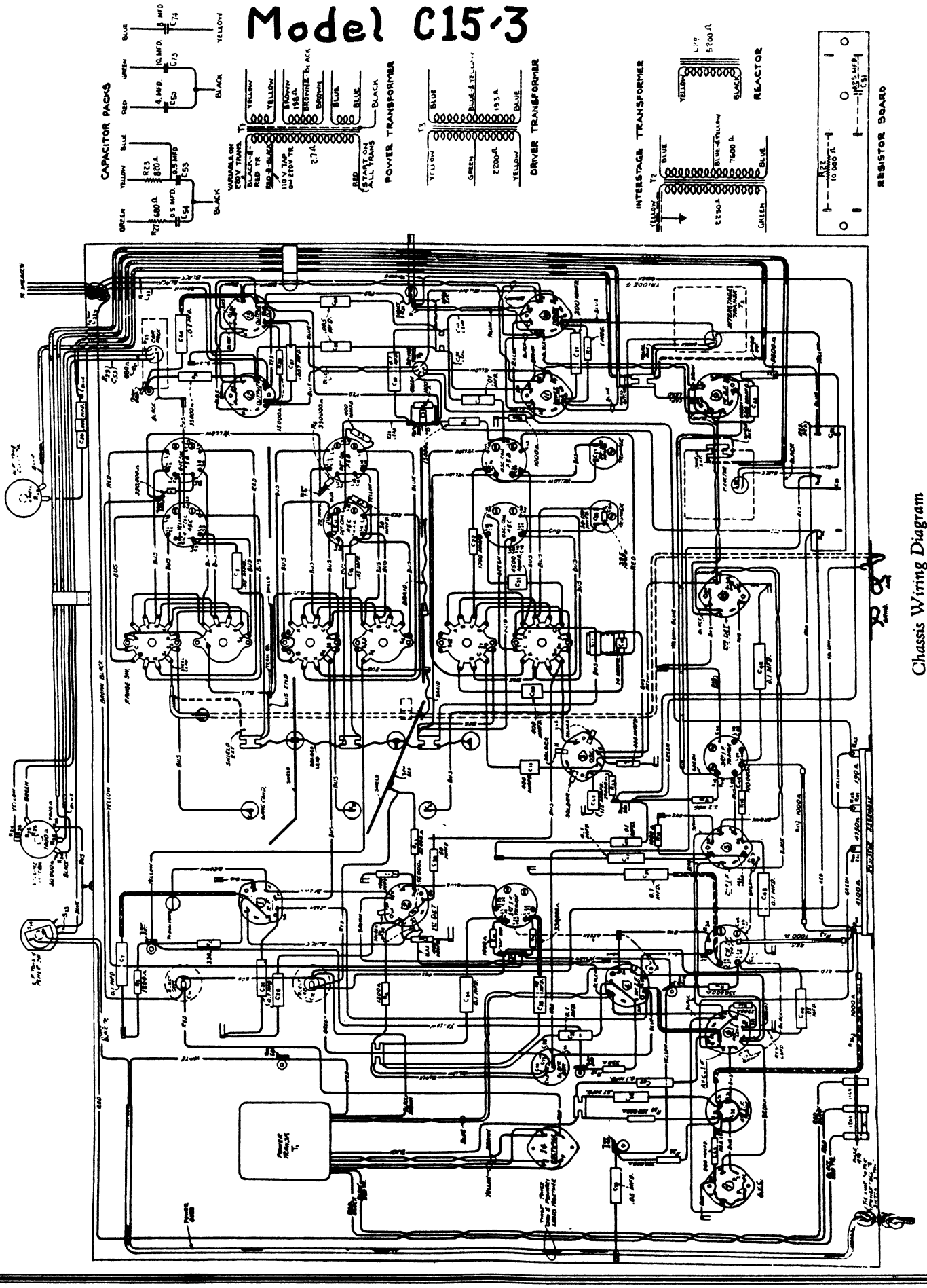
Model C15-3



RCA MANUFACTURING CO., Inc.

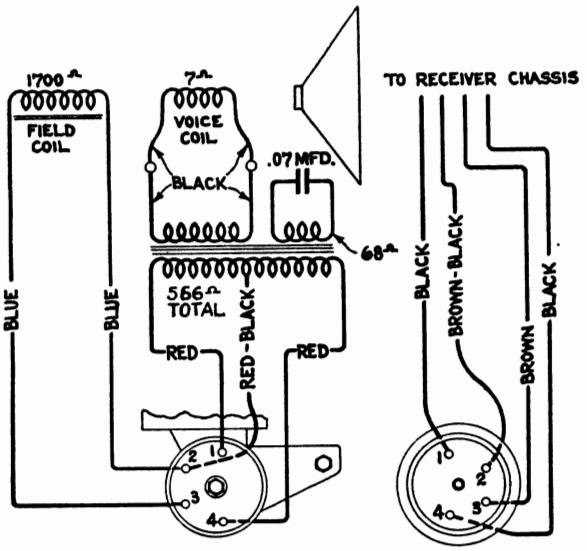
Model C15-3



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model C15-3



Loudspeaker Schematic and Wiring

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to ground on Figure 8 will serve to assist in locating causes for faulty operation when existent. Each value as specified should hold within + 20% when the receiver is normally operative at the rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given on the diagram are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance is comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each check is chosen as high as possible consistent with good readability.

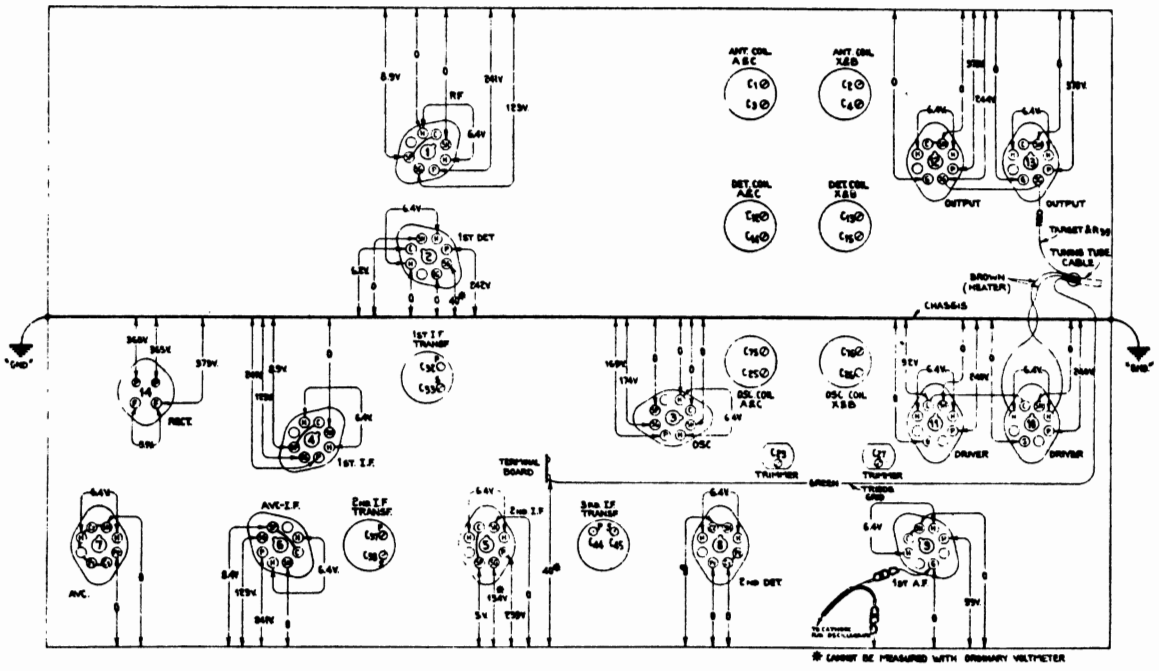


Figure 8—Trimmer Locations and Radiotron Socket Voltages

Measured at 120 volts A.C.—No Signal—All Tubes Intact—Volume Control Maximum—Band Switch on "A"

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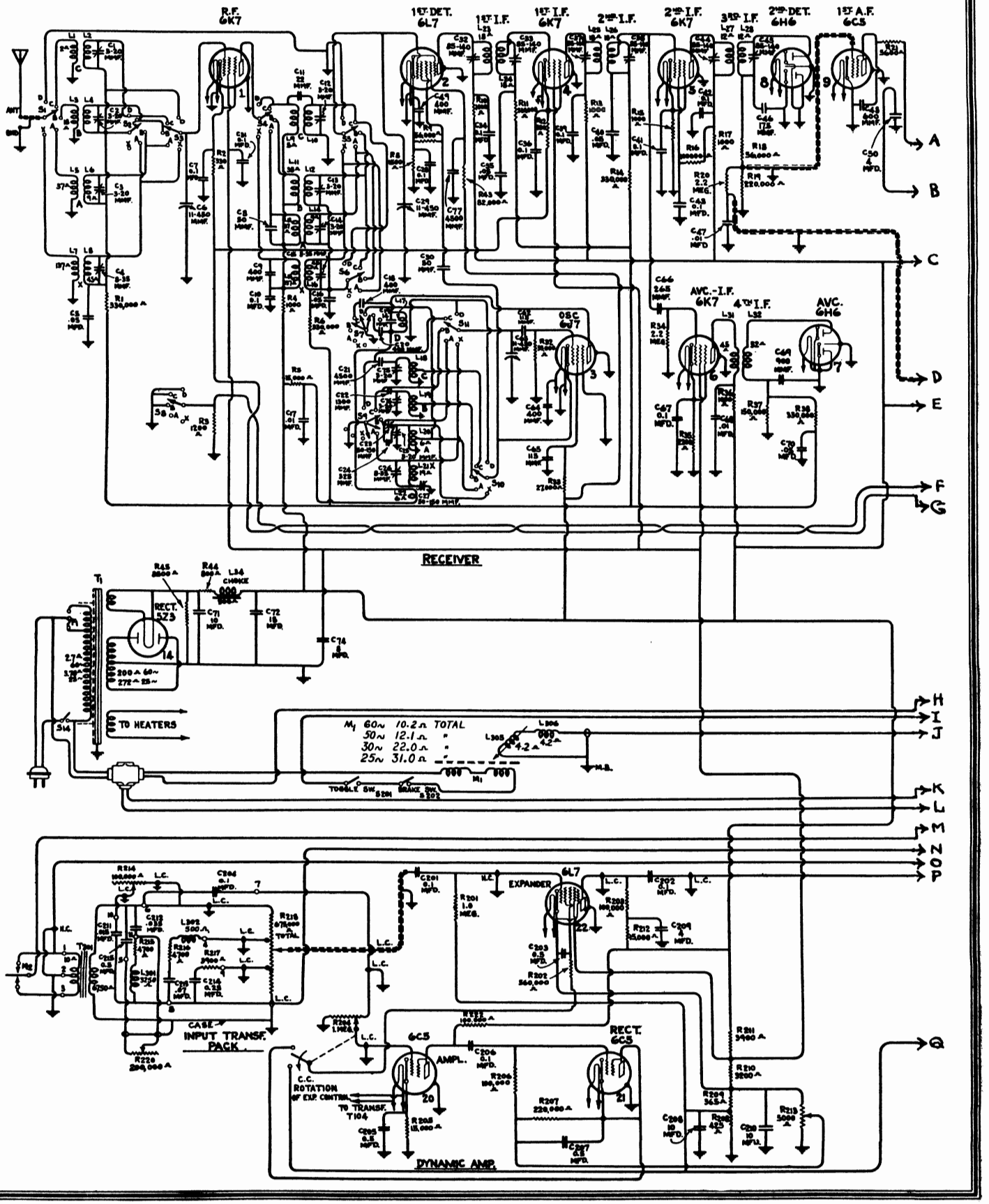
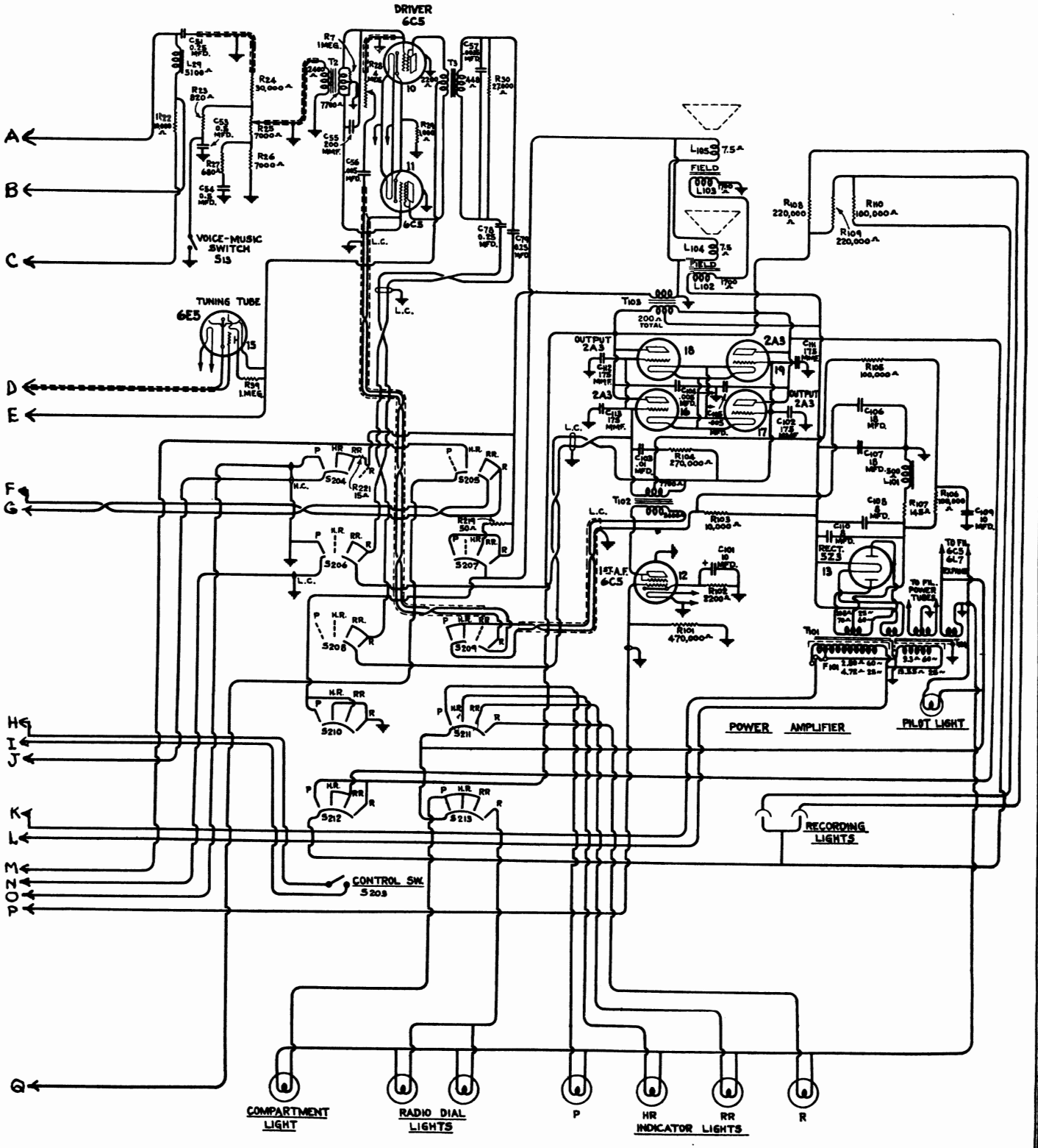
MODEL D22-1



RCA MANUFACTURING CO., Inc.

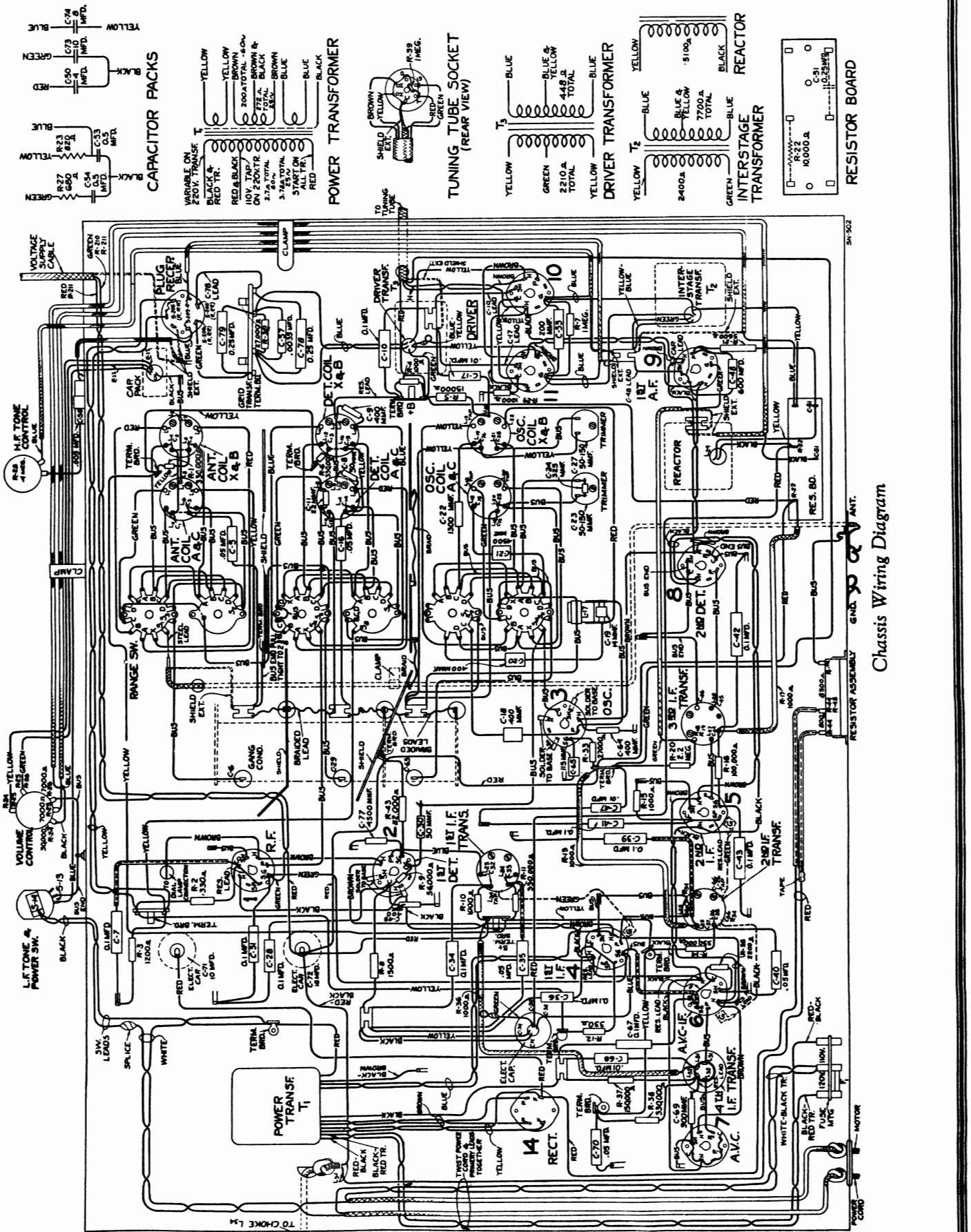
MODEL D22-1



I.F. PEAK — 460 KC.

RCA MANUFACTURING CO., Inc.

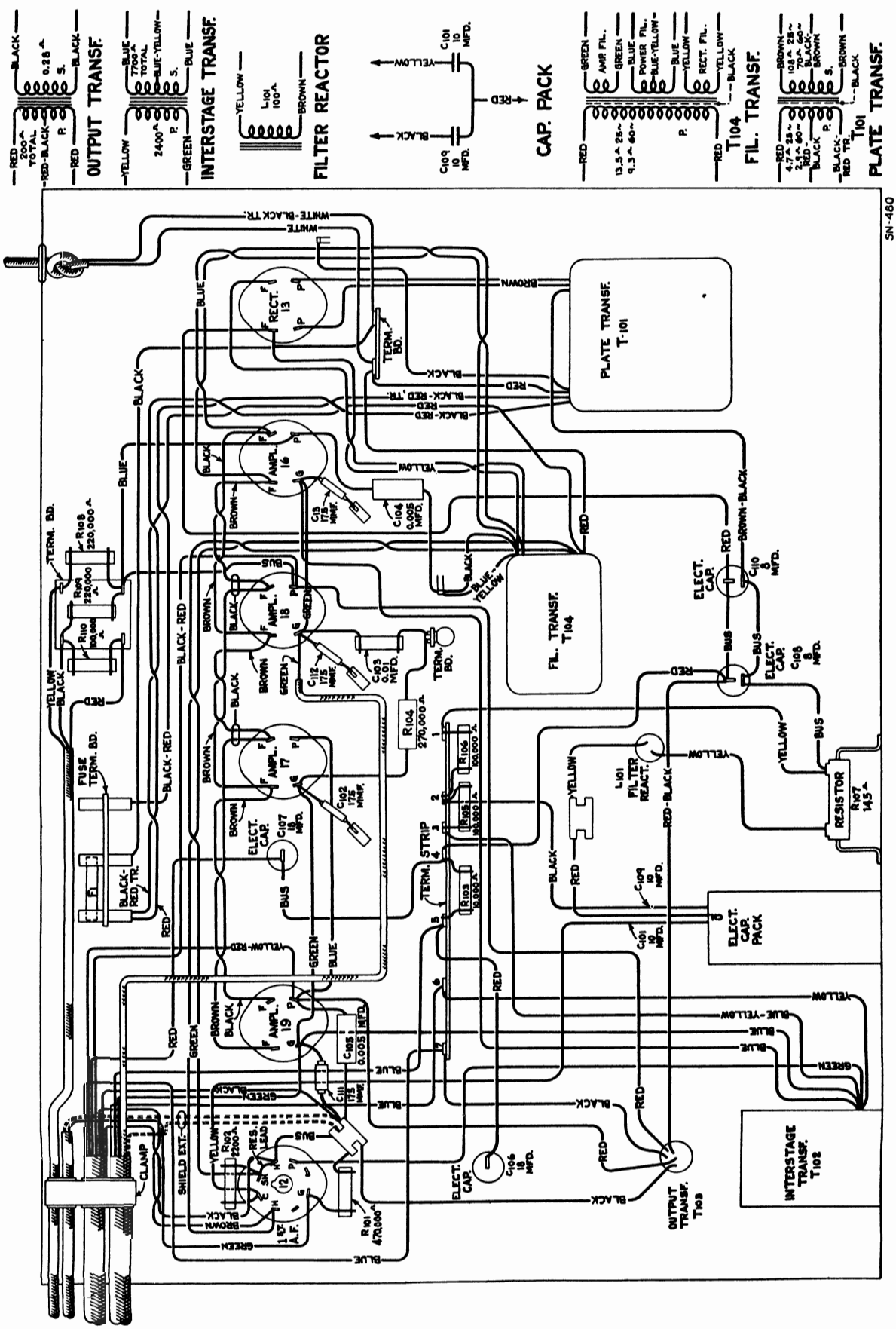
MODEL D22-1



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

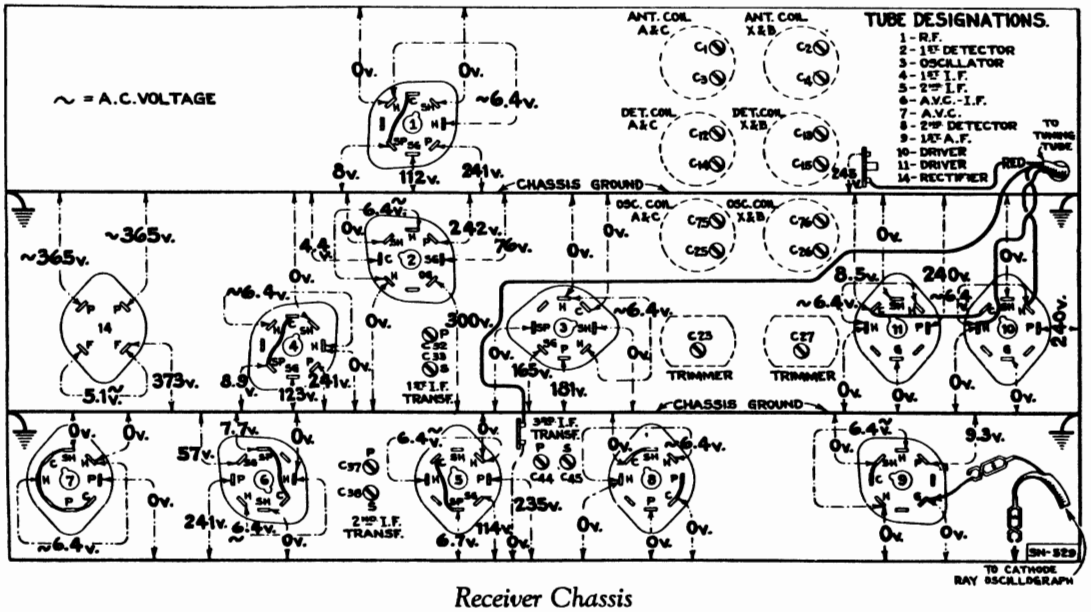
MODEL D22-1



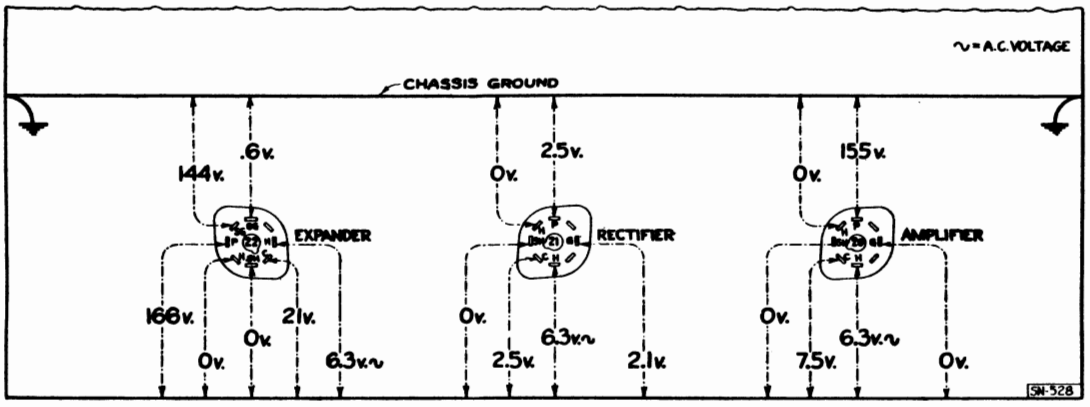
Power Amplifier Wiring

RCA MANUFACTURING CO., Inc.

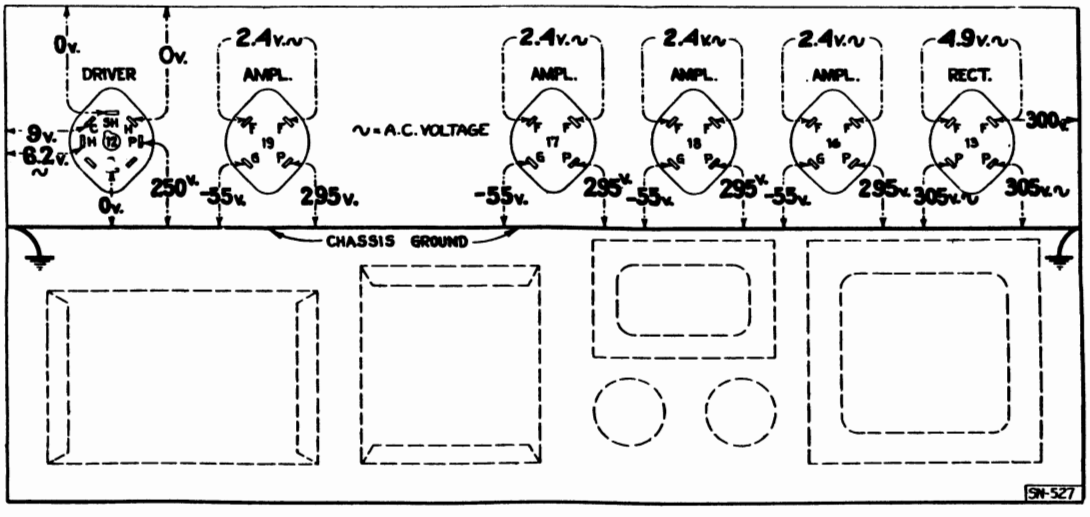
MODEL D22-1



Receiver Chassis



Dynamic Amplifier



Power Amplifier

Radiotron Socket Voltages

Measured at 115 volts, 60 cycle supply—No signal being received

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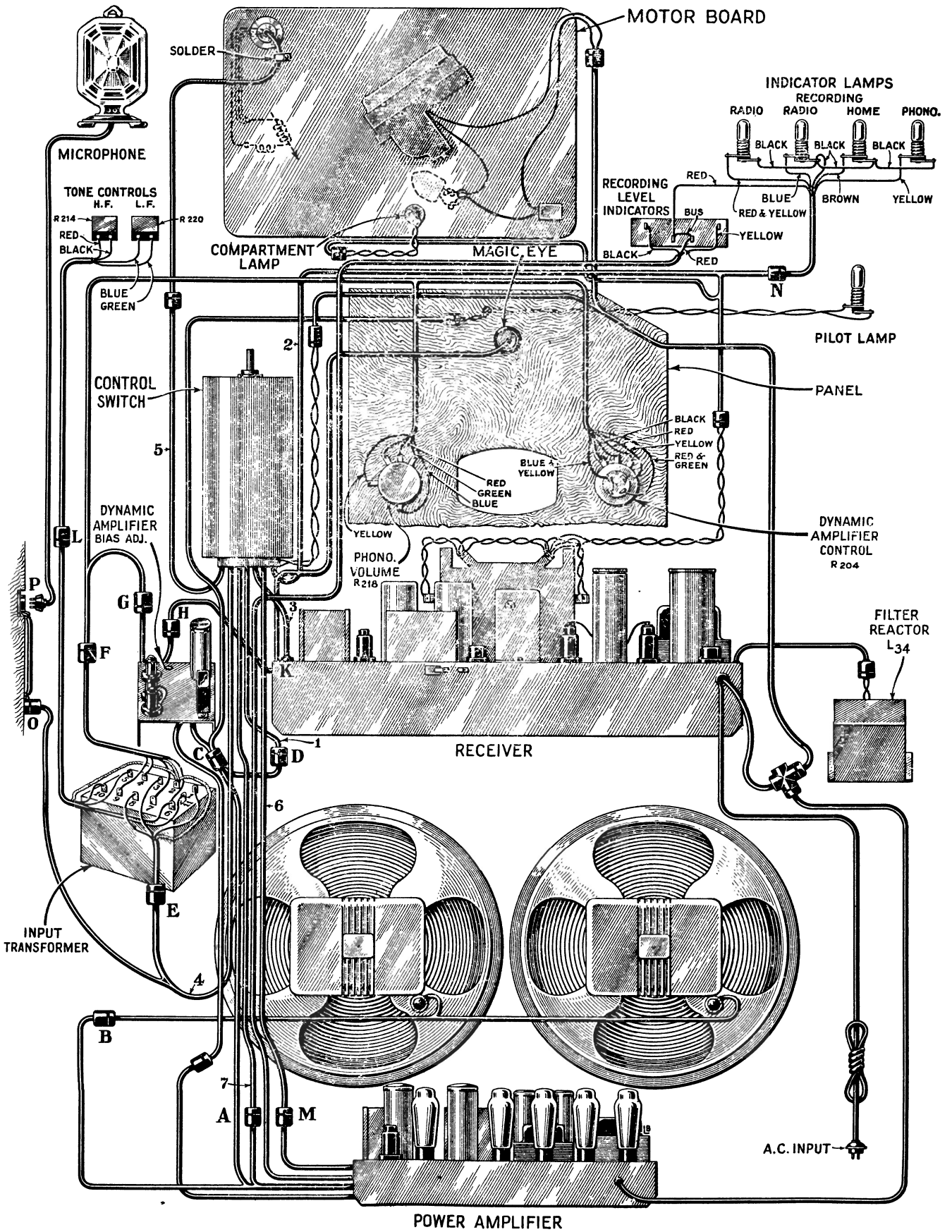
MODEL D22-1



-Assembly Wiring

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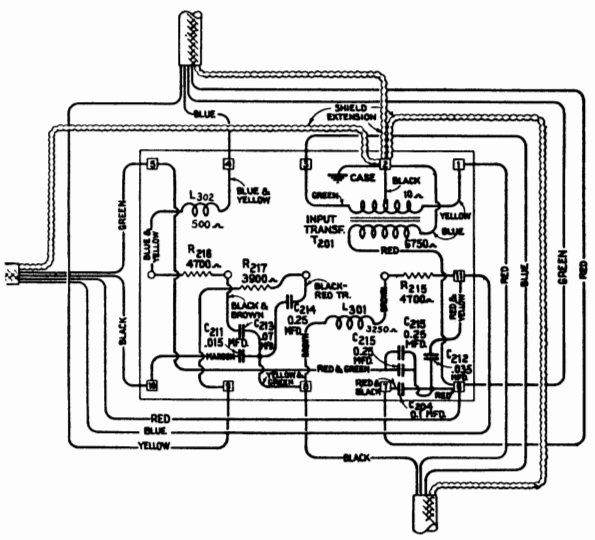
MODEL D22-1



Input Transformer Wiring

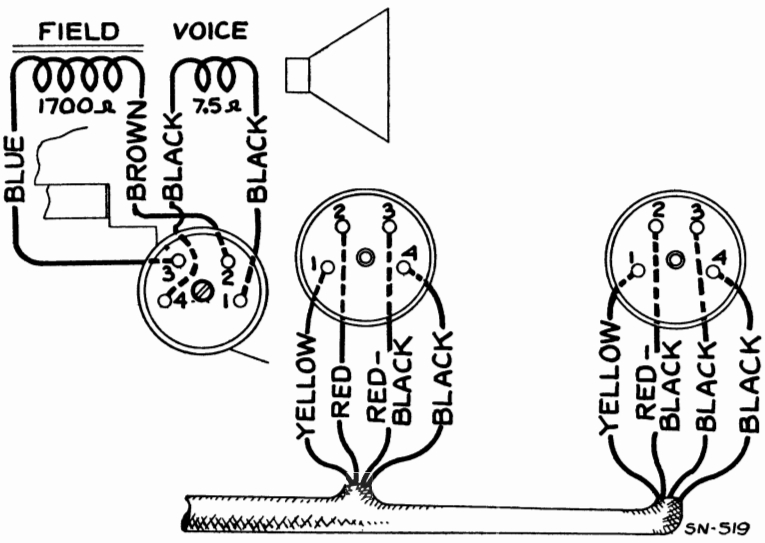
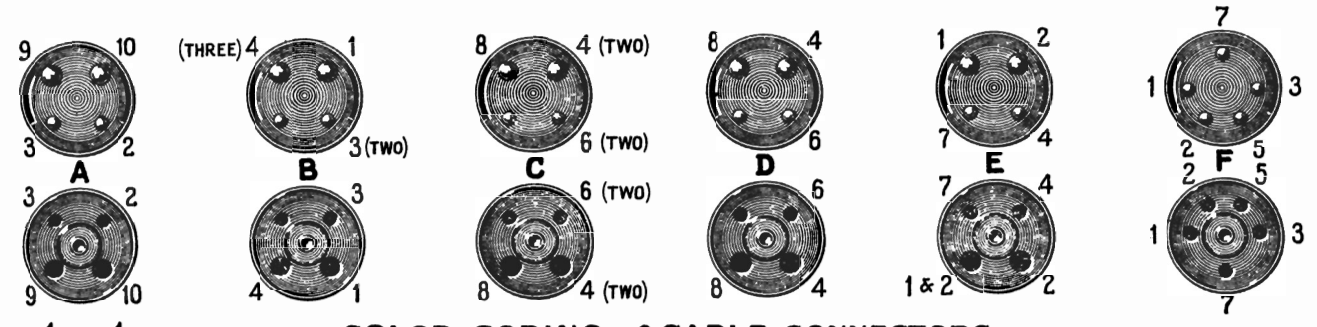


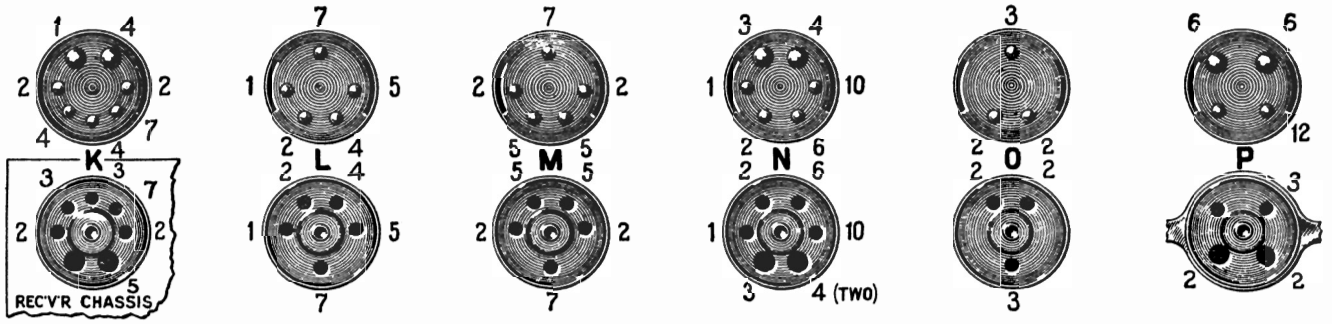
Figure 5—Loudspeaker Wiring



COLOR CODING of CABLE CONNECTORS

1 RED	6 BROWN
2 BLUE	7 SHIELD
3 YELLOW	8 RED & GREEN
4 BLACK	9 RED & BLACK
5 GREEN	10 RED & YELLOW

11 YELLOW & BLUE
12 BROWN WITH RED TR.



RCA MANUFACTURING CO., Inc.

MODEL D22-1

Alignment Procedure

Fourteen alignment trimmers are provided in the r-f, first detector, and oscillator tuning system and six are used in the i-f system. All of these are accurately adjusted during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or have been altered by other means. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for alignment of this particular instrument is illustrated and described on a separate page of this booklet.

The extensive frequency range of this receiver necessitates a more or less involved method of alignment. However, if the following directions are carefully applied, normal performance of the instrument will be obtained.

Two methods of alignment are applicable. One utilizes a cathode-ray oscillograph as a means of output indication and the other follows former procedure where a glow-type indicator, or meter, is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural methods, but each adjustment can be made with definite precision. Both methods are hereinafter outlined so that the alignment operations may be made in accordance with the equipment available.

CATHODE-RAY ALIGNMENT

Equipment

A standard source of alignment frequencies is required. Such a source should consist of an RCA Full-Range Oscillator, Stock No. 9595. Output indication should be by means of an RCA Cathode-Ray Oscillograph, Stock No. 9545. An RCA Frequency Modulator, Stock No. 9558, will be needed to sweep the generated signal and synchronize it with the Oscillograph in order to obtain visual representation of the resonant characteristic of the circuit being tuned on the cathode-ray fluorescent screen.

I-F Trimmer Adjustments

Six trimmers are associated with the three i-f transformers. Their locations on the chassis are shown by Figure 4. Each must be aligned to a basic frequency of **460 kc.** The last i-f transformer should be adjusted first, the one preceding it second and the operation carried through successive stages until the first transformer has been aligned. For such a process, it is necessary to feed the output of the Full-Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each and observing the effect at the second-detector output on the Cathode-Ray Oscillograph. The most convenient point for connection of the Oscillograph is at the control-grid of the RCA-6C5 first audio tube, with the vertical "Hi" input terminal attached to the grid connection and the "Gnd" to the chassis. The "Ext. Sync." terminals of the Oscillograph should be connected to the Frequency Modulator as illustrated in Figure 2. A .001 mfd. capacitor installed in series with the Oscillator "Ant." output lead will prevent the voltage constants of the stage being aligned, from becoming upset.

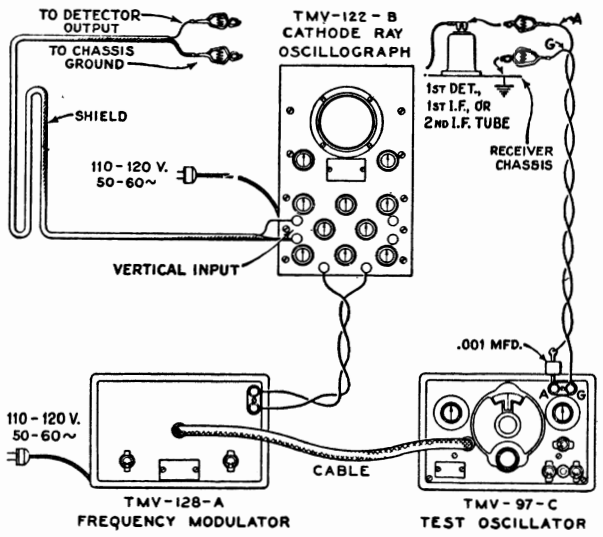


Figure 2—Alignment Apparatus Connections

The vertical "A" amplifier should be "On" for the ensuing adjustments and its gain control kept at maximum. For each adjustment, the Oscillator output must be regulated so that the image obtained on the Oscillograph screen will be of the minimum size convenient for accurate observation. Proceed further as follows:—

(a) Place the Receiver, Oscillograph, and Test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be encountered from signal pickup or from the RCA-6J7 oscillator, removing the tube if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of spot.

(b) Attach the output of the test Oscillator between the control-grid cap of the second i-f tube (RCA-6K7) and chassis ground as shown typically by Figure 2. Tune the Oscillator to **460 kc.** and set its modulation switch to "On." Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give a shape which is convenient for peak indications. Cause the image to stand still on the screen by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-44 and C-45 of the third i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.

RCA MANUFACTURING CO., Inc.

MODEL D22-1
ALIGNMENT (2)

(c) The Frequency Modulator should then be placed in operation and interconnected with the Full-Range Oscillator by means of the special shielded patch cord. Figure 2 shows the proper arrangement. Set the Frequency Modulator sweep-range switch to its "Lo" position and turn the Oscillator modulation switch to "Off." Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly coincident at their highest points. This condition will be found to occur at an Oscillator setting of *approximately 540 kc*. The curves will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirement and to make them remain motionless on the screen. This will require a setting of approximately ½ clockwise rotation of the frequency control. The trimmers C-44 and C-45 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.

(d) Leaving the equipment connected and adjusted as above, change the Oscillator output to the control-grid cap of the first i-f tube (RCA-6K7). Adjust the two trimmers C-37 and C-38 of the second i-f transformer until the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude.

(e) Change the test Oscillator output to the control-grid of the first detector tube (RCA-6L7) without disturbing the connections and adjustments of the other apparatus. Then align the trimmers C-32 and C-33 of the first i-f transformer to produce waves of maximum coincidence and maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the over-all tuning characteristic of the i-f system.

R-F Trimmer Adjustments

For Bands A and X, adjustments must be made at the high and low frequency ends of the range. On Bands B and C, alignment is required only at the high frequency end. Band D is permanently adjusted during manufacture, hence no alignment will be necessary in this range. Locations of the various antenna, detector, and oscillator trimmers are shown on Figure 4. The test Oscillator should be removed from connection with the i-f system and its output attached to the antenna-ground terminals of the receiver. No changes are to be made in the attachment of the Oscillograph at the second detector. During the adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to this procedure will obviate apparent broadness of tuning which would result from a.v.c. action on a stronger signal. The sequence of alignment should be Band A, Band X, Band B, and Band C. Proceed with the adjustments as follows:—

Calibration

Set the receiver range switch to Band A and rotate the station selector until the tuning condenser plates are in full mesh (maximum capacitance). Then move the main dial pointer until it points exactly to the horizontal line at the low frequency end of the Band A scale. Correct the setting of the vernier second hand pointer to read zero.

Band A

(a) With the receiver range switch in its Band A position, tune the station selector until the dial pointer is at a reading of **1720 kc.** Adjust the test Oscillator to **1720 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output to produce a registration on the Oscillograph. Carefully align the oscillator, detector, and antenna trimmers, C-25, C-14, and C-3 respectively, so that each brings about maximum amplitude of output as shown by the wave on the Oscillograph. It will be necessary to have the timing control of the Oscillograph on "Int." for this operation. After each trimmer has been peaked, the Oscillograph timing control should be set to "Ext." and the Frequency Modulator placed into operation with its connections to the Oscillator and Oscillograph made in accordance with Figure 2. Turn the modulation switch of the Oscillator to "Off" and retune the Oscillator (increase frequency) until the forward and reverse waves show on the Oscillograph and become coincident at their highest points. Adjust the trimmers C-25, C-14, and C-3 again, setting each to the point which produces the best coincidence and maximum amplitude of the wave images.

(b) Remove the Frequency Modulator cable from the Oscillator and shift the signal frequency to **600 kc.** Place the modulation switch to "On". Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then insert the Frequency Modulator plug and retune the Oscillator (modulation "Off") until the two similar forward and reverse waves appear on the screen. For this adjustment, it is advisable to shift the Oscillator to its 200-400 kc. range using the third harmonic of the generated signal in order to obtain the desired range of sweep. The oscillator series trimmer, C-23, should then be adjusted to produce maximum amplitude of the images. No rocking will be necessary on the station selector inasmuch as the signal frequency is being "wobbled" by the Frequency Modulator to produce the same effect. After completing this adjustment, the trimmer C-25 should be re-aligned as in (a) to correct for any change brought about by the adjustment of C-23.

Band X

(a) Disconnect the Frequency Modulator and tune the test Oscillator to a frequency of **400 kc.** (Modulation "On"). Place the receiver range

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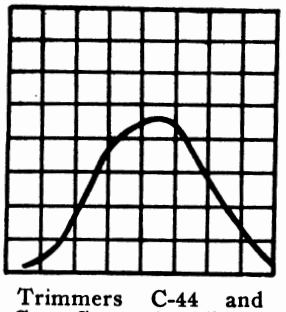
MODEL D22-1

ALIGNMENT (3)

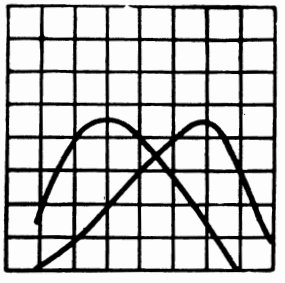
switch in its Band X position and turn the station selector until the dial pointer reads **400 kc.** Adjust the Oscillograph timing control to "Int." Then align each of the trimmers C-26, C-15, and C-4 to the point producing maximum output at the Oscillograph. Place the Frequency Modulator in operation and attach it to the Oscillator in the normal manner. Change the Oscillograph timing to "Ext." Increase the frequency of the Oscillator (modulation "Off") until the two waves appear and become coincident at their highest points, *approximately at 462 kc.* They may be made to remain stationary on the screen by manipulation of the Oscillograph range switch and frequency control. Readjust the three trimmers C-26, C-15, and C-4 to give maximum amplitude and complete coincidence of the waves.

(b) Change the test Oscillator so that it delivers a signal of **150 kc.** with the Frequency Modulator disconnected. Tune this signal on the receiver which has previously been set to Band X, disregarding the dial reading at which the signal is best received. Then interconnect the Frequency Modulator with the Oscillator and retune the latter to the point at which the two similar waves appear on the screen. Adjust trimmer C-27, for maximum amplitude of the wave images. Rocking of the tuning condenser will not be necessary as the Frequency Modulator duplicates such an operation. Repeat the alignment of C-26 as outlined in (a) to correct for any reflective error brought about by the adjustment of C-27.

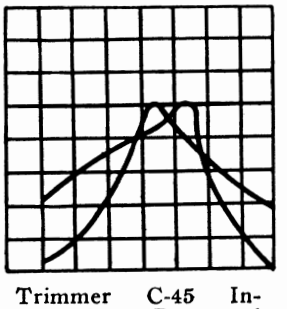
CURVES OF 3RD I-F TRANSFORMER



Trimmers C-44 and C-45 Correctly Aligned

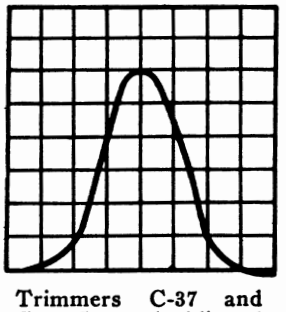


Trimmer C-44 Increased or Decreased 1/8th turn

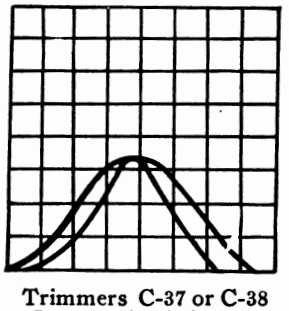


Trimmer C-45 Increased or Decreased 1/8th turn

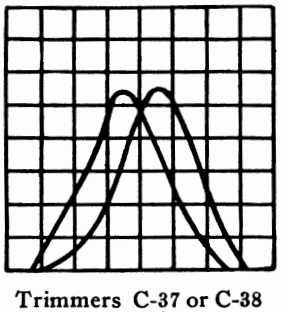
CURVES OF 2ND AND 3RD I-F TRANSFORMERS



Trimmers C-37 and C-38 Correctly Aligned

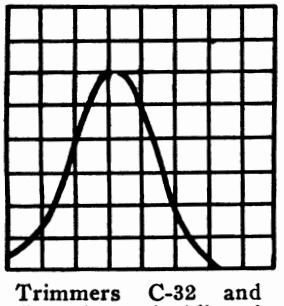


Trimmers C-37 or C-38 Increased 1/8th turn

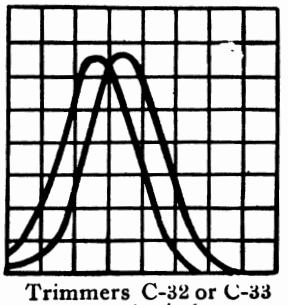


Trimmers C-37 or C-38 Decreased 1/8th turn

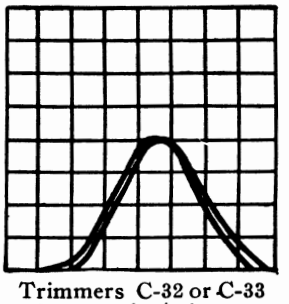
CURVES OF 1ST, 2ND AND 3RD I-F TRANSFORMERS



Trimmers C-32 and C-33 Correctly Aligned



Trimmers C-32 or C-33 Increased 1/8th turn



Trimmers C-32 or C-33 Decreased 1/8th turn

Figure 3—Cathode-Ray Images for I-F System

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MODEL D22-1

ALIGNMENT (4)

BAND B

(a) Advance the receiver range switch to its Band B position and tune the station selector to a dial reading of **6132 kc.** Set the test Oscillator to **6132 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output until a suitable indication is apparent on the Oscillograph. The Oscillograph should be adjusted for "Int." timing. Then adjust the oscillator trimmer, C-76, to the point at which maximum amplitude of the image is obtained. Two positions will be found for this trimmer which gives such a maximum. The one of least capacitance is correct and should be used. This can be checked by tuning the "image" signal, which will be received at **5212 kc.** on the dial if the adjustment of C-76 has been properly made. An increase in the test Oscillator output may be necessary for this test. *Its frequency should not be changed from* **6132 kc.** *nor any trimmer adjustments made on the receiver.*

(b) Return the station selector to the **6132 kc.** reading and align the detector, and antenna coil trimmers, C-13 and C-2 respectively, for maximum (peak) output as shown by the Oscillograph. No further adjustments are to be made on this band.

BAND C

(a) Turn the range switch of the receiver to its Band C position and tune the station selector until the dial pointer reads **18,000 kc.** Set the test Oscillator to **18,000 kc.** (Modulation "On" and Frequency Modulator disconnected), regulating its output to the level required for convenient observation. Adjust trimmer C-75 to the point producing maximum output as indicated on the Oscillograph. Check for the presence of "image" signals by tuning the receiver to **17,080 kc.** The **18,000 kc.** signal of the Oscillator will be received at this point if the adjustment of C-75 has been properly made, using the position of minimum capacitance giving maximum receiver output. It may be necessary to increase the output of the Oscillator in order to get an indication of the "image". *No adjustments should be made during this check.*

(b) Return the receiver tuning to **18,000 kc.**, realign C-75 if necessary, and then adjust the detector and antenna trimmers C-12, and C-1 for maximum signal output as evidenced by the oscillographic image. No further adjustments are to be made on Band C.

BAND D

No adjustments are required on this band.

OUTPUT METER ALIGNMENT

To align the receiver by other methods than that explained above will require the use of a standard test oscillator, such as the Stock No. 9595, and a suitable output indicator, such as the Stock No. 4317. The indicator should be connected either to the voice coil circuit or across the output transformer primary. For each adjustment, the volume control should be maintained at maximum and the Oscillator output regulated until the indication is barely perceptible. The smaller the amount of glow, the more accurate will be the indication. The signal level will also be below the range of the receiver a.v.c., preventing broadness of tuning.

I-F Adjustments—Connect the output of the test Oscillator from the RCA-6L7 first detector control-grid to chassis-ground and adjust its frequency to **460 kc.** Tune the receiver to Band "A", setting the station selector at a point where no interference is received from local stations or the local oscillator. Then tune the i-f trimmers C-45, C-44, C-38, C-37, C-33, and C-32 in order, each for maximum indicated receiver output.

R-F Adjustments—Connect the Oscillator output to the antenna-ground terminals of the receiver. Keep the output indicator attached to the receiver output as above. For each adjustment, use the minimum signal which will give a perceptible indication on the glow indicator.

BAND A

(a) Set the range switch of the receiver to its Band A position and tune the selector to a dial reading of **1720 kc.** Tune the Oscillator to this same frequency and adjust trimmers C-25, C-14, and C-3 to produce maximum indicated receiver output.

(b) Shift the Oscillator to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then adjust trimmer C-23, simultaneously rocking the tuning control backward and forward through the signal, until maximum output is obtained from the combined operations. Repeat the alignment of C-25 as in (a) to correct for any change caused by adjustment of C-23.

BAND X

(a) Change the range switch to its Band "X" position. Tune the receiver to read **400 kc.** and set the Oscillator to produce this same frequency. Adjust trimmers C-26, C-15, and C-4 to produce maximum receiver output.

(b) Shift the Oscillator frequency to **150 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then tune the oscillator series trimmer, C-27, simultaneously rocking the tuning control (receiver) backward and forward through the signal, until maximum output results from the combined operations. Repeat the alignment of C-26 as in (a) to correct for any change caused by the adjustment of C-27.

BAND B

Place the receiver range switch in its Band "B" position and tune the station selector to a dial reading of **6132 kc.** Set the frequency of the Oscillator to **6132 kc.** Then adjust trimmer C-76 to give maximum receiver output. Two positions may be found which fulfill this condition. The one of least capacitance is correct. To assure that the right peak has been used, tune the *receiver* to **5212 kc.** and increase the Oscillator output. The "image" of **6132 kc.** will be received at this point if C-76 has been adjusted to the proper point of maximum output. *No trimmer adjustments are to be made during this check.* Return the receiver tuning to **6132 kc.**, readjust C-76 if necessary, and then tune the

RCA MANUFACTURING CO., Inc.

MODEL D22-1

ALIGNMENT (5)

detector and antenna coil trimmers, C-13 and C-2 to produce maximum (peak) receiver output as indicated on the glow meter.

Band C

Turn the receiver range switch to its Band "C" position and set the tuning control to a dial reading of **18,000 kc.** Tune the Oscillator to this same frequency. Adjust the oscillator parallel trimmer C-75 to produce maximum receiver output. Two positions of the trimmer will be found which fulfill such a condition. The one of least capacitance is correct. To assure that the right position has been used, check for the "image" of the **18,000 kc.** signal which will be received at **17,080 kc.** on the dial if C-75 is correctly adjusted. An increase in Oscillator output may be necessary. *No trimmer adjustments should be made during this check.* Return the receiver tuning to **18,000 kc.**, readjust C-75 if necessary, and then tune the detector and antenna trimmers, C-12 and C-1 to give maximum receiver output.

Alignment Frequencies

Band X	150 kc. (osc.),	400 kc. (osc., det., ant.)
Band A	600 kc. (osc.),	1,720 kc. (osc., det., ant.)
Band B	6,132 kc.	(osc., det., ant.)
Band C	18,000 kc.	(osc., det., ant.)
Band D	No adjustments necessary	

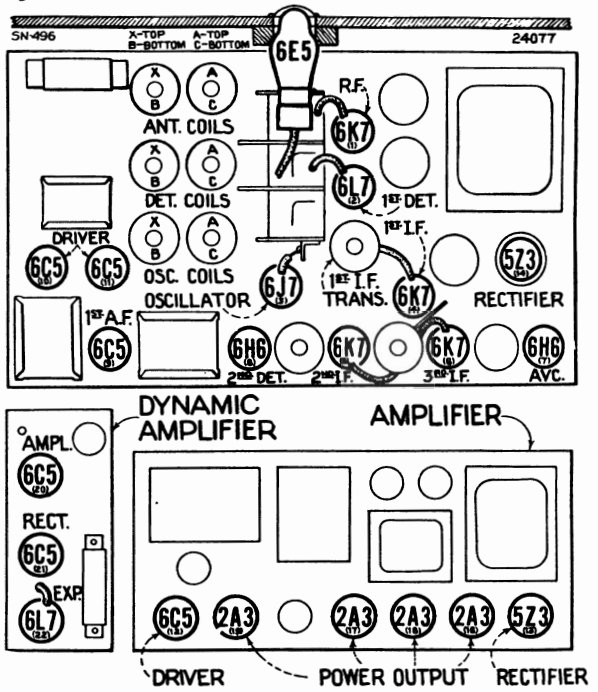
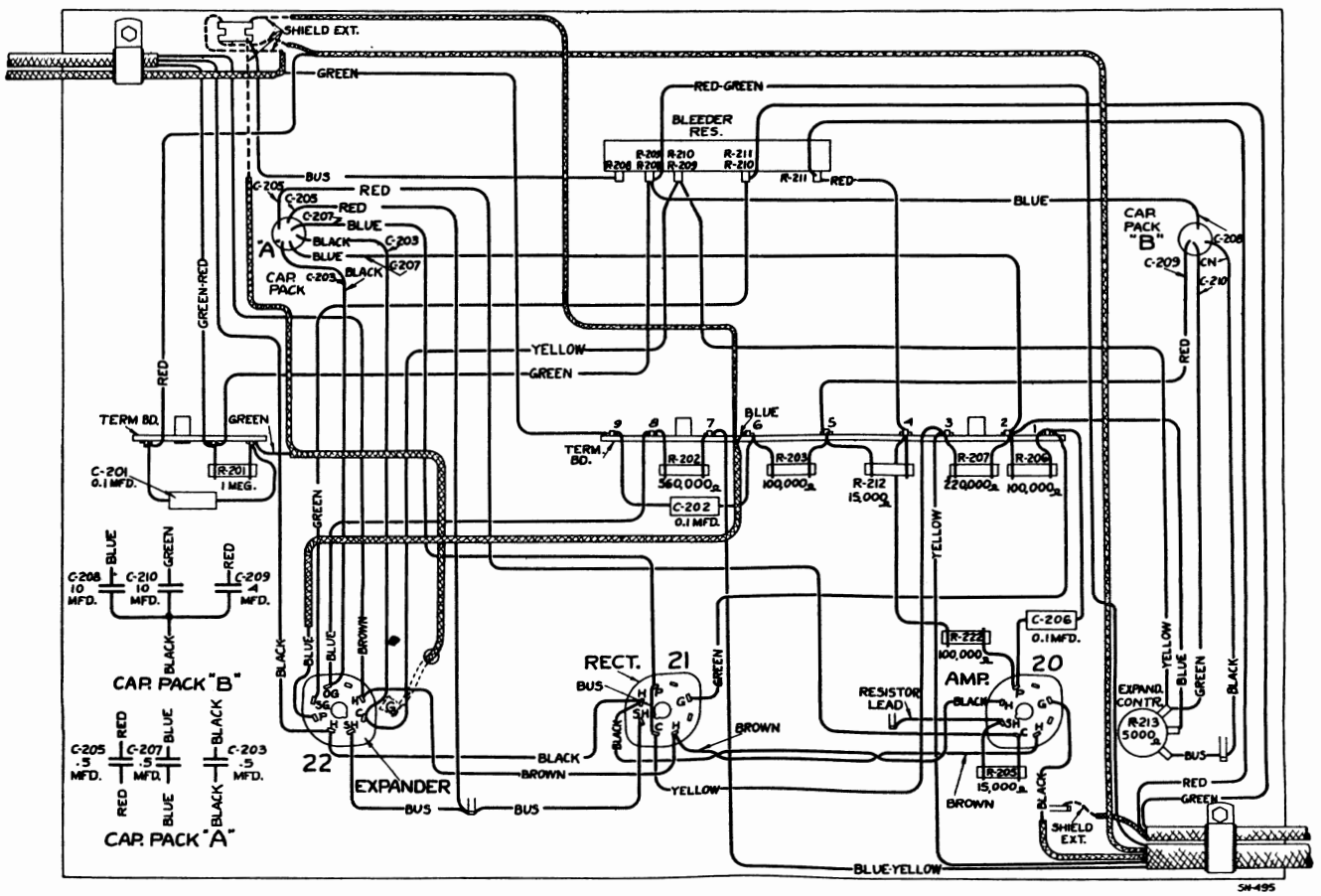


Figure 1—Radiotron and Coil Locations



Dynamic Amplifier Wiring

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Model RK-24 Phono-Oscillator

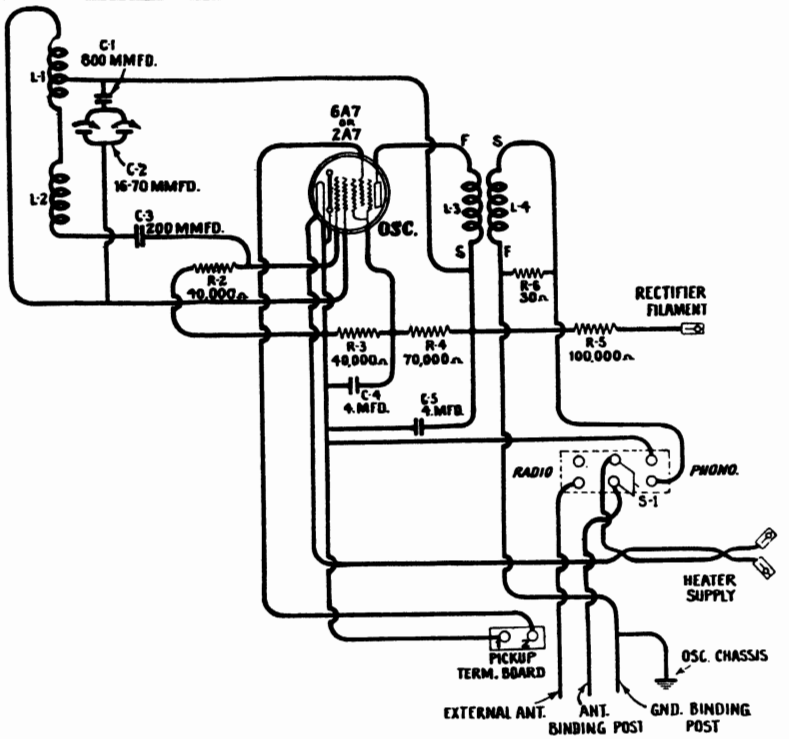


Figure 2—Schematic Circuit Diagram

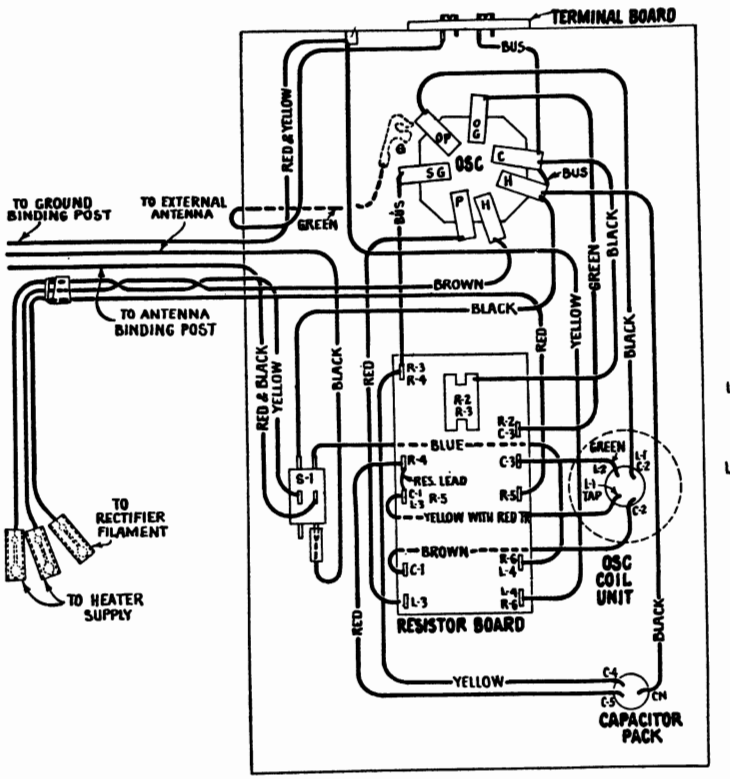
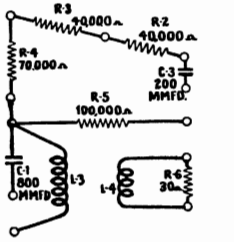
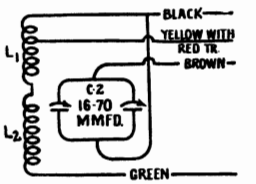


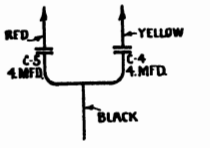
Figure 3—Chassis Wiring



RESISTOR BOARD CONNECTIONS



INTERNAL CONNECTIONS OF OSCILLATOR COIL UNIT



INTERNAL CONNECTIONS OF CAPACITOR PACK

The RCA Victor RK-24 Phonograph Oscillator is a modulated R. F. oscillator designed for use in conjunction with the RCA Victor Record Player Model R-93. The purpose of the RK-24 Oscillator is to facilitate and ensure the proper connection and operation of the R-93 when connected to a radio receiver of any type and manufacture.

The Oscillator uses Radiotron RCA-2A7 or RCA-6A7, depending on the heater voltage of the receiver with which it is to be used. This Radiotron is of the dual purpose variety and functions both as an oscillator and a modulator. The modulation is of the pentode control grid type and results in excellent quality throughout the audio range of the pickup.

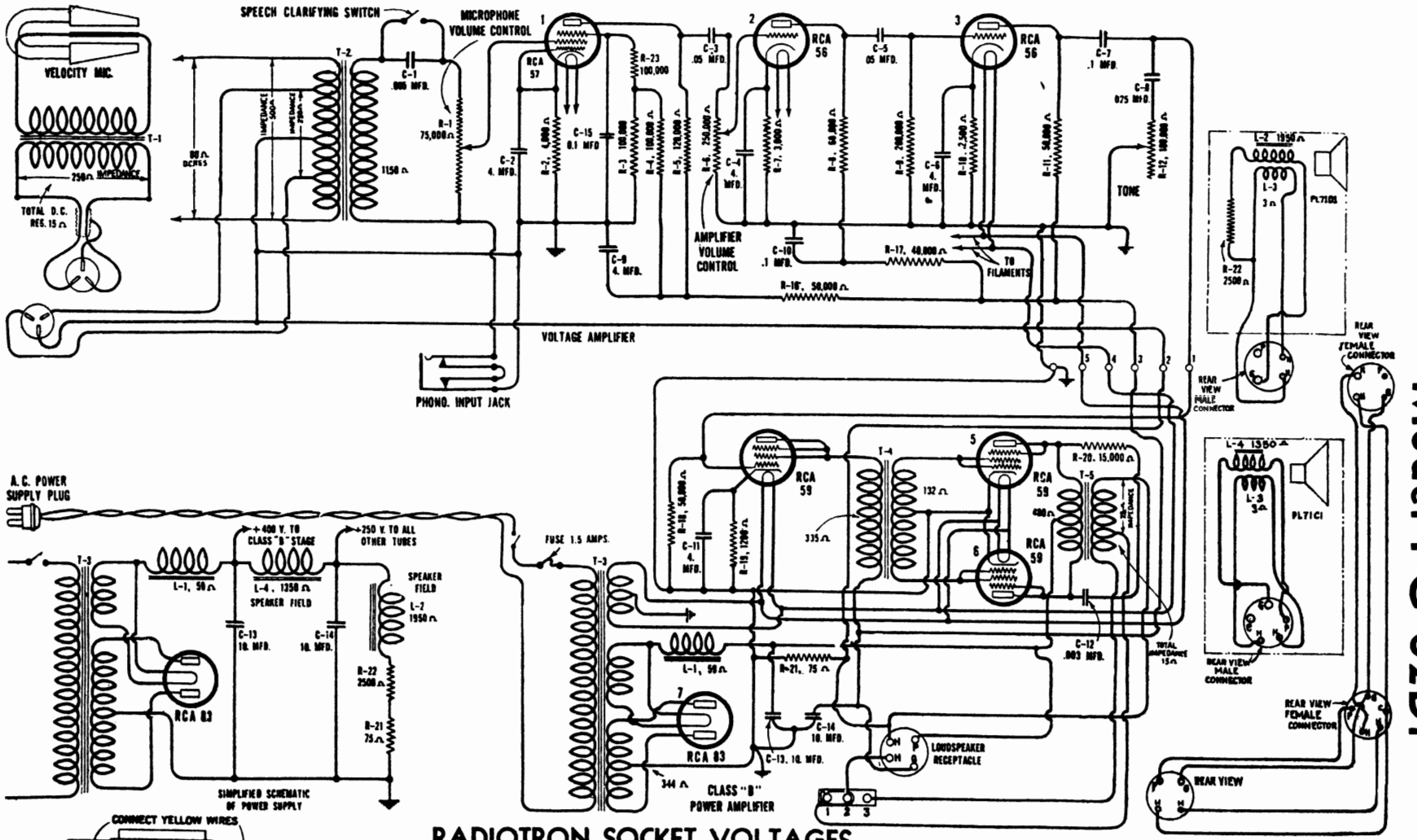
A typical connection of the RK-24 in conjunction with the R-93 Record Player is shown in Figure 1.

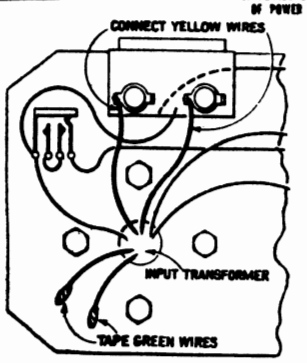
Figure 2 shows the schematic circuit diagram, while Figure 3 shows the chassis wiring diagram.

RCA MANUFACTURING CO., Inc.

Portable Public Address System

Model PG 62D1





Wiring changes for two microphone operation

RADIOTRON SOCKET VOLTAGES

115 Volt A. C. Line—No Input Signal Voltage

Radiotron No.	Control Grid Volts	Screen Grid Volts	Plate Volts	Plate Current M. A.	Filament or Heater Volts
1. RCA-57	1.0	80	145	.25	2.5
2. RCA-56	3.5	—	120	1.2	2.5
3. RCA-56	4.0	—	165	1.6	2.5
4. RCA-59	2.8	—	242	23.0	2.5
5. RCA-59	0	—	390	13.0	2.5
6. RCA-59	0	—	390	13.0	2.5

CAUTION—Whenever the Radiotron RCA-83 rectifier is removed from or installed in its socket, the A. C. power control switch should be in the "off" position.

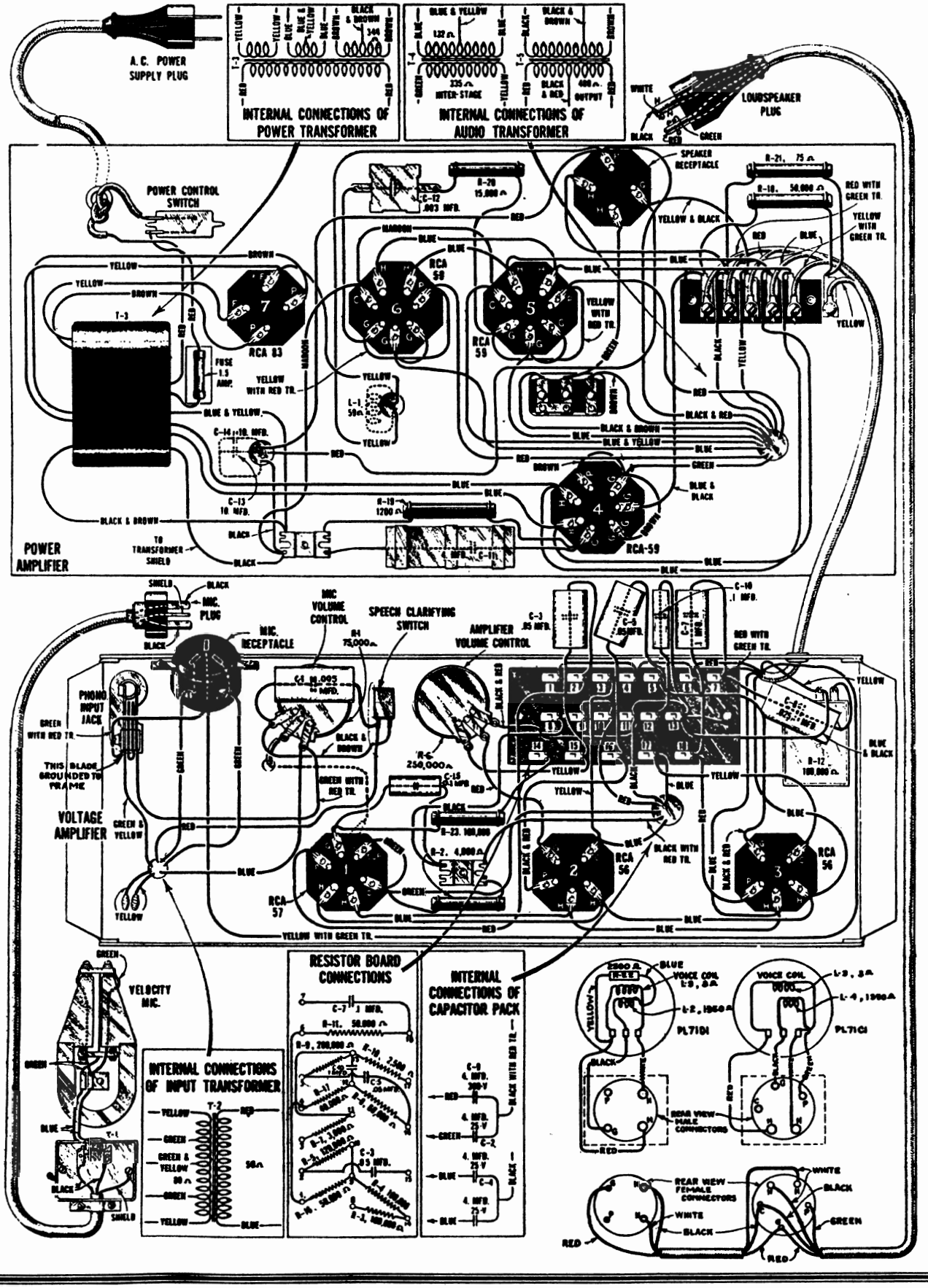
Radiotron Socket Voltages

The Radiotron socket voltages given in the following tabulation are the actual values at which each Radiotron should operate. In circuits containing high resistance, voltages read on a set analyzer will not agree with the values in the table, due to the relatively low resistance of the meter employed. Therefore, a correction must be applied to the meter reading to

RCA MANUFACTURING CO., Inc.

Portable Public Address System

Model PG 62D1



RCA MANUFACTURING CO., Inc.

Junior Slide-Film Reproducing Equipment

Type PG-75

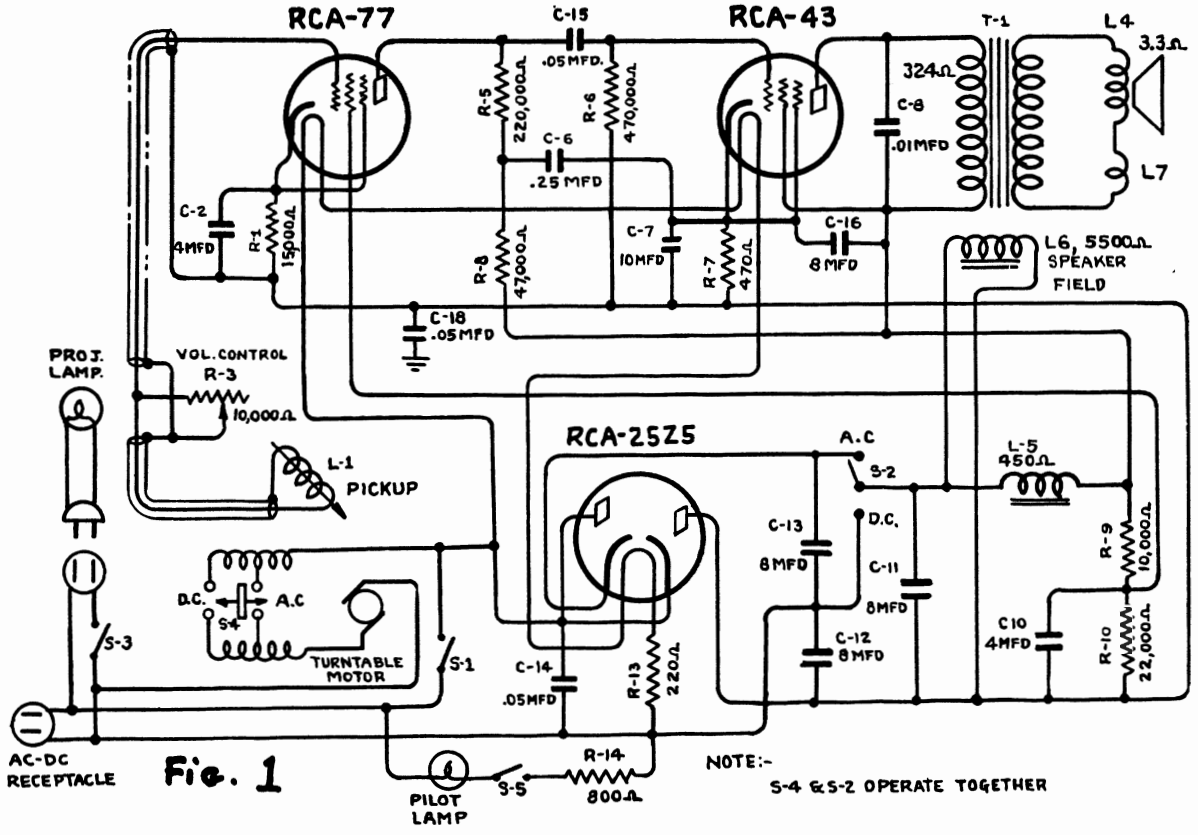


Fig. 1

PART I—SERVICE DATA—AMPLIFIER

(1) DESCRIPTION OF ELECTRICAL CIRCUIT

The magnetic pickup is coupled to the RCA-77 in the first stage of the amplifier and this tube is in turn resistance coupled to the power output Pentode RCA-43. The output of the RCA-43 is fed to the dynamic loudspeaker through a stepdown transformer.

The rectifier is an RCA-25Z5 and is used as a voltage doubler when operated from an A.C. power source. That is, it is capable of furnishing approximately twice the D.C. output voltage compared to the A.C. voltage input. The loudspeaker field is connected as a bleeder across the output of the rectifier tube.

A volume control rheostat is connected across the pickup circuit to control the output volume of the amplifier. The amplifier may be operated on D.C.

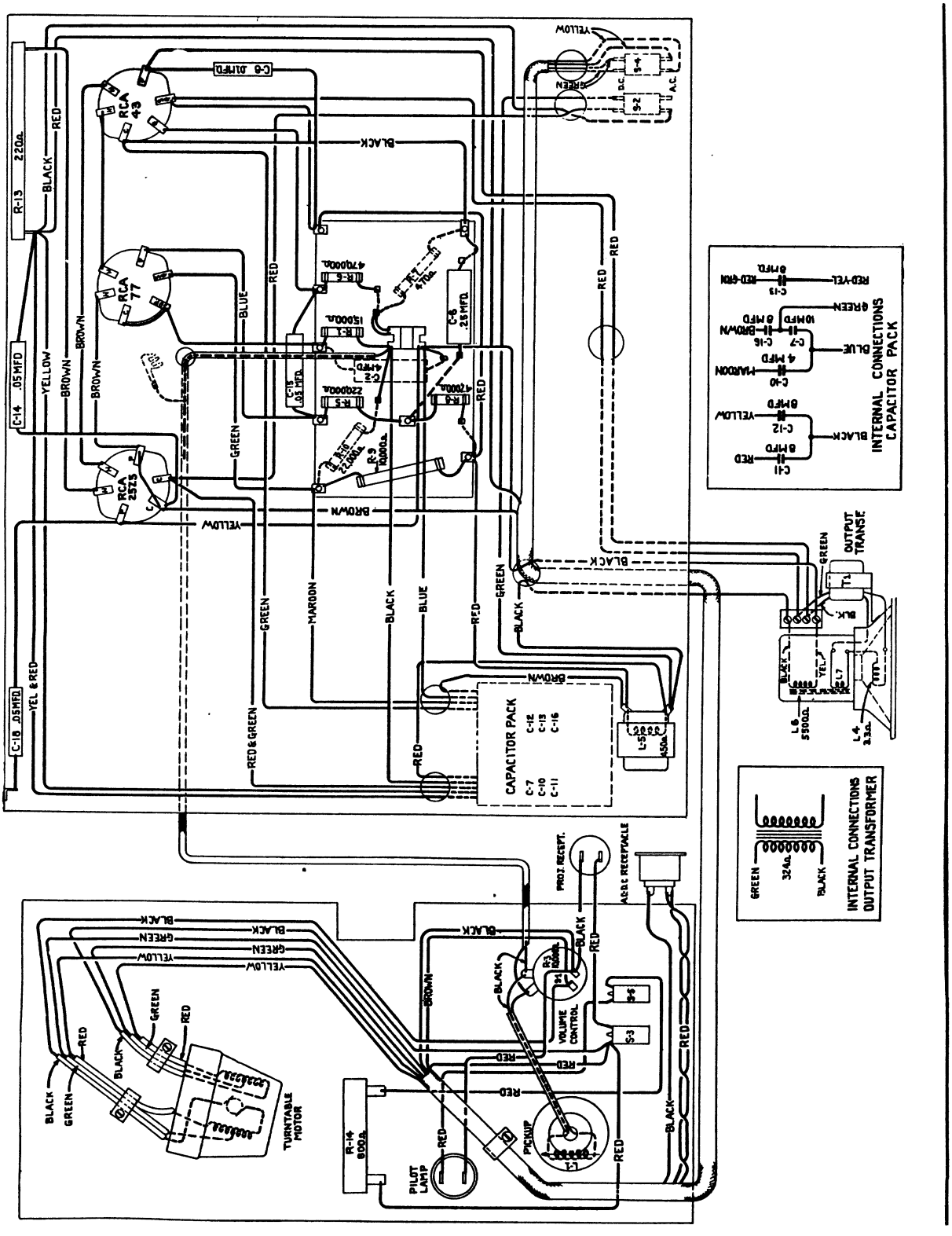
(Continued next Page)

Radiotron	*Control Grid Volts, D. C.		*Screen Grid Volts, D. C.		*Plate Volts, D. C.		Plate Current, M. A.		Heater Volts, A. C.
	A. C. Supply	D. C. Supply	A. C. Supply	D. C. Supply	A. C. Supply	D. C. Supply	A. C. Supply	D. C. Supply	
RCA-77	4.8	1.5	100.0	50.0	80.0	45.0	0.32	0.1	6.0
RCA-43	21.0	12.0	135.0	80.0	125.0	72.0	35.0	20.0	25.0
RCA-25Z5	115 Volts R.M.S.						79.0 Total	40.0 Total	25.0

* Voltages to cathode.

RCA MANUFACTURING CO., Inc.

Junior Slide-Film Reproducing Equipment Type PG-75



Wiring Diagram—PG-75 Equipment

RCA MANUFACTURING CO., Inc.

Junior Slide-Film Reproducing Equipment

Type PG-75

by simply turning a special switch, provided in the motor and amplifier circuits, to the D.C. position.

(2) WIRING

The schematic circuit diagram for the Type PG-75 equipment is shown in Figure 1. The wiring connection diagram is shown in Figure 2.

(3) RADIOTRON SOCKET VOLTAGES

The socket voltages given in the following tabulation are the actual values at which each Radiotron should operate. In circuits containing high resistance, voltages read on a set analyzer will indicate values less than that shown in the table, due to the relatively low resistance of the meter employed.

PART II—SERVICE DATA—MAGNETIC PICKUP

(1) REPLACING MAGNET COIL, PIVOT RUBBERS, ARMATURE OR DAMPING BLOCK

In order to replace a defective coil or the hardened pivot rubbers (see Figure 4), proceed as follows:

(a) Remove the pickup cover by removing the center holding screw and needle screw.

(b) Remove the pickup magnet and the magnet clamp by pulling them forward.

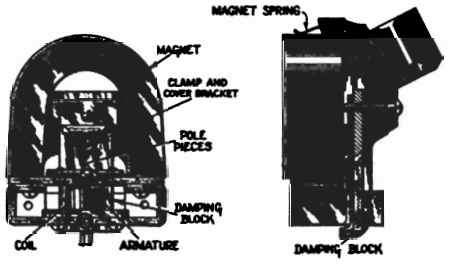


Figure 3—Details of Pickup

(c) Unsolder the coil leads and remove the mechanism assembly from the back plate by releasing the two mounting screws and the damping block clamping screw.

(d) Remove screws A and B, Figure 4, and then remove the mechanism assembly from the pole pieces.

(e) The coil or the front pivot rubber may now be removed and replaced. If it is desired to replace the rear pivot rubber, then the end of the armature soldered to the mechanism support must be unsoldered and the damping block removed. The rear pivot rubber may now be replaced. After putting the pivot rubbers in place a new damping block should be fastened to the armature as outlined in instructions on replacing the damping block.

(f) The mechanism should now be reassembled, except for the magnet, which must be magnetized. After being magnetized, the mechanism—with the pole pieces upward—should be placed so that the magnet may be slid from the magnetizer onto the pole pieces without breaking physical contact. After placing the pole pieces on the magnet, the entire assembly should be remagnetized thoroughly, being careful not to change the polarity obtained by the initial magnetization.

(g) After assembling the mechanism, the entire assembly should be fastened to the back plate by means of the screws provided, making sure the damping block is securely clamped. At the same time, the metal dust cover must be placed in position.

(h) After remagnetizing, it is necessary to correctly center the armature. This may be done quite accurately by feeling its play after the needle is inserted. A little practice will quickly show which way an adjustment is necessary to have the armature centered properly. The adjustment is made by loosening screws A and B (Figure 4), and sliding the mechanism into proper relation with the pole pieces.

(i) The cover may be now replaced over the entire assembly, and the pickup returned to the tone arm.

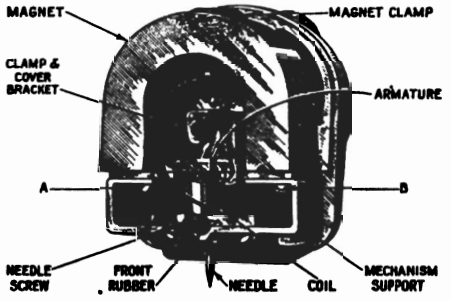


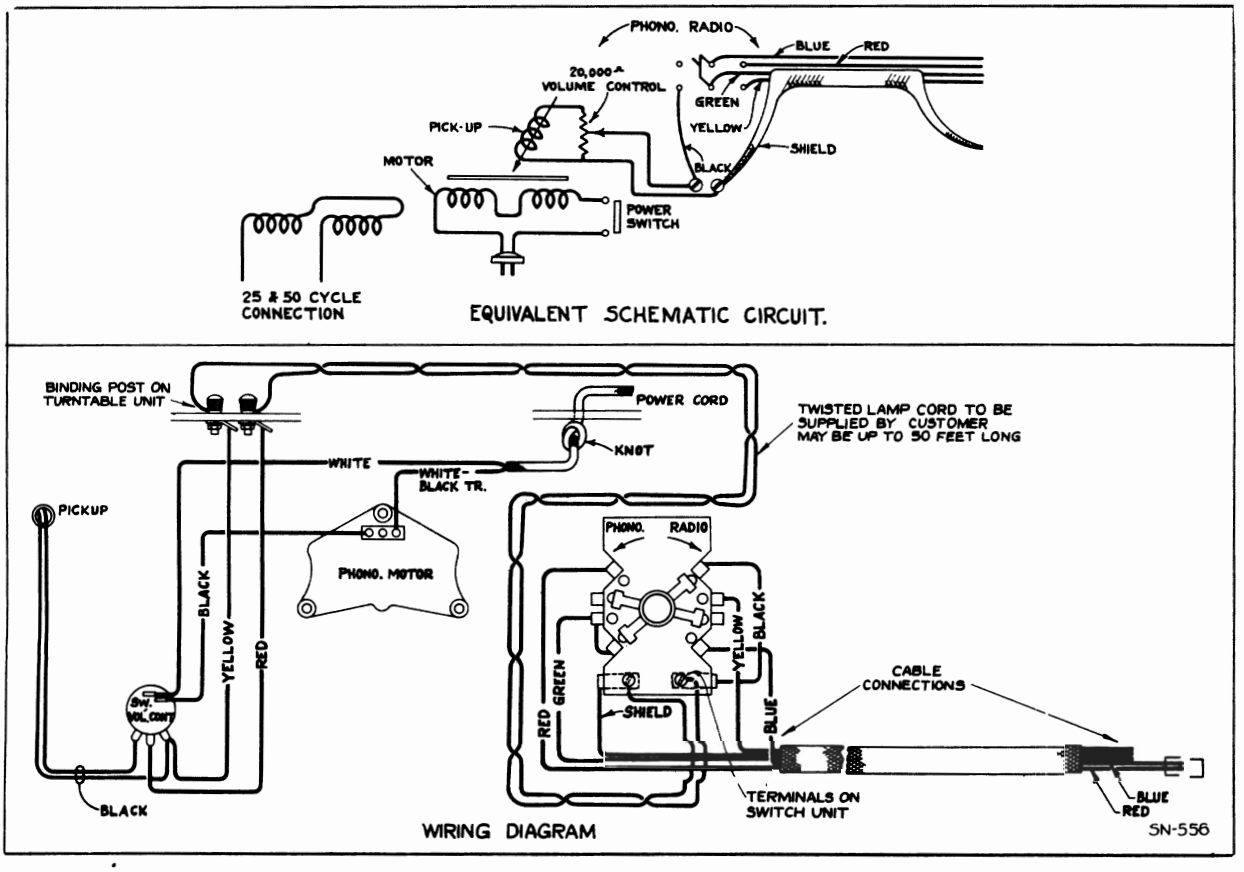
Figure 4—Pickup Nomenclature

In assembling, it may be desirable to check the armature air gap by means of a small feeler gauge. This air gap should be .009" on each side of the armature. However, a little practice with the needle in place will quickly disclose whether or not the armature is centered.

The RCA Junior Slide-Film Reproducing Equipment consists of a 33⅓ R.P.M. turntable and magnetic pickup, an audio amplifier, loudspeaker and a slide-film projector. It is designed to protect still pictures from 35 mm. film together with musical or voice accompaniment. All units of the equipment, except the 200-watt projector, are contained in one small case which weighs only 30 pounds.

RCA MANUFACTURING CO., Inc.

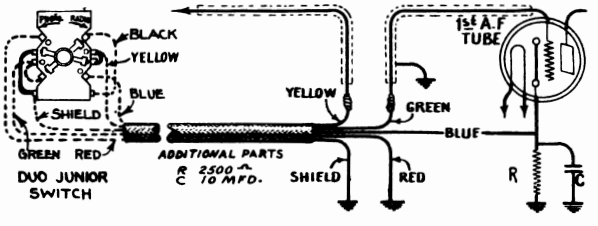
Model R-93 Duo Junior



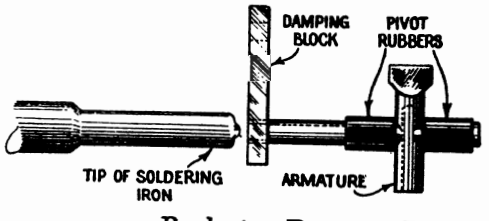
Wiring Diagram and Equivalent Schematic Circuit

This phonograph turntable and pickup assembly is designed to provide record reproduction to the owner of a modern radio receiver. Use of the audio amplifying system and loudspeaker of the radio receiver provides a quality of reproduction equal to or better than that obtained from radio stations. A switch is provided for changing from radio to record reproduction, or vice-versa. Simplicity, compact size and ease of connections are outstanding features of this instrument.

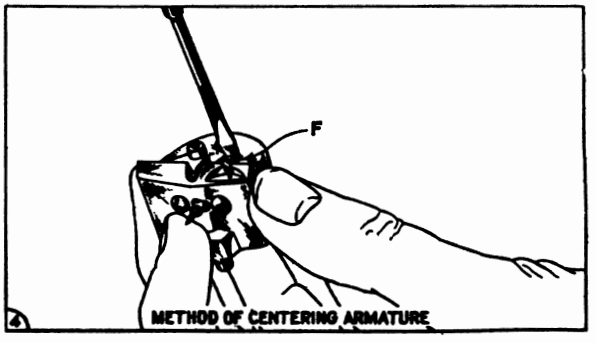
Electrically, the instrument consists of a magnetic pickup—for transforming the mechanical variations of the record grooves to voltage variations—a volume control for adjusting the output voltage to any desired level and a radio-record switch for shifting the connections to the receiver so that either radio or record reproduction may be obtained as desired by the user.



Typical Connections for Model C 15-3



Replacing Damping Block



Turntable Speed.....78 R.P.M.
Pickup Impedance at 1000 Cycles.....2450 Ohms
Pickup Output Voltage.....0.4 Volt at 400 Cycles
Volume Control Resistance.....20,000 Ohms

RCA MANUFACTURING CO., Inc.

Model 93-R Duo Junior

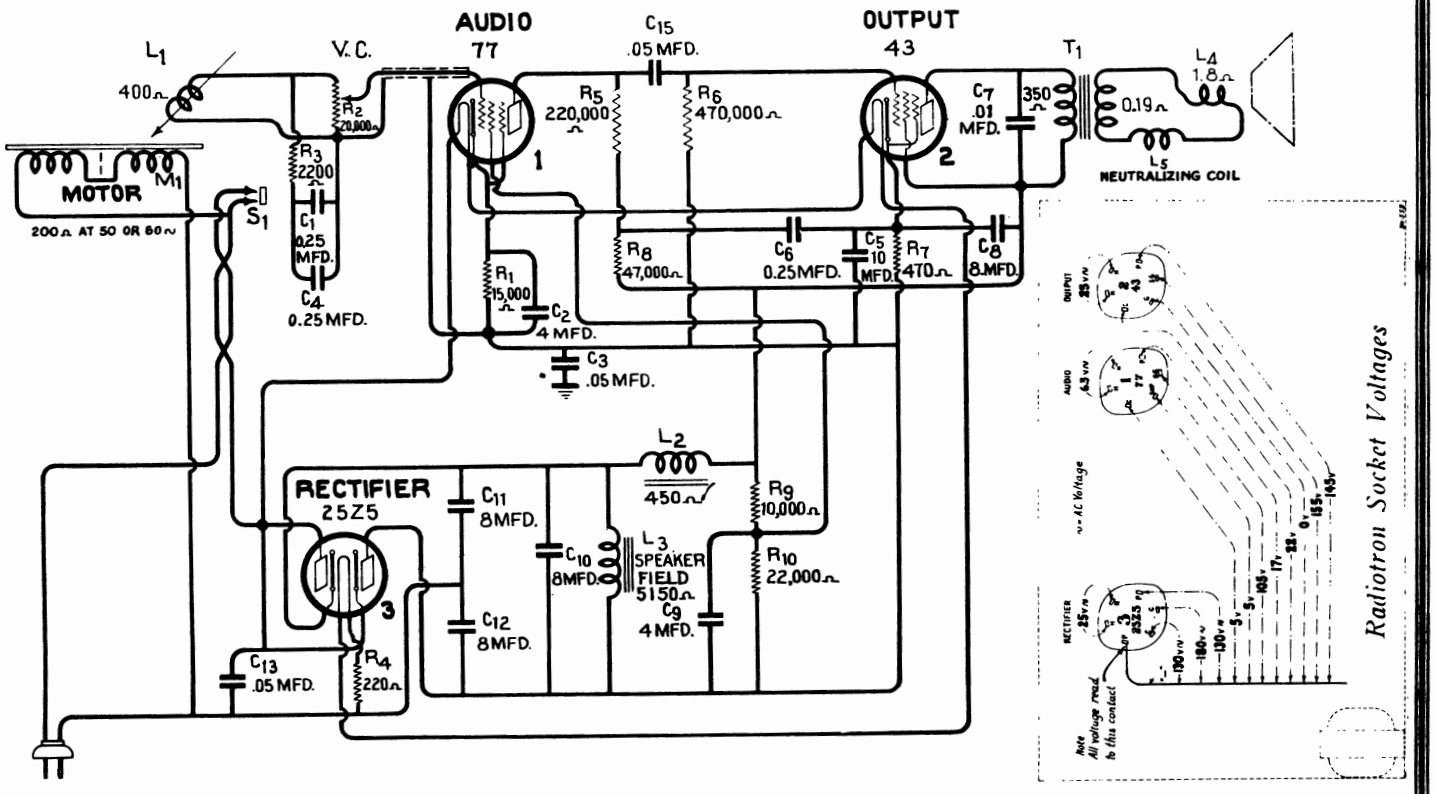
RCA VICTOR RECEIVERS—DETAILS OF LEAD CONNECTIONS

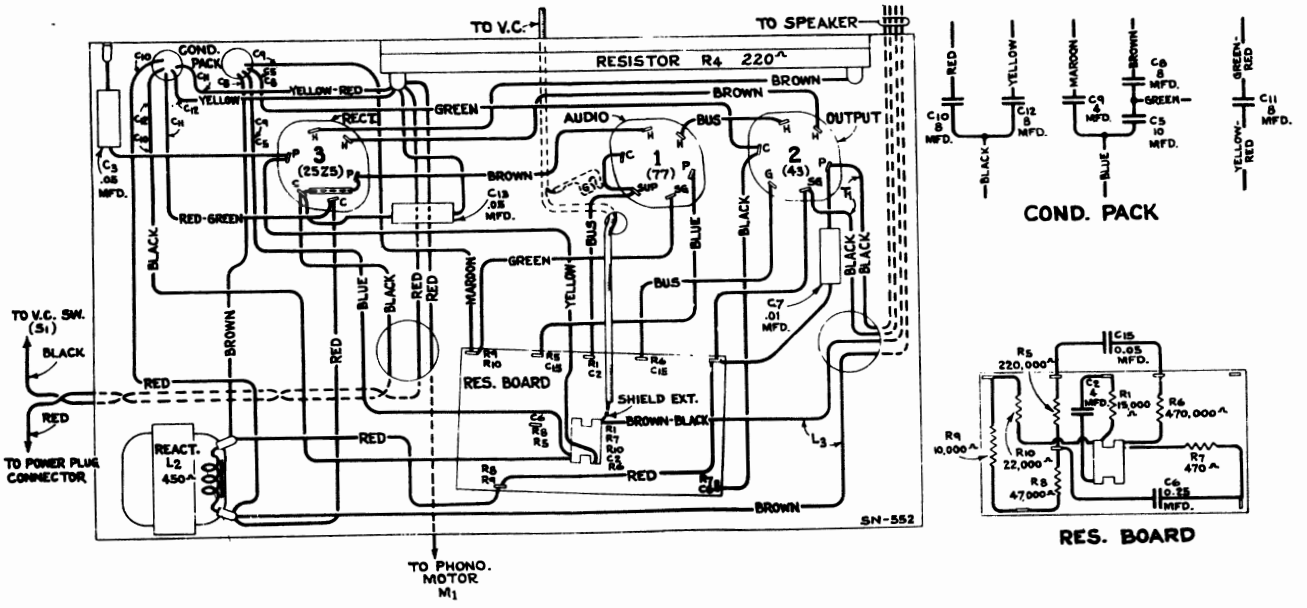
Model	Method of Connection	Green	Yellow	Red	Blue	Shield
R-4, 6, 8, 10, 12, 70, 71, 72, 74, 76, 77	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Chassis
R-5, 17M, 27	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Det. Cathode (Yellow)
R-7, 7A	2. Term. Board	Term. 2 (Open Link)	Term. 1	Ant.	Ant. Lead	Term. 4
R-11,21	2. Term. Board	Term. 2 (Open Link)	Term. 3	Term. 4 (Open Link)	Term. 5	Term. 6
R-18W, 22	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Det. Cathode (Yellow)
RO-23	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Chassis
R-28	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Chassis
R-37, 38, 73, 73A, 75, 75A	3. Grid Clip	Grid Cap of Tube	Grid Clip	Ant.	Ant. Lead or Bind. Post	Chassis
Rad. 48	2. Term. Board	Term. 4 (Open Link)	Term. 5	Term. 2 (Open Link)	Term. 3	Term. 5
R-50, 55	2. Term. Board	Term. 3 (Open Link)	Term. 4	Term. 1 (Open Link)	Term. 2	Term. 6
R-78	2. Term. Board	Term. 7 (Open Link)	Term. 8	Term. 1 (Open Link)	Term. 2	Chassis
Rad. 80	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Bind. Post	Chassis
Rad. 82	2. Term. Board	Term. 2 (Open Link)	Term. 3 (Tie-in Term.1 to Term.3)	Term. 2	Term. 3	Term. 3
R-90, 260, 261	5. Adapter	Det. Cathode	Cathode Socket Contact	I-F Amp.* Cathode	I-F Cathode Socket Contact	Chassis
103	6. Under Chassis	Det. Grid Term.	Grid Lead	Ant.	Ant. Lead	Chassis
110, 111, 115, 210	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead or Bind. Post	Cathode Socket Contact
114	5. Adapter	Det. Cathode	Cathode Socket Contact	Ant.	Ant. Lead	Det. Cathode (Yellow)
117, 118, 119, 120, 121, 122, 124, 125, 128, 211, 214, 220, 221, 222, 224, 225, 226	3. Grid Clip	Grid Cap of Tube	Grid Clip	Ant.	Ant. Lead or Bind. Post	Chassis
140, 141, 240	2. Term. Board	Term. 3	Tape	Term. 1	Term. 2	Term. 1
143, 242	2. Term. Board	Term. 5 (Open Link)	Term. 4	Term. 1 (Open Link)	Term. 2	Chassis
262	2. Term. Board	Term. 2 (Open Link)	Term. 1	I-F Cathode (Adapter)	I-F Cathode Socket Contact	Chassis
280	5. Adapter	Det. Cathode	Cathode Socket Contact	I-F Cathode*	I-F Cathode Socket Contact	Chassis
T 4-8, 4-9	6. Under Chassis	Det. Grid Term.	Grid Lead	Ant.	Ant. Lead	Chassis
T 4-8A, 4-9A, 4-10, 5-2	3. Grid Clip	Grid Cap of Tube	Grid Clip	Ant.	Ant. Lead	Chassis
T 6-1, 6-9, 7-5, 8-14	4. Grid Clip	Grid Cap of Tube	Grid Clip	I-F Cathode (Adapter)	I-F Cathode Socket Contact	Chassis
C 6-2, 7-6, 8-15, 9-4	4. Grid Clip	Grid Cap of Tube	Grid Clip	I-F Cathode (Adapter)	I-F Cathode Socket Contact	Chassis
T 8-16, 9-9 C 8-17, 9-6	2. Term. Board	Term. 2 (Open Link)	Term. 1 (Left Term.)	Term. 3 (OpenLink)	Term. 4	Chassis
T 10-1 C 11-1, 13-2, 15-3	5. Adapter	1st Audio Cathode	Cathode Socket Contact	I-F Cathode*	I-F Cathode Socket Contact	Chassis
T 10-3, 11-8	2. Term. Board	Term. 2 (Open Link)	Term. 1	I-F Cathode (Adapter)	I-F Cathode Socket Contact	Chassis

* Use a second adapter.

RCA MANUFACTURING CO., Inc.

Model R-95 "Electrola"





Amplifier Wiring Diagram

Excessive Vibration and Hum

A small amount of hum when starting, decreasing to a negligible amount while running, is normal. If excessive vibration occurs either at starting or running, it may be due to one of the following:

(1) Insufficient lubrication in outer bearing or any other failure that will cause the stator to bind.

(2) Metal washer not above the leather washer at the bottom of the main bearing.

(3) Leather washer not oiled. When replacing the leather washer, make sure that it is thoroughly soaked in oil.

(4) Motor not properly supported from motor board. Unless the motor is properly supported from the motor board, normal vibration will be excessive.

RCA MANUFACTURING CO., Inc.

R-95 "Electrola"

Phonograph Motor

The synchronous motor used in this instrument is designed to be simple and foolproof. Among its many features are low power consumption, single moving part, ease of starting, viscoloid damper, and long life. The main parts of the motor and the points that may require attention are shown in Figure 4. The motor is started by giving it a clockwise spin with the hand. If the motor is difficult to start

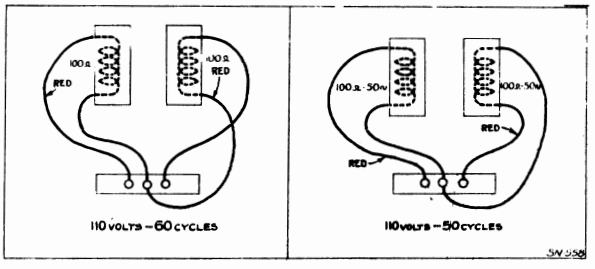
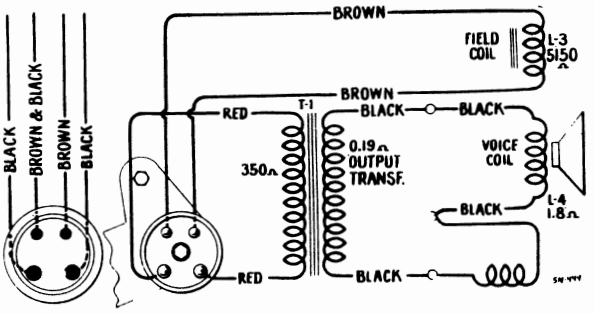
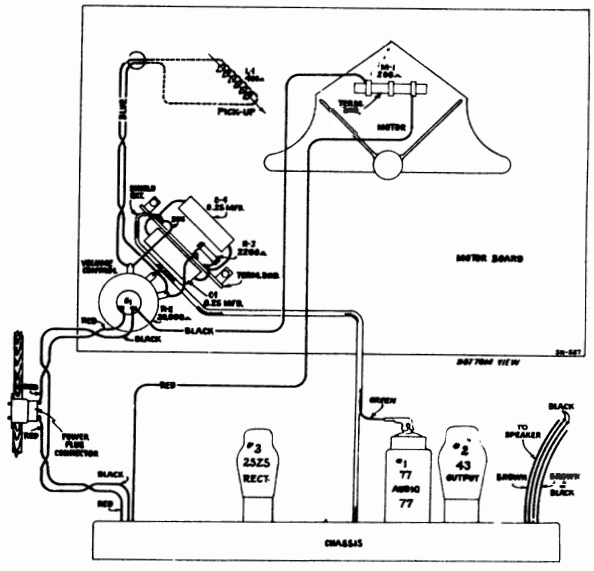


Figure 3—Motor Wiring

it may be due to the stator failing to rotate on the outer bearing. This may be corrected by applying a slight amount of oil to the bearing surfaces. It is very important that the ball bearing be at the bottom of the main bearing assembly.



–Loudspeaker Wiring



-Assembly Wiring

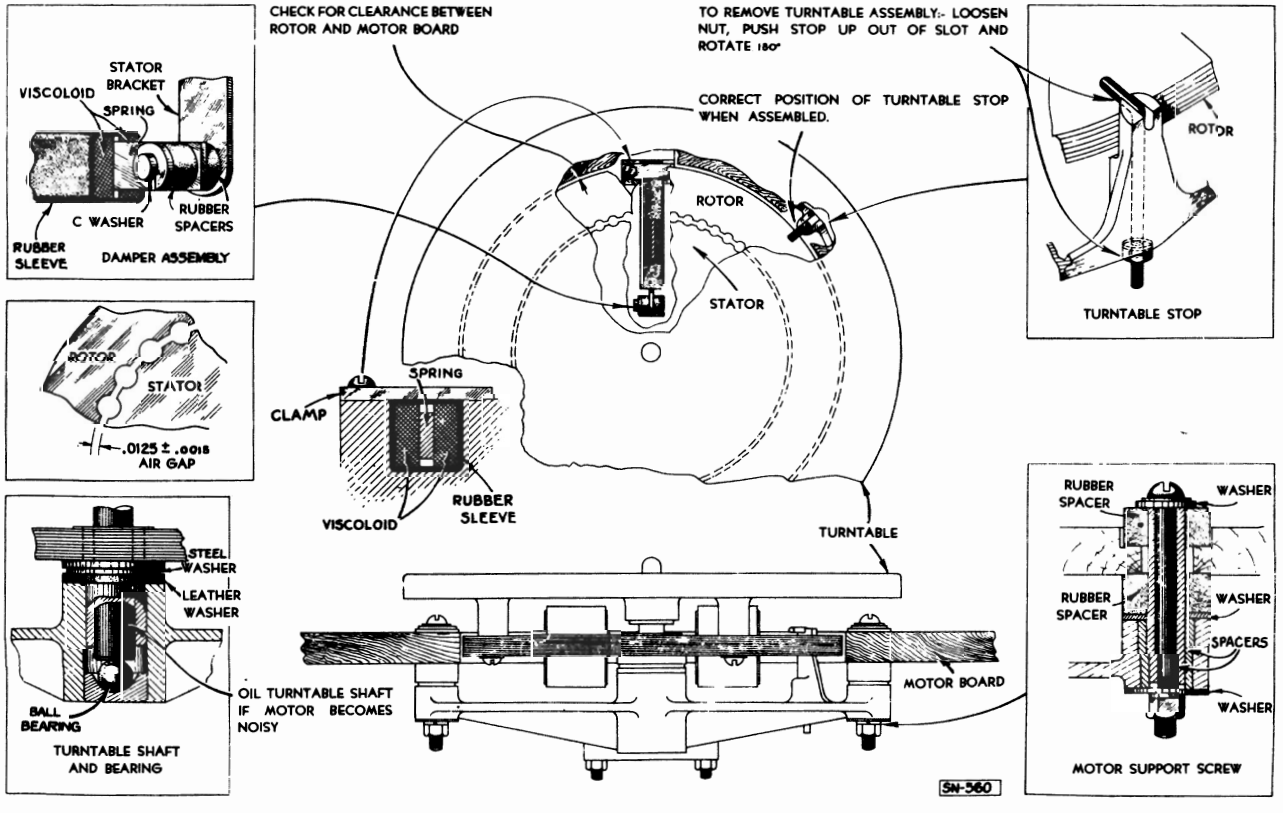
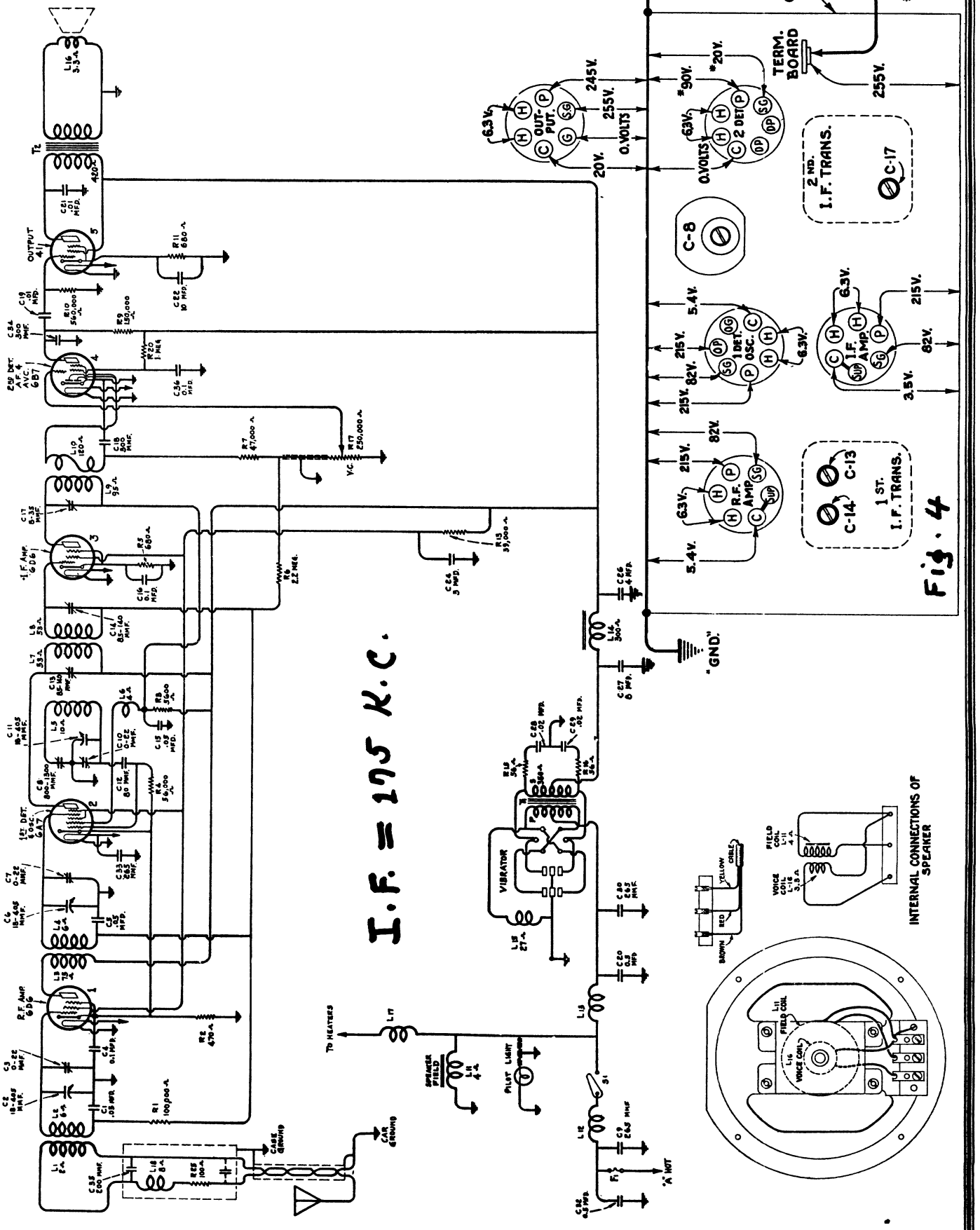
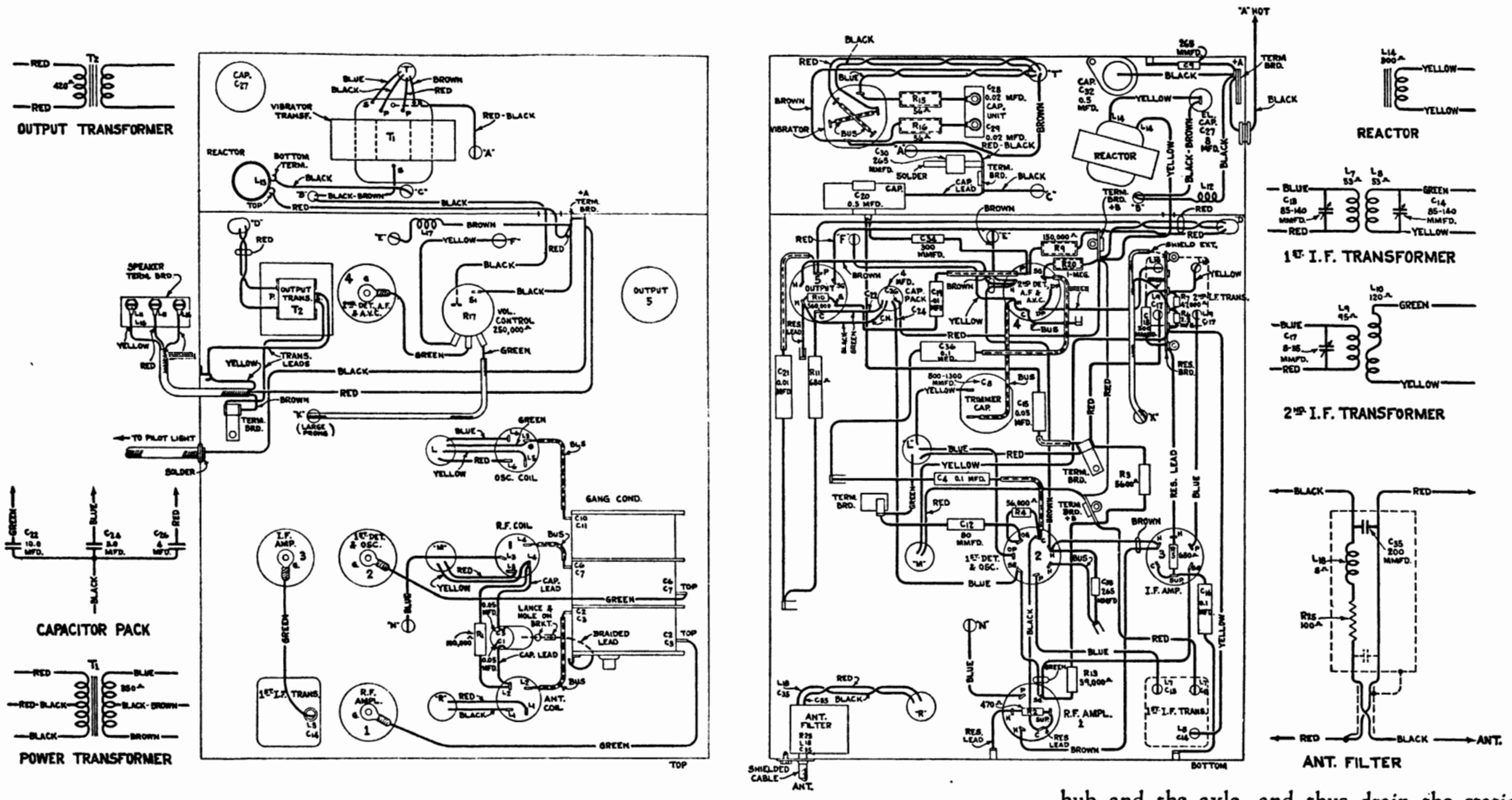


Figure 4—Motor Board Adjustments

RCA MANUFACTURING CO., Inc.

MODEL M-101





Chassis Wiring Diagram

MISCELLANEOUS SERVICE HINTS

If back-lash is apparent, the large gear assembly should be removed and the free gear moved (against the spring compression) 2 to 3½ teeth in relation to the fixed gear and the assembly slid in place on the shaft and in mesh with the pinion. The set screws should then be securely tightened.

(a) The grounding of the outer end of the antenna lead shield is quite critical, in that ignition interference may be minimized by selecting the proper point of attachment to the car frame, determined by experiment for each individual installation.

(b) In some cars, ignition interference may be introduced through lack of antenna lead shielding. In such cases, a shield should be placed over the exposed section of antenna lead and carried as near as possible to the actual antenna. It should be solidly grounded.

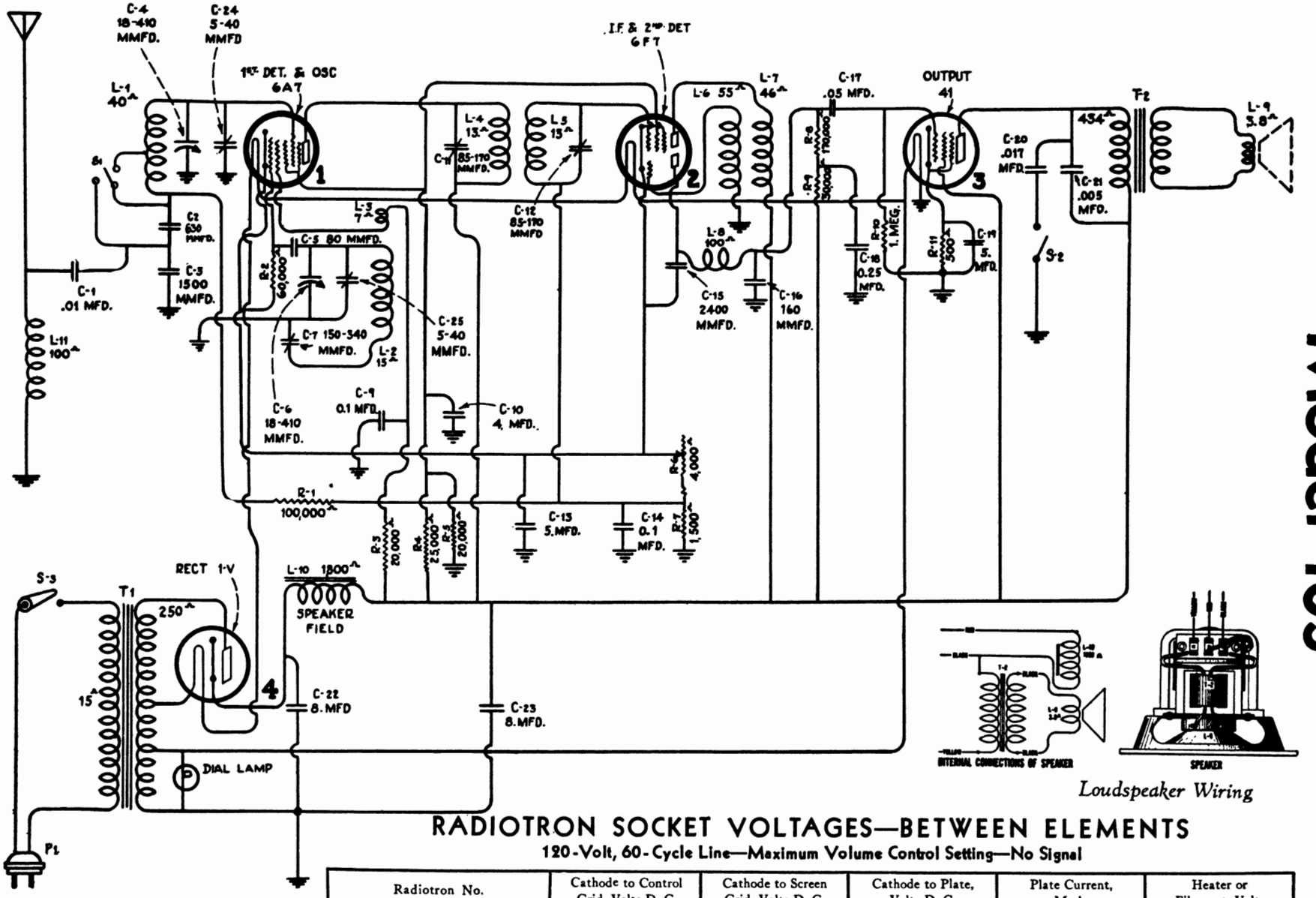
(c) Interference in the form of a grating scratch may arise from static collecting on the front wheels of some cars due to road surface friction in dry weather. The insulation caused by the grease of the wheel hub enables this action to develop. A number of devices are available through automotive supply dealers which are designed to eliminate this type of trouble. They all serve to form a grounding tie between the hub and the axle, and thus drain the static to the frame of the car (ground).

(d) If the flexible tuning shaft is installed so that it protrudes through the insulating coupling at the receiver end and makes intermittent contact with the metal of the pinion gear, some r-f disturbance will result. The shaft should therefore be inserted into the coupling just far enough to be properly secured by the set screw.

(e) The screws holding the chassis to the case must all be in place and tightly installed, inasmuch as they appreciably affect the ground resistance of the assembly and will consequently have a bearing on the amount of ignition noise received.

RCA MANUFACTURING CO., Inc.

Model 103



Loudspeaker Wiring

RADIOTRON SOCKET VOLTAGES—BETWEEN ELEMENTS

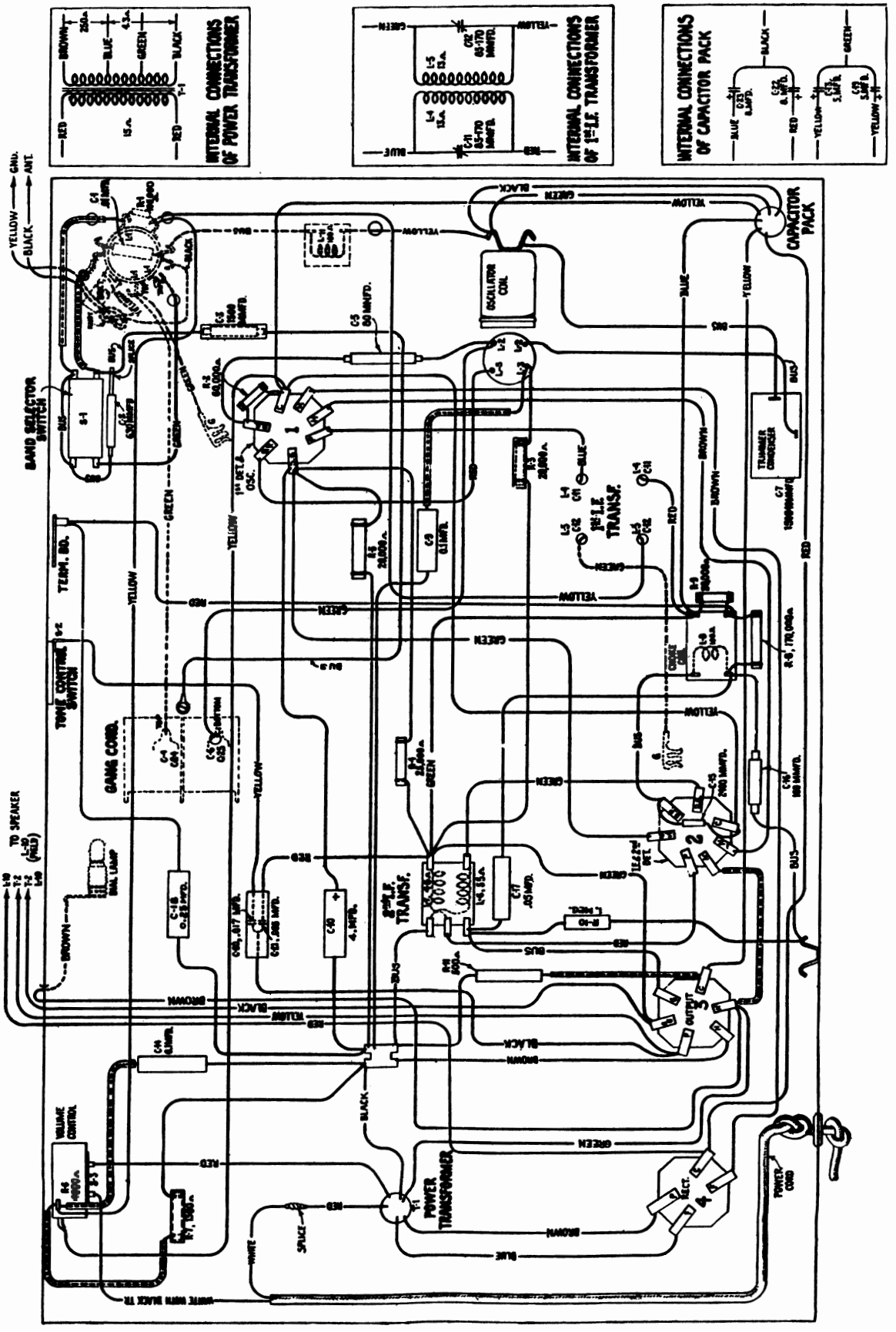
120-Volt, 60-Cycle Line—Maximum Volume Control Setting—No Signal

Radiotron No.		Cathode to Control Grid, Volts D. C.	Cathode to Screen Grid, Volts D. C.	Cathode to Plate, Volts D. C.	Plate Current, M. A.	Heater or Filament, Volts
RCA-6A7	First Detector	1.25	70	235	2.5	6.3
	Oscillator	—	—	180	3.5	
RCA-6F7	I. F.	1.25	70	235	5.5	6.3
	Second Detector	19.0	—	145*	0.4	
RCA-41 Output		17.0	240	230	26.5	6.3
RCA-1-V Rectifier		—	—	335 R.M.S.	50.0	6.3

*Actual voltage cannot be measured with ordinary voltmeter.

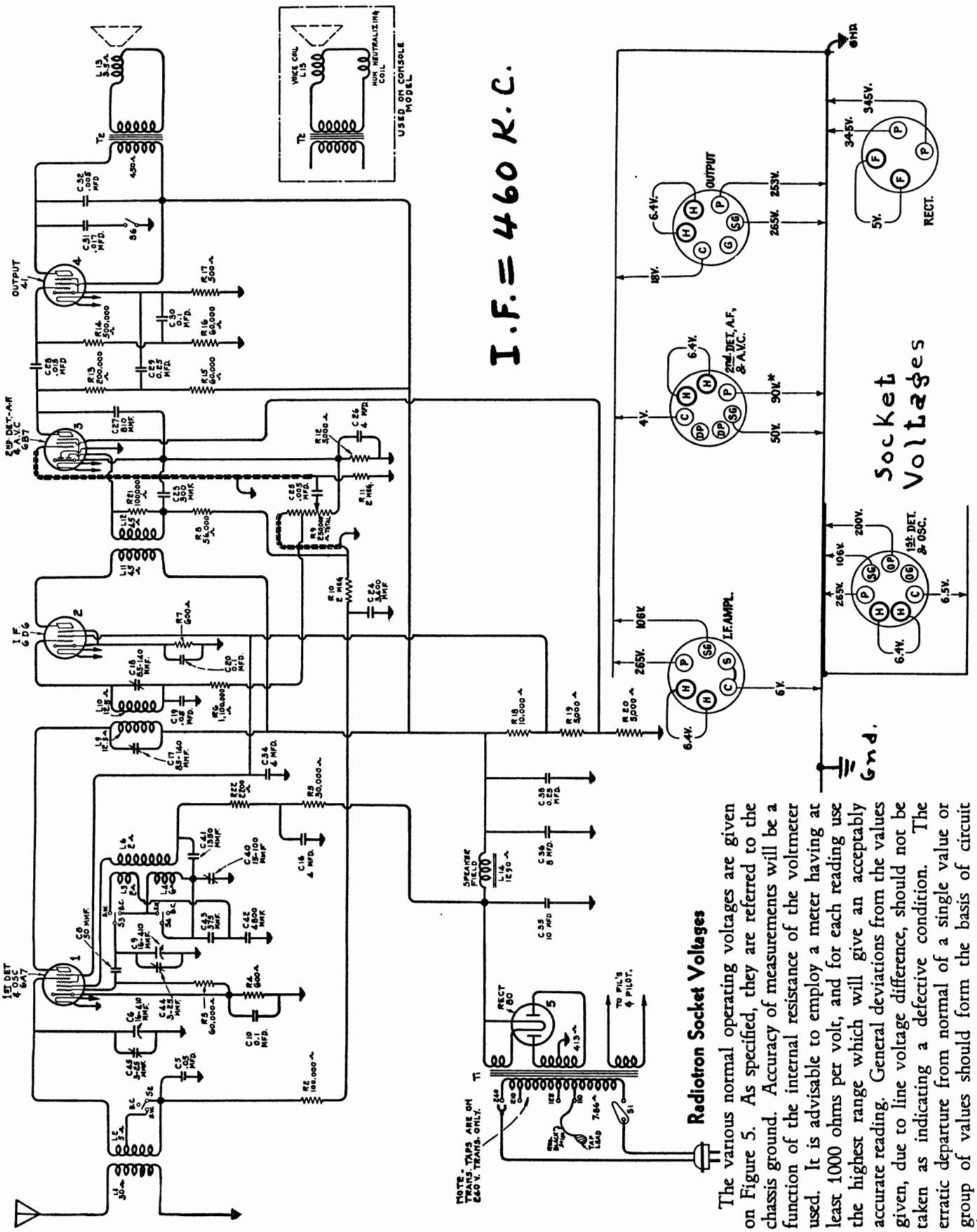
RCA MANUFACTURING CO., Inc.

Model 103



RCA MANUFACTURING CO., Inc.

Models 117 and 214

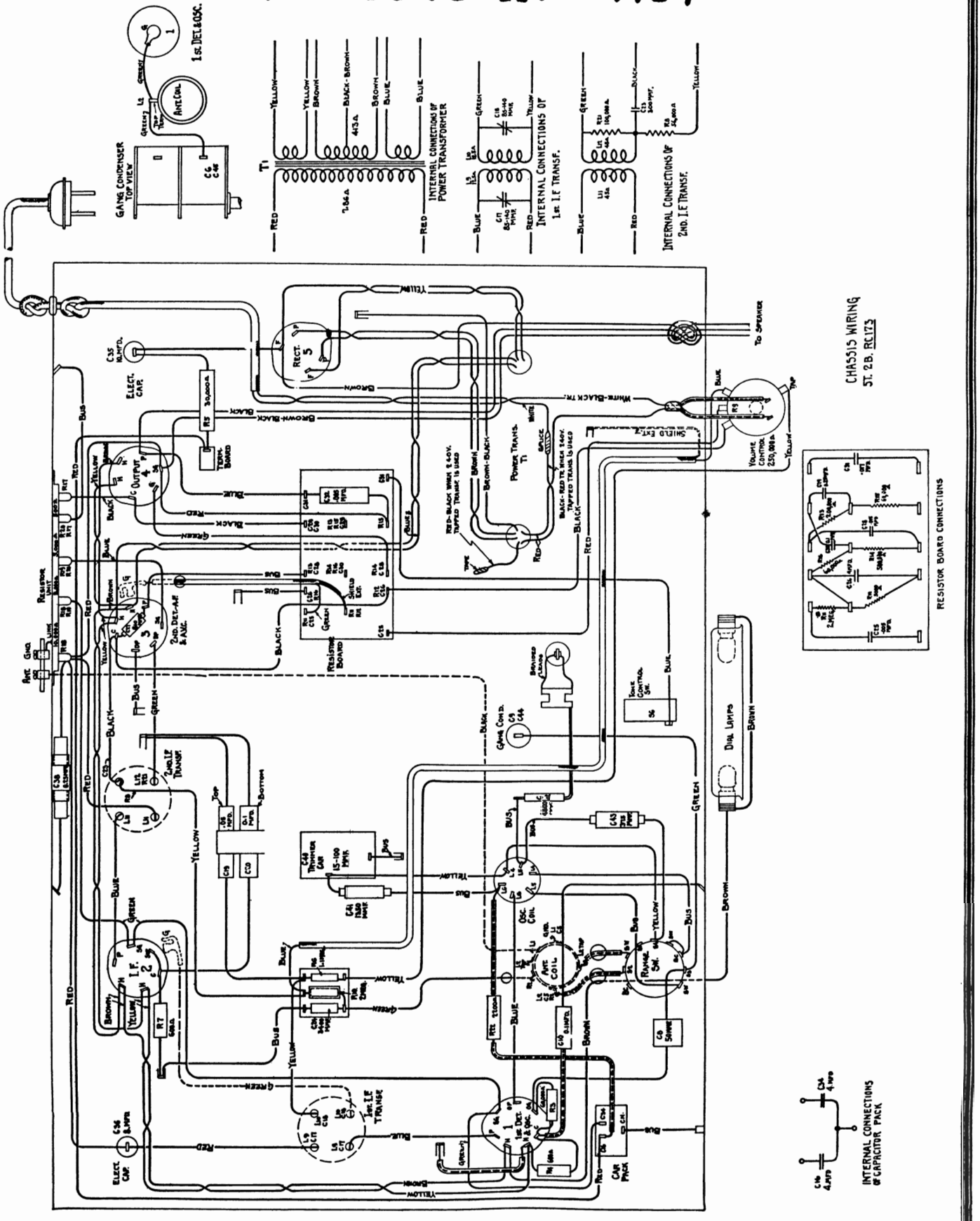


Radiotron Socket Voltages

The various normal operating voltages are given on Figure 5. As specified, they are referred to the chassis ground. Accuracy of measurements will be a function of the internal resistance of the voltmeter used. It is advisable to employ a meter having at least 1000 ohms per volt, and for each reading use the highest range which will give an acceptably accurate reading. General deviations from the values given, due to line voltage difference, should not be taken as indicating a defective condition. The erratic departure from normal of a single value or group of values should form the basis of circuit diagnosis.

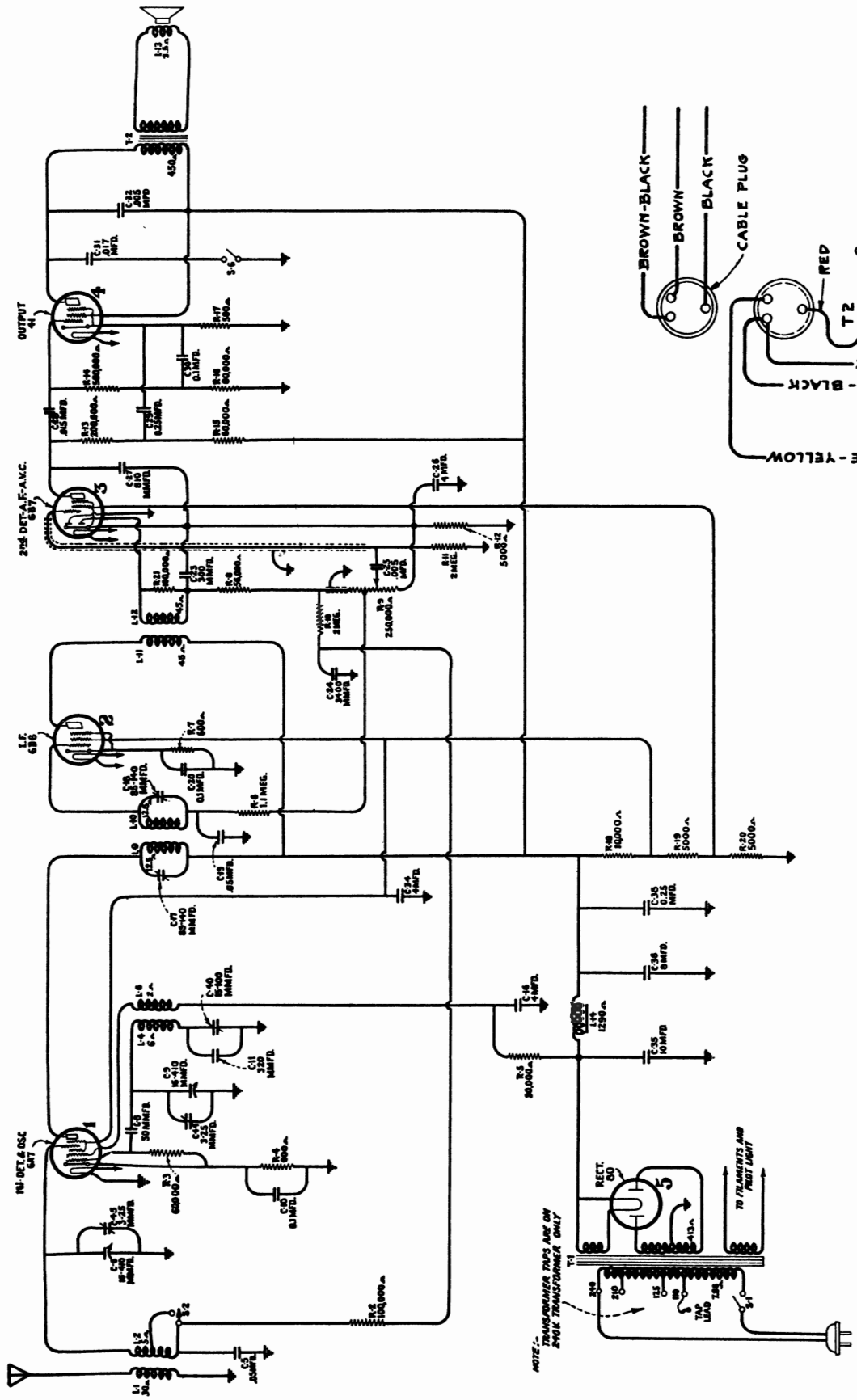
RCA MANUFACTURING CO., Inc.

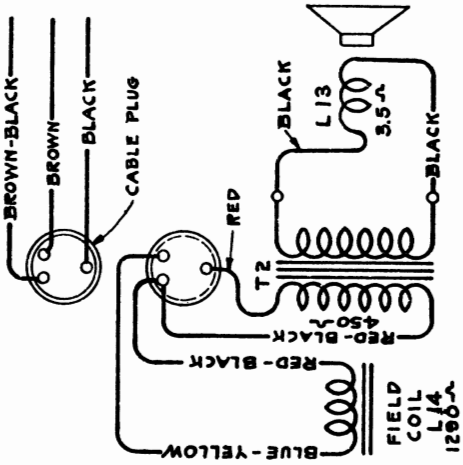
Models 117-214



RCA MANUFACTURING CO., Inc.

Model 119





INTERNAL CONNECTIONS OF SPEAKER

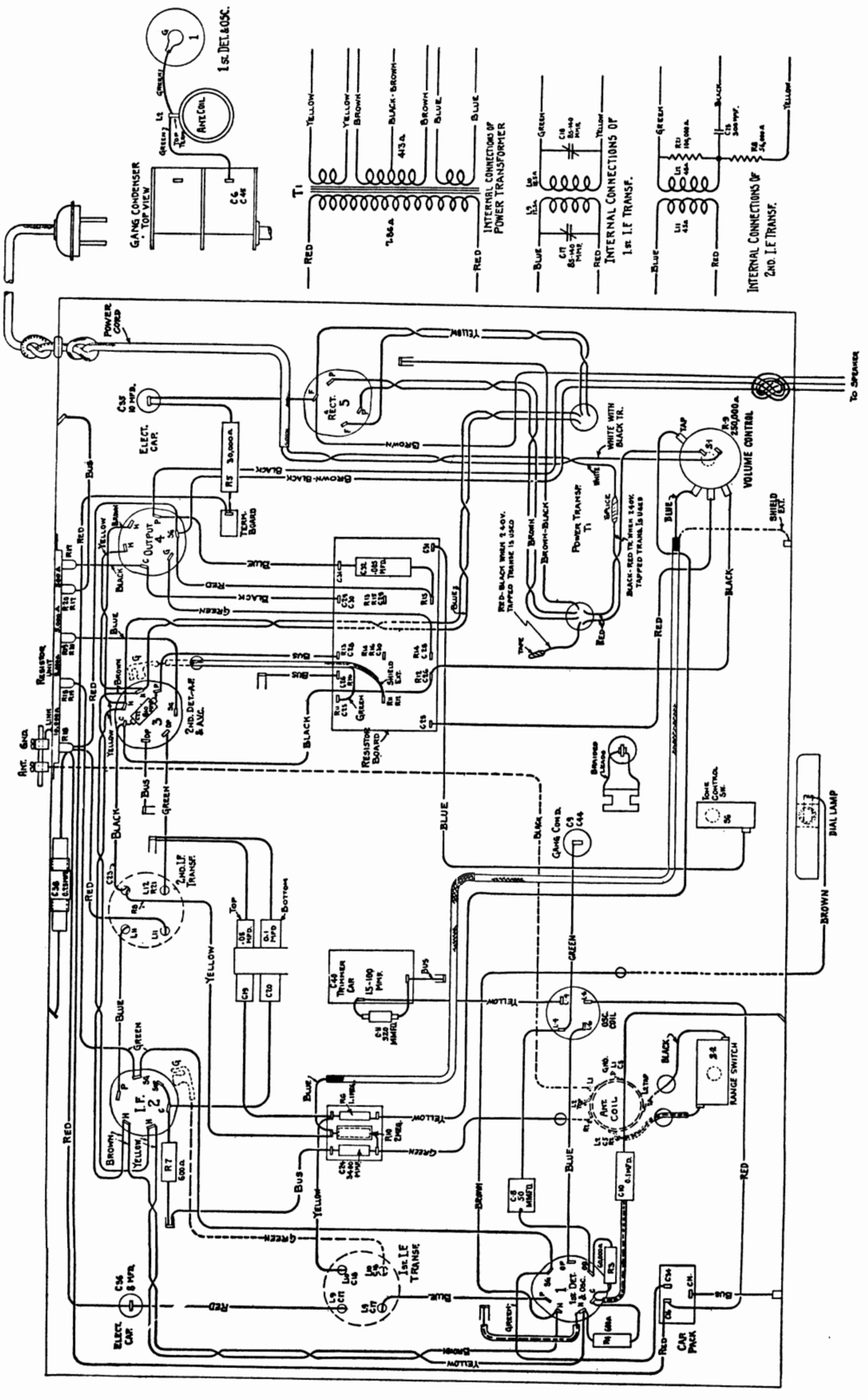
I.F. = 460 K.C.

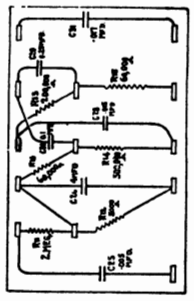
Alignment Frequencies.

460 KC. (I.F.), 1720 KC. (R.F. and Oscillator) 600 KC. (Oscillator)

RCA MANUFACTURING CO., Inc.

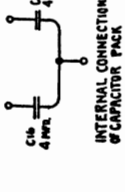
Model 119





RESISTOR BOARD CONNECTIONS

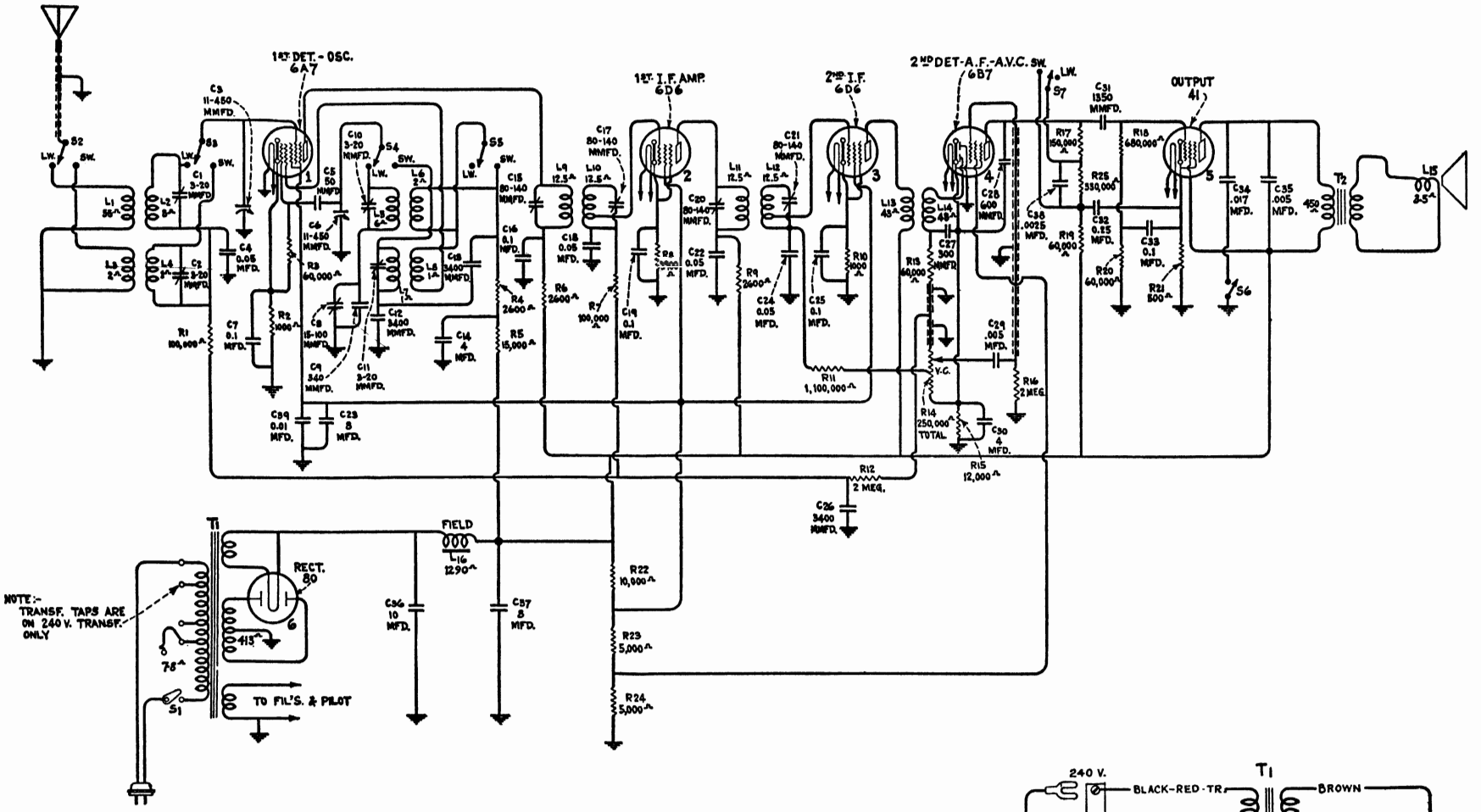
Chassis Wiring Diagram



INTERNAL CONNECTIONS OF CAPACITOR PACK

RCA MANUFACTURING CO., Inc.

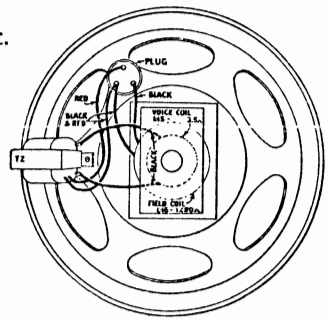
Models 125-225



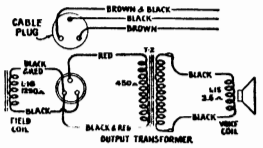
Alignment Frequencies

460 KC. (I.F.), 600 KC. (Osc.), 1720 KC. (Osc. and Det.) and 18,000 KC. (Osc. and Det.)

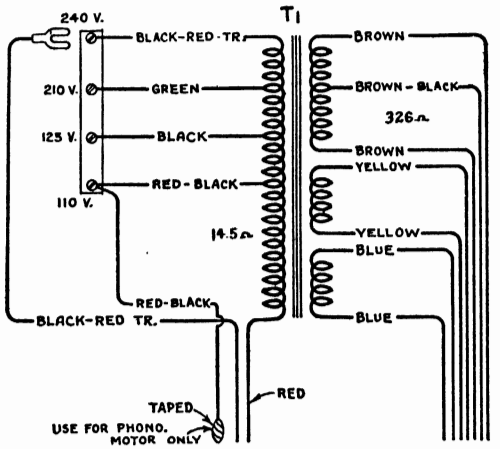
I. F. = 460 K.C.



Loudspeaker Wiring—Console Model



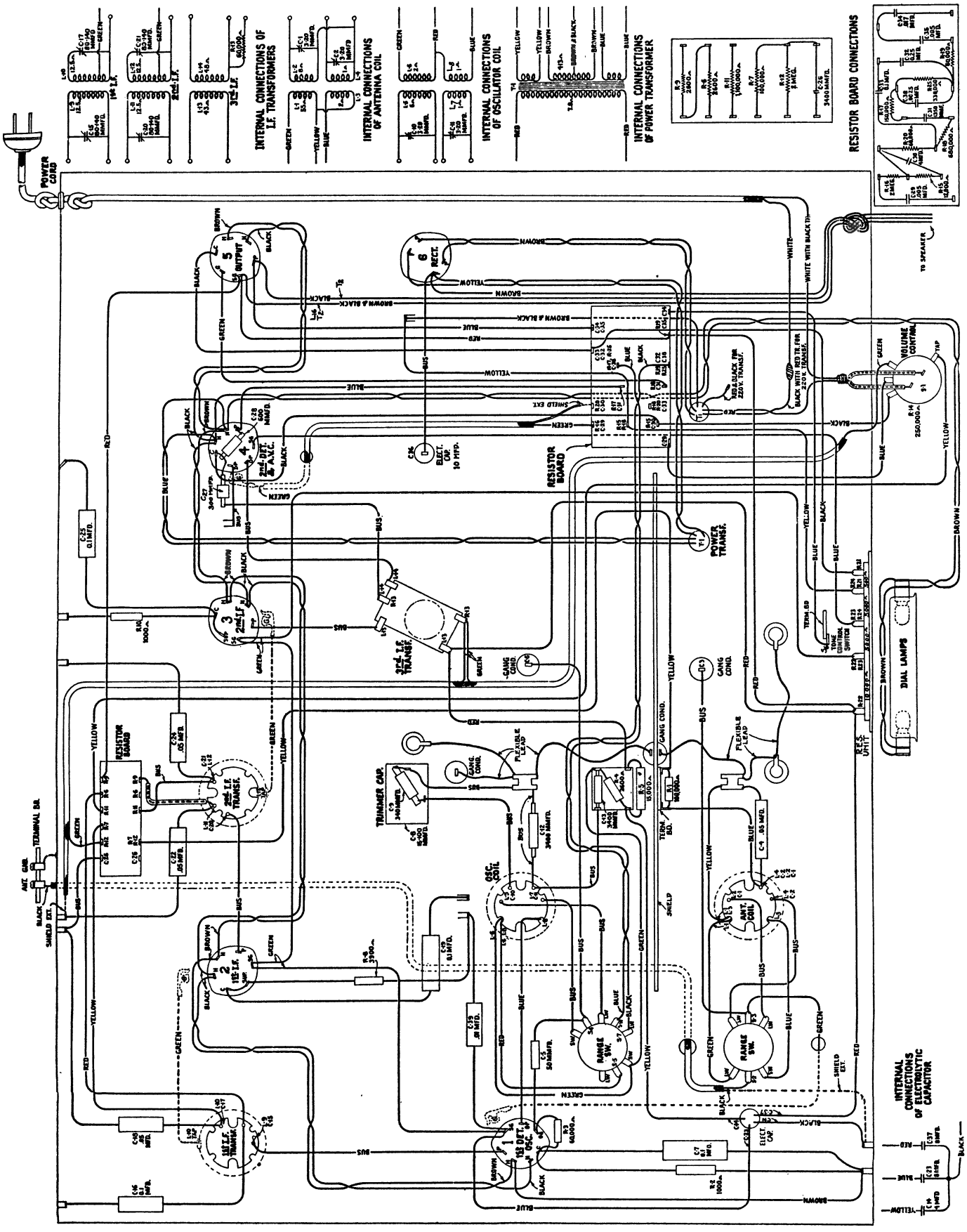
INTERNAL CONNECTIONS OF SPEAKER



INTERNAL CONNECTIONS OF POWER TRANSF.

RCA MANUFACTURING CO., Inc.

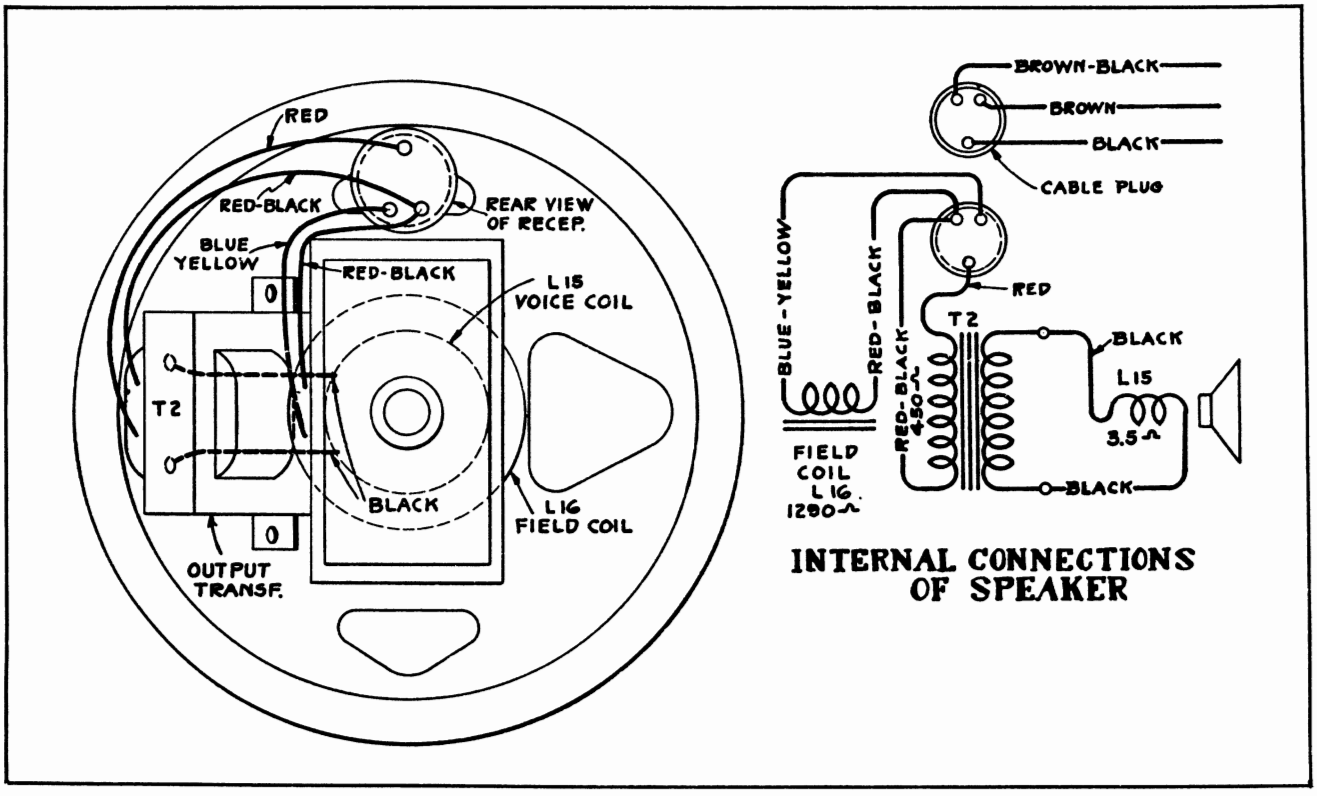
Models 125-225



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Models 125-225



Loudspeaker Wiring—Table Model

RADIOTRON SOCKET VOLTAGES

(Referred to ground)

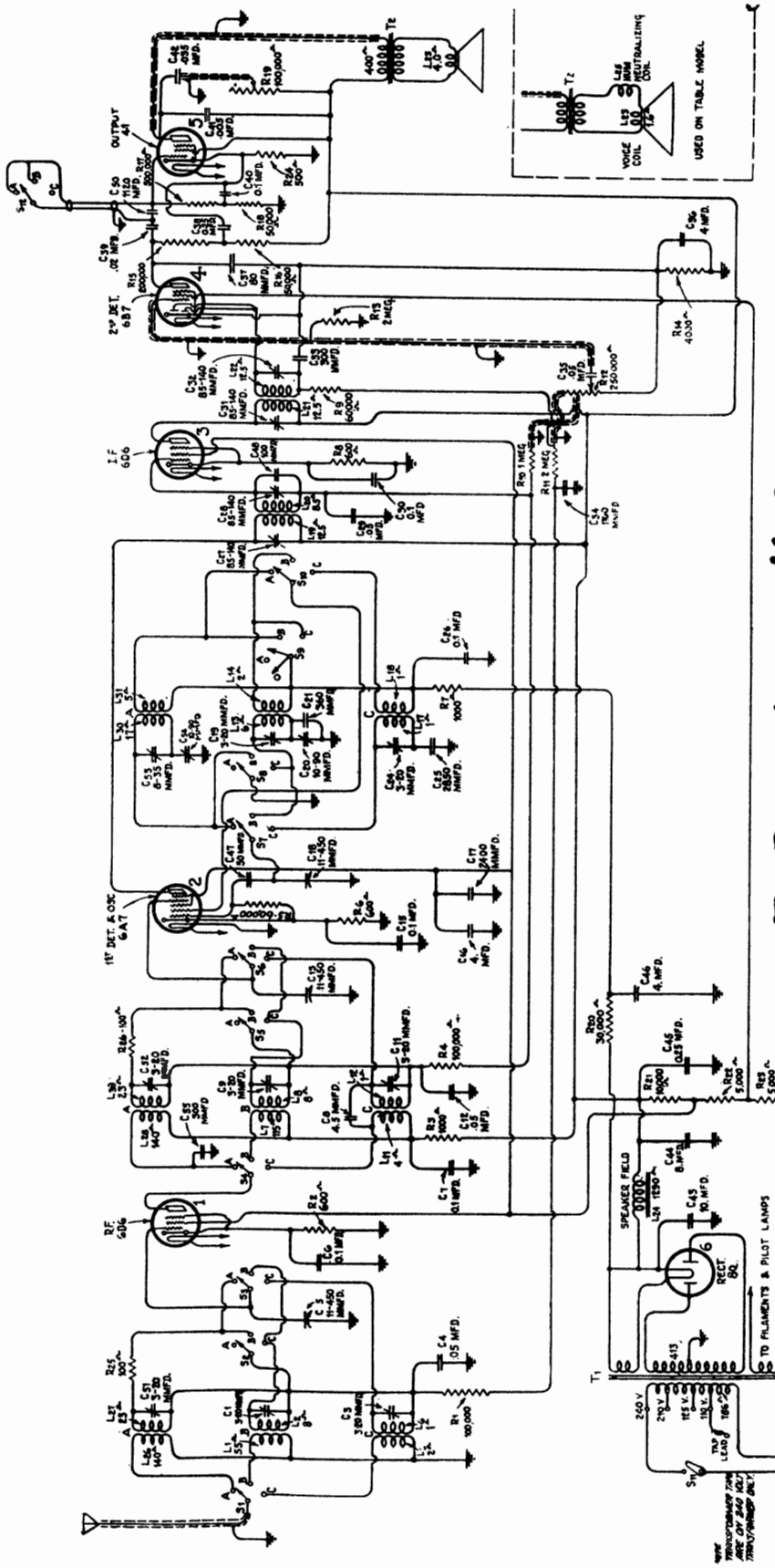
Maximum Volume Control—No Signal—115 Volts A. C. Input

Radiotron		Plate to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Cathode to Ground Volts, D.C.	Plate Current	Heater Volts
RCA-6A7	Oscillator	185	—	—	4.5	—
	Detector	265	109	9.5	1.6	6.3
RCA-6D6 First I.F.		257	109	11.2	2.2	6.3
RCA-6D6 Second I.F.		265	109	8.3	6.6	6.3
RCA-6B7 Second Det.		80*	109	4.5	0.3	6.3
RCA-41 Power		255	265	18.0	30.0	6.3
RCA-80 Rectifier		345/345	—	—	68.0	5.0

*Calculated from +B.

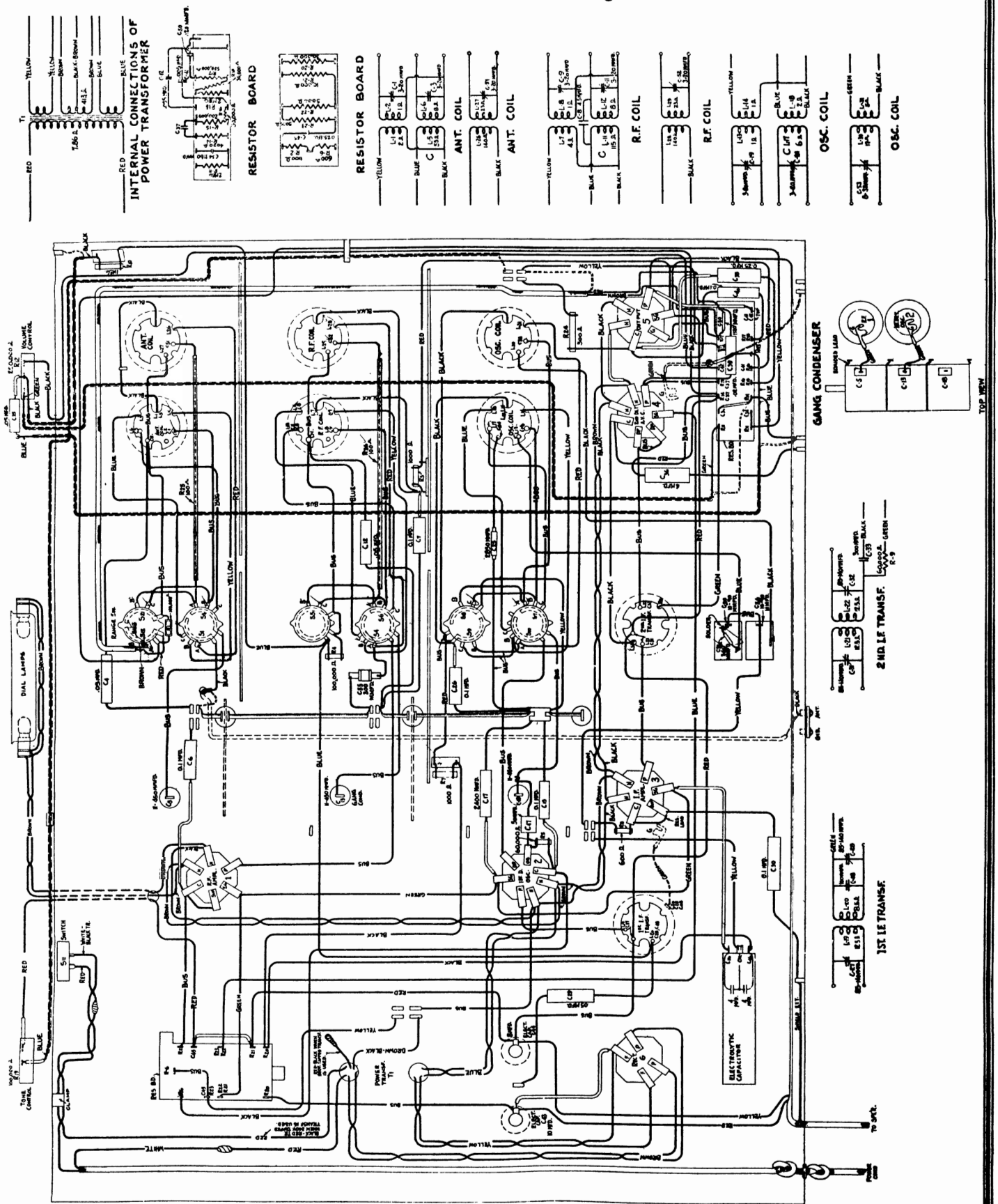
RCA MANUFACTURING CO., Inc.

Models 128-E, 224-E



RCA MANUFACTURING CO., Inc.

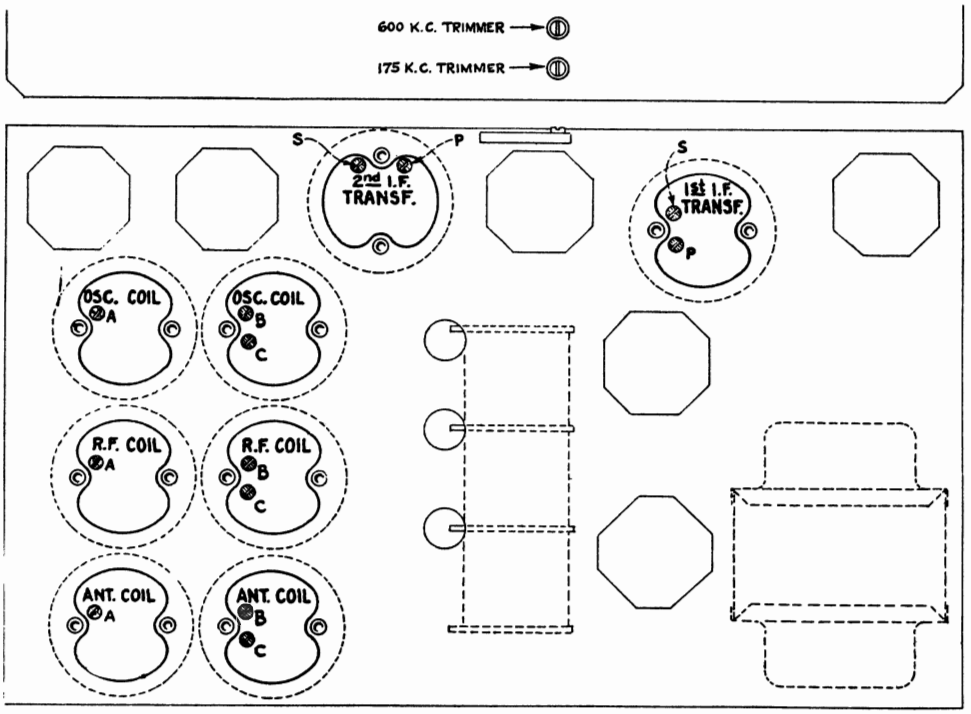
Models 128E, 224-E



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Models 128-E, 224-E



Location of Line-Up Capacitors

RADIOTRON SOCKET VOLTAGES

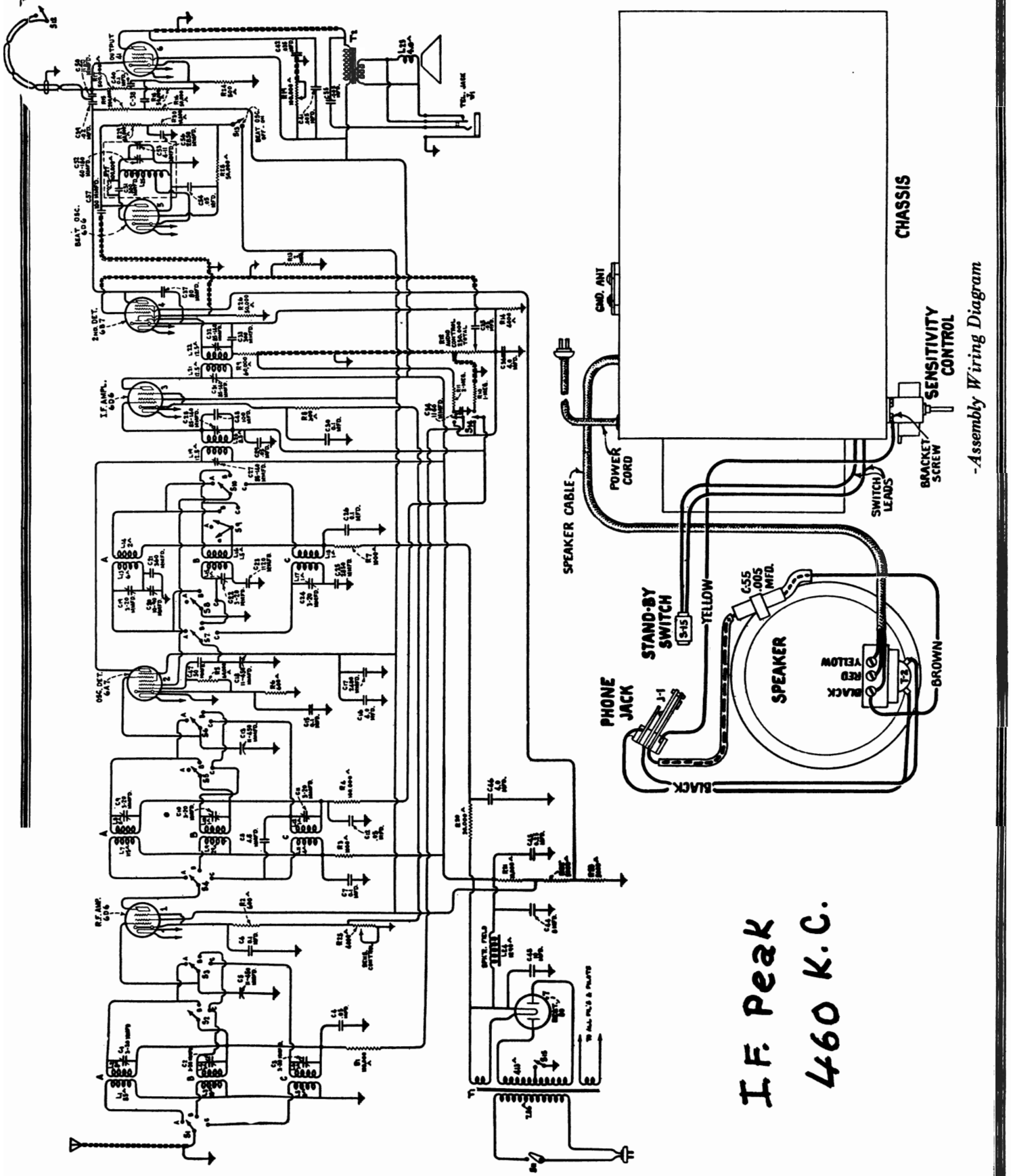
115-Volt A. C. Line—No Signal—Volume Control Maximum

Radiotron Number		Cathode to Ground, Volts, D. C.	Screen Grid to Ground, Volts, D. C.	Plate to Ground, Volts, D. C.	Plate Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		6.0	105	265	9.0	6.3
RCA-6A7	Det.	6.0	105	265	3.5	6.3
	Osc.	—	—	220	4.5	
RCA-6D6—I. F.		6.0	105	265	9.0	6.3
RCA-6B7—2nd Detector		3.0	50	90*	0.7	6.3
RCA-41—Power		16.5	265	245	30.0	6.3
RCA-80—Rectifier		—	—	690 (RMS)	70.0	5.0

*Voltage calculated from 265 V. + B.

RCA MANUFACTURING CO., Inc.

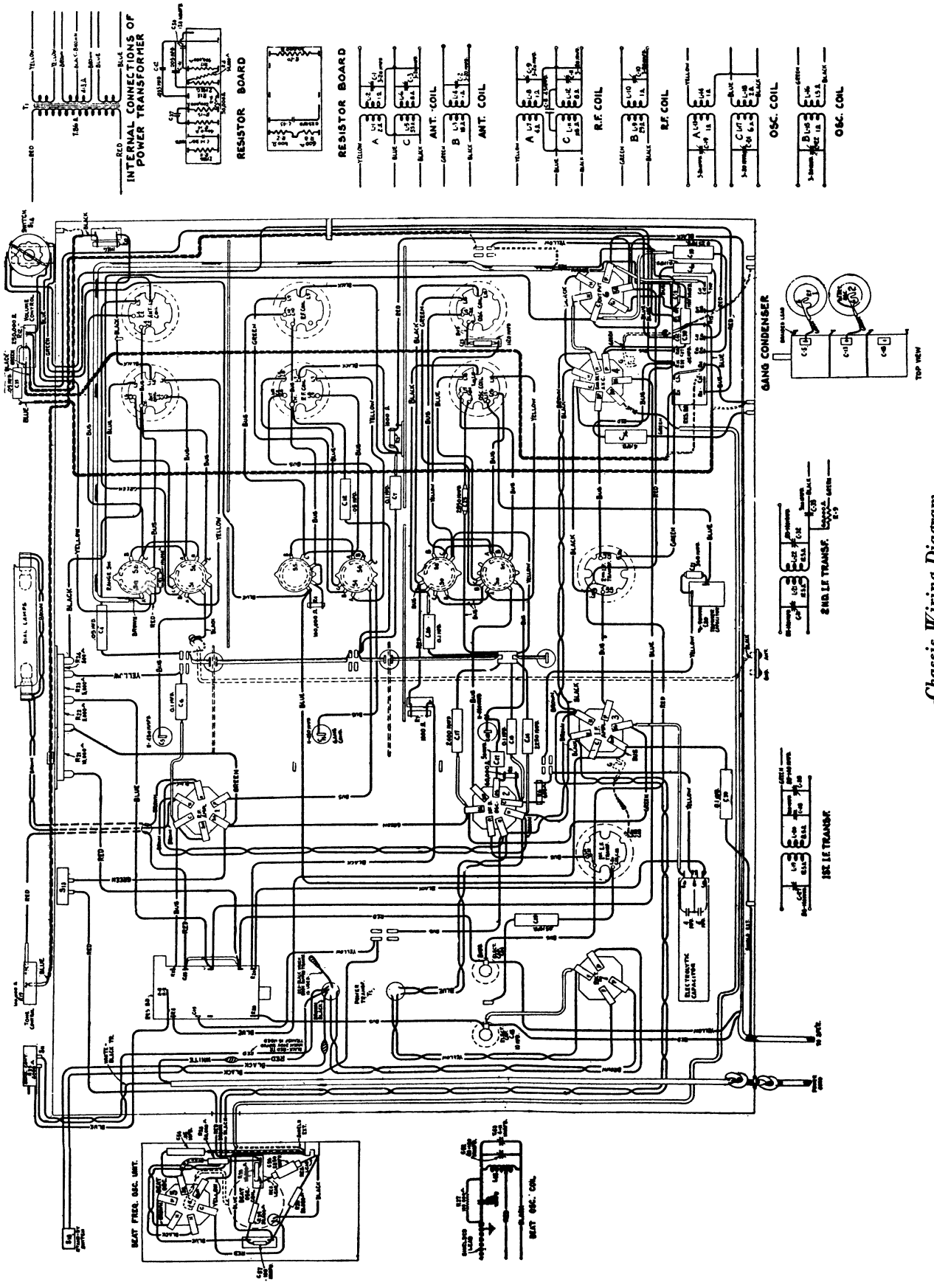
Model ACR-136



-Assembly Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model ACR-136



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model ACR-136

A-C Line Voltages

this receiver is manufactured in three a-c line ratings designated as A, B and C, respectively. The first two models (A and B) cover a single-voltage range (105 to 125 volts), whereas the third or "C" model is operable in either of four ranges (100 to 117, 117 to 130, 195 to 225 and 225 to 250), three taps being provided on the primary of the power transformer. Internal connections of the transformer are shown in Figure 4. All taps are brought out to a terminal board on the top of the transformer and may be interchanged without removing the chassis from its case.

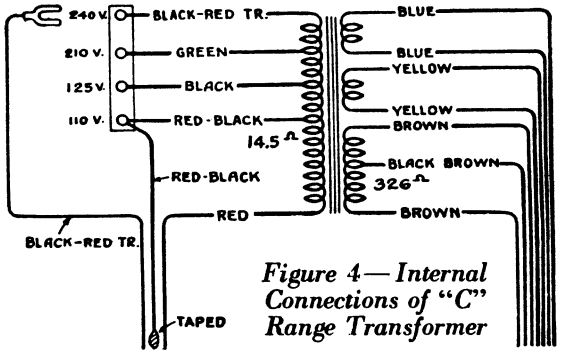
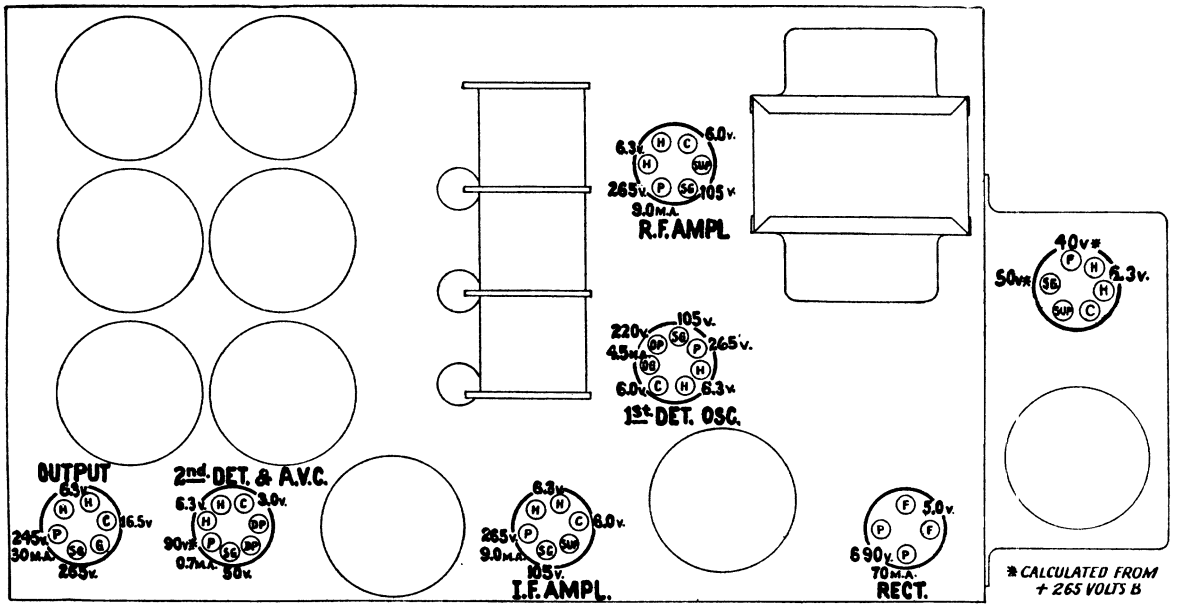
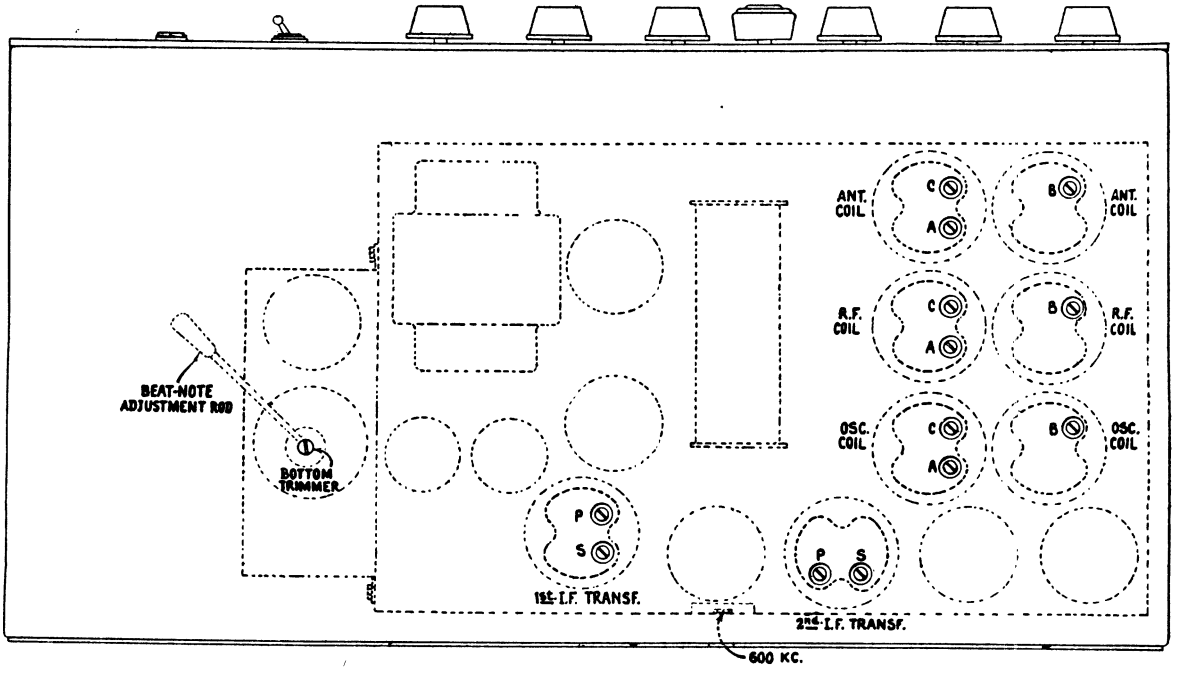


Figure 4—Internal Connections of "C" Range Transformer



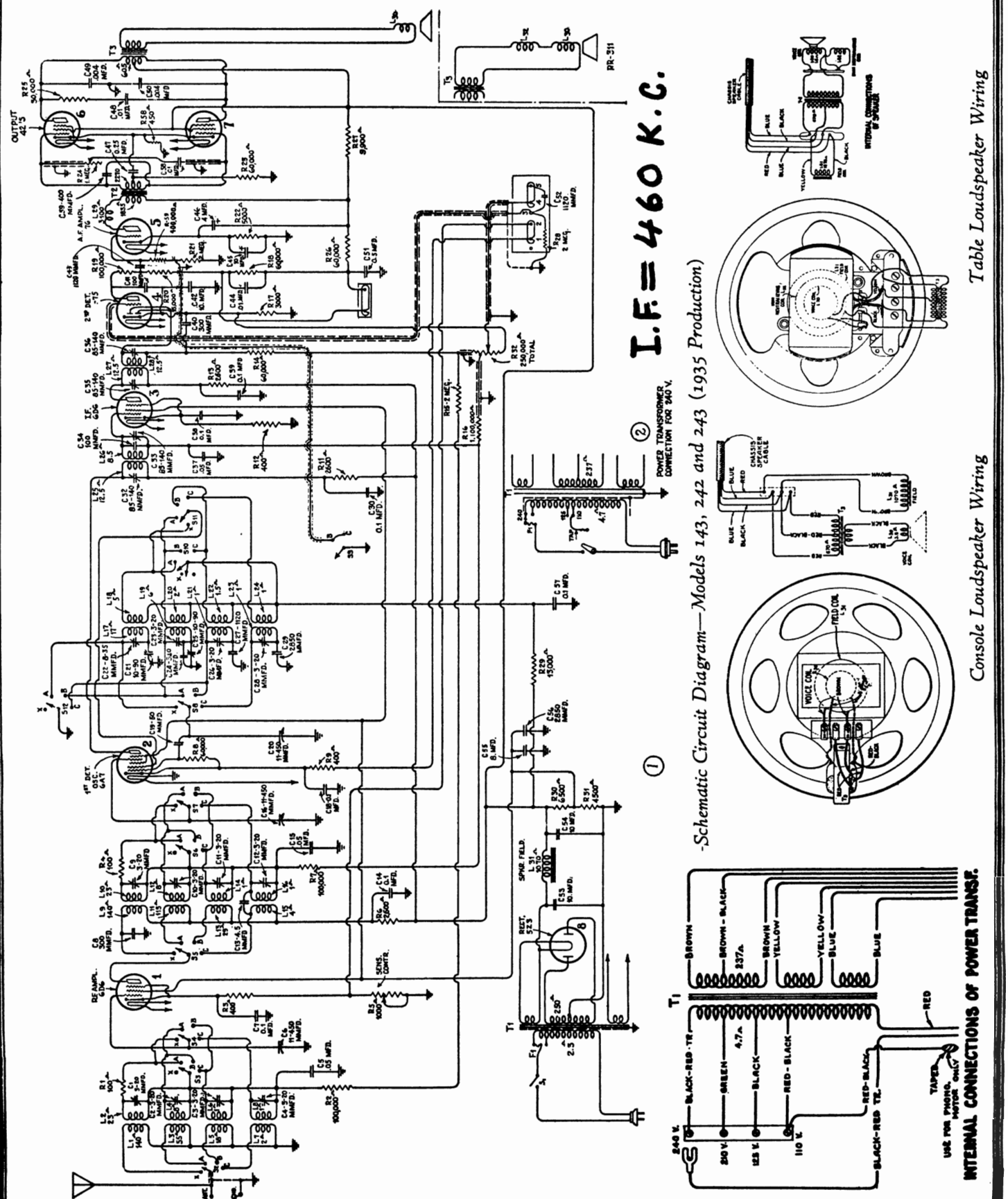
-Tube Voltages



Locations of Trimmers (viewing bottom of case)

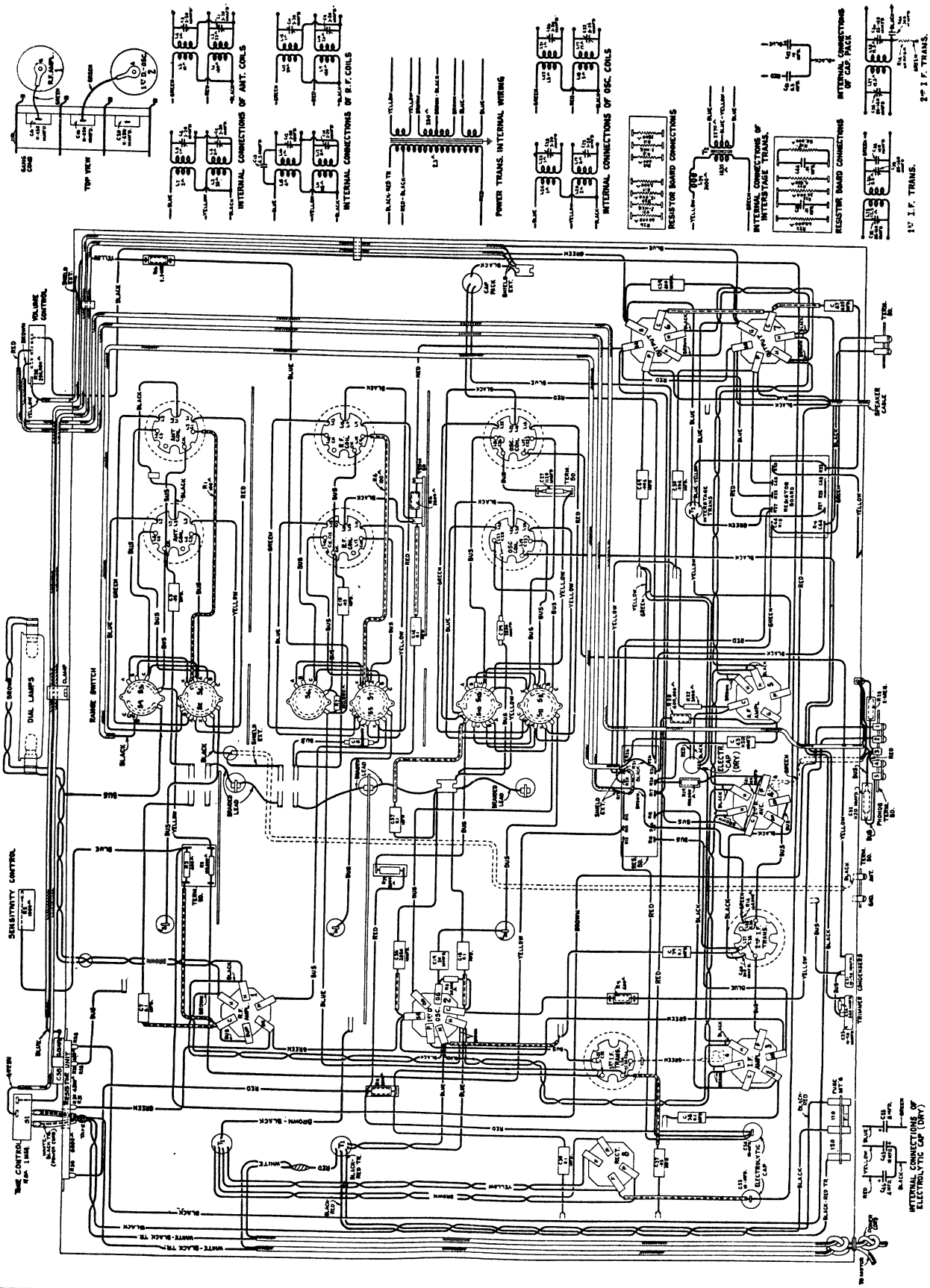
RCA MANUFACTURING CO., Inc.

Models 143, 242, 243



RCA MANUFACTURING CO., Inc.

Models 143, 242, 243



—Chassis Wiring Diagram

Models 143, 242 and 243 (1935 Production)

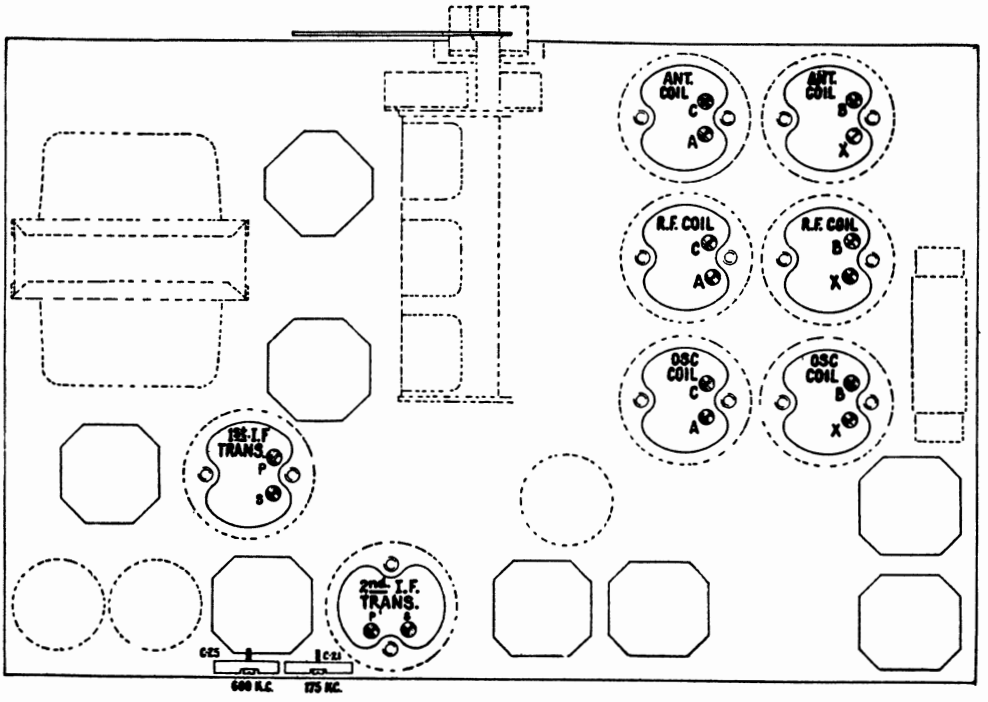
RCA MANUFACTURING CO., Inc.

Models 143, 242, 243

FIDELITY LINK

It will be noted that a small link is mounted on the rear apron of the chassis, which is normally closed on table models and open on the console models. The low-frequency output of the receiver is increased when the link is opened.

R-F, Oscillator and First Detector Tuned Circuit Alignment. Whenever the i-f line-up is corrected, it will be necessary to re-align r-f circuits preceding the first detector tube, as the correct operation of the receiver depends on the interlocking of the two.



—Location of Trimmer Capacitors

Alignment Frequencies.....175 KC, 410 KC, 460 KC, 600 KC, 1720 KC, 5160 KC, 18,000 KC

RADIOTRON SOCKET VOLTAGES

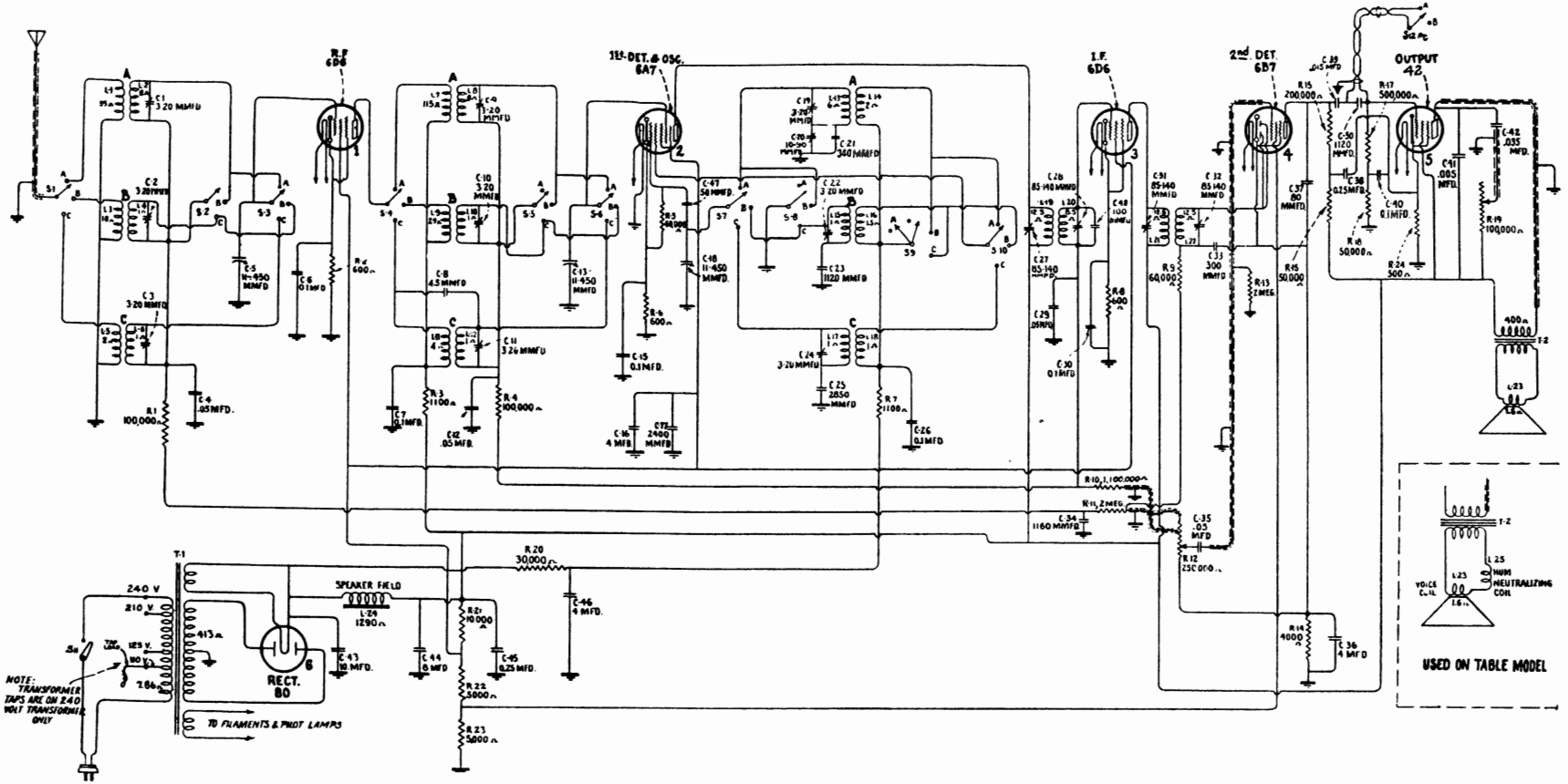
120-Volt A.C. Line—Maximum Volume and Sensitivity—No Signal

Radiotron No.		Cathode to Ground Volts, D. C.	Screen Grid to Ground Volts, D. C.	Plate to Ground Volts, D. C.	Cathode Current, M. A.	Heater Volts, A. C.
RCA-6D6 R. F.		4.2	110	272	10.5	6.3
RCA-6A7	Oscillator	—	—	225	11.4	6.3
	1st Detector	4.6	110	282		
RCA-6D6 I. F.		4.2	110	272	10.5	6.3
RCA-75 2nd Det.		1.2	—	170*	0.4	6.3
RCA-76 A. F.		14.0	—	252	2.8	6.3
RCA-42 Power		22.0	295	290	24.5	6.3
RCA-42 Power		22.0	295	290	24.5	6.3
RCA-5Z3 Rectifier		—	—	768/384 R. M. S.	110.0	5.0

*Cannot be measured with ordinary voltmeter.

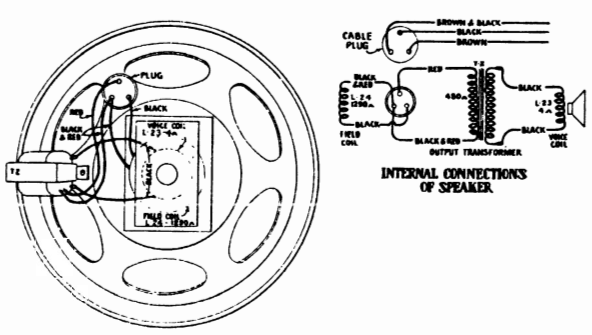
RCA MANUFACTURING CO., Inc.

MODELS 226 and 128

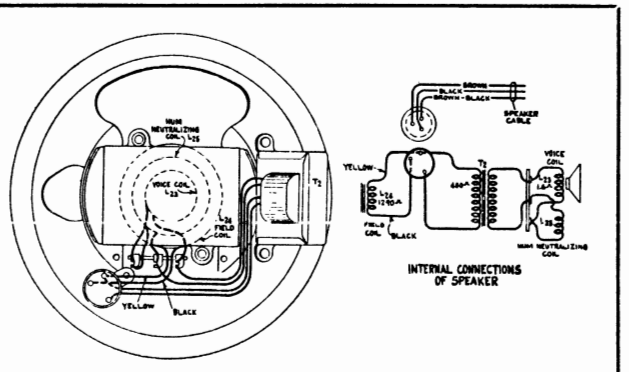


Alignment Frequencies.....460 K. C., 600 K. C., 1,720 K. C., and 18,000 K. C.

I.F. PEAK 460 KC.



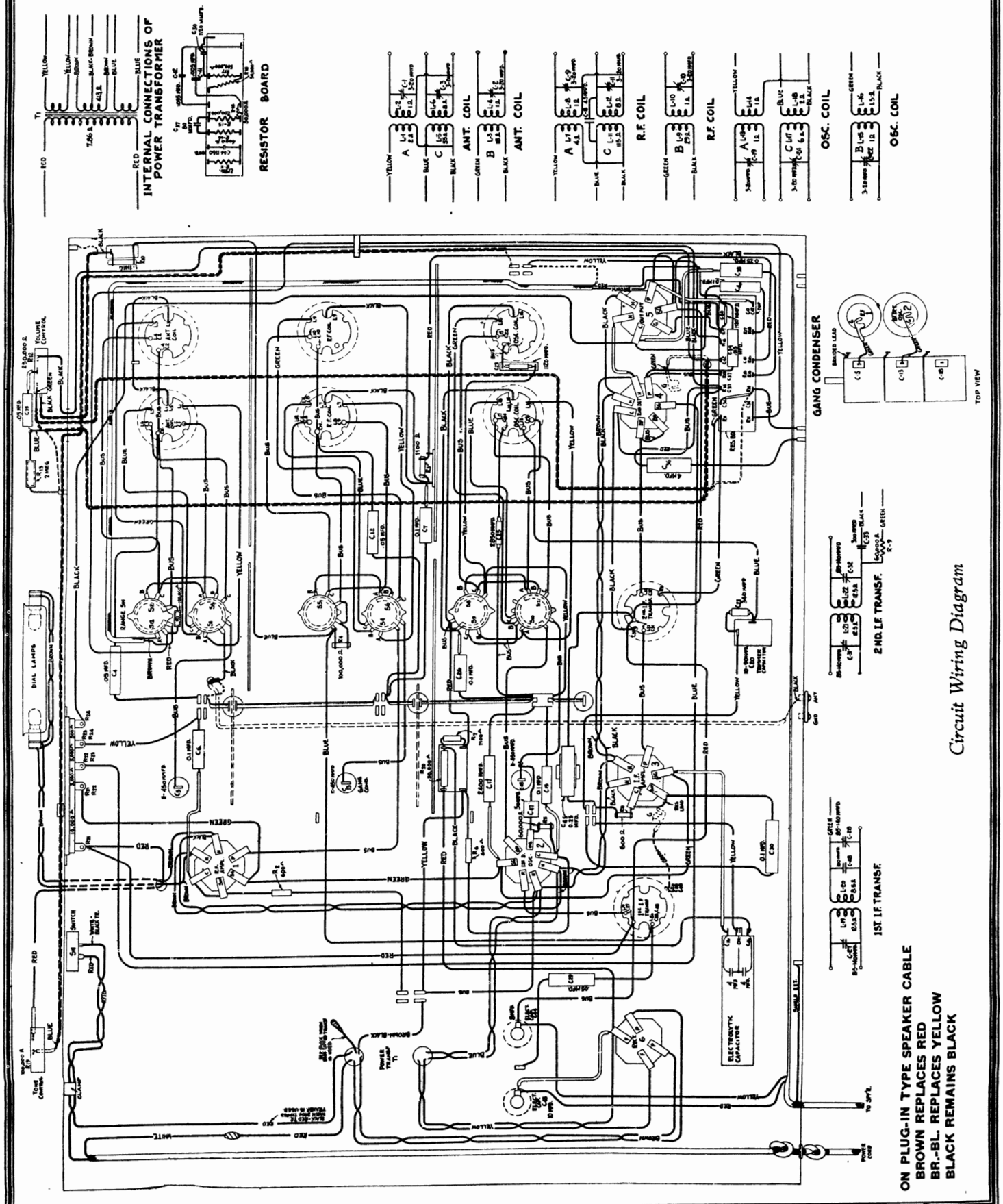
Console Model Loudspeaker (with cable plug)



-Table Model Loudspeaker Wiring (with cable plug)

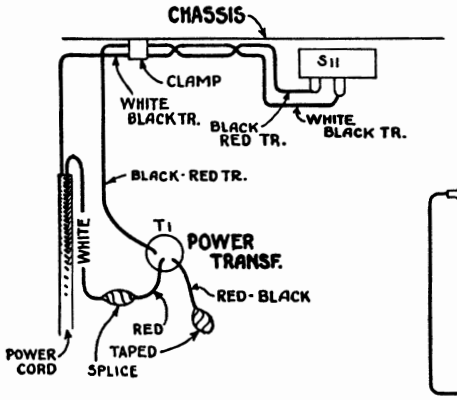
RCA MANUFACTURING CO., Inc.

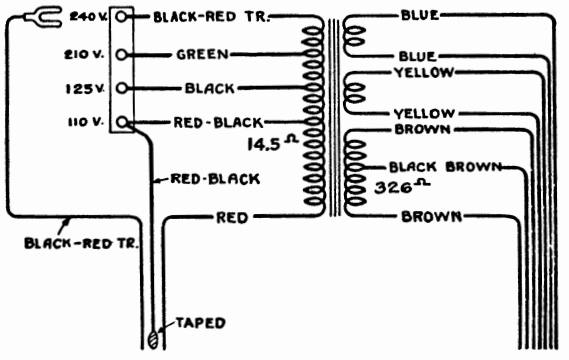
Models 226-128



RCA MANUFACTURING CO., Inc.

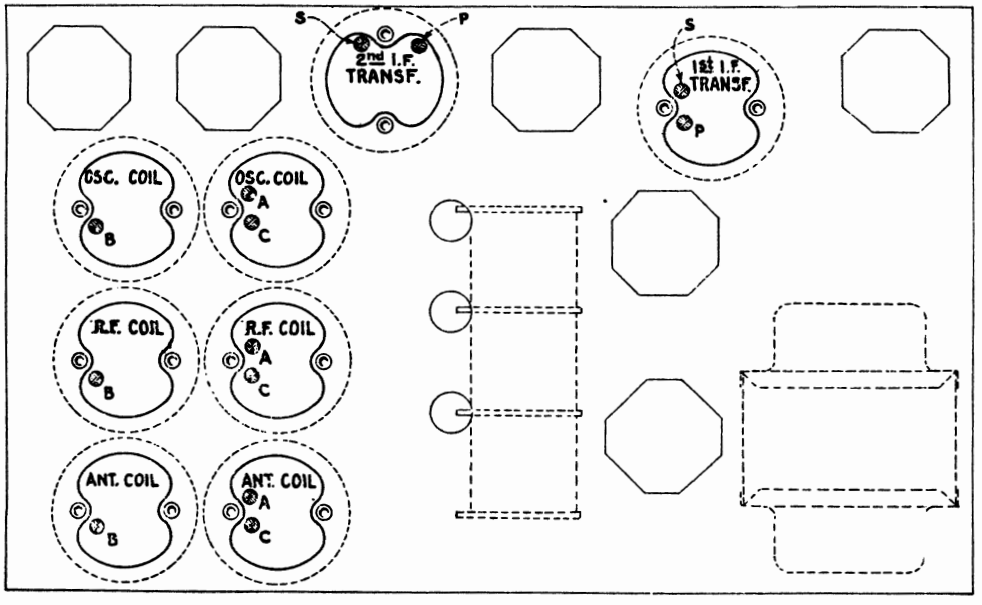
Models 226–128





INTERNAL CONNECTIONS OF POWER TRANSF.

Universal Transformer Connections (50–60 Cycles)



Location of Line-up Capacitors

RADIOTRON SOCKET VOLTAGES

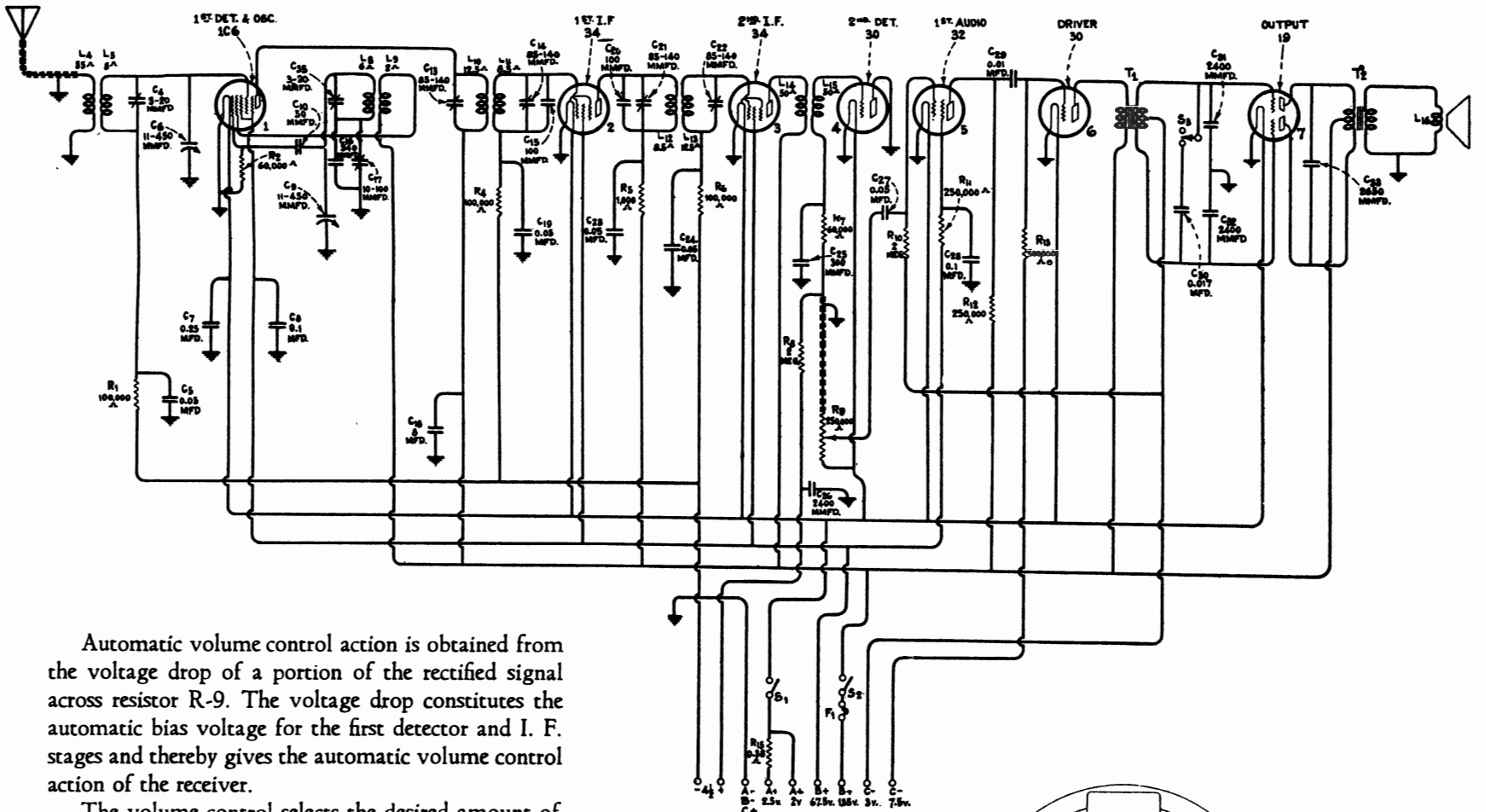
115-Volt A. C. Line—No Signal—Volume Control—Maximum

Radiotron Number		Cathode to Ground Volts, D. C.	Screen Grid to Ground, Volts, D. C.	Plate to Ground, Volts, D. C.	Plate Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		6.0	105	265	9.0	6.3
RCA-6A7	Det.	6.0	105	265	3.5	6.3
	Osc.	—	—	220	4.5	
RCA-6D6—I. F.		6.0	105	265	9.0	6.3
RCA-6B7—2nd Detector		3.0	50	90*	0.7	6.3
RCA-42—Power		16.5	265	245	30.0	6.3
RCA-80—Rectifier		—	—	690 (RMS)	70.0	5.0

*Voltage calculated from 265 V. + B.

RCA MANUFACTURING CO., Inc.

Model 236-B

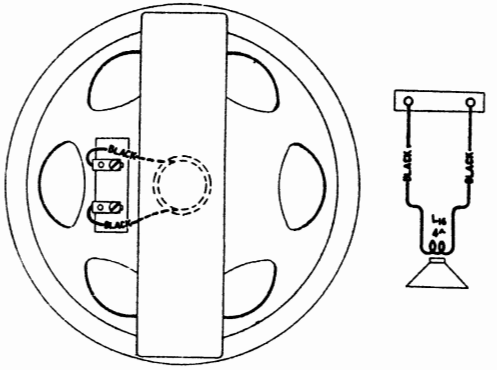


Automatic volume control action is obtained from the voltage drop of a portion of the rectified signal across resistor R-9. The voltage drop constitutes the automatic bias voltage for the first detector and I. F. stages and thereby gives the automatic volume control action of the receiver.

The volume control selects the desired amount of audio signal from the drop across R-9 and applies it to the grid circuit of the first audio stage, RCA-32.

Plate, grid and filament voltages are supplied by individual batteries. Two +A leads are provided, one permitting operation on a 2-volt storage cell; and the other used for operation on a 2.5-volt "Eveready Air Cell." A fuse in the "B" battery lead provides protection for the Radiotrons in event of short circuits or wrong battery connections. Figure 1 shows the schematic diagram,

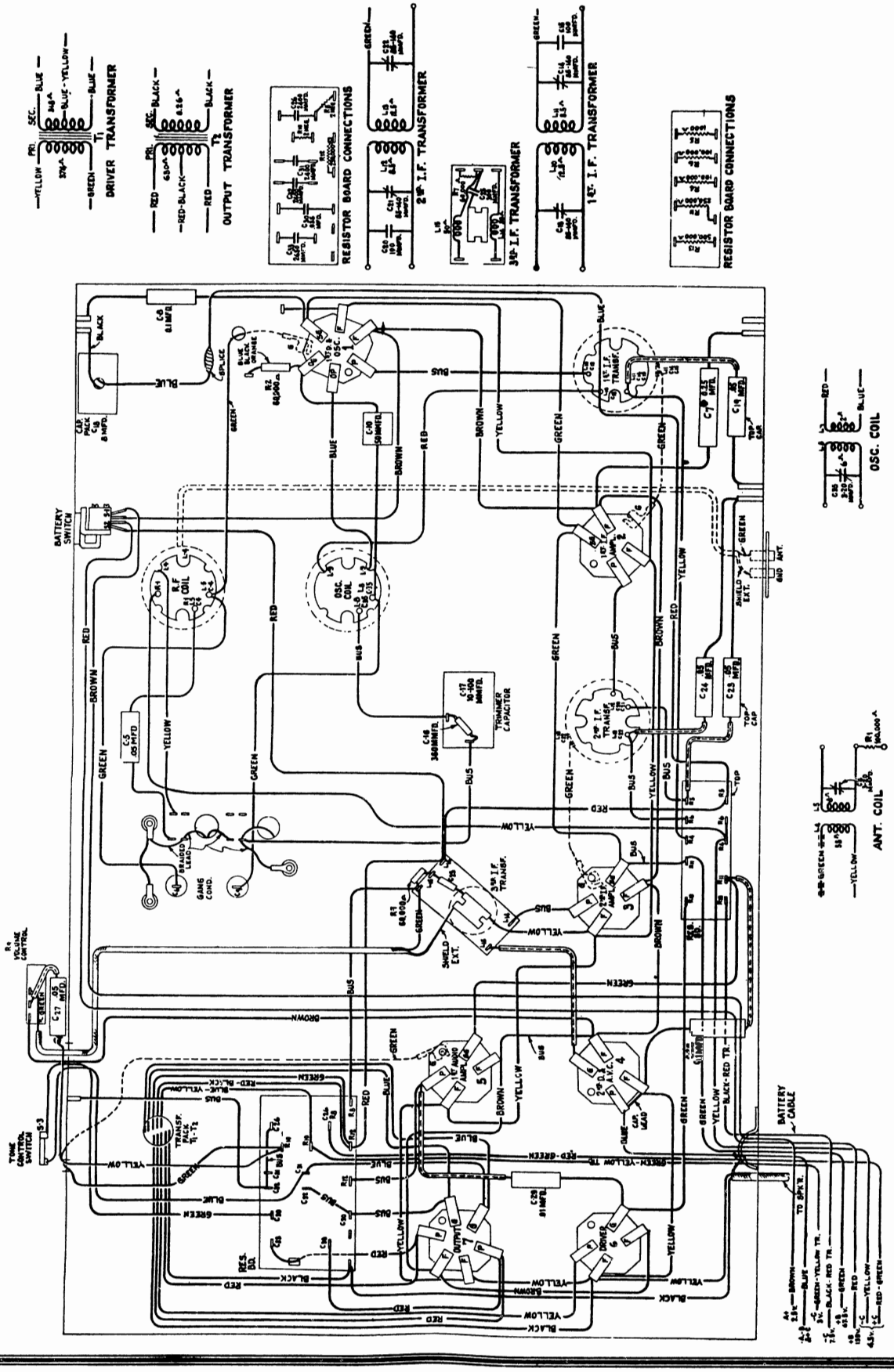
I.F. Peak
460 K.C.



Loudspeaker Wiring

RCA MANUFACTURING CO., Inc.

Model 236-B



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model 236-B

Voltage and Current Measurements

Voltage and current values listed in the following table and indicated at the Radiotron socket contacts on Figure 4 form a reference basis for test of the receiver. It is to be noted that all voltages are given with respect to chassis-ground, excepting those appearing across the filaments (F-F). The values shown are obtainable when the receiver is in normal operating condition. They do not take into account inaccuracies caused by current consumed in the voltmeter used for the tests; the lower the voltmeter resistance, the lower the degree of accuracy. Allowances must therefore be made, dependent upon the type of test instrument used, for the loading effect of the voltmeter on the circuit.

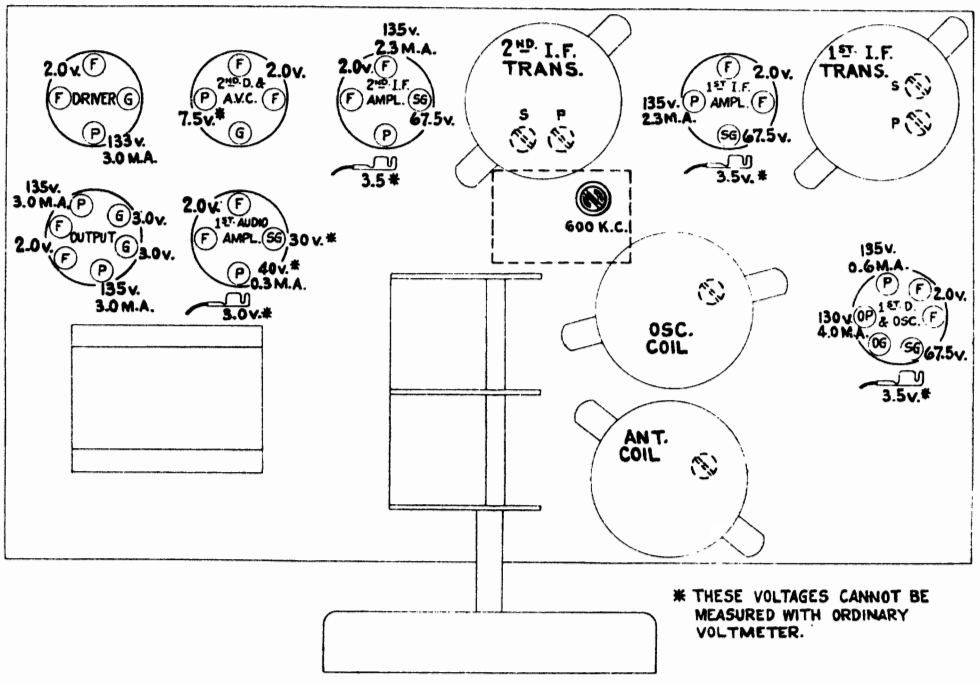


Figure 4—Line-Up Capacitor Locations and Voltage Values at Socket Contacts

RADIOTRON SOCKET VOLTAGES

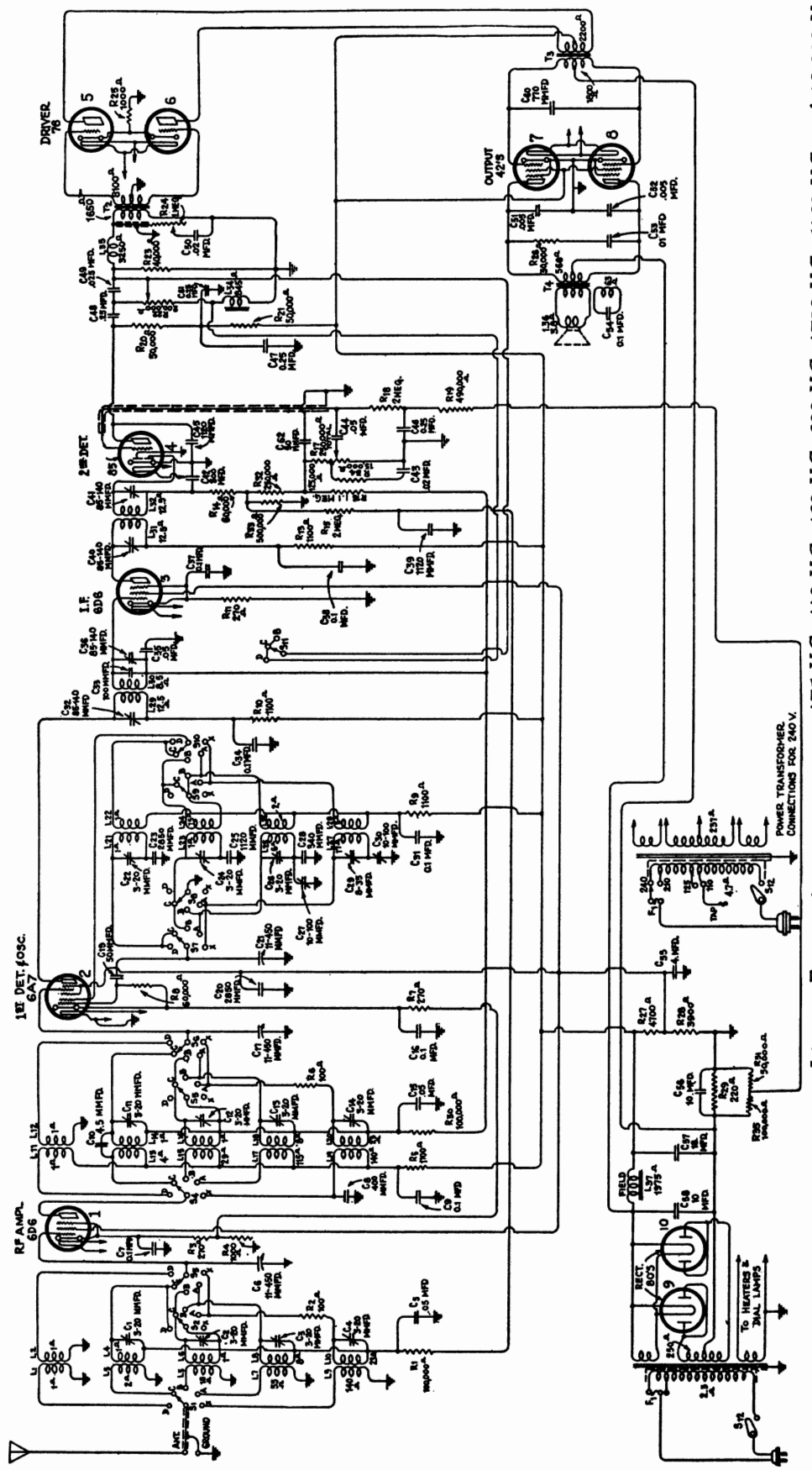
Volume Control at Maximum—No Signal—135 Volt "B" Battery—4.5 and 7.5-Volt Bias Batteries

Radiotron No.		Control Grid to Ground	Screen Grid to Ground	Plate to Ground	Plate, M. A.	Filament Volts
RCA-1C6	1st Detector	3.5*	67.5	135	0.6	2.0
	Oscillator	—	—	130	4.0	
RCA-34—I. F.		3.5*	67.5	135	2.3	2.0
RCA-34—I. F.		3.5*	67.5	135	2.3	2.0
RCA-30—Detector AVC		—	—	—	—	2.0
RCA-32—Audio		3.0*	30*	40*	0.3	2.0
RCA-30—Driver		7.5*	—	133	4.0	2.0
RCA-19—Power		3.0	—	135	3.0	2.0

*These voltages cannot be measured with ordinary voltmeter.

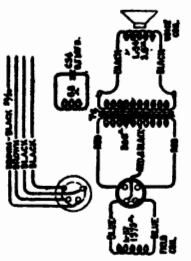
RCA MANUFACTURING CO., Inc.

Models 262–263

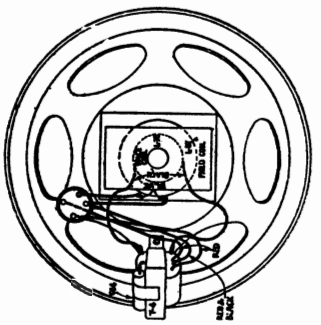


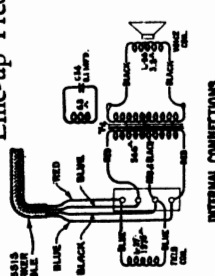
Line-up Frequencies.....175 KC, 410 KC, 460 KC, 600 KC, 1720 KC, 5160 KC, and 18,000 KC

I.F. Peak
460 K.C.

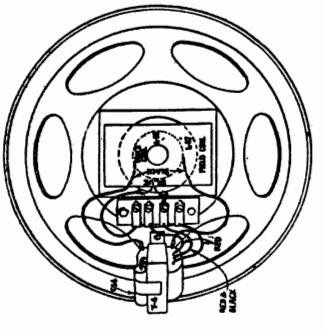


Loudspeaker Wiring for Plug-In Type



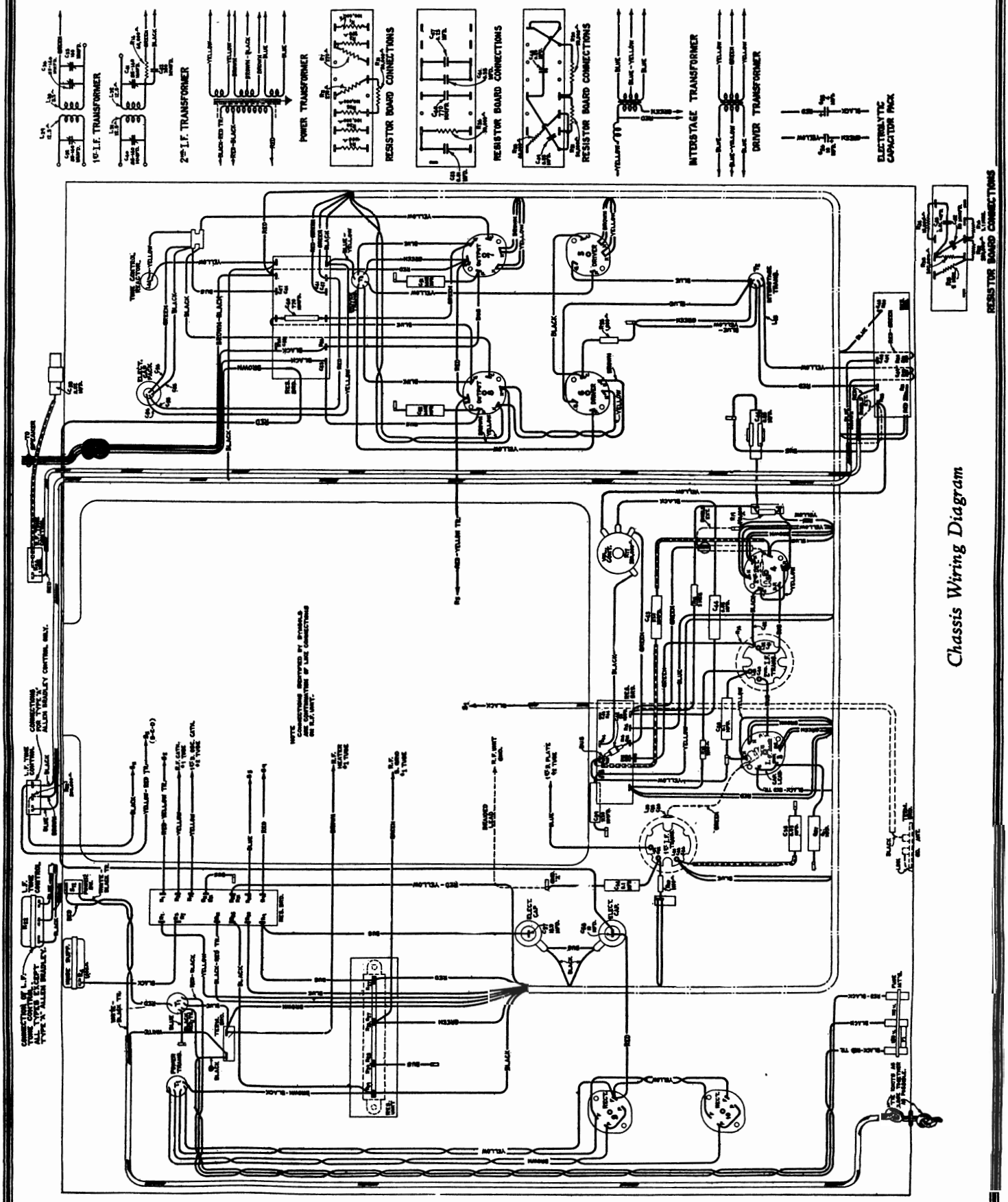


Loudspeaker Wiring—Without Plug



RCA MANUFACTURING CO., Inc.

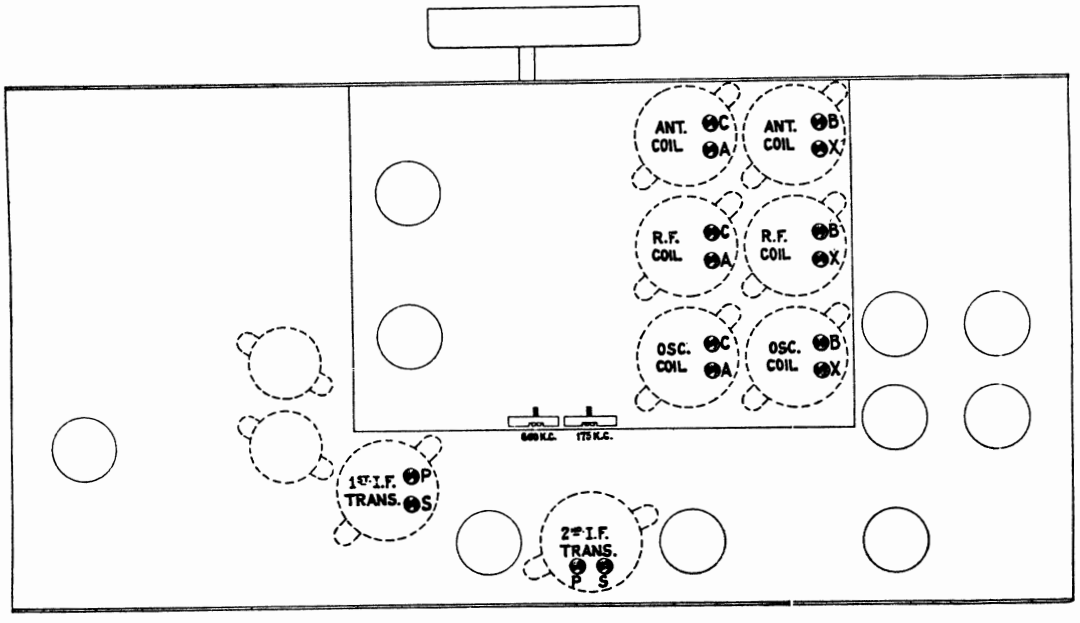
Models 262-263



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Models 262-263



Location of Trimmer Capacitors

RADIOTRON SOCKET VOLTAGES

120-Volt A. C. Input—Volume and Sensitivity Controls Maximum—Band Switch at "A"—No Signal

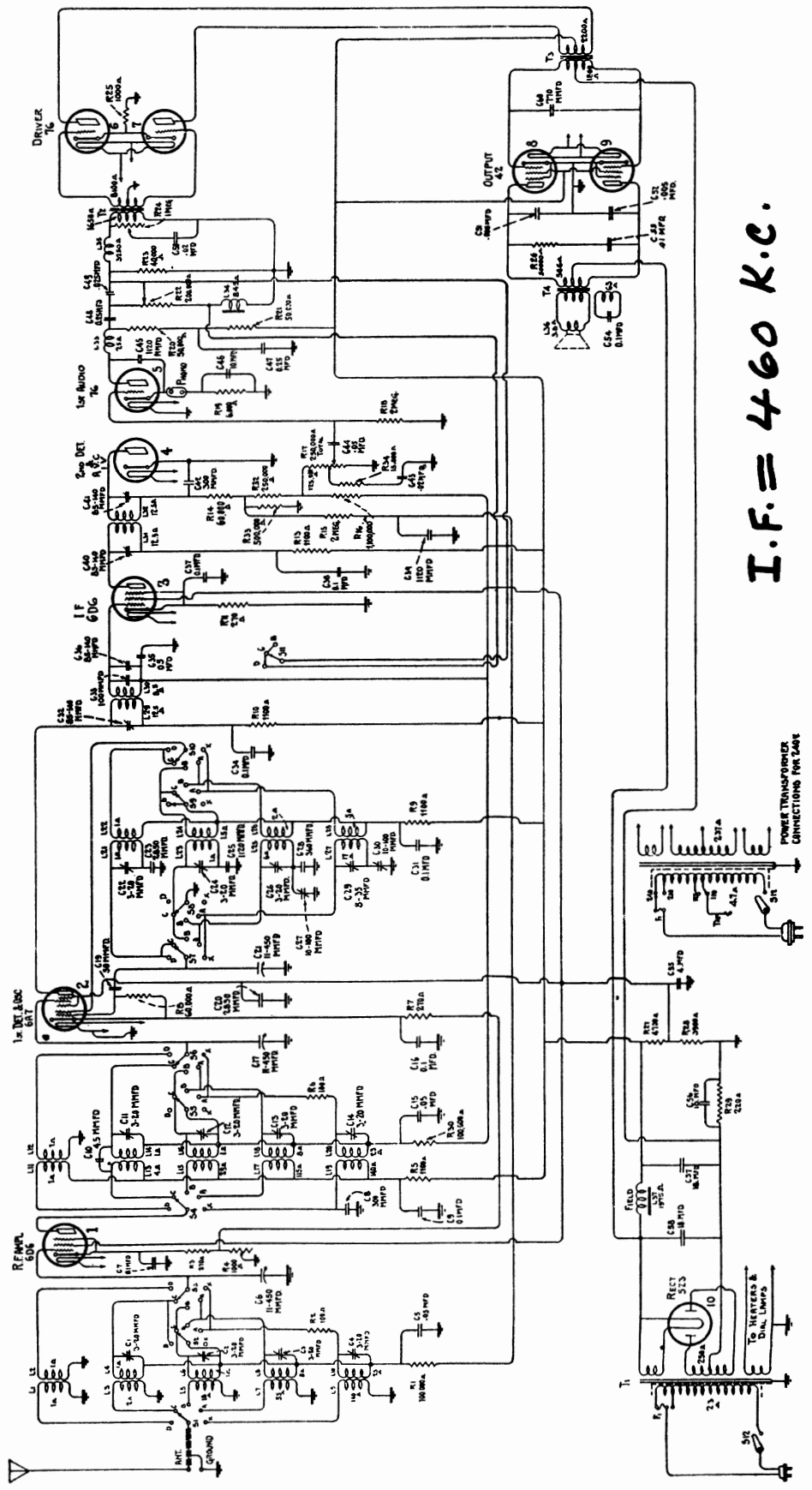
Radiotron Type and Purpose		Cathode to Ground Volts, D. C.	Screen Grid to Ground Volts, D. C.	Plate to Ground Volts, D. C.	Cathode Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		2.5	101	242	9.2	6.3
RCA-6A7	Detector	2.8	101	244	10.9	6.3
	Oscillator	—	—	244		
RCA-6D6—I. F.		2.5	101	242	9.2	6.3
RCA-85—2nd Det. AVC		0	—	107*	1.4	6.3
RCA-76—Driver		11.4	—	247	5.6	6.3
RCA-76—Driver		11.4	—	247	5.6	6.3
RCA-42—Power		0	247	376	21.0	6.3
RCA-42—Power		0	247	376	21.0	6.3
RCA-80—Rectifier		—	—	768/384 R. M. S.	56.0	5.0
RCA-80—Rectifier		—	—		56.0	5.0

*Cannot be measured with ordinary voltmeter.

RCA MANUFACTURING CO., Inc.

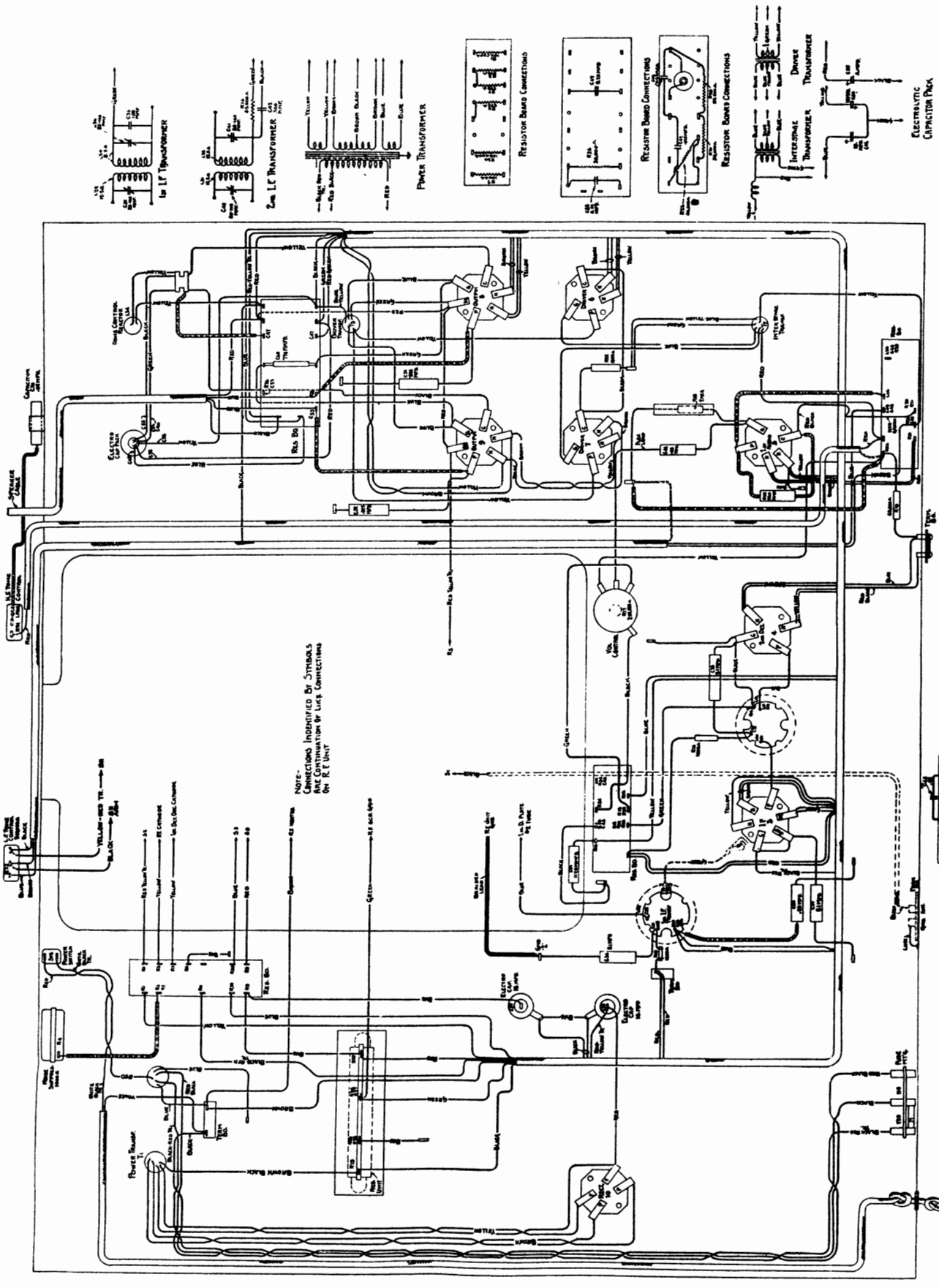
SUPPLEMENT
to
RCA VICTOR MODEL 262 SERVICE NOTES

Late production of the RCA Victor Model 262 uses Radiotron RCA-1-V as the second detector instead of Radiotron RCA-76.



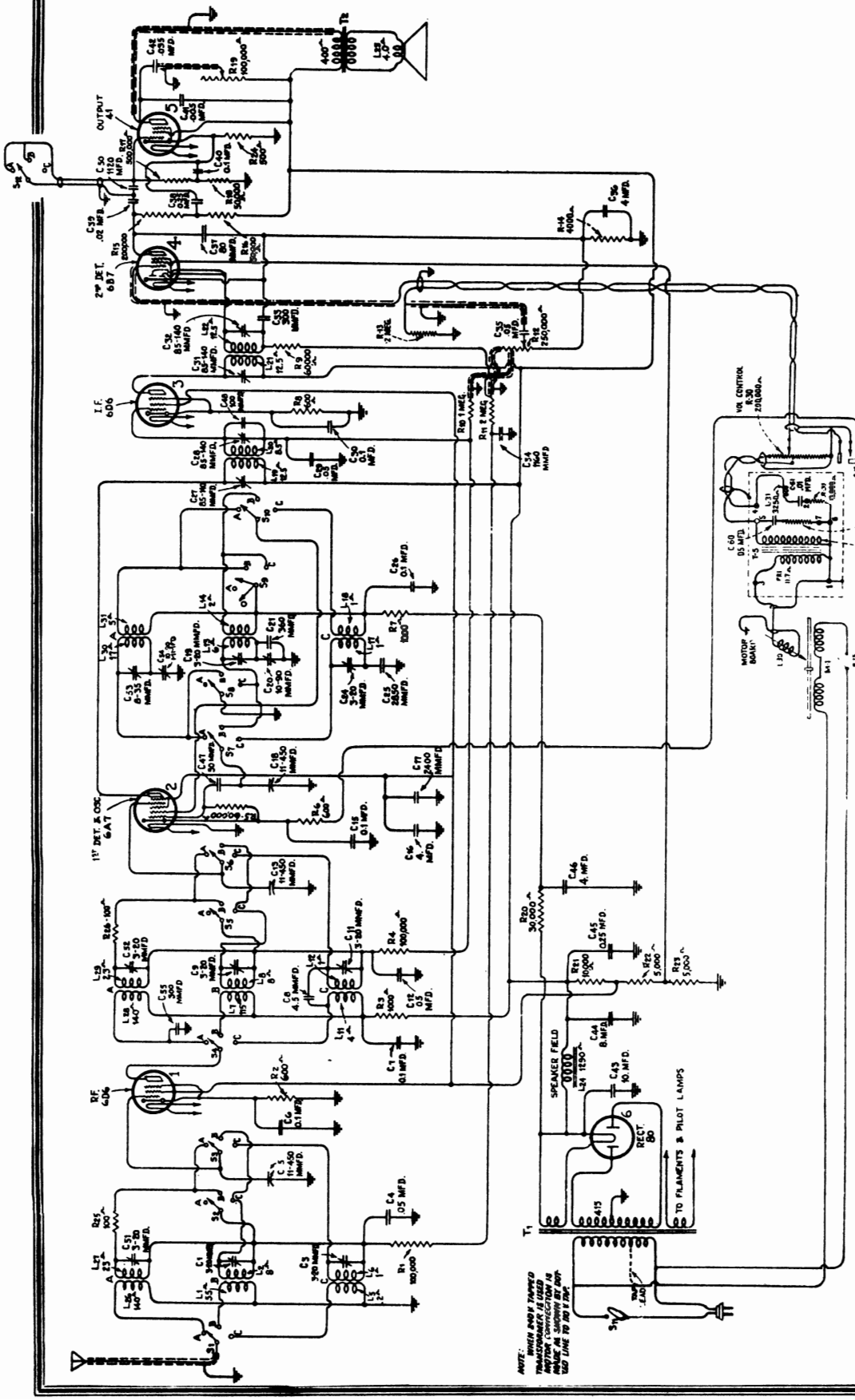
RCA MANUFACTURING CO., Inc.

Model 262 (Supplement)

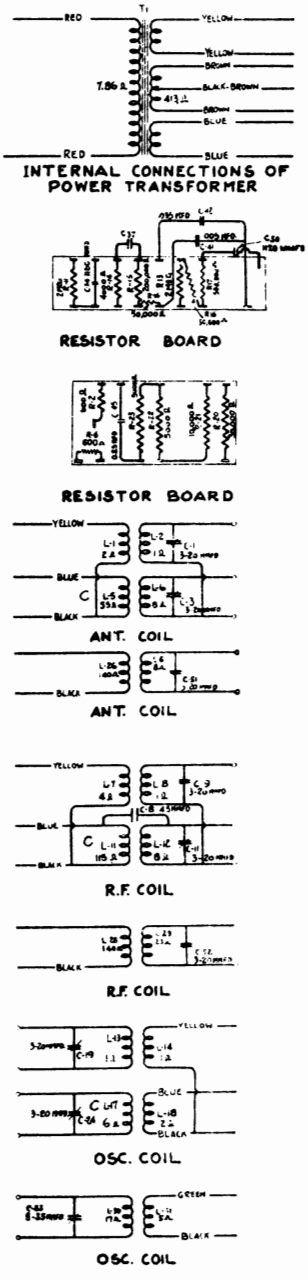


RCA MANUFACTURING CO., Inc.

Model 322-E "DUO"



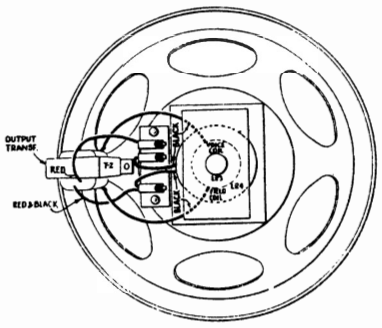
—Schematic Circuit Diagram—Some models may have R-32 comprised of two resistors, one internal (4000-ohm) and one external (10,000-ohm)

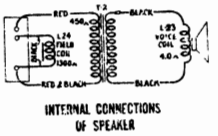


I.F. Peak
460 K.C.

RCA MANUFACTURING CO., Inc.

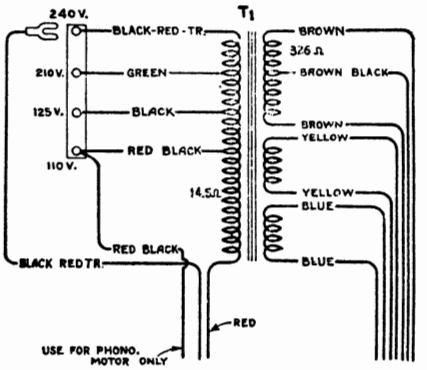
Model 322-E "DUO"



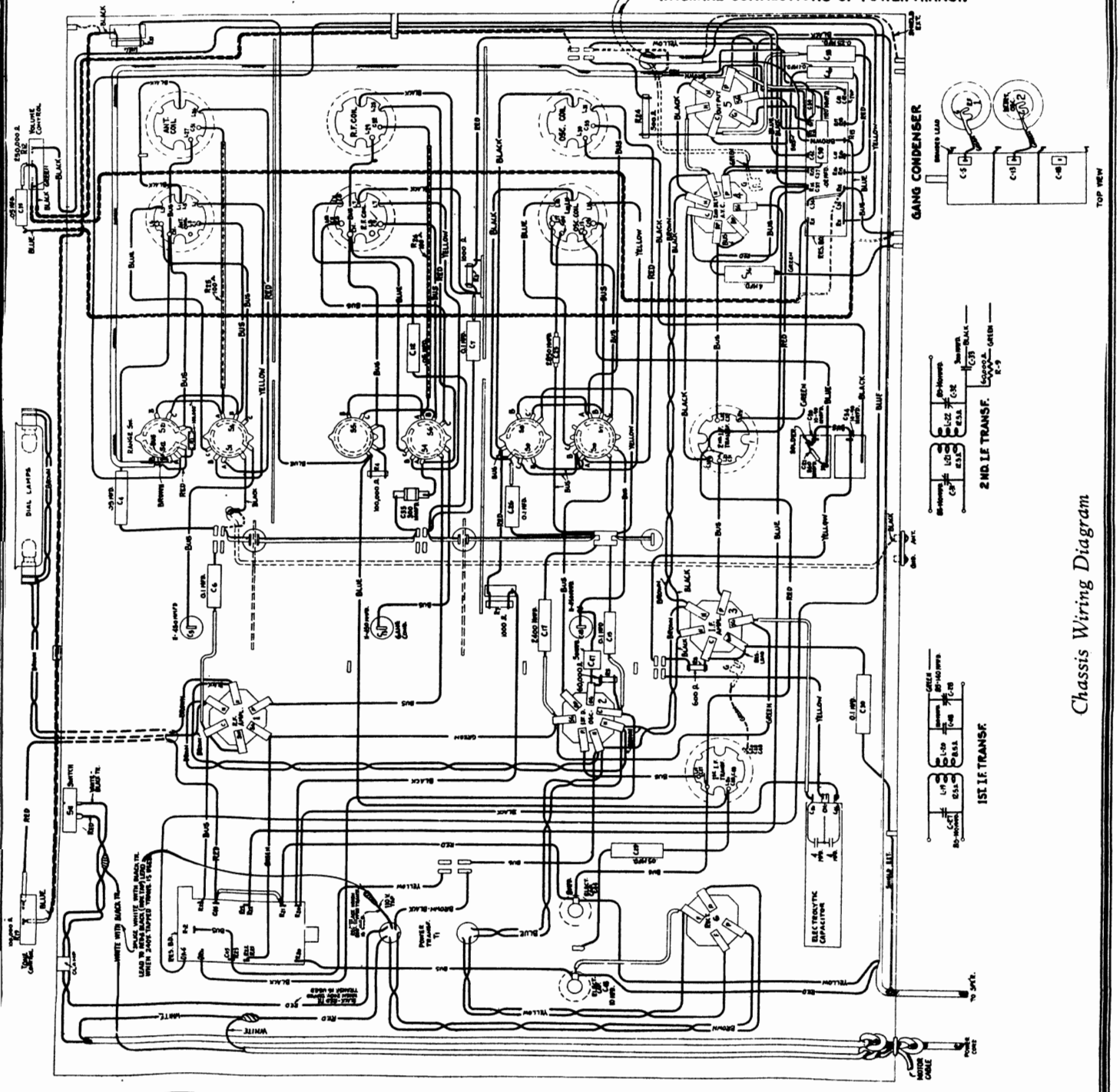


INTERNAL CONNECTIONS OF SPEAKER

Loudspeaker Wiring



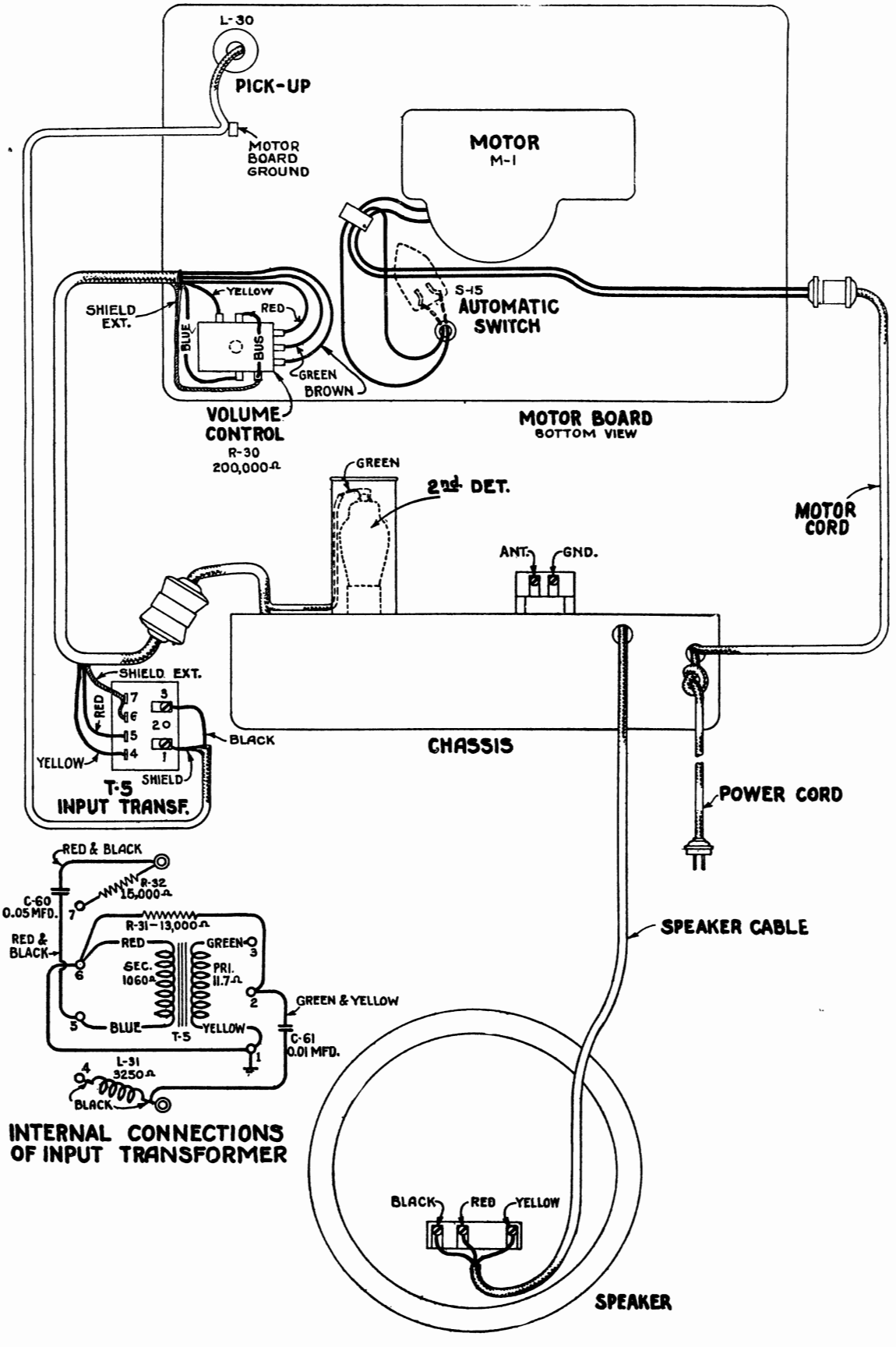
INTERNAL CONNECTIONS OF POWER TRANSF.



Chassis Wiring Diagram

RCA MANUFACTURING CO., Inc.

Model 322-E "DUO"



INTERNAL CONNECTIONS OF INPUT TRANSFORMER

Assembly Wiring Diagram—Some mode's may have R-32 consisting of a 4000-ohm resistor with an additional 10,000-ohm resistor substituted for the jumper between terminals 6 and 7 of the input transformer.

RCA MANUFACTURING CO., Inc.

Model 322-E "DUO"

(1) LINE-UP PROCEDURE

The line-up procedure of this receiver is somewhat involved and it is important that these instructions be carefully followed when making adjustments. Properly aligned, this receiver has outstanding performance; improperly aligned, it may be impossible to receive signals on all bands.

(2) I. F. TUNING CAPACITOR ADJUSTMENTS

This receiver has one I. F. stage, which uses two transformers. The transformers are all peaked at 460 K. C.

A detailed procedure for making this adjustment follows:

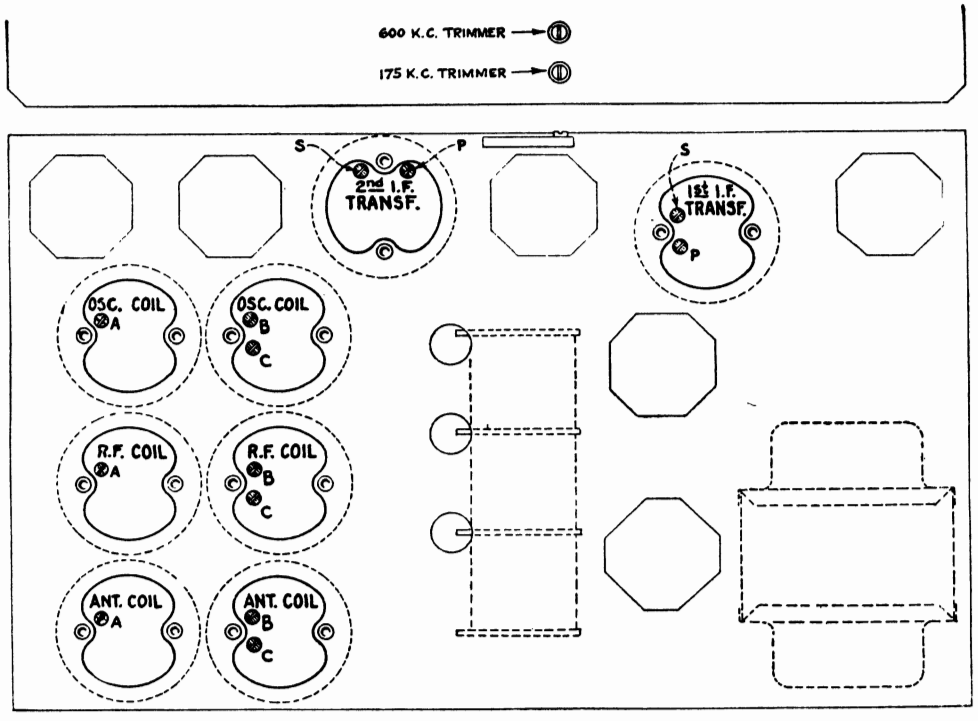
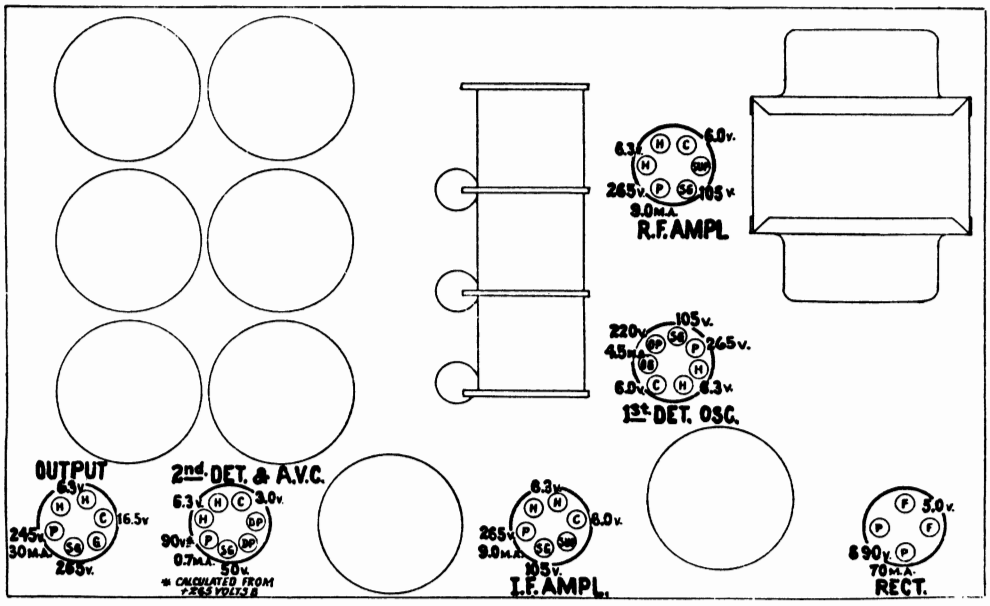


Figure 6—Location of Line-up Capacitors



ALL D. C. VOLTAGES ARE TO GROUND

Tube Socket Voltages

RCA MANUFACTURING CO., Inc.

Model 322-E "DUO"

Alignment (continued)

(a) Connect the output of an external oscillator tuned to 460 K. C. between the first detector grid and ground. Connect the output indicator across the voice coil of the loudspeaker.

(b) Place the oscillator in operation at 460 K. C. Place the receiver in operation and adjust the station selector until a point is reached (band B) where no signals are heard and turn the volume control to its maximum position. Reduce the oscillator input until a slight indication is obtained in the output indicator.

(c) Refer to Figure 6. Adjust each trimmer of the I. F. transformers until a maximum output is obtained. Go over the adjustments a second time.

This completes the I. F. adjustments. However, it is good practice to follow the I. F. adjustments with the R. F. and oscillator adjustments due to interlocking which always occurs.

(3) R. F. OSCILLATOR AND FIRST DETECTOR ADJUSTMENTS

Four R. F., oscillator and first detector adjustments are required in bands "A and B." Three are required in band "C."

To properly align the various bands, each band must be aligned individually. The preliminary set-up requires the external oscillator to be connected between the antenna and ground terminals of the receiver and the output indicator must be connected across the voice coil of the loudspeaker. The volume control must be at its maximum position and the input from the oscillator must be at the minimum value possible to get an output indication under these conditions. In the high-frequency band, it may be necessary to disconnect the oscillator from the receiver and place it at a distance in order to get a sufficiently low input to the receiver.

The dial pointer must be properly set before starting any actual adjustments. This is done by turning the variable capacitor until it is at its maximum capacity position. One end of the pointer should point exactly at the horizontal line at the lowest frequency end of band "B," while the other end should point to within 1/64 inch of the horizontal line at the highest frequency end of band "B."

Figure 6 shows the location of the trimmers for each band. Care must be exercised to merely adjust the trimmers in the band under test.

Band "A"

(a) Set the Band Switch at "A."

(b) Tune the external oscillator to 410 K. C., set the dial pointer at 410 K. C. and adjust the oscillator, detector and R. F. trimmers for maximum output.

(c) Shift the external oscillator frequency to 175 K. C. Tune in the 175 K. C. signal irrespective of scale calibration and adjust the series trimmer, marked 175 K. C. on Figure 6, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 410 K. C. as described in (b).

Band "B"

(a) Set the Band Switch at "A."

(b) Tune the external oscillator to 1,720 K. C., set the pointer at 1,720 K. C. and adjust the oscillator, detector and R. F. trimmers for maximum output.

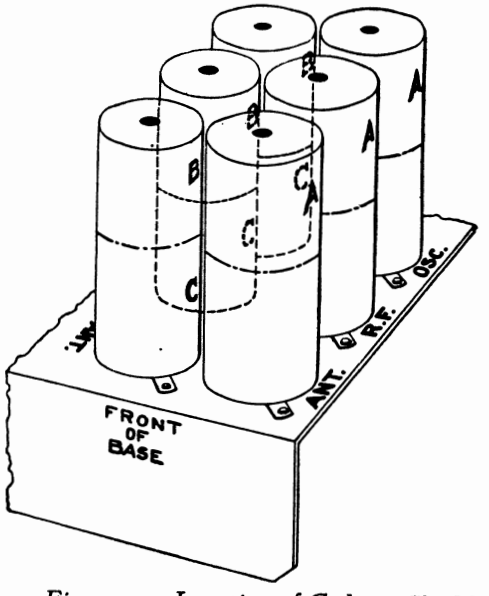


Figure 5—Location of Coils in Shields

(c) Shift the external oscillator frequency to 600 K. C. Tune in the 600 K. C. signal, irrespective of scale calibration, and adjust the series trimmers, located on rear apron of chassis, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 1,720 K. C. as described in (b).

Band "C"

(a) Set the Band Switch at "C."

(b) Tune the external oscillator to 18,000 K. C., and set the pointer at 18 M. C. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.

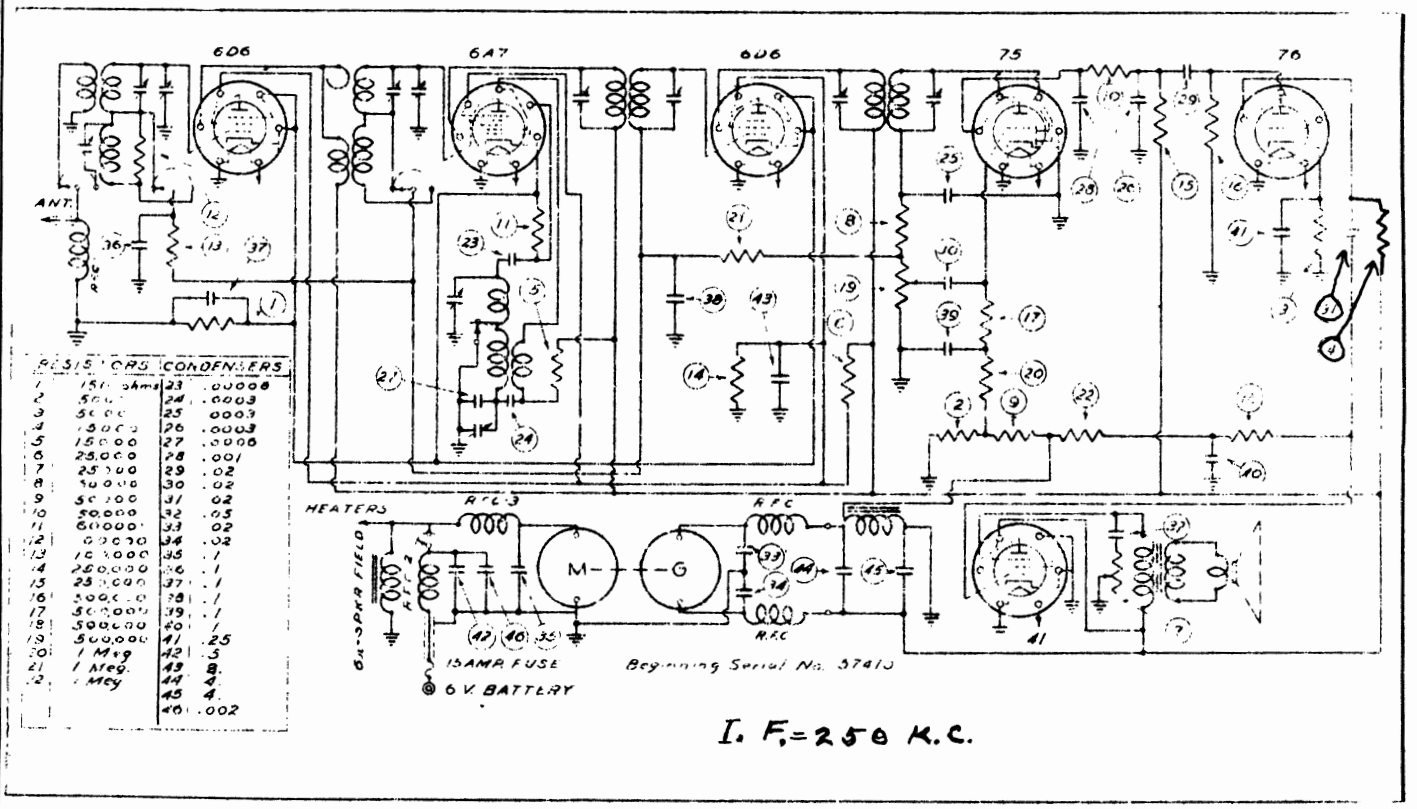
(c) Check for the image signal, which should be received at approximately 17,080 on the dial. It may be necessary to increase the external oscillator output for this check.

(d) Reduce the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal disappears. The first detector circuit is then aligned with the oscillator circuit and the RCA-6A7 tube is blocked. Then increase the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal is peaked for maximum output.

(e) The antenna trimmer should now be peaked for maximum output. It is not necessary to rock the main tuning capacitor while making this adjustment.

REMLER CO., Ltd.

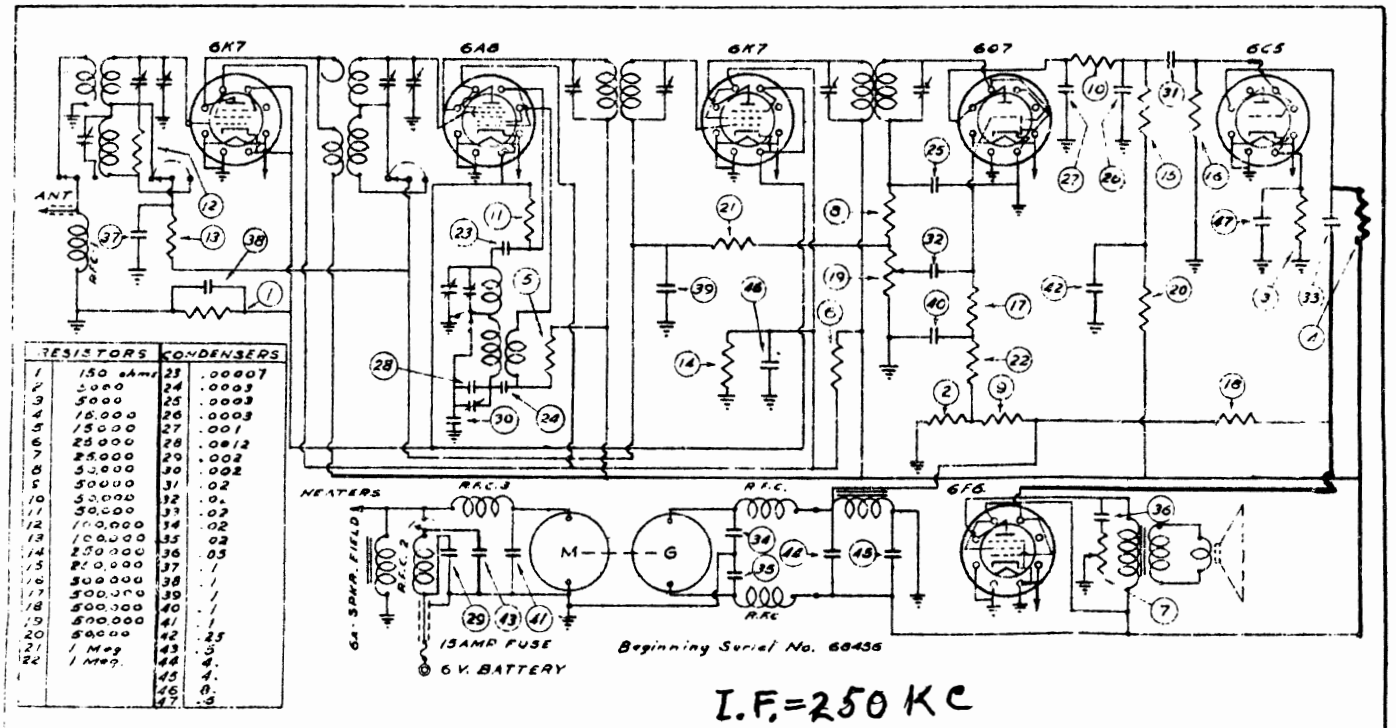
Model 36 Auto Set



RESISTORS		CONDENSERS	
1	150 ohms	23	.00008
2	500	24	.0003
3	5000	25	.0003
4	15000	26	.0003
5	15000	27	.0006
6	25000	28	.001
7	25000	29	.02
8	50000	30	.02
9	50000	31	.02
10	50,000	32	.05
11	60000	33	.02
12	60000	34	.02
13	100000	35	.1
14	250,000	36	.1
15	250,000	37	.1
16	500,000	38	.1
17	500,000	39	.1
18	500,000	40	.1
19	500,000	41	.25
20	1 Meg	42	.5
21	1 Meg.	43	8.
22	1 Meg	44	4.
		45	4.
		46	.002

I. F. = 250 K.C.

Model 37 Auto Set



RESISTORS		CONDENSERS	
1	150 ohms	23	.00007
2	2000	24	.0003
3	5000	25	.0003
4	15,000	26	.0003
5	15000	27	.001
6	25000	28	.0012
7	25000	29	.002
8	50,000	30	.002
9	50000	31	.02
10	50,000	32	.05
11	50,000	33	.02
12	100,000	34	.02
13	100,000	35	.03
14	250,000	36	.1
15	250,000	37	.1
16	500,000	38	.1
17	500,000	39	.1
18	500,000	40	.1
19	500,000	41	.1
20	50,000	42	.25
21	1 Meg	43	.5
22	1 Meg	44	4.
		45	4.
		46	8.
		47	.5

I. F. = 250 KC

REMLER CO., Ltd.

Model 42

This is a six tube superheterodyne receiver with automatic volume control, tone compensator and police call switch. It is designed to operate from a 110 to 125 volt, 50 or 60 cycle, alternating current power supply.

INSTALLATION:

An antenna of from twenty-five to a hundred feet in length should be connected to the blue wire extending from the back of the set. The antenna and lead-in wire should be kept clear of all metal objects such as pipes and wires, and be run in as straight a line as possible. An indoor antenna may be used to receive local stations or where the receiver is used in an isolated wooden building.

A good ground is essential for clearest reception. Connect the black wire at the back of the set to a water or steam pipe. The pipe should first be scraped clean before attaching the ground wire.

CONTROLS:

The knob on the left is the volume control and also operates the ON and OFF switch in the extreme left position.

The selector knob is at the right. The dial is calibrated in hundreds of kilocycles and covers a range of from 540 to 1720 K. C. The lower frequency police band is tuned from 16 to 17 on the dial. Police calls from stations on the higher frequency band may be received by shifting the police call switch on the back of the receiver to the right and tuning from 15 to 17 on the dial. Police radio stations operate intermittently to suit their particular needs and do not operate continuously as do the broadcast stations.

A tone control is located on the back of the receiver. When turned to the left the higher audio frequencies are suppressed and static and interfering noises are reduced.

OPERATION:

With the line plug connected, turn the volume control to the right. The dial lights should light up brightly. Allow about one half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud reduce the volume by turning the volume control to the left. For best quality the selector knob should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SERVICE DATA:

The following tubes are used in this receiver:

6D6 - R. F. amplifier
6A7 - Converter (mixer-oscillator)
6D6 - I. F. amplifier
75 - Diode detector and audio amplifier
42 - Output amplifier
80 - Rectifier
Dial lights 6 - 8 volts.

SERVICE DATA - Cont'd.

The antenna and R. F. coils are in the shielding can nearest the front of the chassis and the mixer coil is in the shield within the chassis. The first I.F. transformer is mounted in the shield between the 6A7 and 6D6 tubes; while the second I.F. transformer is located between the 6D6 and 75 tubes. The oscillator coil is within the chassis and is trimmed by the trimmer condenser nearest the back of the variable condenser.

Trimmers for the I. F. transformers are adjustable through holes in the shield cans.
The intermediate frequency is 450 K.C. Use a weak signal or oscillator input when adjusting the trimmers. In removing the chassis from the cabinet pry off the knobs with a wooden screw driver with a piece of cardboard against the cabinet and pull off the pointer from the condenser shaft.

Voltage readings for service work follow:

A. C. VOLTAGES:

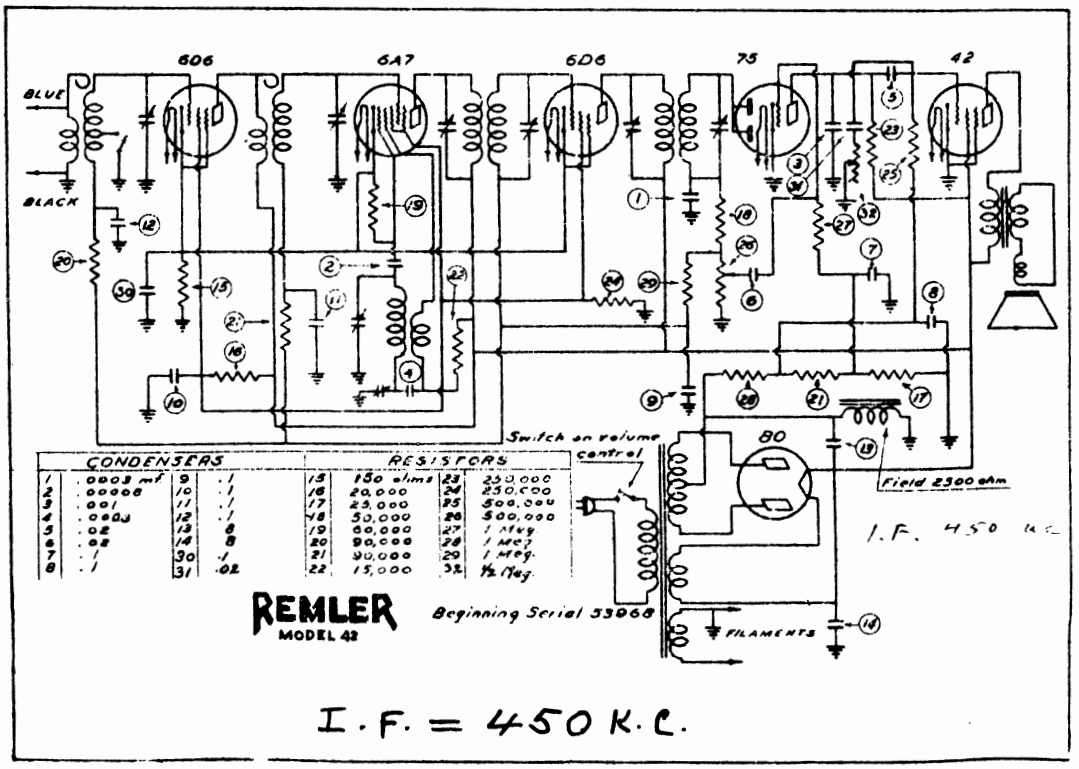
Line	120 volts
Filaments 6A7, 6D6's, 75 and 42	6.3 "
Filaments 80	5.2 "

D. C. VOLTAGES: (no signal)

From ground to:

80 Rectifier filament	270 volts
42 Plate	260 "
42 Screen grid	270 "
42 Grid	18 "
75 Plate	140 "
75 Grid	3 "
6D6 I. F. plate	270 "
6D6 I. F. screen grid	110 "
6D6 I. F. Cathode	5 "
6A7 Plate (mixer)	270 "
6A7 Screen grid	110 "
6A7 Cathode	5 "
6A7 Plate (oscillator)	110 "
6D6 R. F. plate	270 "
6D6 R. F. screen grid	110 "
6D6 R. F. cathode	5 "
Speaker field	120 "

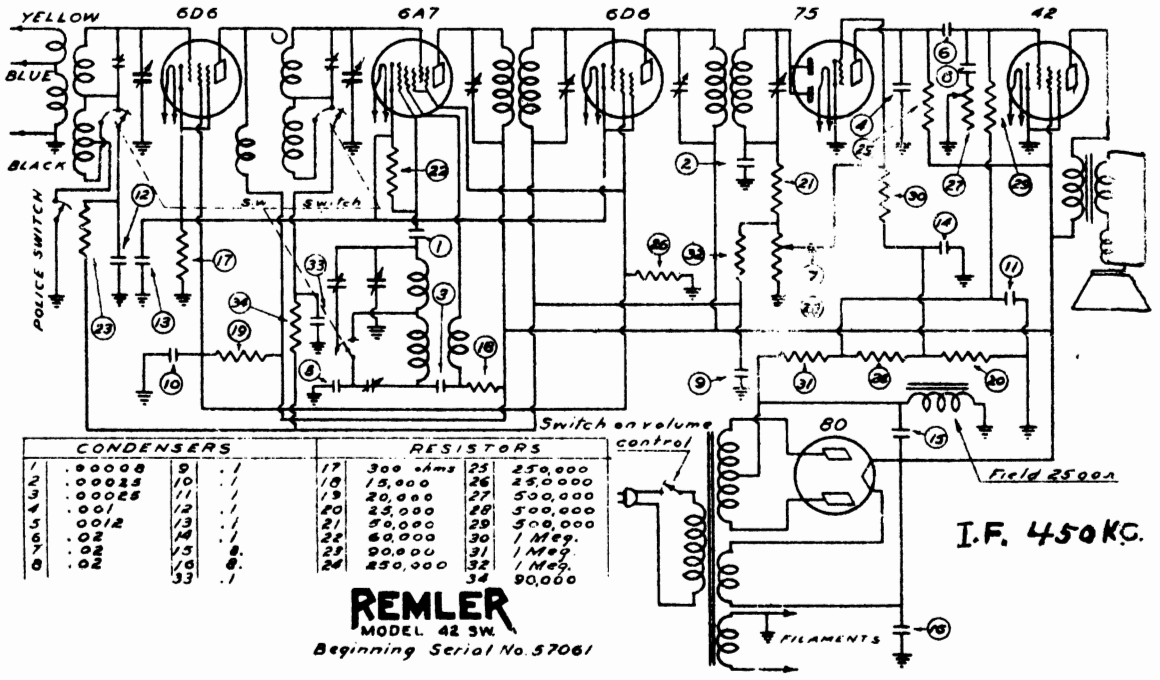
Due to current taken by voltmeter used, readings of 75 and 42 grid voltages will be less than those above.



I. F. = 450 K. C.

REMLER CO., Ltd.

Model 42 - Short Wave



REMLER
MODEL 42 SW.
Beginning Serial No. 5706!

This is a six tube superheterodyne receiver with two tuning ranges, automatic volume control, variable tone control and police call switch. It is designed to operate from a 110 to 125 volt, 50 or 60 cycle, alternating current power supply.

INSTALLATION:

An antenna of from twenty five to one hundred feet in length should be connected to the blue wire extending from the back of the set. The antenna and lead-in wire should be kept clear of all metal objects such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used to receive local stations or when the receiver is used in an isolated wooden building. Superior performance on short waves will result from the use of a well constructed doublet antenna or short wave antenna system. Such antennas are available on the market in kit form with complete instructions for their installation. Lead-in wires from doublet antenna systems should be connected to the blue and yellow wires extending from the receiver.

A good ground is essential for clearest reception. Connect the black wire to a steam or water pipe. The pipe should be scraped clean before attaching the ground wire.

CONTROLS:

The knob on the left is the volume control and also operates the ON and OFF switch in the extreme left position. The selector knob is on the right. The dial is of the universal type; that is, the calibrations are in hundreds of kilocycles for the broadcast band and in thousands of kilocycles for the short wave band. The broadcast range is thus 540 to 1700 kilocycles and the short wave range 5400 to 17000 kilocycles or 5.4 to 17 megacycles. The range change switch is located below the selector control. Turn to the left for short wave reception. The tone control is located below the volume control. When turned to the left the higher audio frequencies are suppressed and static and interfering noises are reduced.

Police calls from stations on the lower frequency band may be tuned in from 16 to 17 on the dial, while calls from stations on the higher frequency band are received by shifting the police switch on the back of the receiver to the right and tuning from 15 to 16 on the dial. The range switch should be in the broadcast position to receive police calls. Police radio stations operate intermittently to suit their particular needs and do not operate continuously as do the broadcast stations.

OPERATION:

With the line cord connected, turn the volume control to the right. The dials should light up brightly. Allow about one half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud, reduce the volume by turning the volume control to the left. For best quality the selector should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SHORT WAVE RECEPTION:

Read carefully the attached sheet on Short Wave Reception before attempting to tune in short wave stations; then refer to the card secured to the back of the cabinet for further instructions.

SERVICE DATA:

The following tubes are used in this receiver:-

6D6 - R.F. Amplifier
6A7 - Converter (Mixer-oscillator)
6D6 - I.F. Amplifier
75 - Diode detector and Audio Amplifier
42 - Output Amplifier
80 - Rectifier
Dial Lights 6-8 Volts.

The antenna and R.F. coils are in the shielding can nearest the front of the chassis and the mixer coil is in the shield within the chassis. The first I.F. transformer is mounted in the shield between the 6A7 and 6D6 tubes; while the second I.F. transformer is located between the 6D6 and 75 tubes. The oscillator coil is within the set and is trimmed by the trimming condenser mounted adjacent to the coil.

Trimmers for the short wave position are located at the top of the R.F. coil and on the right end of the chassis within the coil shields. No trimmer is provided for the oscillator short wave position. The oscillator padding condenser for the broadcast position is located at the right end of the chassis.

Trimmers for the I. F. transformers are adjustable through holes in the shield cans.

The intermediate frequency is 450 K.C. Use a weak signal or oscillator input when adjusting the trimmers. In removing the chassis from the cabinet pry off the knobs with a wooden screw driver with a piece of cardboard against the cabinet and pull off the pointer from the condenser shaft.

Voltage readings for service work follow:

A.C. VOLTAGES:

Line	- 120 volts
Filaments 6A7, 6D6's, 75 and 42	6.3 "
Filaments 80	5.2 "

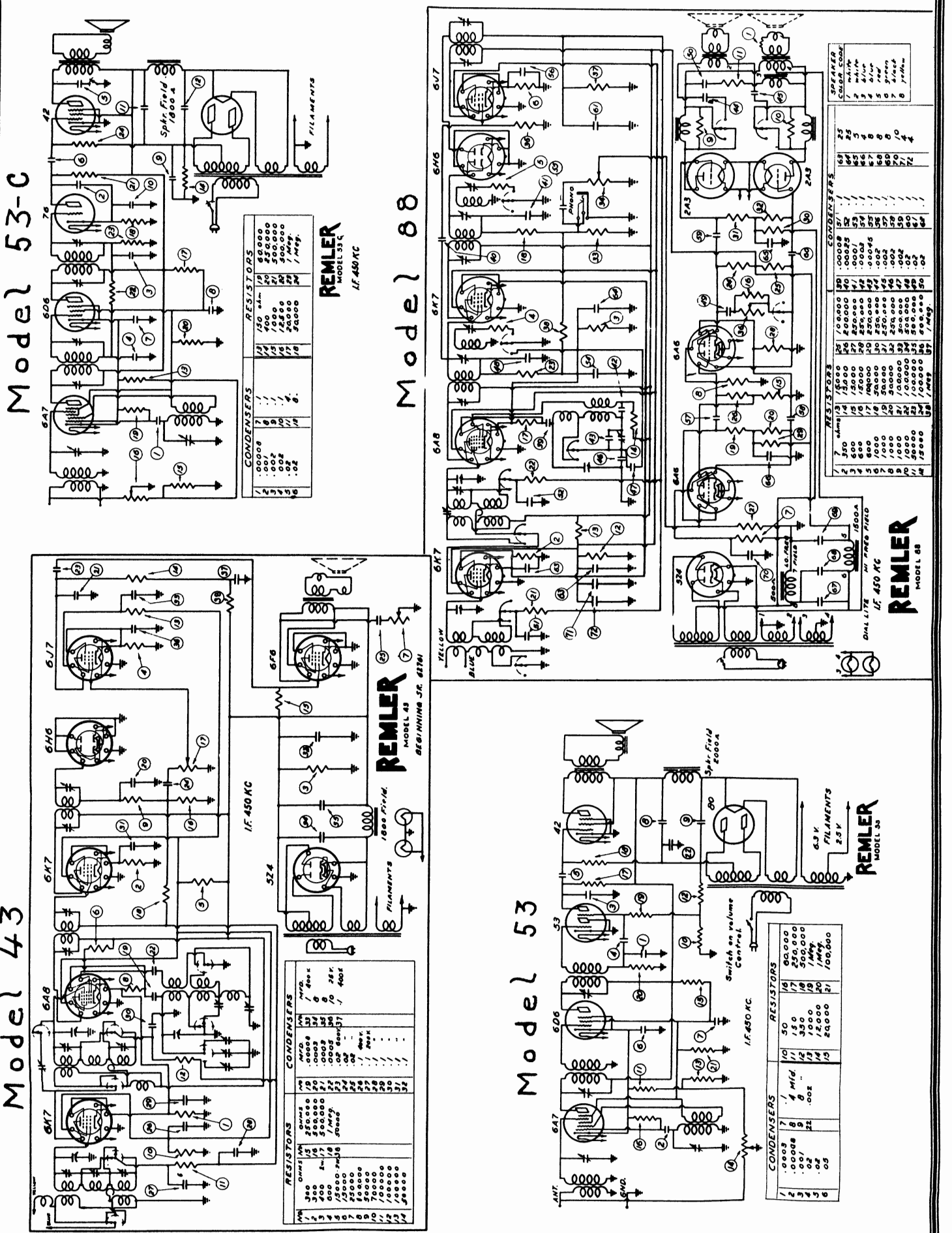
D.C. VOLTAGES: (no signal)

From ground to:

80 Rectifier filament	- 270 volts
42 Plate	260 "
42 Screen grid	270 "
42 Grid	18 "
75 Plate	140 "
75 Grid	3 "
6D6 I. F. Plate	270 "
6D6 I. F. Screen Grid	110 "
6D6 I. F. Cathode	5 "
6A7 Plate (mixer)	270 "
6A7 Screen grid	110 "
6A7 Cathode	5 "
6A7 Plate (oscillator)	110 "
6D6 R.F.Plate	270 "
6D6 R.F. Screen grid	110 "
6D6 R.F. Cathode	5 "
Speaker Field	120 "

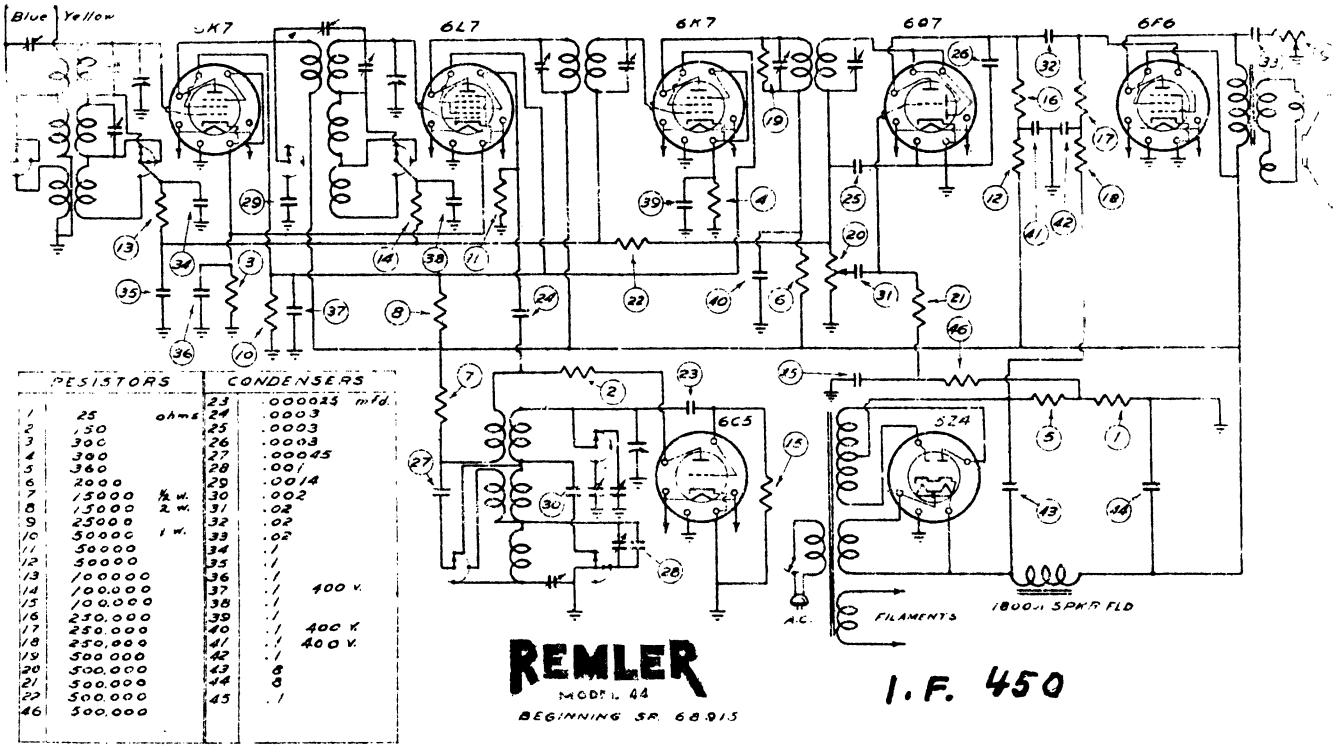
Due to current taken by voltmeter used, readings of 75 and 42 grid voltages will be less than those above.

REMLER CO., Ltd.



REMLER CO., Ltd.

Model 44



RESISTORS			CONDENSERS	
1	25	ohms	23	.000025 mfd.
2	50		24	.0003
3	300		25	.0003
4	300		26	.0003
5	360		27	.00045
6	2000		28	.001
7	15000	½ w.	29	.0014
8	15000	2 w.	30	.002
9	25000		31	.02
10	50000	1 w.	32	.02
11	50000		33	.02
12	50000		34	.1
13	100000		35	.1
14	100,000		36	.1
15	100,000		37	.1 400 v.
16	250,000		38	.1
17	250,000		39	.1
18	250,000		40	.1 400 v.
19	500,000		41	.1 400 v.
20	500,000		42	.1
21	500,000		43	8
22	500,000		44	8
46	500,000		45	.1

MODEL #44

This is a seven tube all-wave receiver with metal tubes. It is designed to operate from a 110 to 125 Volt, 50 or 60 cycle power supply.

INSTALLATION:

When a standard antenna is used, the length should be from 25 to 100 feet. Connect to the blue wire extending from the back of the receiver. The antenna and lead-in should be kept clear of all metal objects, such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used to receive local stations or when the receiver is used in an isolated wooden building. Superior performance on short waves will result from the use of a well constructed doublet antenna, or short wave antenna system. Such antennae are available on the market in kit form with complete instructions for their installation. When this type is used, connect the lead-in wires direct to the yellow and blue leads.

A good ground is essential for clearest reception. Connect the black wire to a steam or water pipe. The pipe should be scraped clean before attaching the wire.

CONTROLS:

The knob on the upper left is the volume control and also operates the ON and OFF switch in the extreme left position The tone control is below the volume control. When turned to the left, the higher audio frequencies are suppressed and static and interfering noises are reduced. The selector knob is on the right.

The outer circle of figures on the dial is the calibration for the broadcast range which extends from 540 to 1715 kilocycles. The medium wave range is indicated by the middle circle of figures which are colored green. This range covers from 1.7 megacycles to 5.6 megacycles and includes amateur, police and aircraft bands. The inner scale is the short-wave range and extends from 5.6 to 18 megacycles. The various foreign and American short-wave broadcast bands are included on this range and are denoted by the heavy bars on the scale.

OPERATION:

With the line cord connected, turn the volume control to the right. The dial should light up brightly. Allow about one-half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud, reduce the volume by turning the volume control to the left. For best quality, the selector should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SHORT-WAVE RECEPTION:

Read carefully the attached sheet on short-wave reception before attempting to tune in short-wave stations.

SERVICE DATA:

The following tubes are used in this receiver:

6K7 - R.F. Amplifier
6L7 - Mixer
6C5 - Oscillator
6K7 - I.F. Amplifier
6Q7 - Detector amplifier
6F6 - Power amplifier
5Z4 - Full-wave rectifier
Type 50, 6-8 volt dial lamps

The R.F. stage coils are located in the shield at the back of the variable condenser and the mixer coils in the shield between the 6K7 R.F. amplifier tube and the first I.F. stage The oscillator coils are within the shield nearest the front of the chassis. Trimmers for the oscillator coils are mounted at the bottom of the coil and are accessible from within the chassis. The B.C. trimmer is nearest the front of the chassis and the S.W. section next. The trimmers for the S.W., R.F. and mixer coils are located in the tops of the respective coil shields. The trimmer nearest the back of the gang switch trims the M.W. R.F. coil, while the trimmer between the switch and the end of the chassis is a coupling condenser from the R.F. to mixer stages.

Trimmers for the I.F. transformers are adjustable through holes in the transformer shield cans. The I.F. frequency is 450 K.C.

Use a weak signal or oscillator input when adjusting the trimmers.

VOLTAGE READINGS FOR SERVICE WORK FOLLOW:

A.C. VOLTAGES:

Line	120 volts
Filaments. 6K7, 6L7, 6K7, 6C5, 6Q7, 6F6	6.3 "
Filament. 5Z4	5 "

D.C. VOLTAGES: (No signal)

From ground to:

5Z4 Rectifier filament	340 volts
6F6 Plate	235 "
6F6 Screen grid	245 "
6F6 Grid bias supply	19 "
6Q7 Plate	85 "
6Q7 Grid bias supply	1.4 "
6K7 I.F. Plate	245 "
6K7 I.F. Screen grid	100 "
6K7 I.F. Cathode	3 "
6L7 Mixer plate	245 "
6L7 Screen grid	100 "
6L7 Cathode	4 "
6C5 Oscillator plate	160 "
6K7 R.F. Plate	245 "
6K7 R.F. Screen grid	100 "
6K7 Cathode	4 "

REMLER CO., Ltd.

Model 44-A

MODEL #44-A

This is a seven tube all-wave receiver with metal tubes. It is designed to operate from a 110 to 125 Volt, 50 or 60 cycle power supply.

INSTALLATION:

When a standard antenna is used, the length should be from 25 to 100 feet. Connect to the blue wire extending from the back of the receiver. The antenna and lead-in should be kept clear of all metal objects, such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used to receive local stations or when the receiver is used in an isolated wooden building. Superior performance on short waves will result from the use of a well constructed doublet antenna, or short wave antenna system. Such antennae are available on the market in kit form with complete instructions for their installation.

A good ground is essential for clearest reception. Connect the black wire to a steam or water pipe. The pipe should be scraped clean before attaching the wire.

CONTROLS:

The knob on the upper left is the volume control and also operates the ON and OFF switch in the extreme left position The tone control is below the volume control. When turned to the left, the higher audio frequencies are suppressed and static and interfering noises are reduced. The selector knob is on the right.

The outer circle of figures on the dial is the calibration for the broadcast range which extends from 540 to 1715 kilocycles. The medium wave range is indicated by the middle circle of figures which are colored green. This range covers from 1.7 megacycles to 5.6 megacycles and includes amateur, police and aircraft bands. The inner scale is the short-wave range and extends from 5.6 to 18 megacycles. The various foreign and American short-wave broadcast bands are included on this range and are denoted by the heavy bars on the scale.

OPERATION:

With the line cord connected, turn the volume control to the right. The dial should light up brightly. Allow about one-half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud, reduce the volume by turning the volume control to the left. For best quality, the selector should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SHORT-WAVE RECEPTION:

Read carefully the attached sheet on short-wave reception before attempting to tune in short-wave stations.

SERVICE DATA:

The following tubes are used in this receiver:

6K7 - R.F. Amplifier
6L7 - Mixer
6C5 - Oscillator
6K7 - I.F. Amplifier
6Q7 - Detector amplifier
6F6 - Power amplifier
5Z4 - Full-wave rectifier
Type 50, 6-8 volt dial lamps

The R.F. stage coils are located in the shield at the back of the variable condenser and the mixer coils in the shield between the 6K7 R.F. amplifier tube and the first I.F. stage. The oscillator coils are within the shield nearest the front of the chassis. Trimmers for the oscillator coils are mounted at the bottom of the coil and are accessible from within the chassis. The B.C. trimmer is nearest the front of the chassis and the S.W. section next. The trimmers for the S.W., R.F. and mixer coils are located in the tops of the respective coil shields. The trimmer nearest the back of the gang switch trims the B.C. R.F. coil, while the trimmer on the bottom of the mixer coil is a coupling condenser from the R.F. to mixer stages, and is used for trimming the broadest band.

Trimmers for the I.F. transformers are adjustable through holes in the transformer shield cans. The I.F. frequency is 450 K.C.

Use a weak signal or oscillator input when adjusting the trimmers.

VOLTAGE READINGS FOR SERVICE WORK FOLLOW:

A.C. VOLTAGES:

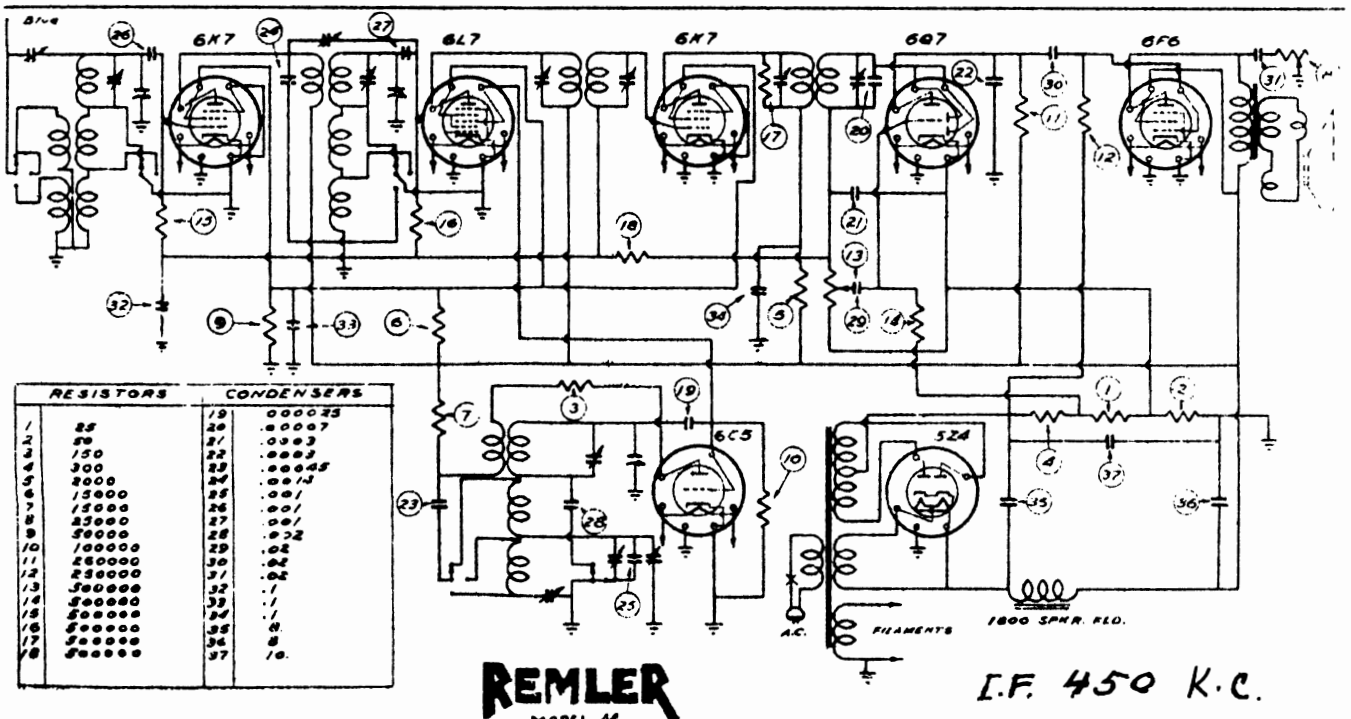
Line	120 volts
Filaments, 6K7, 6L7, 6K7, 6C5, 6Q7, 6F6	6.3 "
Filament, 5Z4	5 "

D.C. VOLTAGES: (No signal)

From ground to:

5Z4 Rectifier filament	340 volts
6F6 Plate	235 "
6F6 Screen grid	245 "
6F6 Grid bias supply	20 "
6Q7 Plate	95 "
6Q7 Grid bias supply	1.4 "
6K7 I.F. Plate	245 "
6K7 I.F. Screen grid	90 "
6K7 I.F. Grid bias	3 "
6L7 Mixer plate	245 "
6L7 Screen grid	90 "
6L7 Grid bias	3 "
6C5 Oscillator plate	160 "
6K7 R.F. Plate	245 "
6K7 R.F. Screen grid	100 "
6K7 Grid bias	3 "

Readings taken with 1000-Ohm per volt meter.



RESISTORS		CONDENSERS	
1	25	19	.000035
2	50	20	.00007
3	150	21	.0003
4	300	22	.0005
5	2000	23	.00045
6	15000	24	.00/3
7	15000	25	.00/
8	25000	26	.00/
9	50000	27	.00/
10	100000	28	.022
11	250000	29	.02
12	250000	30	.02
13	500000	31	.02
14	500000	32	.1
15	500000	33	.1
16	500000	34	.1
17	500000	35	8.
18	500000	36	8
		37	10.

REMLER CO., Ltd.

Model 51

GENERAL DESCRIPTION:

This radio receiver employs the tuned radio frequency circuit and utilizes four tubes - two triple grid pentode type tubes, one power amplifier pentode and a full wave rectifier tube. A police switch is provided in order that police calls on the higher frequency police band may be received as well as calls on the lower frequency police band.

INSTALLATION:

The receiver is designed for operation from an alternating current (A.C.) power supply of 110-125 volts, 50 or 60 cycles.

Flexible leads for connecting antenna and ground leads extend from the back of the cabinet. A good ground connection to the black lead is essential for best performance. This lead should be as short as possible and preferably attached to a water pipe. An indoor type antenna connected to the blue lead may be used to receive local stations. In rural locations or when more distant reception is required, an outdoor antenna up to a hundred feet in length is recommended.

OPERATION:

The knob on the left controls the volume and operates the ON and OFF switch at the extreme left position. The knob on the right is the station selector. The dial is calibrated in kilocycles. The lower frequency police band may be tuned in near 1700 on the dial with the switch on the back of the set in the "BC" position. When this switch is turned to the position marked "P", police calls from stations on the higher frequency band may be tuned in over the portion of the dial marked POLICE. These stations operate intermittently to suit their particular needs and are not operated continuously as are the broadcast stations.

SERVICE DATA:

The antenna-R.F. coil is located in back of the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The detector coil is mounted under the chassis and is trimmed by the front trimmer section.

TUBES:

Type 78 Triple grid super control amplifier
Type 77 Triple grid detector
Type 42 Power amplifier pentode
Type 80 Full-wave rectifier
Type 50 Dial lamp

A.C. VOLTAGES:

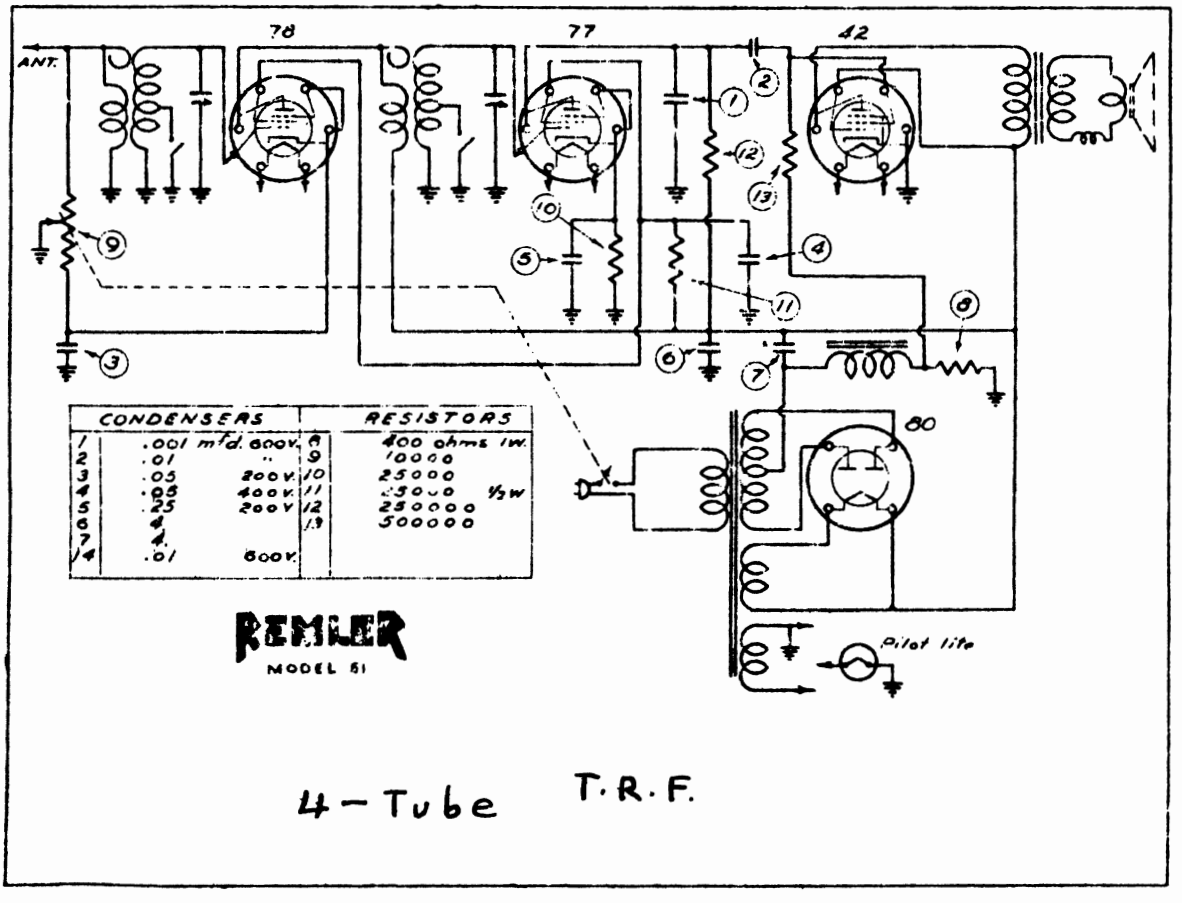
Line	120 volts
Secondary	670 volts
Filaments - #80	5.5 "
#77 - 78 - 42	6.3 "

D.C. VOLTAGES: Full volume, no signal

From ground to:

80	Rectifier filament	235 volts
42	Plate	225 "
42	Screen grid	235 "
42	Grid - bias	18.5 "
77	Plate	90 "
77	Screen grid	135 "
77	Cathode	7 "
78	Plate	235 "
78	Screen grid	135 "
78	Cathode	5 "
Voltage across field		115 "

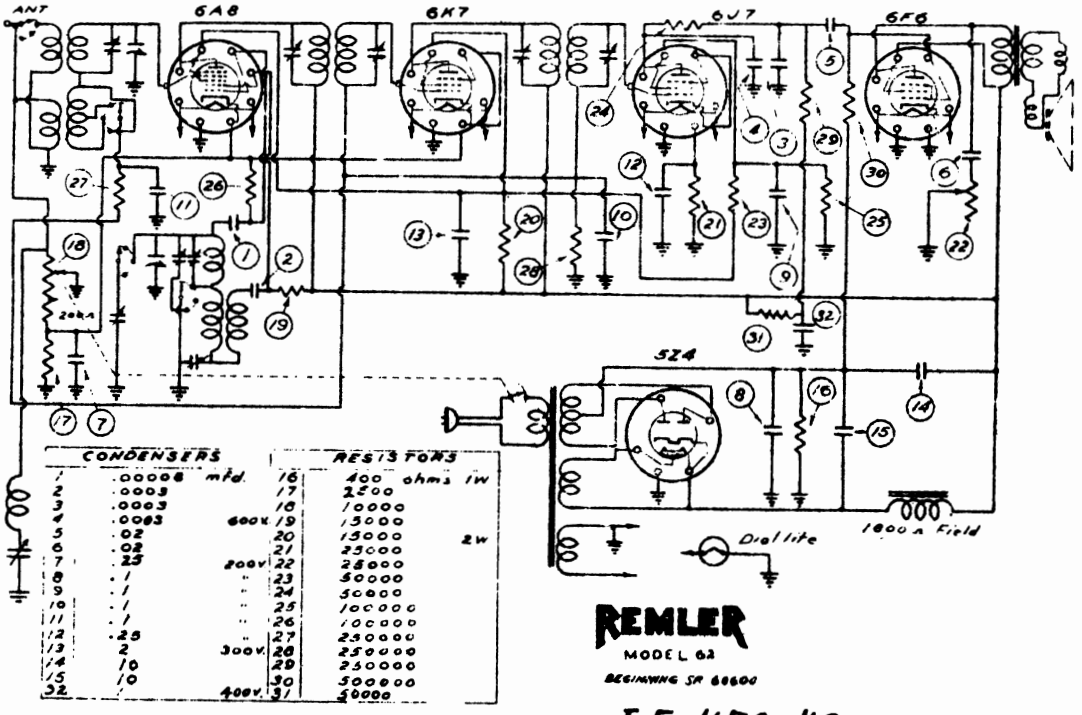
Voltages read with 1000-Ohm per volt meter



4 - Tube T.R.F.

REMLER CO., Ltd.

Model 62



CONDENSERS			RESISTORS		
1	.00008 mfd.		16	400 ohms	1W
2	.0003		17	2500	
3	.0003		18	10000	
4	.0003	600V	19	15000	
5	.02		20	15000	2W
6	.02		21	25000	
7	.25	200V	22	28000	
8	.1	"	23	50000	
9	.1	"	24	50000	
10	.1	"	25	100000	
11	.1	"	26	100000	
12	.25	"	27	250000	
13	2	300V	28	250000	
14	10		29	250000	
15	10		30	500000	
32	/	400V	31	50000	

I.F. 450 Kc.

Model #62

This is a five tube superheterodyne receiver with metal tubes and short wave coverage. It is designed to operate from 110 to 125 volts, 50 or 60 cycle, alternating current power supply.

INSTALLATION:

An antenna of from twenty-five to one hundred feet in length should be connected to the blue wire extending from the back of the set. The antenna and lead-in should be kept clear of all metal objects such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used to receive local stations or when the receiver is used in an isolated wooden building. Superior performance on short waves will result from the use of a well constructed doublet antenna or short wave antenna system. Such antennae are available on the market in kit form with complete instructions for their installation.

A good ground is essential for clearest reception. Connect the black wire to a steam or water pipe. The pipe should be scraped clean before attaching the wire.

CONTROLS:

The knob on the left is the volume control and also operates the ON and OFF switch in the extreme left position. The tone control knob is below the volume control. When turned to the left, the higher audio frequencies are suppressed and static and interfering noises are reduced. The selector knob is on the right.

The outer circle of figures on the dial is the calibration for the broadcast range which extends from 540 to 1715 kilocycles. The figures signify hundreds of kilocycles; i.e., 9 is equivalent to 900 kilocycles. The short wave range is indicated on the inner circle figures. This range is from 4.5 to 13 megacycles, and includes the principal American and foreign short wave bands, as well as aircraft and amateur bands. The short wave broadcast bands are indicated by the heavy bars on the scale with the corresponding wave length opposite.

The range change switch is located below the selector knob. This is a three-position switch. When in the center, or white, position, the broadcast range is covered. When turned to the left, or green, position, the short wave range is covered. Turning the switch to the right allows police calls to be received from police stations operating on the higher frequency police bands. This position is indicated by a red dot. These stations may be tuned in from 15 to 16 on the dial. Police calls from stations operating on the lower frequency police band may be tuned in from 16 to 17 on the dial with the range switch in the central or standard broadcast position. Police stations operate intermittently to suit their own particular needs and are not on the air continuously as are the broadcast stations.

OPERATION:

With the line cord connected, turn the volume control to the right. The dials should light up brightly. Allow about one-half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud reduce the volume by turning the volume control to the left. For best quality the selector should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SERVICE DATA:

The following tubes are used in the receiver:

6A8 - Pentagrid converter
6K7 - Triple grid super control amplifier
6J7 - Triple grid detector amplifier
6F6 - Power amplifier pentode
5Z4 - Full wave rectifier
Type 50, 6-8 volt dial lamps

The antenna and mixer coils are located adjacent to the variable condenser, while the oscillator coils are mounted below the chassis floor. The trimmer for the short-wave section of the mixer coil is located on top of the coil form. The oscillator series padding condenser for the broadcast range is mounted at the right end of the chassis. The I.F. transformers are located within the two shield cans; trimmers for adjusting these are located in the tops of the shield cans. In removing the chassis from the cabinet, pry off the knobs with a wooden screwdriver.

VOLTAGE READINGS FOR SERVICE WORK FOLLOW:

A.C. VOLTAGES:

Line	120 volts
Filaments, 6A8, 6K7, 6J7 and 6F6	6.3 "
Filaments, 5Z4	4.5 "

D.C. VOLTAGES: (No signal; volume control full on)

From ground to:

5Z4 Rectifier filament	350 volts
6F6 Plate	235 "
6F6 Screen grid	250 "
6F6 Grid bias supply	20 "
6J7 Plate	100 "
6J7 Screen grid	85 "
6J7 Cathode	5 "
6K7 Plate	250 "
6K7 Screen grid	125 "
6K7 Cathode	4.5 "
6A8 Amplifier plate	250 "
6A8 Oscillator plate	200 "
6A8 Screen grid	125 "
6A8 Cathode	4.5 "

Readings taken with 1000-Ohm per volt meter.

REMLER CO., Ltd.

Model 63

MODEL #63

This is a six tube superheterodyne receiver with metal tubes and short wave coverage. It is designed to operate from 110 to 125 volts, 50 or 60 cycle, alternating current power supply.

INSTALLATION:

An antenna of from twenty-five to one hundred feet in length should be connected to the blue wire extending from the back of the set. The antenna and lead-in should be kept clear of all metal objects such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used to receive local stations or when the receiver is used in an isolated wooden building. Superior performance on short waves will result from the use of a well constructed doublet antenna or short wave antenna system. Such antennae are available on the market in kit form with complete instructions for their installation.

A good ground is essential for clearest reception. Connect the black wire to a steam or water pipe. The pipe should be scraped clean before attaching the wire.

CONTROLS:

The knob on the left is the volume control and also operates the ON and OFF switch in the extreme left position. The tone control knob is below the volume control. When turned to the left, the higher audio frequencies are suppressed and static and interfering noises are reduced. The selector knob is on the right.

The outer circle of figures on the dial is the calibration for the broadcast range which extends from 540 to 1715 kilocycles. The short wave range is indicated on the inner circle figures. This range is from 4.5 to 13 megacycles, and includes the principal American and foreign short wave bands, as well as aircraft and amateur bands. The short wave broadcast bands are indicated by the heavy bars on the scale with the corresponding wave length opposite.

The range change switch is located below the selector knob. This is a three-position switch. When in the center, or white, position, the broadcast range is covered. When turned to the left, or green, position, the short wave range is covered. Turning the switch to the right allows police calls to be received from police stations operating on the higher frequency police bands. This position is indicated by a red dot. These stations may be tuned in from 1500 to 1600 on the dial. Police calls from stations operating on the lower frequency police band may be tuned in from 1600 to 1700 on the dial with the range switch in the central or standard broadcast position. Police stations operate intermittently to suit their own particular needs and are not on the air continuously as are the broadcast stations.

OPERATION:

With the line cord connected, turn the volume control to the right. The dials should light up brightly. Allow about one-half minute for the tubes to warm up and slowly turn the selector knob until the desired program is heard. If too loud, reduce the volume by turning the volume control to the left. For best quality, the selector should be adjusted to the center of the range on the dial within which the station is heard and the volume adjusted with the volume control only.

SERVICE DATA:

The following tubes are used in the receiver:

6A8 - Pentagrid converter
6K7 - Triple grid super control amplifier
6H6 - Diode detector
6F5 - Audio amplifier
6F6 - Power amplifier pentode
5Z4 - Full wave rectifier
Type 50, 6-8 volt dial lamps

The antenna and mixer coils are located adjacent to the variable condenser, while the oscillator coils are mounted below the chassis floor. The trimmer for the short-wave section of the mixer coil is located on top of the coil form. The oscillator series padding condenser for the broadcast range is mounted at the right end of the chassis. The I.F. transformers are located within the two shield cans; trimmers for adjusting these are located in the tops of the shield cans. In removing the chassis from the cabinet, pry off the knobs with a wooden screwdriver where set screw knobs are not used.

VOLTAGE READINGS FOR SERVICE WORK FOLLOW:

A.C. VOLTAGES:

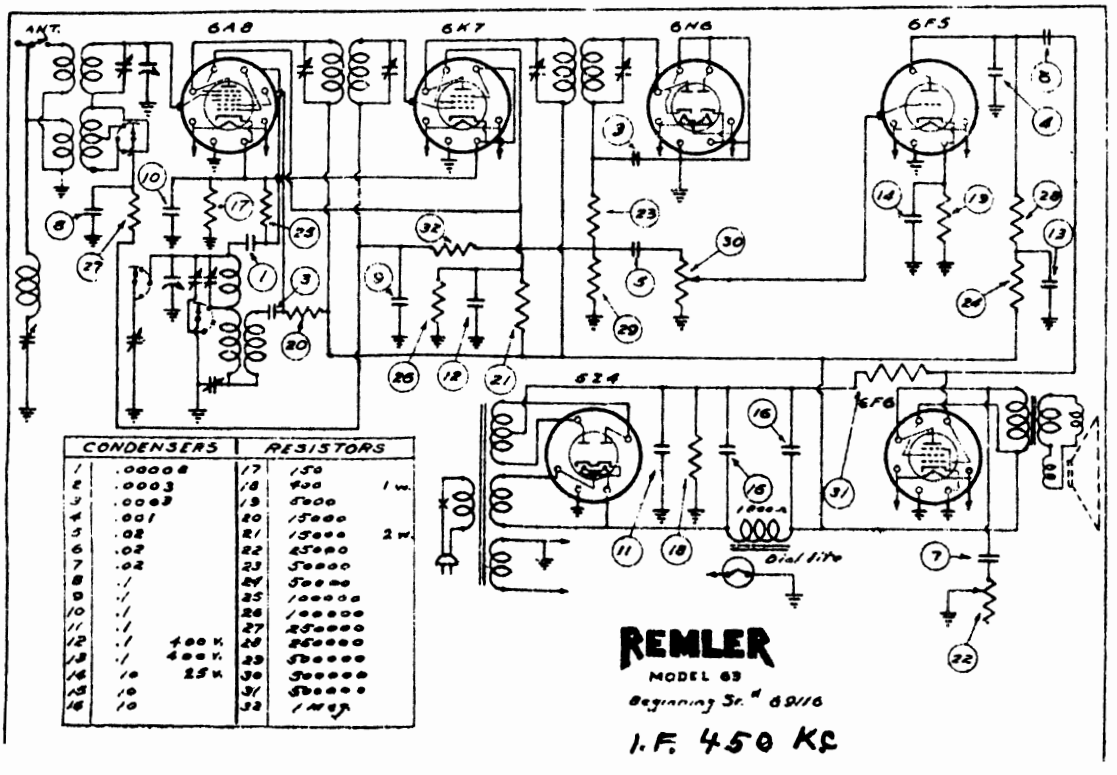
Line	120 volts
Filaments, 6A8, 6K7, 6H6, 6F5, 6F6	6.3 "
Filaments, 5Z4	4.5 "

D.C. VOLTAGES: (No signal; volume control full on)

From ground to:

5Z4 Rectifier filament	350 volts
6F6 Plate	235 "
6F6 Screen grid	250 "
6F6 Grid bias supply	18 "
6F5 Plate	100 "
6F5 Cathode	1.5 "
6K7 Plate	250
6K7 Screen grid	125 "
6K7 Cathode	4.5 "
6A8 Amplifier plate	250 "
6A8 Oscillator plate	200 "
6A8 Screen grid	125 "
6A8 Cathode	4.5 "

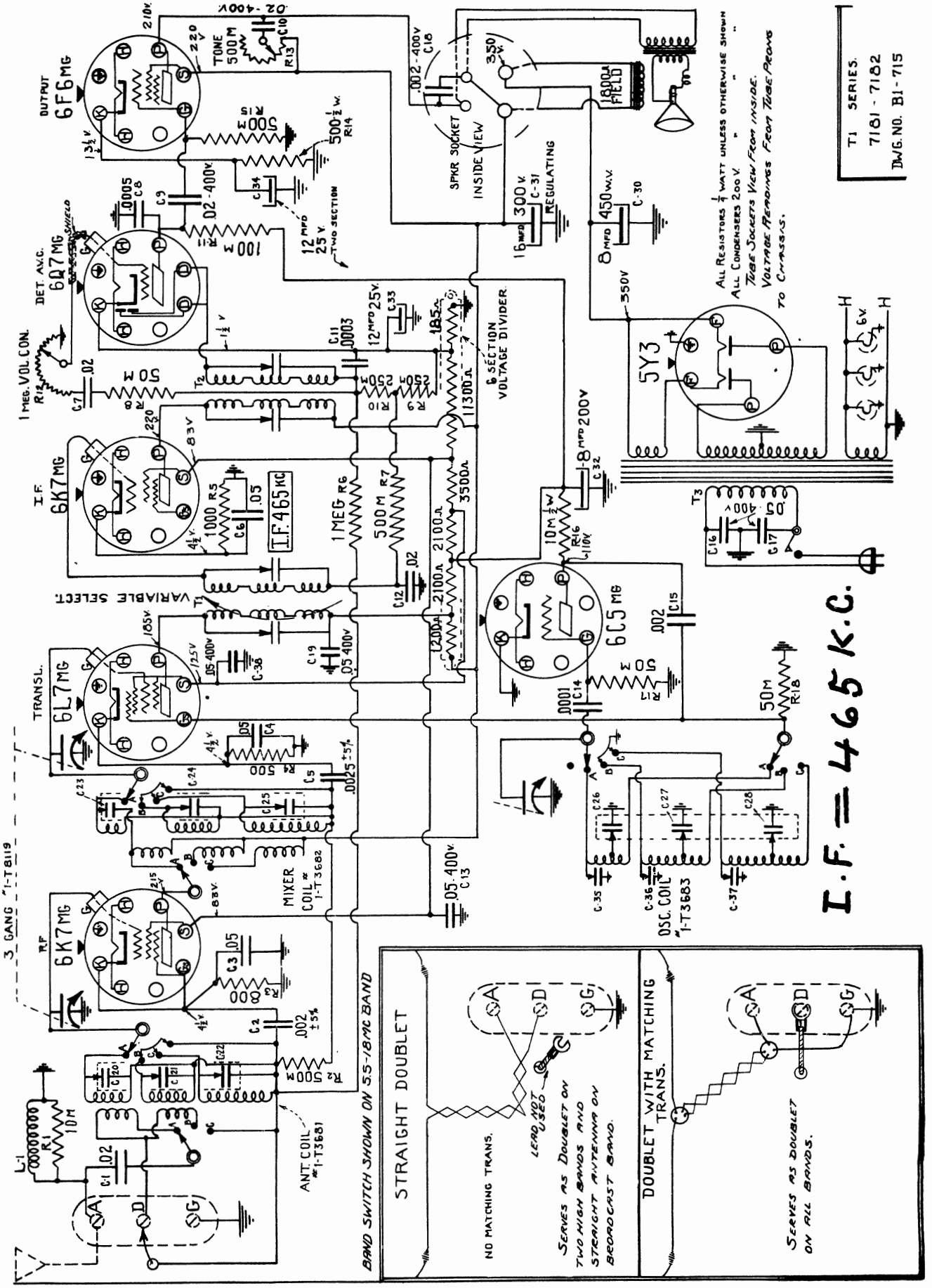
Readings taken with 1000-Ohm per volt meter.

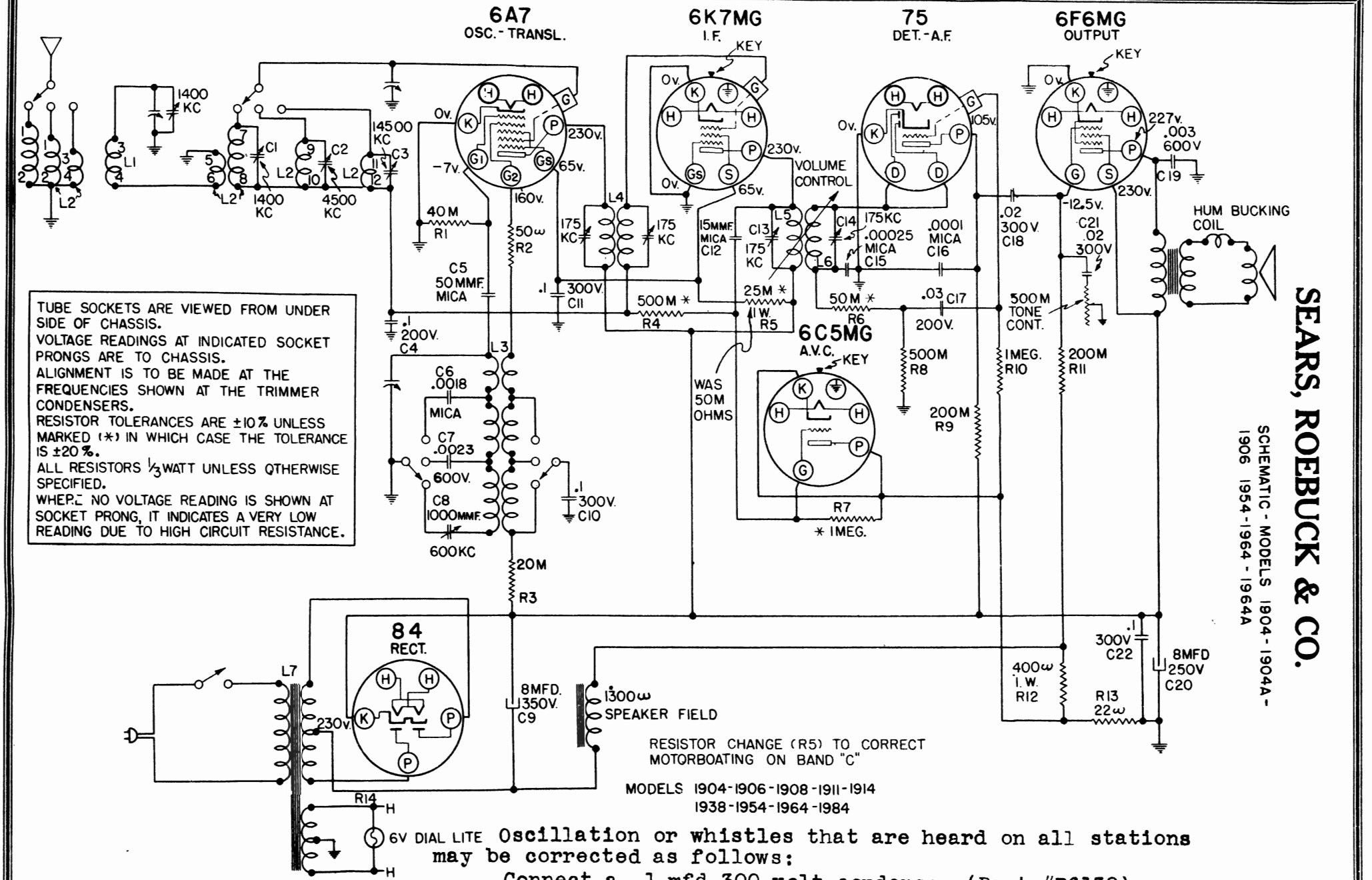


CONDENSERS		RESISTORS		
1	.00006	17	150	
2	.0003	18	400	1 w.
3	.0003	19	5000	
4	.001	20	15000	
5	.02	21	15000	2 w.
6	.02	22	45000	
7	.02	23	50000	
8	.1	24	500000	
9	.1	25	100000	
10	.1	26	100000	
11	.1	27	250000	
12	.1	400 K.	28	250000
13	.1	400 K.	29	500000
14	.1	25 K.	30	500000
15	.1		31	500000
16	.1		32	1 Meg.

SEARS, ROEBUCK & CO.

Silvertone Models 1781-1782



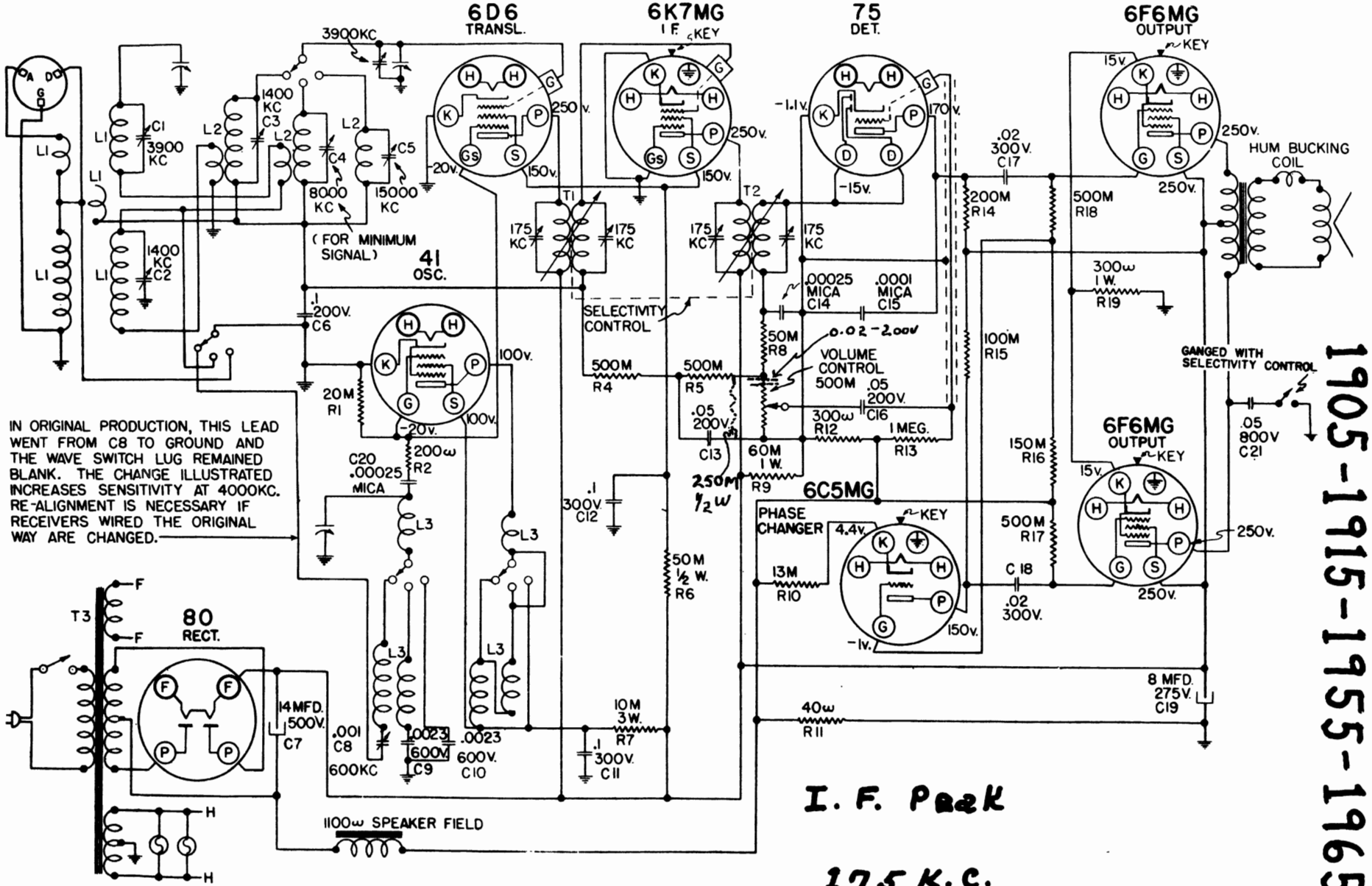


SEARS, ROEBUCK & CO.

SCHEMATIC - MODELS 1804-1904A-1906 1954-1964-1964A

Oscillation or whistles that are heard on all stations may be corrected as follows:

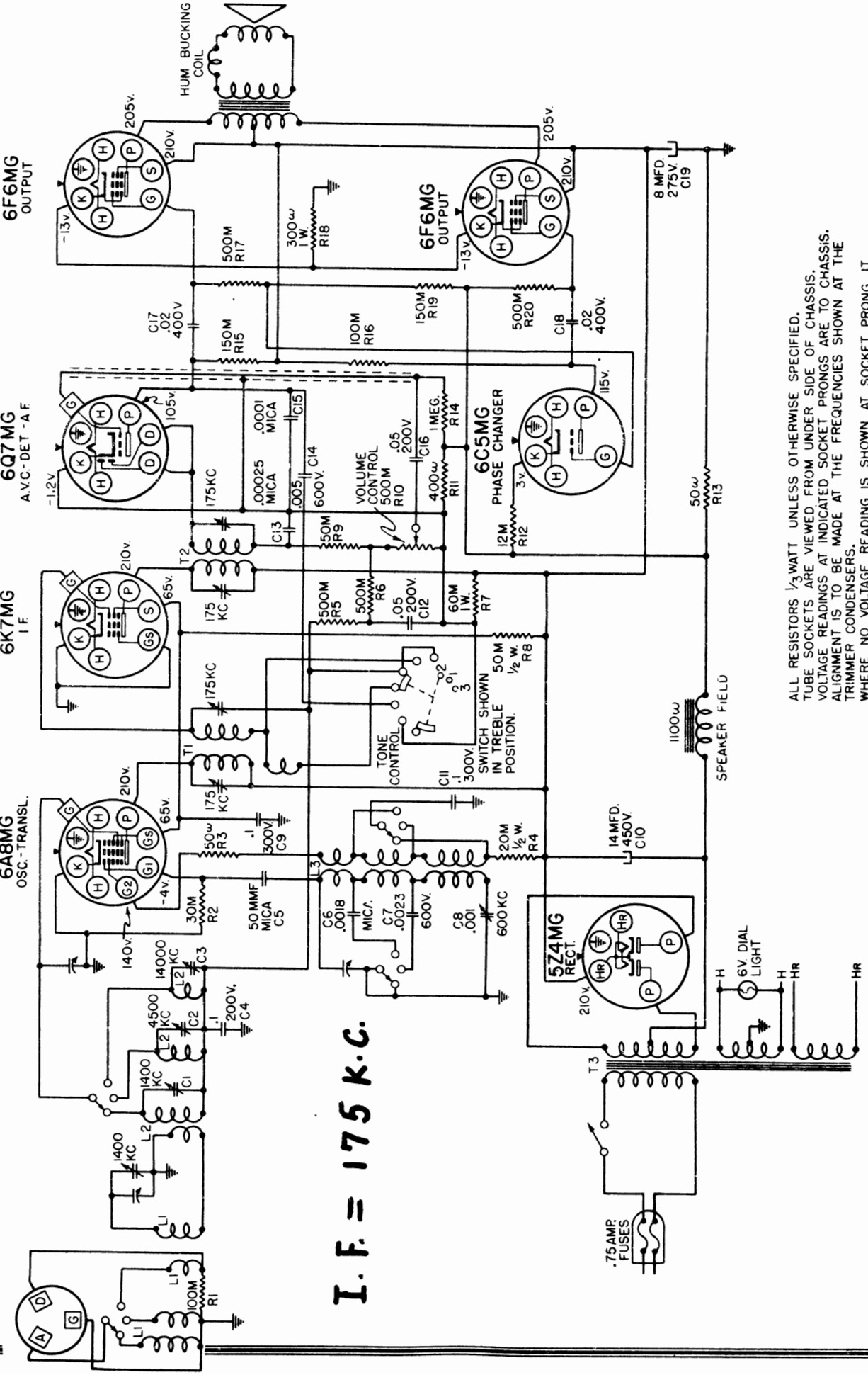
Connect a .1 mfd 300 volt condenser (Part #R6138) across the 8 mfd 250 volt electrolytic condenser, C20. This .1 mfd condenser has been added in later production and is shown as C22 in the attached schematic.



MODELS 1905-1915-1955-1965
CIRCUIT CHANGE IN VOLUME CONTROL CIRCUIT (DOTTED LINES)
TO CORRECT NOISY VOLUME CONTROLS.

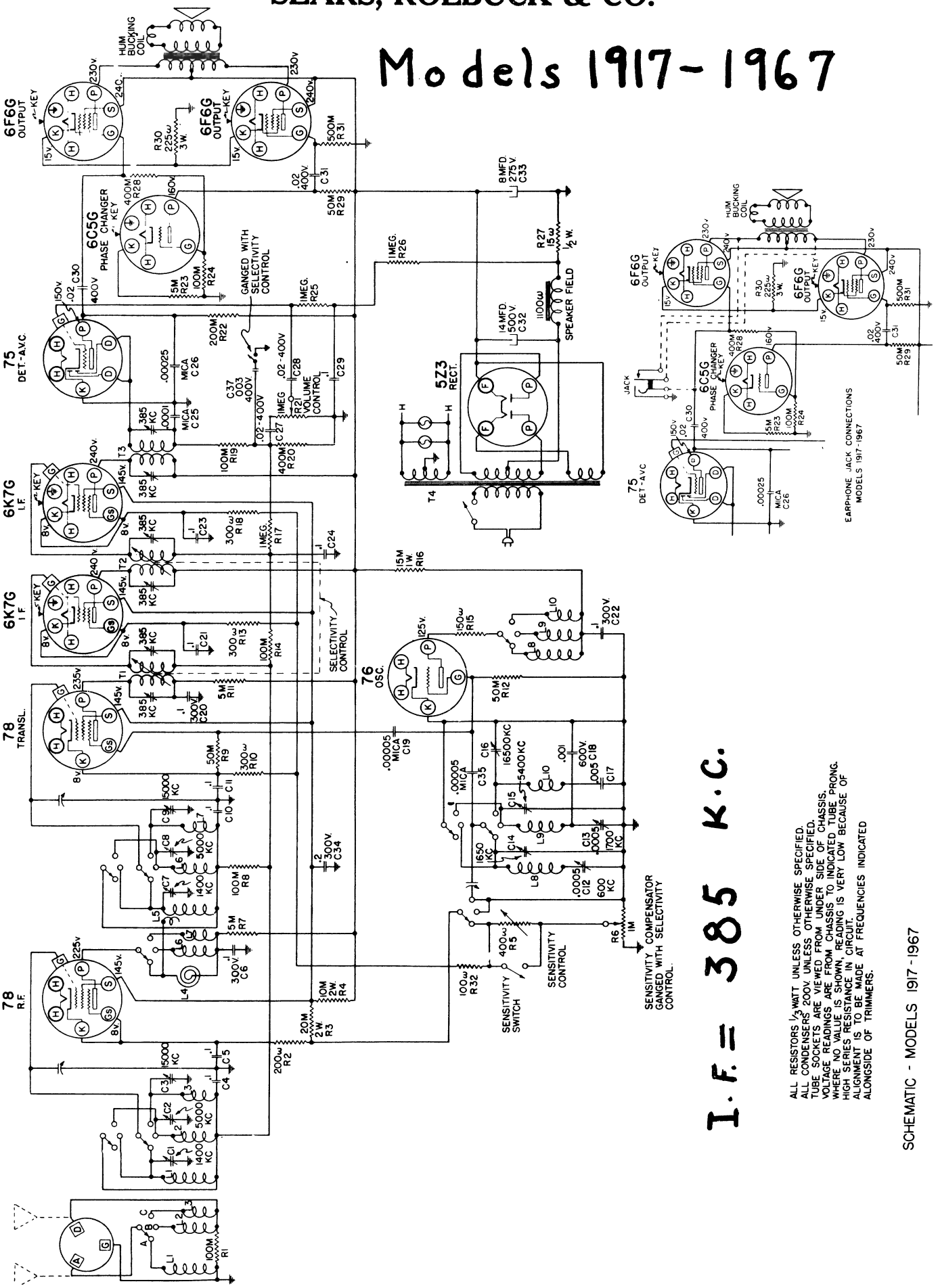
SEARS, ROEBUCK & CO.

SCHEMATIC - MODELS 1909 - 1912 - 1962



SEARS, ROEBUCK & CO.

Models 1917-1967

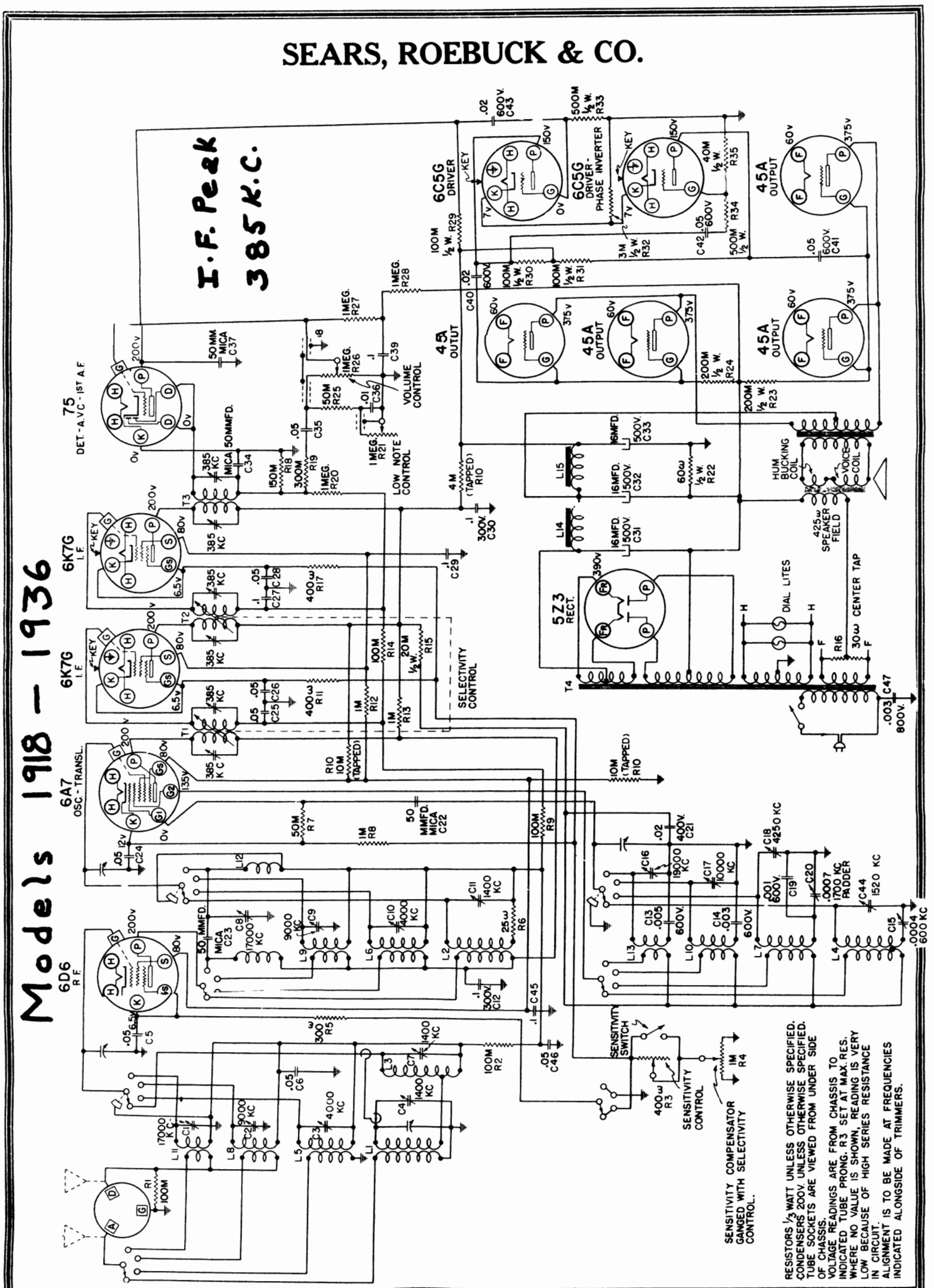


I.F. = 385 K.C.

ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ALL CONDENSERS 200V UNLESS OTHERWISE SPECIFIED.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS ARE FROM CHASSIS TO INDICATED TUBE PRONG.
WHERE NO VALUE IS SHOWN, READING IS VERY LOW BECAUSE OF HIGH SERIES RESISTANCE IN CIRCUIT.
ALIGNMENT IS TO BE MADE AT FREQUENCIES INDICATED ALONGSIDE OF TRIMMERS.

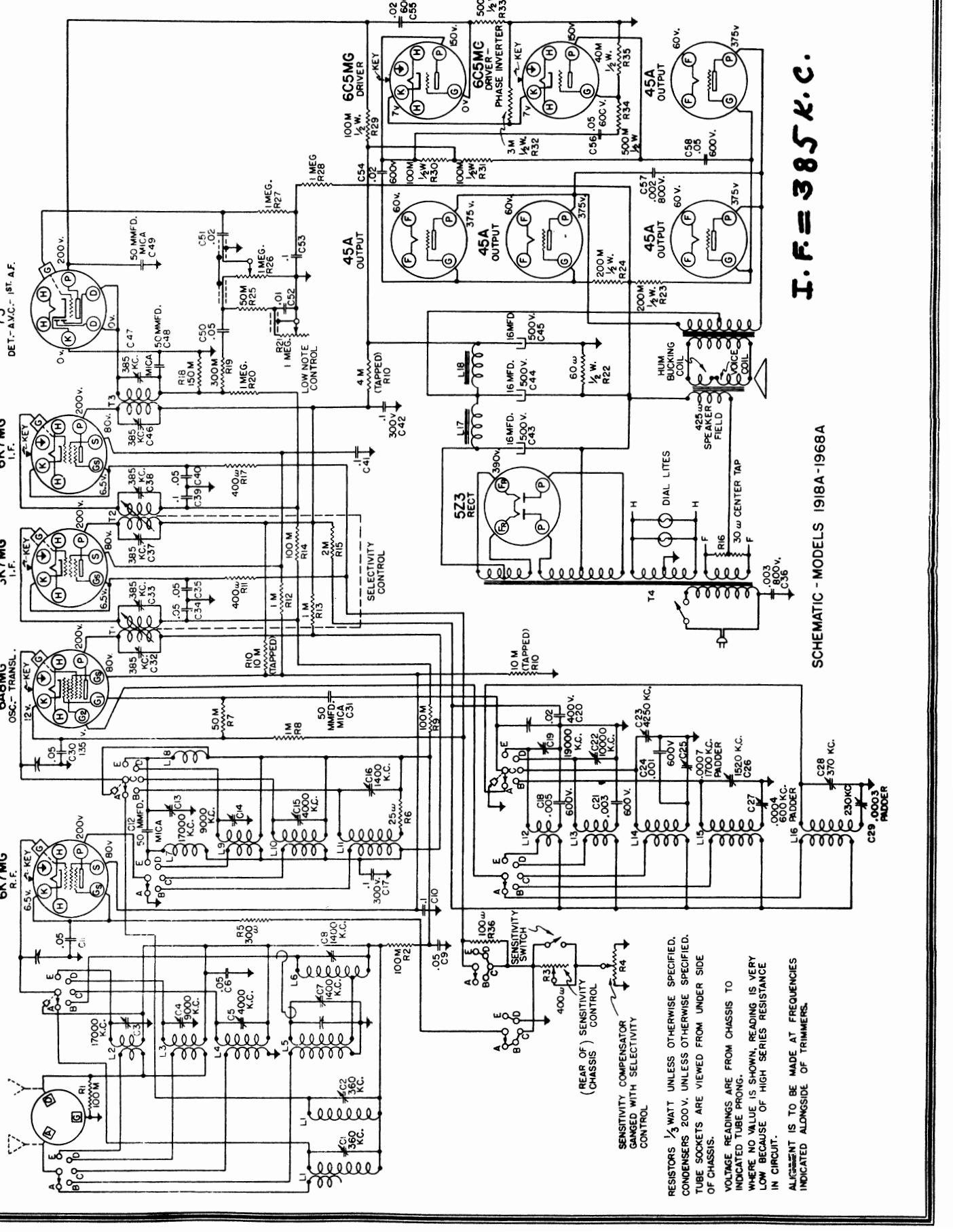
SCHEMATIC - MODELS 1917-1967

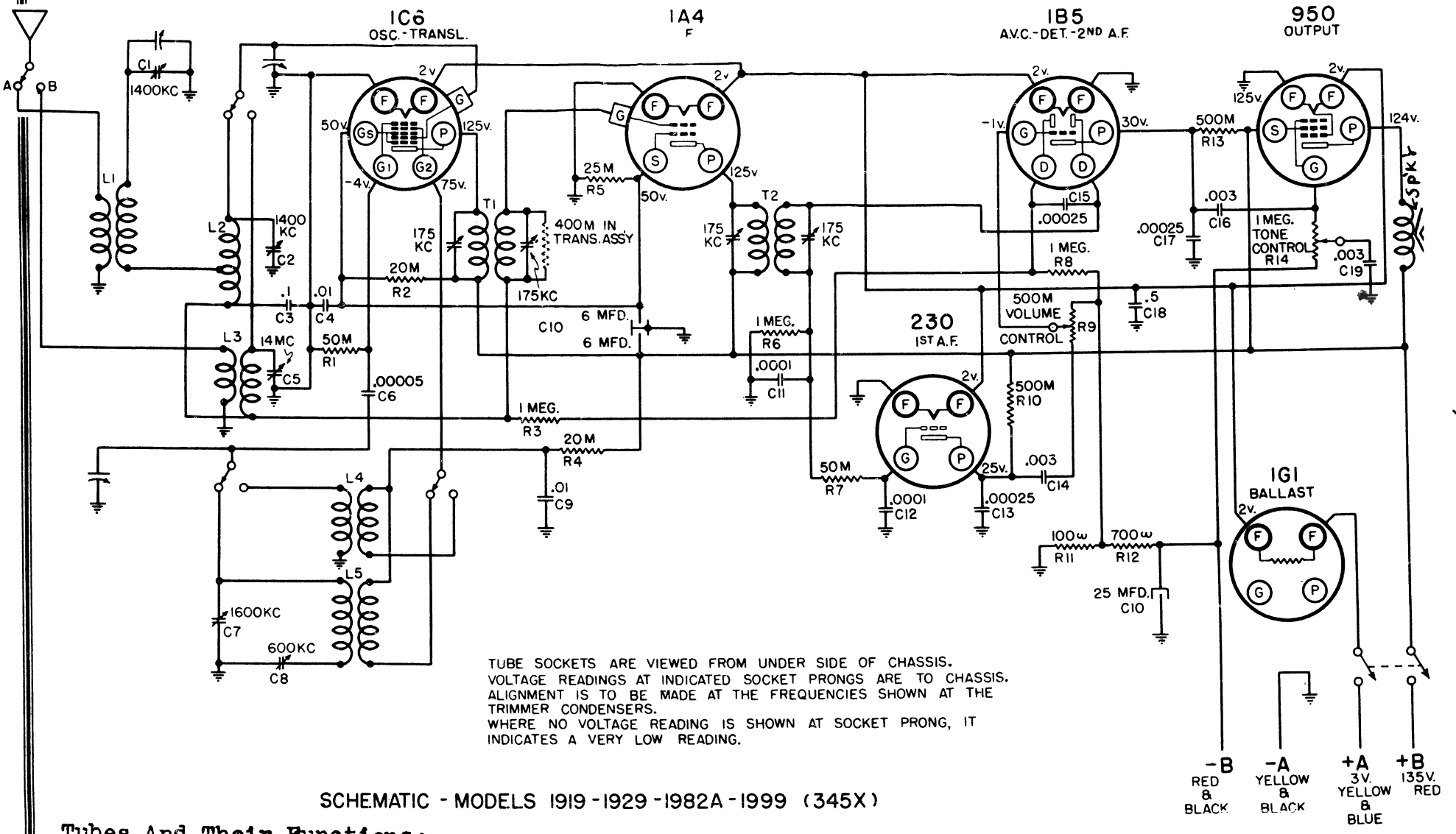
SEARS, ROEBUCK & CO.



SEARS, ROEBUCK & CO.

Models 1918A-1968A





TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

SCHEMATIC - MODELS 1919 - 1929 - 1982A - 1999 (345X)

Tubes And Their Functions:

1C6 - Oscillator - Translator
1A4 - IF
1B5 - AVC - Detector - Second AF
230 - First AF
950 - Output
1G1 - Ballast

I.F. Peak

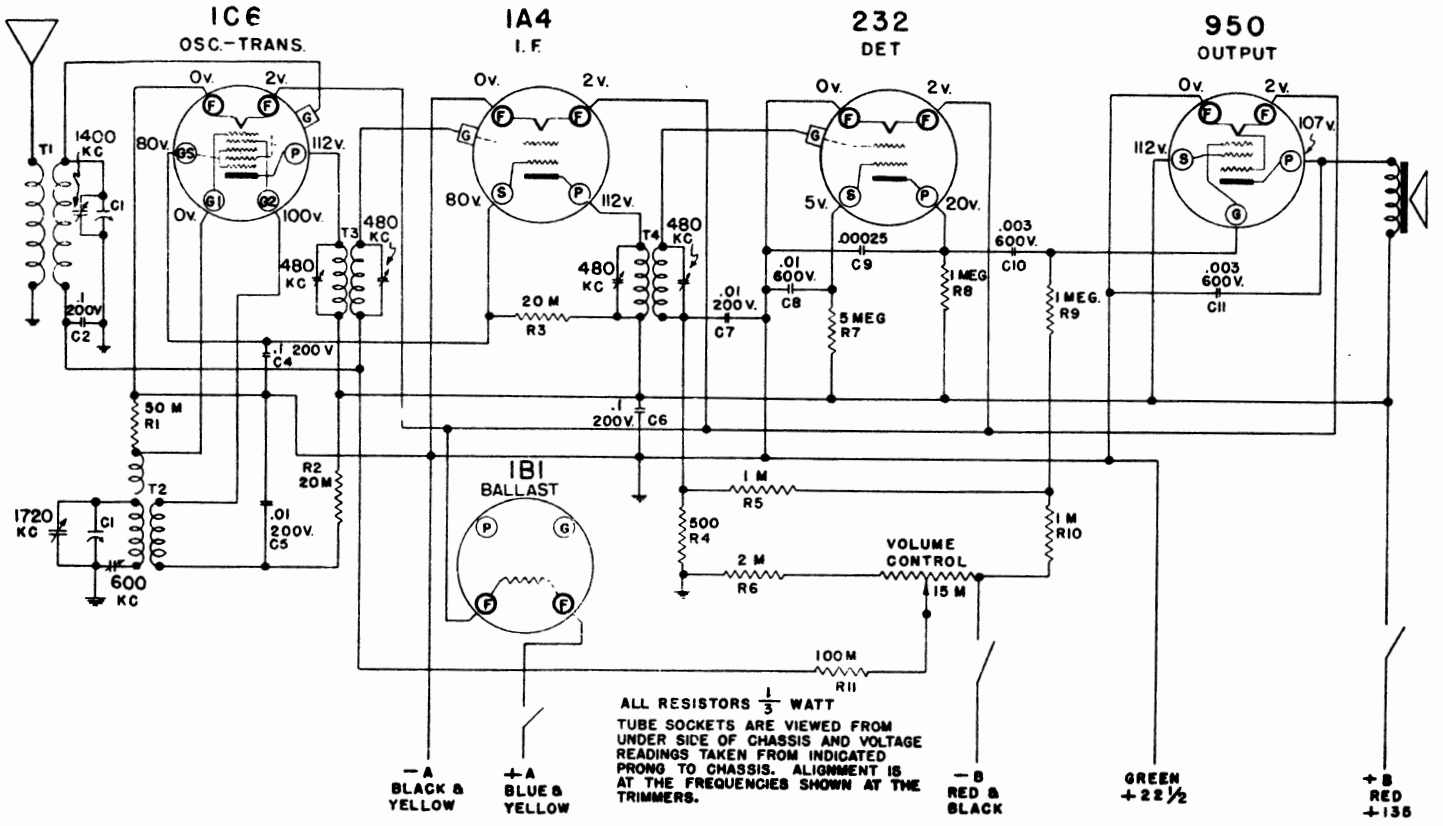
175 K.C.

MODELS 1919 - 1929 - 1982A - 1999.

SEARS, ROEBUCK & CO.

SEARS, ROEBUCK & CO.

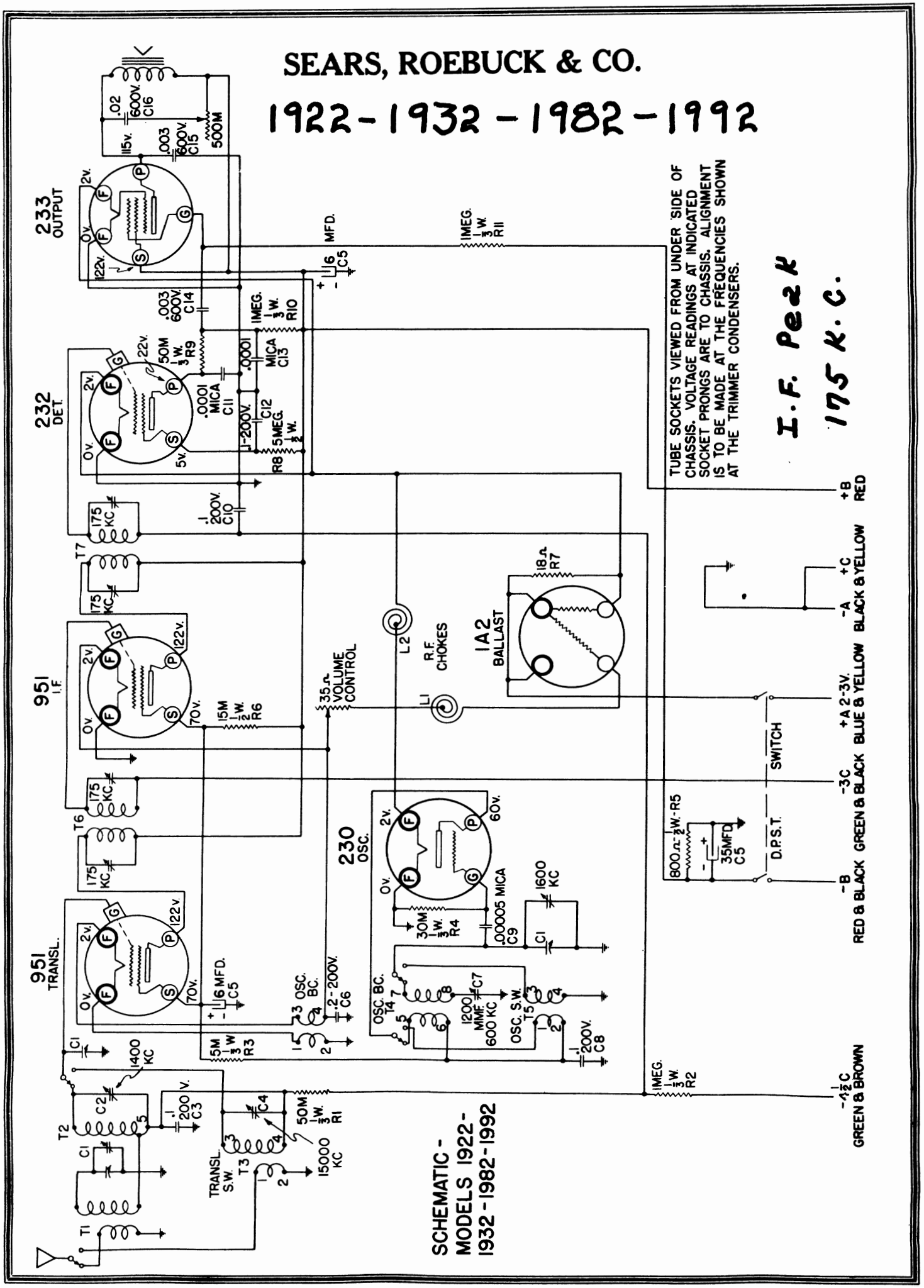
Models 1920-1926-1980



R7	R8393	Resistor - 5 megohms, 1/3 watt carbon
R8,R9	R7585	Resistor - 1 megohm, 1/3 watt carbon
R11	R7586	Resistor - 100M ohms, 1/3 watt carbon
R1	R6637	Resistor - 50M ohms, 1/3 watt carbon
R2,R3	R6640	Resistor - 20M ohms, 1/3 watt carbon
R6	R6634	Resistor - 2M ohms, 1/3watt carbon
R5,R10	R6636	Resistor - 1M ohms, 1/3 watt carbon
R4	R10142	Resistor - 500 ohms, 1/3 watt carbon
C2,C4,C6	R6444	Condenser - .1 mfd. 200 volts
C5,C7	R8432	Condenser - .01 mfd. 200 volts
C8	R7070	Condenser - .01 mfd. 600 volts
C10,C11	R7681	Condenser - .003 mfd. 600 volts
C9	R4592	Condenser - .00025 mfd. mica

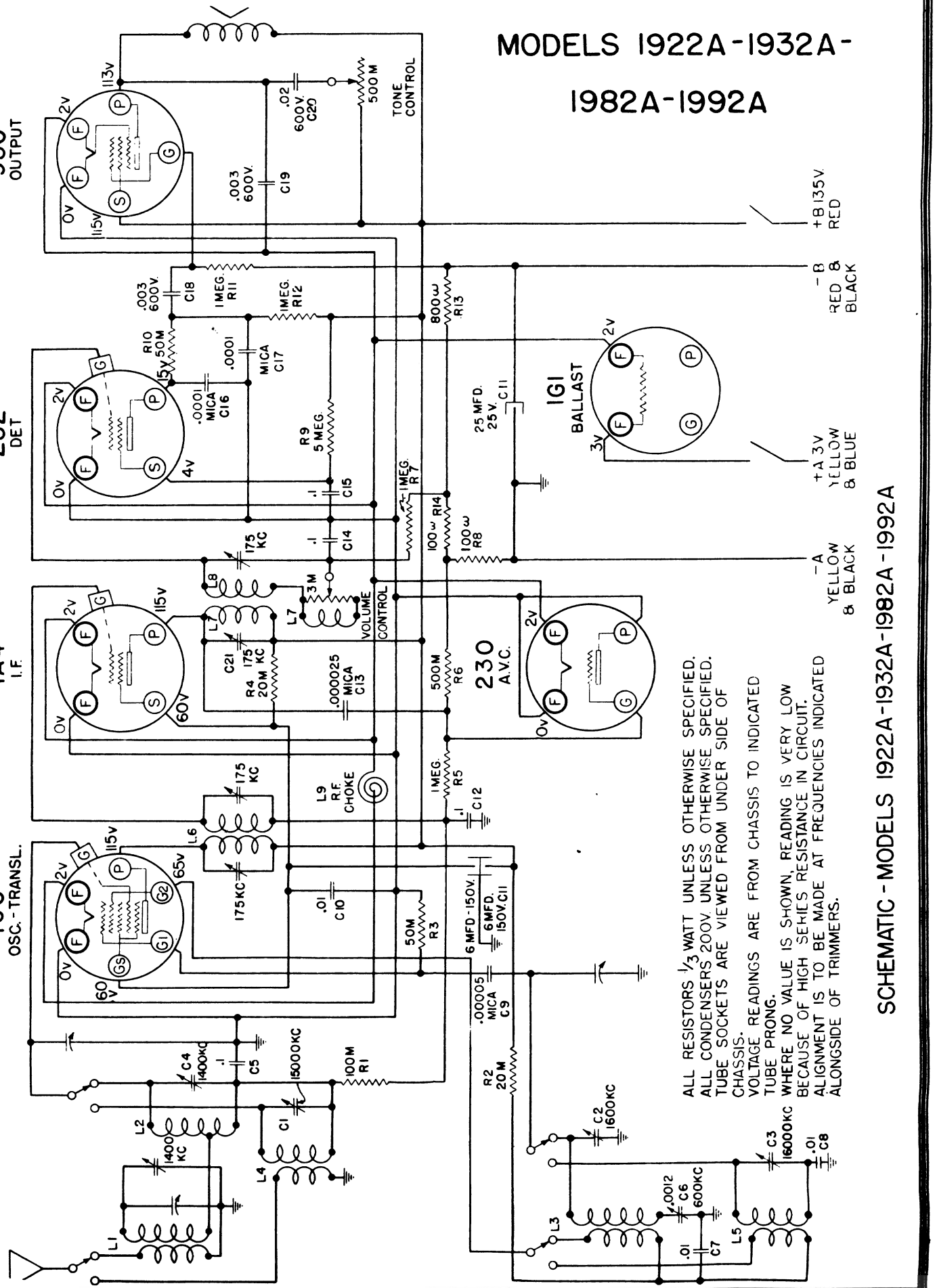
I. F. Peak

480 K.C.


SEARS, ROEBUCK & CO.
1922-1932-1982-1992
I.F. Peak
175 K.C.
TUBE SOCKETS VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
233 OUTPUT
232 DET.
951 I.F.
951 TRANSL.
230 OSC.
1A2 BALLAST
R.F. CHOKES
VOLUME CONTROL
SWITCH
D.P.S.T.
-B RED & BLACK
-3C GREEN & BLACK
+A 2-3V. BLUE & YELLOW
-A BLACK & YELLOW
+C
+B RED
-1½C GREEN & BROWN
TRANSL. S.W.
SCHEMATIC - MODELS 1922-1932-1982-1992

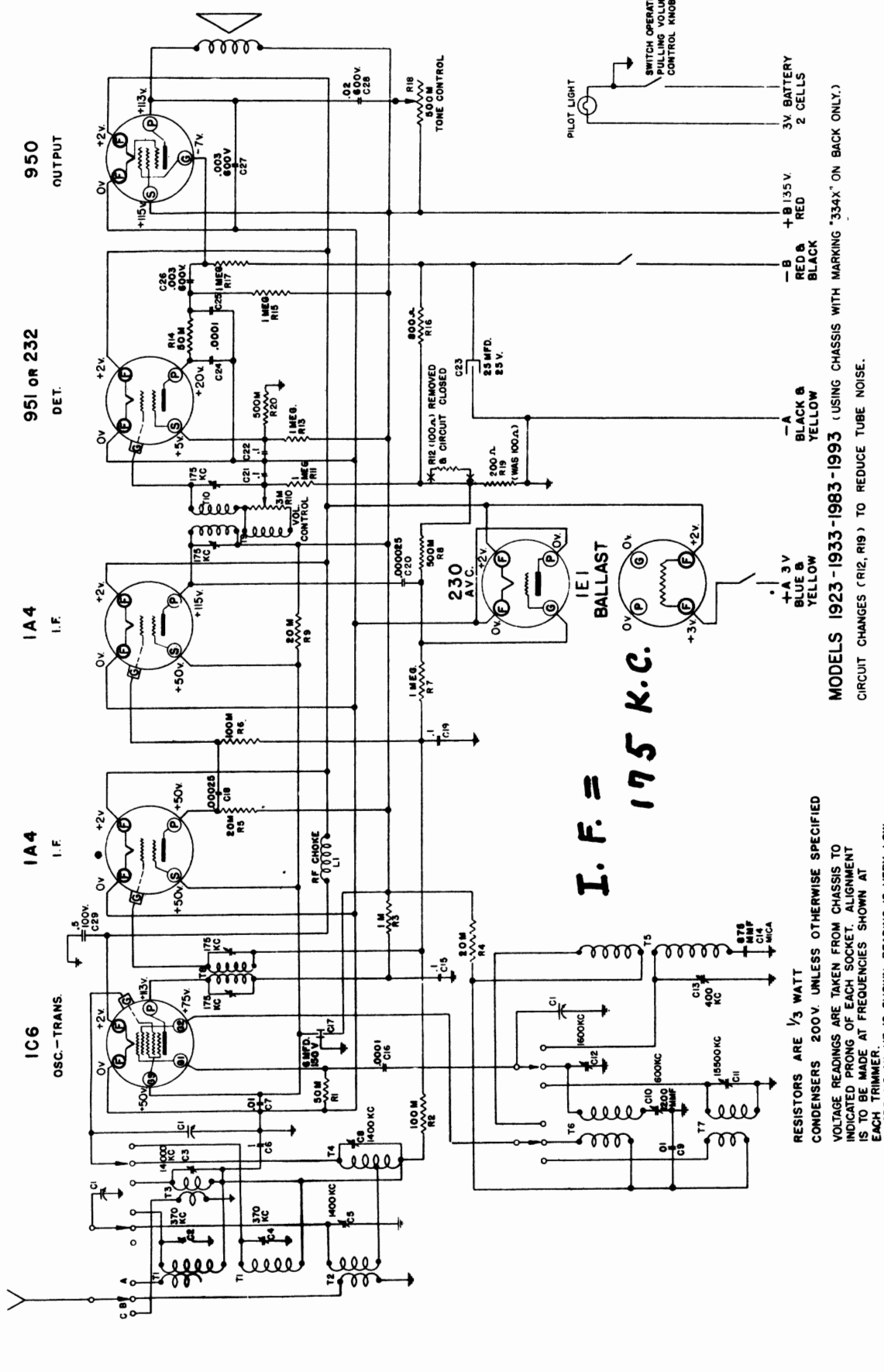
SEARS, ROEBUCK & CO.

MODELS 1922A-1932A-1982A-1992A



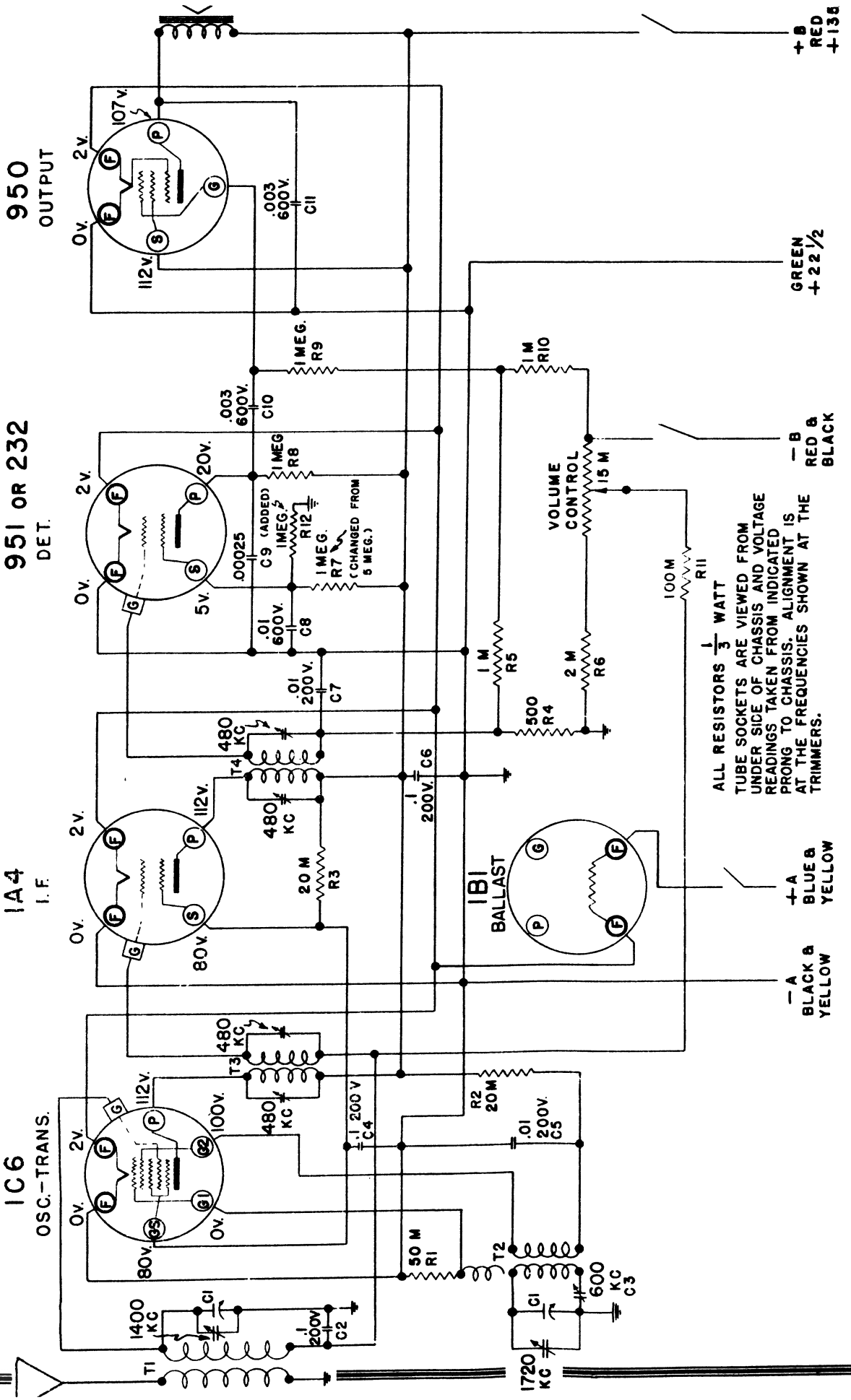
SCHEMATIC - MODELS 1922A-1932A-1982A-1992A

SEARS, ROEBUCK & CO.



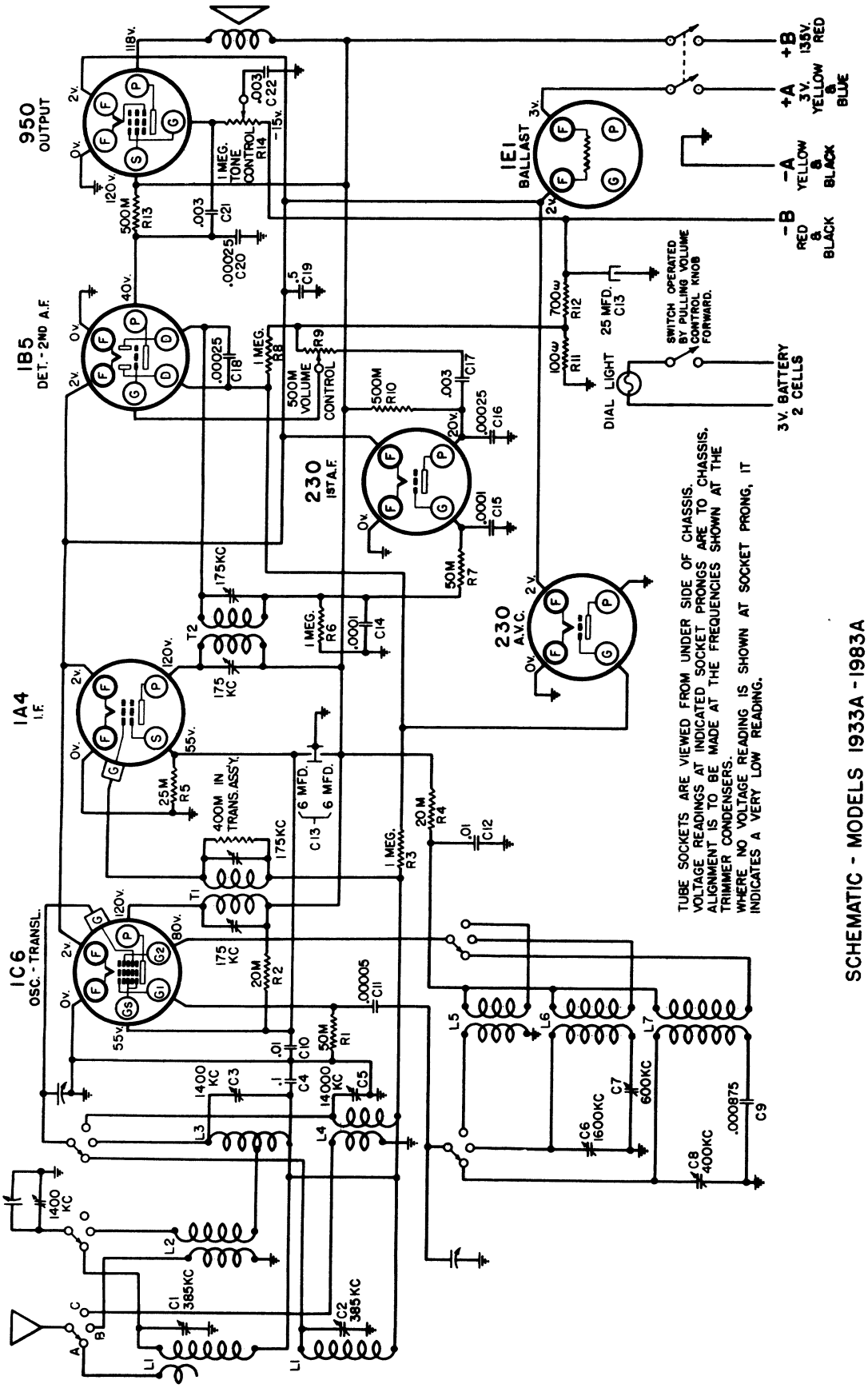
SEARS, ROEBUCK & CO.

MODELS 1928-1978



SEARS, ROEBUCK & CO.

MODELS 1933A - 1983A.



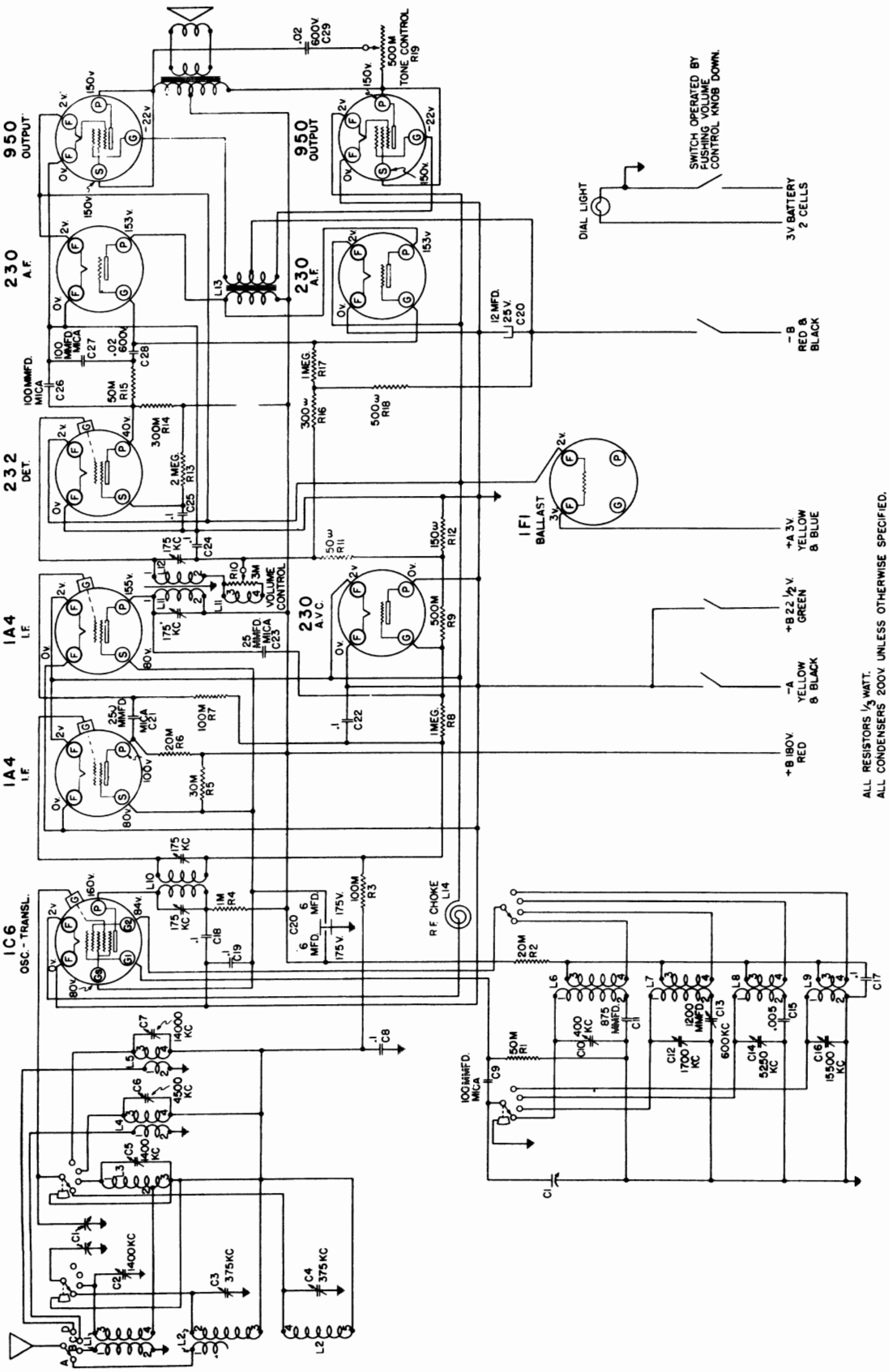
SCHEMATIC - MODELS 1933A - 1983A

Tubes And Their Functions:

1C6 - Oscillator - Translator
1A4 - IF
1B5 - Detector - Second AF
230 - First AF
230 - AVC
950 - Output
1E1 - Ballast

SEARS, ROEBUCK & CO.

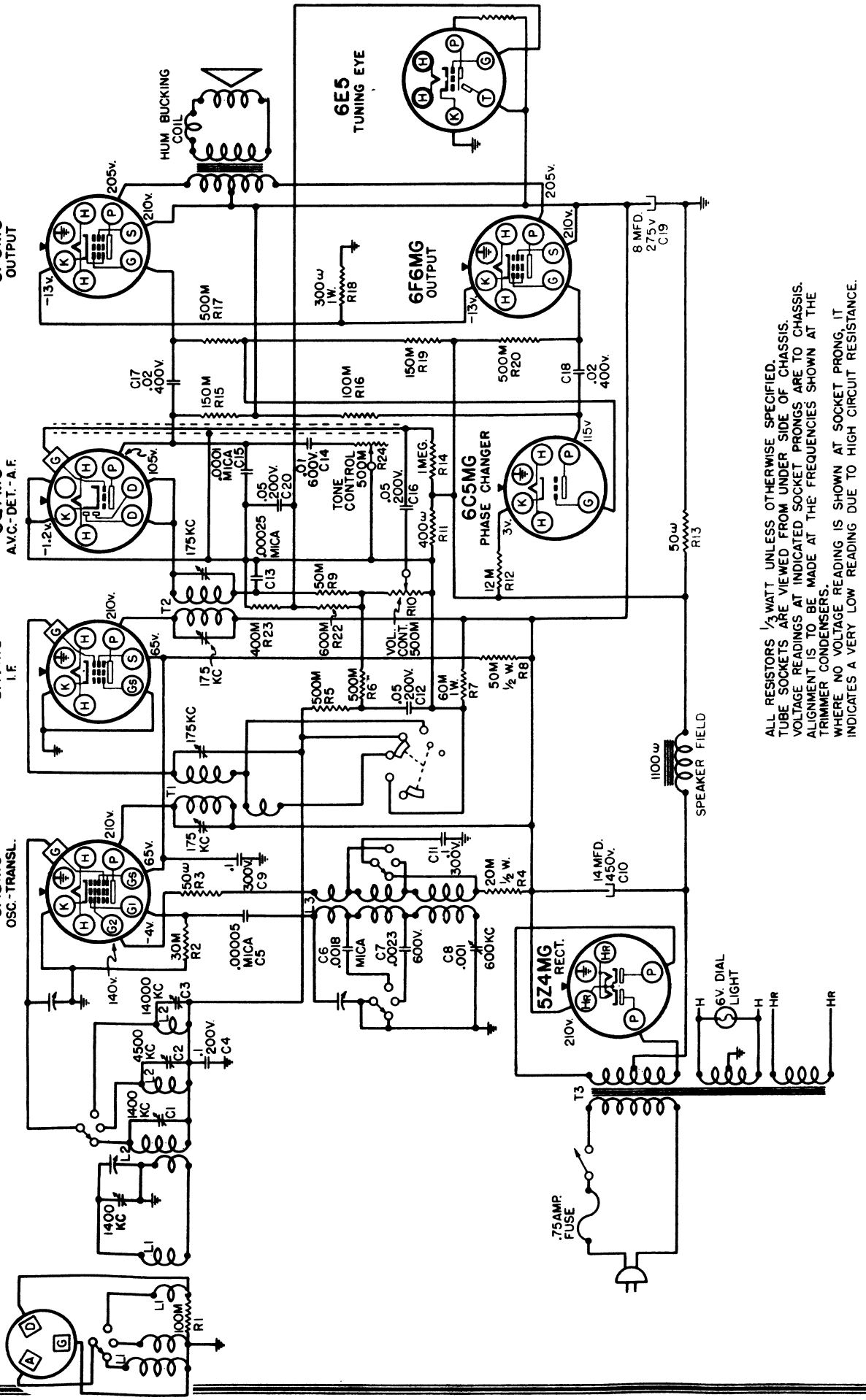
Models 1936 - 1996



SCHEMATIC - MODELS 1936 - 1996

SEARS, ROEBUCK & CO.

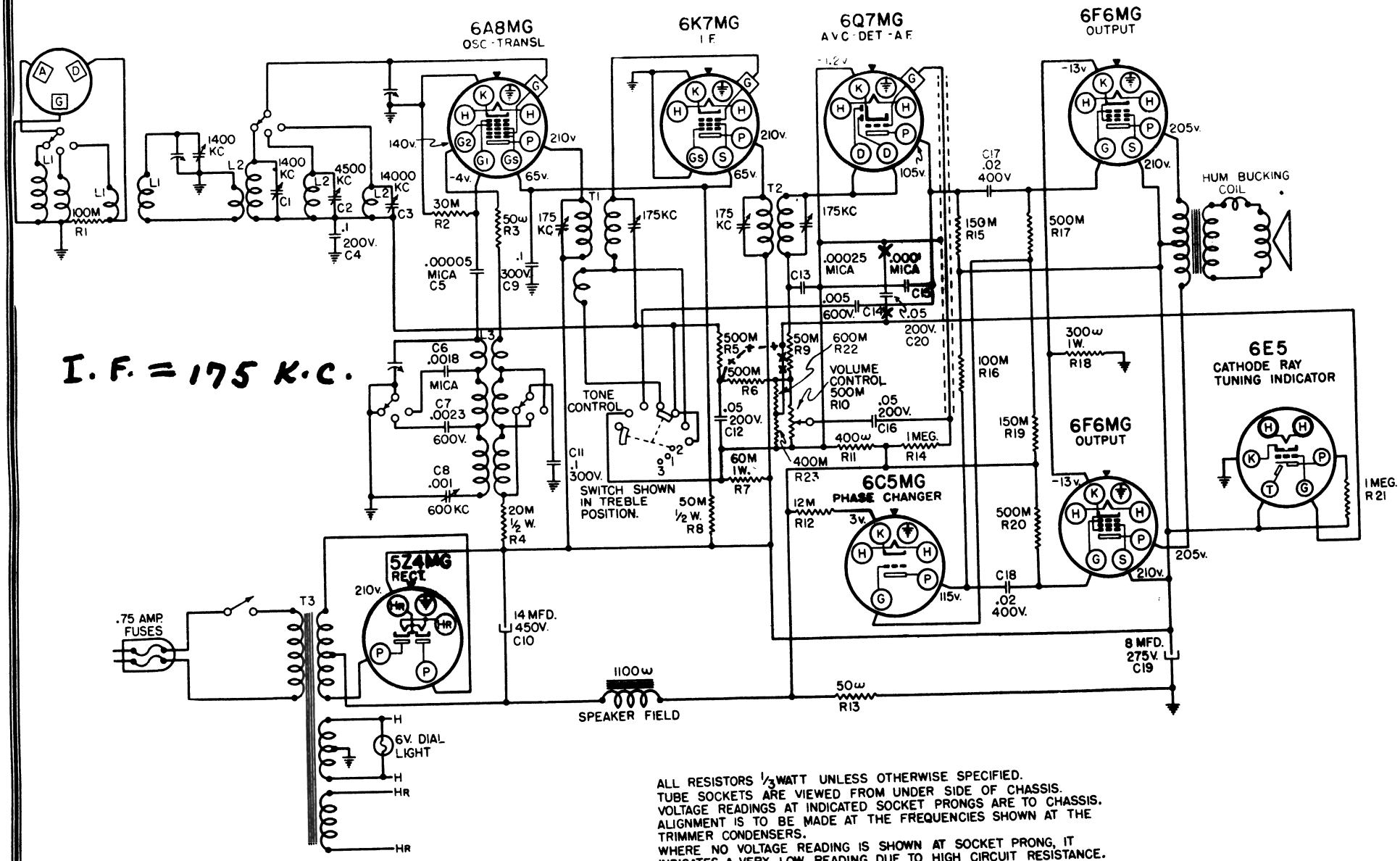
LOCATIONS OF PARTS - MODELS 1942-1972-1994



ALL RESISTORS 1/3 WATT UNLESS OTHERWISE SPECIFIED.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING DUE TO HIGH CIRCUIT RESISTANCE.

SCHEMATIC - MODELS 1942-1972-1994

Models 1942 - 1944 - 1972 (Chassis 391-X)



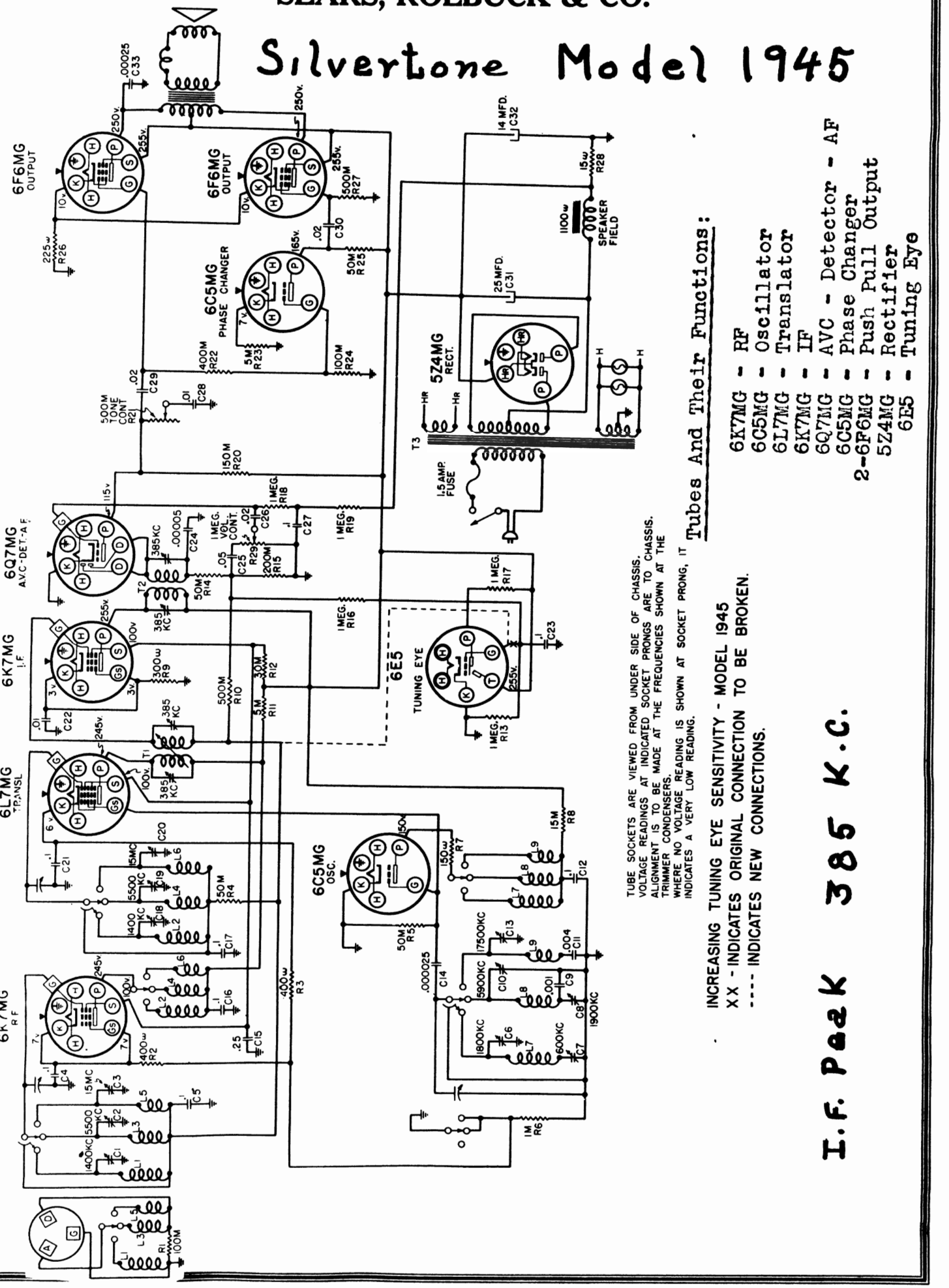
ALL RESISTORS 1/3 WATT UNLESS OTHERWISE SPECIFIED.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING DUE TO HIGH CIRCUIT RESISTANCE.

INCREASING TUNING EYE SENSITIVITY - MODELS 1942-1944-1972
XX - INDICATES ORIGINAL CONNECTIONS TO BE BROKEN.
-+-+- INDICATES NEW CONNECTIONS.

SEARS, ROEBUCK & CO.

SEARS, ROEBUCK & CO.

Silvertone Model 1945



Tubes And Their Functions:

6K7MG - RF
6C5MG - Oscillator
6L7MG - Translator
6K7MG - IF
6Q7MG - AVC - Detector - AF
6C5MG - Phase Changer
2-6F6MG - Push Pull Output
5Z4MG - Rectifier
6E5 - Tuning Eye

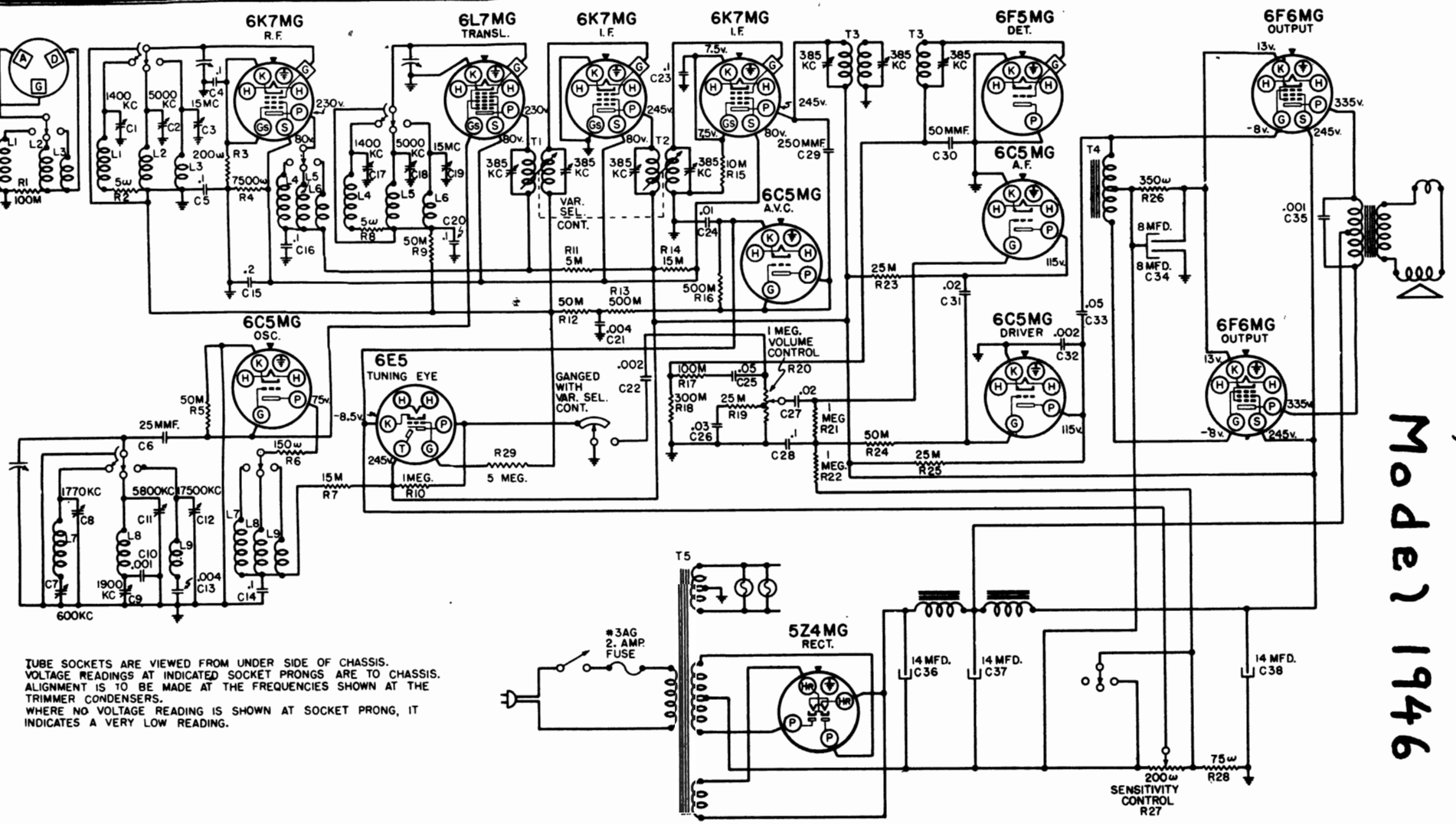
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

INCREASING TUNING EYE SENSITIVITY - MODEL 1945
XX - INDICATES ORIGINAL CONNECTION TO BE BROKEN.
---- INDICATES NEW CONNECTIONS.

I.F. Peak 385 K.C.

SEARS, ROEBUCK & CO.

Model 1946



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

SCHEMATIC - MODEL 1946

Tubes And Their Functions:

6K7MG - RF
6C5MG - Oscillator
6L7MG - Translator
6K7MG - First IF
6K7MG - Second IF
6C5MG - AVC

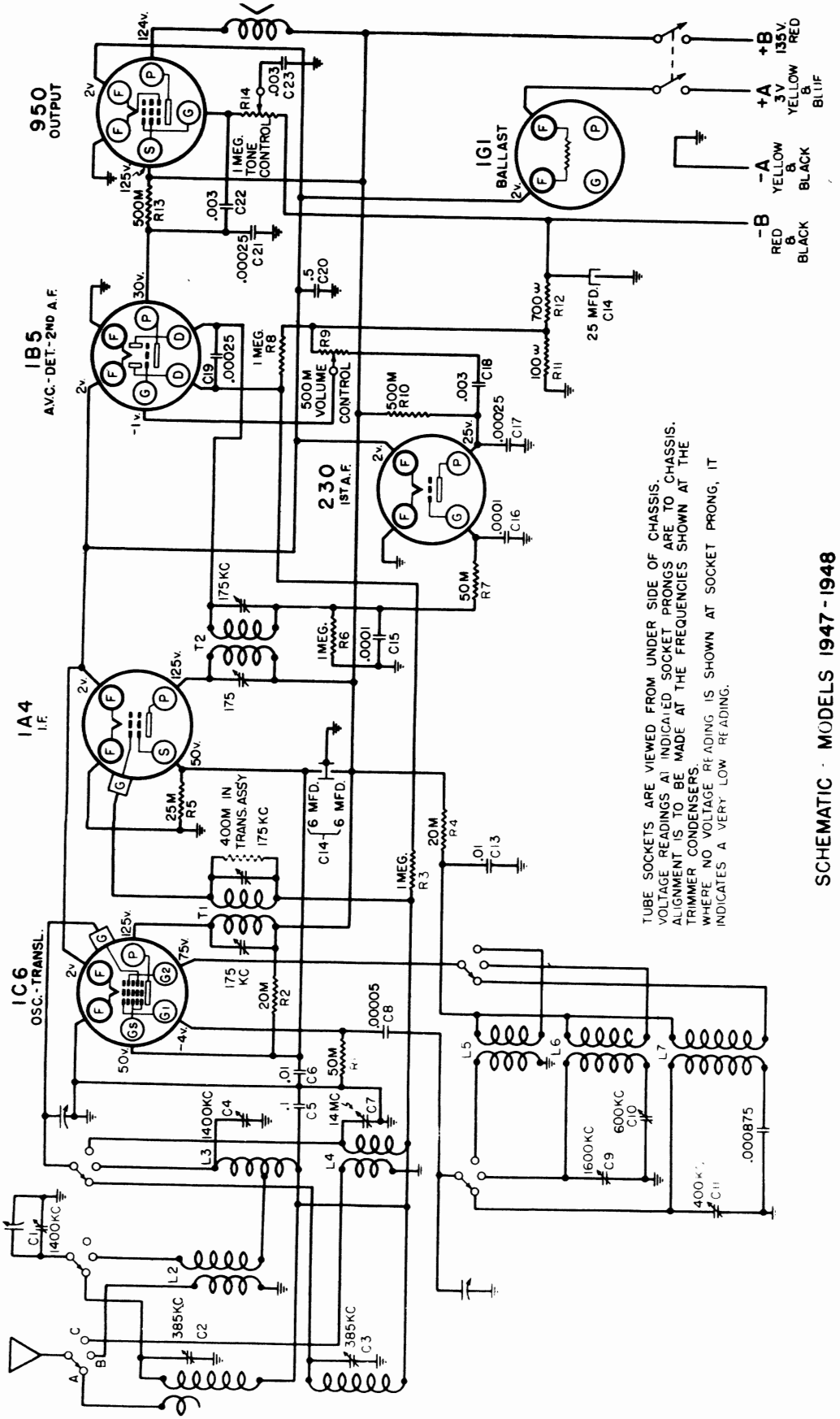
6F5MG - Detector
6C5MG - First AF
6C5MG - Driver
2-6F6MG - Push Pull Output
5Z4MG - Rectifier
6E5 - Tuning Eye

I.F. Peak

385 K.C.

SEARS, ROEBUCK & CO.

Models 1947-1948



SCHEMATIC - MODELS 1947-1948

Tubes And Their Functions:

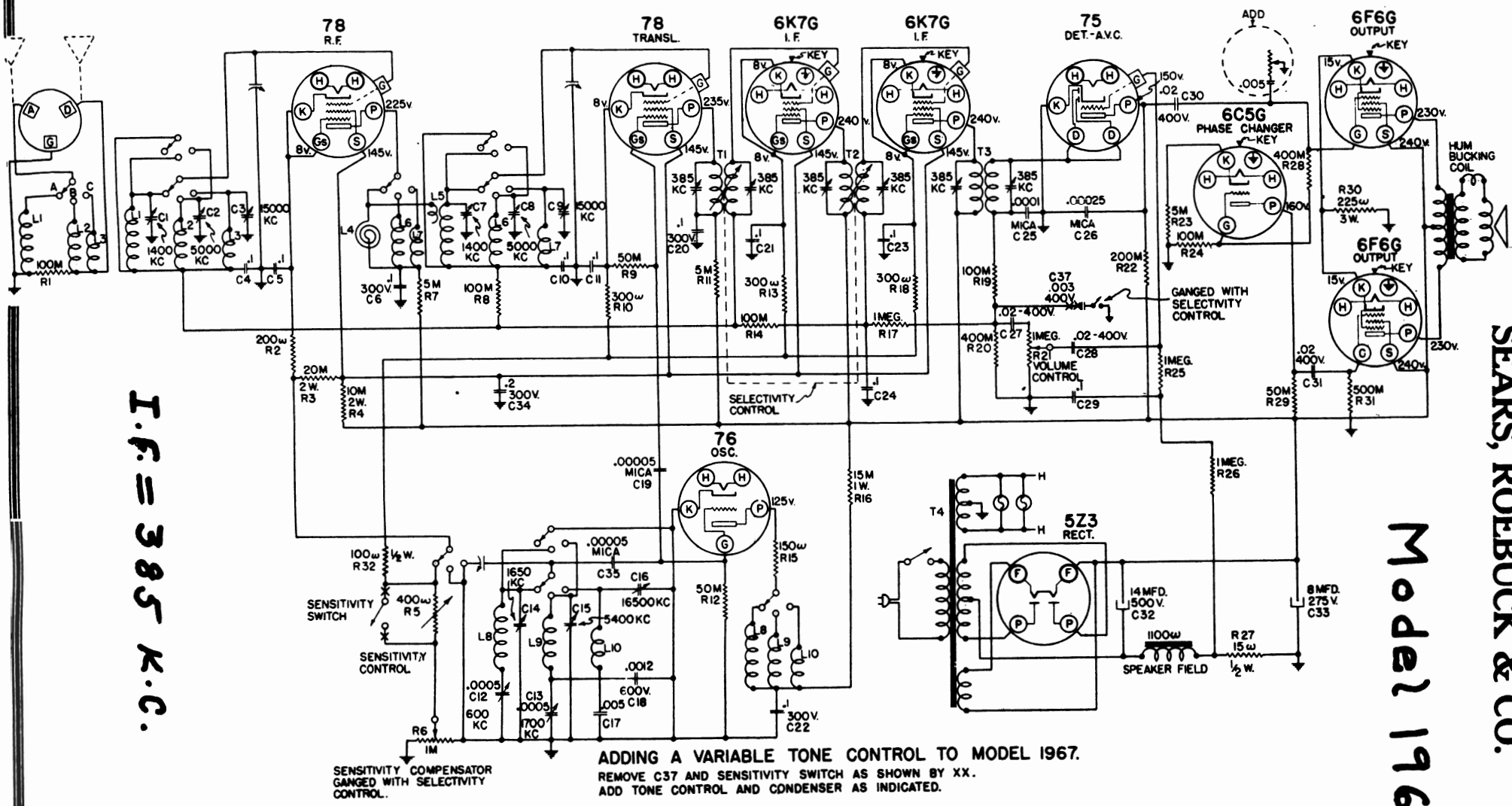
1C6 - Oscillator - Translator
1A4 - IF
1B5 - AVC - Detector - Second AF
230 - First AF
950 - Output
1G1 - Ballast

Color Code Of The Electrolytic Condenser, C14:

Black - Common, grounded
Brown - Minus 25 mfd.
Red - Plus 6 mfd.
Blue - Plus 6 mfd.

SEARS, ROEBUCK & CO.

Model 1967



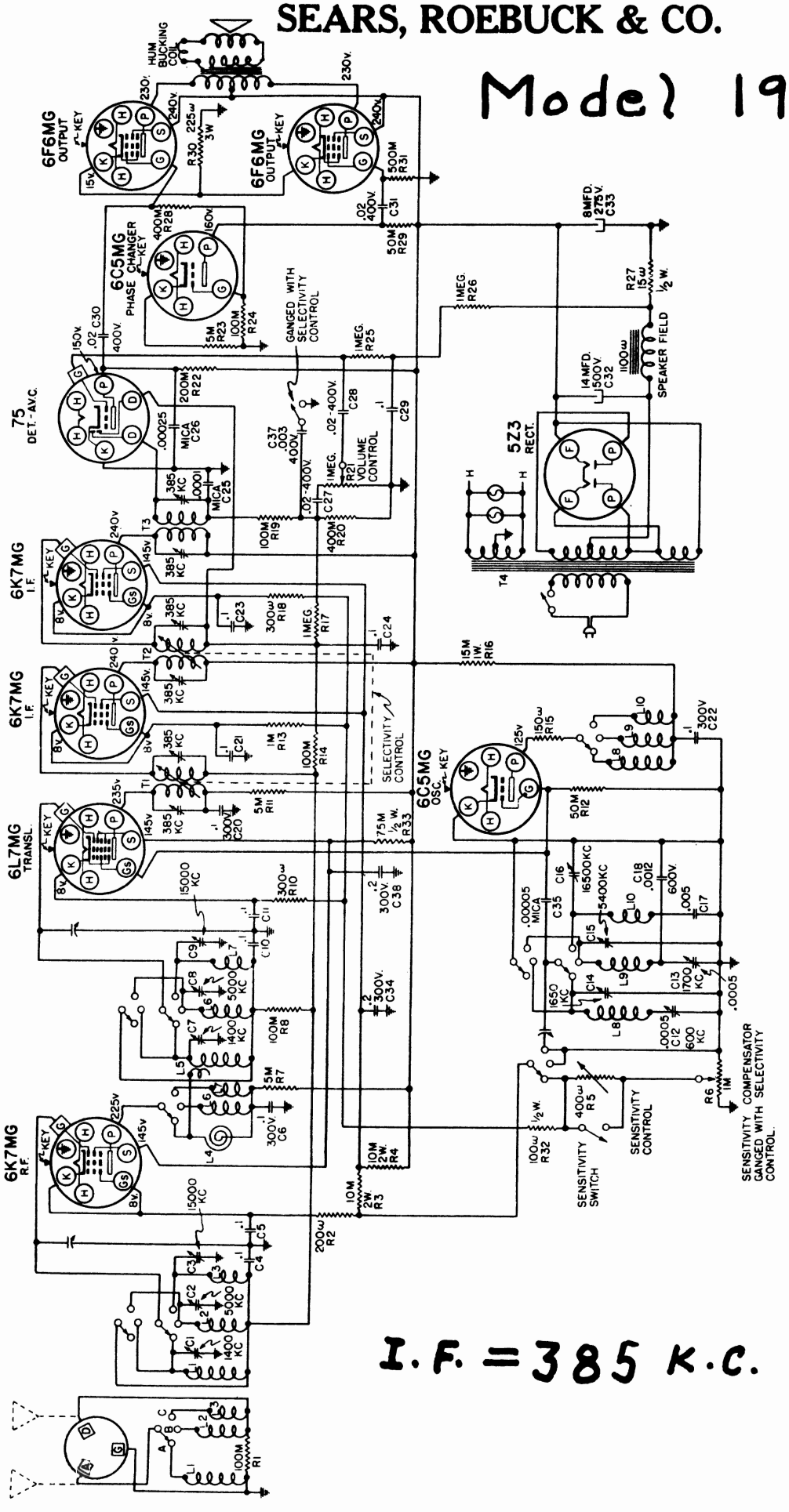
ADDING A VARIABLE TONE CONTROL TO MODEL 1967.

REMOVE C37 AND SENSITIVITY SWITCH AS SHOWN BY XX.
ADD TONE CONTROL AND CONDENSER AS INDICATED.

Since the original Sensitivity switch has been removed, the sensitivity adjustment at the rear of the chassis should be set at the best "average" position.

SEARS, ROEBUCK & CO.

Model 1967-A



ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ALL CONDENSERS 200V UNLESS OTHERWISE SPECIFIED.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS ARE FROM CHASSIS TO INDICATED TUBE PRONG.
WHERE NO VALUE IS SHOWN, READING IS VERY LOW BECAUSE OF HIGH SERIES RESISTANCE IN CIRCUIT.
ALIGNMENT IS TO BE MADE AT FREQUENCIES INDICATED ALONGSIDE OF TRIMMERS.

SCHEMATIC - MODEL 1967A

I.F. = 385 K.C.

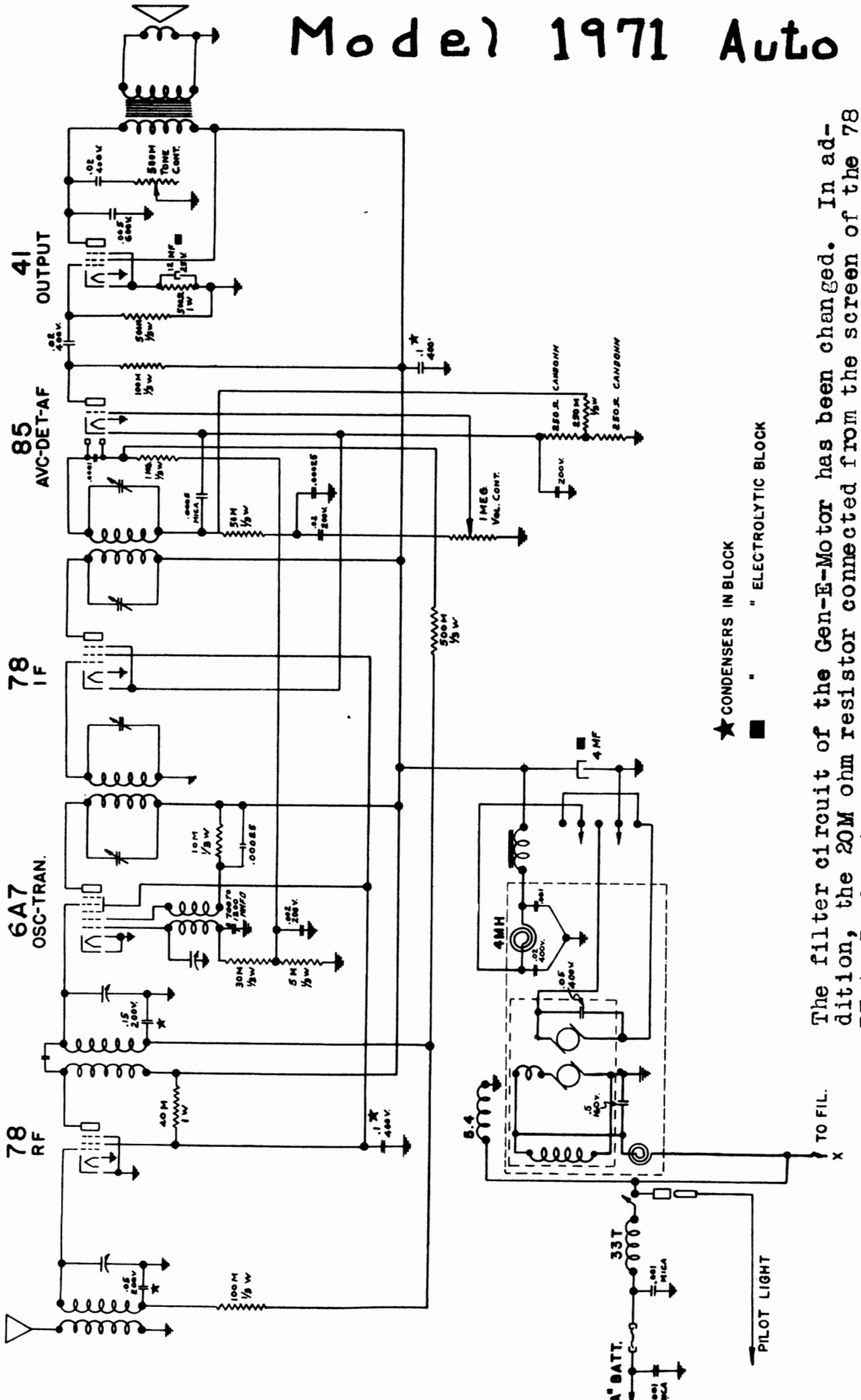
Silvertone Model 1967-A

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	PRICE
C37	R10478	Condenser - .003 mfd. 400 volts	.10
C17	R12312	Condenser - .005 mfd. 200 volts	.08
C18	R13604	Condenser - .0012 mfd. 600 volts	.12
C25	R4303	Condenser - .0001 mfd. mica	.23
C26	R4592	Condenser - .00025 mfd. mica	.24
C35	R8621	Condenser - .00005 mfd. mica	.13
R6	R13309	Control - 1000 ohms, ganged with Selectivity control	.72
R21	R12633	Control - Volume, 1 megohm	.54
R5	R12468	Control - Sensitivity, 400 ohms, at rear of chassis	.27
	R6989	Cord - Power	.45
	R10319	Cover - Chassis bottom	.47
	R12463	Escutcheon	.35
	R11946	Folder - Short wave	.02
	R13230B	Gear - Dial drive assembly	.42
	R13235A	Gear - Band spread	.33
	R12459	Glass - Dial	.07
	R10980	Grommet - Variable condenser mounting	.02
	R12636A	Indicator - Dial	.89
	R12681	Knob - Selectivity control	.13
	R12707	Knob - Sensitivity control and "On-Off" switch	.14
	R12467A	Knob - Tuning	.20
	R12418	Knob - Volume control	.14
	R13338	Knob - Wave switch	.15
	R2288	Lamp - Dial	.12
	R13572	Leaflet - Instruction	.10
	R12546A	Lever - Variable selectivity control actuating	.22
	R5321	Pin - Marker, in cabinet 100 for	.11
	R12359B	Pointer - Band spread	.17
	R12653A	Pointer - Dial	.17
	R13307A	Rack - Variable selectivity actuating	.36
R17,R25,R26	R7585	Resistor - 1 megohm, 1/3 watt carbon	.17
R31	R7228	Resistor - 500M ohms, 1/3 watt carbon	.15
R20,R28	R6710	Resistor - 400M ohms, 1/3 watt carbon	.15
R22	R6638	Resistor - 200M ohms, 1/3 watt carbon	.17
R1,R8,R14, R19,R24	R7586	Resistor - 100M ohms, 1/3 watt carbon	.17
R12,R29	R6637	Resistor - 50M ohms, 1/3 watt carbon	.15
R3	R12735	Resistor - 20M ohms, 2 watts carbon	.21
R16	R6504	Resistor - 15M ohms, 1 watt carbon	.19
R4	R12734	Resistor - 10M ohms, 2 watts carbon	.19
R7,R11,R23	R7226	Resistor - 5M ohms, 1/3 watt carbon	.15
R13	R6636	Resistor - 1M ohms, 1/3 watt carbon	.15
R10,R18	R10621	Resistor - 300 ohms, 1/3 watt carbon	.15
R30	R10751	Resistor - 225 ohms, 3 watts, flexible	.19
R2	R7227	Resistor - 200 ohms, 1/3 watt carbon	.17
R15	R10818	Resistor - 150 ohms, 1/3 watt carbon	.15
R32	R6976	Resistor - 100 ohms, 1/2 watt carbon	.17
R27	R10752	Resistor - 15 ohms, 1/2 watt, flexible	.17
	R12458	Ring - Glass clamping	.03
	R12503	Shaft - Dial drive, dual ratio	.93
	R6450	Shield - Electrolytic condenser	.03

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	PRICE
	R12552	Adapter - Dial pointer	.13
	R12578B	Arm - Visual band indicator actuating	.23
	R12532A	Block - Terminal, antenna and ground connections	.27
L4	R6127	Choke - RF plate	.20
	R11043	Clip - Grid	.01
	R12808	Clip - Grid, small	.01
L1	R12531	Coil - Antenna, broadcast	.50
L8	R12591	Coil - Oscillator, broadcast	.31
L5	R12659	Coil - Translator, broadcast	.42
L2	R12704A	Coil - Antenna, Band B	.55
L6	R12704B	Coil - RF, Band B	.61
L9	R12704C	Coil - Oscillator, Band B	.60
L3	R12704D	Coil - Antenna, Band C	.55
L7	R12704E	Coil - RF, Band C	.55
L10	R12704F	Coil - Oscillator, Band C	.60
	R12630	Condenser - Variable	3.16
	R12630B	Condenser - Variable, with drive assembly	6.36
C32	R7236	Condenser - Electrolytic, 14 mfd. 500 volts	1.16
C33	R11153	Condenser - Electrolytic, 8 mfd. 275 volts	.68
C1,C2,C3, C7,C8,C9, C14,C15,C16	R10948	Condenser - Trimmer, 2-10 mmf. triple	.31
C12,C13	R12632	Condenser - Padding, 500 mmf. dual	.62
C34	R12631	Condenser - .2 mfd. 300 volts	.14
C6,C20,C22	R6138	Condenser - .1 mfd. 300 volts	.31
C4,C5,C10, C11,C21,C23, C24,C29 C27,C28,	R6444	Condenser - .1 mfd. 200 volts	.17
C30,C31	R9818	Condenser - .02 mfd. 400 volts	.13
	R8395	Shield - Tube, base	.02
	R10440	Shield - Tube, top	.08
	R10441	Shield - Tube, cap	.04
	R10654	Shield - Coil, base	.03
	R12641A	Shield - Coil	.27
	R13116	Shield - Tube, Goat 6F6G tubes	.07
	R8315	Socket - 4 prong	.06
	R8368	Socket - Speaker	.07
	R8092	Socket - 6 prong	.07
	R10549	Socket - Pilot light	.07
	R12757	Socket - 7 prong Octal	.14
	R12809	Socket - 6 prong Octal	.14
	R12559	Spacer - Wood, shipping	.02
	R13549	Speaker - 10", 1100 ohms, Dynamic	6.58
	R12644	Switch - "On-Off" and sensitivity	.65
	R12643A	Switch - Wave	2.76
T1	R12492A	Transformer - IF Input	1.82
T2	R12493A	Transformer - IF Interstage	1.82
T3	R12645	Transformer - IF Output	1.06
T4	R12800A	Transformer - Power, 60 cycle	6.34
T4	R12629A	Transformer - Power, 25 cycle	10.95

SEARS, ROEBUCK & CO.

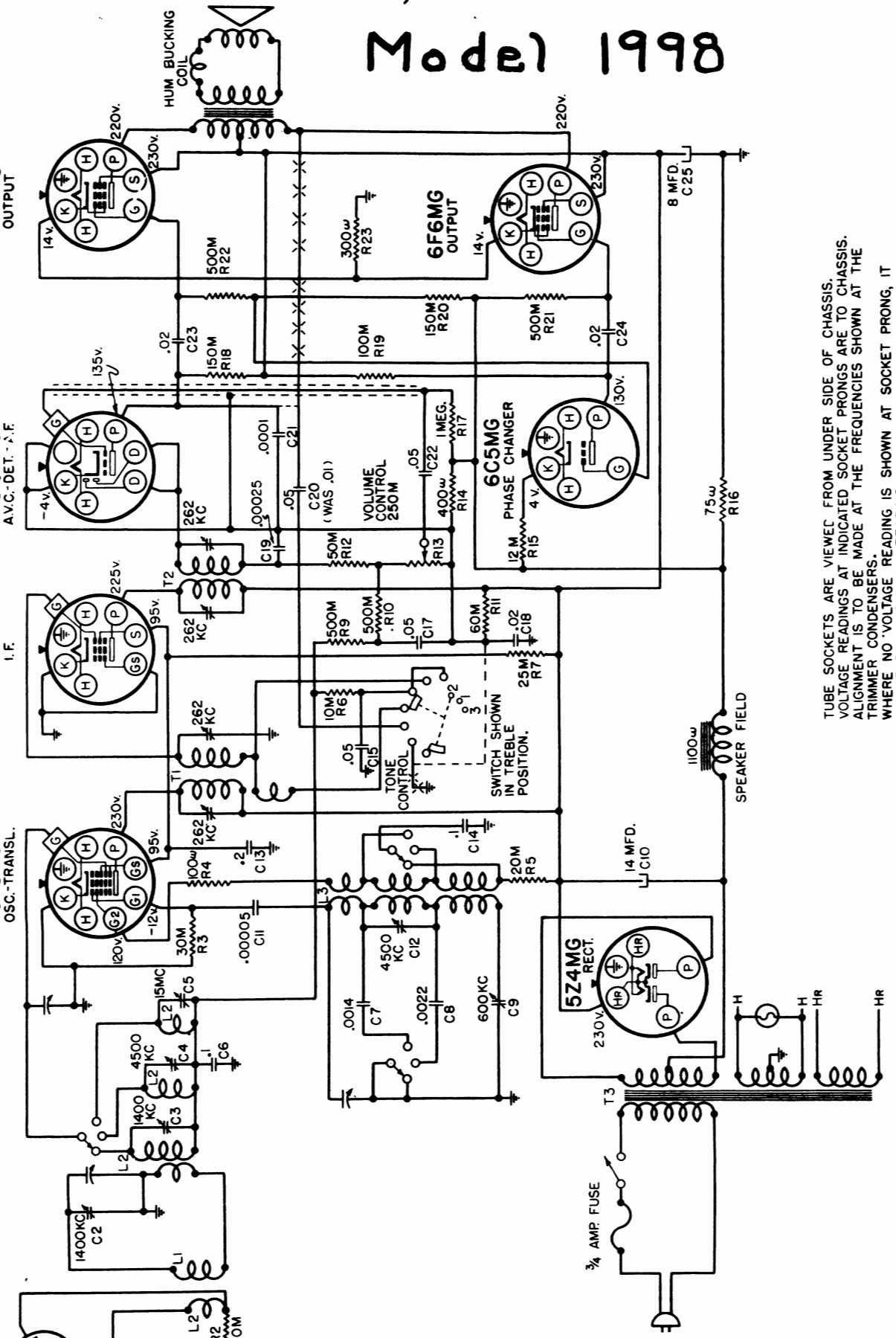
Model 1971 Auto Set



The filter circuit of the Gen-E-Motor has been changed. In addition, the 20M ohm resistor connected from the screen of the 78 RF to B plus has been changed to a 40M ohm resistor. A can, containing the parts for the filter circuit, has been mounted on top of the Gen-E-Motor housing. A plate has been soldered at the bottom of the Gen-E-Motor housing to improve the shielding. This plate must be unsoldered before it is possible to get at any of the parts mounted under the Gen-E-Motor housing.

SEARS, ROEBUCK & CO.

Model 1998



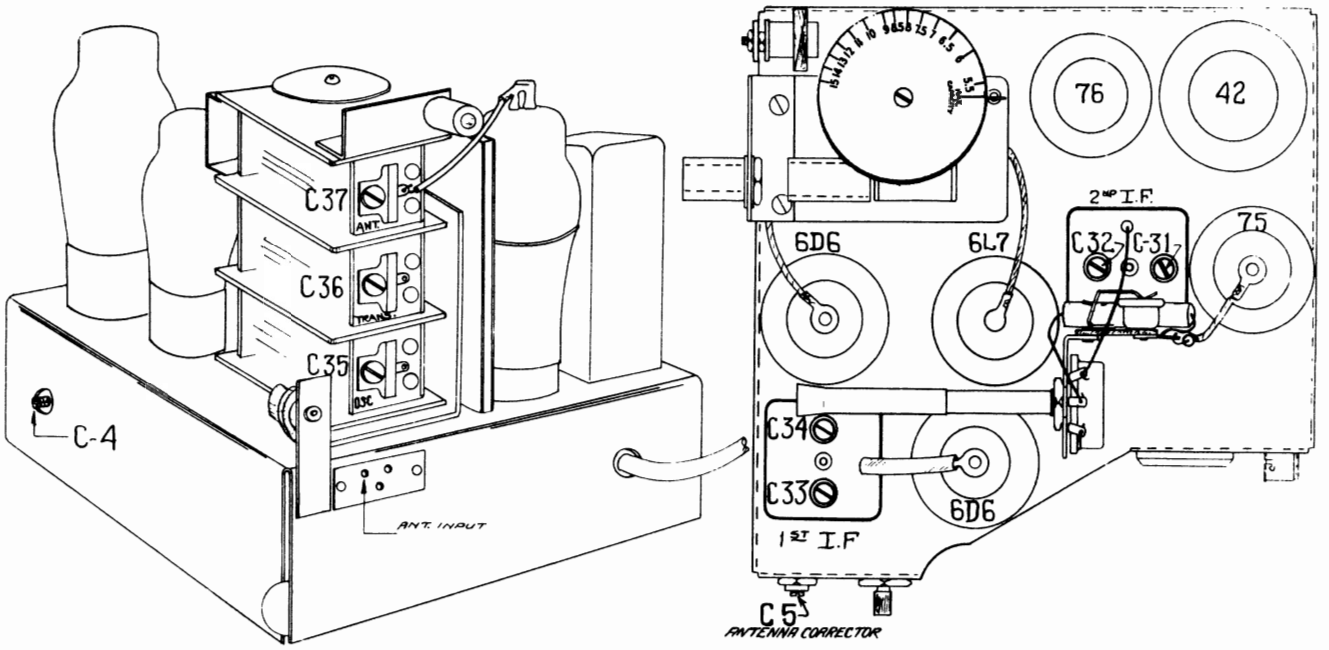
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

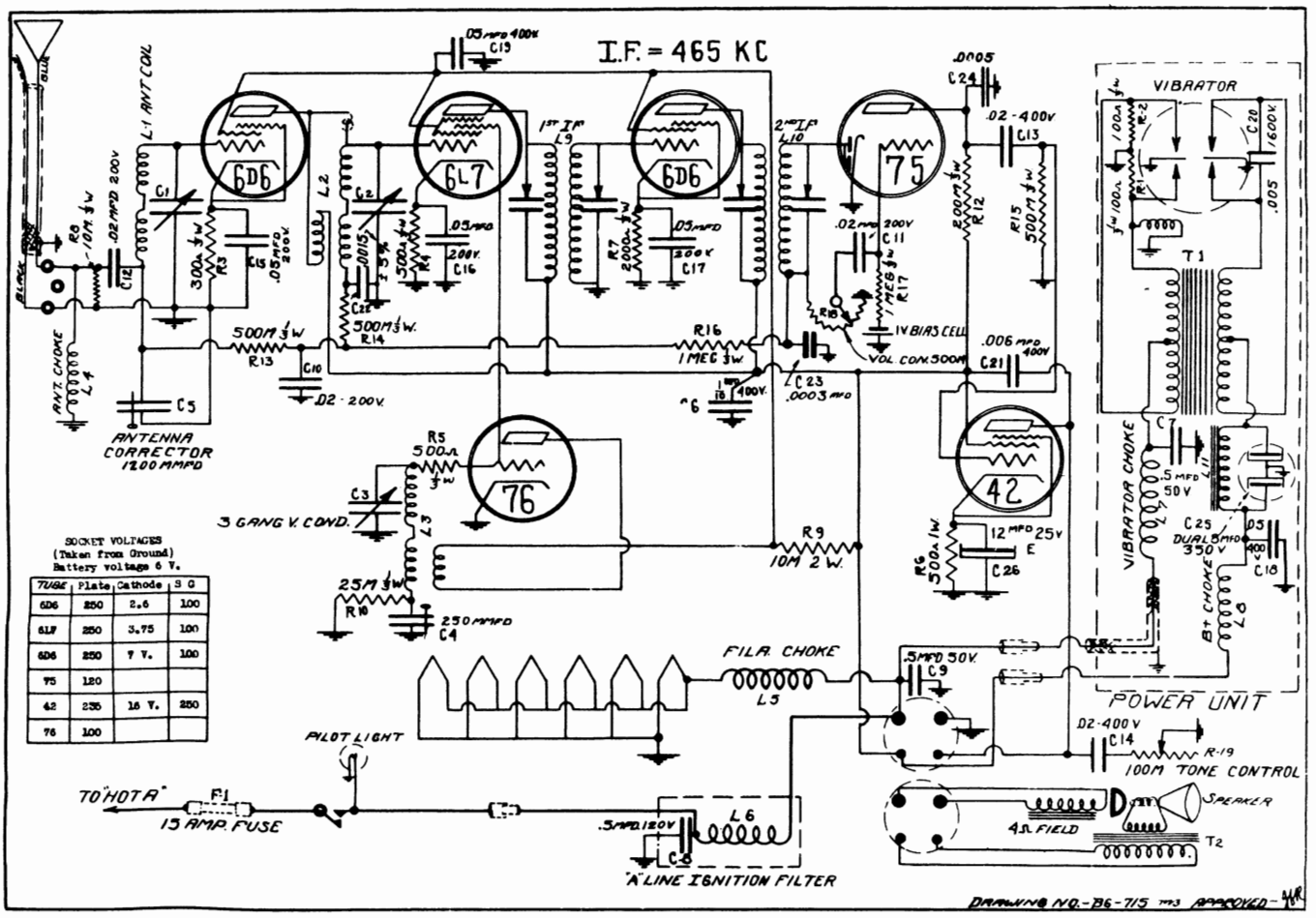
MODEL 1998

CIRCUIT CHANGES TO ELIMINATE HUM WHEN TONE CONTROL IS IN BASS POSITION. (C20 & TONE CONTROL SWITCH)
DOTTED LINES SHOW CIRCUIT BEFORE CHANGE WAS MADE.

SEARS, ROEBUCK & CO.

Model 4400 Auto Set





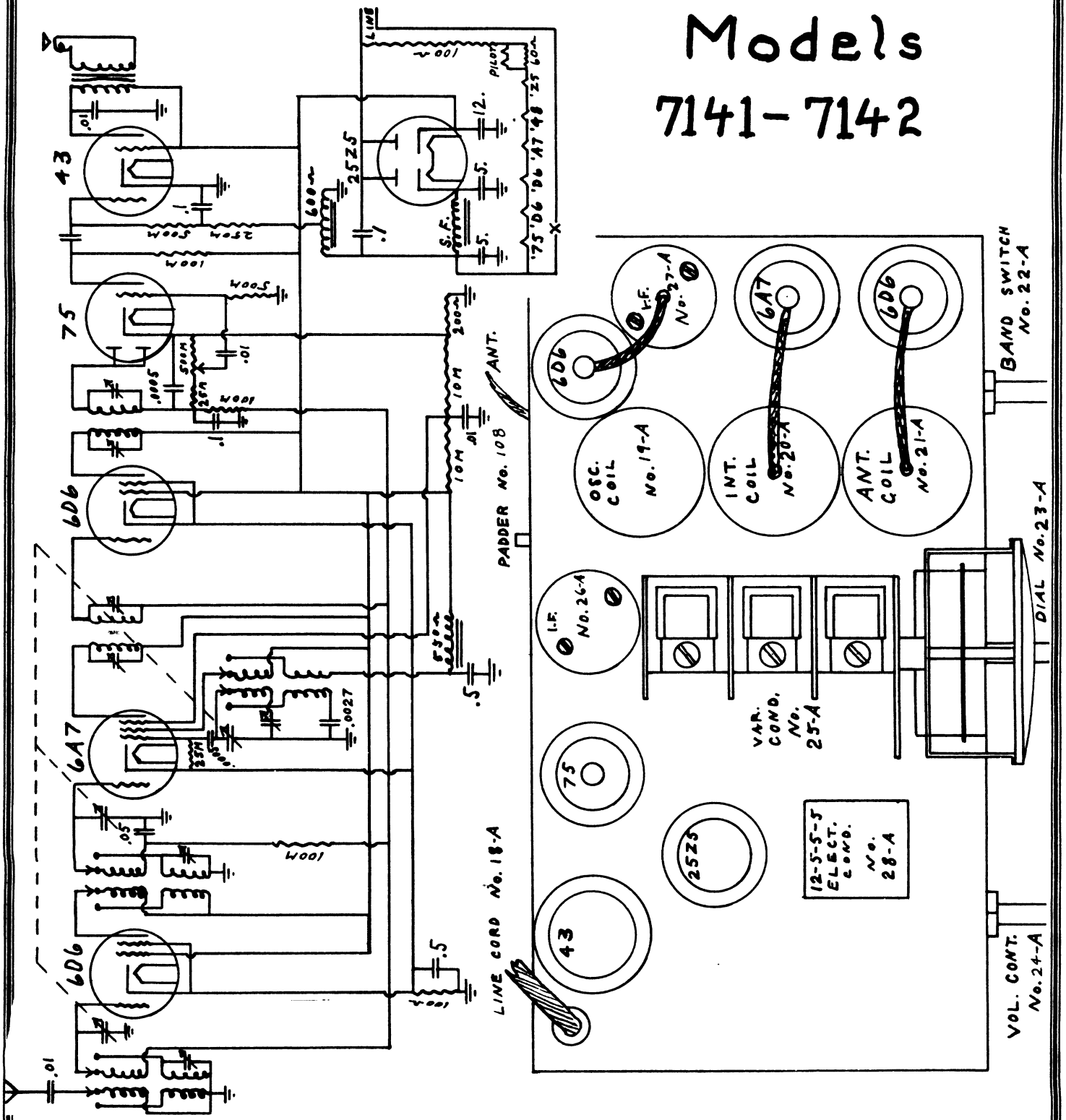
SOCKET VOLTAGES
(Taken from Ground)
Battery voltage 6 V.

TUBE	Plate	Cathode	S G
6D6	250	2.6	100
6L7	250	3.75	100
6D6	250	7 V.	100
75	120		
42	235	16 V.	250
76	100		

DRAWING NO.-B6-715 THIS APPROVED-

SEARS, ROEBUCK & CO.

Models 7141-7142



Type	Position	EF	EK	EG2	EG3	EP
6D6	RF & IF Amp.	6.3	2.2	85	2.2	85
6A7	1st Det.& Osc.	6.3	2.2	35	85•	85
75	2nd Det.& AVC	6.3	.8			55
43	Power output	30.	-.4#	85		80

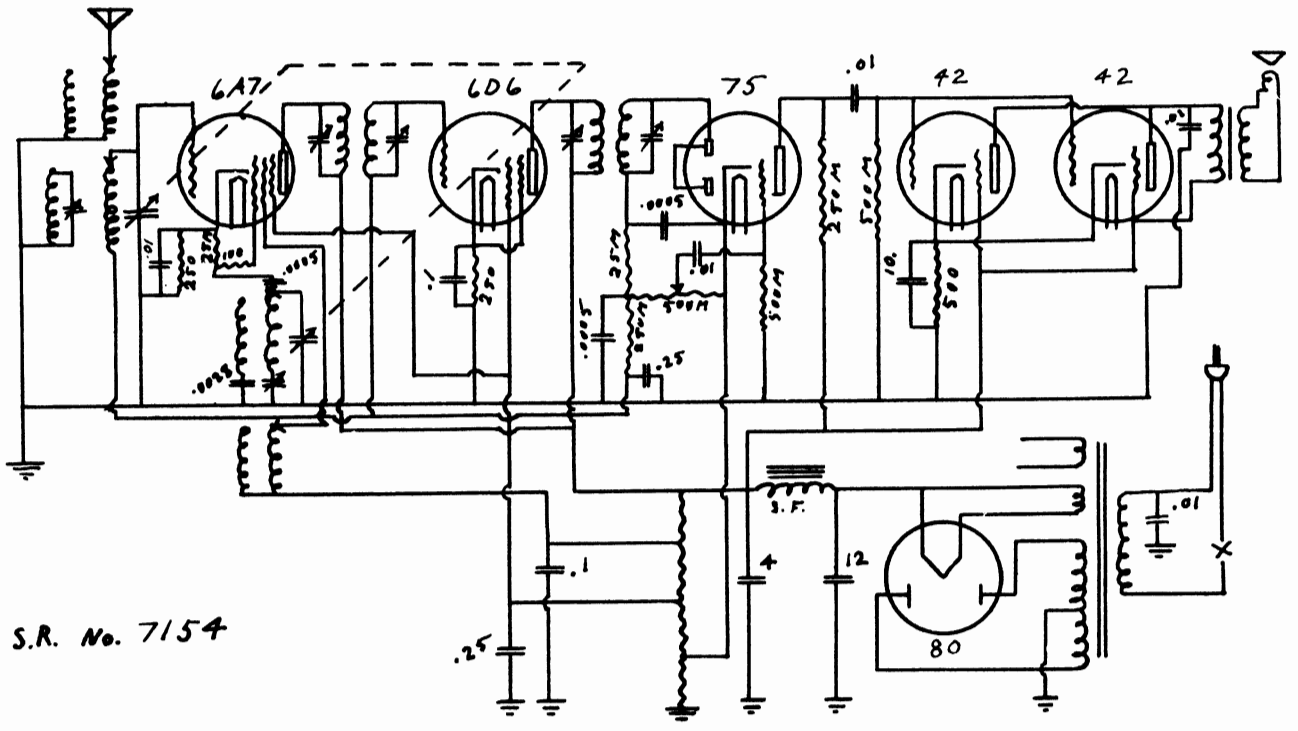
• Osc. plate
43 grid
F Filament

K - Cathode
G2- Screen grid
G3- Suppressor grid

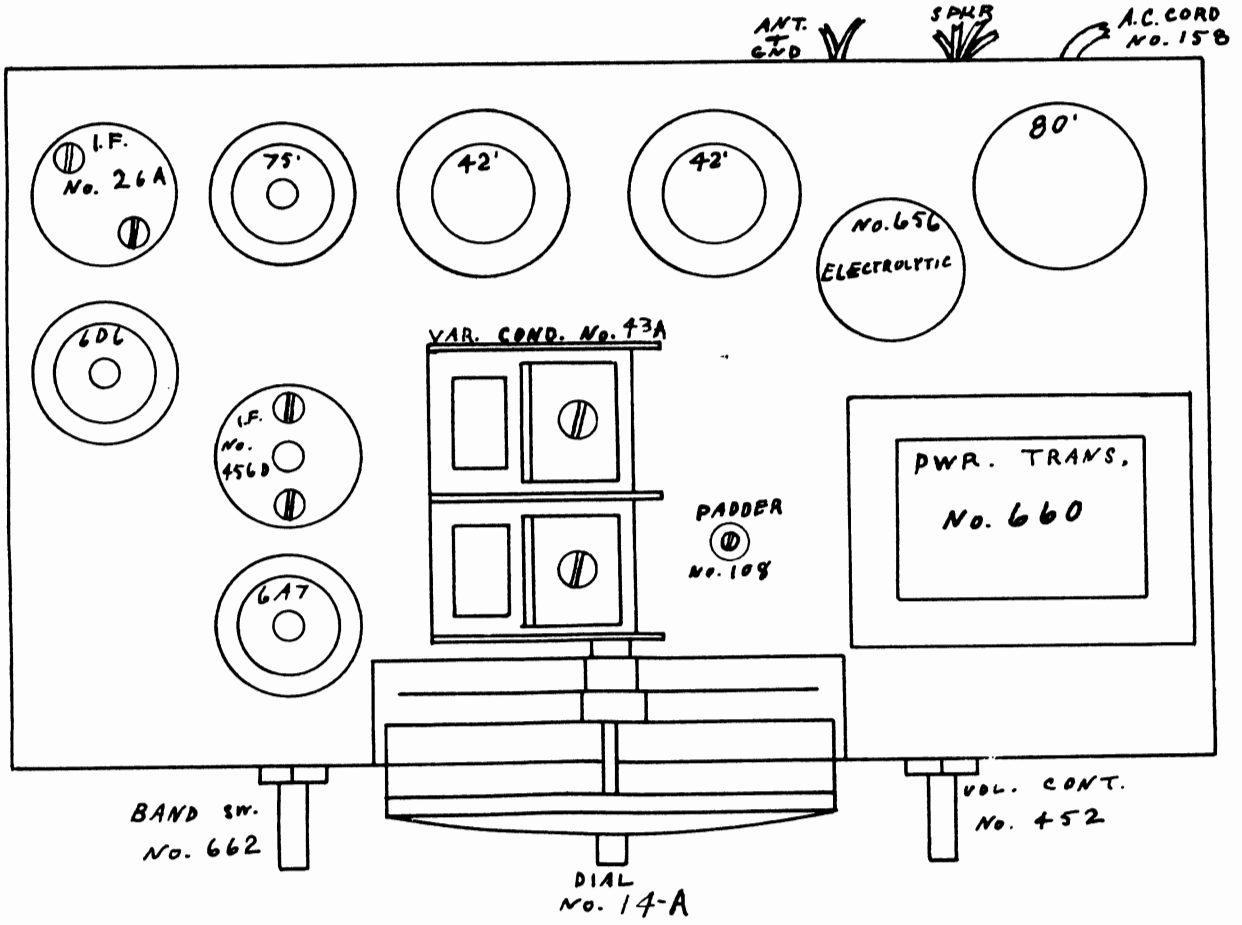
P - Plate

SEARS, ROEBUCK & CO.

Model 7154

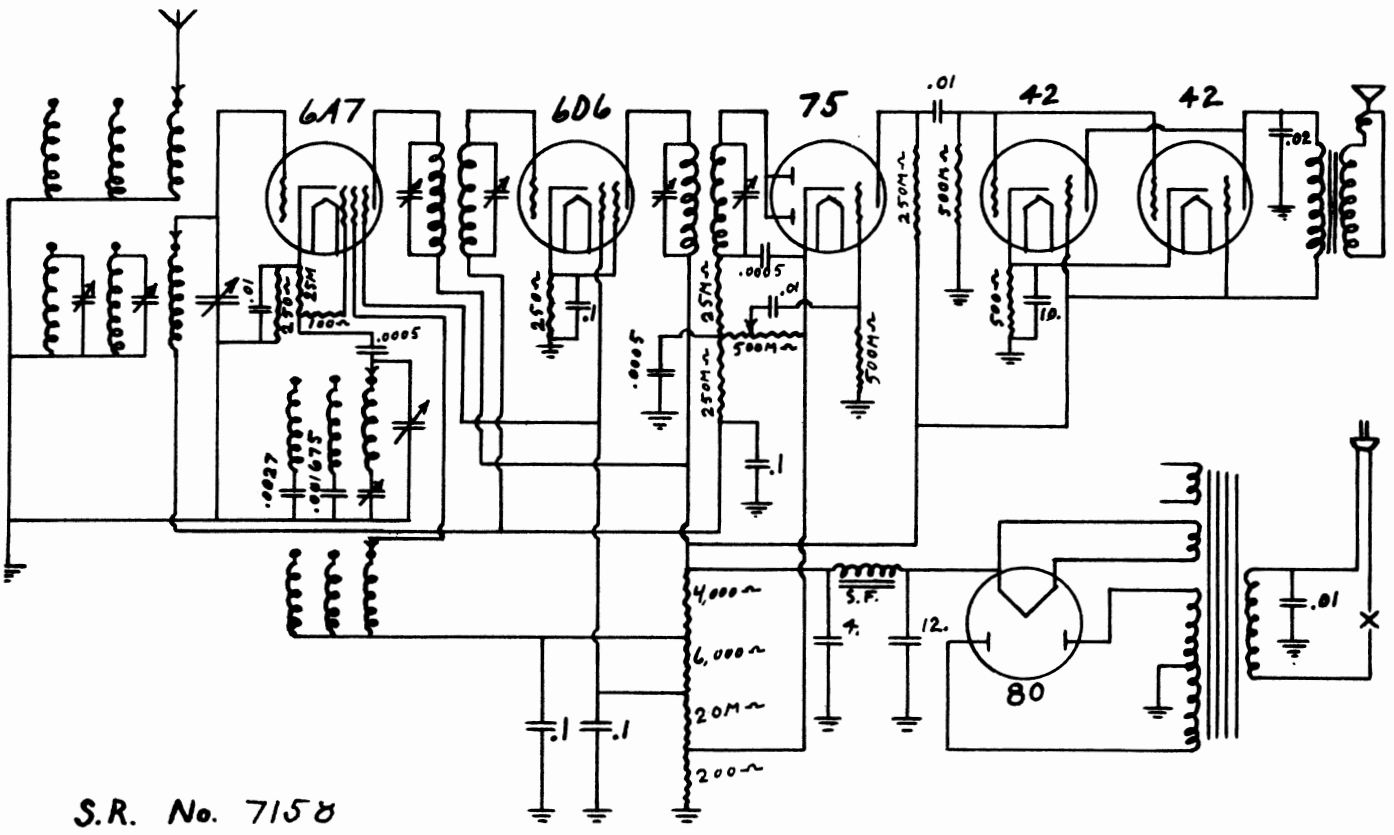


S.R. No. 7154

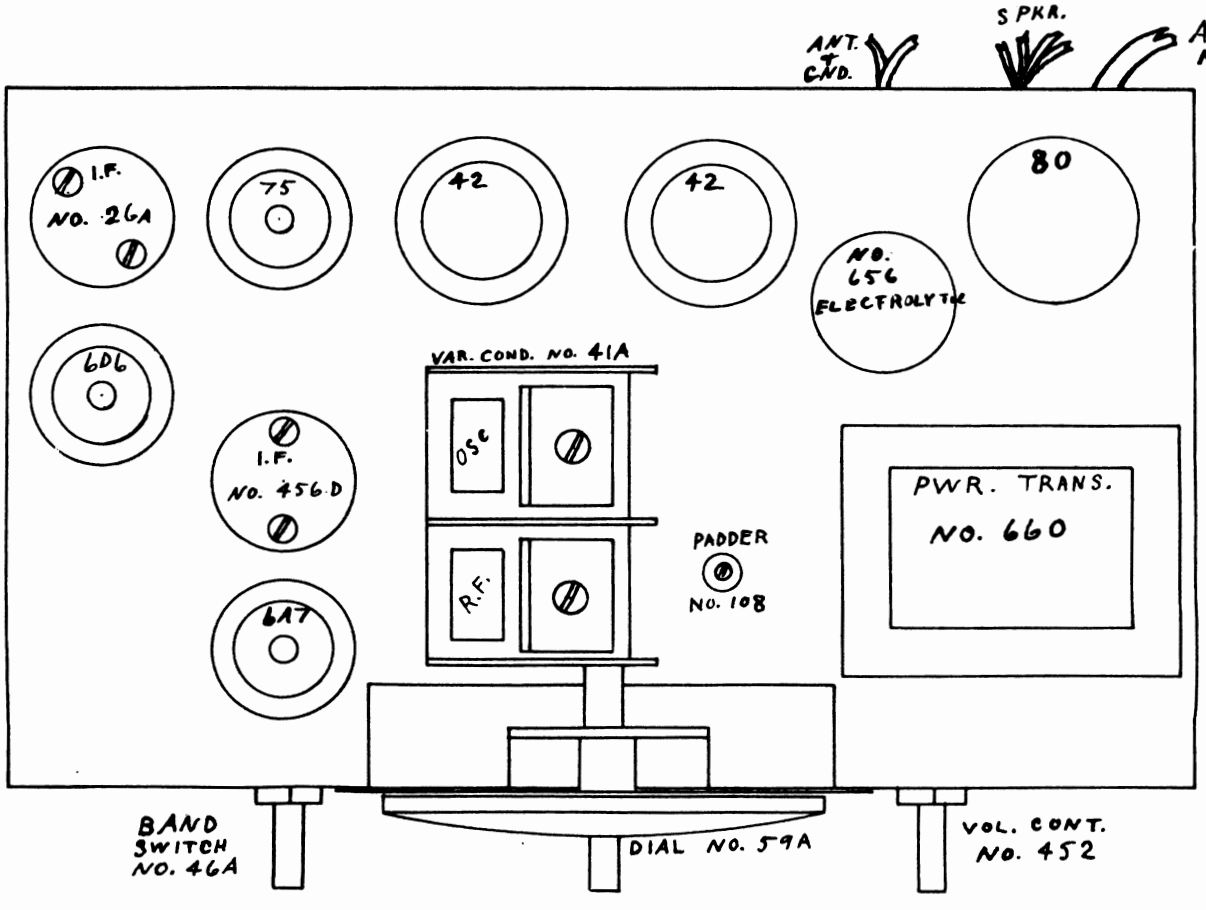


SEARS, ROEBUCK & CO.

Model 7158

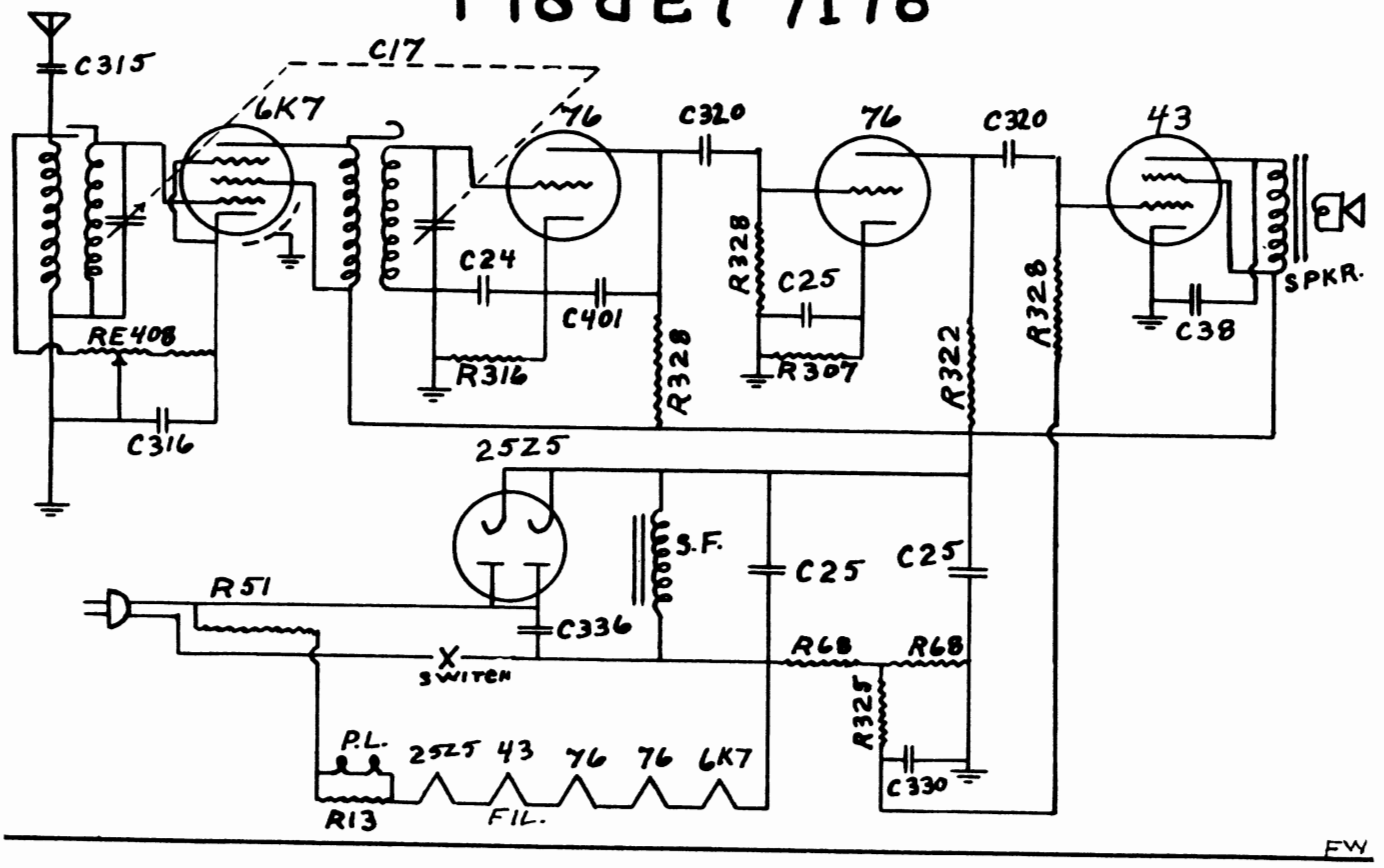


S.R. No. 7158



SEARS, ROEBUCK & CO.

Model 7176



LEGEND

C17 - 360 MMF. Var. Cond.
C24 - 5 MFD. 35V. Elect.
C25 - 16-8-5 MFD
C38 - .003 MFD. 800V.
C315 - .01 MFD. 200V
C316 - .01 MFD. 400V
C320 - .02 MFD. 200V
C330 - .05 MFD. 200V
C336 - .1 MFD. 400V
C401 - .0001 Mica

R13 - 50 OHMS.
R51 - 135 OHM. Cordohm
R68 - 400 OHMS
R307 - 2,500 OHMS
R316 - 15,000 OHMS
R322 - 50,000 OHMS
R328 - 1 MEG.
RE408 - 300,000 OHM Vol. Cont.
P.L. - Pilot Lights
S.L. - Speaker Field

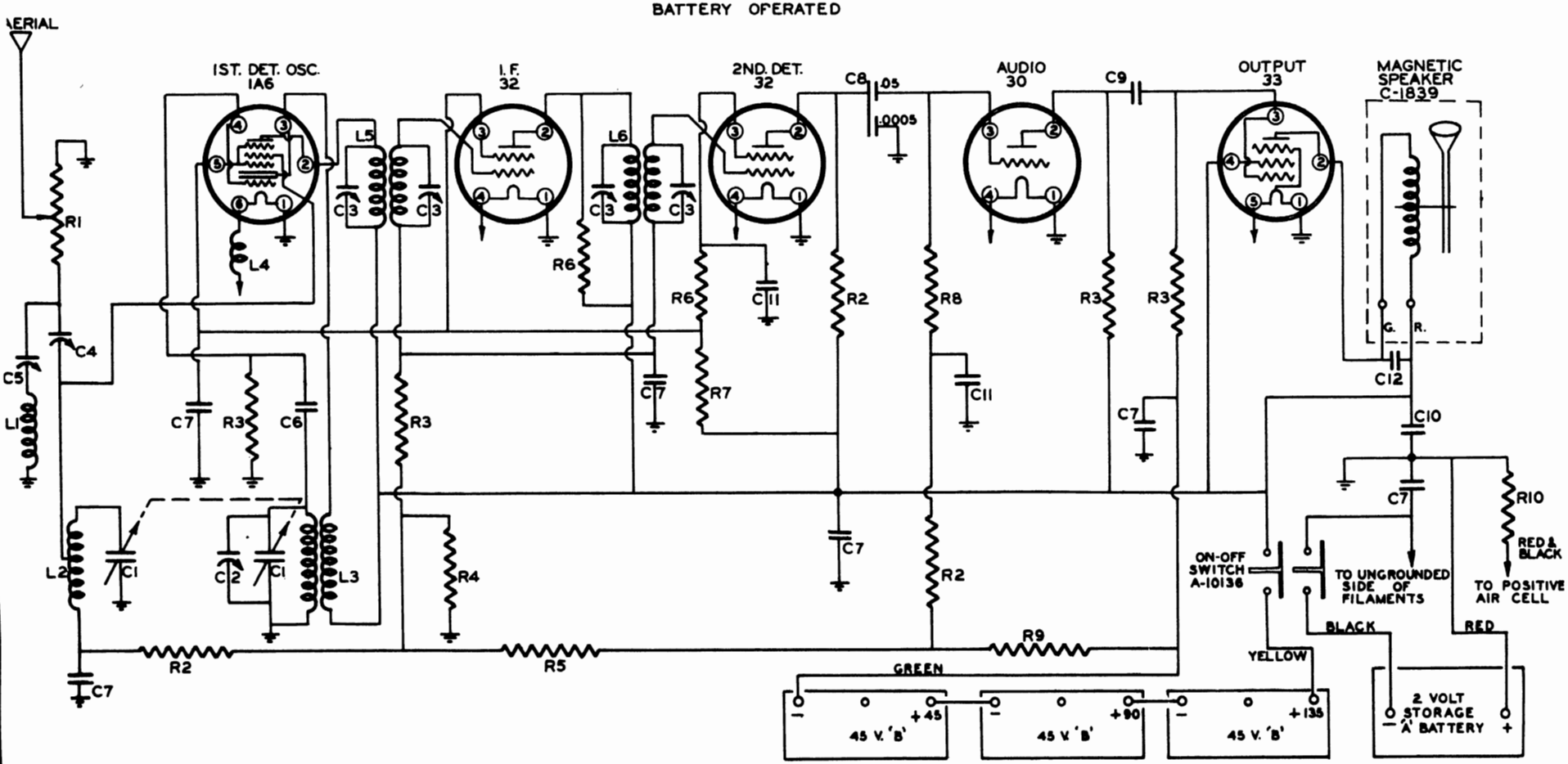
SERVICE SUGGESTIONS

An open filament will of course cause the receiver to be inoperative. With an AC DC receiver, an open filament of any tube will cause all tubes not to light, so all tubes must be tested to determine which one is faulty.

Another common source of trouble is with the 25Z5 tube. If this tube is burned out, check filter condenser before replacing the tube, in as much as the tube burn out may cause the filter to short. In such cases merely replacing the tube would do nothing more than blow the tube again. In most cases it will be necessary to replace both tube and filter.

Of course the usual proceedure of tube checking and examination of antenna and power connections will correct the majority of troubles with a receiver of this type.

SCHEMATIC DIAGRAM
SPARTON MODEL 58 SUPERHETERODYNE
COUNTRY HOME RECEIVER
BATTERY OPERATED



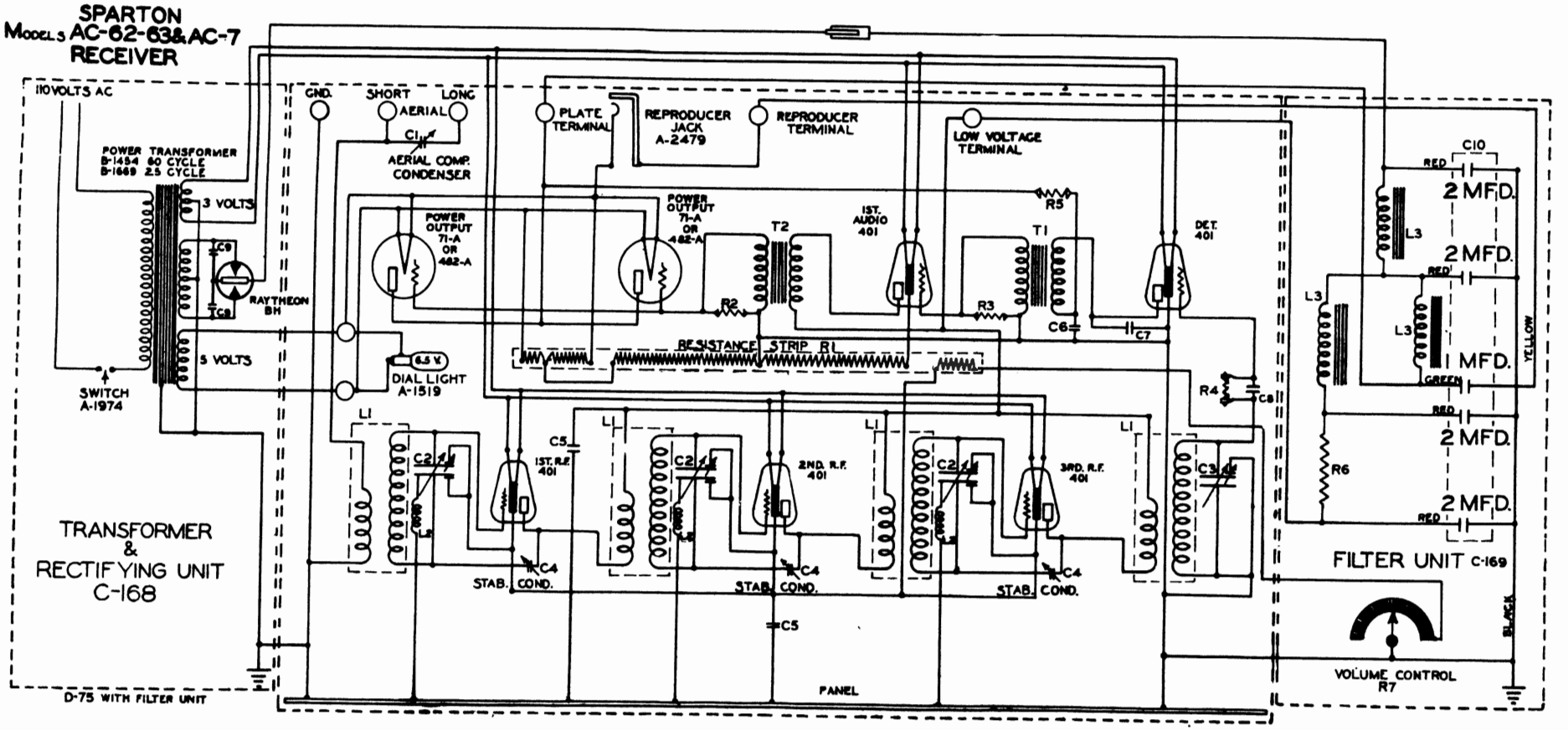
C1	VARIABLE CONDENSER		B-5650-1
C2	ADJUSTABLE CONDENSER		
C3	I. F. TRANSFORMER TRIMMERS		
C4	ANTENNA TRIMMER		A-7809-2
C5	EQUALIZING TRIMMER		A-7809-3
C6	.00025 MFD.	MOLDED	A-5175
C7	.2 MFD.	200 V.	A-6869-A
C8	.05-.0005 MFD.	200 V.	A-9576
C9	.025 MFD.	200 V.	A-10206
C10	2 MFD.	150 V.	A-10318
C11	.05 MFD.	200 V.	A-9919
C12	.006 MFD.	600 V.	A-4434

R1	25,000 Ω	VOLUME CONTROL	A-10316
R2	250,000 Ω	.25 W.	B-5737-1
R3	50,000 Ω	.25 W.	B-5737-4
R4	200 Ω	WIREWOUND	B-5243-2
R5	100 Ω	WIREWOUND	B-5243-14
R6	500,000 Ω	.25 W.	B-5737-5
R7	25,000 Ω	.5 W.	B-4114-18
R8	100,000 Ω	.25 W.	B-5737-2
R9	750 Ω	WIREWOUND	B-5243-8
R10	.47 Ω	WIREWOUND	A-10000-3

L1	ANT. CHOKE COIL	A-9750
L2	NO. 1 R.F. COIL	A-11564
L3	OSCILLATOR COIL	A-10330
L4	CATHODE CHOKE	A-10401
L5	NO. 1 I.F. TRANSFORMER	A-10229-4
L6	NO. 2 I.F. TRANSFORMER	A-10356-1

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON MODELS AC-62, AC-63 AND AC-7



NOTE: MODELS AC-62, AC-63 EQUIPPED WITH ONE POWER OUTPUT TUBE
MODEL AC-62 NOT EQUIPPED WITH DIAL LIGHT

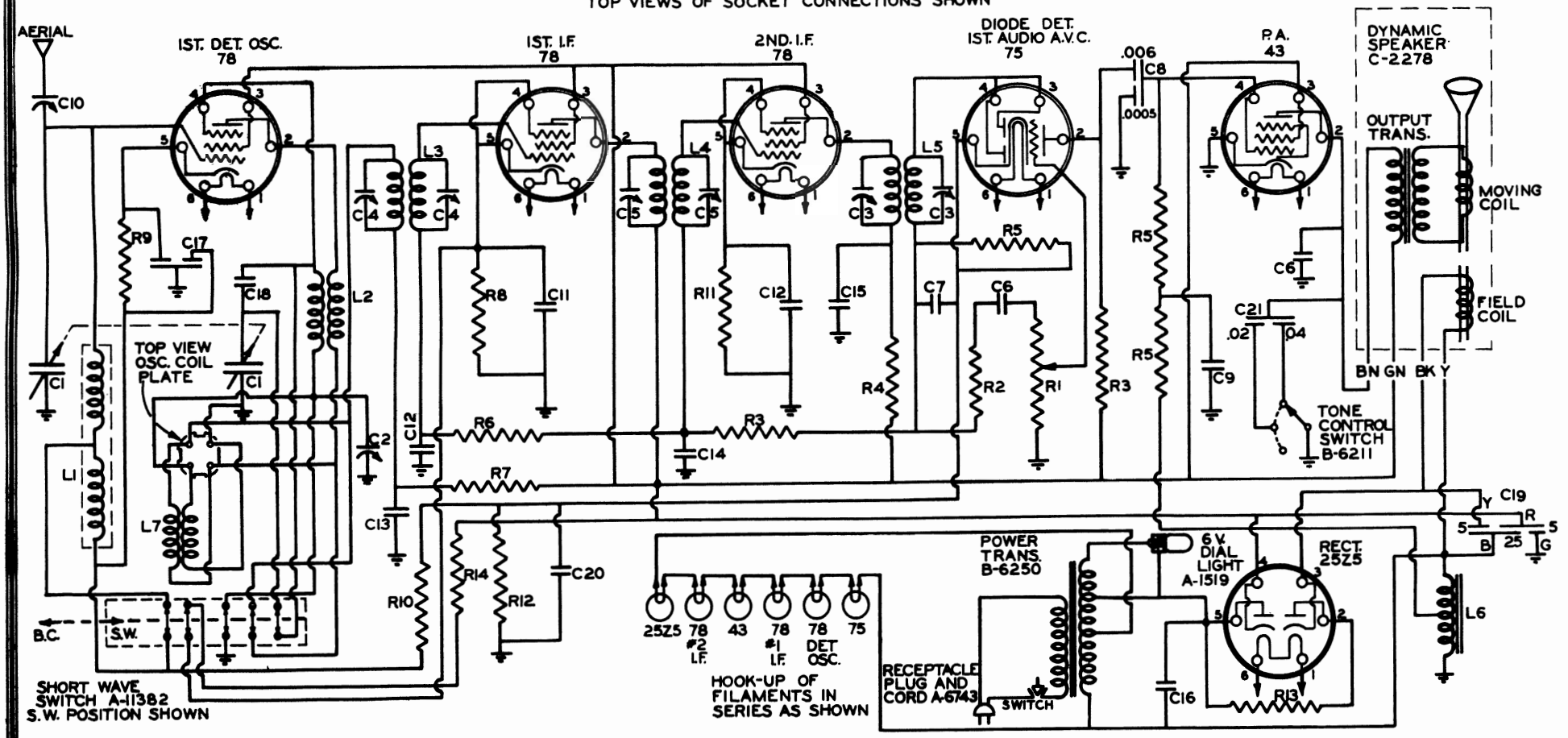
C1	AERIAL COMP. CONDENSER	A-2545
C2	VARIABLE CONDENSER	B-1457
C3	VARIABLE CONDENSER	B-1458
C4	NEUTRALIZING CONDENSER	A-2480-1
C5	.5 MFD.	A-2434
C6	1 MFD.	A-2511
C7	.002 MFD.	A-2441
C8	.00025 MFD.	A-2440
C9	BUFFER CONDENSER .1-1 MFD.	A-3494
C10	BLOCK CONDENSER 60 CYCLE	B-1642
	25 CYCLE	B-1476

R1	GRID BIAS RESISTOR — AC-62, AC-63	A-2777
	GRID BIAS RESISTOR — AC-7	A-2540
R2	1 MEGOHM	A-2702-11
R3	.25 MEGOHM	A-2702-6A
R4	3 MEGOHM	A-2702-13D
R5	20,000 OHM	A-2702-5C
R6	10,000 OHM	A-2043
R7	20,000 OHM	A-2460

L1	R.F. TRANSFORMER	A-2506
L2	R.F. CHOKE	A-2418
L3	FILTER CHOKE	A-1977
T1	FIRST AUDIO TRANSFORMER	B-1456-1
T2	SECOND AUDIO TRANSFORMER	B-1456-2

SCHEMATIC DIAGRAM
SPARTON MODELS 65T AND 66T SUPERHETERODYNE
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF SOCKET CONNECTIONS SHOWN

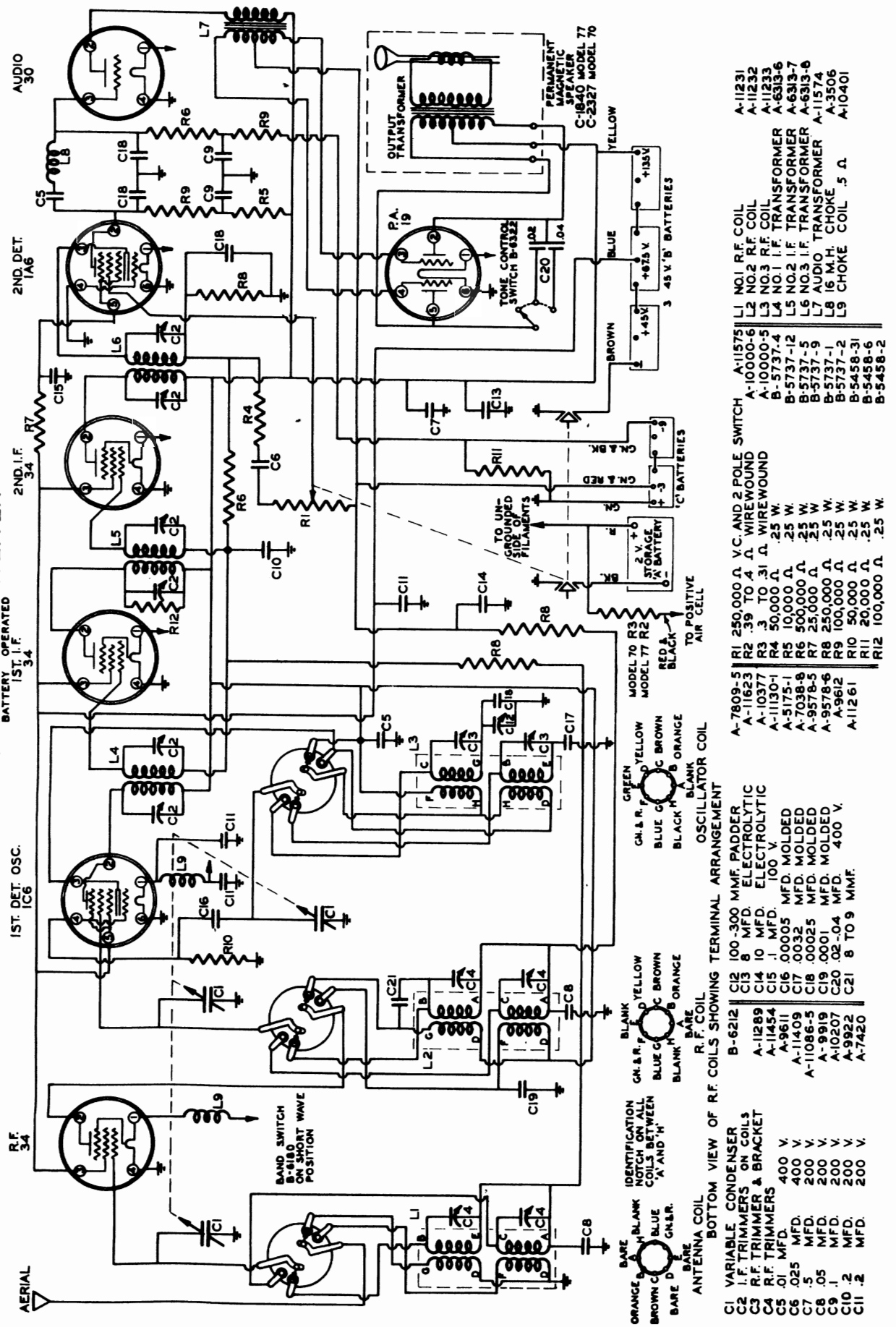


SPARKS WITHINGTON CO.

C1	VARIABLE CONDENSER	B-6153
C2	B.C. OSCILLATOR TRIMMER	A-10972
C3	ADJUSTABLE CONDENSER	A-11474
C4	ADJUSTABLE CONDENSER	A-10977
C5	ADJUSTABLE CONDENSER	A-11034
C6	.006 MFD. 400 V.	A-11130-4
C7	.0005 MFD. MOLDED	A-11095-1
C8	.006-.0005 MFD. 400 V.	A-11092-2
C9	.5 MFD. 100 V.	A-11130-2
C10	ANTENNA TRIMMER	A-11071
C11	.1 MFD. 100 V.	A-11086-1
C12	.05 MFD. 100 V.	A-11086-2
C13	.05 MFD. 200 V.	A-11087-1
C14	.1 MFD. 100 V.	A-11089-1
C15	.05 MFD. 200 V.	A-11086-3
C16	.025 MFD. 400 V.	A-11086-4
C17	.05-.05 MFD. 100 V.	A-11092-1
C18	.0005 MFD. MOLDED	A-9578-14
C19	5-25-5 MFD. ELECTROLYTIC	A-11093
C20	.1 MFD. 100 V.	A-11130-1
C21	.04-.02 MFD. 200 V.	A-9612-1
R1	250,000 Ω VOL. CONTROL	A-11492
R2	50,000 Ω .25 W.	B-5458-27
R3	500,000 Ω .25 W.	B-5458-28
R4	3,000 Ω .25 W.	B-5458-19
R5	300,000 Ω .25 W.	B-5458-29
R6	100,000 Ω .25 W.	B-5458-30
R7	15,000 Ω .5 W.	B-4114-23
R8	1,700 Ω .25 W.	B-5458-15
R9	290 Ω WIREWOUND	B-5243-36
R10	2,200 Ω WIREWOUND	B-5243-13
R11	2,200 Ω .25 W.	B-5458-1
R12	100 Ω WIREWOUND	B-5243-37
R13	50 Ω 2 W.	B-6061-2
R14	50,000 Ω .25 W.	B-5458-31
L1	PRE-SELECTOR COIL	A-11045
L2	FOREIGN BAND OSC. COIL	A-11047
L3	NO. 1 I.F. TRANSFORMER	A-11039
L4	NO. 2 I.F. TRANSFORMER	A-11040
L5	NO. 3 I.F. TRANSFORMER	A-11535
L6	CHOKE COIL	A-11038
L7	BROADCAST OSC. COIL	A-11068

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON MODELS 70 AND 77 SUPERHETERODYNE COUNTRY HOME RECEIVER
BATTERY OPERATED



C1	VARIABLE CONDENSER	B-6212
C2	I.F. TRIMMERS ON COILS	
C3	R.F. TRIMMER & BRACKET	A-11289
C4	R.F. TRIMMERS	A-11454
C5	.01 MFD. 400 V.	A-9611
C6	.025 MFD. 400 V.	A-11409
C7	.5 MFD. 200 V.	A-11086-5
C8	.05 MFD. 200 V.	A-9919
C9	.1 MFD. 200 V.	A-10207
C10	.2 MFD. 200 V.	A-9922
C11	.2 MFD. 200 V.	A-7420
C12	100-300 MMF. PADDER	A-7809-5
C13	8 MFD. ELECTROLYTIC	A-11623
C14	10 MFD. ELECTROLYTIC 100 V.	A-10377
C15	.1 MFD.	A-11130-1
C16	.00005 MFD. MOLDED	A-5175-1
C17	.0032 MFD. MOLDED	A-7038-8
C18	.00025 MFD. MOLDED	A-9578-5
C19	.0001 MFD. MOLDED	A-9578-6
C20	.02-.04 MFD. 400 V.	A-9612
C21	8 TO 9 MMF.	A-11261

R1	250,000 Ω V.C. AND 2 POLE SWITCH	A-11575
R2	.39 TO .4 Ω WIREWOUND	A-10000-6
R3	.3 TO .31 Ω WIREWOUND	A-10000-5
R4	50,000 Ω .25 W.	B-5737-4
R5	10,000 Ω .25 W.	B-5737-12
R6	500,000 Ω .25 W.	B-5737-5
R7	25,000 Ω .25 W.	B-5737-9
R8	250,000 Ω .25 W.	B-5737-1
R9	100,000 Ω .25 W.	B-5737-2
R10	50,000 Ω .25 W.	B-5458-31
R11	20,000 Ω .25 W.	B-5458-6
R12	100,000 Ω .25 W.	B-5458-2

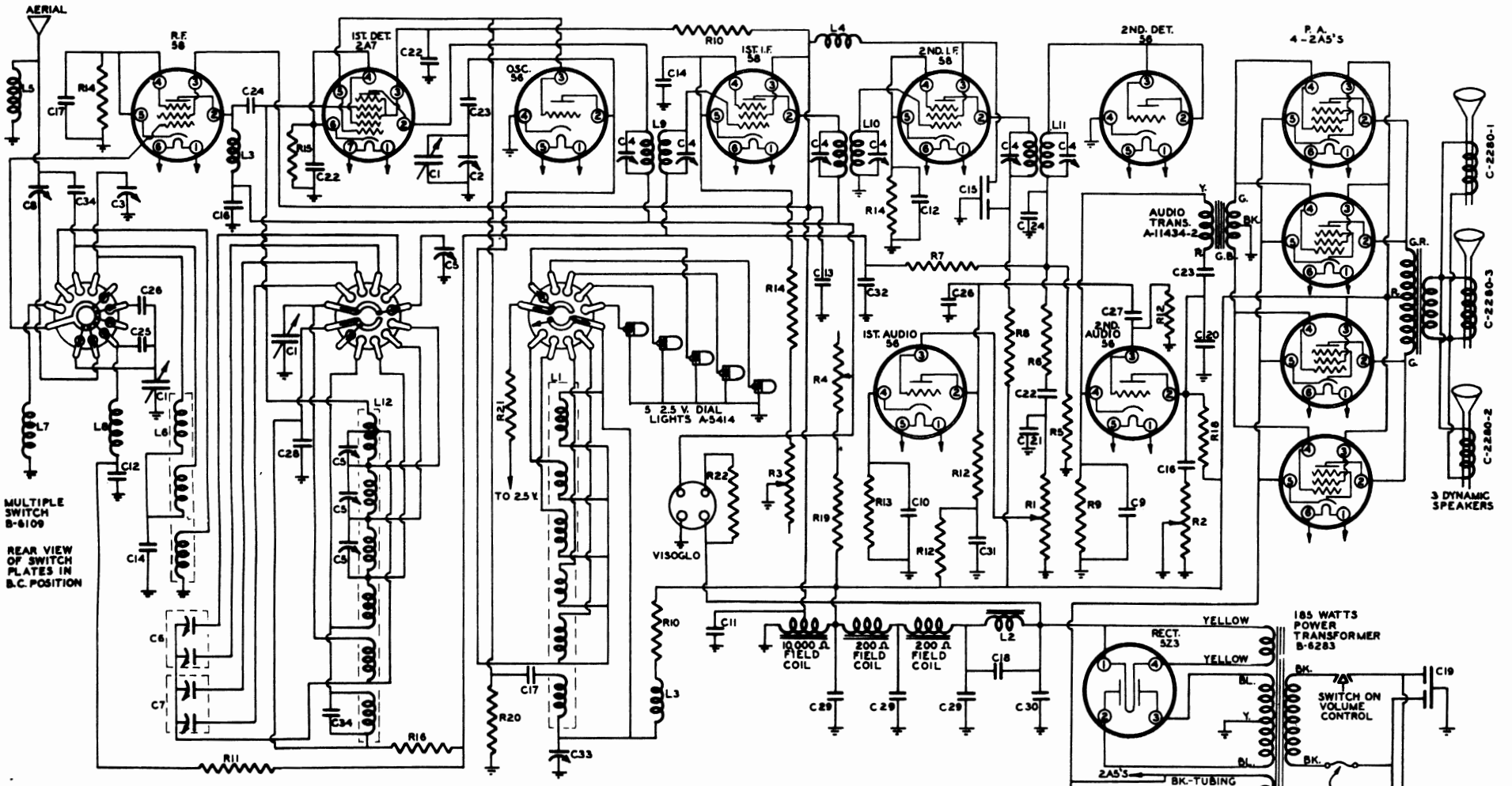
L1	NO.1 R.F. COIL	A-11231
L2	NO.2 R.F. COIL	A-11232
L3	NO.3 R.F. COIL	A-11233
L4	NO.1 I.F. TRANSFORMER	A-6313-6
L5	NO.2 I.F. TRANSFORMER	A-6313-7
L6	NO.3 I.F. TRANSFORMER	A-6313-8
L7	AUDIO TRANSFORMER	A-11574
L8	16 M.H. CHOKE	A-3506
L9	CHOKE COIL .5 Ω	A-10401

SPARTON MODELS 134 AND 136 SUPERHETERODYNE

SCHEMATIC DIAGRAM

INTERMEDIATE FREQUENCY 456 KILOCYCLES

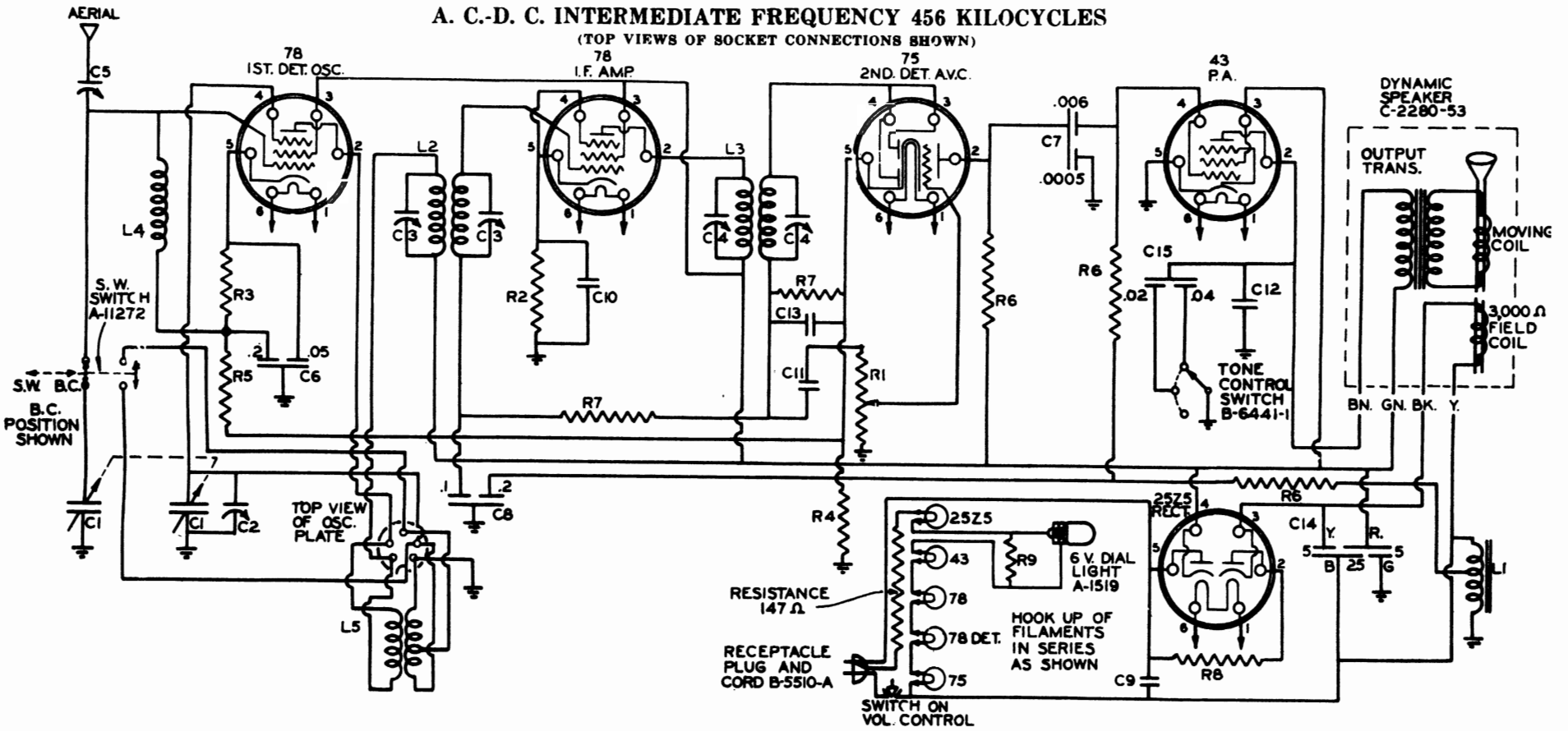
(TOP VIEWS OF SOCKET CONNECTIONS SHOWN)



C1	VARIABLE CONDENSER	C-1994
C2	EQUALIZING CONDENSER	
C3	S.W. ANT. EQUAL. COND.	A-10520
C4	I.F. TRIMMING COND.	A-6580-1
C5	TRIMMING CONDENSERS	A-7809-2
C6	TANDEM TRIMMER	A-10646-4
C7	TANDEM TRIMMER	A-10646-3
C8	B.C. BAND ANT. EQ. COND.	A-7809-2
C9	10 MFD. 25 V.	A-10377
C10	10 MFD. 25 V.	A-11582
C11	10 MFD. 200 V.	A-6316-1
C12	.1 MFD. 200 V.	A-7224
C13	.2 MFD. 200 V.	A-7005
C14	.05 MFD. 200 V.	A-10205
C15	.05-.05 MFD. 400 V.	A-9920
C16	.05 MFD. 400 V.	A-8927
C17	.006 MFD. 400 V.	A-9916
C18	.5 MFD. 400 V.	A-10758-3
C19	.006-.006 MFD. 600 V.	A-7878
C20	.002 MFD. MOLDED	A-9578-1
C21	.00025 MFD. MOLDED	A-9578-5
C22	.025 MFD. 200 V.	A-10206-1
C23	.025 MFD. 400 V.	A-9575
C24	.00025 MFD. MOLDED	A-5175
C25	.001 MFD. MOLDED	A-7038-2
C26	.0005 MFD. MOLDED	A-9578
C27	.025 MFD. 400 V.	A-10758-2
C28	.05 MFD. 100 V.	A-8315-1
C29	.5 MFD. 400 V.	A-8611-A
C30	4 MFD. 500 V.	A-8123-1
C31	2 MFD. 250 V.	A-10809-1
C32	.1 MFD. 100 V.	A-11130-1
C33	PADDING CONDENSER	A-9941
C34	.000012 MFD.	A-10896
R1	250,000 Ω VOL. CONTROL	A-10447
R2	100,000 Ω TONE CONTROL	A-10418
R3	100,000 Ω SENSITIVITY CONT.	A-10446
R4	5,000 Ω VOLT. REGULATOR	A-11381
R5	300,000 Ω .25 W.	B-5458-4
R6	50,000 Ω .25 W.	B-5458-5
R7	500,000 Ω .25 W.	B-5458-12
R8	3,000 Ω .25 W.	B-5458-21
R9	1,700 Ω WIREWOUND	B-5243-27
R10	10,000 Ω .5 W.	B-4114-7
R11	10,000 Ω .25 W.	B-5458-20
R12	100,000 Ω .25 W.	B-5458-34
R13	5,000 Ω .5 W.	B-4114-20
R14	400 Ω WIREWOUND	B-5243-41
R15	500 Ω WIREWOUND	B-5243-32
R16	2,000 Ω .25 W.	B-5458-14
R17	170 Ω WIREWOUND	B-6061-6
R18	20,000 Ω .5 W.	B-4114-24
R19	7,000 Ω WIREWOUND	B-6061-7
R20	25,000 Ω .25 W.	B-5458-17
R21	1 Ω RESISTANCE WIRE	A-10717
R22	1,000,000 Ω .25 W.	B-5737-6
L1	OSCILLATOR COIL	A-10629
L2	CHOKE COIL	A-8572-2
L3	18 M.H. CHOKE COIL	A-3506
L4	CATHODE CHOKE COIL	A-7209
L5	ANT. CHOKE COIL	A-8145-1
L6	NO. 2,3,4 S.W. ANT. COIL	A-10893
L7	NO. 5 S.W. ANT. COIL	A-10853
L8	NO. 1 R.F. COIL	A-10805
L9	NO. 1 I.F. TRANSFORMER	A-10454
L10	NO. 2 I.F. TRANSFORMER	A-10455
L11	NO. 3 I.F. TRANSFORMER	A-10456
L12	R.F. TRANSFORMER	A-10885

SPARKS WITHINGTON CO.

SPARTON MODEL 506 SUPERHETERODYNE
SPARTON MODEL 594 SUPERHETERODYNE
SCHEMATIC DIAGRAM
A. C.-D. C. INTERMEDIATE FREQUENCY 456 KILOCYCLES
(TOP VIEWS OF SOCKET CONNECTIONS SHOWN)

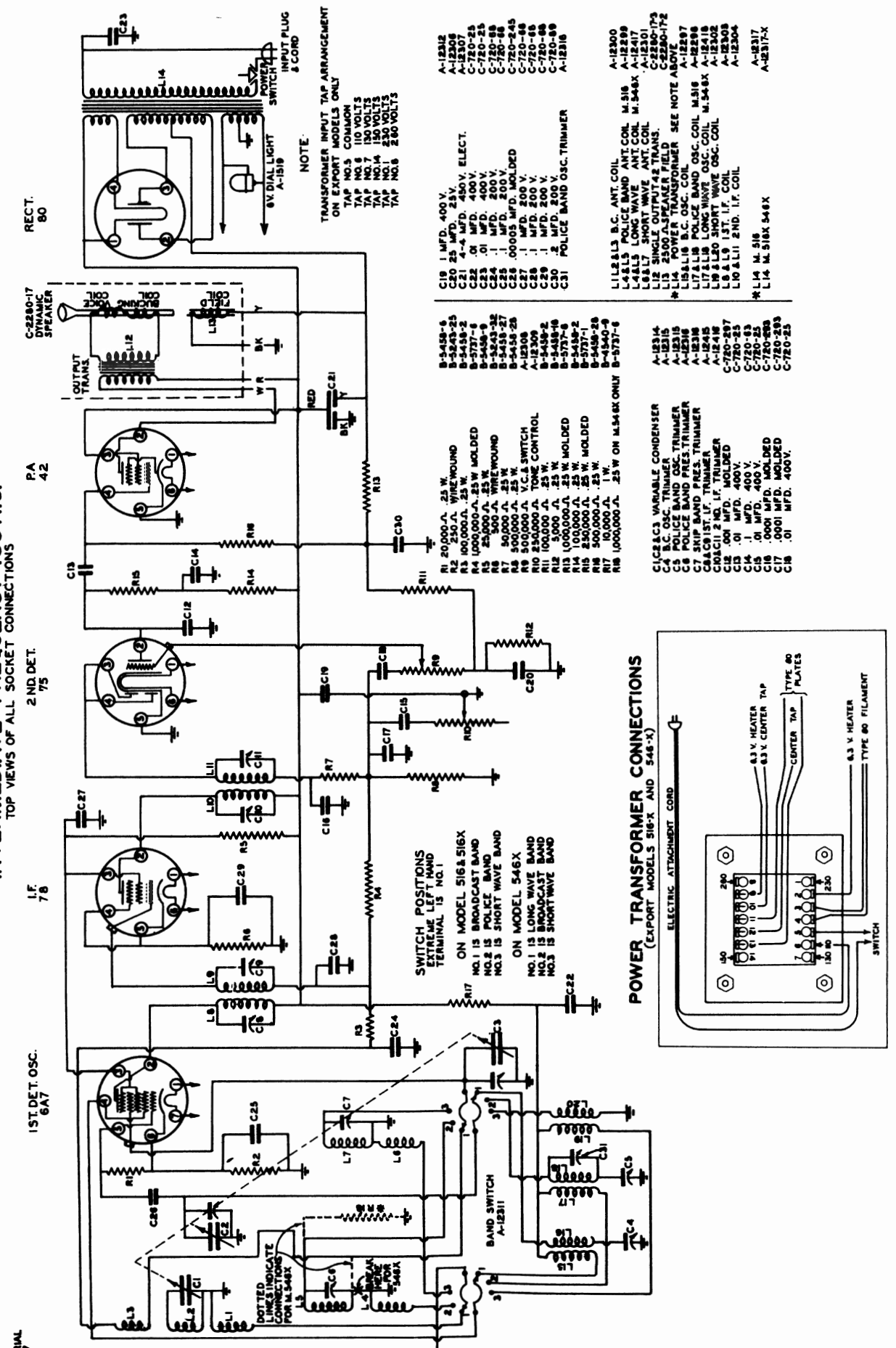


C1	VARIABLE CONDENSER	B-5509	C8	.1-.2 MFD. 100 V.	A-11092-6	R1	500,000 Ω VOL. CONTROL	A-11480	L1 TAPPED CHOKE A-9566
C2	ADJUSTABLE CONDENSER		C9	.025 MFD. 400 V.	A-11086-4	R2	400 Ω WIREWOUND	B-5243-30	L2 NO. 1 I.F. TRANSFORMER A-11476
C3	NO. 1 I.F. TRIMMER	A-11474	C10	.1 MFD. 100 V.	A-11130-1	R3	290 Ω WIREWOUND	B-5243-36	L3 NO. 2 I.F. TRANSFORMER A-11477
C4	NO. 2 I.F. TRIMMER	A-9553	C11	.006 MFD. 400 V.	A-11130-4	R4	100 Ω WIREWOUND	B-5243-37	L4 PRE SELECTOR COIL A-9601
C5	ANTENNA TRIMMER	A-11499	C12	.01 MFD. 200 V.	A-11130-7	R5	2,200 Ω WIREWOUND	B-5243-13	L5 OSCILLATOR COIL A-11504
C6	.05-.2 MFD. 100 V.	A-11092-7	C13	.0005 MFD. MOLDED	A-9578	R6	300,000 Ω .25 W.	B-5737-3	
C7	.006-.0005 MFD. 400 V.	A-11092-2	C14	5-25-5 MFD. ELECTROLYTIC	A-11093-1	R7	500,000 Ω .25 W.	B-5737-5	
			C15	.04-.02 MFD 200 V.	A-9612-1	R8	50 Ω WIREWOUND	B-6061-1	
						R9	25 Ω WIREWOUND	A-9647	

SPARKS WITHINGTON CO.

SPARKS WITHINGTON CO.

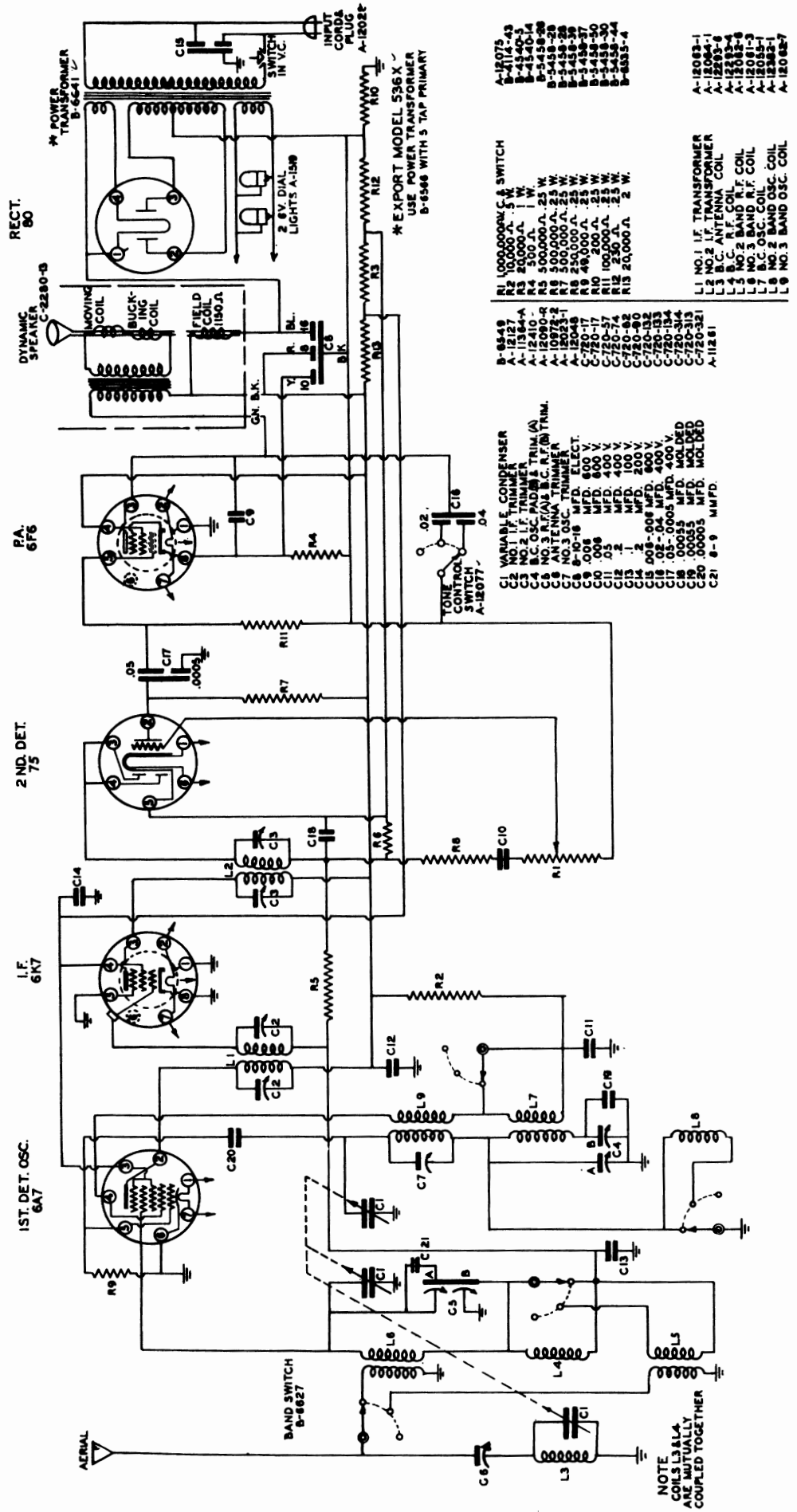
SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 516, 516X & 546X
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



SPARKS WITHINGTON CO.

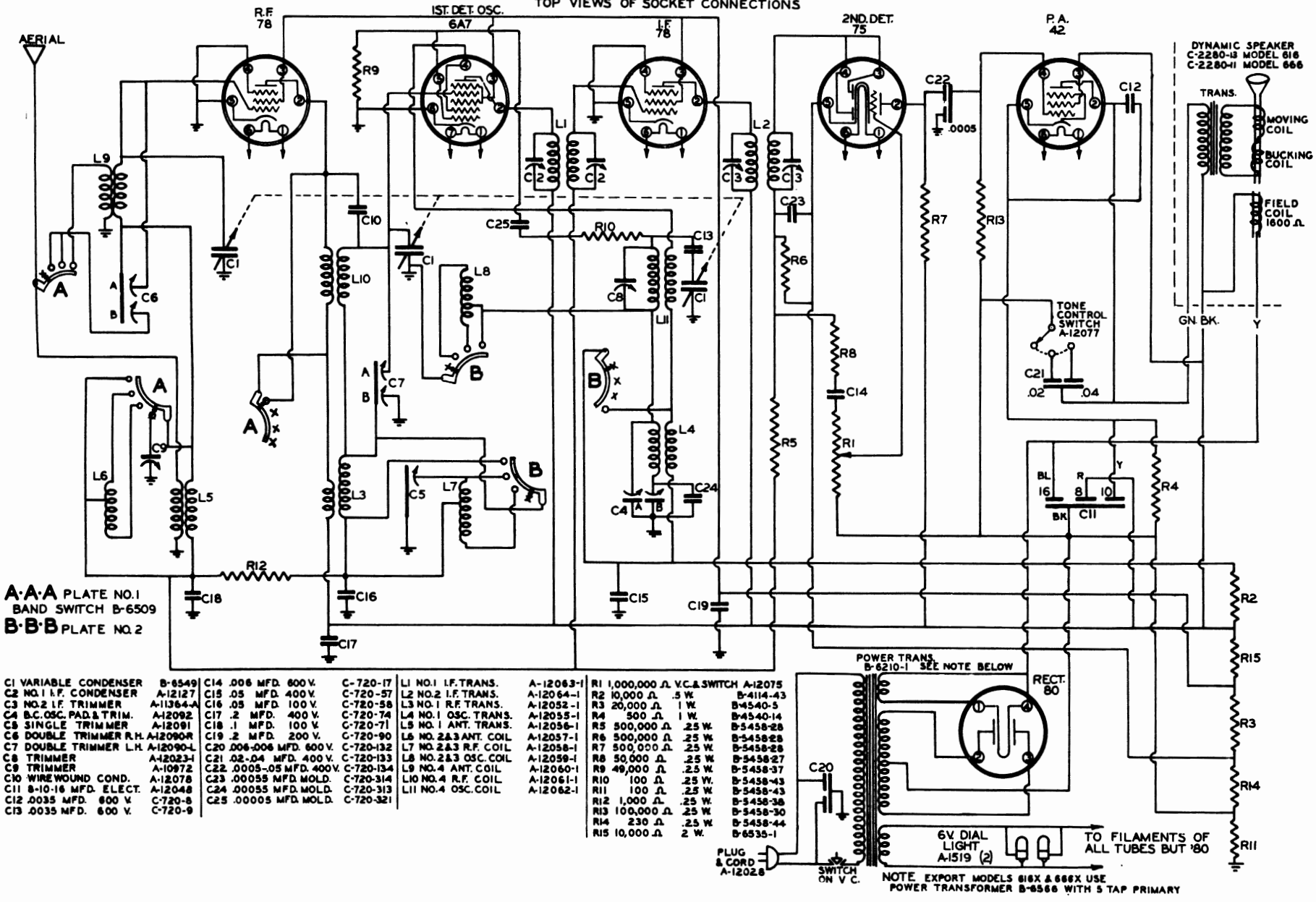
SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 536 & 536X
INTERMEDIATE FREQUENCY 345 K.C.

TOP VIEWS OF SOCKET CONNECTIONS SHOWN



SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 616, 616X, 666 & 666X
INTERMEDIATE FREQUENCY 345KC.

TOP VIEWS OF SOCKET CONNECTIONS

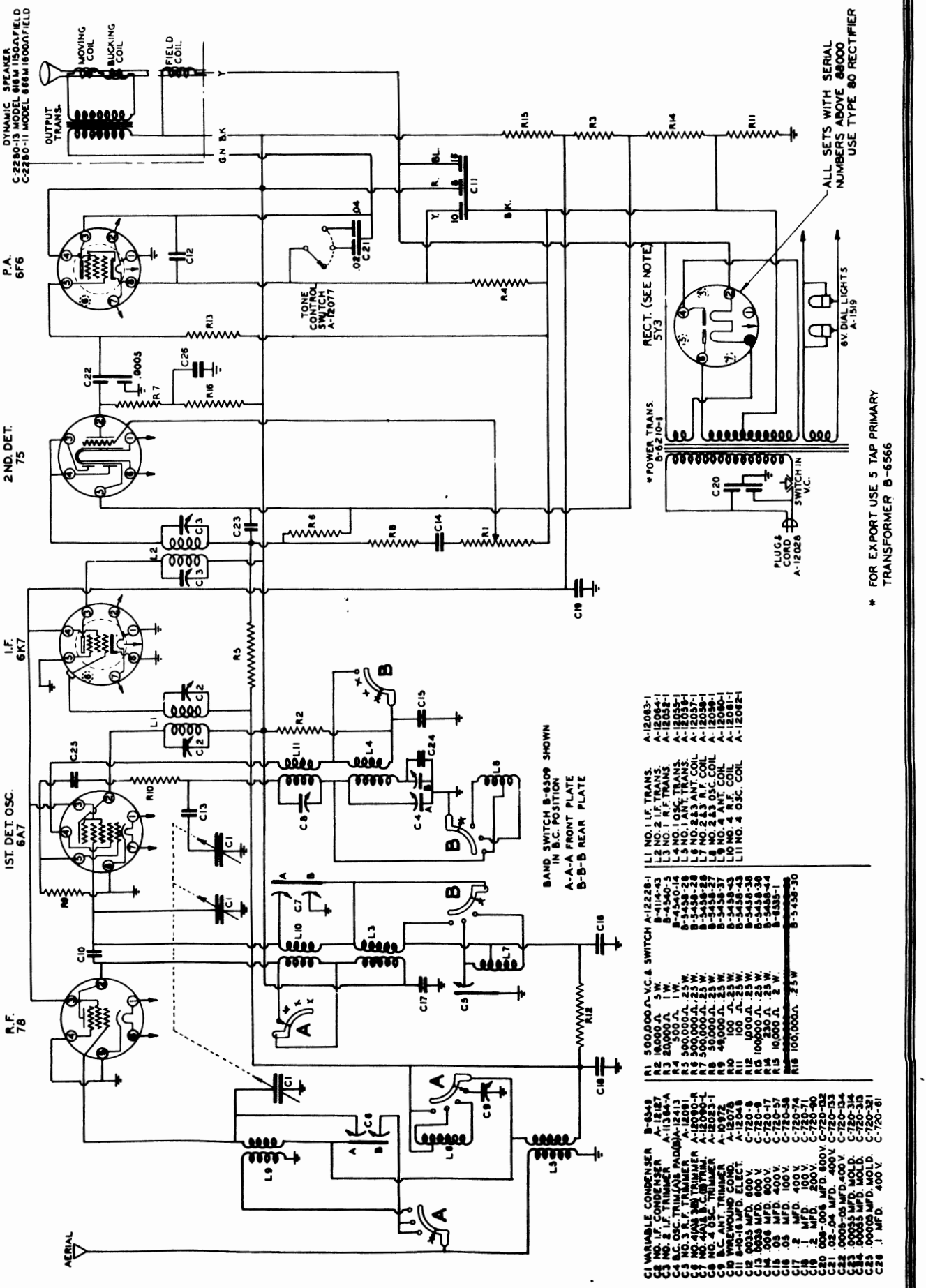


C1 VARIABLE CONDENSER	B-6549	C14 .006 MFD. 600 V.	C-720-17	L1 NO.1 I.F. TRANS.	A-12063-1	R1 1,000,000 Ω V.C. & SWITCH	A-12075
C2 NO.1 I.F. CONDENSER	A-12127	C15 .05 MFD. 400 V.	C-720-57	L2 NO.2 I.F. TRANS.	A-12064-1	R2 10,000 Ω .5 W.	B-4114-43
C3 NO.2 I.F. TRIMMER	A-11364-A	C16 .05 MFD. 100 V.	C-720-58	L3 NO.1 R.F. TRANS.	A-12052-1	R3 20,000 Ω 1 W.	B-4540-5
C4 B.C. OSC. PAD. & TRIM.	A-12092	C17 .2 MFD. 400 V.	C-720-74	L4 NO.1 OSC. TRANS.	A-12055-1	R4 500 Ω 1 W.	B-4540-14
C5 SINGLE TRIMMER	A-12091	C18 .1 MFD. 100 V.	C-720-71	L5 NO.1 ANT. TRANS.	A-12056-1	R5 500,000 Ω .25 W.	B-5458-28
C6 DOUBLE TRIMMER R.H.	A-12090-R	C19 .2 MFD. 200 V.	C-720-90	L6 NO. 2&3 ANT. COIL	A-12057-1	R6 500,000 Ω .25 W.	B-5458-28
C7 DOUBLE TRIMMER L.H.	A-12090-L	C20 .006-.006 MFD. 600 V.	C-720-132	L7 NO. 2&3 R.F. COIL	A-12058-1	R7 500,000 Ω .25 W.	B-5458-28
C8 TRIMMER	A-12023-1	C21 .02-.04 MFD. 400 V.	C-720-133	L8 NO. 2&3 OSC. COIL	A-12059-1	R8 50,000 Ω .25 W.	B-5458-27
C9 TRIMMER	A-10972	C22 .0005-.05 MFD. 400 V.	C-720-134	L9 NO.4 ANT. COIL	A-12060-1	R9 49,000 Ω .25 W.	B-5458-37
C10 WIREWOUND COND.	A-12078	C23 .00055 MFD. MOLD.	C-720-314	L10 NO.4 R.F. COIL	A-12061-1	R10 100 Ω .25 W.	B-5458-43
C11 8-10-16 MFD. ELECT.	A-12048	C24 .00055 MFD. MOLD.	C-720-313	L11 NO.4 OSC. COIL	A-12062-1	R11 100 Ω .25 W.	B-5458-43
C12 .0035 MFD. 600 V.	C-720-8	C25 .00005 MFD. MOLD.	C-720-321			R12 1,000 Ω .25 W.	B-5458-38
C13 .0035 MFD. 600 V.	C-720-9					R13 100,000 Ω .25 W.	B-5458-30
						R14 230 Ω .25 W.	B-5458-44
						R15 10,000 Ω 2 W.	B-6535-1

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 616M, 616MX, 666M & 666MX
INTERMEDIATE FREQUENCY 345 K.C.

TOP VIEWS OF SOCKET CONNECTIONS



C1 VARIABLE CONDENSER	B-6340	R1 500,000Ω V.C. & SWITCH	A-12228-1
C2 NO. 1 I.F. TRIMMER	A-11227	R2 80,000Ω 5 W.	B-4146-43
C3 NO. 2 I.F. TRIMMER	A-11227	R3 20,000Ω 5 W.	B-4146-42
C4 O.S.C. TRIMMER PADDER	A-12341-A	R4 300Ω 1 W.	B-4140-3
C5 NO. 3 R.F. TRIMMER	A-12091	R5 500,000Ω .25 W.	B-4138-24
C6 NO. 4 ANT. TRIMMER	A-12090-R	R6 500,000Ω .25 W.	B-4138-24
C7 NO. 4 ANT. TRIM.	A-12090-L	R7 500,000Ω .25 W.	B-4138-24
C8 NO. 4 O.S.C. TRIMMER	A-12023-1	R8 50,000Ω .25 W.	B-4138-27
C9 B.C. ANT. TRIMMER	A-10972	R9 40,000Ω .25 W.	B-4138-37
C10 WIREWOUND COND.	A-12078	R10 100Ω .25 W.	B-4138-43
C11 8-10-16 MFD. ELECT.	A-12048	R11 100Ω .25 W.	B-4138-43
C12 .0033 MFD. 600 V.	C-720-8	R12 1,000Ω .25 W.	B-4138-30
C13 .0033 MFD. 600 V.	C-720-8	R13 100,000Ω .25 W.	B-4138-30
C14 .006 MFD. 600 V.	C-720-17	R14 230Ω .25 W.	B-4138-44
C15 .05 MFD. 400 V.	C-720-57	R15 10,000Ω 2 W.	B-4135-1
C16 .05 MFD. 100 V.	C-720-58	R16 100,000Ω .25 W.	B-4138-30
C17 .2 MFD. 400 V.	C-720-74		
C18 .1 MFD. 400 V.	C-720-71		
C19 .1 MFD. 200 V.	C-720-70		
C20 .006-.006 MFD. 600 V.	C-720-52		
C21 .02-.04 MFD. 400 V.	C-720-153		
C22 .0008-.08 MFD. 400 V.	C-720-134		
C23 .0033 MFD. MOLD.	C-720-314		
C24 .00033 MFD. MOLD.	C-720-315		
C25 .00009 MFD. MOLD.	C-720-121		
C26 .1 MFD. 400 V.	C-720-61		

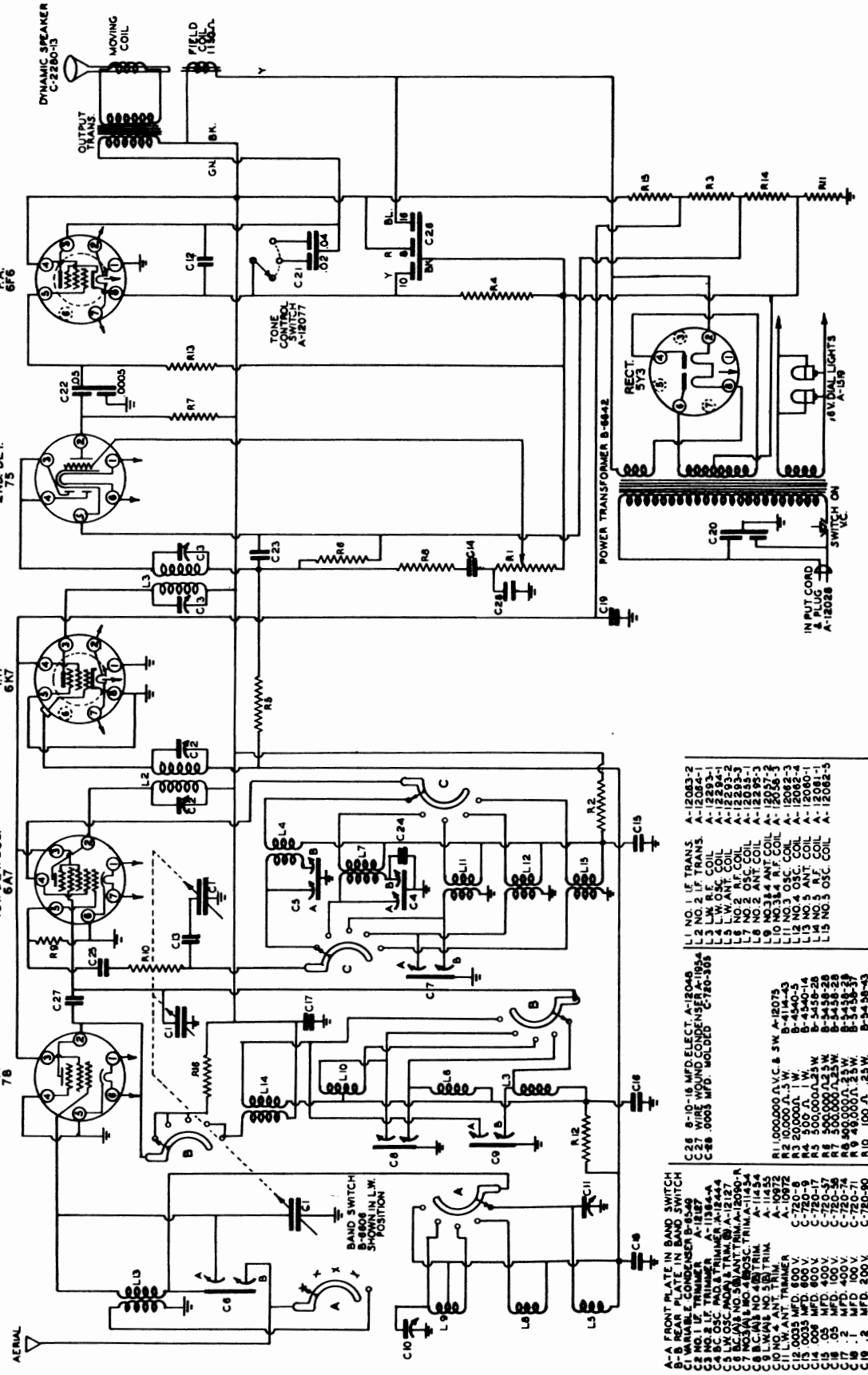
L1 NO. 1 I.F. TRANS.	A-12063-1		
L2 NO. 2 I.F. TRANS.	A-12064-1		
L3 NO. 1 R.F. TRANS.	A-12062-1		
L4 NO. 1 OSC. TRANS.	A-12025		
L5 NO. 1 ANT. TRANS.	A-12035-1		
L6 NO. 2 & 3 ANT. COIL	A-12037-1		
L7 NO. 2 & 3 R.F. COIL	A-12038-1		
L8 NO. 2 & 3 OSC. COIL	A-12039-1		
L9 NO. 4 ANT. COIL	A-12060-1		
L10 NO. 4 R.F. COIL	A-12061-1		
L11 NO. 4 OSC. COIL	A-12062-1		

* FOR EXPORT USE 5 TAP PRIMARY TRANSFORMER B-6566

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 636MX.
INTERMEDIATE FREQUENCY 345 K.C.

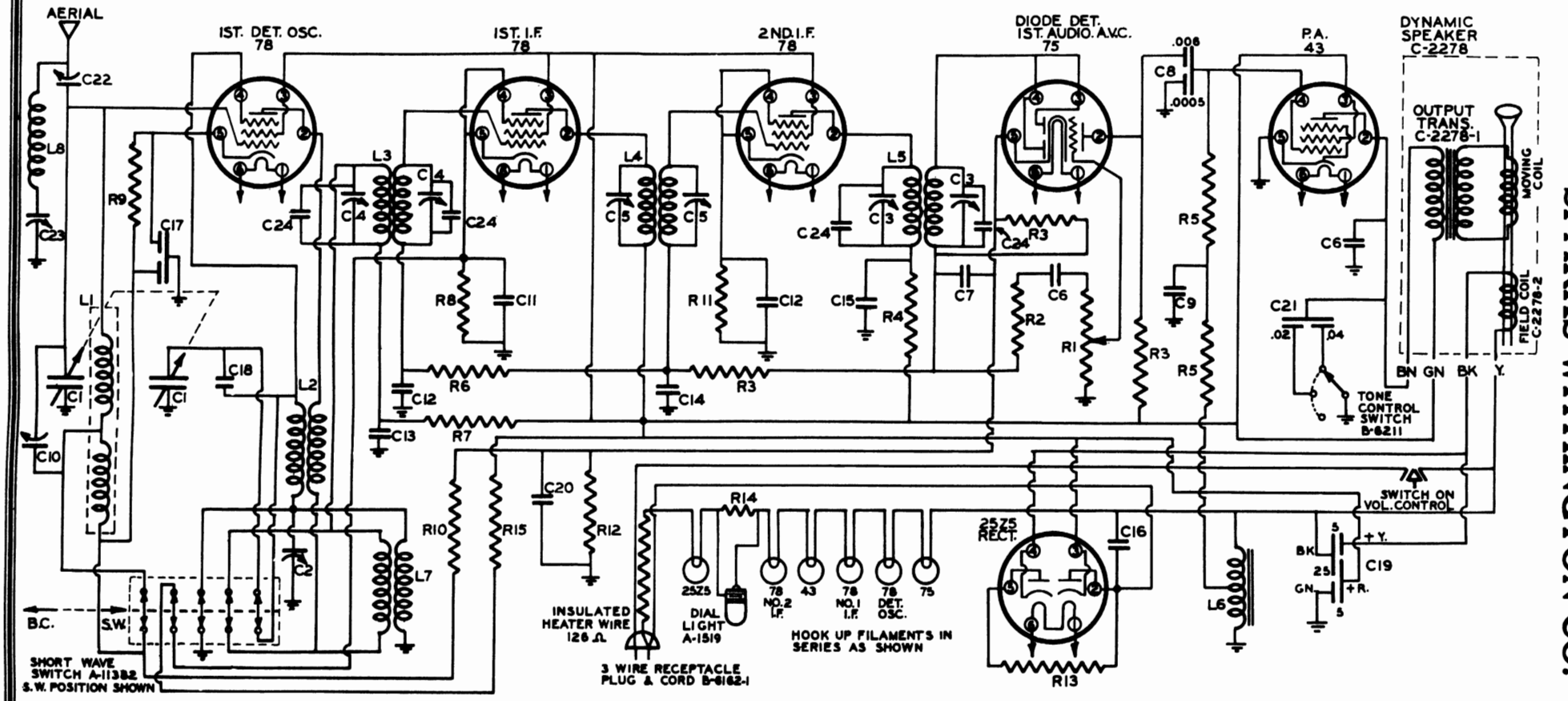
TOP VIEWS OF SOCKET CONNECTIONS SHOWN



A-A FRONT PLATE IN BAND SWITCH
B-B REAR PLATE IN BAND SWITCH
C1 VARIABLE CONDENSER B-6549
C2 NO. 1 I.F. TRIMMER A-11854
C3 NO. 2 I.F. TRIMMER A-11854
C4 B.C. OSC. PAD. & TRIMMER A-12444
C5 L.W. OSC. PAD. & TRIM. (B) A-12127
C6 B.C. (A) & NO. 5 ANT. TRIM. A-12090-R
C7 NO. 3 (A) & NO. 4 OSC. TRIM. A-11454
C8 B.C. (A) NO. 4 (B) TRIM. A-11454
C9 L.W. (A) NO. 5 (B) TRIM. A-11455
C10 L.W. ANT. TRIM. A-10972
C11 L.W. ANT. TRIMMER A-10972
C12 .0035 MFD. 600 V. C-720-8
C13 .0035 MFD. 600 V. C-720-9
C14 .006 MFD. 600 V. C-720-17
C15 .05 MFD. 400 V. C-720-37
C16 .05 MFD. 400 V. C-720-38
C17 .1 MFD. 400 V. C-720-74
C18 .2 MFD. 200 V. C-720-80
C19 .006-.008 MFD. 600 V. C-720-132
C20 .02-.04 MFD. 400 V. C-720-133
C21 .05-.0005 MFD. 400 V. C-720-134
C22 .00035 MFD. MOLDED C-720-314
C23 .00035 MFD. MOLDED C-720-313
C24 .00005 MFD. MOLDED C-720-321
C25 8-10-16 MFD. ELECT. A-12048
C27 .005 WOUND CONDENSER B-6546-1054
C28 .0005 MFD. MOLDED C-720-306
R1 1,000,000 Ω V.C. & SW. A-12075
R2 10,000 Ω .5 W. B-4114-43
R3 20,000 Ω 1 W. B-4540-5
R4 500 Ω 1 W. B-4540-14
R5 500,000 Ω .23 W. B-5438-28
R6 500,000 Ω .23 W. B-5438-28
R7 500,000 Ω .23 W. B-5438-28
R8 400,000 Ω .23 W. B-5438-27
R9 400,000 Ω .23 W. B-5438-27
R10 1,000 Ω .23 W. B-5438-43
R11 100 Ω .23 W. B-5438-43
R12 1,000 Ω .23 W. B-5438-43
R13 100,000 Ω .23 W. B-5438-30
R14 2,300 Ω .25 W. B-5438-44
R15 10,000 Ω .25 W. B-8333-1
R16 5,000 Ω .5 W. B-4114-46
L1 NO. 1 I.F. TRANS. A-12083-2
L2 NO. 2 I.F. TRANS. A-12084-1
L3 L.W. B.C. COIL A-12293-1
L4 L.W. OSC. COIL A-12293-2
L5 L.W. ANT. COIL A-12293-2
L6 NO. 2 R.F. COIL A-12293-2
L7 NO. 2 OSC. COIL A-12055-1
L8 NO. 2 ANT. COIL A-12295-3
L9 NO. 3&4 ANT. COIL A-12057-2
L10 NO. 3&4 R.F. COIL A-12058-3
L11 NO. 3 OSC. COIL A-12063-3
L12 NO. 4 OSC. COIL A-12063-4
L13 NO. 5 ANT. COIL A-12060-1
L14 NO. 5 R.F. COIL A-12061-1
L15 NO. 5 OSC. COIL A-12062-5

SCHEMATIC DIAGRAM
SPARTON MODEL 655 SUPERHETERODYNE
A C-D C INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF SOCKET CONNECTIONS SHOWN



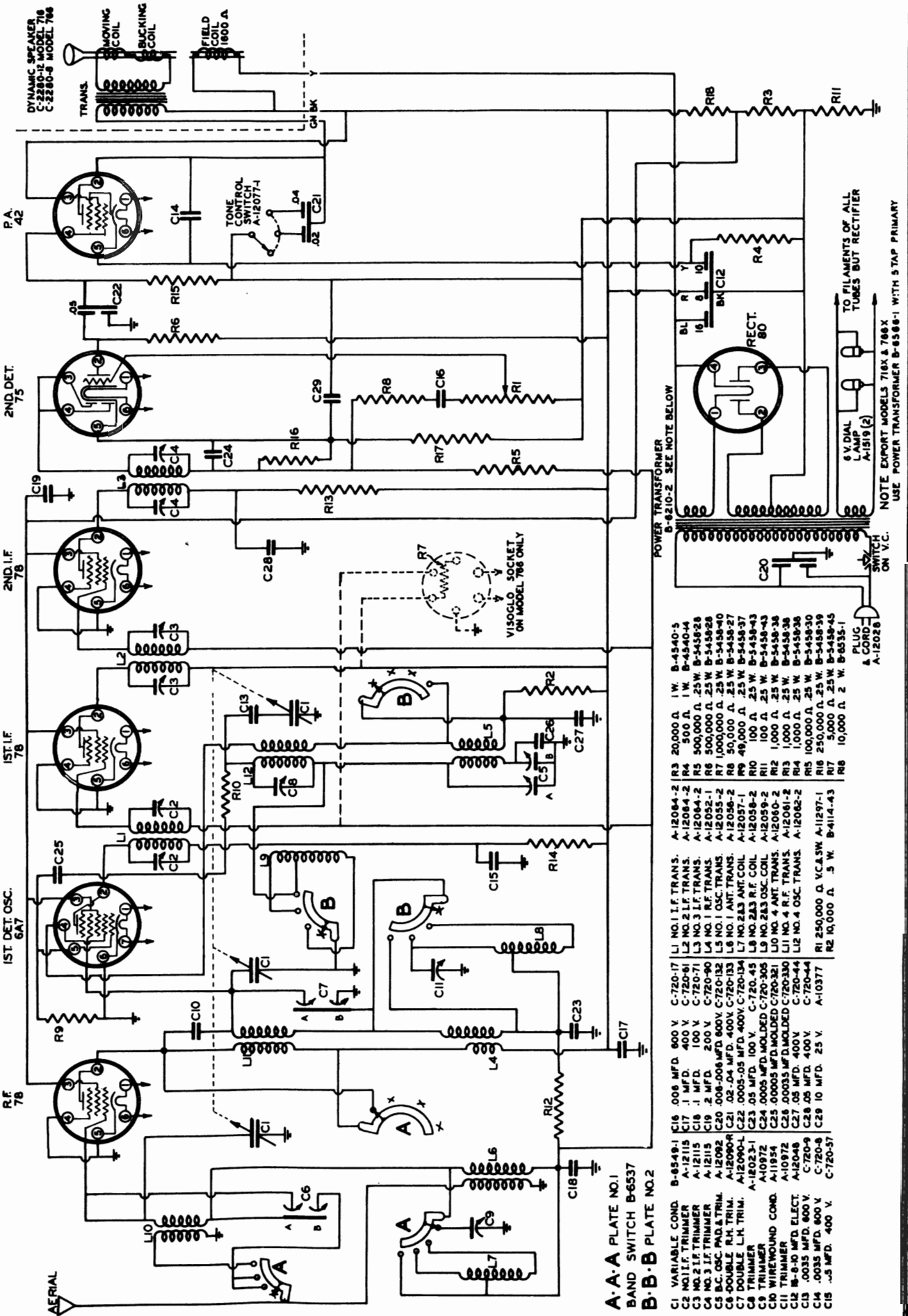
SPARKS WITHINGTON CO.

C1	VARIABLE CONDENSER	B-6153	C13	.05 MFD. 200 V.	C-720-49	R1	250,000 Ω	VOL. CONTROL	A-11069
C2	B.C. OSCILLATOR TRIMMER	A-10972	C14	.1 MFD. 100 V.	C-720-66	R2	50,000 Ω	.25 W.	B-5458-27
C3	ADJUSTABLE CONDENSER	A-11474	C15	.05 MFD. 200 V.	C-720-52	R3	500,000 Ω	.25 W.	B-5458-28
C4	ADJUSTABLE CONDENSER	A-10977	C16	.025 MFD. 400 V.	C-720-41	R4	3,000 Ω	.25 W.	B-5458-19
C5	ADJUSTABLE CONDENSER	A-11697	C17	.05-.05 MFD. 100 V.	C-720-108	R5	300,000 Ω	.25 W.	B-5458-29
C6	.006 MFD. 400 V.	C-720-13	C18	.0005 MFD. MOLDED	A-9578-14	R6	100,000 Ω	.25 W.	B-5458-30
C7	.0005 MFD. MOLDED	A-11095-1	C19	5-25-5 MFD. ELECTROLYTIC	A-11093	R7	15,000 Ω	.5 W.	B-4114-23
C8	.006-.0005 MFD. 400 V.	C-720-109	C20	.1 MFD. 100 V.	C-720-62	R8	1,000 Ω	.25 W.	B-5458-35
C9	.5 MFD. 100 V.	C-720-94	C21	.02-.04 MFD. 200 V.	C-720-131	R9	290 Ω	WIREWOUND	B-5243-36
C10	S.W. ANTENNA TRIMMER	A-11071	C22	B.C. ANTENNA TRIMMER	A-11484	R10	2,200 Ω	WIREWOUND	B-5243-13
C11	.1 MFD. 100 V.	C-720-69	C23	I.F. WAVE TRAP TRIMMER	A-11693	R11	600 Ω	.25 W.	B-5243-23
C12	.05 MFD. 100 V.	C-720-51	C24	.0001 MFD. MOLDED	A-11095-3	R12	100 Ω	WIREWOUND	B-5243-37

R13	50 Ω 2 W.	B-6061-2
R14	25 Ω WIREWOUND	A-9647
R15	20,000 Ω .5 W.	B-4114-24
L1	PRE-SELECTOR COIL	A-11045
L2	FOREIGN BAND OSC. COIL	A-11047
L3	NO.1 I.F. TRANSFORMER	A-11686
L4	NO.2 I.F. TRANSFORMER	A-11687
L5	NO.3 I.F. TRANSFORMER	A-11688
L6	CHOKE COIL	A-11038
L7	BROADCAST OSC. COIL	A-11763
L8	I.F. WAVE TRAP COIL	A-11692

SPARKS WITHINGTON CO.

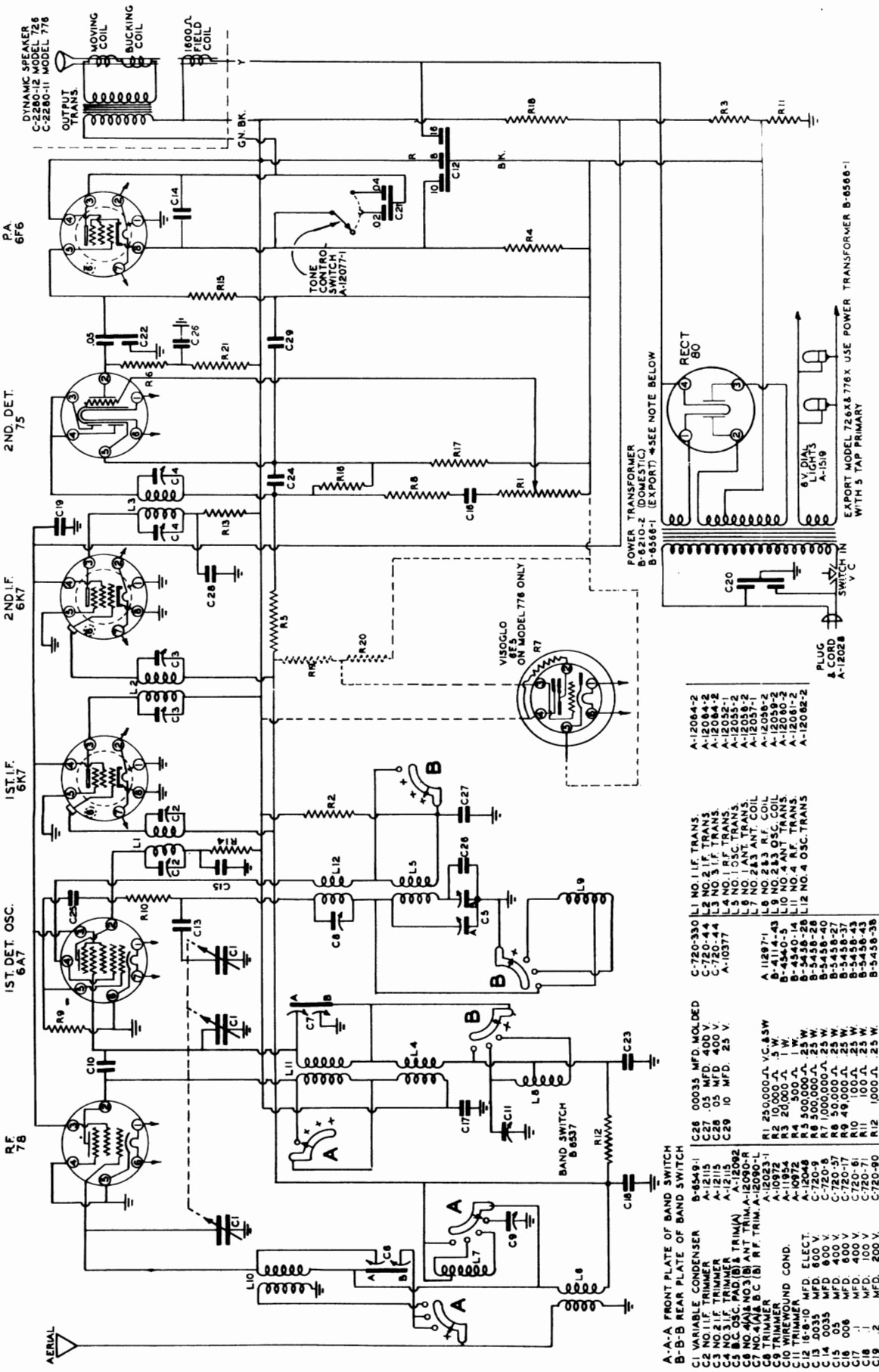
SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 716X, 766 & 766X
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF SOCKET CONNECTIONS



C1	VARIABLE COND.	B-6549-1	C16	.006 MFD.	600 V.	C-720-17	L1	NO.1 I.F. TRANS.	A-12064-2	R3	20,000 Ω	1 W.	B-4540-5
C2	NO.1 I.F. TRIMMER	A-12115	C17	.1 MFD.	400 V.	C-720-61	L2	NO.2 I.F. TRANS.	A-12064-2	R4	500 Ω	1 W.	B-4540-44
C3	NO.2 I.F. TRIMMER	A-12115	C18	.1 MFD.	100 V.	C-720-71	L3	NO.3 I.F. TRANS.	A-12064-2	R5	500,000 Ω	.25 W.	B-5458-28
C4	NO.3 I.F. TRIMMER	A-12115	C19	.2 MFD.	200 V.	C-720-90	L4	NO. 1 R.F. TRANS.	A-12052-1	R6	500,000 Ω	.25 W.	B-5458-28
C5	B.C. OSC. PAD. & TRIM.	A-12092	C20	.006-.006 MFD.	600 V.	C-720-132	L5	NO. 1 OSC. TRANS.	A-12055-2	R7	1,000,000 Ω	.25 W.	B-5458-40
C6	DOUBLE R.H. TRIM.	A-12090-R	C21	.02-.04 MFD.	400 V.	C-720-133	L6	NO. 1 ANT. TRANS.	A-12056-2	R8	50,000 Ω	.25 W.	B-5458-27
C7	DOUBLE L.H. TRIM.	A-12090-L	C22	.0005-.05 MFD.	400 V.	C-720-134	L7	NO. 2&3 ANT. COIL	A-12057-1	R9	49,000 Ω	.25 W.	B-5458-37
C8	TRIMMER	A-12023-1	C23	.05 MFD.	100 V.	C-720-45	L8	NO. 2&3 R.F. COIL	A-12058-2	R10	100 Ω	.25 W.	B-5458-43
C9	TRIMMER	A-10972	C24	.0005 MFD.	MOLDED	C-720-305	L9	NO. 2&3 OSC. COIL	A-12059-2	R11	100 Ω	.25 W.	B-5458-43
C10	WIREWOUND COND.	A-11954	C25	.00005 MFD.	MOLDED	C-720-321	L10	NO. 4 ANT. TRANS.	A-12060-2	R12	1,000 Ω	.25 W.	B-5458-38
C11	TRIMMER	A-10972	C26	.00035 MFD.	MOLDED	C-720-130	L11	NO. 4 R.F. TRANS.	A-12061-2	R13	1,000 Ω	.25 W.	B-5458-38
C12	15-8-10 MFD. ELECT.	A-12048	C27	.05 MFD.	400 V.	C-720-44	L12	NO. 4 OSC. TRANS.	A-12062-2	R14	1,000 Ω	.25 W.	B-5458-38
C13	.0035 MFD. 600 V.	C-720-9	C28	.05 MFD.	400 V.	C-720-44				R15	100,000 Ω	.25 W.	B-5458-30
C14	.0035 MFD. 600 V.	C-720-9	C29	10 MFD.	25 V.	A-10377	R1	250,000 Ω	V.C.A. SW. A-11297-1	R16	250,000 Ω	.25 W.	B-5458-39
C15	.05 MFD. 400 V.	C-720-57					R2	10,000 Ω	.5 W. B-4114-43	R17	5,000 Ω	.25 W.	B-5458-45
										R18	10,000 Ω	2 W.	B-6535-1

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 726X, 776 & 776X
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



A-A-A FRONT PLATE OF BAND SWITCH
B-B-B REAR PLATE OF BAND SWITCH

C1	VARIABLE CONDENSER	B-6549-1	
C2	NO. 1 I.F. TRIMMER	A-12115	
C3	NO. 2 I.F. TRIMMER	A-12115	
C4	NO. 3 I.F. TRIMMER	A-12115	
C5	B.C. OSC. PAD (B) & TRIM (A)	A-12092	
C6	NO. 4 (A) & NO. 3 (B) ANT. TRIM.	A-12090-R	
C7	NO. 4 (A) & B.C. (B) R.F. TRIM.	A-12090-L	
C8	TRIMMER	A-10972-1	
C9	WIREWOUND COND.	A-11954	
C10	TRIMMER	A-10972	
C11	16-8-10 MFD. ELECT.	A-12048	
C12	.0035 MFD. 600 V.	C-720-9	
C13	.0035 MFD. 600 V.	C-720-8	
C14	.05 MFD. 600 V.	C-720-57	
C15	.006 MFD. 600 V.	C-720-17	
C16	.1 MFD. 400 V.	C-720-61	
C17	.1 MFD. 100 V.	C-720-71	
C18	.2 MFD. 200 V.	C-720-90	
C19	.008-.006 MFD. 600 V.	C-720-132	
C20	.02-.04 MFD. 400 V.	C-720-133	
C21	.0005-.05 MFD. 400 V.	C-720-134	
C22	.05 MFD. 100 V.	C-720-45	
C23	.0005 MFD. MOLDED	C-720-305	
C24	.0005 MFD. MOLDED	C-720-302	
C25	.1 MFD. 400 V.	C-720-61	
C26	.00033 MFD. MOLDED	C-720-330	
C27	.05 MFD. 400 V.	C-720-44	
C28	.05 MFD. 400 V.	C-720-44	
C29	.1 MFD. 25 V.	A-10377	
R1	250,000Ω VC. & SW	A-11297-1	
R2	10,000Ω .5 W.	B-4114-43	
R3	20,000Ω 1 W.	B-4540-5	
R4	300Ω 1 W.	B-4540-14	
R5	500,000Ω .25 W.	B-5438-28	
R6	300,000Ω .25 W.	B-5438-28	
R7	1,000,000Ω .25 W.	B-5438-40	
R8	50,000Ω .25 W.	B-5438-27	
R9	49,000Ω .25 W.	B-5438-37	
R10	100Ω .25 W.	B-5438-43	
R11	100Ω .25 W.	B-5438-43	
R12	1000Ω .25 W.	B-5438-38	
R13	1000Ω .25 W.	B-5438-38	
R14	1000Ω .25 W.	B-5438-38	
R15	100,000Ω .25 W.	B-5438-30	
R16	250,000Ω .25 W.	B-5438-39	
R17	3,000Ω .25 W.	B-5438-45	
R18	10,000Ω 2 W.	B-6533-1	
R19	2,000,000Ω .25 W.	B-5438-26	
R20	1,500,000Ω .25 W.	B-5438-49	
R21	100,000Ω .25 W.	B-5438-30	
L1	NO. 1 I.F. TRANS.	A-12084-2	
L2	NO. 2 I.F. TRANS.	A-12084-2	
L3	NO. 3 I.F. TRANS.	A-12084-2	
L4	NO. 1 R.F. TRANS.	A-12032-1	
L5	NO. 1 OSC. TRANS.	A-12035-2	
L6	NO. 2 & 3 ANT. TRANS.	A-12036-2	
L7	NO. 2 & 3 ANT. COIL	A-12037-1	
L8	NO. 2 & 3 R.F. COIL	A-12058-2	
L9	NO. 2 & 3 OSC. COIL	A-12059-2	
L10	NO. 4 ANT. TRANS.	A-12060-2	
L11	NO. 4 R.F. TRANS.	A-12061-2	
L12	NO. 4 OSC. TRANS.	A-12062-2	

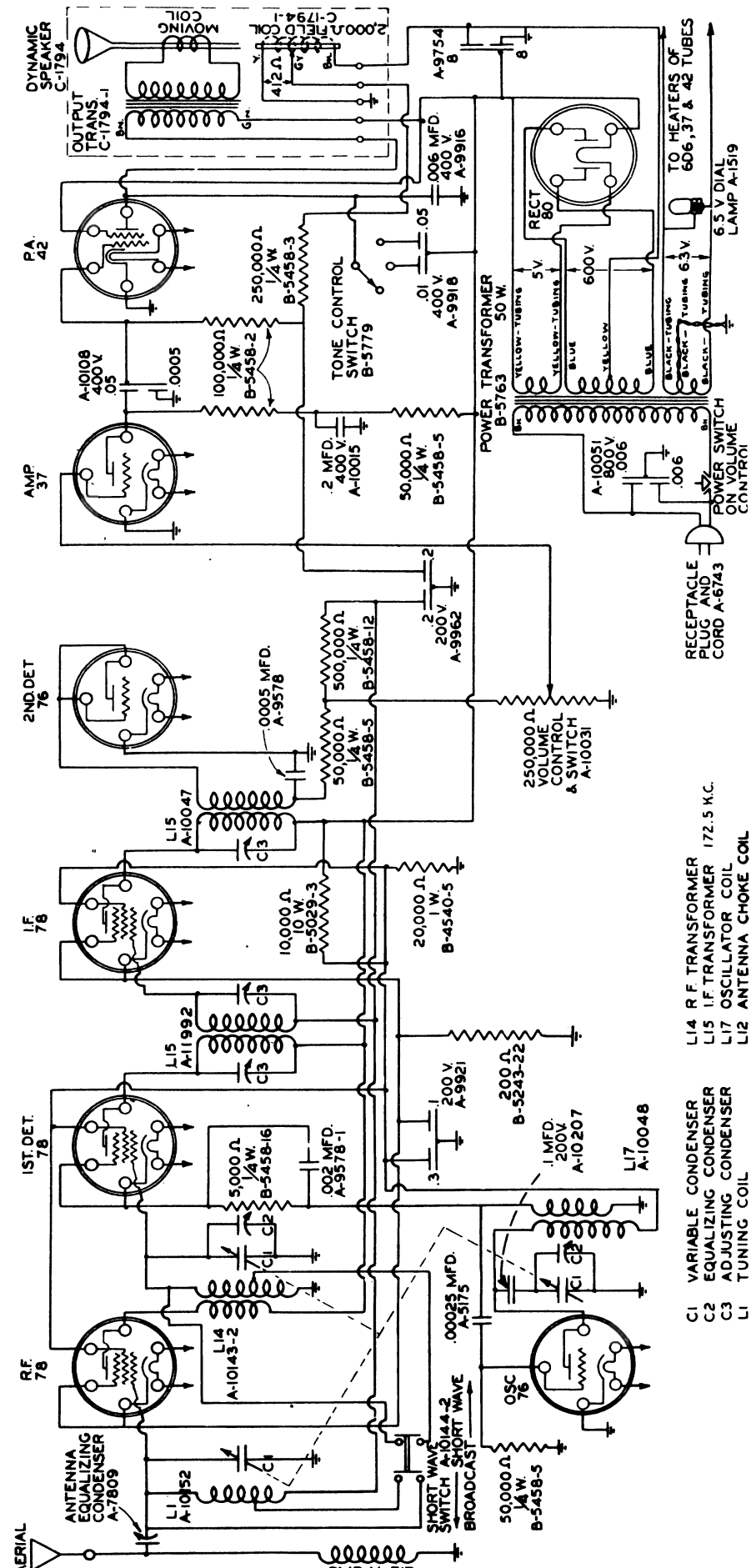
SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM

SPARTON MODEL 785 SUPERHETERODYNE

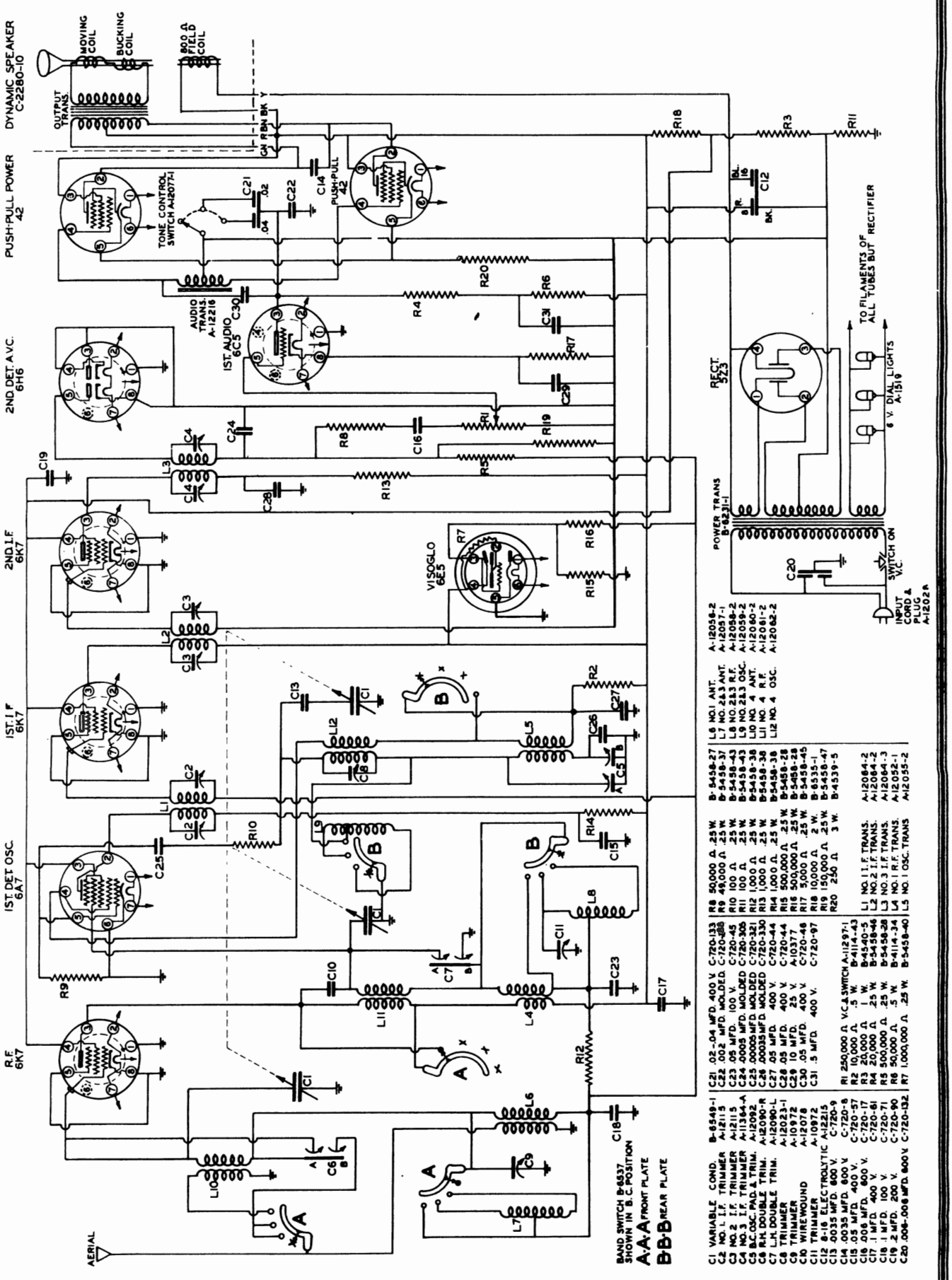
INTERMEDIATE FREQUENCY 172.5 KILOCYCLES

(TOP VIEWS OF SOCKET CONNECTIONS SHOWN)



SPARKS WITHINGTON CO.

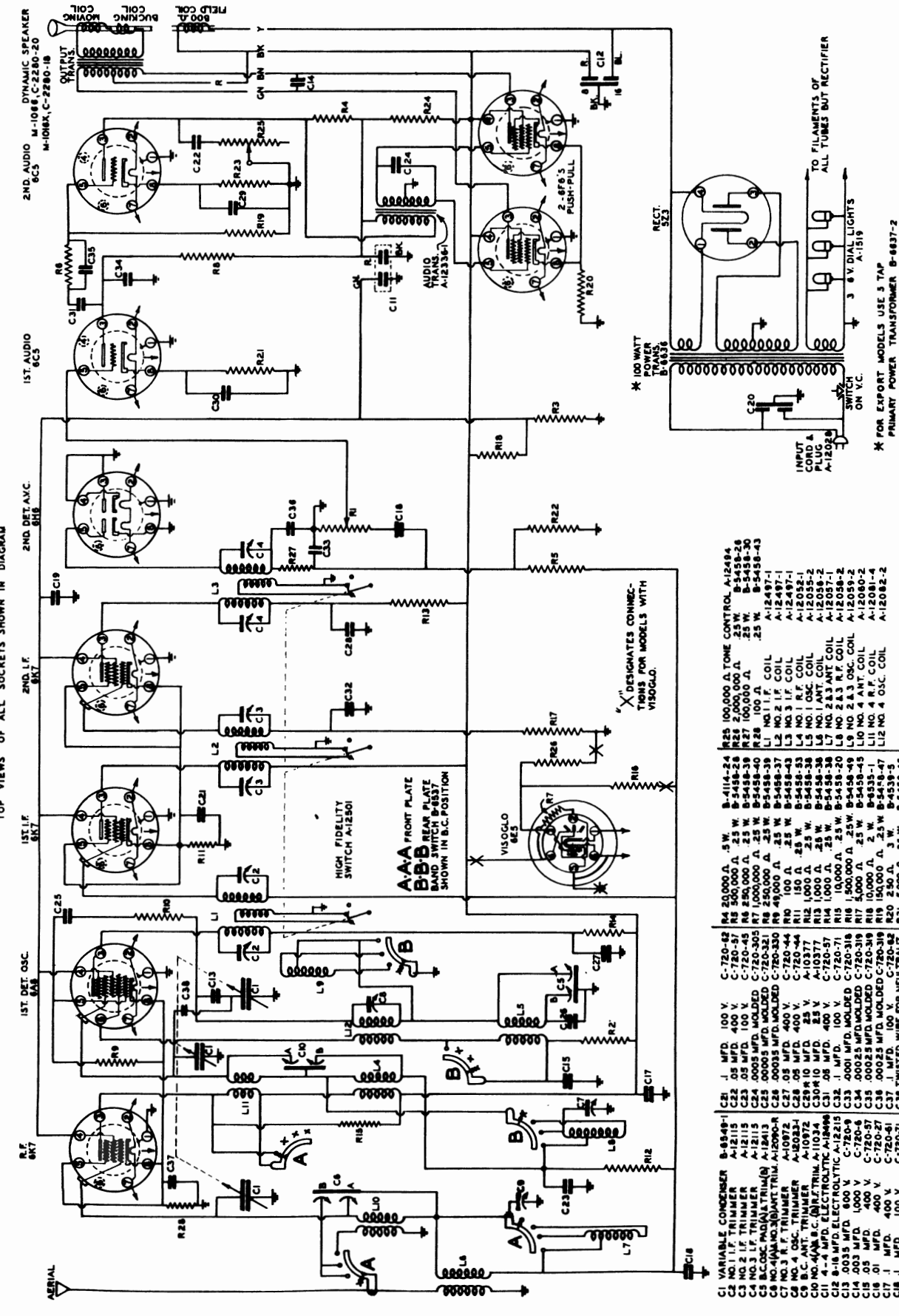
SCHEMATIC DIAGRAM
SPARTON MODEL 966 SUPERHETERODYNE
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



C1 VARIABLE COND.	B-6549-1	C21 .02-.04 MFD. 400 V.	C-720-133	R8 50,000 Ω .25 W.	B-5458-27	L6 NO.1 ANT.	A-12058-2
C2 NO. 1 I.F. TRIMMER	A-12115	C22 .002 MFD. MOLDED	C-720-088	R9 49,000 Ω .25 W.	B-5458-37	L7 NO. 2 & 3 ANT.	A-12057-1
C3 NO. 2 I.F. TRIMMER	A-12115	C23 .05 MFD. 100 V.	C-720-45	R10 100 Ω .25 W.	B-5458-43	L8 NO. 2 & 3 R.F.	A-12056-2
C4 NO. 3 I.F. TRIMMER	A-11364-A	C24 .0005 MFD. MOLDED	C-720-305	R11 100 Ω .25 W.	B-5458-43	L9 NO. 2 & 3 OSC.	A-12059-2
C5 B.C. OSC. PAD. & TRIM.	A-12092	C25 .00005 MFD. MOLDED	C-720-321	R12 1,000 Ω .25 W.	B-5458-38	L10 NO. 4 ANT.	A-12060-2
C6 R.H. DOUBLE TRIM.	A-12090-R	C26 .00035 MFD. MOLDED	C-720-130	R13 1,000 Ω .25 W.	B-5458-38	L11 NO. 4 R.F.	A-12061-2
C7 L.H. DOUBLE TRIM.	A-12090-L	C27 .05 MFD. 400 V.	C-720-44	R14 1,000 Ω .25 W.	B-5458-38	L12 NO. 4 OSC.	A-12062-2
C8 TRIMMER	A-12023-1	C28 .05 MFD. 400 V.	C-720-44	R15 500,000 Ω .25 W.	B-5458-28		
C9 TRIMMER	A-10972	C29 .1 MFD. 200 V.	A-10277	R16 500,000 Ω .25 W.	B-5458-28		
C10 WIREWOUND	A-12078	C30 .05 MFD. 400 V.	C-720-44	R17 5,000 Ω .25 W.	B-5458-45		
C11 TRIMMER	A-10972	C31 .5 MFD. 400 V.	C-720-97	R18 10,000 Ω 2 W.	B-6535-1		
C12 8-16 ELECTROLYTIC	A-12215			R19 150,000 Ω .25 W.	B-5458-47		
C13 .0035 MFD. 600 V.	C-720-8			R20 250 Ω 3 W.	B-4539-5		
C14 .0035 MFD. 600 V.	C-720-9						
C15 .05 MFD. 400 V.	C-720-57	R1 250,000 Ω V.C. & SWITCH	A-11297-1				
C16 .006 MFD. 600 V.	C-720-17	R2 10,000 Ω .5 W.	B-4114-43				
C17 .1 MFD. 400 V.	C-720-61	R3 20,000 Ω 1 W.	B-4540-5	L1 NO. 1 I.F. TRANS.	A-12084-2		
C18 .1 MFD. 100 V.	C-720-71	R4 20,000 Ω .25 W.	B-5458-46	L2 NO. 2 I.F. TRANS.	A-12084-2		
C19 .2 MFD. 200 V.	C-720-90	R5 500,000 Ω .25 W.	B-5458-28	L3 NO. 3 I.F. TRANS.	A-12084-3		
C20 .006-.006 MFD. 600 V.	C-720-132	R6 50,000 Ω .5 W.	B-4114-34	L4 NO. 1 R.F. TRANS.	A-12052-1		
		R7 1,000,000 Ω .25 W.	B-5458-40	L5 NO. 1 OSC. TRANS	A-12055-2		

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 1066, 1016X
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKETS SHOWN IN DIAGRAM



C1 VARIABLE CONDENSER	B-6548-1	C-720-62	R4 20,000 Ω .5 W.	B-4114-24	R25 100,000 Ω TONE CONTROL	A-12484	
C2 NO. 1 I.F. TRIMMER	A-12115	C-720-57	R5 500,000 Ω .25 W.	B-5458-28	R26 2,000,000 Ω .25 W.	B-5458-28	
C3 NO. 2 I.F. TRIMMER	A-12115	C-720-45	R6 250,000 Ω .25 W.	B-5458-39	R27 100,000 Ω .25 W.	B-5458-30	
C4 NO. 3 I.F. TRIMMER	A-12115	C-720-305	R7 1,000,000 Ω .25 W.	B-5458-40	R28 100 Ω .25 W.	B-5458-43	
C5 B.C. OSC. PAD (A) ALTRIM (B)	A-12413	C-720-325	R8 250,000 Ω .25 W.	B-5458-39	L1 NO. 1 I.F. COIL	A-12497-1	
C6 NO. 4 (A) ANT. NO. 3 (B) ANT. TRIM.	A-12090-R	C-720-330	R9 49,000 Ω .25 W.	B-5458-37	L2 NO. 2 I.F. COIL	A-12497-1	
C7 NO. 3 R.F. TRIMMER	A-10972	C-720-44	R10 100 Ω .25 W.	B-5458-43	L3 NO. 3 I.F. COIL	A-12497-1	
C8 NO. 4 OSC. TRIMMER	A-12033	C-720-44	R11 150 Ω .25 W.	B-5458-53	L4 NO. 1 R.F. COIL	A-12052-1	
C9 B.C. ANT. TRIMMER	A-10972	A-10377	R12 1,000 Ω .25 W.	B-5458-38	L5 NO. 1 OSC. COIL	A-12055-2	
C10 NO. 4 (A) B.C. (B) R.F. TRIM.	A-11034	C-720-57	R13 1,000 Ω .25 W.	B-5458-38	L6 NO. 1 ANT. COIL	A-12056-2	
C11 4-4 MFD. ELECTROLYTIC	A-12445	C-720-71	R14 1,000 Ω .25 W.	B-5458-38	L7 NO. 2 & 3 ANT. COIL	A-12057-1	
C12 8-16 MFD. ELECTROLYTIC	A-12215	C-720-316	R15 10,000 Ω .25 W.	B-5458-20	L8 NO. 2 & 3 R.F. COIL	A-12058-2	
C13 .0035 MFD. 600 V.	C-720-9	C-720-318	R16 1,500,000 Ω .25 W.	B-5458-49	L9 NO. 2 & 3 OSC. COIL	A-12059-2	
C14 .003 MFD. 1,000 V.	C-720-4	C-720-319	R17 5,000 Ω .25 W.	B-5458-45	L10 NO. 4 ANT. COIL	A-12060-2	
C15 .05 MFD. 400 V.	C-720-57	C-720-319	R18 150,000 Ω 2 W.	B-6535-1	L11 NO. 4 R.F. COIL	A-12061-4	
C16 .01 MFD. 400 V.	C-720-27	C-720-319	R19 150,000 Ω .25 W.	B-5458-47	L12 NO. 4 OSC. COIL	A-12062-2	
C17 .1 MFD. 400 V.	C-720-61	C-720-319	R20 250 Ω 3 W.	B-6539-5			
C18 .1 MFD. 100 V.	C-720-71	C-720-322	R21 250,000 Ω .25 W.	B-5458-45			
C19 .2 MFD. 200 V.	C-720-90	C-720-321	R22 10,000 Ω .25 W.	B-5458-30			
C20 .006-.006 MFD. 600 V.	C-720-132	C34 TWISTED WIRE FOR NEUTRALIZING	R23 2,000 Ω .25 W.	B-5458-16			
		R1 250,000 Ω V.C. & SWITCH	A-11237-1	R24 10,000 Ω .25 W.	B-5458-20		
		R2 10,000 Ω 5 W.	B-4114-43				
		R3 20,000 Ω 1 W.	B-4540-5				

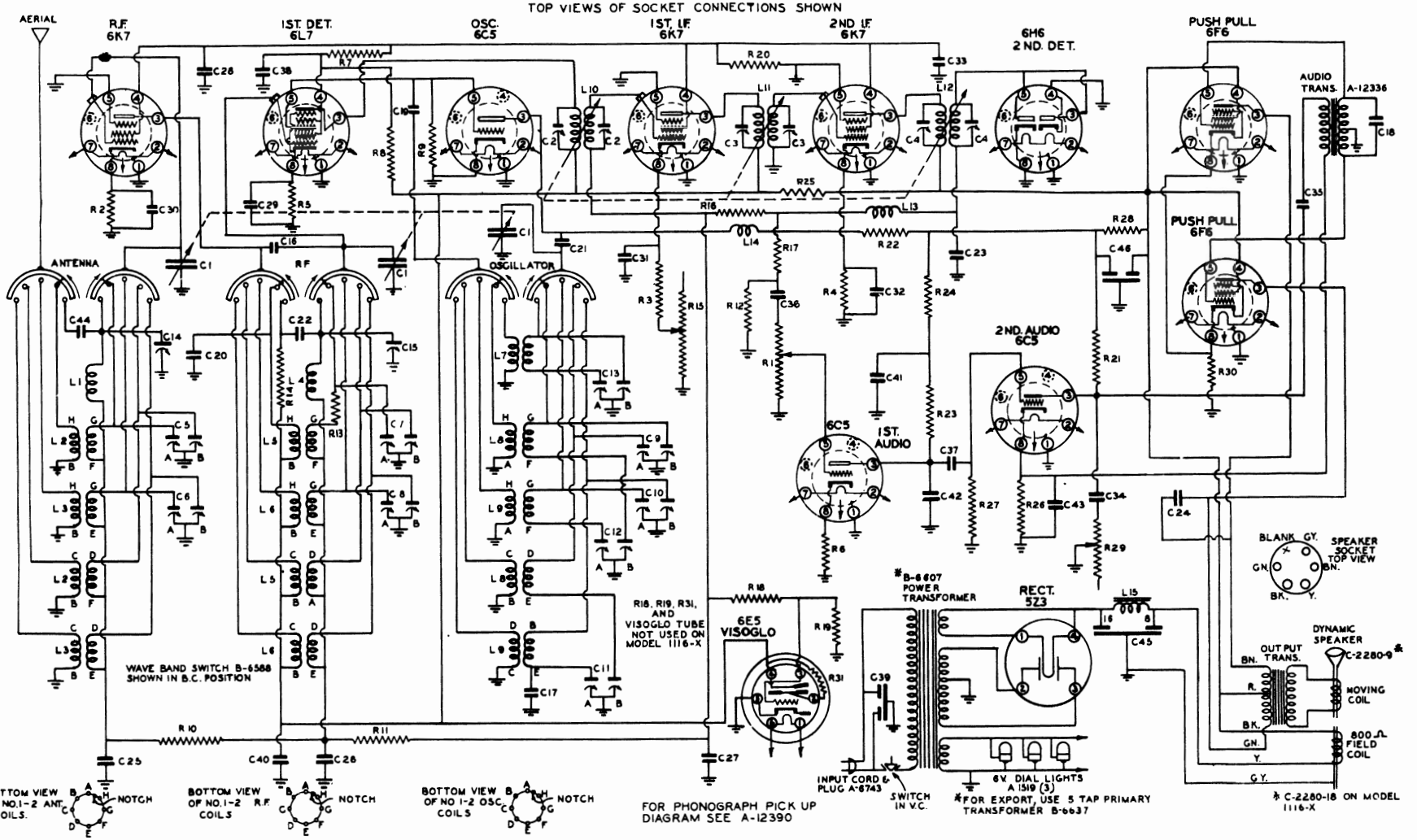
* FOR EXPORT MODELS USE A-10377-EXP.

ON MODEL 1016X REMOVE R7, R16, R28, AND VISOGLO WITH PARTS.

* FOR EXPORT MODELS USE 5 TAP PRIMARY POWER TRANSFORMER B-6637-2

SCHEMATIC DIAGRAM
SPARTON MODELS 1116X, 1166, 1176, 1176XP, 1176XS, 1186, 1196 SUPERHETERODYNE
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF SOCKET CONNECTIONS SHOWN

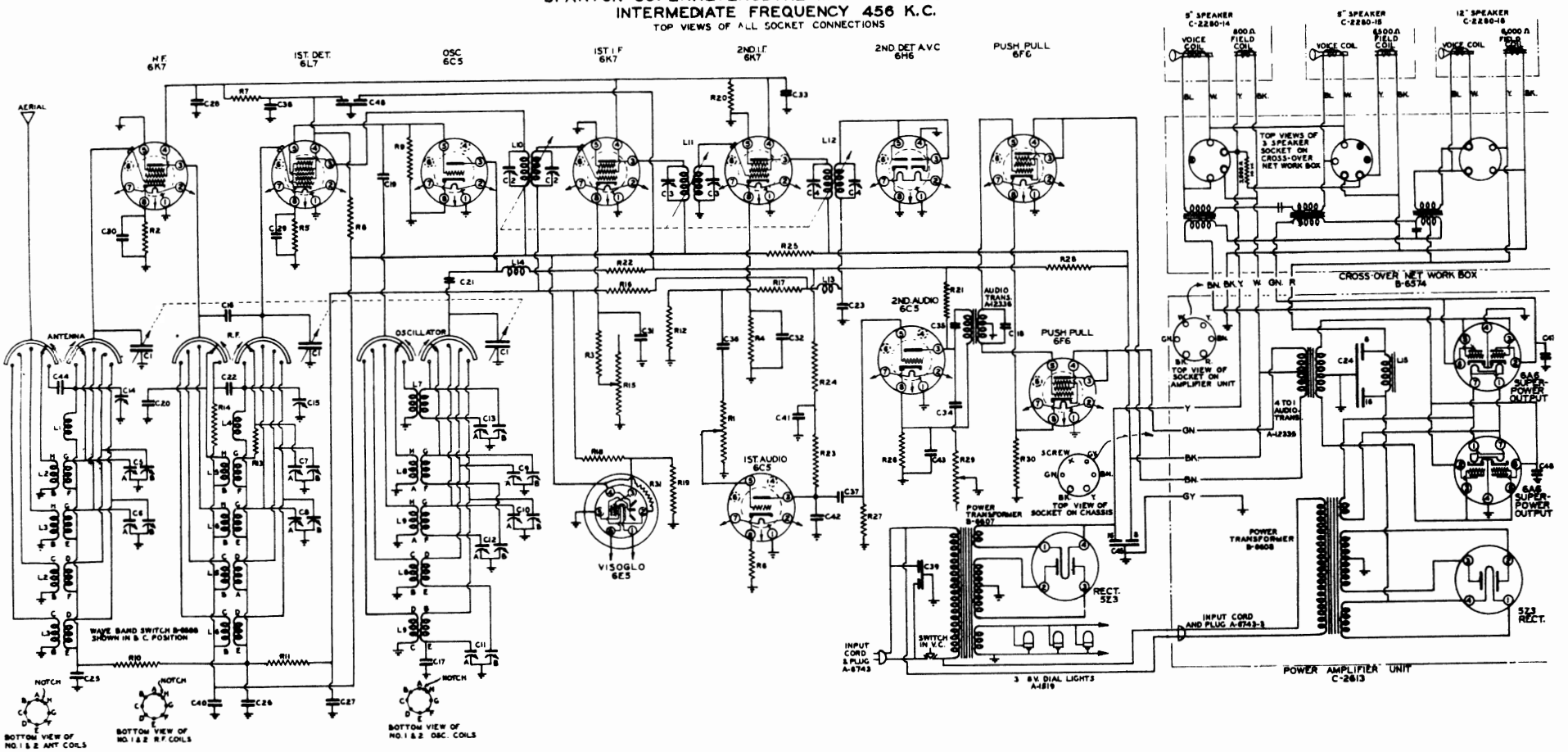


C1 VARIABLE CONDENSER	B-6218-1	C20 .0001 MFD. MOLDED	C-720-318	C39 .006-.006 MFD. 600V.	C-720-112	R10 50,000Ω 25 W.	B-5458-27
C2 NO.1 I.F. TRIMMER	A-11364-A	C21 .00005 MFD. MOLDED	C-720-320	C40 .2 MFD. 600 V.	C-720-93	R11 50,000Ω .25 W.	B-5458-27
C3 NO.2 I.F. TRIMMER	A-11364-A	C22 .00005 MFD. MOLDED	C-720-321	C41 .5 MFD. 400 V.	C-720-100	R12 50,000Ω .25 W.	B-5458-27
C4 NO.3 I.F. TRIMMER	A-11364-A	C23 .00025 MFD. MOLDED	C-720-319	C42 .0005 MFD. MOLDED	C-720-331	R13 10Ω 1 W.	B-6569-1
C5 NO.4 (A) & 2 (B) ANT. TRIM.	A-12333	C24 .002 MFD. MOLDED	C-720-288	C43 10 MFD. 25 V. ELECT.	A-10377	R14 3,000Ω 25 W.	B-5458-19
C6 NO.3 (A) & 1 (B) ANT. TRIM.	A-12334	C25 .05 MFD. 200 V.	C-720-54	C44 12 MMFD.	A-10896	R15 100,000Ω NOISE SUPP.	A-10446
C7 NO 4 (A) & 2 (B) R.F. TRIM.	A-12333	C26 .05 MFD. 200 V.	C-720-54	C45 16-8 MFD. ELECT.	A-12330	R16 500,000Ω 25 W.	B-5458-28
C8 NO.3 (A) & 1 (B) R.F. TRIM.	A-12334	C27 .05 MFD 200 V.	C-720-54	C46 8-8 MFD. ELECT.	A-11223-1	R17 100,000Ω 25 W.	B-5458-30
C9 NO.2 (A) & 4 (B) OSC. TRIM.	A-12333	C28 .1 MFD. 200 V.	C-720-67			R18 2,000,000Ω 25 W.	B-5458-26
C10 NO.3 (A) & 1 (B) OSC. TRIM	A-12334	C29 .1 MFD. 100 V.	C-720-62			R19 1,500,000Ω 25 W.	B-5458-49
C11 NO 1 (A) & 2 (B) OSC. PADDER	A-10846-2	C30 .1 MFD. 100 V.	C-720-62	R1 500,000Ω V.C. & SWITCH	A-12228	R20 25,000Ω 1 W.	B-4540-6
C12 NO.3 (A) & 4 (B) OSC. PADDER	A-10846-3	C31 .1 MFD 100 V.	C-720-62	R2 400Ω .5 W.	B-4114-44	R21 25,000Ω 1 W.	B-4540-6
C13 L.W. PADDER (A) & TRIM (B)	A-12229	C32 .1 MFD. 100 V.	C-720-66	R3 400Ω .5 W.	B-4114-44	R22 100Ω 1 W.	B-4540-9
C14 L.W. ANT. TRIM	A-12023-1	C33 .2 MFD. 200 V.	C-720-92	R4 400Ω .5 W.	B-4114-44	R23 5,000Ω .25 W.	B-5458-45
C15 L.W. R.F. TRIM.	A-12023-1	C34 .025 MFD. 600 V.	C-720-34	R5 1000Ω 25 W.	B-5458-35		
C16 8T09 MMFD.	A-11261	C35 .025 MFD. 600 V.	C-720-34	R6 1,000Ω 25 W.	B-5458-35		
C17 .001 MFD. MOLDED	C-720-297	C36 .025 MFD. 400 V.	C-720-35	R7 5,000Ω 1 W.	B-4540-16		
C18 .001 MFD. MOLDED	C-720-297	C37 .025 MFD. 400 V.	C-720-35	R8 3,000Ω 1 W.	B-4540-15		
C19 .0001 MFD. MOLDED	C-720-318	C38 .1 MFD. 400 V.	C-720-61	R9 50,000Ω .25 W.	B-5458-27		

R24 50,000Ω W.	B-4540-7	L5 BC. & NO.4 BAND R.F. COIL	A-11213
R25 3000Ω 10 W.	B-5029-5	L6 NO.3 & 5 BAND R.F. COIL	A-11214
R26 1,500Ω 25 W.	B-5458-48	L7 L.W. OSC. COIL	A-12052-2
R27 250,000Ω 25 W.	B-5458-39	L8 BC. & NO.4 BAND OSC.	A-11215
R28 5,000Ω 3 W.	B-4539-6	L9 NO.3 & 5 BAND OSC.	A-11216
R29 100,000Ω TONE CON.	A-11334-1	L10 NO 1 I.F. COIL	A-6314-16
R30 300Ω 2 W.	B-6535-2	L11 NO. 2 I.F. COIL	A-6314-16
R31 1,000,000Ω .25 W.	B-5458-40	L12 NO. 3 I.F. COIL	A 6314-17
		L13 1 4 5 M.H. CHOKE	A-3506-1
L1 L.W. ANT. COIL	A-12293-5	L14 1 4 5 M.H. CHOKE	A-3506-1
L2 BC. & NO.4 BAND ANT. C.	A-11211	L15 CHOKE COIL	A-12371
L3 NO.3 & 5 BAND ANT. COIL	A-11212		
L4 L.W. R.F. COIL	A-12293-5		

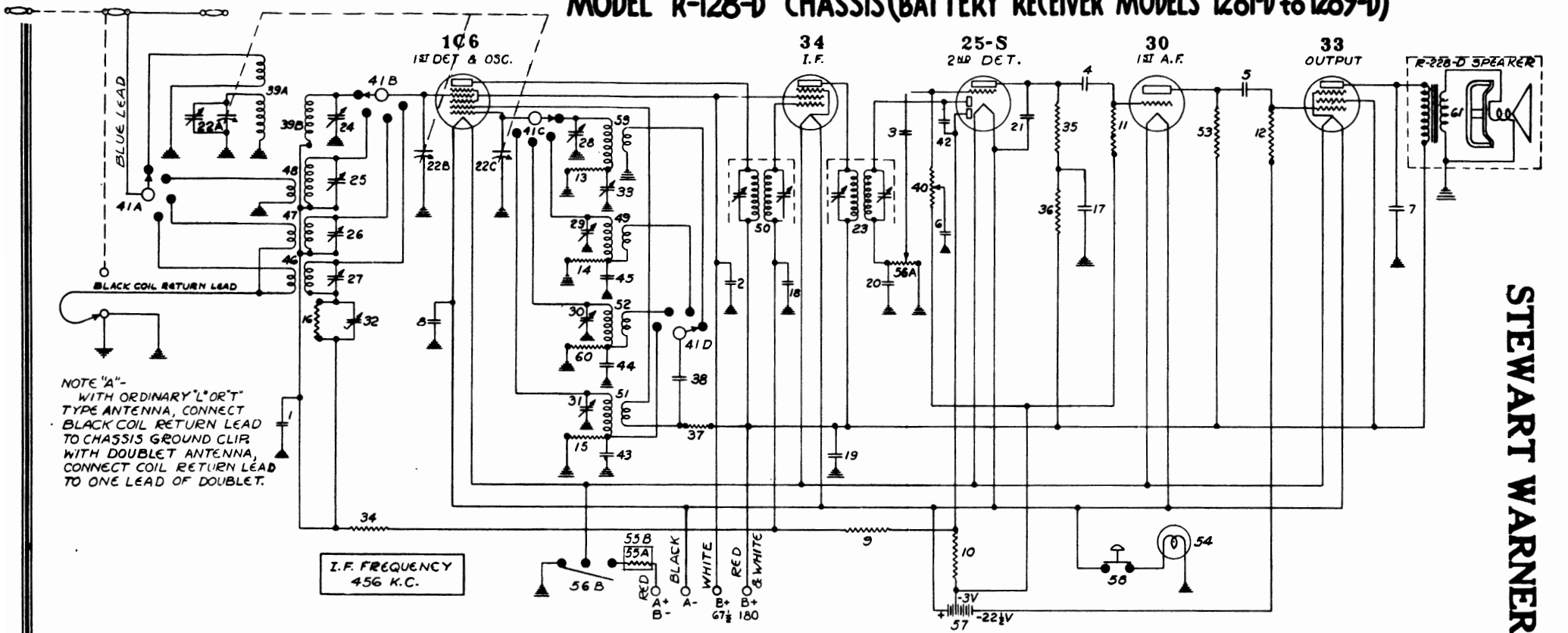
SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 1466 AND 1476
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



C1 VARIABLE CONDENSER	B-6218-1	C17 .001 MFD. MOLDED	C-720-297	C33 .2 MFD. 200 V.	C-720-92	R1 500,000 Ω VOL. & SWITCH	A-12228	R17 100,000 Ω .25 W.	B-5458-30	L1 L.W. ANTENNA COIL	A-12293-5
C2 NO.1 I.F. TRIMMER	A-11364-A	C18 .001 MFD. MOLDED	C-720-297	C34 .025 MFD. 600 V.	C-720-34	R2 400 Ω .5 W.	B-4114-44	R18 2,000,000 Ω .25 W.	B-5458-26	L2 B.C. & NO.4 ANT. COIL	A-11211
C3 NO.2 I.F. TRIMMER	A-11364-A	C19 .0001 MFD. MOLDED	C-720-318	C35 .025 MFD. 600 V.	C-720-34	R3 400 Ω .5 W.	B-4114-44	R19 1,500,000 Ω .25 W.	B-5458-49	L3 NO.3 & 5 ANTENNA COIL	A-11212
C4 NO.3 I.F. TRIMMER	A-11364-A	C20 .0001 MFD. MOLDED	C-720-318	C36 .025 MFD. 400 V.	C-720-35	R4 400 Ω .5 W.	B-4114-44	R20 .25,000 Ω 1 W.	B-4540-6	L4 L.W. R.F. COIL	A-12293-5
C5 NO.4 (A) & 2 (B) ANT TRIM	A-12333	C21 .00005 MFD. MOLDED	C-720-320	C37 .025 MFD. 400 V.	C-720-35	R5 1,000 Ω .25 W.	B-5458-35	R21 .25,000 Ω 1 W.	B-4540-6	L5 B.C. & NO.4 R.F. COIL	A-11213
C6 NO.3 (A) & 1 (B) ANT TRIM	A-12334	C22 .00005 MFD. MOLDED	C-720-321	C38 .1 MFD. 400 V.	C-720-61	R6 1,000 Ω .25 W.	B-5458-35	R22 10,000 Ω 1 W.	B-4540-9	L6 NO.3 & 5 R.F. COIL	A-11214
C7 NO.4 (A) & 2 (B) R.F. TRIM	A-12333	C23 .00025 MFD. MOLDED	C-720-319	C39 .006+.006 MFD. 800 V.	C-720-112	R7 .5,000 Ω 1 W.	B-4540-16	R23 5,000 Ω .25 W.	B-5458-45	L7 L.W. OSC. COIL	A-12052-2
C8 NO.3 (A) & 1 (B) R.F. TRIM	A-12334	C24 16-8 MFD. ELECTRO.	A-12330	C40 .2 MFD. 800 V.	C-720-93	R8 3,000 Ω 1 W.	B-4540-15	R24 50,000 Ω 1 W.	B-4540-7	L8 B.C. & NO.4 OSC. COIL	A-11215
C9 NO.2 (A) & 4 (B) OSC. TRIM.	A-12333	C25 .05 MFD. 200 V.	C-720-54	C41 .1 MFD. 400 V.	C-720-100	R9 50,000 Ω .25 W.	B-5458-27	R25 3,000 Ω 10 W.	B-5029-5	L9 NO.3 & 5 OSC. COIL	A-11216
C10 NO.3 (A) & 1 (B) OSC. TRIM	A-12334	C26 .05 MFD. 200 V.	C-720-54	C42 .0005 MFD. MOLDED	C-720-331	R10 50,000 Ω .25 W.	B-5458-27	R26 1,500 Ω .25 W.	B-5458-49	L10 NO.1 I.F. COIL	A-8314-18
C11 NO.1 (A) & 2 (B) OSC. PAD	A-10846-2	C27 .05 MFD. 200 V.	C-720-54	C43 10 MFD. 25 V. ELECT.	A-10377	R11 50,000 Ω .25 W.	B-5458-27	R27 250,000 Ω .25 W.	B-5458-39	L11 NO.2 I.F. COIL	A-8314-16
C12 NO.3 (A) & 4 (B) OSC. PAD	A-10846-3	C28 .1 MFD. 200 V.	C-720-67	C44 12 MMFD.	A-10998	R12 80,000 Ω .25 W.	B-5458-27	R28 .5,000 Ω 3 W.	B-4539-8	L12 NO.3 I.F. COIL	A-8314-17
C13 L.W. PAD(A) & TRIMMER(B)	A-12229	C29 1 MFD. 100 V.	C-720-62	C45 16-8 MFD. ELECT.	A-12336-	R13 10 Ω 1 W.	B-9549-1	R29 100,000 Ω TONE CONT.	A-11334-1	L13 14.5 H.M. CHOKE	A-35061
C14 L.W. ANTENNA TRIM	A-12023-1	C30 .1 MFD. 100 V.	C-720 62	C46 8-8 MFD. ELECT.	A-11223-1	R14 3,000 Ω .25 W.	B-5458-19	R30 800 Ω 2 W.	B-8635-2	L14 14.5 M.H. CHOKE	A-35064
C15 L.W. R.F. TRIM	A-12023-1	C31 .1 MFD. 100 V.	C-720-62	C47 .002 MFD. MOLDED	C-720-288	R15 100,000 Ω NOISE SUPP.	A-10446	R31 1,000,000 Ω .25 W.	B-5458-40	L15 CHOKE COIL	A-12371-1
C16 6 TO 9 MMFD.	A-11261	C32 .1 MFD. 100 V.	C-720-66	C48 .002 MFD. MOLDED	C-720-288	R16 500,000 Ω .25 W.	B-5458-28				

MODEL R-128-D CHASSIS (BATTERY RECEIVER MODELS 1281-D to 1289-D)

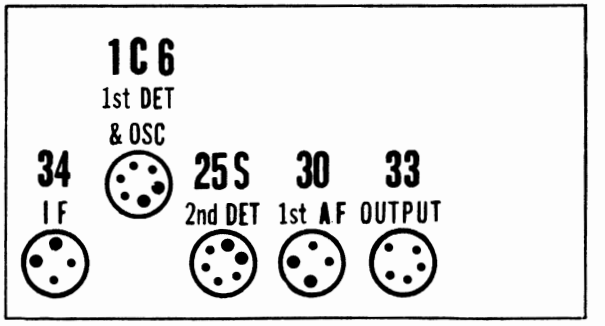


DIAG. NO.	PART NO.	DESCRIPTION	LIST PRICE
33	84195	Padding Trimmer (300-600 mmfd.)	.50
34	84198	110,000 ohm, 1/4 watt carbon resistor	.20
35	84198	110,000 ohm, 1/4 watt carbon resistor	.20
36	84198	110,000 ohm, 1/4 watt carbon resistor	.20
37	84199	16,000 ohm, 1/4 watt carbon resistor	.20
38	84200	.004 mfd. molded mica condenser. 500 volt	.50
39A	84229	Broadcast Pre-Selector Coil Assembly	1.00
39B			
40	84368	300,000 ohm, variable Tone Control resistor	.80
41A			
41B			
41C	84369	Range Switch	1.50
41D			
42	84370	.00011 mfd. molded mica condenser. 500 volt	.15
43	84371	.0004 mfd. molded mica condenser. 500 volt	.20
44	84372	.006 mfd. molded mica condenser. 500 volt	.60
45	84373	.0015 mfd. molded mica condenser. 500 volt	.25
46	84377	#4 band antenna coil	.90
47	84381	#3 band antenna coil (substitute #84734)	
48	84385	#2 band antenna coil	.55
49	84387	#2 band oscillator coil	.55
50	84511	1st. I. F. Transformer	1.75
51	84512	#4 band oscillator coil	1.00
52	84513	#3 band oscillator coil	.85
53	84514	51,000 ohm 1/2 watt carbon resistor	.20
54	84515	Dial light bulb (2.0 volts, .06 amp)	.25
55A	84527	Manganin Resistance wire 5-1/2"	.02
55A 55B	84528	(500,000 ohm volume control) (on-off switch) In one unit	1.25
56B			
57	84529	22-1/2 volt tapped C battery	
58	84532	Dial light push button switch	1.00
59	84542	Broadcast oscillator coil	.75
60	84553	26,000 ohm, 1/4 watt carbon resistor	.20
47	84734	#3 band antenna coil	.75
61	R-228-D	P.M. Speaker and Output Transformer	12.00

DIAG. NO.	PART NO.	DESCRIPTION	LIST PRICE
55B	87035	Tubing for 84527. 4-3/8"	$ .06
1	81630	.1 mfd. 100 volt tubular paper condenser	.30
2	81630	.1 mfd. 100 volt tubular paper condenser	.30
3	83007	.02 mfd. 600 volt tubular paper condenser	.35
4	83007	.02 mfd. 600 volt tubular paper condenser	.35
5	83007	.02 mfd. 600 volt tubular paper condenser	.35
	83011	.004 mfd. 600 volt tubular paper condenser	.30
	83011	.004 mfd. 600 volt tubular paper condenser	.30
8	83063	.5 mfd. 100 volt tubular paper condenser	.45
9	83072	510,000 ohm, 1/4 watt carbon resistor	.20
10	83072	510,000 ohm, 1/4 watt carbon resistor	.20
11	83072	510,000 ohm, 1/4 watt carbon resistor	.20
12	83072	510,000 ohm, 1/4 watt carbon resistor	.20
13	83080	51,000 ohm, 1/4 watt carbon resistor	.20
14	83080	51,000 ohm, 1/4 watt carbon resistor	.20
15	83080	51,000 ohm, 1/4 watt carbon resistor	.20
16	83082	260,000 ohm, 1/4 watt carbon resistor	.20
17	83214	.25 mfd. 250 volt tubular paper condenser	.30
18	83353	.06 mfd. 100 volt tubular paper condenser	.30
19	83429	.5 mfd. 300 volt tubular paper condenser	.55
20	83539	.00026 mfd. molded mica condenser. 500 volt	.25
21	83539	.00025 mfd. molded mica condenser. 500 volt	.25
22A			
22B	84174	3 gang variable condenser	4.00
22C			
23	84188	2nd I. F. Transformer	1.75
24	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
25	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
26	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
27	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
28	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
29	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
30	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
31	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
32	84195	Padding Trimmer (300-600 mmfd.)	.50

TUBE LOCATIONS

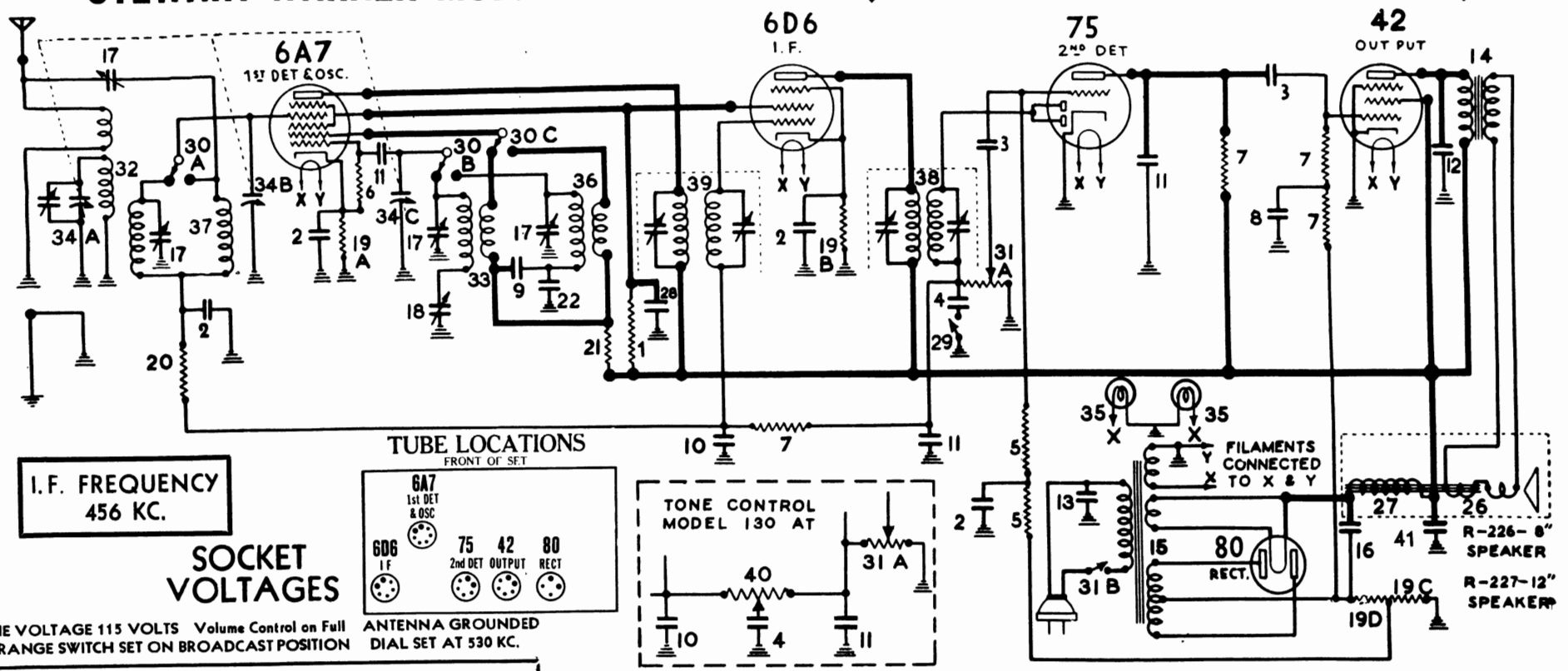
FRONT OF SET



Form 6339 Printed in U.S.A.

STEWART WARNER CORP.

STEWART-WARNER MODEL R-130 CHASSIS (RECEIVER MODELS 1301 to 1309)



I. F. FREQUENCY
456 KC.

SOCKET VOLTAGES

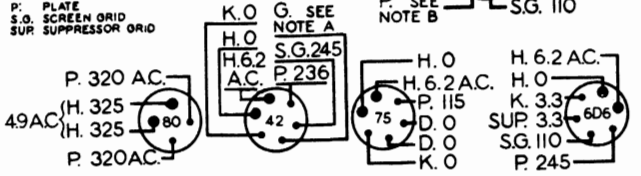
LINE VOLTAGE 115 VOLTS Volume Control on Full
RANGE SWITCH SET ON BROADCAST POSITION

TUBE LOCATIONS
FRONT OF SET

ANTENNA GROUNDED
DIAL SET AT 530 KC.

VOLTAGES MEASURED BETWEEN CHASSIS AND SOCKET TERMINALS AS SEEN FROM THE BOTTOM
FRONT OF CHASSIS

ABBREVIATIONS
D. DIODE
G. GRID
H. HEATER
K. CATHODE
P. PLATE
S.G. SCREEN GRID
SUP. SUPPRESSOR GRID



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

Speaker field voltage with coil warm is 70 volts D. C.

NOTE A: The bias on the 42 output tube is —17 volts measured across the metal clad bias resistor 19C and 19D. The grid bias on the 75 second detector is —1.5 volts measured across the bias resistor 19C.

NOTE B: The oscillator plate voltage for the broadcast range setting with the dial set at 530 KC should be approximately 180 volts. The oscillator grid voltage under the same conditions should be about —18 volts.

R-130 PARTS LIST

Diag. No.	Part No.	Description	LIST PRICE
1	62183	30,000 ohm, 1 watt carbon resistor	.20
2	81630	.1 mfd. 100 volt paper condenser	.30
3	83007	.02 mfd. 600 volt paper condenser	.35
4	83011	.004 mfd. 600 volt paper condenser	.30
5	83072	510,000 ohm, ¼ watt carbon resistor	.20
6	83080	51,000 ohm, ¼ watt carbon resistor	.20
7	83082	260,000 ohm, ¼ watt carbon resistor	.20
8	83219	.01 mfd. 600 volt paper condenser	.30
9	83352	.015 mfd. 600 volt paper condenser	.35
10	83353	.05 mfd. 100 volt paper condenser	.30
11	83539	.00026 mfd. molded mica condenser	.35
12	83706	.006 mfd. 600 volt paper condenser	.35
13	83976	.012 mfd. 1000 volt shielded paper condenser	.35
14	84153	Output transformer (for R-226-8 inch speaker) (See 84312 transformer for 12 inch speaker)	2.25
15	84189	Power transf. 115 volts, 60 cycles, R-130-A only (See 84408 for other voltages and frequencies)	4.00
16	84193	16 mfd. 350 volt wet electrolytic condenser	1.50
17	84194	R.F. trimmer condenser (3 to 30 mmfd.)	.15
18	84195	Oscillator padding trimmer (300-600 mmfd.)	.50
19A, 19B, 19C, 19D	84196	300 ohm resistor; 300 ohm resistor; 25 ohm resistor; 275 ohm resistor	.65
20	84198	110,000 ohm ¼ watt carbon resistor	.20
21	84199	16,000 ohm ¼ watt carbon resistor	.20
22	84200	.004 mfd. molded mica condenser	.50
	84312	Output transformer (on R-227 12" speaker)	2.50
23	84404	Phonograph switch (D.P.D.T.) (R-130-X only)	1.10
24	84407	Phonograph terminal strip (R-130-X only)	.12
25	84408	Power transformer (100 to 240 volts, 25 to 133 cycles) (R-130-X only)	7.00
26	84504	Diaphragm and shell assembly (For R-226 8" speaker) (Also see 84506)	2.50
27	84505	Field coil and housing (For R-226 8" speaker) (Also see 84507)	3.75
	84506	Diaph'm and shell as'mby (For R-227 12" spkr.)	3.25
	84507	Field coil and housing (For R-227 12" speaker)	4.00
28	84601	.25 mfd. 300 volt paper condenser	.30
29	84737	Tone control switch	.35
30	84738	Range switch	.75
31A, 31B	84739	500,000 ohm volume control and line switch	1.25
32	84746	Broadcast preselector coil assembly	1.15
33	84749	Broadcast oscillator coil	.50
34	84750	Three gang variable condenser	4.50
35	84759	6-8 volt dial light bulb	.20
36	84763	Short wave oscillator coil	.60
37	84765	Short wave antenna coil	.50
38	84776	2nd I.F. transformer	2.00
39	84777	1st I.F. transformer	2.00
40	84942	300,000 ohm Tone Control (AT and XT models only)	.75
41	85112	16 mfd. 300 volt wet electrolytic cond	1.50

STEWART WARNER CORP.

STEWART WARNER CORP.
MODEL R-130 CHASSIS (Receiver Models 1301 to 1309)

ALIGNING EQUIPMENT

Experience has definitely shown that a selective radio chassis such as the Stewart-Warner Model R130 cannot be properly aligned by ear or "on the air". **An output meter and a high grade modulated service oscillator are absolutely essential.**

The oscillator should be capable of generating the frequencies of 456 KC., 600 KC., 1400 KC., and a short wave range extending to 4000 K.C. or more.

When using your oscillator do not rely on calibration curves for frequency determination but check the frequencies by comparison with broadcast station signals.

PRELIMINARY STEPS

To align the R130 chassis proceed as follows:

1. Remove the chassis from the cabinet.
2. Connect the output meter across the primary of the output transformer on the dynamic speaker (red and yellow wires on terminal strip.)
3. Turn the volume control to maximum volume position.

ALIGNMENT OF THE I. F. AMPLIFIER

1. (a) Set the test oscillator to exactly 456 KC.

(b) Connect the output leads of the oscillator to the 6A7 control grid and ground.

(c) Set the range switch (right hand knob) to the broadcast position (fully clockwise). Make certain that no station is tuned in.

(d) Carefully adjust the I.F. transformer trimmers Nos. 1, 2, 3, and 4 for maximum output meter deflection.

(e) Repeat the four trimmer adjustments since the adjustment of each trimmer has some effect on the others.

BROADCAST RANGE CALIBRATION

1. Check the position of the pointer on the condenser shaft by turning the rotor plates of the gang condenser to full mesh by means of the tuning knob. The pointer should then coincide with the heavy horizontal line separating the broadcast and short-wave dial scales. If it does not, remove the dial glass and turn the pointer to the proper position, being careful not to break or bend the pointer.
2. Turn the range switch (right hand knob) to the maximum clockwise position, which is the broadcast setting.
3. To calibrate the set at the high frequency end, use a broadcast station signal between 1300 and 1420 KC. If no such station can be heard, you can use a 1400 KC. signal from your oscillator provided its calibration is accurately known.

(a) Turn the set dial to the exact frequency setting of the signal (either a station or the oscillator).

(b) Carefully adjust trimmer No. 5 (broadcast oscillator calibration trimmer) until the signal may be tuned in with maximum volume at its correct frequency setting.

BROADCAST RANGE ALIGNMENT

IMPORTANT

4. Connect a .0001 MICA CONDENSER in series with the test oscillator output and the blue receiver antenna lead. IT IS ABSOLUTELY ESSENTIAL THAT THIS CONDENSER REMAIN CONNECTED FOR ALL BROADCAST AND SHORT WAVE ADJUSTMENTS in order to secure proper alignment of the antenna stage. Do not connect any resistor in series with the .0001 mfd. condenser.

Ground the receiver chassis and connect the oscillator ground lead to the chassis.

5. (a) Set the test oscillator to approximately 1400 KC. and carefully tune the receiver to the signal.

(b) Adjust trimmers No. 6 and No. 7 (broadcast detector shunt trimmer and broadcast pre-selector shunt trimmer respectively) for maximum output meter reading.

(c) Retune the receiver and check the adjustments of trimmers No. 6 and No. 7. Do not touch trimmer No. 5 since this will change the calibration.

6. (a) Set the test oscillator to approximately 600 KC. and tune the receiver to the signal.

(b) Adjust trimmer No. 8 (broadcast oscillator padding trimmer) to get maximum output meter deflection.

(c) Retune the receiver dial to a peak and readjust trimmer No. 8.

(d) Continue this procedure of adjusting the trimmer and retuning the set until the output meter reading cannot be increased. **This procedure must be followed or the receiver will not be properly aligned.**

7. Repeat 5 a, 5 b, and 5 c.

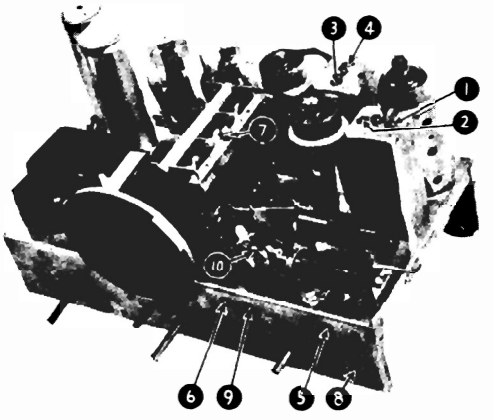
SHORT WAVE RANGE CALIBRATION

1. Turn the receiver range switch to the short wave band position (counter-clockwise).

2. Adjust the test oscillator to exactly 16,000 KC. If you cannot obtain this frequency on your oscillator, you may use the second harmonic of 8000 KC., or the fourth harmonic of 4000 KC., either of which will give a 16,000 KC. signal.

3. (a) Set the receiver dial at 16.0 MC. on the dial scale and adjust trimmer No. 9 (shortwave oscillator calibration trimmer) until the signal may be tuned in at the correct dial setting with maximum volume. There will be two peaks. The proper one is that with the trimmer screw farthest out.

(b) To be sure you have not adjusted trimmer No. 9 to the image frequency, check this point by setting the receiver dial to the image frequency, approximately 15.1 MC., and see if the image signal can be heard. **(The image frequency is always the signal frequency minus twice the I.F. frequency or in this case 16,000 — 912 = 15,088 KC. or approximately 15.1 MC.)** If no signal can be heard at 15.1 MC. dial setting even with greatly increased test oscillator output, but can be heard at 16.9 MC dial setting, trimmer No. 9 is evidently improperly adjusted to the image frequency and so must be reset to the proper peak with the screw farther out. After readjusting trimmer No. 9, again check to see that the image comes in at 15.1 MC. dial setting and not at 16.9 MC dial setting.



SHORT WAVE RANGE ALIGNMENT

4. (a) Tune the set very carefully to the oscillator frequency, 16.0 MC for maximum output meter reading.

(b) Adjust trimmer No. 10 (shortwave range detector shunt trimmer) to a peak. After this is done try to increase the output meter reading by detuning trimmer No. 10 slightly and retuning the receiver dial. Continue detuning trimmer No. 10 and retuning the set until maximum output meter deflection is secured.

NOTE: In some cases, the receiver will oscillate when trimmer No. 10 is set with the trimmer screw too far out. This oscillation which can be eliminated by correct adjustment, is normal when the detector circuit is tuned to the receiver oscillator frequency instead of to the correct signal frequency.

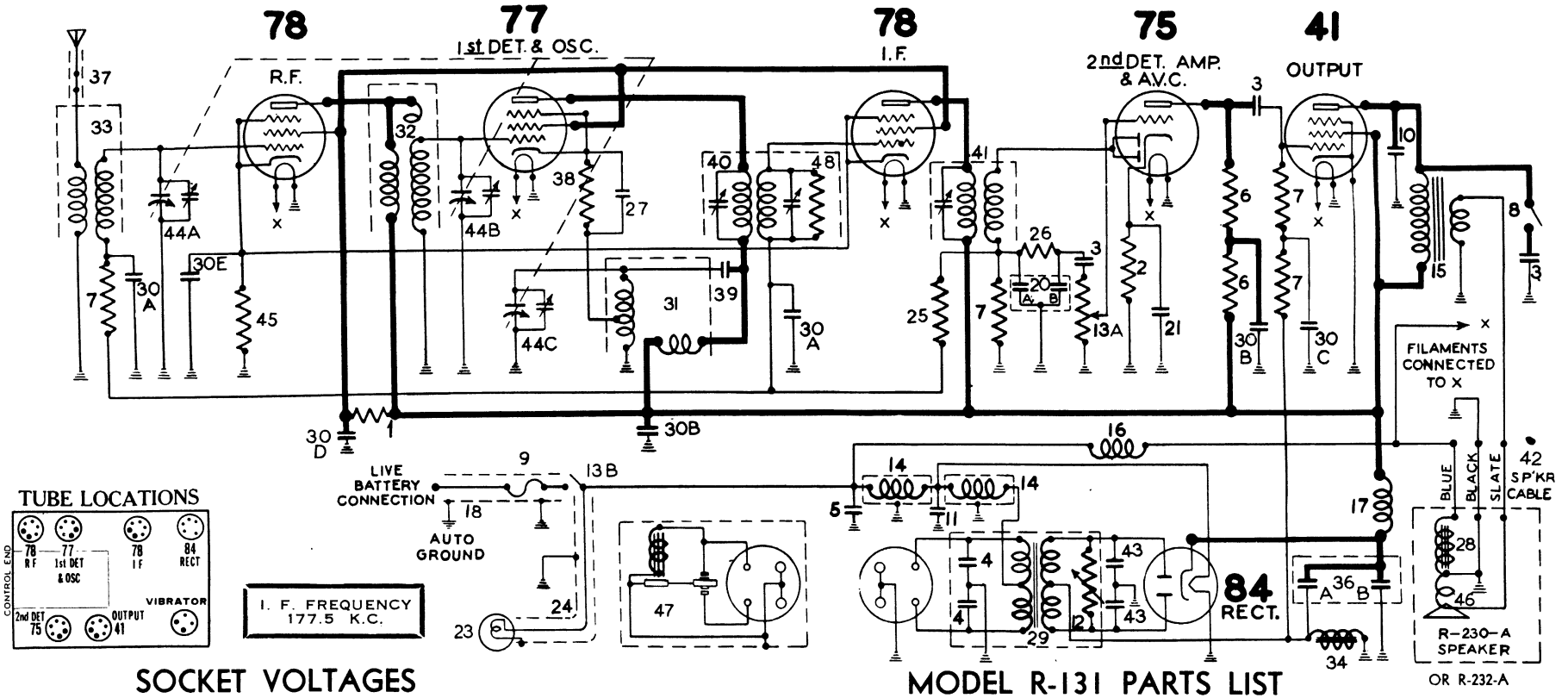
If the set seems to motorboat when making the short wave adjustments, reduce the output of the oscillator. This motorboating will stop when an antenna is connected to the set.

(c) Check the adjustment of trimmer No. 10 by tuning the receiver to about 15.1 MC. and noting if the image signal at this point is much weaker than the 16 MC. signal. If the signal at the 15.1 Mc. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 10 is not properly adjusted and must be readjusted in accordance with 4 (b) with the trimmer screw **FURTHER IN.**

MISCELLANEOUS PARTS NOT SHOWN ON DIAGRAM

67568	Embossed insulating washer for mtg. elect condenser	.05
83560	Tube shield	.15
83668	Electrolytic condenser mtg. nut	.03
83718	Gang condenser mtg. cup washer	.01
84428	Rubber chassis mtg. washer	.03
84493	Chassis mounting screw (No. 10x1¼ self tapping)	.03
84751	Dial mechanism	3.00
84752	Dial drive disc	.35
84753	Dial (Celluloid)	.65
84754	Dial pointer	.30
84755	Dial gasket	.01
84756	Dial glass	.20
84757	Dial glass retainer ring	.01
84758	Dial light socket	.15
84793	Cabinet	11.00
84794	Dial escutcheon	.50
84797	Knobs (R-1301 only)	.15
84805	Felt knob washer	.01
84924	Dial escutcheon mtg. screw No. 1 x ⅜" oval H.W.S.	.01
84935	Knobs (R-1305 only)	.15

STEWART-WARNER MODEL R-131 CHASSIS (RECEIVER MODELS 1311 to 1319)

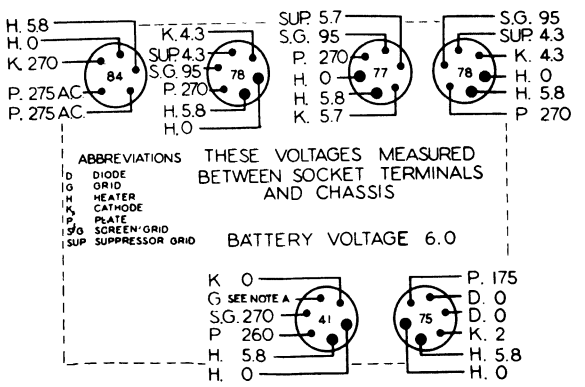


TUBE LOCATIONS

I. F. FREQUENCY 177.5 K.C.

SOCKET VOLTAGES

BOTTOM VIEW OF CHASSIS



IMPORTANT: Use high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon range of meter. Make allowances for battery voltage variations.

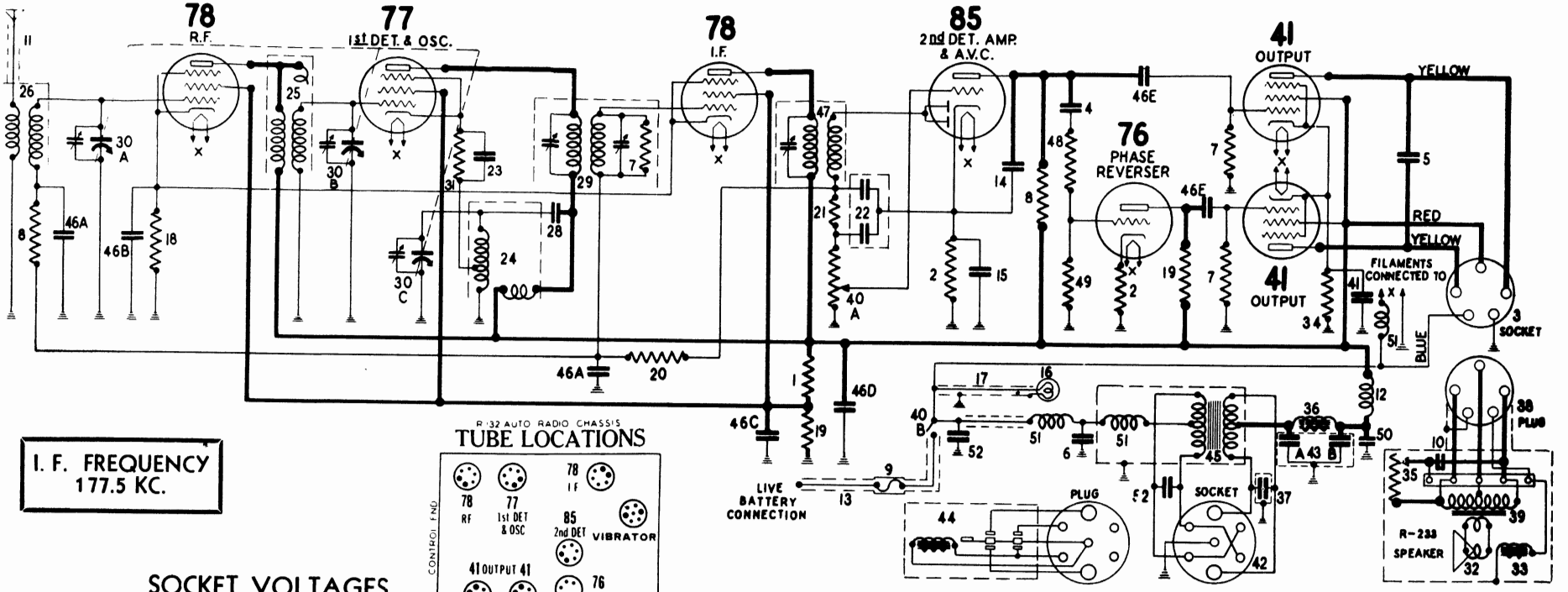
NOTE A: The actual bias on the grid of the 41 tube is —23 volts which must be measured from chassis to the ungrounded filter choke terminal. Due to the high resistance of the grid leak, the voltmeter will show only about —1 volt at the grid.

MODEL R-131 PARTS LIST

Diag. No.	Part No.	Description	List Price
1	66023	60,000 ohm 1 watt carbon resistor	$0.25
2	67580	6,000 ohm ¼ watt carbon resistor	.25
3	83007	.02 mfd. 600 volt paper condenser	.35
4	83058	.25 mfd. 100 volt paper condenser	.35
5	83063	.5 mfd. 100 volt paper condenser	.45
6	83080	51,000 ohm ¼ watt carbon resistor	.20
7	83082	260,000 ohm ¼ watt carbon resistor	.20
8	83179	Tone control switch	.30
9	83207	15 ampere fuse	.05
10	83706	.006 mfd. 600 volt paper condenser	.35
11	83714	1.5 mfd. 100 volt shielded condenser	.80
12	83725	Special Globar resistor	.45
14	83730	Vibrator R.F. Choke	.25
15	83731	Output transformer	2.00
16	83742	Filament R.F. choke	.16
13A, 13B	83728	500,000 ohm volume control Line Switch	1.20
17	83770	"B" supply R.F. choke	.40
18	83777	Battery lead and fuse housing	.50
20	83785	Dual .0005 mfd. molded mica condenser	.32
21	83803	12 mfd. 25 volt dry electrolytic condenser	.80
23	84058	6 - 8 volt dial light bulb	.15
24	84099	Dial light cable	.35
25	84235	1.1 megohm carbon resistor	.20
26	84238	11,000 ohm ¼ watt carbon resistor	.20
27	84282	.001 mfd. molded mica condenser	.25
28	84791	Field coil and housing (R-230A only) (Part 85118 for R-232A)	2.50
29	84798	Power transformer	3.50

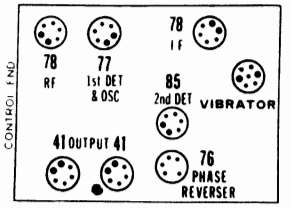
Diag. No.	Part No.	Description	List Price
30A, 30B, 30C, 30D, 30E	84806	.05 mfd. 300 volt paper cond. (green-white); .1 mfd. 400 v. paper cond. (red or red-white); .25 mfd. 100 volt paper cond. (green lead); .25 mfd. 300 volt paper cond. (white lead); .5 mfd. 100 volt paper cond. (orange lead)	2.50
31	84814	Oscillator (O) coil and shield assembly	1.50
32	84822	R.F. (B) coil and shield assembly	1.50
33	84825	Antenna (A) coil and shield assembly	1.40
34	84827	"B" supply filter choke	1.25
36A, 36B	84829	4 mfd.—400 volt dry electrolytic condenser; 8 mfd.—400 volt dry electrolytic condenser	2.50
37	84831	Antenna lead and plug	.10
38	85051	8000 ohm ¼ watt carbon resistor	.20
39	84833	.00007 mfd. molded mica condenser	.20
40	84838	1st. I.F. transformer assembly	2.75
41	84842	2nd. I.F. transformer assembly	2.60
42	84845	Speaker cable	.50
43	84850	.03 mfd. 750 volt paper condenser	.25
44A, 44B, 44C	84866	Three gang variable condenser with mounting plate and shaft coupling	6.00
45	84888	300 ohm. ½ watt flexible wire resistor	.20
46	84891	Diaphragm, voice coil, and shell assembly (R-230A only) (Part 85119 for R-232A)	2.10
47	84904	Vibrator	5.00
48	83072	510,000 ohms ¼ watt resistor	.20
38	85051	8000 ohm ¼ watt carbon resistor	.20
28	85118	Field coil and housing (R-232A only)	2.50
46	85119	Diaphragm, and shell assembly (R-232A only)	2.10

FIRESTONE - STEWART-WARNER MODEL R-1322 AUTO RADIO

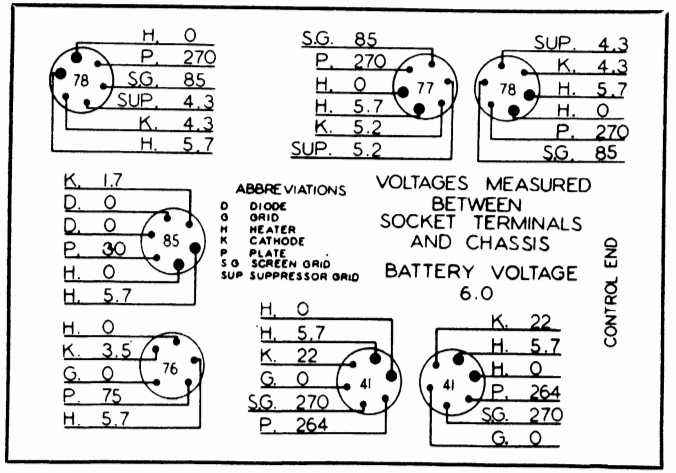


I. F. FREQUENCY
177.5 KC.

R-32 AUTO RADIO CHASSIS
TUBE LOCATIONS



SOCKET VOLTAGES
BOTTOM VIEW OF CHASSIS



IMPORTANT: Use high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon range of meter. Make allowances for battery voltage variations.

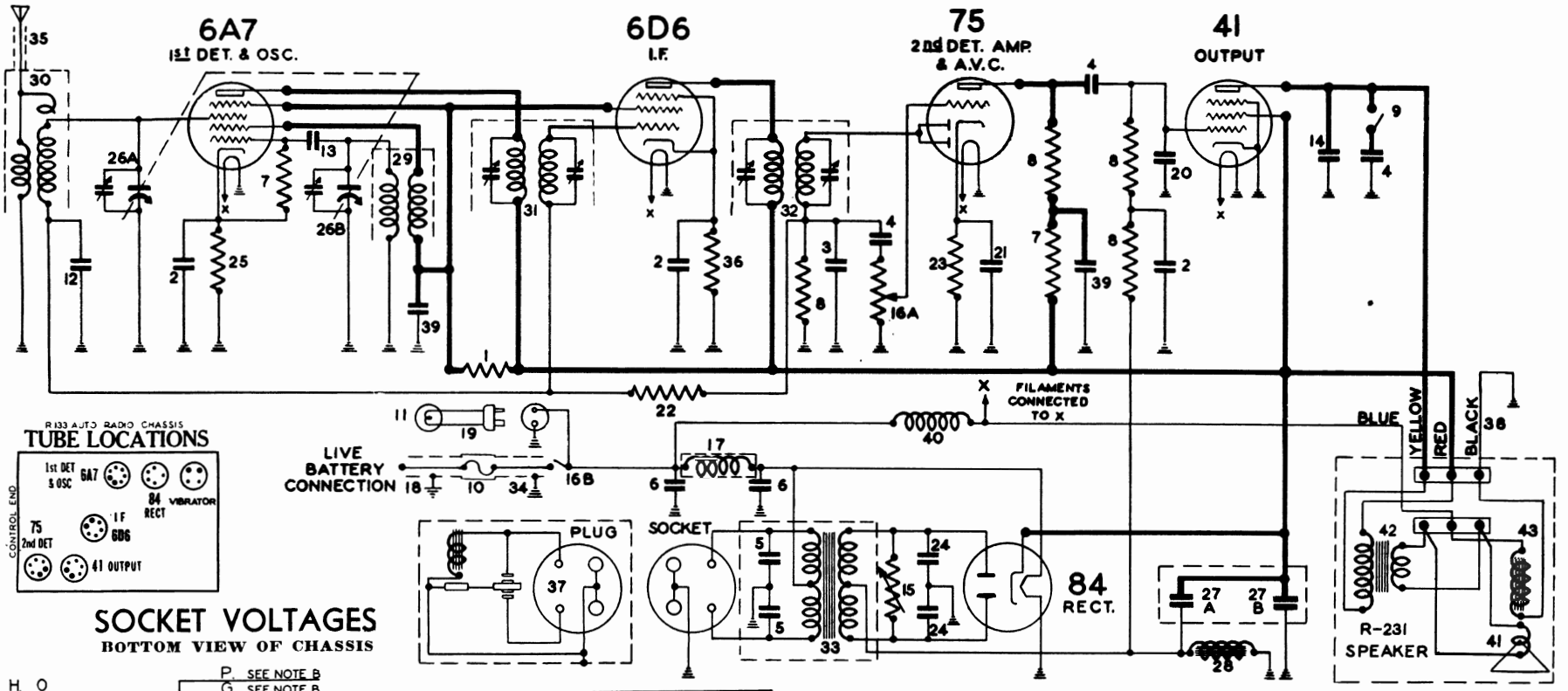
R-1322 PARTS LIST

Diag. No.	Part No.	Description	List Price
1	66023	60,000 ohm 1 watt carbon resistor	$0.25
2	67303	2,000 ohm ¼ watt carbon resistor	.25
3	81951	Speaker socket	.10
4	83007	.02 mfd. 600 volt paper condenser	.35
5	83011	.004 mfd. 600 volt paper condenser	.30
6	83063	.5 mfd. 100 volt paper condenser	.45
7	83072	510,000 ohm ¼ watt carbon resistor	.15
8	83082	260,000 ohm ¼ watt carbon resistor	.20
9	83207	15 ampere fuse	.05
10	83219	.01 mfd. 600 volt paper condenser	.30
11	83723	Antenna lead	.75
12	83770	"B" supply R. F. choke	.40
13	83777	Shielded battery lead and fuse housing	.50
14	83784	.0011 mfd. mica condenser	.22
15	83803	12 mfd. 25 volt dry electrolytic condenser	.80
16	84058	Pilot lamp	.15
17	84099	Pilot light cable	.35
18	84131	400 ohm ½ watt resistor	.20
19	84198	110,000 ohm ¼ watt resistor	.20
20	84235	1.1 meg. ¼ watt carbon resistor	.20
21	84238	11,000 ohm ¼ watt carbon resistor	.20
22	84281	Dual .00026 mfd. mica condenser	.35
23	84282	.001 mfd. mica condenser	.25
24	84814	Oscillator coil	1.50
25	84822	R. F. coil	1.50
26	84825	Antenna coil	1.40
28	84833	.00007 mfd. mica condenser	.20
29	84838	1st I. F. transformer	2.75
30A, 30B, 30C	84866	Three gang variable condenser with mounting plate and shaft coupling	6.00

Diag. No.	Part No.	Description	List Price
31	85051	8000 ohm ¼ watt carbon resistor	.20
32	85058	Diaphragm and shell assembly	3.50
33	85098	Field coil and bracket assembly	3.25
34	85114	500 ohm 2 watt resistor	.25
35	85179	80,000 ohm tone control	.90
36	85183	Filter choke	1.50
37	85190	.005 mfd. 1200 volt paper condenser	.85
38	85193	Speaker plug and cable assembly	1.25
39	85195	Output transformer	3.25
40A, 40B	85215	250,000 ohm volume control; On-off switch	1.20
41	85216	10 mfd. 50 volt dry electrolytic condenser	.80
42	85217	Vibrator Socket	.15
43	85237	Dual 8 mfd. electrolytic condenser	3.00
44	85243	Vibrator	6.50
45	85256	Power transformer	5.00
46A, 46B, 46C, 46D, 46E	85259	.05 mfd. 300 volt cond. (green-white lead); .5 mfd. 100 v. cond. (orange lead); .25 mfd. 300 v. cond. (white lead); .1 mfd. 400 v. cond. (red lead); .02 mfd. 600 v. cond. (yellow & green leads)	2.75
47	85262	2nd I. F. transformer	2.50
48	85265	600,000 ohm ¼ watt carbon resistor	.20
49	85266	70,000 ohm ¼ watt carbon resistor	.20
50	85267	.01 mfd. mica condenser	.50
51	85391	R. F. choke assembly	.30
52	85394	.0005 mfd. mica condenser	.25

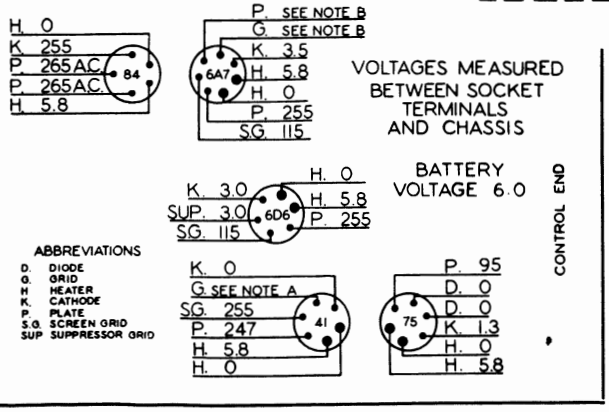
STEWART WARNER CORP.

FIRESTONE-STEWART-WARNER MODEL R-1332 AUTO RADIO



R133 AUTO RADIO CHASSIS
TUBE LOCATIONS

SOCKET VOLTAGES
BOTTOM VIEW OF CHASSIS



IMPORTANT: Use high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon range of meter. Make allowance for battery voltage variations.

NOTE A: The actual bias on the grid of the 41 tube is —23 volts which must be measured from chassis to the ungrounded filter choke terminal. Due to the high resistance of the grid leak, the voltmeter will show only about —1 volt at the grid.

NOTE B: The oscillator grid voltage varies from about —3 at 1500 KC. to —5.0 at 530 KC. The oscillator anode voltage may vary from 115 at 1500 KC. to 120 at 530 KC.

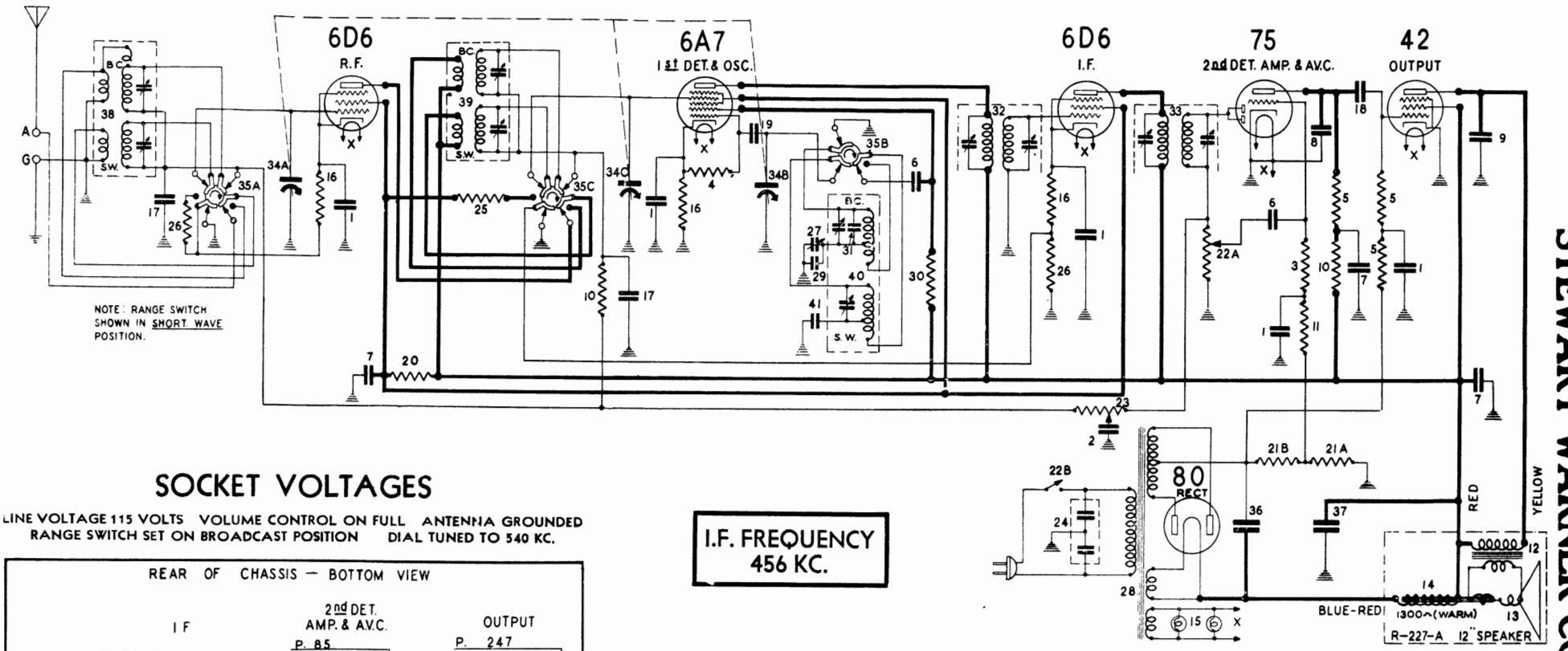
I.F. FREQUENCY 456 KC.

R-1332 PARTS LIST

Diag. No.	Part No.	Description	List Price
1	66875	16,000 ohm 1 watt carbon resistor	$0.50
2	81630	.1 mfd. 100 volt paper condenser	.30
3	81812	.00051 mfd. mica condenser	.25
4	83007	.02 mfd. 600 volt paper condenser	.35
5	83058	.25 mfd. 100 volt paper condenser	.35
6	83063	.5 mfd. 100 volt paper condenser	.45
7	83080	51,000 ohm ¼ watt resistor	.20
8	83082	260,000 ohm ¼ watt resistor	.20
9	83179	Tone Control switch	.30
10	83207	Fuse	.05
11	83278	Pilot lamp	.15
12	83353	.05 mfd. 100 volt paper condenser	.30
13	83539	.00026 mfd. mica condenser	.25
14	83706	.006 mfd. 600 volt condenser	.35
15	83725	0-500,000 globar resistor	.45
16A, 16B	83728	Volume Control and On-Off Switch	1.20
17	83730	R. F. Choke	.25
18	83777	Battery lead and fuse housing	.50
19	83778	Light cable and plug assembly	.50
20	83783	.00011 mfd. mica condenser	.16
21	83803	12 mfd. 15 volt electrolytic condenser	.80
22	84235	1.1 meg. ¼ watt resistor	.20
23	84240	4000 ohm ¼ watt resistor	.20
24	84850	.03 mfd. 750 volt paper condenser	.25
25	84888	300 ohm ½ watt resistor	.20
26A, 26B	84958	Two-gang variable condenser with shaft coupling	4.50
27A, 27B	84961	4 mfd. 400 volt electrolytic condenser and 8 mfd. 400 volt electrolytic condenser	2.50
28	84962	Filter choke	1.25
29	84963	Oscillator coil assembly	1.00
30	84969	Antenna coil and shield assembly	1.25
31	84972	1st I.F. transformer assembly	2.75
32	84974	2nd I.F. transformer assembly	2.75
33	84975	Power transformer	3.50
34	84977	Battery lead and cap (to chassis)	.34
35	84978	Antenna lead	.40
36	84979	250 ohm ½ watt resistor	.15
37	84995	Vibrator	5.00
38	85027	Speaker cable	.30
39	85029	.1 mfd. 300 volt paper condenser	.40
40	85048	Filament R.F. Choke	.25
41	85376	Diaphragm and voice coil assembly	2.00
42	85378	Output transformer	2.00
43	85379	Field coil	1.25

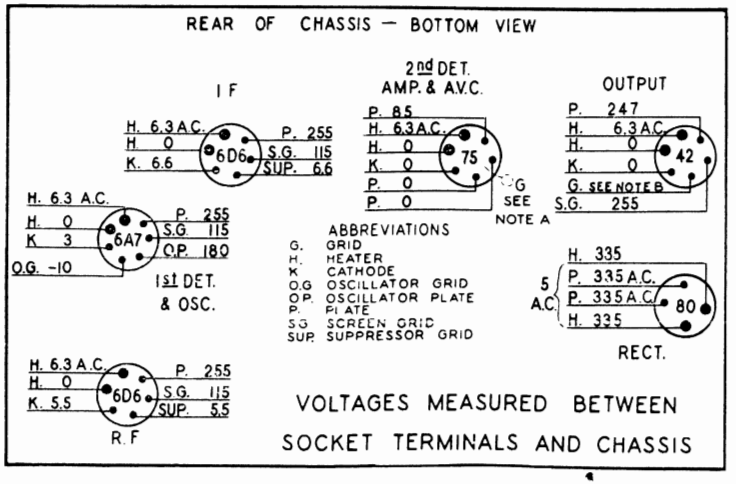
STEWART WARNER CORP.

STEWART-WARNER MODEL R-134 CHASSIS (RECEIVER MODELS 1341 to 1349)



SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS VOLUME CONTROL ON FULL ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION DIAL TUNED TO 540 KC.



IMPORTANT: Use a high resistance meter of 1000 ohms per volt.

NOTE A: The grid bias for the 75 triode section is —1.2 volts measured across resistor 21A.

NOTE B: The grid bias on the 42 output tube is —16 volts, measured across the resistors 21A and 21B.

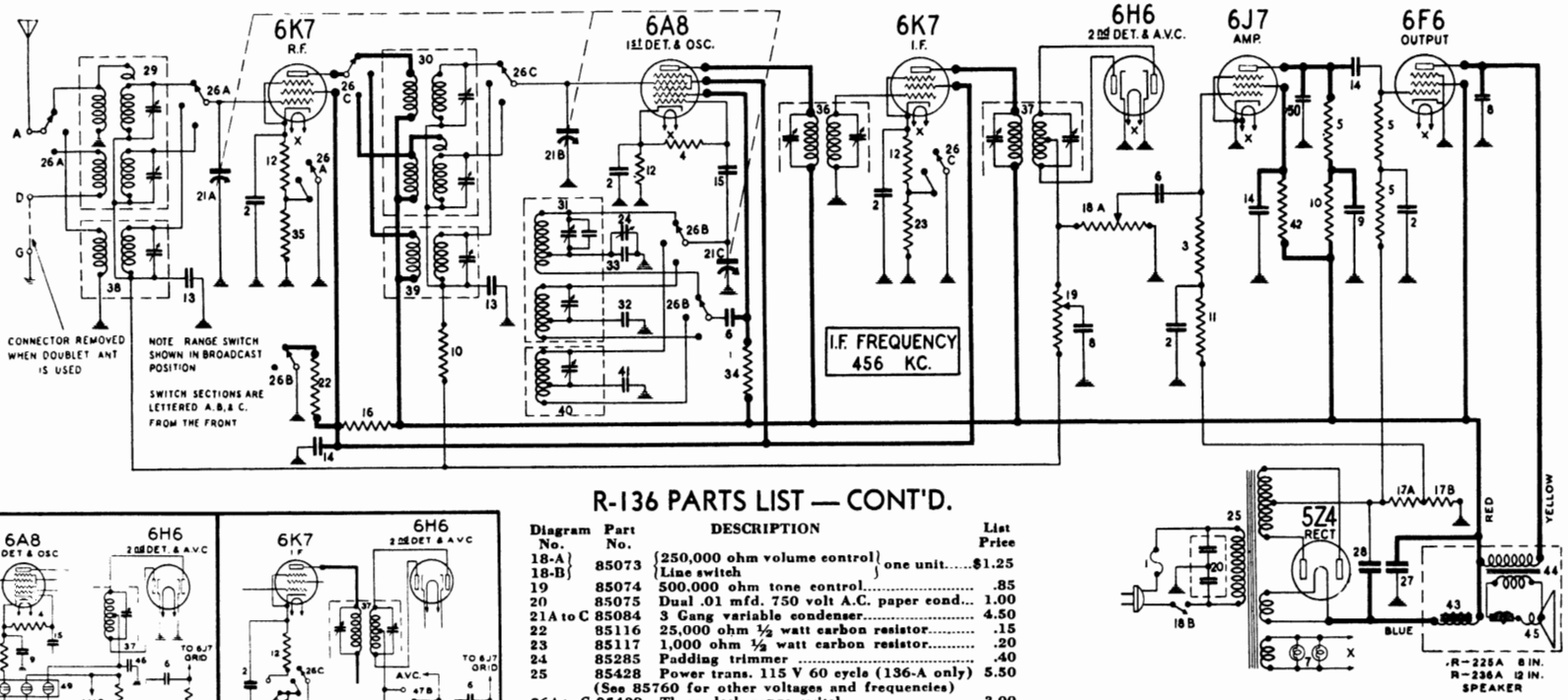
MODEL R-134 PARTS LIST

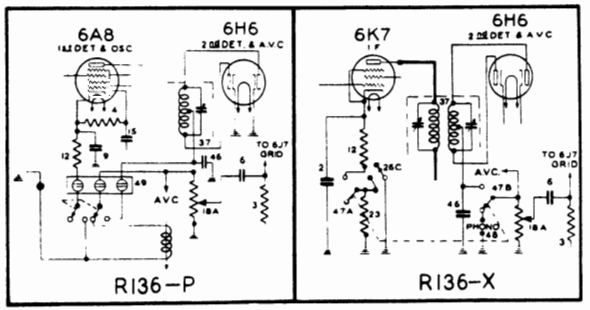
Diag. No.	Part No.	DESCRIPTION	List Price
1	81630	.1 mfd. 175 volt paper condenser	.30
2	83011	.004 mfd. 600 volt paper condenser	.30
3	83072	510.00 ohm ¼ watt carbon resistor	.20
4	83080	51,000 ohm ¼ watt carbon resistor	.20
5	83082	260,000 ohm ¼ watt carbon resistor	.20
6	83219	.01 mfd. 600 volt paper condenser	.30
7	83440	.1 mfd. 400 volt paper condenser	.30
8	83539	260 mmfd. mica condenser	.25
9	83706	.006 mfd. 600 volt paper condenser	.35
10	84198	110,000 ohm ¼ watt carbon resistor	.30
11	84235	1.1 megohm ¼ watt carbon resistor	.20
12	84312	Output transformer (on R-227-A Spkr.)	2.50
13	84506	Diaphragm and shell assembly for (R-227-A Spkr.)	3.25
14	84507	Field coil and housing for (R-227-A Spkr.)	4.00
15	84759	Pilot lamp, 6-8 volt	.20
16	84888	300 ohm ½ watt W.W. resistor	.15
17	85053	.05 mfd. 100 volt paper condenser	.35
18	85059	.05 mfd. 300 volt paper condenser	.35
19	85061	51 mmfd. mica condenser	.15
20	85063	15,000 ohm 2 watt carbon resistor	.25
21A (20 ohm) / 21B (220 ohm)	85067	Bias resistor (wire wound)	.50
22A / 22B	85073	Volume Control (250,000 ohm) / Line Switch	1.25
23	85074	Tone Control (500,000 ohm)	.85
24	85075	Dual .01 mfd. 750 volt paper condenser	1.00
25	85116	25,000 ohm ½ watt carbon resistor	.15
26	85117	1,000 ohm ½ watt carbon resistor	.20
27	85285	Padding trimmer	.40
28	85428	Power transformer, 115 volt 60 cycle	5.50
29	85441	420 mmfd. mica condenser	.25
30	85442	21,000 ohm ½ watt carbon resistor	.20
31	85454	11 mmfd. mica condenser	.20
32	85788	1st I.F. transformer	2.25
33	85789	2nd I.F. transformer	2.25
34 A to C	85790	Three gang condenser	4.50
35 A to C	85791	Range switch	3.00
36	85792	16 mfd. 475 volt electrolytic condenser	1.25
37	85793	16 mfd. 475 volt electrolytic condenser	1.25
38	85829	Antenna coil and shield assembly	3.00
39	85830	R.F. coil and shield assembly	3.00
40	85831	Oscillator coil and shield assembly	3.00
41	85837	.00194 mfd. mica condenser	.30

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STEWART WARNER CORP.

STEWART-WARNER MODEL R-136 CHASSIS (RECEIVER MODELS 1361 to 1369)





PHONOGRAPH MODEL CIRCUITS

R-136 PARTS LIST

Diagram No.	Part No.	DESCRIPTION	List Price
1	38841	Fuse, 1 amp.	$0.10
2	81630	.1 mfd. 175 volt paper condenser	.20
3	83072	510,000 ohm ¼ watt carbon resistor	.20
4	83080	51,000 ohm ¼ watt carbon resistor	.20
5	83082	260,000 ohm ¼ watt carbon resistor	.20
6	83219	.01 mfd. 600 volt paper condenser	.30
7	83278	Dial lamp 6.3 volt	.15
8	83706	.006 mfd. 600 volt paper condenser	.35
9	83974	.1 mfd. 200 volt paper condenser	.25
10	84198	110,000 ohm ¾ watt carbon resistor	.30
11	84235	1.1 megohm ¼ watt carbon resistor	.20
	84312	Output transformer (R-225-A 8" spkr.)	2.50
	84504	Diaphragm and shell assembly (R-225-A 8 inch speaker)	2.50
	84505	Field coil assembly (R-225-A 8" spkr.)	3.75
12	84888	300 ohm ½ watt wire wound resistor	.15
13	85053	.05 mfd. 100 volt paper condenser	.35
14	85059	.05 mfd. 300 volt paper condenser	.35
15	85061	.000051 mfd. mica condenser	.15
16	85063	15,000 ohm 2 watt carbon resistor	.25
17-A, 17-B	85067	275 ohm wire wound bias resistor, 25 ohm wire wound bias resistor — one unit	.50

R-136 PARTS LIST — CONT'D.

Diagram No.	Part No.	DESCRIPTION	List Price
18-A, 18-B	85073	250,000 ohm volume control, Line switch — one unit	$1.25
19	85074	500,000 ohm tone control	.85
20	85075	Dual .01 mfd. 750 volt A.C. paper cond.	1.00
21A to C	85084	3 Gang variable condenser	4.50
22	85116	25,000 ohm ½ watt carbon resistor	.15
23	85117	1,000 ohm ½ watt carbon resistor	.20
24	85285	Padding trimmer	.40
25	85428	Power trans. 115 V 60 cycle (136-A only) (See 85760 for other voltages and frequencies)	5.50
26A to C	85429	Three deck range switch	3.00
27	85430	16 mfd. 300 volt electrolytic condenser	1.25
28	85431	16 mfd. 400 volt electrolytic condenser	1.25
29	85432	Antenna coil and shield assembly (B & No. 3 S.W.)	2.75
30	85433	R. F. coil and shield assembly (B & No. 3 S.W.)	3.00
31	85434	Oscillator coil and shield assembly (B & No. 3 S.W.)	3.00
32	85440	.00351 mfd. mica condenser	.40
33	85441	.00042 mfd. mica condenser	.25
34	85442	21,000 ohm ½ watt carbon resistor	.20
35	85443	2,000 ohm ½ watt carbon resistor	.20
36	85452	1st I.F. transformer	2.50
37	85453	2nd I.F. transformer	2.50
38	85455	Antenna coil assembly (No. 2 S.W.)	1.50
39	85456	R.F. coil assembly (No. 2 S.W.)	1.50
40	85457	Oscillator coil assembly (No. 2 S.W.)	1.25
41	85467	.00137 mfd. mica condenser	.30
42	85472	1.6 megohm ¼ watt carbon resistor	.15
43	85478	Field coil assembly (R-236-A spkr.) (See 84505 for R-225-A 8" spkr.)	5.00
44	85482	Output transformer (R-236-A 12" spkr.) (See 84312 on R-225-A 8" spkr.)	2.50
45	85592	Diaphragm and shell assembly (R-236-A 12" spkr.) (See 84504 for R-225-A 8 inch speaker)	3.50
50	81370	.00011 mfd. mica condenser	.15

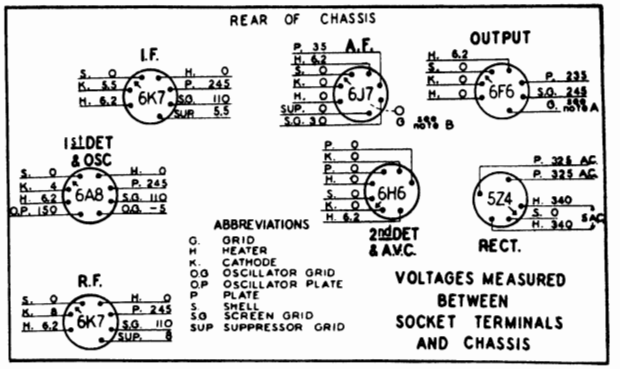
R-136P AND R-136X PARTS

46	83539	.00026 mfd. mica cond. (136P & 136X)	$0.25
47A & B	84404	Phono toggle switch D.P.D.T. (136X)	1.10
48	84407	Phono terminal strip (136X)	.12
49	84412	3 lug terminal strip (136P)	.03
	85760	Power transformer 136X & 136-P only. (100 to 240 volts) (25 to 133 cycles)	8.50

Prices subject to change without notice

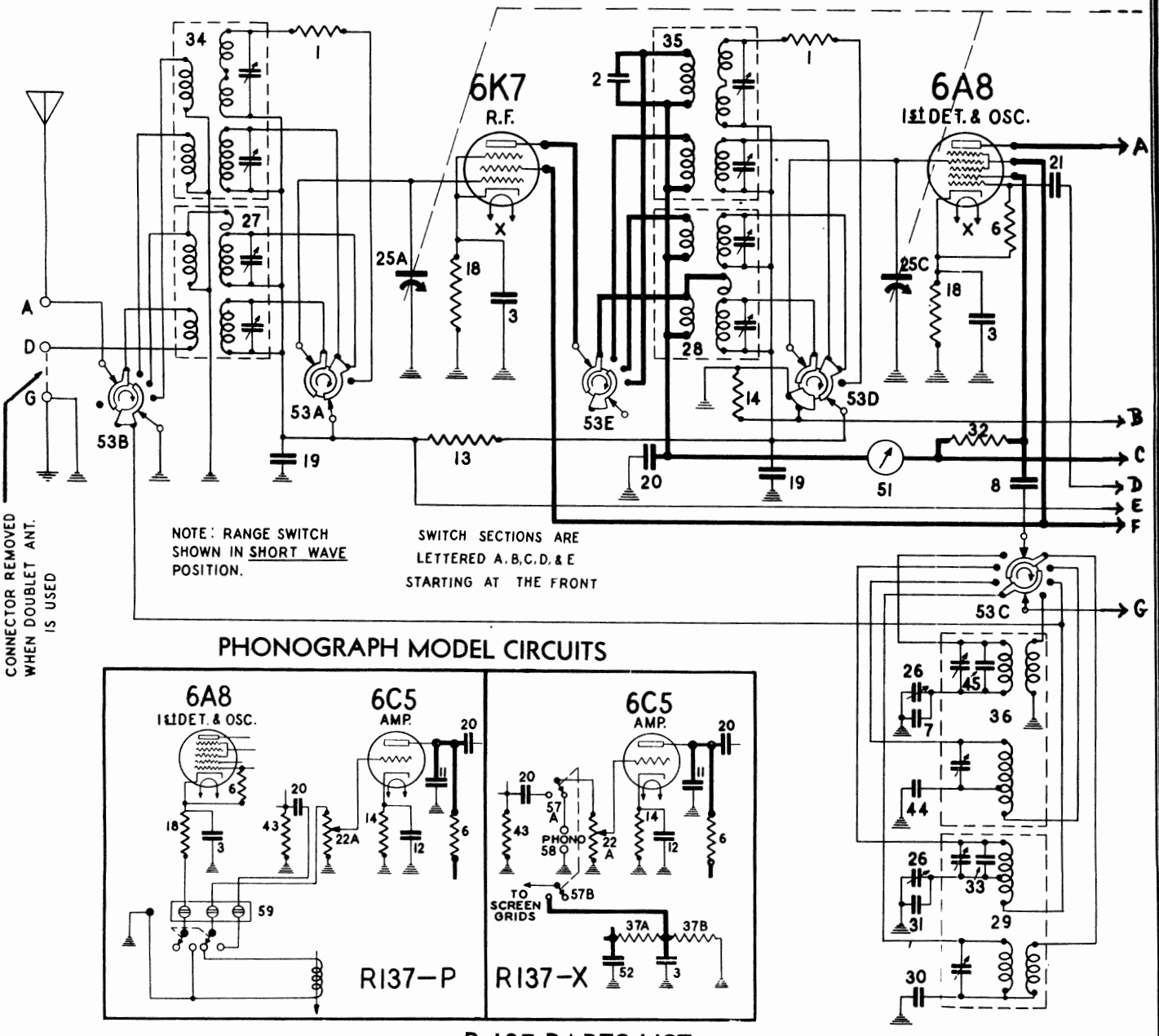
SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS Volume Control on Full — ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION — DIAL TUNED TO 540 KC.



IMPORTANT: Use a high resistance meter of 1000 ohms per volt.
NOTE A: The grid bias on the 6F6 output tube is —16.5 volts, measured across the resistors 17A and 17B.
NOTE B: The grid bias on the 6J7 amplifier tube is —1.7 volts measured across resistor 17B.
Speaker field resistance is 1300 ohms with coil warm.

STEWART WARNER CORP.
MODEL R-137 CHASSIS (RECEIVER MODELS 1371 to 1379)



PHONOGRAPH MODEL CIRCUITS

R-137 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	67786	100 ohm ¼ watt carbon resistor	$0.20
2	81157	.00025 mfd. mica condenser	.30
3	81630	.1 mfd. 175 volt paper condenser	.30
4	81727	1000 ohm ¼ watt carbon resistor	.20
5	83072	510,000 ohm ¼ watt carbon resistor	.15
6	83080	51,000 ohm ¼ watt carbon resistor	.20
7	83109	.0001 mfd. mica condenser	.20
8	83219	.01 mfd. 600 volt paper condenser	.30
9	83278	Dial or tuning indicator lamp (6.3V)	.15
10	83352	.015 mfd. 600 volt paper condenser	.35
11	83539	.00026 mfd. mica condenser	.25
12	83803	12 mfd. 15 volt electrolytic condenser	.80
13	84198	110,000 ohm ¼ watt carbon resistor	.30
14	84236	2,500 ohm ¼ watt carbon resistor	.20
15	84370	.00011 mfd. mica condenser	.15
16	84601	.25 mfd. 300 volt paper condenser	.30
17	84672	Fuse (2 ampere)	.10
18	84888	300 ohm ½ watt flexible resistor	.15
19	85053	.05 mfd. 100 volt paper condenser	.35
20	85059	.05 mfd. 300 volt paper condenser	.35
21	85061	.000051 mfd. mica condenser	.15
22A } 22B }	85073	{ Volume Control 250,000 ohms } { Line switch }	1.25
23	85074	Tone Control 500,000 ohms	.85
24	85075	Dual .01 mfd. 750 volt AC. paper condenser	1.00
25A to C	85084	Three gang condenser	4.50
26	85285	Padding Trimmer	.40

Diag. No.	Part No.	DESCRIPTION	List Price
27	85432	Antenna coil & shield assembly (B & No. 4 S.W.)	$2.75
28	85433	R.F. coil & shield assembly (B & No. 4 S.W.)	3.00
29	85434	Oscillator coil & shield assembly (B & No. 4 S.W.)	3.00
30	85440	.00351 mfd. mica condenser	.40
31	85441	.00042 mfd. mica condenser	.25
32	85442	21,000 ohm ½ watt carbon resistor	.20
33	85454	.000011 mfd. mica condenser	.20
34	85515	Antenna coil & shield assembly (L.W. & No. 3 S.W.)	3.25
35	85516	R.F. coil & shield assembly (L.W. & No. 3 S.W.)	3.25
36	85517	Oscillator coil & shield assembly (L.W. & No. 3 S.W.)	3.25
37A } 37B }	85538	{ 5,200 ohm resistor } { 4,500 ohm resistor } wire wound	1.00
38	85546	Filter choke assembly	2.75
39	85549	Input filter choke assembly	2.50
40	85553	Output transformer (on R-237-A speaker)	4.50
41	85556	Power transformer assembly, 115 V. 60 C. (See 85835 for other voltages and frequencies)	8.50
42	85560	Push-pull input transformer	4.00
43	85561	200,000 ohm ¼ watt carbon resistor	.15
44	85562	.00144 mfd. mica condenser	.30
45	85563	.000026 mfd. mica condenser	.15
46	85565	40 mfd. 100 volt elect. cond. (137A only) (Part No. 85764 used in 137X & 137P models)	2.00

See Next Page →

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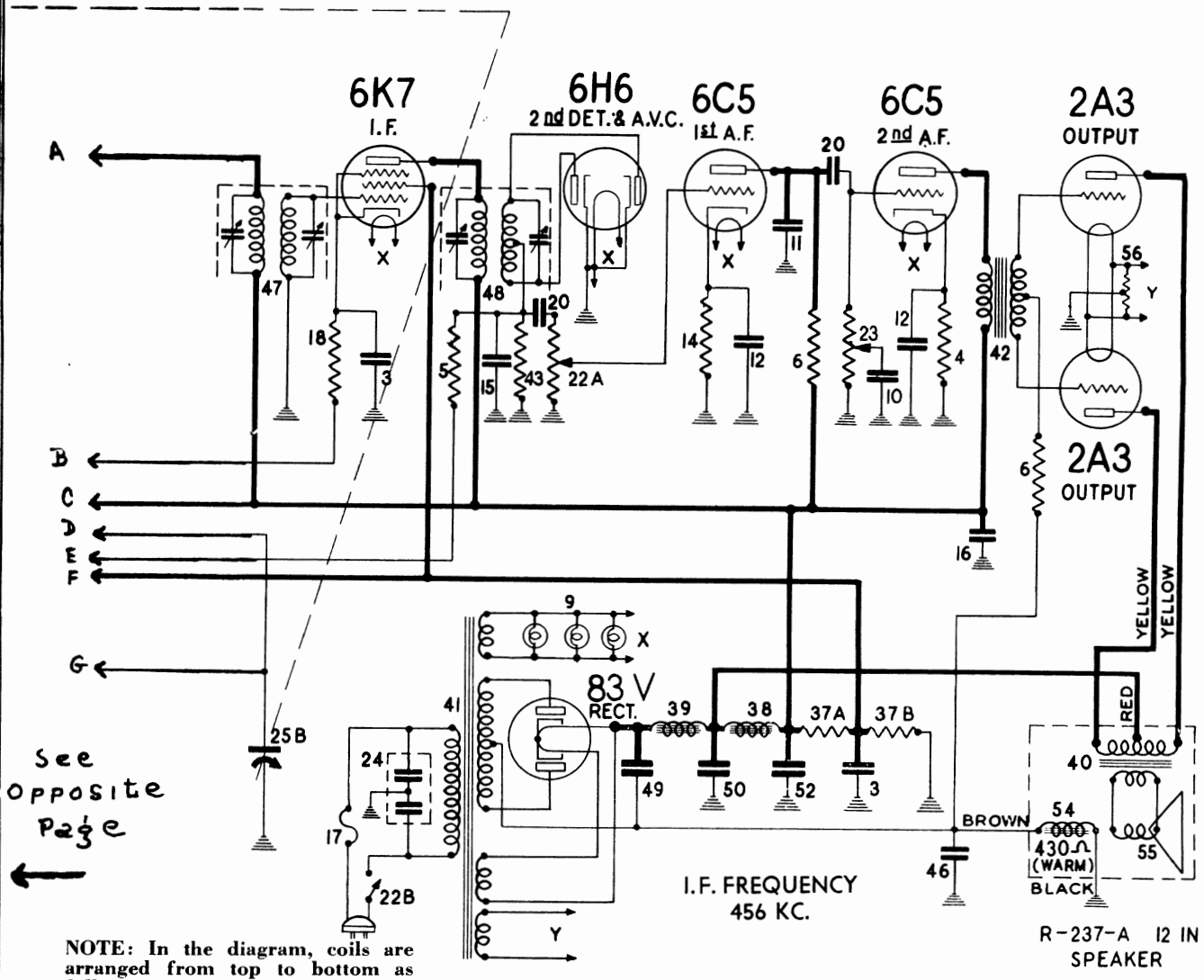
STEWART WARNER CORP.

MODEL R-137 CHASSIS (RECEIVER MODELS 1371 to 1379) [continued]



NOTE: In the diagram, coils are arranged from top to bottom as follows:—

(1) 140 to 400 KC.
(2) 1800 to 6000 KC.
(3) 540 to 1750 KC.
(4) 5.85 to 18 MC.

The first and second are wound on one form and placed in one shield. The third and fourth are wound on another form and placed in another shield.

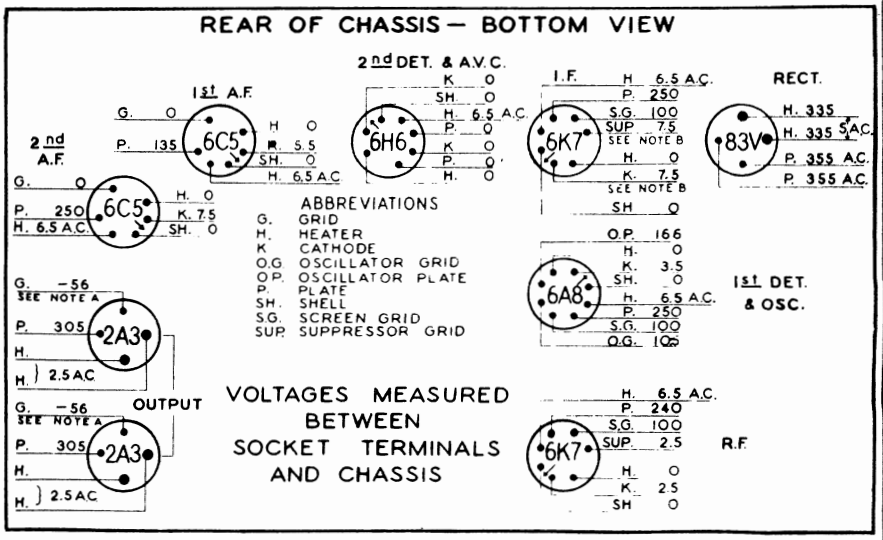
Diag. No.	Part No.	DESCRIPTION (Cont'd)
47	85566	1st I.F. transformer assembly
48	85567	2nd I.F. transformer assembly
49	85583	16 mfd. 450 volt electrolytic condenser
50	85584	16 mfd. 350 volt electrolytic condenser
51	85587	Tuning indicator
52	85588	16 mfd. 300 volt electrolytic condenser
53A to E	85589	Range Switch
54	85593	Field coil & housing assembly (R-237A speaker)
55	85601	Diaphragm & shell assembly (R-237A speaker)
56	85605	20 ohm wire wound center-tapped resistor

R-137-X & R-137-P PARTS

57A & B	84404	Phonograph toggle switch (D.P.D.T.) (137-X only)
58	84407	Phonograph terminal strip (137-X only)
59	84412	Three-lug terminal strip (137-P only)
	85764	40 mfd. 100 volt electrolytic condenser
	85835	Power transformer (100 to 240 volts, 25 to 133 cycles)

SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS — VOLUME CONTROL ON FULL — ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION — SET TUNED TO 540 K.C.



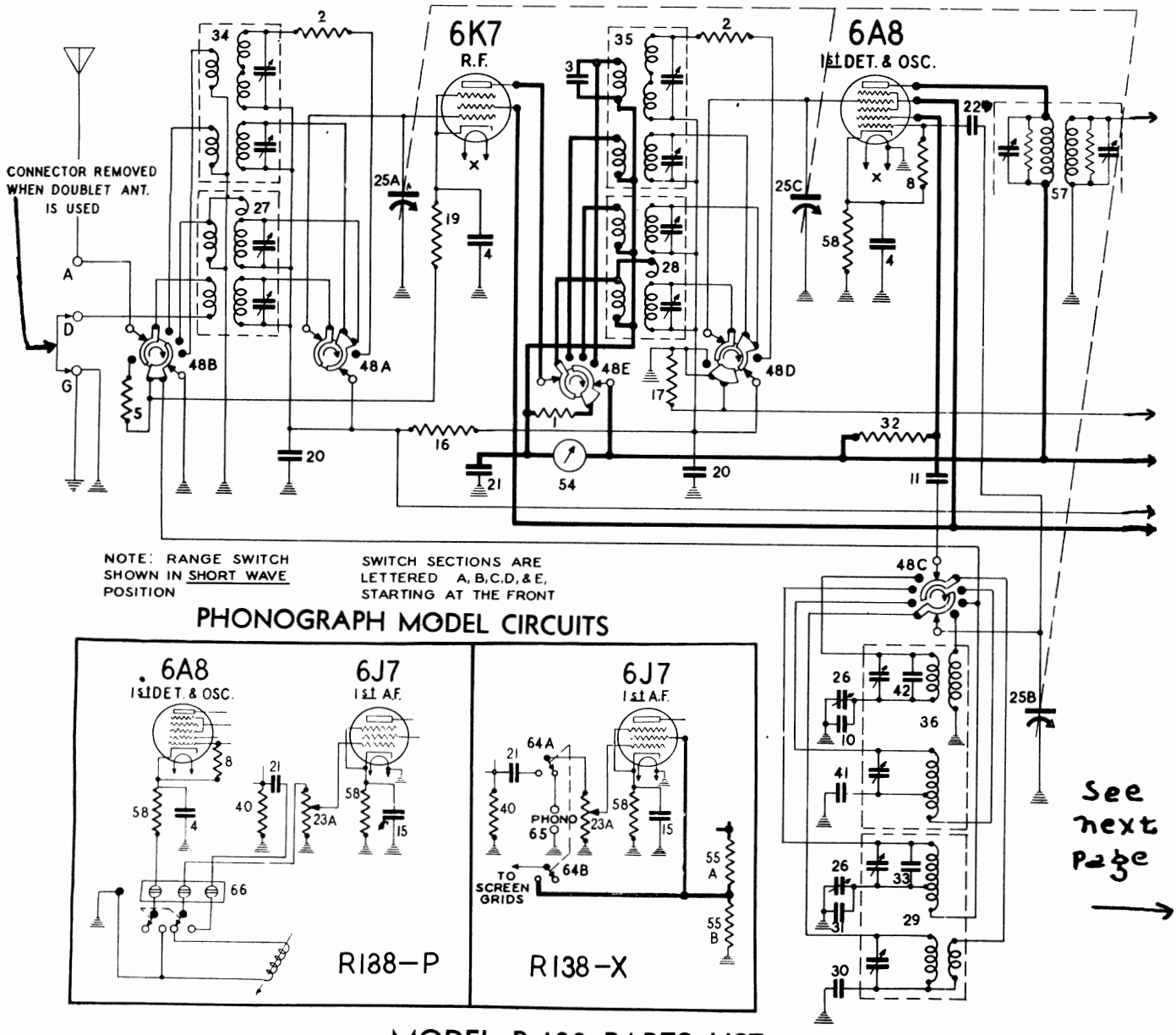
IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The grid bias on the 2A3 tubes is —62 volts, measured across the speaker field.

NOTE B: The cathode and suppressor grid voltage for the 6K7 I.F. tube is 2.5 volts for the two short-wave settings of the range switch.

STEWART WARNER CORP.

MODEL R-138 CHASSIS (RECEIVER MODELS 1381 to 1389)



PHONOGRAPH MODEL CIRCUITS

See next page →

MODEL R-138 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	67303	2000 ohm ¼ watt carbon resistor	$0.25
2	67786	100 ohm ¼ watt carbon resistor	.20
3	81157	.00025 mica condenser	.30
4	81630	.1 mfd. 175 volt paper condenser	.30
5	81727	1000 ohm ¼ watt carbon resistor	.20
6	83063	.5 mfd. 200 volt paper condenser	.45
7	83072	510,000 ohm ¼ watt carbon resistor	.15
8	83080	51,000 ohm ¼ watt carbon resistor	.20
9	83082	260,000 ohm ¼ watt carbon resistor	.20
10	83109	.0001 mfd. mica condenser	.20
11	83219	.01 mfd. 600 volt paper condenser	.30
12	83278	Dial or tuning indicator lamp (6.3 volt)	.15
13	83352	.015 mfd. 600 volt paper condenser	.35
14	83539	.00026 mica condenser	.25
15	83803	12 mfd. 15 volt electrolytic condenser	.80
16	84198	110,000 ohm ¼ watt carbon resistor	.30
17	84236	2500 ohm ¼ watt carbon resistor	.20
18	84672	Fuse (2 ampere)	.10
19	84888	300 ohm ½ watt flexible resistor	.15
20	85053	.05 mfd. 100 volt paper condenser	.35
21	85059	.05 mfd. 300 volt paper condenser	.35
22	85061	.000051 mica condenser	.15
23A 23B	85073	Volume control (250,000 ohm) line switch	1.25
24	85075	Dual .01 mfd. 750 volt A.C. paper cond.	1.00
25A to C	85084	Three gang condenser	4.50
26	85285	Padding trimmer	.40
27	85432	Antenna coil & shield assembly (B & No. 4 S.W.)	2.75
28	85433	R.F. coil & shield assembly (B. & No. 4 S.W.)	3.00
29	85434	Oscillator coil & shield assembly (B. & No. 4 S.W.)	$3.00
30	85440	.00351 mica condenser	.40
31	85441	.00042 mica condenser	.25
32	85442	21,000 ohm ½ watt carbon resistor	.20
33	85454	.000011 mfd. mica condenser	.20
34	85515	Antenna coil & shield assembly (L.W. & No. 3 S.W.)	3.25
35	85516	R.F. coil & shield assembly (L.W. & No. 3 S.W.)	3.25
36	85517	Oscillator coil & shield assembly (L.W. & No. 3 S.W.)	3.25
37	85549	Input filter choke	2.50
38	85556	Power transformer, 115 volt, 60 cycle (See 85835 for other voltages and frequencies)	8.50
39	85560	Push-pull input transformer	4.00
40	85561	200,000 ohm ¼ watt carbon resistor	.15
41	85562	.00144 mfd. mica condenser	.30
42	85563	.000026 mfd. mica condenser	.15
43	85565	40 mfd. 100 volt electrolytic condenser (See 85764 for models 138X & 138P)	2.00
44	85567	Third I.F. transformer assembly	2.50
45	85583	16 mfd. 450 volt electrolytic condenser	3.00
46	85584	16 mfd. 350 volt electrolytic condenser	2.50
47	85588	16 mfd. 300 volt electrolytic condenser	2.50
48A to E	85589	Range switch	4.00
49	85605	20 ohm w.w. center-tapped ½ watt resistor	.25
50	85620	Treble tone control (1 megohm)	.80
51	85621	Bass tone control (500,000 ohms)	.80
52	85644	Tone compensator assembly	6.00
53	85650	Output transformer (on R-238 speaker)	4.50

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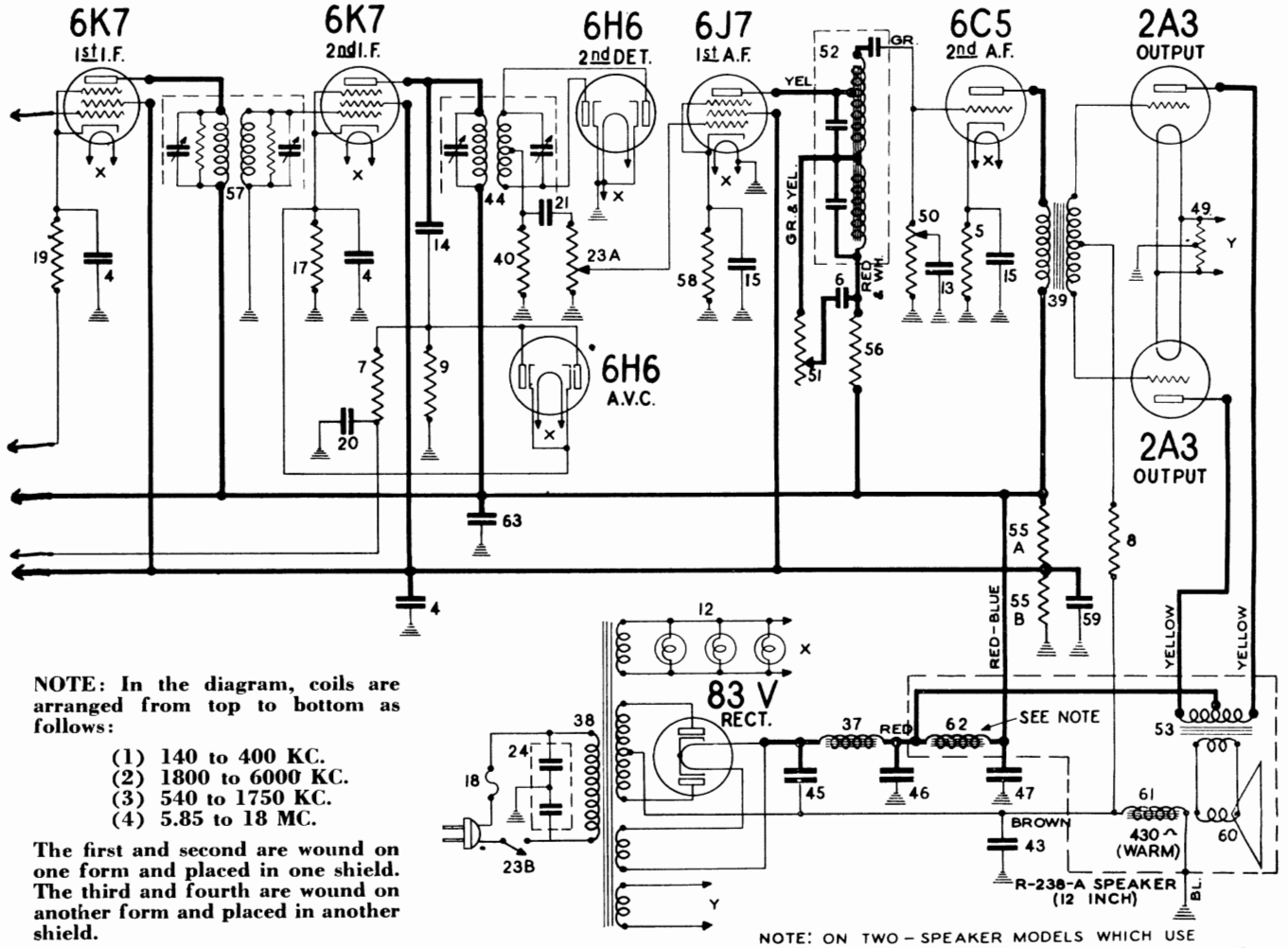
STEWART WARNER CORP.

R-138 CHASSIS (RECEIVER MODELS 1381 to 1389) [continued]



NOTE: In the diagram, coils are arranged from top to bottom as follows:

(1) 140 to 400 KC.
(2) 1800 to 6000 KC.
(3) 540 to 1750 KC.
(4) 5.85 to 18 MC.

The first and second are wound on one form and placed in one shield. The third and fourth are wound on another form and placed in another shield.

NOTE: ON TWO-SPEAKER MODELS WHICH USE THE R-239-A 14 INCH AND R-240-A 6 INCH SPEAKERS THE VOICE COILS ARE CONNECTED IN PARALLEL AND ITEM 62 FILTER CHOKE IS REPLACED BY THE FIELD OF THE R-240-A SPEAKER.

← See opposite page

I. F. FREQUENCY
456 KC.

Parts List (continued)

Diag. No.	Part No.	DESCRIPTION
54	85665	Tuning meter
55A	85666	5500 ohm resistor } Wire wound
55B		5000 ohm resistor }
56	85667	5000 ohm ¼ watt carbon resistor
57	85668	First or second I.F. transformer assembly
58	85691	500 ohm ½ watt carbon resistor
59	85692	4 mfd. 150 volt electrolytic condenser (See 85768 for models 138X & 138P)
60	85700	Diaphragm, V.C. & shell assembly (R-238-A 12" spkr.)
61	85703	Field coil and housing (R-238-A 12" spkr.)
62	85712	Filter choke (on R-238-A 12" spkr.)
	85741	Field coil (R-239-A 14" spkr.)
	85744	Output transformer (on R-239-A 14" spkr.)
	85747	Diaphragm V.C. and shell assembly (R-239-A 14" spkr.)
63	85950	.4 mfd. 250 volt paper condenser
	R-240	High frequency spkr. used with R-239-A on two-spkr. models

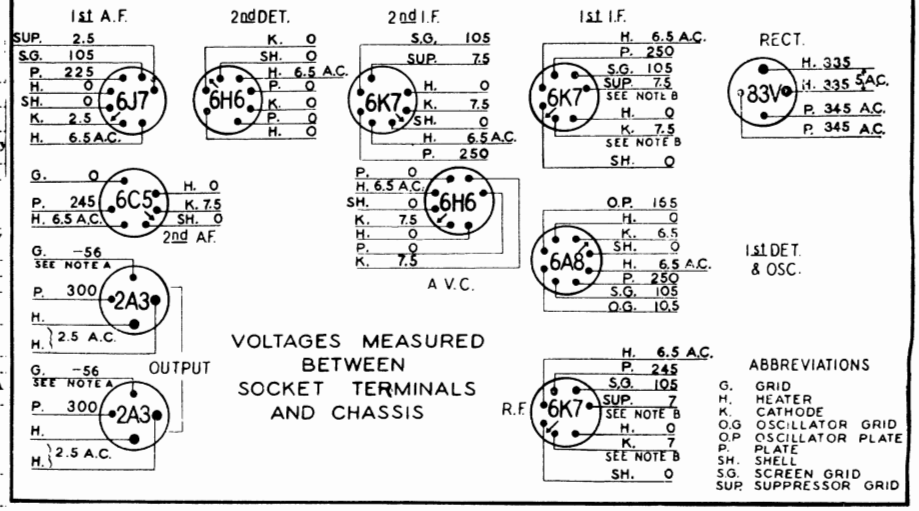
R-138-X and R-138-P PARTS

64A&B	84404	Phonograph toggle switch (D.P.D.T.) (138X only)
65	84407	Phonograph terminal strip (138X only)
66	84412	3 lug terminal strip (138P only)
	85764	40 mfd. 100 volt electrolytic condenser
	85768	4 mfd. 150 volt electrolytic condenser
	85835	Power transformer (100 to 240 volts, 25 to 133 cycles)

SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS — VOLUME CONTROL ON FULL — ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION — SET TUNED TO 540 K. C.

REAR OF CHASSIS — BOTTOM VIEW

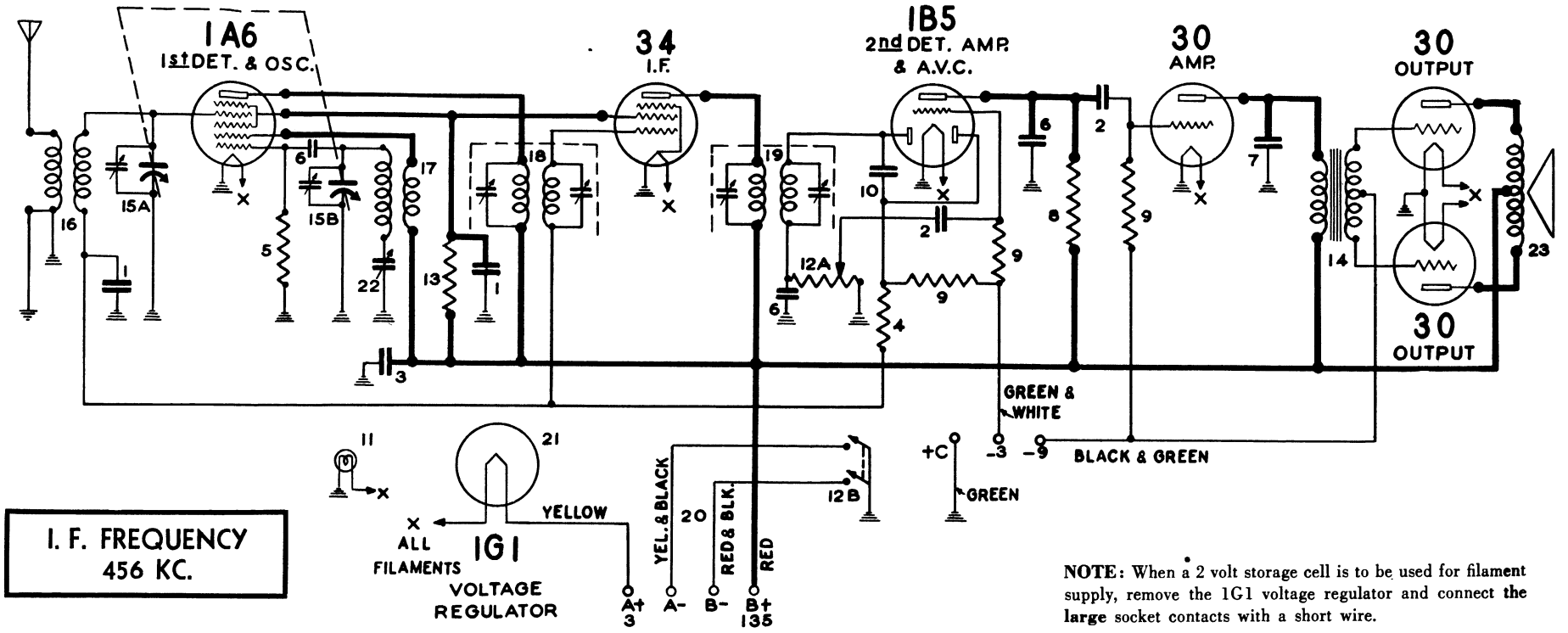


IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The grid bias on the 2A3 tubes is —62 volts, measured across the speaker field.

NOTE B: The cathode and suppressor grid voltage for the 6K7 R.F. and I.F. tubes is 2.5 volts for the two short-wave settings of the range switch.

STEWART-WARNER MODEL R-139-D CHASSIS (RECEIVER MODELS 1391-D to 1399-D)



I. F. FREQUENCY 456 KC.

NOTE: When a 2 volt storage cell is to be used for filament supply, remove the 1G1 voltage regulator and connect the large socket contacts with a short wire.

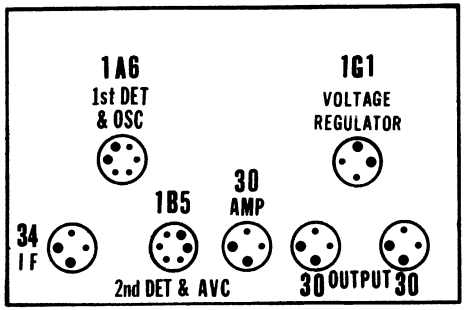
R-139-D PARTS LIST

Diag No.	Part No.	DESCRIPTION	List Price
1	81630	.1 mfd. 175 volt paper condenser	$0.30
2	83007	.02 mfd. 600 volt paper condenser	.35
3	83063	.5 mfd. 150 volt paper condenser	.45
4	83072	510,000 ohm ¼ W. carbon resistor	.15
5	83080	51,000 ohm ¼ W. carbon resistor	.20
6	83539	.00026 mfd. mica condenser	.25
7	83784	.0011 mfd. mica condenser	.22
8	84198	110,000 ohm ¼ W. carbon resistor	.30
9	84235	1.1 megohm ¼ W. carbon resistor	.20
10	84370	.00011 mfd. mica condenser	.15
11	84515	Dial lamp 2.0 volt .060 amp.	.25
12A, 12B	84528	Volume control, 500,000 ohm; Line switch	1.25
13	85116	25,000 ohm ¼ W. carbon resistor	.15
14	85404	Push-pull input transformer	2.50
15A, 15B	85405	Two gang variable condenser	$4.00
16	85406	Antenna coil assembly	1.00
17	85408	Osc. coil assembly	.75
18	85409	1st I.F. transformer	2.50
19	85410	2nd I.F. transformer	2.50
20	85416	Battery cable	.60
21	85420	Voltage regulator tube	1.10
22	85505	Padding trimmer	.50
23	R-234-D	6" magnetic spkr. used on 1391 D	5.75
	R-235-D	8" magnetic spkr. used on 1395 D	6.50
	85938	"A" battery cable 1395 D (special)	.30
	85939	"B" & "C" battery cable & plug 1395 D (special)	1.10

Prices subject to change without notice.

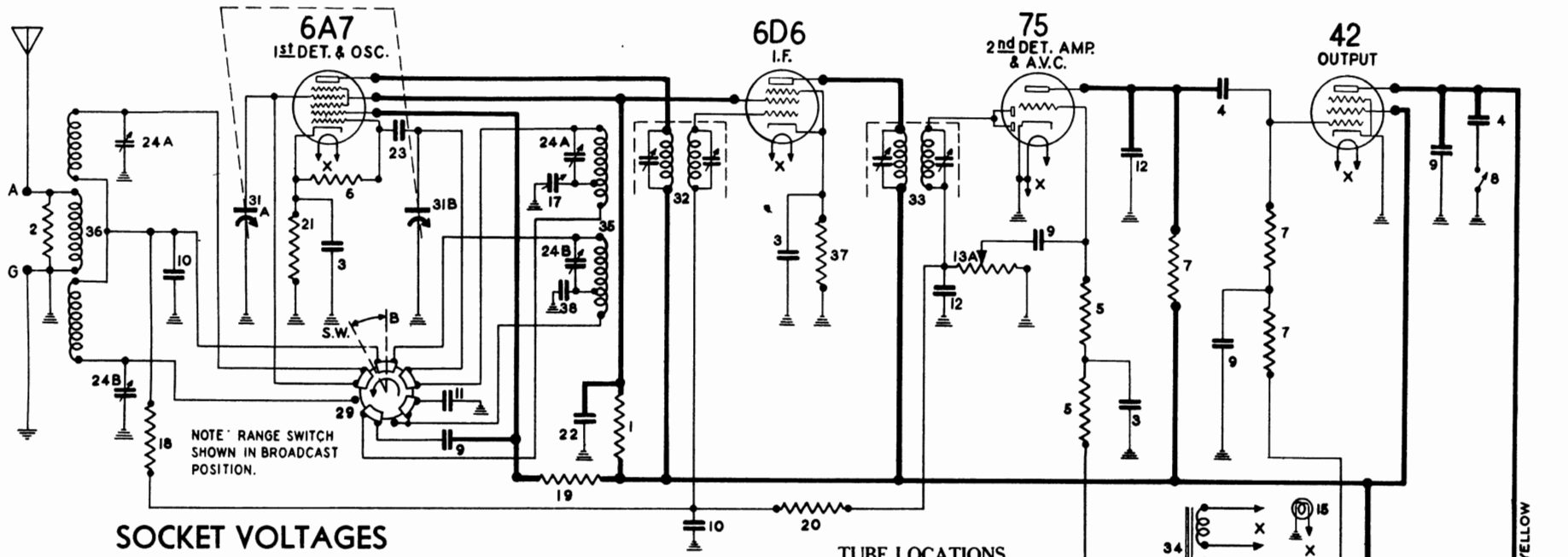
TUBE LOCATIONS

FRONT OF SET



STEWART WARNER CORP.

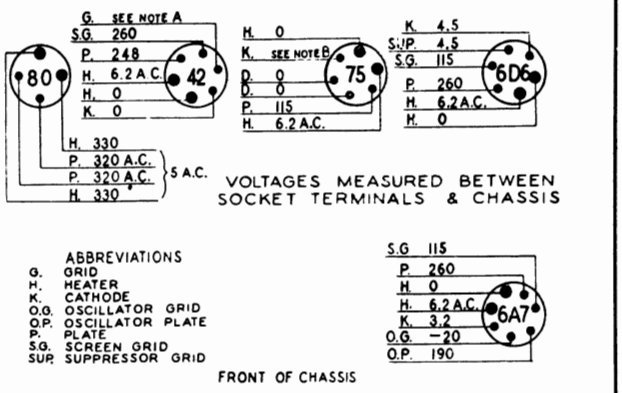
STEWART-WARNER MODEL R-140 CHASSIS (RECEIVER MODELS 1401 to 1409)



SOCKET VOLTAGES

BOTTOM VIEW OF CHASSIS

LINE VOLTAGE 115 VOLTS Volume Control on Full ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION SET TUNED TO 540 K.C.



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS & CHASSIS

ABBREVIATIONS

G.	GRID
H.	HEATER
K.	CATHODE
O.G.	OSCILLATOR GRID
O.P.	OSCILLATOR PLATE
P.	PLATE
S.G.	SCREEN GRID
SUP.	SUPPRESSOR GRID

FRONT OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

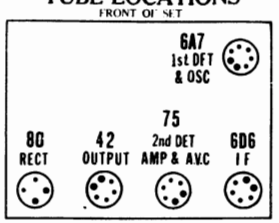
Voltage across speaker field with coil warm is 70 volts D. C.

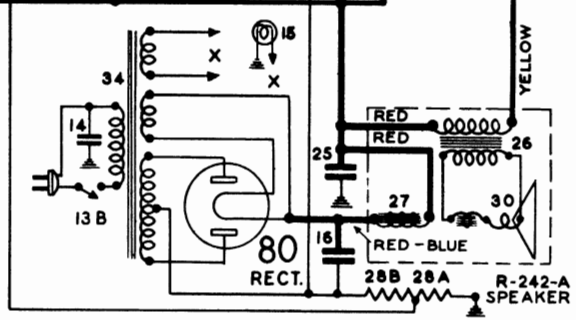
NOTE A: The bias on the 42 output tube is —17.5 volts measured across the metal-clad bias resistor 28A and 28B.

NOTE B: The grid bias on the 75 second detector is —1.5 volts measured across the bias resistor 28A.

I.F. FREQUENCY 456 KC.

TUBE LOCATIONS
FRONT OF SET



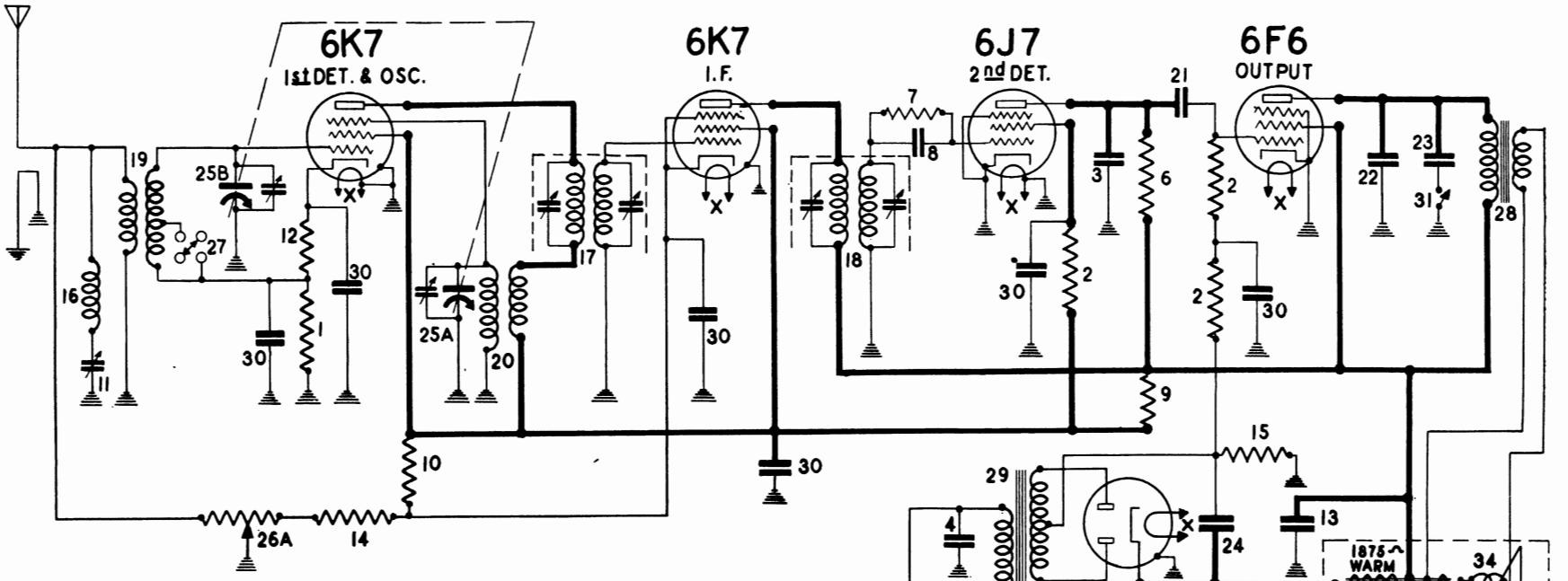


R-140 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	62183	30,000 ohm 1 watt carbon resistor	$0.20
2	67303	2000 ohm ¼ watt carbon resistor	.25
3	81630	.1 mfd. 175 volt paper condenser	.30
4	83007	.02 mfd. 600 volt paper condenser	.35
5	83072	510,000 ohm ¼ watt carbon resistor	.15
6	83080	51,000 ohm ¼ watt carbon resistor	.20
7	83082	260,000 ohm ¼ watt carbon resistor	.20
8	83179	Tone control switch	.30
9	83219	.01 mfd. 600 volt paper condenser	.30
10	83353	.05 mfd. 100 volt paper condenser	.30
11	83436	.002 mfd. 1000 volt paper condenser	.25
12	83539	.00026 mfd. mica condenser	.25
13A 13B	83551	Volume control, 500,000 ohm Line switch	1.25
14	83976	.012 mfd. 1000 volt paper condenser	.35
15	84058	Pilot lamp 6 volt	.15
16	84193	16 mfd. 350 volt electrolytic condenser	1.50
17	84195	Padding trimmer	.50
18	84198	110,000 ohm ¼ watt carbon resistor	.30
19	84199	16,000 ohm ¼ watt carbon resistor	.20
20	84235	1.1 megohm ¼ watt carbon resistor	.20
21	84888	300 ohm ⅔ watt wire wound resistor	.15
22	85059	.05 mfd. 300 volt condenser	.35
23	85061	.000051 mfd. mica condenser	.15
24A & B	85087	Dual trimmer condenser	.35
25	85112	16 mfd. 300 volt electrolytic condenser	1.50
26	85843	Output transformer (242-A Speaker)	2.00
27	85846	Field coil and housing (R 242A Spkr.)	3.00
28A 28B	85849	25 ohm bias resistor 275 ohm bias resistor	.35
29	85850	Range switch	1.00
30	85852	Diaphragm and shell assembly (R 242A Spkr.)	2.25
31A & B	85853	Two gang variable condenser	3.00
32	85856	1st I.F. Transformer	2.50
33	85857	2nd I.F. Transformer	2.50
34	85865	Power Transformer (R-140-A)	6.00
35	85867	Oscillator coil assembly	1.25
36	85868	Antenna coil assembly	1.50
37	85881	600 ohm ½ watt W.W. resistor	.15
38	85882	.001 mfd. mica condenser	.25
	85963	Power Transformer (R-140-B) 25 cycle	7.50
	85968	Power Transformer (R-140-X) (100-240 volts, 50 cycle)	8.00

STEWART WARNER CORP.

STEWART-WARNER MODEL R-142A & R-142AS CHASSIS (RECEIVER MODELS 1421 TO 1429)



LINE VOLTAGE 115 VOLTS. VOLUME CONTROL ON FULL. ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION. SET TUNED TO 530 KC.

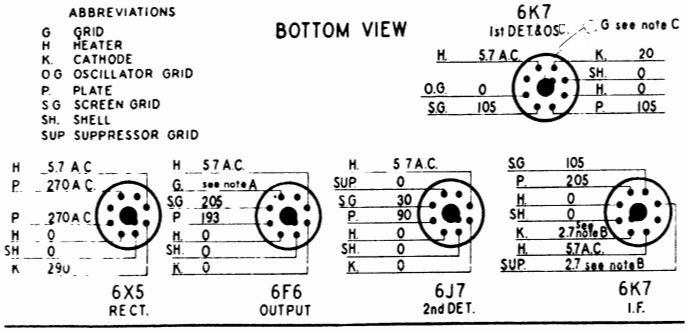
I.F. FREQUENCY 456 KC.

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

ABBREVIATIONS

G	GRID
H	HEATER
K	CATHODE
OG	OSCILLATOR GRID
P	PLATE
SG	SCREEN GRID
SH.	SHELL
SUP	SUPPRESSOR GRID

BOTTOM VIEW



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

NOTE A: The bias on the 6F6 output is —14 volts measured across the flexible wire wound resistor No. 15 in the circuit diagram.

NOTE B: The cathode voltage varies with the setting of the volume control, from +2.5 volts for maximum volume to +30 volts for minimum volume.

NOTE C: Grid voltage for the 6K7 first detector is +17 volts measured across resistor No. 1 in the cathode circuit. Grid bias is —3 volts measured across resistor No. 12.

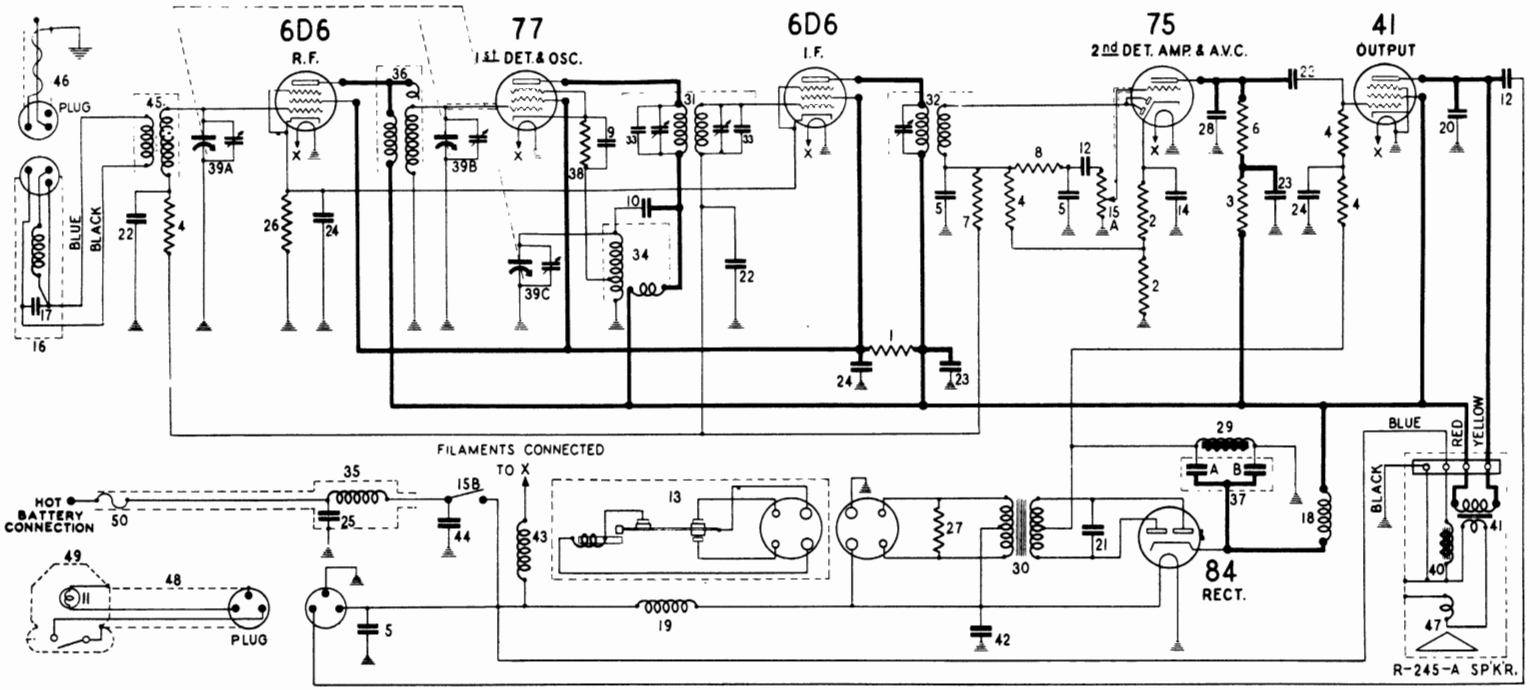
R-142A & R-142AS PARTS LIST

Diag. No.	Part. No.	DESCRIPTION	List Price
1	71657	3000 Ohm ¼ watt Carbon Resistor	$0.25
2	83082	260,000 Ohm ¼ watt Carbon Resistor	.20
3	83539	260 mmfd. Mica Condenser	.25
4	83976	.012 mfd. 1000 volt Paper Condenser	.35
5	84058	Dial Lamp, 6-8 volt	.15
6	84198	110,000 ohm ¼ watt Carbon Resistor	.30
7	84235	11 megohm ¼ watt Carbon Resistor	.20
8	85061	51 mmfd. Mica Condenser	.15
9	85064	10,000 ohm 1 watt Carbon Resistor	.20
10	85266	70,000 ohm ¼ watt Carbon Resistor	.20
11	85285	456 KC. Wave Trap Trimmer	.40
12	85691	500 ohm ½ watt Wire Wound Resistor	.20
13	88007	8 mfd. 250 volt Electrolytic Condenser	1.00
14	88009	200 ohm ½ watt Wire Wound Resistor	.15
15	88010	320 ohm 1½ watt Wire Wound Resistor	.15
16	88014	456 KC. Wave Trap Coil	.50
17	88016	1st I.F. Transformer	2.00
18	88017	2nd I.F. Transformer	2.00
19	88018	Antenna Coil	1.00
20	88019	Oscillator Coil	.70
21	88026	.02 mfd. 400 volt Paper Condenser	.30
22	88029	.004 mfd. 400 volt Paper Condenser	.20
23	88030	.01 mfd. 400 volt Paper Condenser	.30
24	88033	8 mfd. 350 volt Electrolytic Condenser	$1.10
25A & B	88035	2 Gang Variable Condenser	2.75
26 (A) (B)	88036	(Volume Control, 22,000 ohm (Line Switch	1.25
27	88037	Range Switch	.60
28	88040	Output Transformer	1.50
29	88044	Power Transformer 115 volt 60 cycle (See 88138 for 115 volt 25 cycle)	4.20
30	88046	.1 mfd. 150 volt Paper Condenser	.30
31	88054	Tone Control Switch	.30
32	88055	¾ Amp. Fuse	.12
33	88085	Field Coil Shell & Brkt. (R-243-A - 5" Spkr.) (See 88120 for R-244-A - 8" Spkr.)	3.75
34	88100	Diaphragm and voice coil (R-243-A - 5" Spkr.) (See 88133 for R-244-A - 8" Spkr.)	1.50
	88120	Field Coil and Housing (R-244A - 8" Spkr.)	3.60
	88133	Diaphragm & Shell Assembly (R-244-A - 8" Spkr.)	2.00
	88138	Power Transformer, 115 volt, 25 cycle	5.50
	R-243A	5" Speaker (on chassis)	4.50
	R-244A	8" Speaker	5.70

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

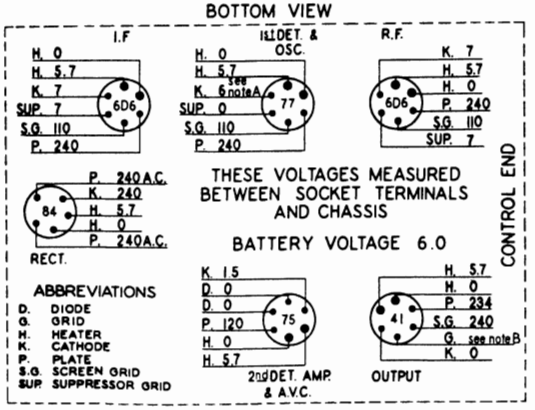
STEWART WARNER CORP.

FIRESTONE - STEWART-WARNER MODEL R-1431 AUTO RADIO



SOCKET VOLTAGES

BOTTOM VIEW



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Make allowances for battery voltage variation.
NOTE A: The cathode voltage of the 77 varies from 6 to 10 volts, depending on the gang condenser setting.
NOTE B: The grid bias on the 41 output tube is —18 volts, measured from the chassis to the ungrounded filter choke terminal.

I.F. FREQUENCY 177.5 KC.

R-1431 PARTS LIST

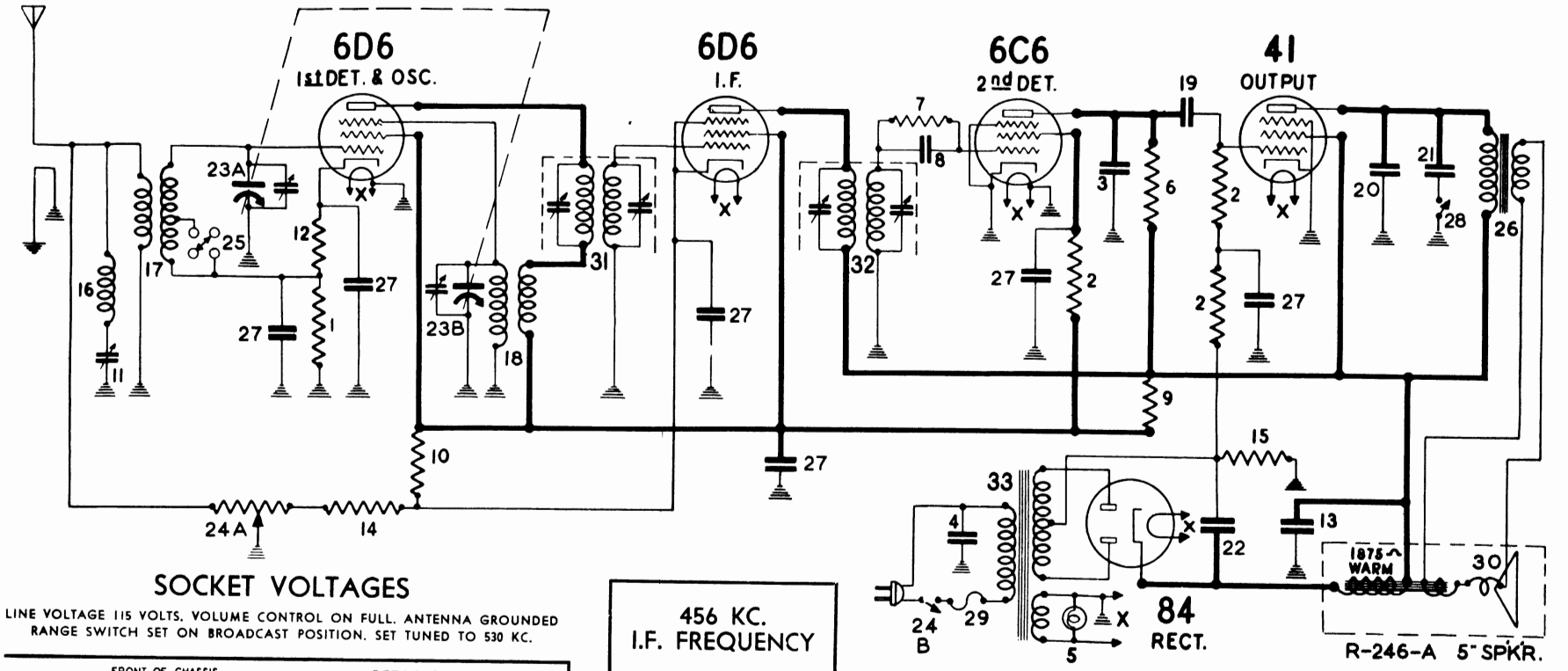
Diag. No.	Part No.	DESCRIPTION	List Price
1	66023	60,000 ohm 1 watt carbon resistor	$0.25
2	67303	2,000 ohm ¼ watt carbon resistor	.25
3	83080	51,000 ohm ¼ watt carbon resistor	.20
4	83082	260,000 ohm ¼ watt carbon resistor	.20
5	83539	260 mmfd. mica condenser	.25
6	84198	110,000 ohm ¼ watt carbon resistor	.30
7	84235	1.1 megohm ¼ watt carbon resistor	.20
8	84238	11,000 ohm ¼ watt carbon resistor	.20
9	84282	.001 mfd. mica condenser	.25
10	84833	70 mmfd. mica condenser	.20
11	85296	Pilot lamp 6-8 volt (bayonet base)	.18
12	88026	.02 mfd. 400 volt paper condenser	.30
13	88156	Vibrator	3.50
14	88170	10 mfd. 25 volt electrolytic condenser	.80
15A } 15B }	88171	{ Volume control 500.00 ohm } { Line switch }	1.20
16	88172	Antenna Filter	1.20
17	88173	50 mmfd. mica condenser	.20
18	88181	R. F. choke coil	.40
19	88183	R. F. choke coil (to vibrator)	.25
20	88185	.006 mfd. 600 volt paper condenser	.35
21	88187	.01 mfd. 1500 volt paper condenser	.40
22	88189	.05 mfd. 200 volt paper condenser	.35
23	88191	.1 mfd. 300 volt paper condenser	.35
24	88193	.25 mfd. 150 volt paper condenser	.35
25	88195	.5 mfd. 150 volt paper condenser	.50
26	88203	600 ohm ¼ watt carbon resistor	.15
27	88204	210 ohm ½ watt carbon resistor	.15
28	88205	.0021 mfd. mica condenser	$0.35
29	88210	Filter choke	1.25
30	88213	Power transformer	3.50
31	88222	1st I.F. transformer	2.75
32	88223	2nd I.F. transformer	2.60
33	88233	110 mmfd. mica condenser	.25
34	88234	Oscillator coil and shield assembly	1.50
35	88239	"A" filter	1.00
36	88250	R.F. coil and shield assembly	1.50
37A } 37B }	88256	{ Electrolytic condenser 4 mfd. 350 volt } { Electrolytic condenser 8 mfd. 350 volt }	2.40
38	88257	9,500 ohm ¼ watt carbon resistor	.15
39A to C	88258	Three gang variable condenser	6.00
40	88274	Field coil and housing (for R-245-A spkr.)	2.50
41	88276	Output transformer	2.00
42	88285	1.25 mfd. 150 volt paper condenser	.80
43	88289	R.F. choke (to filaments)	.20
44	88298	.25 mfd. 150 volt paper condenser (low reactance)	.40
45	88312	Antenna coil and shield assem. (iron core)	2.00
46	88327	Antenna cable and plug	1.10
47	88328	Diaphragm and shell assem. (R-245-A spkr.)	2.10
48	88339	Pilot light and tone control cable with plug	.90
49	88364	Control head less shell, knobs and shafts	3.50
50	88365	Fuse, 10 amperes	.05
	83777	Battery lead and fuse housing	.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STEWART WARNER CORP.

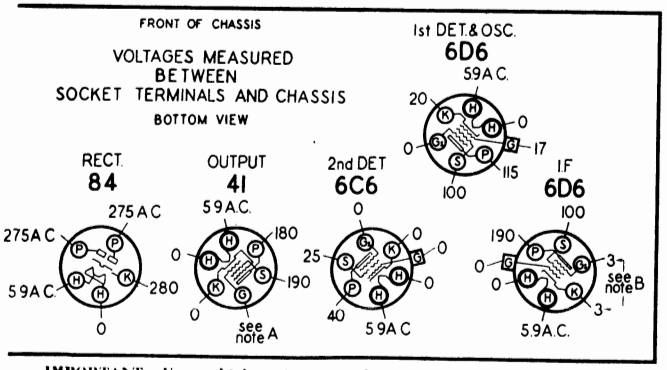
STEWART WARNER CORP.

MODEL R-144AS CHASSIS (RECEIVER MODELS 1441 TO 1449)



SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS, VOLUME CONTROL ON FULL. ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION. SET TUNED TO 530 KC.



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

NOTE A: The bias on the 6F6 output is —14 volts measured across the flexible wire wound resistor No. 15 in the circuit diagram.

NOTE B: The cathode voltage varies with the setting of the volume control, from +3 volts for maximum volume to —30 volts for minimum volume.

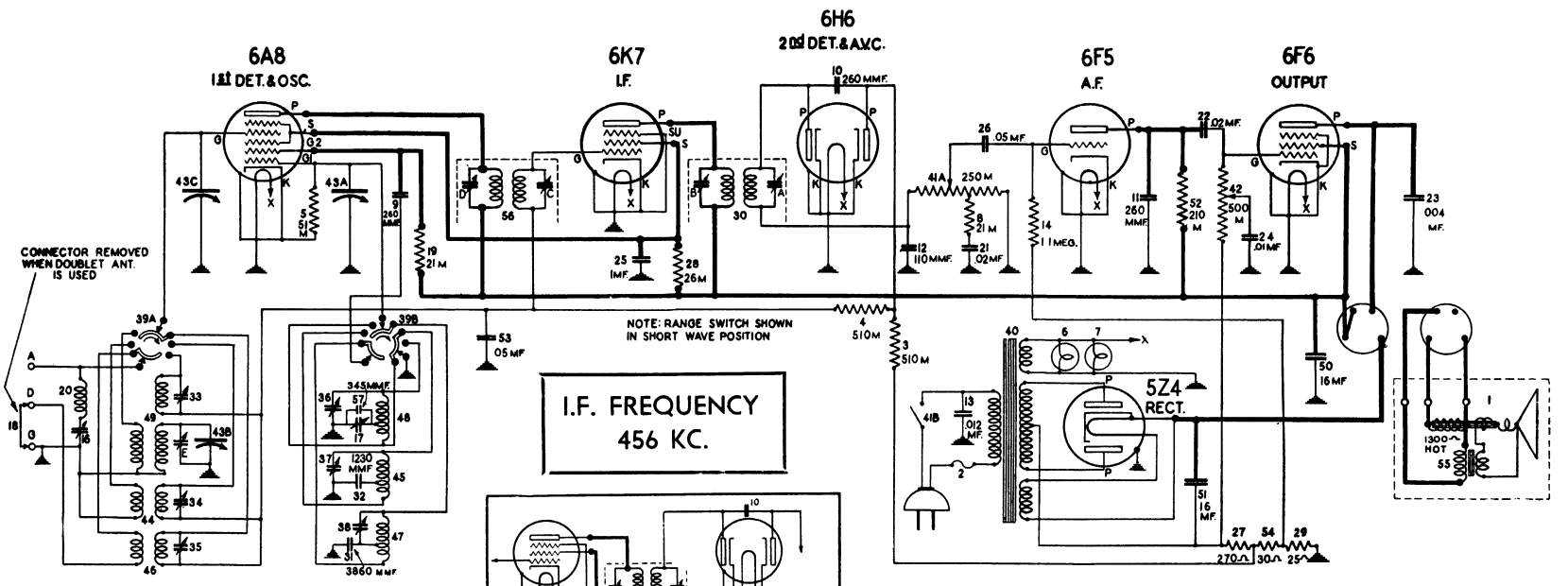
R-144AS PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	71657	3000 Ohm ¼ watt Carbon Resistor	$0.25
2	83082	260,000 Ohm ¼ watt Carbon Resistor	.20
3	83539	260 mmfd. Mica Condenser	.25
4	83976	.012 mfd. 1000 volt Paper Condenser	.35
5	84058	Dial Lamp, 6-8 volt	.15
6	84198	110,000 ohm ¼ watt Carbon Resistor	.30
7	84235	1.1 megohm ¼ watt Carbon Resistor	.20
8	85061	51 mmfd. Mica Condenser	.15
9	85064	10,000 ohm 1 watt Carbon Resistor	.20
10	85266	70,000 ohm ¼ watt Carbon Resistor	.20
11	85285	456 KC. Wave Trap Trimmer	.40
12	85691	500 ohm ½ watt Wire Wound Resistor	.20
13	88007	8 mfd. 250 volt Electrolytic Condenser	1.00
14	88009	200 ohm ½ watt Wire Wound Resistor	.15
15	88010	320 ohm 1½ watt Wire Wound Resistor	.15
16	88014	456 KC. Wave Trap Coil	.50
17	88018	Antenna Coil	1.00
18	88019	Oscillator Coil	.70
19	88026	.02 mfd. 400 volt Paper Condenser	$0.30
20	88029	.004 mfd. 400 volt Paper Condenser	.30
21	88030	.01 mfd. 400 volt Paper Condenser	.30
22	88033	8 mfd. 350 volt Electrolytic Condenser	1.10
23A & B	88035	2 Gang Variable Condenser	2.75
24 A & B	88036	{Volume Control, 22,000 ohm} {Line Switch}	1.25
25	88037	Range Switch	.60
26	88040	Output Transformer	1.50
27	88046	.1 mfd. 150 volt Paper Condenser	.30
28	88054	Tone Control Switch	.30
29	88055	¾ Amp. Fuse	.12
30	88100	Diaphragm and voice coil	1.50
31	88389	1st I. F. Transformer	2.00
32	88390	2nd I. F. Transformer	2.00
33	88393	Power Transformer, 115 V-60 cycle	4.20
	R-246-A	Speaker—5 inch	4.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STEWART WARNER CORP.

MODEL R-145 CHASSIS (RECEIVER MODELS 1451 to 1459)



MODEL R-145 PARTS LIST

Diag. No.	Part No.	Description	List Price
1	{R-247-A	8" Dynamic Speaker	$ 9.00
	{R-248-A	12" Dynamic Speaker	11.50
2	38841	Fuse, 1 ampere	.10
3-4	83072	510,000 ohm ¼ watt carbon resistor	.15
5	83080	51,000 ohm ¼ watt carbon resistor	.20
6-7	83278	Pilot lamp, 6-8 volt	.15
8	83286	21,000 ohm ¼ watt carbon resistor	.20
9-10-11	83539	260 mmfd. mica condenser	.15
12	83783	110 mmfd. mica condenser	.16
13	83976	.012 mfd. 1000 v. shielded condenser	.35
14	84235	1.1 megohm ¼ watt carbon resistor	.20
16	85285	Wave trap trimmer	.40
17	85285	Padding trimmer	.40
18	85321	Ground connector	.01
19	85442	21,000 ohm ½ watt carbon resistor	.20
20	88014	Wave trap coil	.50
21-22	88026	.02 mfd. 400 v. paper condenser	.30
23	88029	.004 mfd. 400 v. paper condenser	.30
24	88030	.01 mfd. 400 v. paper condenser	.30
25	88046	.1 mfd. 150 v. paper condenser	.30
26	88189	.05 mfd. 200 v. paper condenser	.35
27	88463	270 ohm 1 watt carbon resistor	.15
28	88464	26,000 ohm ¼ watt carbon resistor	.15
29	88465	25 ohm ½ watt wire wound resistor	.12
30	88468	2nd I.F. transformer	2.40
31	88472	3860 mmfd. mica condenser	.35
32	88473	1230 mmfd. mica condenser	.25
33-34-35	88477	Trimmer condenser	.12
36-37-38	88477	Trimmer condenser	.12
39A&B	88480	Range switch	1.90
40	88481	Power transformer, 115 v. 60 cycle	5.00
41-A	88487	(Volume control (250,000 ohm)	1.25
41-B		A. C. line switch	
42	88488	Tone control (500,000 ohm)	$ .80
43A to C	88493	Three gang condenser	5.40
44	88499	Antenna coil (Police)	.85
45	88501	Oscillator coil (Police)	.65
46	88502	Antenna coil (S.W.)	.80
47	88504	Oscillator coil (S.W.)	.80
48	88506	Oscillator coil (B.C.)	.55
49	88507	Antenna coil (B.C.)	1.60
50	88511	16 mfd. 300 v. electrolytic condenser	1.10
51	88512	16 mfd. 400 v. electrolytic condenser	1.10
52	88532	210,000 ohm ¼ watt carbon resistor	.12
53	88534	.05 mfd. 150 v. condenser (low loss)	.25
54	88613	30 ohm ½ watt wire wound resistor	.15
55	88529	Output transformer (on 247 speaker)	2.00
55	88796	Output transformer (on 248 speaker)	2.50
56	88466	1st I.F. transformer	2.40
57	89564	345 mmfd. mica condenser	.25

MODEL 145-X PARTS

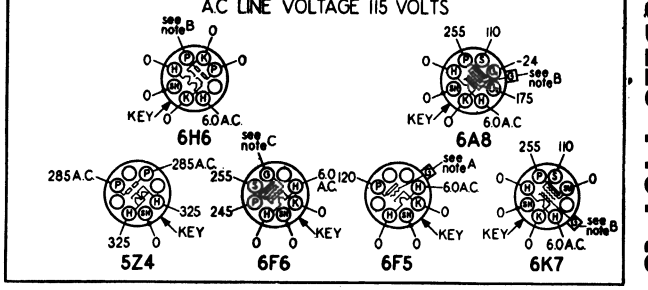
Diag. No.	Part No.	Description	List Price
58	84404	Phonograph Toggle Switch D.P. D.T.	$ 1.10
59	84407	Phonograph terminal strip	.12
	89216	Power transformer (100 to 240 volts, 25 to 133 cycles) Model R145X only	11.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

VOLUME CONTROL ON FULL — ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION — DIAL TUNED TO 525 KC.

BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
A.C LINE VOLTAGE 115 VOLTS



REAR OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

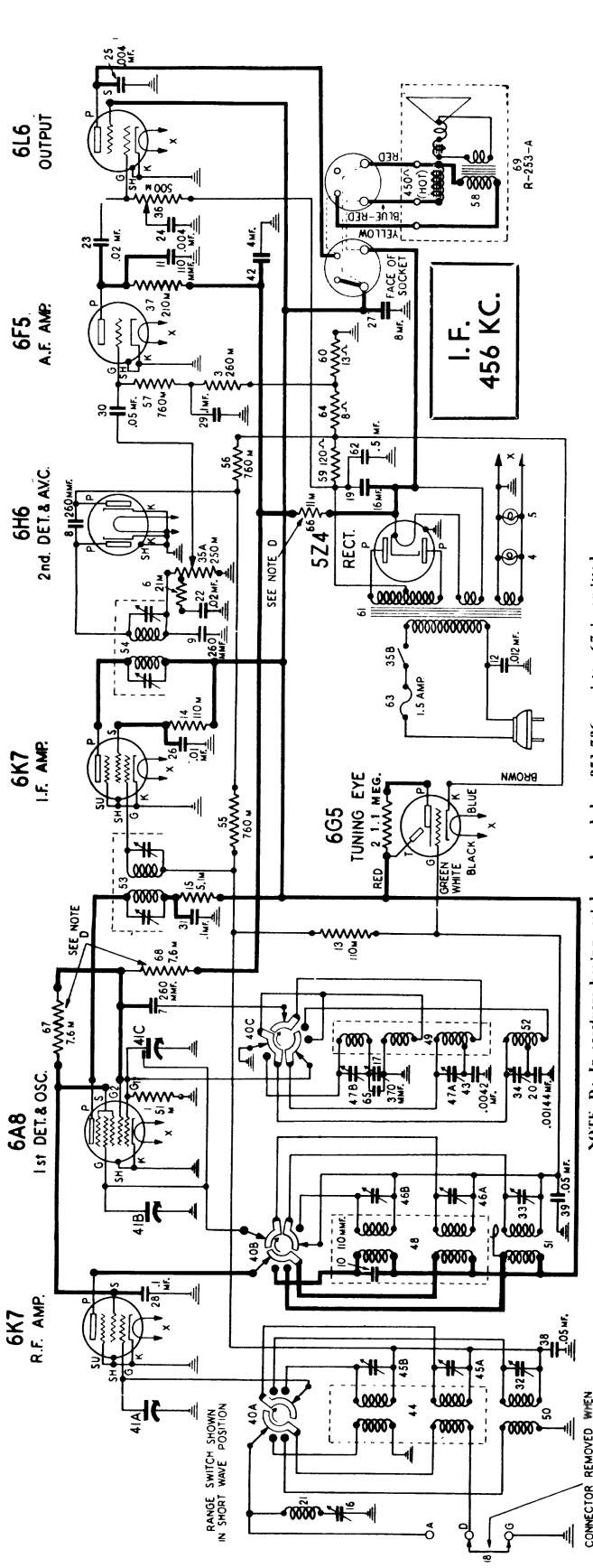
NOTE A: The grid bias for the 6F5 is—1.5 volts measured across resistor 29.

NOTE B: The grid bias for the 6A8, 6A7, and the anode voltage of the A.V.C. section of the 6H6 is—3.5 volts measured across resistors 29 and 54.

NOTE C: The grid bias for the 6F6 output tube is—19.5 volts measured across resistors 29, 54 and 27.

STEWART WARNER CORP.

MODEL R-147 CHASSIS (RECEIVER MODELS 1471 to 1479)



NOTE D: In receivers having serial numbers below 351,736, resistor 67 is omitted, and the screen grids of the 6K7, R.F. amplifier and the 6A8 receive their current through a 31,000 ohm. 1 watt carbon resistor which is connected to the screen grid of the 6L6. In addition, resistor 66 has a rating of 30,000 ohms. 1 watt and resistor 68 has a rating of 16,000 ohms, ¾ watt.

MODEL R-147 PARTS LIST

Diagram Number	Part Number	Description	List Price
1	83080	51,000 ohm ¼ watt carbon resistor	$ .20
2	81235	1.1 megohm ¼ watt carbon resistor	.12
3	83082	260,000 ohm ¼ watt carbon resistor	.20
4-5	83278	Pilot lamp No. 40, 6-8 volts	.15
6	83286	21,000 ohm ¼ watt carbon resistor	.20
7-8-9	83539	260 mmfd. mica condenser	.15
10-11	83783	110 mmfd. mica condenser	.20
12	83976	.012 mfd. 1000 V. shielded condenser	.35
13-14	84198	110,000 ohms ¼ watt carbon resistor	.30
15	84720	5100 ohms ¼ watt carbon resistor	.12
16	85285	Wave trap condenser	.40
17	85285	Padding condenser	.10
18	85321	Ground connector	.01
19	85431	16 mfd. 400 V. Electrolytic condenser	1.25
20	85562	.00144 mfd. mica condenser	.30
21	88014	Antenna trap coil	.50
22-23	88026	.02 mfd. 400 V. paper condenser	.30
24-25	88029	.004 mfd. 400 V. paper condenser	.30
26	88030	.01 mfd. 400 V. paper condenser	.30
27	88033	8 mfd. 350 V. electrolytic condenser	1.10
28-29	88046	.1 mfd. 150 V. paper condenser	.30
30	88189	.05 mfd. 200 V. paper condenser	.35
31	88191	.1 mfd. 300 V. paper condenser	.35
32-33-34	88477	Trimmer condenser	.12
35A	88487	Volume control (250,000 ohms)	1.25
35B		A. C. line switch	
36	88488	Tone control (500,000 ohms)	.80
37	88532	210,000 ohms ¼ watt carbon resistor	.12
38-39	88534	.05 mfd. 150 V. condenser (low loss)	.24
40A to C	88573	Range switch	2.50

Diagram Number	Part Number	Description	List Price
41 to C	88574	Three gang condenser	5.00
42	88576	.4 mfd. 250 V. electrolytic condenser	.80
43	88587	.0042 mfd. mica condenser	.35
44	88592	Antenna coil and shield assem. (B.C.& S.W.) with trimmer	2.20
45A-45B	88596	Trimmer condenser	.25
46A-46B 47A-47B	88597	R. F. coil and shield assem. (B.C.&S.W.) with trimmer	2.40
48	88599	Oscillator coil and shield assem. (B.C.&S.W.) with trimmer	2.20
50	88602	Antenna coil assem. (Police) with trimmer	.85
51	88604	R. F. coil assem. (Police) with trimmer	1.00
52	88605	Oscil. coil assem. (Police) with trimmer	.70
53	88606	1st I.F. transformer	2.50
54	88607	2nd I.F. transformer	2.50
55-56-57	88854	760,000 ohms ¼ watt carbon resistor	.12
58	88870	Output transformer (on R-253 speaker)	2.50
59	88896	120 ohms 2 watt carbon resistor	.18
60	88897	13 ohms ½ watt carbon resistor	.12
61	88898	Power transformer, 115 volts—60 cycles	6.00
62	88990	.5 mfd. 150 V. paper condenser	.35
63	89002	Fuse, 1.5 amperes	.10
64	89001	8 ohms ¼ watt wire wound resistor	.15
65	89525	370 mmfd. mica condenser	.32
66	89751	11,000 ohm 1 watt carbon resistor	.12
67	89752	7,600 ohm ½ watt carbon resistor	.12
68	89754	7,600 ohm 1 watt carbon resistor	.12
69	R-253-A	12 inch dynamic speaker	11.50

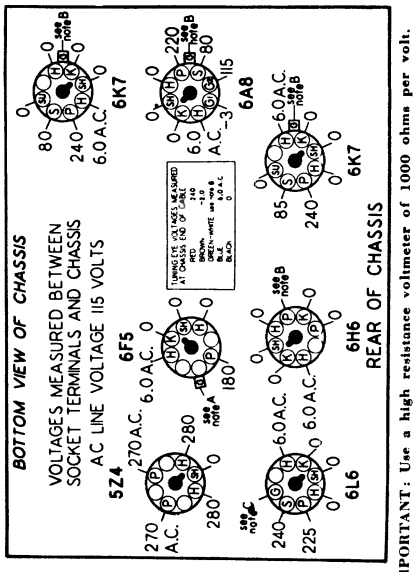
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

RANGE SWITCH ON BROADCAST POSITION — DIAL TUNED TO 525 KC.
VOLUME CONTROL ON FULL — ANTENNA GROUNDED

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
AC LINE VOLTAGE 115 VOLTS



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

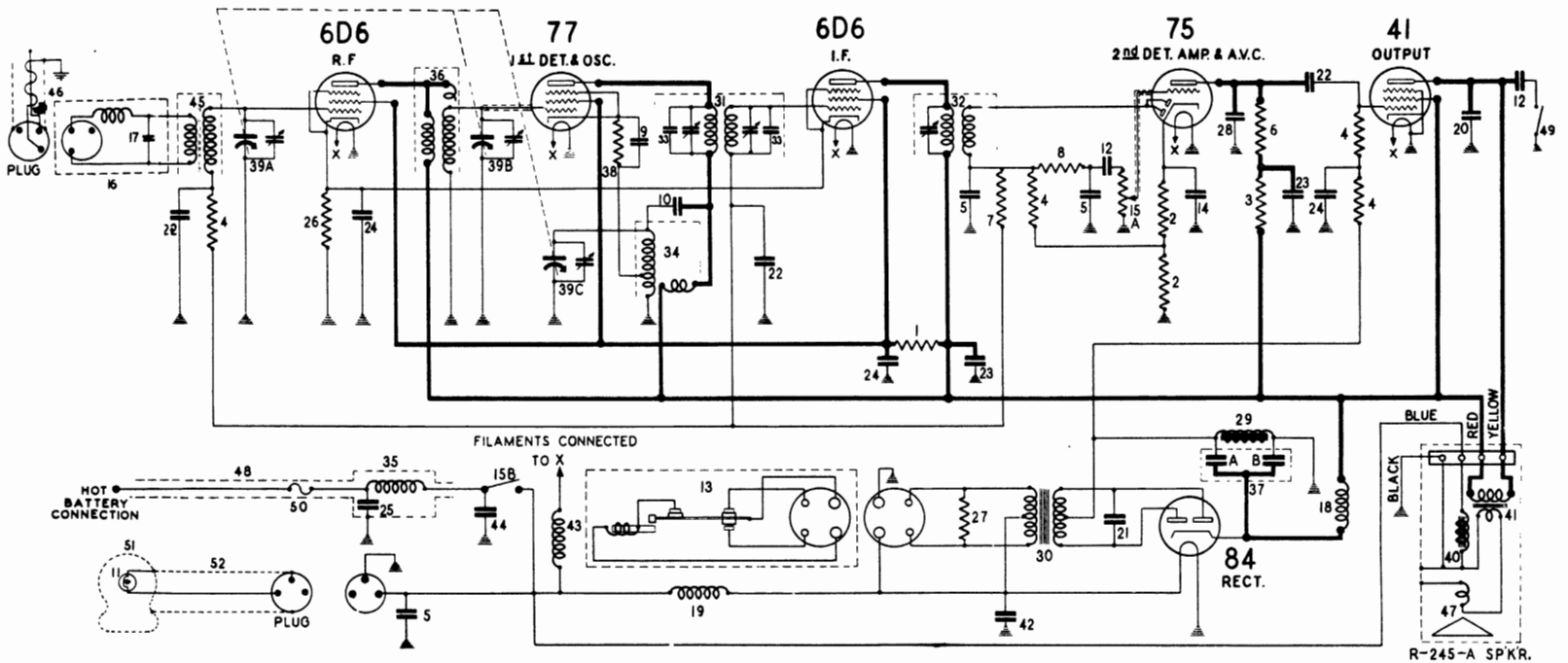
NOTE A: The grid bias for the 6F5 is −1.3 volts measured across resistor 60

NOTE B: The grid bias for the 6A8, 6K7's, and the anode voltage of the A.V.C. section of the 6H6 is −2.0 volts measured across resistors 60 and 64.

NOTE C: The grid bias for the 6L6 output tube is −13.0 volts measured across resistor 59, 61 and 60.

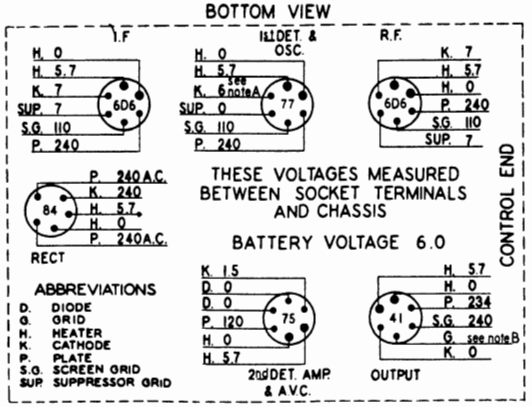
STEWART WARNER CORP.

MODEL R-160 AUTO RADIO CHASSIS (RECEIVER MODELS 1601 to 1609)



SOCKET VOLTAGES

BOTTOM VIEW



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Make allowances for battery voltage variation.
NOTE A: The cathode voltage of the 77 varies from 6 to 10 volts, depending on the gang condenser setting.
NOTE B: The grid bias on the 41 output tube is —18 volts, measured from the chassis to the ungrounded filter choke terminal.

I.F. FREQUENCY 177.5 KC.

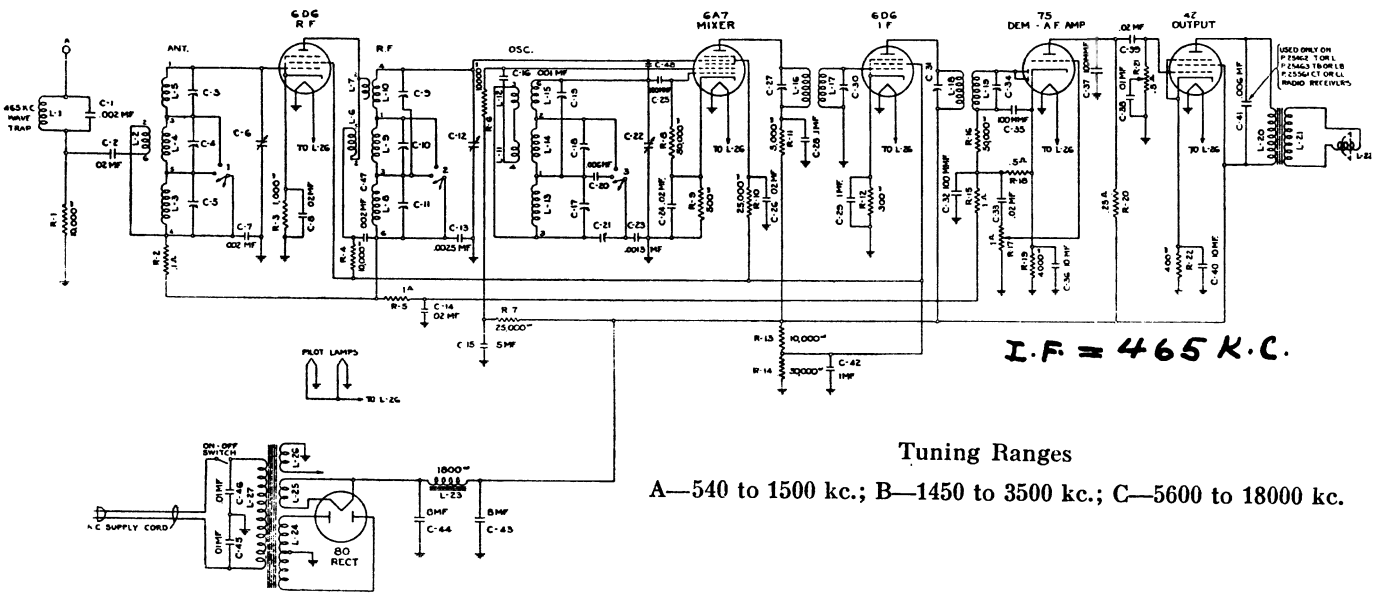
R-1601 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	66023	60,000 ohm 1 watt carbon resistor	$0.25
2	67303	2,000 ohm ¼ watt carbon resistor	.25
3	83080	51,000 ohm ¼ watt carbon resistor	.20
4	83082	260,000 ohm ¼ watt carbon resistor	.20
5	83539	260 mmfd. mica condenser	.25
48	83777	Battery cable and fuse housing	.50
6	84198	110,000 ohm ¼ watt carbon resistor	.30
7	84235	1.1 megohm ¼ watt carbon resistor	.20
8	84238	11,000 ohm ¼ watt carbon resistor	.20
9	84282	.001 mfd. mica condenser	.25
10	84833	70 mmfd. mica condenser	.20
11	85296	Pilot lamp 6-8 volt (bayonet base)	.18
12	88026	.02 mfd. 400 volt paper condenser	.30
49	88054	Tone control switch	.30
13	88156	Vibrator	3.50
14	88170	10 mfd. 25 volt electrolytic condenser	.80
15A	88171	{Volume control 500,000 ohm}	1.20
15B		{Line switch}	
16	88172	Antenna Filter	1.20
17	88173	50 mmfd. mica condenser	.20
18	88181	R. F. choke coil	.40
19	88183	R. F. choke coil (to vibrator)	.25
20	88185	.006 mfd. 600 volt paper condenser	.35
21	88187	.01 mfd. 1500 volt paper condenser	.40
22	88189	.05 mfd. 200 volt paper condenser	.35
23	88191	.1 mfd. 300 volt paper condenser	.35
24	88193	.25 mfd. 150 volt paper condenser	.35
25	88195	.5 mfd. 150 volt paper condenser	.50
26	88203	600 ohm ¼ watt carbon resistor	.15
27	88204	210 ohm ½ watt carbon resistor	.15
28	88205	.0021 mfd. mica condenser	.35
29	88210	Filter choke	1.35
30	88213	Power transformer	3.50
31	88222	1st I.F. transformer	2.75
32	88223	2nd I.F. transformer	2.60
33	88233	110 mmfd. mica condenser	.25
34	88234	Oscillator coil and shield assembly	1.50
35	88239	"A" filter	1.00
36	88250	R.F. coil and shield assembly	1.50
37A	88256	{Electrolytic condenser 4 mfd. 350 volt}	2.40
37B		{Electrolytic condenser 8 mfd. 350 volt}	
38	88257	9,500 ohm ¼ watt carbon resistor	.15
39A to C	88258	Three gang variable condenser	6.00
40	88274	Field coil and housing (for R-245-A spkr.)	2.50
41	88276	Output transformer	2.00
42	88285	1.25 mfd. 150 volt paper condenser	.80
43	88289	R.F. choke (to filaments)	.20
44	88298	.25 mfd. 150 volt paper condenser (low reactance)	.40
45	88312	Antenna coil and shield assem. (iron core)	2.00
46	88327	Antenna cable and plug	1.10
47	88328	Diaphragm and shell assem. (R-245-A spkr.)	2.10
48	83777	Battery cable and fuse housing	.50
49	88054	Tone control switch	.30
50	88365	Fuse, 10 amperes	.05
51	88730	Control head less shafts	4.75
52	88738	Pilot light cable with plug, 31"	.90

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 58 Radio Receiver



Tuning Ranges

A—540 to 1500 kc.; B—1450 to 3500 kc.; C—5600 to 18000 kc.

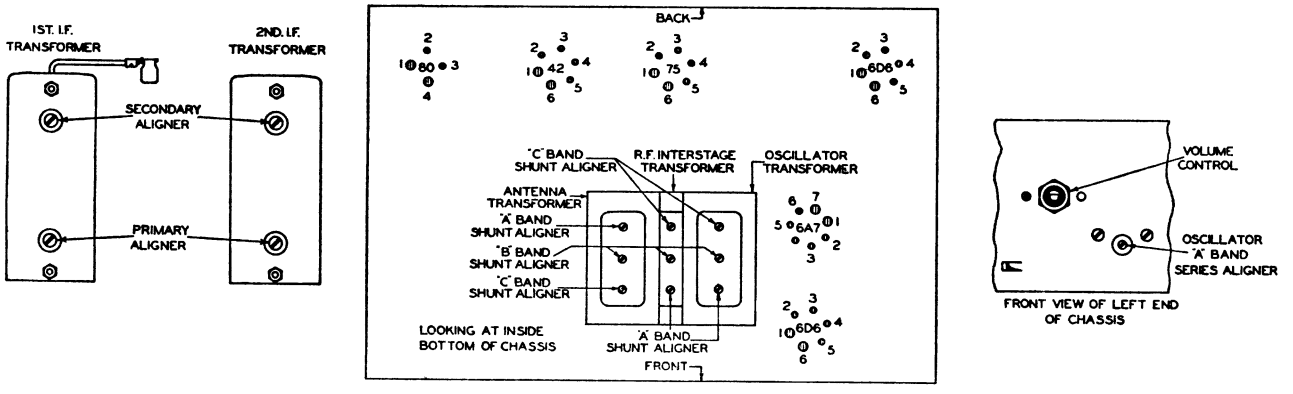


Fig 1—Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the base with the tubes in place. The receiver is therefore in operation when the measurements are made. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers. The terminals of each socket are numbered, starting with one heater or filament pin and proceeding around the pin circle clockwise to the other heater or filament pin. This is done looking at the bottom of the socket.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	*Heater Voltages Between Terminals Nos. at 120 Volts*
6D6	R. F. Amp.	0		+ 53	+105	+ 5.8	+ 5.8		—	1-6, *6.3* volts
6A7	Osc.-Mod.	0		+225	+ 58	+145	— 4.4	+ 2.8		1-7, *6.3* volts
6D6	I. F. Amp.	0		+235	+105	+ 3.1	+ 3.1		—	1-6, *6.3* volts
75	Dem., A.V.C., Audio	0		+ 61	0	0	+ 1.2		—	1-6, *6.3* volts
42	Output	—		+225	+235	0	+13.5		—	1-6, *6.3* volts
80	Rectifier	—	+355	*335*	*335*	+355	—	—	—	1-4, *4.8* volts

Set tuned to 1000 kc., "A" Band. A. C. voltages are indicated by italics.

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 61 Radio Receiver

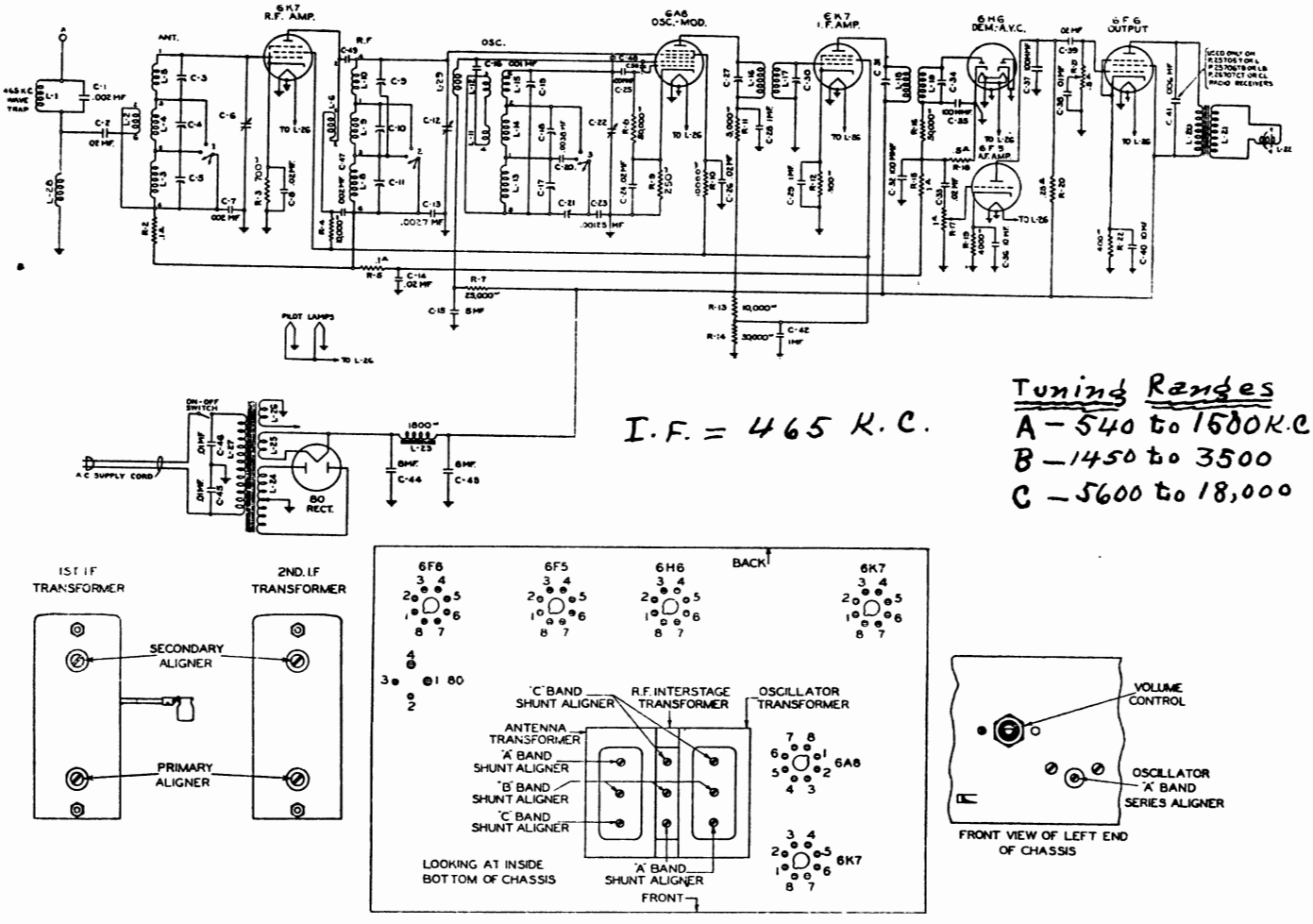


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the base with the tubes in place. The receiver is therefore in operation when the measurements are made. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts.

			Terminals of Sockets								*Heater Voltages Between Terminals Nos. at 120 Volts*
Tube	*Circuit*	*Cap.*	1	2	3	4	5	6	7	8	
6K7	R. F. Amp.	0	0	0	+ 50	+100	+ 4.5	—	0	+ 4.5	2-7, *6.3* Volts
6A8	Osc.-Mod.	0	0	0	+220	+ 72	— 6	+160	0	+ 1.8	2-7, *6.3* Volts
6K7	I. F. Amp.	0	0	0	+235	+100	+ 3	—	0	+ 3	2-7, *6.3* Volts
6H6	Dem.—A.V. C.	—	0	0	0	0	— .5	—	0	0	2-7, *6.3* Volts
6F5	A. F. Amp.	0	0	0	—	+ 58	—	—	0	+ 1.2	2-7, *6.3* Volts
6F6	Output	—	0	0	+220	+235	0	—	0	+14	2-7, *6.3* Volts
80	Rectifier	—	+355	*335*	*335*	+355	—	—	—	—	1-4, *4.8* Volts

Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.

STROMBERG CARLSON TELEPHONE MF'G. CO.

No. 61 AC-DC Radio Receiver

CIRCUIT DESCRIPTION

This superheterodyne receiver has seven tubes and may be operated on a power supply circuit of either alternating or direct current at the voltages and frequency (for AC operation) specified above. It has three tuning ranges and employs some metal tubes. For properly installing and operating this receiver see P-25794 Installation and Operating Instructions.

The various tubes are used as follows: One No. 6K7 tube functions as an R. F. Amplifier, and the other No. 6K7 tube is used in the I. F. Amplifier stage. The No. 6A8 tube is used as both Oscillator and Modulator. The No. 6Q7 tube is a triple purpose tube operating as a Demodulator, Automatic Volume Control, and Audio Amplifier tube. The No. 43 tube is used in the Audio Power Output stage. One No. 25Z5 tube is used as the Rectifier tube for the loud speaker's field power supply, and the other No. 25Z5 tube is used as the Rectifier tube for the receiver "B" voltage supply.

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the heavy bus wire with the tubes in their respective sockets. A receiver is, therefore, in operation when the measurements are made. The heavy bus wire, which is the negative side of the grid and plate voltages, is plainly marked on the schematic and wiring diagram shown on pages three and four. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts A.C. Allowance should be made for the difference when the line voltage is higher or lower.

IMPORTANT: If the receiver is operated from a direct current power supply circuit, the various voltages measured will be slightly lower than those listed in the table for AC operation. A meter having a resistance of 1000 ohms per volt should be used for measuring the DC voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts.

When the receiver is being operated from an alternating power supply circuit, it will be necessary to have a high resistance AC voltmeter for checking the AC voltages.

			TERMINALS OF SOCKETS								*Heater Voltages Between Heater Terminals*	
TUBE	*CIRCUIT*	*CAP.*	1	2	3	4	5	6	7	8	*Terminal Nos.*	*Volts*
6K7	R. F. Amp.	0	0	*19*	+ 45	+110	+ 5	0	+13	+5	2-7	*6.0*
6A8	Mod.—Osc.	0	0	*6*	+117	+ 52	− 4	+90	+13	+2	2-7	*6.0*
6K7	I. F. Amp.	0	0	*26*	+120	+110	+ 3	—	*19*	+3	2-7	*6.0*
6Q7	Dem.—A. V. C. —Audio	0	0	0	30	0	0	0	*6*	+1	2-7	*6.0*
43	Output	—	*26*	+112	+120	0	+14	*51*	—	—	1-6	*26*
25Z5	Chassis Rectifier	—	*76*	*115*	+135	+135	*115*	51	—	—	1-6	*26*
25Z5	Speaker Rectifier	—	*76*	*114*	+117	+117	*114*	*101*	—	—	1-6	*26*

Voltage across pilot lamps—27 volts

A.C. voltages are indicated by italics; when the receiver is operated from a D.C. power supply, D.C. voltages will be obtained in place of the A.C. voltages.
Receiver tuned to 1000 kc., no signal.

I.F. = 465 K.C.

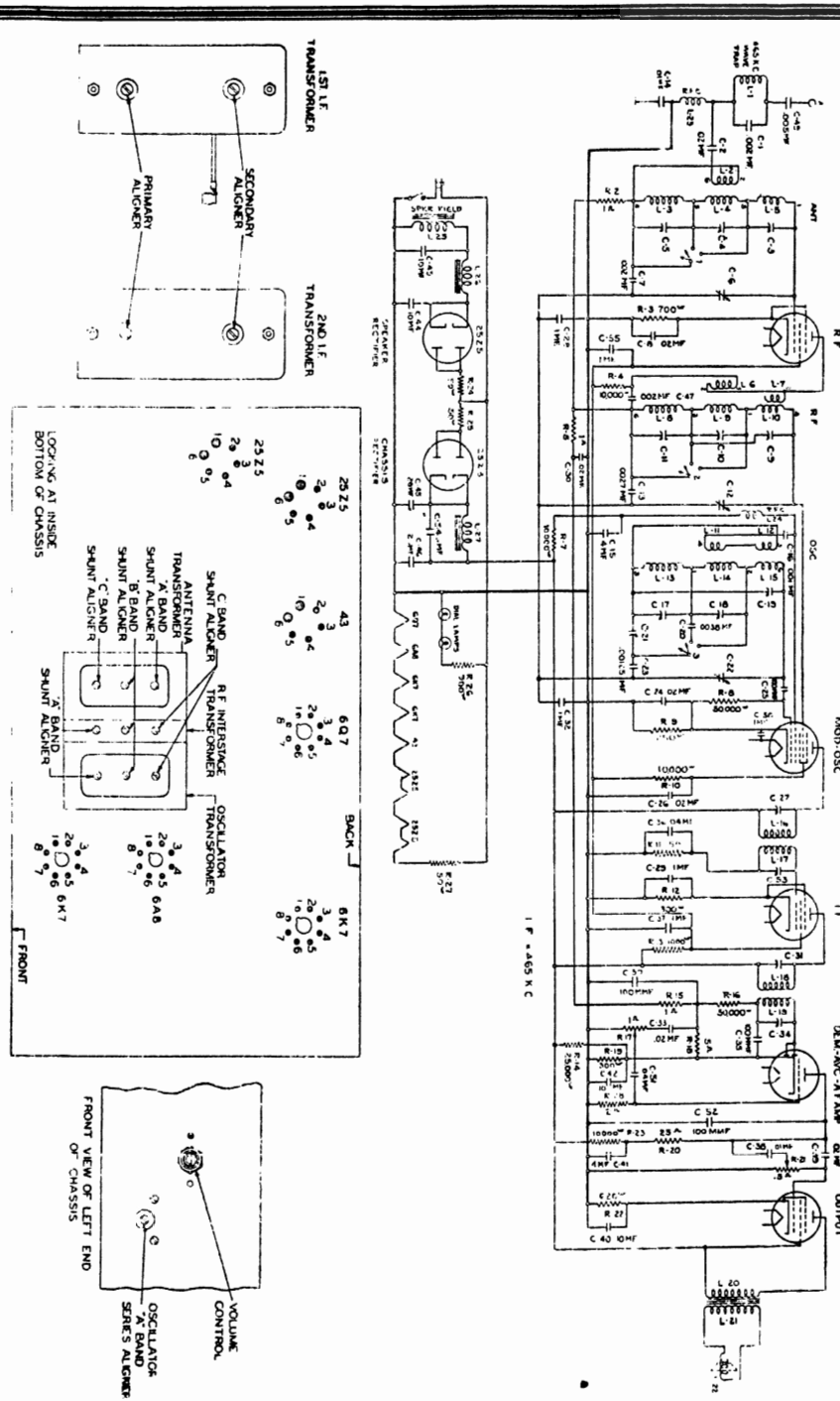


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Type of Circuit ..... Superheterodyne
Tuning Ranges ..... A—540 to 1500 kc.; B—1450 to 3500 kc.; C—5600 to 18,000 kc.
Number and Types of Tubes ..... 2 No. 6K7, 1 No. 6A8, 1 No. 6Q7, 1 No. 43, 2 No. 25Z5
Voltage Rating ..... 105 to 125 Volts, AC or DC
Frequency Rating (For AC Operation) ..... 50-60 Cycles
Wattage Rating ..... 65 Watts
Intermediate Frequency ..... 465 Kilocycles

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 62 and No. 63 Radio Receivers

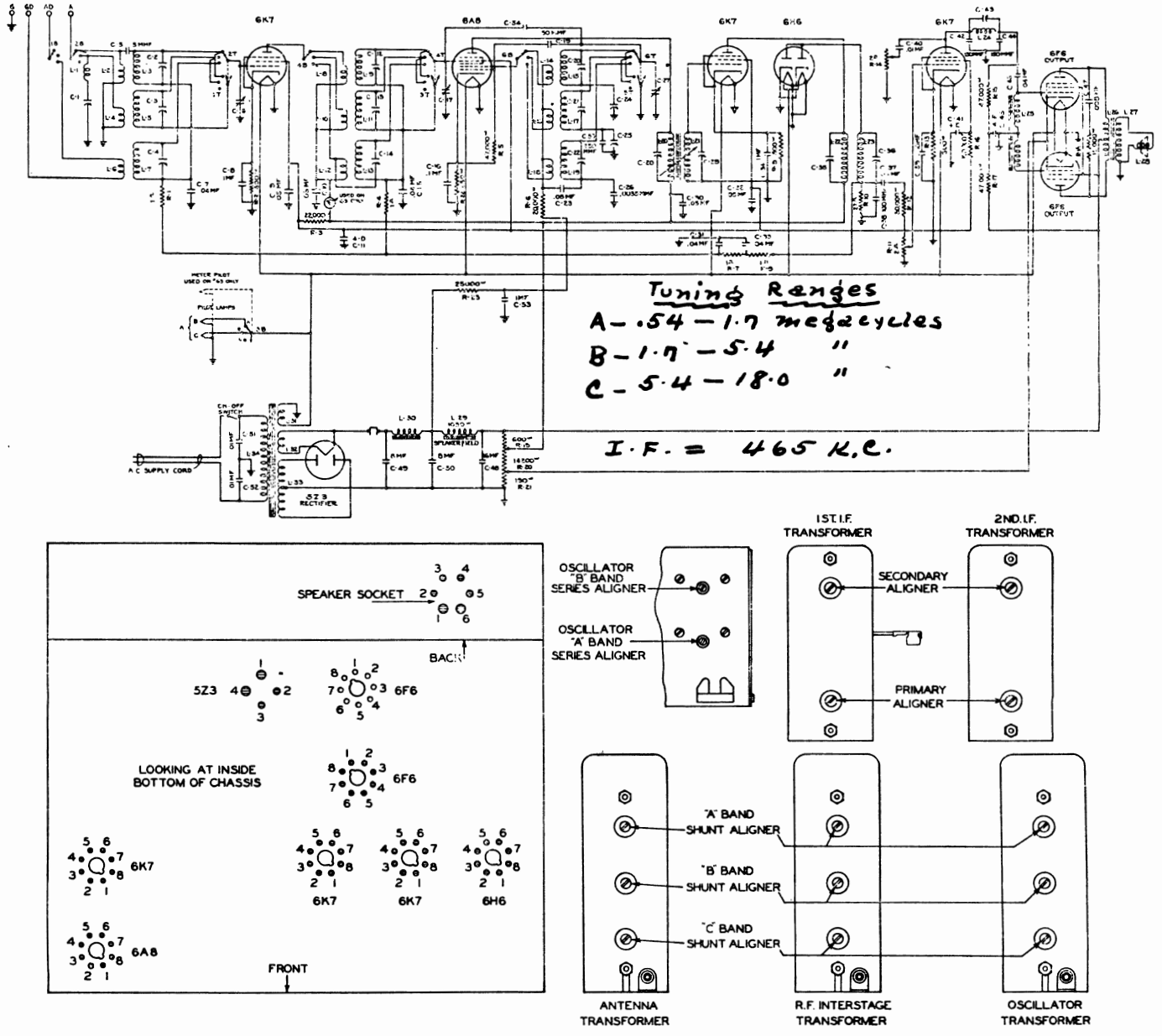


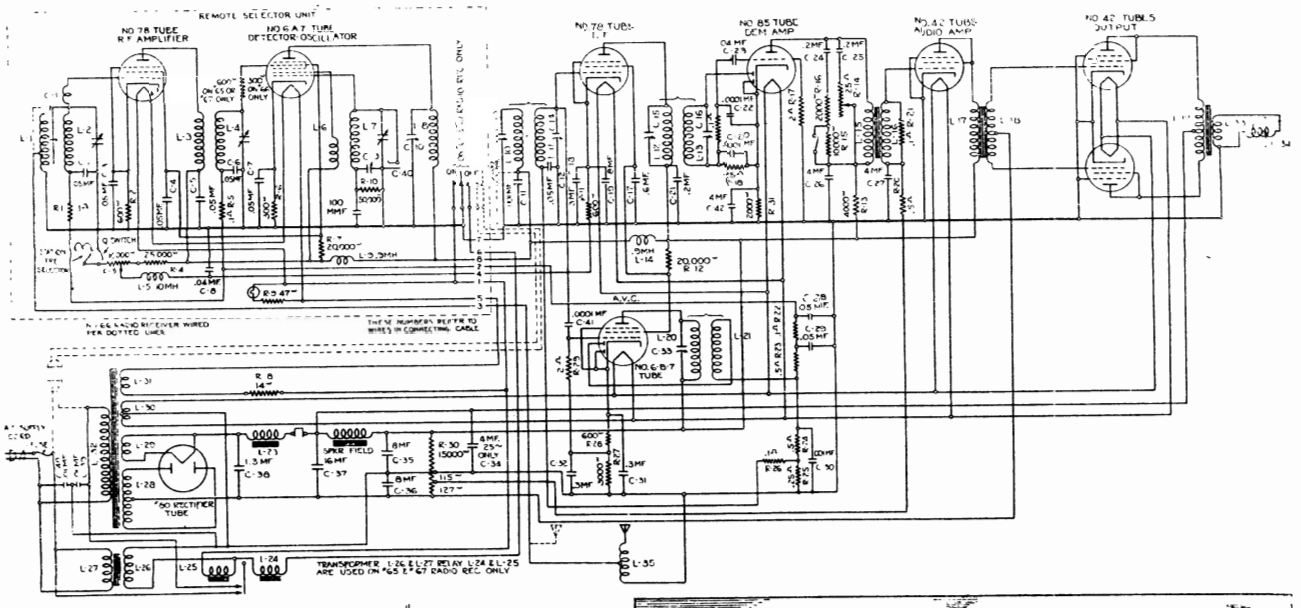
Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver With Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

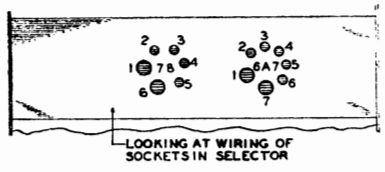
Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.

Tube	Circuit	Cap.	Terminal Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Terminal Nos. at Volts
6K7	R. F. Amp.	0	0	—	+230	+ 95	+ 3	—	—	+ 3	2–7, *6.3* volts
6A8	Mod.-Osc.	0	0	—	+235	+ 95	0	+150	—	+ 3	2–7, *6.3* volts
6K7	I. F. Amp.	0	0	—	+230	+ 95	+ 3.5	—	—	+ 3.5	2–7, *6.3* volts
6H6	Dem.-A. V. C.	—	0	—	0	0	0	—	—	—	2–7, *6.3* volts
6K7	A. F. Amp.	0	0	—	+ 25	+ 35	+1.5	—	—	+ 1.5	2–7, *6.3* volts
6F6	Output	—	0	0	+250	+260	0	—	0	+16	2–7, *6.3* volts
5Z3	Rectifier	—	+428	*405*	*405*	+428					1–4, *4.85* volts
Speaker Socket			+260	+400	+430	+430	+260	+260			

STROMBERG CARLSON TELEPHONE MFG. CO.

Nos. 65, 66, and 67 Receivers





INSIDE BACK OF BASE

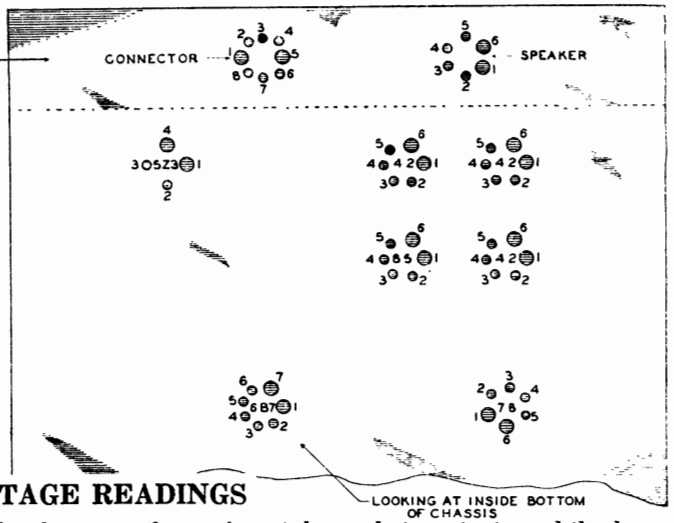


Fig. 2. Terminal Layout of Sockets for Voltage test.

I.F. = 175 K.C.

NORMAL VOLTAGE READINGS

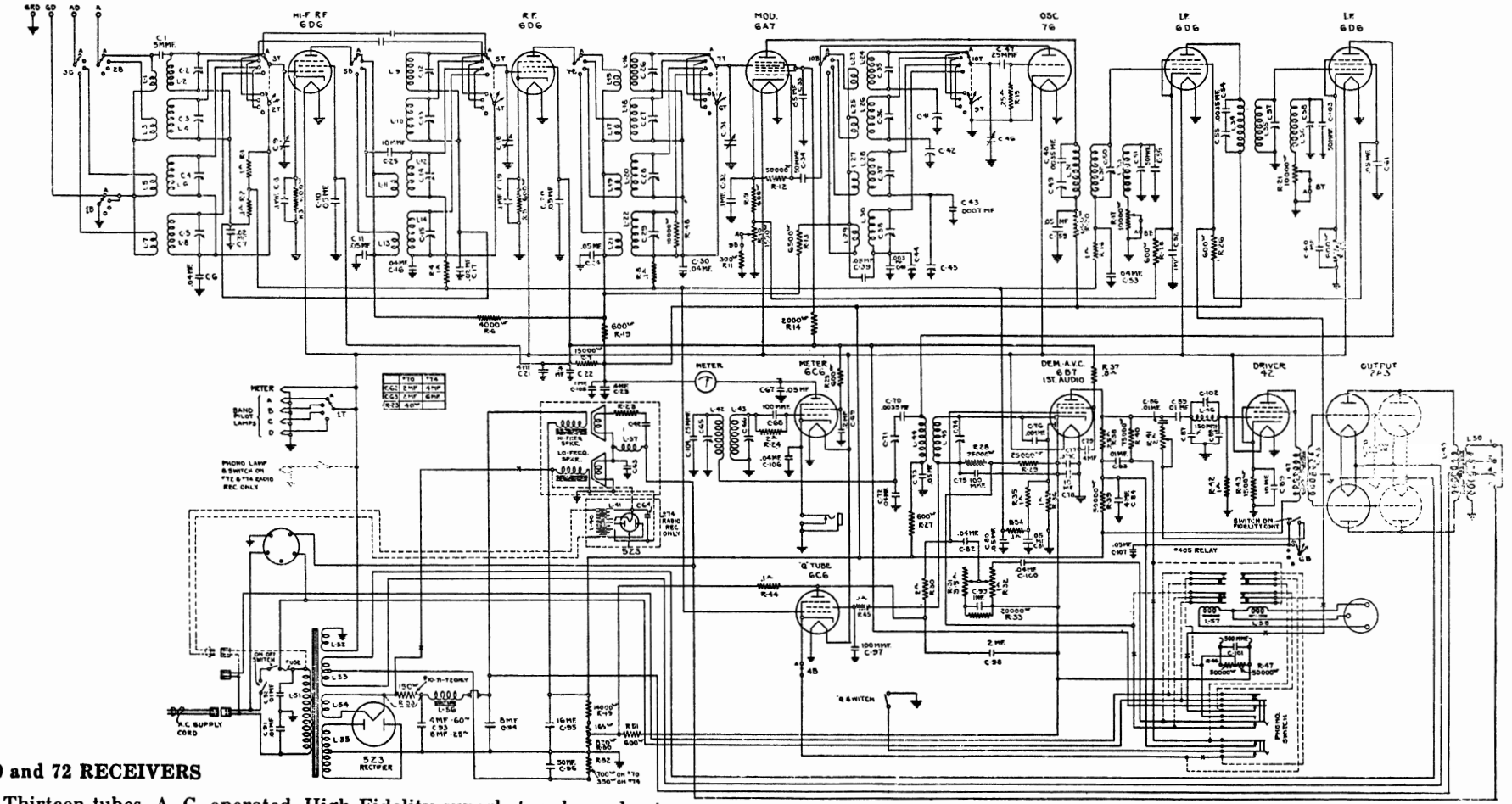
These voltage readings are obtained by measuring between the various tube socket contacts and the bases with the tubes, speaker, and cable plug in place. The set is therefore in operation when the measurements are made. Fig. 2 shows the terminal layout of the sockets with the proper terminal numbers. The terminals of each socket are numbered, starting with one heater or filament pin and proceeding around the pin circle clockwise to the other heater or filament pin. This is done looking at the bottom of the socket.

Voltages are given for a line voltage of 120 volts and allowance should be made for differences when the line voltage is higher or lower. A meter with a resistance of 1,000 ohms per volt should be used for measuring the D. C. voltages. The Volume Control should be set all "On" (clockwise) before measuring voltages. See page 2.

A. C. voltages are indicated by italics.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	*A. C. Meter for Heater Voltages Between Terminal Nos.*
78	R. F. Amp.	0		+200	+100	+ 3	+ 3			1–6—*6.5* volts
6A7	Mixer-Osc.			+200	+100	+200	— 11	+ 3		1–7—*6.5* volts
78	I. F.			+180	+ 75	+ 2	+ 2			1–6—*6.5* volts
6B7	I. F. Dem.			+180	+ 75	0	+ 12	+ 12		1–7—*6.5* volts
85	1st Audio			+180	0	+ 13	+ 13			1–6—*6.5* volts
42	2nd Audio			+170	+170	— 16	0			1–6—*6.5* volts
42's	Outputs			+345	+345	— 32	0			1–6—*6.5* volts
5Z3	Rectifier		A. C. voltage between plate terminals and chassis base	*500*	*500*					1–4—*4.8* volts
Speaker Socket			0	+193	+350	+350	+350	0		

Models 70, 72, 74



No. 70 and 72 RECEIVERS

Thirteen tubes, A. C. operated, High Fidelity superheterodyne, having four tuning ranges. See P-25252, Installation and Operating Instructions, for installation and operating procedure.

One 6D6 functions as an R. F. high frequency amplifier only on the "C" and "D" bands. On the other two lower bands this tube is shorted out and the tuning system functions as a "bi-resonator" system. The next 6D6 is used as an R. F. Amplifier. The remaining two 6D6 tubes are used as I. F. Amplifiers. The 6A7 is used as a modulator tube only. This is done in order to obtain maximum freedom of detrimental coupling between the oscillator and modulator.

The 76 tube functions as the oscillator. One 6C6 tube is used in a vacuum tube voltmeter circuit, resonance being indicated by the meter in the plate circuit of this tube, while the other 6C6 tube is used in the automatic noise suppression or "Q" circuit. The 6B7 tube acts as a demodulator, automatic volume control tube, and a triode first audio tube.

The No. 42 tube is operated as a triode audio driver tube for the No. 2A3 power output tubes. The 5Z3 tube is the rectifier tube in the power supply.

No. 74 RECEIVER

The arrangement and type of tubes used in this receiver is the same as in the No. 70 and 72 Receivers except for the addition of two more 2A3 tubes in the audio power output stage, and the additional 5Z3 rectifier tube in the power unit of the auditorium type loud speaker.

Tuning Ranges

A = 520 — 1600 K.C.

B = 1500 — 4200 K.C.

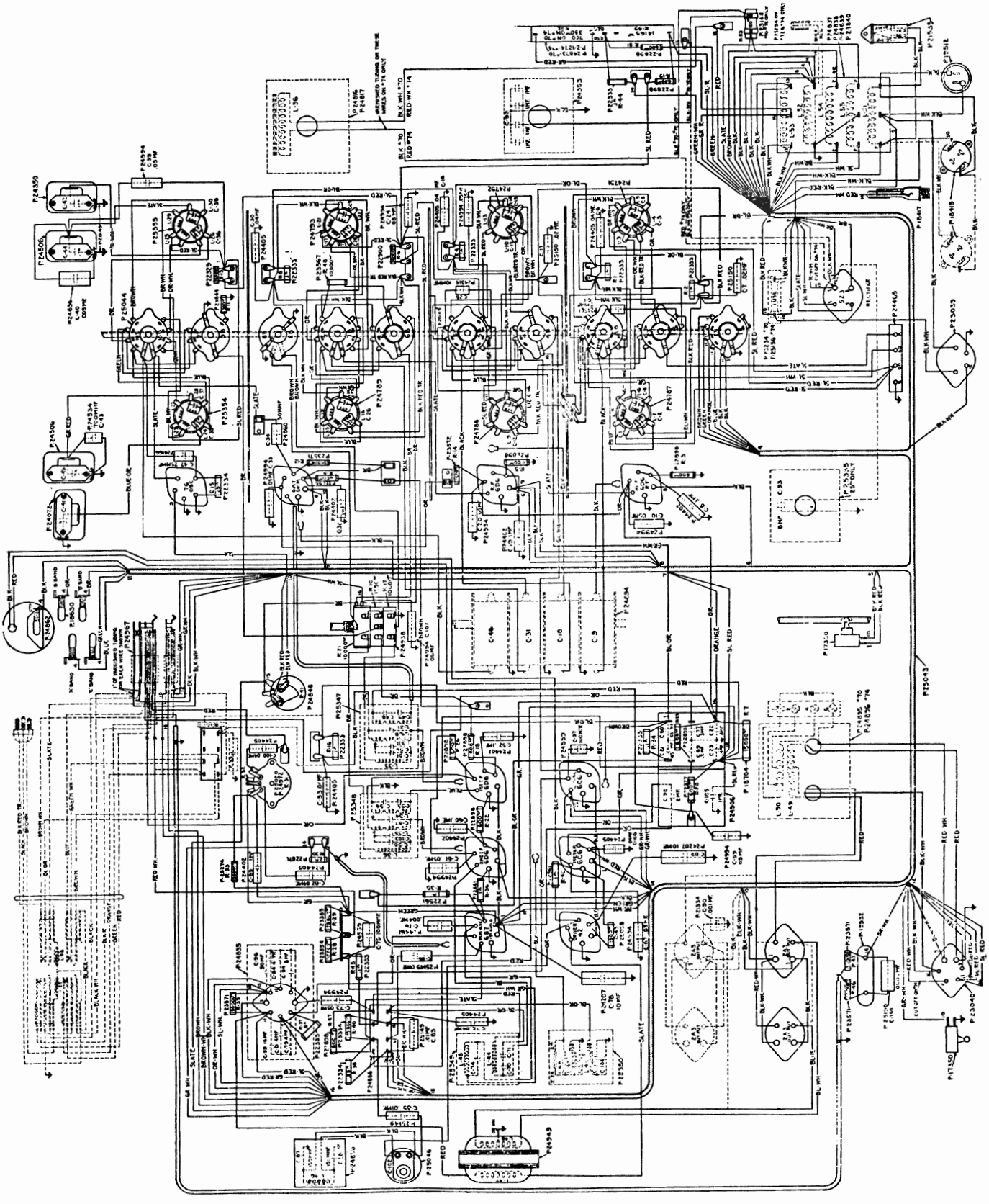
C = 3700 — 10,000 K.C.

D = 8500 — 23,000 K.C.

I.F. = 260 or 370 K.C.

STROMBERG CARLSON TELEPHONE MFG. CO.

Models 70, 72, 74



Wiring Diagram of Chassis.

STROMBERG CARLSON TELEPHONE MFG. CO.

Models 70, 72, 74

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the base; with the tubes in place. The Receiver is, therefore, in operation when the measurements are made. Fig. 1, shows the terminal layout of the sockets with the proper terminal numbers. The terminals of each socket are numbered, starting with one heater or filament pin and proceeding around the pin circle clockwise to the other heater or filament pin. This is done looking at the bottom of the socket.

Voltages are given for a line voltage of **120 volts** and allowance should be made for differences when the line voltage is higher or lower. A meter with a resistance of 1,000 ohms per volt should be used for measuring the D. C. voltages.

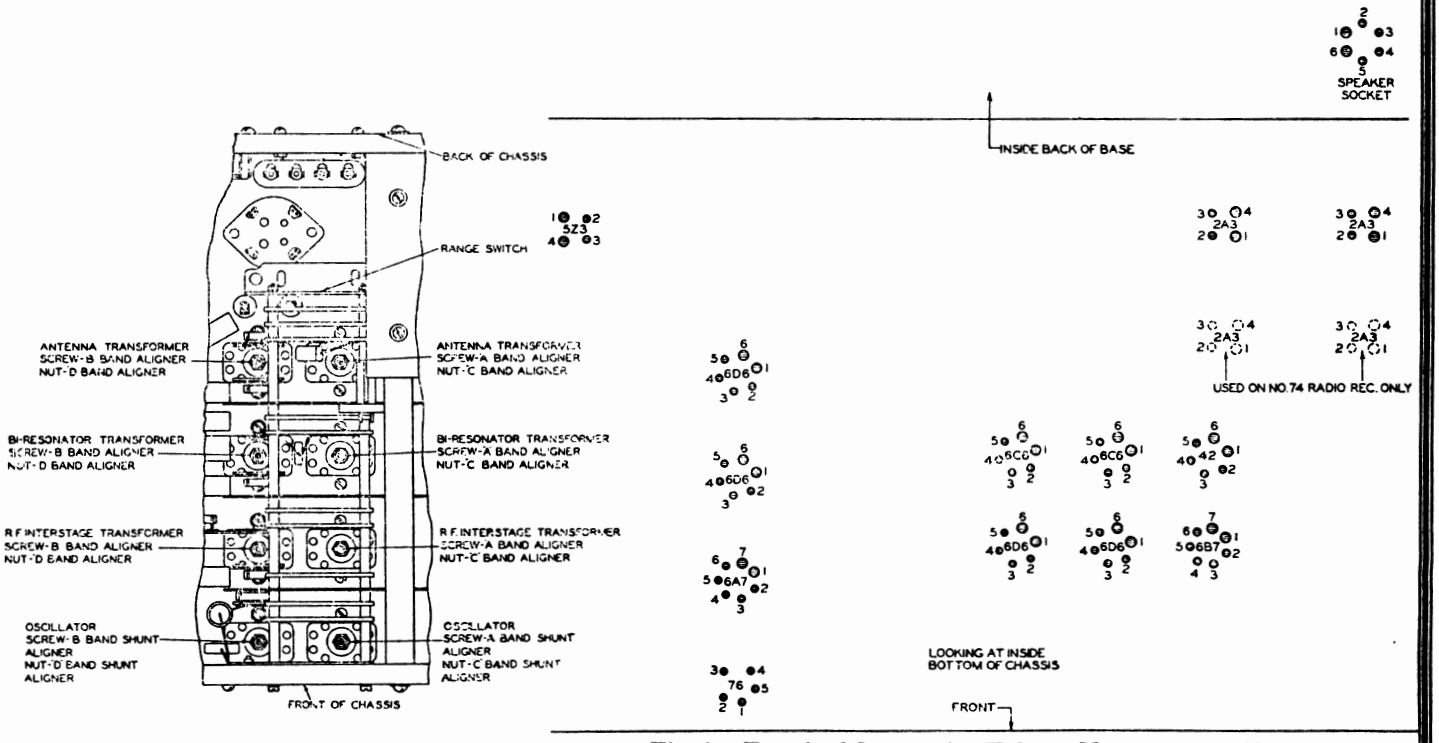


Fig. 1. Terminal Layout for Voltage Measurement Chart

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	*Heater Voltages Between Terminal Nos. at 120 Volts*
6D6	Hi-F, R. F.	0		+200	+ 87	+3.5	+3.5		—	1-6, *6.3* volts
6D6	R. F. Amp.	0		+220	+ 87	+3.5	+3.5		—	1-6, *6.31* volts
6A7	Mod.	0		+225	+ 75	+ 75	— 10			1-7, *6.31* volts
76	Osc.	—		+180	—25	0		—	—	1-5, *6.31* volts
6D6	1st I. F. Amp.	0		+225	+ 87	+ 10	+ 10		—	1-6, *6.32* volts
6D6	2nd I. F. Amp.	0		+225	+ 87	+3.5	+3.5		—	1-6, *6.32* volts
6B7	Dem.-Aud.	3		+130	+ 25	+ 12	0			1-7, *6.32* volts
6C6	"Q"	0		+ 12	+ 12	0	0		—	1-6, *6.32* volts
6C6	Meter	0		+225	+ 87	0	0			1-6, *6.32* volts
42	2nd Audio	—		+220	+220	0	+ 20		—	1-6, *6.32* volts
2A3s'	Output	—	+ 60	+375	0	+ 60	—	—	—	1-4, *2.53* volts
5Z3	Rectifier		+410	*405*	*405*	+410	—	—	—	1-4, *4.81* volts
Speaker			0	+388	+228	+365	+388	0	—	

Set tuned to 1000 kc., "A" Band, "Hi" Fidelity Control not operated, "Q" Switch Off, A. C. voltages are indicated by italics

Models 70,72, 74

ALIGNMENT INSTRUCTIONS

The unexcelled performance of a High Fidelity receiver cannot be obtained unless the receiver is properly aligned. In order to obtain this performance, it is necessary that these adjustments be carefully done. In the High Fidelity type of receiver, these adjustments will, of necessity, be more critical than in the standard radio receiver.

In making these adjustments, it is necessary that a good signal generator be used. In conjunction with the use of this signal generator, a good voltage output meter must be used in order to determine when resonance in the various circuits is obtained. An artificial antenna (dummy) of some sort should also be used. For most practical cases, a 250 micromicrofarad capacitor may be connected in series with the high side terminal of the signal generator. This capacitor should be connected as closely as possible to this terminal. CAUTION: Because of the different type circuit employed in these receivers for operating the visual tuning meter, it will not be possible to make the aligning adjustments by noting the action of this meter.

1. Remove the chassis from the cabinet but have it near enough to the cabinet so that the cords of the loud speakers may be plugged in. Then, turn the power switch to the "On" position. Make sure that the "Q" circuit switch is in the "Off" position and that the High Fidelity control is set for the normal selectivity position. Set the range switch to the "A" band position, and operate the volume control to the maximum position. Also operate the tone control to the normal position.

   Connect the ground or low side output terminal of the signal generator to the "Gd" and "G" binding posts on the receiver chassis. From the remaining terminal of the artificial antenna connect a wire to the "A" and "AD" binding posts on the receiver chassis.

2. **R. F. Adjustments.**

   Noting the various designated aligning capacitors shown in Figure 5, proceed in the following manner for aligning the radio frequency and meter circuits.

   (a) Operate the range switch on the chassis, to the "A" band position (full clockwise rotation). Align the receiver at 1500 Kc., aligning in the following sequence: Oscillator, R. F. Amplifier, "Bi" Resonator, Antenna.

   Align the oscillator's low frequency aligner (series aligning capacitor) at 600 Kc. on this "A" band. **Only the oscillator should be aligned at this frequency.**

   Check the alignment of all the R. F. circuits again at 1500 Kc.

   (b) Operate the range switch on the chassis, one position counter-clockwise from the "A" band position. This will be the position for the "B" band operation.

   Align the receiver at 4 megacycles in the same manner as was done for the 1500 Kc. of the **"A" band.**

   Align the oscillator's low frequency aligner (series aligning capacitor) at 1500 Kc. on this "B" band. **Only the oscillator should be aligned at this frequency.**

   Check the alignment of all the R. F. circuits again at 4 megacycles.

   (c) Operate the range switch on the chassis, one position counter-clockwise from the "B" band position. This will be the position for the "C" band operation.

   Align the receiver at 10 megacycles in the same manner as was done for the 1500 Kc. of the "A" band.

   Align the oscillator's low frequency aligner (series aligning capacitor) at 4 megacycles on this "C" band. **Only the oscillator should be aligned at this frequency.**

   Check the alignment of all the R. F. circuits again at 10 megacycles.

   (d) Operate the range switch on the chassis, one position counter-clockwise from the "C" band position. This will be the position for the "D" band operation.

   Align the receiver at 19.8 megacycles in the same manner as was done for the 1500 Kc. of the "A" band.

   Align the oscillator's low frequency aligner (series aligning capacitor) at 10 megacycles on this "D" band. **Only the oscillator should be aligned at this frequency.**

   Check the alignment of all the R. F. circuits again at 19.8 megacycles.

   NOTE: It will be noted that no instructions are given for aligning the receivers at other than two frequencies for any band. Every receiver is given an exacting check for "tracking" at various frequencies in each band before leaving the factory. It is felt by the manufacturers that should any receiver through accident require a check on the "tracking", it should be returned to the factory, where this may be easily and accurately done.

3. **Meter Circuit Adjustment**

   Adjust the signal generator to 600 Kc. and tune in this signal on the radio receiver. Be sure to tune for the maximum or peak as indicated on the visual meter of the chassis. Before adjusting the aligning capacitors of this circuit, make sure that the volume control is at the maximum volume position and the high fidelity control must be in the normal selectivity position. Also, release the locking nuts of the aligning capacitors. Then adjust the two aligning capacitors of this circuit, obtaining maximum indication on the visual tuning meter. After this adjustment, tighten the lock-nuts of these capacitors.

4. **I. F. Alignment**

   Because of the necessity of obtaining the proper shape of resonance curve of these stages, it is recommended that, unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system, which allows the operator to see the exact shape of the resonance curve. For this reason, it is better to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed.

   Set the signal generator to exactly 260 Kc., or 370 Kc., depending upon the intermediate frequency of the particular receiver stamped on the chassis. Operate the range switch of the receiver to the "A" band position. Set the receiver tuning dial at its extreme low frequency position and operate the tone control to the normal position. **Turn the high fidelity control to the normal selectivity position.** Never attempt to adjust the I. F. stages with the high fidelity control set at the high fidelity position. Before proceeding with the aligning, remove the 250 micromicrofarad capacitor (artificial antenna) from the signal generator lead and substitute for it a capacitor having a value of at least 0.25 microfarad. Now, connect this lead to the grid cap of the 6D6 tube used in the second I. F. amplifier stage. Do not remove the grid lead from the chassis connecting to this tube. Before attempting to adjust any of the I. F. aligning capacitors, release the locking-nuts and, after completing the adjustment, make sure that these lock-nuts are securely tightened.

   (a) Now, note from Figure 5, the aligning capacitors C-74 and C-71, and adjust these capacitors in the order given for maximum output reading on the output meter.

   (b) Move the signal generator lead and capacitor from the grid cap of the 6D6 tube used in the second I. F. amplifier stage to the grid cap of the 6D6 tube used in the first I. F. amplifier stage and adjust the aligning capacitors C-57 and C-55 (in this sequence), for maximum output reading on the output meter.

   (c) Move the signal generator lead from the grid cap of the first 6D6 tube used in the first I. F. amplifier stage, to the grid cap of the 6A7 tube. Now, adjust the aligning capacitors C-50 and C-49 for maximum output reading on the output meter. This completes the necessary adjustments on the I. F. stages for normal operation of these High Fidelity receivers.

5. **Adjusting the I. F. Tertiary Circuits**

   In the High Fidelity receiver, some means must be used to obtain that selectivity which will give the necessary band width for High Fidelity reproduction. In these receivers, it will be noted from the schematic diagram that the first and second I. F. transformers are made up of three tuned circuits: the primary, secondary, and a third which we call the tertiary circuit. Included in each tertiary circuit is a variable resistance in series with the coil. Incorporated in these variable resistances is a switch which opens or closes this circuit. When the fidelity control is turned counter-clockwise as far as it is possible, the receiver functions with normal selectivity because the switches (incorporated in the variable resistors) are open. When the fidelity control is operated in a clockwise direction as far as it is possible, minimum resistance is inserted in series with the coil, resulting in the tertiary circuits acting as a heavy load across the secondary circuits, which, of course, results in broader tuning. As the fidelity control is operated in the opposite direction, more resistance is added in series with the tertiary coils which makes these circuits less effective, resulting in greater selectivity.

   When the R. F. and I. F. circuits are carefully aligned, operate the high fidelity control to the high fidelity position (maximum clockwise rotation). Now note from Figure 5 the location of the aligning capacitors in each tertiary circuit. Then, with the signal generator still set at the intermediate frequency, and its lead connected to the grid cap of the 6A7 tube, adjust these capacitors. Adjust the first I. F. tertiary aligning capacitor, C-51, until a **minimum** reading is obtained on the output meter. Then, adjust the second I. F. tertiary aligning capacitor, C-58, in the same manner.

   In order to make all these aligning adjustments in the most satisfactory manner, it is recommended that the service man use the special aligning tools manufactured by this company and listed as follows:

DESCRIPTION OF THE TE-LEK-TOR REMOTE CONTROL SYSTEM FOR USE WITH THE NOS. 70, 72 AND 74 RECEIVERS

All Nos. 70, 72 and 74 Receivers are provided with mechanical and electrical fittings for the Stromberg-Carlson Te-lek-tor System of Remote Control as shown in Figs. 4, 5 and 6. Thus, any of these receivers can be equipped for remote control operation without requiring any special work on the part of the installer. In fact, the Te-lek-tor Motor Unit for operating the Radio Chassis (See Fig. 17) can be installed at any time and made ready for operation in less than 15 minutes. The only tool required for this job is a screwdriver.

The Stromberg-Carlson Te-lek-tor System is the most simple, efficient and reliable type of Remote Control yet devised for Radio Receiver operation. The first of these controls was made in 1930 and through gradual improvements in details of design, this unit has been brought to a high state of perfection.

From the standpoint of operation, the Te-lek-tor System is extremely simple and direct, as it is completely push-button controlled, with one button for each operation and a plainly printed designation adjacent to each button indicating its function. Thus, strangers can operate the system at once, with little or no instructions.

Te-lek-tor Systems are very flexible in design, the most simple being a Motor Unit with one or two key boxes to control the operation of the radio chassis at any remote location in the same room in which the No. 70, 72 or 74 Receiver is installed (See Fig. 17). In this case no permanent house wiring is required as the circuits between the Receiver and the Te-lek-tor Key Box are made through a flexible flat (ribbon shaped) cord which can be concealed under the edges of rugs or other floor coverings. The standard lengths of this flat cord regularly furnished with the key boxes, are 10 feet and 30 feet.

There are two key box outlets in the back of the Te-lek-tor Motor Unit, allowing two of the key boxes to be used in this simple installation. In this case one of the key boxes can have a short connecting cord (10 ft.) for operating the Receiver from a chair or couch, located close to the instrument, and the other key box with a long cord (30 ft.) for operating from a more distant location.

A more complete Te-lek-tor System can be provided for operating the phonograph as well as the radio system in the Nos. 72 and 74 Receivers (See Fig. 18.) The Phonograph control, however, requires the installation of a Phonograph Switching Relay in the radio chassis circuits. This can be done at the factory on special order. Authorized Stromberg-Carlson Te-lek-tor System Dealers are in position to make this Phonograph Relay installation and to install permanent (concealed) wiring in the home to accommodate extension speakers and Te-lek-tor Key Boxes in other rooms, remote from the room containing the Radio Receiver Cabinet.

1—Services Provided by the Te-lek-tor System

For practical reasons, the Te-lek-tor System is limited to performing those functions which are involved in normal, every-day service. Thus, tuning is confined to standard broadcast-station reception without attempting to accomplish the extremely fine hair-breadth tuning required for short wave reception. Remote control of the Fidelity and Tone Controls is not attempted, it being assumed that these will normally be left in "SR" fidelity position and for any desired tone quality.

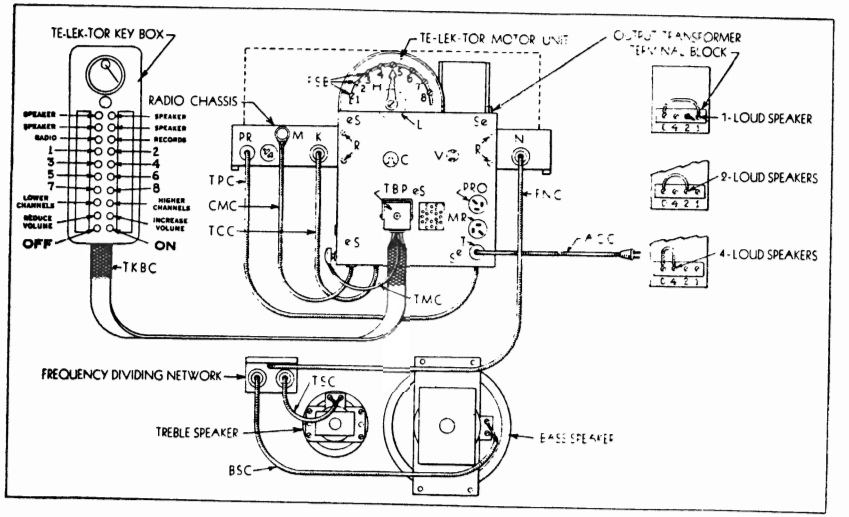


Fig. 17

Te-lek-tor Motor Unit Mounted on the Back of the Radio Chassis of a No. 70, 72 or 74 Receiver for Performing the following Remote Control Operations:

1—Turning the Receiver "On" and "Off"

2—Selecting any one of Eight "Favorite" (Pre-Set) Standard Broadcast Stations

3—Rotating the Dial in Either Direction for "Sharpening" Tuning or for Tuning Stations not Pre-Set

4—Tuning Accurately by Meter (Visual Tuning)

5—Setting Volume Level of Radio Reproduction

This equipment can be installed in a few minutes by a service man, without any Changes in the Radio Circuits or Extra Wiring.

An electrical inter-lock is provided so that the manual on-off switch (combined with the tone control) is not effective when the receiver is set for Te-lek-tor operation, so that the Tone Control may be left in any desired setting. Going to the receiver, an operator may adjust the Fidelity, Tone or Volume Controls without affecting the Te-lek-tor; or the operator may "take manual control", in which case this operator alone can tune the instrument, adjust its volume and other controls, change to phonograph operation or turn the instrument on and off, although listeners at remote Te-lek-tor control positions are still free to turn their loud speakers on or off to "listen in".

The following remote control operations are provided by the Stromberg-Carlson Te-lek-tor System when installed on the Nos. 70, 72 and 74 Receivers.

(a) Simple Te-lek-tor Radio Remote Control System (See Fig. 17)

This simple system of Radio Chassis Remote Control can be used on the No. 70, 72 or 74 Receiver and provides push buttons on each Key Box for the following operations:

—One Button for Turning the Radio "On"
—One Button for Turning the Radio "Off"
—One Button for Increasing the Volume Level
—One Button for Decreasing the Volume Level
—One Button for Turning the Dial clockwise for tuning "DX"

STROMBERG CARLSON TELEPHONE MFG. CO.

Te-leK-tor Models 70-72-74 (cont'd)

Fig. 18 Complete Te-lek-tor Radio and Phonograph Remote Control System on Nos. 72 and 74 Receivers

stations or for "sharpening the tuning" of pre-set stations, by meter indication.
—One Button for Turning the Dial counter-clockwise for tuning "DX" stations or for "sharpening the tuning" of pre-set stations, by meter indication.
—Eight Buttons for Turning the Dial Directly to any of eight "Favorite Stations" that are set up previously on the Te-lek-tor Motor Unit

In this simple system, there will be left on the key box six push buttons, which are not used. These are reserved for extension speakers, etc., which may be added to the system at some later date. Each Te-lek-tor Key Box contains an accurate Visual Tuning Meter for use in sharpening the tuning of stations selected by any of the eight favorite station buttons or by the "DX" buttons. A combined Pilot and Meter Lamp is supplied on each Key Box to provide illumination for the meter and keys and to serve as a visual indication (when this lamp is lighted) that the Radio is operating, and that control of the Radio is switched to the Te-lek-tor System.

(b) Complete Te-lek-tor Radio and Phonograph Remote Control System (See Fig. 18)

This complete system of Radio and Phonograph Remote Control can be used on the No. 72 or No. 74 Radio and Automatic Phonographs and provides push buttons on each key box for the following operations:

—One Button for Turning the Radio or Phonograph "On"
—One Button for Turning the Radio or Phonograph (and any connected Extension Speakers) "Off"
—One Button for Increasing the Volume Level of Radio or Phonograph
—One Button for Decreasing the Volume Level of Radio or Phonograph
—One Button for Turning the Dial clockwise for Tuning "DX" Stations, or for "Sharpening the Tuning" of pre-set stations by means of Meter Indication.
—One Button for Turning the Dial Counter-Clockwise for Tuning "DX" Stations, or for sharpening the tuning of pre-set Stations by means of Meter Indication.
—Eight Buttons for Turning the Dial Directly to any of eight "Favorite Stations" that are set-up previously on the Te-lek-tor Motor Unit.
—One Button for Turning on the Phonograph and Transferring a Record from the Magazine to the Turntable and Starting Playing. Pressing this Button when a Record is playing, immediately transfers the next Record from the Magazine to the Turntable and starts playing (acting as a "Record Reject")
—One Button for Turning off the Phonograph and connecting the radio into circuit.
—One Button for Disconnecting the Loud Speaker System in the Receiver Cabinet (For use when reproduction is desired only from one or more Extension Speakers, and not from the Radio Set).
—Three Buttons for Connecting or otherwise Controlling Several Extension Speakers, located in other rooms.

In this system all twenty push buttons of each Key Box are used, and as many Key Boxes as desired can be installed (usually one Key Box in each room in which an Extension Loud Speaker is located). Tuning Meters on each Key Box give accurate tuning control for best audio quality. A combined Pilot and Meter Light also is provided on each Key Box.

2—Installing the Te-lek-tor Motor Unit

This is a simple operation, if the following sequence of instructions is observed. (This work should be done by the Dealer's Service Man).

First—Remove the Dust Cover from the Te-lek-tor Motor Unit by first taking out the five screws "S" and pulling off the Tuning Knob "C", Figs. 17 and 18.

Second—Turn the Volume Control Knob of the Radio Chassis (Fig. 7) to complete Counter-Clockwise Rotation, so as to bring the wide slot in the Coupling Disc "V" (Located at the back of the Radio Chassis as shown in Figs. 4, 5 and 6) to the bottom.

Third—Turn the Volume Control Drive Coupling Arm located on the motor side of the Te-lek-tor Motor Unit, to the bottom so as to be in position to engage the wide slot in Coupling Disc (mentioned in the previous paragraph) when the installation is made.

Fourth—See that the Large Radio Chassis Knob (marked "Fidelity Control" in Fig. 7) is pushed "In".

Fifth—With four Te-lek-tor Unit Mounting Screws within reach, take the Te-lek-tor Motor Unit in the two hands and insert the gear shift stud (located on the motor side of the unit) into the lower half of the opening "C" (Figs. 4, 5 and 6) at the back of the radio chassis.

Sixth—Now, raise the Te-lek-tor Motor Unit so as to cause the slot in the end of the Fidelity Control Shaft Lug to engage or hook into the "necked" portion of the Te-lek-tor Unit Gear Shift Stud. This engagement can be checked by pulling the complete Te-lek-tor Motor Unit back (holding up so as to insure engagement) and away from the Radio Chassis. If it can move only a small distance, then the proper engagement is made.

Seventh—With this engagement made, hold the Te-lek-tor Motor Unit against the back of the Radio Chassis with one hand and with the other hand, insert the four mounting screws "R", Figs. 17 and 18, into the threaded holes in the back of the radio chassis. Turn these screws into the holes just far enough to hold the Motor Unit loosely in place.

Eighth—Check the proper engagement of the Volume Control Drive to the Te-lek-tor Unit by turning the Volume Control Knob on the front of the Radio Chassis and observe whether the Volume Control gears of the Te-lek-tor Unit are rotated.

Ninth—Check the engagement of the Large Radio Chassis Knob (Fidelity Knob, Fig. 7) Shaft to the Te-lek-tor Gear Shift Mechanism by observing whether the Tuning Gears of the Te-lek-tor Motor Unit are engaged and disengaged when this large knob is pulled "out" and pushed "in".

Tenth—If both of these controls are properly engaged, proceed to line up the pin on the end of the Tuning Crank Shaft of the Te-lek-tor Motor Unit with the hole in the end of the Tuning Shaft of the Radio Chassis. This can be done by lifting up or moving to either the right or left the complete Te-lek-tor Motor Unit until a position is reached where the Tuning Shaft Disc "L" (Figs. 17 and 18) can be moved freely towards and away from the back of the Te-lek-tor Motor Unit. Before this test can be made, the Round Stud on the End of the Te-lek-tor Tuning Crank must be lined up with the notch in the Radio Chassis Tuning Drive Disc "L" (Figs. 17 and 18).

Eleventh—Now, tighten all four Te-lek-tor Mounting Screws "R" (Figs. 17 and 18) and check for proper and free operation of the Volume Control Drive, and of the Te-lek-tor Tuning Drive and Gear Shift. (See Section 5 of this Chapter on "Operating the Te-lek-tor System".)

Twelfth—Before replacing the Dust Cover on the Te-lek-tor Motor Unit, check the electrical and mechanical operation of the installation, by temporarily making electrical connections between the Te-lek-tor Motor Unit and Radio Chassis as shown in Fig. 17, for a simple radio installation on a No. 70, 72 or 74 Receiver or as shown in Fig. 18, for a Radio and Phonograph Installation on a No. 72 or 74 Radio and Automatic Phonograph. It will be noted that the Power Supply Cord, marked "A. C. Plug" in Figs. 4, 5 and 6, is removed from the socket in the back of the Radio Chassis and inserted in a similar socket, marked "T" in the lower right hand corner of the Te-lek-tor Motor Unit (Figs. 17 and 18). Now, the Te-lek-tor Power Cord, marked "TPC" in Figs. 17 and 18, can be inserted in the socket "PR", just vacated in the back of the Radio Chassis. Follow the Operating Instructions in Section 5 of this Chapter when checking the various electrical operations of the Te-lek-tor Motor Unit.

Thirteenth—If the system employs a No. 72 or 74 Receiver equipped with both a Phonograph Switching Relay and Record Reject Magnet, it will be necessary to "short circuit" the lower protective resistor in the lower left-hand corner of the Motor Unit. This resistor is provided to protect the Phonograph Relay against excessive voltage where the lighting circuit voltage is high and no Reject Magnet is used.

Fourteenth—After checking the installation and finding that it works correctly, the Dust Cover can be replaced on the Te-lek-tor Motor Unit and fastened by the five screws "S" (Figs. 17 and 18). In order to do this, it is necessary to temporarily remove the several circuit connecting plugs and Tuning Knobs (TBP, P, T, C, etc., Figs. 17 and 18) from the face of the Te-lek-tor Motor Unit. Be sure to install the Motor Unit Tuning Knob "C", Figs. 17 and 18, on its shaft.

The various connecting cords and mechanical details of the Te-lek-tor equipped No. 70 series Receivers are identified by the following letters in Figs. 17 and 18:

ACC	A. C. Current Supply Cord (Connecting Te-lek-tor Unit to House A. C. Current Supply)
ANT	Antenna Connection to Chassis
BSC	Bass Speaker Cord
BSPC	Bass Speaker Power Supply Cord
CMC	Chassis (Radio) Meter Cord (from Te-lek-tor Unit)
ESC	Extension Speaker Cord (Connecting Matching Transformer to Special House Wiring Circuits)
ESRC	Extension Speaker Relay Cord (Connecting Te-lek-tor Unit to Special House Wiring Circuits)
FNC	Frequency Dividing Network Cord (to Master Speaker Relay)
GND	Ground Connection to Chassis
MRC	Master Relay Cord (to Radio Chassis)
MREC	Master Relay Extension Cord (Two Conductors Connecting Master Relay to Matching Transformer)
MRSC	Master Relay Single Cord (Connecting Master Relay to Matching Transformer)
PGC	Phonograph Ground Cord (to Radio Chassis)
PMC	Phonograph Motor Current Supply Cord
PPC	Phonograph Pickup Transformer Connecting Cord
PRC	Phonograph Reject Magnet Cord
PTC	Phonograph Transformer Cord (to Radio Chassis)
TCC	Te-lek-tor Circuit Connecting Cord (to Radio Chassis)
TEC	Te-lek-tor Extension Cord (to Special House Wiring Circuits)
TGC	Transformer (Pickup) Ground Cord (to Phonograph Chassis)

TKBC	Te-lek-tor Key Box Cord
TMC	Te-lek-tor Key Box Tuning Meter Cord
TPC	Te-lek-tor Power Cord (to Radio Chassis)
TSC	Treble Speaker Cord
C	Notched Lug on End of Radio Chassis Te-lek-tor Control Shaft
FSB	Favorite Station Brushes on Te-lek-tor Motor Unit
H	Favorite Station Brush Indicating Pointer on Te-lek-tor Unit
K	Te-lek-tor Motor Unit Circuit Outlet on Radio Chassis
L	Clutch Disc on Tuning Shaft of Radio Chassis
M	Tuning Meter Jack on Radio Chassis
MR	Master Relay Outlet on Te-lek-tor Motor Unit
N	Audio Output Circuit Outlet on Radio Chassis
PR	Power Outlet on Radio Chassis
PRO	Phonograph Relay Outlet on Te-lek-tor Motor Unit
R	Te-lek-tor Motor Unit Mounting Screws (4)
S	Te-lek-tor Motor Unit Cover Holding Screws (5)
T	Power Outlet on Te-lek-tor Unit
TBP	Te-lek-tor Box Plug on End of Cord
V	Notched Disc on Volume Control Shaft of Radio Chassis

3—Setting of Favorite Station Brushes on the Te-lek-tor Motor Unit

There are eight Push Buttons provided on each Te-lek-tor Key Box for the automatic selecting of eight "Favorite Stations" on a Te-lek-tor equipped No. 70, 72 or 74 Receiver. The Te-lek-tor Motor Unit is provided with eight Adjustable Brushes for setting up these eight Favorite Stations, this operation being as follows:

First—Decide on the eight best local or nearby stations which are regularly heard (night and day) in your locality, and arrange these stations in a list, in the order of their channel assignment (kilocycle markings on the Radio Dial). For example, if the receiver is installed in a locality in or near New York City, the following list of stations might be selected, and arranged in this order:

Station No.	Kilocycle	Station Letters
1	660	WEAF
2	710	WOR
3	760	WJZ
4	860	WABC
5	1010	WHN
6	1100	WLWL
7	1180	WINS
8	1300	WBBR—WFAB—WEVD

When selecting this list, it is necessary to see that the separation of these stations on the dial is sufficient to allow adjacent Te-lek-tor Motor Brushes to be properly located in the adjusting slot. On the higher channel end of the No. 70 type Tuning Dial, the brushes cannot be placed closer than 60 kilocycles. On the middle and lower channel end of the Dial, the tuning scale is more open, allowing for less than 40 kilocycles setting of adjacent brushes.

Second—With the Large Knob (Fidelity Knob, Fig. 7) of the Radio chassis, turned to the "SR" position and pulled out for Te-lek-tor Operation (See Section 5 of this Chapter) and the Tuning Dial turned by hand by the Station Selector Knob to the position where the Te-lek-tor Tuning Clutch has snapped into engagement (Station Selector Knob will not turn the Dial in this engaged position), proceed to rotate the dial by the Te-lek-tor Motor Unit (pressing the "Lower Channel" button on the Te-lek-tor Key Box) until Station No. 1 of your list of "Favorite Stations" is reached. Now, tune this station as accurately as possible by momentarily pressing, either the lower channel button or the higher channel button, until the station is heard with good quality and the pointer on the Tuning Meter gives the maximum swing to the right.

Third—Loosen, about one-half a turn, the knurled metal nut holding the Favorite Station Brush (Brushes marked "FSB" in Figs. 17 and 18) in the extreme left hand end of the adjusting slot and marked "1" in the diagram. Slide this brush in the slot until it is directly in line with the end of the pointer "H" and tighten the knurled nut tightly with the fingers. Now, turn the Knob "C" on the motor Unit, clockwise about one-half a turn and press the Te-lek-tor Key Box Button No. 1 (See Key marked "1" on Fig. 17) and hold down until the Te-lek-tor Hand "H" comes to rest. If the setting of Bush No. 1 was accurate, Station No. 1 of your list should be correctly tuned. Look at the dial on the front of the receiver to check the station tuned-in, to see that it corresponds to the No. 1 Station of your list. Correct the setting of Brush No. 1 by moving it in the slot a very small amount in the desired direction and checking the new setting by turning Knob "C" clockwise one-half turn and pressing Push Button No. 1 on the Key Box to rotate the dial until Hand "H" comes to rest.

It is to be noted that the Brush No. 1 for the first station in the list of Favorite Stations, need be adjusted for accuracy of setting in one direction only as the Te-lek-tor Motor will always rotate in that one direction when automatically tuning from any station of higher channel numbering to this lowest pre-set station.

Fourth—Proceed to set up the second, and the other remaining stations in your Selected list of Favorite Stations, in the same manner described in the "Second" and "Third" operations of these instructions, the second station using Brush "2" on the Te-lek-tor Motor Unit and Push Button "2" on the Te-lek-tor Key Box, etc. (See Figs. 17 and 18.) There is one important exception on this operation, as Brushes 2, 3, 4, 5, 6 and 7 must be set so that fairly accurate tuning of these six intermediate pre-set stations will be obtained when the dial is rotating in either direction in the automatic selecting of these stations. The best setting of these six stations can be obtained by checking the accuracy of each of these Te-lek-tor Brushes as follows: Turn the Te-lek-tor Knob "C" one-half turn clockwise and rotate the Tuning Dial back to rest by pressing the corresponding Button on the Key Box, and immediately turn this Knob "C" one-half turn counter-clockwise and again rotate the Tuning Dial back to rest by pressing the same Key Box Button as before. Compare the extent of the movement of the pointer of the Te-lek-tor Box Tuning Meter, and readjust the position of the Te-lek-tor Brush until the Meter Pointer swings the same amount for both directions of tuning. This may not be the exact position of the dial for sharpest tuning of the receiver, required for best audio quality on the Nos. 70, 72 and 74 Receivers, but it gives a positive selection of these pre-set Favorite Stations by the mere pressure on one push button of the Te-lek-tor Key Box.

For best audio quality on any of these eight automatically selected stations, the tuning can be sharpened by momentarily pressing the Higher Channel Button or the Lower Channel Button to give maximum swing to the right of the pointer of the Key Box Tuning Meter. When the tuning is correctly sharpened, the audio reproduction will give maximum low frequency response and be free from any raspy or high pitched effects.

Fifth—Adjust Favorite Station Brush No. 8 the same as for Brush No. 1, excepting turn the Knob "C" (Fig. 17) on the back of the Te-

lek-tor Motor Unit in one direction only (counter-clockwise one-half turn), for checking the accuracy of brush setting. This is the direction that the tuning dial always rotates when automatically selecting this eighth station.

Sixth—Write the Station Call Letters of the eight Favorite Stations of your list on the designation strips of the Key Box, so as to correspond to the keys used in setting up the stations on the Te-lek-tor Motor Unit. These push button strips are printed on both sides so as to allow for another list of Favorite Stations, if at any time in the future another choice of stations is made.

4—Te-lek-tor Extension Speakers

Each No. 70, 72 and 74 Receiver Chassis has a special Terminal Block on the Output Transformer to allow for adjusting the impedance of the Audio Output Circuits to accommodate several extension loud speakers as shown in the right hand section of Fig. 17.

(a) Connection with No Extension Speakers

The correct connection of the Output Transformer adjusting cord for regular operation of the receiver (with no extension loud speaker) is between Terminal marked "0" and Terminal marked "1", as shown in Fig. 17 for "1—Loud Speaker". When only one speaker is to be connected to the output of the Radio Chassis at any one time, that is the speaker system in the receiver being disconnected when an extension speaker is connected, then the Output Transformer adjusting cord should be left connected between Terminal marked "0" and Terminal marked "1", as shown for "1—Loud Speaker" in Fig. 17.

(b) Permanent Connection with One Extension Speaker

If one Extension Speaker is likely to be connected at the same time that the loud speaker system in the receiver is operating, making a total of two speakers operating from the radio chassis, the adjusting cord should be connected between Terminal "0" and Terminal "2", as shown for "2—Loud Speakers" in Fig. 17.

(c) Permanent Connection with Two or Three Extension Speakers

When two or three Extension Speakers are likely to be connected to the radio set. making a total of three or four speakers operating from the radio chassis, then the Output Transformer adjusting cord should be connected between Terminal "0" and Terminal "4", as shown for "4—Loud Speakers" in Fig. 17.

(d) Correct Impedances of Extension Speakers

The Loud Speaker System employed in the Nos. 70 and 72 Receivers has a different impedance to that used in the No. 74 Receiver, requiring that the Extension Speakers also have different voice coil impedance, as follows:

—For the Nos. 70 and 72 Receivers the Extension Speakers should preferably have voice coil impedances of approximately 24 ohms each. Otherwise, special impedance matching precautions, such as the use of a P-22057 Matching Transformer may be required in addition to the matching facilities provided by the tapped output transformer on the chassis.

—For the No. 74 Receiver the Extension Speakers should preferably have voice coil impedances of approximately 8 ohms each. Otherwise special impedance matching precautions, such as the use of a P-22057 Matching Transformer may be required, in addition to the taps on the output transformer of the chassis.

(e) Connecting an Extension Speaker Impedance Matching Transformer to the Receiver

When a Te-lek-tor System employs extension speakers of different voice coil impedances from those specified above, or it is desirable to keep the volume level of reproduction from the several extension speakers somewhat below that of the speaker system in the Receiver Cabinet, then a Stromberg-Carlson P-22057 Matching Transformer can be employed to advantage as shown in the Te-lek-tor Installation, Fig. 18. This P-22057 Matching Transformer has its winding and taps arranged as shown in the upper right hand diagram of Fig. 18. This diagram shows also the impedance between the various taps of the transformer.

The P-22057 Matching Transformer is an "Auto-Transformer" having an excellent frequency characteristic and power-handling capacity sufficient to drive one Stromberg-Carlson No. 1 High Fidelity Loud Speaker or three or four ordinary Dynamic Loud Speakers.

When the P-22057 Matching Transformer is used, a section of its winding is placed in parallel with the Receiver Loud Speaker system, the same as if it were another loud speaker of similar impedance to that employed in the receiver. Thus, in order to obtain correctly balanced results, the impedance of this portion of the Matching Transformer winding should equal the impedance of the Loud Speaker System in the receiver. The Matching Transformer should also be treated as one loud speaker when determining which tap to employ on the chassis output transformer. The impedance of the Speaker System in the Nos. 70 and 72 Receivers is 24 ohms, so that the connections from the receiver to the Matching Transformer should be made to taps Nos. 1 and 7, which provides a Transformer Impedance of 25 ohms. The No. 74 Receiver Speaker System has an impedance of 8 ohms, so that connections to the Matching Transformer for this receiver should be made to taps Nos. 1 and 4, which provide a transformer impedance of 8 ohms. This connection for a Te-lek-tor equipped No. 74 Receiver is shown in the main diagram of Fig. 18.

(f) Connecting Extension Speakers to an Impedance Matching Transformer

The P-22057 Matching Transformer provides a sufficient number of taps to allow for correct impedance matching for various arrangements of Extension Speakers of either Dynamic or Magnetic types. Special instructions are supplied with each of these Transformers for correct installation of speakers. For example, with three Dynamic Extension Speakers having voice coil impedance of about 15 ohms each, the Extension Speaker Circuit should be connected to taps Nos. 3 and 6 of the P-22057 Matching Transformer (4 ohms impedance) as shown in the main diagram of Fig. 18.

In general, the connection of Extension Loud Speakers to the P-22057 Matching Transformer should be made as follows:

1 (only)	Dynamic Speaker	-	Use Taps No. 1 and No. 5
1 to 2	Dynamic Speakers	-	Use Taps No. 1 and No. 4
1 to 4	Dynamic Speakers	-	Use Taps No. 1 and No. 3
1 to 5	Magnetic Speakers	-	Use Taps No. 6 and No. 10
1 to 10	Magnetic Speakers	-	Use Taps No. 6 and No. 9
1 to 60	Magnetic Speakers	-	Use Taps No. 6 and No. 8

5—Operating the Te-lek-tor System

A Te-lek-tor equipped No. 70, 72 or 74 Receiver can be operated either as a Remote Control instrument or as a Manual Control set, the switching from one method of operation to the other, being accomplished by the pulling out or pushing in of the Large Knob (Fidelity Control Knob, Fig. 7).

(a) Manual Operation

Complete hand (manual) control of a Te-lek-tor equipped No. 70 series Receiver is obtained by merely pushing in the Large (Fidelity Control) Knob and following the instructions given in Article 4 of Chapter 2, covering "Operating Procedure for the Radio Receiver". **The only precaution is to be sure that the Te-lek-tor Control is set for Radio Operation (not Phonograph Operation) before this Large (Fidelity Control) Knob is pushed in for Manual Control.**

When the Large (Fidelity Control) Knob is pushed in for Manual Control, the Te-lek-tor Tuning Mechanism is completely disconnected so that the Tuning Dial is as free to turn by hand as a receiver not equipped with a Te-lek-tor Motor Unit. This is necessary for accurate hand tuning of short-wave stations.

The Te-lek-tor System is not designed or intended to be used for tuning short-wave stations, as this service requires that the operator be stationed at the Receiver for manipulating the special controls necessary for switching from one Range to another, the hand operation of the Vernier Tuning Knob, etc.

(b) Te-lek-tor Operation

Te-lek-tor Remote Control of a No. 70 series Receiver has been made simple by providing individual push buttons on the Key Boxes for each separate operation, there being twenty buttons as shown in the upper left hand section of Fig. 17. Each button has a plainly printed designation to clearly indicate its operation. The following sequence of operations should be followed when operating a No. 70 series Receiver by Te-lek-tor Control:

First—Pull out the Large (Fidelity Control) Knob (Fig. 7), to connect the Radio Chassis to the Te-lek-tor Motor Unit for Remote Control operation, and immediately rotate the Station Selector Knob (Fig. 7) until a position is reached where the Te-lek-tor Clutch engages the Tuning Dial Drive. When this engagement is made a slight click will be heard, and the Tuning Dial will be locked against any further motion in either direction. **The Fidelity Control Knob (Fig. 7) should be set with the letters "SR" at the top, for Standard Radio Selectivity, when operating the Radio by Te-lek-tor Control, in order to insure against adjacent channel interference, etc.**

Second—Press momentarily the Key Box Button marked "On", Fig. 17, to operate a relay for switching the operating current to the Receiver Chassis. The Pilot Lamp on the Te-lek-tor Key Box will light to indicate that this operation has been accomplished.

Third—Press the Key Box Button associated with the particular Favorite Radio Station desired (Station Call Letters marked on the Designation Strip adjacent to the button) and hold this button down until the radio set tuning dial is automatically rotated to the correct position for that station. The pilot light will be dimmed while the dial is being rotated, but will come to full brilliancy when the dial stops rotating. Also, no sound will come from the loud speaker while the radio dial is being rotated but sound will be heard as soon as the dial stops. The Tuning Meter on the Te-lek-tor Key Box shows by the movement of its pointer when the receiver tuning dial is being rotated, as this pointer gives a distinct swing for each radio station signal passed over and comes to rest when the dial stops its movement.

Fourth—To raise the Volume Level of Reproduction, press the Key Box Button marked "Increase Volume". To reduce the Volume Level of Reproduction, press the Key Box Button marked "Decrease Volume". A separate electric motor is provided on the Te-lek-tor Motor Unit to operate the Volume Control of the Radio Chassis. This motor is operated in one direction by the "Increase Volume" Push Button and in the other direction by the "Decrease Volume" Push Button. Thus, the length of time the Push Button is pressed determines the amount of volume increase. A momentary pressure on a Volume Control Button, therefore, will give a noticeable change in the Loud Speaker volume. A longer pressure, a greater change of volume, etc.

Fifth—Now, if necessary, sharpen the tuning of the radio station just selected automatically, for best audio quality, by momentarily pressing the "Higher Channel" Button or the "Lower Channel" Button **so as to obtain maximum low frequency response and freedom from high pitched tone effects or raspy reproduction.**

This method of sharpening of tuning requires that the Fidelity Control Knob on the Receiver is previously set with the letters "SR" at the top.

This position of the Radio Tuning Dial for best reproduction, also will be indicated by a maximum swing to the right of the pointer of the Key Box Tuning Meter.

The fine audio quality incorporated in the design of the No. 70 series Receivers, depends on accuracy of tuning, so that these two methods of sharpening of tuning by Remote Control are provided on the Te-lek-tor System and should be used as required.

Sixth—To select another Favorite Station, press the Key Box Button associated with the desired station call letters, following the instructions contained in the previous operations "Third" and "Fifth".

Seventh—The two buttons, marked "Higher Channels" and "Lower Channels" used to sharpen tuning in the fifth operation (above), can be employed for locating other stations which are not set up on the eight Favorite Station Buttons. In this case, the maximum swing of the pointer on the Key Box Tuning Meter to the right will serve as a visual indication when one of these other station signals is being passed over by the rotating of the Tuning Dial of the Receiver. Immediately removing the pressure on the button and reversing the direction of the dial by the other Channel Push Button will allow this particular station to be

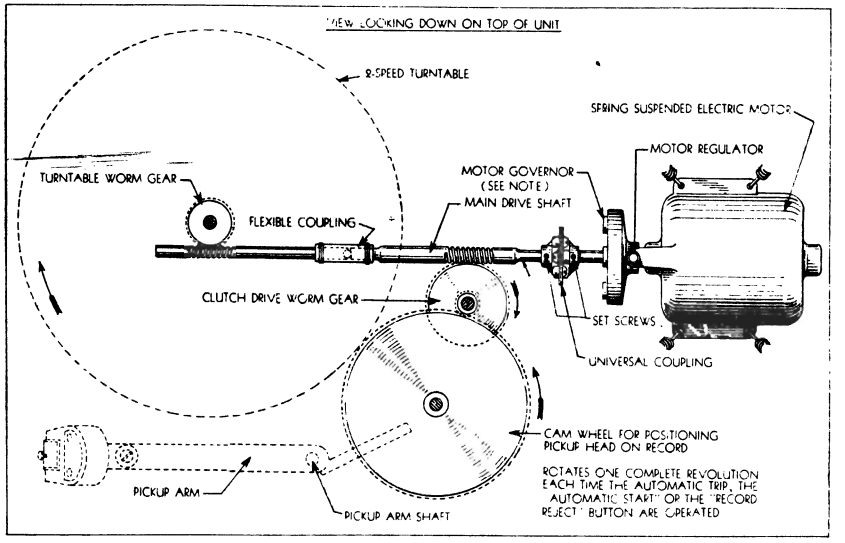
tuned in. Sharpen the tuning by maximum swing to the right of the Tuning Meter or by maximum low frequency audio response from the speaker.

Eighth—Press Key Box Button marked "Off" to turn the receiver off. The Pilot Lamp of the Key Box will go out to indicate that this is done.

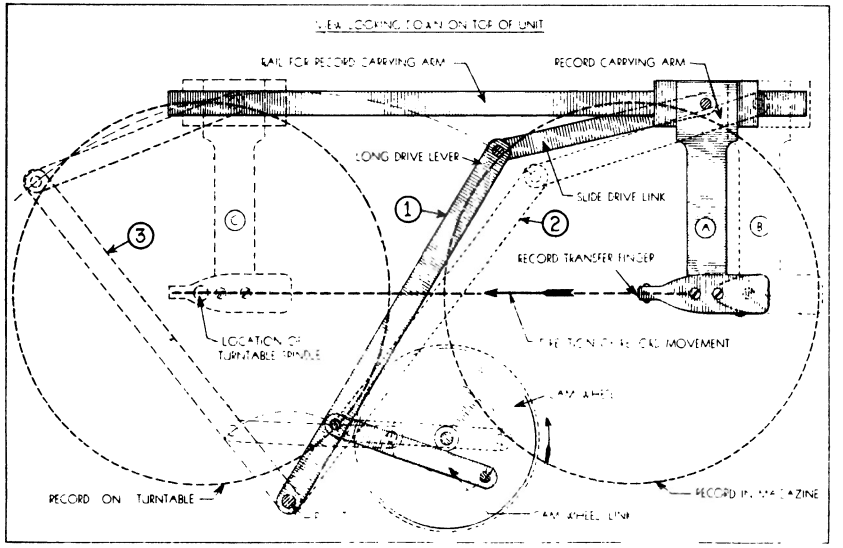
Ninth—When the Te-lek-tor System is installed on a No. 72 or 74 Receiver, with Phonograph Switching Relay and Record Reject Magnet, as shown in Fig. 18, the momentary pressing of the Te-lek-tor Key Box Button marked "Records" will automatically switch the circuits in the radio cabinet from radio operation to phonograph operation and transfer automatically the top record in the Phonograph Magazine space to the Turntable and start playing. The volume level of the record reproduction can be regulated with the same Te-lek-tor Key Box Buttons used for regulating the volume of radio reproduction. (See "Fourth" operation of these instructions.) If at any time, when a record is being played, it is desired to substitute another record without waiting for the completion of the selection, the momentary pressing of the button marked "Record" will cause the next record in the Phonograph Magazine to be transferred immediately to the turntable and played.

Tenth—With the Te-lek-tor controlled Phonograph operating as just described, the momentary pushing of the Selector Key Box Button marked "Radio" will immediately stop the phonograph operation and connect the radio. The next time the "Record" button is pressed, the phonograph is started and a new record is carried from the Record Magazine to the Turntable. Thus, any unfinished record on the Turntable is not played. This avoids confusion as each switching to phonograph operation (by pressing the "Record" button) starts playing a record at its beginning, regardless of whether the previous record on the phonograph turntable has completed its playing when the last switch from Phonograph to Radio operation was made.

Eleventh—If the Te-lek-tor installation includes Extension Loud Speakers (See Section 4 of this Chapter) as shown in Fig. 18, up to three extension speakers can be assigned to three of the buttons, marked "Speaker" on the Te-lek-tor Key Box (Fig. 17) and the fourth button used to control a Master Speaker Relay. The circuits for controlling these Speakers can be arranged in several ways (See special instructions furnished with each Te-lek-tor System), one of the most convenient being a separate button for turning on each Extension Speaker and one button for turning off the Speaker System in the Radio Cabinet (Master Speaker). With this arrangement, all Extension Speakers are turned off when the "Off" button is pressed on the Te-lek-tor Box, and the Master Speaker is turned on when the "on" button is pressed. Thus, the next time the "on" button of the Key Box is pressed (after the "off" button is operated), the receiver will be turned on with only the Master Speaker connected, all Extension Speakers being disconnected. This avoids any errors in operation and allows the desired arrangement of speakers to be selected each time the radio set is turned on.



Rotating Mechanism of the Automatic Phonograph Unit, showing Great Simplicity. (Motor Governor not used on the No. 74.)



Record Carrying Mechanism of the Automatic Phonograph Unit. One revolution of the Cam Wheel Transfers a Record from the Magazine to the Turntable.
"1" and "A"—Normal Position of Mechanism
"2" and "B" —Initial Movement to the Right for Positioning the Record in the Magazine.
"3" and "C" —Full movement to the left for Depositing the Record on the Turntable.

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 80 Radio Receiver

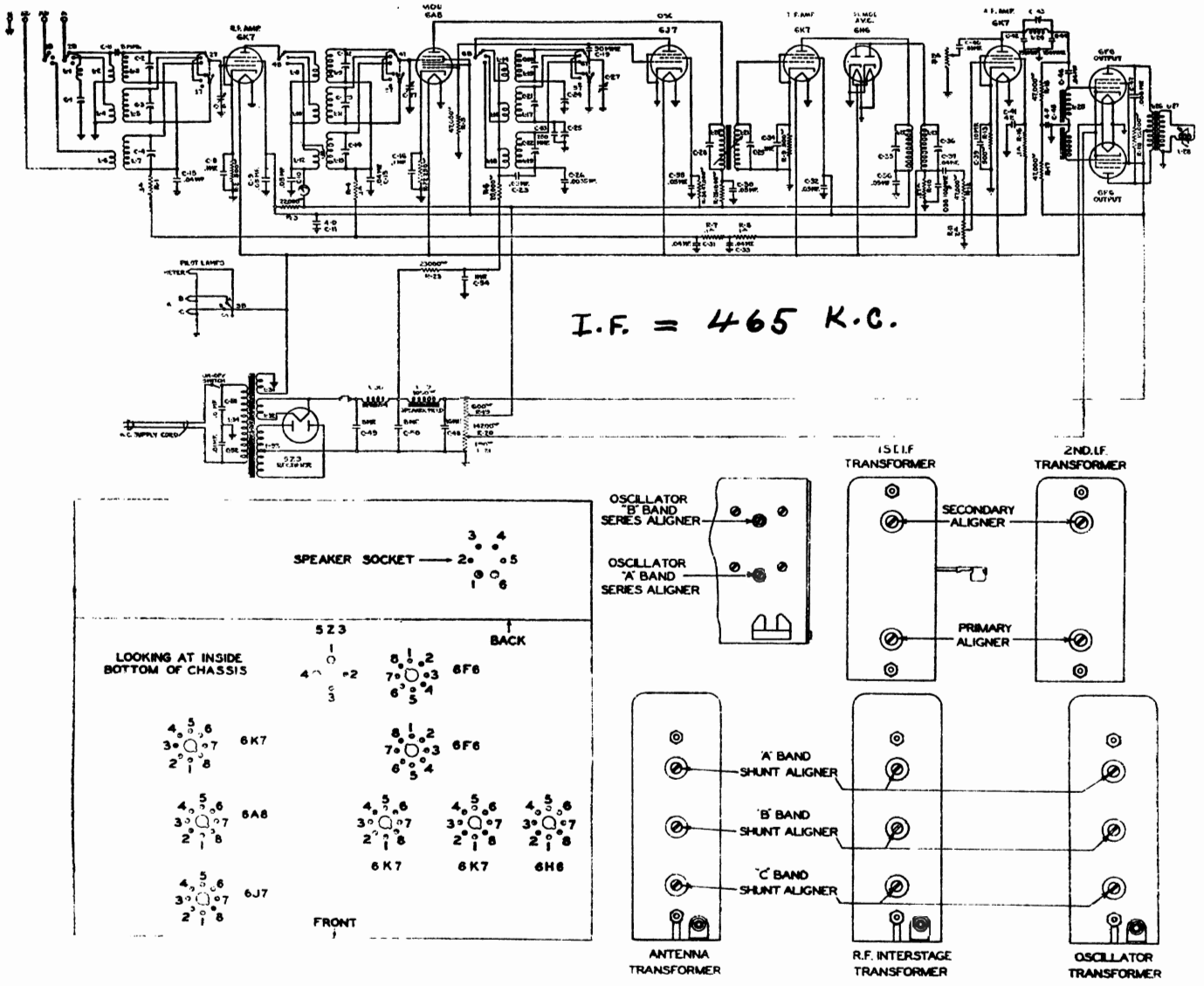


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver with Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

Tube	*Circuit*	*Cap*	*Terminals of Sockets* 1	2	3	4	5	6	7	8	*Heater Voltages Between Terminal Nos. at 120 Volts*
6K7	R. F. Amp.	0	0	—	+242	+ 96	+3.4	—	—	+ 3.4	2-7, *6.3* Volts
6A8	Mod.	0	0	—	+245	+ 96	— 13	+ 96	—	+ 1.6	2-7, *6.3* Volts
6J7	Osc.	0	0	—	+165	+125	0	—	—	—	2-7, *6.3* Volts
6K7	I. F. Amp.	0	0	—	+244	+ 95	+3.2	—	—	—	2-7, *6.3* Volts
6H6	Dem.—A.V. C.	—	0	—	0	0	0	0	—	—	2-7, *6.3* Volts
6K7	A. F. Amp.	0	0	—	+ 35	+ 25	+1.5	—	—	+ 1.5	2-7, *6.3* Volts
6F6	Output	—	0	—	+260	+270	--	—	0	+16	2-7, *6.3* Volts
5Z3	Rectifier	—	+426	*405*	*405*	+426					1-4, *4.8* Volts
Speaker Socket			+260	+403	+425	+425	+265	+260			

Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 82 Radio Receiver

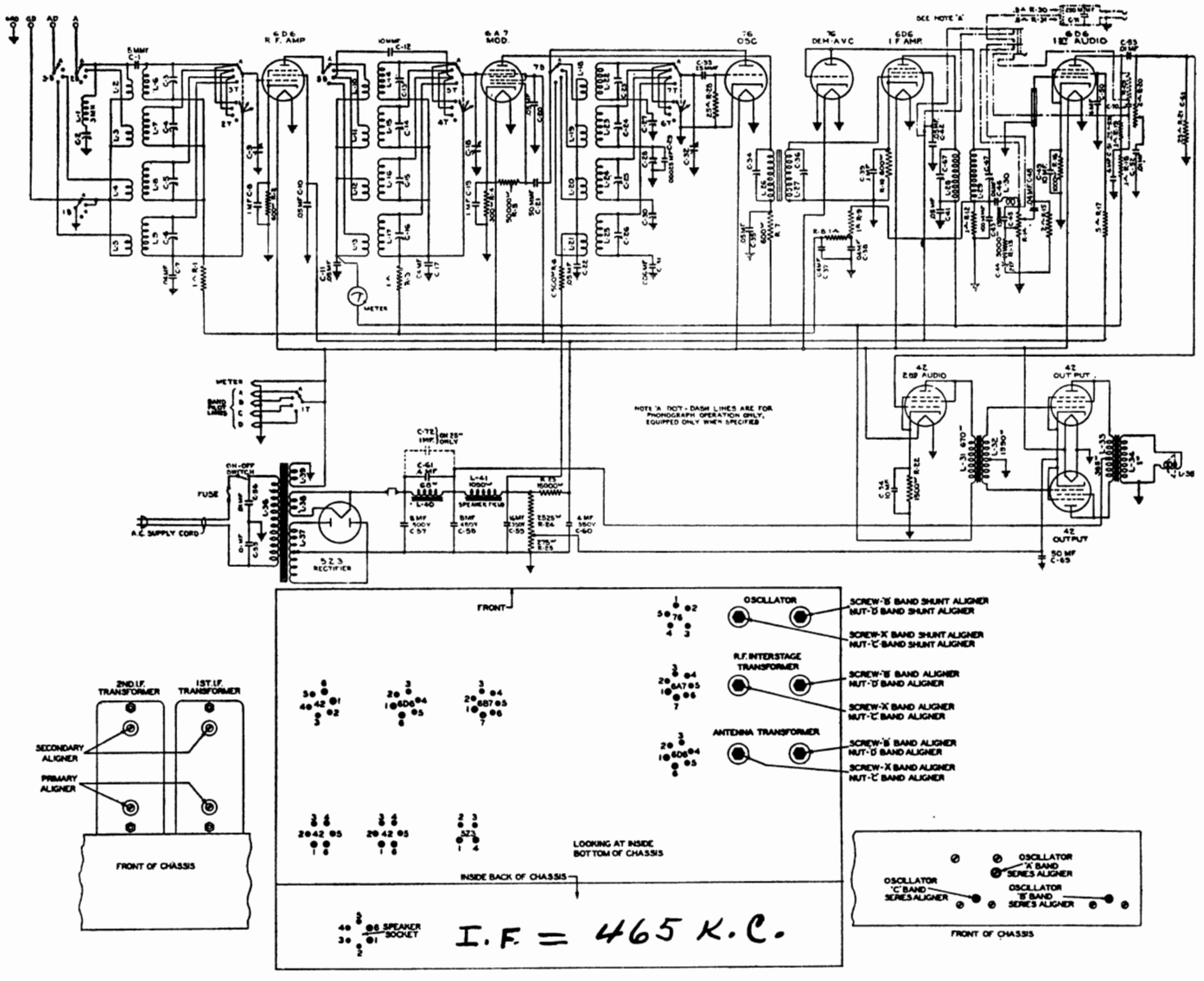


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	*Heater Voltages Between Terminals Nos at 120 Volts*
6D6	R. F. Amp.	0		+240	+ 95	+ 4	0			1-6, *6.4* volts
6A7	Mod.	0		+240	+ 95	+ 95	— 2	+3.1	0	1-7, *6.4* volts
76	Osc.	—		+195	+ 30	0				1-5, *6.4* volts
6D6	I. F. Amp.	0		+240	+ 95	+3.5	+3.5			1-7, *6.4* volts
76	Demod-A. V. C.	—		0	0	0				1-5, *6.4* volts
6D6	1st Audio	0		+ 68	+ 20	+ 1	+ 1			1-6, *6.4* volts
42	2nd Audio	—		+230	+230	0	+ 21			1-6, *6.4* volts
42	Output	—		+390	+390	0	+ 37			1-6, *6.4* volts
5Z3	Rectifier	—	+410	*398*	*398*	+410				1-4, *4.75* volts
Speaker Socket			0	+245	+400	+400	+390	0		

Set tuned to 1000 Kc., "A" Band, A. C. voltages are indicated by italics

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 83 Radio Receiver

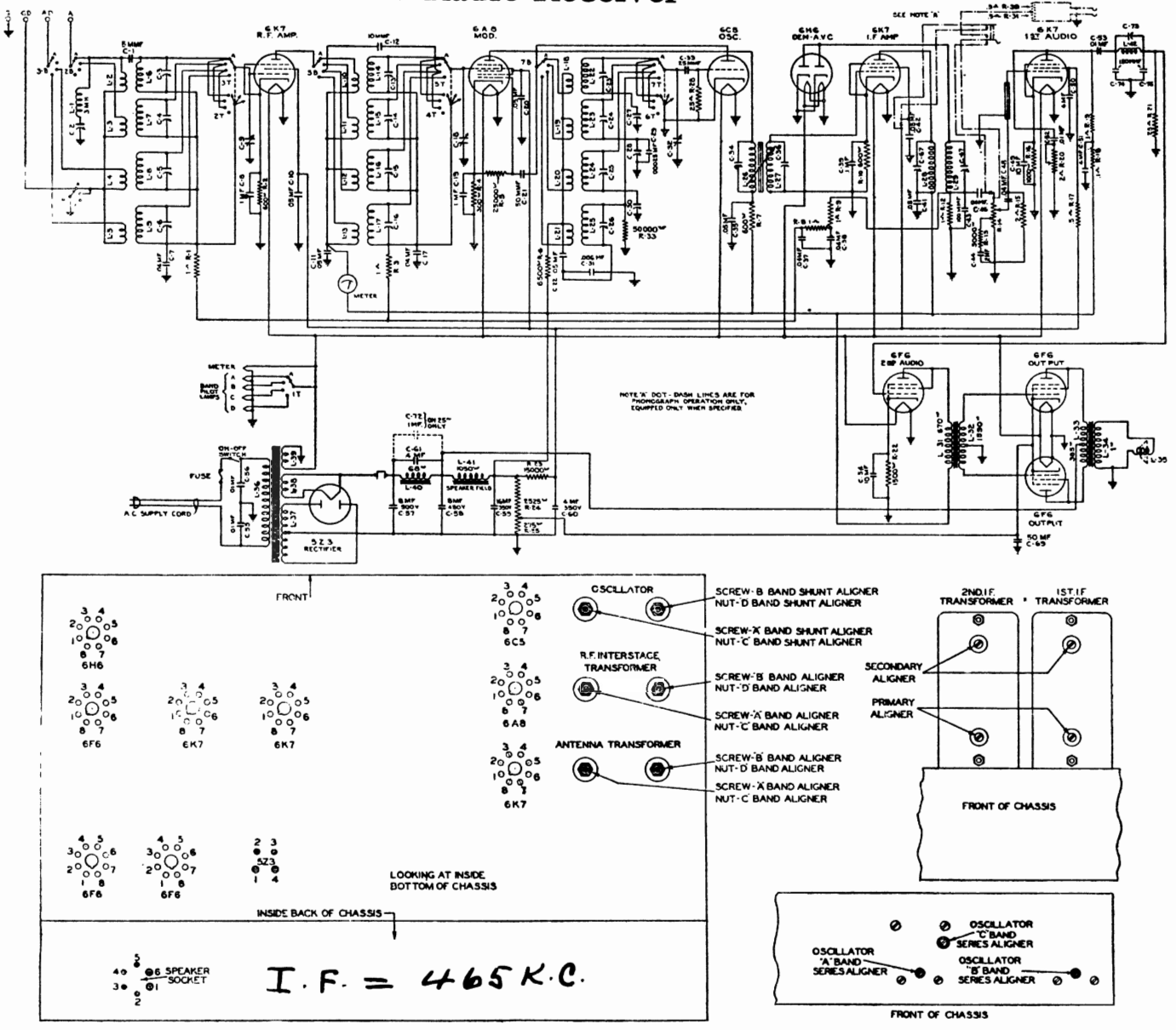


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver With Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

			Terminals of Sockets Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.								*Heater Voltages Between Terminals Nos. at 120 Volts*
Tube	*Circuit*	*Cap.*	1	2	3	4	5	6	7	8	
6K7	R. F. Amp.	0	0	—	+250	+ 70	+ 3	0	—	+ 3	2–7, *6.4* Volts
6A8	Mod.	0	0	—	+250	+ 70	—	+ 70	—	+ 2.5	2–7, *6.4* Volts
6C5	Osc.	—	0	—	+210	0	—	—	—	—	2–7, *6.4* Volts
6K7	I. F. Amp.	0	0	—	+250	+ 70	+ 3	—	—	+ 3	2–7, *6.4* Volts
6H6	Dem.—A. V. C.	—	0	—	—	—	—	—	—	—	2–7, *6.4* Volts
6K7	1st Audio	0	0	—	+100	+ 35	+ 1	—	—	+ 1	2–7, *6.4* Volts
6F6	2nd Audio	—	0	—	+240	+240	0	—	—	+20	2–7, *6.4* Volts
6F6	Output	—	0	—	+390	+390	0	—	—	+35	2–7, *6.4* Volts
5Z3	Rectifier	—	+410	*395*	*395*	+410					1–4, *4.75* Volts
Speaker Socket			0	+250	+410	+410	+395	0			

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 84 Receiver

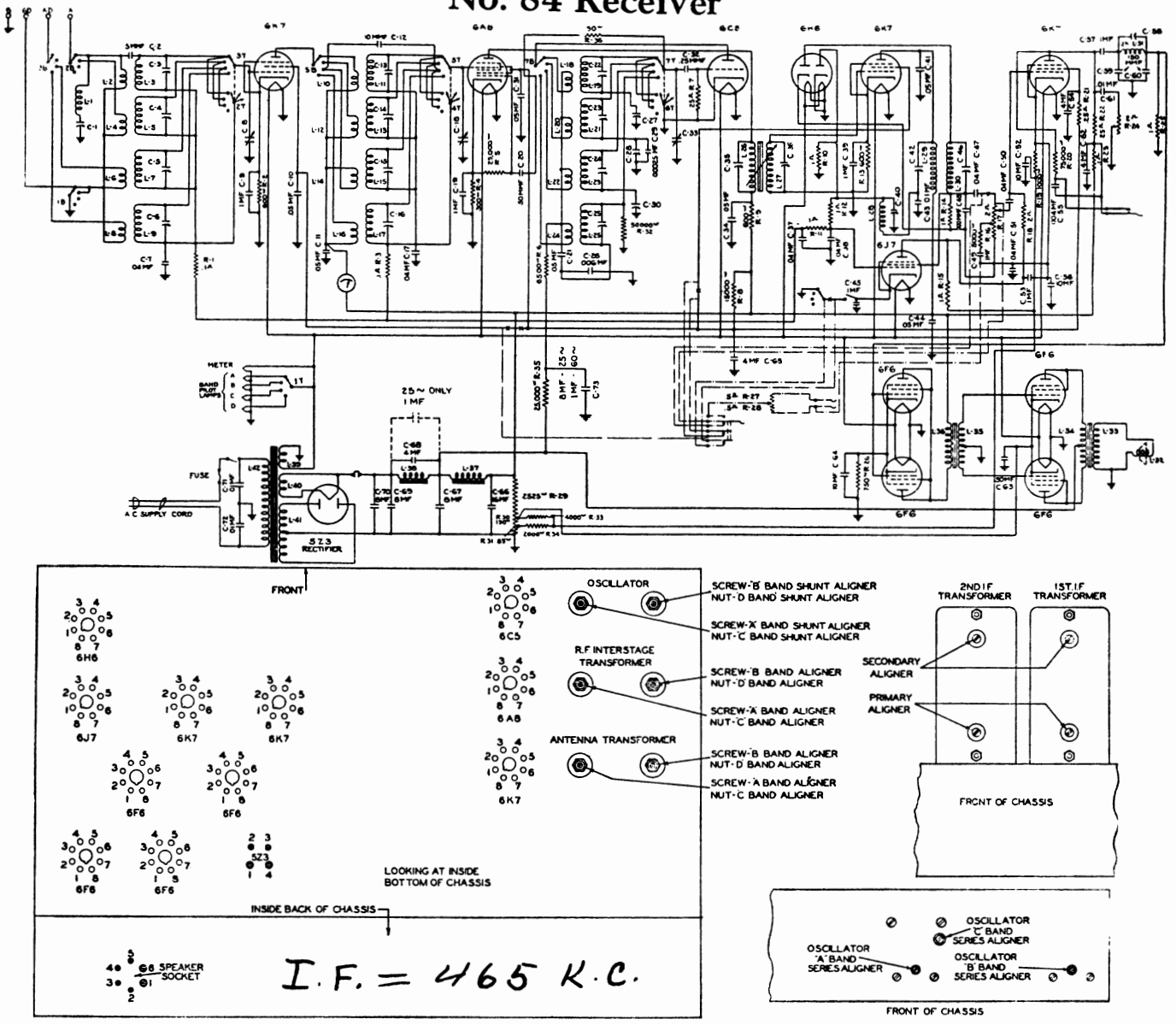


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver With Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

A. C. voltages are indicated by italics.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	8	*Heater Voltages Between Terminals Nos. at 120 Volts*
6K7	R. F. Amp.	0	0	—	+240	+ 90	+ 3.5	0	—	+ 3.5	2-7, *6.3 Volts*
6A8	Mod.	0	0	—	+240	+ 85	—	+ 85	—	+ 2	2-7, *6.3 Volts*
6C5	Osc.	—	0	—	+195	—	—	—	—	—	2-7, *6.3 Volts*
6K7	I. F. Amp.	0	0	—	+230	+ 85	+ 3.5	—	—	+ 3.5	2-7, *6.3 Volts*
6H6	Dem.—A.V. C.	—	0	—	+ .5	+ 20	— .25	—	0	0	2-7, *6.3 Volts*
6K7	1st Audio	0	0	—	+100	+ 35	+ 10	—	—	+10	2-7, *6.3 Volts*
6J7	"Q"	0	0	—	+ .5	+ .5	+ .35	—	0	+ .35	2-7, *6.3 Volts*
6F6	2nd Audio	—	0	—	+220	+220	0	—	—	+20	2-7, *6.3 Volts*
6F6	Output	—	0	—	+390	+390	0	—	—	+30	2-7, *6.3 Volts*
5Z3	Rectifier	—	+410	*395*	*395*	+410					1-4, *4.75 Volts*
Speaker Socket			0	+250	+410	+410	+ 395	0			

STROMBERG CARLSON TELEPHONE MFG. CO.

No. 115 Radio Receiver

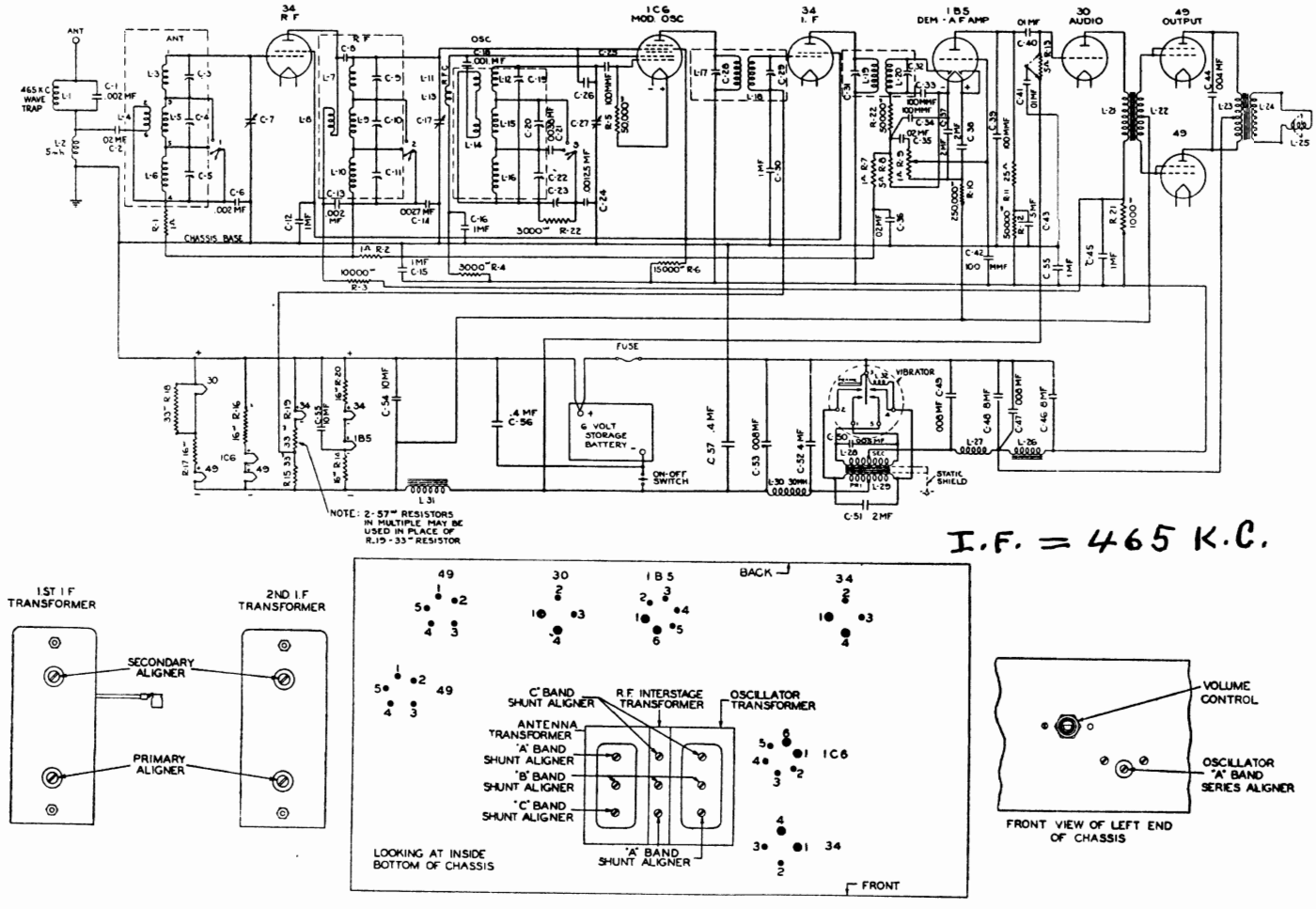


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

NORMAL VOLTAGE READINGS

The voltage readings listed in the table below are obtained by measuring between the various tube socket contacts and the base with the tubes in place. The receiver is, therefore, in operation when the measurements are made. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers.

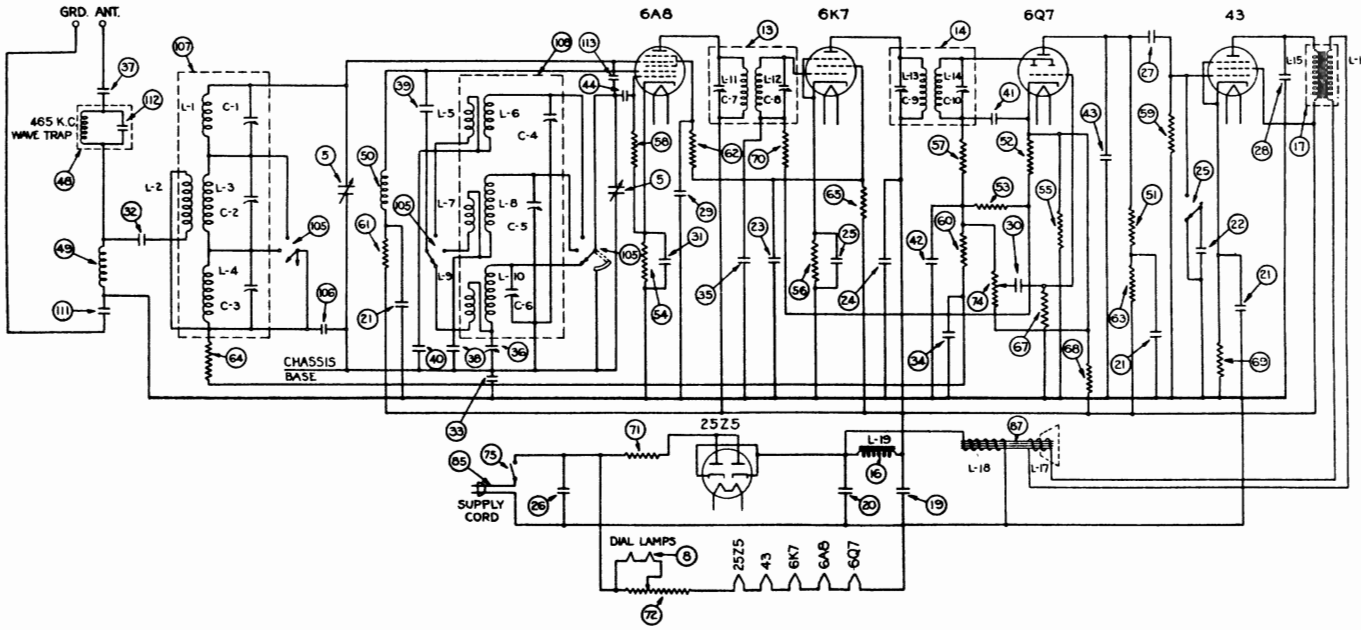
Voltages are given for a battery supply of 6.0 volts and allowance should be made for differences when this battery voltage is slightly higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring these voltages. The voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts.

TUBE	*CIRCUIT*	*CAP.*	*TERMINALS OF SOCKETS* 1	2	3	4	5	6	*Filament Voltages Between Filament Terminals* Terminal Nos.	Volts
34	R. F. Amp.	—.15	—0.9	+ 86	+ 62	—2.8	—	—	1-4	1.8
1C6	Mod.-Osc.	—.37	—1.9	+132	+117	—6.4	+ 62	—3.8	1-6	1.95
34	I. F. Amp.	—3.6	—1.8	+130	+ 63	0	—	—	1-4	1.85
1B5	Demod.-A. V. C. —Audio	—	—2.7	+ 30	—2.7	—1.3	—1.6	—4.7	1-6	2.0
30	Audio	—	—1.9	+117	—.05	0	—	—	1-4	1.88
49	Power Output	—	—3.8	+145	—5.6	—5.6	—5.8	—	1-5	2.0

Receiver tuned to 1000 kc., no signal, volume control set at minimum.

STROMBERG CARLSON TELEPHONE MFG. CO.

Model 125



I. F. = 465 K.C.

REPLACEMENT PARTS

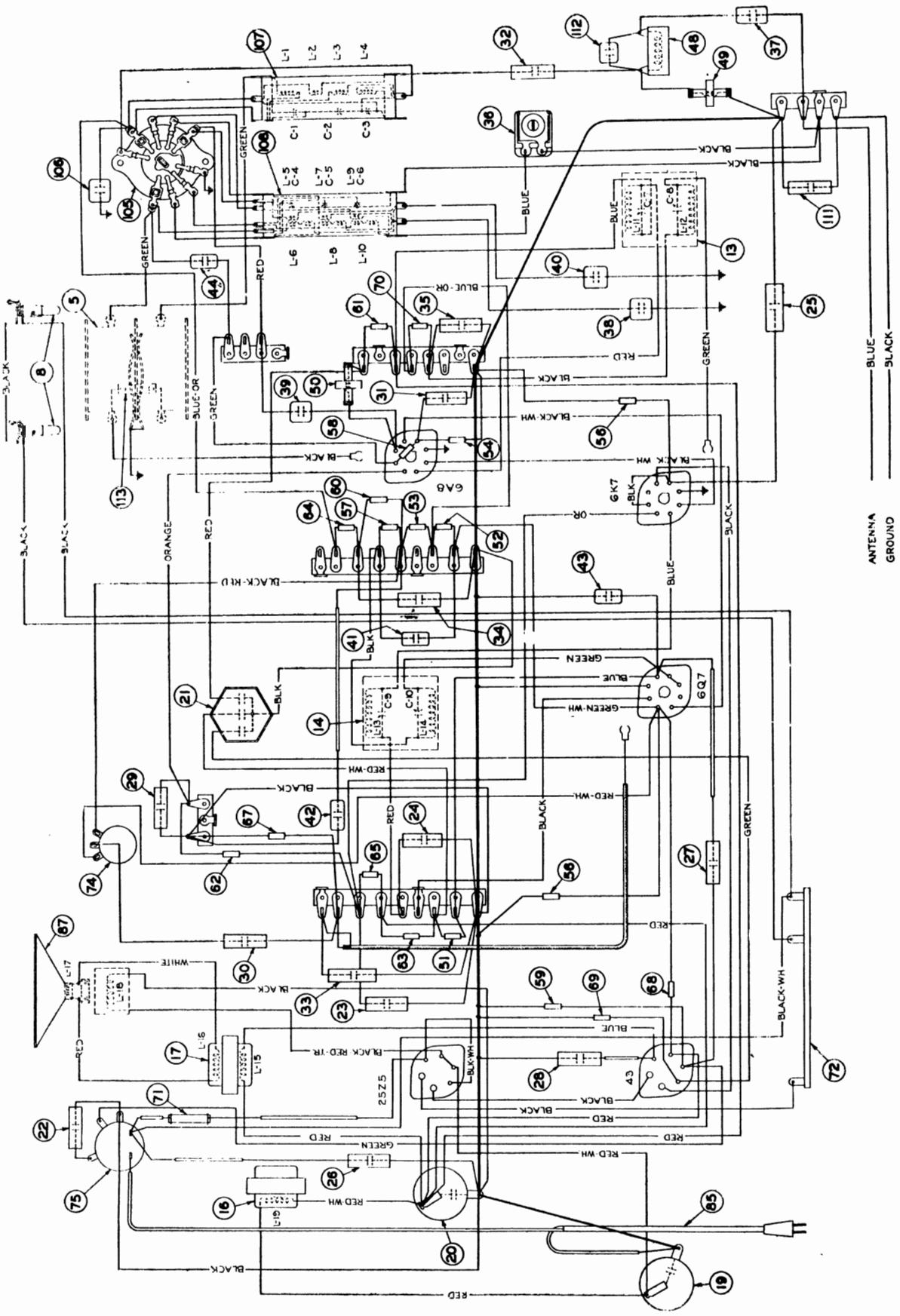
Item Number	Piece Number	Part
2	25998	Bracket Assembly
5	26057	Gang Tuning Condenser
6	26143	Dial Assembly
8	26287	Dial Lamp
13	26121	1st I. F. Transformer
14	25506	2nd I. F. Transformer
16	26133	Choke Assembly
17	26135	Transformer, Output
19	26162	Capacitor, Electrolytic 25 Mf.
20	26163	Capacitor, Electrolytic 40 Mf.
21	26164	Capacitor, Electrolytic 4-4-12 Mf.
22	25481	Capacitor .002 Mf.
23	25483	Capacitor .1 Mf.
24	25483	Capacitor .1 Mf.
25	25483	Capacitor .1 Mf.
26	25150	Capacitor .02 Mf.
27	25150	Capacitor .02 Mf.
28	25150	Capacitor .02 Mf.
29	25150	Capacitor .02 Mf.
30	25150	Capacitor .02 Mf.
31	25150	Capacitor .02 Mf.
32	25150	Capacitor .02 Mf.
33	25389	Capacitor Assembly .2 Mf.
34	24405	Capacitor Assembly .04 Mf.
35	24405	Capacitor Assembly .04 Mf.
36	26747	Capacitor, Aligner
37	26778	Capacitor .005 Mf.
38	25487	Capacitor .001 Mf.
39	25487	Capacitor .001 Mf.
40	25489	Capacitor .00125 Mf.
41	25504	Capacitor 100 Mmf.
42	25504	Capacitor 100 Mmf.
43	25504	Capacitor 100 Mmf.
44	24559	Capacitor 100 Mmf.
48	25513	Coil Assembly, Wave Trap
49	25814	Coil Assembly, Choke
50	25814	Coil Assembly, Choke
51	26362	Resistor Type "E" .27 Megohms
52	26362	Resistor Type "E" .27 Megohms
53	26362	Resistor Type "E" .27 Megohms
54	26326	Resistor Type "E" 270 Ohms
55	26327	Resistor Type "E" 330 Ohms
56	26327	Resistor Type "E" 330 Ohms
57	26353	Resistor Type "E" 47,000 Ohms
58	26353	Resistor Type "E" 47,000 Ohms
59	26369	Resistor Type "E" 1 Megohm
60	26369	Resistor Type "E" 1 Megohm
61	26345	Resistor Type "E" 10,000 Ohms
62	26345	Resistor Type "E" 10,000 Ohms
63	26345	Resistor Type "E" 10,000 Ohms
64	26357	Resistor Type "E" .1 Megohm
65	26333	Resistor Type "E" 1,000 Ohms
67	26373	Resistor Type "E" 2.2 Megohms
68	26408	Resistor Type "C" 27,000 Ohms
69	26330	Resistor Type "E" 560 Ohms
70	26365	Resistor Type "E" .47 Megohms
71	25911	Resistor Type "B" 50 Ohms
72	26127	Resistor, "B" Voltage Divider
73	26252	Insulation (For Tone Control)
74	26114	Potentiometer (Volume Control)
75	26061	Off-On Switch—Tone Control
77	25539	Tube Socket, 8 Prong
78	22974	Tube Socket, 6 Prong
85	24268	Cord, Power Supply
86	25594	Grid Clip Assembly
87	26053	Speaker Assembly
105	26172	Range Switch
106	25488	Capacitor .002 Mf.
107	26113	Coil Assembly, Antenna
108	26157	Coil Assembly, Oscillator
109	26424	Dial Lamp Socket Assembly
111	25149	Capacitor Assembly, .01 Mf.
112	25488	Capacitor .002 Mf.
113	26417	Capacitor (Gimmick)

MISCELLANEOUS PARTS

Piece Number	Part
26096	Cone Assembly (For P-26053 Speaker)
26296	Knob (Used on Volume, "Off-on-Tone" and Station Selector Controls) 3 Required for Each Receiver
26297	Knob (For Range Switch) 1 Required

STROMBERG CARLSON TELEPHONE MFG. CO.

Model 125



Wiring Diagram of Chassis.

STROMBERG CARLSON TELEPHONE MFG. CO.

Model 125

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 1 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Adjustments

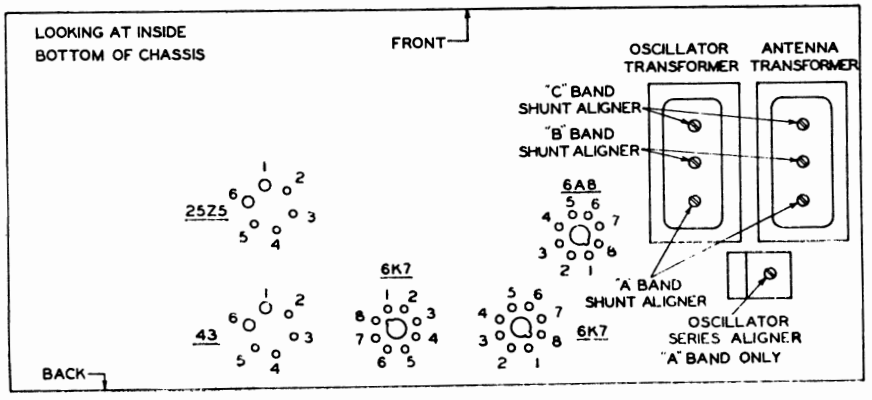
The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-10).
2. Primary of 2nd I. F. Transformer (Capacitor (C-9).
3. Secondary of 1st I. F. Transformer (Capacitor C-8).
4. Primary of 1st I. F. Transformer (Capacitor C-7).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-4).
2. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-1).
3. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
4. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
5. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
6. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).
7. Oscillator's "A" Band Series Aligner at 600 Kilocycles (Capacitor (36)).
8. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
9. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).



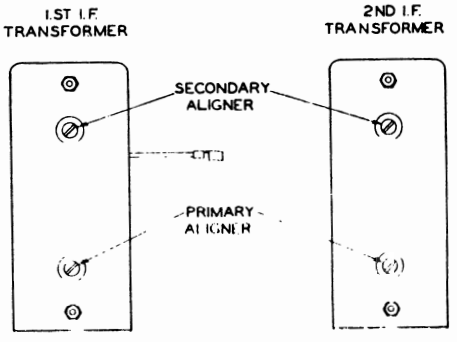


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	8	*Heater Voltages Between Heater Terminals* — *Terminal Numbers*	*Volts*
6A8	Mod.—Osc.	—.02	*125*	0	+ 97	+ 60	— 7	+73	*6.3*	+1.3	2-7	*6.3*
6K7	I. F. Amp.	0	*125*	0	+ 97	+ 91	+ 3	—	*18*	+3	2-7	*6.3*
6Q7	Dem.—A.V.C. —Audio	0	0	0	+55*	0	0	—	*6.2*	+1	2-7	*6.3*
43	Audio Output	—	*43*	+ 90	+ 96	0	+ 12	*18*	—	—	1-6	*24*
25Z5	Rectifier	—	*65*	*112*	+102	+102	*112*	*43*	—	—	1-6	*22*

Voltage across pilot lamps—*8.2* volts

A.C. voltages are indicated by italics;

IMPORTANT—If the receiver is operated from a direct current power supply circuit, the various voltages measured will be slightly lower than those listed in the table for A. C. operation. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: O-2.5, O-10, O-100, O-250, O-500, O-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

STROMBERG CARLSON TELEPHONE MFG. CO.

130 Series

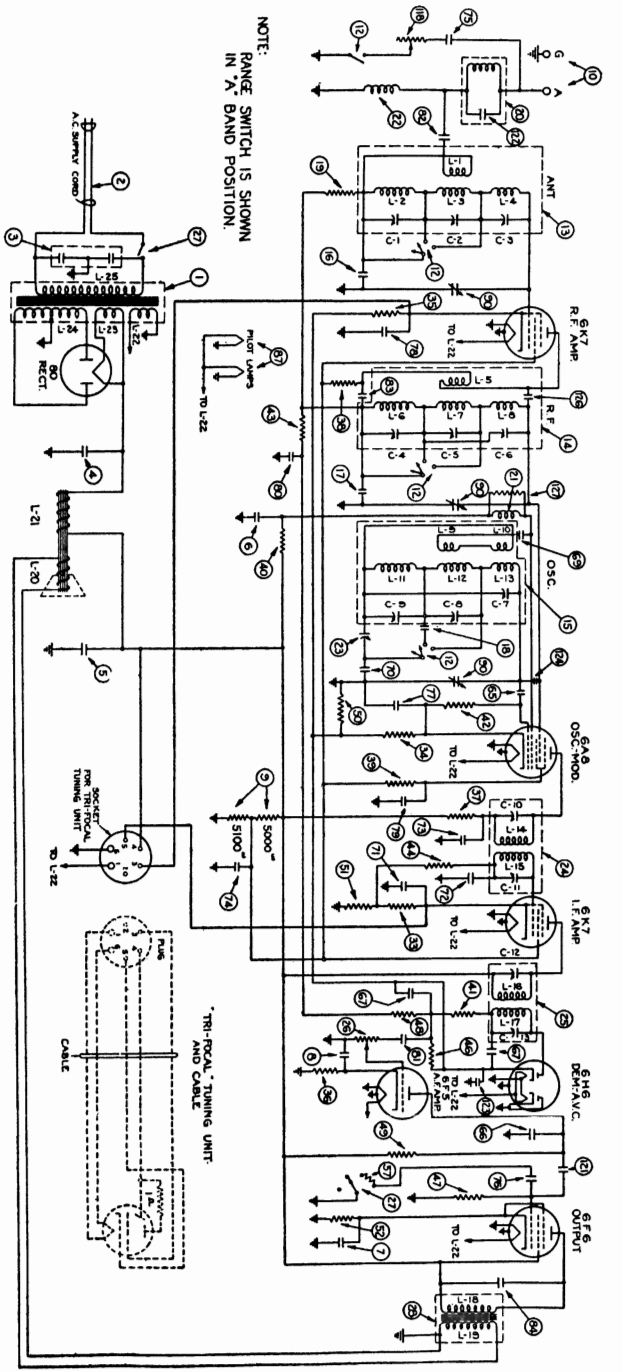
REPLACEMENT PARTS

Item Number	Piece Number	Part
1	26248	Power Transformer (50 to 60 Cycles)
1	26249	Power Transformer (25 to 60 Cycles)
2	24268	Cord, A. C. Supply
3	21535	Capacitor Assembly (2-.01 Mf. Capacitors)
4	26403	Capacitor, Electrolytic, 25Mf.
5	25458	Capacitor, Electrolytic, 16 Mf.
6	25458	Capacitor, Electrolytic, 16 Mf.
7	24207	Capacitor, Electrolytic, 10 Mf., 25 Volts
8	24207	Capacitor, Electrolytic, 10 Mf., 25 Volts
9	26405	Resistor, "B" Voltage Divider
12	26402	Range Switch
13	25510	Coil Assembly, Antenna
14	25511	Coil Assembly, R. F.
15	25512	Coil Assembly, Oscillator
16	25488	Capacitor, .002 Mf.
17	25527	Capacitor, .0027 Mf.
18	25490	Capacitor, .0038 Mf.
19	26383	Resistor, Type "E1", .1 Megohm
20	25513	Coil Assembly, Wave Trap
21	25814	Coil Assembly, R. F. Choke
22	25814	Coil Assembly, R. F. Choke
23	26047	Capacitor, Osc. Series Aligner
24	26406	1st I. F. Transformer
25	25506	2nd I. F. Transformer
26	26114	Potentiometer, Volume Control
27	26271	Switch, "Off-On-Tone"
28	26411	Transformer, Audio Output
29	22988	Socket, 4 Pong
30	22974	Socket, 6 Prong
31	23517	Socket, 7 Prong
32	25539	Socket, 8 Prong
33	26327	Resistor, Type "E", 330 Ohms
34	26326	Resistor, Type "E", 270 Ohms
35	26331	Resistor, Type "E", 680 Ohms
36	26340	Resistor, Type "E" 3900 Ohms
37	26341	Resistor, Type "E", 47,000 Ohms
38	26345	Resistor, Type "E", 10,000 Ohms
39	26345	Resistor, Type "E", 10,000 Ohms
40	26350	Resistor, Type "E", 27,000 Ohms
41	26353	Resistor, Type "E", 47,000 Ohms
42	26353	Resistor, Type "E", 47,000 Ohms
43	26357	Resistor, Type "E", .1 Megohm
44	26357	Resistor, Type "E", .1 Megohm
46	26365	Resistor, Type "E", .47 Megohm
47	26365	Resistor, Type "E", .47 Megohm
48	26369	Resistor, Type "E", 1 Megohm
49	26362	Resistor, Type "E", .27 Megohm
50	26328	Resistor, Type "E", 390 Ohms
51	26330	Resistor, Type "E", 560 Ohms
52	25500	Resistor, 400 Ohms, 1 Watt
57	26353	Resistor, Type "E", 47,000 Ohms
60	25998	Bracket Assembly
65	25504	Capacitor, 100 Mmf.
66	25504	Capacitor, 100 Mmf.
67	26512	Capacitor Assembly, 2—100 Mmf.
69	25487	Capacitor, .001 Mf.
70	25489	Capacitor, .00125 Mf.
71	24402	Capacitor Assembly, .1 Mf.
72	24402	Capacitor Assembly, .1 Mf.
73	25483	Capacitor Assembly, .1 Mf., 400 Volts
74	25483	Capacitor Assembly, .1 Mf., 400 Volts
75	25149	Capacitor Assembly, .01 Mf.
76	25149	Capacitor Assembly, .01 Mf.
77	25150	Capacitor Assembly, .02 Mf.
78	25150	Capacitor Assembly, .02 Mf.
79	25150	Capacitor Assembly, .02 Mf.
80	25150	Capacitor Assembly, .02 Mf.
81	25150	Capacitor Assembly, .02 Mf.
82	25150	Capacitor Assembly, .02 Mf.
83	25481	Capacitor Assembly, .002 Mf.
84	25533	Capacitor Assembly, .006 Mf.
87	26287	Pilot Lamp
89	26285	Dial Assembly
90	26414	Gang Tuning Capacitor
121	25149	Capacitor Assembly, .01 Mf.
122	25488	Capacitor, .002 Mf.
123	24402	Capacitor Assembly, .1 Mf.
124	26417	Capacitor, Gimmick
127	26350	Resistor, Type "E", 27,000 Ohms

MISCELLANEOUS PARTS

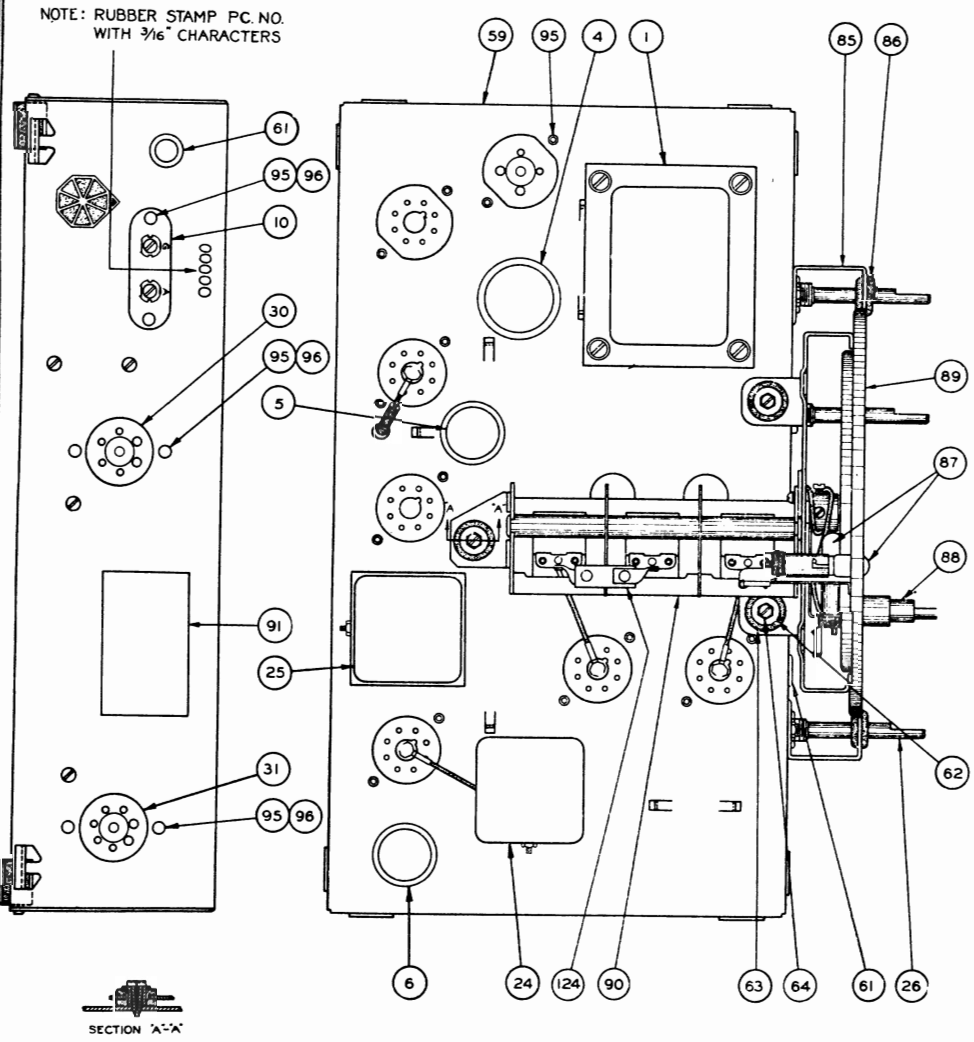
Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
25492	Cone Assembly (For P-26171 Speaker)
26043	Plug (For Loud Speaker Cable)
26491	Plug (For Tri-Focal Tuning Unit Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26147	Pilot Lamp Socket
26302	Knob (For Volume Control. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26303	Knob (For Volume Control. Used only on the No. 130-R Receivers)
26385	Knob (For Range Switch. Used on Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26304	Knob (For Range Switch. Used only on the No. 130-R Receivers
26384	Knob (For Off-On-Tone Control. Used on Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26298	Knob (For Off-On-Tone Control. Used only on the No. 130-R Receiver)
26305	Knob (For Large Portion of Tuning Shaft. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26307	Knob (For Large Portion of Tuning Shaft. Used only on the No. 130-R Receivers)
26306	Knob (For Vernier Portion of Tuning Shaft. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers
26308	Knob (For Vernier Portion of Tuning Shaft. Used only on the No. 130-R Receivers)

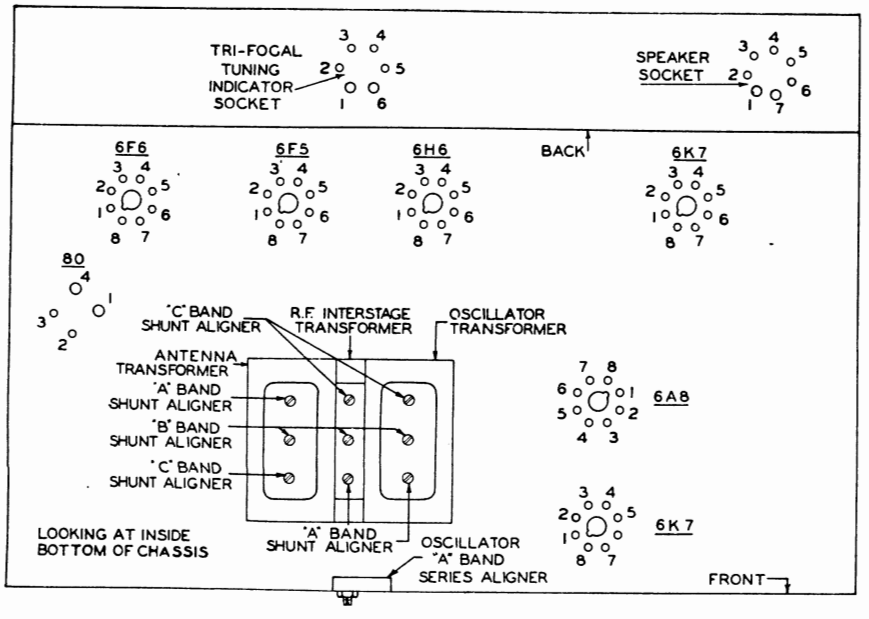
I.F. = 465 K.C.

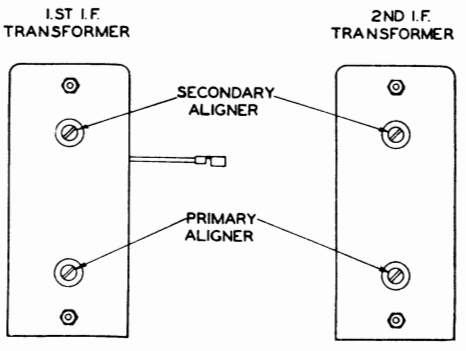


STROMBERG CARLSON TELEPHONE MF G. CO.

130 SERIES







The No. 130 Series of Radio Receivers are divided into two groups; the Nos. 130-U, 130-H, and 130-L are seven tube receivers and are not equipped with the "Tri-Focal Tuning System". The Nos. 130-M and 130-R are eight tube receivers and are equipped with the exclusive Stromberg-Carlson "Tri-Focal Tuning System". A socket is provided on the rear of the chassis for making connections between the tuning indicator and receiver circuits. The chassis used in these different models of No. 130 Receivers are identical.

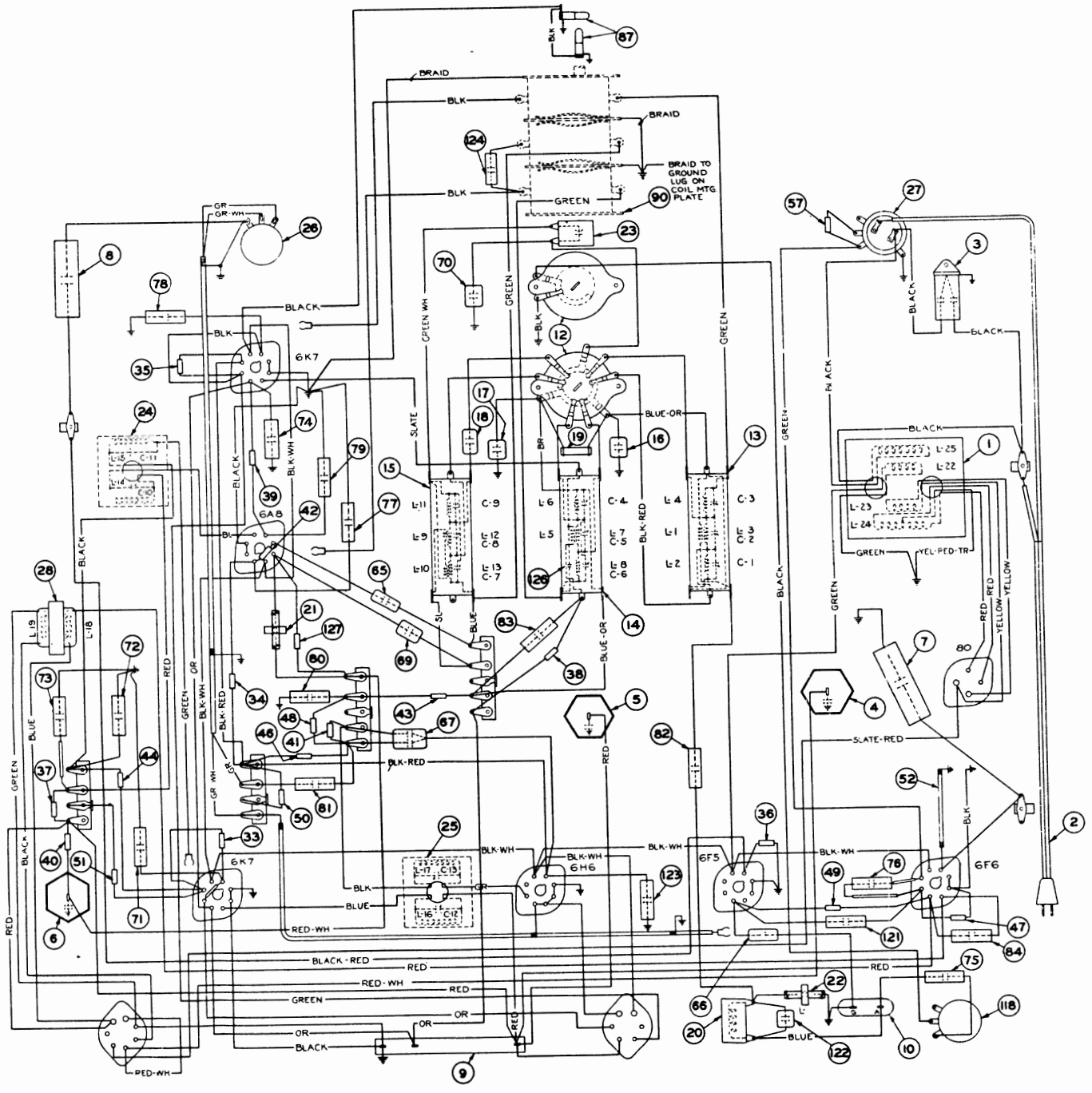
These No. 130 Receivers are composed of a seven tube chassis employing metal tubes, and have three tuning ranges. In order to obtain maximum performance from these receivers, a sensitivity control is provided for use on the standard broadcast band only. Its control knob is located on the rear of the chassis base. When either the "B" or "C" ranges are in operation, this sensitivity control is automatically cut out of the circuit so that the receiver will function at its maximum sensitivity on these two ranges. In some localities it will be found that without the use of this control, it will be impossible to eliminate adjacent channel interference. When this condition is obtained, the receiver should be tuned accurately to the desired station, and this sensitivity control adjusted so that minimum interference is obtained from the interfering station. See Figure 1.

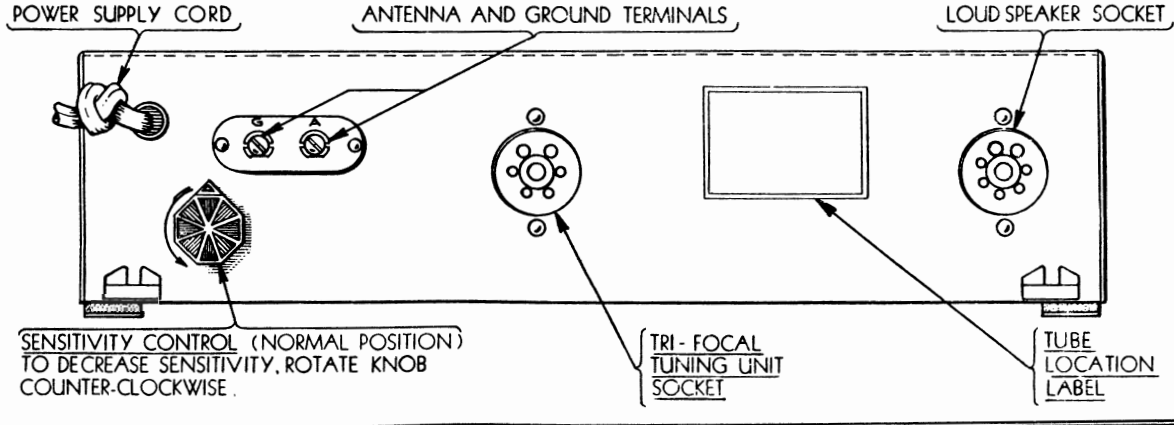
The various tubes are used in these receivers as follows: One No. 6K7 tube is used in the R. F. Amplifier, and the other No. 6K7 is used in the I. F. Amplifier. The No. 6A8 tube functions as both Oscillator and Modulator tube. The No. 6H6 tube is used as a Demodulator and Automatic Volume Control tube. The No. 6F5 tube is used in the Audio Frequency Amplifier Stage (Driver), and the No. 6F6 tube is used in the Audio Power Output Stage. The No. 80 tube is the Rectifier tube of the power supply unit. In the Nos. 130-M and 130-R Receivers the No. 6E5 tube is used as the indicator of the Tri-Focal Tuning System.

Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

STROMBERG CARLSON TELEPHONE MFG. CO.

130 SERIES





STROMBERG CARLSON TELEPHONE MFG. CO.

130 Series

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: O-2.5, O-10, O-100, O-250, O-500, O-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

Tube	Circuit	Cap.	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+ 54	+ 96	+7.6	+4.5	*6.3*	+7.6	2-7	*6.3*
6A8	Osc.-Mod.	0	0	0	+222	+ 72	—1.0	+143	*6.3*	+6.1	2-7	*6.3*
6K7	I. F. Amp.	0	0	0	+240	+ 96	+7.4	+4.5	*6.3*	+7.4	2-7	*6.3*
6H6	Dem.—A.V.C.	—	0	0	0	0	0	—	*6.3*	+4.5	2-7	*6.3*
6F5	Audio Amp.	0	0	0	—	+122*	—	—	*6.3*	+.75	2-7	*6.3*
6F6	Audio Output	—	0	0	+226	+237	0	0	*6.3*	+ 15	2-7	*6.3*
80	Rectifier	—	+330	*325*	*325*	+330	—	—	—	—	1-4	*4.8*
Tri-Focal Tuning Indicator Plug's Socket When Tri-Focal Tuning Unit Is Used			*6.3*	0	+7.6	+235	+7.8	0	—	—	1-6	*6.3*
Tri-Focal Tuning Indicator Plug's Socket When Tri-Focal Tuning Unit Is Not Used			*6.3*	0	+7.6	+237	+7.3	0	—	—	1-6	*6.3*
Speaker Socket			+327	0	0	+327	+327	0	+237	—	—	—

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 2 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-13).
2. Primary of 2nd I. F. Transformer (Capacitor C-12).
3. Secondary of 1st I. F. Transformer (Capacitor C-11).
4. Primary of 1st I. F. Transformer (Capacitor C-10).

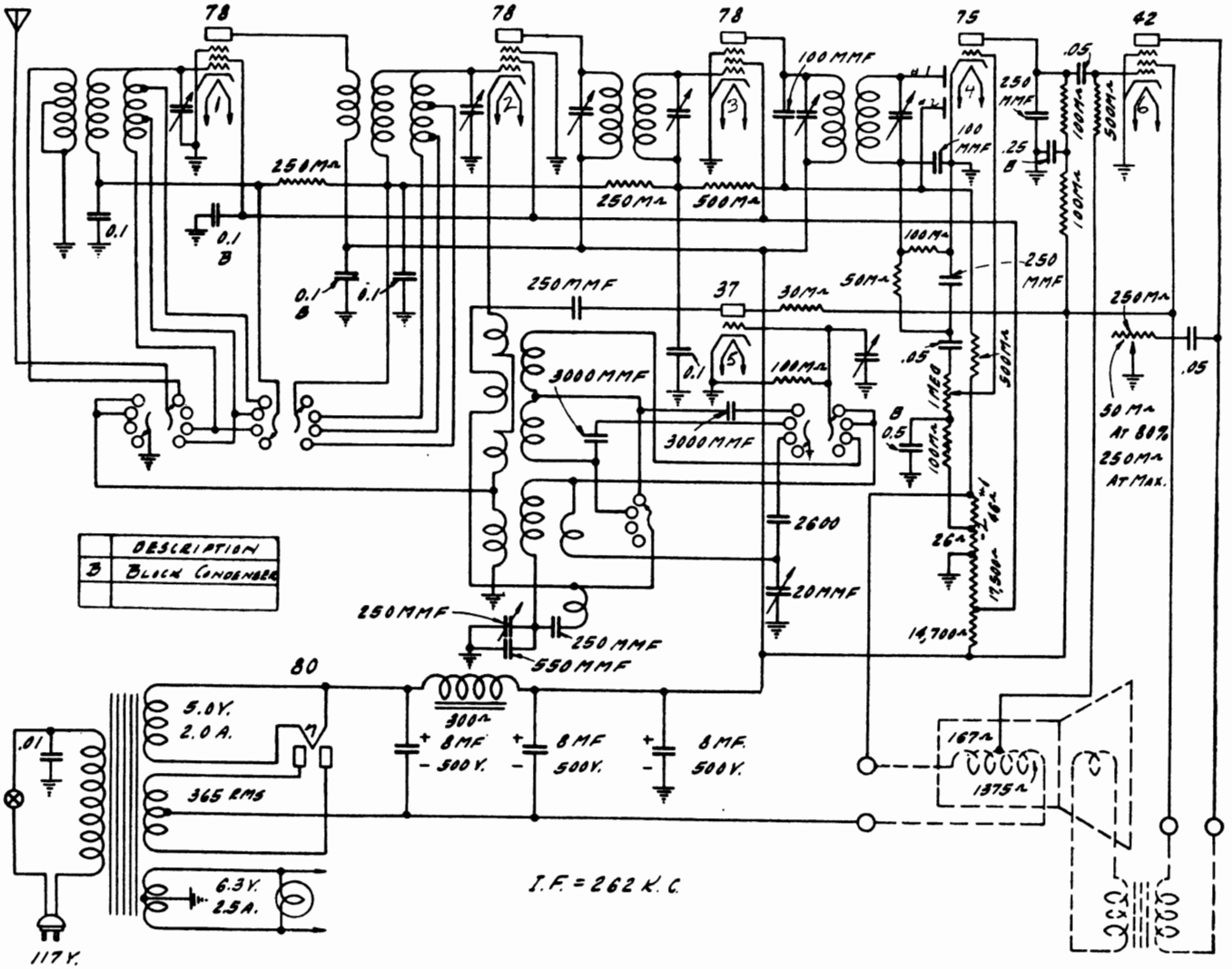
Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-7).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor (23)).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

TRANSFORMER CORP. OF AMERICA

Clarion "7"—Models TC-1 and TC-2

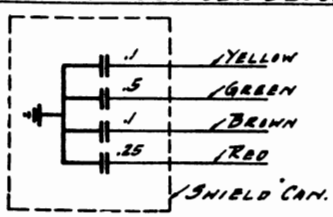


TUBE SOCKET VOLTAGES

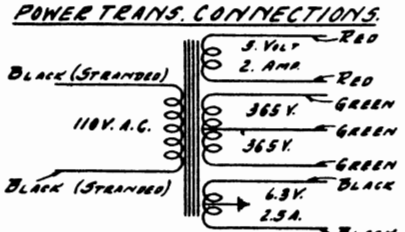
Tube No.	Heater to Cathode Voltage	Control Grid to Cathode Voltage	Screen to Cathode Voltage	Plate to Cathode Voltage	Plate MA	Heater or Fil. Voltage
1—R. F.	0	4 5*	100	250	6.0	6 3
2—1st Det.	0	4 5*	100	250	6 0	6.3
3—I. F.	0	4 5*	100	250	6.0	6 3
4—2nd Det. AVC.	0	2.0**	0	125	75	6 3
5—Osc.	0	2 6	0	95	5 5	6.3
6—Audio	0	20.0	250	225	31 0	6.3
7—Rect.	0				32 per plate	5.0

Voltage reading taken with 1000 ohm per volt meter using test prods. All tubes in sockets, Ant. ground to chassis, no signal.
*Voltage from ground to terminal No. 1 ON THE VOLTAGE DIVIDER.
**Voltage from ground to terminal No. 2 ON THE VOLTAGE DIVIDER.

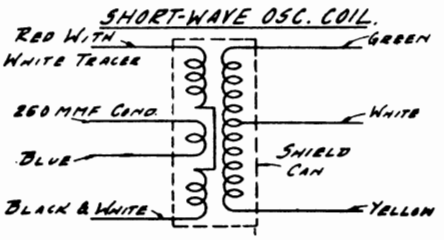
BY PASS CONDENSER BLOCK.



POWER TRANS. CONNECTIONS.



SHORT-WAVE OSC. COIL.



ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated, and then only by an experienced service man. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is essential that in all the following tests the signal generator output be attenuated as much as possible at all times and that the receiver volume control be always set at maximum.

I.F. ALIGNMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7) tube. With the oscillator section of the tuning condenser short-circuited the i.f. trimmers are adjusted for maximum output. These may be found on top of the i.f. transformer shield cans in the right hand rear corner of the chassis.

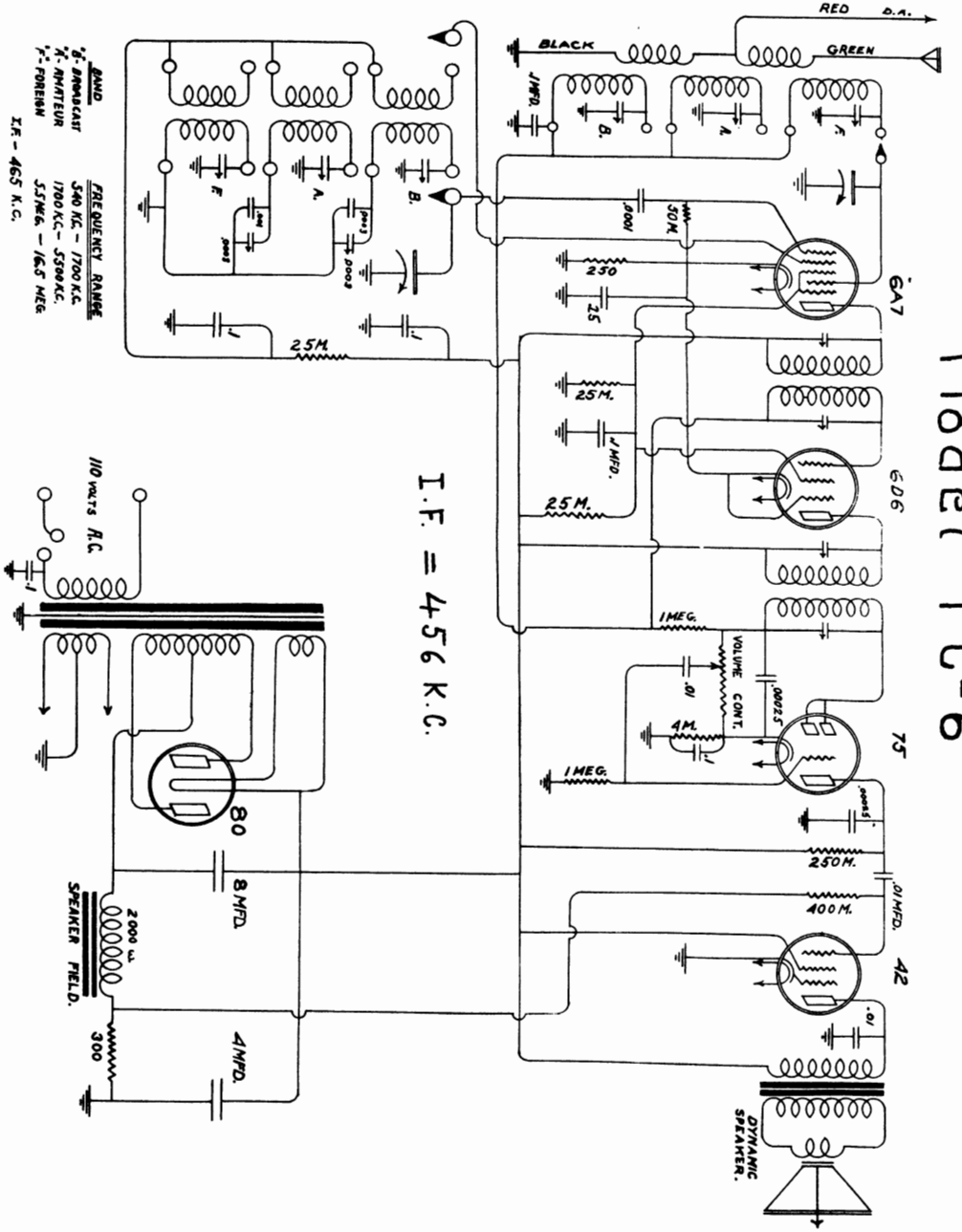
FOREIGN BAND ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side of the signal generator is connected to the ground post. The receiver and the signal are both tuned to a frequency of 16 mc. with the selector switch in position for this band. The oscillator trimmer is adjusted for maximum receiver output. This trimmer is located on the oscillator coil on the under side of the chassis. It is the right hand one of the three trimmers found here. The antenna preselector for this band is then adjusted in the same manner. This is found on the preselector coil on the top side of the chassis and is the right hand one of the three found here.

AMATEUR BAND ADJUSTMENT - With the band selector switch in position for operation on this band, and the receiver and signal generator both set at 5.4 mc., the procedure outlined above is repeated. The oscillator trimmer for this band is found on the oscillator coil on the under side of the chassis and is the center one of the three. The preselector trimmer is found on the preselector coil on top of the chassis and is the center one of the three.

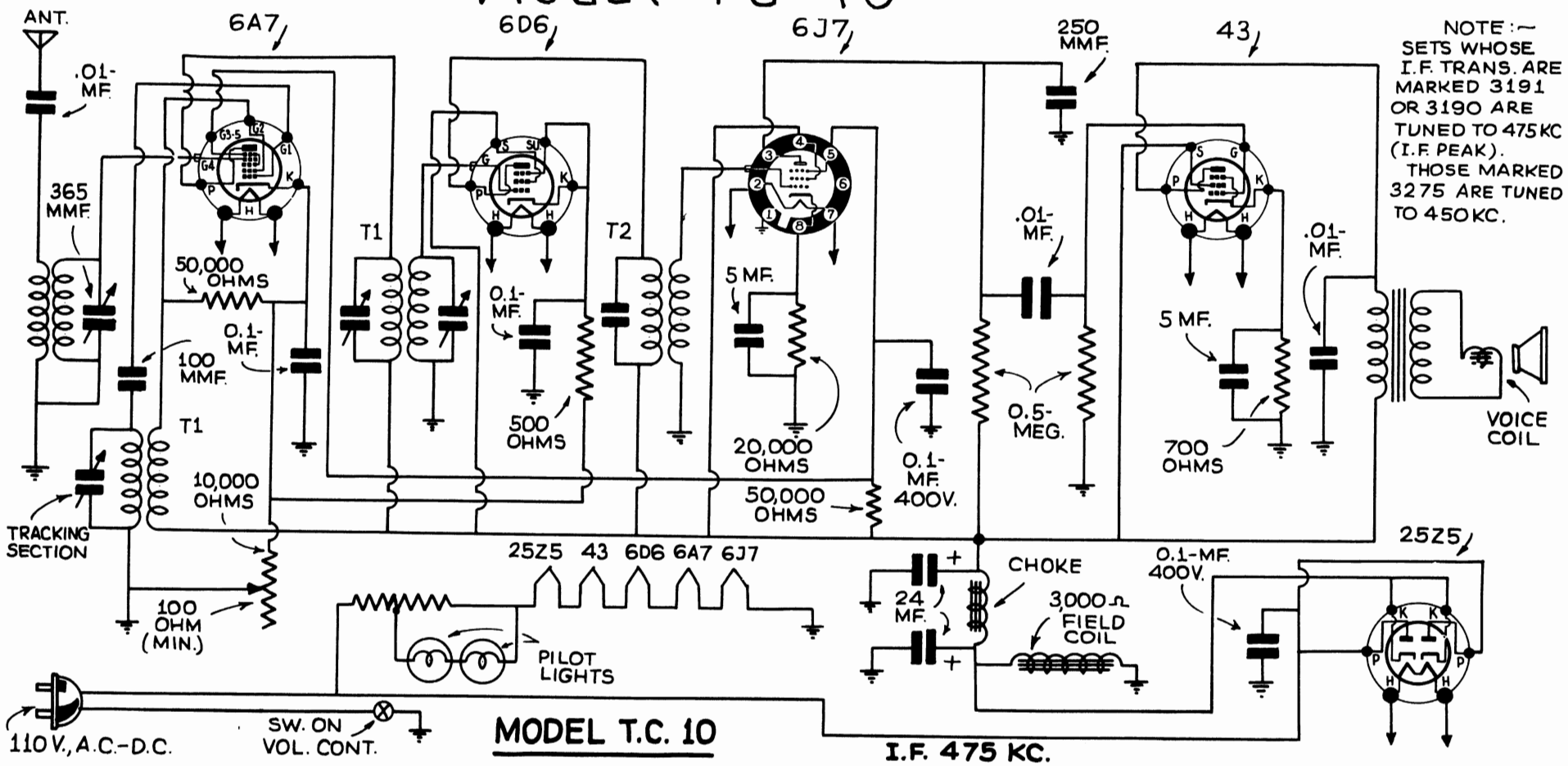
The signal generator should then be set at 1.7 mc. and the signal tuned in on thedial. The series padder for this band should be adjusted for maximum output while the receiver dial is rocked slightly back and forth. The 5.4 mc. setting should then be rechecked. The padder is located on the right side of the front chassis skirt and is the left hand one of the two located here.

BROADCAST BAND ADJUSTMENT - With the band selector switch in position for operation on this band and the receiver and signal generator both set at 1400 kc. the procedure outlined above is repeated. The oscillator and preselector trimmers are found on the tops of their respective coils and are on the extreme left in each case.

The signal generator should then be set at 600 kc. and the signal tuned in on the dial. The series padder for this band should be adjusted for maximum output while the receiver dial is rocked slightly back and forth. The 1400 kc. adjustment should then be rechecked as the subsequent adjustments have a detuning effect on this circuit. This padder is located on the right hand side of the front chassis skirt and is the right hand one of the two located here.



Model TC-10



MODEL T.C. 10

I.F. 475 KC.

TRANSFORMER CORP. OF AMERICA

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have first been thoroughly investigated. A signal generator which is accurately calibrated and some form of output meter for indicating the effects of adjustment are required.

I.F. ADJUSTMENT - The i.f. stages are peaked at the intermediate frequency indicated on the diagram. The signal generator should be set at this frequency and connected to the grid cap of the first detector (6A7) tube. The oscillator section (rear) of the tuning consenser should be short-circuited for this adjustment. With minimum signal from the generator and the receiver volume control at maximum, the i.f. trimmers are adjusted for maximum response as indicated by the output meter.

The i.f. trimmers are located on top of the i.f. transformer shield cans. The first i.f. transformer is in the right rear corner of the chassis. The second i.f. transformer is between the 6D6 and the 6J7 tubes. This transformer has only one trimmer.

PRESELECTOR ADJUSTMENT - The trimmers for this adjustment are located directly on the tuning condenser, the preselector trimmer being on the front section and the oscillator trimmer on the rear section. The latter is adjusted first, with the receiver and signal generator both set at 1400 kc. and the signal being fed in through the antenna and ground posts of the receiver.

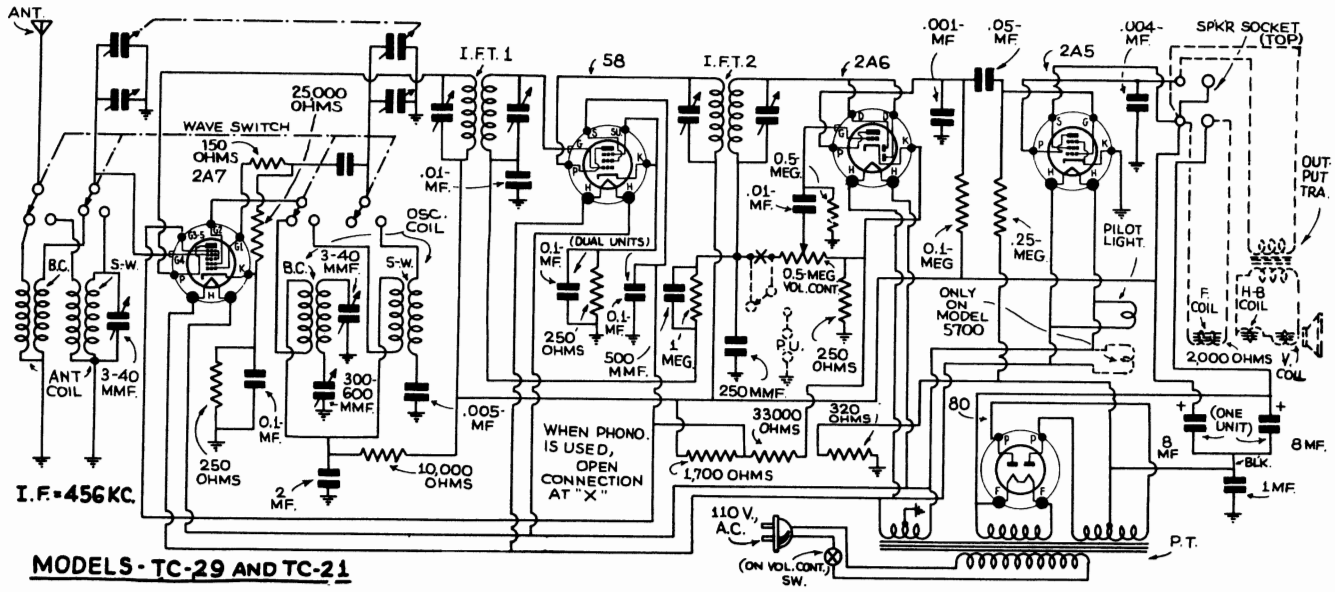
VOLTAGE TABLE

All voltages are measured between socket terminals and chassis; set in operation; volume control full on; antenna disconnected. Voltmeter sensitivity - 1000 ohms-per-volt. Line voltage measured: 115.0.

TUBE	FUNCTION	H'T'R	PLATE	SCR.GR.	SUPPR.GR.	CATH.	OSC.PL.
6A7	det.-osc.	5.6	104.0	50.0	-----	5.2	100.0
6D6	i.f. ampl.	5.6	104.0	104.0	6.6	6.6	----
6J7	2nd det.	5.6	----	50.0	5.0	5.0	-----
43	audio outp.	26.0	98.0	104.0	----	13.5	-----
25Z5	rectifier	26.0	115.0	-----	----	115.0	-----

TRANSFORMER CORP. OF AMERICA

Models TC-20 and TC-21



MODELS - TC-29 AND TC-21

TUBE		FIL.	PLATE	SCREEN	CATHODE	GRID NO.1	GRID NO.2	GRID NO. 3 & 5
58	I. F. Amplifier	2.45	205	80	2			
2A7	Oscillator & 1st Detector	2.45	205		2.5	1.5	160	80
2A6	Second Detector Diode AVC and Triode	2.45	100##		1			
2A5	Output	2.45	190	205	.8###			
80	Rectifier	4.85						

Triode Plate. Comparative voltage only. The voltmeter is in series with a high resistance and is therefore not the true voltage applied.

Read all voltages from socket to chassis unless otherwise specified.

Read from grid to chassis.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 2A7 tube leaving the grid cap disconnected. The ground side of the oscillator should be connected to the receiver chassis.

2. Set the oscillator at 465 kilocycles (this must be accurate) and adjust the output of the oscillator so that a convenient reading is obtained on the output meter.

3. Align the first intermediate transformer by turning the intermediate transformer brass hext adjusting nut located on top of the intermediate transformer can up and down until maximum reading is obtained on the output meter. Then adjust the trimmer screw located inside the brass hex nut for maximum output.

4. Adjust the second I. F. transformer in the same manner as the first I. F. transformer.

VARIABLE CONDENSER ALIGNMENT: It is essential that the following instructions be carefully adhered to in the order given otherwise the receiver will be insensitive and the dial calibration will be inaccurate.

1. Connect the high side of the oscillator output to the set antenna lead and the oscillator ground to the receiver chassis.

2. Place the band selector switch for operation on the 16 to 5.2 megacycle band.

3. Set the oscillator frequency to exactly 15 megacycles and adjust the receiver dial to exactly 15 megacycles. Then BRING IN THE 15 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE trimmer condenser of the oscillator gang condenser section. The oscillator trimmer condenser is mounted on top of the rear section of the variable condenser. The front section of the variable condenser tunes the antenna stage.

4. Place the band selector switch for operation on the 1715 to 535 kilocycle band, set the oscillator to exactly 1400 kilocycles and tune the receiver dial to 1400 kilocycles. BRING IN THIS 1400 KILOCYCLE SIGNAL BY ADJUSTING THE SMALL TRIMMER CONDENSER which is located underneath near the center and towards the front of the chassis.

5. Next adjust the antenna variable gang condenser section trimmer condenser for maximum output (front section).

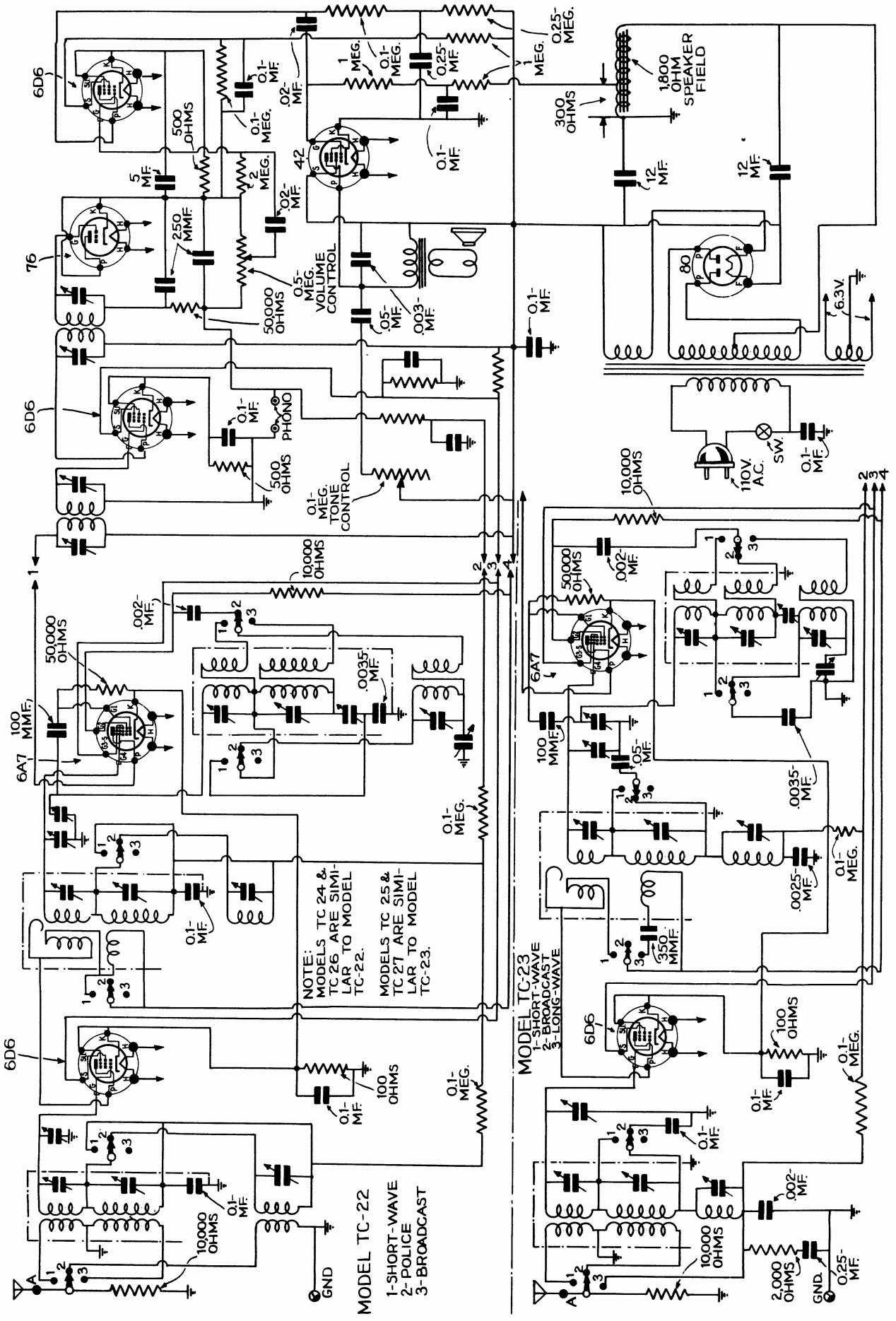
6. Leave the receiver operating on the same band and set the oscillator frequency to approximately 600 kilocycles and adjust the dial to approximately 600 kilocycles. Then while rocking the variable condenser slightly to the right and left, adjust the 600 kilocycle padding condenser which is located below the speaker and accessible through the front of the chassis for maximum output.

7. Recheck the 1400 kilocycle adjustment.

8. Place the band selector switch for operation on the 16 to 5.2 megacycle band and tune the dial to exactly 15 megacycles and set the oscillator frequency to 15 megacycles. Then adjust the trimmer condenser which is located underneath and toward the center of the right hand side of the chassis for maximum output.

TRANSFORMER CORP. OF AMERICA

TC-22, TC-23, TC-39A, TC-39LW



TRANSFORMER CORP. OF AMERICA

Models TC-28 and TC-29

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted except by an experienced service man, and then only after all possible causes of faulty operation have been thoroughly investigated. An accurately calibrayed signal generator which will cover the various bands and a suitable output meter for indicating the effects of adjustments are required.

I.F. ADJUSTMENT - The signal generator is set at 465 kc. and its output connected between the control grid of the first detector (6A8) tube and the ground post of the receiver. The oscillator (rear) section of the tuning condenser is short-circuited and the volume control set at maximum. The signal generator output is attenuated as much as possible and the i.f. trimmers adjusted for maximum gain. These trimmers are found in the right hand rear corner of the chassis., on top of the i.f.t. shield cans.

1400 KC. ADJUSTMENT - The signal generator is set at 1400 kc. and its output connected between the aerial and ground posts of the receiver. It is extrimely important that a weak signal be used in order to prevent the a.v.c. action from nullifying the effect of adjustments. The receiver dial is set at the same frequency and with the volume control at maximum, the 1400 kc. trimmer is adjusted for greatest gain. The series padder for this band should now be adjusted by setting the signal generator at 600 kc. and tuning the signal in on the receiver dial. This padder should be adjusted for maximum response while the tuning condenser is rocked slightly back and forth. The 1400 kc. adjustment should then be rechecked.

The location of all the r.f. trimmers are shown on the accompanying sketch.

SHORT WAVE BAND ADJUSTMENT - For this band the oscillator and antenna coil trimmers should be adjusted at 16 megacycles in the manner described above and the series padder adjustment made at 5.7 megacycles.

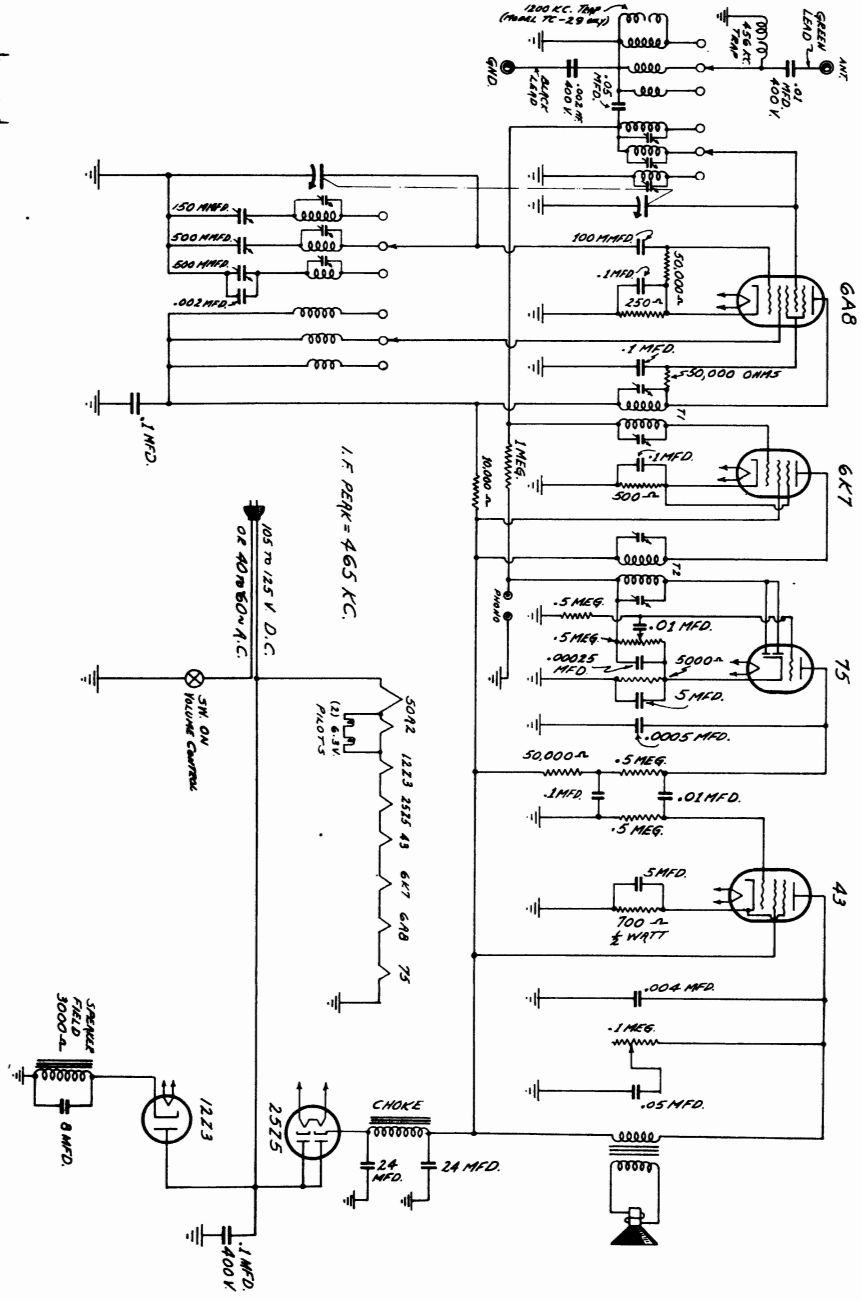
LONG WAVE BAND ADJUSTMENT - This adjustment is for the model TC-29 only. The oscillator and antenna coil trimmers should be adjusted at 375 kc. as outlined above, and the series padder at 150 kc.

POLICE BAND ADJUSTMENT - This adjustment is for the model TC-28 only. The oscillator and antenna coil trimmers should be adjusted at 3500 kc. and the series padders at 1600 kc.

VOLTAGE TABLE

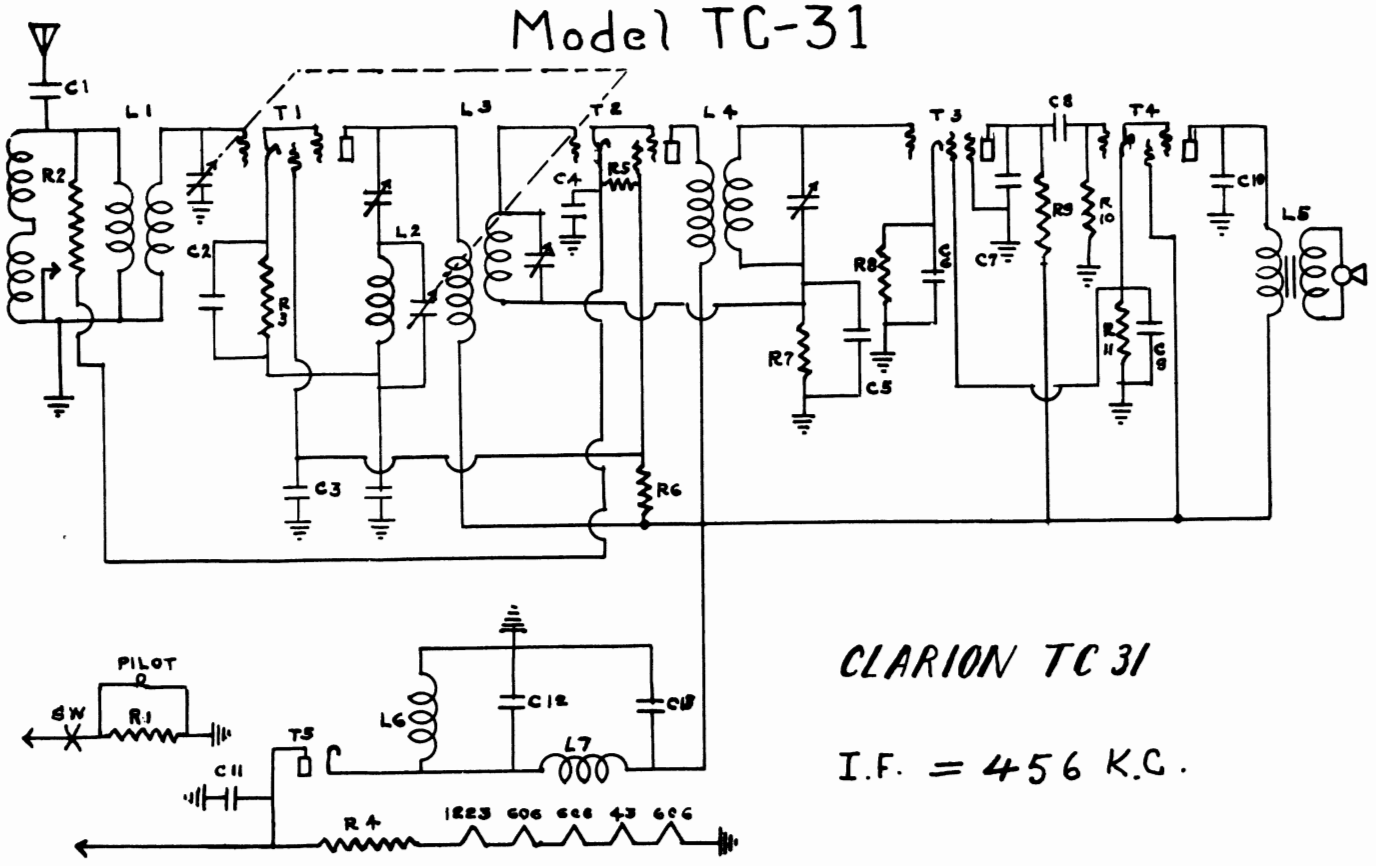
All voltages are measured between socket terminals and chassis; set in operation; volume control "full on"; antenna disconnected. Voltmeter sensitivity - 1000-ohms-per-volt. Line voltage measured:- 115.0

TUBE	FUNCTION	H'T'R	PLATE	SCR.GR.	SUPPR.GR.	CATH.	OSC.PL.
6A8	det.-osc.	5.0	90.8	50.0	----	1.0	98.0
6K7	i.f. amplif.	5.0	120.0	120.0	4.2	4.2	----
75	2nd det.	5.2	60.0	----	----	---	----
43	audio output	22.5	120.0	120.0	----	18.0	----
2525	rectifier	22.5	120.0	----	----	120.0	----
12Z3	spkr.rect.	10.1	120.0	----	----	120.0	----



TRANSFORMER CORP. OF AMERICA

Model TC-31



CLARION TC 31

I.F. = 456 K.C.

SERVICE SUGGESTIONS

CIRCUIT: The receiver uses a superhet circuit. The tubes used are: type 6C6 as oscillator and modulator, a type 6D6 in the I.F. stage, a type 6C6 as second detector and audio amplifier and a type 43 output tube. The I.F. is 456 K.C.

ALIGNING THE SET: Only in rare cases will it be found necessary to adjust any trimmers. If the volume is low, everything else should be checked before attempting to align the set. The only case where the fault is in the alignment is when both low volume and poor selectivity are present. To align the I.F.'s: set the test oscillator to 456 K.C. and connect it to the grid of the first 6C6 tube and adjust the upper screw on the first I.F. transformer and the screw on the second I.F. (small round can) for maximum output. Now set the test oscillator to 1400 K.C. The signal should come in between 15 and 20 on the dial. Adjust the two trimmers on the tuning condenser for maximum output. Check at 600 K.C. The lower trimmer on the first I.F. transformer is the oscillator coupling condenser and should not be changed.

LACK OF VOLUME: Volume control partly open. Antenna condenser C1 open. One or more defective tubes. Check all voltages.

HUM: This may be due to one or more bad tubes, open filter condenser or shorted choke.

SET DEAD: See if tubes light, if not, one of the tubes or the 200 ohm filament resistor is open. If operating on D.C. and tubes light; try reversing the plug.

L1	Antenna coil
L2	Oscillator coil
L3	First I. F.
L4	Second I. F.
L5	Speaker Transformer
L6	Speaker Field
L7	Choke
R1	Pilot shunt
R2&SW	Volume control and switch
R3	7500 ohm carbon resistor
R4	Filament resistor 200 ohms
R5	50,000 ohm carbon resistor
R6	10,000 ohm carbon resistor
R7	500,000 ohm carbon resistor
R8	25,000 ohm carbon resistor
R9	200,000 ohm carbon resistor
R10	500,000 ohm carbon resistor
R11	750 ohm carbon resistor
C1	.1 mfd. paper condenser
C2	.002 mfd. paper condenser
C3	.1 mfd. paper condenser
C4	.1 mfd. paper condenser
C5	.1 mfd. paper condenser
C6	10 mfd. electrolytic condenser
C7	.001 mfd. paper condenser
C8	.05 mfd. paper condenser
C9	10 mfd. electrolytic condenser
C10	.006 mfd. paper condenser
C11	.05 mfd. paper condenser
C12	16 mfd. electrolytic condenser
C13	8 mfd. electrolytic condenser

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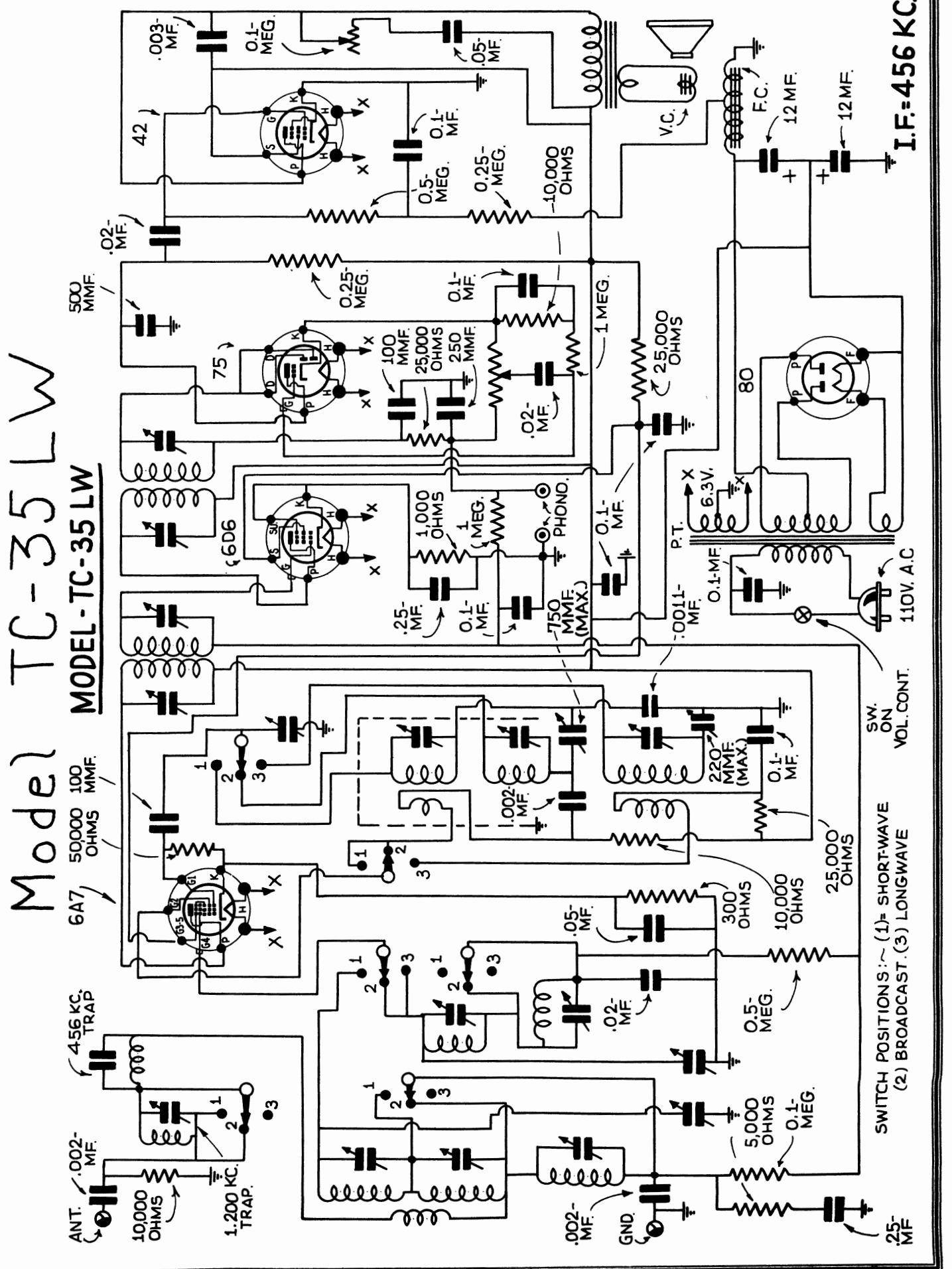
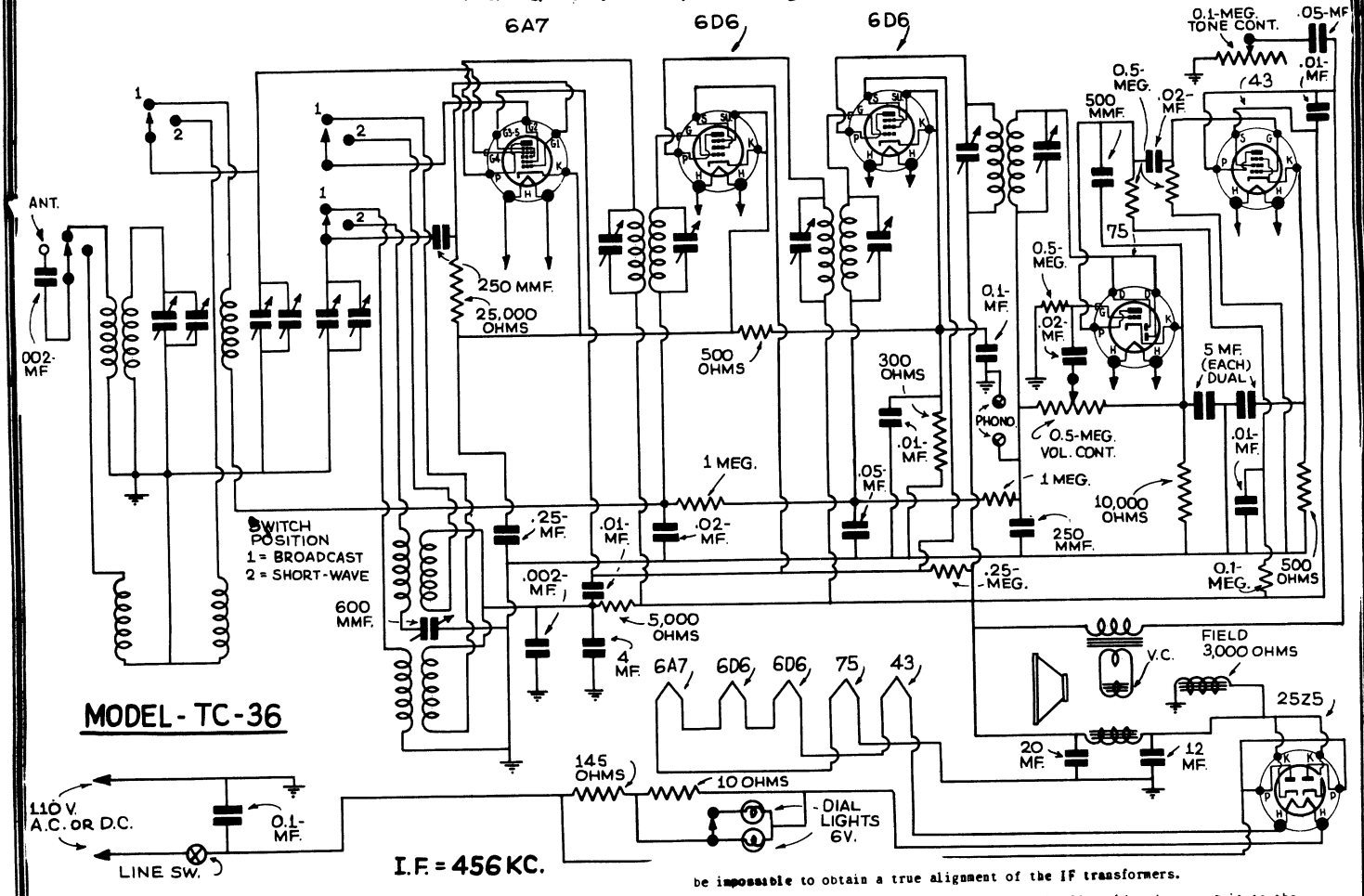


TRANSFORMER CORP. OF AMERICA

Model TC-36



To shut off the set-turn the Combination Volume-Control and Switch (left hand knob) to the left until the switch snaps 'off' and comes to a stop.

NOTES:

The heat generated in normal operation is about the same as that produced by an ordinary medium size electric light bulb. To allow normal ventilation so that this heat is not sealed in the cabinet do not cover the back of the cabinet or prevent the circulation of air by placing its back tightly against a wall or other obstruction.

It is not advisable to place the set on a radiator or other heating device, as some owners insist on doing. This practice may mar the finish of the cabinet and will produce excess heat that may injure the set.

MINOR REASONS FOR FAILURE TO OPERATE:

1. Tubes not in sockets
2. Grid Clips not on tubes
3. Defective tubes
4. Not sufficient antenna
5. On D.C. - supply-plug reversed

VOLTAGE READINGS:

Readings should be taken with volume control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

	Plate to Ground	Screen to Ground	Cathode to Ground	Grid #1	Grid #2	Suppressor
6A7 Det. Osc.	115	38	5	3	103	
6D6 I.F. Amp.(1)	114	38	5			5
6D6 I.F. Amp.(2)	101	37	1.5			1.5
75 Det.	32		0.25			
43 Output	105	112	14.			14
25Z5 Rectifier			125.			

Power Drawn by receiver 40 Watts.

ALIGNMENT OF T C 36

With the wave-band switch in the broadcast position (right) connect the oscillator, set at 456 k.c., to the grid of the 6A7 tube (with the grid cap in place) and to the chassis. The volume control should be set at maximum and the oscillator output reduced so as to obtain about 15 volts reading on the output meter (4000 to 8000 ohms) connected across the loud speaker transformer primary (plate and screen prongs of the 43 tube).

Carefully rotate the screws on the top of the IF transformers (square cans) until the maximum reading is obtained on the output meter. Where round cans are used, two adjustments are concentric and may be adjusted by use of screw driver and socket wrench. If the output is considerably in excess of 15 volts reduce the oscillator output further.

The object of this is to operate at such a low level that the automatic volume control, the purpose of which is to maintain the signal level constant, does not operate; otherwise this adjustment will appear very broad and it will be impossible to obtain a true alignment of the IF transformers.

Now, remove the oscillator clip from the 6A7 grid and connect it to the antenna lead. Set the oscillator to 1400 k.c. If the received signal does not come exactly at this frequency adjust the small trimming condenser at the left of the small oscillator coil, so that it does. Tune the oscillator signal in very carefully, and then adjust the two trimmers on top of the gang condenser for maximum output as before. Now, set the oscillator to 600 k.c., and tune this in on the receiver. Check for alignment by rotating the padding condenser which is mounted on the rear of the chassis. The adjusting screw for this condenser projects through the chassis. While adjusting the padding condenser rock the tuning control so as to obtain the greatest output. Leave this padder set for maximum signal strength.

SHORT WAVE BAND:

Turn the wave band switch to the left. If a short wave oscillator is not available, set the regular broadcast oscillator to 1000 k.c. If the harmonics are sufficiently powerful it should be possible to pick up a signal at points all along the dial one megacycle apart, as for example 6 m.c., 7 m.c., 8 m.c. and 9 m.c. On earlier sets no adjustments were necessary, later sets are equipped with a trimmer (approximately 3 to 30 mmfds) connected from the grid end of the short wave antenna coil to chassis.

At 14 m.c. adjust this trimmer for maximum output at the same time CAREFULLY re-tune the signal, as a re-adjustment of the trimmer shifts the signal slightly on the dial.

NOTE:

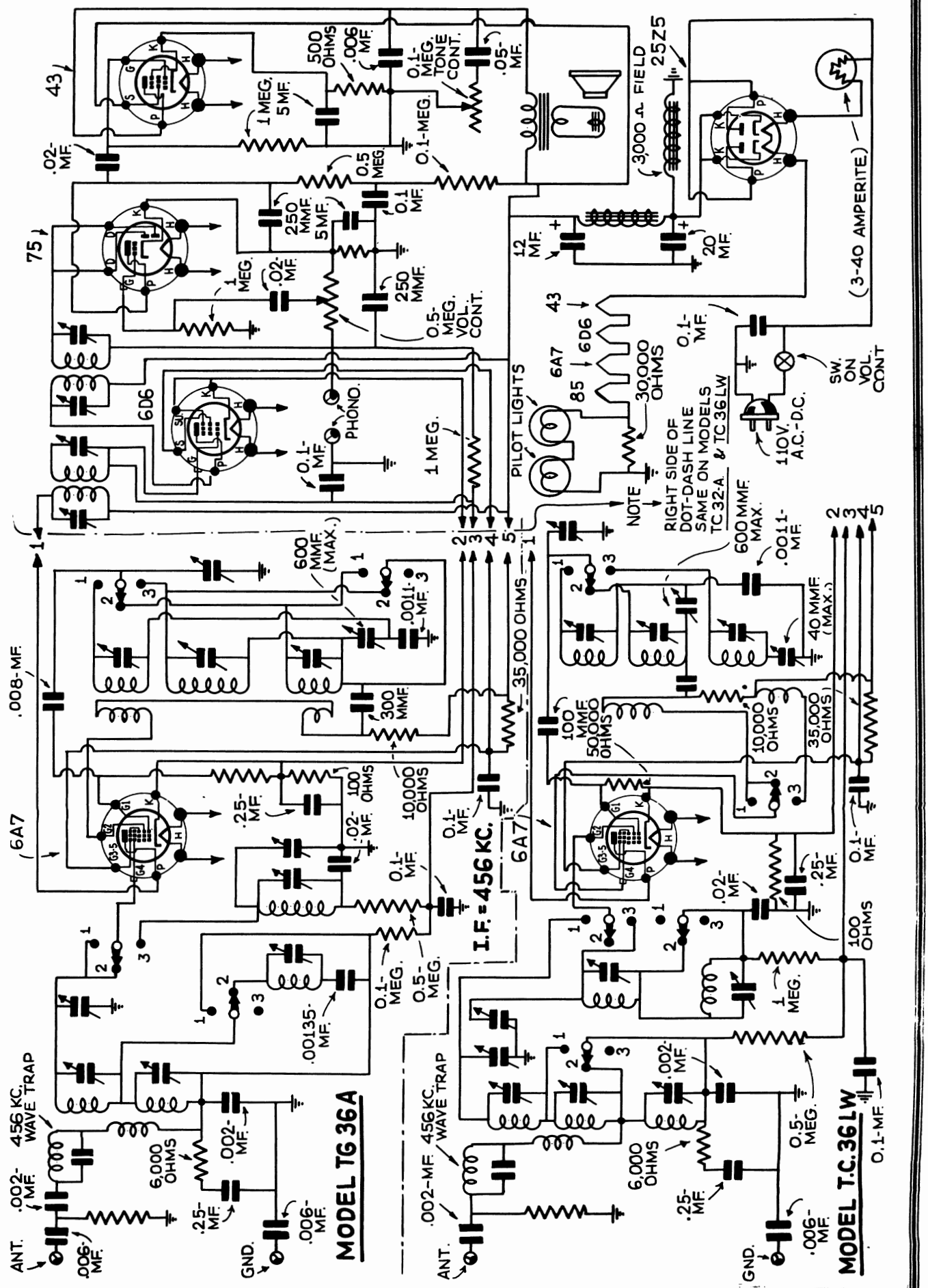
In all the above adjustments it is imperative that the volume control be set near maximum and that the oscillator be reduced sufficiently so that no more than 15 volts output is obtained. If necessary set the oscillator some distance away and pick up the signal by means of a wire placed near it and connected to the receiver.

REPLACEMENT PART LIST

Description	List Price Each
Pre-selector	$ 2.60
IF Transformer First, Second or Third	2.00
Long Wave Oscillator	.68
Short Wave Oscillator	.68
12 plus 20 Mfd. Filter Condenser	2.32
Three Gang Tuning Condenser	4.28
Combination Volume Control and Switch	1.76
Tone Control	1.18
Any Socket - Give Tube Number	.10
Any Small Tubular Condenser - Give Value	.00
4 Mfd. Tubular Bypass Condenser	.88
Any Moulded Condenser - Give Value	.18
Any Carbon Resistor - Give value	.10
Filament Dropping Resistor 155 ohms	.56
Filter Choke	.96
Dynamic Speaker	6.00
Wave Band Selector Switch - Single Gang	.80
Trimmer Condenser - 3 to 30 Mmf.	.20
Padding Condenser - Single	.44

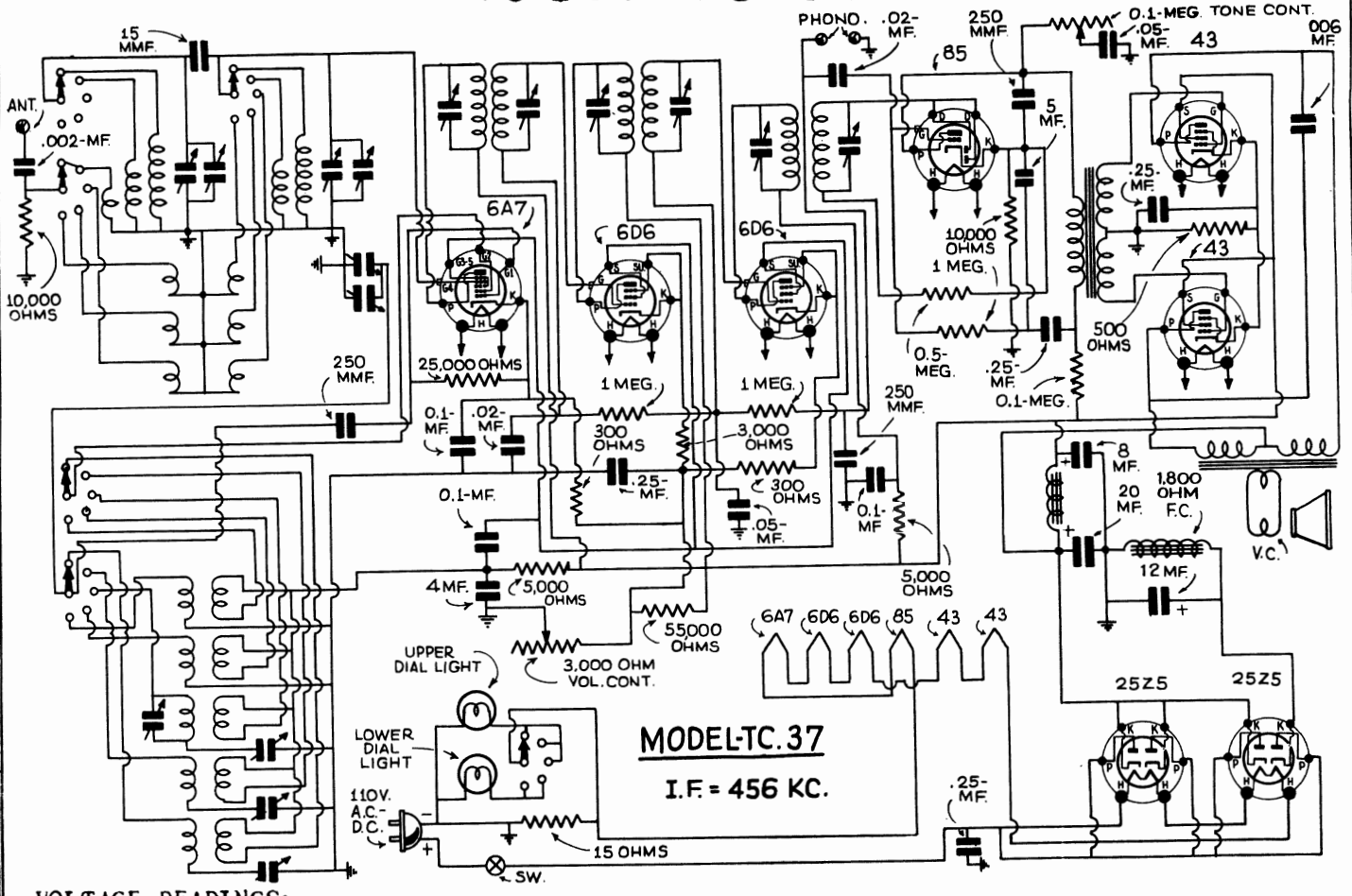
TRANSFORMER CORP. OF AMERICA

Models TC-36A and TC-36LW



TRANSFORMER CORP. OF AMERICA

Model TC-37



VOLTAGE READINGS:

Readings should be taken with volume control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

	Plate to Ground	Screen to Ground	Cathode to Ground	Suppressor to Ground
6D6 IF Amp. (1)	128	38	7	7
6D6 IF Amp. (2)	123	38	7	7
85 Diode Det.	57	--	6	6
43 Output Tubes	129	127	20	20
25Z5 Rectifier	132			
6A7 Det. Osc.	127	37	3	Grid (1) 8, Grid (2) 114

Power Drawn by receiver 47 watts.

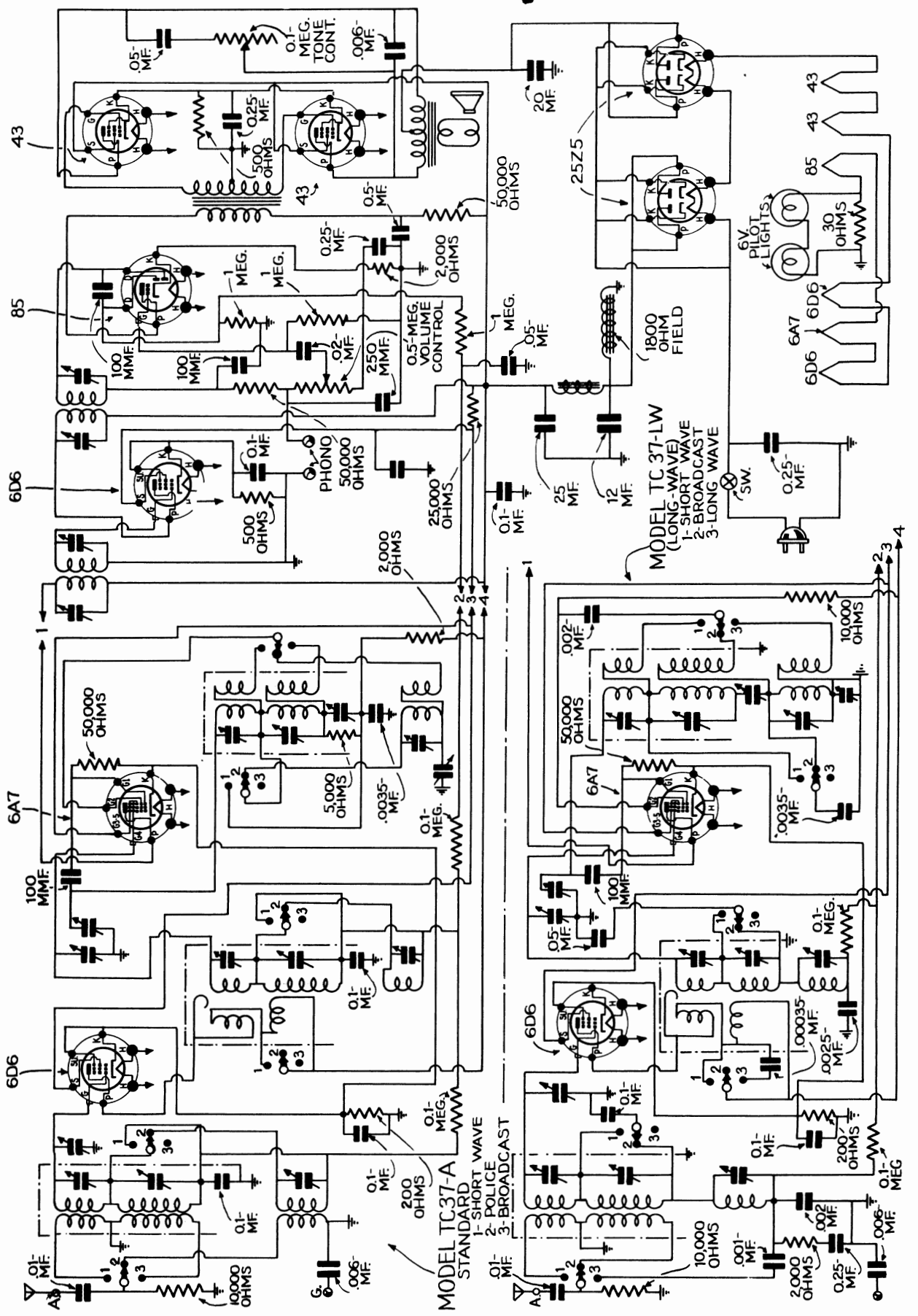
In some localities it may be found that operation on D.C. gives rise to noisy reception. This noise interference is principally due to disturbances set up in the power line by electric appliances, i.e., motors, fans, sign flashers, ventilators, trolleys, etc., and is not a reflection on the receiver as the correct elimination of such noise requires corrective filters at the source of the offending apparatus. It is possible, usually to minimize these noises by proper antenna placement or connection to an outside antenna which is free and clear and does not pick up the interference.

The entire frequency spectrum- 13 to 2000 meters - is covered as follows:

13 to 25 meters - Ultra Short Wave
25 to 75 meters - Short Wave
75 to 200 meters - Medium Wave
200 to 560 meters - Broadcast
750 to 2000 meters - Long Wave

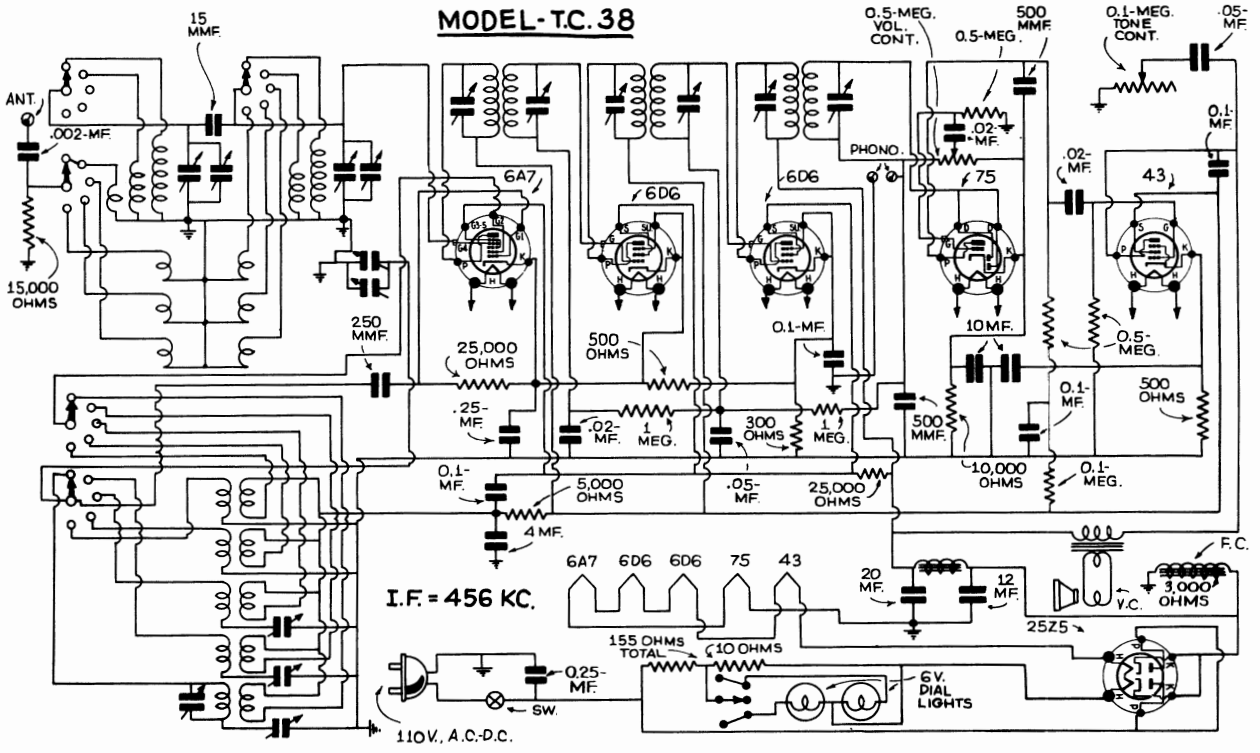
TRANSFORMER CORP. OF AMERICA

MODELS TC-37A, TC-37LW



TRANSFORMER CORP. OF AMERICA

Model TC-38



VOLTAGE READINGS:

Readings should be taken with volume control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

	Plate to Ground	Screen to Ground	Cathode to Ground	Suppressor to Ground
6D6 IF Amp.(1)	114	42	5	5
6D6 IF Amp.(2)	105	42	2	2
75 2nd. Det.	34	--	2	
43 Output Tube	107	115	15	
25Z5 Rectifier			127	
6A7 Det. Osc.	115	43	5	Grid#1-3, Grid#2-100

Power Drawn by receiver 40 Watts.

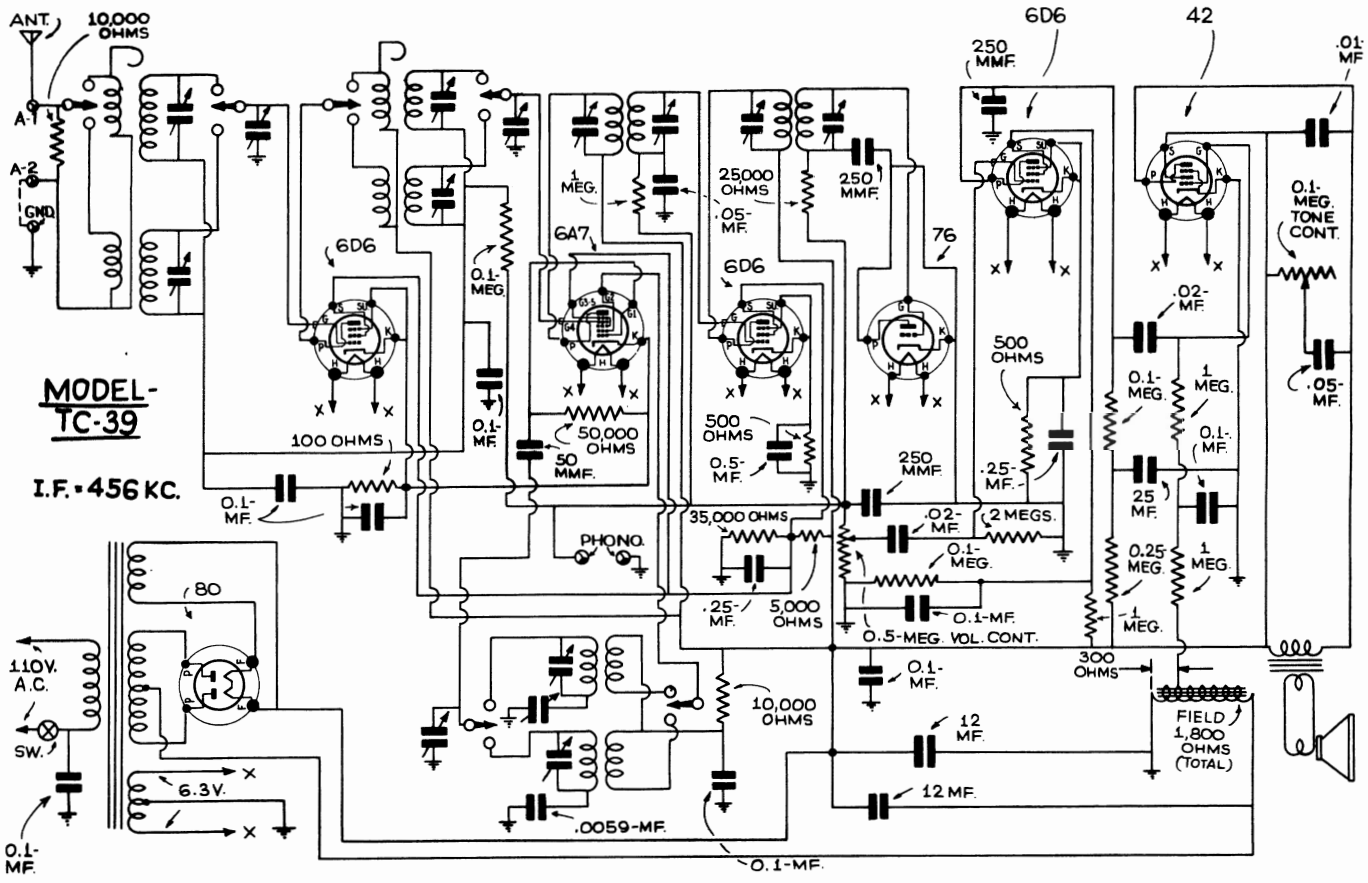
There are no adjustments necessary on the short wave bands, simply make sure that the same potentials are obtained at the 6A7 when the wave band switch is shifted to the short wave position. Any irregularity in the short wave band will show up by some change in these voltages. A further check on the short wave operation may be obtained by picking up harmonics of the broadcast test oscillator at several points.

The entire frequency spectrum - 13 to 2000 meters is covered as follows:

13 to 25 meters - Ultra Short Wave
25 to 75 meters - Short Wave
75 to 200 meters - Medium
200 to 560 meters - Broadcast
750 to 2000 meters - Long Wave.

TRANSFORMER CORP. OF AMERICA

Model TC-39



To shut off the set - turn the Combination Volume-Control and Switch (lower center knob) to the left until the switch snaps 'off' and comes to a stop.

The heat generated in normal operation is about the same as that produced by a medium size electric light bulb. To allow normal ventilation so that this heat will not be sealed in the cabinet do not cover the rear of the cabinet or prevent the circulation of air by placing its back tightly against a wall or other obstruction.

It is not advisable to place the set on a radiator or other heating device, as some owners insist on doing. This practice may mar the finish of the cabinet and will produce excess heat that may injure the set.

MINOR REASONS FOR FAILURE TO OPERATE:

1. Tubes not in sockets
2. Grid clips not on tubes
3. Defective tubes
4. Not sufficient antenna

VOLTAGE READINGS:

Readings should be taken with the Volume Control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

	Plate to Ground	Screen to Ground	Cathode to Ground	Suppressor to Ground
6D6 RF Amp.	235	155	3	3
6A7 Det. Osc.	230	155	3	
6D6 IF Amp.	250	155	6	6
76 Second Det.				
6D6 AF Amp.	50	12	0.2	0.2
42 Output	228	234	23	
80 Rectifier	Filament to Ground 250 volts.			

Power Drawn by Receiver 57 Watts.

ALIGNMENT OF T C 39

With the wave band switch in the broadcast position (right) connect the oscillator, set at 456 k.c. to the grid of the 6A7 tube (with the grid cap in place) and to the chassis. The volume control should be set at maximum and the oscillator output reduced so as to obtain about 15 volts reading on an output meter (4000 to 8000 ohms) connected across the loud speaker transformer primary (plate and screen prongs of the 42 tube).

Carefully rotate the screws on the tops of the IF transformers (square cans) until the maximum reading is obtained on the output meter. If the output is considerably in excess of 15 volts reduce the oscillator output further.

The object of this is to operate at such a low level that the automatic volume control; the purpose of which is to maintain the signal level constant, does not operate; otherwise this adjustment will appear very broad and it will be impossible to obtain a true alignment of the IF transformers.

Now, remove the oscillator clip from the 6A7 grid and connect it to the antenna terminal marked A_1. Terminals A_2 and G must be connected together by jumper. Set the oscillator to 1400 k.c. (Three tall round cans located to the right of the tuning condenser are as follows: antenna coil, interstage RF, and Oscillator coil looking from front to rear of chassis.) If the received signal does not come in exactly at this frequency adjust the broadcast oscillator trimmer (trimmer projects through the upper hole in the side of the oscillator can) so that it does. Next adjust the trimmers on the antenna coil and the interstage RF coil (trimmers project through upper hole on right hand side of the antenna and RF coil cans) for maximum output as before. Now set the oscillator to 600 k.c., and tune this in on the receiver. Check for alignment by rotating the padding condenser screw (screw projects through the chassis directly to the left of the oscillator coil can) at the same time rocking the tuning condenser so as to obtain maximum output. Leave this padder set for maximum signal.

SHORT WAVE BAND: Turn the wave band switch to the left. If a short wave oscillator is not available, set the regular broadcast oscillator to 1000 k.c. If the harmonics are sufficiently powerful it should be possible to pick up a signal at points all along the dial one megacycle apart, as for example 6 m.c., 7 m.c., 8 m.c. and 9 m.c.

Tune in signal at approximately 14 m.c. and very carefully adjust the short wave trimmers on the antenna and RF coils (lower openings on right side of front and middle cans) for maximum output. Carefully retune the signal as a re-adjustment of the trimmers may shift the signal slightly on the dial.

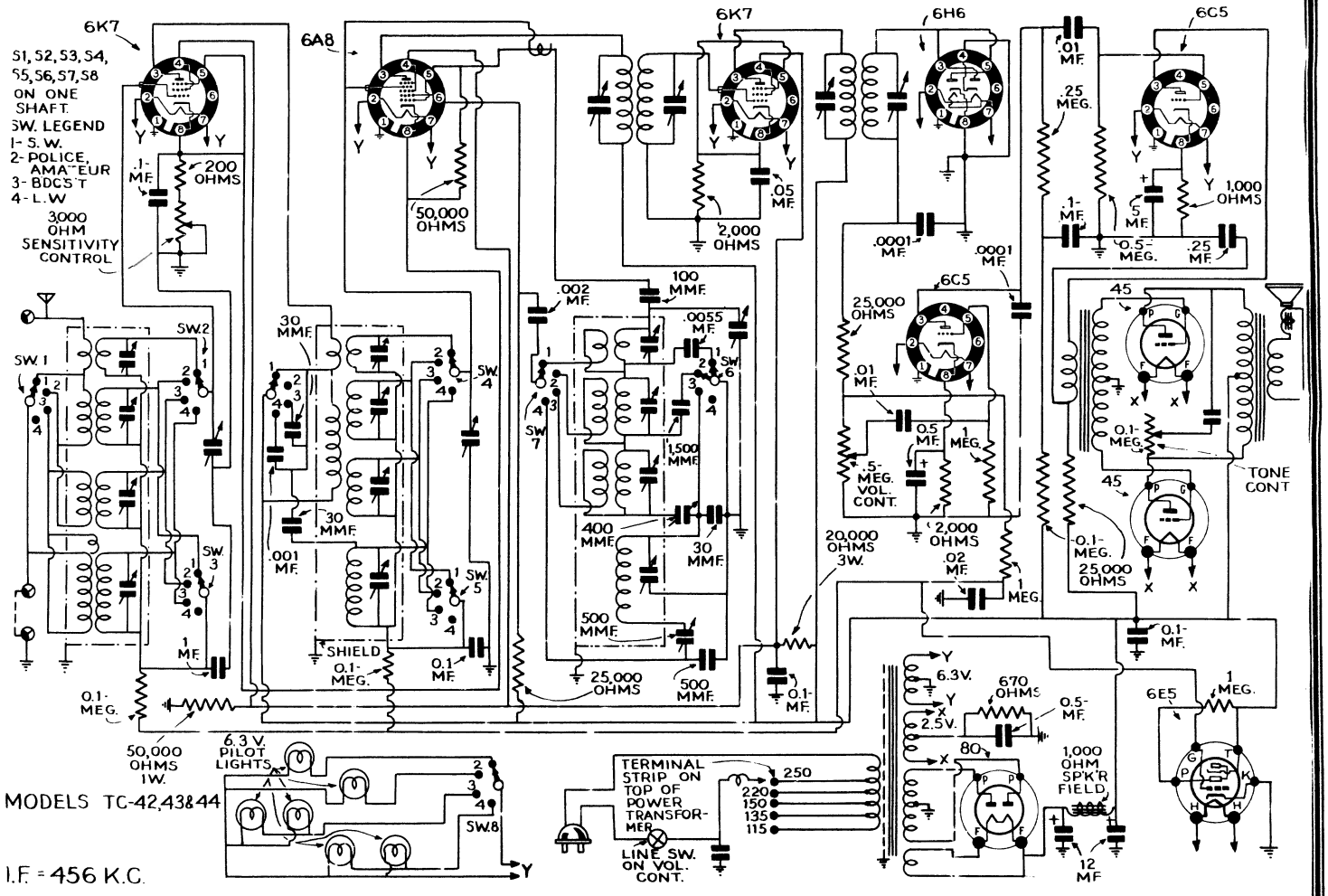
NOTE: In all the above adjustments it is imperative that the volume control be set near maximum and that the oscillator be reduced sufficiently so that no more than 15 volts output is obtained. If necessary set the oscillator some distance away and pick up the signal by means of a wire placed near it and connected to the receiver.

REPLACEMENT PART LIST

Description	Each List Price
Antenna Coupling Transformer	$2.12
RF Transformer	2.12
Oscillator	2.12
IF Transformer First or Second	2.08
12 Mfd. Wet Electrolytic Filter Condenser	1.52
Three Gang Tuning Condenser	4.28
Combination Volume Control and Switch	1.76
Tone Control	1.18
Power Transformer	7.52
Any Socket - Give tube Number	.10
Any Tubular Condenser - Give Value	.40
Any Moulded Condenser - Give Value	.18
Any Carbon Resistor - Give Value	.14
Band Selector Switch - Three gang	2.12
Dynamic Speaker	8.25
Padding Condenser - Single	.44

TRANSFORMER CORP. OF AMERICA

Models TC-42, TC-43 and TC-44



MODELS TC-42,43&44

I.F. = 456 K.C.

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A8). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side to the ground post. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no.1. The oscillator trimmer condenser is adjusted for maximum receiver output, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denote the trimmer for the no. 1 band.

5.2 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2. and the receiver and signal generator both set at 5.2 mc. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the rod painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5.2 mc. adjustment should then be rechecked. The 1.7 mc. padder is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one of the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

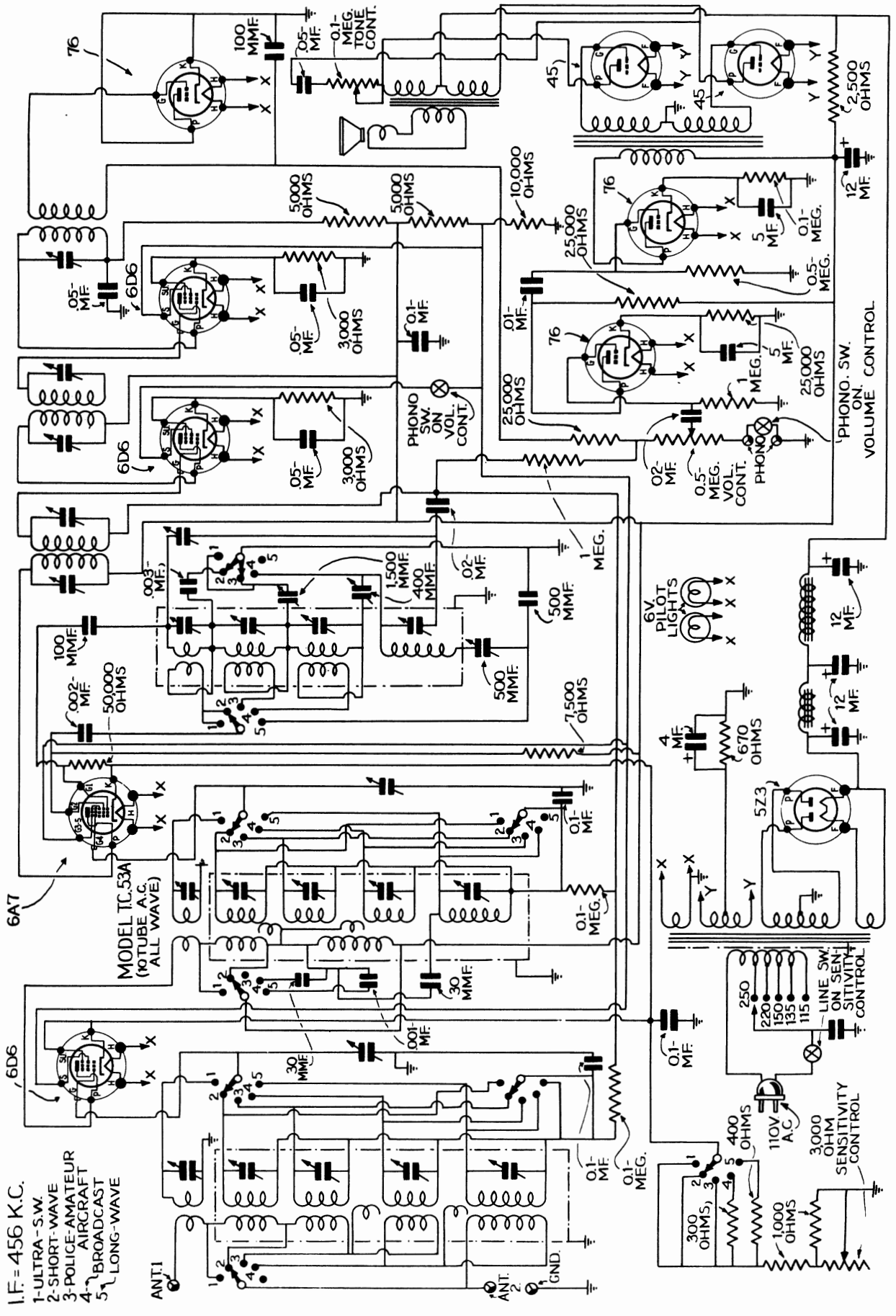
The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 140 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 kc. adjustment should then be rechecked. The 140 kc. padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

TRANSFORMER CORP. OF AMERICA

Model TC-53A



TRANSFORMER CORP. OF AMERICA

Model TC-60

SERVICE SUGGESTIONS

NOISY RECEPTION - Noisy reception may be checked by disconnecting the antenna from the receiver. If the noise stops or diminshes in volume it is an indication that the noise is being picked up by the antenna, and is not a fault of the set. However if this does not affect the noise it is an indication that it may be in the receiver and is usually caused by defective tubes and can be sometimes found by tapping lightly on the tubes or other parts of the receiver.

LOW VOLUME - This may be caused by weak or defective tubes (replace with set of tubes known to be in good condition), antenna may be in highly shielded location.

LOW VOLTAGE - Low voltage may be caused by defective 2525 rectifier shorted filter or bypass condenser, or low line voltage.

OSCILLATION - This may be caused by open bypass condenser in the I.F. or R.F. stages; Tube shields not making proper contact with their bases; grid wires out of their proper position.

HUM - This will never occur when the set is operating on D.C. If hum is encountered on A.C. it may be due to a bad 2525 tube. Open filter condenser (any one of the filter condenser being open would cause an excessive hum), or defective speaker field coil. The field coil is part of the filter system and shorted turns or grounded coil will cause hum. Shorted or grounded filter choke would cause similar trouble.

R.F. And I.F. ALIGNMENT - The trimmer on the tuning condensers and the I.F. are very accurately adjusted before the set leaves the factory and should require litter, if any adjustment. To check adjustments the following procedure should be adhered to:

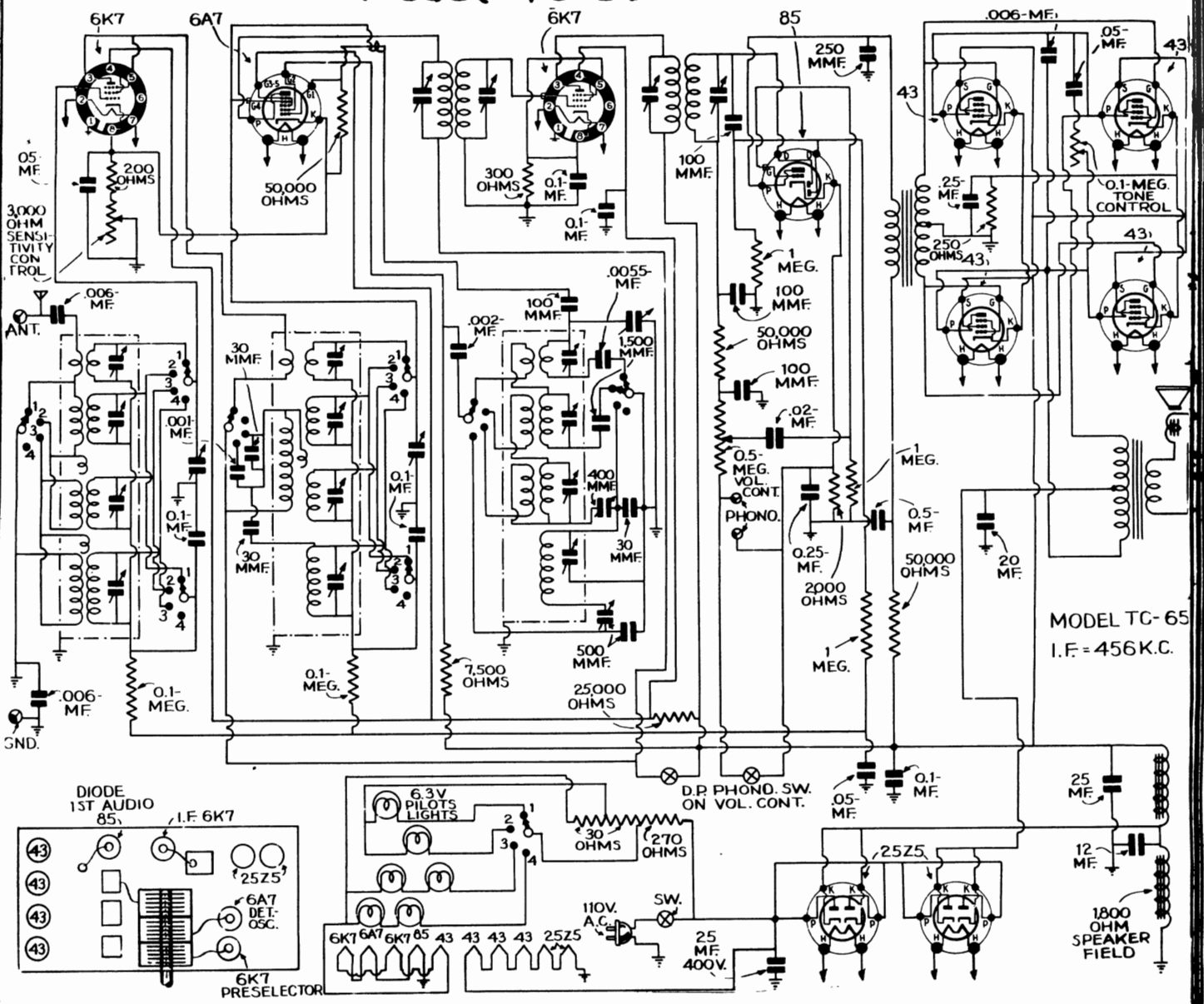
The action of the A.V.C. will defeat the purpose of an output meter if used in the normal manner. To obviate this, the oscillator output should be turned to as low a setting as will cause a reading on the output meter with the volume control on the set turned to maximum. This will allow the out meter to function correctly. Adjust the test oscillator to 456 K.C. and connect to the grid cap of the 6A7 tube and adjust the trimmers on the three I.F. stages. (There are two adjustments in each coil; a screw and a nut.)

R.F. ALIGNMENT-Connect oscillator to antenna wire on set and adjust oscillator to 1400 K.C. Set receiver dial to 1400 K.C. and wave band switch to the broadcast position. Adjust output of oscillator as outlined under I.F. alignment. Adjust trimmers on sections 1 and 2 for maximum output. Then adjust section 3 of the variable condenser for maximum output. The oscillator padder condenser is the center one of three located on the back of the chassis. In the event that the oscillator section does not track through the broadcast band; this trimmer should be adjusted.

No adjustments are necessary on the other wave bands. All the coils are correctly matched so that they will be in alignment if the above adjustments are correctly made.

TRANSFORMER CORP. OF AMERICA

Model TC-65



I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis.

16 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side to the ground post. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no.1. The oscillator trimmer condenser is adjusted for maximum receiver output, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denote the trimmer for the no. 1 band.

5.2 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2. and the receiver and signal generator both set at 5.2 mc. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5.2 mc. adjustment should then be rechecked. The 1.7 mc. padder is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one of the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

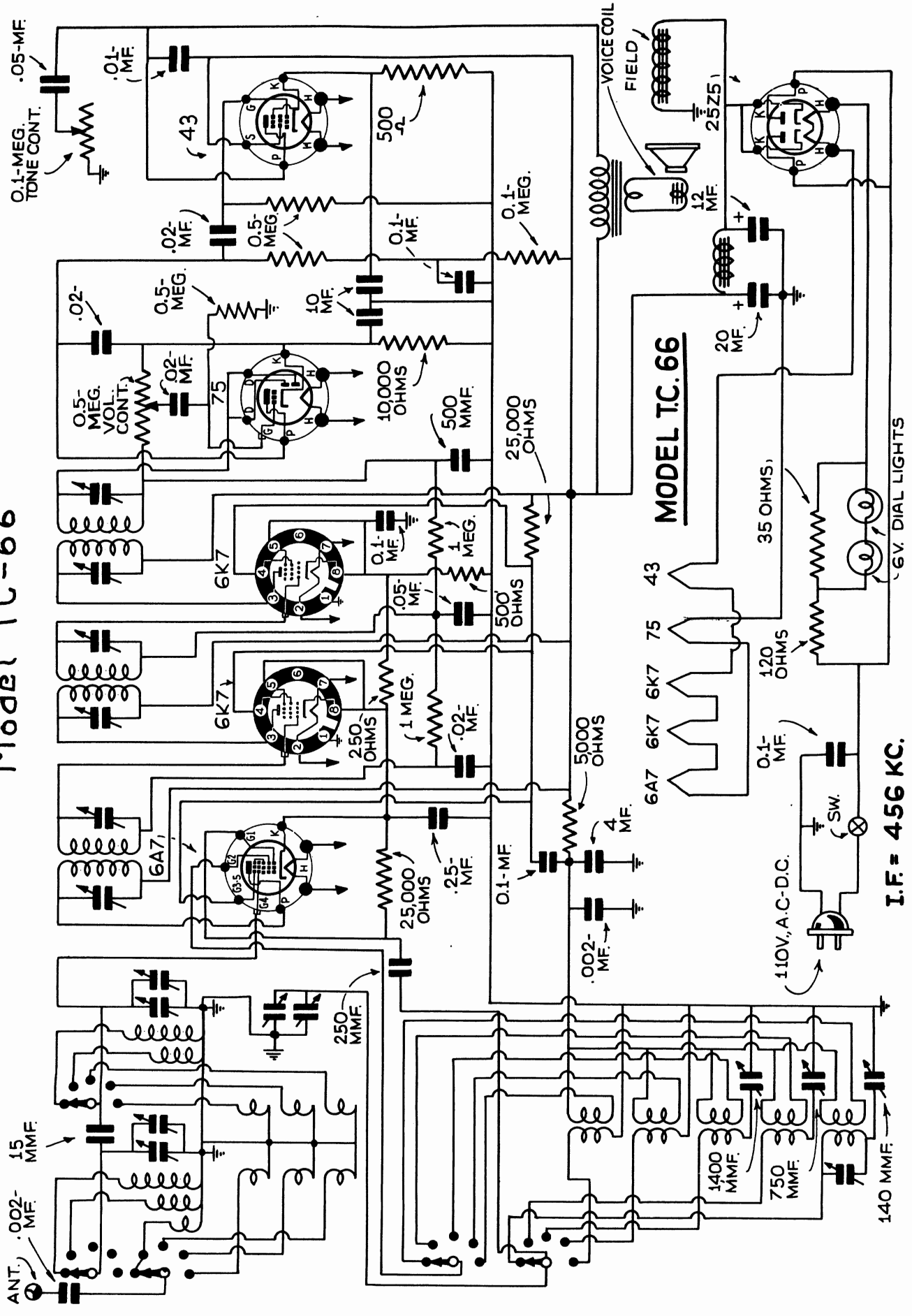
The signal generator is set at 140 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 kc. adjustment should then be rechecked. The 140 kc. padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

VOLTAGE TABLE

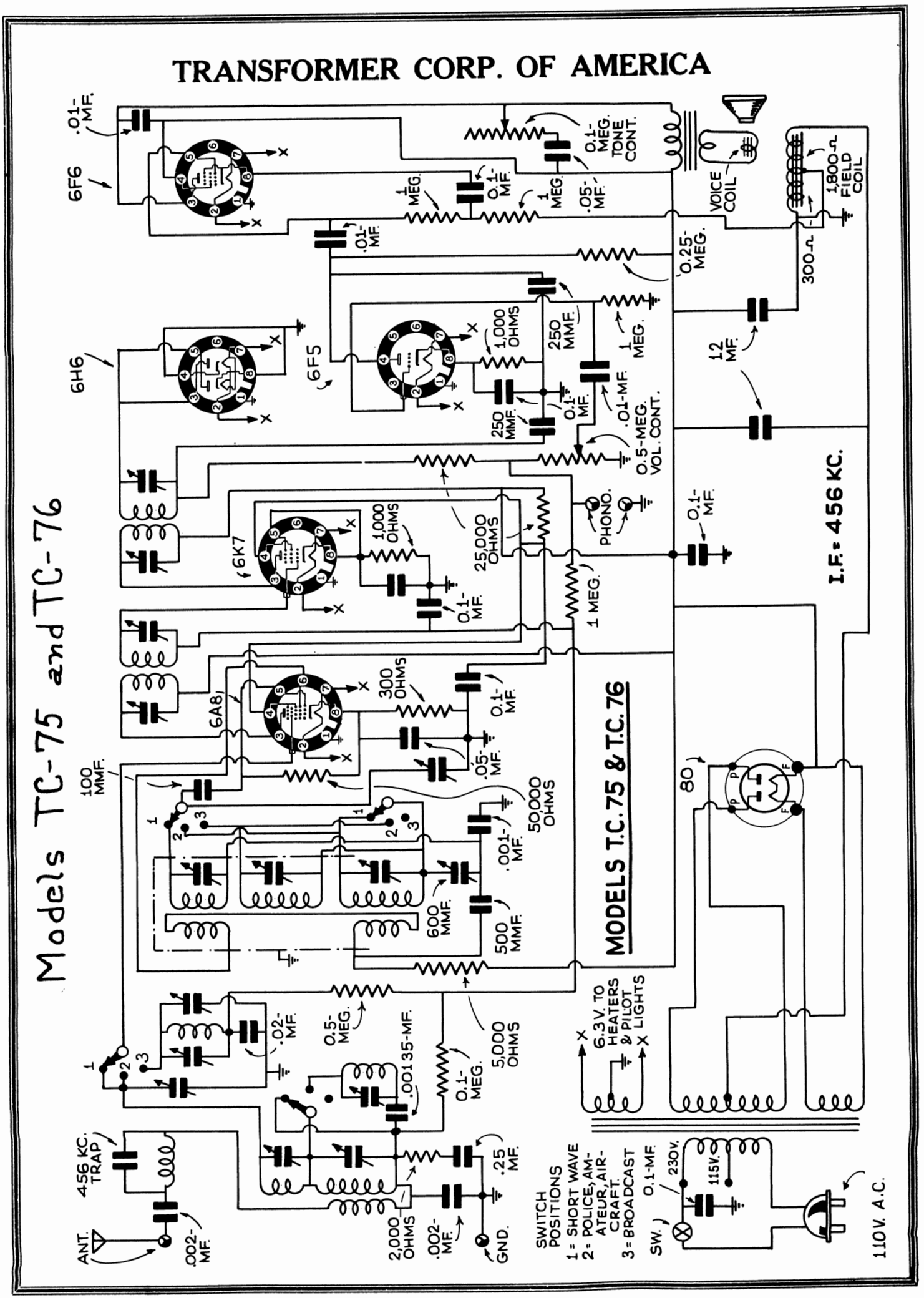
TUBE	FUNCTION	HEATER	SCR.	SUPPR.	OSC. PL.	CATH.	PLATE
6K7	Preselector	5.1	98.0	1.2		1.2	96.0
6A7	det.-osc.	4.8		100.0	78.0	1.2	196.0
6K7	1st. i.f.	5.0	187.0	8.0		8.0	187.0
85	det. audio	5.2				1.2	35.0
43							
43	audio output	21.0	98.0	14.0		14.0	120.0
43							
25Z5	rectifiers	24.0					112.0
25Z5							

All voltages are measured from socket terminals to chassis, while set is in operation and volume control is full on.

TRANSFORMER CORP. OF AMERICA



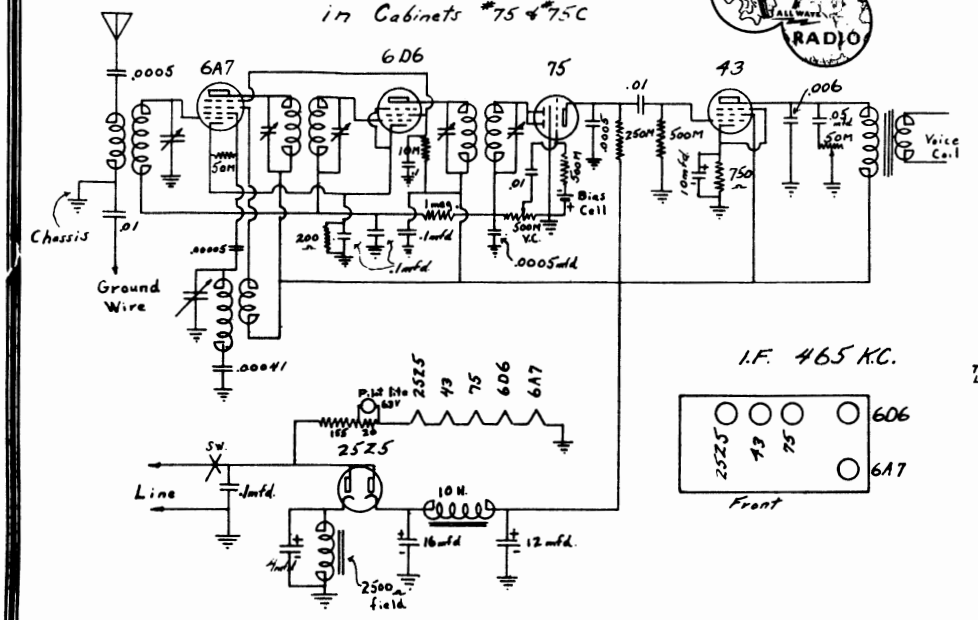
TRANSFORMER CORP. OF AMERICA



TROY RADIO MFG. CO.

TROY #175AC-DC

in Cabinets #75 & #75C



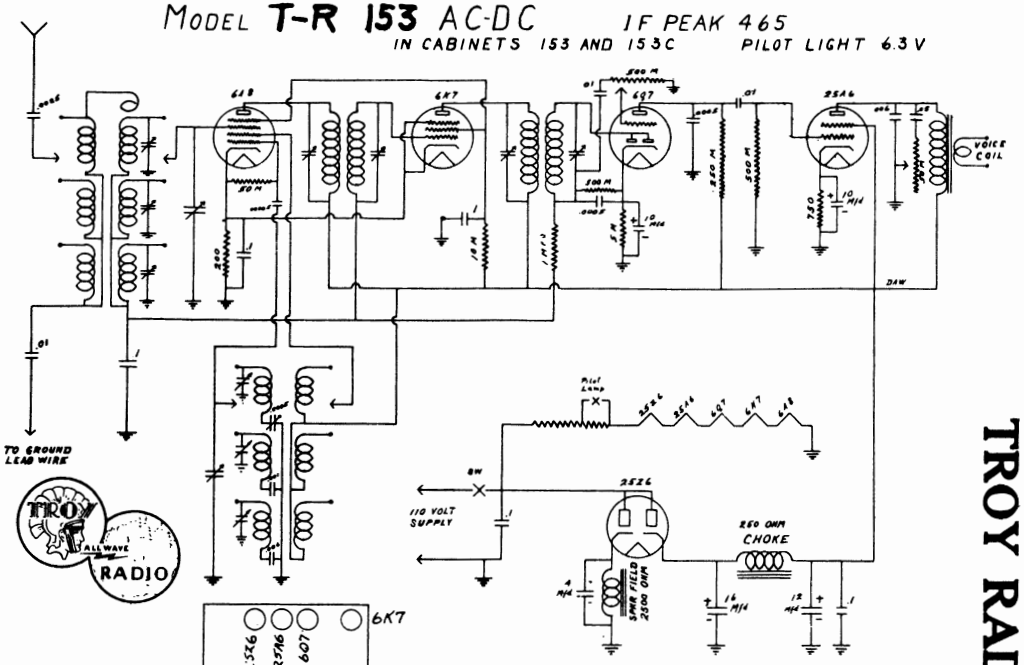
I.F. 465 K.C.

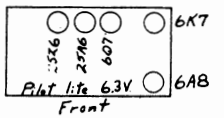
MODEL T-R 153 AC-DC

IF PEAK 465

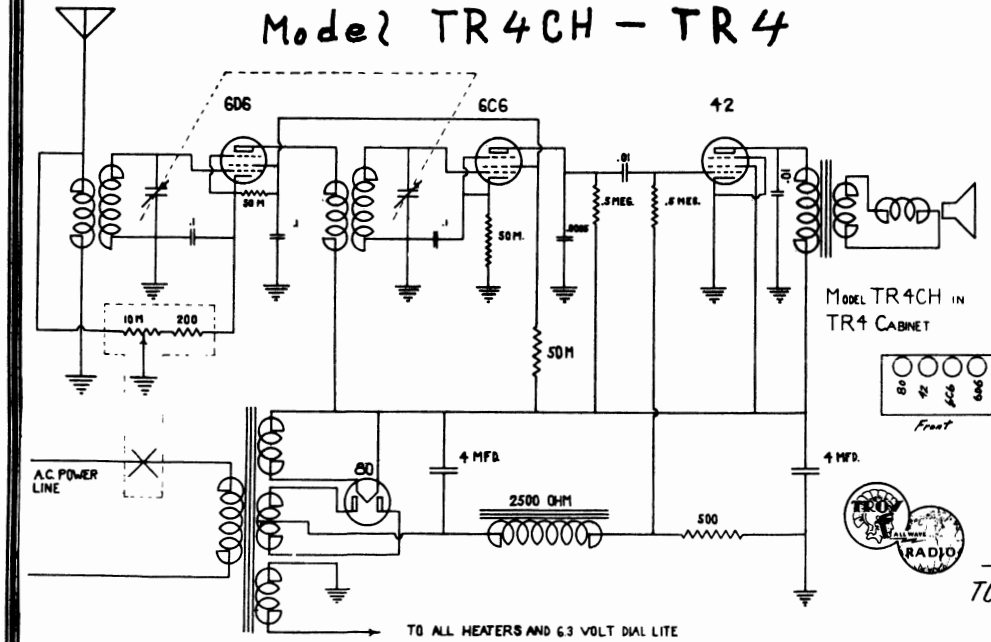
IN CABINETS 153 AND 153C

PILOT LIGHT 6.3 V

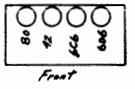


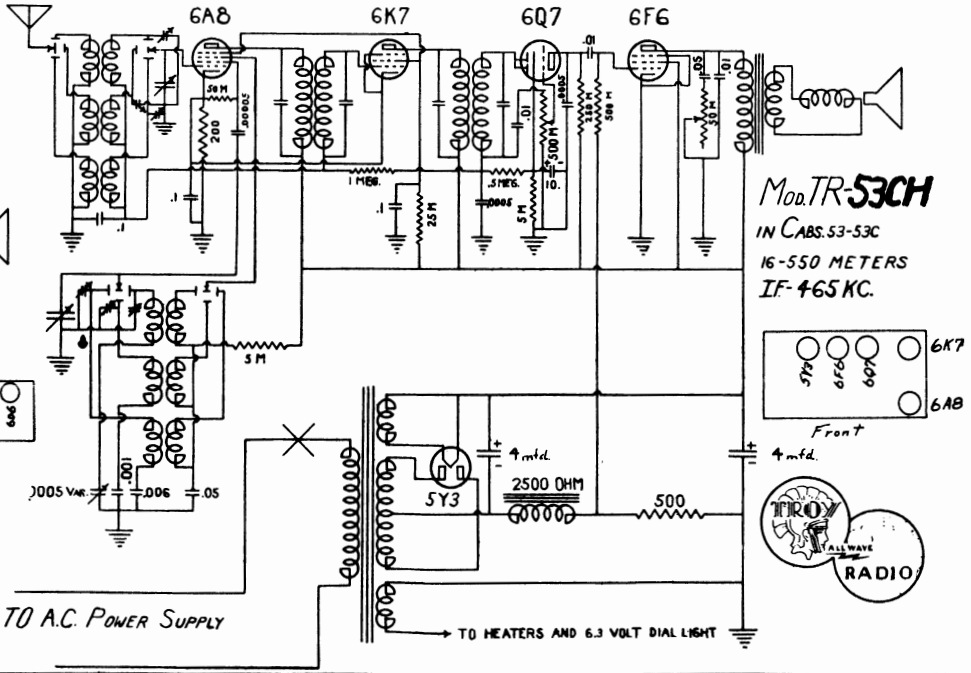


Model TR4CH – TR4



MODEL TR4CH IN TR4 CABINET





MOD. TR-53CH

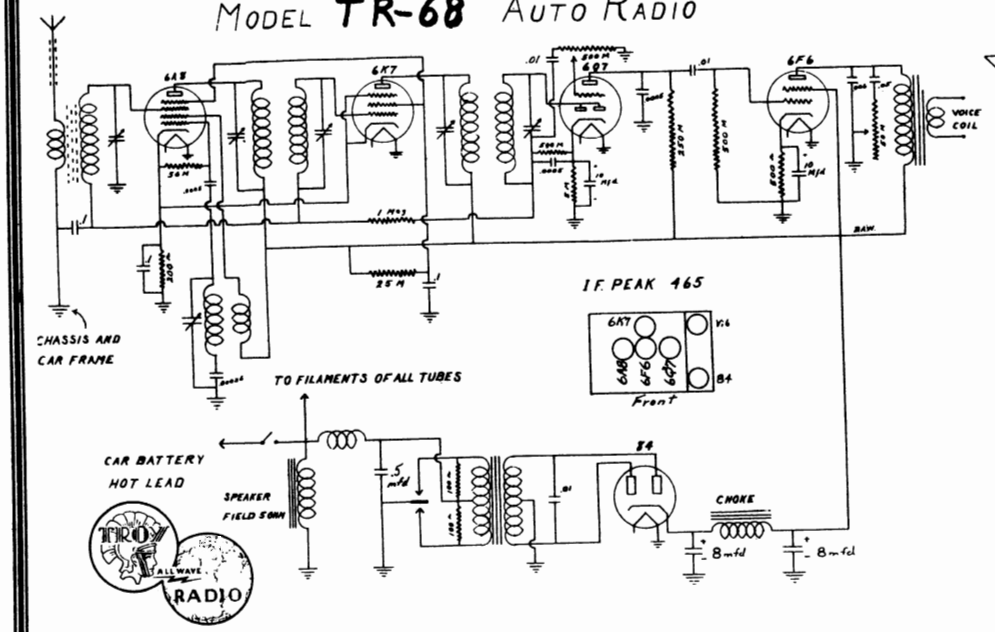
IN CABS. 53-53C

16-550 METERS

IF-465 KC.

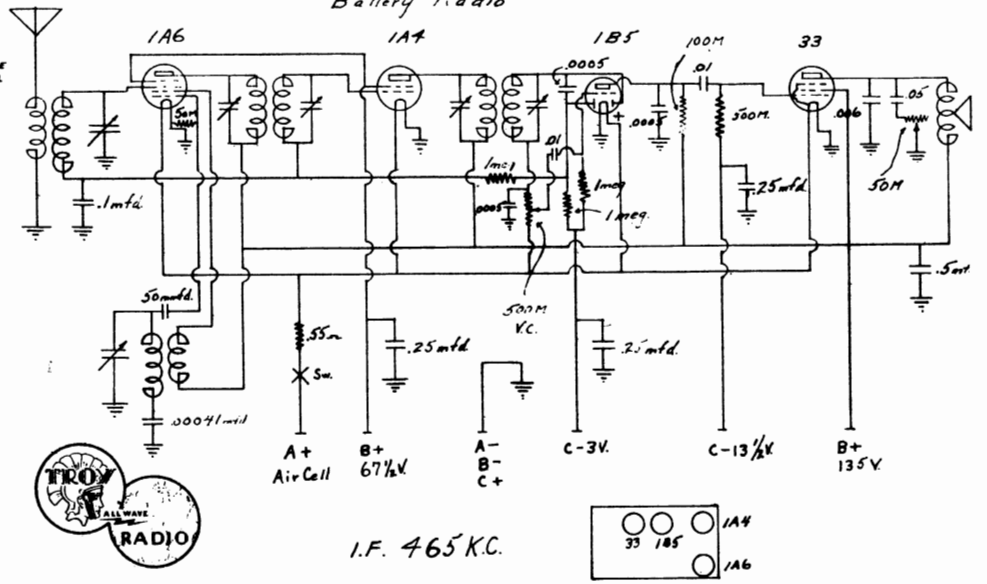
TROY RADIO MFG. CO.

MODEL TR-68 AUTO RADIO



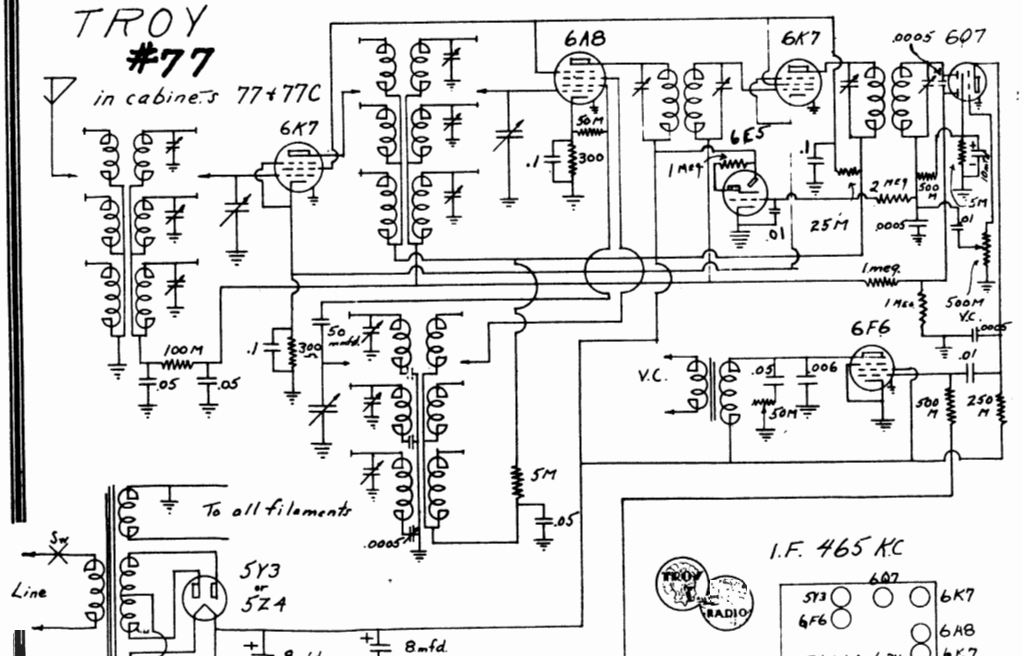
TROY #75B Battery Radio

in cabinets 75 & 75C

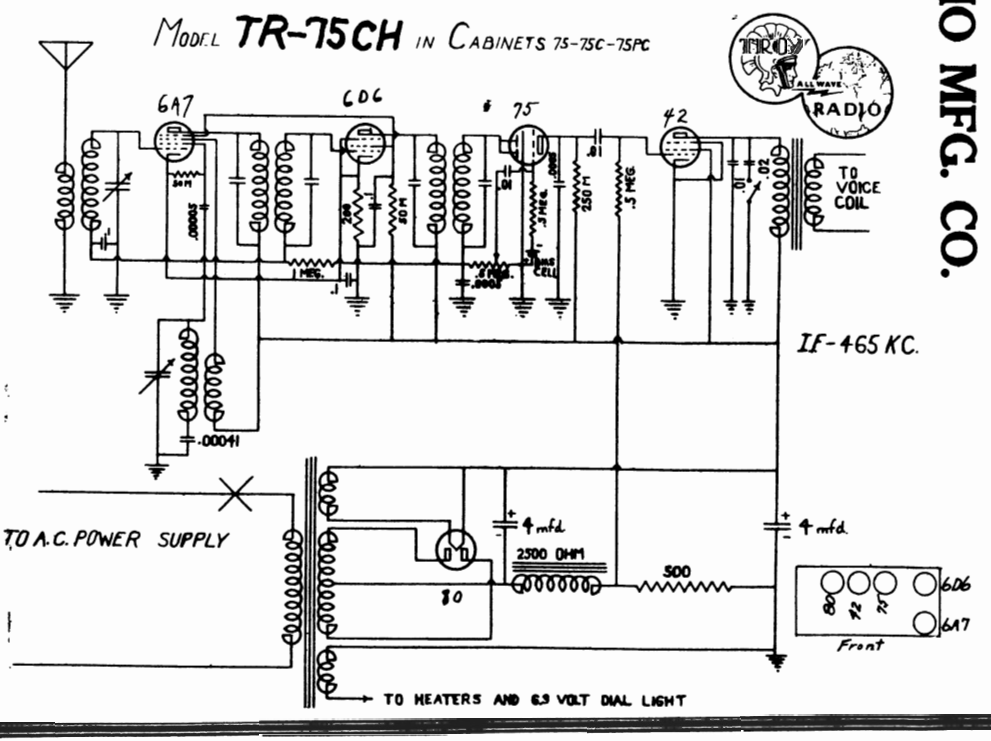


TROY #77

in cabinets 77 & 77C



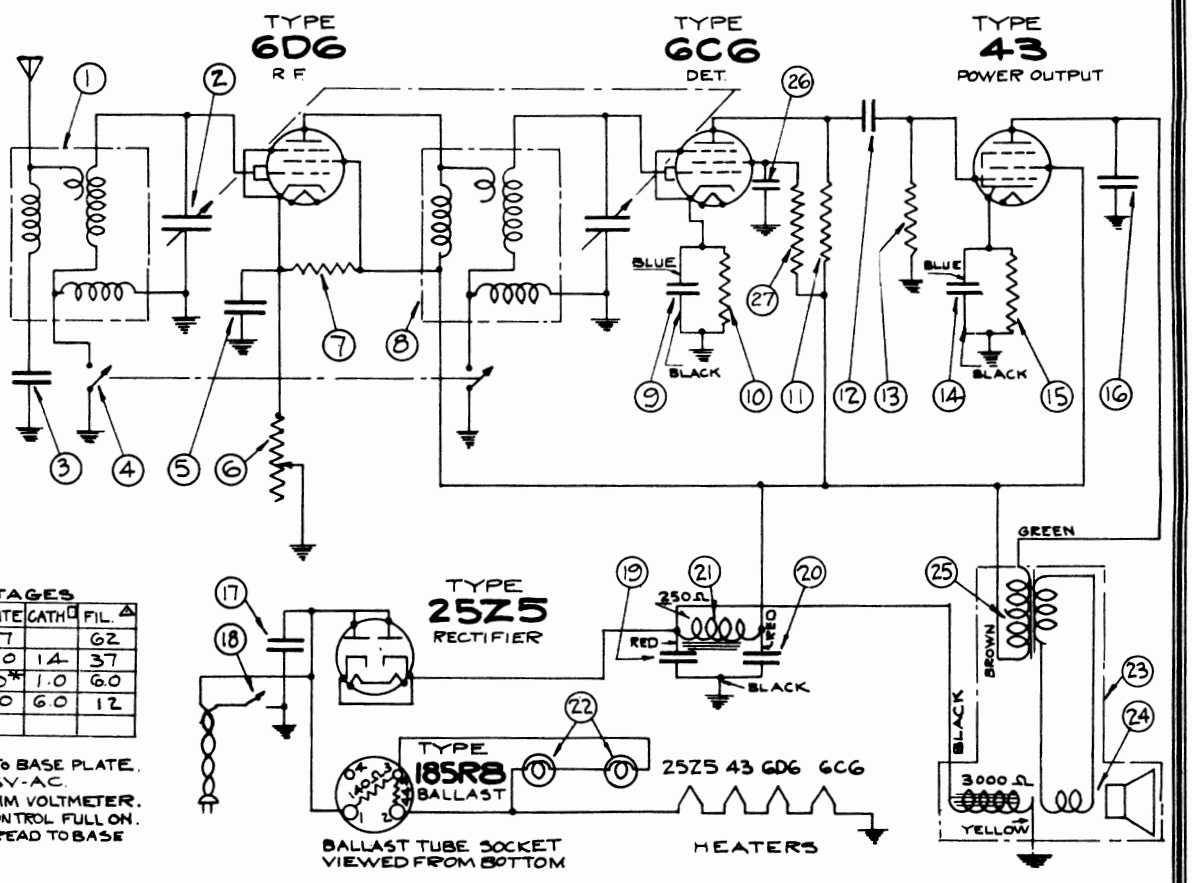
MODEL TR-75CH IN CABINETS 75-75C-75PC



UNITED AMERICAN BOSCH CORP.

MODEL 04

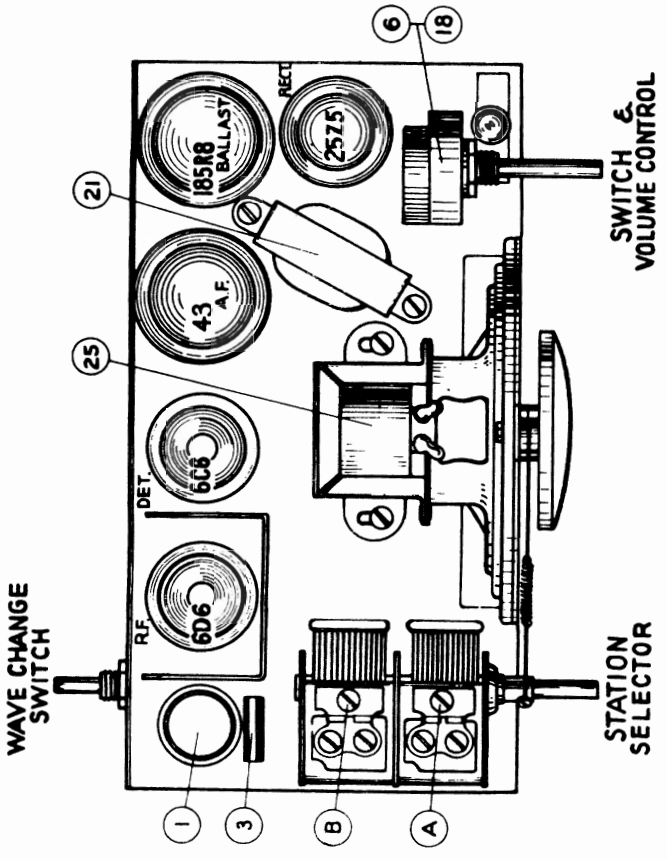
1	ANT COIL ASSY
2	VARI. COND (2 GANG)
3	COND. .01 400V
4	WAVE CHANGE SW
5	COND. .1 200V
6	VOL. CONT.
7	RES. 50,000 Ω ½W
8	R.F. COIL ASSY.
9	COND (ELECT) 5 MF. 35 P.V.
10	RES. 2500 Ω ¼W
11	RES. 500,000 Ω ¼W
12	COND. .01 400V
13	RES. 500,000 Ω ¼W
14	COND (ELECT) 3 MF. 35 P.V.
15	RES. 600 Ω 1W.
16	COND .01 400V
17	COND. .1 200V
18	SWITCH (ON-OFF)
19	COND (ELECT) 10 MF. 25 P.V.
20	COND (ELECT) 10 MF. 10 P.V.
21	CHOKE 250 Ω
22	LAMPS (2) 6-8V
23	SPEAKER.
24	DIAPHR. COIL ASSY
25	OUTPUT TRANS.
26	COND. .1 MF-200V.
27	RES. 500,000 Ω ¼W



SOCKET VOLTAGES

TUBE	STAGE	SCREEN	PLATE	CATH □	FIL △
25Z5	RECTIFIER		117		62
43	POWER OUTPUT	110	100	14	37
6C6	DET.	14	50*	1.0	6.0
6D6	R F	110	110	6.0	12

ALL VOLTAGES TAKEN TO BASE PLATE.
LINE VOLTAGE = 115V-AC.
* TAKEN WITH 600,000 OHM VOLTMETER.
□ TAKE WITH VOLUME CONTROL FULL ON.
△ FILAMENT VOLTAGES READ TO BASE PLATE.



The receiver uses a type 6D6 tube as an R.F. amplifier, a type 6C6 tube as the detector, a type 43 as a power output tube, a type 25Z5 as a rectifier, and type 185R8 as a ballast tube.

LINE-UP CAPACITOR ADJUSTMENTS

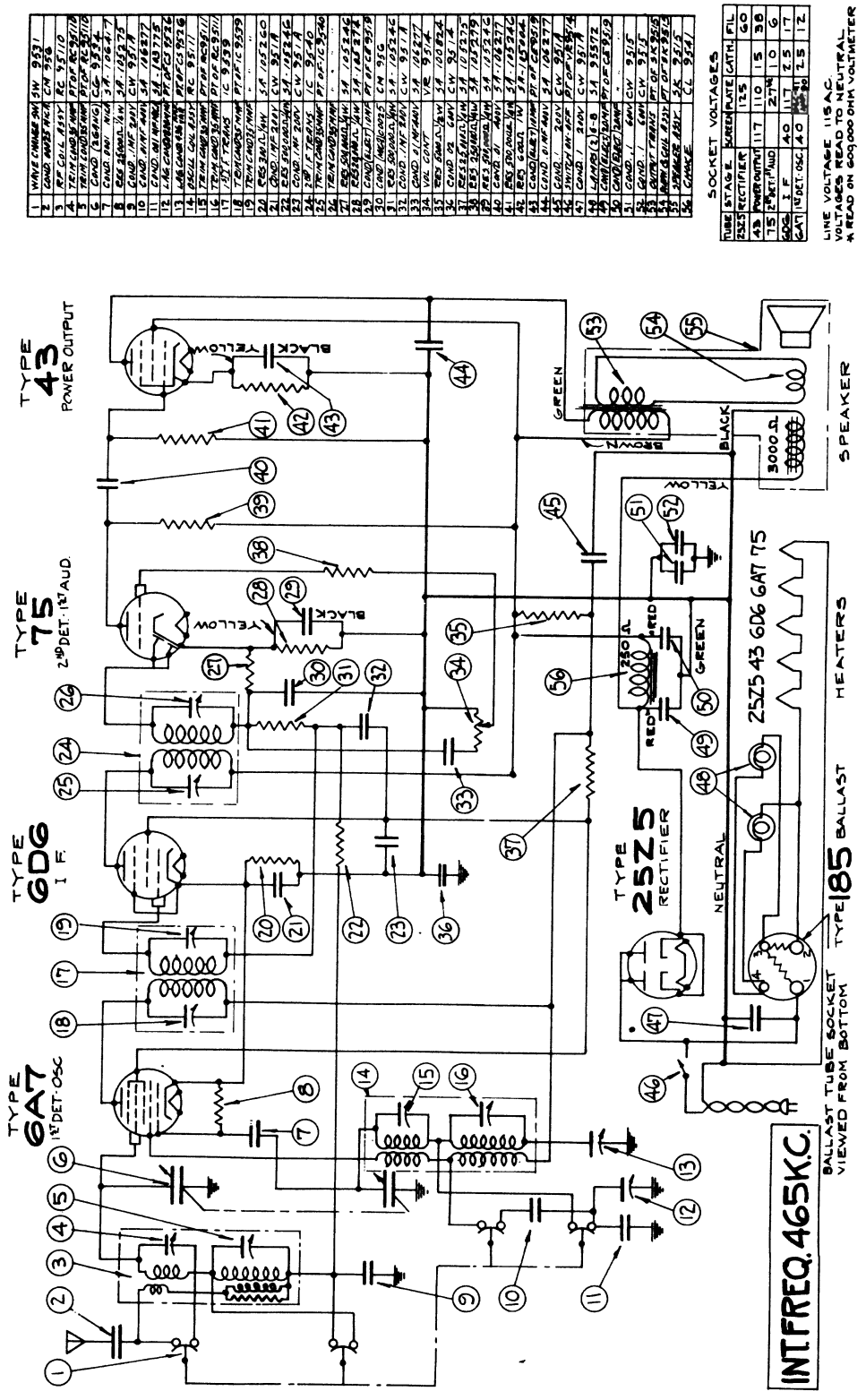
To align the circuits of this receiver, it is necessary only to adjust the two trimmer condensers located on top of the variable condenser gang. After the broadcast band has been properly adjusted, it is not necessary to make any further adjustment for the short-wave band. To align the broadcast band proceed as follows:

1. Turn volume control to maximum position and wave-change switch (located on rear of chassis) to the broadcast-band position.
2. Connect output meter to speaker voice coil terminals.
3. Set dial indicator and test oscillator to 1400 K.C. and apply test signal to antenna lead and frame of chassis.
4. Adjust trimmers "A" and "B" to maximum output.
5. Set dial indicator and test oscillator to 600 K.C. and check sensitivity.
6. Set wave-change switch to short-wave position.
7. Set dial indicator and test oscillator to 4500 K.C. and check sensitivity.
8. Set dial indicator and test oscillator to 1600 K.C. and check sensitivity.

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH RADIO MODEL 05

Five-Tube, Two Band, AC-DC, Superheterodyne Receiver



1	WIRE CHASSIS ANT	SW 9551
2	COND ANT. TRIM	CM 9516
3	RF COIL ASSY	RC 95110
4	TRIM COND OSC	PT OF RC95110
5	TRIM COND ANT	PT OF RC95110
6	COND. GANG	CG 95112
7	COND. OSC. PADD	SM. 105277
8	RES 350Ω ½ WW	SM. 105275
9	COND. I MF 2ND	CW 9517
10	COND. I MF ANT	SM. 106377
11	COND. OSC TRIM	SM. 106378
12	OSC CONDENSER	PT OF CG 9512
13	ANT CONDENSER	PT OF CG 9512
14	COIL OSC ASSY	RC 9511
15	TRIM COND OSC	PT OF RC9511
16	TRIM COND ANT	PT OF RC9511
17	SET TRIMS	PT OF IC 9539
18	TRIM CONDENSER	PT OF IC 9539
19	TRIM COND TRIM	PT OF IC 9539
20	RES 3M Ω ½W	SM. 105260
21	COND I MF 2ND	CW 9517
22	COND VOL CONTROL	SM. 106246
23	COND VOL CONTROL	SM. 106246
24	1ST I.F. TRANS	CW 9517
25	TRIM COND SCREW	PT OF CG 9520
26	TRIM COND SCREW	PT OF CG 9520
27	RES 50,000Ω ½W	SM. 105246
28	RESISTANCE ½W	SM. 105274
29	COND I MF 2ND	PT OF CG 9519
30	COND MEDIUM 2	CM 9516
31	RES 800Ω ½W	SM. 105246
32	COND I MF 2ND	CW 9517
33	COND 2 MF ANT	SM. 106227
34	VOL CONT	VR 9514
35	RES 8M Ω ½W	SM. 100824
36	COND 02 GANG	CW 9514
37	RESISTANCE ½W	SM. 105235
38	RES 150,000Ω ½W	SM. 105279
39	RES 1M Ω ½W	SM. 105272
40	RES 50,000Ω ½W	SM. 105272
41	RES 6,000Ω ½W	SM. 105246
42	COND (ELECTROLYTIC)	PT OF CE 9519
43	COND ANT. TRIM	PT OF CG 9513
44	COND ANT. TRIM	PT OF CG 9513
45	COND. I GANG	CW 9515
46	SWITCH ON OFF	SM. 106377
47	COND. I GANG	CW 9514
48	LAMP (2) 6-8	SM. 95572
49	CONDENSER BANK	PT OF CE 9519
50	COND ELECT BANK	-
51	COND. I GANG	CW 9515
52	COND. I GANG	CW 9515
53	OUTPUT TRANS	PT OF SK 9515
54	NAME & DIAL ASSY	PT OF SK 9515
55	SPEAKER ASSY	SK 9513
56	CHOKE	CC 9511

SOCKET VOLTAGES

TUBE	STAGE	SCREEN	PLATE	CATH.	FIL.
2525	RECTIFIER		125		60
43	POWER OUTPUT	117	110	15	38
75	2ND DET. 1ST AUD.		274	10	6
6D6	I F	40	117	2.5	17
6A7	1ST DET. OSC.	40	85 to 90	2.5	12

LINE VOLTAGE 115 A.C.
VOLTAGES READ TO NEUTRAL
* READ ON 60,000 OHM VOLTMETER

GENERAL DESCRIPTION

The Model 402 is a five tube, A.C. - D.C., superheterodyne receiver whose circuits consist of a combined first detector-oscillator, a stage of intermediate frequency amplification, a combined second detector - automatic volume control and audio amplifier, a power output stage and a rectifier.

Model 402 Ed. 2 varies from Model 402Ed. 1 in that it is equipped with a police band.

Model 402 Ed.3 varies from Model 402 Ed. 2 in that the dial light is connected in the low side of the plate circuit instead of the filiment circuit. This will prevent high voltage on the dial light when the receiver is first turned on, for the dial light will not light until the tubes heat up and start to operate. Should any short occur in the plate circuit the dial light will act as a fuse and burn out thus protecting the rectifier tube.

The Model 402 Ed. 1 is designed to operate on frequencies from 550 to 1750 K.C.

The Models 402 Ed. 2 & 3 are designed to operate on the frequencies from 550 to 1750 K.C. and from 2400 to 2500 K.C.

VOLTAGE READINGS

NOTE: Since no circuits are directly connected to the metal chassis as in the usual A.C. radio sets, it is necessary to measure voltages to the negative side of the circuit designated as "Z" on the wiring diagram. A high resistance voltmeter must be used or readings will be inaccurate.

The following voltage readings were taken with the receiver supplied by 115 volts 60 cycle alternating current. Voltage readings will be slightly lower when D.C. is used and will vary with the type of meter used.

I. - A.C. MEASUREMENT

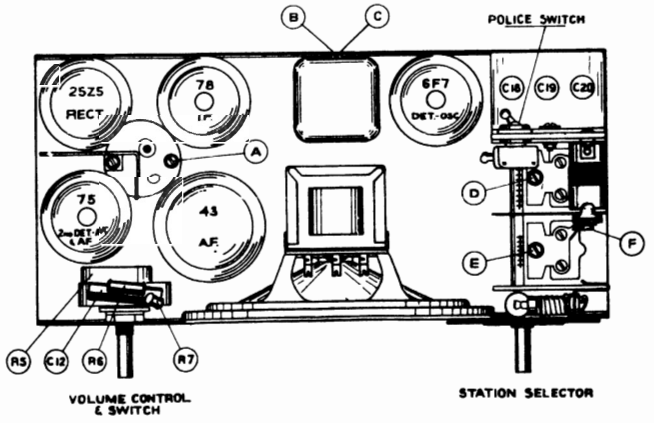
Stage	Tube	Filament	Plate	Screen	Cathode
1st Detector	6F7	6.0	115	115	12
Oscillator	-	-	115	-	-
I.F.	78	6.0	115	115	2.8
2 Det.-A.V.C.-A.F.	75	5.9	30	-	0.7
Power	43	22	115	115	17
Rectifier	25Z5	25	125	-	-

Line Voltage	115	Resistor Strip Volts	47
Power in Watts	47	Dynamic Field	108 Volts
Dial Lamp Volts	6.0	Filter Choke Drop	8.8 Volts

II. - D.C. MEASUREMENT

Stage	Tube	Filament	Plate	Screen	Cathode
1st Detector	6F7	6.2	102	102	8.7
Oscillator	-	-	102	-	-
I.F.	78	5.9	102	102	2.5
2 Det.-A.V.C.-A.F.	75	5.8	27	-	0.6
Power	43	24	102	102	13
Rectifier	25Z5	27	110	-	-

Line Volts	115	Resistance Strip Volts	47
Dial Lamp Volts	6	Dynamic Field Volts	115



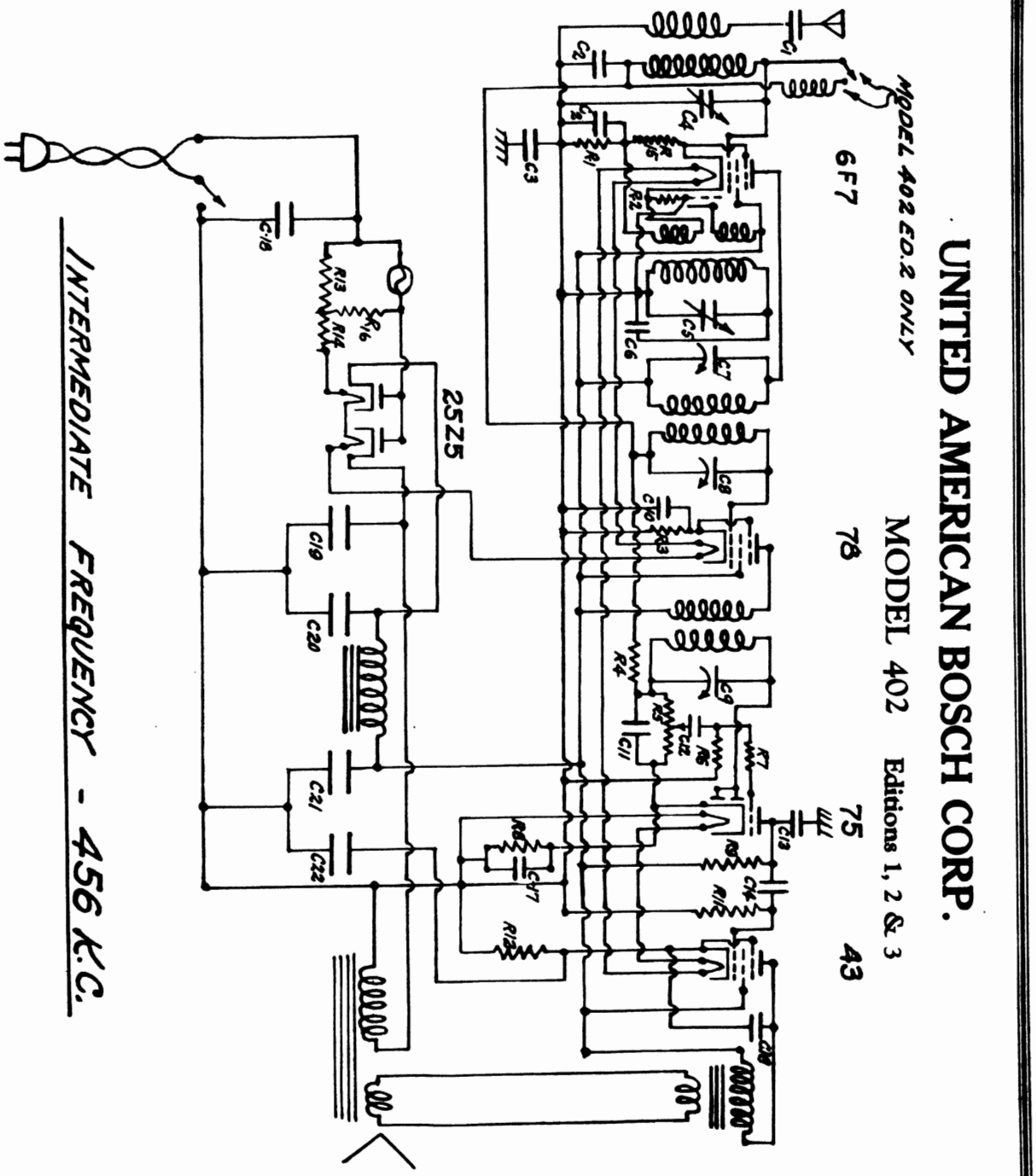
UNITED AMERICAN BOSCH CORP.

MODEL 402 ED.2 ONLY

MODEL 402 Editions 1, 2 & 3

6F7 78 75 43

25Z5



INTERMEDIATE FREQUENCY - 456 K.C.

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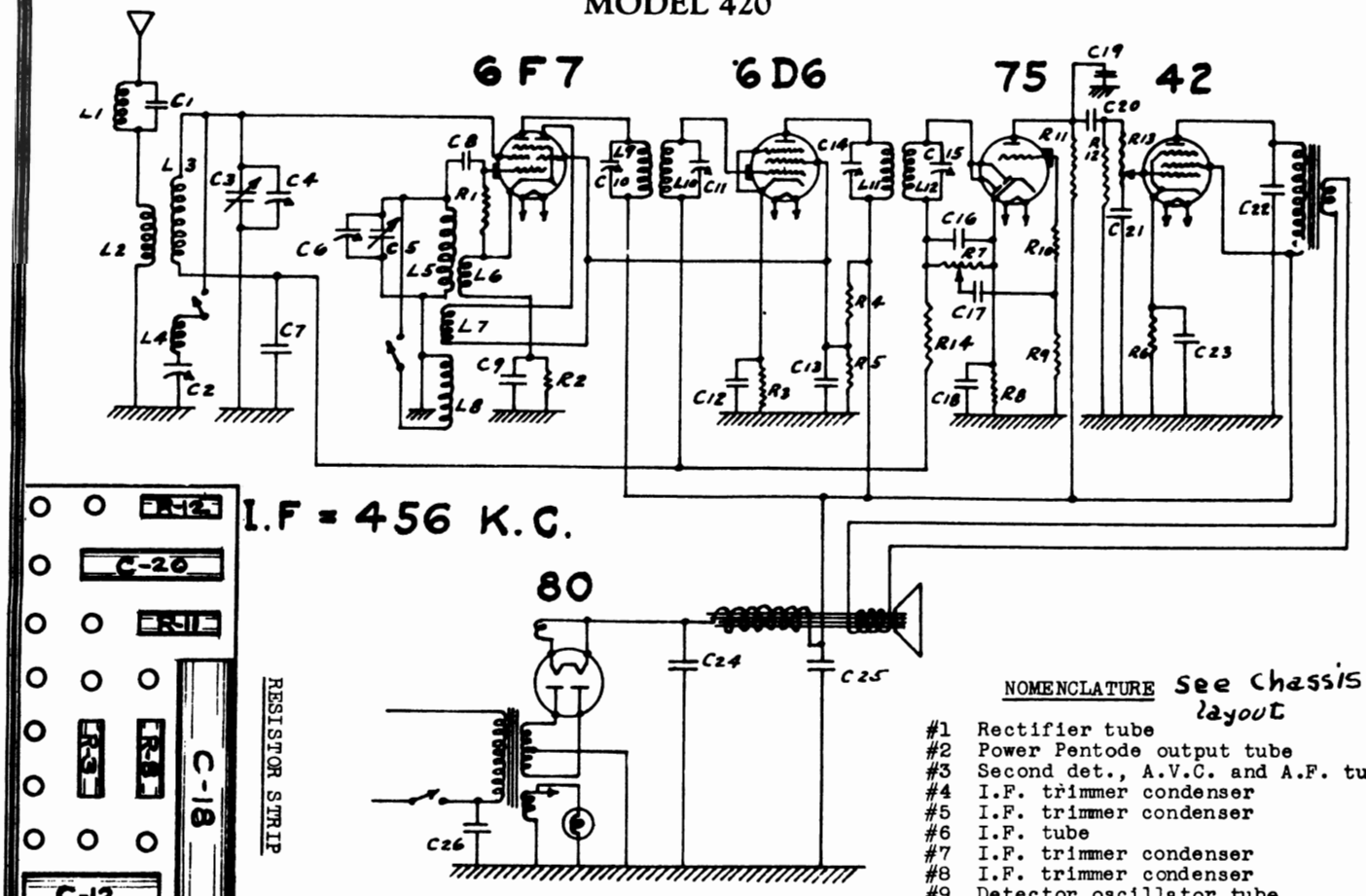
MODEL 420



NOMENCLATURE See Chassis layout

#1 Rectifier tube
#2 Power Pentode output tube
#3 Second det., A.V.C. and A.F. tube
#4 I.F. trimmer condenser
#5 I.F. trimmer condenser
#6 I.F. tube
#7 I.F. trimmer condenser
#8 I.F. trimmer condenser
#9 Detector oscillator tube
#10 Oscillator trimmer condenser
#11 Antenna trimmer condenser
#12 Police Band Lag. condenser

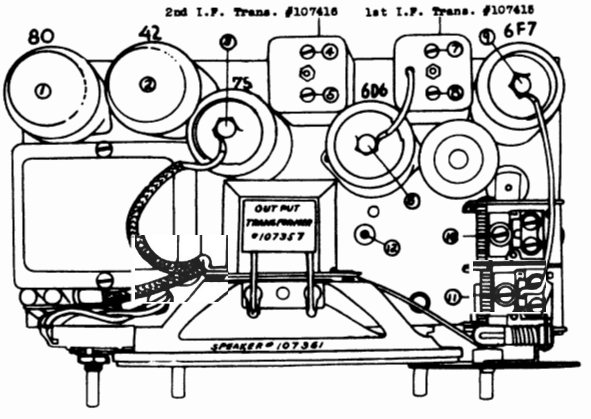
ELECTRICAL VALUES

R1	100,000 - 1/4 W	105278	C3	Variable gang)		C21	.001 mf 500 V	106403
R2	3,000 - 1/4 W	105271	C4	condenser)	107445	C22	.01 mf 350 V	102500
R3	500 - 1/4 W	105264	C5	with)		C23	10 mfd. 25 V)	
R4	12,000)		C6	trimmers)		C24	8 mfd. 475 V)	107288
R5	13,000)	107291	C7	.05 mf - 200 V	106386	C25	8 mfd. 450 V)	
R6	600)		C8	.0001 mf mica	101143	C26	.01 mf 500 V	107615
R7	500,000 variable	107253	C9	.05 mf 200 V	106386	L1	Wave trap	107434
R8	2,000 - 1/4 W	105245	C10	Part of	107415	L2	Antenna)	
R9	1 meg. 1/4 W	105281	C11	Part of	107415	L3	Coil)	107414
R10	100,000 - 1/4 W	105278	C12	.05 mf 200 V	106386	L4	assembly)	
R11	100,000 - 1/4 W	105278	C13	.05 mf 200 V	106386	L5	Oscillator)	
R12	1/4 meg - 1/4 W	105279	C14	Part of	107416	L6	coil)	107413
R13	1/4 meg - tone cont.	107251	C15	Part of	107416	L7	assembly)	
R14	1/2 meg - 1/4 W	105246	C16	.0001 mf. mica	106417	L8	)	
C1	.0005 mf. mica- part		C17	.005 mf 350 V	103659	L9	1st I. F.)	107415
	of	107434	C18	.5 mf 200 V	102499	L10	assembly)	
C2	295-525 mmf	107289	C19	.002 mf. 500 V	103852	L11	2nd I.F.)	107416
			C20	.005 mf. 350 V	103659	L12	assembly)	

SOCKET VOLTAGES

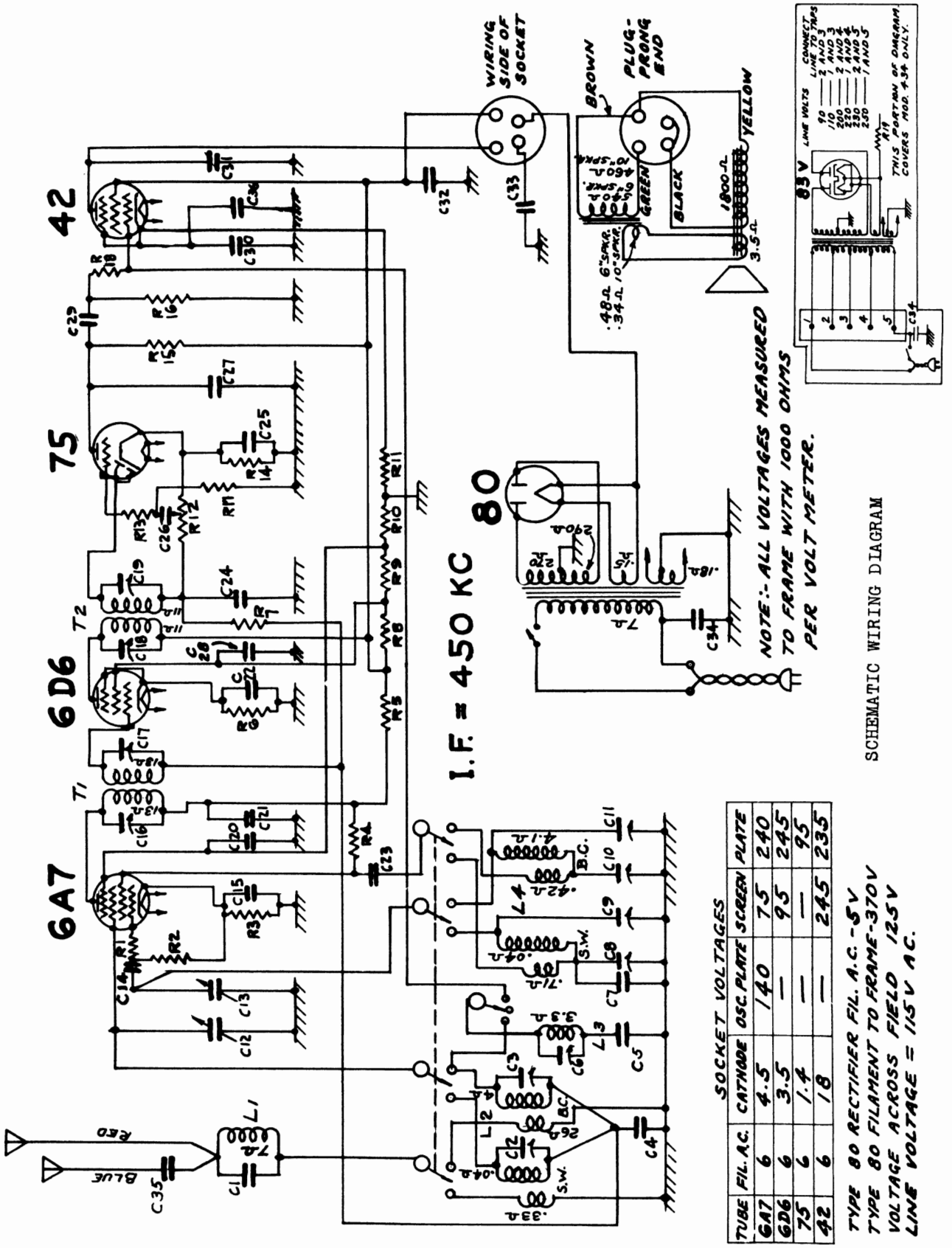
Tube	Stage	Fil.	Plate	Screen	Cathode
80	Rectifier	4.9	377		
42	Power output	6.2	253	268	19.4
75	2nd det. AVC. & A.F.	6.2	145		1.28
6D6	I. F.	6.2	268	110	4.8
6F7	1st det.	6.2	265	108	12.3
	Oscillator		108		

Line voltage = 111



UNITED AMERICAN BOSCH CORP.

Model 430



SOCKET VOLTAGES

TUBE	FIL. A.C.	CATHODE	OSC. PLATE	SCREEN	PLATE
6A7	6	4.5	140	75	240
6D6	6	3.5	—	95	245
75	6	1.4	—	—	95
42	6	18	—	245	235

TYPE 80 RECTIFIER FIL. A.C. -5V
TYPE 80 FILAMENT TO FRAME-370V
VOLTAGE ACROSS FIELD 125V
LINE VOLTAGE = 115V A.C.

UNITED AMERICAN BOSCH CORP.

Model 430

MODEL 430 AMERICAN-BOSCH RADIO RECEIVER

CIRCUIT DESCRIPTION

The American-Bosch Model 430 is a five tube, three band superheterodyne receiver. The tuning range of this receiver covers a broadcast band extending from 540 to 1750 kilocycles, which includes one band of police frequencies, a higher frequency police band of 2400 to 2600 k.c. and a short wave broadcast band extending from 5900 to 18,200 kilocycles.

The circuit consists of a combined detector oscillator (type 6A7); an intermediate frequency amplifier (type 6D6) including four tuned I. F. circuits of the "High Q" type; a combined second detector, A.V.C. and audio stage (type 75) and a power output pentode (type 42).

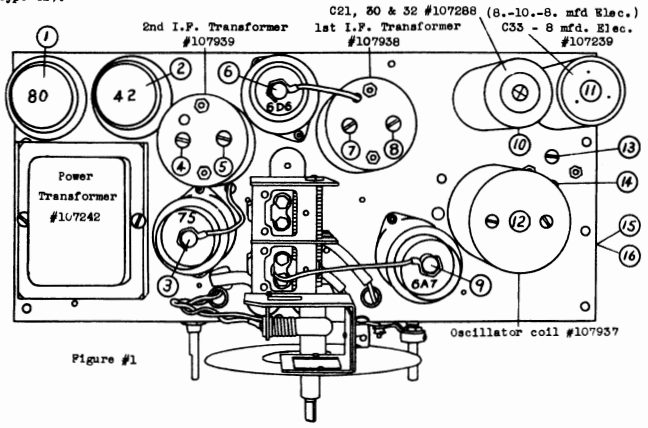


Figure #1

NOMENCLATURE

#1 - Rectifier tube
#2 - Power output tube
#3 - 2nd detector A.V.C. and A.F. tube
#4 - 2nd I.F. trimmers
#5 - 2nd I.F. trimmers
#6 - I.F. tube
#7 - 1st I.F. trimmers
#8 - 1st I.F. trimmers
#9 - 1st detector tube
#10- Dry electrolytic condenser
#11- Wet electrolytic condenser
#12- Oscillator coil assembly
#13- B.B. oscillator trimmer
#14- S.W. oscillator trimmer
#15- B.B. oscillator lag. (top)
#16- S.W. oscillator lag. (bottom)
#17- B.B. antenna trimmer (Fig. #2)
#18- S.W. antenna trimmer (Fig. #2)
#19- P.B. trimmer (Fig. #2)

ALIGNING INSTRUCTIONS

To align the Model 430 chassis, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R. F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function, making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in Figures #1 and #2 and should be carefully studied before the actual work is started.

ALIGNING THE I.F. 450 K.C.

1. Set volume control on full.
2. Set tone control (lower center knob) at center position or treble.
3. Connect output meter across voice coil of loud speaker (speaker impedance is 3.5 ohms).
4. Connect in series with high side of the test oscillator output leads a blocking condenser of at least .25 mfd. Set test oscillator to 450 kilocycles and adjust its output to produce a measurable reading on output meter when test oscillator is connected between frame of chassis and grid of 6D6 I.F. amplifier tube #6.
5. Adjust #4 and #5 to maximum output, reducing test oscillator output as stage is brought into resonance.
6. Connect test oscillator to grid of 6A7, 1st detector (#9) and adjust #7 and #8 to maximum output.

ALIGNING B.C. OSCILLATOR AND R.F.

1. Set wave change switch to broadcast scale position.
2. Set test oscillator to 1500 K.C. and connect to grid of 1st detector tube 6A7 (#9).
3. Set dial scale to maximum mark beyond 540 K. C. calibration point when the gang is entirely closed.
4. Set dial scale at 1500 K.C. and adjust #13 to maximum output.
5. Connect test oscillator to antenna through a .0002 mfd. condenser and with scale still set at 1500 K.C. adjust condensers #13 and #17 to maximum output.
6. Set scale and test oscillator to 550 K. C. and adjust #15 simultaneously changing this adjustment and the station selector of the chassis for maximum output. This type of adjustment is known as "max-max" and is obtained in the following manner:

   Tune receiver with left hand by means of tuning knob and adjust #15 in either direction and then without changing it, tune the receiver through a maximum, noting the value of output meter reading. Change #15 further in same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of #15, continue this type of trial and error adjustment until no further improvement can be made when either tuning control or #15 are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few moments.

7. With test oscillator and scale set at 1500 K.C. readjust #13 and #17 since previous operations may have altered oscillator trimmer setting.
8. Check sensitivity across band.

ALIGNING POLICE BAND

1. Set combination tone control - police band - switch (lower center knob) on first or left hand position.
2. Leave wave change switch in standard broadcast position.
3. Set dial scale at 1500 K.C. (this is reception point for 2400 K.C. on range marked "police switch").
4. Set test oscillator to 2400 K.C. and tune in signal with station selector.
5. Adjust trimmer condenser #19 to maximum output.

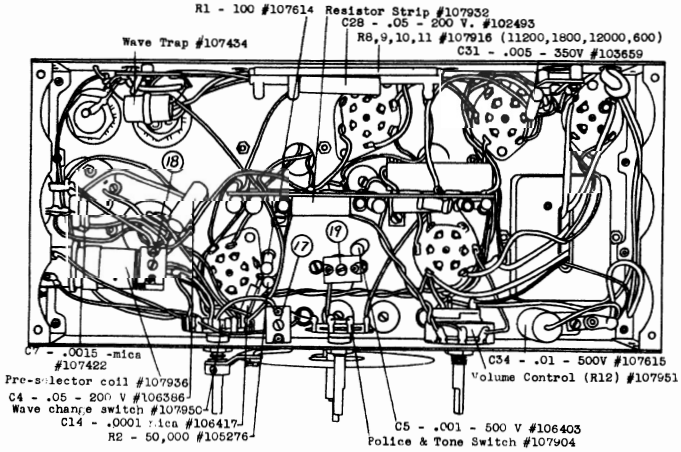
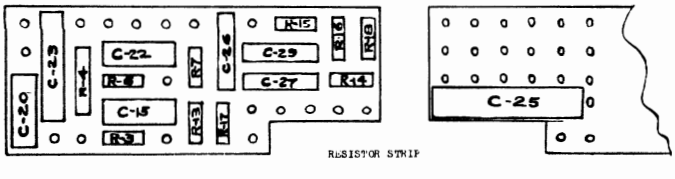


Figure #2



ALIGNING S.W. OSCILLATOR AND R.F.

1. Set wave change switch to short wave or lower dial scale position.
2. Connect test oscillator to antenna through .0002 mf. and 400 ohms resistor in series (this condenser and resistor is the approximate equivalent of a short wave antenna).
3. Set test oscillator and dial scale to 16 M.C. (16000 K.C.) and adjust trimmers #14 and #18 to obtain reading on output meter.
4. Simultaneously adjust station selector and #18 in the same manner as described under operation #6 of B.C. Alignment (this is necessary because sufficient coupling exists in the 6A7 tube to cause a serious shift in the frequency of the oscillator as #18 is adjusted).
5. Set test oscillator and dial scale to 6 M.C. (6000 K.C.) and adjust "max-max" #16.
6. Repeat operation #4 as operation #5 may have disturbed oscillator adjustment.
7. Check sensitivity across band.

SERVICE PARTS LIST

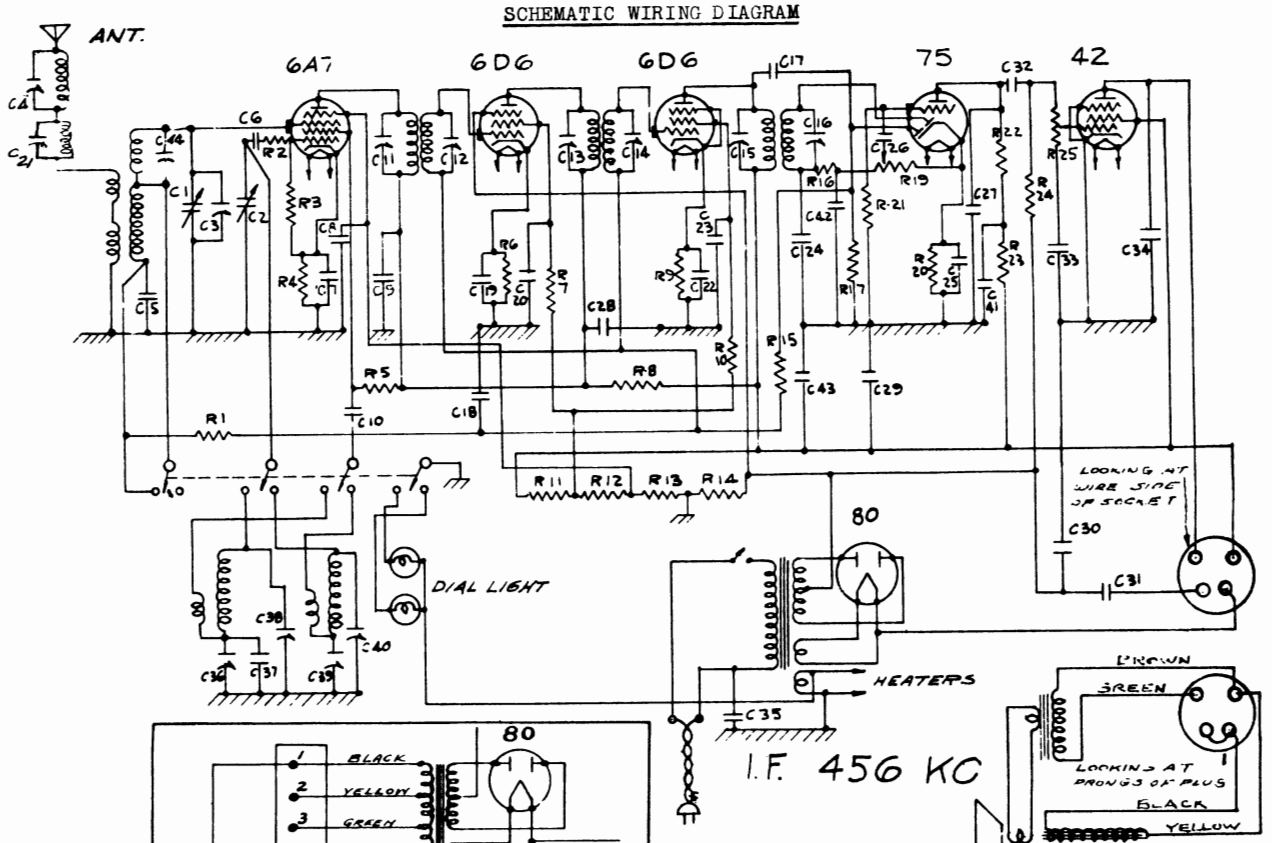
Models 430 and 430J (105-125 Volts 60 Cycle AC)
Models 431 and 431J (105-125 Volts 25 Cycle AC)
Models 434 and 434J (90-110-200-220-230-250 volts 50 cycles A.C.)

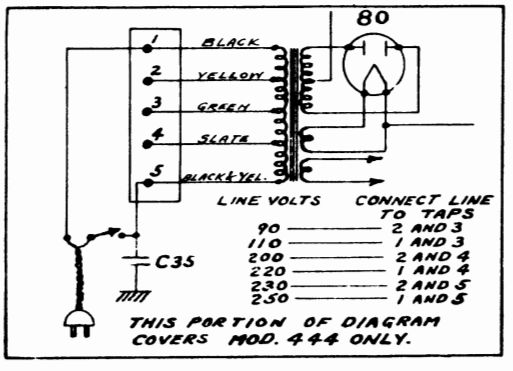
Part No.	Dia.#	Description of Parts
		CONDENSERS
	C1	.0005 mf. (part of 107434)
107995	C2	Trimmer condenser
108080	C3	Trimmer condenser
106386	C4	.05 mf - 2 ply - 200 V.
106403	C5	.001 mf - 4 ply - 500 V.
107995	C6	10-55 mmf
107422	C7	1500 mmf - mica
	C8	1100-2000 mmf (part of 108001)
107237	C9	Trimmer condenser
	C10	300-600 mmf (part of 108001)
107237	C11	Trimmer condenser
107921	C12)	Variable condenser gang
107921	C13)	
106417	C14	.0001 mf - mica
106386	C15	.05 mf - 2 ply - 200 V.
	C16)	Part of 107938
	C17)	
	C18)	Part of 107937
	C19)	
106386	C20	.05 mf - 2 ply - 200 V.
	C21	8 mf elec. dry (part of 107288)
106386	C22	.05 mf - 2 ply - 200 V.
102504	C23	.02 mf - 3 ply - 350 V.
106417	C24	.0001 mf - mica
102499	C25	.5 mf - 2 ply - 200 V.
103659	C26	.005 mf - 3 ply - 350 V.
106403	C27	.001 mf - 4 ply - 500 V.
102493	C28	.05 mf - 2 ply - 200 V.
103659	C29	.005 mf - 3 ply - 350 V.
	C30	10 mf - elec. (part of 107288)
103659	C31	.005 mf - 3 ply - 350 V.
	C32	8 mf elec. dry (part of 107288)
107239	C33	8 mf elec. wet
107615	C34	.01 mf - 4 ply - 500 V.
106417	C35	.0001 mf - mica
106386	C36	.05 - 2 ply - 200 V.
		RESISTORS
107614	R1	100 ohms 1/4 watt
105276	R2	50000 ohms 1/4 watt
105262	R3	450 ohms 1/4 watt
100815	R4	20000 ohms 1/2 watt
105267	R5	1000 ohms 1/4 watt
105260	R6	300 ohms 1/4 watt
105246	R7	.5 meg. 1/4 watt
	(R8	11200 ohms
	(R9	1800 ohms
107916	(R10	12000 ohms
	(R11	600 ohms
107951	R12	.5 meg. volume control
105278	R13	.1 meg. 1/4 watt
105249	R14	5000 ohms 1/4 watt
105279	R15	.25 meg. 1/4 watt
105279	R16	.25 meg. 1/4 watt
105281	R17	1 meg. 1/4 watt
105279	R18	.25 meg. 1/4 watt
		COILS
107434	L1	Trap coil assembly
107936	L2	Antenna coil assembly
107965	L3	Police coil assembly
107937	L4	Oscillator coil assembly
107938	T1	1st I. F. coil assembly
107939	T2	2nd I. F. coil assembly

UNITED AMERICAN BOSCH CORP.

MODEL 440

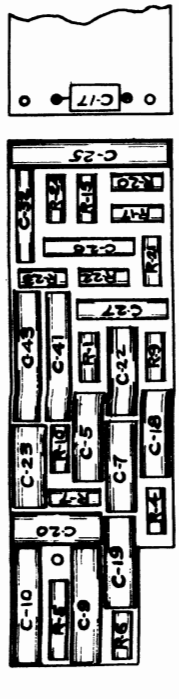
SCHEMATIC WIRING DIAGRAM





SOCKET VOLTAGES

Stage	Tube	Fil.	Plate	Screen	Cathode
Rectifier	80	4.85	382		
Power output	42	6.1	234	245	18
2nd Detector	75	6.1	126		0.87
1st I.F.	6D6	6.1	245	99	5.6
2nd I.F.	6D6	6.1	245	96	5.6
Oscillator	6A7	6.1	236-136	87	4.7

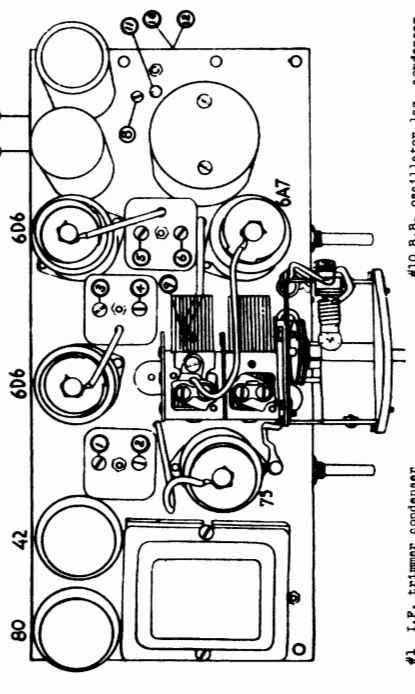


RESISTOR STRIP #107260

SERVICE PARTS LIST

Models 440C and T - (105-125 Volts 60 Cycles AC)
Models 441C and T - (105-125 Volts 25 Cycles AC)
Models 444C and T - (90-110-200-220-230-250 Volts 50-60 Cycles)

Part No.	Dia. #	Description of Parts	Part No.	Dia. #	Description of Parts
		CONDENSERS		C37	1500 mmf. mica
			107237	C38	Trimmer condenser
	(C1)	Variable gang with trimmer	107241	C39	425 mmf. variable
107256	(C2)		107237	C40	Trimmer condenser
	(C3)		102492	C41	.05 mf. 350 V.
107238	C4	600 mmf. variable	106417	C42	.0001 mica
106586	C5	.05 mf. 200 V.	102492	C43	.05 mf. 350 V.
106417	C6	.0001 mf. mica		C44	4-40 mmf. variable - part of 107246
106586	C7	.05 mf. 200 V.			
102493	C8	.05 mf. 200 V.			RESISTORS
102492	C9	.05 mf. 350 V.			
102504	C10	.02 mf. 350 V.	105278	R1	.1 meg. 1/4 W.
	C11)	Part of 107247	105265	R2	50,000 ohms 1/4 W.
	C12)		105276	R3	2 meg. 1/4 W.
	C13)	Part of 107248	105264	R4	500 ohms 1/4 W.
	C14)		100813	R5	20,000 ohms 1/2 W.
	C15)	Part of 107249	105267	R6	1,000 ohms 1/4 W.
106417	C16)	.001 mica	105249	R7	5,000 ohms 1/4 W.
	C17)		105267	R8	1,000 ohms 1/4 W.
106586	C18)	.05 mf. 200 V.	105267	R9	1,000 ohms 1/4 W.
	C19)		105249	R10	5,000 ohms 1/4 W.
	C20)	10 to 55- see 107242		R11	11,200 ohms
	C21			R12	1,800 ohms
106586	C22)	.05 mf. 200 V.	107236	R13	12,000 ohms
	C23)	.0001 mica-part of 107249		R14	300 ohms
102499	C24	.5 mf. 200 V.	105281	R15	50,000 ohms 1/4 W. - part of 107249
105659	C25	.005 mf. 350 V.		R16	50,000 ohms 1/4 watt - part of 107249
106403	C26	.001 mf. 600 V.	105281	R17	1 meg. 1/4 W.
107239	C27	8 mf. electrolytic	105562	R19	.5 meg. variable
	C28	4 mf. electrolytic	105245	R20	2,000 ohms 1/4 W.
106665	C29	8 mf. electrolytic	105281	R21	1 meg. 1/4 W.
	C30	20 mf. electrolytic	106277	R22	75,000 ohms 1/4 W.
	C31	8 mf. electrolytic	106278	R23	50,000 ohms 1/4 W.
103559	C32	.005 mf. 350 V.	105279	R24	.25 meg. 1/4 W.
106403	C33	.001 mf. 600 V.	107253	R25	.25 meg. variable
105695	C34	.01 mf. 600 V.			
105931	C35	.01 mf. 600 V.			
107241	C36	425 mmf. variable			



#1 I.F. trimmer condenser
#2 I.F. trimmer condenser
#3 I.F. trimmer condenser
#4 I.F. trimmer condenser
#5 I.F. trimmer condenser
#6 I.F. trimmer condenser
#7 Wave trap tuning cond. (456 K.C.)
#8 B.B. oscillator trim. condenser
#9 Selector trimmer condenser
#10 B.B. oscillator lag. condenser - top screw
#11 S.W.B. oscillator trim condenser
#12 S.W.B. oscillator lag. condenser (bottom screw)
#13 Wave trap tuning condenser (2400 K.C.)
#14 R. F. trimmer condenser

UNITED AMERICAN BOSCH CORP.

Model 450

SERVICE PARTS LIST

Models 450L & H (105-125 Volts 60 Cycles AC)
Models 451L & H (105-125 Volts 25 Cycles AC)
Models 454L & H (90-250 Volts 50 Cycles AC)

Part No.	Dia. #	Description of Parts
106417	1	100 Mfd. mica
	2	.005 mfd. mica)part of
	3	Trap coil-)107434
	4	Preselector switch)part of
	5	Osc. switch)SW 954
107904	6	Tone control switch
	7	H.F. pres. coil)part of
	8	0-60 mmf. 107936
	9	B.C. pres. coil - part of 107936
107995	10	0-15 mmf.
106386	11	.05 - 2 ply
	12	Police band coil)part of
	13	10-55 mmf.)RC95248
106403	14	.001 - 4 ply
107995	15	0-15 mmf.
107422	16	1500 mmf. mica
	17	1100-2000 mmf)part of 108001
	18	H.F. osc. coil)part of
	19	B.C. osc. coil)RC9523A
107503	20	0-25 mmf.
	21	300-600 mmf part of 108001
	22	Var. gang part of CG 957
	23	Var. gang part of CG 957
105278	*24	.1 meg. 1/4 W.
106282	*25	.05 - 2 ply
106417	26	100 mmf. mica
107614	27	100 - 1/4 W.
105276	28	50,000 - 1/4 W.
105264	*29	500 - 1/4 W.
106386	*30	.05 - 2 ply
106386	*31	.05 - 2 ply
	32	8 mfd. elec. (dry) part of 107288
102504	33	.02 mfd. - 3 ply
100813	*34	20,000 - 1/2 W.
	35	.30 mmf. part of IC952A
	36	I.F. trans. part of IC952A
	37	35-130 mmf. part of IC952A
105267	*38	1000 - 1/4 W.
106386	*39	.05 - 2 ply
106386	40	.05 - 2 ply
105267	*41	1000 - 1/4 W.
102492	*42	.05 - 3 ply
	43	35-130 mmf.
	44	I.F. trans. coil- part of IS952A
	45	35-130 mmf.- part of IC 952A
105267	*46	1000 - 1/4 W.
106386	*47	.05 - 2 ply
103062	48	400 - 1 W.
105246	*49	5 meg. - 1/4 W.
106417	50	.0001 mmf. mica
	51	30-130 mmf.)
	52	3rd IF coil) part of
	53	30-130 mmf.) IC954 A
105278	*54	.1 meg. 1/4 W.
107951	55	.5 meg. vol. cont.
103659	*56	.005 mfd. - 3 ply
105281	*57	1 meg. 1/4 W.
105249	*58	5000 - 1/4 W

Part No.	Dia. #	Description of Parts
102499	*59	.5 - 2 ply
106403	*60	.001 - 4 ply
105279	*61	.25 meg. 1/4 W.
103659	*62	.005 mfd - 3 ply
105279	*63	.25 meg. 1/4 W.
105279	*64	.25 meg. 1/4 W.
	65	10 mfd. elec. part of 107288
106386	66	.05 - 2 ply
103659	67	.005 - 3 ply
	68	8 mfd. elec. dry - part of 107288
107239	69	8 mfd. elec. wet
107242	70	Power transformer
	71	On-Off switch part of 107951
107615	72	.01 - 4 ply
	(73	600 ohms resistor
	(74	1200 ohms resistor
107916	(75	1800 ohms resistor
	(76	11200 ohms resistor
105267	77	1000 - 1/4 W.
107912	78	Power transformer

MAIN ASSEMBLIES

CH9512A	Chassis assembly- Mdls 454L & H
CH9517A	Chassis assembly- Mdls 451L & H
CH9511A	Chassis assembly- Mdls 450L & H
107369	Speaker - Mdls 450L, 451L, 454L
107284	Speaker - Mdls 450H, 451H, 454H
KA 956	Cabinet - Mdls 450L, 451L, 454L
KA 955	Cabinet - Mdls 450H, 451H, 454H

BRACKETS, CLIPS & CLAMPS

BK9529	Bracket for preselector coil
106964	Bracket for dial indicator

CABLES & CABLE ASSEMBLIES

CB9512	Line cable
105952	Antenna cable - Red
107768	Antenna cable - Blue
CB9510A	Ground cable
98511	Cable for dial pulley

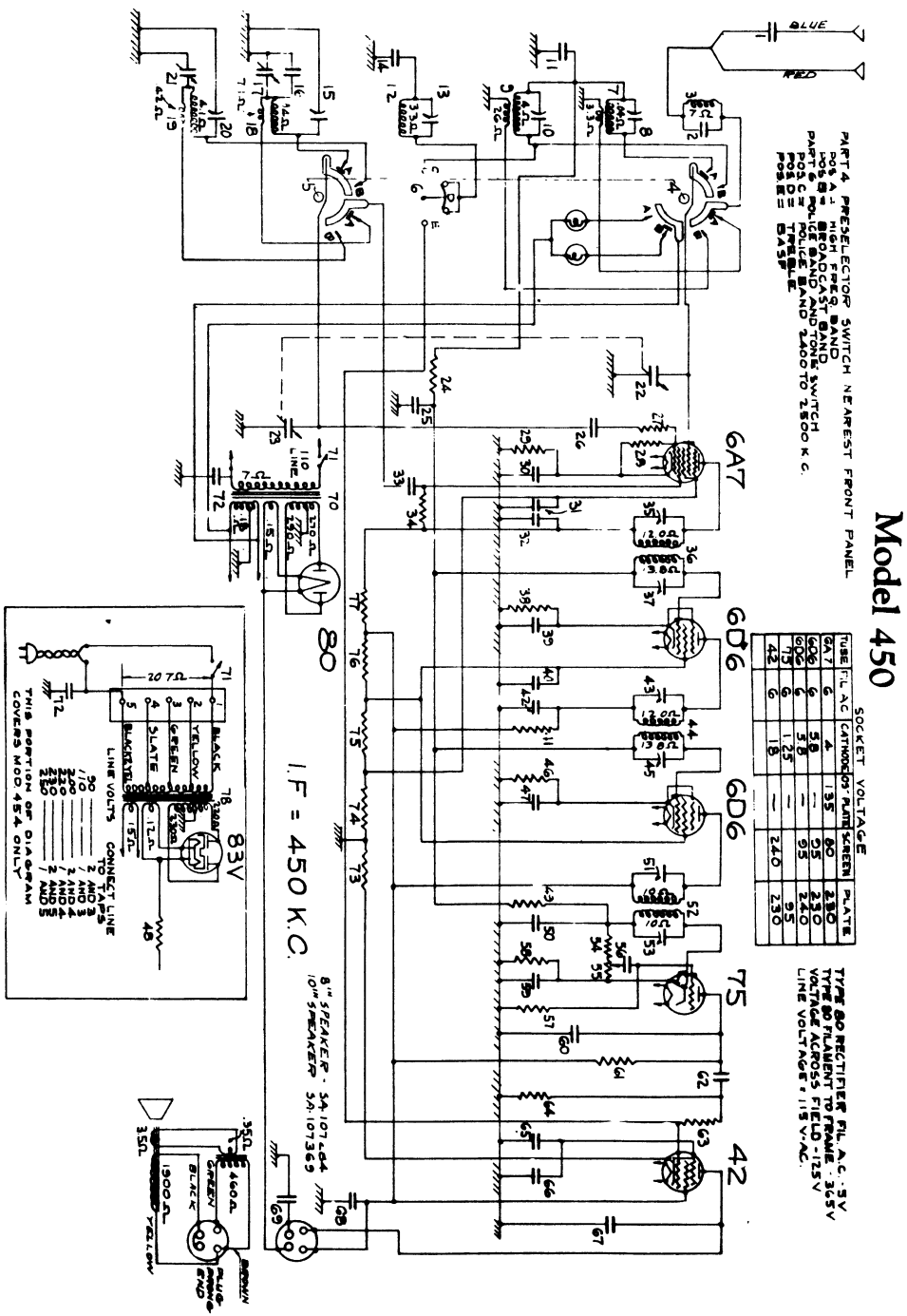
TUBES

75	2nd detector, A.V.C., 1st audio
6A7	1st detector oscillator
6D6	I.F. amplifier
42	Output pentode
80	Rectifier

TUBE SOCKETS & TUBE SHIELDS

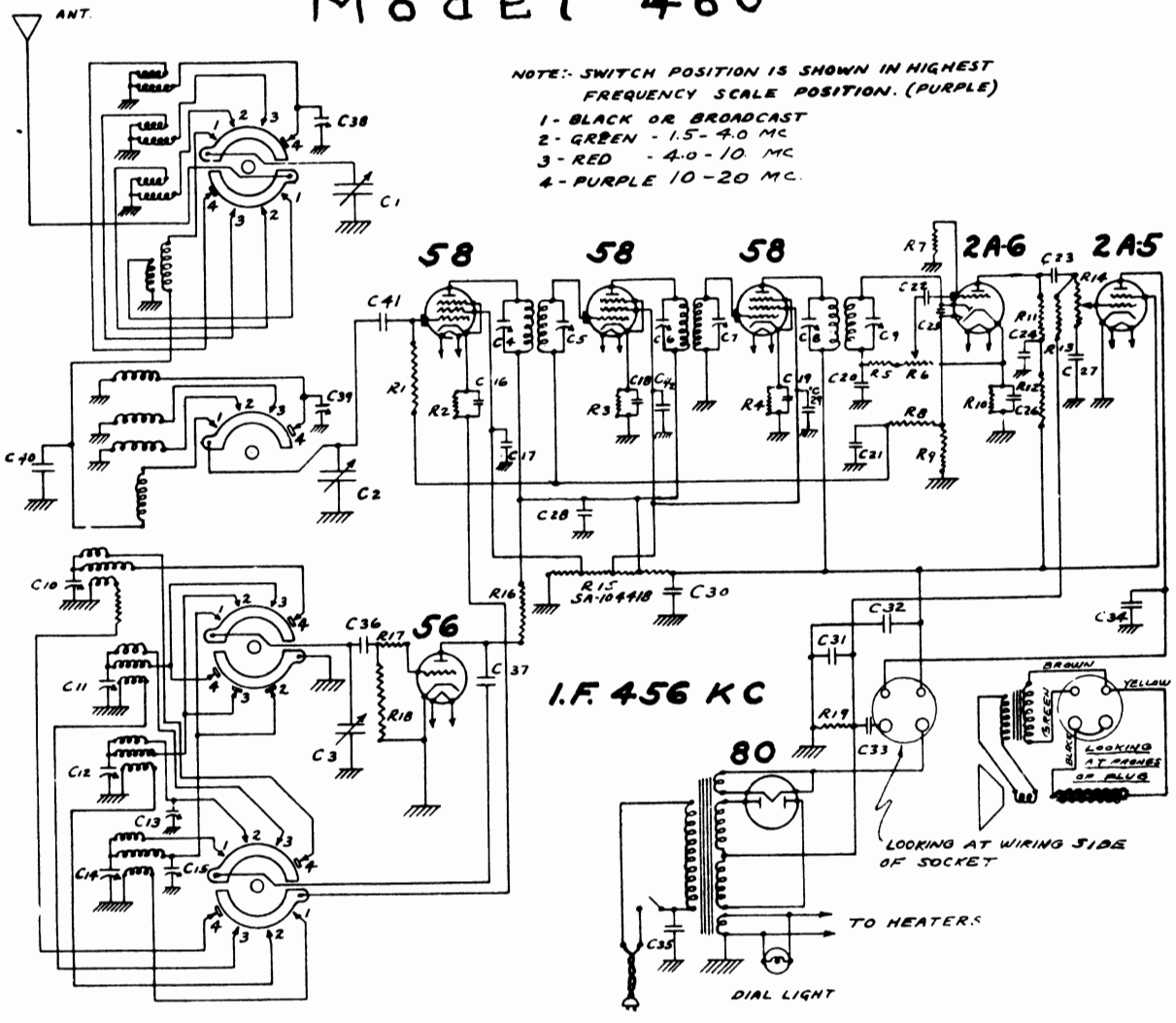
104615	Tube socket - 4 prong
104617	Tube socket - 6 prong
103513	Tube socket - 6 prong
105624	Tube socket - 7 prong
CV 954	Tube shield

* These parts are on IS9530A.



UNITED AMERICAN BOSCH CORP.

Model 460



SERVICE PARTS LIST

Models 460A, B, R (105-125V 60 Cycles AC)
461A, B, R (105-125V 25 Cycles AC)
464A, B, R (90 -250V 50 Cycles AC)

Dia. #	Description of Parts	Part No.	Dia. #	Description of Parts
	CONDENSERS			RESISTORS (Cont'd)
(C1)	Variable condenser	100197	R16	25,000 - 1/2 W.
(C2)		100814	R17	50 - 1/2 W.
(C3)		105274	R18	20,000 - 1/4 W.
C4	Part of 105695	103062	R19	400 - 1 W.
C5				COILS
C6	Part of 105695			
C7		105684		Oscillator coil - broadcast
C8	Part of 105696	105683		Oscillator coil - green band
(C9)		105689		Oscillator coil - red band
(C10)	2000 mmf. variable	105687		Oscillator coil - purple band
(C11)	7-70 mmf. variable	105690		Preselector coil - broadcast
C12	1200 mmf. variable	105691		Preselector coil - green band
C13	7-70 mmf.	105685		Preselector coil - red band
C14	300 mmf. variable	105686		Preselector coil - purple band
C15	.05 mf - 200 V.	105688		Intermediate coil
C16	.05 mf - 200 V.	105695		Intermediate coil
C17	.05 mf - 200 V.	105696		Intermediate coil
C18	.05 mf - 200 V.			MAIN ASSEMBLIES
C19	100 mmf. - mica			
C20	.05 mf. 200 V.	107460		Chassis assembly for 460A,B,R
C21	.005 mf. 350 V.	107761		Chassis assembly for 461A,B,R
C22	.02 mf. 350 V.	107878		Chassis assembly for 464A,B,R
C23	.1 mf. 350 V.	107264		Speaker-460A-B-461A0B 461A-E
C24	100 mmf. mica	107569		Speaker-460R,461R 464R
C25	.5 mf. 200 V.	107370		Cabinet - Mod. 460A, 461A, 464A
C26	.001 mf. 500 V.	107371		Cabinet - Mod. 460B, 461B, 464B
C27	.05 mf. 350 V.	107372		Cabinet - Mod. 460R, 461R, 464R
C28	.05 mf. 200 V.			SCREWS
C29	.05 mf. 200 V.			
C30	.05 mf. 350 V.	102441		Set screw - dial gear
(C31)	20 mf. electrolytic	105642		Screw #7 - chassis
(C32)	4 mf. electrolytic	101700		Screw #8
(C33)	8 mf. electrolytic	104335		Screw resistor & insul. strip
C34	.01 mf. 500 V.	75517		Screw #6-32 x 1/4"
C35	.01 mf. 500 V.	96988		Screw - condenser to end plate
C36	100 mmf. mica	101865		Screw - 1/2" Parker-Kalon
C37	.05 mf. 200 V.	104387		Screw - variable cond. gang
C38	Trimmer condenser	96225		Screw - variable cond. gang
C39	Trimmer condenser	101951		Drive screw - nameplate
C40	.05 mf. 200 V.	107395		Fastening screw- spkr. 460A & B
C41	100 mmf. mica	107388		Screw - chassis mounting
C42	.05 - 200 V.	102444		Fastening screw - spkr. 460R
	RESISTORS			TRANSFORMERS
R1	1/2 meg. 1/4 W.			
R2	2000 ohms 1/4 W.	105781		Power trans. - Mdls. 460A,B,R
R3	1000 ohms 1/4 W.	106098		Power trans. - Mdls. 461A,B,R
R4	1000 ohms 1/4 W.	107875		Power trans. - Mdls. 464A,B,R
R5	50,000 ohms - 1/4 W.			WASHERS, BUSHINGS & SPACERS
R6	500,000 volume			
R7	1 meg. 1/4 W.			
R8	1/2 meg. 1/4 W.	105145		Washer, rubber - var. condenser
R9	1 meg. 1/4 W.	105144		Bushing, rubber- var. condenser
R10	2000 - 1/4 W.	65644		Lock washer #6, Shakeproof
R11	70,000 - 1/4 W.	108		Lock washer - #8 split type
R12	70,000 - 1/4 W.	80589		Lock washer - vol. & tone cont.
R13	1/4 meg. 1/4 W.	96702		Plain washer- var. condenser
R14	Variable	79849		Washer - dial guide
R15	Multiple			

Model 460 American-Bosch Radio Receiver

Model 460 American-Bosch Radio Receiver

CIRCUIT DESCRIPTION

The Model 460 is a seven tube superheterodyne receiver whose circuit comprises a first detector, an oscillator, two stages of I. F. amplification, a combined double diode second detector and first audio amplifier, a power amplifier and rectifier tube.

Selectivity is provided by a double tuned antenna selector and three double tuned I.F. transformers, comprising eight selective circuits in all. The double tuned antenna selector is important in the broadcast band for reasons well known, and is all the more important on the short wave band in order to prevent "repeat points", that is, reception of the same station at two points on the scale.

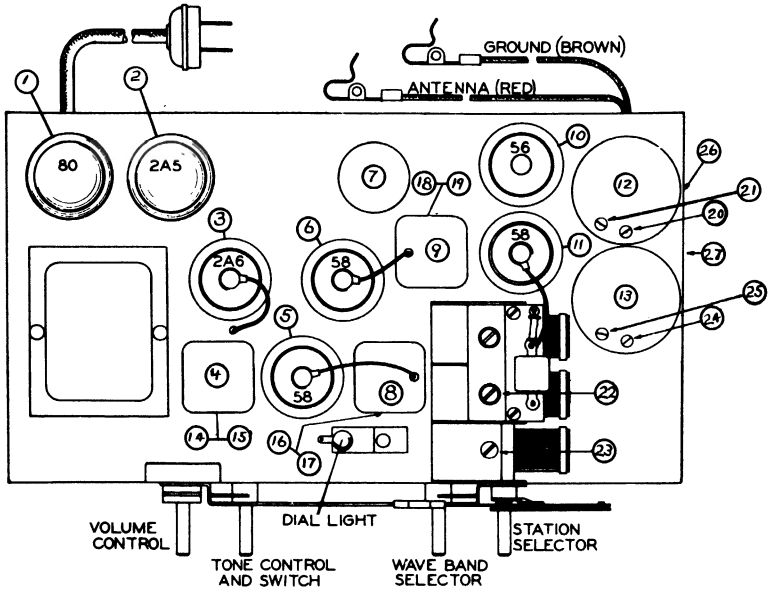


Figure #1

NOMENCLATURE

#1 Type 80 rectifier
#2 Type 2A5 output pentode
#3 Type 2A6 2nd det. A.V.C. & 1st A.F.
#4 3rd I.F. transformer
#5 Type 58 I.F. tube
#6 Type 58 I.F. tube
#7 Filter condenser
#8 2nd I.F. transformer
#9 1st I.F. transformer
#10 Type 56 oscillator
#11 Type 58 1st detector
#12 Broadcast oscillator coil
#13 Green band oscillator coil
#14-#15 3rd I.F. trimmer
#16 2nd I.F. trimmer
#17 2nd I.F. trimmer
#18 1st I.F. trimmer
#19 1st I.F. trimmer
#20 Broadcast oscillator trim. cond.
#21 Broadcast oscillator lag. cond.
#22 Preselector trimmer
#23 Preselector trimmer
#24 Green band trimmer
#25 Green band lagging
#26 Red band lagging
#27 Purple band lagging
#28) Purple band trimmers (underneath
#29) chassis) (See Figure #2)

ALIGNING THE CHASSIS

To properly align the Model 460 chassis, it is essential to use a high grade modulated oscillator and a sensitive output meter. The R. F. signal fed into the receiver must be very weak or it will cause the A.V.C. to function making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. A top view of the chassis is shown in Fig. #1 and should be carefully studied before the actual work is started.

A- ALIGNING THE I.F. (456 K.C.)

1. Set test oscillator to 456 K.C.

2. Connect test oscillator to grid of second I.F. tube #5 and adjust #14 and #15 to maximum output, reducing test oscillator as required.

3. Connect test oscillator to grid of first I.F. amplifier #6 and adjust #16 and #17 to maximum output.

4. Connect test oscillator to grid of first detector #11 and adjust #18 and #19 to maximum output.

5. Recheck the above four operations for accuracy.

B- ALIGNING THE R. F.

1. Set test oscillator to 1500 K. C. and connect to grid of first detector #11. Place pointer of radio to 1.5 mark on dial. Adjust #20 until signal is tuned in. This adjusting screw is usually designated by a Red color dot. Having obtained tune at this point, set test oscillator to 600 K. C. and tune station selector to .6 mark on dial. Adjust #21 until the signal is tuned in. Now return to 1500 K. C. point with set and test oscillator and make the resetting of #20 to obtain accurate adjustment to scale reading.

2. Connect test oscillator to antenna lead, making sure the equivalent (200 mmf.) is in the circuit.

3. Continue setting of 1500 K. C. Adjust #22 and #23 for maximum output. Check sensitivity and calibration at several points on dial. Set should come correctly to kilocycle settings of important broadcasting stations.

C- ALIGNING THE GREEN BAND

1. Set test oscillator to 3600 K.C. and indicator of radio at 3.6 mark on dial.

2. Adjust #24 until signal is tuned in. This trim condenser is usually marked with a Red color dot. Set test oscillator at 1600 K. C. and tune set to 1.6 mark. Adjust #25 to maximum output. Return to 3600 K. C. and repeat adjustment. In adjusting the 3600 K. C. point it is possible to obtain two settings for different position of the trim condenser. This denotes merely the plug and minus frequency between oscillator and test oscillator which will give the correct I. F. frequency. The correct setting of the trim condenser is the one wherein the screw is turned furthest out. In any event, an incorrect setting will always be denoted by lack of sensitivity when the set and test oscillator are tuned to 2500 K.C. (mid-band).

D- ALIGNING THE RED BAND

1. Set test oscillator to 8000 K. C. marking and tune receiver in region of 8.0 on dial scale. Note when signal is received. Next set test oscillator to 4000 K. C. setting and tune set to 4.0 on dial scale. Adjust #26 on right side of chassis until signal is heard.

2. Retune set and test oscillator to 8000 K. C. and observe pointer setting and sensitivity. Slight deviations from calibration can be compensated by manipulating the stiff wires connecting the oscillator coil to switch.

Alignment Model 460

E- ALIGNING THE PURPLE BAND

1. Set test oscillator to 20,000 K. C. or if this is not available, then adjust to highest possible frequency, which preferably should be at least 15,000 K. C. Tune set to this frequency and note where set oscillator is received on dial scale. Then place test oscillator on 10,000 K.C. and adjust #27 on right of chassis until test oscillator is tuned at 10. on dial scale. Now return both test oscillator and radio set to high frequency. Located underneath the base and adjacent to the switch and high frequency selector coils are two trim condensers #28 and #29 which are used for correct adjustment at this high frequency.

Increase setting of test oscillator until signal generator can be tuned in at two points on dial (say 20 and 19). Then with pointer of set at 20 adjust #28 and #29 for maximum output decreasing test signal as signal becomes better tuned. At correct adjustment a very loud signal will be obtained at 20 on dial while a feeble signal or none at all is observed at 19. This is a practical illustration of the effectiveness of preselection as outlined in the first part of this description.

The adjustment instructions just given apply to the Model 460 receiver which is in reasonable operating condition, but in some manner has been thrown out of adjustment. Obviously, before the radio service man can go through with the adjustments given here, he must assure himself that defective tubes, injured parts, such as punctured condensers, shorted variable condensers, open resistors, scratched high frequency coils, etc., are not such as to cause the set to be inoperative on one or more bands of frequencies.

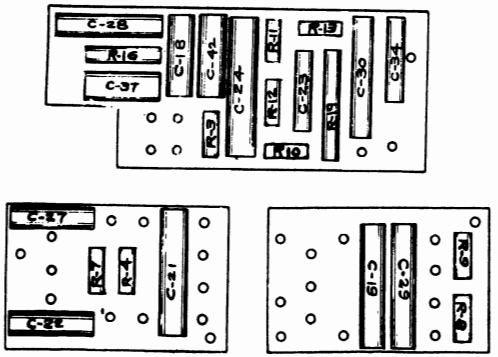
SOCKET VOLTAGES

Tube	Stage	Fil.	Plate	Screen	Cathode	Grid
58	1st Det.	2.65	220	40	2.8	- - -
58	1st I.F.	2.65	220	95	2.0	- - -
58	2nd I.F.	2.65	240	95	2.7	- - -
56	Osc.	2.65	75	-	0	25
2A6	2nd Det.	2.65	90	-	1.4	- - -
2A5	Output	2.65	235	240	0	- - -
80	Rectifier	4.8	-	-	-	

Bias on 2A5 (across 400 ohms) - 22 volts
Output of rectifier - - - - - - 360 volts

Line volts - - - - 115
Power - - - - - - - 60 watts

Note: These values are readings of a high resistance voltmeter from each socket terminal to ground, with the exception of the filament voltages. The values are only approximate and will vary with the line voltage and the type of meter employed.



RESISTOR STRIPS

R.M.A. RESISTOR COLOR CODE

Body	Tip	Dot
0-BLACK	0-BLACK	.0-BLACK
1-BROWN	1-BROWN	0-BROWN
2-RED	2-RED	00-RED
3-ORANGE	3-ORANGE	000-ORANGE
4-YELLOW	4-YELLOW	0000-YELLOW
5-GREEN	5-GREEN	00000-GREEN
6-BLUE	6-BLUE	000000-BLUE
7-PURPLE	7-PURPLE	
8-GREY	8-GREY	
9-WHITE	9-WHITE	

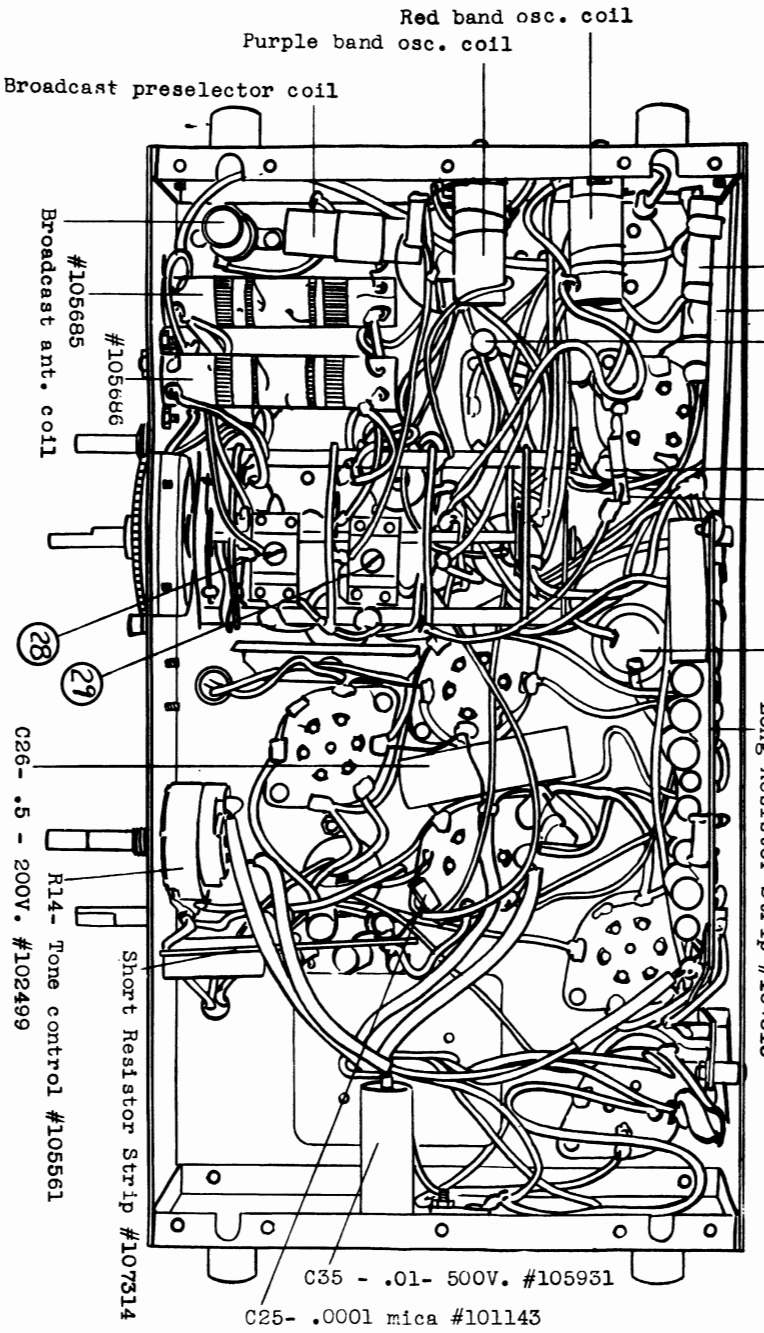


Figure #2

UNITED AMERICAN BOSCH CORP.

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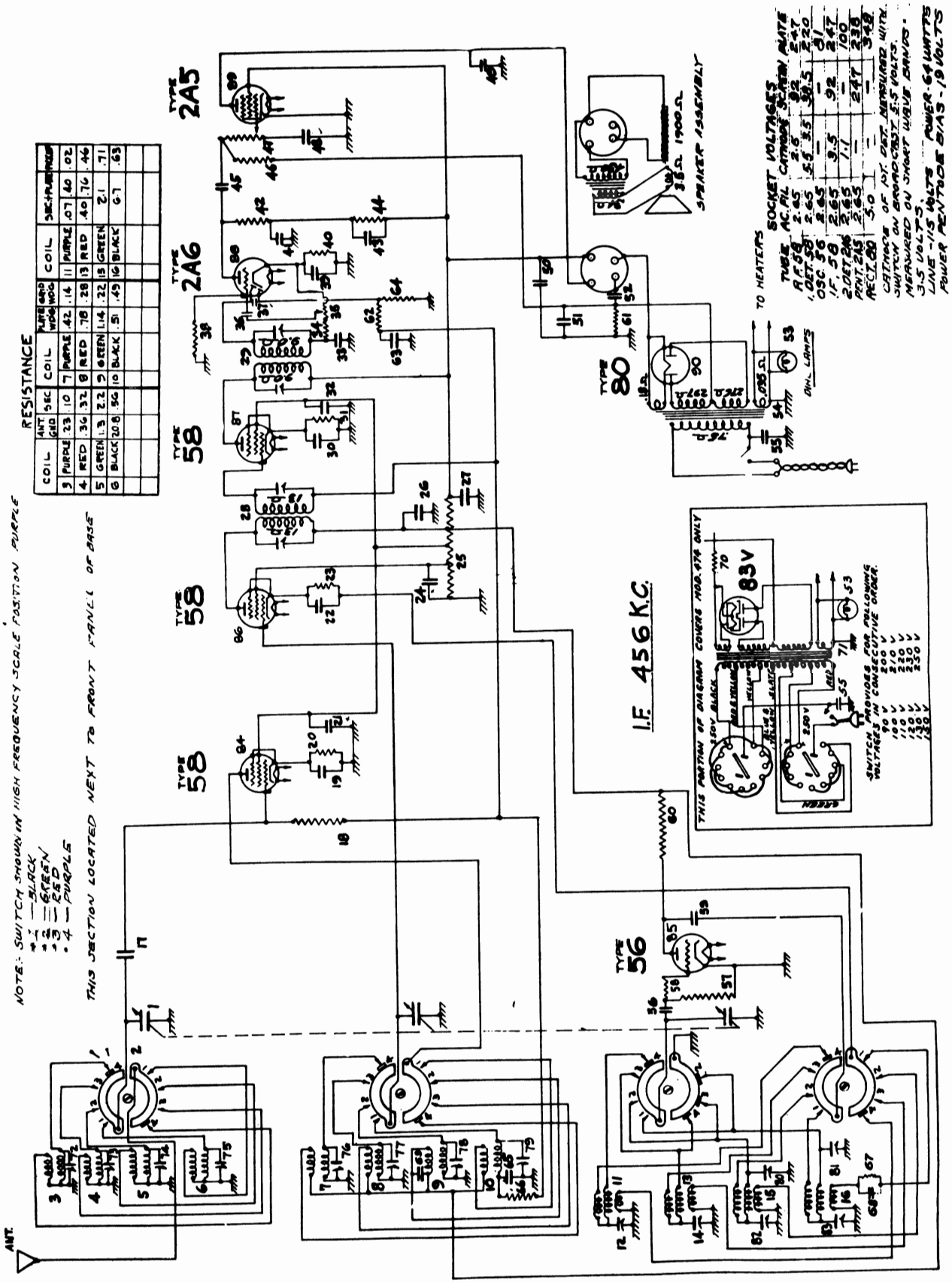


Model 460 - Edition 2

Model 460 Ed2 American-Bosch Radio Receiver

CIRCUIT DESCRIPTION

The Model 460 Ed. 2 is a seven-tube superheterodyne all-wave receiver whose circuit comprises an R. F. amplifier stage, a first detector, an oscillator, a stage of I. F. amplification, a combination second detector, A.V.C. and first A. F. amplifier, a power output stage and a rectifier tube. Selectivity is provided by antenna tuning, R. F. stage tuning and four I.F. tuned circuits.

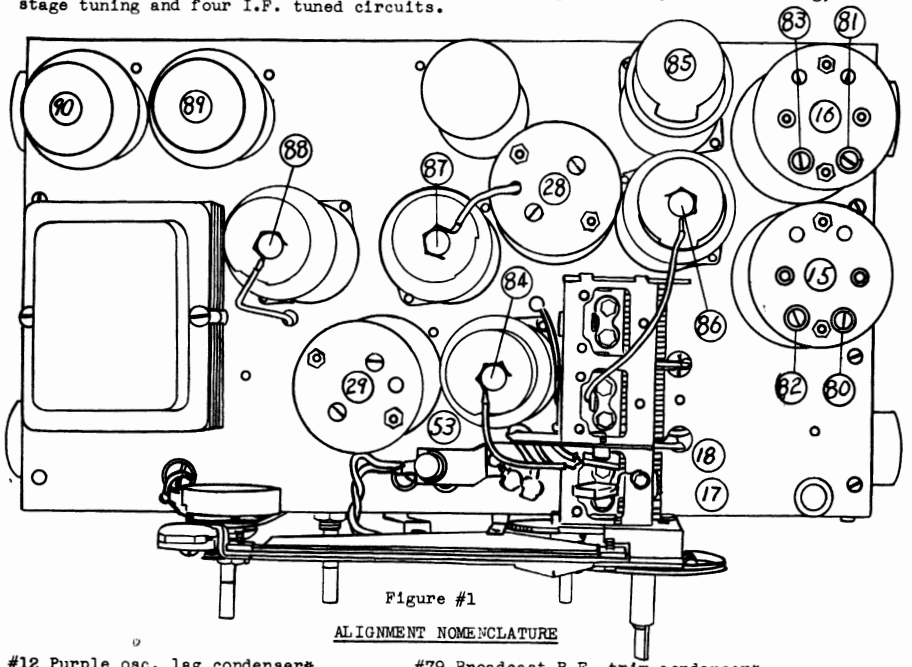


Figure #1

ALIGNMENT NOMENCLATURE

#12 Purple osc. lag condenser*
#14 Red osc. lag condenser*
#15 Green band osc. coil
#16 Broadcast osc. coil
#28 First I.F. transformer
#29 Second I.F. transformer
#72 Purple ant. trim condenser*
#73 Red ant. trim condenser*
#74 Green ant. trim. condenser*
#75 Broadcast ant. trim. condenser*
#76 Purple R.F. trim condenser*
#77 Red R.F. trim condenser*
#78 Green R.F. trim condenser*
#79 Broadcast R.F. trim condenser*
#80 Green osc. trim condenser
#81 Broadcast osc. trim. condenser
#82 Green osc. lag condenser
#83 Broadcast osc. lag condenser
#84 Type 58 R.F. amplifier
#85 Type 56 oscillator
#86 Type 58 first detector
#87 Type 58 I.F. amplifier
#88 Type 2A6 2nd detector, A.V.C., 1st A.F.
#89 Type 2A5 power pentode
#90 Type 80 rectifier
* Trimmers are shown in Fig. #2

ALIGNMENT PROCEDURE

To properly align the Model 460 Ed. 2 receiver, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. Top and bottom view of the chassis is shown in the Figures #1 and #2 and should be carefully studied before the actual work is started.

A - ALIGNING THE I.F. (456 K.C.)

1. Set test oscillator to 456 K.C.

2. Connect test oscillator leads through a .25 mf'd. condenser between grid of I. F. tube #87 and frame of the chassis.

3. Adjust trimmers on I. F. coil #29 to maximum output, reducing output of test oscillator as required.

4. Connect test oscillator to grid of first detector tube #86 and adjust trimmers on I.F. coil #28 to maximum output.

B - ALIGNING THE R.F.

1. Set test oscillator to 1500 K. C. and connect to grid of first detector #86. Set station indicator to 1500 K.C.

2. Adjust #81 until signal is tuned in. This adjustment screw is designated by a color dot. Having obtained tune at this point set test oscillator and station selector to 600 K. C. and adjust #83 until the signal is tuned in. Now return to 1500 K.C. point with set and test oscillator and readjust #81 to obtain accurate adjustment to scale reading.

3. Connect test oscillator to antenna lead, making sure the capacity equivalent of .0002 mf'd. is in the circuit.

4. Continue setting of 1500 K. C. and adjust #75 and #79 to maximum output. Check sensitivity and calibration at several points on the dial. Receiver should come correctly to kilocycle settings of important broadcasting stations.

C - ALIGNING THE GREEN BAND

1. Set test oscillator and station selector to 3600 K.C.

2. Adjust #80 until signal is tuned in. This adjustment screw is marked with a color dot.

3. Set test oscillator and station selector to 1600 K. C. and adjust #82 to maximum output.

4. Return to 3600 K. C. setting and repeat adjustment of #80. In adjusting the 3600 K.C. point, it is possible to obtain two different positions of the trimmer condenser. This denotes merely the plus and minus frequency between the set oscillator and test oscillator which will give the I. F. frequency. The correct setting of the trimmer condenser is the one wherein the adjustment screw is furthest out. In any event, any incorrect setting will always be denoted by lack of sensitivity and calibration when the receiver and test oscillator are tuned to 2500 K.C. (mid-band).

5. With station selector and test oscillator both adjusted to 3600 K.C., align the antenna and R.F. circuits by adjusting #74 and #78 to maximum output.

D - ALIGNING THE RED BAND

1. Set test oscillator to 8000 K. C. and tune receiver in region of 8000 K. C. on dial scale. Note where signal is tuned in. Next set test oscillator and receiver to 4000 K.C. and adjust #14 (on right side of chassis) until signal is heard.

2. Retune set and test oscillator to 8000 K. C., and observe pointer setting. Slight deviations from calibration can be compensated by manipulating the stiff wires connecting the oscillator coil #13 to the switch.

3. With set and test oscillator both adjusted to 8000 K.C., align the antenna and R.F. circuits by adjusting #73 and #77 to maximum output.

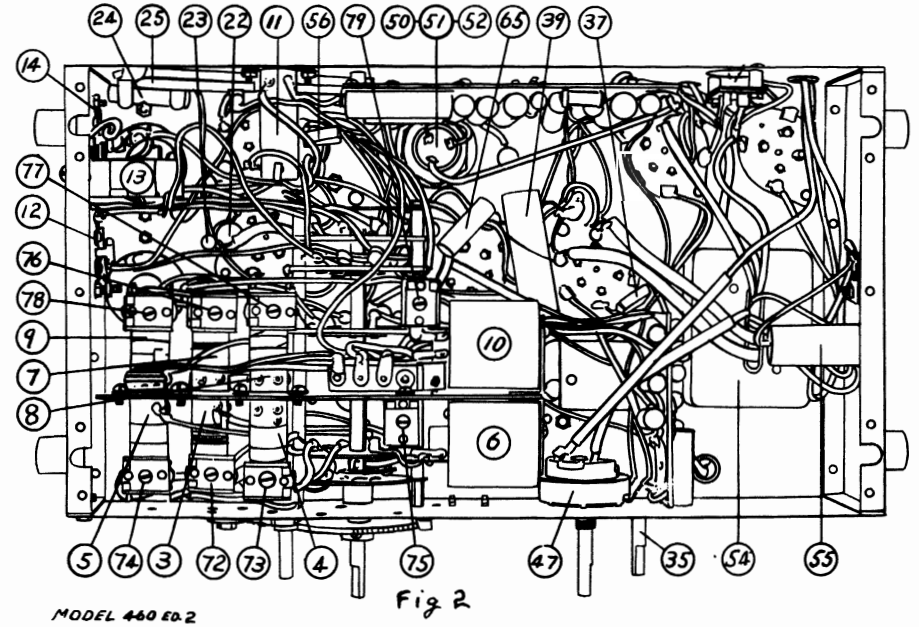
Model 460 Edition 2

E - ALIGNING THE PURPLE BAND

1. Set test oscillator to 18,000 K.C. or if this is not available then adjust to highest frequency preferably 15,000 K. C. Tune set to this frequency and observe where signal is received on the dial scale. Then place test oscillator on 10,000 K. C. and adjust #12 (on right side of chassis) until signal is tuned in at 10. on dial scale.

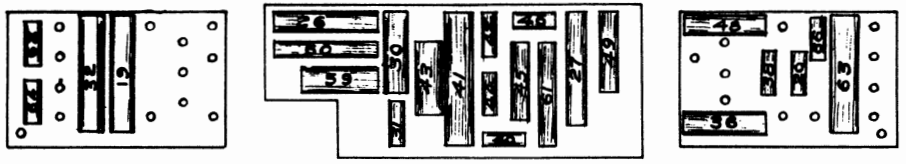
2. Now return both test oscillator and receiver to 18,000 K. C. Increase setting of test oscillator until signal can be turned in at two points on dial (say 18. and 17.), then with pointer of set at 18. adjust #72 and #76 for maximum output decreasing test signal as signal becomes better tuned. At correct adjustment a very loud signal will be obtained at 18 on the dial while a feeble signal will be observed at 17. This is a practical illustration of the effectiveness of preselection.

The adjustment instructions just given apply to the Model 460 Ed-2 receiver which is in reasonable operating condition, but in some manner has been thrown out of adjustment. Obviously, before the radio service man can go through with the instructions given here, he must assure himself that defective tubes, injured parts, such as punctured condensers, shorted variable condensers, opened resistors, damaged high frequency coils, etc., are not such as to cause the set to be inoperative on one or more bands of frequencies.



MODEL 460 ED.2

Fig 2



RESISTOR STRIP

SERVICE PARTS LIST

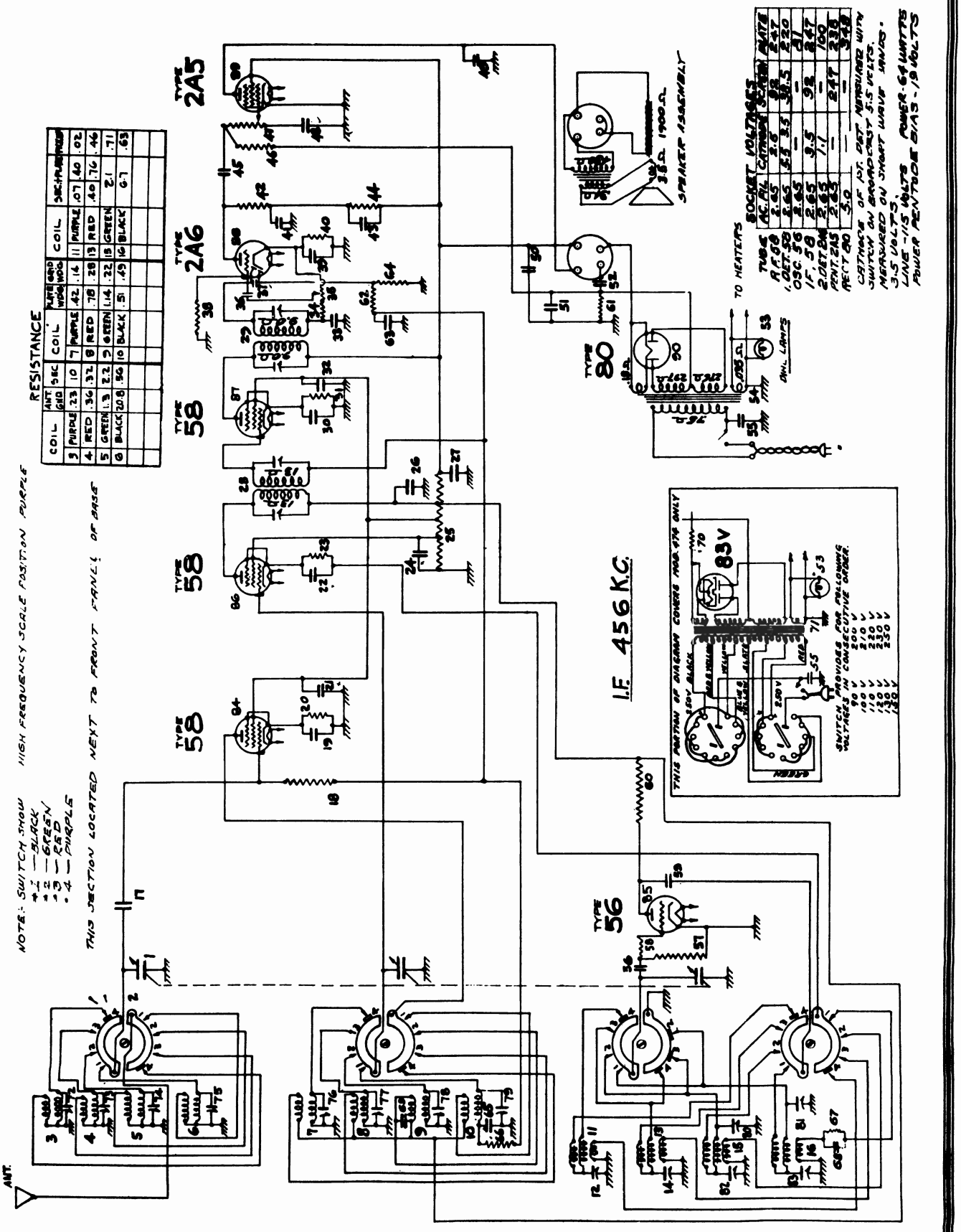
Model 460 Ed.2

Part No.	Dia. #	Description of Parts	Part No.	Dia. #	Description of Parts
108056	1	Variable condenser	105249	RL 40	5000 ohms
108057	2	Wave switch	102494	RL 41	.1 mf. 250 V.
108077	3	Ant. Transf. (purple)	105279	RL 42	.25 megohm
108075	4	Ant. Transf. (red)	106386	RL 43	.05 mf. 90 V.
108073	5	Ant. Transf. (green)	107363	RL 44	70,000 ohms
108070	6	Ant. Transf. (black)	102504	RL 45	.02 mf. 250 V.
108076	7	R.F. Transf. (purple)	105279	RL 46	.25 megohm
108074	8	R.F. Transf. (red)	107250	47	Tone Cont. .25 meg.
108072	9	R.F. Transf. (green)	106403	RS 48	.001 mf. 500 V.
108071	10	R.F. Transf. (black)	106277	RL 49	.01 mf. 450 V.
105687	11	Osc. coil (purple)		(50	4 mf. 450 V.
103800	12	Comp. condenser	106665	Ed2(51	20 mf. 25 V.
105689	13	Osc. coil (red)		(52	8 mf. 475 V.
103800	14	Comp. condenser	98713	53	Dial light
105683	15	Osc. assembly (green)	105781	54	Power transformer
105684	16	Osc. assembly (black)	107615	C 55	.01 mf. 500 V.
106417	VC 17	100 mmf. mica	101143	C 56	100 mmf. mica
105246	VC 18	.5 megohm	105274	C 57	20,000 ohms
106386	RS 19	.05 mf. 90 V.	100814	C 58	500 ohms
105260	RS 20	300 ohms	106386	RL 59	.05 mf. 90 V.
106386	C 21	.05 mf. 90 V.	99777	RL 60	25,000 ohms 1 W.
106386	C 22	.05 mf. 90 V.	103062	RL 61	400 ohms 1 W.
105245	C 23	2000 ohms	105246	RS 62	.5 megohm
106386	C 24	.05 mf. 90 V.	102493	RS 63	.05 mf. 90 V.
104418	C 25	Tapped resistor	105281	RS 64	1 megohm
102492	RL 26	.05 mf. 250 V.	106386	C 65	.05 mf. 90 V.
102492	RL 27	.05 mf. 250 V.	105278	RS 66	100,000 ohms
108063	28	I.F. transformer	105272	67	10,000 ohms
108064	29	I.F. transformer	106386	68	.05 mf. 90 V.
106386	RL 30	.05 mf. 90 V.	108043	C 69	.0001 mmf. mica
105260	RL 31	300 ohms	103062	C 70	400 ohms 1 W.
106386	RS 32	.05 mf. 90 V.	107875	C 71	Power transformer
101143	IF 33	100 mmf. mica	107503	72	4-25 mmf.
105276	IF 34	50,000 ohms	107503	73	4-25 mmf.
105562	35	Vol. Cont. 5 meg.	107503	74	4-25 mmf.
103659	RS 36	.005 mf. 250 V.	107503	75	4-25 mmf.
101143	C 37	100 mf. mica	107503	76	4-25 mmf.
105281	RS 38	1 megohm	107503	77	4-25 mmf.
102499	C 39	.5 mf. 90 V.	107503	78	4-25 mmf.

Parts marked "RL" are on Large Resistance Strip.
Parts marked "RS" are on Small Resistance Strip.
Parts marked "C" are on chassis.
Parts marked "VC" are on Variable Condenser.

UNITED AMERICAN BOSCH CORP.

Model 470



Model 470

Model 470 American-Bosch Radio Receiver

CIRCUIT DESCRIPTION

The Model 470 is a seven-tube superheterodyne all-wave receiver whose circuit comprises an R. F. amplifier stage, a first detector, an oscillator, a stage of I. F. amplifier, a combination second detector, A.V.C. and first A. F. amplifier, a power output stage and a rectifier tube. Selectivity is provided by antenna tuning, R.F. stage tuning and four I.F. tuned circuits.

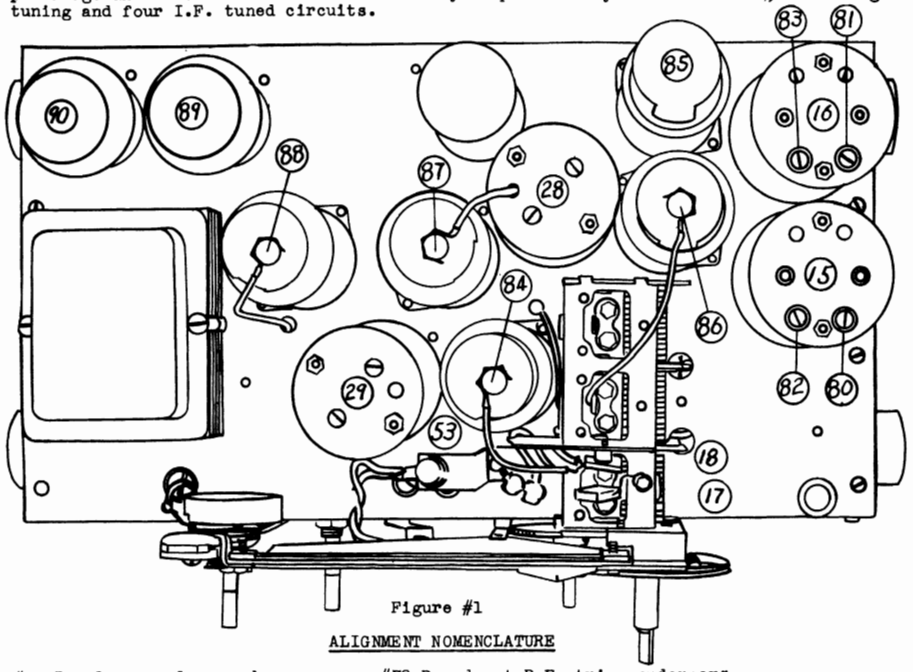


Figure #1

ALIGNMENT NOMENCLATURE

#12 Purple osc. lag condenser*
#14 Red osc. lag condenser*
#15 Green band osc. coil
#16 Broadcast osc. coil
#28 First I.F. transformer
#29 Second I.F. transformer
#72 Purple ant. trim condenser*
#73 Red ant. trim condenser*
#74 Green ant. trim. condenser*
#75 Broadcast ant. trim condenser*
#76 Purple R.F. trim condenser*
#77 Red R.F. trim condenser*
#78 Green R.F. trim condenser*
#79 Broadcast R.F. trim condenser*
#80 Green osc. trim condenser
#81 Broadcast osc. trim condenser
#82 Green osc. lag condenser
#83 Broadcast osc. lag condenser
#84 Type 58 R.F. amplifier
#85 Type 56 oscillator
#86 Type 58 First detector
#87 Type 58 I.F. amplifier
#88 Type 2A6 second detector A.V.C., 1st A.F.
#89 Type 2A5 power pentode
#90 Type 80 rectifier
* Trimmers are shown in Figure #2

ALIGNMENT PROCEDURE

To properly align the Model 470 receiver, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R. F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. Top and bottom views of the chassis is shown in the figures #1 and #2 and should be carefully studied before the actual work is started.

A - ALIGNING THE I.F. (456 K.C.)

1. Set test oscillator to 456 K.C.

2. Connect test oscillator leads through a .25 mfd. condenser between grid of I. F. tube #87 and frame of the chassis.

3. Adjust trimmers on I. F. coil #29 to maximum output, reducing output of test oscillator as required.

4. Connect test oscillator to grid of first detector tube #86 and adjust trimmers on I. F. coil #28 to maximum output.

B - ALIGNING THE R.F.

1. Set test oscillator to 1500 K. C. and connect to grid of first detector #86. Set station indicator to 1500 K.C.

2. Adjust #81 until signal is tuned in. This adjustment screw is designated by a color dot. Having obtained tune at this point set test oscillator and station selector to 600 K. C., adjust #83 until the signal is tuned in. Now return to 1500 K.C. point with set and test oscillator and readjust #81 to obtain accurate adjustment to scale reading.

3. Connect test oscillator to antenna lead, making sure the capacity equivalent of .0002 mfd. is in the circuit.

4. Continue setting of 1500 K. C. and adjust #75 and #79 to maximum output. Check sensitivity and calibration at several points on the dial. Receiver should come correctly to kilocycle settings of important broadcasting stations.

C - ALIGNING THE GREEN BAND

1. Set test oscillator and station selector to 3600 K.C.

2. Adjust #80 until signal is tuned in. This adjustment screw is marked with a color dot.

3. Set test oscillator and station selector to 1600 K. C. and adjust #82 to maximum output.

4. Return to 3600 K. C. setting and repeat adjustment of #80. In adjusting the 3600 K. C. point it is possible to obtain two different positions of the trimmer condenser. This denotes merely the plus and minus frequency between the set oscillator and test oscillator which will give the I. F. frequency. The correct setting of the trimmer condenser is the one wherein the adjustment screw is furthest out. In any event, an incorrect setting will always be denoted by lack of sensitivity and calibration when the receiver and the test oscillator are tuned to 2500 K.C. (mid-band).

5. With station selector and test oscillator both adjusted to 3600 K.C., align the antenna and R.F. circuits by adjusting #74 and #78 to maximum output.

D - ALIGNING THE RED BAND

1. Set test oscillator to 8000 K.C. and tune receiver in region of 8000 K.C. on dial scale. Note where signal is tuned in. Next set test oscillator and receiver to 4000 K.C. and adjust #14 (on right side of chassis) until signal is heard.

2. Retune set and test oscillator to 8000 K. C. and observe pointer setting. Slight deviations from calibration can be compensated by manipulating the stiff wires connecting the oscillator coil to the switch.

3. With set and test oscillator both adjusted to 8000 K. C., align the antenna and

Model 470

R. F. circuits by adjusting #73 and #77 to maximum output.

E - ALIGNING THE PURPLE BAND

1. Set test oscillator to 18,000 K. C. or if this is not available then adjust to highest frequency preferably 15,000 K.C. Tune set to this frequency and observe where signal is received on the dial scale. Then place test oscillator on 10,000 K. C. and adjust #12 (on right side of chassis) until signal is tuned in at 10. on dial scale.

2. Now return both test oscillator and receiver to 18000 K. C. Increase setting of test oscillator until signal can be tuned in at two points on dial (say 18. and 17.) then with pointer of set at 18. adjust #72 and #76 for maximum output decreasing test signal as signal becomes better tuned. At correct adjustment a very loud signal will be obtained at 18 on the dial, while a feeble signal will be observed at 17. This is a practical illustration of the effectiveness of preselection.

The adjustment instructions just given apply to Model 470 receiver which is in reasonable operating condition, but in some manner has been thrown out of adjustment. Obviously, before the radio service man can go through with the instructions given here, he must assure himself that defective tubes, injured parts, such as punctured condensers, shorted variable condensers, opened resistors, damaged high frequency coils, etc., are not such as to cause the set to be inoperative on one or more bands of frequencies.

IMPORTANT

If the Model 470 receiver oscillates after it has been carefully aligned, the tube shields should be carefully inspected to assure that positive contact exists between tube shields, tube shield base and chassis base. In some cases where a loose shield base is encountered, it may be necessary to solder the shield base to the chassis frame.

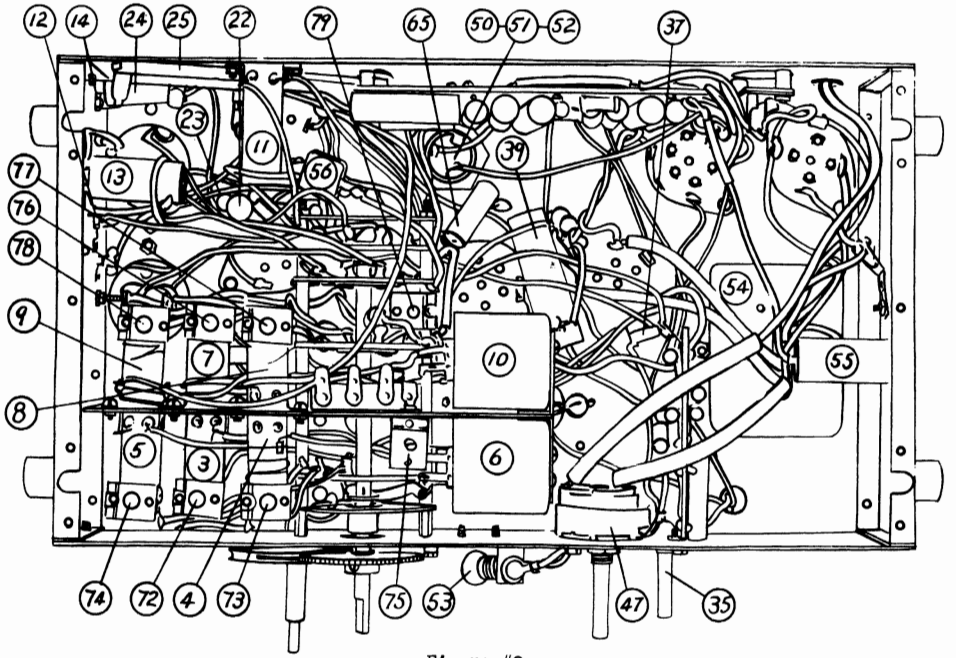
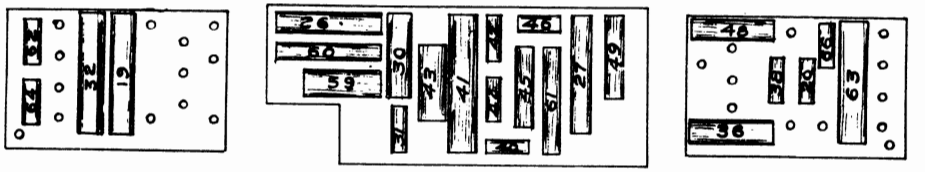


Figure #2



RESISTOR STRIP

SERVICE PARTS LIST

Models 470G & U (105-125 Volts 50-60 Cycle AC)
Models 471G & U (105-125 Volts 25 Cycles AC)
Models 474G & U (90-250 Volts 50 Cycles AC)

Part No.	Dia. #	Description of Parts
CG 955	1	Variable condenser
SW 953	2	Wave switch
108077	3	Ant. Tfs. (purple)
108075	4	Ant. Tfs. (Red)
108073	5	Ant. Tfs. (green)
108070	6	Ant. Tfs. (black)
108076	7	R.F. Tfs. (purple)
108074	8	R.F. Tfs. (red)
108072	9	R.F. Tfs. (green)
108071	10	R.F. Tfs. (black)
105687	11	Osc. coil (purple)
103800	12	Comp. condenser
105689	13	Osc. coil (red)
103800	14	Comp. condenser
105683	15	Osc. assembly (green)
RC9513A	16	Osc. assembly (black)
106417 VC	17	100 mmf. mica
105246 VC	18	.5 meg.
106386 RS	19	.05 mf. - 90 V.
105260 RS	20	300 ohm
106386 C	21	.05 mf. - 90 V.
106386 C	22	.05 mf. - 90 V.
105245 C	23	2000 ohms
106386 C	24	.05 mf. - 90 V.
104418 C	25Ed3	Tapped resistor
102492 RL	26	.05 mf. - 250 V.
102492 RL	27	.05 mf. - 250 V.
108063	28	I.F. transformer
108064	29	I.F. transformer
106386 RL	30	.05 mf. - 90 V.
105260 RL	31	300 ohms
106386 RS	32	.05 mf. - 90 V.
101143 IF	33	100 mmf. mica
105276 IF	34	50,000 ohms
VR 954	35	Vol. cont.- 5 meg.
103659 RS	36	.005 mf. - 250 V.
101143 C	37	100 mmf. mica
105281 RS	38	1 megohm
102499 C	39	.5 mf. - 90 V.

Part No.	Dia. #	Description of Parts
105249 RL	40	5000 ohms
102494 RL	41	.1 mf. - 250 V.
105279 RL	42	.25 meg.
106386 RL	43	.05 mf. - 90 V.
107363 RL	44	70,000 ohms
102504 RL	45	.02 mf. - 250 V.
105279 RL	46	.25 meg.
VR 955	47	Tone cont. 25 meg.
106403 RS	48	.001 mf. - 500 V.
106277 RL	49	.01 mf. - 250 V.
	(50	4 mf. 450 V.
CE 954	(51	20 mf. - 25 V.
	(52	8 mf. 475 V.
LP 952	53	Dial light
105781	54	Power transformer
107615 C	55	.01 mf. - 500 V.
101143 C	56	100 mmf. mica
105274 C	57	20,000 ohms
100814 C	58	50 ohm
106386 RL	59	.05 mf. - 90 V.
99777 RL	60	25,000 ohms 1 W.
103062 RL	61	400 ohms - 1 W.
105246 RS	62	.5 meg.
102493 RS	63	.05 mf. - 90 V.
105281 RS	64	1 meg.
106386 C	65	.05 mf. - 90 V.
105278 RS	66	100,000 ohms
105272	67	10,000 ohms
106386	68	.05 mf. - 90 V.
108043 C	69	.00001 mmf. mica
103062 C	70	400 ohms 1 W.
107875	71	Power transformer
107503	72	4-25 mmf.
107503	73	4-25 mmf.
107503	74	4-25 mmf.
107503	75	4-25 mmf.
107503	76	4-25 mmf.
107503	77	4-25 mmf.
107503	78	4-25 mmf.

Parts marked "RL" are on Large Resistance Strip.
Parts marked "RS" are on Small Resistance Strip.
Parts marked "C" are on Chassis.
Parts marked "VC" are on Variable Condenser.

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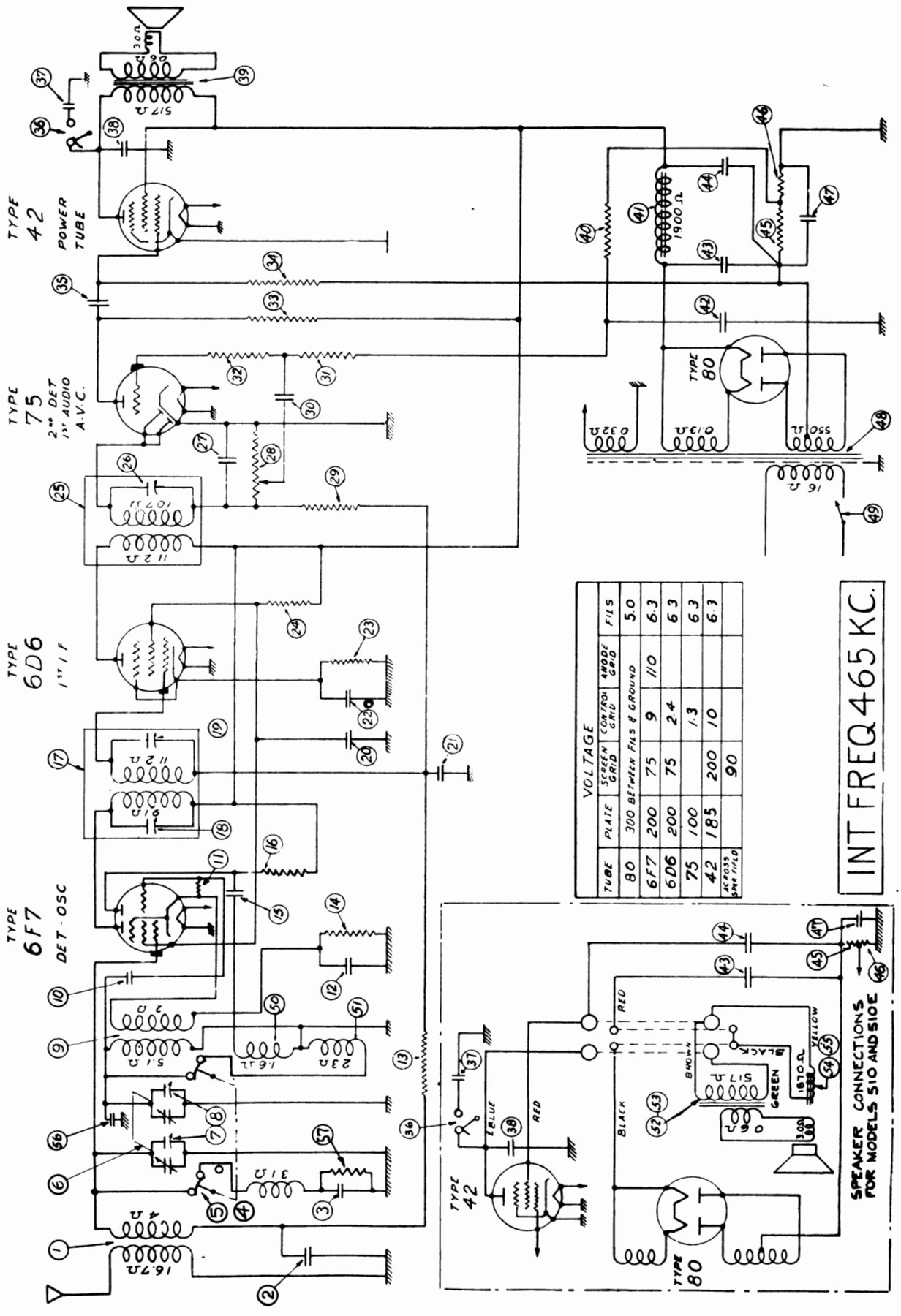
AMERICAN-BOSCH RADIO MODEL 505



Model 505

AMERICAN-BOSCH RADIO MODEL 505

Five Tube, Two Band, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6F7, 1 #6D6, 1 #75, 1 #42, 1 #80 - Total 5
Power Supply	105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption	46 Watts
Tuning Ranges	530 to 1500 K.C. and 1500 to 3300 K.C.
Maximum Undistorted Output	1.5 Watts
Maximum Output	2.8 Watts
Line-Up Frequencies	I.F. 465 K.C., 1400 K.C.

GENERAL DESCRIPTION

This model is a five-tube, A.C., two-band superheterodyne receiver whose circuit comprises a combined first detector-oscillator an intermediate frequency amplifier, a combined second detector, A.V.C. and first audio amplifier, a power pentode output stage and a rectifier with its associated filter circuit and power transformer.

This model is designed to work over two bands, the broadcast band extending from 530 to 1500 K.C. and a police band which extends from 1500 to 3300 K.C.

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment.

A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in Fig. #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

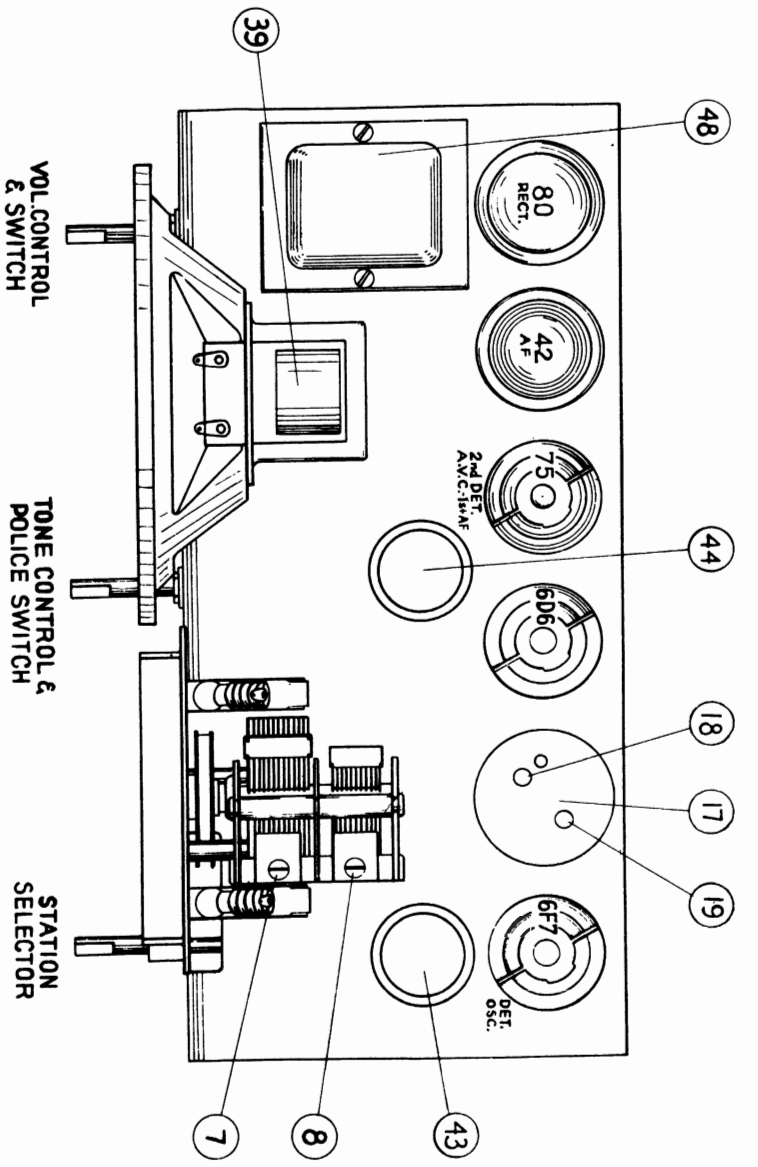
1. Set volume control on full and turn tone control knob to the right hand position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6D6 I.F. tube thru a .25 mfd. blocking condenser.
4. Adjust #26 (see Fig. #2) to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6F7 first detector-oscillator tube and adjust #18 and #19 (Fig. #1) to maximum output.
6. With test signal still on the grid of 6F7 tube, repeat the above adjustments for greatest sensitivity.

ADJUSTMENT OF BROADCAST BAND

1. Leave test signal on grid of 6F7 tube and set the test oscillator to 1400 K.C.
2. Turn the gang condenser to its maximum position. Adjust dial indicator until either end is directly over the long horizontal lines on the dial scale. Then set dial indicator to 1400 K.C.
3. Adjust trimmer #8 to maximum output.
4. Apply test signal to antenna of set thru a .0002 mfd. condenser and adjust trimmer #7 to maximum output.

ADJUSTMENT OF POLICE BAND

When adjustments as outlined under the broadcast band are completed, the police band requires no adjustment unless the coil had been changed. In this event, set test oscillator and station indicator to 1700 K.C. and apply test signal to antenna lead. The police band winding is indicated by "A" in Fig. #2. Adjust the position of this winding by sliding it back and forth on the core until maximum output is indicated on the output meter. This winding should then be secured in place by applying a thin coat of coil cement.



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MODEL 505

SERVICE PARTS LIST MODEL 505

Dia. #	Part #	Description
1	RC 9588	Antenna coil assy.
2		.05 mfd. 200 V. cond. - part of SA 105327
3	CM 958	400 mmfd. mica cond.
4		Police pre-selector coil-part of RC 9588
5	SW 9519	Switch assembly
6	CG 9522	Variable gang condenser
7-8		Trimmer condensers - part of CG 9522
9	RC 9589	Oscillator coil assy.
10	SA 106417	100 mmfd. mica condenser
11	SA 105276	50,000 ohm ½ W. resistor
12	SA 106386	.05 mfd. 200 V. cond.
13	SA 105279	250,000 ohm ½ W. res.
14	SA 105269	1800 ohm ½ W. resistor
15	SA 106277	.01 mfd. 400 V. cond.
16	SA 100197	25,000 ohm ½ W. resistor
17	IC 9532	1st I.F. transformer
18-19		I.F. trimmer condensers - part of IC 9532
20	SA 102494	.1 mfd. 400 V. condenser
21-22		.05 mfd. 200 V. condensers - part of SA 105327
23	SA 105264	500 ohm ½ W. resistor
24	SA 101163	75,000 ohm ½ W. resistor
25	IC 9533	2nd I.F. transformer
26		I.F. trimmer condenser - part of IC 9533
27	SA 106417	100 mmfd. mica condenser
28	VR 957	Volume control and line switch (500,000 ohm)
29	SA 105281	1 meg. ½ W. resistor
30	CW 9512	.02 mfd. 400 V. condenser
31	SA 105281	1. meg. ½ W. resistor
32	SA 105278	100,000 ohm ½ W. resistor
33	SA 105279	250,000 ohm ½ W. resistor
34	SA 100195	250,000 ohm ½ W. resistor
35	CW 9512	.02 mfd. 400 V. condenser
36		Tone control switch - part of SW 9519
37	CW 9512	.02 mfd. 400 V. condenser
38	SA 103695	.01 mfd. 600 V. condenser
39	SA 107357	Speaker output trans.
40	SA 105276	50,000 ohm ½ W. resistor
41	SA 107358	Speaker field coil - (1900 ohm)
42		.05 mfd. 200 V. condenser - part of SA 105327
43	CE 9512	12 mfd.electrolytic cond.
44	CE 9511	8 mfd. electrolytic cond.
45		320 ohm resistor - part of RE 9513
46		30 ohm resistor - part of RE 9513
47	CE 958	10 mfd.electrolytic cond.
48	TR 9511	Power transformer
49		Line switch-part of VR 957
50		Oscillator feed back coil - part of RC 9589
51		Police oscillator coil - part of RC 9589
56	SA 108043	.00001 mfd. mica cond
57	SA 105272	10,000 ohm ½ W. res.

Part #	Description
	CHASSIS ASSEMBLY
CH 9517	Chassis assembly
KA 9513	Cabinet
SK 957	Speaker assembly
	BRACKETS, CLIPS AND CLAMPS
BK 9545	Dial scale frame
BK 9566	Dial scale frame mtg. bracket
BK 9567	Speaker to chassis mounting bracket
	CABLE AND CABLE ASSEMBLIES
PR 97160	Cord for dial indicator
CB 9512	Line cable assembly
KL 99561	Ground cable - Black
KL 99562	Antenna cable - Blue
	TUBE SOCKETS & TUBE SHIELDS
CV 9560	Tube shield - plain top
CV 9559	Tube shield - slotted top
FP 105947	Tube shield ring
SA 104615	Tube socket - 4 prong
SA 104617	Tube socket - 6 prong
SA 105461	Tube socket - 7 prong
BE 9536	Tube shield base
	SCREWS & NUTS
SC 106932	Self-tapping screw #7 x ⅜"
SC 106677	Speaker plate to core fastening screws
NT 103039	Nut for volume and tone contro
	WASHERS, BUSHINGS & SPACERS
FP 108003	Felt washer under knob
WA 106339	Washer - cabinet
SR 1009CA	Brass spacer - bracket to condenser mounting
IS 1002	Rubber bushing - condenser mounting
WA 106382	Split copper washer on drive shaft
FP 102301	Spacer - power transformer
SR 953	Spacer - variable condenser
WA 80598	Lockwasher - volume & tone control
WA 74084	Washers for plate to core fastening screw
	MISCELLANEOUS
GA 952	Dial rubber gasket - on cabinet

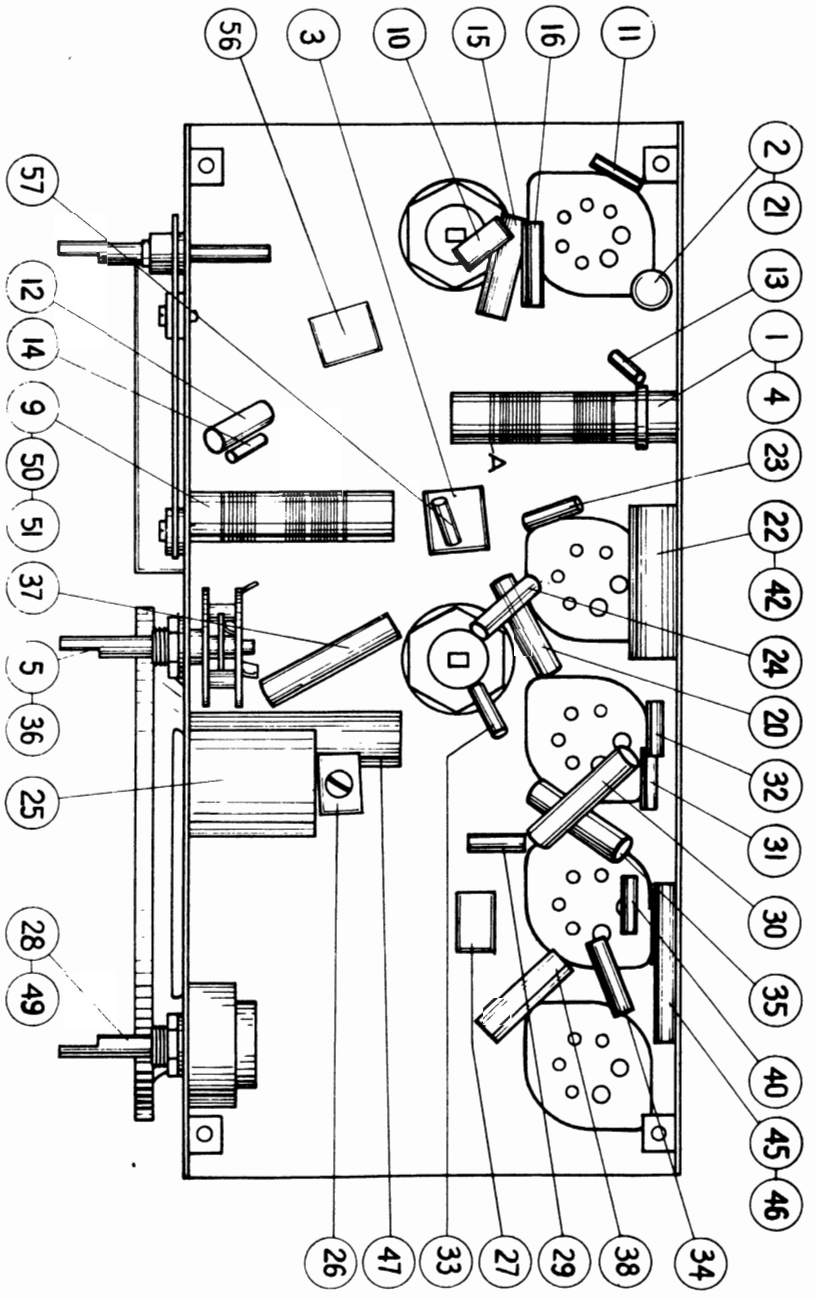

Figure No. 2

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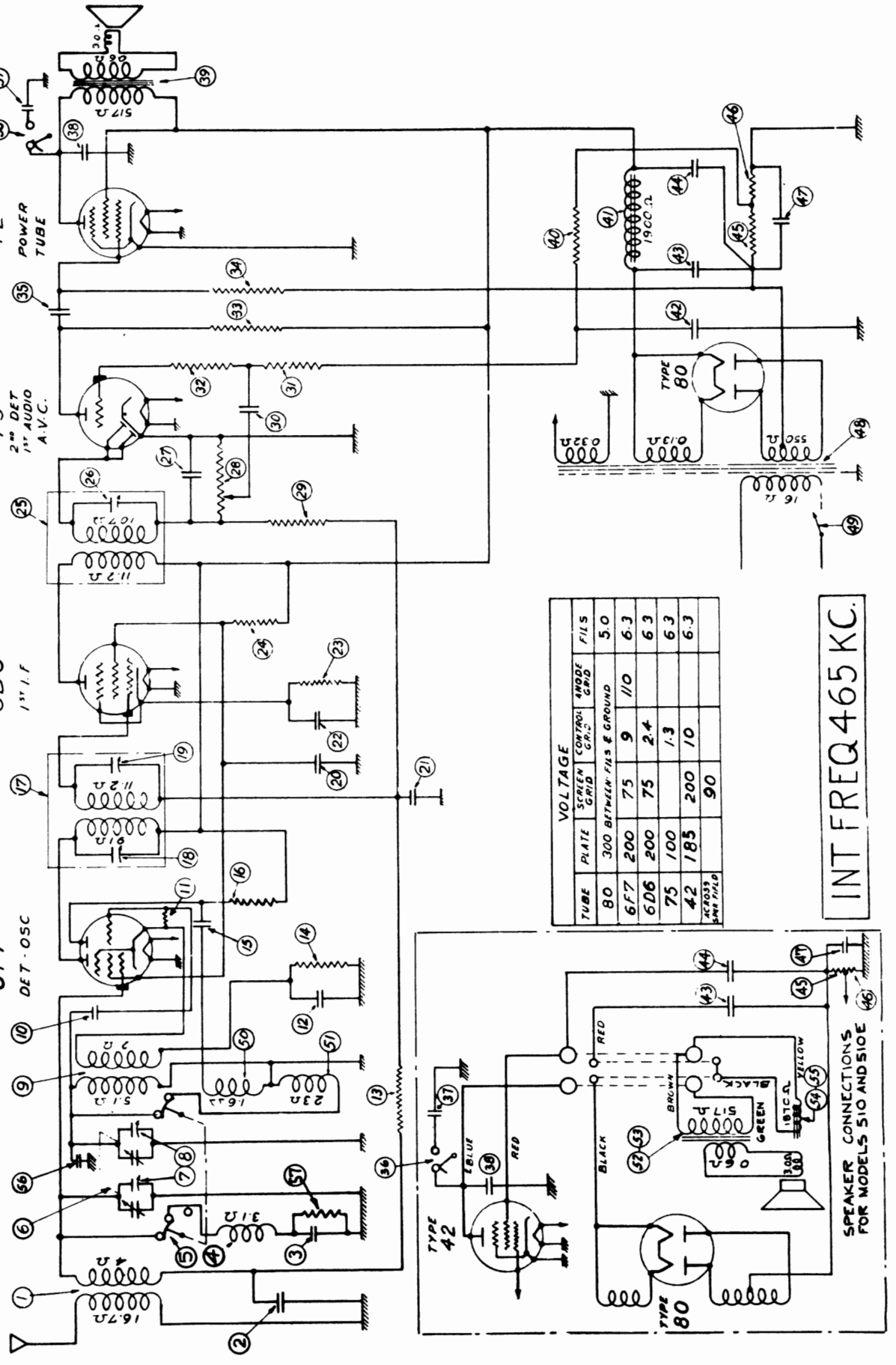
AMERICAN-BOSCH RADIO MODELS 510-510E



Model 510-510E

AMERICAN-BOSCH RADIO MODEL 510

Five Tube, Two Band, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6F7, 1 #6D6, 1 #75, 1 #42, 1 #80 - Total 5
Power Supply	105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption	46 Watts
Tuning Ranges	530 to 1500 K.C. and 1500 to 3300 K.C.
Maximum Undistorted Output	1.5 Watts
Maximum Output	2.8 Watts
Line-Up Frequencies	I.F. 465 K.C., 1400 K.C.

GENERAL DESCRIPTION

This is a five-tube, A.C. two band superheterodyne receiver whose circuit comprises a combined first detector-oscillator, an intermediate frequency amplifier, a combined second detector - A.V.C. and first audio amplifier, a power pentode output stage and a rectifier with its associated filter circuit and power transformer.

The model is designed to work over two bands, the broadcast band extending from 530 to 1500 K.C. and a police band which extends from 1500 to 3300 K.C.

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment.

A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

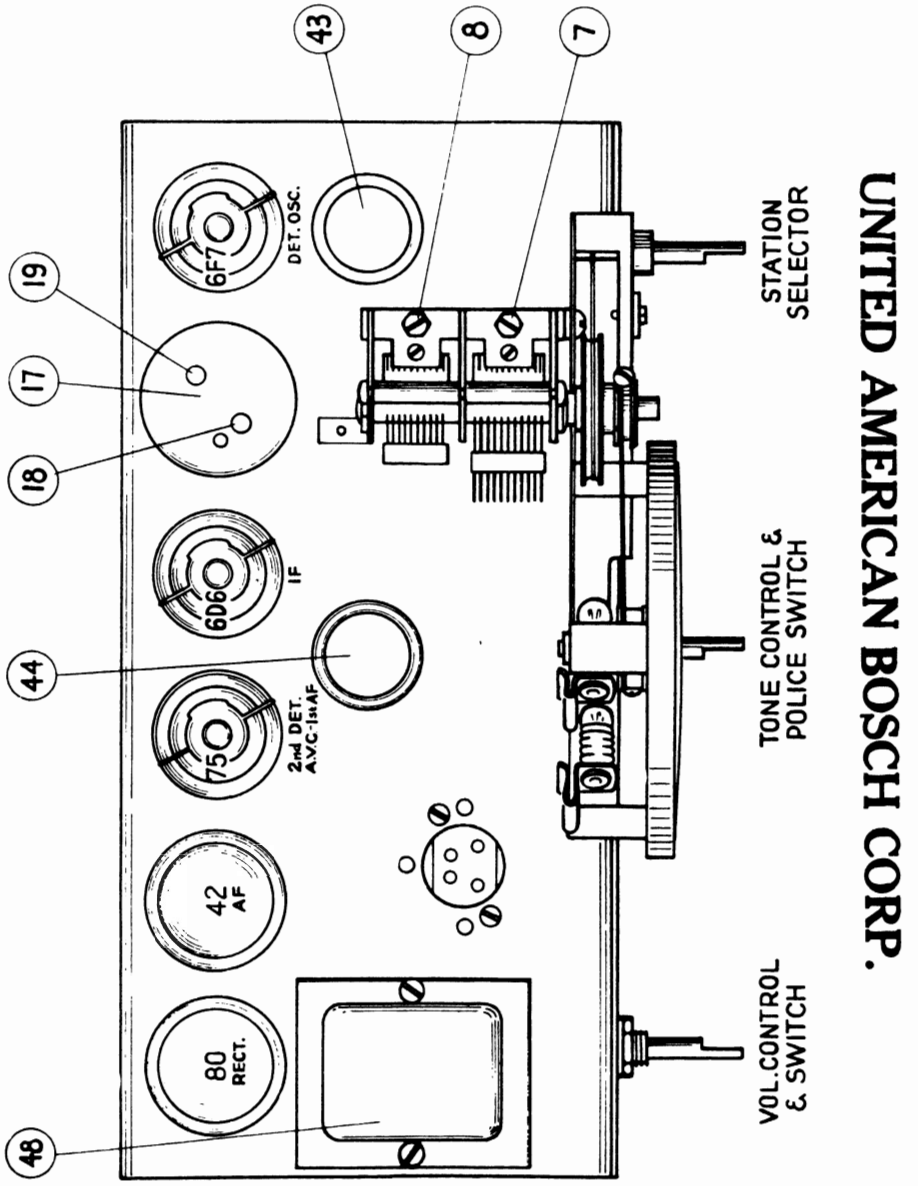
1. Set volume control on full and turn tone control knob to the right hand position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test oscillator is applied to the grid of the 6D6 I.F. tube thru a .25 mfd. blocking condenser.
4. Adjust #26 (see Fig. #2) to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6F7 first detector-oscillator tube and adjust #18 and #19 (see Fig.#1) to maximum output.
6. With test signal still on the grid of the 6F7 tube, repeat the above adjustments for greatest sensitivity.

ADJUSTMENT OF BROADCAST BAND

1. Leave test signal on grid of 6F7 tube and set test oscillator to 1400 K.C.
2. Turn the gang condenser to its maximum position. Adjust dial indicator until either end is directly over the long horizontal lines on the dial scale. Then set dial indicator to 1400 K.C.
3. Adjust trimmer #8 to maximum output.
4. Apply test signal to antenna of set thru a .0002 mfd. series condenser and adjust trimmer #7 to maximum output.

ADJUSTMENT OF POLICE BAND

When adjustments as outlined under the broadcast band are completed, the police band requires no adjustment unless the coil has been changed.
In this event, set test oscillator and station indicator to 1700 K.C. and apply test signal to antenna lead. The police band winding is indicated by "A" in Fig. #2. Adjust the position of this winding by sliding it back and forth on the core until maximum output is indicated on the output meter. This winding should then be secured in place by applying a thin coat of coil cement.



MODELS 510-510E

SERVICE PARTS LIST MODELS 510-510E

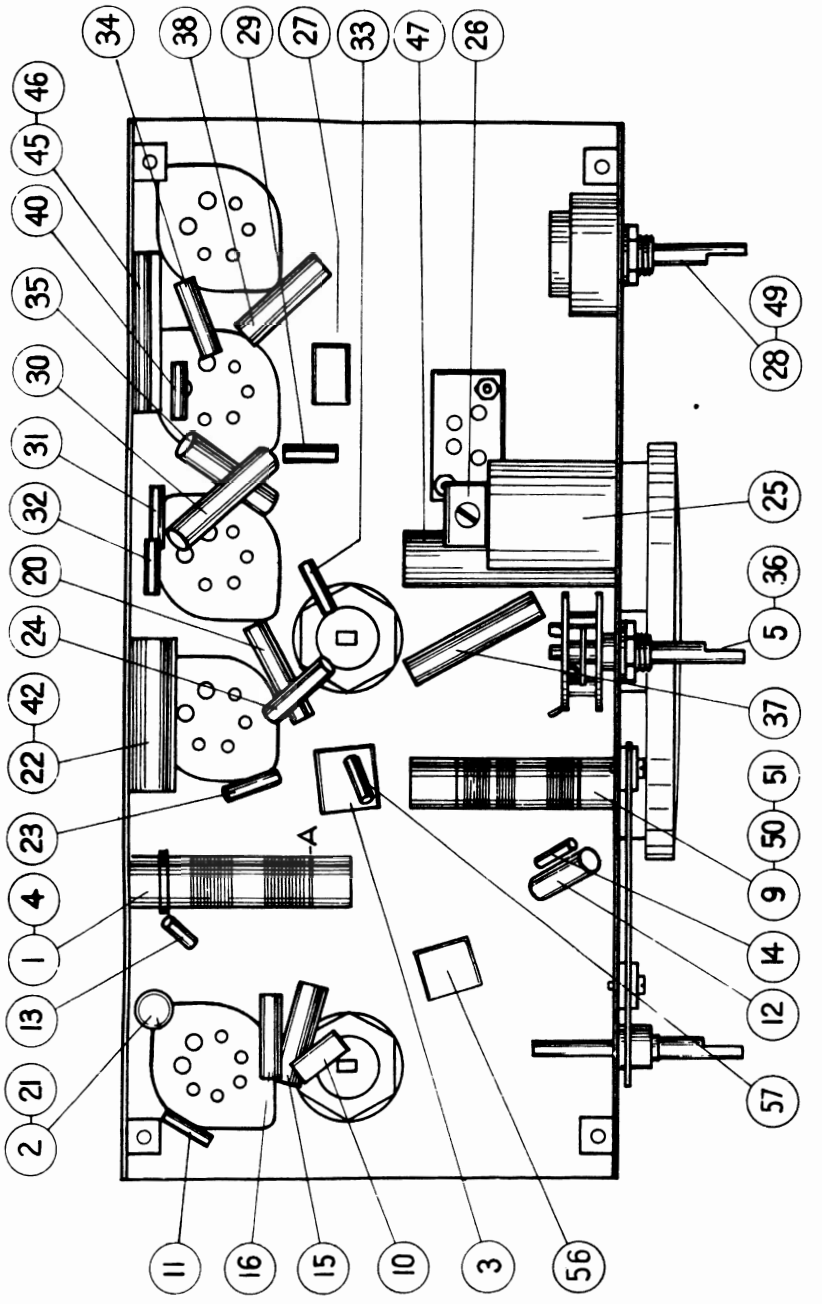


Figure No. 2

Dia. #	Part #	Description
1	RC 9588	Antenna coil assy.
2		.05 mfd. 200 V. cond. - part of SA 105327
3	CM 958	400. mmfd. mica cond.
4		Police pre-selector coil - part of RC 9588
5	SW 9519	Switch assembly
6	CG 9522	Variable gang condenser
7-8		Trimmer condensers - part of CG 9522
9	RC 9589	Oscillator coil assy.
10	SA 106417	100 mmfd. mica cond.
11	SA 105276	50,000 ohm ¼ W. resistor
12	SA 106386	.05 mfd. 200 V. cond.
13	SA 105279	250,000 ohm ¼ W. res.
14	SA 105269	1800 ohm ¼ W. resistor
15	SA 106277	.01 mfd. 400 V. cond.
16	SA 100197	25,000 ohm ½ W. res.
17	IC 9532	1st I.F. transformer
18-19		I.F. trimmer condensers - part of IC 9532
20	SA 102494	.1 mfd. 400 V. cond.
21-22		.05 mfd. 200 V. condensers - part of SA 105327
23	SA 105264	500 ohm ¼ W. resistor
24	SA 101163	75,000 ohm ½ W. res.
25	IC 9533	2nd I.F. transformer
26		I.F. trimmer condenser - part of IC 9533
27	SA 106417	100 mmfd. mica cond.
28	VR 957	Volume control & line switch (500,000 ohm)
29	SA 105281	1 meg. ¼ W. resistor
30	CW 9512	.02 mfd. 400 V. cond.
31	SA 105281	1 meg. ¼ W. resistor
32	SA 105278	100,000 ohm ¼ W. res.
33	SA 105279	250,000 ohm ¼ W. res.
34	SA 100195	250,000 ohm ½ W. res.
35	CW 9512	.02 mfd. 400 V. cond.
36		Tone control switch - part of SW 9519
37	CW 9512	.02 mfd. 400 V. cond.
38	SA 103695	.01 mfd. 600 V. cond.
40	SA 105276	50,000 ohm ¼ W. res.
42		.05 mfd. 200 V. cond. - part of SA 105327
43	CE 9512	12. mfd. electr. cond.
44	CE 9511	8. mfd. electr. cond.
45		320 ohm resistor - part of RE 9513
46		30 ohm resistor - part of RE 9513
47	CE 958	10 mfd. electr. cond.
48	TR 9511	Power transformer
49		Line switch - part of VR 957
50		Oscillator feed back coil - part of RC 9589
51		Police oscillator coil - part of RC 9589
52	SA 108025	Speaker output trans. (used on Mod.510 only)
53	TR 9515	Speaker output trans. (used on Model 510E only)
54	SA 107163	Speaker field coil - (used on Mod. 510 only)
55	CL 9533	Speaker field coil - (used on Mod. 510E only)
56	SA 108043	.00001 mfd. mica cond
57	SA 105272	10,000 ohm ¼ W. res.

Part #	Description
	MAIN ASSEMBLIES
CH 9535	Chassis assembly
SK 9511	Speaker - Model 510E
SA 108024	Speaker - Model 510
KA 9518	Cabinet - Model 510E
KA 9517	Cabinet - Model 510
	CABLE AND CABLE ASSEMBLIES
CB 9512	Line cable assembly
KL 99561	Ground cable - Black
KL 99562	Antenna cable - Blue
	TUBE SOCKETS & TUBE SHIELDS
SA 105143	Tube socket - 4 prong
SA 104617	Tube socket - 6 prong
SA 105461	Tube socket - 7 prong
BE 9526	Tube shield base
SA 107257	Speaker socket - 4 prong
CV 9560	Tube shield - plain top
CV 9559	Tube shield - slotted top
FP 105947	Tube shield ring
	NUTS AND SCREWS
SC 107395	Speaker fastening screws
SC 952	Indicator fastening screw
NT 103039	Nut - volume and tone control
	WASHERS, BUSHINGS & SPACERS
WA 70161	Plain washer used under indicator
WA 106382	Split copper washer on drive shaft
FP 102301	Spacer - power transformer
SR 953	Brass spacer - variable cond
IS 1002	Rubber bushing - condenser mounting
WA 80589	Lock washer - volume and tone control
	SPEAKER PARTS (SA 108024)
SA 106617	Diaphragm and coil assembly
FP 106498	Diaphragm housing

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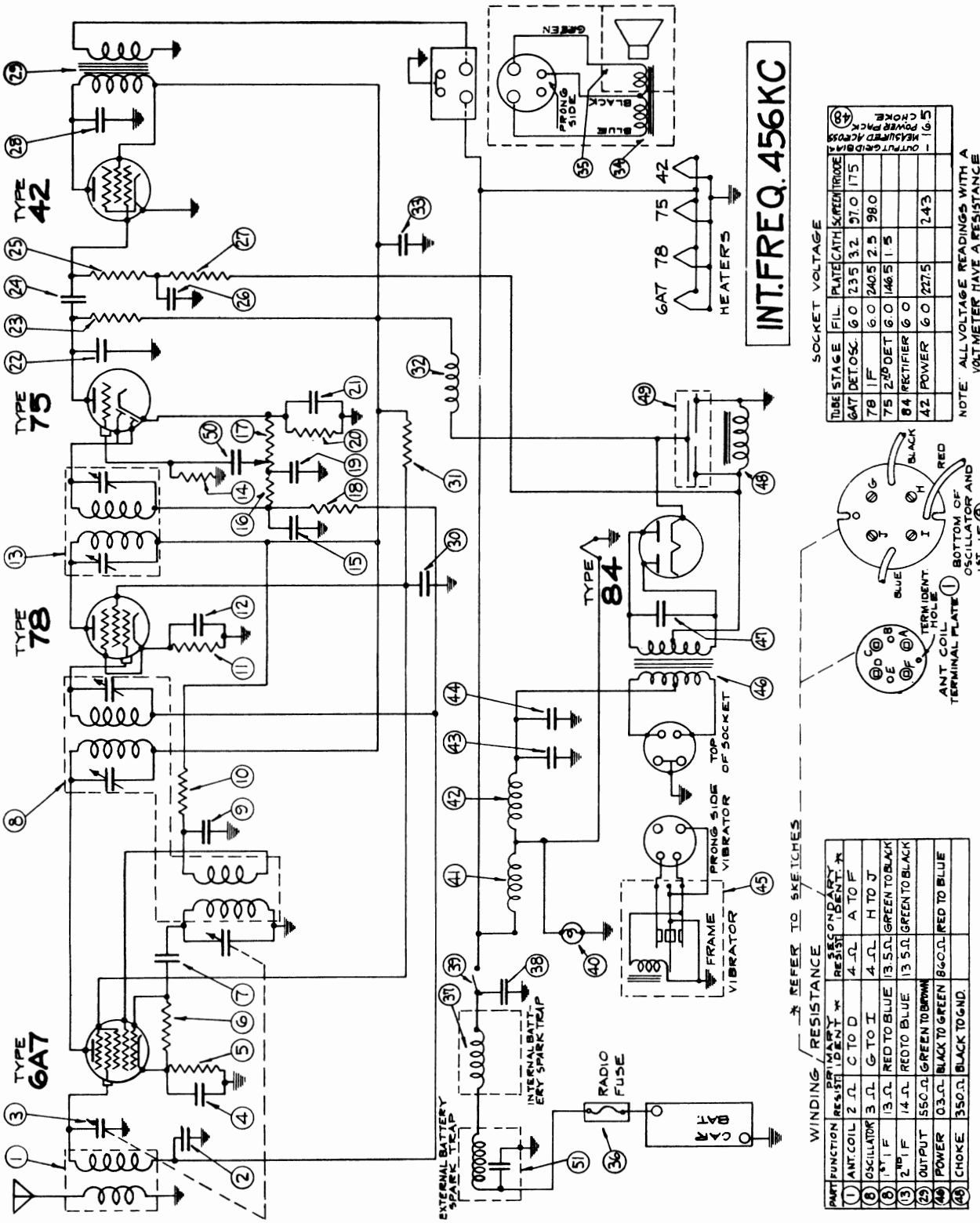
AMERICAN-BOSCH CAR-RADIO MODEL 524A
Editions 1, 2, 2D, 2G



TUBE	STAGE	FIL.	PLATE	CATH	SCREEN	TRIODE
6A7	DET. OSC.	6.0	235	3.2	97.0	175
78	1F	6.0	240	2.5	98.0	
75	2ND DET	6.0	146	1.5		
84	RECTIFIER	6.0				
42	POWER	6.0	227.5		243	

PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT. *	SECONDARY RESIST.	SECONDARY IDENT. *
(1)	ANT. COIL	2 Ω	C TO D	4 Ω	A TO F
(8)	OSCILLATOR	3 Ω	G TO I	4 Ω	H TO J
(6)	1ST I F	13 Ω	RED TO BLUE	13.5 Ω	GREEN TO BLACK
(13)	2ND I F	14 Ω	RED TO BLUE	13.5 Ω	GREEN TO BLACK
(25)	OUTPUT	550 Ω	GREEN TO BROWN		
(49)	POWER	0.3 Ω	BLACK TO GREEN	86 Ω	RED TO BLUE
(48)	CHOKE	350 Ω	BLACK TO GND.		

The circuit is of the superheterodyne type employing five tubes as follows: a type 6A7 as a combined first detector-oscillator, a type 78 as an intermediate frequency amplifier, a type 75 as a combination second detector-A.V.C. and first audio amplifier, a type 42 as a final audio amplifier and a type 84 as a rectifier in the power supply.

The Model 524A Ed. 1 has been designed with an internal tuned spark trap in the battery circuit to assist in suppression of ignition interference.

The Model 524A Ed. 2 has an additional spark trap connected externally in the battery cable. These two spark traps make the use of spark plug suppressors unnecessary in many installations.

MICROPHONIC OR INTERMITTENT

Tap each tube lightly with a small piece of wood or an insulated screw driver handle. The offending tube, when tapped, will usually howl very loudly if microphonic, or will give intermittent results if defective.

AMERICAN-BOSCH CAR-RADIO MODEL 524A

Editions 1, 2, 2D and 2G

Five-Tube, Superheterodyne Receiver

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts
1	RC 9525	Antenna coil assembly
2	SA 106386	.05 mfd. 200 V. cond.
3	CG 953	Condenser gang assy.
4	SA 106386	.05 mfd. 200 V. cond.
5	SA 105260	300 ohms 1/4 W. resistor
6	SA 105276	50,000 ohms 1/4 W. res.
7	SA 106417	.0001 mfd. mica cond.
8	RC 9526	Composite coil assembly
9	SA 102500	.01 mfd. 350 V. cond.
10	SA 105272	10,000 ohms 1/4 W. res.
11	SA 105258	200 ohms 1/4 W. res.
12	CW 951	.1 mfd. 200 V. cond.
13	IC 955	2nd I.F. coil assy.
14	SA 105281	1 meg. 1/4 W. res.
15	SA 106417	.0001 mfd. mica cond.
16	SA 105276	50,000 ohms 1/4 W. res.
17	VR 951	Vol. control-50,000 ohms
18	SA 105246	.5 meg. 1/4 W. resistor
19	SA 106417	.0001 mfd. mica cond.
20	SA 105249	5,000 ohms 1/4 W. res.
21	SA 102497	.25 mfd. 200 V. cond.
22	SA 103852	.002 mfd. 500 V. cond.
23	SA 105276	100,000 ohms 1/4 W. res.
24	SA 103659	.005 mfd. 350 V. cond.
25	SA 105279	.25 meg. 1/4 W. res.
26	CW 951	.1 mfd. 200 V. cond.
27	SA 105279	.25 meg. 1/4 W. res.
28	CW 952	.005 mfd. 500 V. cond.
29	TR 952	Output transformer
30	SA 102492	.05 mfd. 350 V. cond.
31	SA 101471	18,000 ohms 1/2 W. res.
32	RC 9527	Choke coil
33	SA 102496	.25 mfd. 350 V. cond.
34	SK 951	Speaker
35	DM 951	Diaphragm & voice coil assy.
36	FU 951	Fuse - 20 ampere
37	RC 9512	Filter choke
38	CM 953	.00005 mfd. mica cond.
39		Switch - part of VR 951
40	LP 951	Dial light
41	SA 105452	Filter choke
42	SA 105452	Filter choke
43	CW 958	.5 mfd. 200 V. cond.
44	CW 958	.5 mfd. 200 V. cond.
45	VI 951	Vibrator
46	TR 953	Power transformer
47	SA 106804	.008 mfd. 1600 V. cond.
48	TR 951	B choke
49	CE 951	6-10 mfd. electrolytic condenser
50	SA 103659	.005 mfd. 350 V. cond.
		MAIN ASSEMBLIES
	CH 954	Chassis assembly
	CU 951	Control unit-less shafts
	SK 951	Speaker assembly
		BRACKETS, CLIPS & CLAMPS
	FP 79381	Battery and antenna cable to housing mounting clamp

Part #	Description of Parts
	CABLES & CABLE ASSEMBLIES
CB 951	Battery cable assembly
CB 958	Antenna cable assembly
	TUBE SOCKETS & TUBE SHIELDS
CV 954	Tube shield
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 953	Tube socket - 4 prong
SA 105461	Tube socket - 7 prong
SA 107257	Speaker socket
	NUTS
NT 952	Thumb nut - assembly to drive shaft
NT 104935	Mounting nut
FP 106639	Thumb nut - cables to housing
NT 103039	Nut for volume control
	WASHERS, BUSHINGS & SPACERS
WA 104936	Mounting washer
WA 41033	Mounting lock washer
SR 953	Variable condenser mounting bushing spacer
FP 104086	Spacer for speaker & sparktrap
IS 1002	Var. cond. rubber mounting bushing
	SCREWS & STUDS
FP 104892	Cover to housing fastening thumb screw
FP 106571	Mounting stud
SC 1026 CA	Self-tapping screw #6 x 1" long
SC 101700	Self-tapping screw #7 x 1/4"
	MISCELLANEOUS
IS 105430	Insulation for battery cable fuse
SA 106754	Suppressor-coil
SA 107182	Suppressor-spark plug
SA 105300	Suppressor condenser
HG 9532	Housing assembly
CV 959	Cover assy. with name plate
CB 9529	Dial light cable assy. - control unit
WH 952	Window-control head
RG 952	Dial glass rim
BK 955	Control unit mounting bracket
HP 951	Control unit mounting strap
DS 953	Dial scale
SI 9514	Control unit dial scale indicator
KN 956	Knob for tuning
KY 951	Key for volume control
DM 951	Diaphragm assy. - complete
SC 106677	Diaphragm housing to frame fastening screw

Part #	Description of Parts
CL 9513	Speaker field coil
SA 106492	Core and frame assembly
FP 101742	Cardboard washer for speaker field coil
FP 106496	Plate for core & frame assy.
CB 9528	Speaker cable with 4 prong plug assembly
SH 9510	Var. cond. shaft & pinion assy.
FA 951	Speaker silk grill
IF 954	Paper template
	KITS - Control Unit Panel Mounting
KT 951	Under dash mounting
KT 957	1934 Chrysler, Dodge, Plymouth
KT 958	1934 Ford
KT 959	1934 De Soto
KT 9511	1935 Chrysler, Dodge, Plymouth, Hupmobile
KT 9512	1935 Ford
KT 9513	1935 De Soto

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed, or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary and a high grade modulated oscillator is available, then proceed as follows

1. Set test oscillator to 456 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to any metal part of the chassis. (The impedance of the voice coil is 3. ohms.)

4. Apply test signal to grid of 78 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers A and B to maximum output reducing output of test oscillator as required.

5. Apply test signal to grid of 6A7 detector-oscillator tube and adjust trimmers C and D to maximum output.

6. Set test oscillator to 1500 K.C. and turn condenser gang until the rotor plates are wide open. Then place a piece of thin paper (approximately .015 thick) between the rotor and stator at the bottom of the gang, and then close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1500 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

Part #	Description of Parts
	KITS - Control Unit Panel Mounting
KT 951	Under dash mounting
KT 952	1934 Plymouth, Chrysler, Dodge
KT 953	1934 Ford
KT 954	1935 Plymouth, Chrysler, Dodge, Hupmobile
KT 955	1935 Ford
KT 9514	1935 De Soto
KT 9515	1934 De Soto
	MODEL 524A ED. 2D
	All parts same as Model 524A Ed. 2 Except: "D" indicates De Jur control unit
	MISCELLANEOUS
CV 9566	Chassis housing cover with name plate

7. Adjust trimmer E to maximum output and then remove the paper gauge.

8. Set test oscillator and condenser gang to 1400 K.C.

9. Apply test signal to antenna lead through a .0002 mfd. condenser and adjust trimmer F to maximum output. This completes the adjustment of the receiver.

WEAK OR INSENSITIVE AFTER REALIGNMENT

Check coils and associated circuits for resistance in deficient stage.

LOW POWER OUTPUT WITH B VOLTAGE CORRECT

Check speaker field coil, voice coil and associated audio circuit for resistance continuity and defective condensers. All riveted component parts can be removed by merely punching out the rivets with a small diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

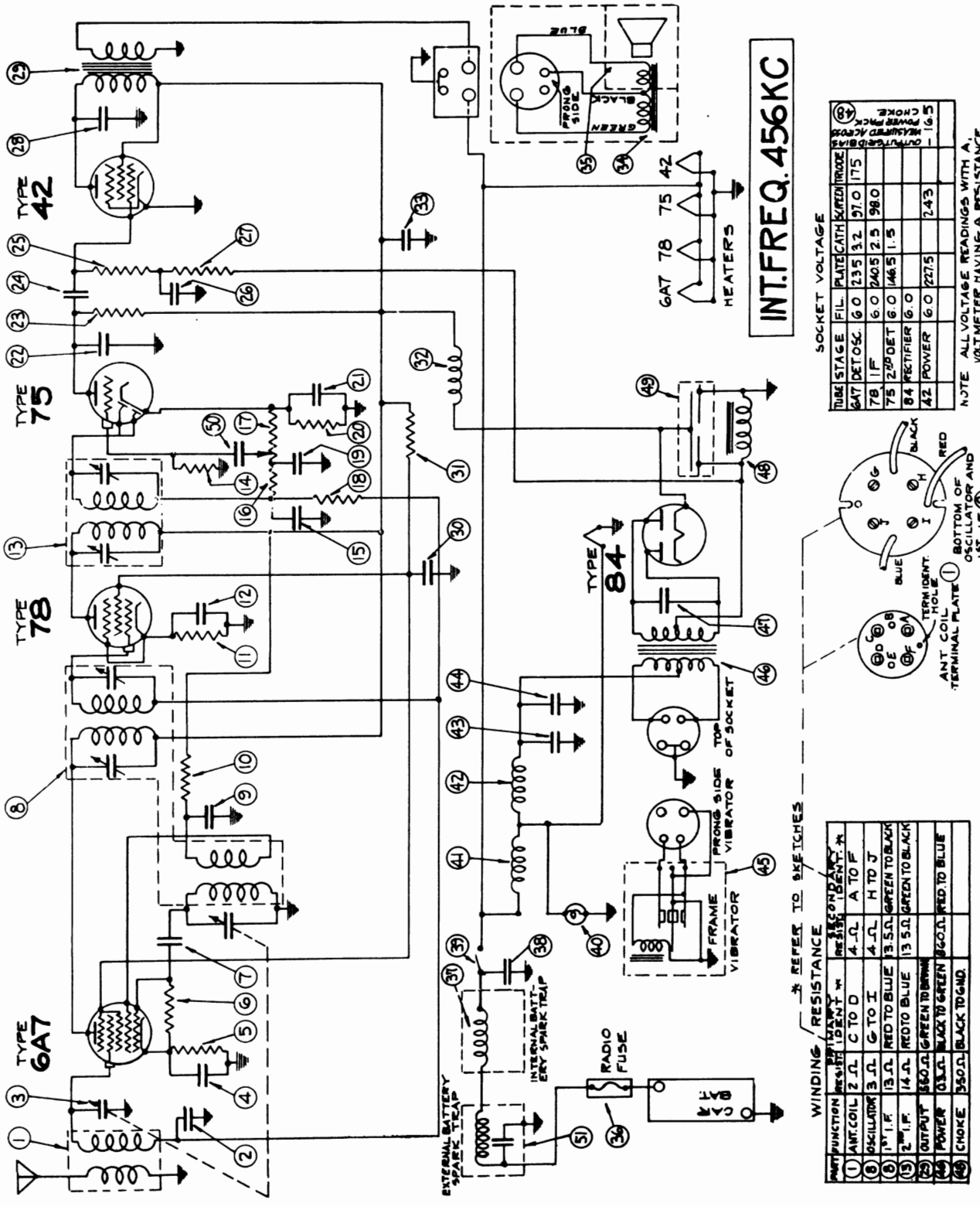
In changing the power transformer, it is only necessary to remove the four drive screws, two located directly over the resistor and condenser strip, and the other two in back of the condenser gang on the power pack shield. In replacing the power trans-

SET INOPERATIVE AND TUBES DO NOT LIGHT

Check fuse in container on receiver ammeter lead. Remove speaker cover and disconnect speaker plug. Remove vibrator, all tubes and disconnect dial light cable from set. Check with ohmmeter from Hot A side of battery cable (male bayonet connector inside the housing that the fuse container engages) to ground. Should ohmmeter show an open circuit when line switch is closed, obviously a tube or the vibrator is shorted and these parts can be checked separately to determine the defective one.

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH CAR-RADIO MODEL 536



UNITED AMERICAN BOSCH CORP.

CAR-RADIO MODEL 536

AMERICAN-BOSCH CAR-RADIO MODEL 536

Five-tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6A7, 1 #76, 1 #75, 1 #42, 1 #84 - Total 5
Battery Current (6.3 Volt Battery)	6.5 Amperes
Tuning Range	540 to 1500 K.C.
Maximum Undistorted Output	3.0 Watts
Maximum Output	4.0 Watts
Line-up Frequencies	1.F. 456 K.C., 1400 K.C., 1500 K.C.

GENERAL DESCRIPTION

The Model 536 Car Radio has been designed, manufactured and tested with special regard for the requirements of automobile radio. The electrical, mechanical and acoustical features of the set have been decided upon after extensive tests in automobiles to determine the proper requirements for satisfaction. This Car Radio is a single unit compact radio chassis, power pack, and speaker with a separate remote control. The set is contained in a cylindrical housing and is provided with many features which result in improved tone quality, attractive appearance, mechanical stability and desirable service features.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type employing five tubes as follows: A type 6A7 as a combined first detector-oscillator, a type 78 as an intermediate frequency amplifier, a type 75 as a combination second detector-A.V.C.-and first audio amplifier, a type 42 as an output tube and a type 84 as a rectifier in the power supply.

As the Model 536 is equipped with both an external spark trap (connected in the battery cable) and an internal, tuned spark trap, the use of spark-plug suppressors is unnecessary in many installations.

SERVICE DATA

COMMON TROUBLES THAT CAN BE EASILY LOCATED AND REMEDIED WITHOUT REMOVING RECEIVER FROM CAR OR FROM ITS HOUSING

DIAL LIGHT DOES NOT LIGHT

Dial light may be loose in socket, broken or burned out.

Socket on end of lead in rear of control head pulls straight out.

SET INOPERATIVE AND TUBES DO NOT LIGHT

Check fuse in container on receiver ammeter lead. Remove speaker cover and disconnect speaker plug. Remove vibrator, all tubes and disconnect dial-light cable from set. Check with ohmmeter from "Hot A" side of battery cable (male bayonet connector inside the fuse-container housing) to ground. Should ohmmeter show an open circuit when line switch is closed, obviously a tube or the vibrator is shorted and these parts can be checked separately to determine which is defective. On the other hand, if ohmmeter shows a short circuit, the chassis should be removed from its housing and checked.

INSENSITIVE OR WEAK

Check car antenna for poor connections and grounds. Also check tubes and the receiver alignment.

INTERMITTENT RECEPTION

This is usually caused by a poor connection from the set antenna lead to the car antenna lead-in, and this point should always be checked when intermittent reception occurs.

MICROPHONIC OR INTERMITTENT

Tap each tube lightly with a small piece of wood or an insulated screw driver handle. The offending tube, when tapped, will usually howl very loudly if microphonic, or will give intermittent results if defective.

LOW POWER OUTPUT

Check tubes and vibrator. Usually caused by the latter.

RECEPTION CUTS OFF AT CERTAIN SETTINGS OF DIAL-SCALE POINTER

Usually caused by some foreign metallic substance shorting a section of the condenser gang. These particles are often too small to be seen but can be removed by blowing them out with an air pressure hose or an ordinary hand pump. Great care must be exercised not to destroy the thin mica insulators assembled under the trimmers on top of condenser gang.

POOR TONE QUALITY

Foreign material is apt to become lodged between the speaker voice coil and the field core. This hampers the movement of the speaker diaphragm. As the rear of the speaker diaphragm is open, this space can be blown out clean with an air hose.

BUZZING SOUND IN SPEAKER

This can be remedied in many cases by the method described above. It can also be caused by a loose winding on the voice coil, in which case the turns of this winding should be pushed together, and a thin coat of collodion or coil cement should be applied to hold the windings in place.

RATTLES

Check receiver for loose cover thumb screws, tube shield, and housing screws. Rattles, seemingly in the radio receiver, are often traced to loose parts on the bulkhead or dashboard of the car.

SET INOPERATIVE
TUBES LIGHT AND VIBRATOR BUZZES

A. Check B voltage (approximately 240 volts) from middle terminal of electrolytic filter condenser #49 to ground. This point is easily reached with the speaker cover removed. If no voltage or low voltage is obtained, test the vibrator and 84 tube. If voltage is still incorrect, the receiver should be removed from its housing for further checking.

B. With the speaker plugged in, remove the clip from the grid of the 75 tube and touch the clip to the grid cap of the tube several times in succession. A clicking noise should be heard in the speaker. This is a practical test for the audio amplifier and speaker. If this clicking noise is not heard, the 75 and 42 tubes should be tested and the voltages checked at the plates of these tubes. The speaker should be also checked with an ohmmeter by testing across the prongs of the speaker plug for continuity. While making this test, the cable should be moved back and forth to show up any possible intermittent open circuit in the speaker cable. Check the voice coil and the field coil for continuity.

If the audio and speaker are still dead, the chassis should be removed from its housing.

If the audio and speaker are working correctly, test the remaining tubes and check the voltages at each socket.

In the event that the chassis has to be removed from the car for repairs, this can easily be done as follows:

Disconnect all chassis cables and the flexible control shafts from the receiver. Remove the speaker cover and pull out the speaker plug. Remove the screws around the outside of the housing and pull the chassis straight out. The chassis can be removed in many cars in this manner without unbolting the chassis housing from the car.

LOCATING TROUBLE IN CHASSIS

To locate a shorted, open, or defective unit, causing low or no B voltage, disconnect the power pack from the receiver section by unsoldering the red lead (coming from coil #32, Fig. 3) from the terminal at the end of resistor #23, Fig. 4. Check the voltage at the free end of this Red lead (should be approximately 250 volts.) If the voltage is incorrect, the trouble is definitely in the power pack and all component parts should then be checked.

Conversely, if the voltage reading proves to be correct, the trouble is in the receiver section and all parts should be checked. In locating a short or open in the filament circuit, the power pack can be disconnected from the filament supply of the receiver section by removing the red wire on the top terminal of the "off" and "on" switch which is connected to the 42 tube. This will connect only the power pack in the filament circuit; and if the short or open is corrected, it will prove that the trouble is in the receiver section.

WEAK OR INSENSITIVE AFTER REALIGNMENT

Check coils and associated circuits in the deficient "stage" of the set for proper resistance values.

LOW POWER OUTPUT WITH B VOLTAGE CORRECT

Check speaker field coil, voice coil and associated audio circuit for resistance continuity and defective condensers. All riveted component parts can be removed by merely punching out the rivets with a small diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four drive screws, two located directly over the resistor and condenser strip, and the other two in back of the condenser gang on the power pack shield. In replacing the power transformer be sure to tighten the screws securely and replace the shield braid bond or vibrator noise will be present.

INSTRUCTIONS FOR ADJUSTING VIBRATOR

After the vibrator has been in use for some time, it may refuse to start operating. This is an indication of "worn" tungsten contact points; but, as a reserve supply of tungsten has been provided, a simple adjustment can be made to prolong the life of the vibrator.

1. Remove the vibrator unit from its housing by removing the tension spring with a pair of round-nose pliers.

2. Remove the rubber sock, being careful not to bend the wires at the soldered connection.

3. Lay the vibrator on a piece of white paper so that when viewed from above it appears exactly as shown in Fig. 1.

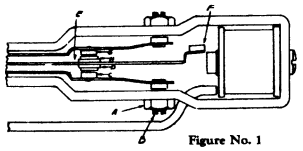


Figure No. 1

4. Loosen lock nut A and turn screw B clockwise until .005" of light can be seen between contacts C and D. If the contact points are somewhat roughened, light cannot be seen across their entire diameter, even though they are correctly re-spaced, that is, within .005" of touching each other.

5. A simple check on the correctness of the spacing adjustment is obtained by pressing lightly against the center of the reed with a small nail in the direction and location shown by arrow E. When the reed is thus moved so as to close contacts C and D, the weight F on the free end of the reed should move 1/64" from its "at rest" position. This check should be made after lock nut A has been firmly retightened.

6. Do not readjust the spacing between contacts G and H unless the tungsten is nearly all worn away. In this case, readjustment may be made in the same manner as for contacts C and D.

7. In re-inserting the vibrator into its rubber sock, be very careful to turn the "flats" of the sock hole so that they are parallel to the flat side of the vibrator frame. This provides ample space in the sock for the free movement of the reed. Make certain that the slot in the prong terminal plate engages the small projection on the inside edge of the housing. Then replace the tension spring. THESE INSTRUCTIONS DO NOT APPLY TO ANY OTHER TYPES OF VIBRATORS.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed, or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary and a high grade modulated oscillator is available. In such a case, proceed as follows, referring to Fig. #2:

1. Set test oscillator to 456 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to any metal part of the chassis. (The impedance of the voice coil is 3.0 ohms.)

4. Apply test signal to grid of 78 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers A and B to maximum output reducing output of test oscillator as required.

5. Apply test signal to grid of 6A7 detector-oscillator tube and adjust trimmers C and D to maximum output.

6. Set test oscillator to 1500 K.C. and turn condenser gang until the rotor plates are wide open. Then place a piece of thin paper (approximately .015 thick) between the rotor and stator at the bottom of the gang, and then close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1500 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

7. Adjust trimmer E to maximum output and then remove the paper gauge.

8. Set test oscillator and condenser gang to 1400 K.C.

9. Apply test signal to antenna lead through a .0002 mfd. condenser and adjust trimmer F to maximum output. This completes the adjustment of the receiver.

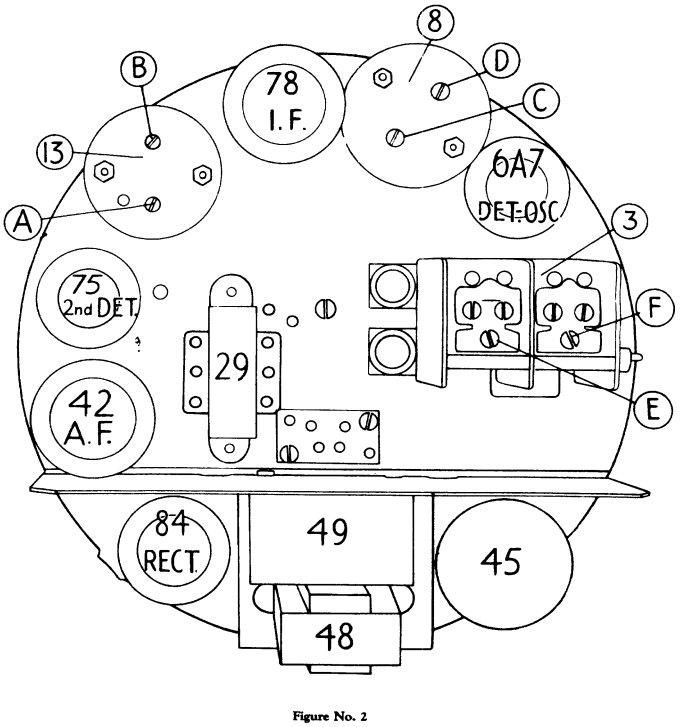


Figure No. 2

AMERICAN-BOSCH CAR-RADIO MODEL 536

Five-tube, Superheterodyne Receiver

SERVICE PARTS LIST MODEL 536

Dia. #	Part #	Description
1	RC 9525	Antenna coil assembly
2	SA 106386	.05 mfd. 200 V. cond.
3	CG 953	Condenser gang assy.
4	SA 106386	.05 mfd. 200 V. cond.
5	SA 105260	300 ohms ¼ W. resistor
6	SA 105276	50,000 ohms ¼ W. res.
7	CM 9513	.0001 mfd. mica cond.
8	RC 9526	Composite coil assy.
9	SA 102500	.01 mfd. 400 V. cond.
10	SA 105272	10,000 ohms ¼ W. res.
11	SA 105258	200 ohms, ¼ W. res.
12	CW 951	.1 mfd. 200 V. cond.
13	IC 955	2nd I.F. coil assy.
14	SA 105281	1 meg. ¼ W. resistor
15	CM 9513	.0001 mfd. mica cond.
16	SA 105276	50,000 ohms ¼ W. res.
17	VR 951	Volume control - 50,000 ohms
18	SA 105246	.5 meg. ¼ W. resistor
19	CM 9513	.0001 mfd. mica cond.
20	SA 105249	5,000 ohms ¼ W. res.
21	SA 102497	.25 mfd. 200 V. cond.
22	SA 103852	.002 mfd. 600 V. cond.
23	SA 105278	100,000 ohms ¼ W. res.
24	SA 103659	.005 mfd. 400 V. cond.
25	SA 105279	.25 meg. ¼ W. resistor
26	CW 951	.1 mfd. 200 V. cond.
27	SA 105279	.25 meg. ¼ W. resistor
28	CW 952	.005 mfd. 600 V. cond.
29	TR 952	Output transformer
30	SA 102492	.05 mfd. 400 V. cond.
31	SA 101471	18,000 ohms ½ W. res.
32	RC 9527	Choke coil
33	SA 102496	.25 mfd. 400 V. cond.
34	SK 951	Speaker
35	DM 951	Diaphragm & voice coil assembly
36	FU 951	Fuse - 20 ampere
37	RC 9512	Filter choke
38	CM 953	.00005 mfd. mica cond.
39		Switch - part of VR 951
40	LP 956	Dial light
41	SA 105452	Filter choke
42	SA 105452	Filter choke
43	CW 958	.5 mfd. 200 V. cond.
44	CW 958	.5 mfd. 200 V. cond.
45	VI 951	Vibrator
46	TR 953	Power transformer
47	SA 106804	.008 mfd. 1600 V. cond.
48	TR 951	B choke
49	CE 951	6-10 mfd. electrolytic condenser
50	SA 103659	.005 mfd. 400 V. cond.
51	CC 953	Spark trap

MAIN ASSEMBLIES

CH 954	Chassis assembly
CU 956	Control unit-less shafts
SK 951	Speaker assembly

CABLE ASSEMBLIES

CB 951	Battery cable assembly
CB 958	Antenna cable assembly

Part #	Description
	TUBE SOCKETS & TUBE SHIELDS
CV 954	Tube shield
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 953	Tube socket - 4 prong
SA 105461	Tube socket - 7 prong
SA 107257	Speaker socket
	NUTS
NT 952	Thumb nut - assy. to drive shaft
NT 104935	Mounting nut
FP 106639	Thumb nut - cables to housing
NT 103039	Nut for volume control
	WASHERS, BUSHINGS & SPACERS
WA 104936	Mounting washer
WA 41033	Mounting lock washer
SR 953	Bushing spacer for mounting variable condenser
FP 104086	Spacer for speaker & spark trap
IS 1002	Variable cond. rubber mounting bushing
	SCREWS & STUDS
FP 104892	Cover-to-housing fastening thumb screw
FP 106571	Mounting stud
SC 1026CA	Self-tapping screw #6 x 1" long
SC 101700	Self-tapping screw #7 x ¼" long
	SPEAKER PARTS
DM 951	Diaphragm assembly - complete
SC 106677	Diaphragm housing-to-frame fastening screw
CL 9513	Speaker field coil
SA 106492	Core-and-frame assembly
FP 106496	Plate for core & frame assy.
CB 9528	Speaker cable with 4 prong plug assembly
FA 958	Speaker silk grill
	MISCELLANEOUS
IF 954	Paper template
SH 951	Drive shafts - 2 used
KT 956	Spark plug suppressor kit
DS 9518	Dial scale
FP 107470	Control unit dial scale indicator
KN 958	Knob - volume control
KN 959	Knob - tuning
IS 105430	Insulation for battery cable fuse
SA 106754	Ignition-coil suppressor
SA 107182	Spark plug suppressor
SA 105300	Suppressor condenser
CV 95172	Cover-and-speaker assembly

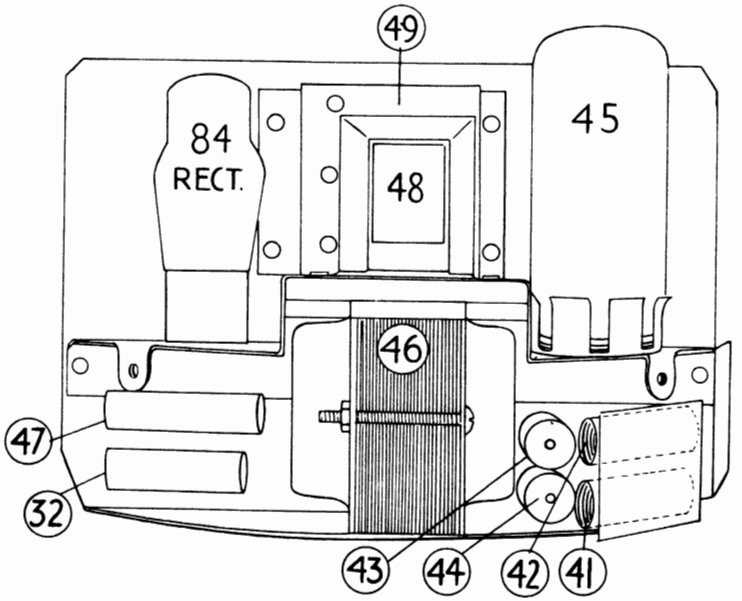


Figure No. 3

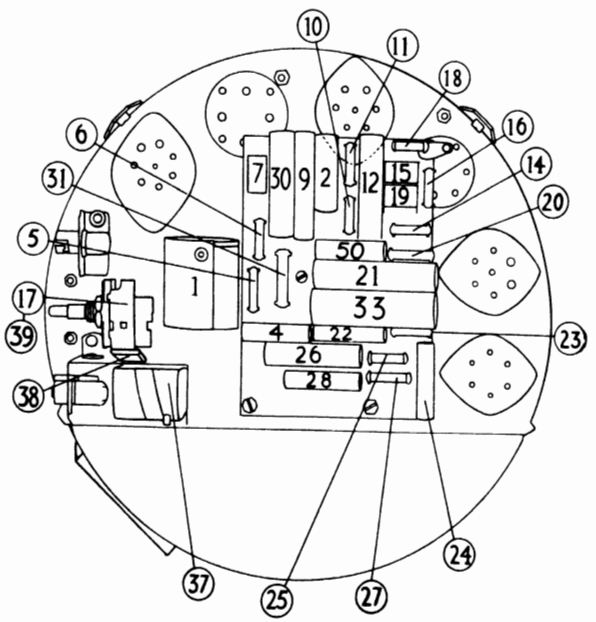
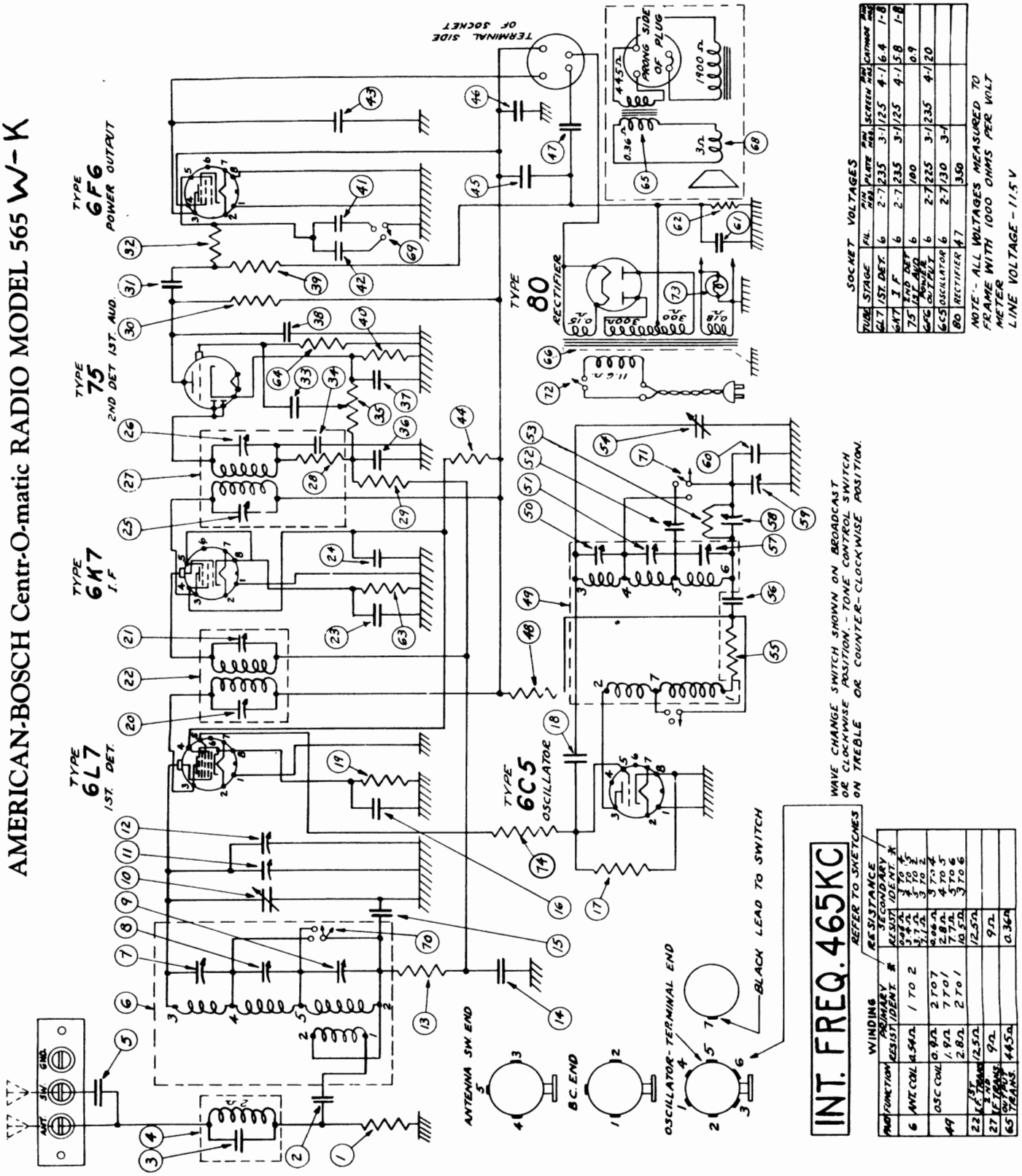


Figure No. 4

UNITED AMERICAN BOSCH CORP.

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH Centr-O-matic RADIO MODEL 565 W-K



SOCKET VOLTAGES

TUBE	STAGE	FIL.	PLATE	SCREEN	CATHODE
6L7	1ST. DET.	6	235	125	4-1/6
6K7	I.F.	6	235	125	4-1/5
75	2ND DET AVC AMPLI	6	100		
6F6	OUTPUT	6	225	235	4-1/20
6C5	OSCILLATOR	6	130		
80	RECTIFIER	4-7	350		

NOTE - ALL VOLTAGES MEASURED TO FRAME WITH 1000 OHMS PER VOLT METER
LINE VOLTAGE - 115 V

PART	FUNCTION	RESIST.	WINDING PRIMARY RESIST.	#	SECONDARY RESIST.	IDENT. #
6	ANT. COIL	4.54Ω	1 TO 2		0.41Ω	1 TO 2
					3.4Ω	2 TO 3
					3.7Ω	3 TO 4
					0.41Ω	4 TO 5
49	OSC COIL	0.8Ω	2 TO 7		4.4Ω	3 TO 4
		1.9Ω	7 TO 1		2.8Ω	4 TO 5
		2.8Ω	2 TO 1		7.7Ω	5 TO 6
					10.5Ω	3 TO 6
22	1ST I.F. TRANS.	12.5Ω				
27	2ND I.F. TRANS.	9Ω			9Ω	
65	OUTPUT TRANS.	445Ω			0.36Ω	

UNITED AMERICAN BOSCH CORP.

Centr-O-matic RADIO MODEL 565 W-K

AMERICAN-BOSCH Centr-O-matic RADIO MODEL 565

Six-tube, Three Band, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ------- 1 #6L7, 1 #6C5, 1 #6K7, 1 #75, 1 #6F6, 1 #80 - Total 6
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles
Power Consumption ---------- 55 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- White Band 540 to 1540 K.C.
Green Band 1540 to 5200 K.C.
Red Band 5900 to 18,200 K.C.
Line-Up Frequencies ------ I.F. 465 K.C., 16,000 K.C., 6000 K.C., 4000 K.C., 1800 K.C., 1400 K.C., 560 K.C.

GENERAL DESCRIPTION

The Model 565 is a six-tube, three-band superheterodyne receiver, designed for world-wide reception and employing the new all-metal tubes.

The circuit of the chassis employs a type 6L7 as a first detector, a type 6C5 as a separate oscillator or mixer tube, a type 6K7 as an intermediate frequency amplifier, a type 75 as a combination second detector, A.V.C. and first audio amplifier, a type 6F6 pentode power amplifier and a type 80 rectifier with its associated filter system.

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver, it is essential to use a high-grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent the action of the A.V.C. of the receiver from occuring when the individual circuits are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are correctly aligned. The sensitivity of this meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the tubes and various alignment condensers. Top and bottom views are shown in Figures #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and adjust tone control to center position.
2. Connect output meter across speaker voice coil terminals.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmers #25 and #26 to maximum output.
5. Apply test signal to grid of 6L7 first detector tube and adjust trimmers #20 and #21 to maximum output.

ADJUSTMENT OF RED BAND

NOTE: Before proceeding with the following adjustments, it is important that trimmer #11 located on top of the condenser gang, be carefully adjusted. This trimmer has been correctly adjusted prior to its shipment at the factory and no further adjustment should be necessary, unless it has been tampered with. In this event, turn the adjustment screw of this trimmer to maximum capacity (screw turned to extreme clockwise position—all the way in), then turn screw about a half-turn in a counter-clockwise direction.

1. Set wave change switch to the red-band position (lower center control turned to its extreme left-hand setting).
2. Set dial indicator and test oscillator to 16,000 K.C. and apply test signal to the "A" and "G" terminals of the chassis thru a .0002 mfd. condenser and a 400 ohm resistor in series. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.
3. Adjust trimmer #50 to maximum output.

NOTE: When adjusting the oscillator trimming condensers, it is possible to obtain two different peaks. Correct adjustment is obtained by trimming to the second peak from maximum capacity of the trim condenser. Adjustment to the wrong peak will result in a lack of sensitivity and poor calibration at mid-band positions.

4. Adjust trimmer #7 by the "max-max" method. This is accomplished as follows: With dial indicator and test oscillator still set at 16,000 K.C., adjust trimmer #7 to maximum output and note reading of the output meter. Then, change the setting of #7 trimmer slightly in either direction and then without changing trimmer screw, tune receiver by means of tuning knob thru a maximum and note reading of output meter. If second reading is lower, reverse the direction of the adjustment of #7 trimmer. Proceed with this adjustment in progressive steps, each time tuning receiver thru a maximum, until no further improvement can be obtained by tuning receiver, the #7 trimmer screw, or both together. Although this proceedure may at first appear a bit complicated, facility is easily acquired with practice; and after a few trials the operation can be completed in a few minutes.
5. Set dial indicator and test oscillator to 6000 K.C. and "max-max" the [illegible] condenser #59 to maximum output.

ADJUSTMENT OF GREEN BAND

1. Set wave-change switch to the green band position (middle setting).
2. Set dial indicator and test oscillator to 4000 K.C. and adjust trimmers #51 and #8 to maximum output.
3. Set dial indicator and test oscillator to 1800 K.C. and "max-max" lagging condenser #52 to maximum output.

ADJUSTMENT OF WHITE BAND

1. Set wave-change switch to the white or broadcast-band position (right-hand setting).
2. Set dial indicator and test oscillator to 1400 K.C. and adjust trimmers #57 and #9 to maximum output.
3. Set dial indicator and test oscillator to 560 K.C. and "max-max" lagging condenser #58 to maximum output.

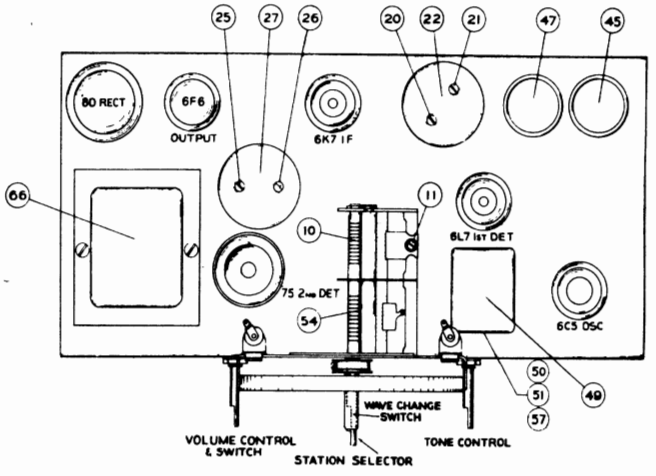


Figure No. 1

SERVICE PARTS LIST MODEL 565W

Dia. #	Part #	Description
1	RE 9549	10,000 ohm, ½ watt res.
2	CW 9512	.02 mfd., 400 V. cond.
3		.002 mfd. mica condenser - part of RC 95102
4	RC 95102	Trap coil assembly
5	SA 106417	.0001 mfd. mica cond.
6	RC 9563	Antenna coil assembly
7		3-30 mmf. trimmer cond. - part of RC 9563 A
8		3-30 mmf. trimmer cond. - part of RC 9563 A
9		3-30 mmf. trimmer cond. - part of RC 9563 A
10		Variable condenser - part of CG 9520
11		Trimmer condenser - part of CG 9520
12		Trimmer condenser - part of CG 9520
13	RE 9534	100,000 ohm, ½ watt res.
14	SA 106386	.05 mfd., 200 V. cond.
15	SA 107801	.0025 mfd. mica cond.
16	SA 106386	.05 mfd., 200 V. cond.
17	RE 9536	20,000 ohm, ½ watt res.
18	SA 106417	.0001 mfd. mica cond.
19	RE 9551	750 ohm, ½ watt resistor
20		30-100 mmf. trimmer cond. - part of IC 9546
21		30-100 mmf. trimmer cond. - part of IC 9546
22	IC 9546	1st I.F. coil assembly
23	SA 106386	.05 mfd., 200 V. cond.
24	SA 102495	.1 mfd., 200 V. cond.
25		(35-100 mmf. trimmer cond.
26	IC 9547	(35-100 mmf. trimmer cond.
27		(2nd I.F. coil assembly
28		50,000 ohm, ½ watt res. - part of IC 9547
29	RE 9530	1 megohm, ½ watt res.
30	RE 9531	250,000 ohm, ½ watt res.
31	CW 9512	.02 mfd., 400 V. cond.
32	RE 9531	250,000 ohm, ½ watt res.
33	SA 106386	.05 mfd., 200 V. cond.
34		.0001 mfd. mica cond. - part of IC 9547
35	VR 9516	Volume control & switch (500,000 ohms)
36	SA 106417	.0001 mfd. mica cond.
37	SA 102499	.5 mfd., 200 V. cond.
38	SA 106417	.0001 mfd. mica cond.
39	RE 9531	250,000 ohm, ½ watt res.
40	RE 9527	5000 ohm resistor
41	SA 106403	.001 mfd. 600 V. cond.
42	CW 954	.0005 mfd. mica cond.
43	CW 952	.005 mfd., 600 V. cond.
44	SA 101404	15,000 ohm, 1 watt res.
45	CE 9511	8 mfd., 300 V. electrolytic condenser
46	SA 102494	.1 mfd., 400 V. cond.
47	CE 9512	12 mfd., 450 V. electrolytic condenser
48	SA 101404	15,000 ohm, 1 watt res.
49	RC 9570	Oscillator coil assembly
		3-30 mmf. trimmer cond. - part of RC 9570
50		3-30 mmf. trimmer cond. - part of RC 9570
51		3-30 mmf. trimmer cond. - part of RC 9570
52	CS 9513	750-1750 mmf. trimmer condenser
53	RE 9550	2000 ohm ½ watt resistor
54		Variable condenser - part of CG 9520
55	RE 9529	300 ohm, ½ watt resistor
56	CW 9512	.02 mfd., 400 V. cond.
57		3-30 mmf. trimmer cond. - part of RC 9570
58		300-600 mmf. trimmer condenser - part of SA 108001
59		1100-2000 mmf. trimmer condenser - part of SA 108001
60	SA 103775	.001 mfd. mica condenser
61	CE 958	10 mfd., 25 V. electrolytic condenser
62	SA 102564	350 ohm, 1 watt resistor
63	RE 9539	500 ohm, ½ watt resistor
64	RE 9530	1 megohm, ½ watt res.
65	SA 108025	Speaker output transformer
66	TH 9512	Power transformer
67	SA 108024	Speaker assy. complete
68	SA 106617	Diaphragm & voice coil assembly
69	SW 9515	Tone control switch
70		Wave change switch - part of SW 9514
71		Wave change switch - part of SW 9514
72		On-Off switch - part of VR 9516
73	SA 106809	Dial lights (6.3 volts) - 3 used
74	RE 9539	500 ohm, ½ watt res.

Part #	Description
MAIN ASSEMBLIES	
CH 9531	Chassis assembly
SA 108024	Speaker assembly, complete
KA 9533	Cabinet
CABLES & CABLE ASSEMBLIES	
CB 9512	Line cable with plug assembly
PR 98511	Cable dial drive (9 inches)
SOCKETS	
SO 956	Tube socket - 8 prong
SA 104617	Tube socket - 6 prong
SA 104615	Tube socket - 4 prong
SA 107257	Speaker socket
SCREWS & NUTS	
SC 1039	Chassis mounting screw
NT 104554	Nut for speaker fastening screw

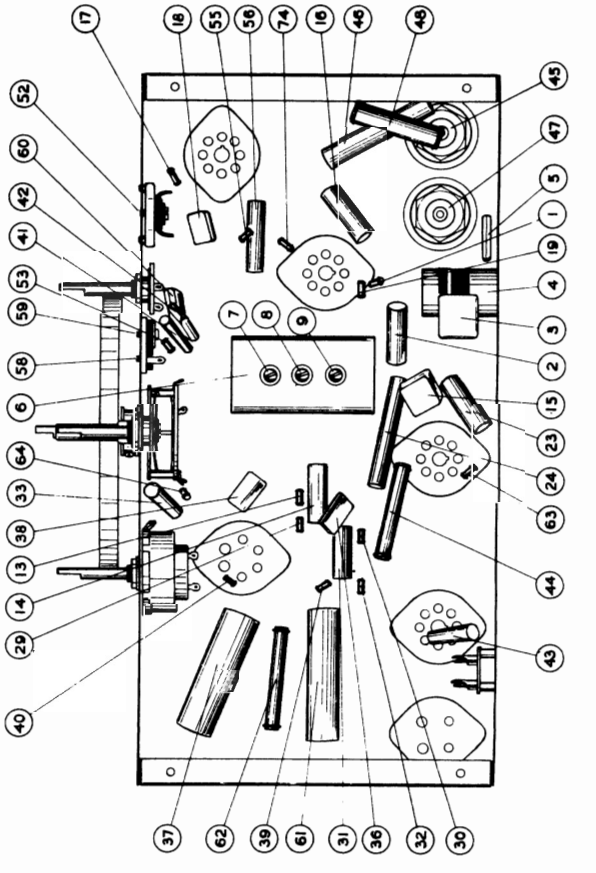


Figure No. 2

UNITED AMERICAN BOSCH CORP.

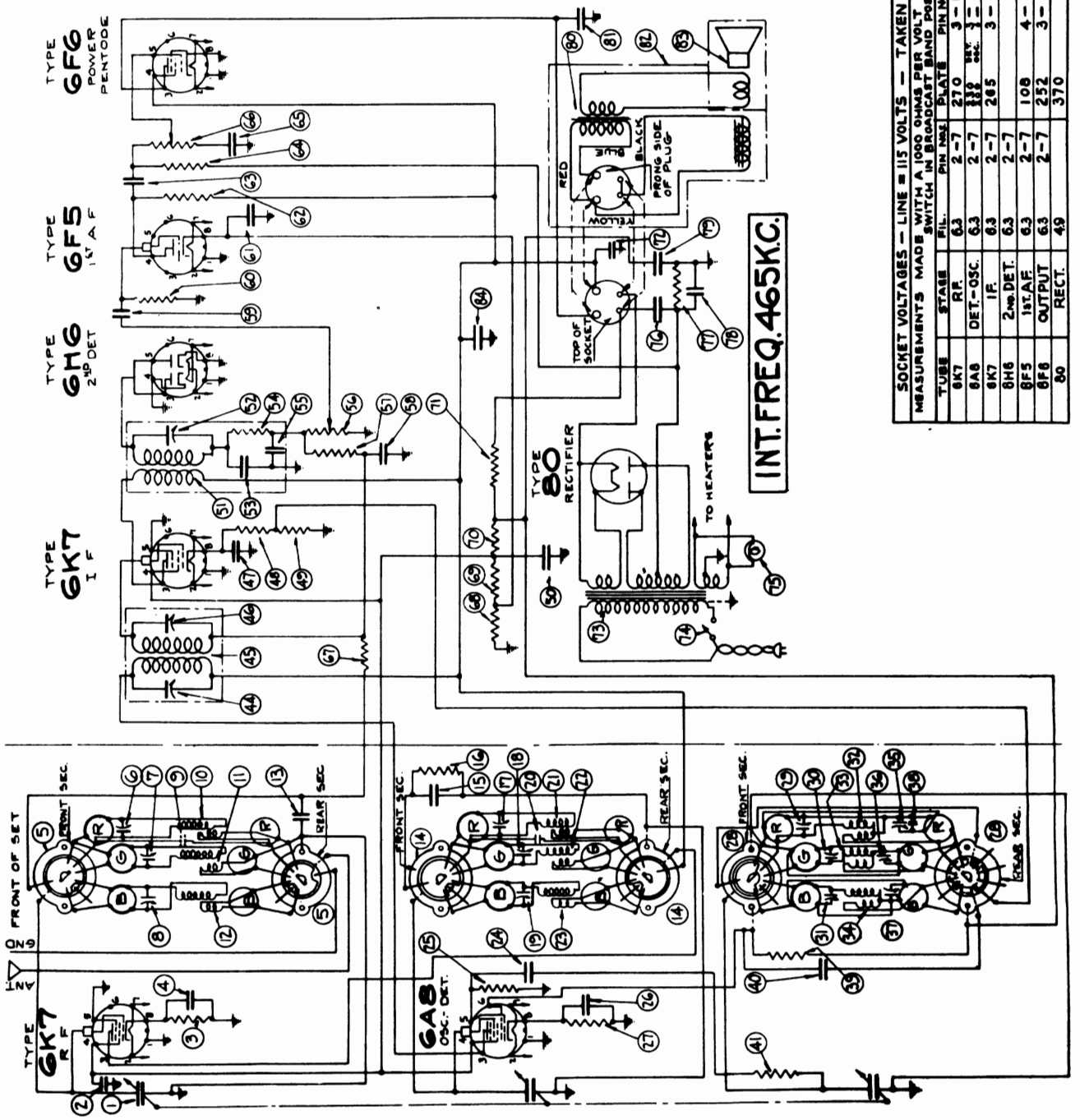
AMERICAN-BOSCH Centr-O-matic RADIO MODEL 575 F – Q

D.C. RESISTANCE
MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION

COIL	DIA.NO	PRIM.	SEC.
B-ANT.	12	22 ohms	4 ohms
B- RF.	23	5 .	4.5 .
B-OSC.	34	1.5 .	3 .
G-ANT.	11	3.2 .	1 .
G - R.F.	22	1.5 .	1 .
G-OSC.	33	.5 .	1 .
R-ANT.	10	1 .	.04 .
R - RF.	21	2 .	.04 .
R-OSC.	32	3 .	.04 .
1st. I.F.	45	1.3 .	13 .
2nd. IF	51	11.5 .	11.5 .
OUTPUT TRANS.	80	450 .	.5 .
SPKR. FIELD		1800 .	
VOICE COIL.	83	3 .	

SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	R.F.	6.3	2-7	270	3-1	100	4-1	2.6	1-8
6A8	DET.-OSC.	6.3	2-7	110 REV. 110 osc.	3-1			4.0	1-8
6K7	I.F.	6.3	2-7	265	3-1	105	4-1	5.5	1-8
6H6	2nd DET.	6.3	2-7						
6F5	1st A.F.	6.3	2-7	100	4-1			1.2	1-8
6F6	OUTPUT	6.3	2-7	252	3-1	270	4-1	18.5 across 77 ohms.	
80	RECT.	4.9		370					



Models 575F-575Q

SERVICE PARTS LIST MODEL 575F-Q

DIA.#	PART#	DESCRIPTION
1	CG 9527	Variable gang condenser
2	SA 106386	.05 mfd. 200 V. condenser
3	RE 9529	300 ohm ¼ W. resistor
4	SA 106386	.05 mfd.200 V. condenser
5	SW 9527	Ant. section of "Centr-O-matic" unit complete with coils,switch and trimmers
6	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)
7	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)
8	CS 9511	4 to 25 mmf. antenna trim condenser(Broadcast Band)
9		Twisted pair of wire-part of RC 9571
10	RC 9571	Antenna coil assembly (Red Band)
11	RC 9574	Antenna coil assembly (Green Band)
12	RC 9577	Antenna coil assembly (Broadcast Band)
13	CW 9513	.05 mfd. 200 V. condenser
14	SW 9528	R.F. section of "Centr-O-matic" unit complete with coils,switch and trimmers
15	CW 9513	.05 mfd. 200 V. condenser
16	RE 9527	5000 ohm ¼ W. resistor
17	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)
18	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Green Band)
19	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Broadcast Band)
20	CM 9512	6 mmf. mica condenser
21	RC 9572	R.F. coil assembly (Red Band)
22	RC 9575	R.F. coil assembly (Green Band)
23	RC 9578	R.F. coil assembly (Broadcast Band)
24	SA 106417	.0001 mica condenser
25	RE 9524	50,000 ohm ¼ W. resistor
26	SA 106386	.05 mfd. 200 V. condenser
27	RE 9529	300 ohm ¼ W. resistor
28	SW 9529	Oscillator section of "Centr-O-matic" unit,complete with coils,switch, trim and lag condensers
29		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Red Band)
30		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Green Band)
31		5 to 25 mmf. oscillator trim condenser-part of CS 9517 (Broadcast Band)
32	RC 95109	Oscillator coil assembly (Red Band)
33	RC 9576	Oscillator coil assembly (Green Band)
34	RC 9579	Oscillator coil assembly (Broadcast Band)
35		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Red Band)
36		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Green Band)
37		300 to 600 mfd. oscillator lag condenser-part of CS 9517 (Broadcast Band)
38	CM 959	.002 mfd. mica condenser
39	RE 9526	5000 ohm 1 W. resistor
40	CW 9513	.05 mfd. 200 V. condenser
41	RE 9537	50 ohm ¼ W. resistor
44		30 to 100 mmf. trim condenser-part of IC 9527
45	IC 9527	1st I.F. transformer assembly
46		30 to 100 mmf. trim condenser-part of IC 9527
47	SA 102493	.05 mfd. 200 V. condenser
48	SA 105261	400 ohm ¼ W. resistor
49	SA 105267	1000 ohm ¼ W. resistor
50	SA 102497	.25 mfd. 200 V. condenser
51	IC 9537	2nd I.F. transformer assembly
52		30 to 100 mmf. trim condenser-part of IC 9537
53		50 mmf. mica condenser - part of IC 9537
54		50,000 ohm ¼ W. resistor-part of IC 9537
55		100 mmf. mica condenser-part of IC 9537
56	VR 959	Volume control (½ meg.)
57	RE 9530	1 meg. ¼ W. resistor
58	SA 106386	.05 mfd. 200 V. condenser
59	CW 9512	.02 mfd. 400 V. condenser
60	RE 9530	1 meg. ¼ W. resistor
61	CE 9515	12. mfd. 25 V. condenser
62	SA 105279	250,000 ohm ¼ W. resistor
63	CW 9512	.02 mfd. 400 V. condenser
64	RE 9531	250,000 ohm ¼ W. resistor
65	SA 106403	.001 mfd. 600 V. condenser
66	VR 9512	Tone control (½ meg.)
67	SA 105278	100,000 ohm ¼ W. resistor
68	SA 105260	300 ohm ¼ W. resistor
69	SA 104966	30,000 ohm ½ W. resistor
70	SA 101404	15,000 ohm 1 W. resistor
71	SA 103835	10,000 ohm 2 W. resistor
72		4. mfd. 450 V. elect. condenser-part of CE 954
73	TR 959	Power transformer
74		Line switch-part of VR9512
75	SA 106809	Dial lights 6 V. (3 used)
76		8. mfd. 475 V. elect. condenser-part of CE 954
77	RE 9523	300 ohm resistor
78		20. mfd. 25 V. elect. condenser-part of CE 954
79	CE 9511	8. mfd. 300 V. elect. condenser
80	TR 9515	Speaker output transformer
81	SA 103659	.005 mfd. 400 V. condenser
82	SK 9511	Speaker

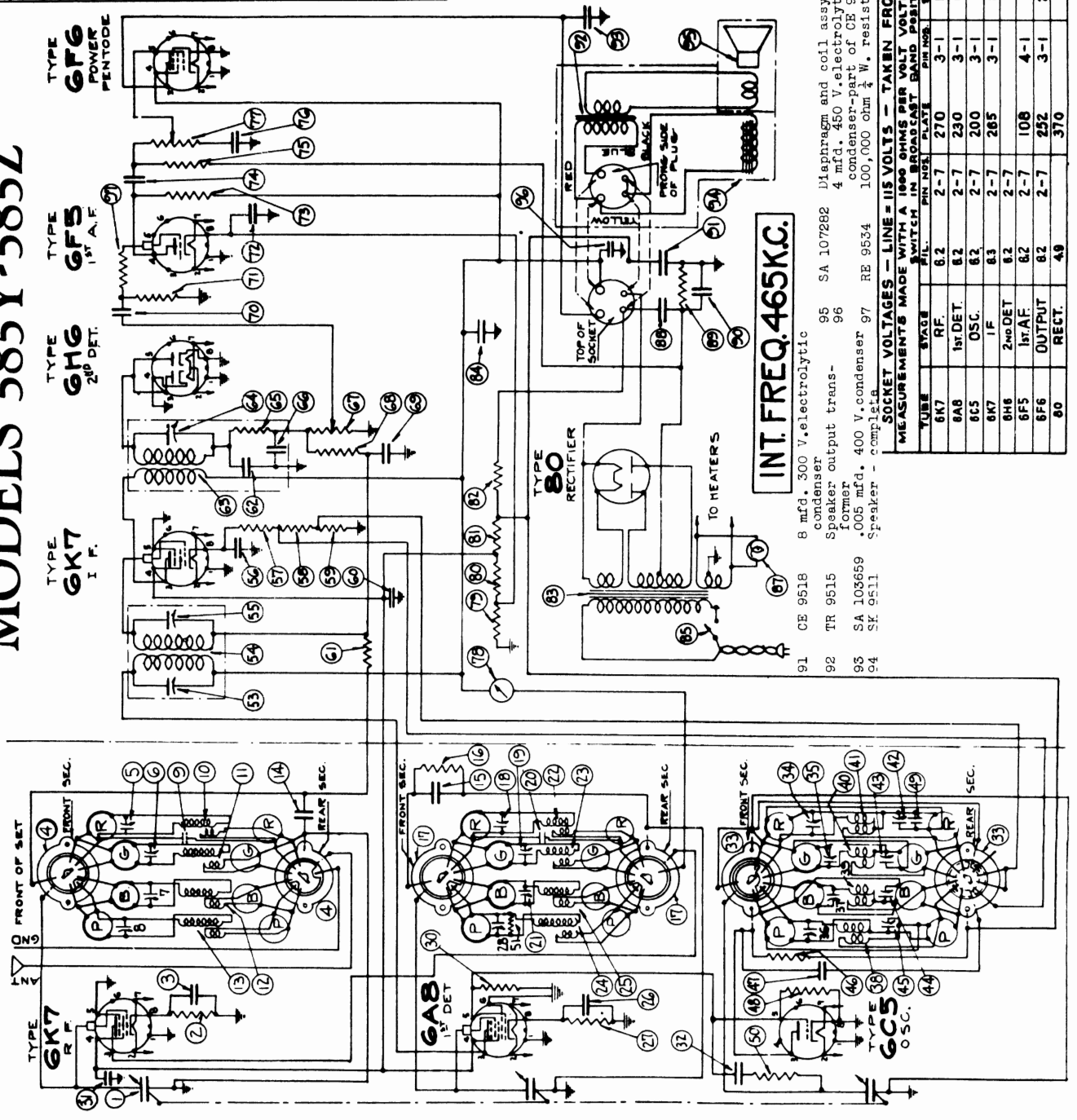
Models 585Y-585Z

SERVICE PARTS LIST MODEL 585 Y-Z

DIA. #	PART #	DESCRIPTION
1	CG 9527	Variable cond. assembly
2	RE 9529	300 ohm ¼ W. resistor
3	SA 106386	.05 mfd. 200 V. condenser
4	SW 9524	Antenna "Centr-O-matic" assembly complete with switch, coils and trimmers
5	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)
6	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)
7	CS 9511	4 to 25 mmf. antenna trim condenser (Black Band)
8	CS 9511	4 to 25 mmf. antenna trim condenser (Purple Band)
9		Twisted pair of wires-part of RC 9571
10	RC 9571	Antenna coil assembly (Red Band)
11	RC 9574	Antenna coil assembly (Green Band)
12	RC 9577	Antenna coil assembly (Black Band)
13	RC 9580	Antenna coil assembly (Purple Band)
14	CW 9513	.05 mfd. 200 V. condenser
15	CW 9513	.05 mfd. 200 V. condenser
16	RE 9527	5000 ohm ¼ W. resistor
17	SW 9525	R.F. "Centr-O-matic" assembly complete with switch, coils and trimmers
18	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)
19	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Green Band)
20	CM 9512	6 mmf. mica condenser
21	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Black Band)
22	RC 9572	R.F. coil assembly (Red Band)
23	RC 9575	R.F. coil assembly (Green Band)
24	RC 9581	R.F. coil assembly (Purple Band)
25	RC 9578	R.F. coil assembly (Black Band)
26	SA 106386	.05 mfd. 200 V. condenser
27	RE 9529	300 ohm ¼ W. resistor
28	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Purple Band)
30	RE 9534	100,000 ohm ¼ W. resistor
31	SA 106386	.05 mfd. 200 V. condenser
32	CM 9511	.000065 mfd. mica cond.
33	SW 9526	Oscillator "Centr-O-matic" assembly complete with switch, coils and trimmers
34		1.5 to 10 mmf. trim condenser-part of CS 9519 (Red Band)
35		3. to 15 mmf. trim condenser-part of CS 9520 (Green Band)
36		10 to 35 mmf. trim condenser-part of CS 9518 (Purple Band)
37		5 to 25 mmf. trim condenser-part of CS 9517 (Black Band)
38	RC 9582	Oscillator coil assembly (Purple Band)
39	RC 9579	Oscillator coil assembly (Black Band)
40	RC 9576	Oscillator coil assembly (Green Band)
41	RC 9573	Oscillator coil assembly (Red Band)
42		800 to 1600 mmf. lag condenser-part of CS 9519 (Red Band)
43		800 to 1600 mmf. lag condenser-part of CS 9520 (Green Band)
44		300 to 600 mmf. lag condenser-part of CS 9517 (Black Band)
45		60 to 150 mmf. lag condenser-part of CS 9518 (Purple Band)
46	RE 9526	5000 ohm 1 W. resistor
47	CW 9513	.05 mfd. 200 V. condenser
48	RE 9524	50,000 ohm ¼ W. resistor
49	CM 959	.002 mfd. mica condenser
50	RE 9537	50 ohm ¼ W. resistor
51	RE 9534	100,000 ohm ¼ W. resistor
53		I.F. trimmer-part of IC 9527
54	IC 9527	1st I.F. transformer
55		I.F. trimmer-part of IC 9527
56	SA 102493	.05 mfd. 200 V. condenser
57	SA 105261	400 ohm ¼ W. resistor
58	SA 105267	1000 ohm ¼ W. resistor
59	SA 105249	5000 ohm ¼ W. resistor
60	SA 102497	.25 mfd. 200 V. condenser
61	SA 105278	100,000 ohm ¼ W. resistor
62		50 mmf. mica condenser-part of IC 9537
63	IC 9537	2nd I.F. transformer
64		I.F. trim condenser-part of IC 9537
65		50,000 ohm ¼ W. resistor-part of IC 9537
66		100 mmf. mica condenser-part of IC 9537
67	VR 959	Volume control-500,000 ohm
68	RE 9530	1 meg. ¼ W. resistor
69	SA 106386	.05 mfd. 200 V. condenser
70	CW 9512	.02 mfd. 400 V. condenser
71	RE 9530	1 meg. ¼ W. resistor
72	CE 9515	12 mfd. 25 V. electrolytic condenser
73	SA 105279	250,000 ohm ¼ W. resistor
74	CW 9512	.02 mfd. 400 V. condenser
75	RE 9531	250,000 ohm ¼ W. resistor
76	SA 106403	.001 mfd. 600 V.condenser

UNITED AMERICAN BOSCH CORP.

MODELS 585Y-585Z



D.C. RESISTANCE MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. No.	PRIM.	SEC.
P-ANT.	13	130 ohms	25 ohms
P-RF.	24	38 "	25 "
P-OSC.	38	8 "	13.5 "
B-ANT.	12	22 "	4 "
B-RF.	25	.5 "	4.5 "
B-OSC.	39	1.5 "	3 "
G-ANT.	11	3.2 "	1 "
G-RF	23	1.5 "	1 "
G-OSC.	40	.5 "	1 "
R-ANT.	10	1 "	.4 "
R-RF.	22	2 "	.4 "
R-OSC.	41	.5 "	.4 "
1st I.F.	54	13 "	13 "
2nd I.F.	83	11.5 "	11.5 "
OUTPUT TRANS.	92	450 "	.5 "
SPKR. FIELD		1800 "	
VOICE COIL	85	3 "	

77	VR 9512	Tone control (500,000 ohm) and switch
78	SI 9538	Tuning meter assembly
79	SA 105260	300 ohm ½ W. resistor
80	SA 104966	30,000 ohm ½ W. resistor
81	SA 105815	10,000 ohm 1 W. resistor
82	RE 9540	7000 ohm 2 W. resistor
83	TR 959	Power transformer
84	SA 102492	.05 mfd. 400 V. condenser
85		Line switch - part of VR 9512
87	SA 106809	Dial light (4 used)
88		8 mfd. 475 V. electrolytic condenser-part of CE 954
89	RE 9523	300 ohm muter resistor
90		20 mfd. 25 V. electrolytic condenser-part of CE 954
91	CE 9518	8 mfd. 300 V. electrolytic condenser
92	TR 9515	Speaker output transformer
93	SA 103659	.005 mfd. 400 V. condenser
94	SP 9511	Speaker - complete
95	SA 107282	Diaphragm and coil assy.
96		4 mfd. 450 V. electrolytic condenser-part of CE 954
97	RE 9534	100,000 ohm ½ W. resistor

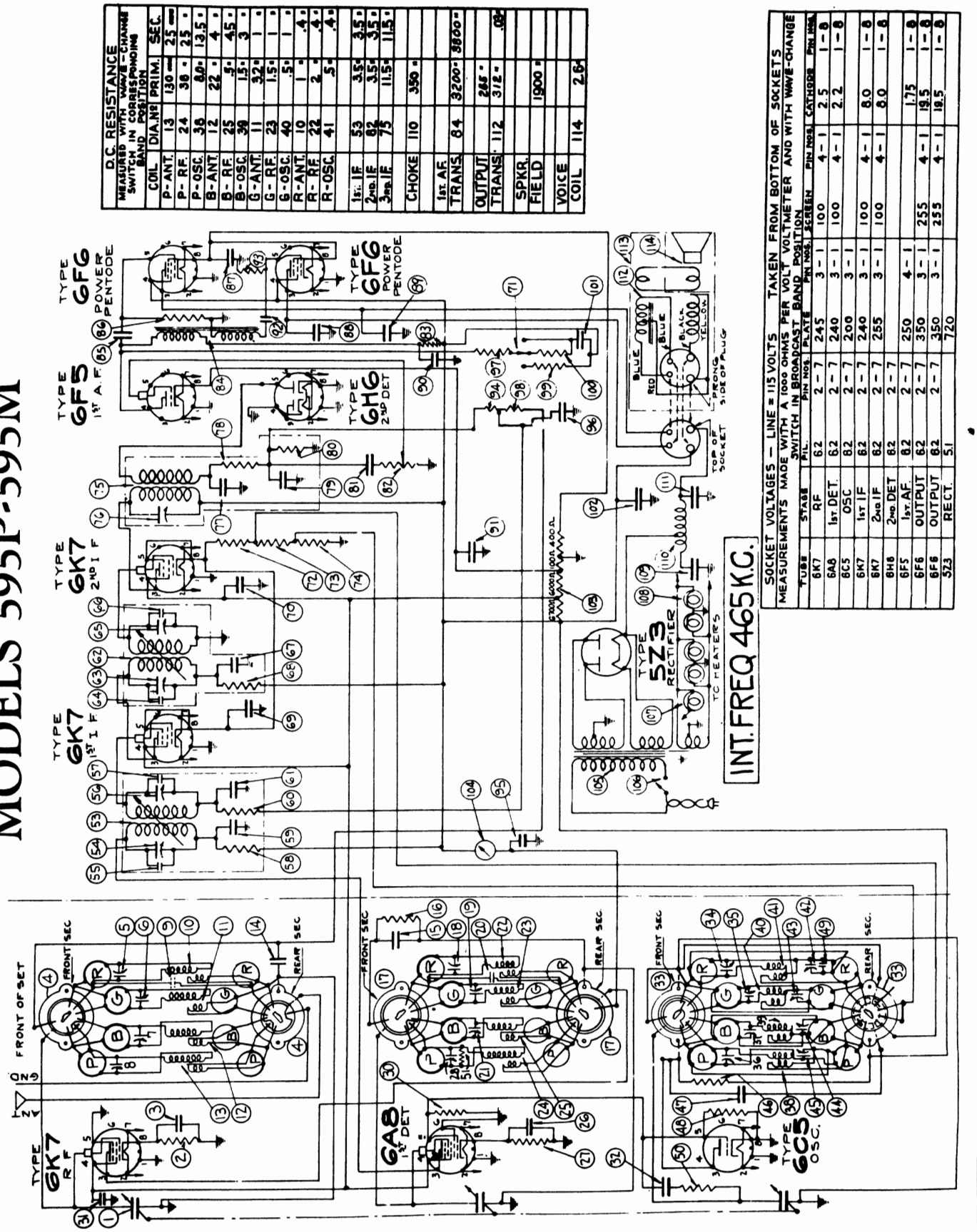
SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS

MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	R.F.	6.2	2-7	270	3-1	108	4-1	2.8	1-8
6A8	1st DET.	6.2	2-7	230	3-1	108	4-1	4.0	1-8
6C5	OSC.	6.2	2-7	200	3-1				
6K7	I.F.	6.3	2-7	265	3-1	105	4-1	5.5	1-8
6H6	2ND DET	6.2	2-7						
6F5	1st A.F.	6.2	2-7	108	4-1			1.2	1-8
6F6	OUTPUT	6.2	2-7	252	3-1	270	4-1	18.5 MAXIMUM * 89 MA.	
80	RECT.	4.9		370					

UNITED AMERICAN BOSCH CORP.

MODELS 595P-595M



D.C. RESISTANCE MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. №	PRIM.	SEC.
P-ANT.	13	130 Ω	2.5 Ω
P-RF.	24	30 "	2.5 "
P-OSC.	38	8.0 "	13.5 "
B-ANT.	12	22 "	4 "
B-RF.	25	.5 "	4.5 "
B-OSC.	38	1.5 "	3 "
G-ANT.	11	32 "	1 "
G-RF.	23	1.5 "	1 "
G-OSC.	40	.5 "	1 "
R-ANT.	10	1 "	.4 "
R-RF.	22	2 "	.4 "
R-OSC.	41	.5 "	.4 "
1st. I.F.	53	3.5 "	3.5 "
2nd. I.F.	82	3.5 "	3.5 "
3rd. I.F.	75	11.5 "	11.5 "
CHOKE	110	350 "	
1st. A.F. TRANS.	84	3200 "	3800 "
OUTPUT TRANS.	112	245 "	.09 "
		312 "	
SPKR. FIELD		1900 "	
VOICE COIL	114	2.6 "	

SOCKET VOLTAGES — LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS. PLATE	PIN NOS. SCREEN	PIN NOS. CATHODE	PIN NOS. BIAS
6K7	RF	6.2	2 - 7 245	3 - 1 100	4 - 1 2.5	1 - 8
6A8	1st DET.	6.2	2 - 7 240	3 - 1 100	4 - 1 2.2	1 - 8
6C5	OSC	6.2	2 - 7 200	3 - 1		
6K7	1st IF	6.2	2 - 7 240	3 - 1 100	4 - 1 8.0	1 - 8
6K7	2nd IF	6.2	2 - 7 255	3 - 1 100	4 - 1 8.0	1 - 8
6H6	2nd DET	6.2	2 - 7			
6F5	1st AF.	6.2	2 - 7 250	4 - 1		1.75 1 - 8
6F6	OUTPUT	6.2	2 - 7 350	3 - 1 255	4 - 1 19.5	1 - 8
6F6	OUTPUT	6.2	2 - 7 350	3 - 1 255	4 - 1 19.5	1 - 8
523	RECT.	5.1	720			

UNITED AMERICAN BOSCH CORP.

MODELS 595P-595M

AMERICAN-BOSCH Centr-O-matic RADIO MODEL 595

Ten-Tube, Four Band, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes -- 3 #6K7,1 #6A8,1 #6C5,1 #6H6,1 #6P5,2 #6F6,1 #5Z3 - Total 10
Power Supply ---------- 105 to 125 volts, 50 to 60 cycle
Power Consumption ---------- 90 Watts
Maximum Undistorted Output ---------- 8 Watts
Maximum Output ---------- 10 Watts

Tuning Ranges ----------
(Purple Band 120 K.C. to 350 K.C.
(Broadcast Band 540 K.C. to 1800 K.C.
(Green Band 1800 K.C. to 6000 K.C.
(Red Band 6000 K.C. to 18,500 K.C.

Line-Up Frequencies -- I.F. 465K.C.,350K.C.,130K.C.,1600K.C.,570K.C.,550OK.C.,1900K.C., 17,000K.C. and 6000K.C.

GENERAL DESCRIPTION

This model is a ten tube, four band superheterodyne receiver designed for world wide reception including the U.S. Weather Band and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by the first detector circuit employing a 6A8 tube and a separate oscillator (type 6C5). These tubes with their associated circuits (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Centr-O-matic" unit.

In addition the set includes a new and novel development of intermediate frequency circuits which allows the adjustment of the band width of the amplifier to be varied over a wide range. At one end of the range is the most selective condition which allows single channel reception even under the influence of powerful nearby stations. At the other end the transmission characteristic of the amplifier is so changed as to allow transmission without attenuation of frequencies up to 7000 cycles on either side of the carrier. As a matter of fact, the amplifier is overcoupled to such a degree that frequencies in the neighborhood of five thousand cycles on either side of the carrier are transmitted at greater efficiency than frequencies close to the carrier. This design is necessary since radio frequency circuits give rise to some side band attenuation, which must be compensated for in the I.F. amplifier. The net result is a smooth transmission curve over the entire band.

From the oscillator the energy passes thru a variable selector I.F. transformer and to a 6K7 amplifier tube. Then thru another variable selector I.F. transformer and to an additional 6K7 amplifier tube. From here further selection takes place in the 3rd I.F. transformer where the energy is passed on to the 2nd detector and A.V.C. diode (type 6H6). After detection there follows a first audio amplifier (type 6C5) and by means of an audio transformer the energy is sent to the power output stage comprising two 6P6 pentode in push-pull. A 5Z3 rectifier supplies the necessary direct current for the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF THE CENTR-O-MATIC UNIT.

If a component part located underneath the switch and coil assemblies of the "Centr-O-matic" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fasten the mounting plate of the wave-change switch shaft to the chassis frame. Pull switch shaft straight out.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch and coil sections are located on top of the "Centr-O-matic" unit and are indicated by X, Y, and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.
   NOTE: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the switch terminal before the section can be removed. On the oscillator section, the plate lead will have to be unsoldered from the 6C5 socket.
6. After repairs have been made resolder the plate leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Centr-O-matic" unit. This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on gang condenser.
9. Replace the switch shaft and the mounting plate fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slot in each switch disc.
10. Before replacing the coil shields, it is advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and first two fingers as shown in figure #1. Pull out the ends of the shield slightly and at the same time apply a little pressure on the sides as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contact, this will also prevent the shields from rattling.

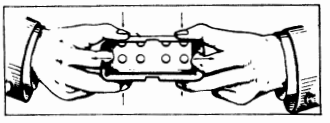


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3, and #4, and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

CAUTION: DO NOT INTERFERE WITH THE I.F. ALIGNMENT OF THIS RECEIVER EXCEPT WHEN IT HAS BEEN ABSOLUTELY DETERMINED THAT THIS IS THE CAUSE OF THE TROUBLE AND ONLY WHEN HIGH GRADE TESTING EQUIPMENT IS AVAILABLE.

NOTE: Because of the variable selectivity incorporated in this receiver, it is important that the procedure outlined below be followed in order to obtain accurate alignment.

The travel brought about by the expander mechanism is limited by definite stops. To properly set the I.F. transformers, turn the fidelity control to the extreme right or clockwise position. Tighten the drive cords of the variable I.F. transformers until the pulleys on the bottom of the transformers are against the stops in counter-clockwise direction.

The I.F. trimmers are adjusted only when the variable selector coils are placed in a particular mechanical position. In order to align the circuits properly, it is necessary to have less coupling in the individual I.F. transformer than that provided by the maximum selectivity setting.

To obtain this lesser coupling, turn the fidelity control to the extreme left or counter-clockwise position and turn the stop-screw (indicated by "W" in figure #3), which acts as a stop to limit selectivity, out 1/4 inch. With the fidelity control in this position align the I.F. stages as follows:

1. Set volume control on full and connect output meter across voice coil of speaker.
2. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 2nd I.F. tube (6K7) thru a .5 mfd. blocking condenser.
3. Adjust trimmer #76 for maximum output, reducing output of test oscillator as required.
4. Apply test signal to grid of 1st I.F. tube (6K7) and adjust #65 and #65 for maximum output.
5. Apply test signal to grid of 1st detector (6A8) and adjust #54 and #56 for maximum output.
6. After the above I.F. adjustments have been made, turn the selectivity control (larger of the double lower right-hand knob) to the extreme right or clockwise direction and reset the stop-screw.

ADJUSTMENT OF PURPLE BAND

Note: During all of the subsequent adjustments, the selectivity control should be turned to the left or counter-clockwise direction.

1. Set wave-change switch to the Purple Band position.
2. Set test oscillator and dial indicator to 350 K.C. and apply test signal to antenna terminal of the chassis thru a .0002 mfd. series condenser and adjust #36, #28 and #8 for maximum output.
3. Set test oscillator and dial indicator to 130 K.C. and adjust #45 for maximum output.
4. Return to 350 K.C. setting with both test oscillator and dial indicator and repeat adjustment of #36, #28 and #8 for accuracy.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to White or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C. and adjust #37, #21 and #7 for maximum output.
3. Set test oscillator and dial indicator to 570 K.C. and adjust #44 for maximum output.
4. Return to 1600 K.C. setting and make readjustment of #37, #21 and #7.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the Green and Red Bands, a .0002 mfd. condenser and a 400 ohms resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short wave antenna.

1. Set wave-change switch to the Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #35, #19 and #6 for maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #43 for maximum output.
4. Return to 5500 K.C. setting and make readjustment of #35, #19 and #6.

ADJUSTMENT OF RED BAND

1. Set wave-change switch to Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #34, #18 and #5 for maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #42 for maximum output.
4. Return to 17000 K.C. setting and make readjustment of #34, #18 and #5.

Note: The adjustment of the two short-wave oscillator lag condensers (#42 and #43) is best made by the max-max. method. This is done as follows:

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading of the output meter. Change the lag condenser further in the same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of lag condenser. Continue this type of trial and error adjustment until no further improvement can be made when either the tuning control or the lag condenser are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few minutes.

IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condenser will ooze out thru the air vents making the condenser appear to be defective. If left in this position too long the condenser may be injured.

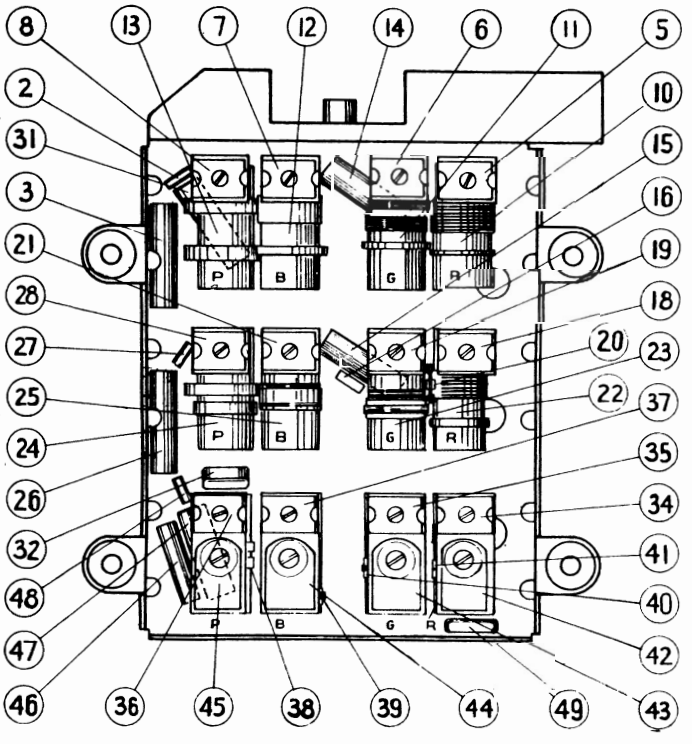


Figure No. 2

UNITED AMERICAN BOSCH CORP.

Models 595P-595M

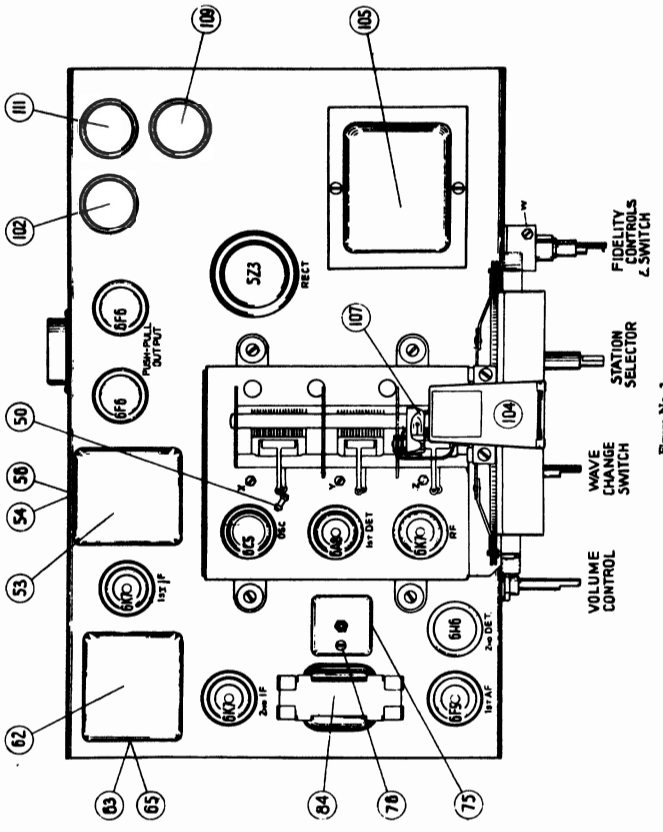


Figure No. 3

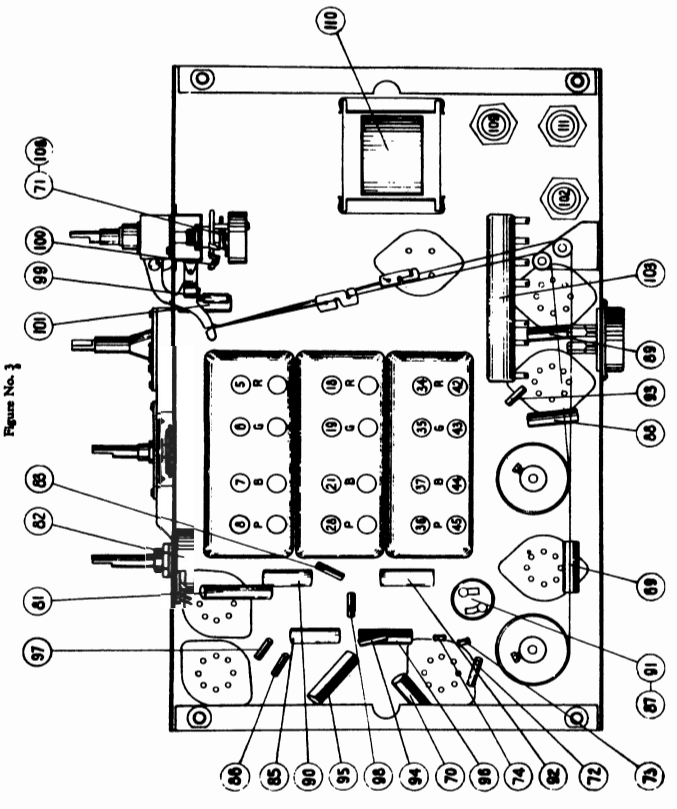


Figure No. 4

SERVICE PARTS LIST MODELS 595P-595M

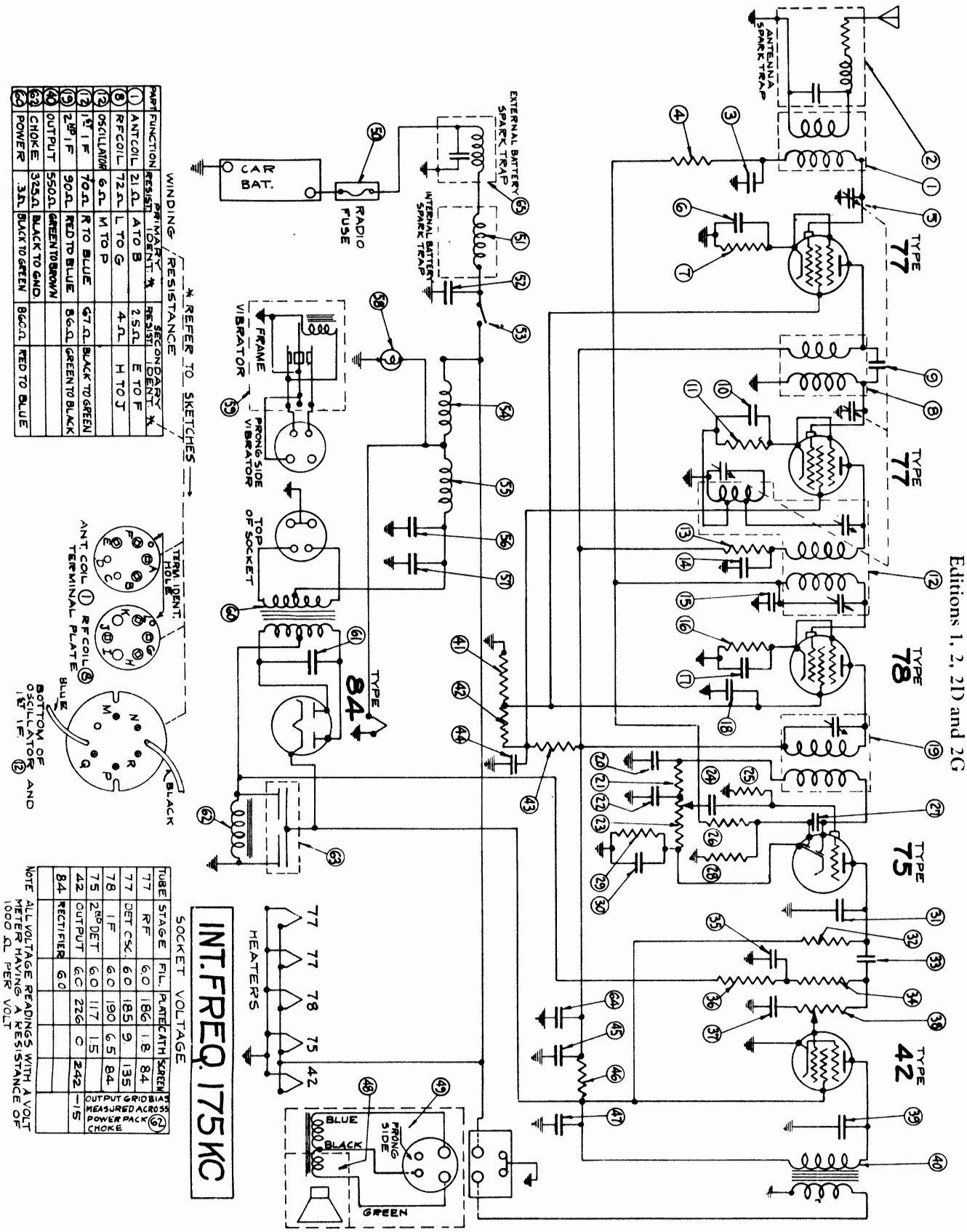
Dia. #	Part #	Description
1	CG 9527	Variable cond. assy.
2	RE 9529	300 ohm ½ W. resistor
3	SA 106386	.05 mfd. 200 V. cond.
4	SW 9524	Antenna section of "Centr-O-matic" assembly complete with switch, coils and trimmers
5	CS 9511	4 to 25 mmf. antenna trim cond.(Red Band)
6	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)
7	CS 9511	4 to 25 mmf. antenna trim condenser (White Band)
8	CS 9511	4 to 25 mmf. antenna trim condenser (Purple Band)
9		Twisted pair of wires - part of RC 9571
10	RC 9571	Antenna coil assembly (Red Band)
11	RC 9574	Antenna coil assembly (Green Band)
12	RC 9577	Antenna coil assembly (White Band)
13	RC 9580	Antenna coil assembly (Purple Band)
14	CW 9513	.05 mfd. 200 V. cond.
15	CW 9513	.05 mfd. 200 V. cond.
16	RE 9527	5000 ohm ½ W. resistor
17	SW 9525	R.F. section of "Centr-O-matic" assy. complete with switch, coils and trimmers
18	CS 9511	4. to 25 mmf. R.F. trim condenser (Red Band)
19	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Green Band)
20	CM 9512	6. mmf. mica condenser
21	CS 9512	1.5 to 10 mmf. R.F. trim condenser (White Band)
22	RC 9572	R.F. coil assembly (Red Band)
23	RC 9575	R.F. coil assembly (Green Band)
24	RC 9581	R.F. coil assembly (Purple Band)
25	RC 9578	R.F. coil assembly (White Band)
26	SA 106386	.05 mfd. 200 V. cond.
27	RE 9529	300 ohm ½ W. resistor
28	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Purple Band)
30	RE 9534	100,000 ohm ½ W. res.
31	SA 106386	.05 mfd. 200 V. cond.
32	CM 9511	.000065 mfd. mica condenser
33	SW 9526	Oscillator section of "Centr-O-matic" assembly complete with switch, coils and trimmers
34		1.5 to 10 mmf. trim condenser - part of CS 9519 (Red Band)
35		3. to 15. mmf. trim condenser - part of CS 9520 (Green Band)
36		10 to 35 mmf. trim condenser - part of CS 9518 (Purple Band)
37		5 to 25 mmf. trim condenser - part of CS 9517 (White Band)
38	RC 9582	Oscillator coil assy. (Purple Band)
39	RC 9579	Oscillator coil assy. (White Band)
40	RC 9576	Oscillator coil assy. (Green Band)
41	RC 9573	Oscillator coil assy. (Red Band)
42		800 to 1600 mmf. lag condenser - part of CS 9519 (Red Band)
43		800 to 1600 mmf. lag condenser - part of CS 9520 (Green Band)
44		300 to 600 mmf. lag condenser - part of CS 9517 (White Band)
45		60 to 150 mmf. lag condenser - part of CS 9518 (Purple Band)
46	RE 9526	5000 ohm 1 W. resistor
47	CW 9513	.05 mfd. 200 V. cond.
48	RE 9524	50,000 ohm ½ W. res.
49	CM 959	.002 mfd. mica cond.
50	RE 9537	50 ohm ½ W. resistor
51	RE 9534	100,000 ohm ½ W. res.
53	IC 9529	1st I.F. transformer assembly
54		250 to 350 mmf. I.F. trim cordenser - part of IC 9529
55	SA 106417	.0001 mfd. mica cond.
56		250 to 350 mmf. I.F. trim condenser - part of IC 9529
57	SA 106417	.0001 mfd. mica cond.
58	RE 9527	5000 ohm ½ W. resistor
59	SA 103659	.005 mfd. 400 V. cond.
60	RE 9534	100,000 ohm ½ W. res.
61	SA 103659	.005 mfd. 400 V. cond.
62	IC 9530	2nd I.F. transformer assembly
63		250 to 350 mmf. I.F. trim condenser - part of IC 9530
64	SA 106417	.0001 mfd. mica cond.
65		250 to 350 mmf. I.F. trim condenser - part of IC 9530
66	SA 106417	.0001 mfd. mica cond.
67	SA 103659	.005 mfd. 400 V. cond.
68	RE 9527	5000 ohm ½ W. resistor
69	SA 106386	.05 mfd. 200 V. cond.
70	SA 106386	.05 mfd. 200 V. cond.
71	VR 9511	Tone control switch
72	SA 105267	1000 ohm ½ W. resistor
73	RE 9528	1000 ohm ½ W. resistor
74	RE 9538	4000 ohm ½ W. resistor
75	IC 9526	3rd I.F. transformer
76		25 to 100 mmf. I.F. trim condenser - part of IC 9526
77		.00005 mfd. mica cond. - part of IC 9526
78		100,000 ohm ½ W. res. - part of IC 9526
79		.0001 mfd. mica cond. - part of IC 9526
80		250,000 ohm ½ W. res. - part of IC 9526
81	SA 102504	.02 mfd. 200 V. cond.
82	VR 9510	Volume control (1 meg.)
83	SA 105249	5000 ohm ½ W. resistor
84	TR 9516	Input transformer
85	CW 9512	.02 mfd. 400 V. cond.
86	SA 105246	½ meg. ½ W. resistor
87		10 mfd. 25 V. electrolytic condenser - part of SA 107913
88	SA 103852	.002 mfd. 600 V. cond.
89	SA 103852	.002 mfd. 600 V. cond.
90	CW 9512	.02 mfd. 400 V. cond.
91		10 mfd. 25 V. electrolytic condenser - part of SA 107913
92	CW 9512	.02 mfd. 400 V. cond.
93	SA 105246	½ meg. ½ W. resistor
94	SA 105281	1 meg. ½ W. resistor
95	SA 102492	.05 mfd. 400 V. cond.
96	SA 106386	.05 mfd. 200 V. cond.
97	SA 105274	20,000 ohm ½ W. res.
98	SA 105279	250,000 ohm ½ W. res.
99	SA 105277	75,000 ohm ½ W. res.
100	RE 9536	20,000 ohm ½ W. res.
101	CW 9512	.02 mfd. 400 V. cond.
102	CE 9517	18. mfd. 300 V. electrolytic condenser
103	RE 9521	Voltage divider res.
104	SI 9532	Tuning meter assembly
105	TR 9517	Power transformer
106		Line switch - part of VR 9511
107	LP 952	Tuning meter light (3.2 V.)
108	LP 952	Dial lights (4 used) (3.2 V.)
109	CE 9516	8. mfd. 450 V. electrolytic condenser
110	SA 101696	Choke coil assembly
111	CE 9516	8. Mfd. 450 V. electrolytic condenser
112	TK 9513	Speaker output trans.
113	SK 959	Speaker
114	DM 956	Diaphragm & voice coil assembly

Part #	Description
	MAIN ASSEMBLIES
CH 9539	Chassis assembly
CH 9538	Chassis assembly "Centr-O-matic" unit
KA 9522	Cabinet - type M
KA 9521	Cabinet - type P
SK 959	Speaker
	BRACKETS AND CLIPS
HP 958	Tension clip for expander cable
BK 95123	Bracket and switch assembly (tone control
HG 9545	Bracket assy. - dial glass
	CABLE AND CABLE ASSEMBLIES
CB 9512	Line cable assembly with plug
CB 9534	Bronze cable assembly - indicator drive
PR 97160	Expander cord - 54" long
	TUBE SOCKETS
SO 956	Tube socket - 8 prong
SA 104615	Tube socket - 4 prong
SA 107257	Speaker socket
	SCREWS
SC 101788	Screws - chassis mounting
SC 103709	Self tapping screws #10 x 3/8"
SC 105642	Self tapping screws #7 x 1/4"
SC 1047	Self tapping screws #4 x 1/4"
	WASHERS
WA 99740	Plain washer for chassis mounting screw
WA 105919	Lock washer for chassis mounting screw
	SPEAKER PARTS
DM 956	Diaphragm and coil assembly
FP 101740	Copper ring
FP 102270	Steel plate
FP 101742	Paper washer
CL 9537	Speaker field coil
SA 101733	Core and frame assembly
SC 102132	Fastening screw - core & frame
FP 73561	Cable clamp
SC 101865	Diaphragm fastening screw
TR 9513	Speaker output transformer
SC 101864	Fastening screw - output trans.
SA 107278	Speaker plug - 4 prong
SA 107279	Speaker plug cover

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH CAR-RADIO MODEL 634A

Editions 1, 2, 2D and 2G



PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT. *	SECONDARY RESIST.	SECONDARY IDENT. *
①	ANT. COIL	21 Ω.	A TO B	2.5 Ω.	E TO F
⑧	RF COIL	72 Ω.	L TO G	4 Ω.	H TO J
⑫	OSCILLATOR	6 Ω.	M TO P		
⑫	1ST I F	70 Ω.	R TO BLUE	67 Ω.	BLACK TO GREEN
⑬	2ND I F	90 Ω.	RED TO BLUE	86 Ω.	GREEN TO BLACK
⑭	OUTPUT	550 Ω.	GREEN TO BROWN		
⑥②	CHOKE	325 Ω.	BLACK TO GND.		
⑥②	POWER	3 Ω.	BLACK TO GREEN	86 Ω.	RED TO BLUE

TUBE	STAGE	FIL.	PLATE	CATH	SCREEN
77	RF	6.0	186	1.8	84
77	DET. OSC.	6.0	185	9.	135
78	I F	6.0	190	6.5	84
75	2ND DET.	6.0	117	1.5	
42	OUTPUT	6.0	226	0	242
84	RECTIFIER	6.0			-15

OUTPUT GRID BIAS MEASURED ACROSS POWER PACK ⑥② CHOKE

SOCKET VOLTAGE

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω. PER VOLT

INT. FREQ. 175 KC

MODEL 634A

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts
1	RC 956	Antenna coil assembly
2	CM 952	.00001 mfd. mica cond.
3	SA 106386	.05 mfd. 200 V. cond.
4	SA 105278	100,000 ohms 1/4 W. res.
5	CG 954	Variable condenser assy.
6	SA 106386	.05 mfd. 200 V. cond.
7	SA 105264	500 ohms 1/4 W. res.
8	RC 957	R.F. coil assembly
9	CM 952	.00001 mfd. condenser
10	SA 103852	.002 mfd. 500 V. cond.
11	SA 105247	7500 ohms 1/4 W. res.
12	RC 958	Composite coil assy.
13	SA 105245	2000 ohms 1/4 W. res.
14	SA 102492	.05 mfd. 350 V. cond.
15	SA 106386	.05 mfd. 200 V. cond.
16	SA 105270	2,500 ohms 1/4 W. res.
17	SA 102497	.25 mfd. 200 V. cond.
18	CW 951	.1 mfd. 200 V. cond.
19	IC 951	I.F. coil assembly
20	SA 106417	.0001 mfd. mica cond.
21	SA 105276	50,000 ohms 1/4 W. res.
22	SA 106417	.0001 mfd. mica cond.
23	VR 951	Vol. control-500,000 ohm
24	SA 103659	.005 mfd. 350 V. cond.
25	SA 105281	1 meg. 1/4 W. res.
26	SA 105246	1/2 meg. 1/4 W. res.
27	SA 106417	.0001 mfd. mica cond.
28	SA 105246	1/2 meg. 1/4 W. res.
29	SA 105249	5,000 ohms 1/4 W. res.
30	SA 102497	.25 mfd. 200 V. cond.
31	SA 103852	.002 mfd. 500 V. cond.
32	SA 105278	100,000 ohms 1/4 W.res.
33	SA 103659	.005 mfd. 350 V. cond.
34	SA 105279	1/4 meg. 1/4 W. res.
35	CW 951	.1 mfd. 200 V. cond.
36	SA 105279	1/4 meg. 1/4 W. res.
37	SA 106403	.001 mfd. 500 V. cond.
38	VR 952	Tone control-250,000 ohms
39	CW 952	.005 mfd. 500 V. cond.
40	TR 952	Output transformer
41	SA 105277	75,000 ohms 1/4 W. res.
42	SA 105274	20,000 ohms 1/4 W. res.
43	SA 105274	20,000 ohms 1/4 W. res.
44	SA 102492	.05 mfd. 350 V. cond.
45	SA 102496	.25 mfd. 350 V. cond.
46	SA 107572	5,000 ohms 1 W. res.
47	CM 951	.001 mfd. mica cond.
48	DM 951	Spkr.dphrgm.& voice coil
49	SK 955	Spkr.with cable & plug
50	FU 951	20 ampere fuse
51	RC 9512	Filter choke coil
52	CM 953	.00005 mfd. mica cond.
53		Switch - part of VR 951
54	SA 105452	Filter choke coil
55	SA 105452	Filter choke coil
56	CW 953	.5 mfd. 200 V. cond.
57	CW 953	.5 mfd. 200 V. cond.
58	SA 106809	Dial light-scr.type base
59	VI 951	Vibrator
60	TR 953	Power transformer
61	SA 106804	.008 mfd. 1600 V. cond.
62	TR 951	B choke
63	CE 951	6. & 10. mfd. elec. cond
64	CM 951	.001 mfd. mica condenser

Part #	Description of Parts
	MAIN ASSEMBLIES
CH 951	Chassis assembly
CU 953	Control Unit - less shafts
SK 955	Speaker complete w/cable & plug
	BRACKETS & CLAMPS
FP 79381	Speaker and antenna cable clamp
FP 105597	Control unit mounting bracket
	CABLE & CABLE ASSEMBLIES
CB 951	Battery cable assy. less fuse & fuse insulation
SA 107550	Dial light cable assy. Control Unit end.
CB 959	Dial light cable assy. - chassis end
CB 958	Antenna cable assembly
CB 951	Battery cable assembly
	TUBE SOCKETS & TUBE SHIELDS
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 952	Tube socket - 4 prong
BE 954	Base for tube shield
CV 954	Tube shield - long
CV 9516	Tube shield - short
	NUTS
FP 106639	Thumb nut for antenna & battery cable
NT 952	Round thumb cable nut for flexable shafts
NT 104935	Nut for mounting studs
NT 103039	Nut for volume control
	WASHERS, BUSHINGS & SPACERS
WA 104936	Washer for mounting studs
WA 41033	Lock washer for mounting studs
IS 1002	Rubber bushings for var. cond.
WA 80589	Lockwasher for volume control
FP 104086	Spacer for speaker plug socket and spark trap
FP 101742	Cardboard washer for speaker field coil
SR 953	Spacer for variable condenser rubber bushing.
	SCREWS & STUDS
FP 104892	Thumb screw on housing cover - 3 used
FP 106571	Mounting studs
SC 1026 CA	Screws for speaker plug socket & spark trap
SC 106677	Diaphragm housing to frame fastening screw
SC 101700	Self tapping screw #7 x 1/4" long

MODELS 636 - 637

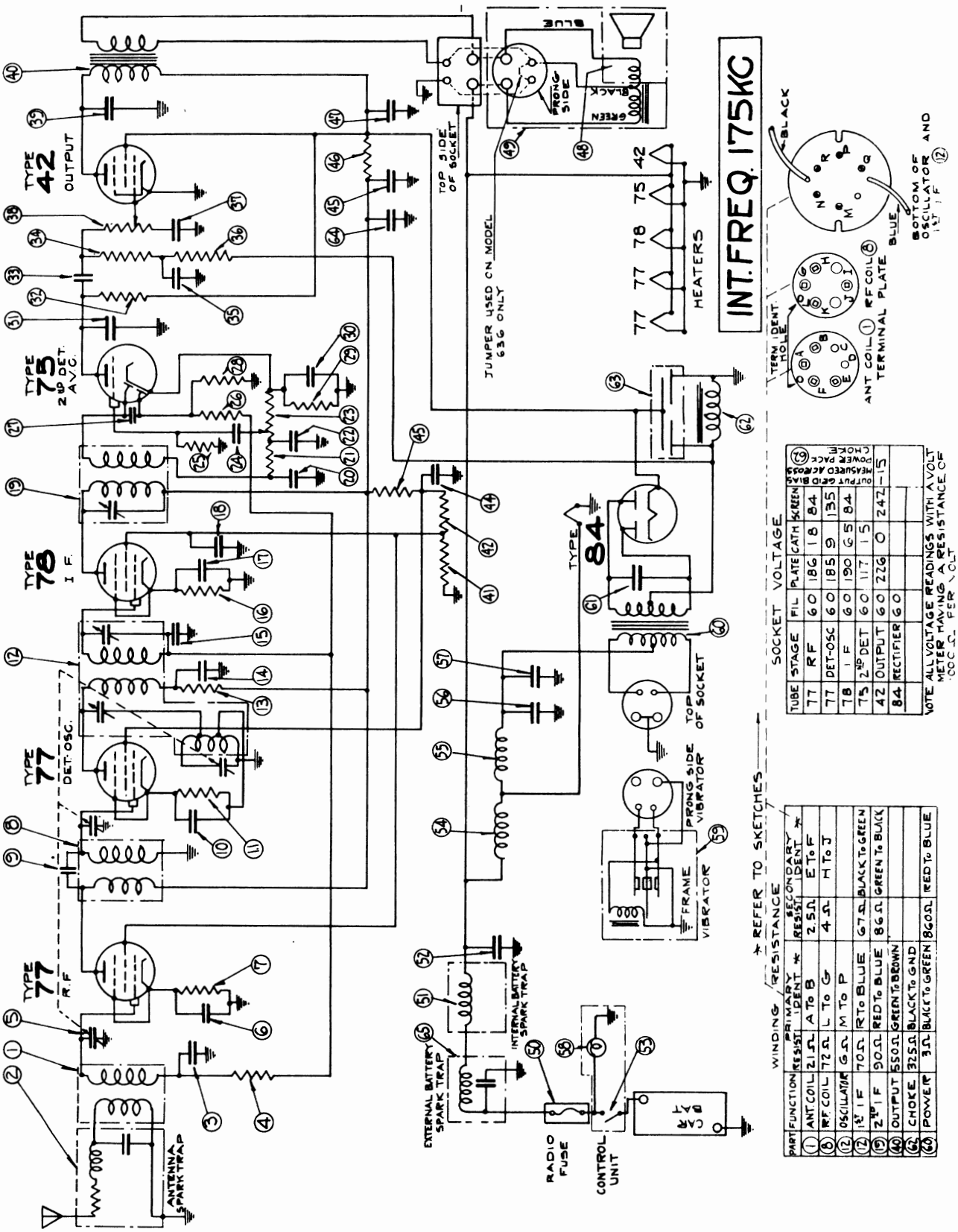
SERVICE PARTS LIST MODEL 636

Dia. #	Part #	Description
1	RC 95128	Antenna coil
2	CC 958	Antenna spark trap
3	SA 106386	.05 mfd. 200 V. cond.
4	SA 105278	100,000 ohm 1/4 W. res.
5	CG 9542	3 gang condenser
6	SA 106386	.05 mfd. 200 V. cond.
7	SA 105264	500 ohm 1/4 W. resistor
8	RC 95130	R.F. coil
9		Twisted wire
10	SA 103852	.002 mfd. 600 V. cond.
11	SA 105247	7500 ohm 1/4 W. resistor
12	RC 95132	Composite coil
13	SA 105245	2000 ohm 1/4 W. resistor
14	SA 102492	.05 mfd. 400 V. cond.
15	SA 106386	.05 mfd. 200 V. cond.
16	SA 105270	2500 ohm 1/4 W. resistor
17	SA 102497	.25 mfd. 200 V. cond.
18	CW 951	.1 mfd. 200 V. cond.
19	IC 951	I.F. coil
20	CM 9513	.0001 mfd. mica cond.
21	SA 105276	50,000 ohm 1/4 W. res.
22	CM 9513	.0001 mfd. mica cond.
23	VR 9524	Volume control
24	SA 103659	.005 mfd. 400 V. cond.
25	SA 105281	1 meg. 1/4 W. resistor
26	SA 105246	1/2 meg. 1/4 W. resistor
27	CM 9513	.0001 mfd. mica cond.
28	SA 105246	1/2 meg. 1/4 W. resistor
29	SA 105249	5000 ohm 1/4 W. res.
30	SA 102497	.25 mfd. 200 V. cond.
31	SA 103852	.002 mfd. 600 V. cond.
32	SA 105278	100,000 ohm 1/4 W. res.
33	SA 103659	.005 mfd. 400 V. cond.
34	SA 105279	1/4 meg. 1/4 W. resistor
35	CW 951	.1 mfd. 200 V. cond.
36	SA 105279	1/4 meg. 1/4 W. resistor
37	SA 106403	.001 mfd. 600 V. cond.
38	VR 9525	Tone control
39	CW 952	.005 mfd. 600 V. cond.
40	TR 952	Output transformer
41	SA 105277	75,000 ohm 1/4 W. res.
42	SA 105274	20,000 ohm 1/4 W. res.
43	SA 105274	20,000 ohm 1/4 W. res.
44	SA 102492	.05 mfd. 400 V. cond.
45	SA 102496	.25 mfd. 400 V. cond.
46	SA 107572	5000 ohm 1 W. res.
47	CM 951	.001 mfd. mica cond.
48	DM 951	Speaker diaphragm
49	SK 955	Speaker
50	FU 951	Fuse (20 amperes)
51	RC 9512	Filter choke
52	CM 953	.00005 mfd. mica cond.
53	SW 9539	Switch assembly complete less cables
54	SA 105452	Filter choke
55	SA 105452	Filter choke
56	CW 958	.5 mfd. 200 V. cond.
57	CW 958	.5 mfd. 200 V. cond.
58	LP 956	Pilot light - 6 V.- .20 amperes)
59	VI 951	Vibrator
60	TR 953	Power transformer
61	SA 106804	.008 mfd. 1600 V. cond.
62	TR 951	"B" choke
63	CE 951	6 & 10 mfd. electrolytic condenser
64	CM 951	.001 mfd. mica cond.
65	CC 959	Spark trap

Part #	Description
	MAIN ASSEMBLIES
CH 9582	Chassis assembly
CU 9517	Tuning unit (less shafts)
SK 955	Speaker
	NUTS
FP 106639	Thumb nut for ant. & bat. cable
NT 104935	Nut for mounting studs
	SCREWS AND STUDS
FP 104892	Thumb screws on housing cover
FP 106571	Mounting studs
SC 1026CA	Self-tapping screw (#6 x 1" long)
SC 101700	Self-tapping screw (#7 x 1/4" long)
	TUBE SOCKETS & TUBE SHIELDS
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 953	Tube socket - 4 prong
BE 956	Base for tube shield
CV 954	Tube shield - long
CV 9516	Tube shield - short
	WASHERS, BUSHINGS & SPACERS
WA 2-12 CA	Mounting washer
WA 7-10	Mounting lock washer
IS 1002	Rubber bushing for variable condenser
FP 104086	Spacer for speaker plug
SR 953	Spacer for variable condenser rubber bushing
	SPEAKER PARTS (SK 955)
CL 9513	Speaker field coil
DM 951	Diaphragm & voice coil assy.
FA 958	Silk speaker grill cloth
CB 9528	Speaker cable with 4 prong plug
SA 107279	Cover for speaker plug
SA 107278	Speaker plug
	MISCELLANEOUS
SH 9537	Variable condenser shaft with pinion
KT 956	Spark plug suppressor kit
DS 956	Dial indicator disc
DS 9547	Glass dial scale
SP 9537	Spring for dial glass
GA 959	Gasket for dial glass
SW 9541	Switch assembly complete with cables

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH CAR-RADIO MODELS 636 and 637



* REFER TO SKETCHES

PART	FUNCTION	PRIMARY WINDING RESIST.	PRIMARY IDENT *	SECONDARY RESIST.	SECONDARY IDENT *
①	ANT. COIL	2.1Ω	A TO B	2.5Ω	E TO F
⑧	RF. COIL	7.2Ω	L TO G	4Ω	H TO J
⑫	OSCILLATOR	6.2Ω	M TO P		
⑫	1ST I.F.	70Ω	R TO BLUE	67Ω	BLACK TO GREEN
⑮	2ND I.F.	90Ω	RED TO BLUE	86Ω	GREEN TO BLACK
㊵	OUTPUT	550Ω	GREEN TO BROWN		
㊶	CHOKE	325Ω	BLACK TO GND		
⑳	POWER	3Ω	BLACK TO GREEN	860Ω	RED TO BLUE

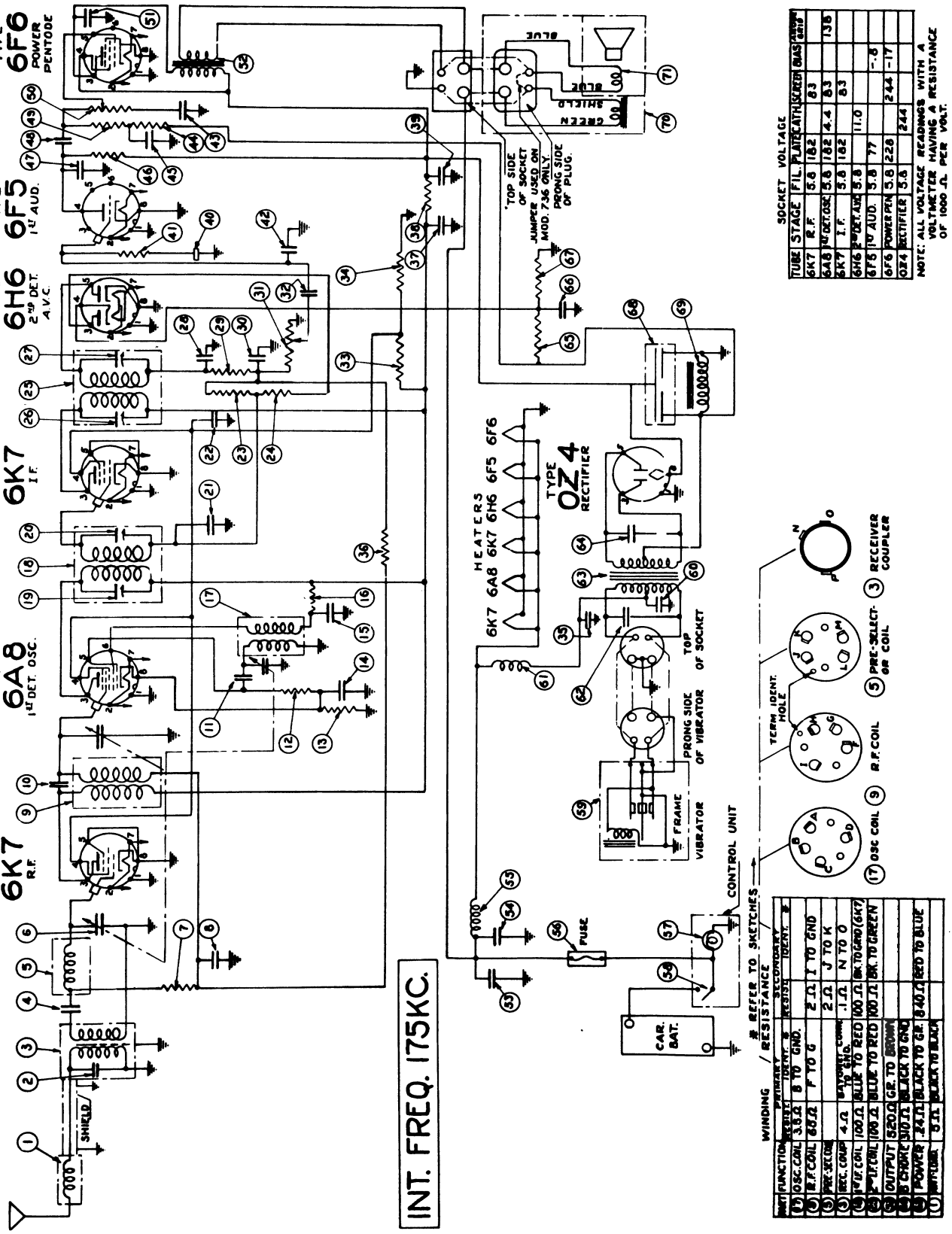
SOCKET VOLTAGE

TUBE	STAGE	FIL	PLATE	CATH	SCREEN	⑬ OUTPUT GRID BIAS MEASURED ACROSS CHOKE POWER PACK
77	RF	6.0	186	1.8	84	
77	DET-OSC	6.0	185	9	135	
78	I.F.	6.0	190	6.5	84	
75	2ND DET	6.0	117	1.5		
42	OUTPUT	6.0	226	0	242	-15
84	RECTIFIER	6.0				

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω PER VOLT

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH CAR-RADIO MODELS 736A2 - 737A2 - 738A2



SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	SCREEN	BIAS	ANODE CURR.
6K7	R.F.	5.8	182	83		
6A8	1ST DET. OSC.	5.8	182	4.4	83	13.6
6K7	I.F.	5.8	182		83	
6H6	2ND DET. A.V.C.	5.8		11.0		
6F5	1ST AUD.	5.8	77		-.8	
6F6	POWER PEN.	5.8	220	244	-17	
OZ4	RECTIFIER	5.8		244		

NOTE: ALL VOLTAGE READINGS WITH A VOLTMETER HAVING A RESISTANCE OF 1000 Ω PER VOLT.

MKT.	FUNCTION	WINDING / RESISTANCE	PRIMARY TERM. #	PRIMARY RESIST.	SECONDARY TERM. #
(17)	OSC. COIL	3.5Ω	B TO GND.	2Ω	I TO GND
(9)	R.F. COIL	6.5Ω	F TO G	2Ω	J TO K
(5)	PRE-SELECTOR COIL				
(3)	REC. COUP.	4Ω		1Ω	N TO O
(9)	R.F. COIL	100Ω	BLUE TO RED	100Ω	BK. TO GND (6K7)
(5)	PRE-SELECTOR COIL	100Ω	BLUE TO RED	100Ω	BK. TO GREEN
(2)	OUTPUT	520Ω	GR. TO BROWN		
(4)	B CHOKE	310Ω	BLACK TO GND		
(1)	POWER	24Ω	BLACK TO GR.	840Ω	RED TO BLUE
(10)	VIBRATOR	0Ω	BLACK TO BLACK		

REFER TO SKETCHES

736A2-737A2-738A2

AMERICAN-BOSCH CAR-RADIO MODELS 736A 2-737A2-738A2

Seven-tube, Superheterodyne Receivers

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ------- 1 #6A8, 2 #6K7, 1 #6H6, 1 #6F5, 1 #6F6, 1 #0Z4-Total 7
Battery Current (6.3-volt Battery) ---------- 6.5 Amperes
Tuning Range ---------- 540 to 1600 K.C.
Maximum Undistorted Output ---------- 3.0 Watts
Maximum Output ---------- 4.0 Watts
Line-Up Frequencies ---------- I.F. 175 K.C., 1400 K.C., 1500 K.C.

LOW POWER OUTPUT WITH "B" VOLTAGE CORRECT

Check the speaker field coil, voice coil and associated audio circuit for resistance continuity and defective 6F6 plate by-pass condenser.

All riveted component parts can be removed merely by punching out the rivets with a small-diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four machine screws. When replacing the power transformer, be sure to tighten these screws securely.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory, and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator and an output meter are available. Then proceed as follows,

NOTE: Before aligning the gang-condenser trimmers on the bottom of the gang condenser, it will be necessary to remove the three rubber plugs from the bottom of the receiver housing. The setting of the trimmer on the TOP of the condenser gang should UNDER NO CIRCUMSTANCES BE DISTURBED.

1. Set test oscillator to 175 K.C.
2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.
3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3.0 ohms.
4. Apply test signal to grid cap of 6K7 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers #26 and #27 to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid cap of 6A8 first detector-oscillator and adjust trimmers #19 and #20 to maximum output.
6. Set test oscillator to 1600 K.C. and rotate condenser gang until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the top of the gang and close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependant upon it.
7. Adjust trimmer "A" to maximum output and then remove the paper gauge.
8. Set test oscillator and condenser gang to 1400 K.C.
9. Apply test signal to grid cap of 6K7 R.F. tube and adjust trimmer "B" to maximum output.
10. Apply test signal to antenna lead thru a .0002 mfd. condenser and adjust trimmer "C" to maximum output.
11. Check sensitivity at several points.

ENGINEERING CHANGES

On early Models 736, 737 and 738 the following changes were made to make these Models 736 A2, 737 A2 and 738 A2:

1. The type 6J7 R.F. tube was changed to a type 6K7.
2. The .005 mfd., 600 volt condenser (CW 952) from the plate of the type 6F6 output tube to ground was changed to a .008 mfd., 600 volt condenser (CW 9524).
3. A .0005 mfd. mica condenser (CM 9519) was added from the grid of the type 6F5 audio tube to ground.
4. The type 6A8 detector-oscillator tube was placed on A.V.C. This change was made by removing the jumper from terminal on R.F. coil to ground and connecting this terminal by a jumper to the terminal on the antenna coil to which the red and yellow lead and the 100,000 ohm resistor are connected.

SERVICE PARTS LIST MODEL 736A2

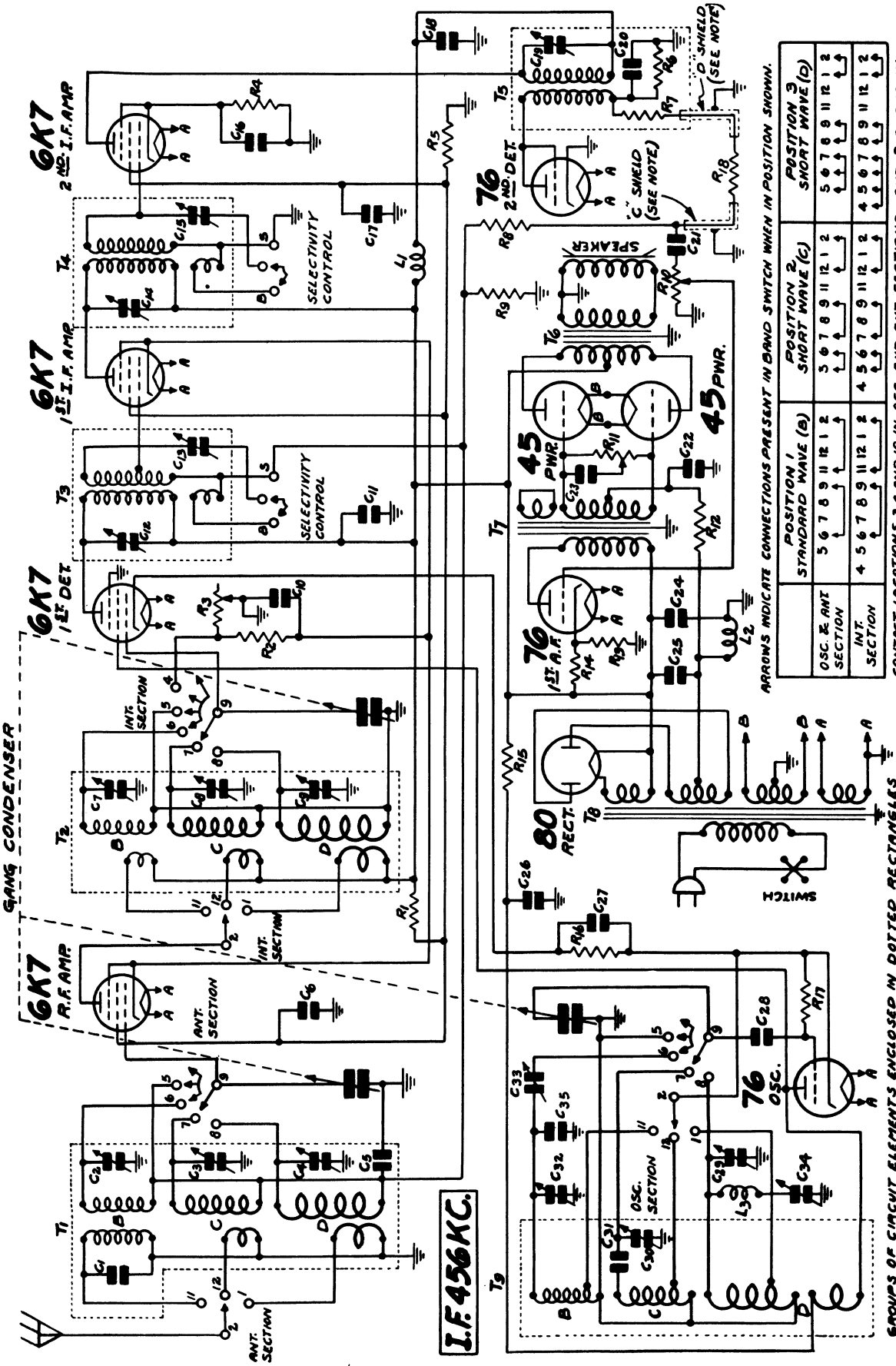
Dia. #	Part #	Description
1		Antenna loading coil - part of RC 95155
2		.000075 mfd. condenser - part of RC 95147
3	RC 95147	Receiver coupler
4	SA 106277	.01 mfd. 400 V. cond.
5	RC 95149	Preselector coil
6	CG 9537	Variable cond. assembly
7	RE 9534	100,000 ohm, 1/4 W. res.
8	SA 106386	.05 mfd., 200 V. cond.
9	RC 95151	R.F. coil
10	CM 952	.00001 mfd. mica cond.
11	CM 9513	.0001 mfd. mica cond.
12	SA 105276	50,000 ohm, 1/4 W. res.
13	SA 105264	500 ohm, 1/4 W. res.
14	SA 106386	.05 mfd., 200 V. cond.
15	SA 106277	.01 mfd., 400 V. cond.
16	SA 105272	10,000 ohm, 1/4 W. res.
17	RC 95153	Oscillator coil assy.
18	IC 9555	1st I.F. coil
19		30-100 mmf. condenser - part of IC 9555
20		30-100 mmf. condenser - part of IC 9555
21	SA 106386	.05 mfd., 200 V. cond.
22	CW 951	.1 mfd., 200 V. cond.
23	SA 105246	1/2 meg., 1/4 W. res.
24	SA 105281	1 meg., 1/4 W. res.
25	IC 9556	2nd I.F. coil
26		30-100 mmf. condenser - part of IC 9556
27		30-100 mmf. condenser - part of IC 9556
28	CM 9513	.0001 mfd. mica cond.
29	SA 105276	50,000 ohm, 1/4 W. res.
30	CM 9513	.0001 mfd. mica cond.
31	VR 9527	.25 meg. volume control
32	SA 103659	.005 mfd., 400 V. cond.
33	SA 99777	25,000 ohm, 1 W. res.
34	SA 100512	50,000 ohm, 1/2 W. res.
35	CW 958	.05 mfd., 200 V. cond.
36	SA 105246	1/2 meg., 1/4 W. res.
37	SA 102496	.25 mfd., 400 V. cond.
38	SA 106531	4000 ohm, 1 W. res.
39	CM 951	.001 mfd. mica cond.
40	BY 952	Grid bias cell
41	SA 105281	1 meg., 1/4 W. res.
42	CM 9519	.0005 mfd. mica cond.
43	SA 106403	.001 mfd., 600 V. cond.
44	SA 105279	250,000 ohm, 1/4 W. res.
45	SA 102497	.25 mfd., 200 V. cond.
46	SA 105279	250,000 ohm, 1/4 W. res.
47	SA 106403	.001 mfd., 600 V. cond.
48	CW 9524	.008 mfd., 600 V. cond.
49	SA 105279	250,000 ohm, 1/4 W. res.
50	VR 9525	250,000 ohm tone control
51	CW 9524	.008 mfd., 600 V. cond.
52	TR 9543	Output transformer
53	CW 957	.5 mfd. 120 V. cond.
54	CM 953	.00005 mfd. mica cond.
55	RC 95157	Choke coil
56	FU 951	20 ampere fuse
57	LP 951	Pilot light
58	SW 9539	On-Off switch assembly
59	VI 955	Vibrator
60	CW 958	.5 mfd., 200 V. cond.
61	RC 95156	Choke coil
62	CW 9523	.5 mfd., 120 V. cond.
63	TR 9547	Power transformer
64	CW 9522	.005 mfd., 1600 V. cond.
65	SA 105272	10,000 ohm, 1/4 W. res.
66	CE 9524	10 mfd. electro. cond.
67	SA 105284	30,000 ohm, 1/4 W. res.
78	CE 951	6 & 10 mfd. elec. cond.
69	TR 951	"B" choke
70	SK 955	Speaker assembly
71	DM 951	Diaphragm assembly - Model 736 only

Part #	Description
	MAIN ASSEMBLIES
CH 9575	Chassis assembly
SK 955	Speaker
CU 9517	Control unit - less shafts
	BRACKETS & CLAMPS
FP 79381	Clamp (Battery, antenna & speaker cables)
BK 95175	Bracket for loading coil
	CABLES & CABLE ASSEMBLIES
CB 9570	Battery cable assembly
TU 1014	Shielded loom
	SOCKETS
SO 958	Speaker socket
SO 953	Tube socket (4 prong)
SO 9511	Tube socket (metal tube)
	WASHERS, BUSHINGS & SPACERS
WA 1048	Washers for mounting studs
WA 8-8 CA	Lock washer for mtg. studs
SR 953	Spacer for variable cond. rubber bushing
IS 1002	Rubber bushing for variable condenser mounting
WA 7-10 CA	Washer for loading-coil mtg.
	SCREWS & STUDS
SD 957	Mounting studs
FP 104892	Thumb screw
	MISCELLANEOUS
NT 103475	Mtg. nuts for loading coil
SH 9533	Flexible drive shaft (2 used)
SW 9540	Switch (complete)
SA 106754	Suppressor (ignition coil)
SA 105300	Suppressor condenser
RC 95155	Ant. loading coil & cable assy.
IS 95152	Rubber plug for alignment holes
KN 9531	Tone control knob (rubber)
IS 95159	Mtg. assy. for grid bias cell
FA 957	Grill cloth

UNITED AMERICAN BOSCH CORP.

WELLS-GARDNER & CO.

Series ODM



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. & ANT SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN OSC. AND ANT. SECTIONS, AND 3 AND 10 IN INT. SECTION ARE BLANK.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

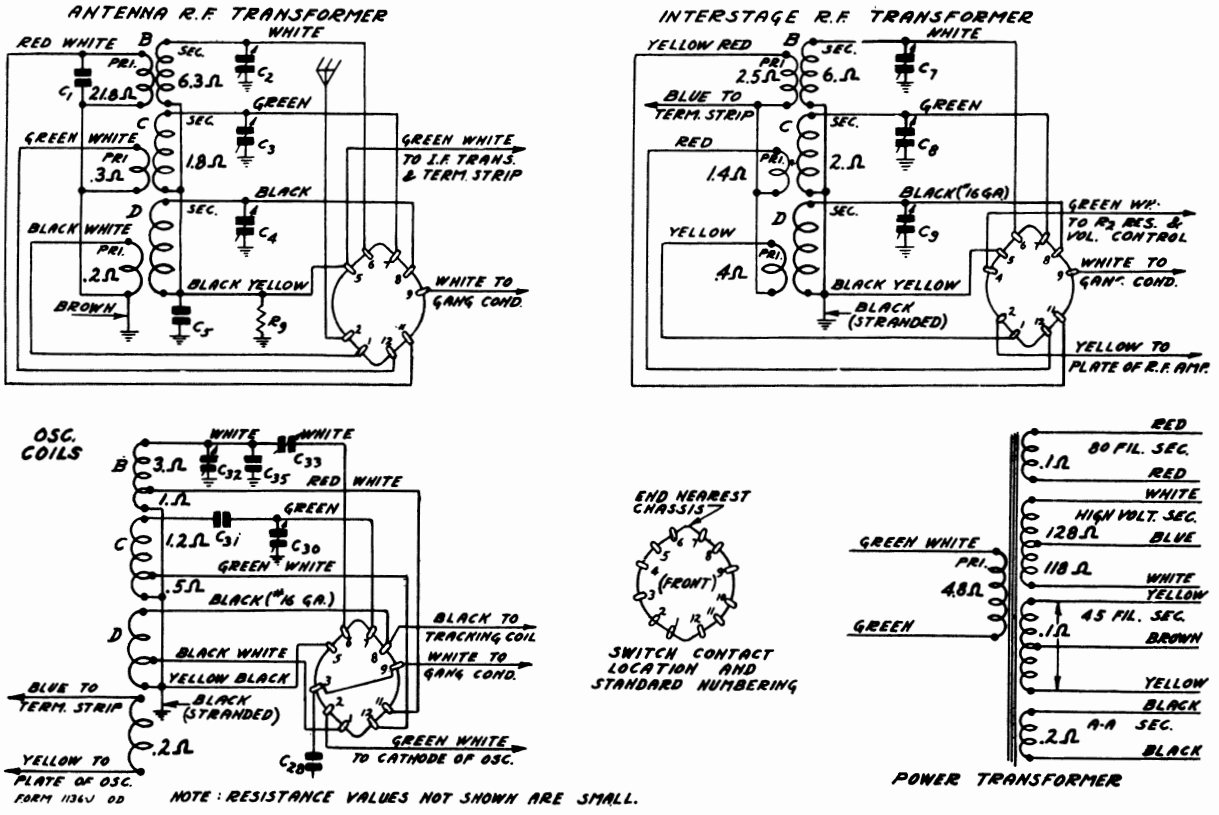
"B" AND "S" ON SELECTIVITY CONTROL DENOTES "BROAD" AND "SHARP" RESPECTIVELY.

THE CAPACITY OF THE "C" SHIELD IS 55 mf. THE CAPACITY OF THE "D" SHIELD IS 20 mf.

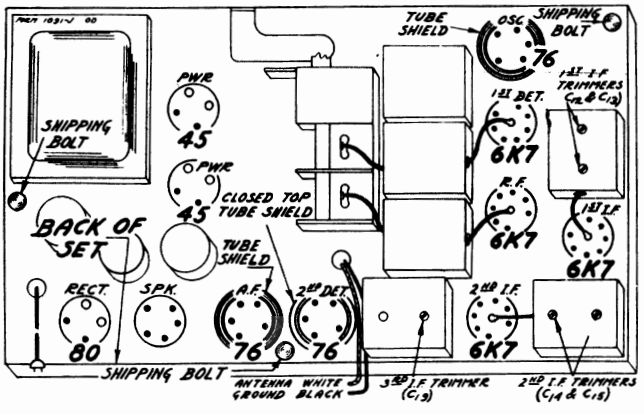
C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 .25 mf. 240 V.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 2-25 mmf.
C10 .25 mf. 180 V.
C11 .25 mf. 360 V.
C12 150-250 mmf. } ONE
C13 150-250 mmf. } UNIT
C14 150-250 mmf. } ONE
C15 150-250 mmf. } UNIT
C16 .05 mf. 180 V.
C17 4.0 mf. 150 V.
C18 .10 mf. 360 V.
C19 70-150 mmf.
C20 50 mmf.
C21 .01 mf. 360 V.
C22 .50 mf. 180 V.
C23 .004 mf. 600 V.
C24 18.0 mf. 290 V.
C25 14.0 mf. 400 V.
C26 .05 mf. 360 V.
C27 .05 mf. 180 V.
C28 .35 mmf.
C29 2-25 mmf.
C30 2-25 mmf.
C31 1400 mmf.
C32 2-25 mmf.
C33 300-600 mmf. } ONE
C34 40-100 mmf. } UNIT
R 1 16,000 ohm 2.0 W.
R 2 150 ohm .2 W.
R 3 2,500 ohm } Dual Volume
R10 2.0 megohm } Control
R 4 400 ohm .2 W.
R 5 30,000 ohm 1.0 W.
R 6 300,000 ohm .2 W.
R 7 100,000 ohm .2 W.
R 8 2.0 megohm .2 W.
R 9 1.0 megohm .2 W.
R11 3.0 megohm Tone Cont.
R12 100,000 ohm .2 W.
R13 1,000 ohm .5 W.
R14 25,000 ohm 3.0 W.
R15 25,000 ohm 1.0 W.
R16 2,500 ohm .2 W.
R17 80,000 ohm .2 W.
T 1 Ant. R.F. Trans.
T 2 Intertage R.F. Trans.
T 3 1st I.F. Trans.
T 4 2nd I. F. Trans.
T 5 Diode Input Trans.
T 6 Audio Output Trans.
T 7 Audio Input Trans.
T 8 Power Trans.
T 9 Osc. Inductors
L 1 Isolating Reactor
L 2 Speaker Field (570 Ohm)
L 3 Osc. Tracking Coil

WELLS-GARDNER & CO.

ODM Series



Color Coding of Coil Wires and D. C. Resistance of Windings

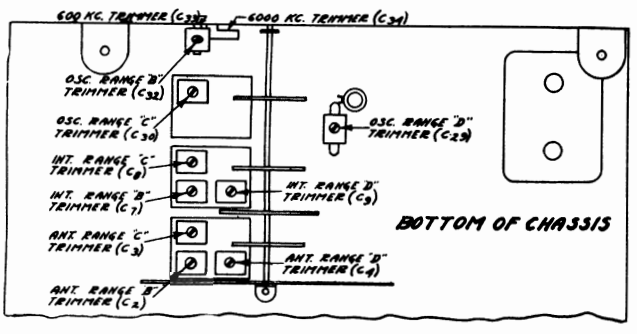


–Location of Tubes

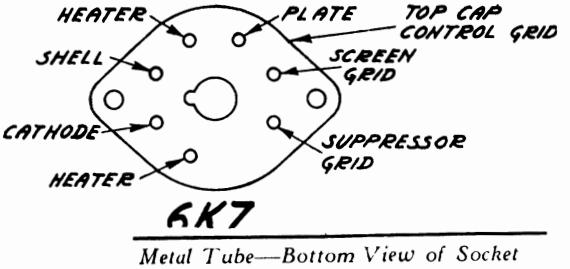
VOLTAGES AT SOCKETS
Line Voltage, 115 - Volume Control at Maximum
Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Ca'hode M. A.
6K7 (6D6)	R. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	1st Det.	6.1	265	110	9.5	3.8
76	Osc.	6.1	110			5.8
6K7 (6D6)	1st. I. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	2nd I. F.	6.1	265	120	3.7	9.0
76	2nd Det.	6.1				
76	1st A. F.	6.1	265		14.	5.0
45	Power	2.5	265		50.(1)	22.
80	Rectifier	4.9				90. (total)

(1) As read with 500 Volt Scale. Grid to Ground.

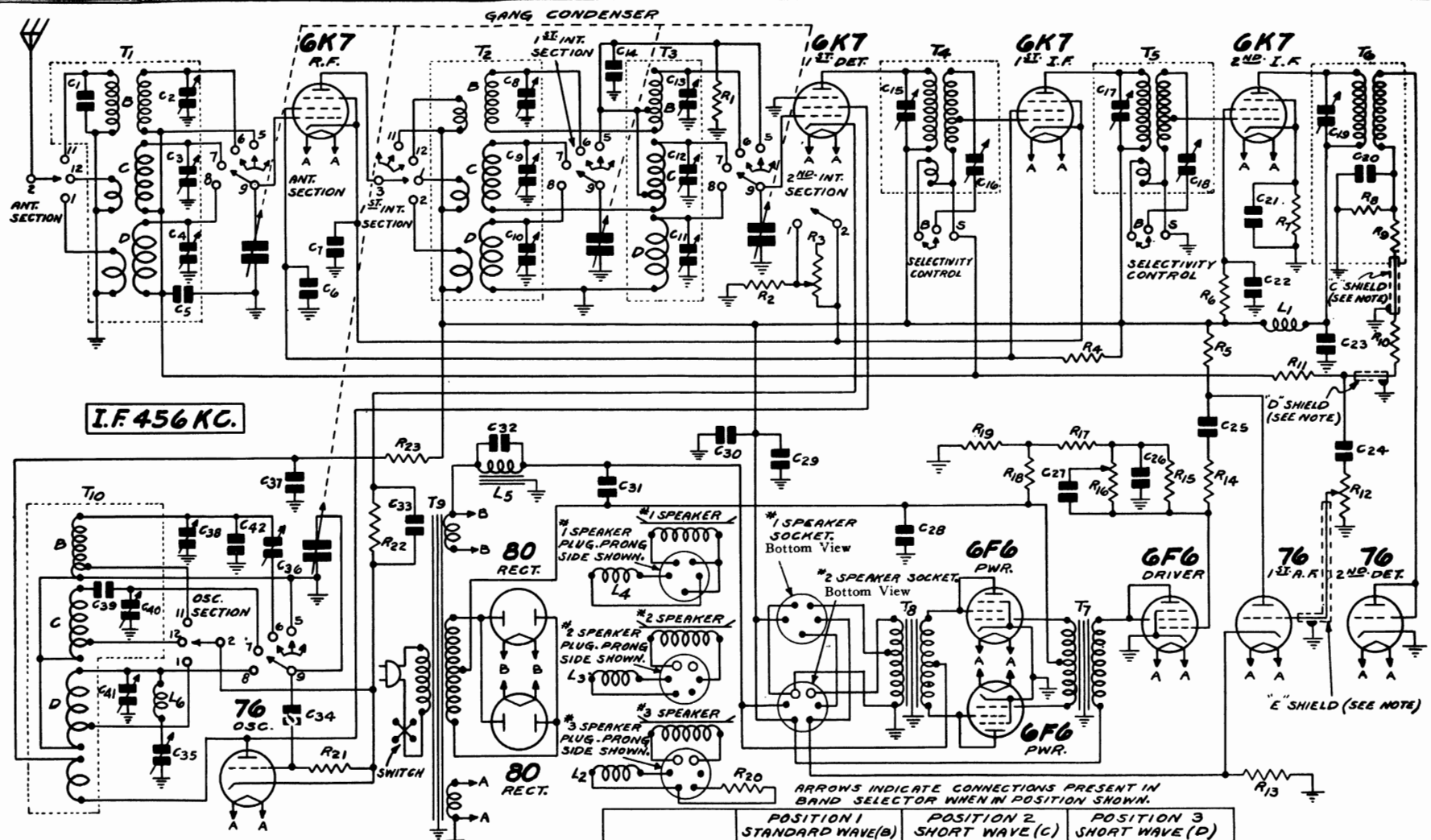


Location of Trimmers



Metal Tube—Bottom View of Socket

WELLS-GARDNER & CO.
Series 2CM



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SELECTOR WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. AND ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9
2ND. INT. SECTION	1 2 5 6 7 8 9	1 2 5 6 7 8 9	1 2 5 6 7 8 9
1ST. INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9

CONTACT LOCATIONS 3, 4 AND 10 IN OSC. AND ANT. SECTIONS, 3, 4, 10, 11 AND 12 IN 2ND. INT. SECTION AND 4 AND 10 IN 1ST. INT. SECTION ARE BLANK.

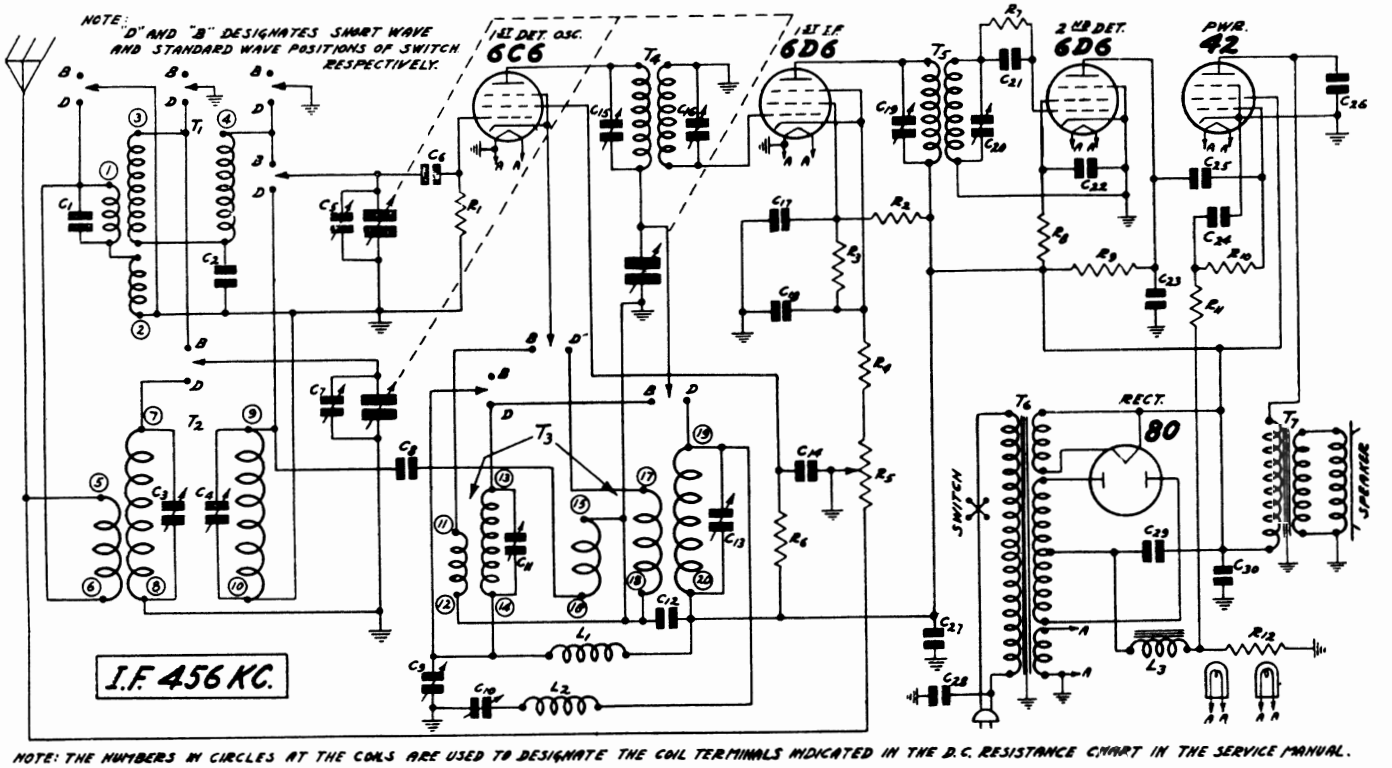
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON SELECTIVITY CONTROL DENOTES BROAD AND SHARP RESPECTIVELY.
THE CAPACITY OF THE "C" SHIELD IS 20 m m f.
THE CAPACITY OF THE "D" SHIELD IS 70 m m f.
THE CAPACITY OF THE "E" SHIELD IS 16 m m f.
ON SETS USING ONE SPEAKER THE #3 SPEAKER IS FURNISHED.
ON SETS USING TWO SPEAKERS THE #1 AND #2 SPEAKERS ARE FURNISHED.

C 1	250 mmf.	C13	2-25 mmf.	C25	.05 mf. 360 V.	C37	.25 mf. 360 V.	R 5	60,000 ohm 0.5 watt
C 2	2-25 mmf.	C14	.05 mf. 180 V.	C26	.25 mf. 180 V.	C38	2-25 mmf.	R 6	100,000 ohm 0.5 watt
C 3	2-25 mmf.	C15	150-250 mmf. } One	C27	.004 mf. 600 V.	C39	1400 mmf.	R 7	500 ohm 0.2 watt
C 4	2-25 mmf.	C16	150-250 mmf. } Unit	C28	125.0 mf. 45 V. Electrolytic	C40	2-25 mmf.	R 8	200,000 ohm 0.5 watt
C 5	.05 mf. 180 V.	C17	150-250 mmf. } One	C29	18.0 mf. 290 V. Electrolytic	C41	2-25 mmf.	R 9	100,000 ohm 0.2 watt
C 6	.70 mf. 360 V.	C18	150-250 mmf. } Unit	C30	.25 mf. 360 V.	C42	10 mmf.	R10	100,000 ohm 0.2 watt
C 7	.25 mf. 180 V.	C19	70-150 mmf.	C31	30.0 mf. 450 V. Electrolytic			R11	2.0 megohm 0.2 watt
C 8	2-25 mmf.	C20	50 mmf.	C32	.15 mf. 280 V. A. C.	R 1	25,000 ohm 0.2 watt	R13	200 ohm 0.5 watt
C 9	2-25 mmf.	C21	.05 mf. 180 V.	C33	.05 mf. 180 V.	R 2	150 ohm 0.2 watt	R14	250,000 ohm 0.2 watt
C10	2-25 mmf.	C22	.05 mf. 360 V.	C34	35 mmf.	R 3	2500 ohm } Dual Volume	R15	250,000 ohm 0.2 watt
C11	2-25 mmf.	C23	.10 mf. 360 V.	C35	40-100 mmf. } One	R12	2.0 megohm } Control	R16	3.0 megohm Tone Control
C12	2-25 mmf.	C24	.01 mf. 480 V	C36	300-600 mmf. } Unit	R 4	50,000 ohm 1.0 watt	R17	100.000 ohm 0.2 watt

R18	128 ohm 2.5 watt } Armored	T 6	3rd I.F. Trans.
R19	145 ohm 3.0 watt } Wire-Wound	T 7	Push-Pull Input Trans.
R20	7800 ohm 12.0 watt	T 8	Push-Pull Output Trans.
R21	80,000 ohm 0.2 watt	T 9	Power Trans.
R22	2,500 ohm 0.2 watt	T10	Osc. Inductors
R23	27,000 ohm 1.0 watt		
		L 1	2nd I. F. Plate Isolating Reactor
T 1	Ant. R.F. Trans.	L 2	No. 3 Speaker Field (1000 ohm)
T 2	1st Interstage R.F. Trans.	L 3	No. 2 Speaker Field (1000 ohm)
T 3	2nd Interstage R.F. Trans.	L 4	No. 1 Speaker Field (6400 ohm)
T 4	1st I.F. Trans.	L 5	Choke Coil
T 5	2nd I.F. Trans.	L 6	Osc. Tracking Coil

WELLS-GARDNER & CO.

Series 5D



NOTE: THE NUMBERS IN CIRCLES AT THE COILS ARE USED TO DESIGNATE THE COIL TERMINALS INDICATED IN THE D.C. RESISTANCE CHART IN THE SERVICE MANUAL.

VOLTAGES AT SOCKETS

Input - 115 Volts 60 Cycles Antenna Shorted to Ground

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6C6	1st Det. & Osc.	6.3	250	175	4.0	8.8
6D6	I. F.	6.3	250	100	4.0	7.0
6D6	2nd Det.	6.3	35	26	0	1.1
42	Output	6.3	230	250	*20.0	28
80	Rectifier	5.0	—	—	—	32.0

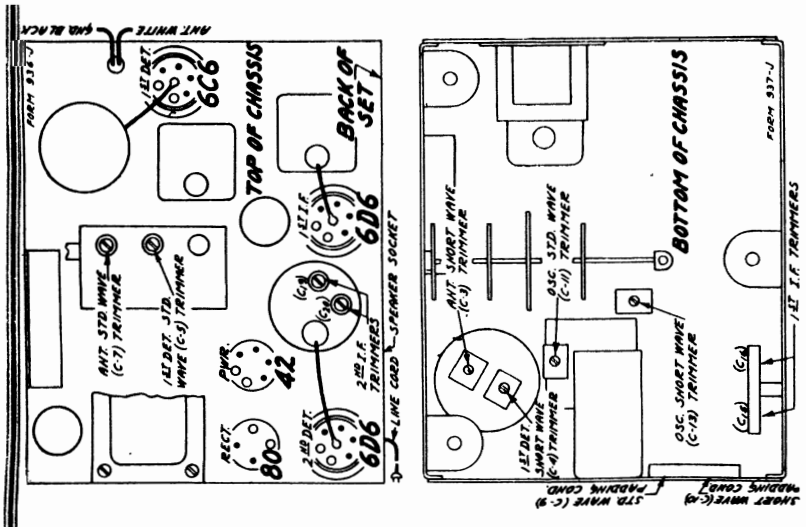
Volume control in maximum position.
*Measured across R12.

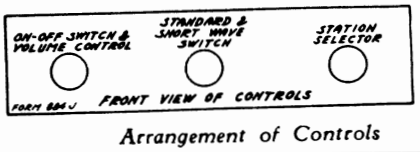
D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	Ohms D.C.
5266	Double Tuned Antenna Std. W. Coil	T1	
	(1-2) Primary Windings in Series	T1	20.0
	(3-4) Secondary Windings in Series	T1	10.0
5267	Double Tuned Antenna Sh. W. Coil	T2	
	(5-6) Primary Winding	T2	0.2
	(7-8) 1st Secondary Winding	T2	Small
	(9-10) 2nd Secondary Winding	T2	Small
5268	Oscillator Coil	T3	
	(11-12) Std. W. Cathode Winding	T3	1.5
	(13-14) Std. W. Plate Winding	T3	3.0
	(15-16) Sh. W. Neutralizing Winding	T3	.43
	(17-18) Sh. W. Cathode Winding	T3	.53
	(19-20) Sh. W. Plate Winding	T3	Small
5271	1st I. F. Coil Primary	T4	12.65
	1st I. F. Coil Secondary	T4	12.75
5272	2nd I. F. Coil Primary	T5	12.65
	*2nd I. F. Coil Secondary	T5	12.75
50661	Power Transformer Primary	T6	7.0
	H. V. Secondary (Center tap to outside)	T6	197.0
	H. V. Secondary (Center tap to inside)	T6	187.0
	Tube Filament Secondary (A-A)	T6	Small
	Rect. Tube Fil. Secondary	T6	Small
50667	Output Trans. Primary	T7	565.0
	Output Trans. Secondary	T7	0.75
2258	Speaker Voice Coil		3.25
	Speaker Field Coil	L3	1100.0
5265	Oscillator Plate Reactor	L1	70.0
5190	Tracking Coil	L2	Small

Remarks Volume Control moveable arm should be disconnected from ground when measuring Antenna Coil primaries.
Band switch position should be in Std. W. when making Std. W. Ant. and Osc. coil measurements.
Band switch position should be in Sh. W. when making Sh. W. Ant. and Osc. Coil measurements.
*If measured from grid clip to ground, will include 2.0 meg. resistance. To get resistance value shown, measure from trimmer condenser rivet, which is plainly visible through hole in top of 2nd I. F. can, to ground.

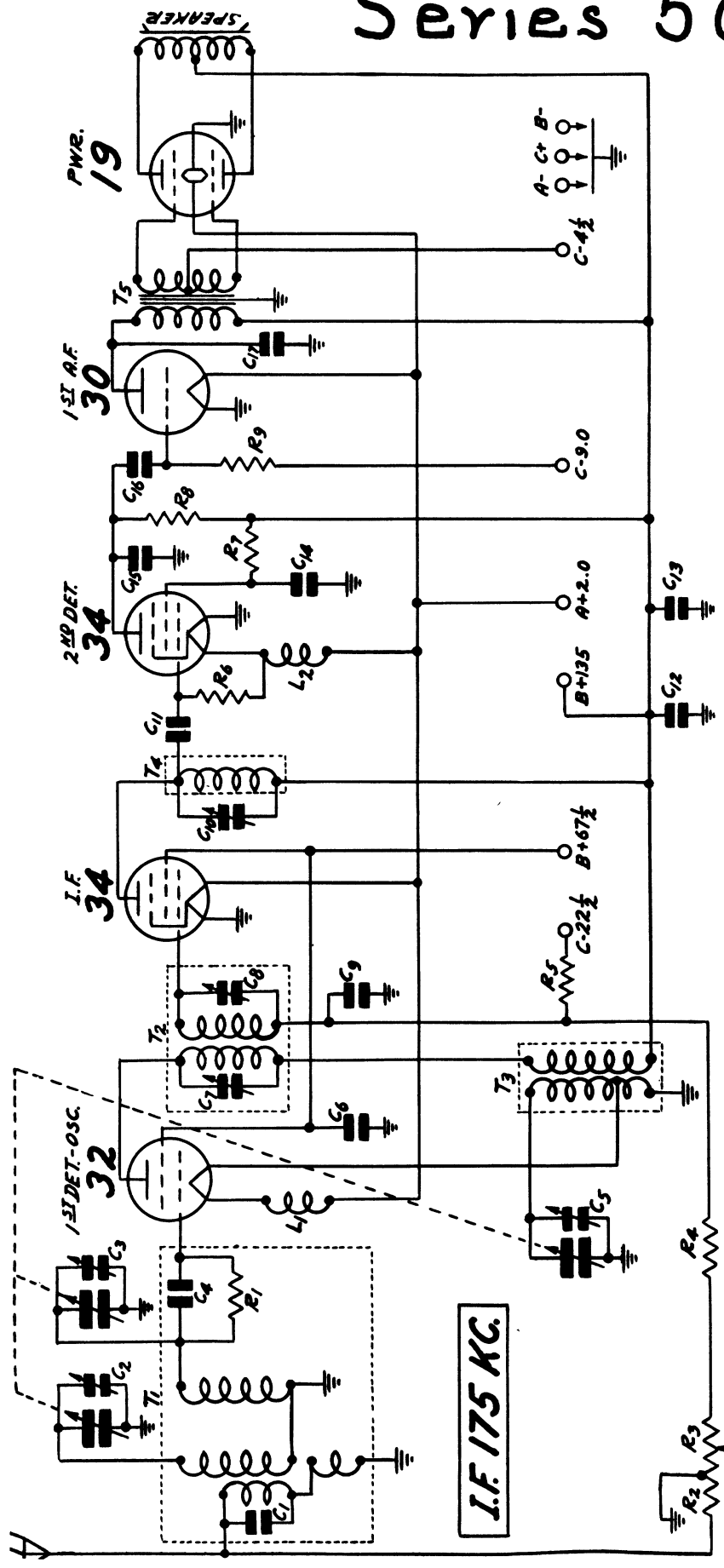




Arrangement of Controls

WELLS-GARDNER & CO.

Series 5G



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C1 150 MMF MOULDED
C2 GANG TRIMMER
C3 GANG TRIMMER
C4 35 MMF MOULDED
C5 GANG TRIMMER
C6 .25 MF 100 V.
C7 40-100 MMF } DUAL
C8 20-70 MMF } (P-17937)
C9 .05 MF 180 V.
C10 40-100 MMF (P-17938)
C11 50 MMF MOULDED
C12 .10 MF 180 V.
C13 4.0 MF 150 V. ELECTROLYTIC (P-45X28)
C14 .10 MF 180 V.

C15 .002 MF 300 V.
C16 .006 MF 300 V.
C17 .002 MF 300 V.

R1 1.0 MEGOHM .2 W.
R2 10 000 OHM } VOLUME CONTROL (P-36X201)
R3 60 000 OHM }
R4 900 OHM .2 W.
R5 6 500 OHM .2 W.
R6 2.0 MEGOHM .2 W.
R7 100 000 OHM .5 W.
R8 40 000 OHM .5 W.
R9 1.0 MEGOHM .2 W.

L1 SINGLE FILAMENT REACTOR (P-9A281)
L2 SINGLE FILAMENT REACTOR (P-9A281)

T1 DOUBLE TUNED ANTENNA COIL (P-9A381)
T2 1ST I.F. COIL (P-9A383)
T3 OSC. COIL (P-9A382)
T4 2ND I.F. COIL (P-9A384)
T5 AUDIO INPUT TRANS. (P-50XH)

WELLS-GARDNER & CO.

Series 5G

Alignment Procedure and Dial Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .1 MF condenser to the coil end of the grid leak resistor R1. There is a lead which runs from the center tuning condenser stator to a lug at the bottom of the R. F. coil assembly. This connection can be made at the lug on the coil to which this lead is connected.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the volume control to the maximum position.

Then adjust the three I. F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 8.

As stated above, use a non-metallic screwdriver to make the adjustment.

1750 KC Adjustment

Set the signal generator for 1750 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the antenna lead of the receiver thru a 250 mmf. condenser to the output of the signal generator.

Keep the volume control at the maximum position.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained. The location of this trimmer is shown in Fig. 8.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Dial Calibration

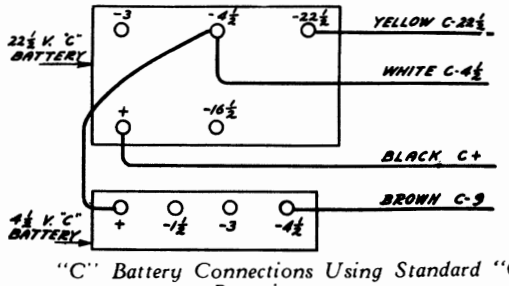
To obtain dial scale calibration tune in an 800 KC signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

VOLTAGES AT SOCKETS

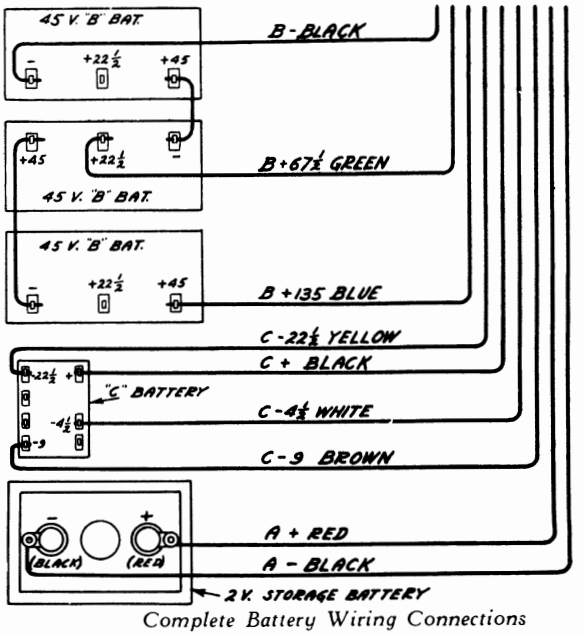
Volume Control at Maximum—Antenna Shorted to Ground. B+135 Volts Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Gnd.	Screen to Gnd.	Grid to Gnd.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5 (1) (2)	2.5
34	I. F.	2.0	135	67.5	2.5 (3)	2.8
34	2nd Det.	2.0	50	40 (1)	0	1.8
30	1st Audio	2.0	135		9 (4)	3.0
19	Output	2.0	135		4.5	3.2 Total

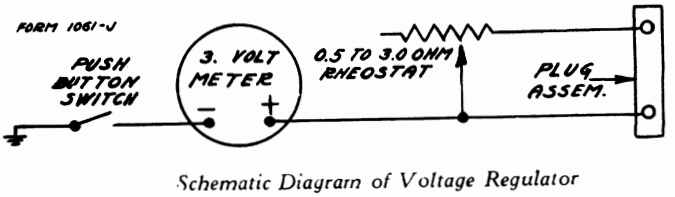
(1) With 250,000 ohm meter.
(2) Subject to variation.
(3) With 25,000 ohm meter.
(4) Read at "C" battery.



"C" Battery Connections Using Standard "C" Batteries



Complete Battery Wiring Connections



Schematic Diagram of Voltage Regulator

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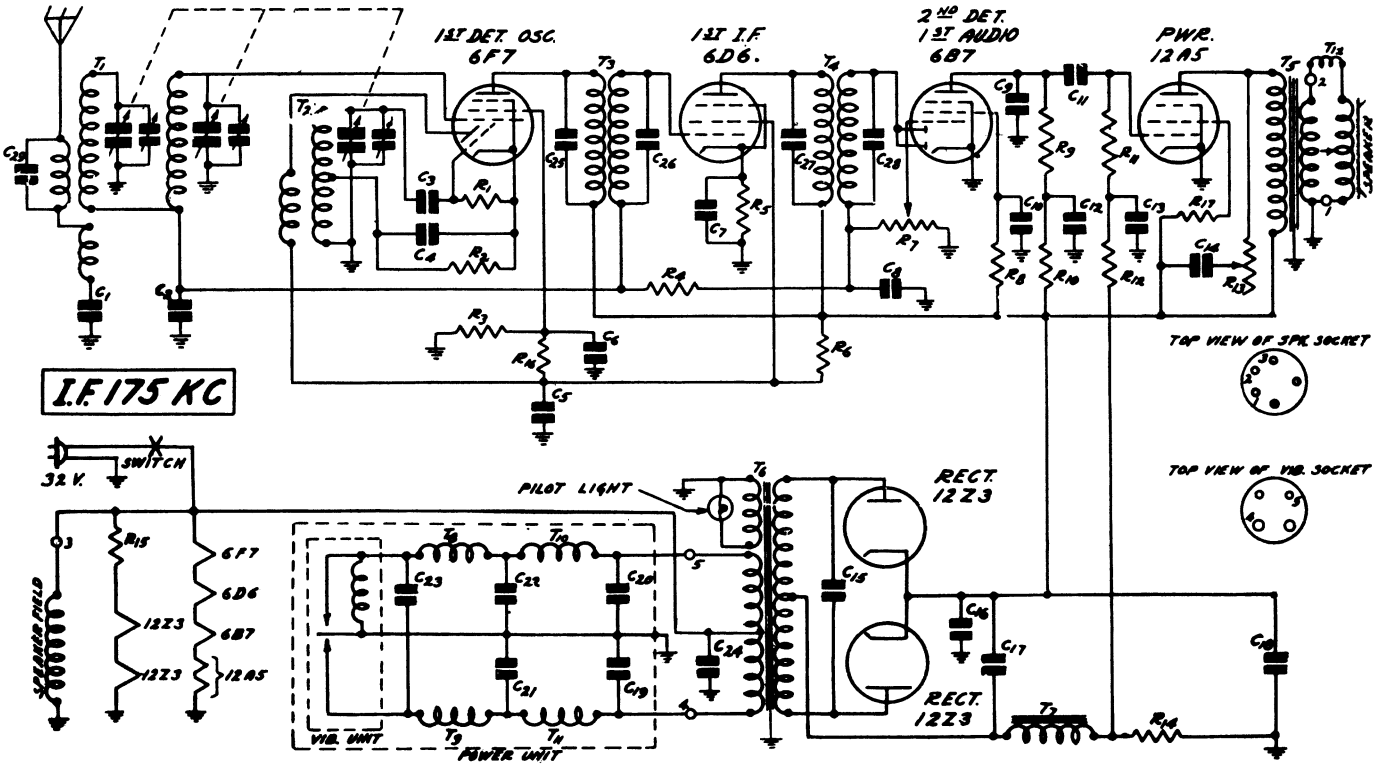
6B Series



The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown in the circuit.

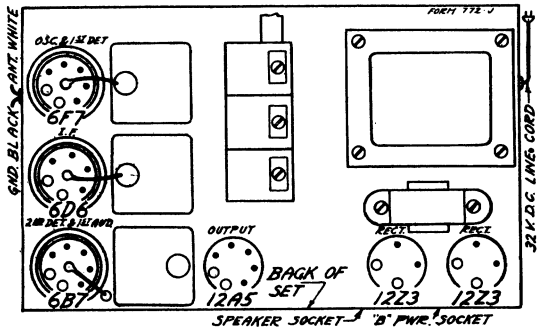


Fig. 2—Arrangement of Tubes

32 Volt Power Supply

This receiver is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The receiver may not be satisfactory on plants which do not use storage batteries.

Line Voltage Range

The receiver will operate satisfactorily within a line voltage range of 27 to 38 volts. If the line voltage runs higher, it will have to be cut down and one method of doing this is to use a series resistor.

Series Resistor

Let us say the line voltage is 40. The receiver uses 1.56 amps. at 32 volts. A resistance of 5.13 ohms, therefore, capable of dissipating 12.5 watts will be required in the receiver line to cut the voltage down to 32. If the line voltage varies a variable resistor may be required.

Starting Current

When first turned on the drain for a few seconds is slightly higher than normal until the tubes heat up. Some automatic plants are adjusted to start under a load of 200 to 300 watts. If a number of devices such as lights or motors are being used and the radio set is turned on the total drain may be sufficient to start the plant.

No Polarity

When inserting the line plug no attention need be paid to polarity.

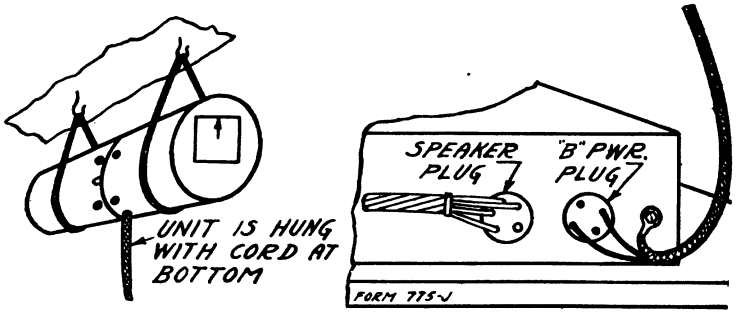


Fig. 3—Method of Installing "B" Power Unit

Servicing Power Unit

Vibrator Unit

The vibrator is mounted inside the "B" power unit. Normally the vibrator will last upward of 1000 hours. However, in the same manner as a tube it may become defective in less time and require replacement.

If the tubes light and by touching the power unit case, no vibration is felt, then the vibrator unit is probably not operating. If the pilot lamp is not lighted this will be a further indication of the same fact.

To replace the vibrator unit in the power supply remove the end of the case on which the label is placed by taking out the four screws which hold the vibrator shield can to the framework. The old vibrator may then be with-

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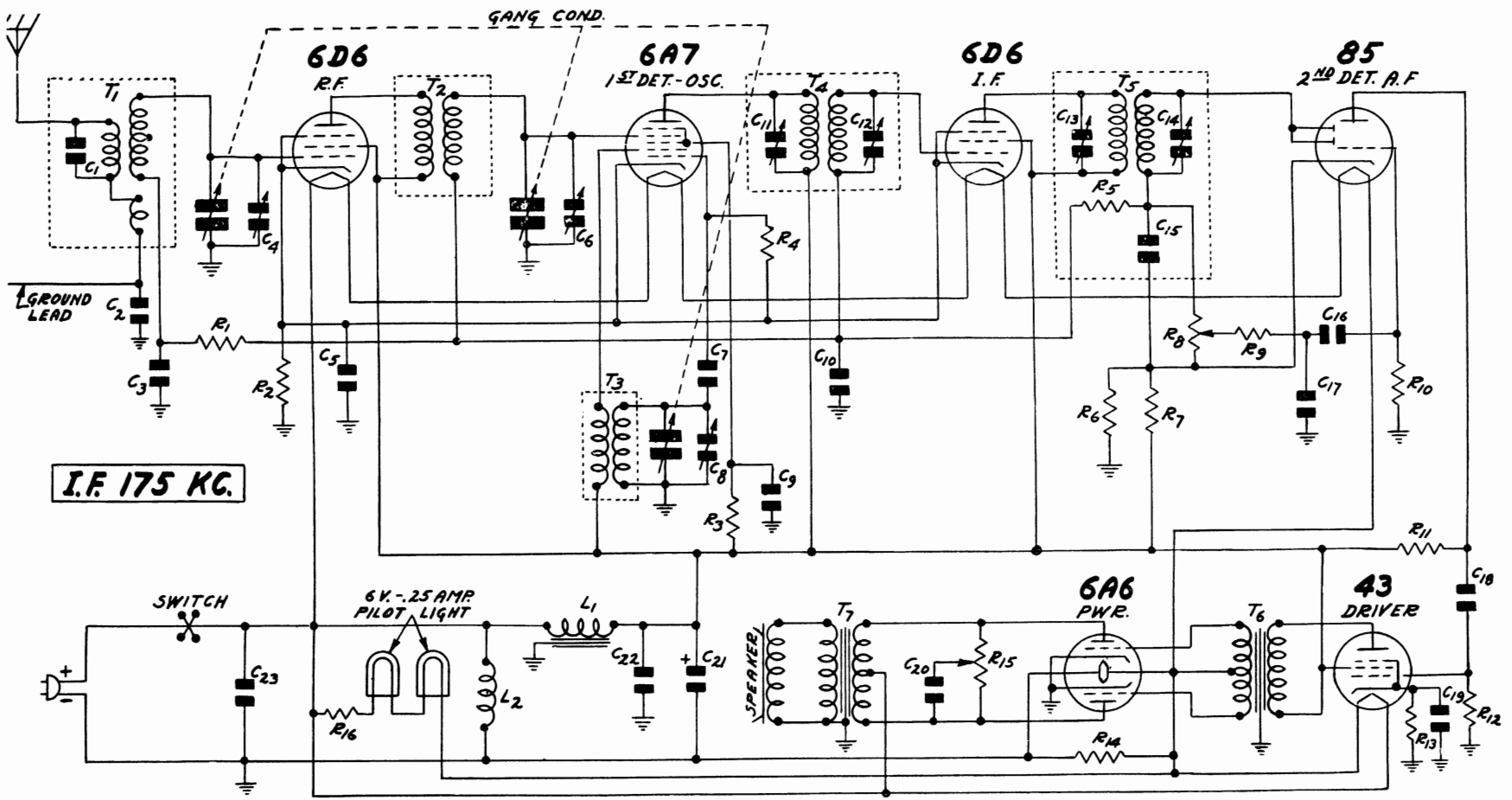
6D SERIES



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C_1	250 MMf MOULDED
C_2	.05 Mf 180V.
C_3	.05 Mf 180V.
C_4	GANG TRIMMER
C_5	.05 Mf 180 V.
C_6	GANG TRIMMER
C_7	35 MMf MOULDED
C_8	GANG TRIMMER
C_9	.05 Mf 180V.
C_{10}	.05 Mf 180V.
C_{11}	40-100 MMf } DUAL
C_{12}	40-100 MMf } P-17A39
C_{13}	40-100 MMf } DUAL
C_{14}	40-100 MMf } P-17A39
C_{15}	100 MMf MOULDED
C_{16}	.01 Mf 180V.
C_{17}	50 MMf MOULDED
C_{18}	.01 Mf 180V.
C_{19}	12. Mf 25V. DRY ELECTROLYTIC P-45X207
C_{20}	.10 Mf 180V.
C_{21}	30 Mf 50V. WET ELECTROLYTIC P-44X25
C_{22}	25 Mf 180V.
C_{23}	25 Mf 180V.

R_1	100 000 OHM .2 W
R_2	450 OHM .2 W.
R_3	30 000 OHM .2 W.
R_4	100 000 OHM .2 W.
R_5	1.0 MEGOHM .2 W.
R_6	350 OHM .2 W.
R_7	6000 OHM .2 W.
R_8	50 MEGOHM VOL. CONTROL P-36X213
R_9	50 000 OHM .2 W.
R_{10}	2.0 MEGOHM .2 W
R_{11}	80 000 OHM .2 W.
R_{12}	1.0 MEGOHM .2 W.
R_{13}	400 OHM 2 W.
R_{14}	180 OHM 1.0 W.
R_{15}	75000 OHM TONE CONTROL
R_{16}	67 OHM 4.0 W ARMORED WIRE WOUND

T_1	ANTENNA INTERSTAGE TRANS. P-9A452
T_2	INTERSTAGE R.F. TRANS P-9A453
T_3	OSC. INDUCTORS
T_4	1ST I.F. TRANS.
T_5	2ND I.F. TRANS.
T_6	INPUT TRANS.
T_7	OUTPUT TRANS.

L_1	FILTER REACTOR P-52X33
L_2	SPEAKER FIELD 100 OHM.

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6D SERIES

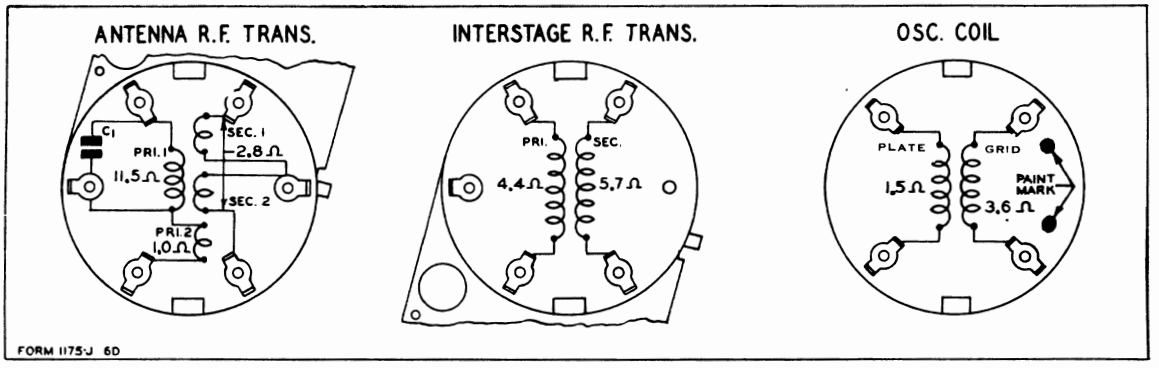

Fig. 3—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings
Refer to Fig. 3

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A452	Antenna R.F. Transformer	T1	
	Primary No. 1		11.5
	Primary No. 2		1.0
	Secondary Windings in Series		2.8
P-9A453	Interstage R.F. Transformer	T2	
	Primary Winding		4.4
	Secondary Winding		5.7
P-9A454	Oscillator Coil	T3	
	Grid Coil		3.6
	Plate Coil		1.5
P-9A455	1st I.F. Transformer	T4	
	Primary Winding		102.0
	Secondary Winding		99.
P-9A456	2nd I.F. Transformer	T5	
	Primary Winding		101.
	Secondary Winding		102.
P-50X22	Audio Input Transformer	T6	
	Primary Winding		380.
	Secondary Winding		
	Center Tap to Inside		85.
	Center Tap to Outside		95.
P-12A219	Dynamic Speaker		
	Speaker Field	L2	100.
	Speaker Voice Coil		3.1
	Audio Output Transformer (51X23)	T7	
	Primary Winding		
	Center Tap to Inside		152.
	Center Tap to Outside		176.
	Secondary Winding		1.4
P-52X33	Filter Choke	L1	50.

Eliminating Ignition and Generator Noise

After the receiver is in working order, the following procedure must be followed in practically all cases to eliminate ignition and generator noise caused by the charging plant. If the charging plant causes no noise, then of course, these steps do not have to be taken.

One spark plug suppressor must be placed on each spark plug of the engine. One spark plug for example would be required on a one-cylinder engine and four must be used on a four-cylinder engine. To connect the spark plug suppressor, remove the wire from the top of the plug, put the suppressor on and attach the wire to the other end of the suppressor.

A generator condenser must be used. This consists of two .5 mfd. sections in one unit. The two sections have one side grounded to the metal case of the condenser. Mount the condenser on the frame of charging plant. This will ground it. Then connect the two leads to the charging switch, one on each side of the line.

In some large installations, where the charging unit is on only two or three times a week, the above steps do not have to be taken, as interference is only caused when the generating plant is in operation.

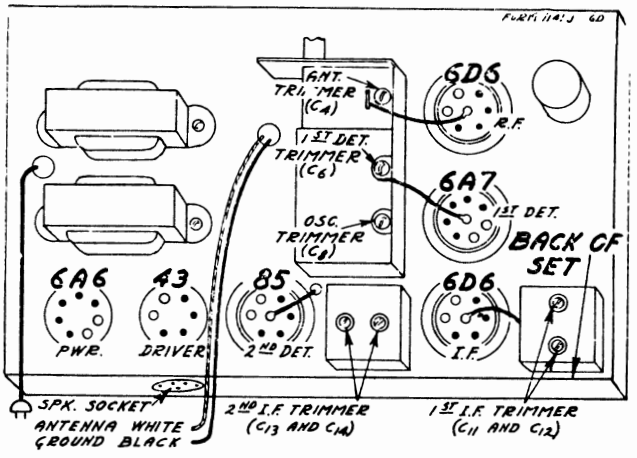

Fig. 4—Tube Arrangement

VOLTAGES AT SOCKETS
Volume Control at Maximum — Antenna Connected to Ground LEAD

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Normal Plate MA.
6D6	R.F.	6.4	31	31	2	1.5
6A7	1st Det. & Osc.	6.4	31 31(1)	18	2	.2 .650
6D6	I.F.	6.4	31	31	2	1.5
85	2nd Det.	6.4	12.5		18	.20
43	1st Audio	25.6	28	31	3.5	7.
6A6	Output	6.4	31		0	11 (per plate)

(1) Anode Grid

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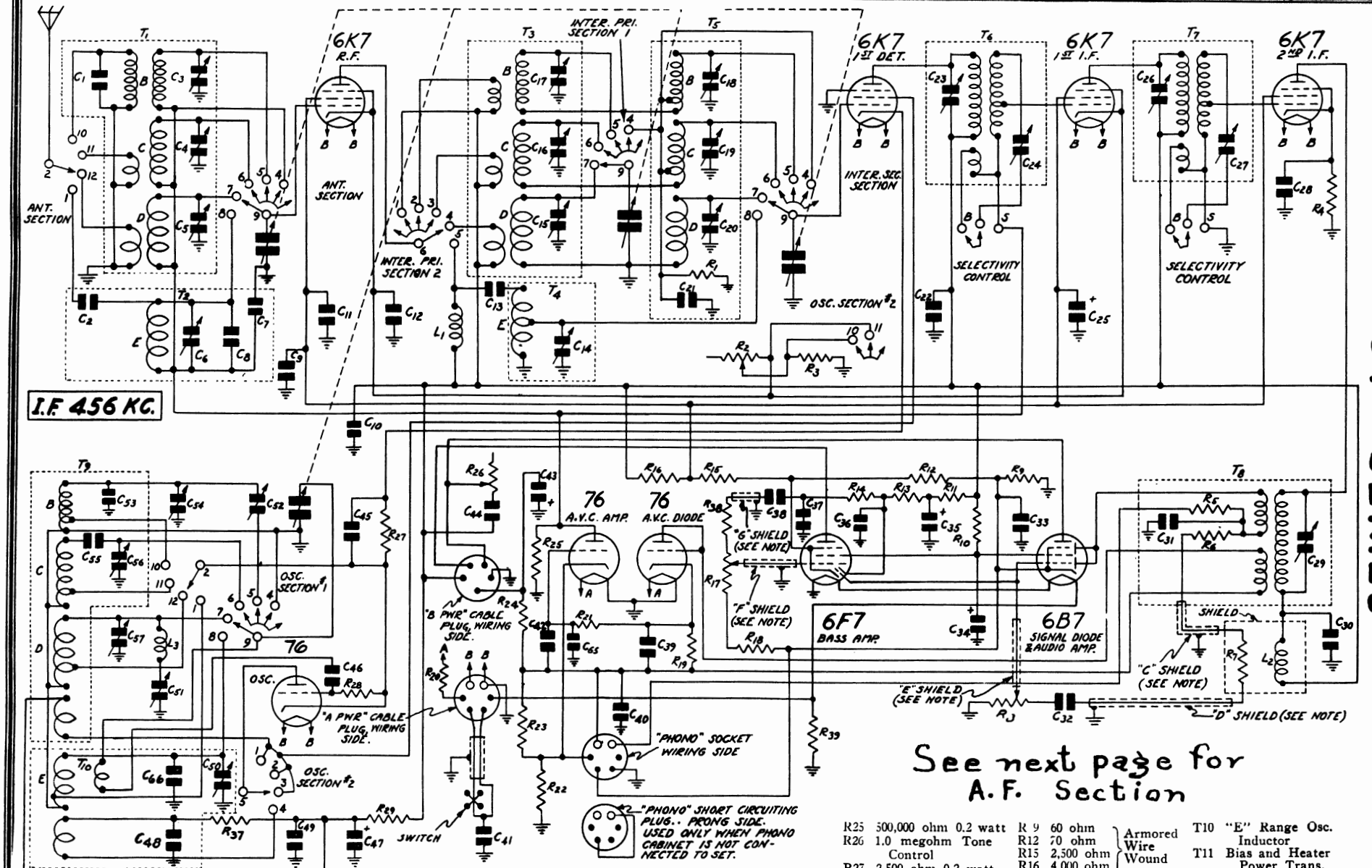
6F SERIES



See next page for A.F. Section

C 1	250 mmf.	C21	.05 mf. 180 V.	C41	.02 mf. 600 V.	C63	30. mf. 400 V. Electrolytic	R 5	100,000 ohm 0.2 watt
C 2	35 mmf.	C22	.25 mf. 480 V.	C42	.05 mf. 180 V.	C64	30. mf. 400 V. Electrolytic	R 6	100,000 ohm 0.2 watt
C 3	2-25 mmf.	C23	150-250 mmf. Dual	C44	.01 mf. 360 V.	C65	500 mmf.	R 7	100,000 ohm 0.2 watt
C 4	2-25 mmf.	C24	150-250 mmf. Dual	C45	.05 mf. 180 V.	C66	20 mmf.	R10	60,000 ohm 1.0 watt
C 5	2-25 mmf.	C25	60.0 mf. Electrolytic	C46	35 mmf.	C67	.70 mf. 280 V. (Block)	R11	10,000 ohm 0.5 watt
C 6	2-25 mmf.	C26	150-250 mmf. Dual	C48	.05 mf. 360 V.	C68	.70 mf. 280 V. (Block)	R13	60,000 ohm 0.5 watt
C 7	.05 mf. 180 V.	C27	150-250 mmf. Dual	C49	.10 mf. 360 V.			R14	40,000 ohm 0.2 watt
C 8	35 mmf.	C28	.05 mf. 180 V.	C50	2-25 mmf.			R18	150,000 ohm 0.2 watt
C 9	250 mmf.	C29	70-150 mmf.	C53	10 mmf.			R19	100,000 ohm 0.2 watt
C10	.05 mf. 480 V.	C30	.10 mf. 480 V.	C54	2-25 mmf.			R20	2.0 ohm 1.0 watt armored wire wound
C11	.25 mf. 180 V.	C31	50.0 mmf.	C55	1400 mmf.				

R25	500,000 ohm 0.2 watt	R 9	60 ohm	T10	"E" Range Osc. Inductor
R26	1.0 megohm Tone Control	R12	70 ohm	T11	Bias and Heater Power Trans.
R27	2,500 ohm 0.2 watt	R15	2,500 ohm	T12	"B" Power Trans.
R28	30.000 ohm 0.2 watt	R16	4.000 ohm	T13	P-P Input Trans.
R29	15,000 ohm 3.0 watt	R39	130 ohm 2.5 watt armored wire wound	T14	P-P Output Trans.
R30	50,000 ohm 0.2 watt			B 1	Block Cond. and 10 KC Filter
R31	2,000 ohm 0.2 watt	T 1	Ant. R.F. Trans.		
R32	2,000 ohm 0.2 watt	T 2	"E" Range Ant. R.F. Trans.	L 1	"E" Range Int. Plate Reactor
R33	200,000 ohm 0.2 watt	T 3	1st Interstage R.F. Trans.	L 2	2nd I.F. Plate Isolating Reactor
R34	200.000 ohm 0.2 watt	T 4	"E" Range Int. R.F. Trans.	L 3	Osc. Tracking Coil
R35	2,000 ohm 0.2 watt	T 5	2nd Interstage R.F. Trans.	L 4	Filter Reactor
R36	2,000 ohm 0.2 watt				
R37	150 ohm 0.2 watt				

WELLS-GARDNER & CO.

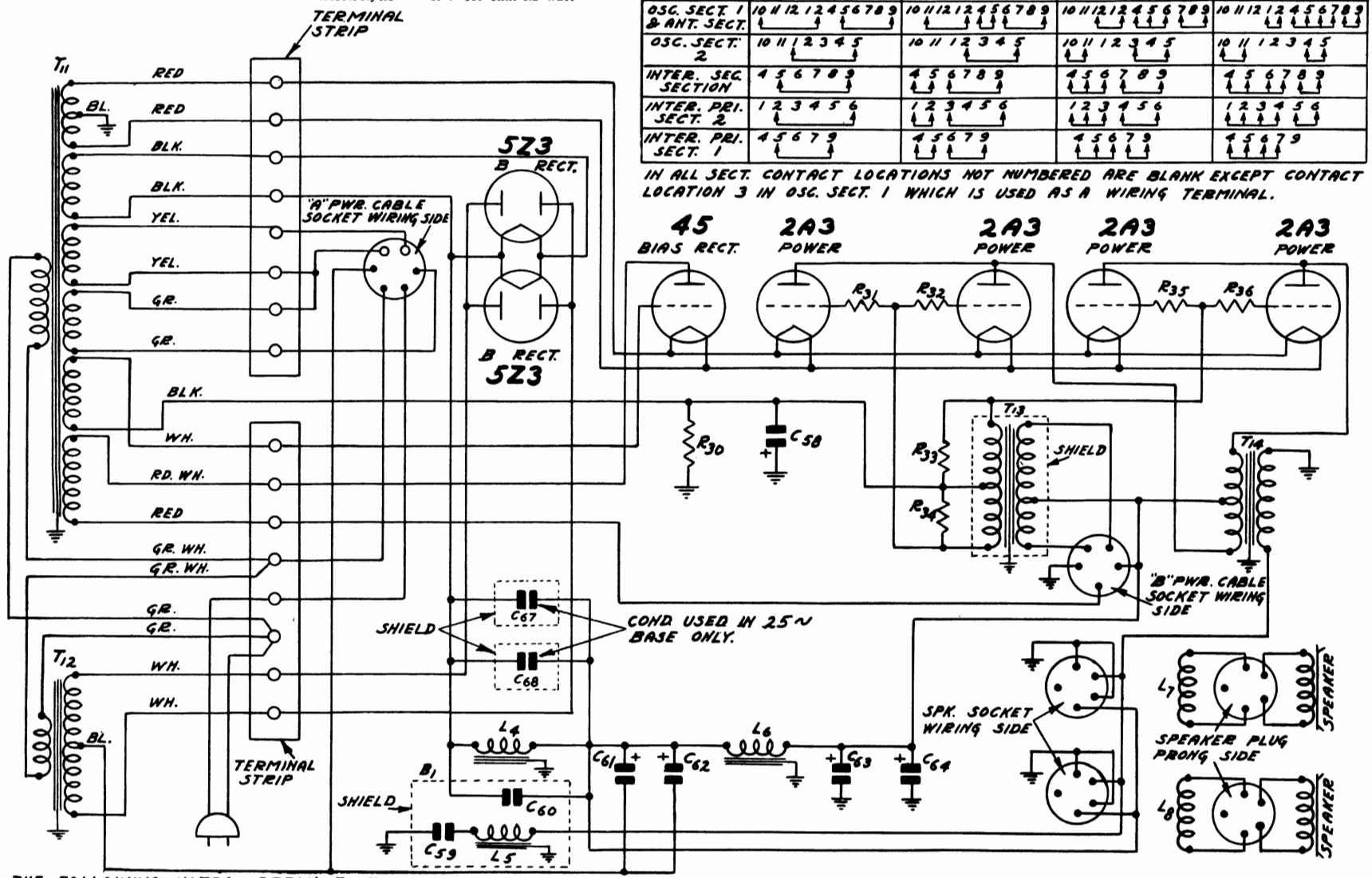
6F Series

C12	.25 mf. 180 V.	C32	.01 mf. 360 V.	C56	2-25 mmf.	C34	4.0 mf. 250 V.	Dry Electro	R21	2.0 megohm 0.2 watt	R38	500.000 ohm 0.2 watt	T 6	1st I.F. Trans.	L 5	Filter Reactor
C13	.05 mf. 480 V.	C33	.05 mf. 180 V.	C57	2-25 mmf.	C43	16.0 mf. 150 V.	lytic	R22	160,000 ohm 0.2 watt	R 2	2,500 ohm Volume	T 7	2nd I.F. Trans.	L 6	Filter Reactor
C14	2-25 mmf.	C35	12.0 mf. 300 V. Electrolytic	C58	60 mf. 150 V. Electrolytic	C47	4.0 mf. 250 V.	Block	R23	25,000 ohm 0.2 watt	R 8	2.0 megohm Control	T 8	3rd I.F. Trans.	L 7	Speaker Field 4500 ohm
C15	2-25 mmf.								R24	25,000 ohm 0.2 watt	R17	1.0 megohm	T 9	Osc. Inductors	L 8	Speaker Field 4500 ohm
C16	2-25 mmf.	C36	.10 mf. 360 V.	C59	.63 mf. 180 V.	C52	300-600 mmf.	Dual								
C17	2-25 mmf.	C37	.02 mf. 360 V.	C60	.35 mf. 280 V.	C51	40-100 mmf.									
C18	2-25 mmf.	C38	.005 mf. 360 V.	C61	30. mf. 400 V. Electrolytic				R 1	25,000 ohm 0.2 watt						
C19	2-25 mmf.	C39	100 mmf.	C62	30. mf. 400 V. Electrolytic				R 3	150 ohm 0.2 watt						
C20	2-25 mmf.	C40	.50 mf. 180 V.						R 4	500 ohm 0.2 watt						

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SW. WHEN IN POS. SHOWN.

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)	POSITION 4 SHORT WAVE (E)
OSC. SECT. 1 & ANT. SECT.	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9	10 11 12 1 2 4 5 6 7 8 9
OSC. SECT. 2	10 11 1 2 3 4 5	10 11 1 2 3 4 5	10 11 1 2 3 4 5	10 11 1 2 3 4 5
INTER. SEC. SECTION	4 5 6 7 8 9	4 5 6 7 8 9	4 5 6 7 8 9	4 5 6 7 8 9
INTER. PRI. SECT. 2	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6
INTER. PRI. SECT. 1	4 5 6 7 9	4 5 6 7 9	4 5 6 7 9	4 5 6 7 9

IN ALL SECT. CONTACT LOCATIONS NOT NUMBERED ARE BLANK EXCEPT CONTACT LOCATION 3 IN OSC. SECT. 1 WHICH IS USED AS A WIRING TERMINAL.



THE FOLLOWING NOTES APPLY TO THE RADIO FREQUENCY CHASSIS.
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON SELECTIVITY CONTROL DENOTES "BROAD" AND "SHARP" RESPECTIVELY.
THE CAPACITY OF "C" SHIELD IS 20 MMF, THE CAPACITY OF "D" "F" & "G" SHIELDS IS 70 MMF EACH. THE CAPACITY OF "E" SHIELD IS 15 MMF.

See preceeding page for R.F. section

WELLS-GARDNER & CO.

Series 6F—Replacement Parts

NOTICE—A change has been made in our parts numbering system. Old parts which are used in new receivers will have a new number assigned to them. For your convenience we are listing below the new part number and the corresponding old part number, should there be one. **Order by new part number only.**

There is a large letter stamped on the bottom side of the chassis base which identifies the set as to major part changes. When ordering parts please be sure to mention the series number and this large letter.

MISCELLANEOUS

(IN R. F. CHASSIS)

New Part No.	Old Part No.	Description	List Price
P-3A120	1944	Type 6B7 Tube Socket (7 Prong)	$ .15
P-3A121	1945	Type 6F7 Tube Socket (7 Prong)	.15
P-3A126	2022	Type 76 Tube Socket (5 Prong)	.10
P-3A211		Type 6K7 Tube Socket (7 Prong) Metal Tube	.15
P-3A213		Phono Socket (6 Prong) in R.F. Chassis	.10
P-6A206		Phono Plug and Cap Assembly	.40
P-32X56		Tube Shield (Used on 6B7, 6F7, 76 Osc. & 76 A.V.C. Amp.)	.20
P-32X57		Close Top Type Tube Shield (76 A.V.C. Diode)	.15
P-32X54		Tube Shield Bases for above Shields	.10
P-12A206		12 Inch Dynamic Speaker (55 Cycle Resonance Point)	23.30
P-12A213		12 Inch Dynamic Speaker (70 Cycle Resonance Point)	23.30
P-17X8		Glass Crystal	.20
P-28X40		Crystal Retaining Ring	.10
Specify Name of Knob and Model of Receiver		Small Push-On Type Knob	.15
		Large Set Screw Type Knob	.20
		Selectivity Control Knob; Special Set Screw Type	.45
P-2X38	10387	Felt Washers (for use with above knobs)	.10
P-8X23	10272	Rubber Chassis Mounting Cushions	.10
P-2A48		Band Selector Switch Only	3.95
P-2A49		Selectivity Control Switch	.85
P-4A50		Two Lug Terminal Strip (Mtg. hole in Center)	.10
P-4A49		Single Lug Terminal Strip (Mounting hole used)	.10
P-4A41	2139	Four Lug Terminal Strip (3 Lugs Insulated—Ground Lug extended as Mounting Foot)	.10
P-4A17	1421	Single Lug Terminal Strip (Mounting Foot to Right of Lug)	.10
P-4A46	2286	Two Lug Terminal Strip (1 Lug Insulated—Ground Lug extended as Mounting Foot)	.10
P-4A18	1441	Two Lug Terminal Strip (2 Lugs Insulated—Mounting Foot in Center)	.10
P-13X220		"A" Power Cable	1.95
P-13X221		"B" Power Cable	2.90
P-13X214		Antenna and Ground Lead Assembly	.30
P-6A205		"A" Power Cable Plug (6 Prong Pin Plate)	.10
P-6A204		"B" Power Cable Plug (5 Prong Pin Plate)	.10
P-30X14	30342	Grid Clip Only (6B7 and 6F7 Tubes)	.10
P-30X44		Grid Clip Only (6K7 Tubes)	.10

(IN A. F. CHASSIS)

P-3A63	1643	Type 45 Tube Socket (4 Prong)	.10
P-3A130	2026	Type 5Z3 Tube Socket (4 Prong)	.10
P-3A209		Type 2A3 Tube Socket (4 Prong)	.10
P-3A58	1637	5 Prong Speaker Socket	.10
P-3A208		"A" Power Cable Socket	.10
P-3A207		"B" Power Cable Socket	.10
P-4A51		10 Lug Terminal Strip	.10
P-4A17	1421	Single Lug Terminal Strip (Mounting Foot to Right of Lug)	.10
P-4A18	1441	Two Lug Terminal Strip (2 Lugs Insulated—Mounting Foot in Center)	.10
P-13X80	70786	Line Cord and Plug	.50

RESISTORS

New Part No.	Code	Resistance	Wattage	Type	List Price
P-A95253	R1	25,000 Ohms	0.2	Carbon	$ .10
P-36X212	R2, R8, R17	2,500 Ohms, 2.0 Megohms, 1.0 Megohm		3 Section Volume Control and Switch	3.15
P-A94151	R3	151 Ohms	0.2	Carbon	.15
P-A94501	R4	500 Ohms	0.2	Carbon	.15
P-A95104	R5	100,000 Ohms	0.2	Carbon	.10
P-A94104	R6	100,000 Ohms	0.2	Carbon	.15
P-A95104	R7	100,000 Ohms	0.2	Carbon	.10
P-43X46	R9	60 Ohms	0.5	Armored Wire Wound	1.30
	R12	70 Ohms	0.5		
	R15	2,500 Ohms	6.0		
	R16	4,000 Ohms	10.0		
P-C94603	R10	60,000 Ohms	1.0	Carbon	.15
P-B95103	R11	10,000 Ohms	0.5	Carbon	.10
P-B95603	R13	60,000 Ohms	0.5	Carbon	.10
P-A94403	R14	40,000 Ohms	0.2	Carbon	.15
P-A94154	R18	150,000 Ohms	0.2	Carbon	.15
P-A94104	R19	100,000 Ohms	0.2	Carbon	.15
P-43X47	R20	2.0 Ohms	1.0	Armored Wire Wound	.15
P-A95205	R21	2.0 Megohms	0.2	Carbon	.10
P-A94164	R22	160,000 Ohms	0.2	Carbon	.15
P-A94253	R23	25,000 Ohms	0.2	Carbon	.15
P-A94253	R24	25,000 Ohms	0.2	Carbon	.15
P-A95504	R25	500,000 Ohms	0.2	Carbon	.10
P-40X208	R26	1.0 Megohm		Tone Control	1.25

RESISTORS—Continued

New Part No.	Code	Resistance	Wattage	Type	List Price
P-A94252	R27	2,500 Ohms	0.2	Carbon	$ .15
P-A94303	R28	30,000 Ohms	0.2	Carbon	.15
P-E94153	R29	15,000 Ohms	3.0	Carbon	.30
*P-A95503	R30	50,000 Ohms	0.2	Carbon	.10
*P-A95202	R31	2,000 Ohms	0.2	Carbon	.10
*P-A95202	R32	2,000 Ohms	0.2	Carbon	.10
*P-A95204	R33	200,000 Ohms	0.2	Carbon	.10
*P-A95204	R34	200,000 Ohms	0.2	Carbon	.10
*P-A95202	R35	2,000 Ohms	0.2	Carbon	.10
*P-A95202	R36	2,000 Ohms	0.2	Carbon	.10
P-A95151	R37	150 Ohms	0.2	Carbon	.10
P-A95504	R38	500,000 Ohms	0.2	Carbon	.10
P-43X53	R39	130 Ohms	2.5	Armored Wire Wound	.35

*These items are part of the A.F. Chassis—All others are in the R.F. Chassis.

CONDENSERS

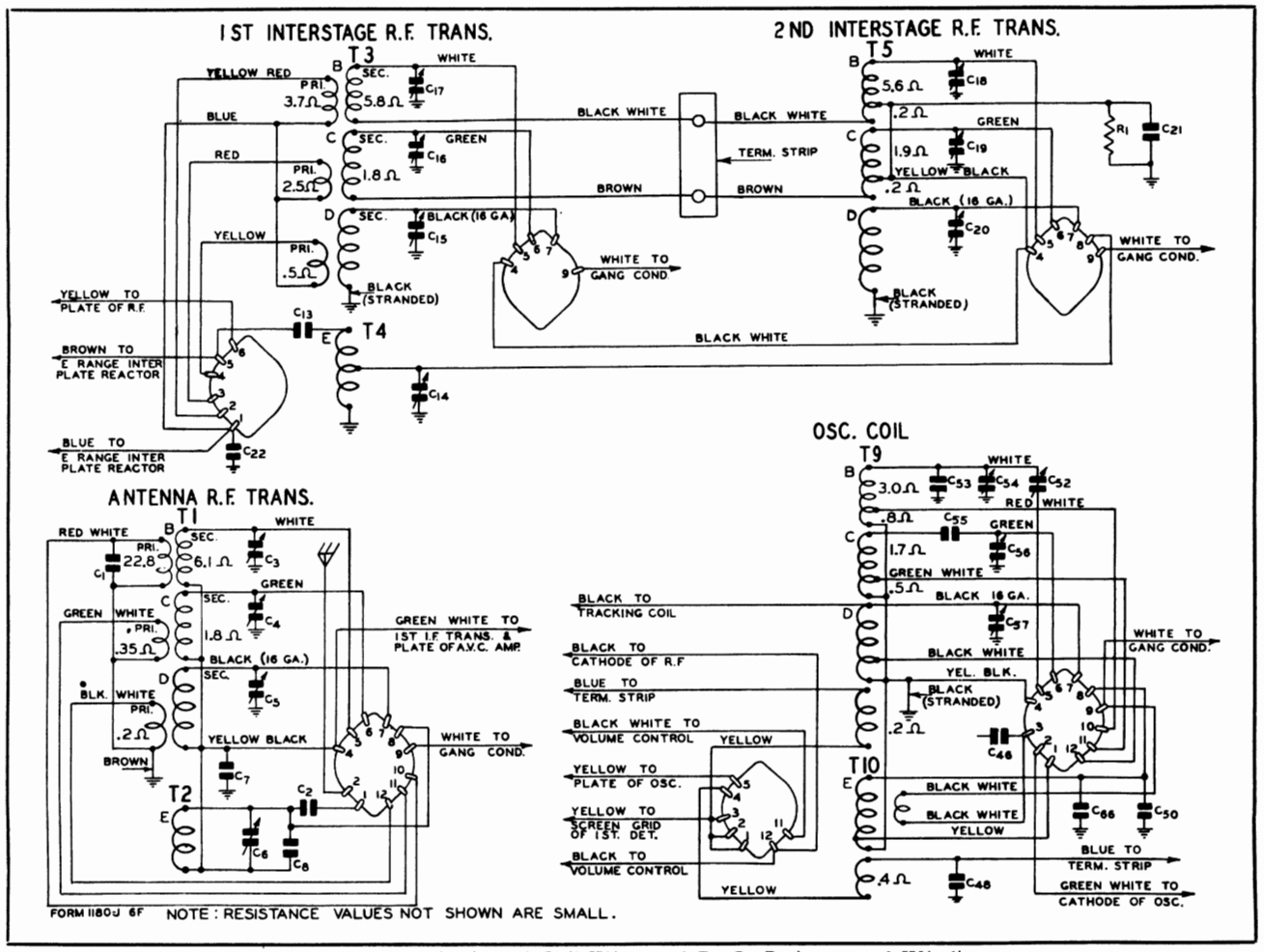
New Part No.	Code	Capacity	Voltage	Type	List Price
P-47X59	C1	250 mmf.		Moulded	$ .15
P-47X53	C2	35 mmf.		Moulded	.10
P-17A36	C3	2-25 mmf.		Range B Antenna Trimmer	.25
P-17A36	C4	2-25 mmf.		Range C Antenna Trimmer	.25
P-17A36	C5	2-25 mmf.		Range D Antenna Trimmer	.25
P-17A41	C6	2-25 mmf.		Range E Antenna Trimmer	.10
P-46X140	C7	0.05 mf.	180	Tubular	.15
P-47X53	C8	35 mmf.		Moulded	.10
P-47X52	C9	250 mmf.		Moulded	.15
P-46X158	C10	0.05 mf.	480	Tubular	.20
P-46X142	C11	0.25 mf.	180	Tubular	.25
P-46X144	C12	0.25 mf.	180	Tubular	.30
P-46X153	C13	0.05 mf.	480	Tubular	.20
P-17A41	C14	2.25 mmf.		Range E Interstage Trimmer	.10
P-17A36	C15	2-25 mmf.		Range D 1st Interstage Trimmer	.10
P-17A36	C16	2-25 mmf.		Range C 1st Interstage Trimmer	.10
P-17A36	C17	2-25 mmf.		Range B 1st Interstage Trimmer	.10
P-17A36	C18	2-25 mmf.		Range B 2nd Interstage Trimmer	.10
P-17A36	C19	2-25 mmf.		Range C 2nd Interstage Trimmer	.10
P-17A36	C20	2-25 mmf.		Range D 2nd Interstage Trimmer	.10
P-46X140	C21	0.05 mf.	180	Tubular	.15
P-46X154	C22	0.25 mf.	480	Tubular	.35
P-17A30	C23, C24	150-250 mmf., 150-250 mmf.		1st I.F. Trimmer Condensers	.45
P-44X23	C25	60.0 mf.	150	Wet Electrolytic	2.05
P-17A30	C26, C27	150-250 mmf., 150-250 mmf.		2nd I.F. Trimmer Condensers	.45
P-46X140	C28	0.05 mf.	180	Tubular	.15
P-17A40	C29	70-150 mmf.		3rd I.F. Primary Trimmer	.30
P-46X155	C30	0.10 mf.	480	Tubular	.20
P-47X56	C31	50 mmf.		Moulded	.10
P-46X138	C32	0.01 mf.	360	Tubular	.15
P-46X140	C33	0.05 mf.	180	Tubular	.15
P-45X205	C34	4.0 mf.	250	Dry Electrolytic Block	2.50
	C43	16.0 mf.	150		
	C47	4.0 mf.	250		
P-44X26	C35	12.0 mf.	300	Tubular	1.25
P-46X148	C36	0.10 mf.	360	Tubular	.20
P-46X149	C37	0.02 mf.	360	Tubular	.15
P-46X147	C38	0.005 mf.	360	Tubular	.15
P-47X57	C39	100 mmf.		Moulded	.10
P-46X156	C40	0.50 mf.	180	Tubular	.30
P-48X202	C41	0.02 mf.	600	Metal Case Block	.40
P-46X140	C42	0.05 mf.	180	Tubular	.15
P-46X138	C44	0.01 mf.	360	Tubular	.15
P-46X140	C45	0.05 mf.	180	Tubular	.15
P-47X53	C46	35 mmf.		Moulded	.10
P-46X152	C48	0.05 mf.	360	Tubular	.20
P-46X146	C49	0.10 mf.	360	Tubular	.20
P-17A41	C50	2-25 mmf.		Moulded	.10
P-17A35	C51, C52	300-600 mmf., 40-100 mmf.	600 KC Osc. Padding Cond., 6000 KC Osc. Padding Cond.		.45
P-47X63	C53	10 mmf.		Moulded	.15
P-17A41	C54	2-25 mmf.		Range B Oscillator Trimmer	.10
P-47X60	C55	1400 mmf.		Moulded	.30
P-17A36	C56	2-25 mmf.		Range C Oscillator Trimmer	.10
P-17A41	C57	2-25 mmf.		Range D Oscillator Trimmer	.10
*P-44X23	C58	60.0 mf.	150	Wet Electrolytic	2.05
*	C59	0.63 mf.	180	Part of P-48X201 Cond. Block and 10 KC Reactor Assembly	
*	C60	0.35 mf.	280		
*P-44X22	C61	30.0 mf.	400	Wet Electrolytic	1.75
*P-44X22	C62	30.0 mf.	400	Wet Electrolytic	1.75
*P-44X22	C63	30.0 mf.	400	Wet Electrolytic	1.75
*P-44X22	C64	30.0 mf.	400	Wet Electrolytic	1.75
P-47X61	C65	500 mmf.		Moulded	.15
P-47X68	C66	20 mmf.		Moulded	.15
†*P-48X203	C67	0.70 mf.	280	Metal Case Block	1.95
†*P-48X203	C68	0.70 mf.	280	Metal Case Block	1.95
P-25A40		4 Section Gang Condenser and Drive Assembly —Less Dial Assembly			7.85

*These items are part of the A.F. Chassis. All others are in R.F. Chassis.

†Used in 25 Cycle receivers only.

WELLS-GARDNER & CO.

6 F SERIES



Color Coding of Coil Wires and D. C. Resistances of Windings

Part No.	Winding	Code	D. C. Resistance in Ohms
P-53X85	"B" Power Transformer (115 Volts 60 Cycles)	T12	
	Primary Winding		1.9
	Secondary Winding		
	Center Tap to Inside		48.0
	Center Tap to Outside		53.1
P-50X25	Audio Input Transformer	T13	
	Primary Winding		
	Tap to Plate of 6F7		6600.
	Tap to Tone Control and Plate of 6B7		4650.
	Secondary Winding		
	Center Tap to Inside		2840.
	Center Tap to Outside		3260.
P-51X33	Audio Output Transformer	T14	
	Primary Winding		
	Center Tap to Inside		19.7
	Center Tap to Outside		22.4
	Secondary Winding		0.4
P-12A206	12" Dynamic Speaker		
	Speaker Voice Coil		6.3
	Speaker Field	L7	4500.
P-12A213	12" Dynamic Speaker		
	Speaker Voice Coil		6.3
	Speaker Field	L8	4500.
P-9A391	"E" Range Interstage Plate Reactor	L1	1.0
P-9A450	2nd I.F. Plate Isolating Reactor	L2	35.0
P-9A391	High Frequency Oscillator Tracking Coil	L3	1.0
P-52X35	Filter Reactor	L4	51.6
P-52X36	Filter Reactor	L6	11.2
P-48X201	Block Condenser & 10 KC Reactor Assembly	B1	
	10 KC Reactor	L5	0.6

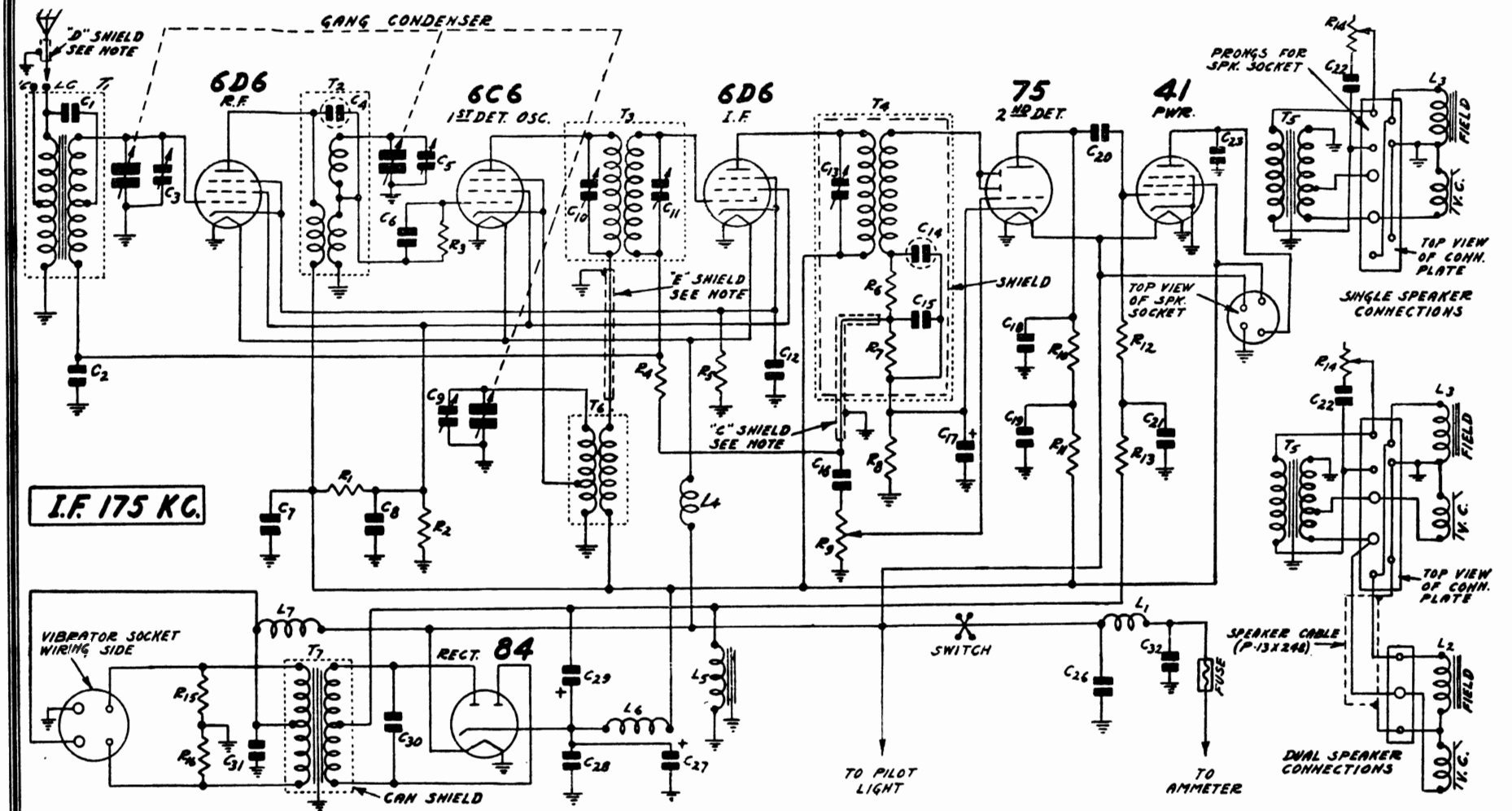
VOLTAGES AT SOCKETS

Antenna Shorted to Ground - Line Voltage 110
Volume Control Maximum

Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode M. A.
6K7	R. F.	5.8	300	110	4.1	10.5
6K7	1st Det.	5.8	300	142	10.0	3.5
76	Osc.	5.8	142			10.0
6K7	1st I. F.	5.8	300	110	4.1	10.5
6K7	2nd I. F.	5.8	300	110	3.7	10.0
6B7	Sig. Diode & Audio Amp.	5.8(1) 5.6(2)	300	115	3.6	4.5
6F7	Bass Amp.	5.8(1) 5.6(2)	275(3) 125(4)	115	7.2	9.0
76	A.V.C. Diode	4.9				
76	A.V.C. Amp.	4.9	0		-62.0	
2A3	Power	2.35	300		60(5)	60.0(6)
5Z3	'B' Rect.	4.8				375.0(7)
45	Bias Rect.	2.4				

(1) Measured with A. C. Voltmeter—early models with letter "A" under chassis.
(2) Measured with D. C. Voltmeter—later models with letter "B" under chassis.
(3) Pentode Plate
(4) Triode Plate
(5) Control Grid to ground.
(6) Each Side of push-pull Circuit—120 Ma. total for 4 tubes.
(7) Total for both tubes—Milliameter in series with 1st Choke.

WELLS-GARDNER & CO.
6N SERIES



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1 10 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } Dual
C11 70-150 mmf. }

C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.

C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C26 2000 mmf.
C28 2000 mmf.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C32 2000 mmf.
C17 4.0 mf. 25 V. } Electrolytic
C27 5.0 mf. 350 V. } Block
C29 8.0 mf. 350 V. }

R 1 17000 ohm 1.0 W.
R 2 20000 ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Vol. Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.

R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

T 1 Antenna Trans.
T 2 R.F. Inter. Trans.
T 3 1st I.F. Trans.
T 4 2nd I.F. Trans.
T 5 Output Trans.

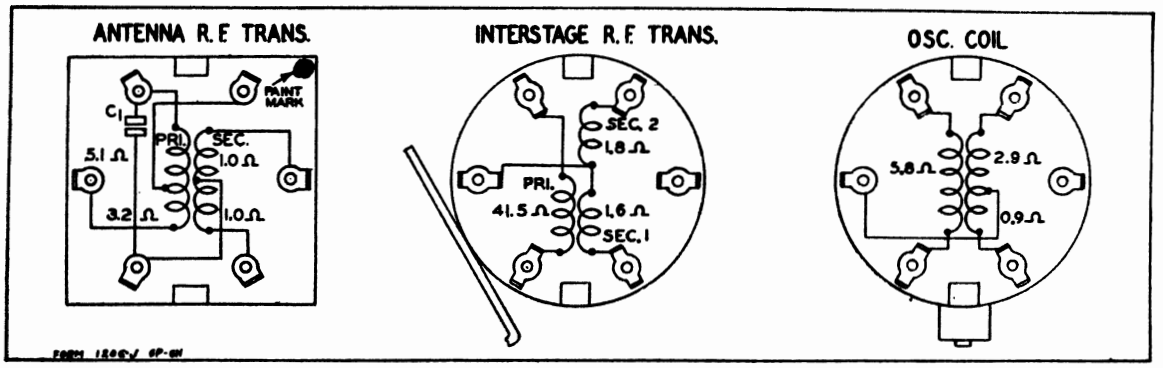
T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 2 Speaker Field 4.9 ohm
L 3 Speaker Field 5.3 ohm
L 4 Filament Reactor
L 5 Filter Reactor
L 6 "B" Reactor
L 7 Vibrator Reactor

WELLS-GARDNER & CO.

6N SERIES

General Service Data



R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	Interstage Transformer	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2
	Dynamic Speaker	
T5	Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	Motor Noise Reactor	Small
L4	Filament Reactor	.22
L5	Filter Choke	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

Voltages at Sockets

In the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

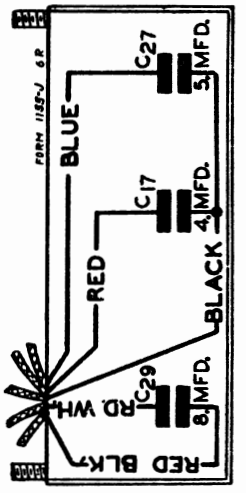
If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

VOLTAGES AT SOCKETS

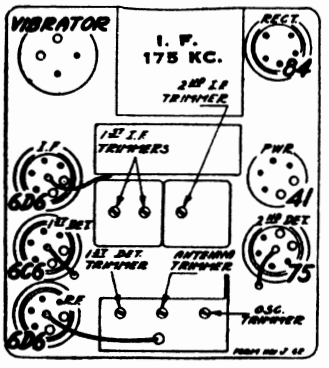
Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)		1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke



Condenser Block—Internal Wiring

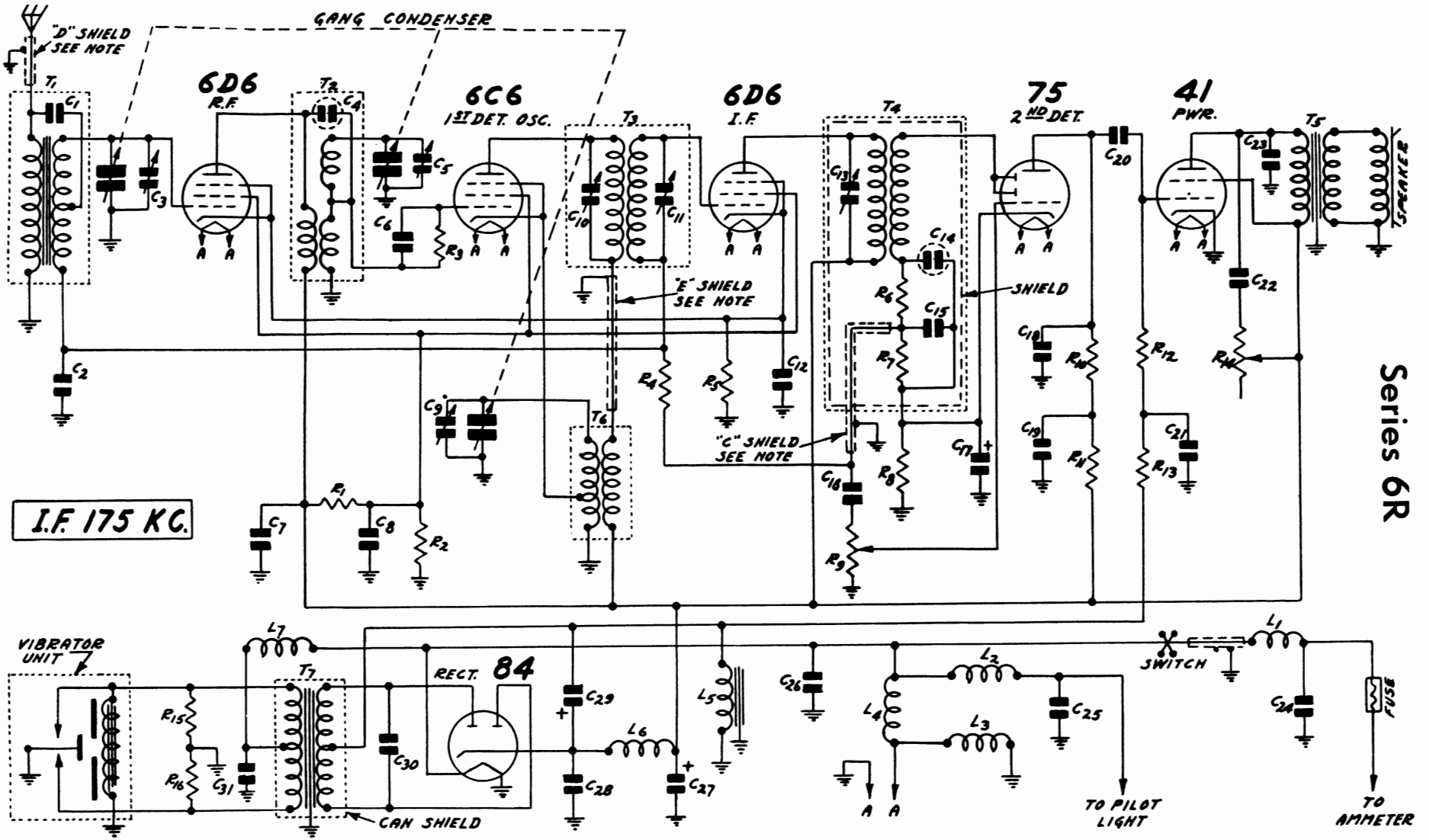


Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. **The antenna trimmer is on the center tuning condenser section—** Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

WELLS-GARDNER & CO.

Series 6R



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THE CAPACITY OF "C" SHIELD IS 37 mmf. THE CAPACITY OF "D" SHIELD IS 85 mmf AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1 21 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } One
C11 70-150 mmf. } Unit
C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.
C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C24 .50 mf. 180 V.
C25 2000 mmf.
C26 2000 mmf.
C28 .01 mf. 360 V.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C17 4.0 mf. 25 V. } Electrolytic
C27 5.0 mf. 350 V } Block
C29 8.0 mf. 350 V }

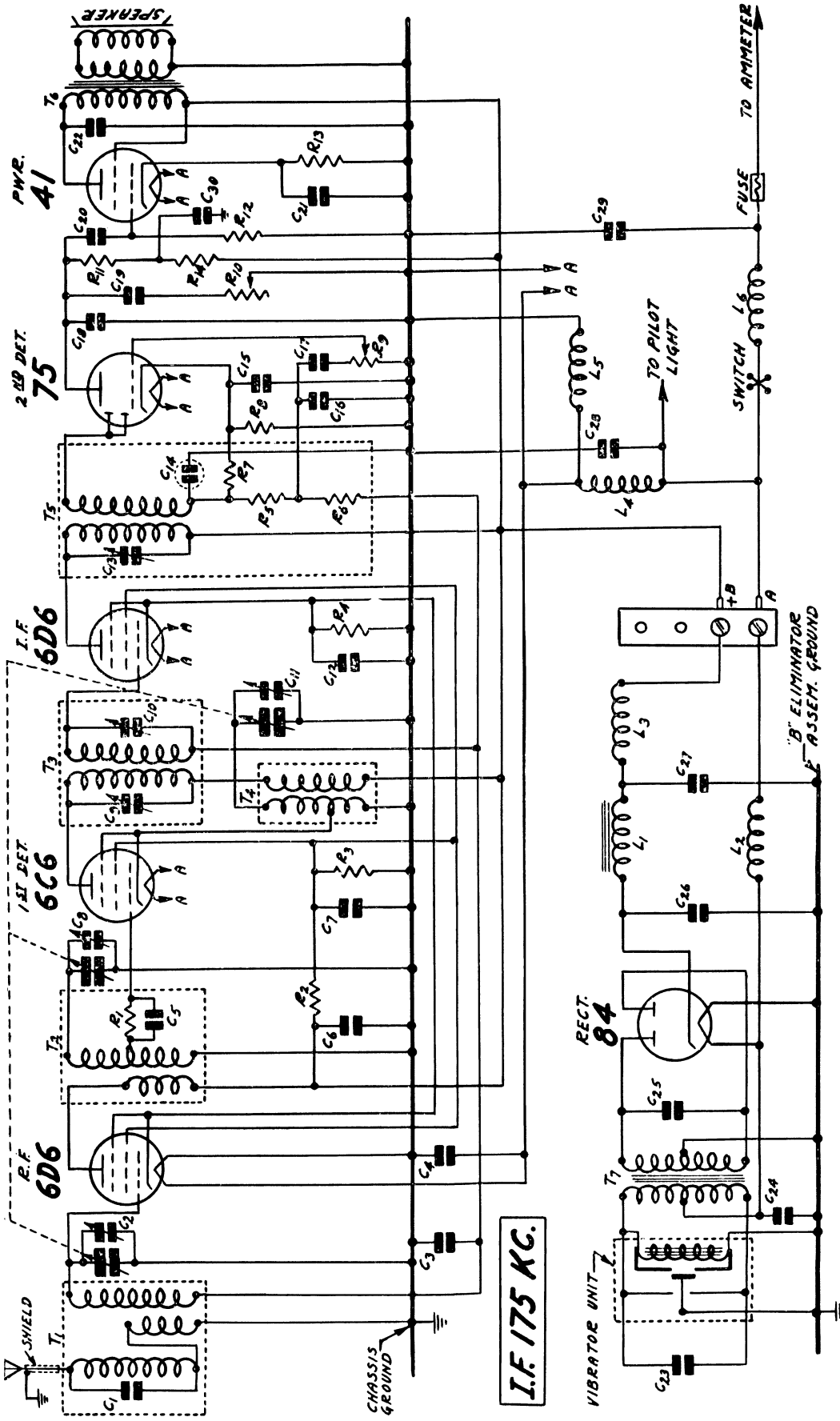
R 1 17000 ohm 1.0 W.
R 2 20000 ohm ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Volume Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.
R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

T 1 Antenna Trans.
T 2 R. F. Interstage Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 2 Pilot Light Reactor
L 3 Speaker Field 5.3
L 4 Filament Reactor
L 5 Filter Choke
L 6 "B" Reactor
L 7 Vibrator Reactor

WELLS-GARDNER & CO.

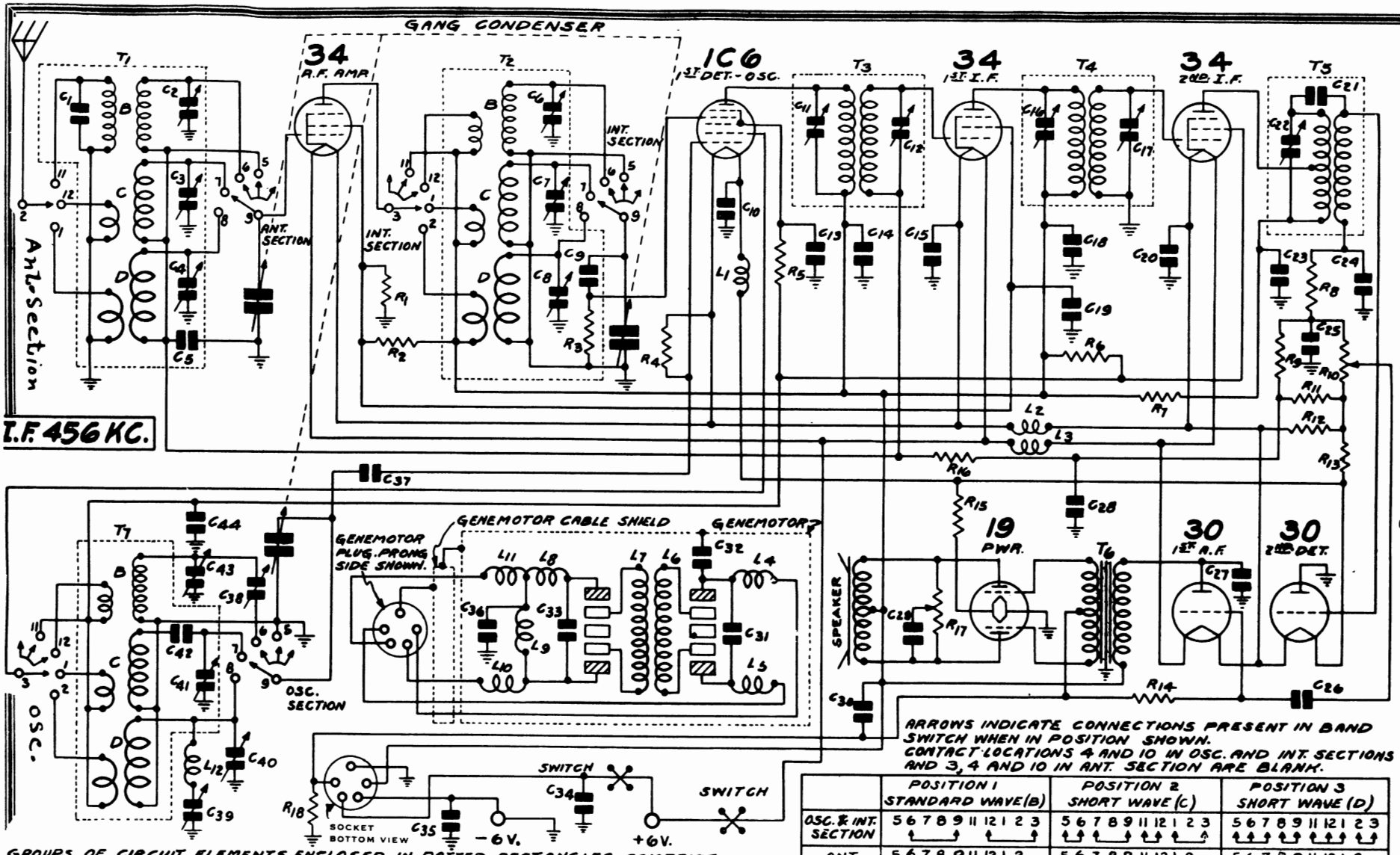
6S Series



NOTE:
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

C1	500 MMF. MOULDED	C11	GANG TRIMMER	C20	.01 MF. 400 V.	E1	1.0 MEGOHM .2 W.	R10	150000 OHM TONE CONTROL	T6	OUTPUT TRANS.
C2	GANG TRIMMER	C12	.10 MF. 180 V.	C22	.002 MF. 600 V.	E2	15000 OHM .5 W.	R11	15000 OHM .2 W.	T7	POWER TRANS.
C3	.05 MF. 180 V.	C13	70-140 MMF.	C23	.50 MF. 180 V.	E3	20000 OHM .5 W.	R12	500000 OHM .2 W.		
C4	.003 MF. MOULDED	C14	250. MMF. MOULDED	C24	1.65 MF. 180 V.	E4	450 OHM .2 W. } ONE	R14	50000 OHM .2 W.	L1	FILTER CHOKE
C5	35. MMF. MOULDED	C15	12.0 MF. 25 V. } ELECTRO-	C25	.01 MF. 1800 V.	R13	800 OHM .5 W. } ASSEMBLY			L2	FILAMENT REACTOR
C6	.10 MF. 400 V.	C21	12.0 MF. 25 V. } LYTIC	C28	.50 MF. 180 V.	R5	50000 OHM .2 W.	T1	ANTENNA TRANS.	L3	"B" REACTOR
C7	.10 MF. 180 V.	C16	.00025 MF. MOULDED	C29	.003 MF. MOULDED	R6	1.0 MEGOHM .2 W.	T2	R. F. INTERSTAGE TRANS.	L4	PILOT LIGHT CHOKE
C8	GANG TRIMMER	C17	.01 MF. 180 V.	C26	6.0 MF. 350 V. } ELECTRO-	R7	500000 OHM .2 W.	T3	1st I. F. TRANS.	L5	SPEAKER FIELD
C9	130-300 MMF. } ONE	C18	.00025 MF. MOULDED	C27	8.0 MF. 350 V. } LYTIC	R8	7500 OHM .2 W.	T4	OSCILLATOR COIL	L6	MOTOR NOISE CHOKE
C10	130-300 MMF. } ASSEMBLY	C19	.006 MF. 600 V.	C30	.25 MF. 300 V.	R9	2.0 MEGOHM VOL. CONTROL	T5	2nd I. F. TRANS.		

WELLS-GARDNER & CO.
Model 7E



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN. CONTACT LOCATIONS 4 AND 10 IN OSC. AND INT. SECTIONS AND 3, 4 AND 10 IN ANT. SECTION ARE BLANK.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. & INT. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 2-25 mmf.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 35 mmf.
C10 .25 mf. 180 V.
C11 70-150 mmf. } ONE
C12 70-150 mmf. } UNIT
C13 .05 mf. 180 V.
C14 20.0 mf. 150 V. Electrolytic
C15 .25 mf. 180 V.
C16 70-150 mmf. } ONE
C17 70-150 mmf. } UNIT
C18 .50 mf. 180 V.
C19 .85 mf. 180 V.
C20 .05 mf. 180 V.
C21 50 mmf.
C22 40-100 mmf.
C23 .05 mf. 180 V.
C24 100 mmf.
C25 50 mmf.
C26 .002 mf. 600 V.
C27 250 mmf.
C28 .01 mf. 180 V.
C29 .05 mf. 240 V.
C30 20.0 mf. 150 V. Electrolytic
C31 .25 mf. 180 V.
C32 .05 mf. 180 V.
C33 .25 mf. 180 V.
C34 .25 mf. 180 V.
C35 .25 mf. 180 V.
C36 .50 mf. 180 V.
C37 35 mmf.
C38 300-600 mmf. } ONE
C39 40-100 mmf. } UNIT
C40 2-25 mmf.
C41 2-25 mmf.
C42 1400. mmf.
C43 2-25 mmf.
C44 .25 mf. 18 V.

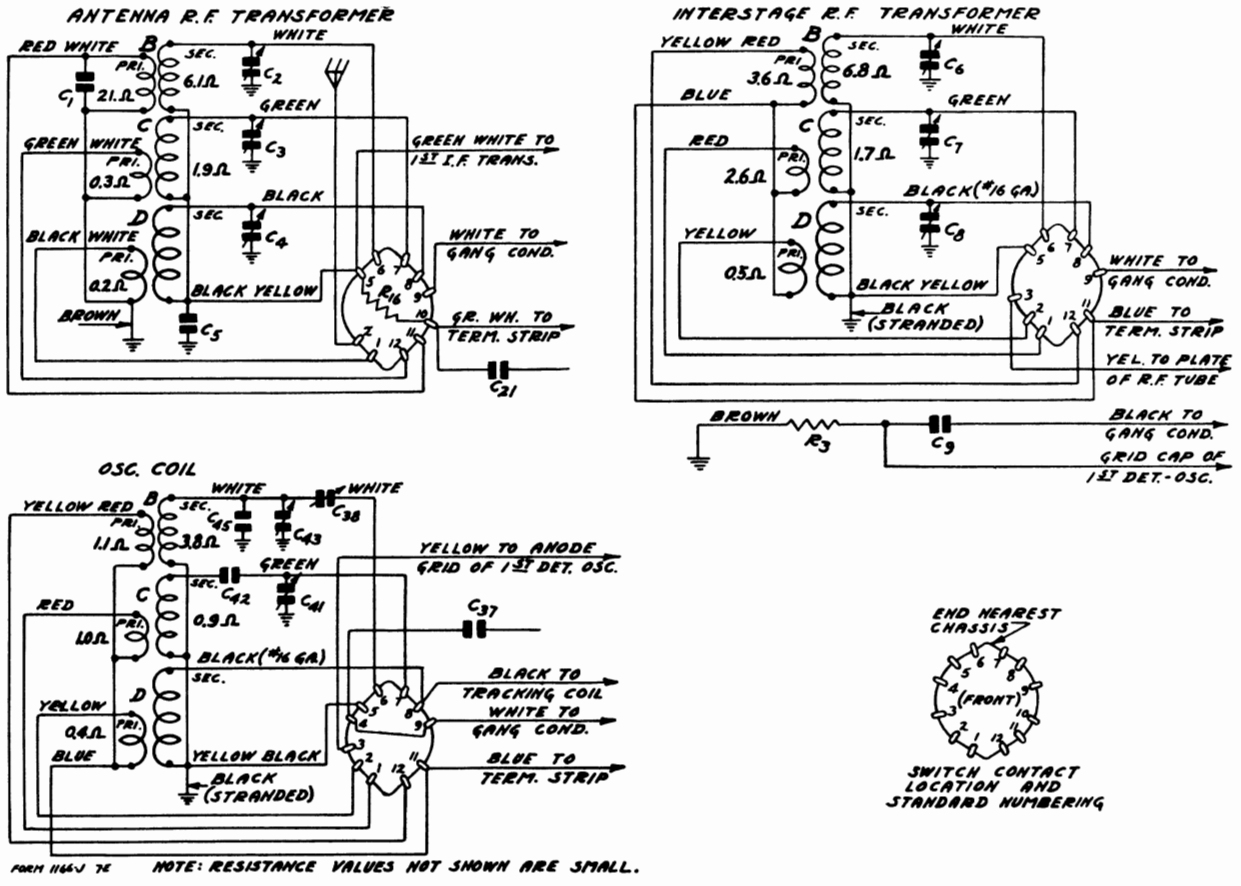
R 1 100,000 ohm .2 W.
R 2 60,000 ohm .2 W.
R 3 1 megohm .2 W.
R 4 100.000 ohm .2 W.
R 5 5,000 ohm .2 W.
R 6 10,000 ohm .5 W.
R 7 1,000 ohm .2 W.
R 8 60,000 ohm .2 W.
R 9 3 megohm .2 W.
R10 1 megohm Vol. Control
R11 1 megohm .2 W.
R14 3 megohm .2 W.
R16 500,000 ohm .2 W.
R17 150,000 ohm Tone Control
R12 12.5 ohm 1.0 W. } ARMORED
R13 12.5 ohm 1.0 W. } WIRE-WOUND
R15 .70 ohm .50 W. } RESISTOR
R18 150 ohm 2.0 W. }

T 1 Ant. R. F. Trans.
T 2 Interstage R. F. Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 3rd I. F. Trans.
T 6 Push Pull Input Trans.
T 7 Osc. Inductors

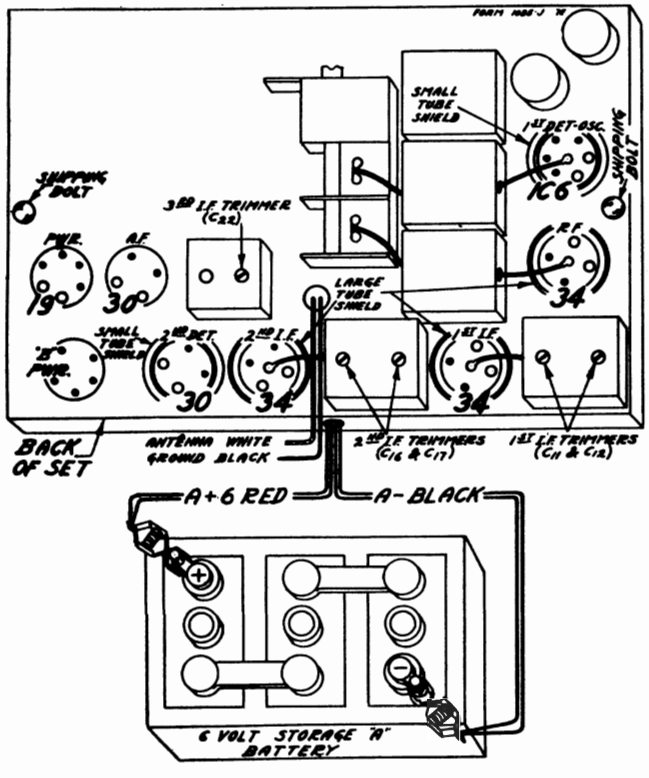
L 1 Single Filament Reactor
L 2 } Double Filament
L 3 } Reactor
L 4 "B" Choke
L 5 "B" Choke
L6, L7, L8 & L9 Genemotor Windings
L10 "A" Choke
L11 "A" Choke
L12 Osc. Tracking Coil

WELLS-GARDNER & CO.

Model 7E



-Color Coding of Coil Wires and D. C. Resistance of Windings.



Tube Arrangement and Battery Connections

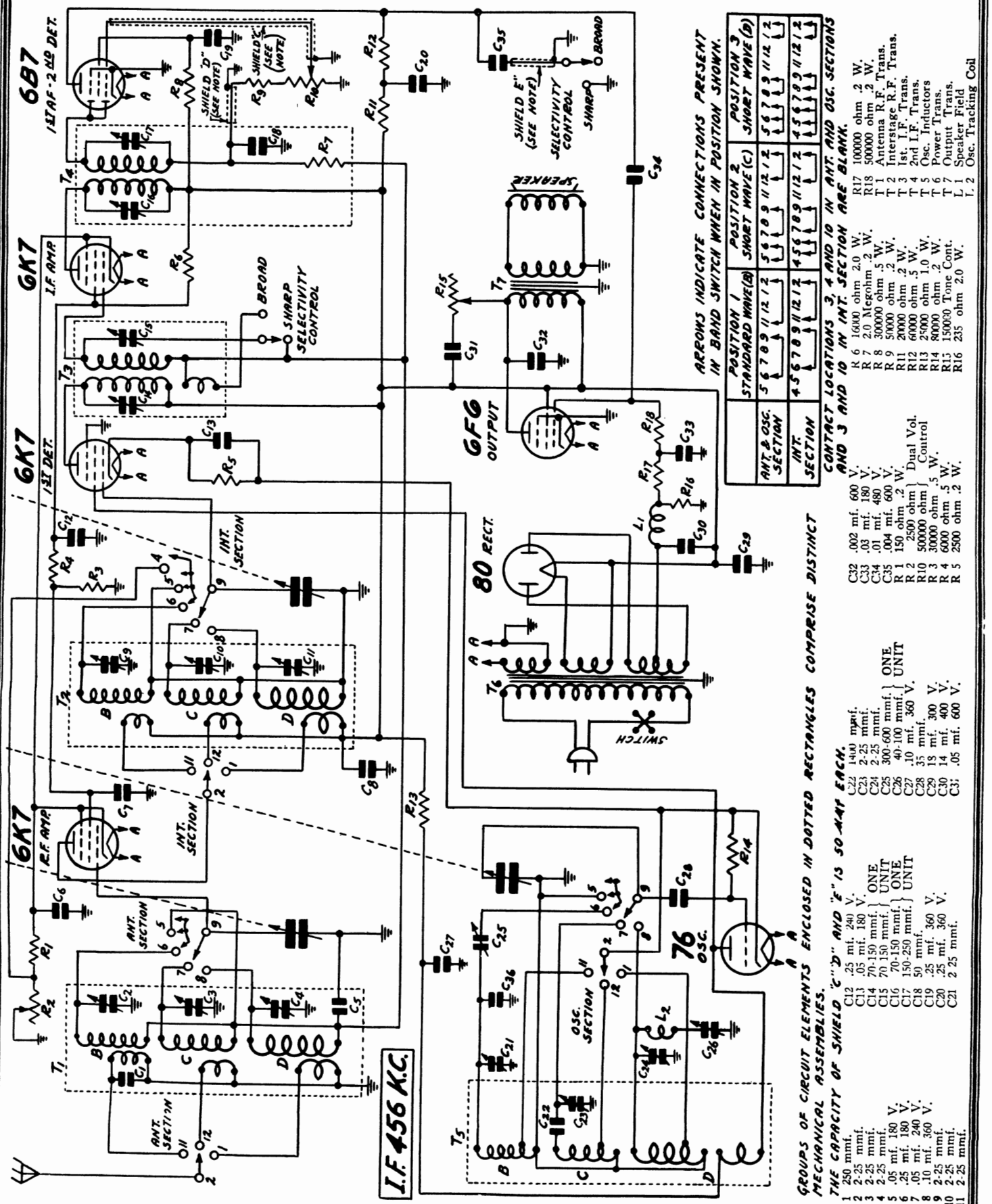
VOLTAGES AT SOCKETS
Antenna Shorted to Ground—Battery 6 Volts under load
Volume Control at Maximum

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage (see Notes)	Normal Plate M. A.
34	R. F.	2.0	135	45	1.5(1)	1.7
1C6	1st Det.	2.0	135 80(2)	70	2.0(3)	3.2 1.7(2)
34	1st I. F.	2.0	135	45	1.5(1)	1.7
34	2nd I. F.	2.0	135	80	4.0(3)	3.2
30	2nd Det.	2.0				
30	1st A. F.	2.0	135		8.0(4)	2.3
19	Power	2.0	135		3.9(5)	2.3 (per plate)

(1) As read from negative filament leg to low potential end of resistor R12.
(2) Anode Grid
(3) As read from negative filament leg to ground.
(4) Total voltage drop from negative filament leg to ground and across R18.
(5) As read across R18.

WELLS-GARDNER & CO.

Series 7GM



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
ANT. & OSC. SECTION	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2
INT. SECTION	4 5 6 7 8 9 10 11 12 1 2	4 5 6 7 8 9 10 11 12 1 2	4 5 6 7 8 9 10 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN ANT. AND OSC. SECTIONS AND 3 AND 10 IN INT. SECTION ARE BLANK.

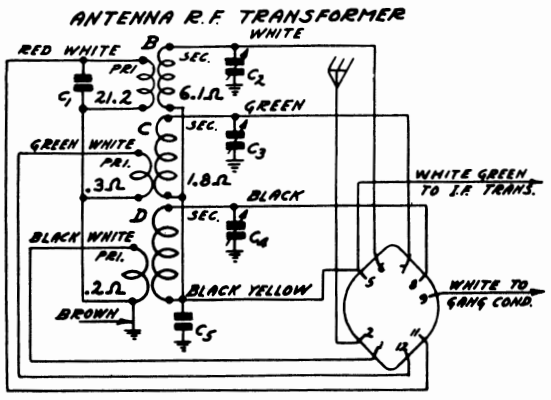
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

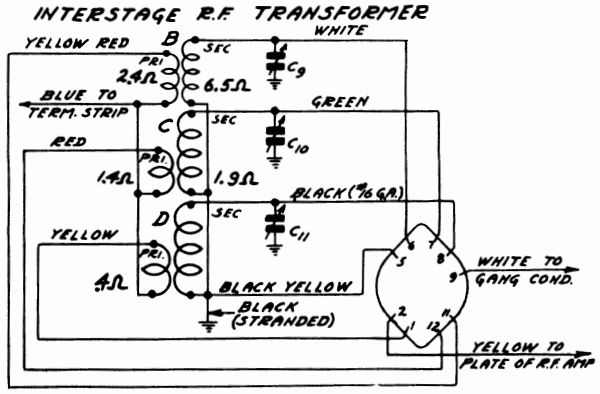
THE CAPACITY OF SHIELD "C" "D" AND "E" IS 50 MMF EACH.

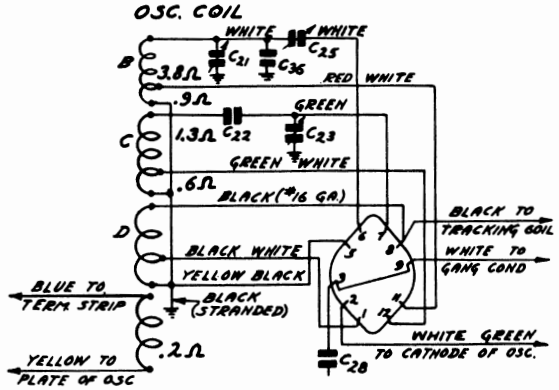
C1	250 mmf.	C12	.25 mf. 240 V.	C22	1400 mmf.	R 6	16000 ohm 2.0 W.
C2	2-25 mmf.	C13	.05 mf. 180 V.	C23	2-25 mmf.	R 7	2.0 Megohm .2 W.
C3	2-25 mmf.	C14	70-150 mmf. } ONE	C24	2-25 mmf.	R 8	300000 ohm .5 W.
C4	2-25 mmf.	C15	70-150 mmf. } UNIT	C25	300-600 mmf. } ONE	R 9	50000 ohm .2 W.
C5	.05 mf. 180 V.	C16	70-150 mmf. } ONE	C26	40-100 mmf. } UNIT	R11	20000 ohm .2 W.
C6	.25 mf. 180 V.	C17	150-250 mmf. } UNIT	C27	.10 mf. 360 V.	R12	60000 ohm .5 W.
C7	.05 mf. 240 V.	C18	50 mmf.	C28	35 mmf.	R13	25000 ohm 1.0 W.
C8	.10 mf. 360 V.	C19	.25 mf. 360 V.	C29	18 mf. 300 V.	R14	80000 ohm .2 W.
C9	2-25 mmf.	C20	.25 mf. 360 V.	C30	14 mf. 400 V.	R15	150000 Tone Cont.
C10	2-25 mmf.	C21	2 25 mmf.	C31	.05 mf. 600 V.	R16	235 ohm 2.0 W.
C11	2-25 mmf.			C32	.002 mf. 600 V.	R17	100000 ohm .2 W.
				C33	.03 mf. 180 V.	R18	500000 ohm .2 W.
				C34	.01 mf. 480 V.	T 1	Antenna R.F. Trans.
				C35	.004 mf. 600 V.	T 2	Interstage R.F. Trans.
				R 1	150 ohm .2 W. } Dual Vol.	T 3	1st. I.F. Trans.
				R 2	2500 ohm } Control	T 4	2nd I.F. Trans.
				R10	500000 ohm }	T 5	Osc. Inductors
				R 3	30000 ohm .5 W.	T 6	Power Trans.
				R 4	6000 ohm .5 W.	T 7	Output Trans.
				R 5	2500 ohm .2 W.	L 1	Speaker Field
						L 2	Osc. Tracking Coil

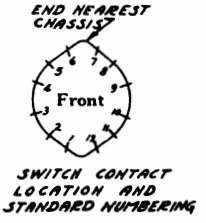
WELLS-GARDNER & CO.

Series 7GM

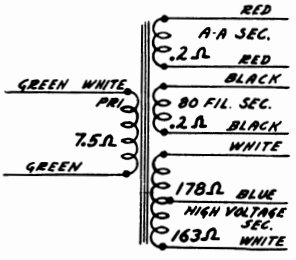






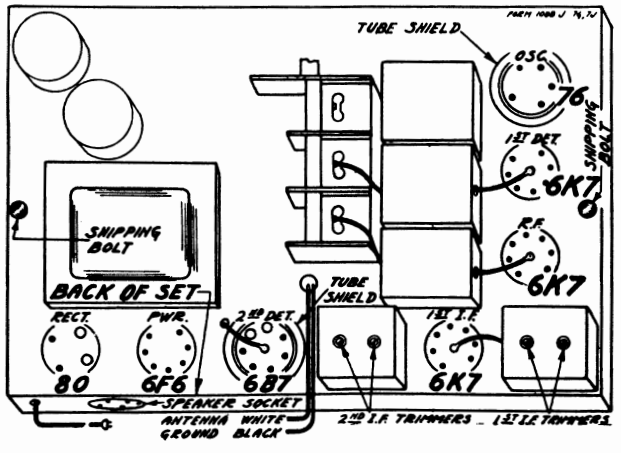


SWITCH CONTACT LOCATION AND STANDARD NUMBERING



POWER TRANSFORMER

FORM 1120-J 7G NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL



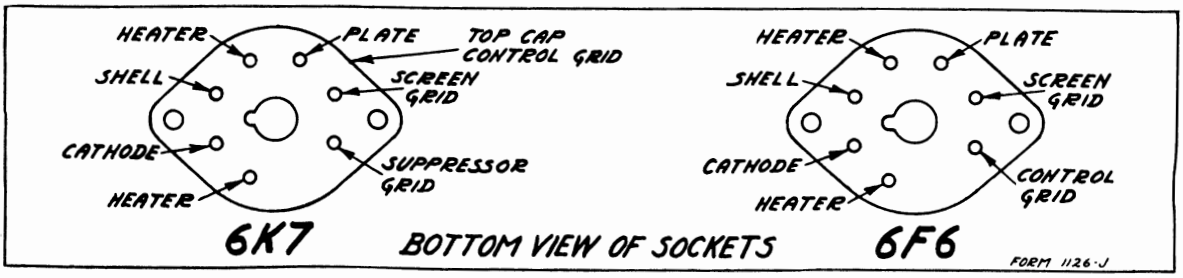
Location of Tubes

VOLTAGES AT SOCKETS

Line Voltage, 115 - Volume Control at Maximum Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6K7 (6D6)	R. F.	6.1	230	95	3.0	6.4
6K7 (6D6)	1st Det.	6.1	230	100	9.0	3.2
76	Osc.	6.1	100			5.2
6K7 (6D6)	I. F.	6.1	230	120	3.0	9.
6B7	2nd Det.	6.1	55(1)	40		2.3
6F6 (42)	Power	6.1	215	230	17(2)	30.0
80	Rectifier	4.7				34. per plate

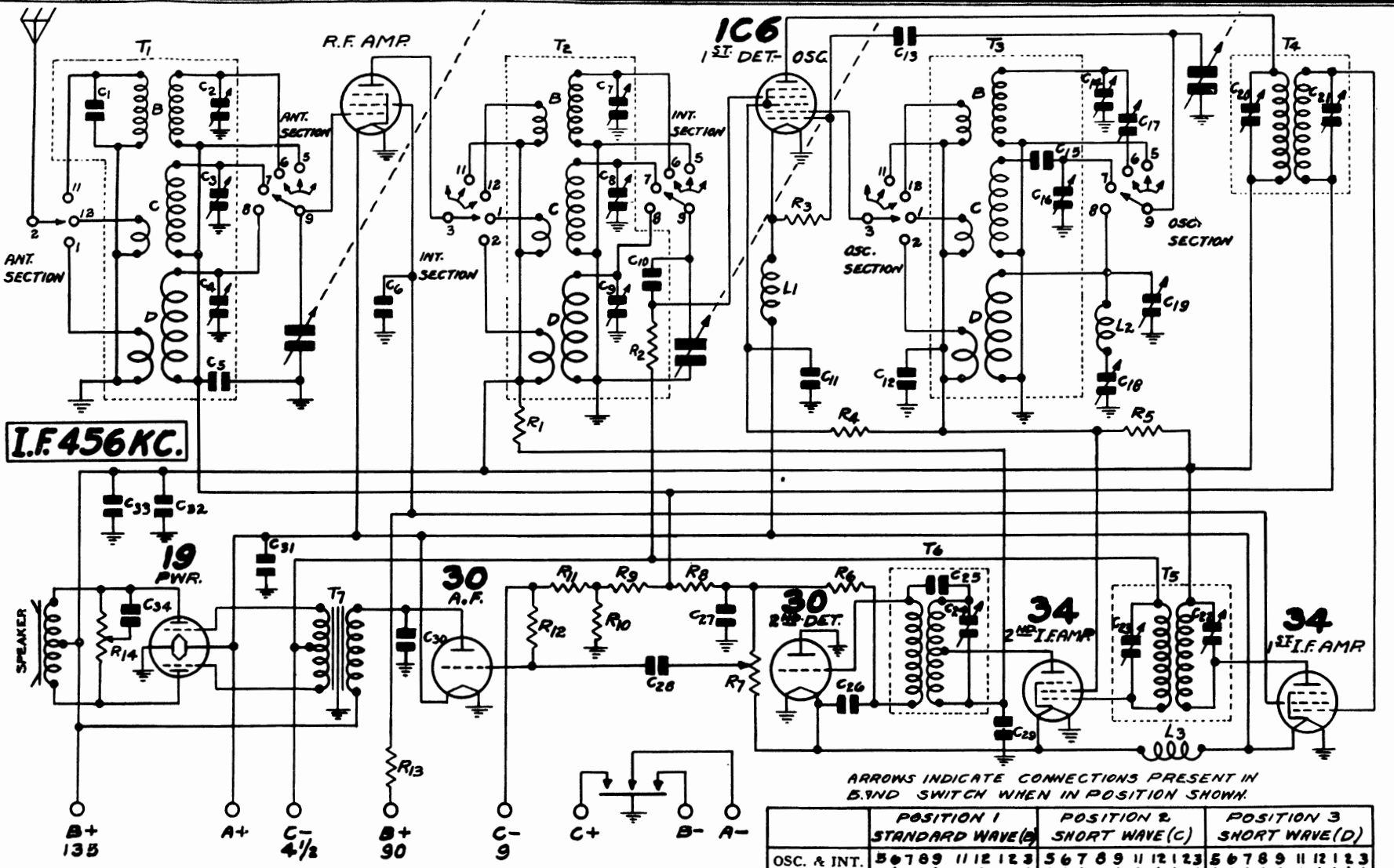
(1) As read with 500,000 ohm meter.
(2) As read across R16



Metal Tubes—Bottom View of Sockets

WELLS-GARDNER & CO.

Series 7H



ARROWS INDICATE CONNECTIONS PRESENT IN B.9ND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE(C)	POSITION 3 SHORT WAVE(D)
OSC. & INT. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

Contact Locations 4 and 10 in Osc. & Int. Sections and 3, 4 and 10 in Ant. Section are Blank.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 .25 mf. 180 V.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 2-25 mmf.
C10 35 mmf.
C11 .05 mf. 180 V.
C12 .25 mf. 180 V.
C13 35 mmf.
C14 2-25 mmf.
C15 1400 mmf.
C16 2-25 mmf.
C17 300-600 mmf. } ONE
C18 40-100 mmf. } ASSEMBLY
C19 2-25 mmf.
C20 70-150 mmf. } ONE
C21 70-150 mmf. } ASSEMBLY
C22 70-150 mmf. } ONE
C23 70-150 mmf. } ASSEMBLY
C24 40-100 mmf.
C25 50 mmf.
C26 100 mmf.
C27 50 mmf.
C28 .002 mf. 600 V.
C29 .05 mf. 180 V.
C30 250 mmf.
C31 .50 mf. 180 V.
C32 .25 mf. 180 V.
C33 20.0 mf. 150 V. Electrolytic
C34 .05 mf. 240 V.

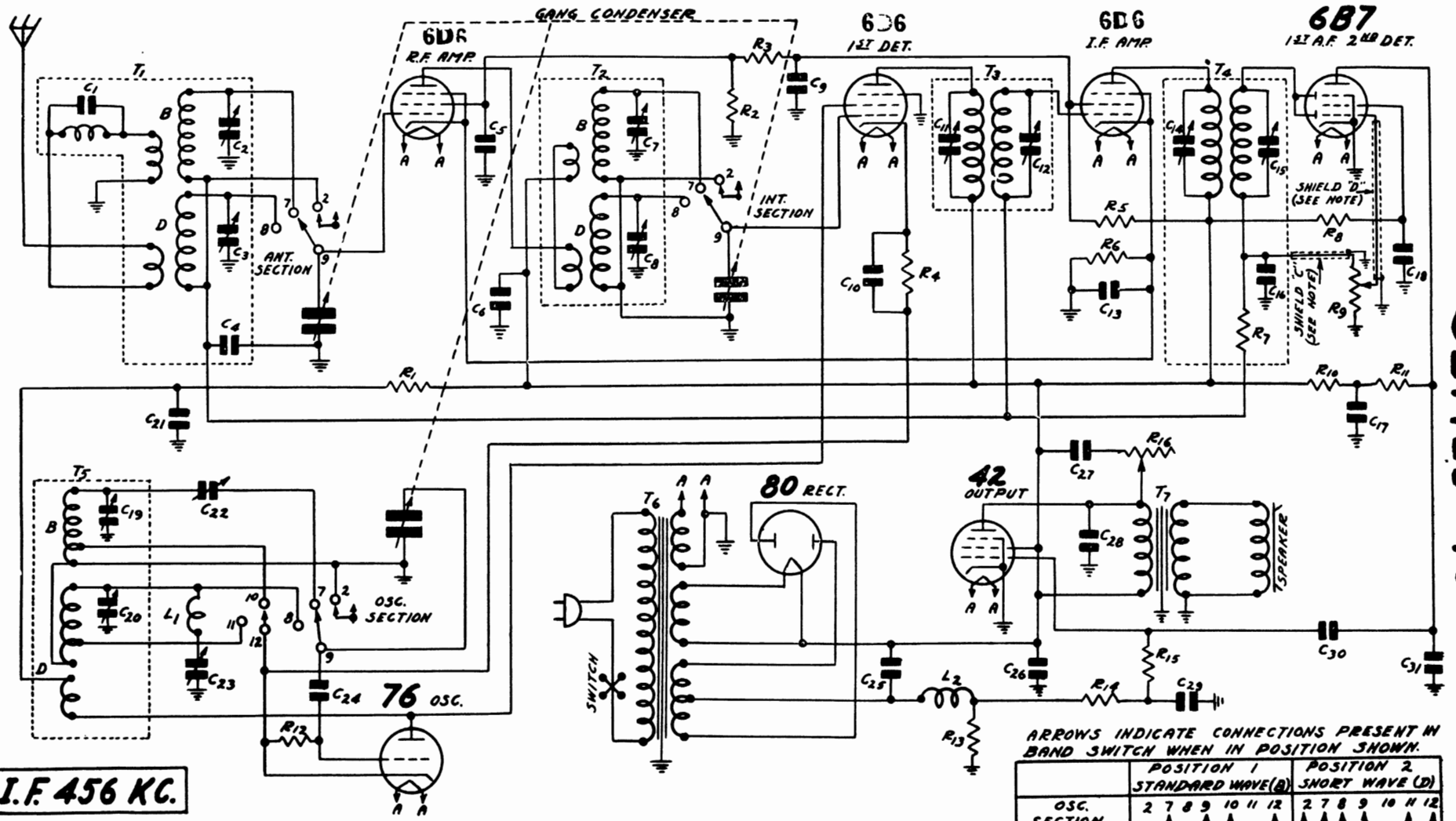
R 1 1,000 Ohm .2 W.
R 2 1.0 Megohm .2 W.
R 3 100,000 Ohm .2 W.
R 4 5.000 Ohm .2 W.
R 5 10.000 Ohm .5 W.
R 6 60,000 Ohm .2 W.
R 7 1.0 Megohm Vol. Cont.
R 8 3.0 Megohm .2 W.
R 9 1.0 Megohm .2 W.
R10 2.000 Ohm .2 W.
R11 7,000 Ohm .2 W.
R12 3.0 Megohm .2 W.
R13 30.000 Ohm .2 W.
R14 150,000 Ohm Tone Control

T 1 Antenna R.F. Trans.
T 2 Interstage R.F. Trans.
T 3 Osc. Inductors
T 4 1st. I.F. Trans.
T 5 2nd. I.F. Trans.
T 6 3rd. I.F. Trans.
T 7 Push-Pull Input Trans.

L 1 Single Filament Reactor
L 2 Osc. Tracking Coil
L 3 Single Filament Reactor

WELLS-GARDNER & CO.

Series 7J



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (D)
OSC. SECTION	2 7 8 9 10 11 12	2 7 8 9 10 11 12
ANT. & INT. SECTION	2 7 8 9	2 7 8 9

CONTACT LOCATIONS NOT NUMBERED ARE BLANK.

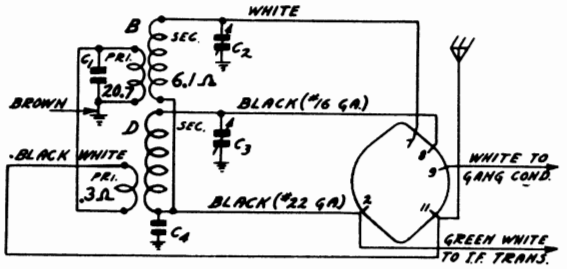
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
THE CAPACITY OF SHIELD "C" AND "D" IS 50 MMF EACH.

C 1 250 mmf. Moulded
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 .05 mf. 180 V.
C 5 .05 mf. 240 V.
C 6 .10 mf. 360 V.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 .25 mf. 240 V.
C10 .05 mf. 180 V.
C11 70-150 mmf. } One
C12 70-150 mmf. } Assembly
C13 .25 mf. 180 V.
C14 70-150 mmf. } One
C15 150-250 mmf. } Assembly
C16 50 mmf. Moulded
C17 .25 mf. 360 V.
C18 .25 mf. 360 V.
C19 2-25 mmf.
C20 2-25 mmf.
C21 .10 mf. 360 V.
C22 300-600 mmf. } One
C23 40-100 mmf. } Assembly
C24 35 mmf. Moulded
C25 14 mf. 400 V. Electrolytic
C26 18 mf. 300 V. Electrolytic
C27 .05 mf. 600 V.
C28 .002 mf. 600 V.
C29 .03 mf. 180 V.
C30 .01 mf. 480 V.
C31 .002 mf. 600 V.
R 1 25000 ohm 1.0 W.
R 2 30000 ohm .5 W.
R 3 6000 ohm .5 W.
R 4 2500 ohm .2 W.
R 5 16000 ohm 2.0 W.
R 6 150 ohm .2 W.
R 7 2.0 Megohm .2 W.
R 8 300000 ohm .5 W.
R 9 500000 ohm Volume Control
R10 20000 ohm .2 W.
R11 60000 ohm .5 W.
R12 80000 ohm .2 W.
R13 235 ohm Armored Wire Wound
R14 100000 ohm .2 W.
R15 500000 ohm .2 W.
R16 150000 ohm Tone Control
T 1 Antenna R. F. Trans.
T 2 Interstage R. F. Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 Osc. Inductors
T 6 Power Trans.
T 7 Output Trans.
L 1 Osc. Tracking Coil
L 2 Speaker Field (1050 ohms)

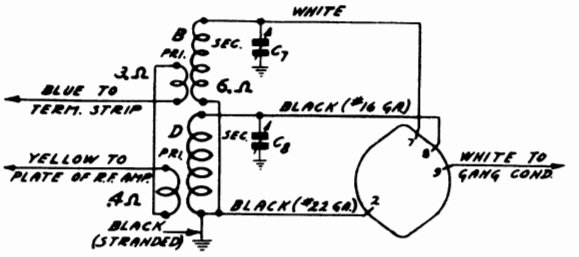
WELLS-GARDNER & CO.

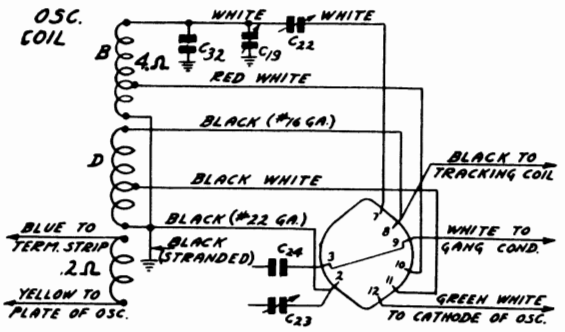
Series 7J

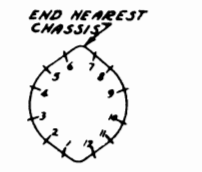
ANTENNA TRANSFORMER

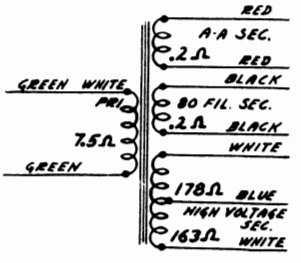


INTERSTAGE R.F. TRANSFORMER









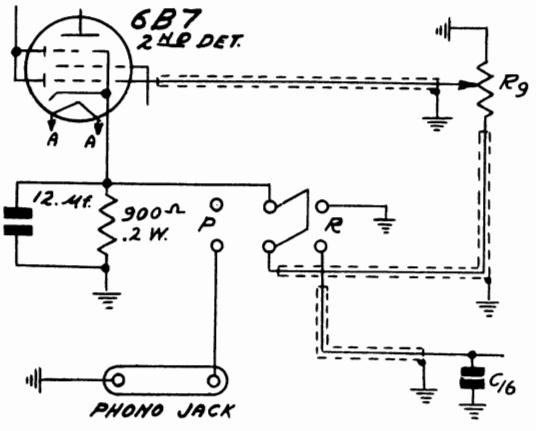
POWER TRANSFORMER

NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

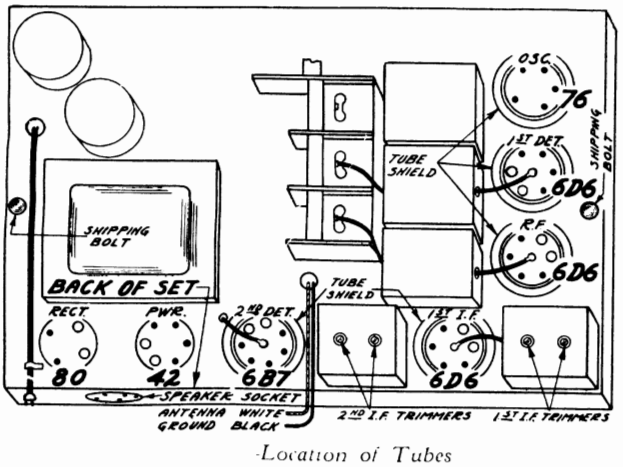
VOLTAGES AT SOCKETS
Line Voltage - 112
Antenna Shorted to Ground

Type of Tube	Function	Heater Volts	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6D6	R. F.	6.1	240	95	3	7.
6D6	1st Det.	6.1	240	100	9	3.5
76	Osc.	6.1	100			5.
6D6	I. F.	6.1	240	120	3	7.5
6B7	2nd Det.	6.1	55	40	0	2.3
42	Power	6.1	225	240	17 (1)	38.0
80	Rectifier	4.6				32.0 per plate

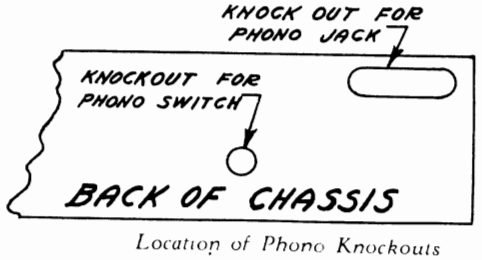
(1) As read across R13.



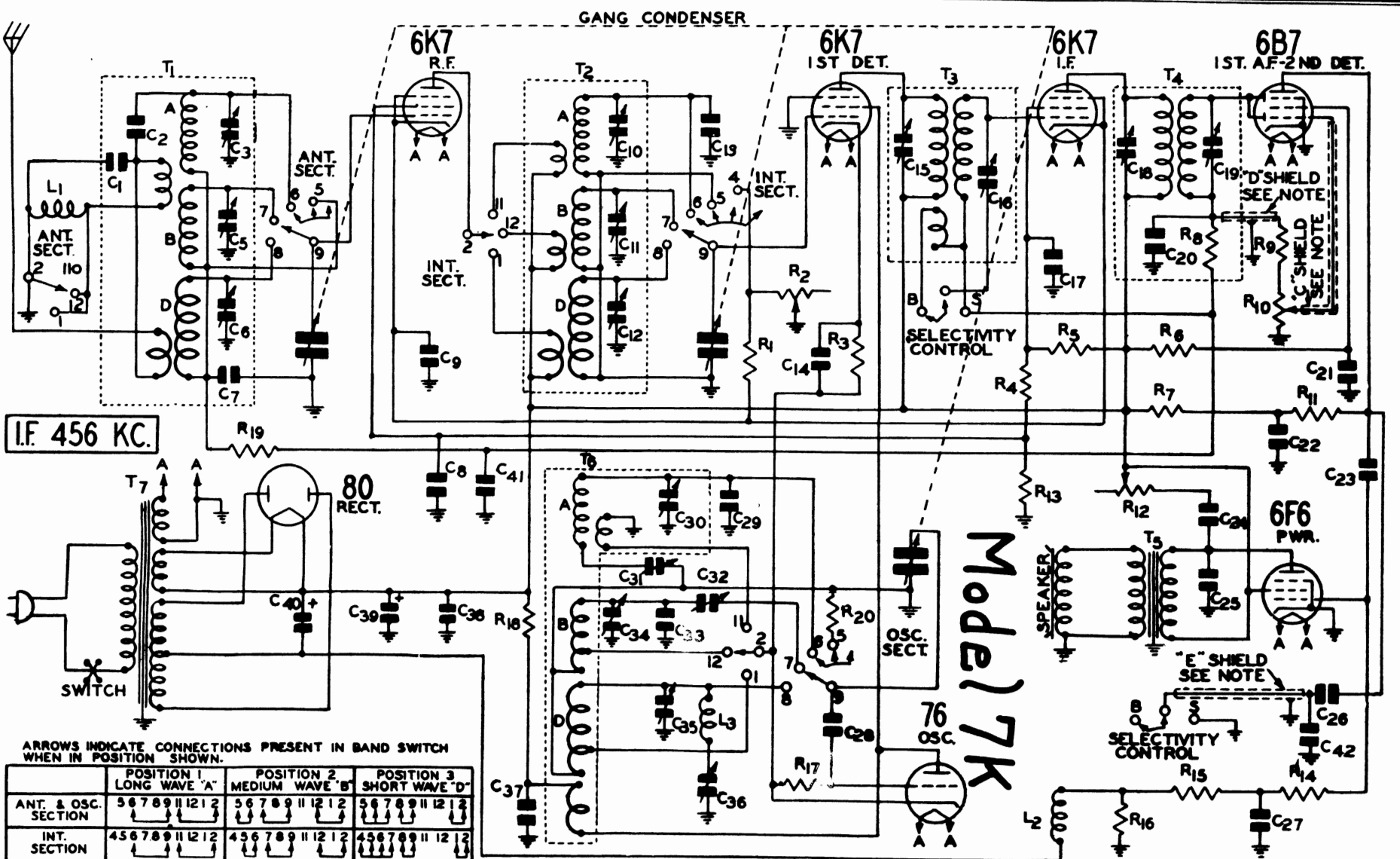
Phonograph Connections



Location of Tubes



Location of Phono Knockouts



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 LONG WAVE "A"	POSITION 2 MEDIUM WAVE "B"	POSITION 3 SHORT WAVE "D"
ANT. & OSC. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2

CONTACT LOCATIONS 3, 4 & 10 IN ANT. & OSC. SECTIONS & 3 & 10 IN INT. SECTION ARE BLANK.

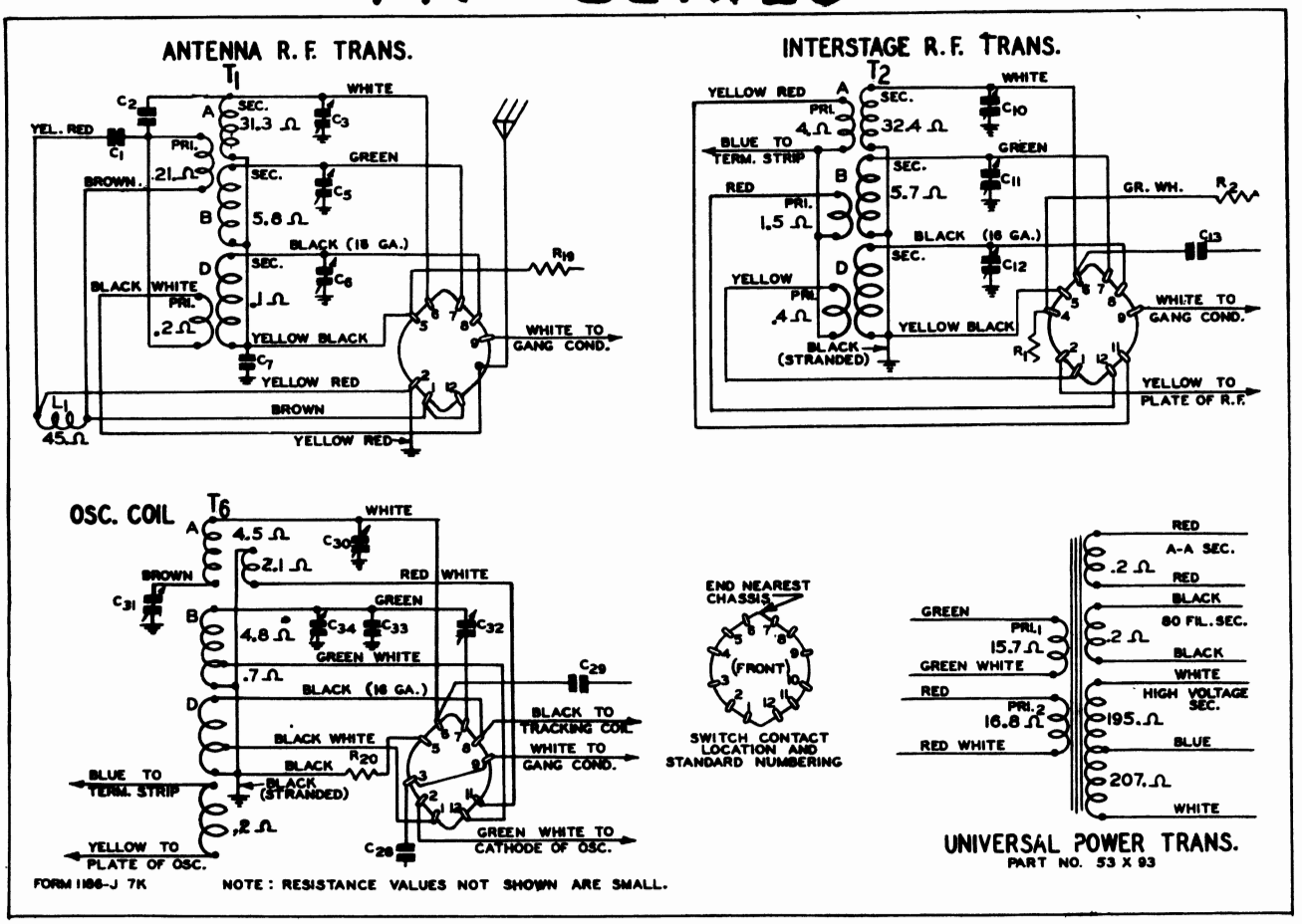
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. "B" AND "S" ON SELECTIVITY CONTROL DENOTES BROAD AND SHARP RESPECTIVELY. THE CAPACITY OF SHIELDS C D & E IS 50 MMF EACH.

C 1 250 mmf.
C 2 20. mmf.
C 3 2-25 mmf.
C 5 2-25 mmf.
C 6 2-25 mmf.
C 7 .05 mf. 180 V.
C 8 .05 mf. 240 V.
C 9 .25 mf. 180 V.
C10 2-25 mmf.
C11 2-25 mmf.
C12 2-25 mmf.
C13 25. mmf.
C14 .05 mf. 180 V.
C15 70-150 mmf. } Dual
C16 70-150 mmf. }
C17 .25 mf. 240 V.
C18 70-150 mmf. } Dual
C19 150-250 mmf. }
C20 50 mmf.
C21 .25 mf. 360 V.
C22 .25 mf. 360 V.
C23 .01 mf. 480 V.
C24 .05 mf. 600 V.
C25 .002 mf. 600 V.
C26 .004 mf. 600 V.
C27 .03 mf. 180 V.
C28 35. mmf.
C29 35. mmf.
C30 2-25 mmf.
C31 100-200 mmf. } Dual
C32 300-600 mmf. }
C33 10. mmf.
C34 2-25 mmf.
C35 2-25 mmf.
C36 40-100 mmf.
C37 .10 mf. 360 V.
C38 .10 mf. 360 V.
C39 18. mf. 300 V. Electrolytic
C40 14. mf. 400 V. Electrolytic
C41 .01 mf. 180 V.
C42 500 mmf.
R 1 150 ohm .2 W.
R 2 2500 ohm } Dual Vol.
R10 500000 ohm } Control
R 3 2500 ohm .2 W.
R 4 6000 ohm .5 W.
R 5 16000 ohm 2.0 W.
R 6 300000 ohm .5 W.
R 7 20000 ohm .2 W.
R 8 2.0 megohm .2 W.
R 9 50000 ohm .2 W.
R11 60000 ohm .5 W.
R12 150000 ohm Tone Cont.
R13 30000 ohm .5 W.
R14 500000 ohm .2 W.
R15 100000 ohm .2 W.
R16 235 ohm 2.0 W. (Armored Wire Wound)
R17 80000 ohm .2 W.
R18 25000 ohm 1.0 W.
R19 100000 ohm .2 W
R20 9000 ohm .2 W
T 1 Antenna R.F. Trans.
T 2 Interstage R.F. Trans.
T 3 1st I.F. Trans.
T 4 2nd I.F. Trans.
T 5 Output Trans.
T 6 Osc. Inductor
T 7 Power Trans.
L 1 "A" Range Ant. Reactor
L 2 Speaker Field
L 3 Osc. Tracking Coil

Model 7K

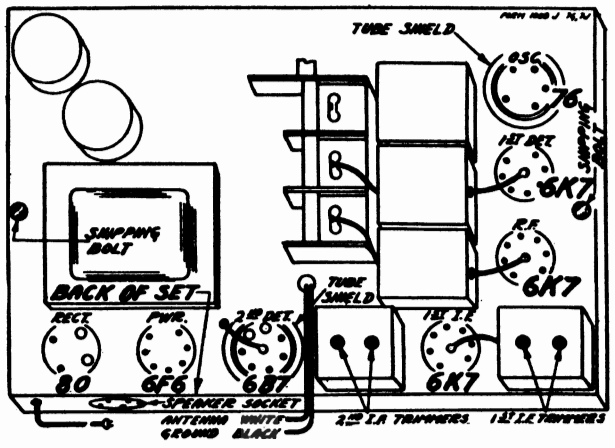
WELLS-GARDNER & CO.

7K SERIES



FORM 1186-J 7K NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

Color Coding of Coil Wires and D. C. Resistance of Windings
(Also see complete D. C. Resistance List in this Manual)

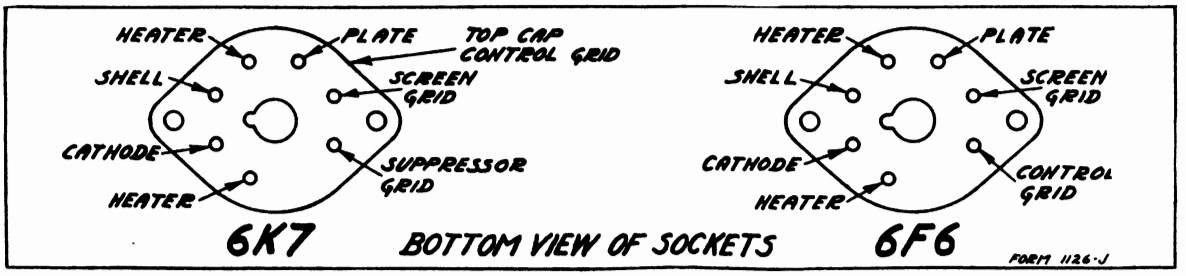


—Location of Tubes

VOLTAGES AT SOCKETS
Line Voltage, 115 - Volume Control at Maximum
Antenna Shorted to Ground

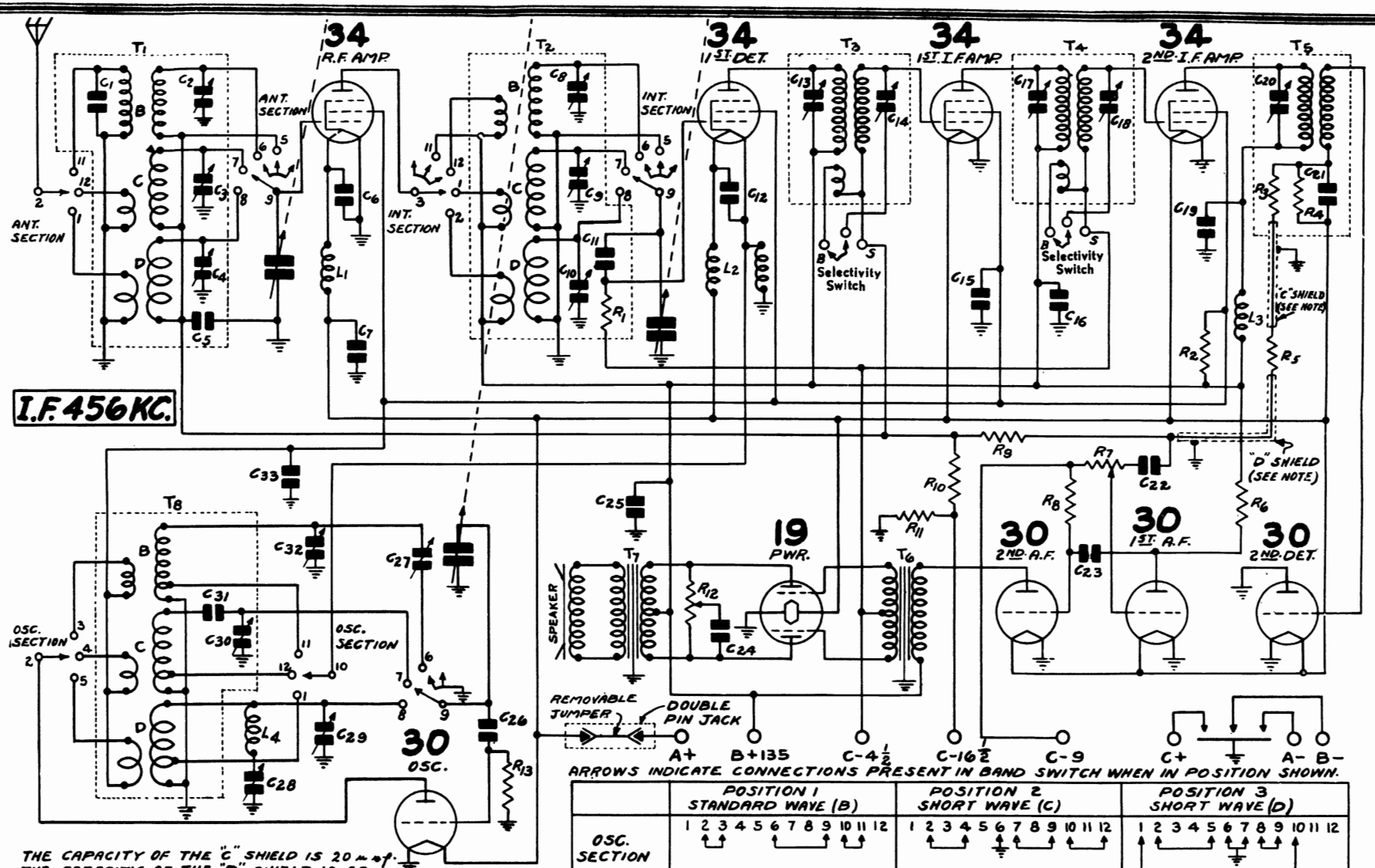
Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6K7	R.F.	6.0	250	110	3.0	9.0
6K7	1st Det.	6.0	250	100	8.3	3.3
76	Osc.	6.0	100			5.0
6K7	I.F.	6.0	250	137	3.0	11.0
6B7	2nd Det. & 1st A.F.	6.0	50(1)	40(1)		3.2
6F6	Power	.6.0	230	250	16.5(2)	36.0
80	Rectifier	4.8				72.0

(1) 500 volt scale (1000 ohms per volt)
(2) Measured across R16.



WELLS-GARDNER & CO.

9C Series



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. SECTION	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9
ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9

CONTACT LOCATIONS 4 AND 10 IN INT. SECTION, AND 3, 4 AND 10 IN ANT. SECTION ARE BLANK.

THE CAPACITY OF THE "C" SHIELD IS 20 mmf.
THE CAPACITY OF THE "D" SHIELD IS 55 mmf.
GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
"B" AND "S" ON Selectivity SWITCH SECTIONS DENOTES "BROAD" AND "SHARP" RESPECTIVELY.

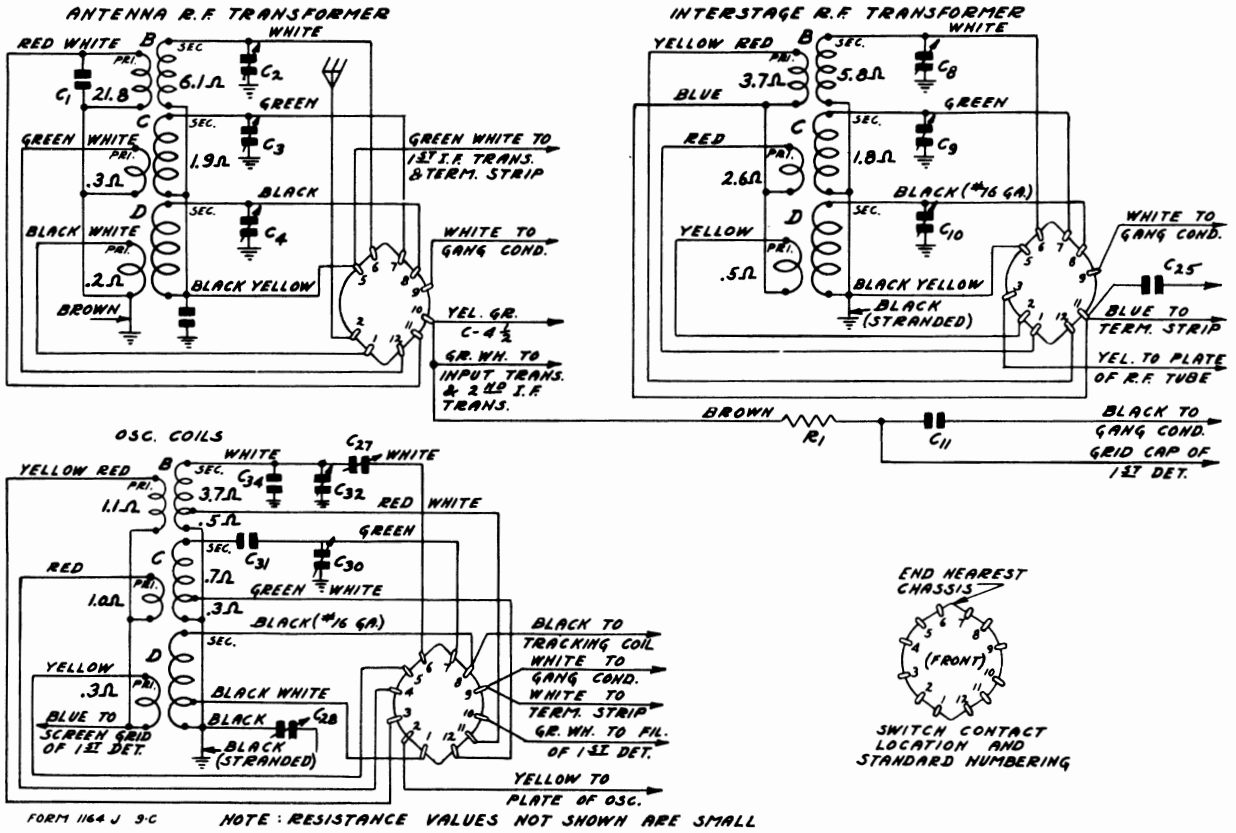
C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 .05 mf. 180 V.
C 7 .25 mf. 180 V.
C 8 2-25 mmf.
C 9 2-25 mmf.
C10 2-25 mmf.
C11 35 mmf.
C12 .05 mf. 180 V.
C13 150-250 mmf. } ONE
C14 150-250 mmf. } UNIT
C15 4.0 mf. 150 V. } ELECTRO-
C16 8.0 mf. 150 V. } LYTIC
C17 150-250 mmf. } ONE
C18 150-250 mmf. } UNIT
C19 .05 mf. 180 V.
C20 70-150 mmf.
C21 70 mmf.
C22 .01 mf. 360 V.
C23 .006 mf. 600 V.
C24 .05 mf. 240 V.
C25 .25 mf. 180 V.
C26 35 mmf.
C27 300-600 mmf. } ONE
C28 40-100 mmf. } UNIT
C29 2-25 mmf.
C30 2-25 mmf.
C31 1400 mmf.
C32 2-25 mmf.
C33 .25 mf. 180 V.

R 1 1.0 Megohm .2 W.
R 2 9.000 Ohm .5 W.
R 3 100.000 Ohm .2 W.
R 4 300.000 Ohm .2 W.
R 5 100.000 Ohm .2 W.
R 6 100.000 Ohm .2 W.
R 7 2.0 Megohm Vol. Cont.
R 8 1.0 Megohm .2 W.
R 9 2.0 Megohm .2 W.
R10 5.0 Megohm .2 W.
R11 15.000 Ohm .2 W.
R12 150.000 Ohm Tone Cont.
R13 100,000 Ohm .2 W.

T 1 Ant. R.F. Trans.
T 2 Int. R.F. Trans.
T 3 1st. I.F. Trans.
T 4 2nd. I.F. Trans.
T 5 3rd. I.F. Trans.
T 6 Push-Pull Input Trans.
T 7 Audio Output Trans.
T 8 Osc. Inductors
L 1 Single Filament Reactor
L 2 Double Filament Reactor
L 3 2nd. I.F. Plate Reactor
L 4 Osc. Tracking Coil

WELLS-GARDNER & CO.

9C Series



Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

VOLTAGES AT SOCKETS
Antenna Shorted to Ground

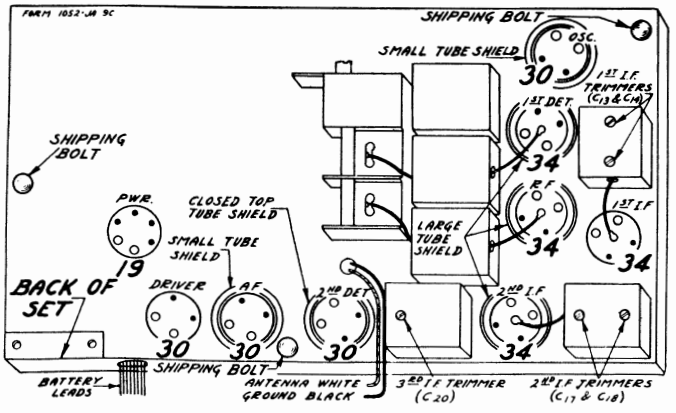
Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Control Grid to Ground	Normal Plate M. A.
34	R. F.	2.0	135	80	4.7(1)	2.4
34	1st. Det.	2.0	135	80	4.5(2)	2.2
30	Oscillator	2.0	80			3.4
34	1st I. F.	2.0	135	80	4.7(1)	2.4
34	2nd I. F.	2.0	135	80	4.5	2.2
30	2nd Det.	2.0				
30	1st Audio	2.0	90		9.0(3)	0.17
30	2nd Audio	2.0	132		9.0(4)	2.5
19	Power	2.0	135		4.5	1.5 (per plate)

(1) Computed figure—cannot be read with ordinary voltmeter.

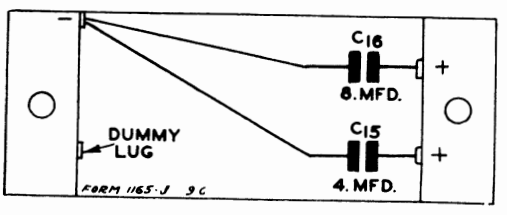
(2) As read at 4½ volt tap on "C" battery.

(3) Volume Control at minimum

(4) As read at 9 volt tap on "C" battery.

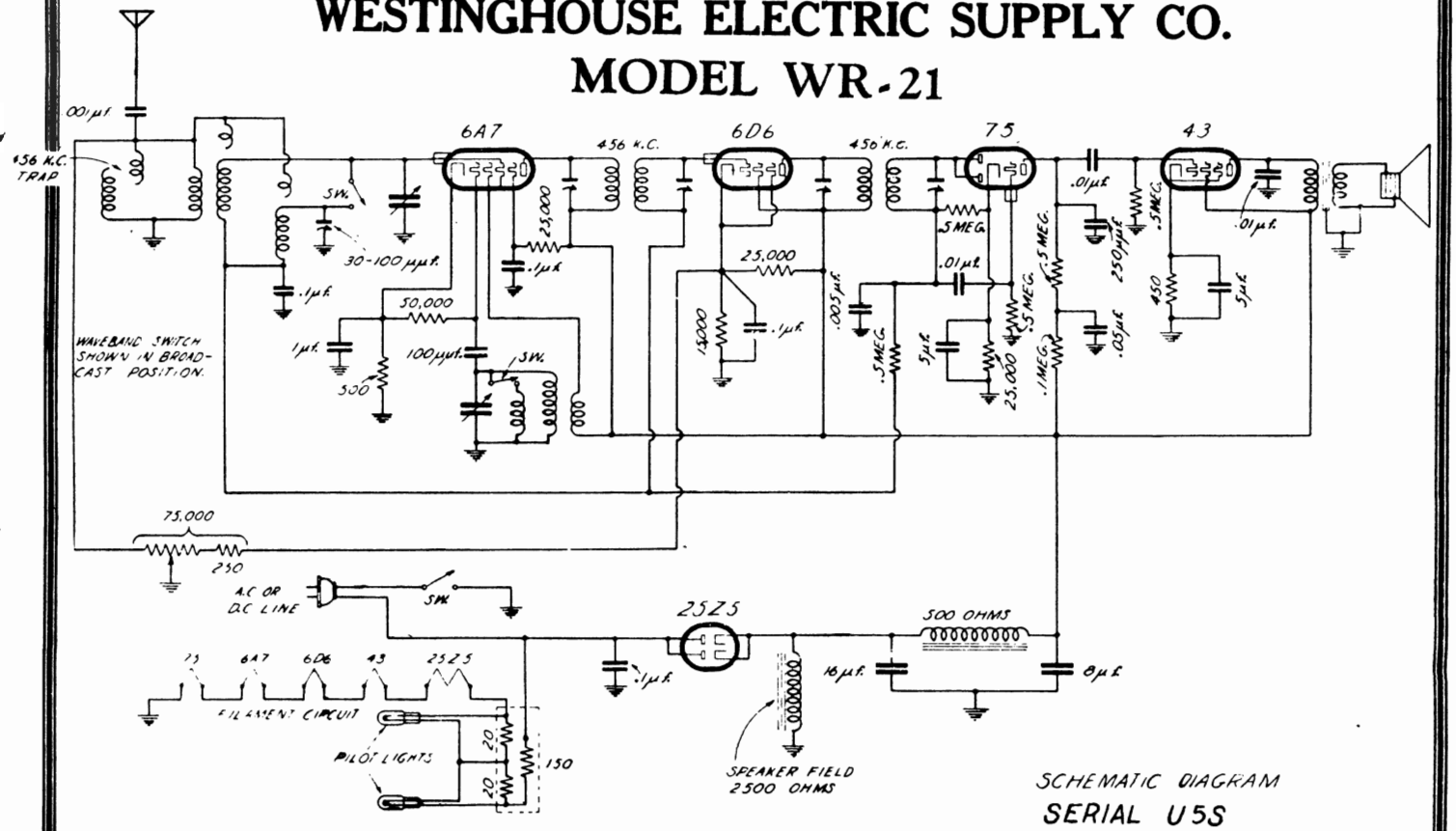


Location of Tubes



-Condenser Block—Internal Wiring

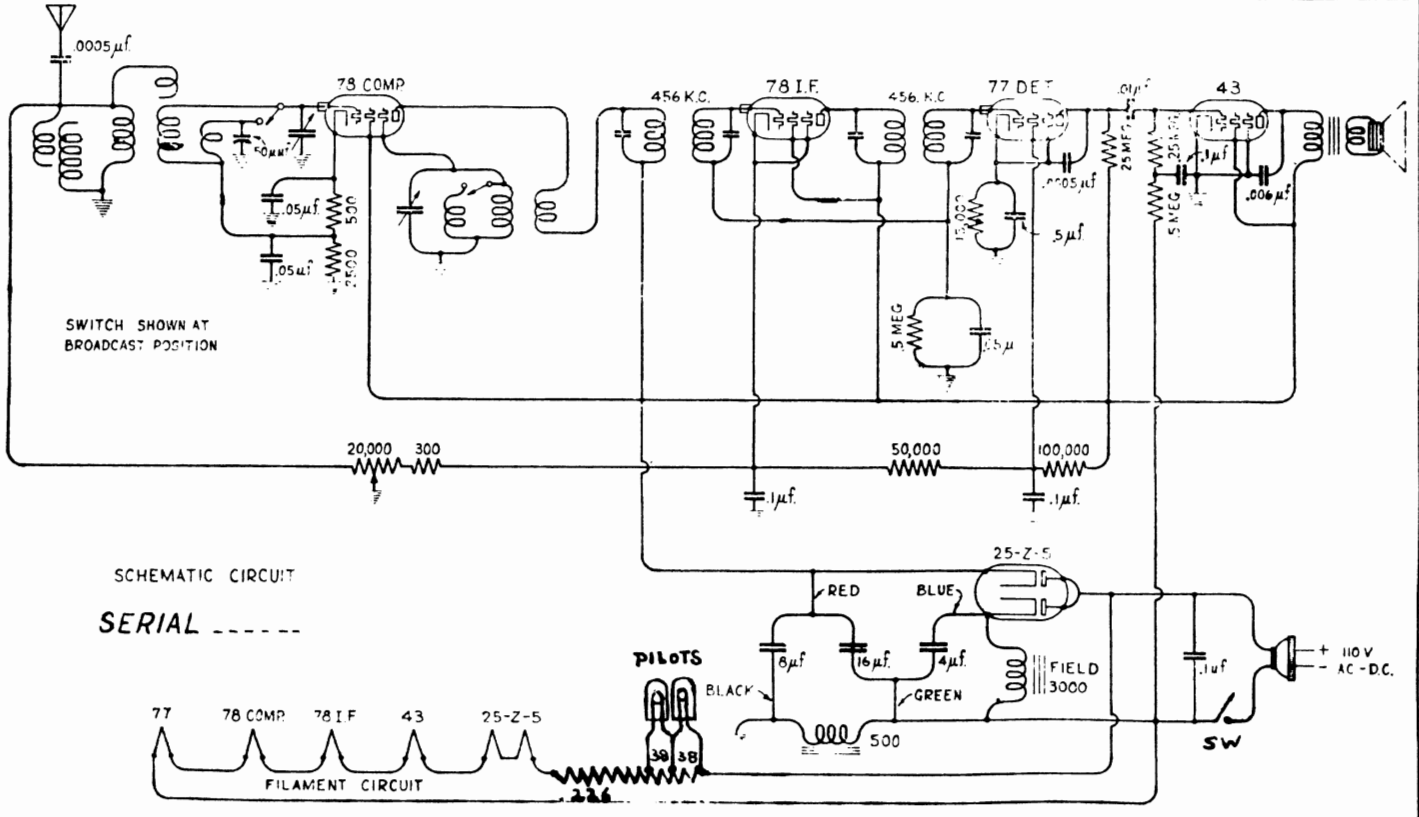
WESTINGHOUSE ELECTRIC SUPPLY CO.
MODEL WR-21



SCHEMATIC DIAGRAM
SERIAL U5S

VACUUM TUBE LOCATIONS (See Alignment Data)

POSITION	1	2	3	4	5
SERIALS	78	78	77	43	25Z5
SERIALS U5S...	6A7	6D6	75	43	25Z5



SCHEMATIC CIRCUIT

SERIAL _____

Alignment MODEL WR-21 Service Data

INTRODUCTION

This dual wave universal superheterodyne receiver has 5 tubes, electro-dynamic speaker and is suitable, because of its small size, for travel use or as an auxiliary receiver in the home. Two recessed dials, which are illuminated for easy reading, are provided. An attached antenna is also included.

ELECTRICAL SPECIFICATIONS

VOLTAGE RATING - - - - - 100 to 135 Volts DC or 25 to 70 cycle AC
FREQUENCY RANGE- - - - - - - 540 to 1500 and 1500 to 3000 KC
POWER CONSUMPTION- - - --- - - - 39.6 Watts
UNDISTORTED OUTPUT - - - - - - - - 1 Watt
TYPE OF CIRCUIT- - - - Superheterodyne with diode detector, automatic volume control and pentode output.

Type of Tubes	Serial numbers	Serial numbers U5S .....
First Detector and Oscillator	78	6A7
Intermediate amplifier	78	6D6
Second detector and AVC	77	75
A. F. Output Amp.	43	43
Dual Rectifier	25Z5	25Z5

Single Purpose Equivalent - - - - - -8 Tubes

CIRCUIT DESCRIPTION

The circuit of this receiver consists essentially of a combined first detector and oscillator feeding a 456 KC intermediate frequency stage of amplification. This intermediate frequency amplifier is coupled to a duplex diode triode tube which acts as detector, automatic volume control and initial audio frequency amplifier. The pentode output tube is resistance coupled to this initial audio amplifier. To insure maximum performance one half of the dual rectifier supplies the loud speaker field while the other half furnishes plate power to the tubes. For the short wave band the proper value of inductance is shunted across each of the coils of each of the two tuned circuits. Individual trimmer condensers are provided so that each band may be correctly aligned.

MECHANICAL CONSTRUCTION

The WR-21 receiver is designed to be as compact as possible, therefore, the complete chassis is assembled to form a single unit. The selector control and combined volume control and "on-off" switch project through the front of the cabinet while the frequency changing switch is reached from the rear. The line cord with its outlet plug and the antenna are attached to the chassis and when not in use may be tucked into the openings in the back cover.

SERVICE DATA

The table below gives a typical set of voltage readings taken using a 115 volt line supply. The readings were taken with a DC voltmeter having a resistance of 1000 ohms per volt with the volume control of the receiver fully on.

STAGE	DET. OSC.	I.F.	2nd DET.	OUTPUT AMP.	RECTIFIER
For Serial Nos.....					
TUBE	78	78	77	43	25Z5
PLATE TO GND.	98	98	35	92	--
SCREEN TO GND.	98	98	25	98	--
CATHODE TO GND.	16.0	2.8	1.5	--	98

Voltage across the speaker field - 100 volts

For Serial No. U5S...					
TUBE	6A7	6D6	75	43	25Z5
PLATE TO GND.	100	100	30	80	--
SCREEN TO GND.	55	100	--	100	--
CATHODE TO GND.	3	3	1.5	---	100

Voltage across the speaker field - 125 volts

The bias for the 43 output amplifier tube is measured across the filter reactor and should be between 15 and 18 volts.

If the receiver fails to operate check;

1. The outlet plug to see that the wires are properly connected to the prongs, and that the prongs make good contact with the outlet.
2. The antenna to see if it is clear and not grounded.
3. If the supply is DC to make sure that the plug is not reversed. Allow the receiver to be turned on for a minute or so and then if it does not sound active reverse the line plug.
4. The tubes in their sockets (after removing the back of the cabinet) to see that the prongs make good contact in the sockets.
5. The grid clips on the tubes.
6. The tubes themselves in a tube checker or by interchanging with tubes that are known to be good.
7. Burned out or grounded pilot lamps.
8. Continuity of the heater circuit by removing the line plug and checking the resistance between the two contacts of the line plug with the switch "on".
9. The voltages at the respective sockets to see if they correspond with those in the above table. It is advisable to remove the chassis from the cabinet to do this.
10. It is suggested that the audio output tube be checked first, the second detector next and so on progressing from the loudspeaker toward the antenna.
11. The cathode voltages of the 25Z5 rectifier. The cathode nearest the front of the chassis supplies the speaker field and should read approximately 100 volts. A higher reading indicates an open speaker field or its associated circuit. A lower voltage indicates a broken down filter condenser or defective rectifier tube.

This Receiver has been carefully adjusted at the factory but due to improper handling or replacement of parts it may have become out of alignment. The following information is given to assist in properly restoring the performance of the receiver. Due to the nature of the adjustments, only experienced personnel equipped with the necessary instruments should ever attempt to realign the receiver.

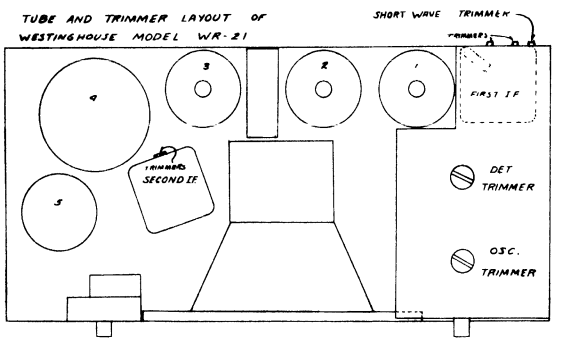
The following apparatus is necessary to make these adjustments correctly,

1. Modulated oscillator equipped with output control and capable of not only tuning over the frequency band of the receiver but also to the intermediate frequency (456 KC in this case).
2. Output meter, to read 1 or 2 volts full scale A.C. audio voltage. The rectox type meter is ideal.
3. Insulated screw driver (preferable).

To make this adjustment proceed in the following order,

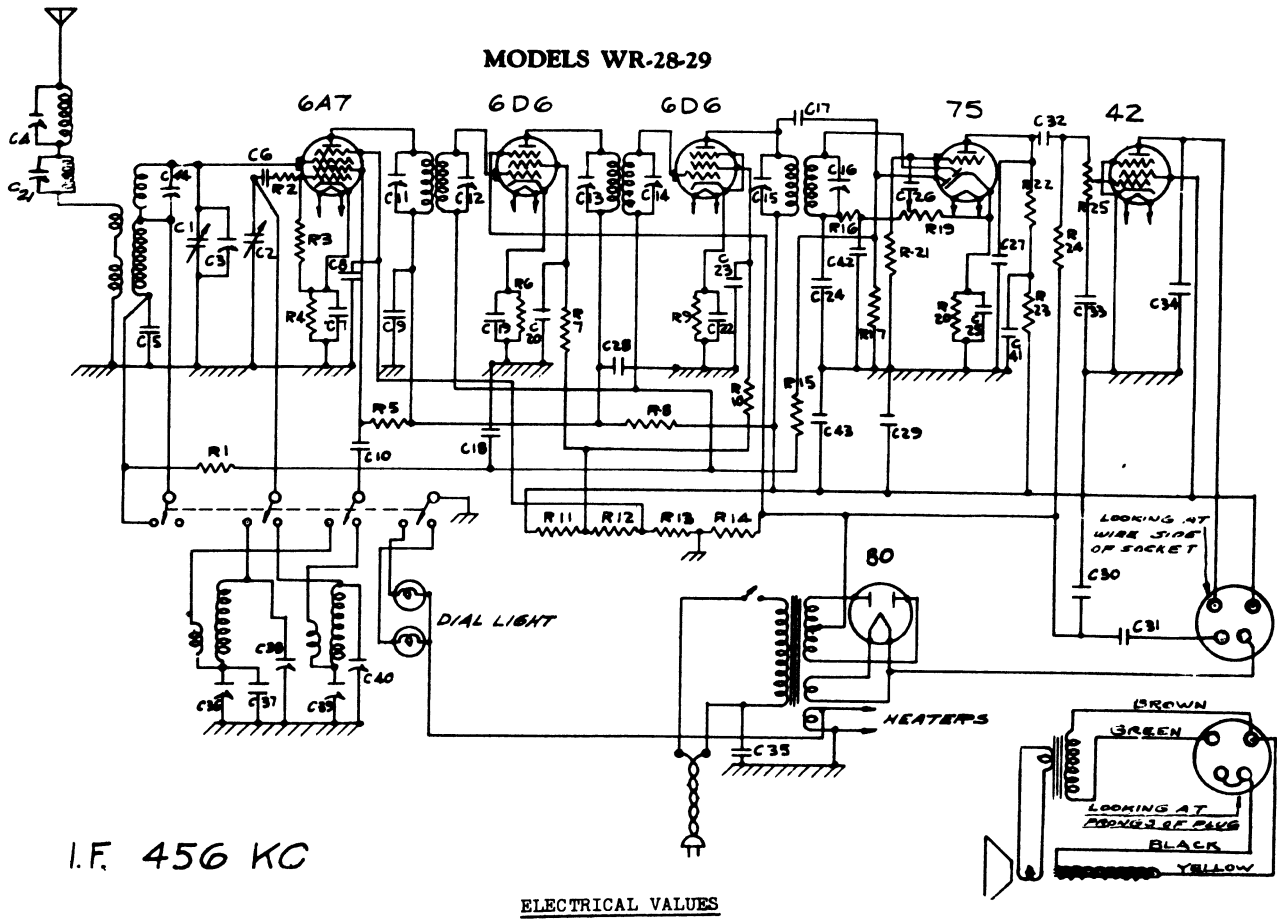
1. Connect the output meter across the speaker voice or cone coil.
2. Connect the receiver which has been checked and known to be in working order to the power line.
3. Connect the output of the modulated oscillator or signal generator as it is commonly called to the grid of the first detector tube (tube nearest to the tuning condenser) and ground, or the frame of the set.
4. Turn the receiver "on" and advance the volume control to the extreme right. See that the station selector is turned so that no station is heard.
5. Tune the modulated oscillator to resonance or back and forth in the vicinity of 456 Kilocycles until the modulating note of the oscillator is heard.
6. Adjust the oscillator output as required to cause a reading of about 1 volt or less on the output meter.
7. Adjust the trimmers on the I.F. transformers (see outline) for maximum output decreasing the output of the oscillator as required to keep the receiver output at 1 volt or less.
8. Change the oscillator connection to the antenna wire and set the oscillator to about 1400 KC.
9. Tune the receiver to the oscillator with the switch turned to "Broadcast".
10. Adjust the trimmers at the top of the tuning condenser for maximum output as before.
11. Set the oscillator at about 600 KC and repeat the above procedure.
12. Recheck at 1400 KC if either trimmer was changed at the 600 KC setting but this time change the trimmer nearest the front by about 1/4 turn, readjust the selector control and line up the other trimmer. Then repeat at 600 KC to see if the alignment is correct. If this adjustment indicates that the two circuits are farther out of "line" than the first check at 600 KC move the first trimmer back 1/2 turn, and repeat the above procedure. Experience will dictate just how many checks are necessary.
13. After the "broadcast" band has been correctly adjusted the oscillator should be set to 2500 KC and the selector adjusted to resonance as before, then adjust the small trimmer at the lower rear corner of the chassis for maximum output.

NOTE: While it is possible to adjust the trimmers with an ordinary metal screw driver it is advisable to use an insulated or non-metallic screw driver to prevent short circuiting the power supply.



WESTINGHOUSE ELECTRIC SUPPLY CO.

MODELS WR-28-29



ELECTRICAL VALUES

Symbol Number	Description	Part Number
C-1, C-2, C-3	Variable gang with trimmer	WR-07256
C-4	600 mmf. variable	WR-07238
C-5	.05 mf - 2 ply	WR-06386
C-6	.0001 mf - mica	WR-06417
C-7	.05 mf - 2 ply	WR-06386
C-8	.05 mf - 2 ply	WR-02493
C-9	.05 mf - 3 ply	WR-02492
C-10	.02 mf - 3 ply	WR-02504
C-11, C-12	Part of I.F. coil	WR-07247
C-13, C-14	Part of I.F. coil	WR-07248
C-15, C-16	Part of I.F. coil	WR-07249
C-17	.001 - mica	WR-06417
C-18	.05 mf - 2 ply	WR-06386
C-19	.05 mf - 2 ply	WR-06386
C-20	.05 mf - 2 ply	WR-06386
C-21	10 to 55 mmfd	WR-07842
C-22	.05 mf - 2 ply	WR-06386
C-23	.05 - 2 ply	WR-06386
C-24	.0001 mica ..... part of	WR-07249
C-25	.5 mf - 2 ply	WR-02499
C-26	.005 mf - 3 ply	WR-03659
C-27	.001 mf - 4 ply	WR-06403
C-28	8 mf - electrolytic	WR-07239
C-29	4 mf - electrolytic	WR-06665
C-30	20 mf - electrolytic	WR-06665
C-31	8 mf - electrolytic	WR-06665
C-32	.005 mf - 3 ply	WR-03659
C-33	.001 mf - 4 ply	WR-06403
C-34	.01 mf - 4 ply	WR-03695
C-35	.01 mf - 4 ply	WR-05931
C-36	425 mmf. variable	WR-07241
C-37	1500 mmf. mica	WR-07422
C-38	Trimmer condenser	WR-07237
C-39	425 mmf. variable	WR-07241
C-40	Trimmer condenser	WR-07237
C-41	.05 mf - 3 ply	WR-02492
C-42	.001 mica	WR-06417
C-43	.05 mf - 3 ply	WR-02492
C-44	4-40 mmf. variable ... part of	WR-07246
R-1	.1 meg. 1/4 watt	WR-05278
R-2	50 ohms 1/4 watt	WR-05255
R-3	50,000 ohms 1/4 watt	WR-05275
R-4	500 ohms 1/4 watt	WR-05264
R-5	20,000 ohms 1/2 watt	WR-05913
R-6	1,000 ohms 1/4 watt	WR-05267
R-7	5,000 ohms 1/4 watt	WR-05249
R-8	1,000 ohms 1/4 watt	WR-05267
R-9	1,000 ohms 1/4 watt	WR-05267
R-10	5,000 ohms 1/4 watt	WR-05249
R-11, R-12, R-13, R-14	11,200 ohms, 1,800 ohms, 12,000 ohms, 300 ohms	WR-07236
R-15	1 meg. 1/4 watt	WR-05281
R-16	50,000 ohms 1/4 watt .. part of	WR-07249
R-17	1 meg. 1/4 watt	WR-05281
R-19	.5 meg. variable	WR-05562
R-20	2,000 ohms 1/4 watt	WR-05245
R-21	1 meg. 1/4 watt	WR-05281
R-22	75,000 ohms 1/4 watt	WR-05277
R-23	50,000 ohms 1/4 watt	WR-05276
R-24	.25 meg. 1/4 watt	WR-05279
R-25	.25 meg variable	WR-07250

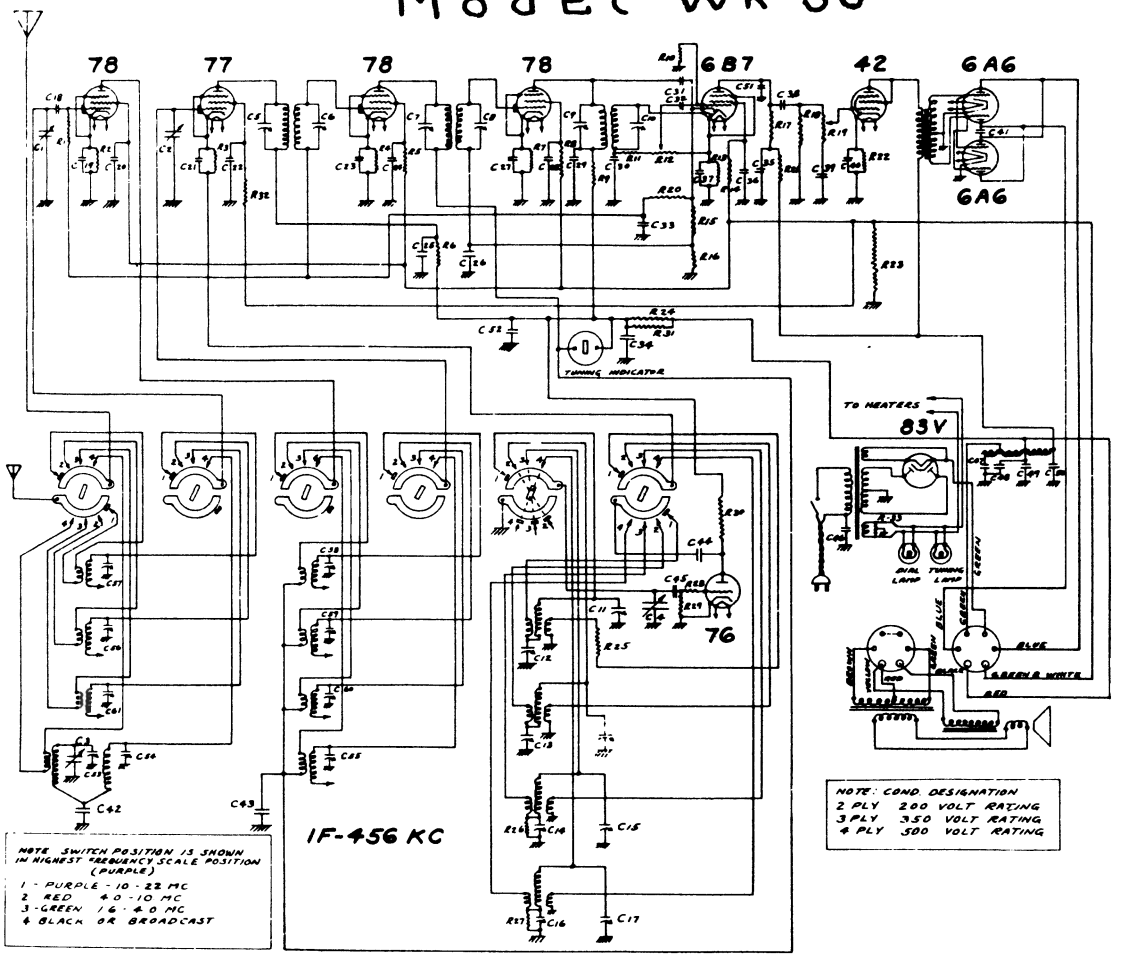
SERVICE TECHNICAL DATA - SOCKET VOLTAGES

Stage	Tube	Filament	Plate	Screen	Cathode
Rectifier	80	4.85	382		
Power Output	42	6.1	234	245	18
2nd Detector	75	6.1	126		0.87
1st I. F.	6D6	6.1	236	99	5.6
2nd I. F.	6D6	6.1	245	96	5.6
Oscillator	6A7	6.1	236-136	87	4.7

Note: These values are readings of a high resistance voltmeter from each socket terminal to ground, with the exception of the filament voltages. The values are only approximate and will vary with the line voltage and the type of meter employed. Line voltage - 112.

WESTINGHOUSE ELECTRIC SUPPLY CO.

Model WR-30



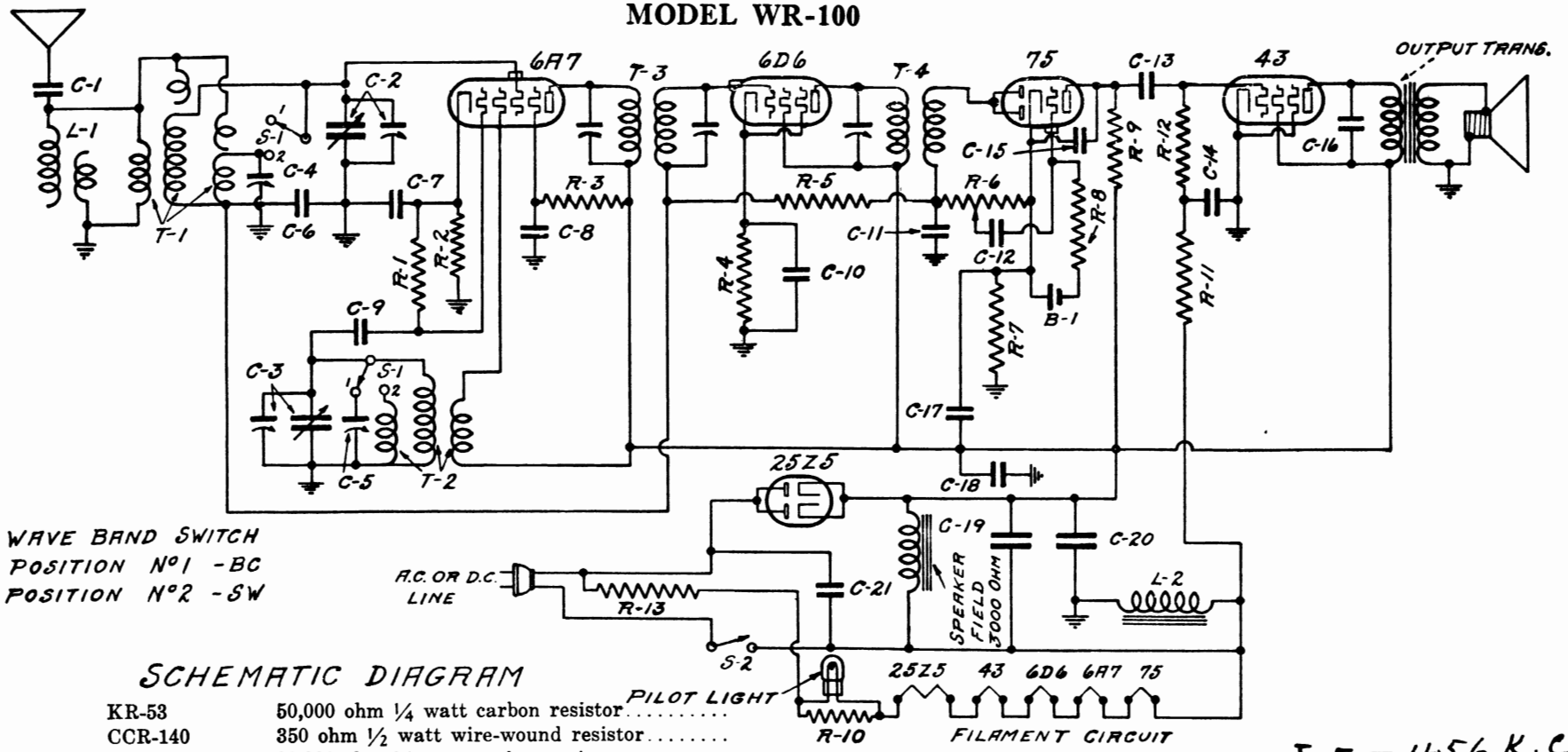
Stage	Tube	Filament	Plate	Screen	Cathode
Rectifier	83V	5.0	305		340
Audio power output	6A6	6.0	305		
Audio power output	6A6	6.0	280	280	30
Audio driver	42	6.0	12	55	3.8
2nd Det., AVC, 1st audio	6B7	6.0	240	100	4.5
I.F. amplifier	78	6.0	230	100	4.5
I.F. amplifier	78	6.0	240	100	2.5
1st Detector, Oscillator	77	6.0	240	100	4.5
	76	6.0	95		

SCHEMATIC WIRING DIAGRAM

ELECTRICAL VALUES

C-1 Variable condenser
C-2 Variable condenser
C-3 Variable condenser
C-4 Variable condenser
C-5 I.F. coil
C-6 I.F. coil
C-7 I.F. coil
C-8 I.F. coil
C-9 I.F. coil
C-10 I.F. coil
C-11 7-70 mmf.
C-12 1000-2000 mmf.
C-13 500-1000 mmf.
C-14 400-800 mmf.
C-15 3-40 mmf.
C-16 270-600 mmf.
C-17 7-70 mmf.
C-18 100 mmf. mica
C-19 .05 - 2 ply
C-20 .05 - 2 ply
C-21 .05 - 2 ply
C-22 .05 - 2 ply
C-23 .05 - 2 ply
C-24 .05 - 3 ply
C-25 .005 - 3 ply
C-26 .05 - 2 ply
C-27 .05 - 2 ply
C-28 .05 - 3 ply
C-29 .005 - 3 ply
C-30 100 mmf. mica
C-31 100 mmf. mica
C-32 .005 - 3 ply
C-33 .05 - 2 ply
C-34 4 mfd. electrolytic
C-35 4 mfd. electrolytic
C-36 .5 - 2 ply
C-37 .5 - 2 ply
C-38 .005 - 3 ply
C-39 .001 - 4 ply
C-40 20 mfd. 25 V.
C-41 .005 - 3 ply
C-42 .05 - 2 ply
C-43 .02 - 3 ply
C-44 .02 - 3 ply
C-45 100 mmf. mica
C-46 .01 - 4 ply
C-47 8 mfd. electrolytic
C-48 4 mfd. electrolytic
C-49 4 mfd. electrolytic
C-50 8 mfd. electrolytic
C-51 .001 - 4 ply
C-52 .1 - 3 ply
C-53 Variable condenser gang
C-54 4-25 mmf.
C-55 4-25 mmf.
C-56 4-25 mmf.
C-57 7-70 mmf.
C-58 7-70 mmf.
C-59 4-25 mmf.
C-60 4-25 mmf.
C-61 4-25 mmf.
R-1 1/2 meg. 1/4 watt
R-2 300 ohms 1/4 watt
R-3 5,000 ohms 1/4 watt
R-4 1,000 ohms 1/4 watt
R-5 5,000 ohms 1/4 watt
R-6 1,000 ohms 1/4 watt
R-7 1,000 ohms 1/4 watt
R-8 5,000 ohms 1/4 watt
R-9 1,000 ohms 1/4 watt
R-10 1 meg. 1/4 watt
R-11 50,000 ohms 1/4 watt
R-12 1/2 meg. volume control
R-13 2,000 ohms 1/4 watt
R-14 50,000 ohms 1/4 watt
R-15 1 meg. 1/4 watt
R-16 250,000 ohms 1/4 watt
R-17 50,000 ohms 1/4 watt
R-18 250,000 ohms 1/4 watt
R-19 1/4 meg. tone control
R-20 1 meg. 1/4 watt
R-21 100,000 ohms 1/4 watt
R-22 2,500 ohms 1/2 watt
R-23 1,800 ohms 30 watt
R-24 5,000 ohms 1 watt
R-25 100 ohms 1/4 watt
R-26 5,000 ohms 1/4 watt
R-27 2,000 ohms 1/4 watt
R-28 50 ohms 1/4 watt
R-29 20,000 ohms 1/4 watt
R-30 20,000 ohms 1 watt
R-31 5,000 ohms 1 watt
R-32 5,000 ohms 1/4 watt
R-33 Mid tap resistor

MODEL WR-100



I.F. = 456 K.C.

SCHEMATIC DIAGRAM

R1	KR-53	50,000 ohm ¼ watt carbon resistor
R2	CCR-140	350 ohm ½ watt wire-wound resistor
R3	ZZR-196	30,000 ohm ¼ watt carbon resistor
R4	AAR-119	300 ohm ½ watt wire-wound resistor
R5, R8	KR-57	1 megohm ¼ watt carbon resistor
R6, S2	2DR-169	Volume control with line switch—0.5 megohm
R7	PR-79	1,000 ohm ¼ watt carbon resistor
R9, R11, R12	KR-56	0.5 megohm ¼ watt carbon resistor
R10	2DR-200	25 ohm wire-wound metal clad resistor
R13	2DW-62	145 ohm, 15 watt resistor wire in line cord
C1, C11	IC-47A	0.0005 mf mica condenser
C2, C3	2DC-202	Two gang variable condenser
C4, C5	2DC-212	Dual trimmer on bakelite strip 3 to 30 mmf—each trimmer
C6, C14, C21	AC-6	0.1 mf, 200 volt tubular condenser
C7, C8, C10	BC-12	0.05 mf, 200 volt tubular condenser
C9	EC-24A	0.0001 mf mica condenser
C12, C13	CCC-127	0.01 mf, 200 volt tubular condenser
C15	AC-7A	0.00025 mf mica condenser
C16	HC-34	0.006 mf, 600 volt tubular condenser
C17	EC-19	0.5 mf, 200 volt tubular condenser
C18	BC-13	0.25 mf, 200 volt tubular condenser
C19, C20	2DC-203	Multiple 8 and 16 mf electrolytic filter cond

VOLTAGE ANALYSIS

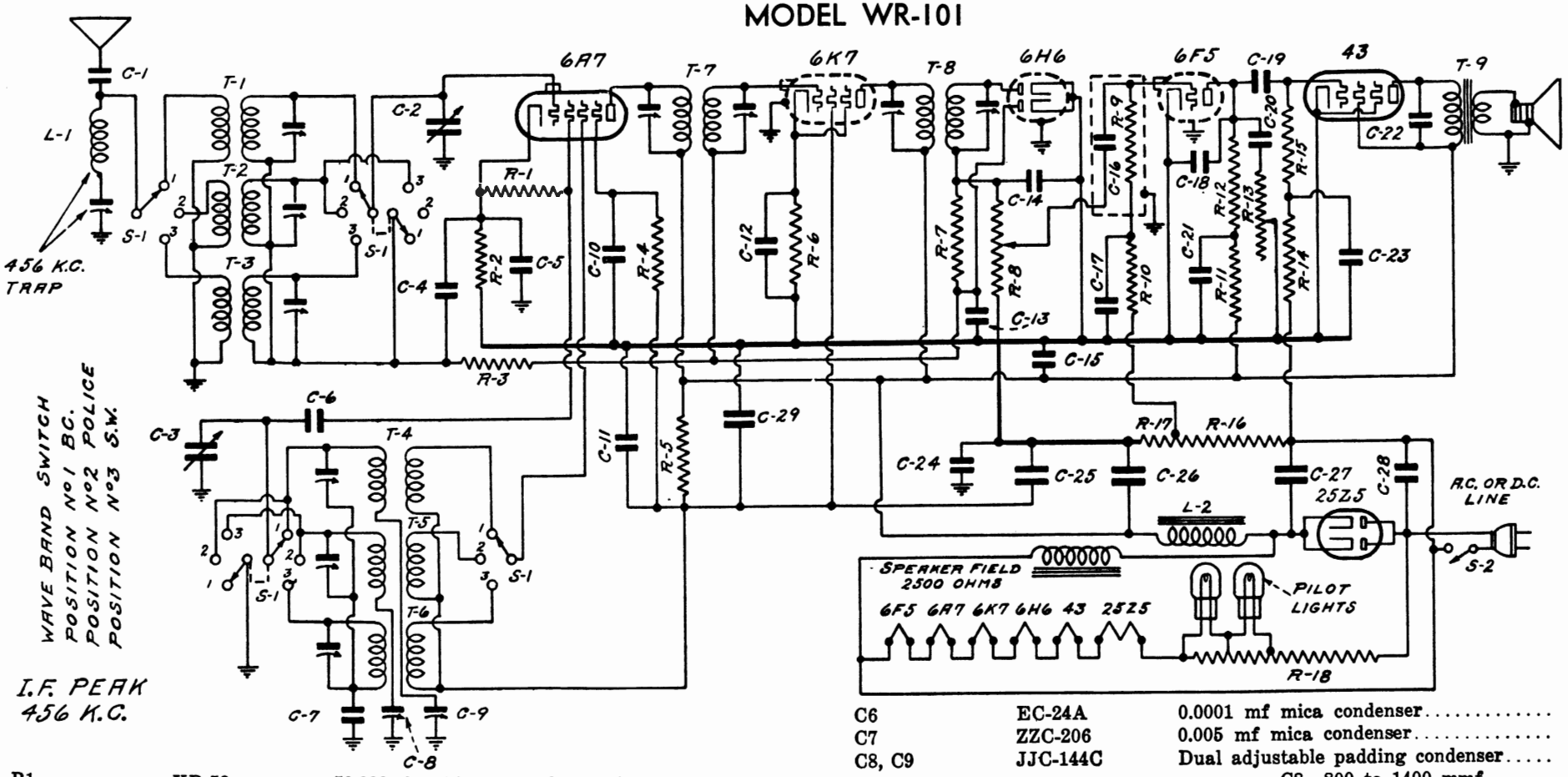
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	105	55	1.6	105	6
6D6	105	105	3.0	—	6
75	45	—	0	—	6
43	100	105	0	—	24

Voltage across speaker field (25Z5 cathode to line switch)—125 volts.
Voltage across choke (chassis to line switch)—20 volts.

PRODUCTION CHANGES

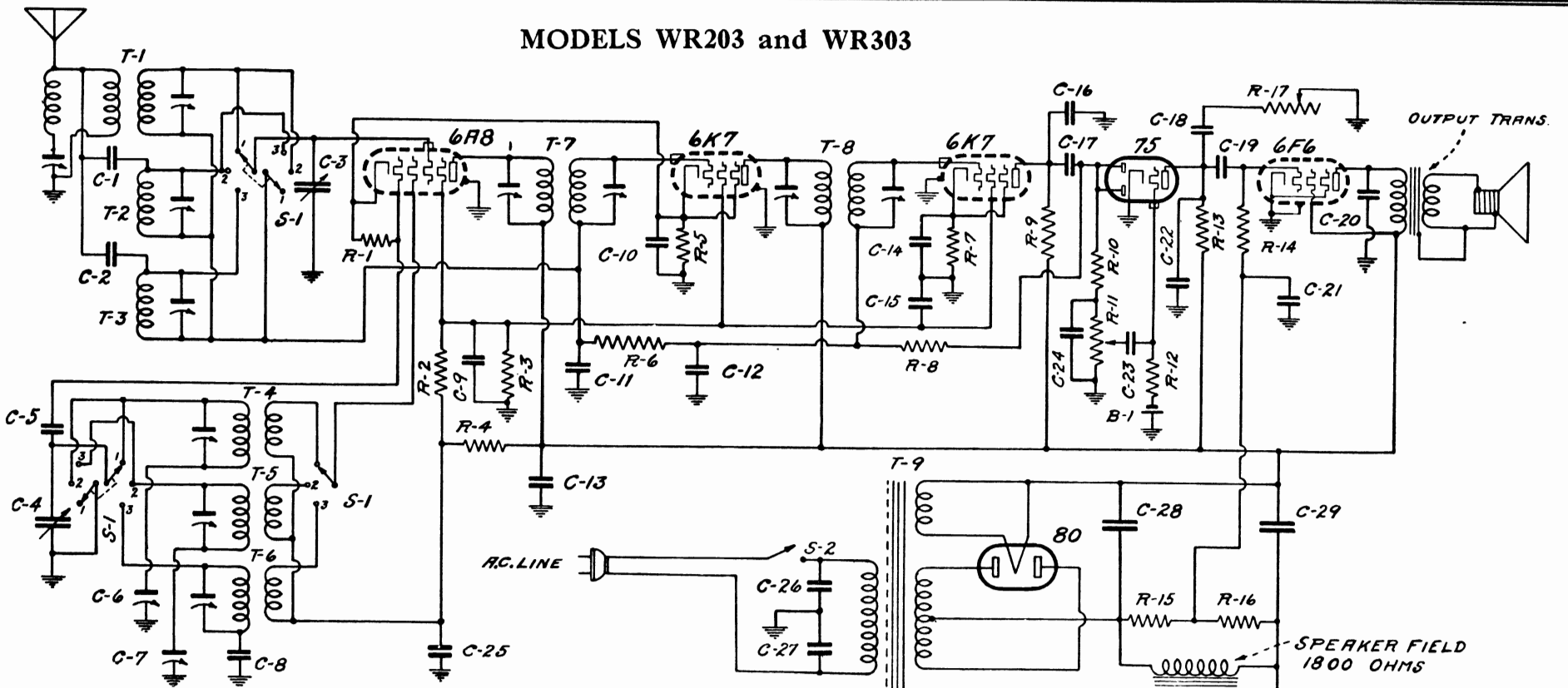
On sets bearing serial numbers higher than 701001 the pilot light has been changed to XL-9, 6.3 volt, .25 amp. Mazda No. 46, and the pilot light resistor has been changed from 2DR-200 to 2DR-213, 40 ohm wire-wound metal-clad resistor.

MODEL WR-101



R1	KR-53	50,000 ohm ¼ watt carbon resistor
R2, R6	CCR-140	350 ohm ½ watt wire-wound resistor
R3	KR-55	250,000 ohm ¼ watt carbon resistor
R4	ZZR-196	30,000 ohm ¼ watt carbon resistor
R5	LR-64	5,000 ohm ¼ watt carbon resistor
R7	KR-57	1 megohm ¼ watt carbon resistor
R8, S2	ZZR-190A	Volume control with line switch—0.5 megohm
R9, R10, R15	KR-56	0.5 megohm ¼ watt carbon resistor
R11	KR-54	100,000 ohm ¼ watt carbon resistor
R12	LR-61	200,000 ohm ¼ watt carbon resistor
R13	ZZR-191A	Tone control—250,000 ohms
R14	OR-73	25,000 ohm ¼ watt carbon resistor
R16, R17	2CR-211	250 ohm, one watt, wire-wound tapped resistor. R16—230 ohms R17—20 ohms
R18	2LR-212	Plug-in type ballast resistor
C1, C22	AAC-114	0.001 mf mica condenser
C2, C3	ZZC-184	Two-gang variable condenser
C4, C5	2LC-225	0.05 mf, 200 volt tubular high-frequency conden
C6	EC-24A	0.0001 mf mica condenser
C7	ZZC-206	0.005 mf mica condenser
C8, C9	JJC-144C	Dual adjustable padding condenser. C8—800 to 1400 mmf C9—250 to 550 mmf
C10, C11, C12 C13, C15, C24	2LC-223	Six-section condenser block. C10—0.1 mf, 200 v. C11—0.1 mf, 200 v. C12—0.1 mf, 200 v. C13—0.05 mf, 200 v. C15—0.1 mf, 200 v. C24—0.2 mf, 200 v.
C14, C18	AC-7A	0.00025 mf mica condenser
C16, C19	CCC-127A	0.01 mf, 200 volt tubular condenser
C17, C21, C23	AC-6	0.1 mf, 200 volt tubular condenser
C20	HC-34	0.006 mf, 600 volt tubular condenser
C25, C26, C27	2LC-224	Multiple 4, 8 and 16 mf electrolytic cond C25—4 mf, 150 volts C26—8 mf, 150 volts C27—16 mf, 150 volts
C28	LC-64	0.05 mf, 400 volt tubular condenser
C29	YC-98A	Tubular 4 mf, 150 volt electrolytic cond

MODELS WR203 and WR303



I.F. = 456 K.C.

WESTINGHOUSE ELECTRIC SUPPLY CO.

R11	XXR-185A	Volume control—.25 megohm
R17, S2	XXR-186A	Tone control with switch—.25 megohm
R7	KR-51	2,500 ohm—¼ watt carbon resistor
R1, R9	KR-53	50,000 " " " " "
R10, R14	KR-54	100,000 " " " " "
R13	LR-61	200,000 " " " " "
R16	XXR-202	210,000 " " " " "
R6	KR-55	250,000 " " " " "
R12	KR-56	500,000 " " " " "
R8	KR-57	1 meg. " " " " "
R15	XXR-203	1.1 " " " " " "
R5	FFR-126	500 ohm wire-wound resistor—½ watt
R2, R3, R4	XXR-194	30,000 ohm metal clad wire-wound tapped resis R2=10,400 ohms—1 watt R3=13,000 ohms—1 watt R4= 6,600 ohms—1¼ watt
C3, C4	XXC-187	Two-gang variable condenser
C28, C29	XXC-188	Dual 8 mf dry electrolytic condenser
C6, C7	JJC-144D	Dual padding condenser C6—250 to 550 mmf. C7—800 to 1400 mmf.

C1, C2, C16	IIC-133A	.000025 mf mica condenser
C5	EC-24A	.0001 mf mica condenser..
C17	AC-7A	.00025 mf mica condenser.
C22, C24	IC-47	.0005 mf mica condenser..
C8	XXC-197	.0038 mf mica condenser..
C18	XXC-207	.005 mf-400 v. tubular cond
C20	ZC-115	.006 mf-1000 v. tubular co
C23	CCC-127	.01 mf-200 v. tubular cond
C19	KC-58	.01 mf-400 v. tubular cond
C11, C12	BC-12	.05 mf-200 v. tubular cond
C26, C27	XXC-220	Dual .01 mf, 250 volt cond
C9, C14 C10, C15	AC-6	.1 mf-200 v. tubular cond
C13, C25	EEC-132	.1 mf-400 v. tubular conde
C21	BC-13	.25 mf-200 v. tubular cond

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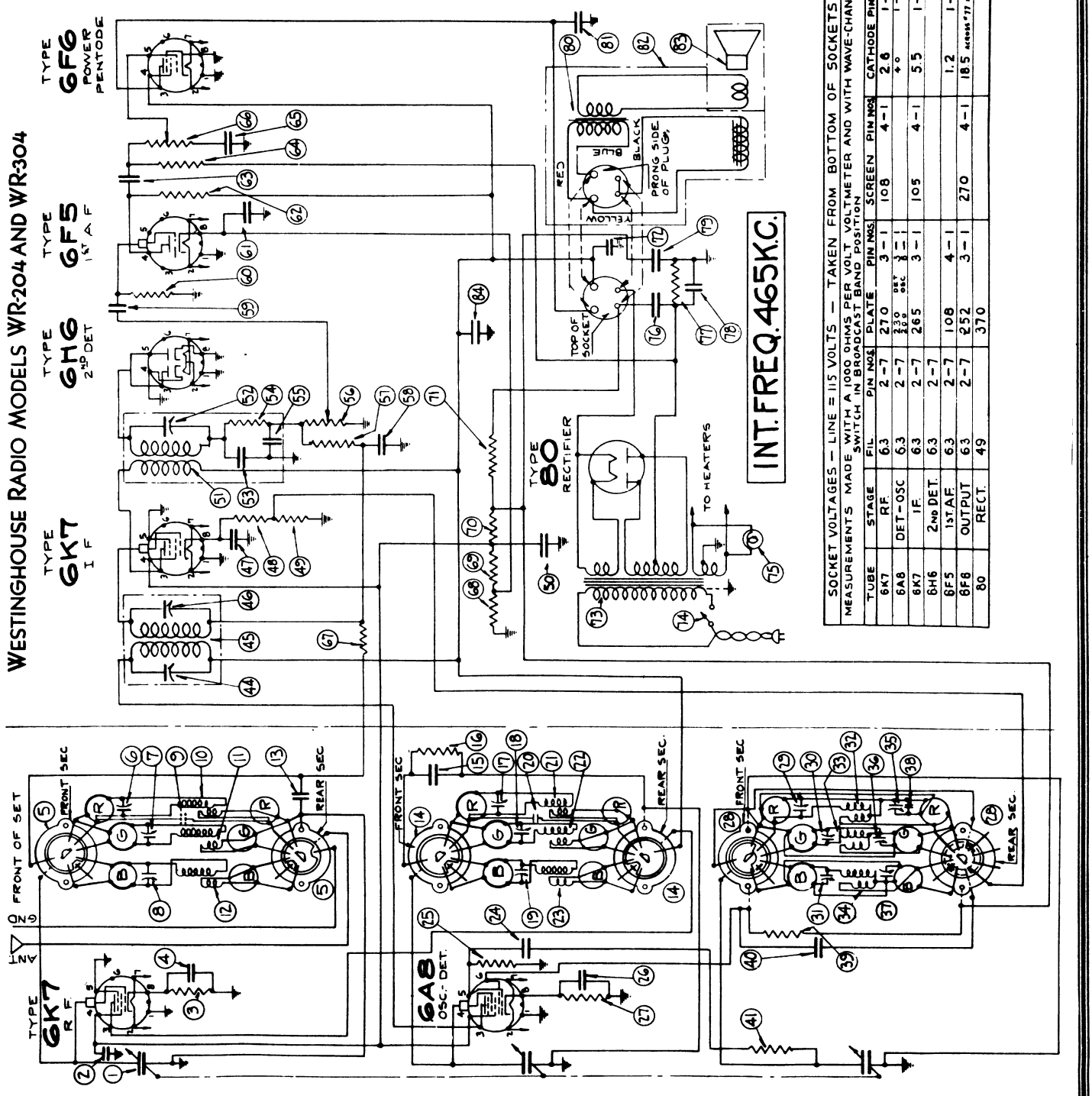
WESTINGHOUSE RADIO MODELS WR-204 AND WR-304



D.C. RESISTANCE
MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION

COIL	DIA. №	PRIM.	SEC.
B-ANT.	12	22 ohms	4 ohms
B-RF.	23	.5 ·	4.5 ·
B-OSC.	34	1.5 ·	3 ·
G-ANT	11	3.2 ·	1 ·
G-RF.	22	1.5 ·	1 ·
G-OSC.	33	.5 ·	1 ·
R-ANT	10	1 ·	.04 ·
R-RF	21	2 ·	.04 ·
R-OSC.	32	.5 ·	.04 ·
1ST. I.F.	45	13 ·	13 ·
2ND I.F.	51	11.5 ·	11.5 ·
OUTPUT TRANS.	80	450 ·	.5 ·
SPKR. FIELD		1900 ·	
VOICE COIL	83	3 ·	

SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	R.F.	6.3	2-7	270	3-1	108	4-1	2.6	1-8
6A8	DET-OSC	6.3	2-7	230 DET. 100 OSC.	3 = 1			4.0	1-8
6K7	I.F.	6.3	2-7	265	3-1	105	4-1	5.5	1-8
6H6	2ND DET.	6.3	2-7						
6F5	1ST A.F.	6.3	2-7	108	4-1			1.2	1-8
6F8	OUTPUT	6.3	2-7	252	3-1	270	4-1	18.5 across 177 ohms	
80	RECT.	4.9		370					

WESTINGHOUSE RADIO MODELS WR 204 AND WR 304

Seven-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes --------- 2 #6K7, 1 #6A8, 1 #6H6, 1 #6F5, 1 #6F6, 1 #80 Total 7
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption ---------- 60 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- (Black Band 540 to 1800 K.C.
(Green Band 1800 to 6000 K.C.
(Red Band 6000 to 18500 K.C.
Line-up Frequencies-I.F.465K.C.,1600K.C.,570K.C.,5500K.C.,1900K.C.,17000K.C., & 6000K.C.

GENERAL DESCRIPTION

This model is a seven-tube, three-band superheterodyne receiver designed for world wide reception and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by a combined first detector-oscillator circuit employing a 6A8 tube. These tubes with their associated circuits, (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". From the high frequency assembly the energy passes thru an I.F. selective transformer and to an I.F. amplifier tube (type 6K7). From here further selection takes place and the energy is sent to the diode (type 6H6) where second detection takes place and voltages are provided for automatic volume control. A first audio amplifier tube (type 6F5) follows the diode and this is further followed by a pentode power amplifier tube (type 6F6). A type 80 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF PRECISION TUNER

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fasten the mounting plate of the wave - change switch shaft to the chassis. Pull switch shaft out straight.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch sections are located on top of the "Precision Tuner" and are indicated by X, Y and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.
   Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the socket before the section can be removed. On the oscillator section, the blue lead from the 6A8 detector-oscillator socket will have to be unsoldered at the switch terminal.
6. After repairs have been made resolder the leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on the gang condenser.
9. Replace the switch shaft and the mounting plate fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slots in each switch disc.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and the first two fingers as shown in figure #1. Pull out the ends of the shields slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling.

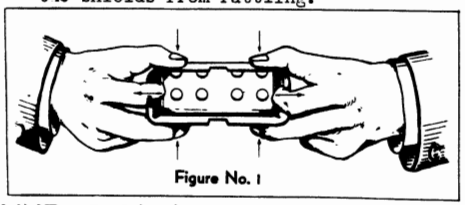


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3 and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and turn tone control to the bass position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measureable reading on output meter when test signal is applied to the grid of the 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmer #52 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 detector-oscillator and adjust #44 and #46 to maximum output.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to the Black or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C.
3. Apply test signal to antenna terminal of chassis thru a .0002 mfd. series condenser and adjust #31, #19 and #8 to maximum output.
4. Set test oscillator and dial indicator to 570 K.C. and adjust #37 to maximum output.
5. Return to 1600 K.C. setting with both test oscillator and dial indicator and readjust #31, #19 and #8 for accuracy.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the two short-wave Bands (Green and Red) a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short wave antenna.

1. Set wave-change switch to the Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #30, #18 and #7 to maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #36 to maximum output.
4. Return to 5500 K.C. setting and make readjustment of #30, #18 and #7.

ADJUSTMENT OF RED BAND

1. Set wave change switch to the Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #29, #17 and #6 to maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #35 to maximum output.
4. Return to 17000 K.C. setting and make readjustment of #29, #17 and #6.
   Note: The adjustment of the two short-wave oscillator lag condensers (#35 and #36) is best made by the max-max. method. This is done as follows:

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading on the output meter. Change the lag condenser further in the same direction retune receiver and note reading. If the output drops with the second adjustment, reverse direction of the adjust of lag condenser. Continue this type of trial and error adjustment until no further improvement can be made when either the tuning control or the lagging condenser are changed. While this proceedure may appear to be difficult, facility can easily be acquired by practice and the operation requires only a few minutes.

IMPORTANT: WHILE TESTING OR MAKING REPAIRS ON THIS RECEIVER THE CHASSIS SHOULD NOT BE TURNED UPSIDE DOWN OR ON ITS SIDE FOR ANY LONG PERIOD OF TIME WHILE THE SET IS TURNED ON AS THE CHEMICALS IN THE ELECTROLYTIC FILTER CONDENSER WILL COME OUT THRU THE AIR VENTS MAKING THE CONDENSER APPEAR TO BE DEFECTIVE. IF THE SET IS LEFT IN THIS POSITION TOO LONG THE CONDENSER MAY BE INJURED.

WESTINGHOUSE ELECTRIC SUPPLY CO.

MODELS WR-204 AND WR-304

SERVICE PARTS LIST

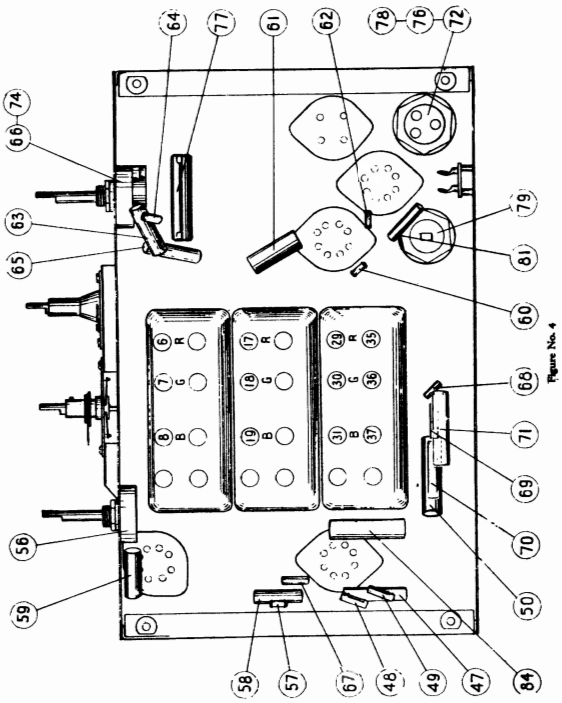


Figure No. 4

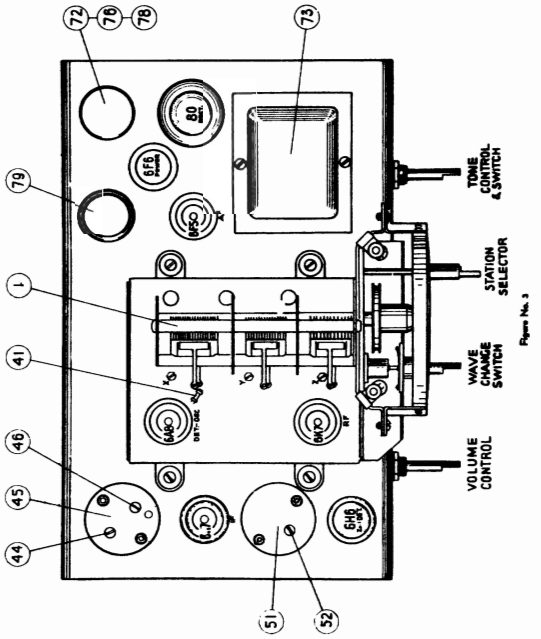
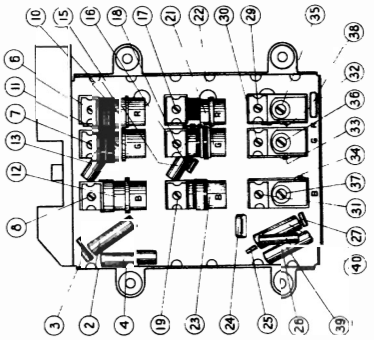


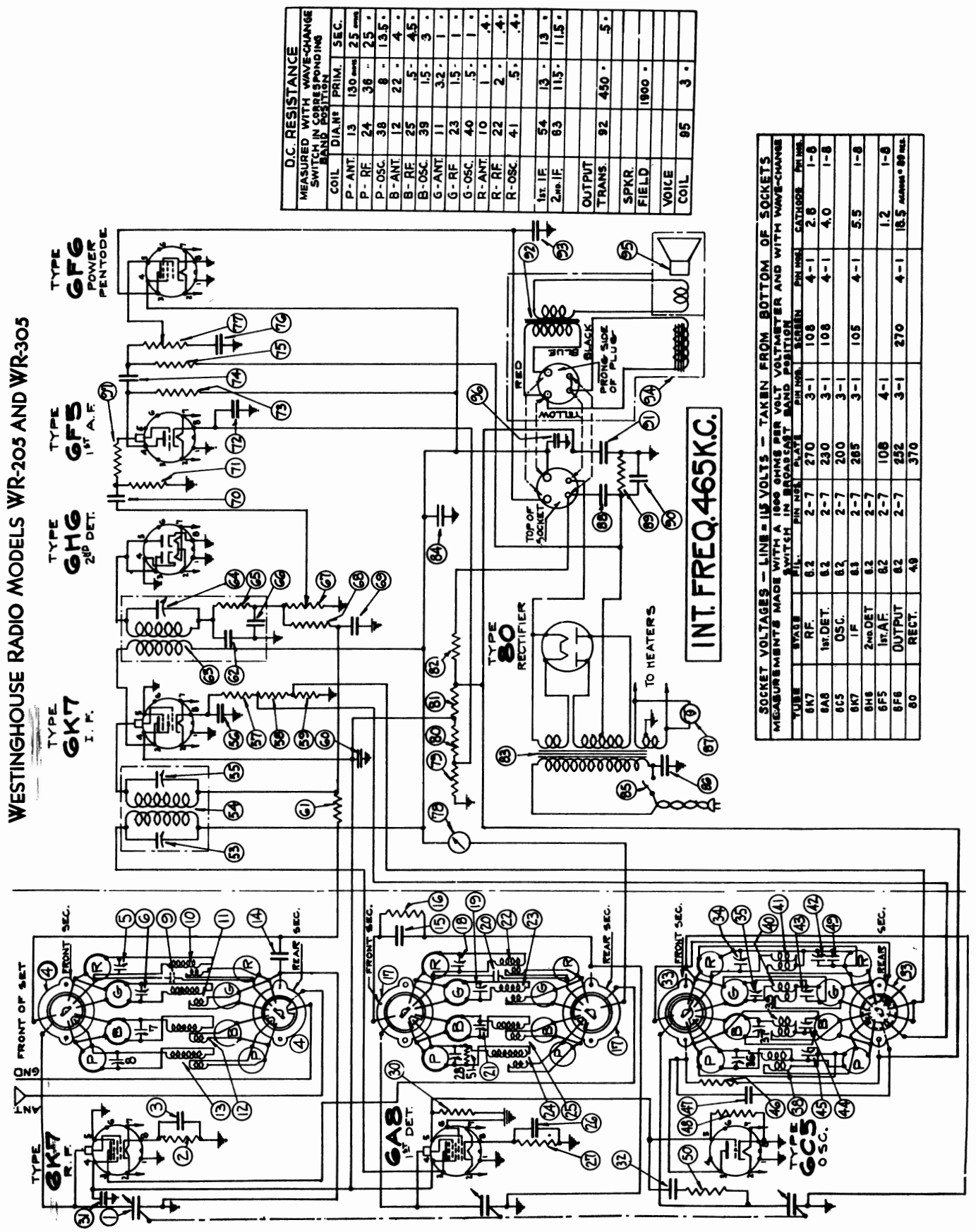
Figure No. 3

Dia. #	Part #	Description of Parts	List Price
1	CG 9527	Variable gang condenser	$ 4.25
2	SA 106386	.05 mfd. 200 V. condenser	.25
3	RE 9529	300 ohm 1/4 W. resistor	.10
4	SA 106386	.05 mfd. 200 V. condenser	.25
5	SW 9527	Ant. section of "Precision Tuner" complete with coils, switch and trimmers	2.30
6	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)	.20
7	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)	.20
8	CS 9511	4 to 25 mmf. antenna trim condenser (Broadcast Band)	.20
9		Twisted pair of wire - part of RC 9571	
10	RC 9571	Antenna coil assembly (Red Band)	.70
11	RC 9574	Antenna coil assembly (Green Band)	.65
12	RC 9577	Antenna coil assembly (Broadcast Band)	1.10
13	CW 9513	.05 mfd. 200 V. condenser	.25
14	SW 9528	R.F. section of "Precision Tuner" complete with coils, switch and trimmers	4.65
15	CW 9513	.05 mfd. 200 V. condenser	.25
16	RE 9527	5000 ohm 1/4 W. resistor	.10
17	CS 9511	4 to 25 mmf. R. F. trim condenser (Red Band)	.20
18	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Green Band)	.20
19	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Broadcast Band)	.20
20	CM 9512	6 mmf. mica condenser	.15
21	RC 9572	R.F. coil assembly (Red Band)	.70
22	RC 9575	R.F. coil assembly (Green Band)	.95
23	RC 9578	R.F. coil assembly (Broadcast Band)	1.15
24	SA 106417	.0001 mica condenser	.20
25	RE 9524	50,000 ohm 1/4 W. resistor	.10
26	SA 106386	.05 mfd. 200 V. condenser	.25
27	RE 9529	300 ohm 1/4 W. resistor	.10
28	SW 9529	Oscillator section of "Precision Tuner", complete with coils, switch, trim and lag condensers	7.75
29		3 to 15 mmf. oscillator trim condenser - part of CS 9520 (Red Band)	
30		3 to 15 mmf. oscillator trim condenser - part of CS 9520 (Green Band)	
31		5 to 25 mmf. oscillator trim condenser - part of CS 9517 (Broadcast Band)	
32	RC 95109	Oscillator coil assembly (Red Band)	1.50
33	RC 9576	Oscillator coil assembly (Green Band)	1.50
34	RC 9579	Oscillator coil assembly (Broadcast Band)	1.50
35		800 to 1600 mfd. oscillator lag condenser - part of CS 9520 (Red Band)	
36		800 to 1600 mfd. oscillator lag condenser - part of CS 9520 (Green Band)	
37		300 to 600 mfd. oscillator lag condenser - part of CS 9517 (Broadcast Band)	
38	CM 959	.002 mfd. mica condenser	.25
39	RE 9526	5000 ohm 1 W. resistor	.20
40	CW 9513	.05 mfd. 200 V. condenser	.25
41	RE 9537	50 ohm 1/4 W. resistor	.10
44		30 to 100 mmf. trim condenser - part of IC 9527	
45	IC 9527	1st I.F. transformer assembly	1.75
46		30 to 100 mmf. trim condenser - part of IC 9527	
47	SA 102493	.05 mfd. 200 V. condenser	.25
48	SA 105261	400 ohm 1/4 W. resistor	.20
49	SA 105267	1000 ohm 1/4 W. resistor	.20
50	SA 102497	.25 mfd. 200 V. condenser	.25
51	IC 9537	2nd I.F. transformer assembly	1.75
52		30 to 100 mmf. trim condenser - part of IC 9537	
53		50 mmf. mica condenser - part of IC 9537	
54		50,000 ohm 1/4 W. resistor - part of IC 9537	
55		100 mmf. mica condenser - part of IC 9537	
56	VR 959	Volume control (1/2 meg.)	1.00
57	RE 9530	1 meg. 1/4 W. resistor	.10
58	SA 106386	.05 mfd. 200 V. condenser	.25
59	CW 9512	.02 mfd. 400 V. condenser	.20
60	RE 9530	1 meg. 1/4 W. resistor	$ .10
61	CE 9515	12 mfd. 25 V. electrolytic condenser	.65
62	SA 105279	250,000 ohm 1/4 W. resistor	.20
63	CW 9512	.02 mfd. 400 V. condenser	.20
64	RE 9531	250,000 ohm 1/4 W. resistor	.10
65	SA 106403	.001 mfd. 600 V. condenser	.20
66	VR 9512	Tone control (1/2 meg.)	1.10
67	SA 105278	100,000 ohm 1/4 W. resistor	.20
68	SA 105260	300 ohm 1/4 W. resistor	.20
69	SA 104966	30,000 ohm 1/2 W. resistor	.20
70	SA 101404	15,000 ohm 1 W. resistor	.25
71	SA 103835	10,000 ohm 2 W. resistor	.55
72	CE 954	4. mfd. 450 V. section of electrolytic condenser	3.50
73	TR 959	Power transformer	5.75
74		Line switch - part of VR 9512	
75	SA 106809	Dial lights 6 V. (3 used)	.15
76		8 mfd. 475 V. electrolytic condenser - part of CE 954	
77	RE 9523	300 ohm resistor	.30
78		20. mfd. 25 V. electrolytic condenser - part of CE 954	
79	CE 9511	8. mfd. 300 V. electrolytic condenser	.95
80	TR 9515	Speaker output transformer	1.85
81	SA 103659	.005 mfd. 400 V. condenser	.30
82	SK 9511	Speaker	7.50
83	SA 107282	Diaphragm and voice coil assembly	1.15
84	SA 102492	.05 mfd. 400 V. condenser	.25



WESTINGHOUSE ELECTRIC SUPPLY CO.

WESTINGHOUSE RADIO MODELS WR-203 AND WR-305



D.C. RESISTANCE
MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION

COIL	DIA.№	PRIM.	SEC.
P-ANT.	13	130 ohms	25 ohms
P-RF.	24	38 "	25 "
P-OSC.	38	8 "	13.5 "
B-ANT.	12	22 "	4 "
B-RF.	25	.5 "	4.5 "
B-OSC.	39	1.5 "	3 "
G-ANT.	11	3.2 "	1 "
G-RF	23	1.5 "	1 "
G-OSC.	40	.5 "	1 "
R-ANT.	10	1 "	.4 "
R-RF.	22	2 "	.4 "
R-OSC.	41	.5 "	.4 "
1st. I.F.	54	13 "	13 "
2nd. I.F.	63	11.5 "	11.5 "
OUTPUT TRANS.	92	450 "	.5 "
SPKR. FIELD		1800 "	
VOICE COIL	85	3 "	

SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	WAVE	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	RF.	6.2	270	2-7	3-1	108	4-1	2.8	1-8
6A8	1st.DET.	6.2	230	2-7	3-1	108	4-1	4.0	1-8
6C5	OSC.	6.2	200	2-7	3-1				
6K7	IF	6.2	285	2-7	3-1	105	4-1	5.5	1-8
6H6	2nd.DET	6.2		2-7					
6F5	1st.AF.	6.2	108	2-7	4-1			1.2	1-8
6F6	OUTPUT	6.2	252	2-7	3-1	270	4-1	18.5 ma.	1-8
80	RECT.	4.8	370						

WESTINGHOUSE ELECTRIC SUPPLY CO.

RADIO MODELS WR-205 AND WR-305

WESTINGHOUSE RADIO MODELS WR-205 AND WR-305

Eight-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes--2 #6K7, 1 #6A8, 1 #6C5, 1 #6H6, 1 #6F5, 1 #6F6, 1 #80-Total 8
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles
Power Consumption ---------- 65 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- (Purple Band 520 to 350 K.C.
(Black Band 540 to 1600 K.C.
(Green Band 1600 to 6000 K.C.
(Red Band 6000 to 18500 K.C.
Line-up Frequencies -- I.F.465 K.C.,350 K.C.,130 K.C.,1600 K.C.,570 K.C.,5500 K.C.,1900 K.C.,17000 K.C., and 6000 K.C.

GENERAL DESCRIPTION

This model is an eight-tube four-band superheterodyne receiver designed for world wide reception including the U.S. Weather Band and employs the new all-metal tubes. The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by the first detector circuit employing a 6A8 tube and a separate oscillator (type 6C5). These tubes with their associated circuits, (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". From the high frequency assembly the energy passes thru an I.F. selective transformer and to an I.F. amplifier tube (type 6K7). From here further selection takes place and the energy is sent to the diode (type 6H6) where second detection takes place and voltages are provided for automatic volume control. A first audio amplifier tube (type 6F5) follows the diode and this is further followed by a pentode power amplifier tube (type 6F6). A type 80 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF PRECISION TUNER

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fasten the mounting plate of the wave-change switch shaft to the chassis frame. Pull switch shaft straight out.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch sections are located on top of the "Precision Tuner" and are indicated by X, Y, and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.

Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the switch terminal before the section can be removed.

On the oscillator section, the plate lead will have to be unsoldered from the 6C5 socket.

6. After repairs have been made resolder the plate leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on gang condenser.
9. Replace the switch shaft and the mounting fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slot in each switch discs.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and the first two fingers as shown in Figure #1. Pull out the ends of the shield slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling.

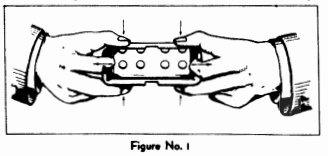


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3 and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and turn tone control to bass position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmer #64 to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector and adjust #63 and #55 to maximum output.

ADJUSTMENT OF PURPLE BAND

1. Set wave-change switch to Purple Band position.
2. Set test oscillator and dial indicator to 350 K.C.
3. Apply test signal to antenna terminal of the chassis thru a .0002 mfd. series condenser and adjust #36, #28 and #8 to maximum output.
4. Set test oscillator and dial indicator to 130 K.C. and adjust #45 to maximum output.
5. Return to 350 K.C. setting with both test oscillator and dial indicator and repeat adjustment of #36, #28 and #8 for accuracy.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to the Black or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C. and adjust #37, #21 and #7 to maximum output.
3. Set test oscillator and dial indicator to 570 K.C. and adjust #44 to maximum output.
4. Return to 1600 K.C. setting and make the readjustment of #37, #21 and #7.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the Green and Red Bands, a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

1. Set wave change-switch to Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #35, #19 and #6 to maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #43 to maximum output.
4. Return to 5500 K.C. setting and make readjustment of #35, #19 and #6.

ADJUSTMENT OF RED BAND

1. Set wave-change switch to Red band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #34, #18 and #5 to maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #42 to maximum output.
4. Return to 17000 K.C. setting and make readjustment of #34, #18 and #5.

Note: The adjustment of the two short-wave oscillator lag condensers (#42 and #43) is best made by the max-max. method. This is done as follows: [see below]

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading of the output meter. Change the lag condenser further in the same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of lag condenser. Continue this type of trial and error adjustment until no further improvement can be made when either the tuning control or the lag condenser are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few minutes.

IMPORTANT: WHILE TESTING OR MAKING REPAIRS ON THIS RECEIVER, THE CHASSIS SHOULD NOT BE TURNED UPSIDE DOWN OR ON ITS SIDE FOR ANY LONG PERIOD OF TIME WHILE THE SET IS TURNED ON AS THE CHEMICALS IN THE ELECTROLYTIC FILTER CONDENSER WILL COME OUT THRU THE AIR VENTS MAKING THE CONDENSER APPEAR TO BE DEFECTIVE. IF LEFT IN THIS POSITION TOO LONG THE CONDENSER MAY BE INJURED.

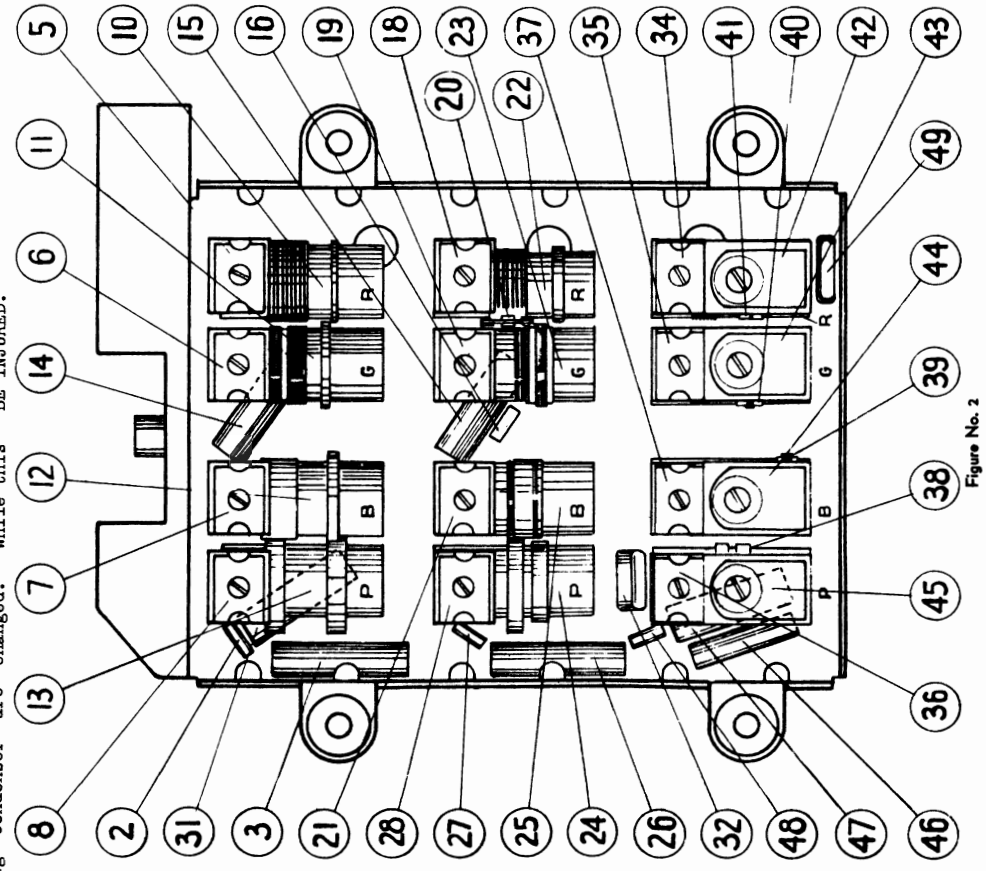


Figure No. 2

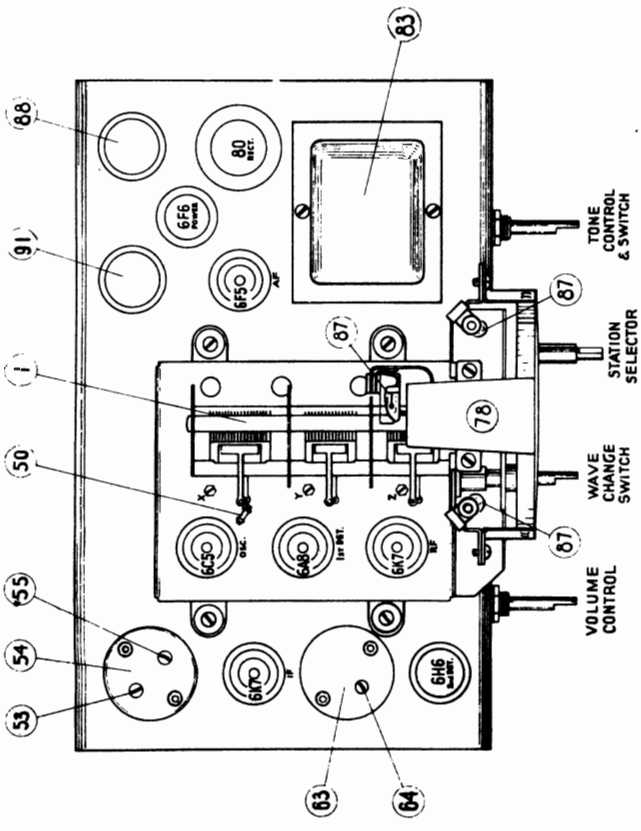
WESTINGHOUSE ELECTRIC SUPPLY CO.

MODELS WR-205 AND WR-305

Dia. No.	Part No.	Description of Parts	List Price
1	CG 9527	Variable condenser assembly	$ 4.25
2	RE 9529	300 ohm 1/4 W. resistor	.10
3	SA 106386	.05 mfd. 200 V. condenser	.25
4	SW 9524	Antenna section "Precision Tuner" assembly complete with switch, coils and trimmers	5.75
5	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)	.20
6	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)	.20
7	CS 9511	4 to 25 mmf. antenna trim condenser (Black Band)	.20
8	CS 9511	4 to 25 mmf. antenna trim condenser (Purple Band)	.20
9		Twisted pair of wires - part of RC 9571	
10	RC 9571	Antenna coil assembly (Red Band)	.70
11	RC 9574	Antenna coil assembly (Green Band)	.65
12	RC 9577	Antenna coil assembly (Black Band)	1.10
13	RC 9580	Antenna coil assembly (Purple Band)	1.25
14	CW 9513	.05 mfd. 200 V. condenser	.25
15	CW 9513	.05 mfd. 200 V. condenser	.25
16	RE 9527	5000 ohms 1/4 W. resistor	.10
17	SW 9525	R.F. section "Precision Tuner" assembly complete with switch, coils and trimmers	6.00
18	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)	.20
19	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Green Band)	.20
20	CM 9512	6. mmf. mica condenser	.15
21	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Black Band)	.20
22	RC 9572	R.F. coil assembly (Red Band)	.70
23	RC 9575	R.F. coil assembly (Green Band)	.95
24	RC 9581	R.F. coil assembly (Purple Band)	1.10
25	RC 9578	R.F. coil assembly (Black Band)	1.15
26	SA 106386	.05 mfd. 200 V. condenser	.25
27	RE 9529	300 ohm 1/4 W. resistor	.10
28	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Purple Band)	.20
29	CM 9511	.000065 mfd. mica condenser	.15
30	RE 9534	100,000 ohm 1/4 W. resistor	.10
31	SA 106386	.05 mfd. 200 V. condenser	.25
32	CM 9511	.000065 mfd. mica condenser	.15
33	SW 9526	Oscillator section "Precision Tuner" assembly complete with switch, coils and trimmers	9.75
34		1.5 to 10 mmf. trim condenser part of CS 9519 (Red Band)	
35		3. to 15 mmf. trim condenser - part of CS 9520 (Green Band)	
36		10 to 35 mmf. trim condenser - part of CS 9518 (Purple Band)	
37		5 to 25 mmf. trim condenser - part of CS 9517 (Black Band)	
38	RC 9582	Oscillator coil assembly (Purple Band)	1.40
39	RC 9579	Oscillator coil assembly (Black Band)	1.50
40	RC 9576	Oscillator coil assembly (Green Band)	1.50
41	RC 9573	Oscillator coil assembly (Red Band)	1.25
42		800 to 1600 mmf. lag condenser - part of CS 9519 (Red Band)	
43		800 to 1600 mmf. lag condenser - part of CS 9520 (Green Band)	
44		300 to 600 mmf. lag condenser - part of CS 9517 (Black Band)	
45		60 to 150 mmf. lag condenser - part of CS 9518 (Purple Band)	
46	RE 9526	5000 ohm 1 W. resistor	.20
47	CW 9513	.05 mfd. 200 V. condenser	.25
48	RE 9524	50,000 ohm 1/4 W. resistor	.10
49	CM 959	.002 mfd. mica condenser	.25
50	RE 9537	50 ohm 1/4 W. resistor	.10
51	RE 9534	100,000 ohm 1/4 W. resistor	.10
53		I.F. trimmer - part of IC 9527	
54	IC 9527	1st I.F. transformer	1.75
55		I.F. trimmer - part of IC 9527	
56	SA 102493	.05 mfd. 200 V. condenser	.25

Dia. No.	Part No.	Description of Parts	List Price
57	SA 105261	400 ohm 1/4 W. resistor	$ .20
58	SA 105267	1000 ohm 1/4 W. resistor	.20
59	SA 105249	5000 ohm 1/4 W. resistor	.20
60	SA 102497	.25 mfd. 200 V. condenser	.35
61	SA 105278	100,000 ohm 1/4 W. resistor	.20
62		50 mmf. mica condenser - part of IC 9537	
63	IC 9537	2nd I.F. transformer	1.75
64		I.F. trim condenser - part of IC 9537	
65		50,000 ohm 1/4 W. resistor - part of IC 9537	
66		100 mmf. mica condenser - part of IC 9537	
67	VR 959	Volume control - 500,000 ohm	1.00
68	RE 9530	1 meg. 1/4 W. resistor	.10
69	SA 106386	.05 mfd. 200 V. condenser	.25
70	CW 9512	.02 mfd. 400 V. condenser	.20
71	RE 9530	1 meg. 1/4 W. resistor	.10
72	CE 9515	12 mfd. 25 V. electrolytic condenser	.65
73	SA 105279	250,000 ohms 1/4 W. resistor	.20
74	CW 9512	.02 mfd. 400 V. condenser	.20
75	RE 9531	250,000 ohm 1/4 W. resistor	.10
76	SA 106403	.001 mfd., 600 V. condenser	.20
77	VR 9512	Tone control (500,000 ohm)	1.10
78	SI 9538	Tuning meter assembly	2.30
79	SA 105260	300 ohm 1/4 W. resistor	.20
80	SA 104966	30,000 ohm 1/2 W. resistor	.20
81	SA 105815	10,000 ohm 1 W. resistor	.25
82	RE 9540	7000 ohm 2 W. resistor	.30
83	TR 959	Power transformer	5.75
84	SA 102492	.05 mfd. 400 V. condenser	.25
85		Line switch - part of VR 9512	
86	CW 959	.01 mfd. 600 V. condenser	.40
87	SA 106809	Dial light (6.3 volt)	.15
88		8 mfd. 475 V. electrolytic condenser - part of CE 954	3.50
89	RE 9523	300 ohm muter resistor	.30
90		20 mfd. 25 V. electrolytic condenser - part of CE 954	
91	CE 9518	8 mfd. 300 V. electrolytic condenser	1.10
92	TR 9515	Speaker output transformer	1.85
93	SA 103659	.005 mfd. 400 V. condenser	.30
94	SK 9511	Speaker - complete	7.50
95	SA 107282	Diaphragm and coil assembly	1.15
96		4 mfd. electrolytic condenser - part of CE 954	
97	RE 9534	100,000 ohm 1/4 W. resistor	.10

Part No.	Description of Parts	List Price
	MAIN ASSEMBLIES	
CH 9555	Chassis assembly	
CH 9537	Chassis assembly "Precision Tuner"	
KA 9527	Cabinet	
SK 9511	Speaker	7.50
	CABLE AND CABLE ASSEMBLIES	
CB 9512	Line cable with plug	.50
PR 97160	Cable - dial drive	.05
FP 103164	Spring for dial cable	.05
	CONDENSERS	
CS 9517	Dual trim condenser (Black Band)	.55
CS 9518	Dual trim condenser (Purple Band)	$ .50
CS 9519	Dual trim condenser (Red Band)	.75
CS 9520	Dual trim condenser (Green Band)	.75



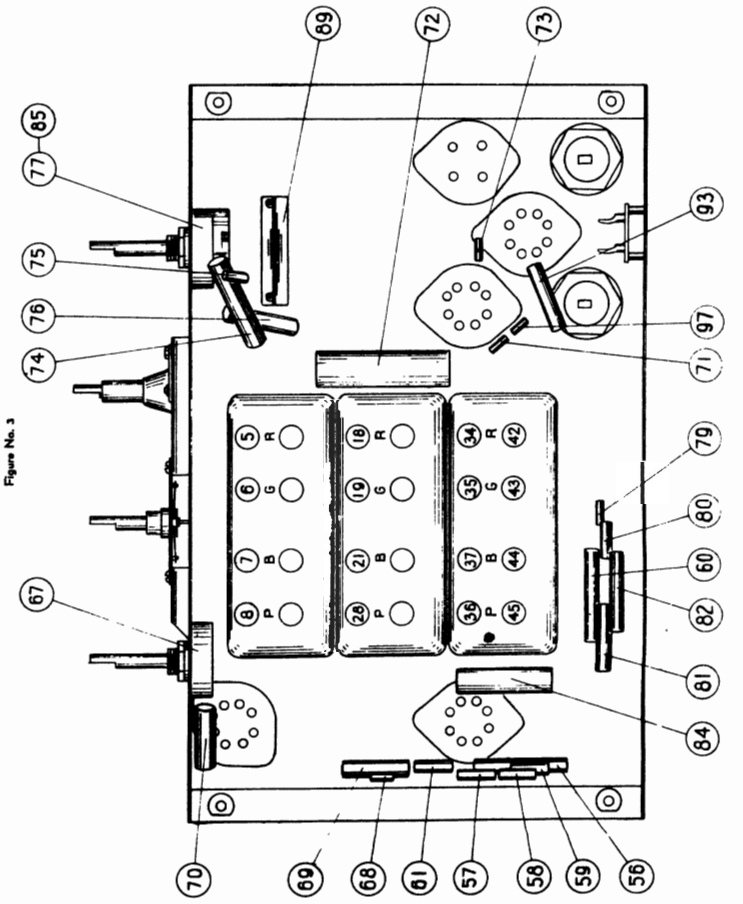
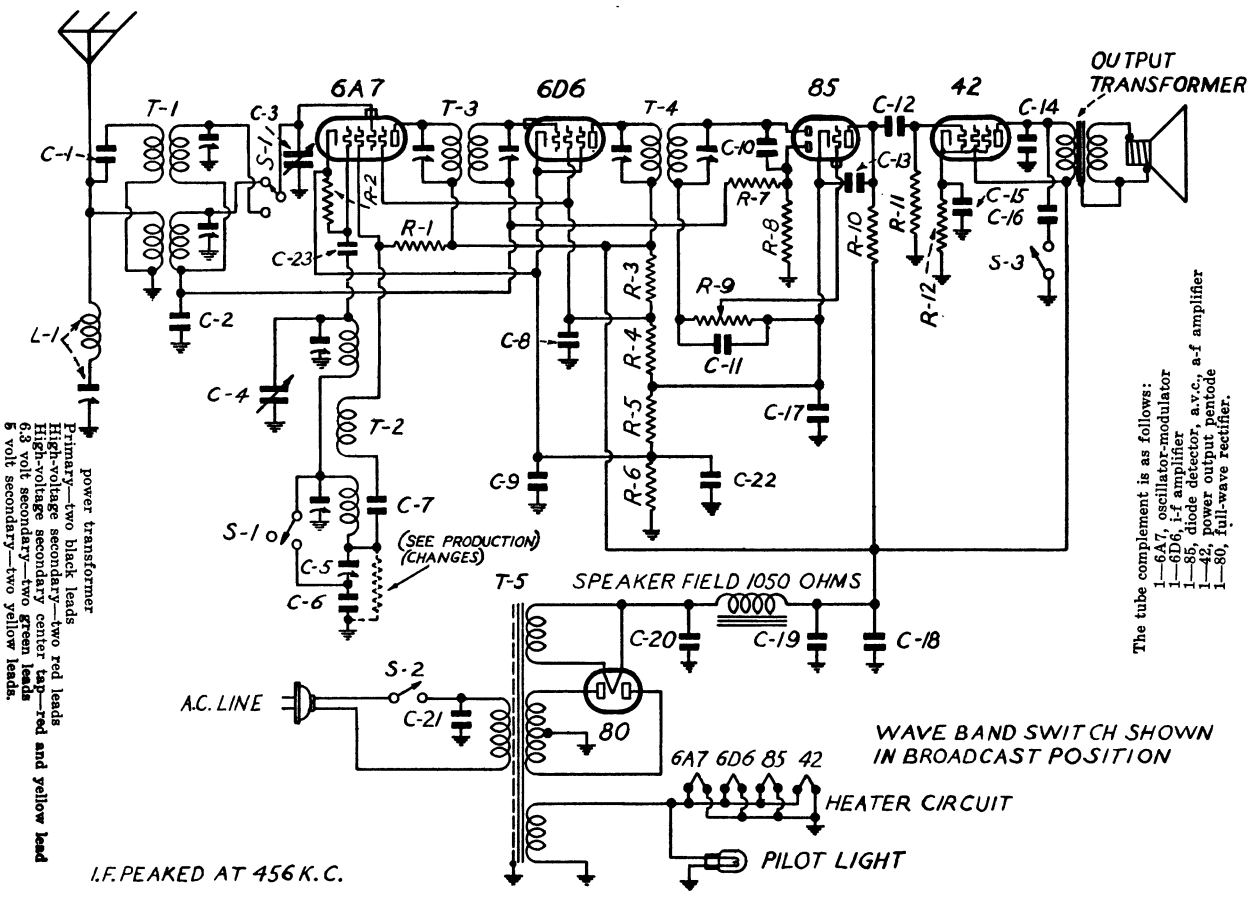


Figure No. 3

WESTINGHOUSE ELECTRIC SUPPLY CO.

MODEL WR208



SCHEMATIC DIAGRAM

REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION	List Price Effective as of Sept. 15, 1935 PRICE
L1	MMT-149	*456 kc adjustable wave trap	$ .85
T1	2NT-226	Two-band antenna coil	1.10
T2	2NT-227	Two-band oscillator coil	.90
T3	2NT-230	456 kc first i-f transformer	.90
T4	2NT-231	456 kc second i-f transformer	.90
T5	2NT-233	Power transformer	2.70
R1	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R2	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R3	BR-12	25,000 ohm 1 watt carbon resistor	.16
R4	2NR-217	40,000 ohm 1 watt carbon resistor	.16
R5	FFR-126	500 ohm ½ watt wire-wound resistor	.16
R6	1IR-130	150 ohm ½ watt wire-wound resistor	.16
R7, R8	KR-57	1 megohm ¼ watt carbon resistor	.16
R9, S2	2NR-214	Volume control with line switch—250,000 ohms	.80
R10	KR-54	100,000 ohm ½ watt carbon resistor	.16
R11	KR-55	500,000 ohm ½ watt carbon resistor	.16
R12	CCR-118	450 ohm 1 watt wire-wound resistor	.16
C1, C23	AAC-106A	0.00005 mf mica condenser	.16
C2, C8	BC-12	0.05 mf, 200 volt tubular condenser	.16
C3, C4	2NC-228	Two gang variable condenser	2.00
C5	2NC-231	Single adjustable padding condenser Range—300 to 600 mmf	.35
C6	2NC-230	0.00135 mf mica condenser	.20
C7	KC-58	0.01 mf, 400 volt tubular condenser	.16
C9	BC-13	0.25 mf, 200 volt tubular condenser	.16
C10, C11, C22	AC-7A	0.00025 mf mica condenser	.16
C12	LC-65	0.02 mf, 400 volt tubular condenser	.16
C13	IC-47	0.0005 mf mica condenser	.16
C14	ZC-115	0.006 mf, 1000 volt tubular condenser	.16
C15	IC-43A	Tubular 5 mf, 25 volt dry electrolytic condenser	.60
C16	2TC-189	0.015 mf, 1000 volt tubular condenser	.16
C17	AC-6	0.1 mf, 200 volt tubular condenser	.16
C18	EEC-182	0.1 mf, 400 volt tubular condenser	.16
C19	2NC-247	16 mf, 405 volt wet electrolytic condenser (regulating type)	.80
C20	2NC-246	16 mf, 450 volt wet electrolytic condenser	.80
C21	2NC-250	0.01 mf, 250 volt a-c condenser in tubular metal container	.20
	2NS-122	6½" dynamic speaker	8.75
S1	TTS-111E	Wave-band switch	.40
S3	2TS-146B	Tone control switch	.25
	XL-9	Pilot light, 6.3 volt, .25 amp. Mazda No. 46	.15
	2ND-34B	Airplane dial	1.80
	2NP-206	Escutcheon with crystal	.50
	2TM-211	Escutcheon reflector ring	.10

PRODUCTION CHANGES

In early production:

a. Airplane dial was part number 2ND-34 and had a grey dial face. Later dial, part number 2ND-34B, has a black dial face.

b. C19 and C20 were each 12 mf, 450 volt electrolytics.

c. R2 was originally in position indicated by dotted lines. It was later placed across the oscillator grid and cathode of the 6A7 tube (as now shown in the schematic) and at the same time C23 was added and C22 omitted.

VOLTAGE ANALYSIS

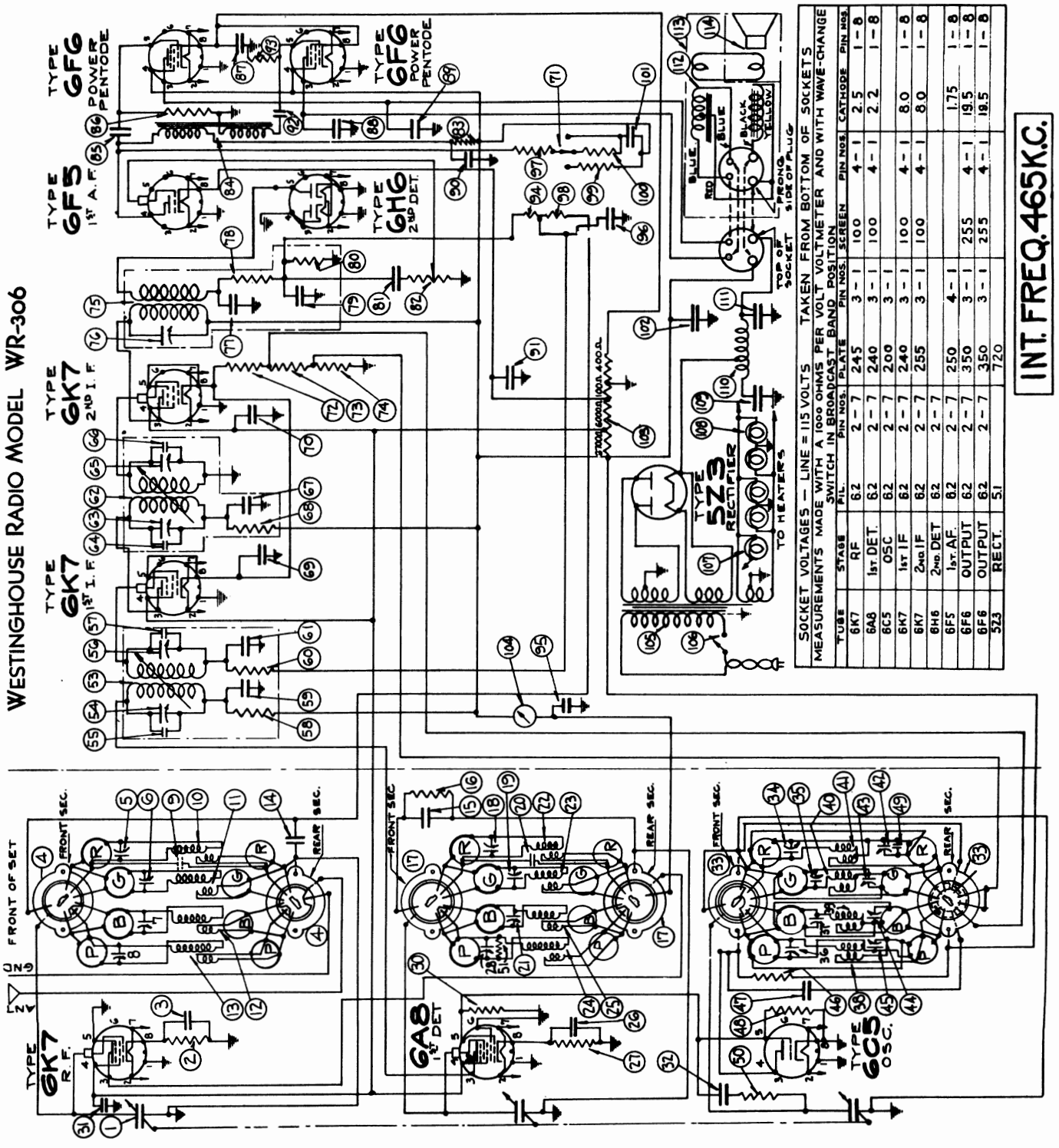
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis). Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	255	90	3.5	170	6.3 a.c.
6D6	255	90	3.5	—	6.3 a.c.
85	37	—	15.5	—	6.3 a.c.
42	240	255	15.0	—	6.3 a.c.

B plus at filament of 80 tube—325 volts
Voltage across speaker field—70 volts.

WESTINGHOUSE ELECTRIC SUPPLY CO.

WESTINGHOUSE RADIO MODEL WR-306



D.C. RESISTANCE MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. №	PRIM.	SEC.
P-ANT.	13	130 ohms	2.5 ohms
P-RF.	24	36 "	2.5 "
P-OSC.	38	8.0 "	13.5 "
B-ANT.	12	22 "	4 "
B-RF.	25	.5 "	4.5 "
B-OSC.	39	1.5 "	3 "
G-ANT.	11	3.2 "	1 "
G-RF.	23	1.5 "	1 "
G-OSC.	40	.5 "	1 "
R-ANT.	10	1 "	.4 "
R-RF.	22	2 "	.4 "
R-OSC.	41	.5 "	.4 "
1ST. I.F.	53	3.5 "	3.5 "
2ND. I.F.	82	3.5 "	3.5 "
3RD. I.F.	75	11.5 "	11.5 "
CHOKE	110	350 "	
1ST. A.F. TRANS.	84	3200 "	3800 "
OUTPUT TRANS.	112	265 " 312 "	.03 "
SPKR. FIELD		1900 "	
VOICE COIL	114		2.6 "

SOCKET VOLTAGES — LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PLATE PIN NOS.	PLATE	SCREEN PIN NOS.	SCREEN	CATHODE PIN NOS.	CATHODE	PIN NOS.
6K7	RF	6.2	2 - 7	245	3 - 1	100	4 - 1	2.5	1 - 8
6A8	1ST. DET.	6.2	2 - 7	240	3 - 1	100	4 - 1	2.2	1 - 8
6C5	OSC	6.2	2 - 7	200	3 - 1				
6K7	1ST IF	6.2	2 - 7	240	3 - 1	100	4 - 1	8.0	1 - 8
6K7	2ND IF	6.2	2 - 7	255	3 - 1	100	4 - 1	8.0	1 - 8
6H6	2ND. DET	6.2	2 - 7						
6F5	1ST. A.F.	6.2	2 - 7	250	4 - 1			1.75	1 - 8
6F6	OUTPUT	6.2	2 - 7	350	3 - 1	255	4 - 1	19.5	1 - 8
6F6	OUTPUT	6.2	2 - 7	350	3 - 1	255	4 - 1	18.5	1 - 8
523	RECT.	5.1		720					

WESTINGHOUSE ELECTRIC SUPPLY CO.

MODEL WR-306

Ten-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes --- 3#6K7, 1#6A8, 1#6C5, 1#6H6, 1#6P5, 2#6P6, 1#5Z3 - Total 10
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles
Power Consumption ---------- 90 Watts
Maximum Undistorted Output ---------- 8 Watts
Maximum Output ---------- 10 Watts
Tuning Ranges ---------- (Purple Band 120 K.C. to 350 K.C. (White Band 540 K.C. to 1800 K.C. (Green Band 1800 K.C. to 6000 K.C. (Red Band 6000 K.C. to 18500 K.C.
Line-Up Frequencies - K.C., 130K.C., 1600K.C., 570K.C., 5500 K.C. 1900K.C., 17000K.C. and 6000 K.C.

GENERAL DESCRIPTION

This model is a ten tube, four band superheterodyne receiver designed for world wide reception including the U.S. Weather Band and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by the first detector circuit employing a 6A8 tube and a separate oscillator (type 6C5). These tubes with their associated circuits (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". In addition the set includes a new and novel development of intermediate frequency circuits which allows the adjustment of the band width of the amplifier to be varied over a wide range. At one end of the range is the most selective condition which allows single channel reception even under the influence of powerful nearby stations. At the other end the transmission characteristic of the amplifier is so changed as to allow transmission without attenuation of frequencies up to 7000 cycles on either side of the carrier. As a matter of fact, the amplifier is overcoupled to such a degree that frequencies in the neighborhood of five thousand cycles on either side of the carrier are transmitted at greater efficiency than frequencies close to the carrier. This design is necessary since radio frequency circuits give rise to some side band attenuation, which must be compensated for in the I.F. amplifier. The net result is a smooth transmission curve over the entire band.

From the oscillator the energy passes thru a variable selector I.F. transformer and tector (6A8) and adjust #54 and #56 to maximum output.

6. After the above I.F. adjustments have been made, replace the stop-screw to original position.

ADJUSTMENT OF PURPLE BAND

Note: During all of the subsequent adjustments, the selectivity control should be turned to the left or counter-clockwise direction.

1. Set wave-change switch to the purple band position.
2. Set test oscillator and dial indicator to 350 K.C. and apply test signal to antenna terminal of the chassis thru a .0002 mfd. series condenser and adjust #36, #28 and #8 to maximum output.
3. Set test oscillator and dial indicator to 130 K.C. and adjust #45 to maximum output.
4. Return to 350 K.C. setting with both test oscillator and dial indicator and repeat adjustment of #36, #28 and #8 for accuracy.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to White or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C. and adjust #37, #21 and #7 to maximum output.
3. Set test oscillator and dial indicator to 570 K.C. and adjust #44 to maximum output.
4. Return to 1600 K.C. setting and make readjustment of #37, #21 and #7.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the Green and Red Bands, a .0002 mfd. condenser and a 400 ohms resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short wave antenna.

1. Set wave-change switch to the Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #35, #19 and #6 to maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #43 to maximum output.
4. Return to 5500 K.C. setting and make readjustment of #35, #19 and #6.

ADJUSTMENT OF RED BAND

1. Set wave-change switch to Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #34, #18 and #5 to maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #42 to maximum output.
4. Return to 17000 K.C. setting and make readjustment of #34, #18 and #5.

Note: The adjustment of the two short-wave oscillator lag condensers (#42 and #43) is best made by the max-max. method. This is done as follows:

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading of the output meter. Change the lag condenser further in the same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of lag condenser. Continue this type of trial and error adjustment until no further improvement can be made when either the tuning control or the lag condenser are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few minutes.

IMPORTANT: WHILE TESTING OR MAKING REPAIRS ON THIS RECEIVER, THE CHASSIS SHOULD NOT BE TURNED UPSIDE DOWN OR ON ITS SIDE FOR ANY LONG PERIOD OF TIME WHILE THE SET IS TURNED ON AS THE CHEMICALS IN THE ELECTROLYTIC FILTER CONDENSER WILL COME OUT THRU THE AIR VENTS MAKING THE CONDENSER APPEAR TO BE DEFECTIVE. IF LEFT IN THIS POSITION TOO LONG THE CONDENSER MAY BE INJURED.

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	CG 9527	Variable condenser assembly	$ 4.25
2	RE 9529	300 ohms ½ W. resistor	.10
3	SA 106386	.05 mfd. 200 V. condenser	.25
4	SW 9524	Antenna section "Precision Tuner" assembly complete with switch, coils and trimmers	5.75
5	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)	.20
6	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)	.20
7	CS 9511	4 to 25 mmf. antenna trim condenser (White Band)	.20
8	CS 9511	4 to 25 mmf. antenna trim condenser (Purple Band)	.20
9		Twisted pair of wires-part of RC 9571	
10	RC 9571	Antenna coil assembly (Red Band)	.70
11	RC 9574	Antenna coil assembly (Green Band)	.65
12	RC 9577	Antenna coil assembly (White Band)	1.10
13	RC 9580	Antenna coil assembly (Purple Band)	1.25
14	CW 9513	.05 mfd. 200 V. condenser	.25
15	CW 9513	.05 mfd. 200 V. condenser	.25
16	RE 9527	5000 ohms ½ W. resistor	.10
17	SW 9525	R.F. section "Precision Tuner" assembly complete with switch, coils and trimmers	6.00
18	CS 9511	4. to 25 mmf. R.F. trim condenser (Red Band)	.20
19	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Green Band)	.20
20	CM 9512	6. mmf. mica condenser	.15
21	CS 9512	1.5 to 10 mmf. R.F. trim condenser (White Band)	.20
22	RC 9572	R.F. coil assembly (Red Band)	.70
23	RC 9575	R.F. coil assembly (Green Band)	.95
24	RC 9581	R.F. coil assembly (Purple Band)	1.10
25	RC 9578	R.F. coil assembly (White Band)	1.15
26	SA 106386	.05 mfd. 200 V. condenser	.25
27	RE 9529	300 ohms 1/4 W. resistor	.10
28	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Purple Band)	.20
30	RE 9534	100,000 ohms ½ W. resistor	.10
31	SA 106386	.05 mfd. 200 V. condenser	.25
32	CM 9511	.000065 mfd. mica condenser	.20
33	SW 9526	Oscillator section "Precision Tuner" assembly complete with switch, coils and trimmers	9.75
34		1.5 to 10 mmf. trim condenser (Red Band) part of CS 9519	
35		3. to 15. mmf. trim condenser-part of CS 9520 (Green Band)	
36		10 to 35 mmf. trim condenser-part of CS 9518 (Purple Band)	
37		5 to 25 mmf. trim condenser-part of CS 9517 (White Band)	
38	RC 9582	Oscillator coil assembly (Purple Band)	1.40
39	RC 9579	Oscillator coil assembly (White Band)	1.50
40	RC 9576	Oscillator coil assembly (Green Band)	1.50
41	RC 9573	Oscillator coil assembly (Red Band)	1.25
42		800 to 1600 mmf. lag condenser-part of CS 9519 (Red Band)	
43		800 to 1600 mmf. lag condenser-part of CS 9520 (Green Band)	
44		300 to 600 mmf. lag condenser-part of CS 9517 (White Band)	
45		60 to 150 mmf. lag condenser-part of CS 9518 (Purple Band)	
46	RE 9526	5000 ohms 1 W. resistor	.20
47	CW 9513	.05 mfd. 200 V. condenser	.25
48	RE 9524	50,000 ohms ½ W. resistor	.10
49	CM 959	.002 mfd. mica condenser	.25
50	RE 9537	50 ohms ½ W. resistor	.10
51	RE 9534	100,000 ohms ½ W. resistor	.10
53	IC 9529	1st I.F. transformer assembly	3.65
54		250 to 350 mmf. I.F. trim condenser-part of IC 9529..	
55	SA 106417	.0001 mfd. mica condenser	
56		250 to 350 mmf. I.F. trim condenser-part of IC 9529..	
57	SA 106417	.0001 mfd. mica condenser	.20
58	RE 9527	5000 ohms ½ W. resistor	.10
59	SA 103659	.005 mfd. 400 V. condenser	.30
60	RE 9534	100,000 ohms ½ W. resistor	.10
61	SA 103659	.005 mfd. 400 V. condenser	.30
62	IC 9530	2nd I.F. transformer assembly	3.45
63		250 to 350 mmf. I.F. trim condenser-part of IC 9530..	
64	SA 106417	.0001 mfd. mica condenser	.20
65		250 to 350 mmf. I.F. trim condenser-part of IC 9530..	

socket.

6. After repairs have been made resolder the plate leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on gang condenser.
9. Replace the switch shaft and the mounting fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slot in each switch discs.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and first two fingers as shown in figure #1. Pull out the ends of the shield slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling

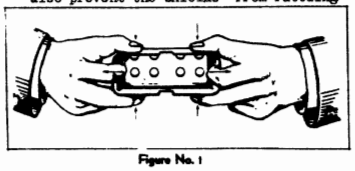


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

CAUTION: DO NOT INTERFERE WITH THE I.F. ALIGNMENT OF THIS RECEIVER EXCEPT WHEN IT HAS BEEN ABSOLUTELY DETERMINED THAT THIS IS THE CAUSE OF THE TROUBLE AND ONLY WHEN HIGH GRADE TESTING EQUIPMENT IS TO BE USED.

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3, and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

NOTE: BECAUSE OF THE VARIABLE SELECTIVITY INCORPORATED IN THIS RECEIVER, IT IS IMPORTANT THAT THE PROCEDURE OUTLINED BELOW BE FOLLOWED IN ORDER TO OBTAIN ACCURATE ALIGNMENT.

THE I.F. TRIMMERS ARE ADJUSTED ONLY WHEN THE VARIABLE SELECTOR COILS ARE PLACED IN A PARTICULAR MECHANICAL POSITION.

TO PROPERLY SET THE I.F. TRANSFORMERS, TURN THE FIDELITY CONTROL TO THE EXTREME RIGHT OR CLOCKWISE POSITION. ADJUST THE PULLEY WHEELS ON THE BOTTOM OF THE TWO VARIABLE I.F. COILS IN A COUNTER-CLOCKWISE DIRECTION UNTIL THEY ARE AGAINST THE STOPS. THIS IS DONE BY TIGHTENING UP THE CORDS WHICH OPERATE THE PULLEYS.

THE CIRCUITS ARE SO DESIGNED THAT THE SENSITIVITY OF THE RECEIVER CHANGES VERY LITTLE FROM MAXIMUM SELECTIVITY TO MAXIMUM FIDELITY. IN ORDER TO ALIGN THE CIRCUITS PROPERLY, IT IS NECESSARY TO HAVE LESS COUPLING IN THE INDIVIDUAL I.F. TRANSFORMER THAN THAT PROVIDED BY THE MAXIMUM SELECTIVITY SETTING.

TO OBTAIN THIS LESSER COUPLING MERELY TURN THE SCREW (INDICATED BY "W" IN FIGURE #3), WHICH ACTS AS A STOP TO LIMIT SELECTIVITY, OUT ABOUT 1/4 INCH FROM ITS ORIGINAL SETTING. THIS ALLOWS A MOVEMENT OF THE VARIABLE COILS WHICH PUTS THE RECEIVER IN A VERY SELECTIVE BUT LESS SENSITIVE CONDITION. WITH THE CONTROL IN THIS POSITION ALIGN THE I.F. STAGES AS FOLLOWS:

1. Set volume control on full and connect output meter across voice coil of speaker.
2. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 2nd I.F. tube (6K7) thru a .5 mfd. blocking condenser.
3. Adjust trimmer #76 to maximum output, reducing output of test oscillator as required.
4. Apply test signal to grid of 1st I.F. tube (6K7) and adjust #63 and #65 to maximum output.
5. Apply test signal to grid of 1st de-

WESTINGHOUSE ELECTRIC SUPPLY CO.

MODEL WR-306

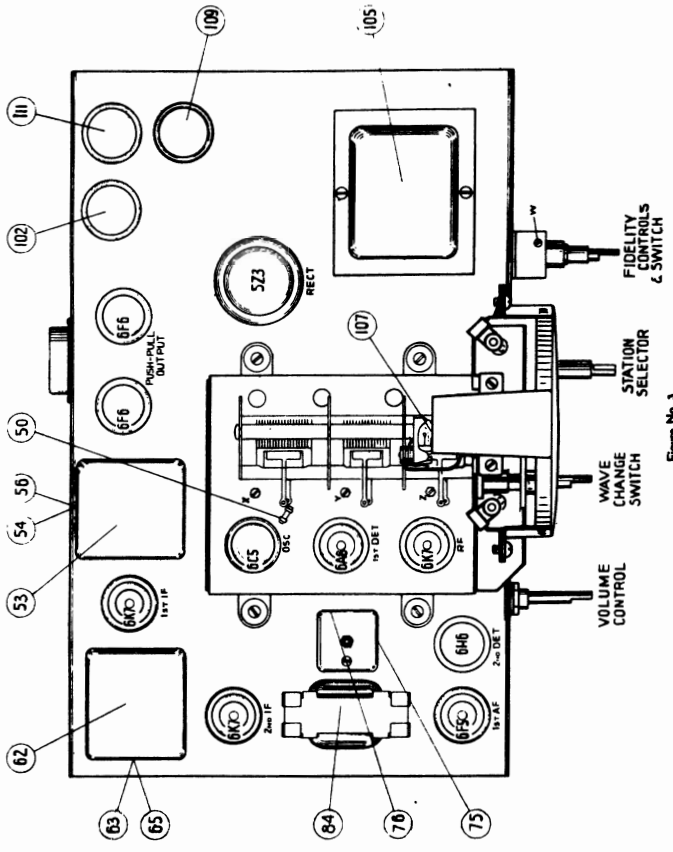


Figure No. 3

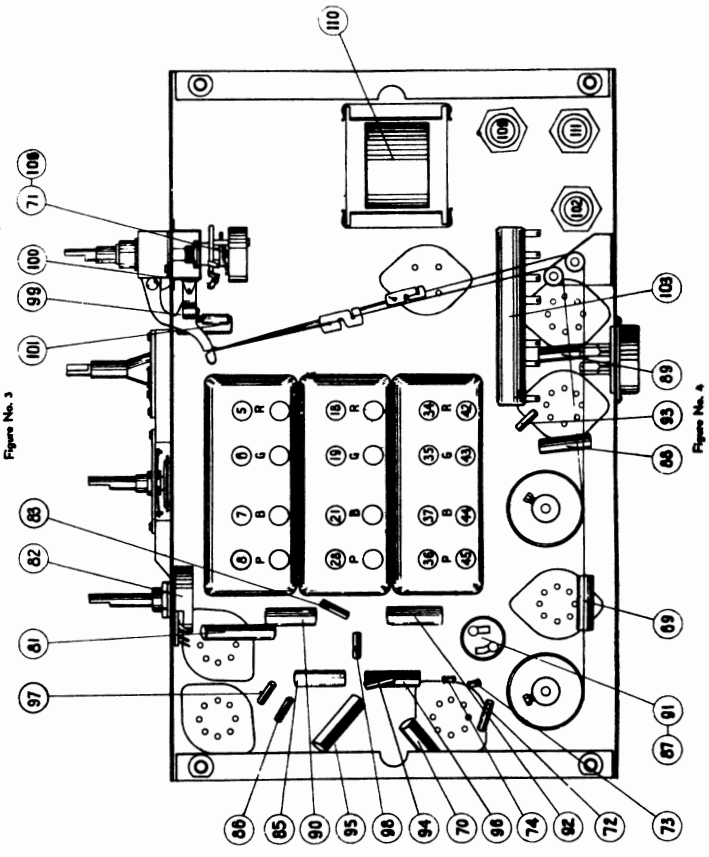


Figure No. 4

66	SA 106417	.0001 mfd. mica condenser	.20
67	SA 103659	.005 mfd. 400 V. condenser	.30
68	RE 9527	5000 ohms ½ W. resistor	.10
69	SA 106396	.05 mfd. 200 V. condenser	.25
70	SA 106386	.05 mfd. 200 V. condenser	.25
71	VR 9511	Tone control switch	1.25
72	SA 105267	1000 ohms ½ W. resistor	.20
73	RE 9528	1000 ohms ½ W. resistor	.10
74	RE 9538	4000 ohms ½ W. resistor	.10
75	IC 9526	3rd I.F. transformer	1.90
76		25 to 100 mmf. I.F. trim condenser-part of IC 9526	
77		.00005 mfd. mica condenser-part of IC 9526	
78		100,000 ohms ½ W. resistor-part of IC 9526	
79		.0001 mfd. mica condenser-part of IC 9526	
80		250,000 ohms ½ W. resistor-part of IC 9526	
81	SA 102504	.02 mfd. 400 V. condenser	.20
82	VR 9510	Volume control (1 meg.)	1.00
83	SA 105249	5000 ohms ½ W. resistor	.20
84	TR 9516	Input transformer	3.25
85	CW 9512	.02 mfd. 400 V. condenser	.20
86	SA 105279	½ meg. ½ W. resistor	.20
87		10 mfd. 25 V. elect. condenser-part of SA 107913	
88	SA 103852	.002 mfd. 600 V. condenser	.25
89	SA 103852	.002 mfd. 600 V. condenser	.25
90	CW 9512	.02 mfd. 400 V. condenser	.20
91		10 mfd. 25 V. elect. condenser-part of SA 107913	
92	CW 9512	.02 mfd. 400 V. condenser	.20
93	SA 105279	½ meg. ½ W. resistor	.20
94	SA 105281	1 meg. ½ W. resistor	.20
95	SA 102492	.05 mfd. 400 V. condenser	.25
96	SA 106386	.05 mfd. 200 V. condenser	.25
97	SA 105274	20,000 ohms ½ W. resistor	.20
98	SA 105279	250,000 ohms ½ W. resistor	.20
99	SA 105277	75,000 ohms ½ W. resistor	.20
100	RE 9536	20,000 ohms ½ W. resistor	.10
101	CW 9512	.02 mfd. 400 V. condenser	.20
102	CE 9517	18. mfd. 300 V. electrolytic condenser	1.10
103	RE 9521	Voltage divider resistor 13,200 ohm tapped	1.00
104	SI 9538	Tuning meter assembly	2.30
105	TR 9517	Power transformer	6.25
106		Line switch-part of VR 9511	
107	LP 952	Tuning meter light (3.2 volts)	.15
108	LP 952	Dial lights (4 used) (3.2 volts)	.15
109	CE 9516	8. mfd. 450 V. electrolytic condenser	1.10
110	SA 101696	Choke coil assembly	2.25
111	CE 9516	8. mfd. 450 V. electrolytic condenser	1.10
112	TR 9513	Speaker output transformer	2.00
113	SK 959	Speaker	10.75
114	DM 956	Diaphragm and voice coil assembly	1.25

MAIN ASSEMBLIES

CH 9540	Chassis assembly
CH 9537	Chassis assembly - "Precision Tuner" unit

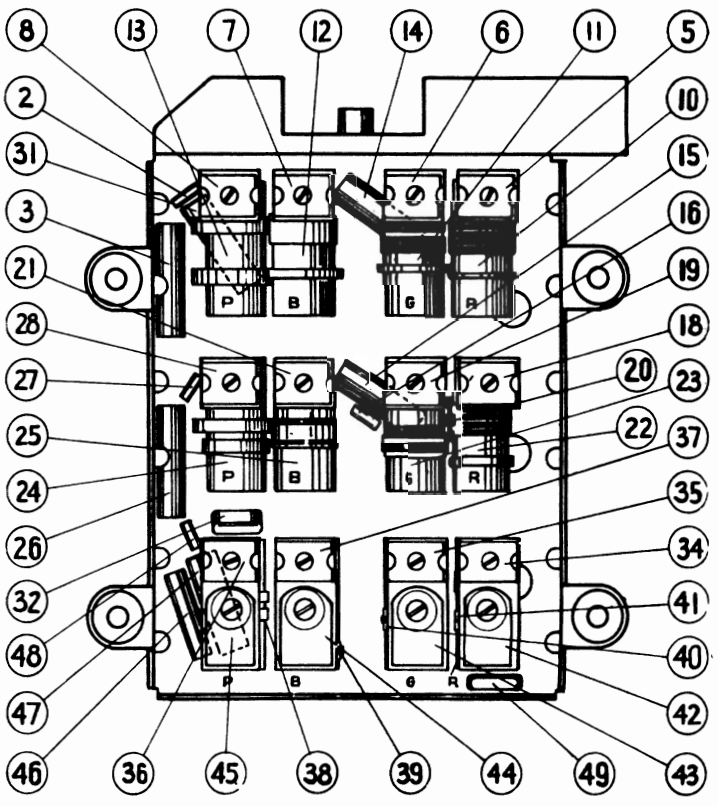
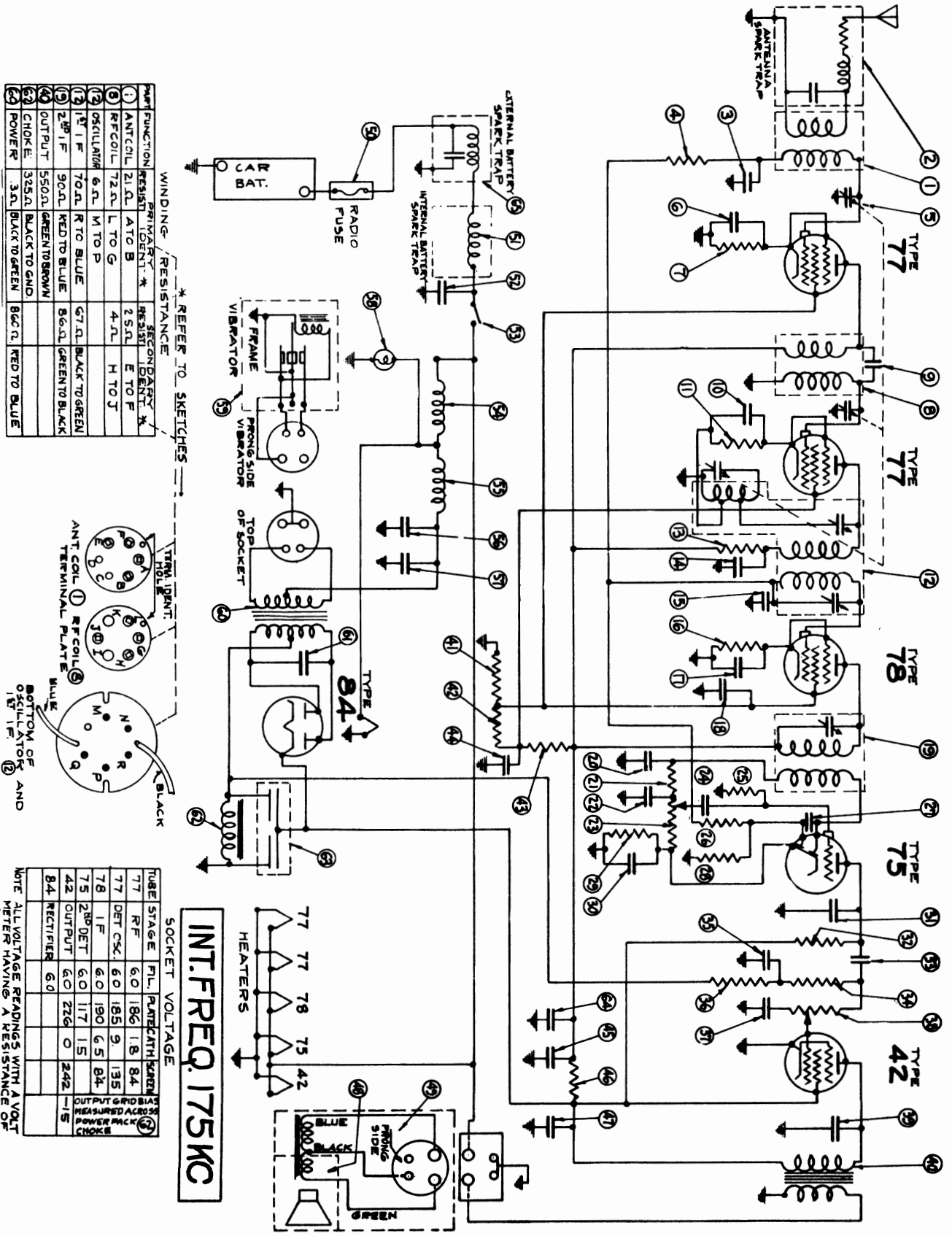


Figure No. 2

WESTINGHOUSE ELECTRIC SUPPLY CO.

WESTINGHOUSE CAR-RADIO MODEL WR-500



* REFER TO SKETCHES

WINDING RESISTANCE

PART	FUNCTION	PRIMARY RESIST	PRIMARY IDENT. *	SECONDARY RESIST	SECONDARY IDENT. *
①	ANT. COIL	21 Ω.	A TO B	25 Ω.	E TO F
⑧	RF COIL	72 Ω.	L TO G	4 Ω.	H TO J
⑫	OSCILLATOR	6 Ω.	M TO P		
⑫	1ST I F	70 Ω.	R TO BLUE	67 Ω.	BLACK TO GREEN
⑬	2ND I F	90 Ω.	RED TO BLUE	86 Ω.	GREEN TO BLACK
㊵	OUTPUT	550 Ω.	GREEN TO BROWN		
㊷	CHOKE	325 Ω.	BLACK TO GND.		
㊹	POWER	3 Ω.	BLACK TO GREEN	866 Ω.	RED TO BLUE

SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	ATH	SCREEN	
77	RF	6.0	186	1.8	84	
77	DET OSC.	6.0	185	9.	135	
78	IF	6.0	190	6.5	84	
75	2ND DET	6.0	117	1.5		
42	OUTPUT	6.0	226	0	242	−15
84	RECTIFIER	6.0				

OUTPUT GRID BIAS MEASURED ACROSS ㊲ ㊳ POWER PACK CHOKE

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω. PER VOLT

WESTINGHOUSE ELECTRIC SUPPLY CO.

CAR-RADIO MODEL WR-500

CAR-RADIO MODEL WR-500
SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 2 #77, 1 #78, 1 #75, 1 #42, 1 #84 - Total 6
Battery Current (6.3 Volt Battery) ..... 6.5 Amperes
Tuning Range ..... 540 K.C. to 1500 K.C.
Maximum Undistorted Output ..... 3. Watts
Maximum Output ..... 4. Watts
Line-up Frequencies ..... I.F. 175 K.C., 1400 K.C., 1500 K.C.

CIRCUIT DESCRIPTION

The circuit of this receiver is of the superheterodyne type employing a type 77 tube as a radio frequency amplifier, a type 77 as a combined first detector-oscillator, a type 78 as an intermediate frequency amplifier, a type 75 as a combined second detector, A.V.C. audio amplifier, a type 42 in the power output stage and a type 84 as a rectifier in the power supply.

The circuit is designed and adjusted for minimum internal noise and equipped with efficient motor noise traps in both antenna and battery circuits making use of spark plug suppressors unnecessary in most installations.

SERVICE DATA

CHANGING TUBES OR VIBRATOR: These components may be changed without removing the set from the car. Remove the three thumb screws around the side of the housing. Pull cover off perpendicular to the bulkhead. The speaker is attached to the set by means of a plug and should be detached. Withdraw defective tube or vibrator and replace with similar component. See Fig. #1 for location of tubes and vibrator.

Replace the cover being careful not to allow the speaker cable to get in a position which might interfere with the rotation of the gang condenser. In replacing the cover, it should be so rotated that the name plate is nearest to the control cables. The guide on the rim of the cover should then be engaged in the slot on the housing and the cover should be pressed on to the housing. The three thumb screws are then replaced, care being taken not to strip the threads and yet to provide a secure attachment of the cover to the housing.

CHANGING PILOT LIGHT BULB: The bulb is located in a socket on the end of the lead at the rear of control head, and can easily be replaced by pulling the socket straight out.

REMOVING CHASSIS FROM HOUSING: If it is necessary to remove the chassis, for serving, proceed as follows:

1. Disconnect battery and pilot light cable: at the receiver and the antenna cable from the car antenna lead.

2. Detach the flexible control head shafts from the receiver by removing the round thumb screws from the shaft receptacles.

3. Remove receiver from bulkhead.

4. Remove cover and detach speaker as described above.

5. Remove the four screws and lock washers which hold the chassis in the housing, also the screw in the antenna cable shield.

6. Turn the receiver upside down and remove the housing from its position around the set, being careful to withdraw the antenna cable without injuring it.

7. After making the necessary repairs, replace the chassis in the housing by first threading the antenna cable through the large hole in the housing to the right of control cable entrances. Replace the five screws in the chassis and antenna shield, and tighten securely.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed, or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a test oscillator is available, then proceed as follows and refer to Fig. #1.

(A) I.F. ADJUSTMENT (175 K.C.)

1. Set output of test oscillator to 175 K.C. and turn condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

2. Connect output meter across voice coil of speaker. This can be done by connecting one lead of the output meter to the blue lead soldered to the speaker terminal strip and with the other output meter lead connected to the metal of the chassis. Impedance of voice coil is 3 ohms.

3. Apply test signal to grid of 78 I.F. tube thru a .5 mfd. blocking condenser.

4. Adjust trimmer "A" (see fig. #1) to maximum output reducing test oscillator output as required.

5. Apply test signal to grid of 77 detector-oscillator and adjust "B" and "C" to maximum output.

6. Leaving test oscillator connected to this same tube, change setting of test oscillator to 1500 K.C.

7. Rotate condenser gang until the rotor plates are wide open. Place a piece of paper (approximately .015 thick) between the rotor and stator at the bottom of the gang, and close the rotor to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1500 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

8. Adjust trimmer "D" to maximum output and remove the paper gauge.

9. Set test oscillator to 1400 K.C. and apply test signal to grid of 77 R.F. tube.

10. Set condenser gang to 1400 K.C. and adjust trimmer "E" to maximum output.

11. Apply test signal to antenna of set thru a .0002 mfd. condenser and adjust trimmer "F" to maximum output.

12. Check sensitivity at several different settings of condenser gang.

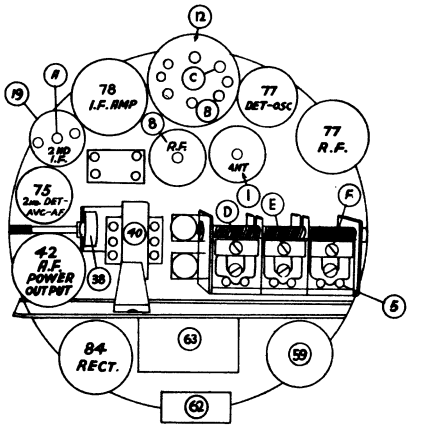


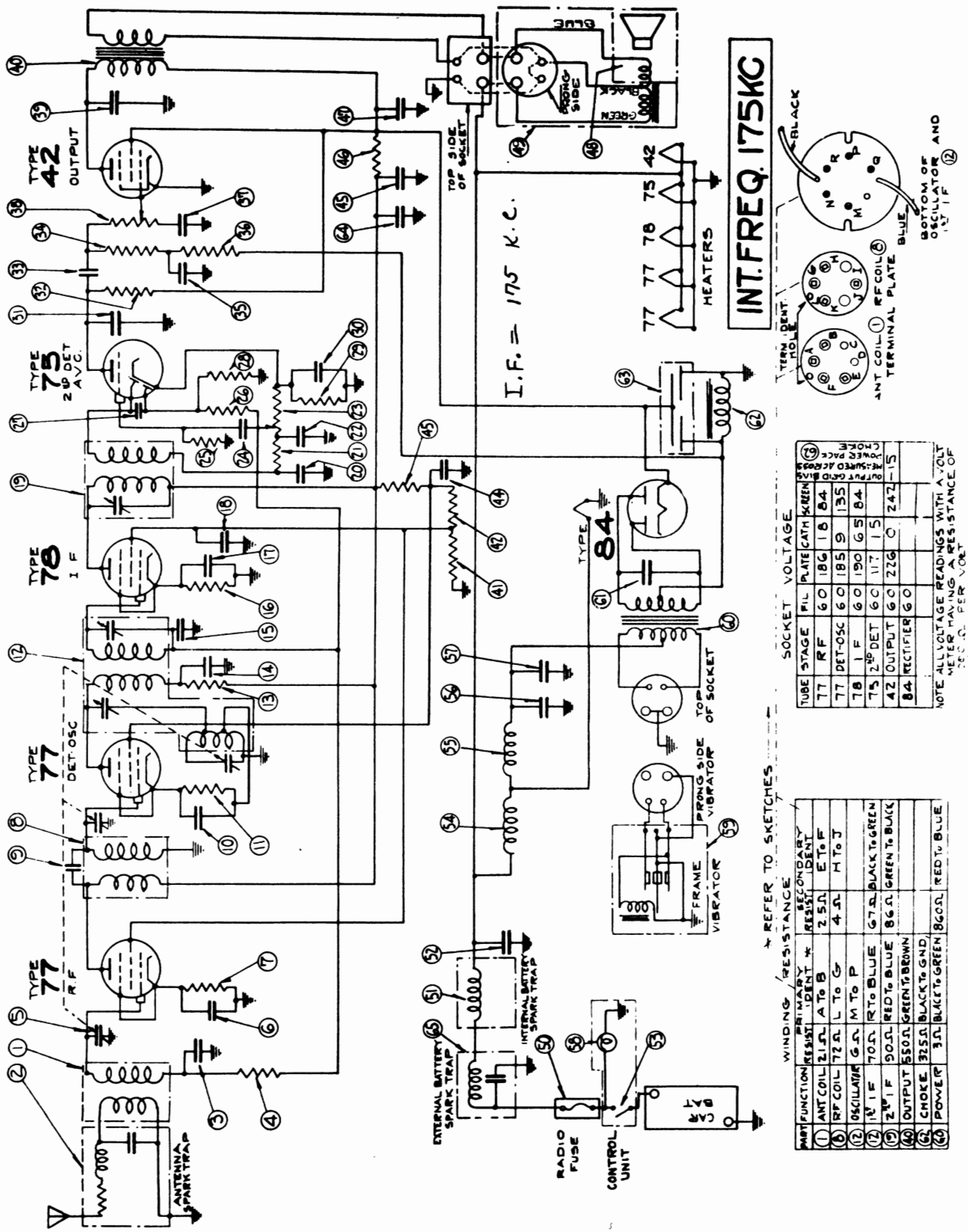
Figure No. 1
Top view of chassis

SERVICE PARTS LIST

Dia. #	Part #	Description of Parts	List Price
1	RC 9554	Antenna coil assembly	*
2	CC 952	Antenna spark trap complete with cable	1.00
3	SA 106386	.05 mfd. 200 V. condenser	1.95
4	SA 105278	100,000 ohms 1/4 W. resistor	.25
5	CG 954	Variable condenser assembly	.20
6	SA 106386	.05 mfd. 200 V. condenser	4.60
7	SA 105264	500 ohms 1/4 W. resistor	.25
8	RC 957	R.F. coil assembly	.20
9		Twisted wire	.95
10	SA 103852	.002 mfd. 500 V. condenser	.25
11	SA 105247	7500 ohms 1/4 W. resistor	.20
12	RC 958	Composite coil assembly	2.20
13	SA 105245	2000 ohms 1/4 W. resistor	.20
14	SA 102492	.05 mfd. 350 V. condenser	.25
15	SA 106386	.05 mfd. 200 V. condenser	.25
16	SA 105270	2500 ohms 1/4 W. resistor	.20
17	SA 102497	.25 mfd. 200 V. condenser	.35
18	CW 951	.1 mfd. 200 V. condenser	.20
19	IC 951	I.F. coil assembly complete with trimmer condenser	1.50
20	SA 106417	.0001 mfd. mica condenser	.20
21	SA 105276	50,000 ohms 1/4 W. resistor	.20
22	SA 106417	.0001 mfd. mica condenser	.20
23	VR 951	Volume control and switch (1/2 meg.)	1.25
24	SA 103659	.005 mfd. 350 V. condenser	.30
25	SA 105281	1 meg. 1/4 W. resistor	.20
26	SA 105246	1/2 meg. 1/4 W. resistor	.20
27	SA 106417	.0001 mfd. mica condenser	.20
28	SA 105246	1/2 meg. 1/4 W. resistor	.20
29	SA 105249	5000 ohms 1/4 W. resistor	.20
30	SA 102497	.25 mfd. 200 V. condenser	.35
31	SA 103852	.002 mfd. 500 V. condenser	.25
32	SA 105278	100,000 ohms 1/4 W. resistor	.20
33	SA 103659	.005 mfd. 350 V. condenser	.50
34	SA 105279	250,000 ohms 1/4 W. resistor	.20
35	CW 951	.1 mfd. 200 V. condenser	.20
36	SA 105279	250,000 ohms 1/4 W. resistor	.20
37	SA 106403	.001 mfd. 500 V. condenser	.20
38	VR 952	Tone control (250,000 ohms)	.90
39	CW 952	.005 mfd. 500 V. condenser	.20
40	TR 952	Output transformer	1.25
41	SA 105277	75,000 ohms 1/4 W. resistor	.20
42	SA 105274	20,000 ohms 1/4 W. resistor	.20
43	SA 105274	20,000 ohms 1/4 W. resistor	.20
44	SA 102492	.05 mfd. 350 V. condenser	.25
45	SA 102496	.25 mfd. 350 V. condenser	.35
46	SA 107572	5000 ohms 1 W. resistor	.20
47	CM 951	.001 mfd. mica condenser	.40
48	DM 951	Speaker diaphragm and voice coil assembly	1.75
49	SK 955	Speaker assembly complete with plug.	5.50
50	FU 951	Fuse (20 amperes)	.05
51	RC 9512	Filter choke coil	.45
52	CM 953	.00005 mfd. mica condenser	.20
53		Switch - part of VR 951	
54	SA 105452	Filter choke	.30
55	SA 105452	Filter choke	.30
56	CW 953	.5 mfd. 200 V. condenser	.55
57	CW 953	.5 mfd. 200 V. condenser	.55
58	LP 956	Pilot light (6. V-.25 amperes)	.20
59	VI 951	Vibrator	4.50
60	TR 953	Power transformer	3.50
61	SA 106804	.008 mfd. 1600 V. condenser	.25
62	TR 951	B-choke	1.25
63	CE 951	6 and 10 mfd. electrolytic condenser	3.00
64	CM 951	.001 mfd. mica condenser	.25

WESTINGHOUSE ELECTRIC SUPPLY CO.

WESTINGHOUSE CAR-RADIO MODEL WR-502



* REFER TO SKETCHES FOR RESISTANCE WINDING

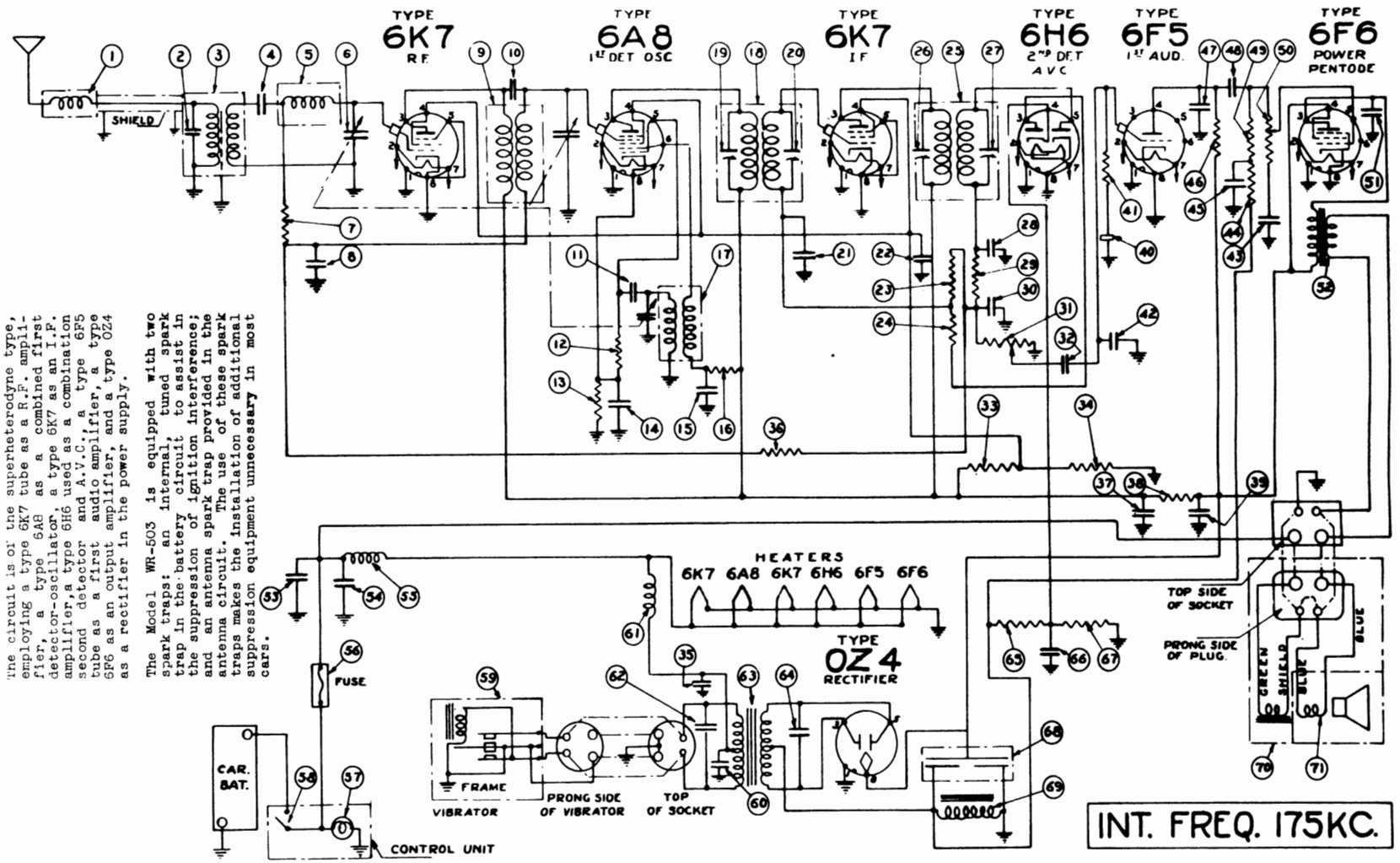
PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT *	SECONDARY RESIST.	SECONDARY IDENT *
①	ANT COIL	2.1Ω	A TO B	2.5Ω	E TO F
⑧	RF COIL	7.2Ω	L TO G	4Ω	H TO J
⑫	OSCILLATOR	6Ω	M TO P		
②	1ST I F	70Ω	R TO BLUE	67Ω	BLACK TO GREEN
⑩	2ND I F	90Ω	RED TO BLUE	86Ω	GREEN TO BLACK
49	OUTPUT	650Ω	GREEN TO BROWN		
62	CHOKE	325Ω	BLACK TO GND		
20	POWER	3Ω	BLACK TO GREEN	860Ω	RED TO BLUE

SOCKET VOLTAGE

TUBE	STAGE	FIL	PLATE	CATH	SCREEN	⑲ REPEAT GRID VOLTAGE MEASURED ACROSS CHOKE
77	RF	6.0	186	1.8	84	
77	DET-OSC	6.0	185	9	135	
78	1 F	6.0	190	6.5	84	
75	2ND DET	6.0	117	1.5		
42	OUTPUT	6.0	226	0	242	-15
84	RECTIFIER	6.0				

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 200 Ω PER VOLT

WESTINGHOUSE CAR-RADIO MODEL WR-503

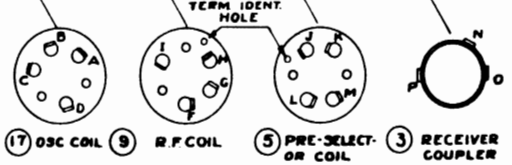


The circuit is of the superheterodyne type, employing a type 6K7 tube as a R.F. amplifier, a type 6A8 as a combined first detector-oscillator, a type 6K7 as an I.F. amplifier, a type 6H6 used as a combination second detector and A.V.C., a type 6F5 tube as a first audio amplifier, a type 6F6 as an output amplifier, and a type OZ4 as a rectifier in the power supply.

The Model WR-503 is equipped with two spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; and an antenna spark trap provided in the antenna circuit. The use of these spark traps makes the installation of additional suppression equipment unnecessary in most cars.

REFER TO SKETCHES →

PART	FUNCTION	WINDING / RESISTANCE PRIMARY RESIST.	PRIMARY IDENT. #	SECONDARY RESIST.	SECONDARY IDENT. #
17	OSC. COIL	3.5Ω	B TO GND.		
9	R.F. COIL	68Ω	F TO G	2Ω	I TO GND.
5	PRE-SEL. COIL			2Ω	J TO K
3	REC. COUP.	4Ω	BAYONET CONN. TO GND.	.1Ω	N TO O
18	1st I.F. COIL	100Ω	BLUE TO RED	100Ω	BK TO GRID (6K7)
25	2nd I.F. COIL	100Ω	BLUE TO RED	100Ω	BK. TO GREEN
39	OUTPUT	520Ω	GR. TO BROWN		
38	B CHOKE	310Ω	BLACK TO GND.		
68	POWER	.24Ω	BLACK TO GR.	840Ω	RED TO BLUE
1	ANT. LOAD	5Ω	BLACK TO BLACK		

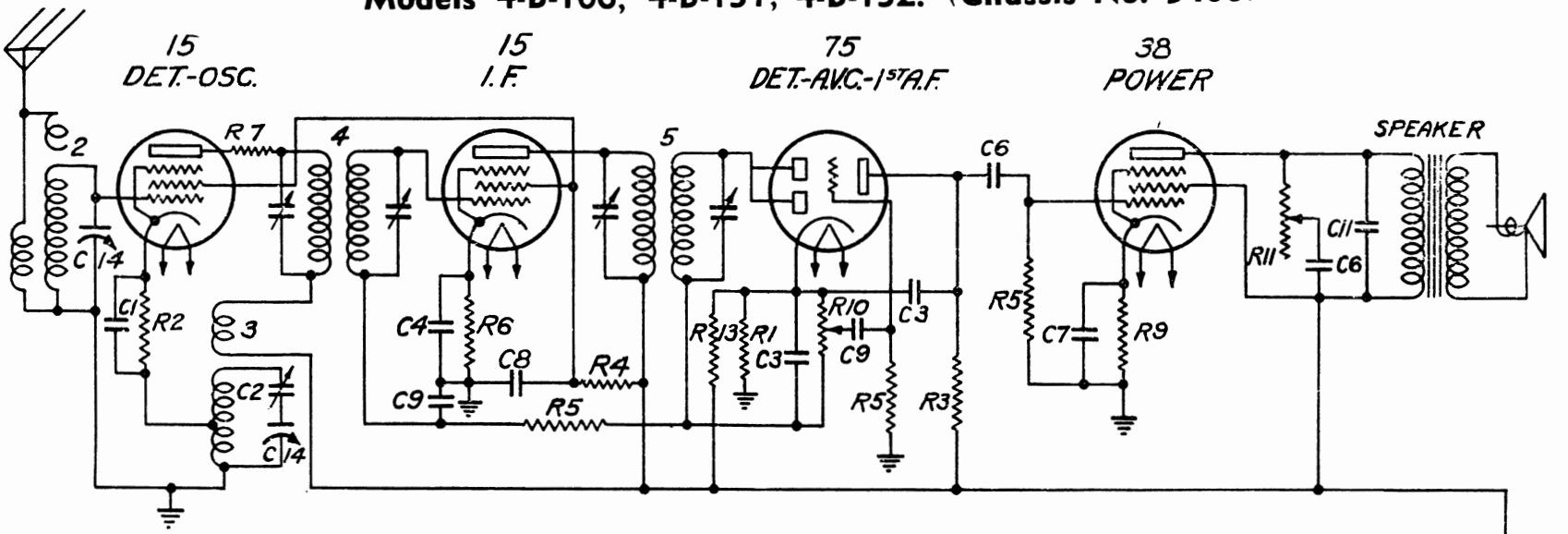


SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	BIAS	SIGNAL GRID
6K7	R.F.	5.8	182		83		
6A8	1st DET. OSC.	5.8	182	4.4	83		138
6K7	I.F.	5.8	162		83		
6H6	2nd DET. A.V.C.	5.8		11.0			
6F5	1st AUD.	5.8	77			-.8	
6F6	POWER PEN	5.8	228		244	-17	
OZ4	RECTIFIER	5.8		244			

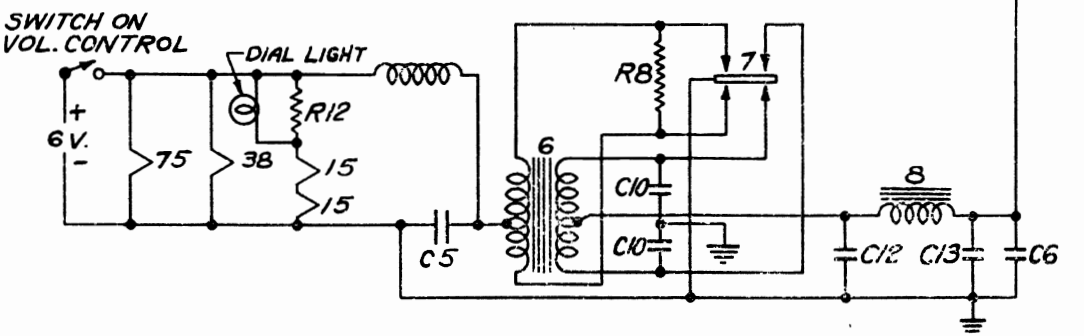
NOTE: ALL VOLTAGE READINGS WITH A VOLTMETER HAVING A RESISTANCE OF 1000 Ω PER VOLT.

Models 4-B-106, 4-B-131, 4-B-132. (Chassis No. 5406)



DIAG Nº	PART Nº	DESCRIPTION	
C1	22-82	.001 MFD	600V
C2	22-205	200-550 MMFD. PADDER	
C3	22-182	.00025 MFD	600V
C4	22-185	.01 MFD	200V
C5	22-199	.5 "	200V
C6	22-212	.05 "	400V
C7	22-225	5 MFD ELECTROLYTIC	25V
C8	22-243	.01 "	400V
C9	22-250	.05 "	200V
C10	22-455	.01 "	1200V
C11	22-358	.002 "	600V
C12	22-419	2 MFD	250V
C13	22-419	8 "	250V
C14	22-426		VARIABLE

DIAG Nº	PART Nº	DESCRIPTION
R13	63-260	100M OHMS 1/4W
1	S-2778	VIB. R.F. CHOKE
2	S-4456	ANT. COIL ASSEM.
3	S-3756	OSC. COIL ASSEM.
4	95-352	1ST I.F. TRANS.
5	95-359	2ND I.F. TRANS.
6	95-300	RECT. TRANS.
7	190-6	VIBRATOR
8	95-298	POWER CHOKE



R1	63-238	1M OHMS 1/4W
R2	63-499	9M " 1/4W
R3	63-258	490M " 1/4W
R4	63-281	29M " 1/4W
R5	63-293	990M " 1/4W
R6	63-303	700 " 1/4W
R7	63-357	300 " 1/4W
R8	63-394	200 " 1/2W
R9	63-418	1500 " 1/2W
R10	63-534	400M " VOL. CONTROL
R11	63-469	100M " TONE "
R12	63-536	30 " WIRE WOUND

SPEAKER		MODELS
49-153	6" P.M.	4-B-131, 4-B-132
49-159	6" P.M.	4-B-106

I.F. = 456 K.C.

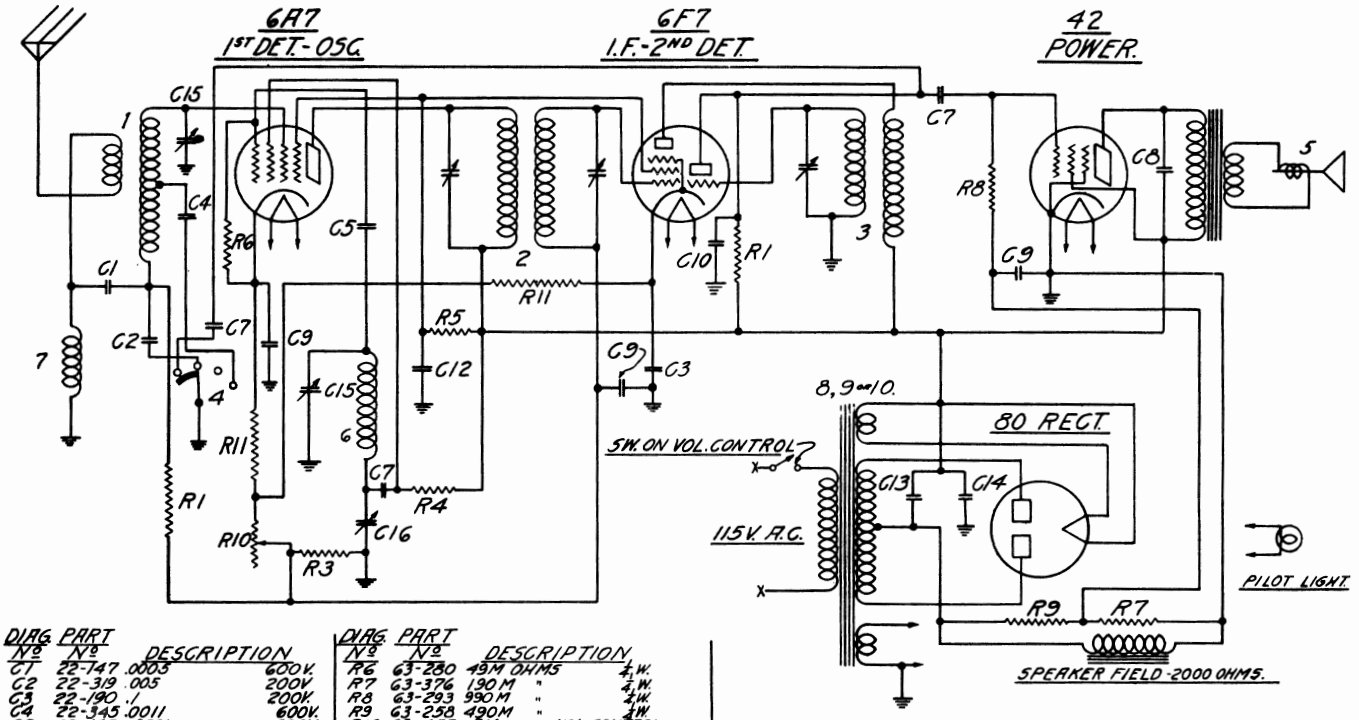
SOCKET VOLTAGES

Tube	Position	Ef	Ek	Eg¹	Eg²	Eg³	Ep
15	1st Det. Osc.	2	8	0	115	—	155
15	I. F.	2	3.5	0	115	—	155
75	2nd Det. A.V.C.	6	1.5	0	—	—	30
38	PWR	6	14	0	155	—	148

f—filament; k—cathode; g¹—control grid; g²—screen grid; g³—suppressor grid; p—plate.

ZENITH RADIO CORP.

Models 4P26, 4T26, 4P51, 4T51 Chassis 5401



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-147	.0003	600V.
C2	22-319	.005	200V.
C3	22-190	.1	200V.
C4	22-345	.0011	600V.
C5	22-162	.0001	600V.
C7	22-243	.01	400V.
C8	22-229	.005	600V.
C9	22-250	.05	200V.
C10	22-358	.002	600V.
C12	22-407	2 MFD. ELECT.	450V.
C13	22-407	8 " "	"
C14	22-407	4 " "	"
C15	22-406	.00036 VARIABLE.	
C16	22-205	200-350 MMFD. PADDER.	
R1	63-290	260M OHMS	½W.
R3	63-300	990	½W.
R4	63-353	19M	½W.
R5	63-263	30M	½W.

DIAG. Nº	PART Nº	DESCRIPTION	
R6	63-280	49M OHMS	½W.
R7	63-376	190M	½W.
R8	63-293	990M	½W.
R9	63-258	490M	½W.
R10	63-455	3M	VOL. CONTROL.
R11	63-265	220	½W.
1	5-3673	ANT. COIL ASSEMBLY.	
2	95-287	1ST I.F. TRANS.	
3	95-284	2ND I.F. TRANS.	
4	85-76	BAND SELECT & TG. SWITCH	
5	49-115	SPEAKER-COMPLETE.	
6	5-3674	OSC. COIL ASSEMBLY.	
7	20-82	ANT. CHOKE.	
8	95-297	115-V-60 CYCLE TRANS.	
9	95-288	115-V-50 CYCLE VAR. VOLT. TRANS.	
10	95-296	115 V.-25 " " "	

2 BANDS { 550 KC. - 1600 KC. / 1550 KC. - 3650 KC.

I.F. FREQUENCY 456 K.C.

4 TUBE SUPERHETERODYNE

CHASSIS NO 5401

ZENITH RADIO CORP.
CHICAGO, ILL.

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st. Det.	6.1	27	0	111	-	231
	Osc.			12	-	-	150
6F7	I.F.	6.1	25	0	111	-	231
	2nd. Det.			0	-	-	195
42	PWR.	6.1	0	-15	231	-	219
80	RECT.	5	-	-	-	-	231

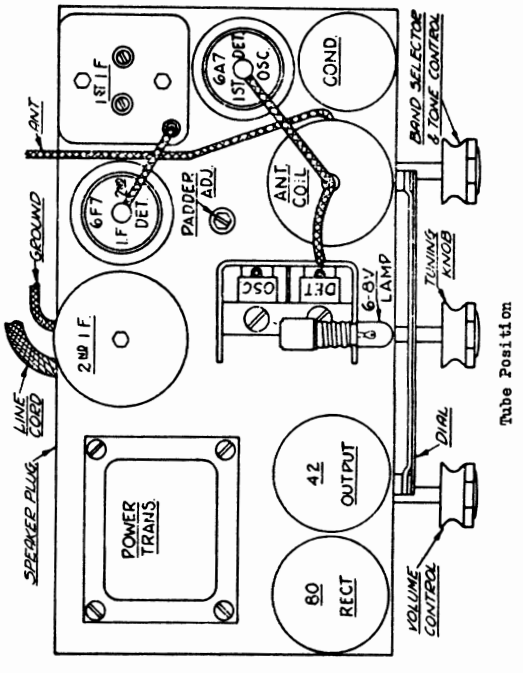
Line 115 V.

f - heaters; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

All measurements taken from point indicated to ground, using a 1,000 ohm per volt D.C. meter (except heater).

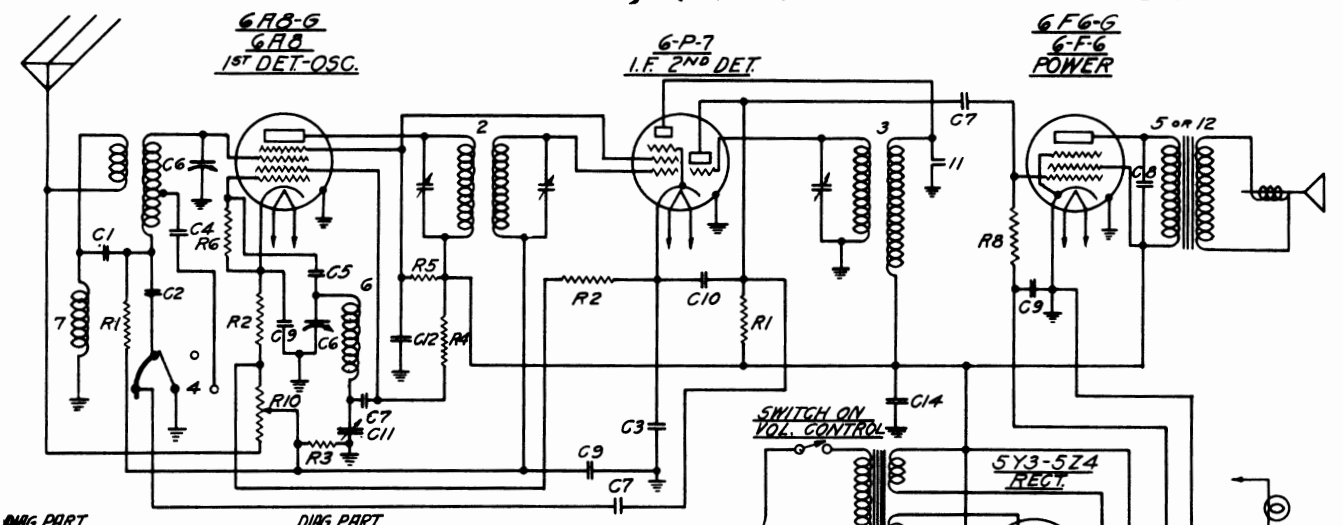
Alignment

(1) Balance I. F. transformer at 456 K.C.
(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C. and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal.
There are no adjustments for the short wave band.



ZENITH RADIO CORP.

Models 4T26, 4T51 - Revised Chassis 5403



DIAG. No.	PART No.	DESCRIPTION	
C1	22-141	.0005	600V.
C2	22-319	.005	200V.
C3	22-190	.1	200V.
C4	22-345	.0011	600V.
C5	22-162	.0001	600V.
C6	22-406	.00036	VARIABLE
C7	22-243	.01	400V.
C8	22-229	.005	600V.
C9	22-250	.05	200V.
C10	22-358	.002	600V.
C11	22-205	.200-550 MMFD.	PADDER
C12	22-407	2 MF.D.	450V.
C13	22-407	8 "	450V.
C14	22-407	4 "	450V.

DIAG. No.	PART No.	DESCRIPTION
1	5-3673	ANT. COIL ASSEM.
2	95-287	1ST I.F. TRANS.
3	95-284	2ND I.F. TRANS.
4	85-76	BAND SELECT. & T.C. SW.
5	49-115	5" SPKR - MOD. 4-T-26
6	5-3674	OSC. COIL ASSEM.
7	20-82	ANT. CHOKE
8	95-297	115 V. 60 CYCLE TRANS.
9	95-298	" 50 " " VAR. VOLTAGE
10	95-296	" 25 " "
11	5-3865	COUPLING CAPACITY
12	49-116	8" SPKR - MOD. 4-T-51

R1	63-290	260 M OHMS ½ W.
R2	63-265	220 ½ W.
R3	63-300	990 ½ W.
R4	63-353	19M ½ W.
R5	63-263	30M ½ W.
R6	63-280	49M ½ W.
R7	63-376	190M ½ W.
R8	63-293	990 ½ W.
R9	63-258	490M ½ W.
R10	63-455	3M VOL. CONTROL.

2 BANDS { 550 KC. - 1600 KC. / 1550 KC. - 3650 KC.

I.F. FREQUENCY 456 KC.
4 TUBE SUPERHETERODYNE
CHASSIS No. 5403

ZENITH RADIO CORP.
CHICAGO, ILL.

MODELS - 4-T-26, 4-T-51
AFTER SERIAL NO.
54439

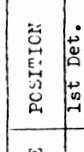
TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	6 AC	220	90	6	125	6 AC	14	0
6P7	I.F. 2nd Det.	0	6 AC	0	220	100	100	0	13	0
6F6	PWR	0	0	200	220	-1	-	6 AC	0	-
5Y3	Rect.	0	220	-	230 AC	-	230 AC	-	220	-

Line Voltage 110 Antenna and Ground Disconnected.

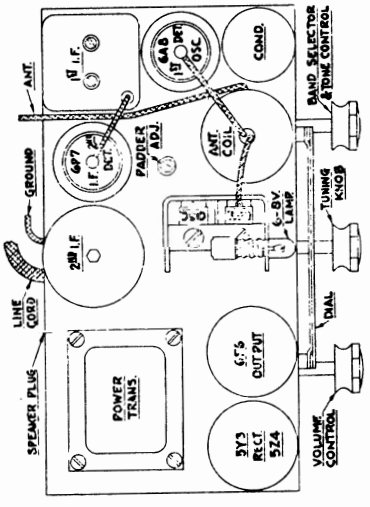
All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise.)

Alignment

(1) Balance I.F. transformer at 456 K.C.
(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C., and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal. There are no adjustments for the short wave band.

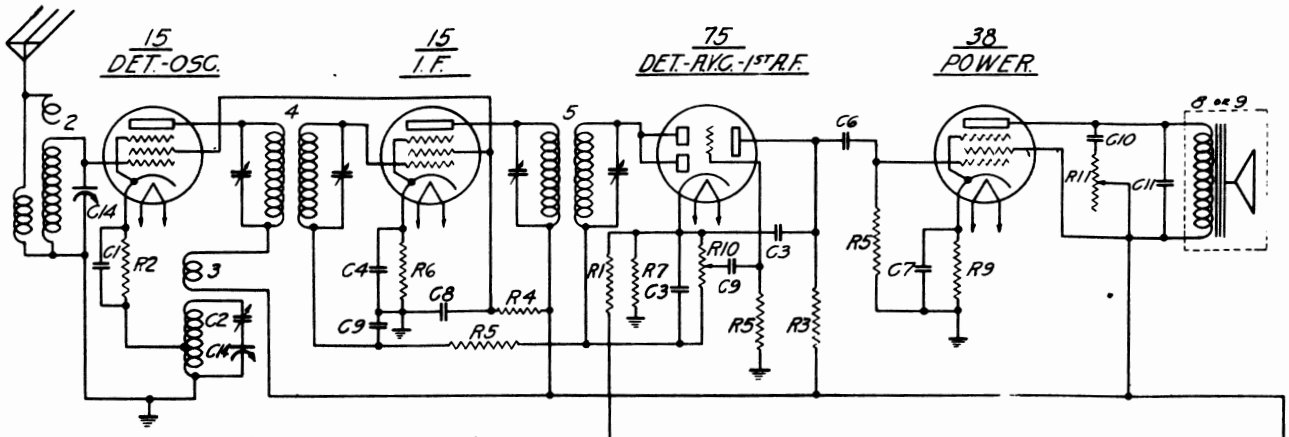


BOTTOM VIEW OF SOCKET



ZENITH RADIO CORP.

Models 4V31 – 4V39 Chassis 5405



DIAG. PART Nº	Nº	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-205	200-530 MMFD. PADDER	
C3	22-182	.00025	600V.
C4	22-185	.01	200V.
C5	22-199	.5	200V.
C6	22-212	.05	400V.
C7	22-225	.5 MFD.	25V.
C8	22-243	.01	400V.
C9	22-250	.05	200V.
C10	22-207	.03	600V.
C11	22-358	.002	600V.
C12	22-418	2 MFD.	250V.
C13	22-419	8 "	250V.
C14	22-426		VARIABLE
C15	22-427	.006	1200V.

DIAG. PART Nº	Nº	DESCRIPTION
1	52-778	VIB. R.F. CHOKE
2	5-3753	ANT COIL ASSEM.
3	5-3756	OSC. COIL ASSEM.
4	95-306	1ST I.F. TRANS.
5	95-309	2ND I.F. TRANS.
6	95-300	REGT. TRANS.
7	190-S	VIBRATOR
8	49-127	6" MAG. SPKR-MOD. 4V-31 " " 4V-39
9	49-130	8"
10	95-298	POWER CHOKE

R1	63-236	1 M OHMS 1/4W.
R2	63-247	6 M " 1/4W.
R3	63-256	490 M " 1/4W.
R4	63-281	29 M " 1/4W.
R5	63-293	990 M " 1/4W.
R6	63-303	700 " 1/4W.
R7	63-378	250 " 1/4W.
R8	63-394	200 " 1/4W.
R9	63-418	1500 " 1/4W.
R10	63-468	200 M V. CONTROL
R11	63-469	50 M T. "
R12	63-476	9.1 1/4W.

ZENITH

4 TUBE BATTERY SUPERHETERODYNE
I.F. FREQUENCY 456 KC.
CHASSIS Nº 5405.
MODELS 4V-31 -4V-59

TUNING RANGE 550-1700 K C.

ZENITH RADIO CORP.
CHICAGO, ILL.

Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
15	1st Det. Osc.	2	8	0	115	-	155
15	I. F.	2	3.5	0	115	-	155
75	2nd Det. A.V.C.	6	1.5	0	-	-	30
38	PWR	6	14	0	155	-	148

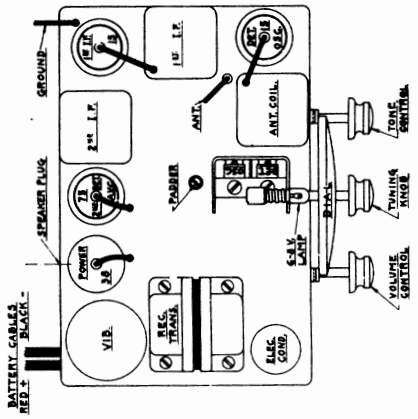
Battery - 6 volts Antenna and ground disconnected.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

All measurements taken from point indicated to ground using a 1000 ohm per volt D. C. meter.

Alignment

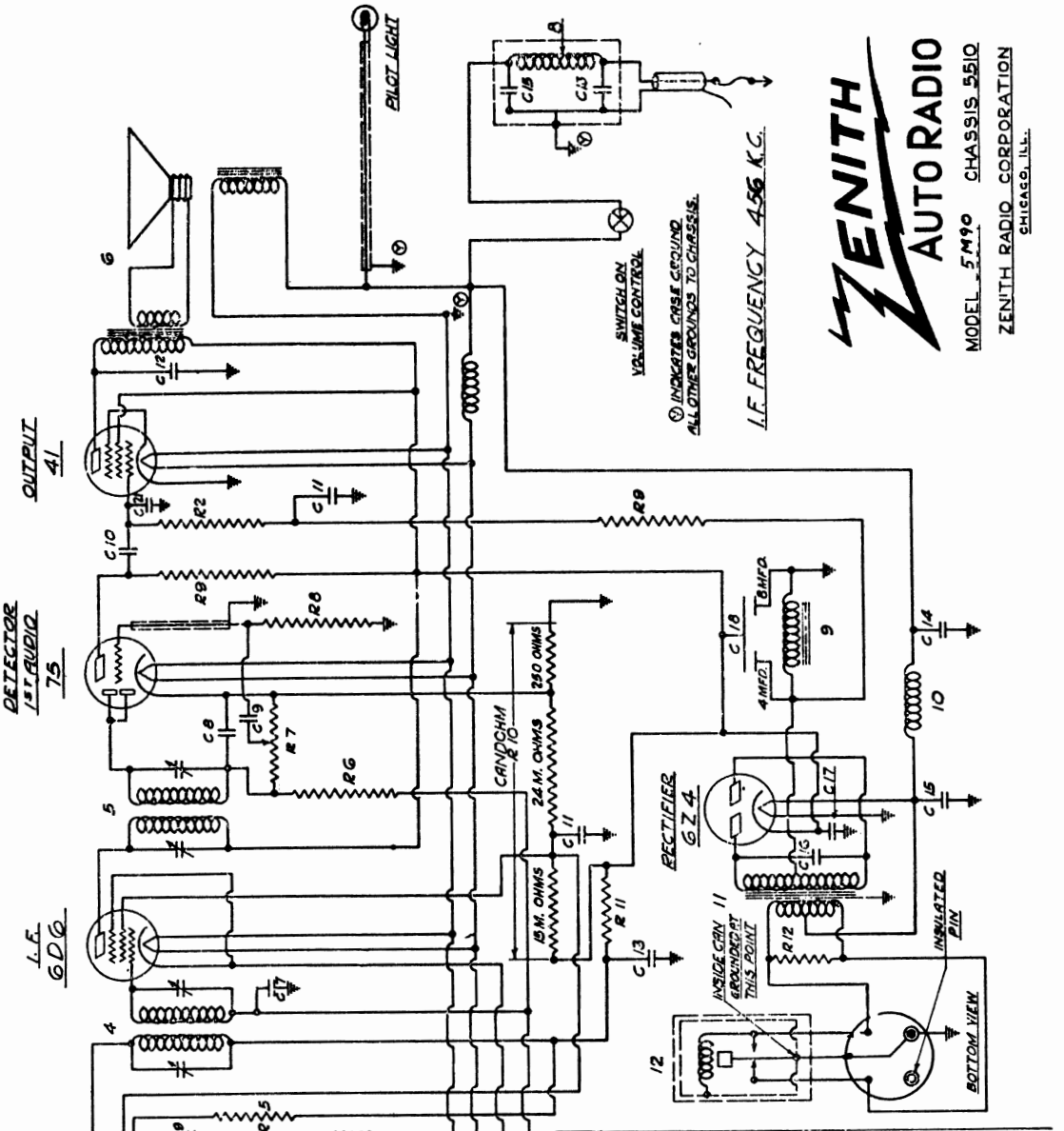
(1) Balance intermediate transformers at 456 K.C. with service oscillator connected to grid of 15 first detector and ground.
(2) Connect service oscillator to antenna and ground.
(3) Adjust oscillator trimmer on gang condenser for correct dial reading at 1400 K.C.
(4) Adjust detector trimmer on gang condenser to resonance.
(5) Adjust oscillator padder (located in rear of gang) meanwhile rocking pointer past 600 K.C. to combination giving greatest output.
(6) Repeat operations 3 and 4.



Tube Layout

ZENITH RADIO CORP.

Circuit Diagram. Model 5-M-90. (Chassis No. 5510)

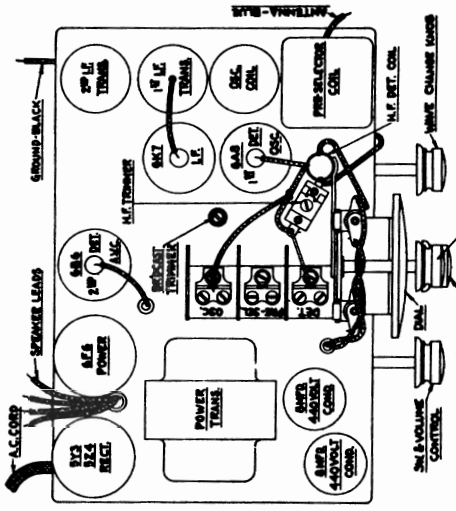


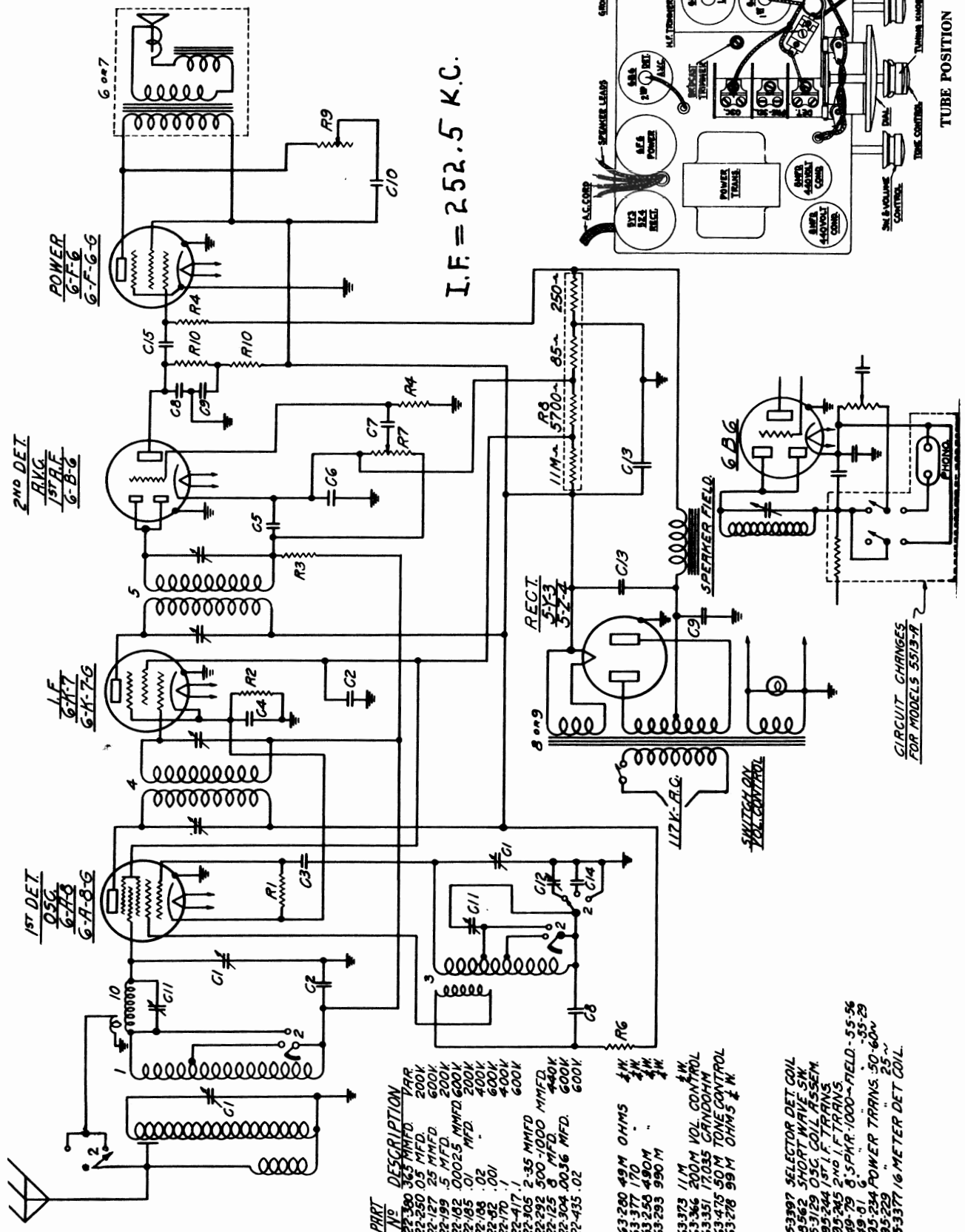
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-393	.0025 MFD. 600 V.	R 6	63-436	750 M. OHMS - 1/4 W.
C 2	327	.02 MFD. 200 V.	R 7	434	500 M. Ω VOL. CONTROL
C 3	413	.006 MFD. 600 V.	R 8	271	1 MEGOHM - 1/4 W.
C 4	391	100-1500 MMFD. PACKARD	R 9	400	2.5 M. OHMS - 1/4 W.
C 5	280	.5 MFD. 200 V.	R 10	433	250 OHMS - 1/4 W.
C 6	390	200-400 MMFD. CEC. PKG.	R 11		24 M. OHMS - 1/2 W.
C 7	280	.05 MFD. 200 V.	R 12		1.5 M. OHMS - 1/2 W.
C 8	147	.0035 MFD. 600 V.		410	1200 OHMS - 1/4 W.
C 9	345	.01 MFD. 200 V.		394	200 OHMS - 1/2 W.
C 10	278	.05 MFD. 400 V.			
C 11	190	.1 MFD. 200 V.			
C 12	354	.007 MFD. 800 V.		20-107	ANTENNA CHOKE
C 13	170	.1 MFD. 400 V.	1	20-105	ANTENNA COIL
C 14	356	.002 MFD. 600 V.	2	20-106	OSCILLATOR COIL
C 15	251	.3 MFD. 200 V.	3	95-274	1ST I.F. TRANSFORMER
C 16	355	.01 MFD. 1400 V.	4	95-275	2ND I.F. TRANSFORMER
C 17	122	.0025 MFD. 600 V.	5	49-111	SPEAKER
C 18	388	4-8 MFD. 350 V.	6	20-103	FILAMENT CHOKE
C 19	82	.001 MFD. 600 V.	7	20-110	MOTOR NOISE FILTER COIL
C 20	389	365 MMF. VARIABLE	8	95-276	HUM FILTER CHOKE
C 21	162	.0001 MFD. 600 V.	9	5-2778	R. F. CHOKE
			10	95-273	POWER TRANSFORMER
			11	190-4	VIBRATOR
			12		
R 1	63-288	19 M. OHMS - 1/4 W.	13		
R 2	401	500 M. OHMS - 1/4 W.			
R 3	387	300 OHMS - 1/4 W.			
R 4	260	100 M. OHMS - 1/4 W.			
R 5	263	30 M. OHMS - 1/2 W.			

ZENITH RADIO CORP.

Models 5529-5556. Chassis 5513-5513A

I.F. = 252.5 K.C.

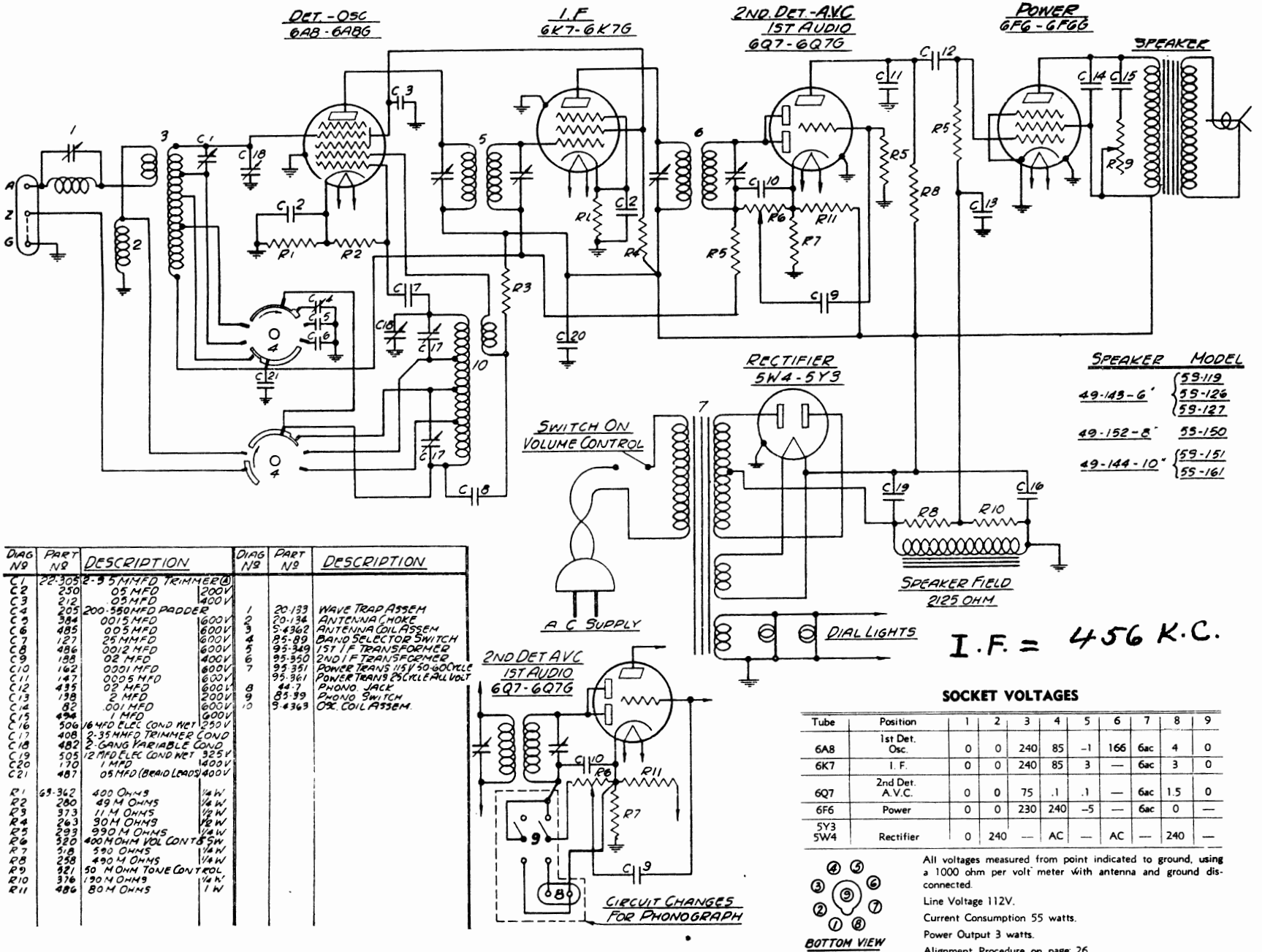




MKE No	PART No	DESCRIPTION	
C1	22-330	365 MMFD.	PAR.
C2	22-250	.05 MFD.	200V.
C3	22-127	.25 MMFD	600V.
C4	22-199	.5 MFD.	200V.
C5	22-182	.00025 MMFD	600V.
C6	22-185	.01 MFD.	200V.
C7	22-188	.02	400V.
C8	22-92	.001	600V.
C9	22-170	.1	400V.
C10	22-417	.1	600V.
C11	22-305	2-35 MMFD	
C12	22-292	500-1000 MMFD.	440V.
C13	22-125	8 MFD.	600V.
C14	22-304	.0036 MFD.	600V.
C15	22-435	.02	
R1	63-280	49M OHMS	1W.
R2	63-377	170	1W.
R3	63-253	480M	1W.
R4	63-293	990M	1W.
R6	63-373	1/M	1W.
R7	63-366	200M VOL. CONTROL	1W.
R8	63-351	17035 CANDOHM	
R9	63-475	50M TONE CONTROL	
R10	63-278	99M OHMS	1W.

1	53397	SELECTOR DET. COIL
2	0562	SHORT WAVE SW.
3	53129	OSC. COIL ASSEM.
4	95-244	1ST I.F. TRANS.
5	95-245	2ND I.F. TRANS.
6 7	49-79	6.3 PWR. 1000~ FIELD - 55-56
8	49-81	6.3 PWR. 1000~ FIELD - 55-29
9	95-234	POWER TRANS. 50-60~
	95-229	" 25~
10	53377	1/6 METER DET COIL.

Models 5-S-119, 5-S-126, 5-S-127, 5-S-150, 5-S-151, 5-S-161. (Chassis No. 5516)



SPEAKER	MODEL
49-143-6"	59-119, 59-126, 59-127
49-152-8"	55-150
49-144-10"	59-151, 55-161

I.F. = 456 K.C.

DIAG Nº	PART Nº	DESCRIPTION	DIAG Nº	PART Nº	DESCRIPTION
C1	22-305	2-9 5 MMFD TRIMMER (A)			
C2	250	.05 MFD 200V			
C3	212	.05 MFD 400V			
C4	205	200-550 MFD PADDER	1	20-133	WAVE TRAP ASSEM
C5	384	.0015 MFD 600V	2	20-134	ANTENNA CHOKE
C6	485	.005 MFD 600V	3	2-4362	ANTENNA COIL ASSEM.
C7	127	25 MMFD 600V	4	85-89	BAND SELECTOR SWITCH
C8	486	.0012 MFD 600V	5	95-349	1ST I.F. TRANSFORMER
C9	188	.02 MFD 400V	6	95-350	2ND I.F. TRANSFORMER
C10	162	.0001 MFD 600V	7	95-351	POWER TRANS 115V 50-60 CYCLE
C11	147	.0005 MFD 600V		95-361	POWER TRANS 25 CYCLE ALL VOLT
C12	435	.02 MFD 600V	8	44-7	PHONO. JACK
C13	138	2 MFD 200V	9	85-99	PHONO. SWITCH
C14	82	.001 MFD 600V	10	9-4363	OSC. COIL ASSEM.
C15	494	1 MFD 600V			
C16	506	16 MFD ELEC COND WET 250V			
C17	408	2-35 MMFD TRIMMER COND			
C18	482	2-GANG VARIABLE COND.			
C19	505	12 MFD ELEC COND WET 325V			
C20	170	1 MFD 1400V			
C21	487	.05 MFD (BRAID LEADS) 400V			
R1	69-342	400 OHMS 1/4 W.			
R2	280	49 M OHMS 1/4 W.			
R3	373	1.1 M OHMS 1/2 W.			
R4	263	90 M OHMS 1/2 W.			
R5	293	990 M OHMS 1/4 W.			
R6	320	400 M OHM VOL CONT & SW			
R7	318	590 OHMS 1/4 W.			
R8	258	490 M OHMS 1/4 W.			
R9	321	50 M OHM TONE CONTROL			
R10	376	190 M OHMS 1/4 W.			
R11	486	80 M OHMS 1 W.			

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	0	240	85	-1	166	6ac	4	0
6K7	I. F.	0	0	240	85	3	—	6ac	3	0
6Q7	2nd Det. A.V.C.	0	0	75	.1	.1	—	6ac	1.5	0
6F6	Power	0	0	230	240	-5	—	6ac	0	—
5Y3 5W4	Rectifier	0	240	—	AC	—	AC	—	240	—

All voltages measured from point indicated to ground, using a 1000 ohm per volt meter with antenna and ground disconnected.

Line Voltage 112V.

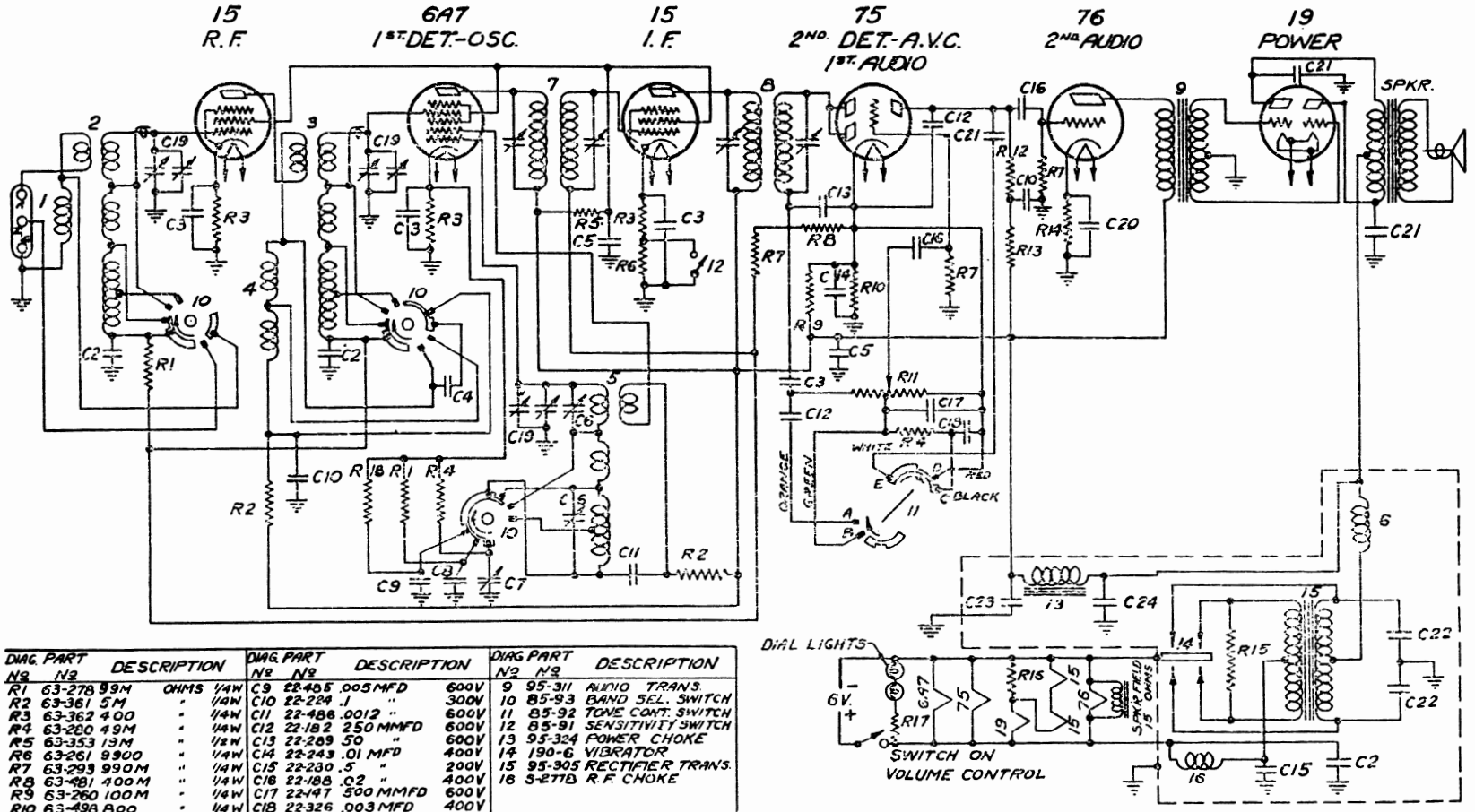
Current Consumption 55 watts.

Power Output 3 watts.

Alignment Procedure on page 26.

ZENITH RADIO CORP.

Models 6-B-107, 6-B-129, 6-B-164. (Chassis No. 5635)



DIAG. No	PART No	DESCRIPTION		
R1	63-278	99M	OHMS	1/4W
R2	63-361	5M	"	1/4W
R3	63-362	400	"	1/4W
R4	63-280	49M	"	1/4W
R5	63-353	19M	"	1/2W
R6	63-261	9900	"	1/4W
R7	63-293	990M	"	1/4W
R8	63-481	400M	"	1/4W
R9	63-260	100M	"	1/4W
R10	63-498	800	"	1/4W
R11	63-522	2 MEG. VOL. CONT.		
R12	63-258	490M	OHMS	1/4W
R13	63-290	260M	"	1/4W
R14	63-360	2M	"	1/4W
R15	63-394	200	"	1/2W
R16	63-477	100 Δ FLEX. WIRE WND		
R17	63-533	13 " "		"
R18	63-288	19M OHMS Ⓐ		1/4W

DIAG. No	PART No	DESCRIPTION	
C2	22-487	.05MFD	400V
C3	22-250	.05MFD	200V
C4	22-127	25MMFD	600V
C5	22-212	.05MFD	400V
C6	22-405	2-35 MMFD	TRIMMER
C7	22-203	200-550 "	PADDER
C8	22-384	.0015 MFD	600V

DIAG. No	PART No	DESCRIPTION	
C9	22-485	.005 MFD	600V
C10	22-224	.1 "	300V
C11	22-486	.0012 "	600V
C12	22-182	250 MMFD	600V
C13	22-289	50 "	600V
C14	22-243	.01 MFD	400V
C15	22-230	.5 "	200V
C16	22-188	.02 "	400V
C17	22-147	500 MMFD	600V
C18	22-326	.003 MFD	400V
C19	22-488	VARIABLE, COND.	
C20	22-225	5MFD ELYTIC	25V
C21	22-492	.002 MFD	600V
C22	22-455	.01 "	1200V
C23	22-459	8 MFD	250V
C24		2 "	250V

DIAG. No	PART No	DESCRIPTION
1	20-71	ANTENNA CHOKE
2	S-4480	ANT. COIL ASSEM.
3	S-4481	DET. COIL ASSEM.
4	20-135	R.F. PLATE CHOKE
5	S-4482	OSC. COIL ASSEM.
6	20-88	R.F. CHOKE
7	95-371	1ST I.F. TRANS.
8	95-372	2ND I.F. TRANS.

DIAG. No	PART No	DESCRIPTION
9	95-311	AUDIO TRANS.
10	85-93	BAND SEL. SWITCH
11	85-92	TONE CONT. SWITCH
12	85-91	SENSITIVITY SWITCH
13	95-324	POWER CHOKE
14	190-6	VIBRATOR
15	95-305	RECTIFIER TRANS.
16	S-2778	R.F. CHOKE

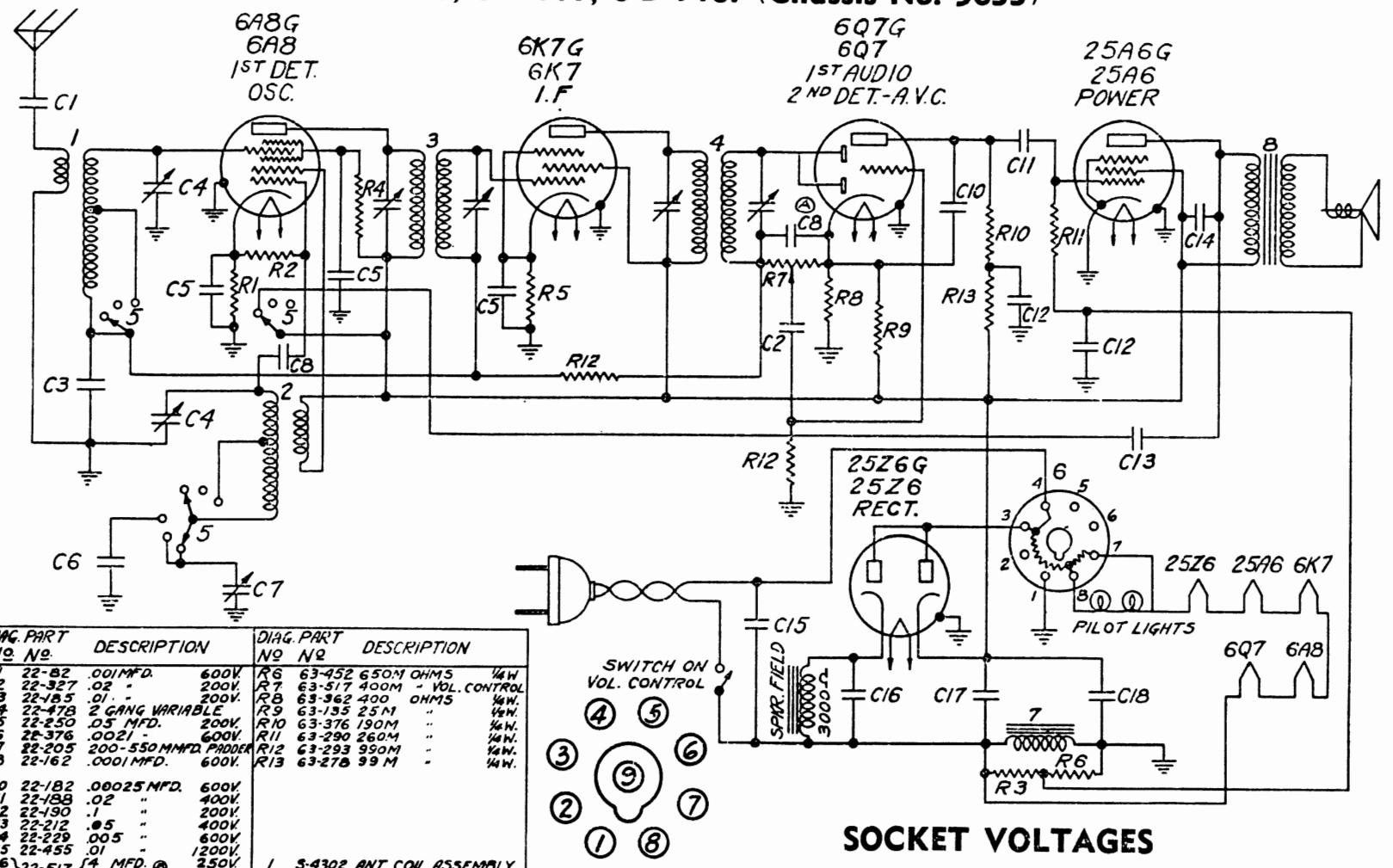
I.F. = 456 K.C.

SOCKET VOLTAGES

Tube	Position	Ef	Eg	Eg¹	Eg²	Eg³	Ep
15	R. F.	2	1.5	0	65	—	115
6A7	Det.	6	2.5	0	75	—	115
	Osc.			−5	—	—	135
15	I. F.	2	3.5	0	75	—	130
75	2nd Det. A.V.C.	6	1.2	0	—	—	35
76	1st Audio	6	6		—	—	125

f—filament; k—cathode; g¹—control grid; g²—screen grid; g³—suppressor grid; p—plate.

Models 6-D-116, 6-D-117, 6-D-118. (Chassis No. 5633)



DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-182	.001 MFD.	600V.
C2	22-327	.02 "	200V.
C3	22-185	.01 "	200V.
C4	22-478	2 GANG VARIABLE	
C5	22-250	.05 MFD.	200V.
C6	22-376	.0021 "	600V.
C7	22-205	200-550 MMFD. PADDER	
C8	22-162	.0001 MFD.	600V.
C10	22-182	.00025 MFD.	600V.
C11	22-188	.02 "	400V.
C12	22-190	.1 "	200V.
C13	22-212	.05 "	400V.
C14	22-229	.005 "	600V.
C15	22-455	.01 "	1200V.
C16	22-517	4 MFD. Ⓐ	250V.
C17	22-517	16 "	250V.
C18	22-516	8 " Ⓒ	250V.
R1	63-377	170 OHMS	1/4 W.
R2	63-261	9500 "	1/2 W.
R3	63-481	400M "	1/2 W.
R4	63-288	19M "	1/2 W.
R5	63-300	990 "	1/2 W.
R6	63-452	650M OHMS	1/4 W
R7	63-517	400M " VOL. CONTROL	
R8	63-362	400 OHMS	1/2 W.
R9	63-135	25M "	1/2 W.
R10	63-376	190M "	1/2 W.
R11	63-290	260M "	1/2 W.
R12	63-293	990M "	1/2 W.
R13	63-278	99M "	1/2 W.

1	5-4302	ANT. COIL ASSEMBLY
2	5-4304	OSC. COIL ASSEMBLY
3	95-346	1ST I.F. TRANS.
4	95-347	2ND I.F. TRANS.
5	85-88	BAND SELECT. SWITCH
6	100-37	BALLAST TUBE 115V
7	95-345	POWER CHOKE
8	49-141	SPEAKER

I.F. = 456 K.C.

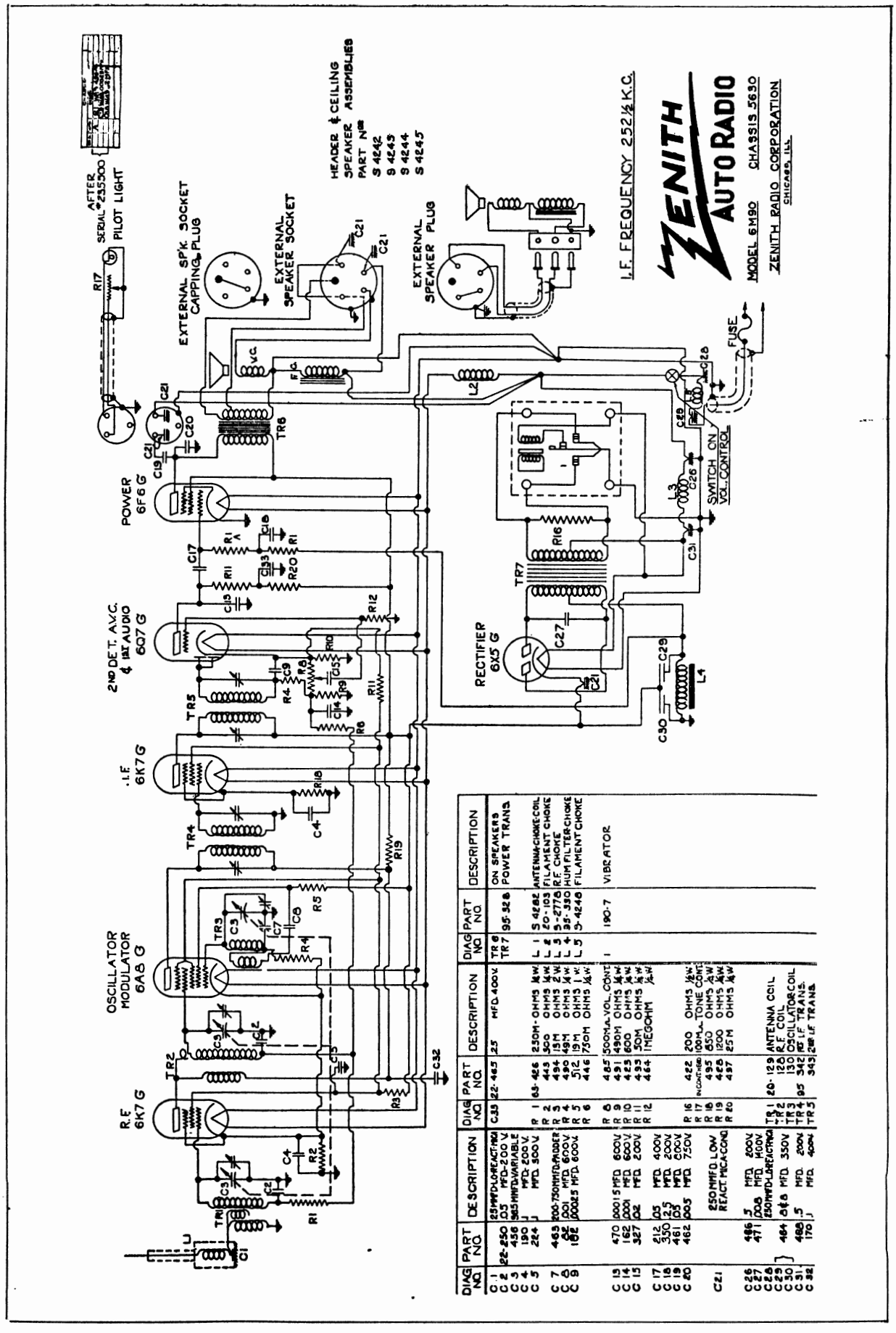
SOCKET VOLTAGES

BOTTOM VIEW

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	AC	100	50	−5	100	AC	1	−1
6K7	I. F.	0	AC	100	100	5	—	AC	5	0
6Q7	2nd Det. A.V.C.	0	AC	50	0	0	—	AC	1	0
25A6	Power	0	AC	90	100	1	—	AC	0	—
25Z6	Rectifier	0	AC	AC	AC	100	—	AC	125	—

ZENITH RADIO CORP.

Circuit Diagram. Models 6-M-90S and 6-M-90D (Chassis No. 5630)



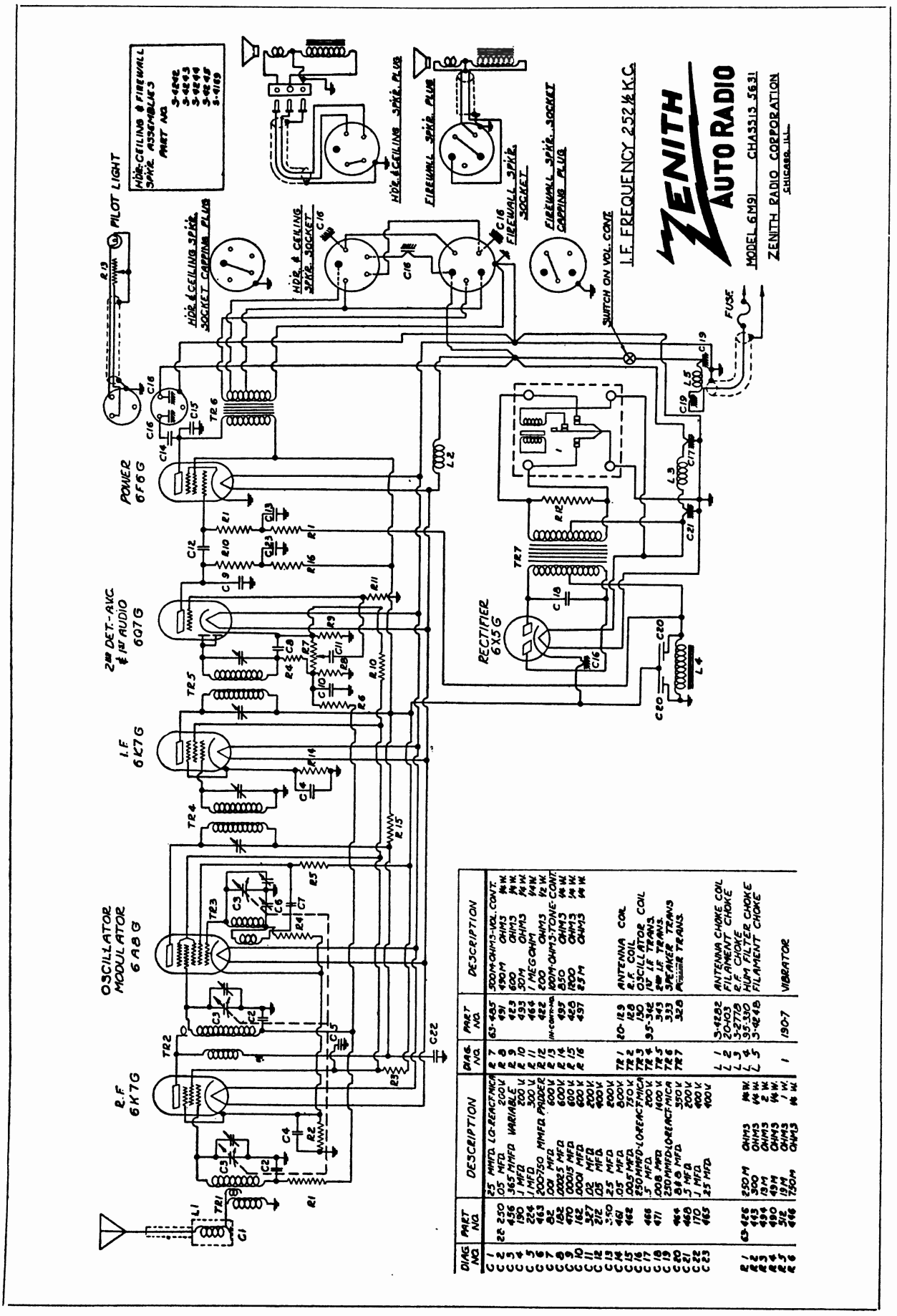
DIAG NO	PART NO	DESCRIPTION
C 1	22-250	25MMFD LOW REACTANCE
C 2	03	MFD 200 V.
C 3	436	365 MMFD VARIABLE
C 4	190	MFD 200 V.
C 5	224	MFD 300 V.
C 7	483	200-750 MMFD TRIMMER
C 8	001	MFD 600 V.
C 9	002	.0025 MFD 600 V.
C 13	470	.00015 MFD 600 V.
C 14	162	.0001 MFD 600 V.
C 15	327	.02 MFD 200 V.
C 17	212	.05 MFD 400 V.
C 18	350	.25 MFD 200 V.
C 19	461	.03 MFD 600 V.
C 20	462	.005 MFD 750 V.
C 21		250 MMFD LOW REACT MICADOND
C 26	486	.5 MFD 200 V.
C 27	471	.006 MFD 400 V.
C 28		250 MMFD LOW REACTANCE
C 29	464	.05 MFD 350 V.
C 30	488	.5 MFD. 200 V.
C 31	170	.1 MFD. 400 V.
C 32		

DIAG NO	PART NO	DESCRIPTION
C 33	22-465	25 MFD 400 V.
R 1	63-426	250 OHMS ½ W.
R 2	443	300 OHMS ½ W.
R 3	494	1 5M OHMS 2 W.
R 4	490	48M OHMS ½ W.
R 5	512	1 9M OHMS 1 W.
R 6	446	730M OHMS ½ W.
R 8	485	500 M.A. VOL. CONT.
R 9	491	490M OHMS ½ W.
R 10	425	600 OHMS ½ W.
R 11	433	50M OHMS ½ W.
R 12	464	1 MEGOHM ½ W.
R 16	422	200 OHMS ½ W.
R 17	MOUNTED	100 M.A. TONE CONT.
R 18	495	650 OHMS ½ W.
R 19	426	1200 OHMS ½ W.
R 20	497	25 M OHMS ½ W.
T R 1	26-129	ANTENNA COIL
T R 2	126	R.F. COIL
T R 3	130	OSCILLATOR COIL
T R 4	95	1ST I.F. TRANS.
T R 5	343	2ND I.F. TRANS.

DIAG NO	PART NO	DESCRIPTION
T R 6	95-328	ON SPEAKERS POWER TRANS.
T R 7		
L 1	S 4282	ANTENNA CHOKE COIL
L 2	20-103	FILAMENT CHOKE
L 3	5-2776	R.F. CHOKE
L 4	35-330	HUM FILTER CHOKE
L 5	5-4240	FILAMENT CHOKE
I	190-7	VIBRATOR

ZENITH RADIO CORP.

Circuit Diagram. Models 6-M-91S and 6-M-91D (Chassis No. 5631)



DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C 1		.25 MMFD. LO-REACTANCE		R 7	63-485	300 OHMS-VOL. CONT.
C 2	22-250	.05 MFD.	200 V.	R 8	491	450 M OHMS ½ W.
C 3	456	365 MMFD VARIABLE		R 9	483	300 M OHMS ½ W.
C 4	190	.1 MFD.	200 V.	R 10	493	1 MEG OHMS ½ W.
C 5	224	.1 MFD.	300 V.	R 11	464	2 MEG OHMS ½ W.
C 6	463	200-750 MMFD. PADDER		R 12	482	20Ω OHMS 2 W.
C 7	82	.001 MFD.	600 V.	R 13	IN CONTROL	100-OHM-3-STONE-CONT.
C 8	182	.0025 MFD.	600 V.	R 14	485	250 OHMS ½ W.
C 9	470	.0005 MFD.	600 V.	R 15	426	1200 OHMS ½ W.
C 10	162	.0001 MFD.	600 V.	R 16	497	2.2 M OHMS ½ W.
C 11	327	.02 MFD.	200 V.			
C 12	212	.05 MFD.	400 V.			
C 13	350	.25 MFD.	200 V.			
C 14	461	.05 MFD.	600 V.	T R 1	20-183	ANTENNA COIL
C 15	462	.005 MFD.	750 V.	T R 2	128	R.F. COIL
C 16		250 MMFD-LOREACTANCE MICA		T R 3	130	OSCILLATOR COIL
C 17		.1 MFD.	200 V.	T R 4	95-342	1ST I.F. TRANS.
C 18	466	.008 MFD.	1400 V.	T R 5	345	2ND I.F. TRANS.
C 19	471	250 MMFD-LOREACT. MICA		T R 6	333	SPEAKER TRANS.
C 20		.8-8 MFD.	350 V.	T R 7	328	POWER TRANS.
C 21	464	.1 MFD.	200 V.			
C 22	466	.1 MFD.	400 V.	L 1	3-4282	ANTENNA CHOKE COIL
C 23	170	.25 MFD.	400 V.	L 2	20-103	FILAMENT CHOKE
	165			L 3	3-2770	R.F. CHOKE
				L 4	35-330	HUM FILTER CHOKE
				L 5	3-4248	FILAMENT CHOKE
R 1	63-426	250 M	OHMS ½ W.	I	1907	VIBRATOR
R 2	443	300	OHMS 2 W.			
R 3	484	1 M	OHMS ½ W.			
R 4	490	1 M	OHMS ½ W.			
R 5	511	1 M	OHMS 1 W.			
R 6	496	150 M	OHMS ½ W.			

ALIGNMENT

Every Zenith receiver is balanced, and the sensitivity measured on accurate crystal controlled signal generators before leaving the factory, and unless a part is changed, or the receiver otherwise altered, the adjustment should not be tampered with.

When alignment is thus required, an accurately calibrated service oscillator and output meter are essential.

The proper procedure is as follows:

MODEL 5M90

"A" Connect the service oscillator output leads to the control grid of the 6A7 tube, and to the chassis. If the oscillator output is a single shielded lead the shield should connect to the chassis.

Connect the output meter across the primary of the speaker transformer.

Set the service oscillator at 456 K.C., and adjust the trimmers on the I F transformers to the point giving the greatest reading on the output meter. These, as well as the following adjustments should be made using as small an output from the signal generator as possible so that the A.V.C. action will be least effective.

"B" Change the service oscillator connection from the grid of the 6A7 to the antenna wire, leaving the other lead attached to the chassis.

Set the service oscillator at 1600 K.C. and rotate the gang condenser until the plates are entirely out of mesh. Adjust the oscillator section trimmer until the 1600 K.C. signal is tuned in.

Change the service oscillator to 1400 K.C. Rotate the gang condenser until this signal is tuned in, and then adjust the ANTENNA trimmer on the gang condenser to the point given the greatest output reading.

"C" Set the service oscillator to 600 K.C., and rock the gang condenser slowly to and fro past the point where this signal is received, meanwhile adjusting the padder condenser for a setting which gives the greatest output reading.

"D" Repeat operation "B".

"E" Reset the service oscillator to 456 K.C., leaving it connected to antenna, and adjust the wave trap trimmer to the point giving the MINIMUM output reading.

MODELS 6-M-90, 6-M-91, 6-M-92

"A" Connect the service oscillator to the control grid of the 6A8 tube and the chassis.

Connect the output meter across the primary of the speaker transformer.

Set the service oscillator to 252.5 K.C., and adjust the trimmers on the I. F. transformers for the greatest output reading. These adjustments should be repeated several times using as weak an input signal as possible so as to obtain greater accuracy.

"B" Change the service oscillator lead from the grid of the 6A8 to the antenna connection. A male Delco Remy connector may be used in making a connection to the antenna lead.

Set the service oscillator at 1400 K.C.

Rotate the gang condenser one and one fourth turns from the minimum setting. At the proper position eight teeth on the tuning gear will be visible past the gear bracket.

Adjust the oscillator, R.F. and antenna trimmers in that order to the point giving the greatest output.

"C" Set the service oscillator at 600 K.C. and rotate the gang condenser to tune in this signal. Move the gang condenser to and fro past the signal meanwhile adjusting the oscillator padder condenser until the combination of adjustments giving the greatest reading of the output meter is obtained.

"D" Repeat operation "B."

MODEL 7-M-91

The alignment of this receiver is identical with Model 6M90.

The sensitivity switch should be in the clockwise or sensitive position during adjustment. The output meter may be connected across the voice coil connections at the speaker socket.

SOCKET VOLTAGES 6-M-92

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	175	84	4.6	—	0	4.6	0
6A8	1st Det. Osc.	0	0	175	84	—16	110	5.8	4.6	0
6K7	I. F. Amp.	0	5.8	180	84	3.6	—	0	3.6	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	130	.3	.3	—	0	1.3	0
6F6	Power	0	0	170	180	—3.4	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	180	—

BOTTOM VIEW

Voltage at Battery 6V.
Voltage at Switch 5.8 V.
Antenna disconnected.
All voltages measured with 1000 ohms per volt D. C. meter.

SOCKET VOLTAGES 6-M-90S, 6-M-90D

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	215	100	5.7	—	0	5.7	0
6A8	1st Det. Osc.	0	0	215	100	—26	150	5.8	5.9	0
6K7	I. F. Amp.	0	5.8	225	100	5.4	—	0	5.4	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	150	—.2	—.2	—	0	2	0
6F6	Power	0	0	210	220	—.3	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	220	—

SOCKET VOLTAGES 6-M-91S, 6-M-91D

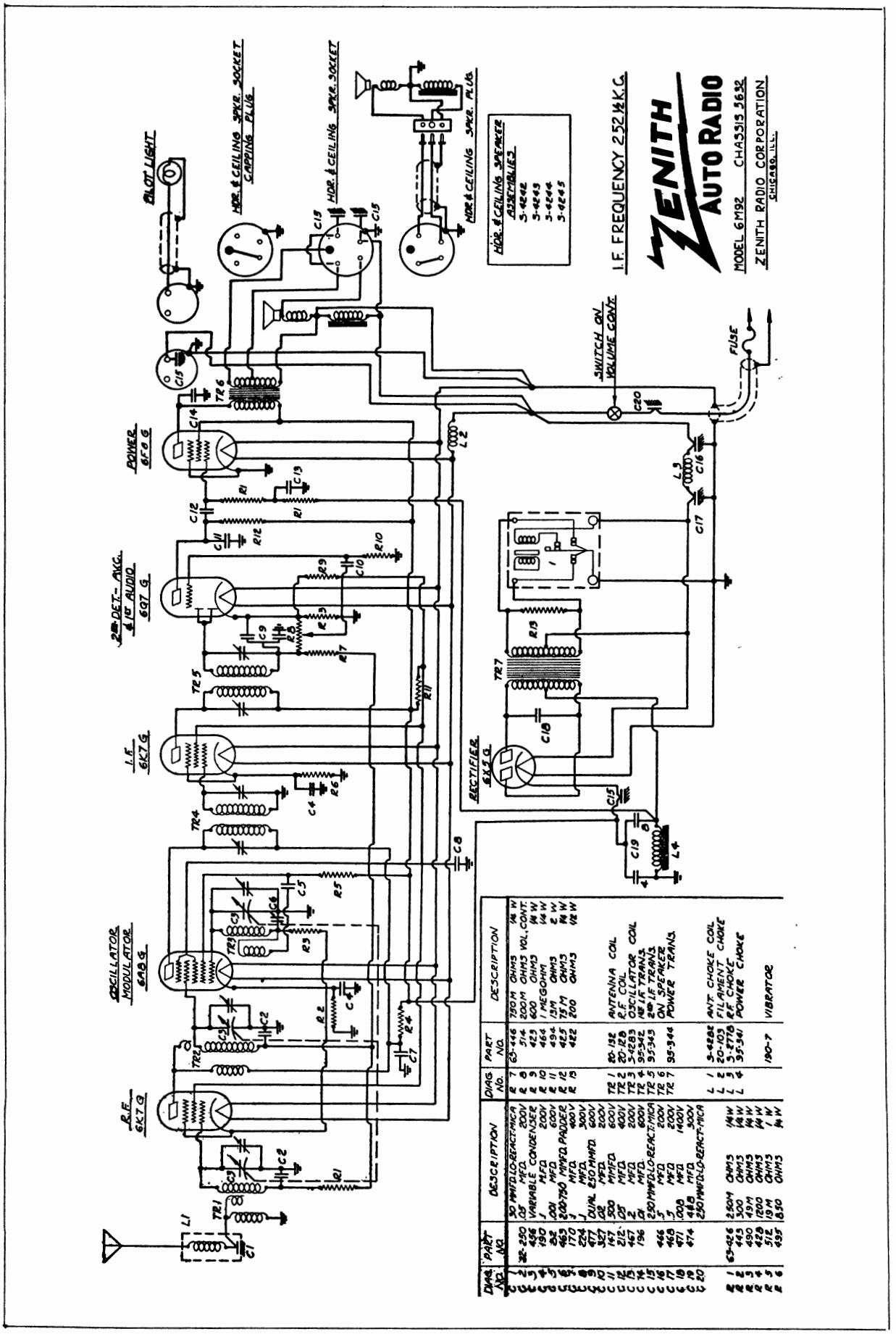
Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	215	100	5.7	—	0	5.7	0
6A8	1st Det. Osc.	0	0	215	100	—26	150	5.8	5.9	0
6K7	I. F. Amp.	0	5.8	225	100	5.4	—	0	5.4	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	150	—.2	—.2	—	0	2	0
6F6	Power	0	0	210	220	—.3	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	220	—

SOCKET VOLTAGES 7-M-91S, 7-M-91D

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	250	100	5.2	—	0	5.2	0
6A8	1st Det. Osc.	0	0	250	100	—23	165	5.8	5.2	0
6K7	I. F. Amp.	0	5.8	240	100	6.7	—	0	6.7	0
6Q7	2nd Det. A. V. C. 1st Audio	0	0	145	—.2	—.2	—	5.8	1.6	0
6C5	Driver	0	0	240	0	0	—	5.8	8.2	—
6N7	Class B Power	0	0	250	0	0	250	5.8	0	—
4X5	RECT.	0	0	AC	—	AC	—	5.8	250	—

ZENITH RADIO CORP.

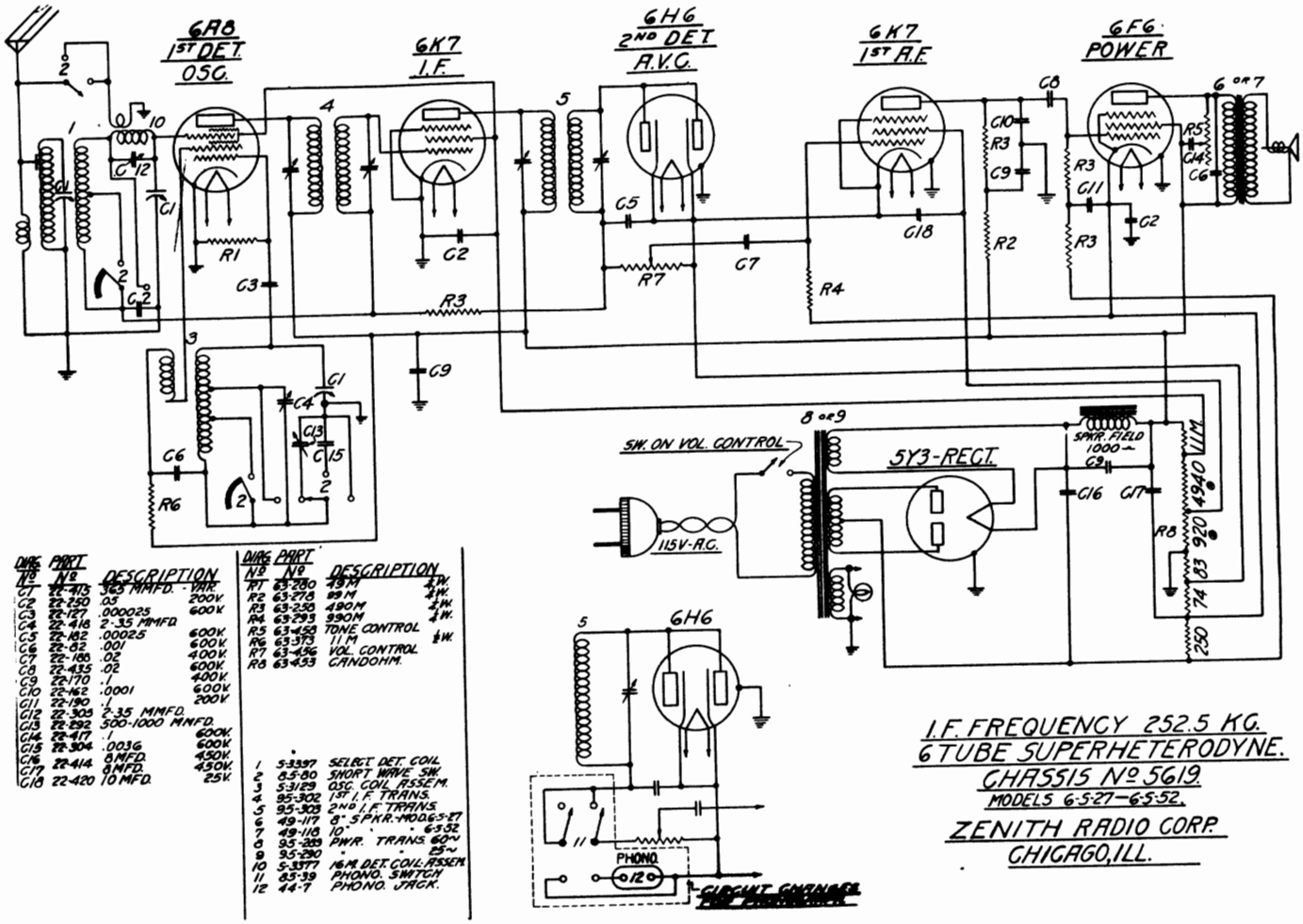
Circuit Diagram. Model 6-M-92. (Chassis No. 5632)



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	
C 1	38-250	30 MMFD-LO-REACT-MICA	R 7	65-446	350M OHMS	½W
C 2	456	200V MFD. CONDENSER	R 8	414	200M OHMS VOL. CONT.	
C 3	180	VARIABLE	R 9	423	6 MEGOHMS	½W
C 4	454	MFD. 600V	R 10	464	1 MEGOHMS	½W
C 5	453	.001 MFD. 600V	R 11	465	1.5M OHMS	½W
C 6	450	230-750 MMFD PADDER	R 12	425	75M OHMS	½W
C 7	170	MFD. 400V	R 13	422	200 OHMS	½W
C 8	224	1 MFD. 300V				
C 9	477	DUAL 230 MMFD. 600V				
C 10	327	.02 MFD. 200V	TR 1	20-132	ANTENNA COIL	
C 11	147	.500 MMFD 600V	TR 2	20-128	R.F. COIL	
C 12	212	.05 MFD. 400V	TR 3	3-4283	OSCILLATOR COIL	
C 13	467	.2 MFD. 200V	TR 4	35-342	1ST I.F. TRANS.	
C 14	196	.01 MFD. 600V	TR 5	35-343	2ND I.F. TRANS. ON SPEAKER	
C 15		230 MMFD-LO-REACT-MICA	TR 6		POWER TRANS.	
C 16	446	.1 MFD. 200V	TR 7	35-344		
C 17	468	.5 MFD. 200V				
C 18	471	.000 MFD. 1400V	L 1	3-4284	ANT. CHOKE COIL	
C 19	474	4MFD MFD. 300V	L 2	20-103	FILAMENT CHOKE	
C 20		230 MMFD-LO-REACT-MICA	L 3	3-2776	R.F. CHOKE	
			L 4	35-341	POWER CHOKE	
R 1	63-426	250M OHMS	½W			
R 2	445	300 OHMS	½W	180-7	VIBRATOR	
R 3	490	49M OHMS	½W			
R 4	428	1200 OHMS	½W			
R 5	512	19M OHMS	1W			
R 6	439	8.50 OHMS	½W			

ZENITH RADIO CORP.

Models 6S27-6S52 Chassis 5619



DWG. No.	PART No.	DESCRIPTION
C1	22-413	365 MMFD. VAR.
C2	22-250	.05 200V
C3	22-127	.000025 600V
C4	22-418	2-35 MMFD.
C5	22-182	.00025 600V
C6	22-52	.001 600V
C7	22-188	.02 400V
C8	22-435	.02 600V
C9	22-170	.1 400V
C10	22-162	.0001 600V
C11	22-190	200V
C12	22-305	2-35 MMFD.
C13	22-292	500-1000 MMFD.
C14	22-417	.1 600V
C15	22-304	.003G 600V
C16	22-414	8 MFD. 450V
C17		8 MFD. 450V
C18	22-420	10 MFD. 25V

DWG. No.	PART No.	DESCRIPTION
RT	63-280	40M 1W.
R2	63-278	89M 1W.
R3	63-250	490M 1W.
R4	63-293	990M 1W.
R5	63-458	TONE CONTROL
R6	63-373	1 M
R7	63-456	VOL. CONTROL
R8	63-453	CANDOHM.

1	5-3397	SELECT. DET. COIL
2	65-80	SHORT WAVE SW.
3	5-3129	OSC. COIL ASSEM.
4	95-302	1ST I.F. TRANS.
5	95-303	2ND I.F. TRANS.
6	49-117	8" SPKR. MODEL 6-5-27
7	49-116	10" " 6-5-52
8	95-289	PWR. TRANS. 60W
9	95-290	" 25W
10	5-3377	1ST & 2ND DET. COIL ASSEM.
11	65-39	PHONO. SWITCH
12	44-7	PHONO. JACK.

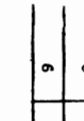
I.F. FREQUENCY 252.5 KC.
6 TUBE SUPERHETERODYNE.
CHASSIS No. 5619.
MODELS 6-5-27—6-5-52.
ZENITH RADIO CORP.
CHICAGO, ILL.

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6a8	1st.Det. Osc.	0	5_{ac}	225	70	-.1	190	0	0	0
6K7	I.F.	0	5_{ac}	225	70	0	-	0	0	0
6H6	2nd Det.	0	5_{ac}	-1	-2.5	-1	-	0	-2.5	-
6K7	1st.Aud.	0	5_{ac}	60	14	-2.5	-	0	-2.5	0
6F6	PwR	0	5_{ac}	220	225	-2.5	-	0	-2.5	-
5Y3	Rect.	0	300	-	305_{ac}	-	305_{ac}	-	300	-

Line voltage 110. Antenna and Ground disconnected.

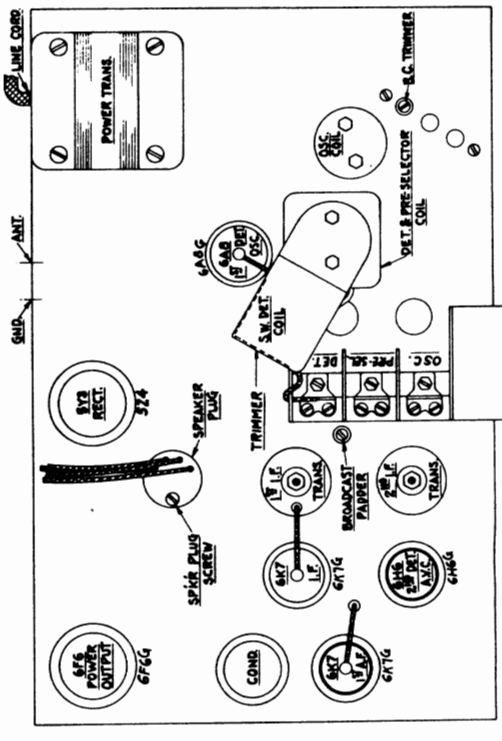
All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise).



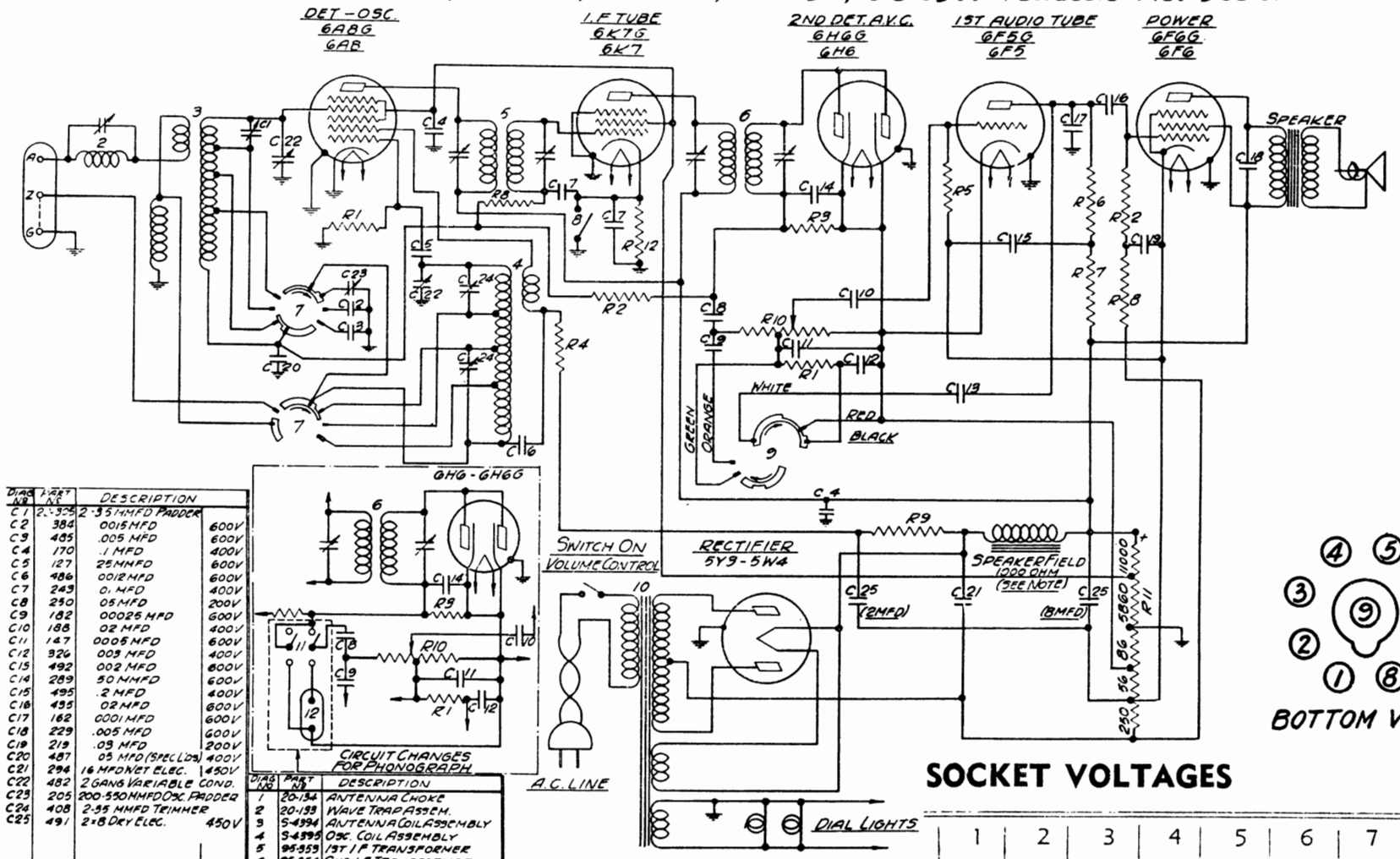
BOTTOM VIEW OF SOCKET

Alignment

(1) Balance I.F. transformers at 252½ K.C. with test oscillator connected to control grid of 6A8 and ground.
(2) Turn band switch to "C" Band. Connect test oscillator to antenna and ground leads and set for 15 megacycles. Adjust oscillator trimmer on gang condenser to secure correct dial reading.
(3) Adjust detector trimmer (located on bracket on top of detector coil) for maximum output.
(4) Turn band switch to "A" Band. Adjust oscillator trimmer (through hole in top of chassis next to oscillator) for correct dial reading at 1400 K.C. Also adjust preselector and detector trimmers on gang for maximum output.
(5) Adjust oscillator padder (next to oscillator section of gang through hole in top of chassis) while rocking pointer back and forth past 600 K.C. to the combination giving greatest output.
(6) Recheck at 1400 K.C.
(7) Repeat entire procedure.



Models 6-S-128, 6-S-137, 6-S-147, 6-S-152, 6-S-157. (Chassis No. 5634)

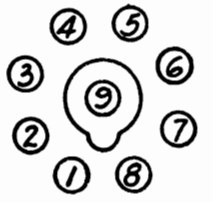


DIAG NO	PART NO	DESCRIPTION	
C1	2-3-35	2-35 MMFD PADDER	
C2	384	0015 MFD	600V
C3	485	.005 MFD	600V
C4	170	.1 MFD	400V
C5	127	25 MMFD	600V
C6	486	0012 MFD	600V
C7	249	.01 MFD	400V
C8	250	.05 MFD	200V
C9	182	00025 MFD	600V
C10	188	.02 MFD	400V
C11	147	0005 MFD	600V
C12	326	.003 MFD	400V
C13	492	.002 MFD	600V
C14	289	50 MMFD	600V
C15	495	.2 MFD	400V
C16	495	.02 MFD	600V
C17	162	.0001 MFD	600V
C18	229	.005 MFD	600V
C19	219	.03 MFD	200V
C20	487	.05 MFD (SPEC L'DS)	400V
C21	294	16 MFD WET ELEC.	450V
C22	482	2 GANG VARIABLE COND.	
C23	205	200-550 MMFD OSC. PADDER	
C24	408	2-35 MMFD TRIMMER	
C25	491	2×8 DRY ELEC.	450V
R1	69-280	49 M OHMS	1/4 W
R2	299	990 M OHMS	1/4 W
R3	481	400M OHMS	1/4 W
R4	379	11 M. OHMS	1/2 W
R5	529	2 MEGOHM	1/4 W
R6	258	490M OHMS	1/4 W
R7	376	190 M OHMS	1/4 W
R8	278	99 M OHMS	1/4 W
R9	353	19 M OHMS	1/2 W
R10	322	2 MEGOHM VOL. CONTROL & SW	
R11	519	CANDOHM RESITOR	
R12	261	4900 OHMS	1/4 W

DIAG NO	PART NO	DESCRIPTION
1	20-134	ANTENNA CHOKE
2	20-138	WAVE TRAP ASSEM.
3	5-4394	ANTENNA COIL ASSEMBLY
4	5-4395	OSC. COIL ASSEMBLY
5	95-353	1ST I.F. TRANSFORMER
6	95-354	2ND I.F. TRANSFORMER
7	85-90	BAND SELECT SWITCH
8	85-91	SENSITIVITY CONTROL
9	85-92	TONE CONTROL SWITCH
10	95-289	POWER TRANS. 115V-50-60 CYCLE
	95-290	POWER TRANS. 25 CYCLE ALL VOLT
11	85-39	PHONO. SWITCH
12	44-7	PHONO. JACK

NOTE:— 22-319 16 MFD DRY ELEC. REPLACE # 22-294 WET ELEC. IN MODEL 69-147 END TABLE

I.F. = 456 K.C.



SOCKET VOLTAGES

SPEAKER: 6A8 — 49-117-8'
49-118-10'

		1	2	3	4	5	6	7	8	9
6A8	1st Det Osc.	0	6AC	280	80	—4	175	0	0	0
6K7	I F	0	6AC	280	80	0	—	0	Local 7	0
6H6	2nd Det A.V.C.	0	6AC	—2	—2	—2	—	0	—2	—
6F5	1st Audio	0	6AC	—	75	—	—	0	—2	—2
6F6	Power	0	6AC	260	280	—2	—	0	—2	—
5Y3 5W4	Rectifier	0	320	—	AC	—	AC	—	320	—

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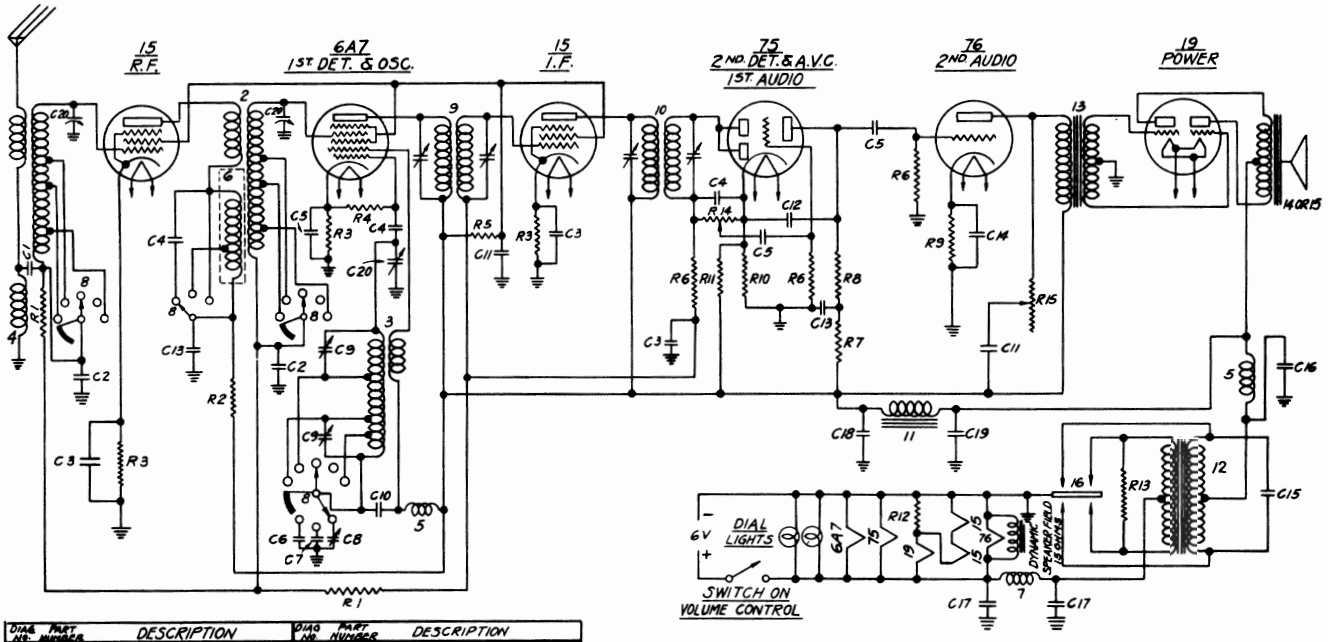
Models 6V27-6V62 Chassis 5621



DIAG. NO.	PART NUMBER	DESCRIPTION	
R1	63-278	99 M OHMS	1/4 W.
R2	63-361	5 M "	1/4 W.
R3	63-362	400 "	1/4 W.
R4	63-280	49 M "	1/4 W.
R5	63-353	19 M "	1/2 W.
R6	63-293	990 M "	1/4 W.
R7	63-290	260 M "	1/4 W.
R8	63-258	490 M "	1/4 W.
R9	63-272	4 M "	1/4 W.
R10	63-238	1 M "	1/4 W.
R11	63-260	100 M "	1/4 W.
R12	63-477	100 FLEXIBLE WIRE WOUND	2 W.
R13	63-394	200 OHMS	1/2 W.
R14	63-456	200 M VOL. CONTROL & SWITCH	
R15	63-458	50 M TONE CONTROL	
C1	22-243	.01 MFD.	400 V.
C2	22-410	.003 "	600 V.
C3	22-250	.05 "	200 V.
C4	22-289	.50 MMFD.	600 V.
C5	22-188	.02 MFD.	400 V.
C6	22-411	.0023 "	600 V.
C7	22-345	.0011 "	600 V.
C8	22-303	200-350 MMFD. PADDER	1

DIAG. NO.	PART NUMBER	DESCRIPTION	
C9	22-408	2-35 MMFD. PADDER	
C10	22-82	.001 MFD.	600 V.
C11	22-212	.05 "	400 V.
C12	22-182	.00025 "	600 V.
C13	22-224	.1 "	300 V.
C14	22-225	.5 "	25 V.
C15	22-437	.01 "	1400 V.
C16	22-228	.5 "	300 V.
C17	22-251	.5 "	200 V.
C18	22-432	2 "	250 V
C19		2 "	
C20	22-403	456 MMF. VAR. COND.	
L	3-3697	ANT. COIL ASSEM.	
2	3-3698	DET. COIL ASSEM.	
3	3-3699	OSC. COIL ASSEM.	
4	20-82	ANT. CHOKE	
5	20-88	R.F. CHOKE	
6	20-119	R.F. PLATE CHOKE	
7	3-2778	R.F. CHOKE	
8	85-78	BAND SELECTOR SWITCH	
9	95-291	1ST I.F. TRANS.	
10	95-292	2ND I.F. TRANS	
11	95-298	POWER CHOKE	
12	95-305	RECTIFIER TRANS.	
13	95-311	AUDIO TRANS.	
14	49-132	8" MAG. SPEAKER	MOD 6V27
15	49-134	12" DYN. " "	MOD 6V62

ZENITH

3 BAND { 550 KC. - 1780 KC. / 2100 KC. - 6800 KC. / 7000 KC. - 23000 KC.

I.F. FREQUENCY 456 KC.
6 TUBE BATTERY SUPERHETERODYNE
CHASSIS Nº 5621

MODELS - 6V27, 6V62

ZENITH RADIO CORP.
CHICAGO, ILL.

SOCKET VOLTAGES

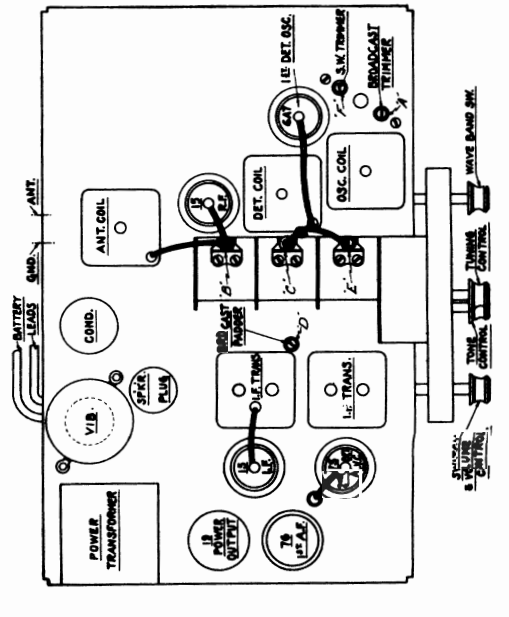
Antenna and Ground Disconnected

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
15	R. F.	2	1.5	0	70	-	125
6A7	Det.-Osc.	6	2	0	150	-	150
				-1	-	-	150
15	I. F.	2	2	0	70	-	150
75	2nd Det. & A.V.C.	6	1.5	0	-	-	40
76	1st Audio	6	8	0	-	-	140
19	PWR.	2	-	0	-	-	160
							160

Battery Voltage 6 Volts
All voltages measured from socket contacts to ground with 1000 ohm per volt D. C. meter.
F - Filament; K - Cathode; g1 - Control grid; g2 - Screen grid; g3 - Suppressor grid; p - plate.

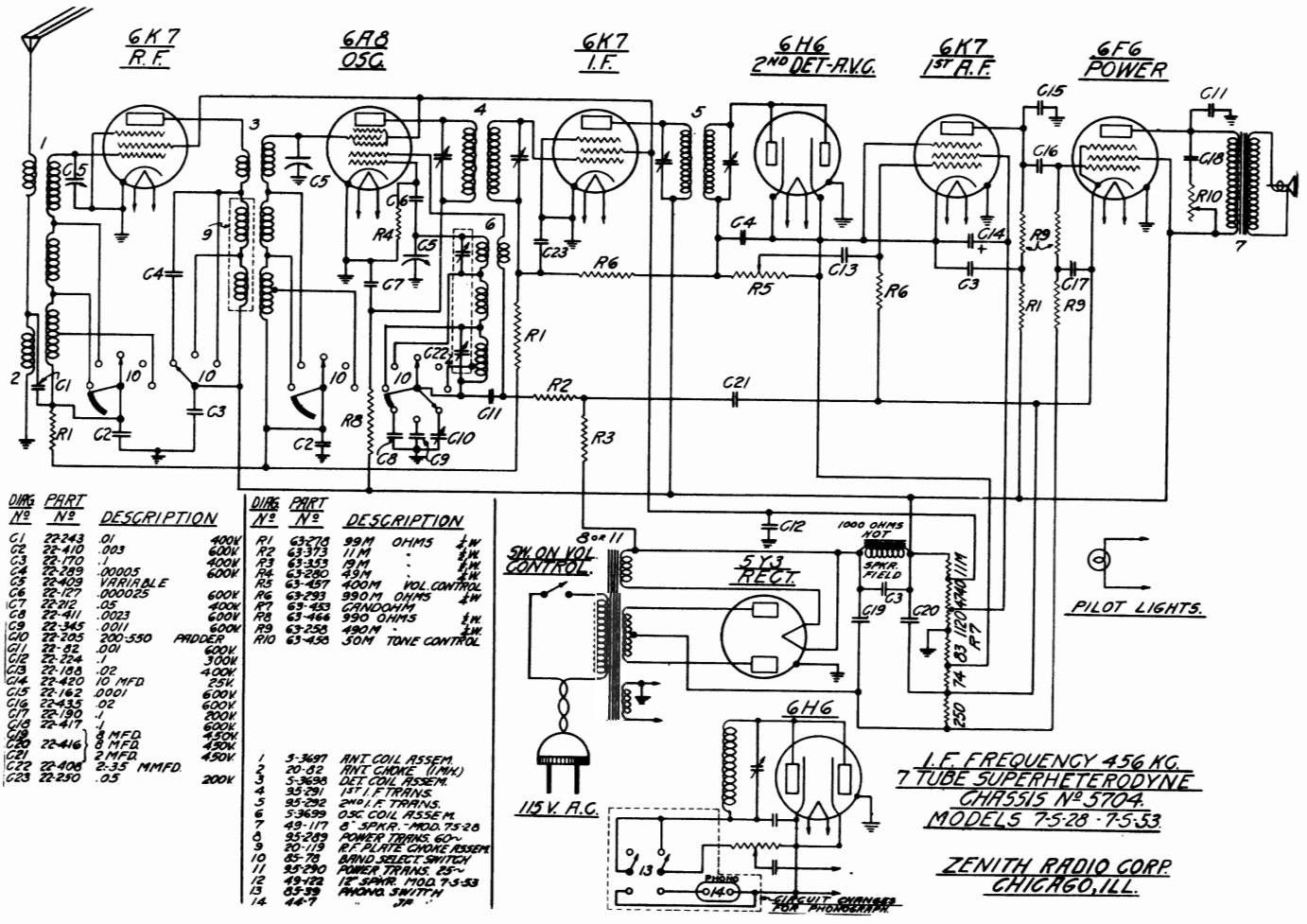
Alignment

1. Attach service oscillator to grid cap of 6A7 tube and adjust I.F. trimmers at 456 K.C.
2. Place band switch in "A" (Standard broadcast) position and attach 1400 K.C. service oscillator to antenna and ground posts. Set dial indicator to 1400 K.C. and adjust trimmers "A" (Osc.); "B" (R.F.); "C" (Det.) to maximum output.
3. Set service oscillator to 600 K.C. and rock indicator over 600 K.C. on dial of receiver while adjusting standard broadcast padder "D".
4. Repeat operations 2 and 3.
5. Place band switch in "B" or 1st short wave position (2100 - 6800 K.C.) and set white dial pointer on 6 megacycles. Set service oscillator to 6 megacycles and adjust trimmer "E" for maximum output while rocking dial pointer slowly over 6 megacycle division.
6. Place band switch on "C" position (7000- 23000 K.C.) and set service oscillator and white dial pointer to 18 megacycles. Adjust trimmer "F" to resonance while rocking dial indicator slowly over 18 megacycle division.
7. Set dial and service oscillator at 9 megacycles and twist or untwist tinned bare wire tuning "loop" (on front section of band switch under chassis) for maximum output.
8. Align standard broadcast band again at 1400 K.C. by adjusting trimmer "A" only. Repeat all eight operations for final accuracy.



ZENITH RADIO CORP.

Models 7S28, 7S30, 7S53— Chassis 5704



DIAG Nº	PART Nº	DESCRIPTION	
C1	22-243	.01	400V
C2	22-410	.003	600V
C3	22-170	.1	400V
C4	22-289	.00005	600V
C5	22-403	VARIABLE	
C6	22-127	.000025	600V
C7	22-212	.05	400V
C8	22-411	.0023	600V
C9	22-345	.0011	600V
C10	22-205	200-550	PADDER
C11	22-32	.001	600V
C12	22-224	.1	300V
C13	22-188	.02	400V
C14	22-420	10 MFD	25V.
C15	22-162	.0001	600V
C16	22-435	.02	600V
C17	22-190	.1	200V
C18	22-417	.1	600V
C19	22-416	8 MFD.	450V.
C20		8 MFD.	450V.
C21		2 MFD.	450V.
C22	22-406	2-35 MMFD.	
C23	22-250	.05	200V

DIAG Nº	PART Nº	DESCRIPTION
R1	63-276	99M OHMS ½W.
R2	63-373	1 M " 1W.
R3	63-355	19M " ½W.
R4	63-280	49M " ½W.
R5	63-497	400M VOL. CONTROL
R6	63-293	990M OHMS ½W
R7	63-483	CANDOHM
R8	63-466	990 OHMS ½W.
R9	63-258	490M " ½W.
R10	63-456	30M TONE CONTROL

1	5-3697	ANT. COIL ASSEM.
2	20-82	ANT. CHOKE (1 MH)
3	5-3698	DET. COIL ASSEM.
4	95-291	1ST I.F. TRANS.
5	95-292	2ND I.F. TRANS.
6	5-3699	OSC. COIL ASSEM.
7	49-117	8" SPKR. - MOD. 7S-28
8	95-289	POWER TRANS. 60~
9	20-119	R.F. PLATE CHOKE ASSEM.
10	85-78	BAND SELECT SWITCH
11	95-290	POWER TRANS. 25~
12	49-122	12" SPKR. MOD. 7-S-53
13	85-39	PHONO SWITCH
14	44-7	" "

I.F. FREQUENCY 456 KC.
7 TUBE SUPERHETERODYNE
CHASSIS Nº 5704.
MODELS 7-S-28 · 7-S-53

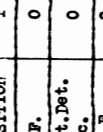
ZENITH RADIO CORP.
CHICAGO, ILL.

Socket Voltages

Line Voltage 115 — Antenna and Ground Disconnected

All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise).

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	6_{ac}	250	75	0	-	0	0	-.1
6A8	1st. Det. Osc.	0	6_{ac}	250	75	-1	195	0	0	-.1
6K7	I. F.	0	6_{ac}	250	75	0	-	0	0	-.1
6H6	2nd Det. A.V.C.	0	6_{ac}	-2	-2.5	-2	-	0	-2.5	-
6K7	1st Audio	0	6_{ac}	65	14	-1	-	0	- 1	-.1
6F6	PWR.	0	6_{ac}	235	250	-10	-	0	-5	-
5Y3	Rect.	0	310	-	250_{ac}	-	250_{ac}	-	310	-



BOTTOM VIEW OF SOCKET

Alignment

The use of an accurately calibrated service oscillator is imperative in the alignment of modern superheterodynes. The alignment procedure is as follows:

(1) Connect service oscillator to grid of 6A8 and ground. Balance I.F. trimmers at 456 K.C.

(2) Connect service oscillator to antenna and ground binding posts and set at 6 megacycles. Adjust trimmer on gang for correct dial reading, (6 megacycles on Band B).

(3) Set service oscillator and pointer to 21 megacycles and adjust S.W. trimmer (through hole in top of chassis) for correct dial reading.

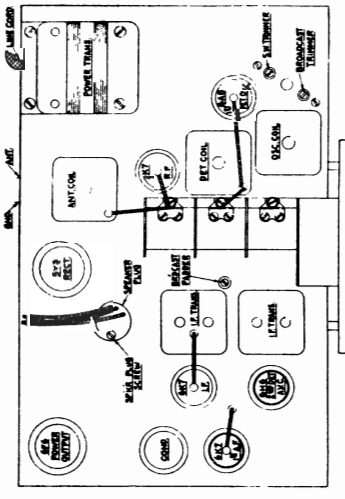
(4) Recheck 6 megacycle adjustment.

(5) Set service oscillator and pointer to 1700 K. C. (Band A) and adjust broadcast trimmer (through hole in top of chassis) for correct dial reading.

(6) Set service oscillator at 600 K.C. Adjust broadcast padder (through hole in top of chassis next to I.F. transformer), meanwhile rocking pointer to and fro past 600 K.C. on dial to combination giving greatest output.

(7) Readjust at 1700 K.C.

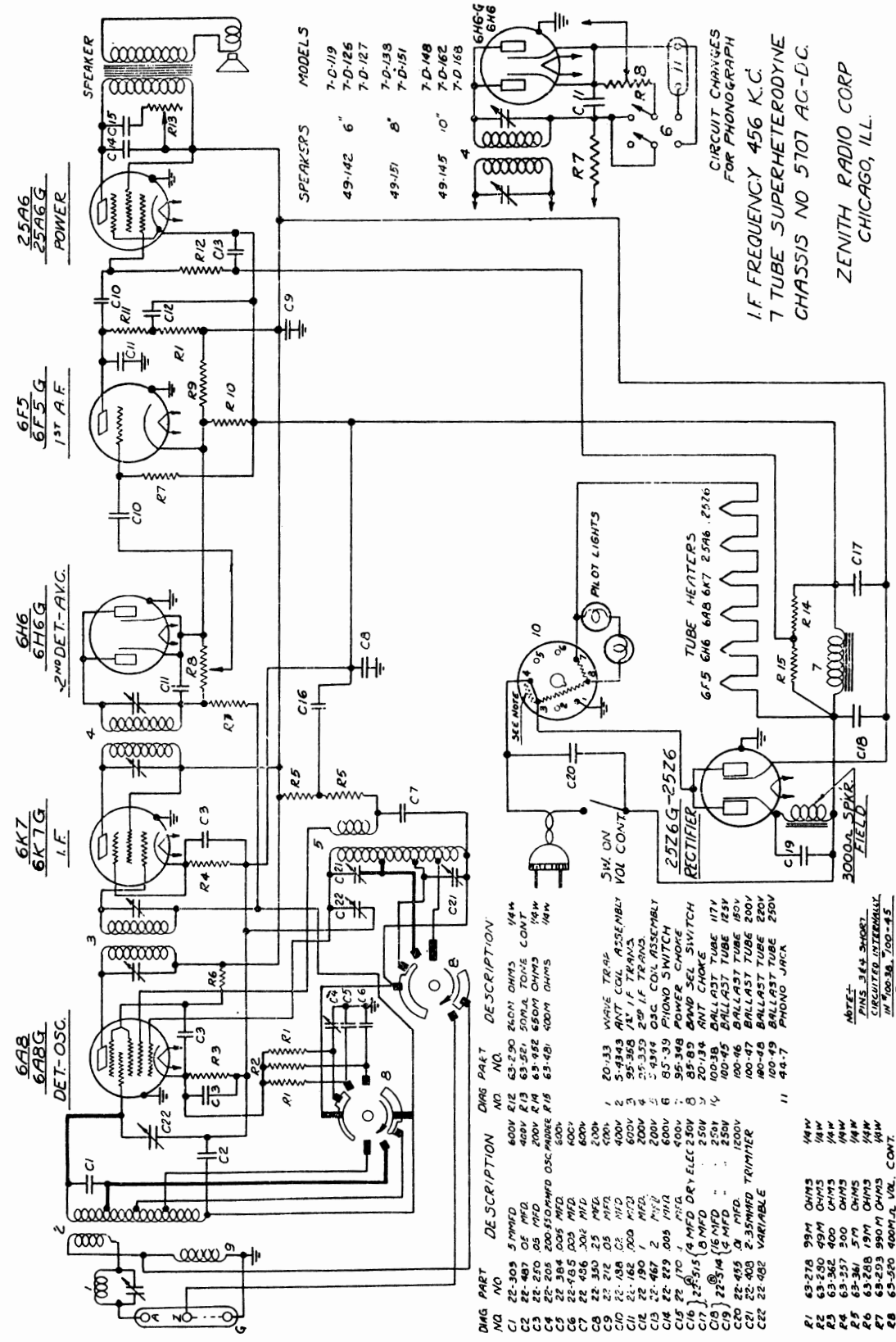
Note: These adjustments affect each other slightly and the entire procedure should be repeated to secure maximum results.



TUBE POSITION

ZENITH RADIO CORP.

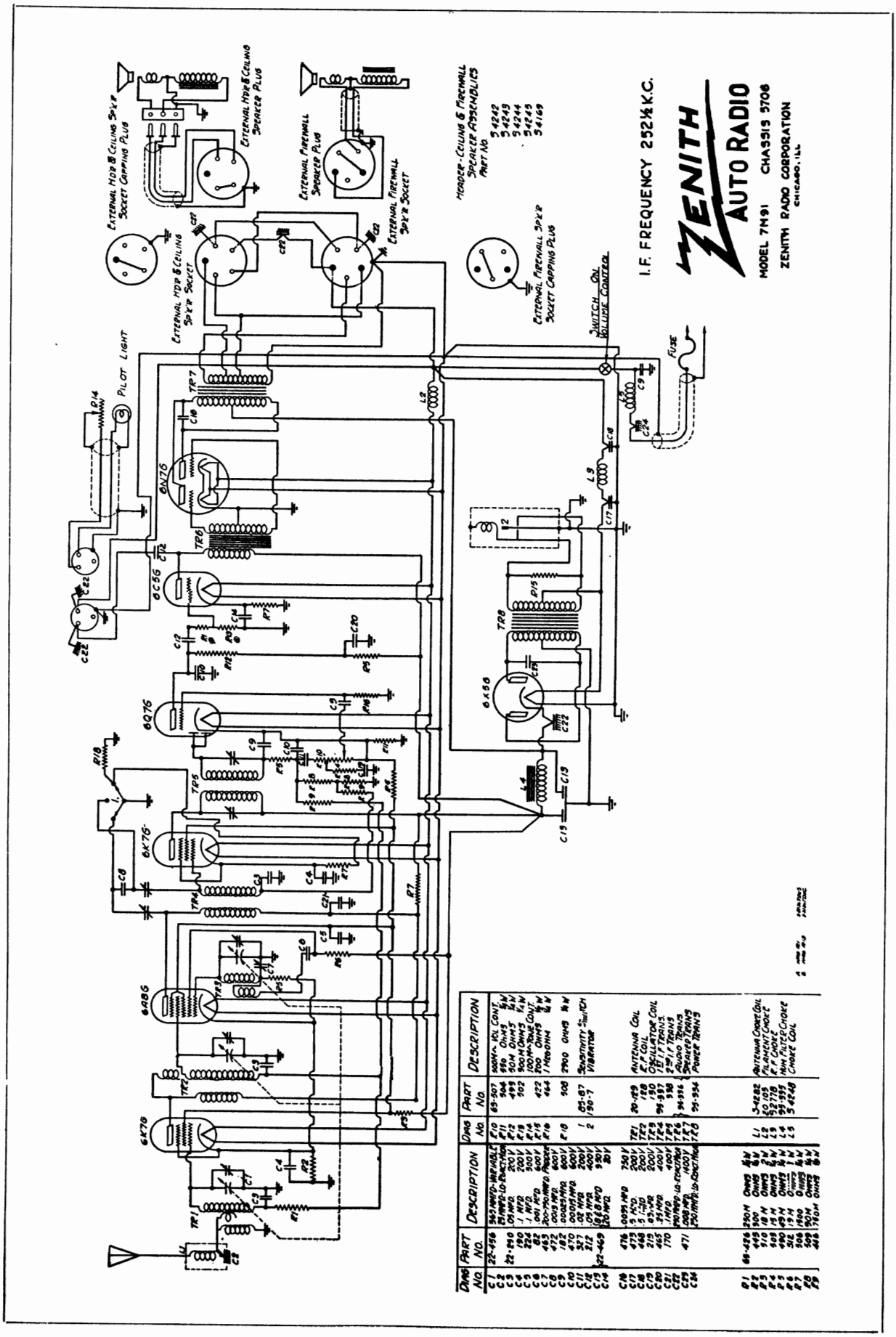
Models 7-D-119, 7-D-126, 7-D-127, 7-D-138, 7-D-151, 7-D-148, 7-D-162, 7-D-168. (Chassis No. 5707)



DWG NO	PART NO	DESCRIPTION	DWG NO	PART NO.	DESCRIPTION
C1	22-303	5 MMFD 600V	R12	63-290	2600 OHMS 1/4W
C2	22-487	.05 MFD. 400V	R13	63-321	50MA TOMS CONT
C3	22-250	.05 MFD 200V	R14	63-432	6500 OHMS 1/4W
C4	22-205	200-510 MMFD OSC PADDER	R15	63-481	400M OHMS
C5	22-384	.005 MFD. 600V			
C6	22-195	.003 MFD. 600V			
C7	22-196	.2 MFD. 200V		20-133	WAVE TRAP
C8	22-350	.25 MFD. 400V	2	54343	ANT. COIL ASSEMBLY
C9	22-272	.05 MFD. 400V	3	95-368	1ST I.F. TRANS.
C10	22-138	.02 MFD. 600V	4	95-333	2ND I.F. TRANS.
C11	22-162	.006 MFD. 200V	5	54344	OSC COIL ASSEMBLY
C12	22-190	.1 MFD. 200V	6	85-39	PHONO SWITCH
C13	22-467	.2 MFD. 600V	7	95-348	POWER CHOKE
C14	22-229	.005 MFD. 400V	8	85-89	BAND SEL. SWITCH
C15	22-210	.1 MFD. 400V	9	20-134	ANT CHOKE
C16	22-515	{4 MFD DRY ELEC. 250V	10	100-38	BALLAST TUBE 117V
C17		{8 MFD " " 250V	11	100-45	BALLAST TUBE 125V
C18	22-514	{16 MFD " " 250V		100-46	BALLAST TUBE 150V
C19		{4 MFD " " 1200V		100-47	BALLAST TUBE 200V
C20	22-455	.01 MFD.		100-48	BALLAST TUBE 220V
C21	22-408	2-35 MMFD TRIMMER		100-49	BALLAST TUBE 250V
C22	22-482	VARIABLE		44-7	PHONO JACK
R1	63-278	99M OHMS 1/4W			
R2	63-280	49M OHMS 1/4W			
R3	63-362	400 OHMS 1/4W			
R4	63-337	300 OHMS 1/4W			
R5	63-361	5M OHMS 1/4W			
R6	63-288	1M OHMS 1/4W			
R7	63-293	990M OHMS 1/4W			
R8	63-500	400M Ω VOL CONT.			
R9	63-442	50M OHMS 1/4W			
R10	63-518	3M OHMS 1/4W			
R11	63-376	190M OHMS 1/4W			

ZENITH RADIO CORP.

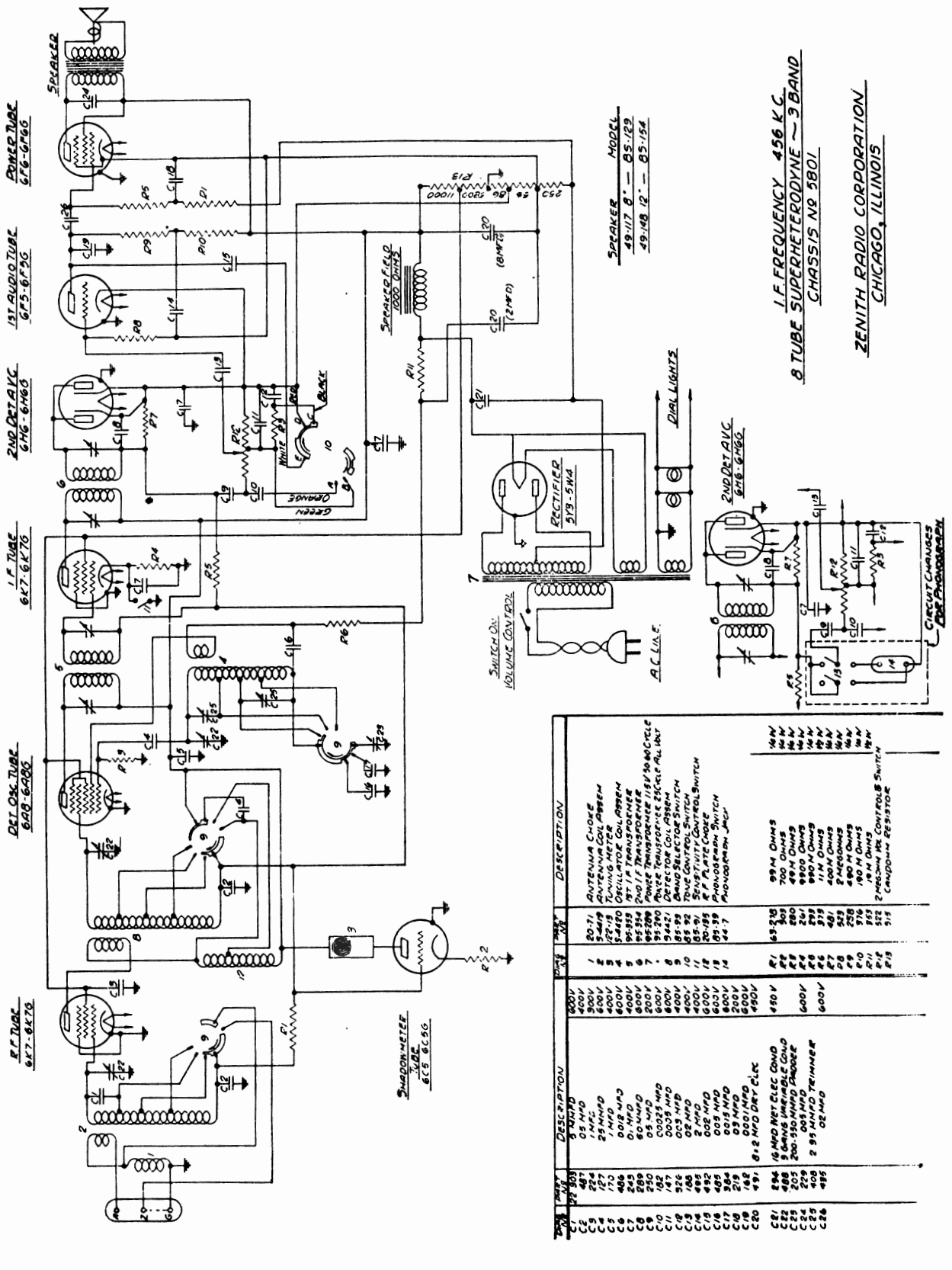
Circuit Diagram. Models 7-M-91S and 7-M-91D. (Chassis No. 5706)



DWG NO.	PART NO.	DESCRIPTION	DWG NO.	PART NO.	DESCRIPTION
C1	22-456	365 MMFD-VARIABLE	P10	65-367	300MA. VOL CONT.
C2		23 MMFD-LO-REACTANCE	P11	964	5% OHMS ½ W
C3	22-490	.05 MFD.	P12	499	10M OHMS ½ W
C4	190	.1 MFD.	P13	502	500 M OHMS ½ W
C5	224	.1 MFD.	P14	422	100M+TONE CONT. ½ W
C6	482	200 MMFD.	P15	464	100 OHMS ½ W
C7	472	200 MMFD.	P16	466	1 MEGOHM ½ W
C8	473	.005 MFD.	P17	508	2500 OHMS 10 W
C9	182	.0025 MFD.	600V		
C10	470	.0001 MFD.	600V		
C11	327	.02 MFD.	2000V		
C12	312	.05 MFD.	400V	1	65-87 SENSITIVITY 1/2 MICH
C13	22-469	.1 MFD.	350V	2	190-7 VIBRATOR
C14		250 MMFD.	350V		
C16	476	.0095 MFD	750 V		
C17	473	.5 MFD.	200V	TF1	20-129 ANTENNA COIL
C18	468	.1 MFD.	200V	TF2	128 R.F. COIL
C19	215	.05 MFD.	200V	TF3	130 OSCILLATOR COIL
C20	465	.25 MFD.	400V	TF4	99-397 1ST I.F. TRANS.
C21	110	250 MMFD.	400V	TF5	398 2ND I.F. TRANS.
C22		250 MMFD.	400V	TF6	99-396 SPEAKER TRANS.
C23	471	.008 MFD.	1400V	TF7	99-394 POWER TRANS.
C24		250 MMFD.	1400V	TF8	
				L1	3-4282 ANTENNA CHOKE COIL
R1	69-426	250 OHM	½ W	L2	20.103 FILAMENT CHOKE
R2	445	500	½ W	L3	52778 R.F. CHOKE
R3	510	18 M	2 W	L4	99-395 1ST I.F. TRANS.
R4	490	18 M	½ W	L5	5-4248 2ND I.F. TRANS.
R5	488	49 M	½ W		HUM FILTER CHOKE
R6	506	1500	½ W		CHOKE COIL
R7	509	90M	½ W		
R8	446	1760M	½ W		

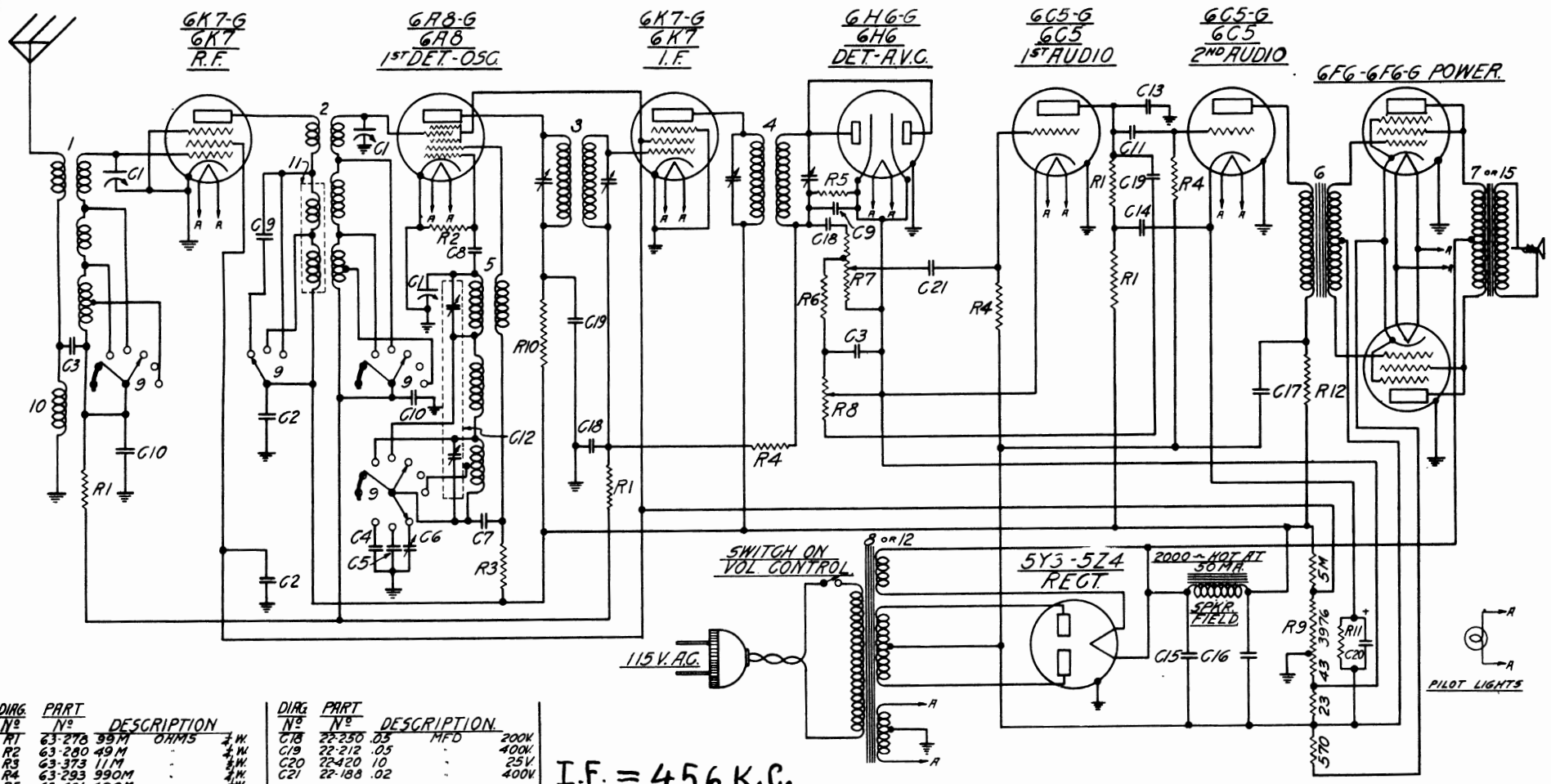
ZENITH RADIO CORP.

Models 8-S-129, 8-S-154. (Chassis No. 5801)



Ckt. No.	Part No.	Description	Volts	Part No.	Description
C1	293	.5 MMFD	600V	R1	99 M Ohms
C2	487	.05 MFD	400V	R2	700 Ohms
C3	224	1 MFD	300V	R3	490 Ohms
C4	127	25 MMFD	400V	R4	990 M Ohms
C5	170	.015 MFD	400V	R5	11 M Ohms
C6	486	.01 MFD	400V	R6	400 M Ohms
C7	245	60 MMFD	600V	R7	2 Megohms
C8	289	.05 MFD	200V	R8	490 M Ohms
C9	250	.0025 MFD	600V	R9	180 M Ohms
C10	182	.003 MFD	600V	R10	1 M Ohms
C11	147	.02 MFD	400V	R11	2 Megohm Vol. Control & Switch
C12	188	2 MFD	400V	R12	Candohm Resistor
C13	493	.002 MFD	400V	R13	
C14	492	.005 MFD	600V		
C15	494	.05 MFD	600V		
C16	219	.03 MFD	200V		
C17	162	.0001 MFD	600V		
C18	191	.012 MFD DRY ELEC	450V		
C19	294	16 MFD WET ELEC COND	450 V		
C20	488	3 GANG VARIABLE COND			
C21	205	200-550 MMFD PADDER	600V		
C22	229	2-95 MMFD TRIMMER	600V		
C23	208	.02 MFD			
C24	495				
C25					
C26					

ZENITH RADIO CORP.

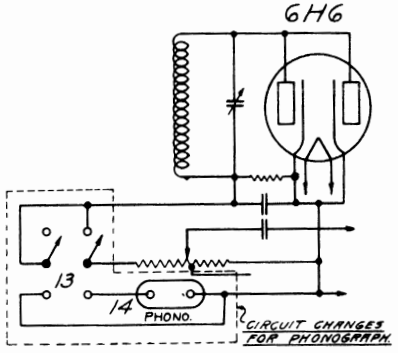


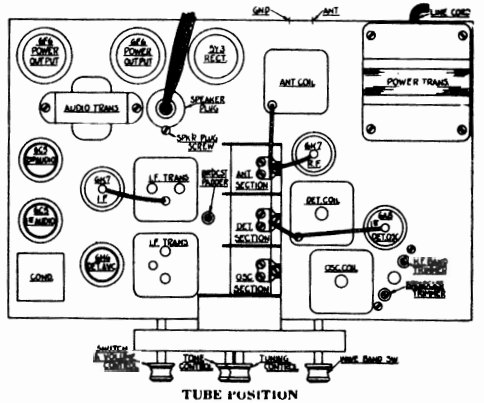
DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-278	99M OHMS	½W.
R2	63-280	49M "	½W.
R3	63-373	11M "	½W.
R4	63-293	990M "	½W.
R5	63-481	400M "	½W.
R6	63-288	19M "	½W.
R7	63-450	1MEG. VOL. CONTROL	
R8	63-451	1 " TONE "	
R9	63-449	GANDOHM	
R10	63-466	990 OHMS	1W.
R11	63-300	990 "	½W.
R12	63-240	1900 "	1W.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-409	VARIABLE	
C2	22-170	.1 MFD.	400V.
C3	22-243	.01 "	400V.
C4	22-411	.0023 "	600V.
C5	22-345	.0011 "	600V.
C6	22-205	200-550 MMFD. PADDER	
C7	22-82	.001 MFD.	600V.
C8	22-127	.000025 "	600V.
C9	22-289	.00005 "	600V.
C10	22-410	.003 "	600V.
C11	22-435	.02 "	600V.
C12	22-403	2-35 MMFD	
C13	22-162	.0001 MFD.	600V.
C14	22-433	5 "	400V.
C15	22-294	16 "	450V.
C16	22-443	4 "	450V.
C17		2 "	450V.

DIAG. Nº	PART Nº	DESCRIPTION	
C18	22-230	.05 MFD	200V.
C19	22-212	.05 "	400V.
C20	22-420	10 "	25V.
C21	22-188	.02 "	400V.

1	5-3697	ANT. COIL ASSEM.
2	5-3698	DET. COIL ASSEM.
3	95-291	1ST I.F. TRANS.
4	95-292	2ND I.F. TRANS.
5	5-3699	OSC. COIL ASSEM.
6	95-294	INPUT TRANS.
7	49-120	SPEAKER-MOD. 9-S-54
8	95-293	POWER TRANS.-50~
9	85-78	BAND SELECT. SWITCH
10	20-82	ANT. CHOKE (1MH)
11	20-119	R.F. PLATE CHOKE ASSEM.
12	95-295	POWER TRANS.-25~
13	85-39	PHONO. SWITCH
14	44-7	PHONO. JACK
15	49-123	SPKR. - MODEL 9-S-55





Models

9S30
9S54
9S55

Chassis 5903

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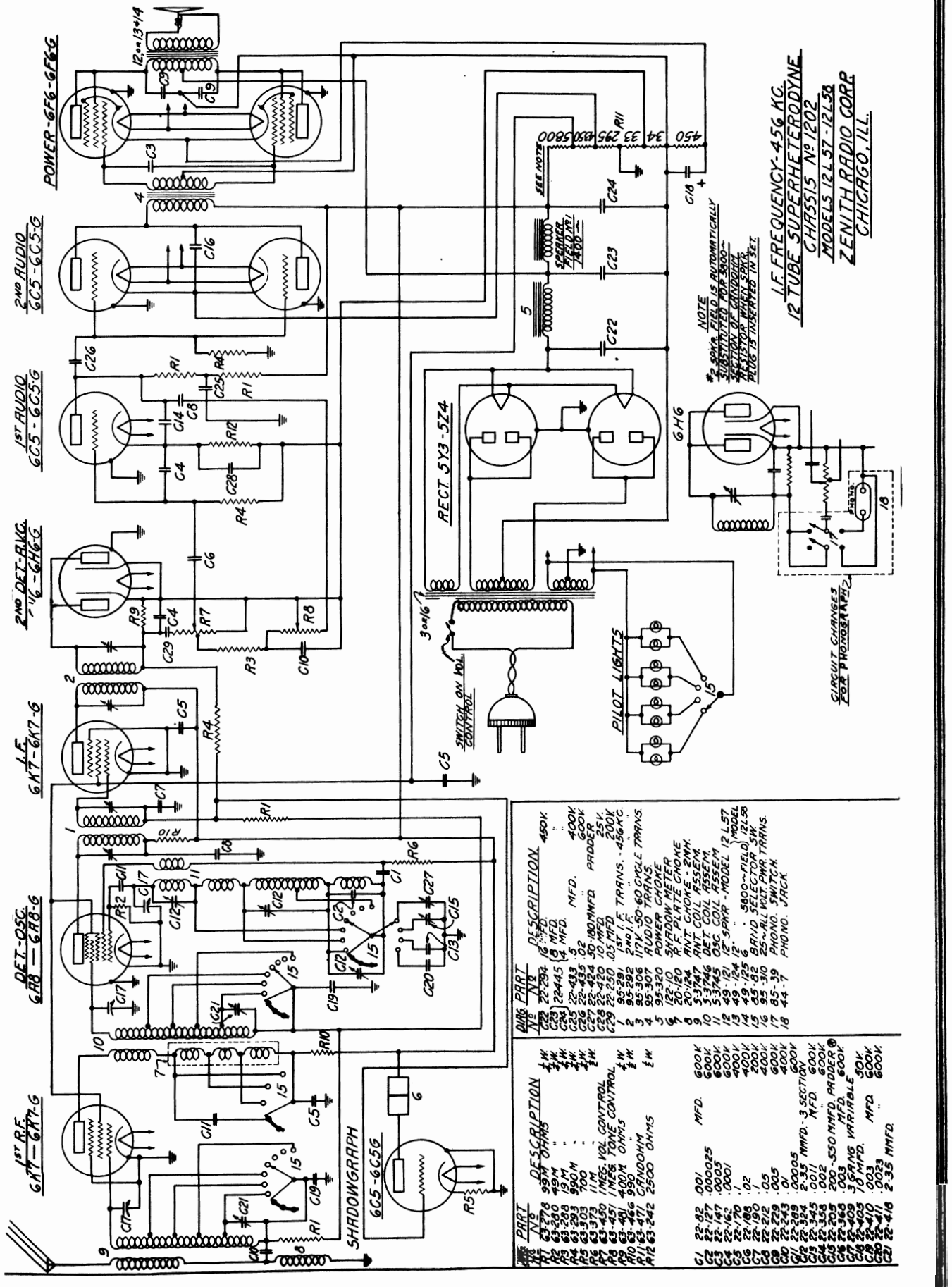


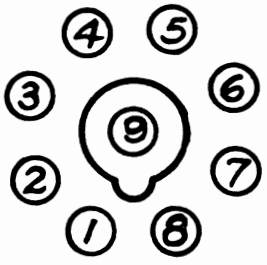
ZENITH RADIO CORP.

Models 12-L-57 and 12-L-58

Chassis 1202-1202A

Socket Voltages

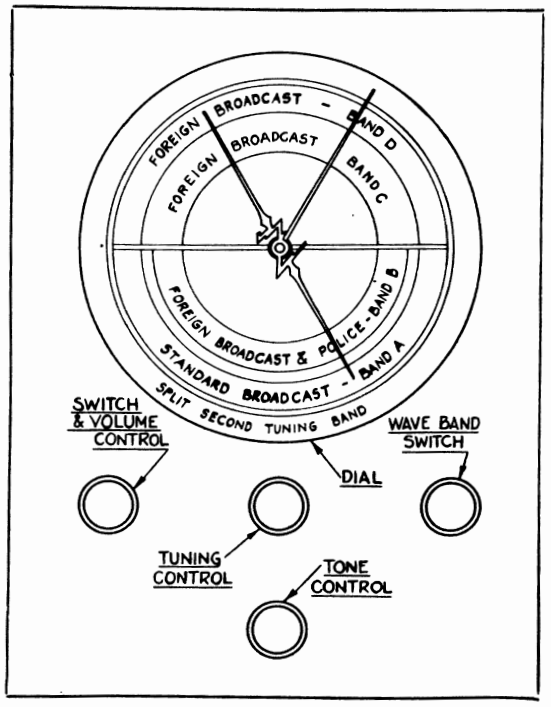
TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	2.9ac	225	97	0	-	2.9ac	0	- .1
6A8	1st.Det. Osc.	0	2.9ac	225	97	-5	200	2.9ac	0	- .1
6K7	I.F.	0	2.9ac	225	97	0	-	2.9ac	0	- .1
6H6	2nd Det. A. V. C.	0	2.9ac	-2.1	-2.5	-2.5	-	2.9ac	-2.5	-
6C5	Shadow Meter	0	2.9ac	215	-	0	-	2.9ac	8.5	-
6C5	1st.Audio	0	2.9ac	42	-	0	-	2.9ac	0	-
6C5	Driver	0	2.9ac	215	-	0	-	2.9ac	8.5	-
6F6	Power	0	2.9ac	340	340	-4.5	-	2.9ac	25	-
5Y3 5Z4	RECT.	0	350	-	300 a.c.	-	300 a.c.	-	350	-



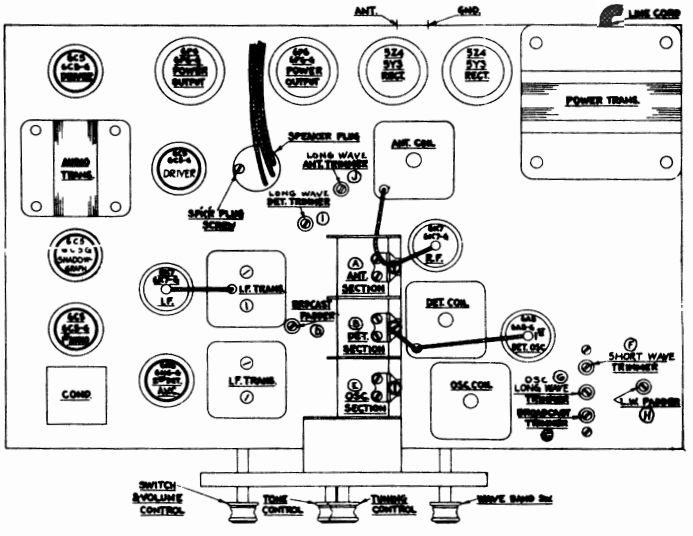
BOTTOM VIEW OF SOCKET

Line Voltage 115 Antenna and Ground Disconnected

Voltages measured from point indicated to ground,using a 1000 ohm per volt meter, except heaters. (2 - 7)



Control Panel



Service Bulletin

ZENITH RADIO

MODELS
12-L-57
12-L-58

SERVICE NOTES

Chassis
No. 1202-1202A

On actual service hints, check all tubes, aerial and ground installation first.

Lack sensitivity -- Re-Balance.

A.V.C. blocks -- Open A.V.C. resistor or grounded circuit, noticeable by distortion. Usually clears up when aerial is removed.

Weak - S.W. -- Open #22-242 .05 condenser.

Weak - all over -- Open #22-190 .1 in A.V.C. circuit.

Dead -- Open #22-435 .02 coupling condenser. If shorted, set will be weak and distorted.

Dead or very weak -- Open #22-188 .02 condenser. If shorted, set will be distorted with no apparent change in volume control.

Dead -- #22-433 .5 shorted.

Hums -- #22-433 .5 open, also mismatched 6R6 tubes. In rare cases defective choke or filter.

Weak -- Open #22-250 .05 condensers.

Weak -- L.W. band, open .000025 - red - green - black. Condenser in L.W. circuit.

Weak -- I.F. or R.F. coil open or shorted. Flutters all bands - Open .1 #22-170 screen condenser. Set dead if shorted with no screen voltage.

Distorted & Weak -- Shorted I.F. grid circuit.

Signals tune sharp -- noise level low off the signal --- check 6H6 tube.

Pointers will not turn -- Belt off pulley. Split second hand will not turn - binds on cabinet or loose planetary lugs - adjust carefully.

Lack sensitivity with oscillation on "D" band around 12 megacycles -- check for open antenna choke or antenna coil.

Carrier Hum -- Open Antenna choke coil.

Oscillates -- Dress all I.F. wires. Check for open condensers, tubes, balance, etc. - check aerial installation and ground.

Off scale -- Large "Z" pointer loose on gang hub.

Alignment

The bands are as follows:

Band	Color	Kilocycles	Megacycles	Meters
A	Green	550 - 1,740	.55 - 1.74	545 - 172
B	Green	2,000 - 7,000	2 - 7	150 - 42.8
C	Red	150 - 370	.15 - .37	2,000 - 800
D	Red	7,000 - 22,500	7 - 22.5	42.8 - 13.3

The diagram on Page 3 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. The Clough-Brengle Model OC is a commercial service oscillator highly recommended for this work.

Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

1. Connect service oscillator to grid of 6A8 detector oscillator tube and peak I.F. trimmers (see diagram Page 3) at 456 K.C.

2. Connect service oscillator to antenna post and set to 1400 K.C. Adjust trimmers A, B and C to resonance with dial indicator to 1400 K.C.

3. Set service oscillator to 600 K.C. and adjust broadcast padder D for maximum gain while rocking dial slowly over 600 K.C.

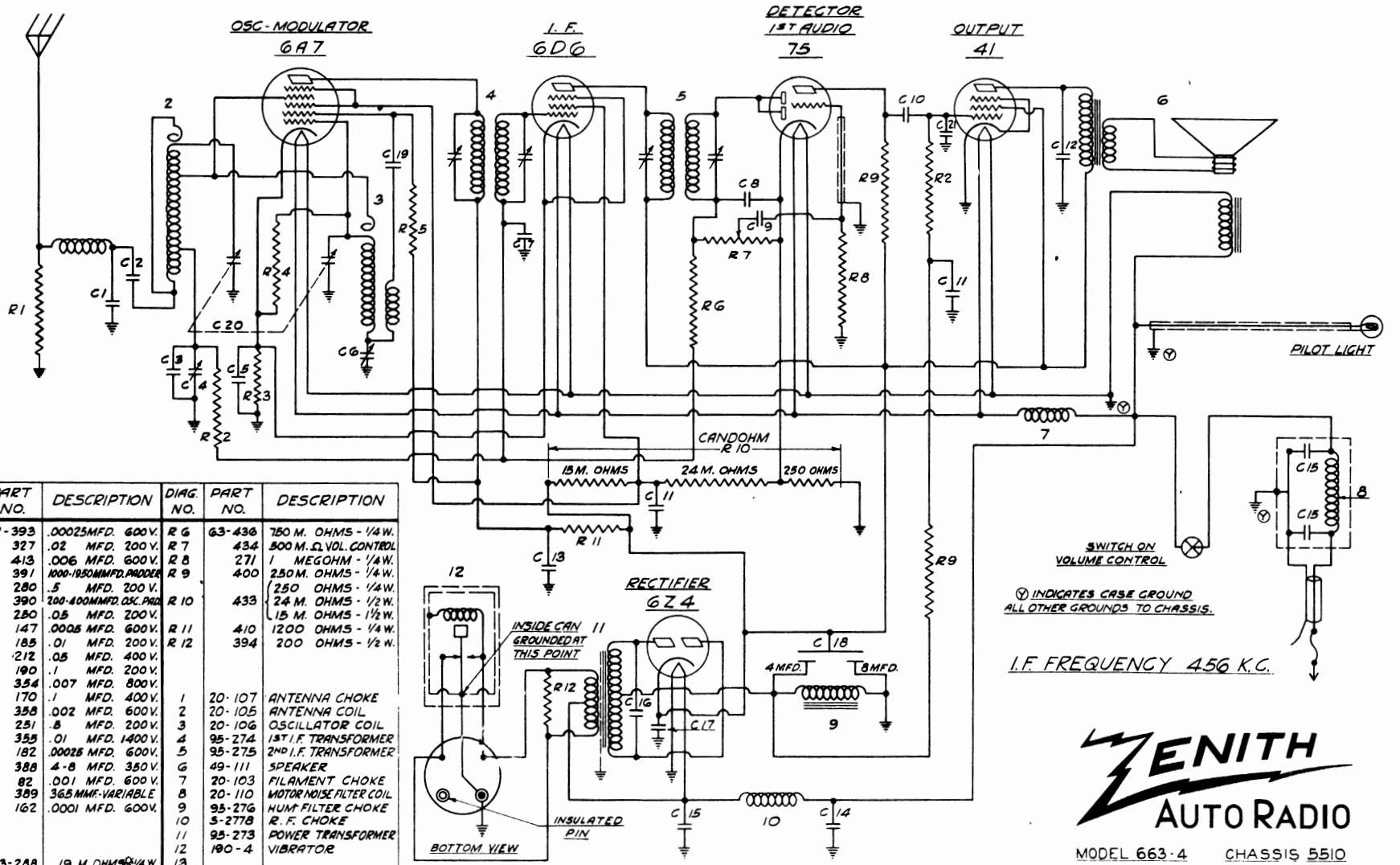
4. Place band switch on band "B" (2 - 7 megacycles) and set service oscillator and dial indicator to 6 megacycles. Adjust gang condenser trimmer E for maximum output while slowly rocking dial over 6 megacycles.

5. Align "D" band (7-22.5 megacycles) next by setting service oscillator and dial indicator to 18 megacycles and rocking indicator slowly over that point while adjusting rimmer F to maximum output.

6. Set band switch to "C" band (long wave) and peak at 350 K.C. with trimmers G, I and J. Turn dial indicator and service oscillator to 150 K.C. and adjust long wave padder H while slowly rocking dial indicator.

7. Re-balance again at 6 megacycles and 1400 K.C. as in 2 and 4.

Model 663-4 Chassis 5510



DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-393	.00025 MFD. 600 V.
C 2	327	.02 MFD. 200 V.
C 3	413	.006 MFD. 600 V.
C 4	391	1000-1950 MMFD. PADDER
C 5	280	.5 MFD. 200 V.
C 6	390	200-400 MMFD. OSC. PADD
C 7	280	.05 MFD. 200 V.
C 8	147	.0005 MFD. 600 V.
C 9	185	.01 MFD. 200 V.
C 10	212	.05 MFD. 400 V.
C 11	190	.1 MFD. 200 V.
C 12	354	.007 MFD. 800 V.
C 13	170	.1 MFD. 400 V.
C 14	358	.002 MFD. 600 V.
C 15	251	.8 MFD. 200 V.
C 16	355	.01 MFD. 1400 V.
C 17	182	.00025 MFD. 600 V.
C 18	388	4-8 MFD. 350 V.
C 19	82	.001 MFD. 600 V.
C 20	389	365 MMF. VARIABLE
C 21	162	.0001 MFD. 600 V.
R 1	G3-288	19 M. OHMS 2W. 1/4 W.
R 2	401	500 M. OHMS - 1/4 W.
R 3	357	300 OHMS - 1/4 W.
R 4	260	100 M. OHMS - 1/4 W.
R 5	263	30 M. OHMS - 1/2 W.
R 6	G3-436	750 M. OHMS - 1/4 W.
R 7	434	500 M. Ω VOL. CONTROL
R 8	271	1 MEGOHM - 1/4 W.
R 9	400	250 M. OHMS - 1/4 W.
R 10	433	250 OHMS - 1/4 W. 24 M. OHMS - 1/2 W. 15 M. OHMS - 1 1/2 W.
R 11	410	1200 OHMS - 1/4 W.
R 12	394	200 OHMS - 1/2 W.
1	20-107	ANTENNA CHOKE
2	20-105	ANTENNA COIL
3	20-106	OSCILLATOR COIL
4	95-274	1ST I.F. TRANSFORMER
5	95-275	2ND I.F. TRANSFORMER
G	49-111	SPEAKER
7	20-103	FILAMENT CHOKE
8	20-110	MOTOR NOISE FILTER COIL
9	95-276	HUM FILTER CHOKE
10	S-2778	R. F. CHOKE
11	95-273	POWER TRANSFORMER
12	190-4	VIBRATOR
13		

ZENITH AUTO RADIO

MODEL 663-4 CHASSIS 5510

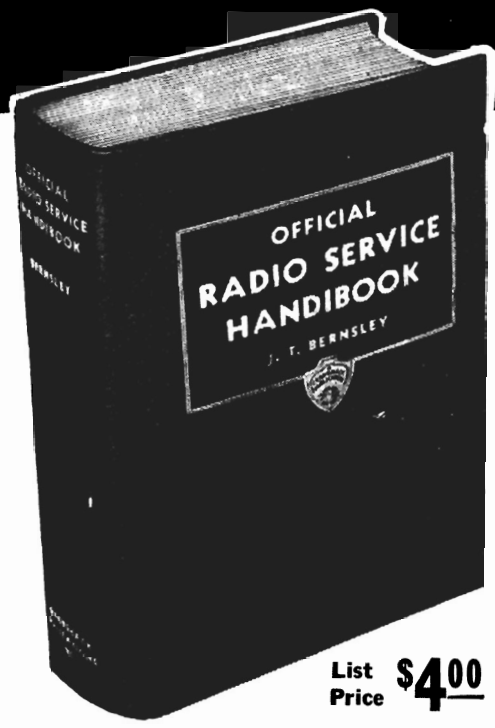
ZENITH RADIO CORPORATION
CHICAGO, ILL.

ZENITH RADIO CORP.

Here is a New Book for Radio Men!

Official Radio Service Handibook

by J. T. Bernsley



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Chapter I. INTRODUCTION.

Chapter II. CIRCUIT FUNDAMENTALS—R. F.
Types of Coupling; Untuned Stages; Neutralization Methods; Types of Detection; Superheterodyne Fundamentals; Types of Circuits.

Chapter III. INTRICATE TUNING CIRCUITS AND ALIGNING DATA

Chapter IV. VOLUME CONTROL, TONE CONTROL, A. V. C. AND RESONANCE-INDICATOR CIRCUITS
Manual-Type Control Circuits, Plain A. V. C. Circuits; A. V. C. in Composite Tube Circuits; Delayed A. V. C.; A. V. C. Troubles; Automatic Noise-Suppression Circuits; Resonance-Indicator Circuits, Tuning Meters, Shadowgraph, Neon Tuning Indicator, Pilot Light Dimmer Reactors, Electron-Ray Tuning Indicator (Magic Eye) and Troubles In Each.

Chapter V. RECEIVER A. F. AMPLIFIER SYSTEMS

Chapter VI. RECEIVER POWER SUPPLIES
For A.C.-D.C. Receivers; For A.C. Receivers; For D.C. Receivers; For Farm Sets; Filtering Methods; Voltage Doubling; Motor-Generator Power Supply Units; Vibrators; Voltage Distribution Circuits; Characteristic Troubles in Each Type.

Chapter VII. LOUD SPEAKERS, PICK-UPS AND ELECTRIC PHONO EQUIPMENT

Chapter VIII. ANALYSIS OF COMMERCIAL RECEIVING CIRCUITS

Chapter IX. FUNDAMENTALS OF METER AND TEST INSTRUMENTS

Chapter X. COMMERCIAL TYPES OF TEST EQUIPMENT

Chapter XI. THE CATHODE-RAY OSCILLOGRAPH AND SUPPLEMENTARY EQUIPMENT
General Discussion of Servicing Applications of Oscillograph;—Fundamentals of Cathode-Ray Tube Operation; The Frequency "Wobbler"; How the Oscillograph Operates.

Chapter XII. PRACTICAL APPLICATIONS OF THE CATHODE-RAY OSCILLOGRAPH
The Controls and Their Functions; Practical Operating Data; Frequency Determination—Lissajou Figures; Aligning Receivers—Typical Patterns; Checking Over-all Receiver Efficiency; Distortion Tests; Beat-Frequency Audio Oscillator Unit for P. A. and Sound Amplifier Tests with Oscillograph; Checking Percentage Modulation with Oscillograph.

Chapter XIII. HOW TO BUILD ESSENTIAL SERVICING AND TEST INSTRUMENTS

Chapter XIV. HINTS ON LOCALIZING TROUBLE

Chapter XV. SHORT CUTS WITH TEST EQUIPMENT

Chapter XVI. HINTS ON RECEIVER REPAIRS
Discussion on Replacement Parts; How to Replace Parts with a Minimum of Trouble.

Chapter XVII. UNUSUAL SERVICING EXPERIENCES

Chapter XVIII. ALL-WAVE HIGH FIDELITY RECEIVER DATA
Fundamentals of High-Fidelity Design; High Fidelity Loud Speaker Systems; Installation Data; Servicing and Aligning Commercial Types of High-Fidelity Sets; Fundamentals of Noise-Reducing Antennas—How to Properly Install with All-Wave and High-Fidelity Receivers.

Chapter XIX. AUTO RADIO INSTALLATION AND SERVICE

Chapter XX. SPECIALIZED INSTALLATION AND SERVICING

Chapter XXI. INTERFERENCE ELIMINATION

Chapter XXII. MODERNIZING AND IMPROVING RECEIVERS
Midget Receivers; Medium-Size A.C. Sets; Installing Police-Band and Short-Wave Coils; Installing Multi-Wave Reception; Installing Wide-Band Variable Coupling and Iron Core I.F. Transformers for High-Fidelity; Improving Audio Response Characteristics; Adding "Tweeters" or High-Frequency Speakers; Installing Metal Tubes in Glass-Tube Receivers.

Chapter XXIII. CONVERTING RADIO RECEIVERS
General Notes on Conversion Work; Converting A.C. Receivers to D.C. Operation; Converting D.C. Receivers for A.C. Operation; Converting Farm or Battery Sets.

Chapter XXIV. IMPROVING KNOWLEDGE AND TECHNIQUE

Chapter XXV. UPLIFTING THE PROFESSION—CONCLUSION

OPERATING NOTES
Introduction to Operating Notes; Tabulations of I.F. Peaks of Manufactured Receivers, Voltage Dividers, Speaker Field Resistances in Popular Commercial Sets, Replacement Volume Controls, etc; Service Notes on Commercial Receivers Manufactured Between 1928-1936.

NOTE: Space does not permit a detailed listing of all the chapters listed above.

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* WHO MAKES THEM?

FOLLOWING is a complete list of Broadcast receivers and other units such as amplifiers, power units, converters, and such apparatus coming in the scope of the work of the serviceman, classified alphabetically by their trade and model names. Many of the organizations whose names appear here are no longer in existence. Some have been absorbed by others, some have changed their names through affiliations and still others can be identified only through their distributing agencies.

There is no strict division between trade names and model names as no confusion can arise in this connection. An alphabetical list of all the present active manufacturers of receivers with their addresses is appended to this index.

Such terms as Superheterodyne, Neutrodyne, T. R. F. Jr., De Luxe, Low-Boy, All-wave, Converter, etc., are not included as they are circuit and cabinet designs rather than model identifications.

A

Abbey	Edison-Splitdorf
A-C Dayton	The A-C Dayton Co.
Ace	Ace Radio Co.
Acme	Acme Electric & Mfg. Co.
Acoustic	RCA Victor
Acratone	Federated Purchaser, Inc.
Administrator	Crosley Radio Corp.
Admiral	Continenal Radio & Television Corp.
Admiralty	Norden Hauk, Inc.
Adventurer	Crosley Radio Corp.
Aero	Chas. Hoodwin Co.
Airex	The Airex Co.
Aircastle	Spiegel May Stern Co.
Air Flight	Silver Marshall Mfg. Co.
Airhound	Pilot Radio & Tube Corp.
Air King	Air King Products Co.
Airline	Wells-Gardner & Co.
Airscout	Pilot Radio & Tube Corp.
Alderman	Crosley Radio Corp.
Alhambra	RCA Victor
All-Amax	All American Mohawk Corp.
All American	All American Mohawk Corp.
Allied Radio	Allied Radio Co.
All World	Silver Marshall
Ambassador	Crosley Radio Corp.
Ambrola	United American Bosch Corp.
American Bosch	United American Bosch Corp.
Amertran	American Transformer Co.
Amperion	Capehart Corp.
Amrad	F. A. D. Andrea Co.
Andrea	Fada Radio Co.
Angelus	Davison Haynes Co.
Announcer	Crosley Radio Corp.
Ansley	Ansley Radio Corp.
Apex	U. S. Radio & Television Co.
Appel-Henderson	Appel-Henderson Radio Co.
Arlington	Well-Gardner & Co.
Arbiter	Crosley Radio Corp.
Arborphone	Arborphone Radio Co.
Arcadia	Wells-Gardner
Argus	Argus Radio Co.
Aria	Amrad Corp.
Arkay	R. K. Radio Laboratories, Inc.
Around the World	Silver Marshall
Arvia	Noblitt-Sparks Industries
Arvin	Noblitt-Sparks Industries
Atchison	Atchison Radio Mfg. Co.
A. T. R.	American Telephone & Radio Co.
Atwater Kent	Atwater Kent Mfg. Co.
Audiola	Audiola Radio Co.
Austin	Austin Radio Mfg. Corp.
Autobox	National Co.
Autocrat	Autocrat Radio Co.
Automatic	Automatic Radio Mfg. Co.
Auto-Roamio	Crosley Radio Corp.
Aztec	Aztec Radio Co.

B

Balboa	Montgomery Ward & Co
Baldwin	Nathaniel Baldwin & Co.
Balkeit	Balkeit Radio Co.
Bandbox	Crosley Radio Corp
Bantam	Ware Mfg. Corp.
Bearcat	Silver Marshall, Inc.
Bel-Canto	Amrad Corp
Bell-Knapp	Bell-Knapp Hardware Co
Belmont	Belmont Radio Corp.
Best	Remler Co., Ltd
Beverly	Wells-Gardner
Bigfella	Crosley Radio Corp
Blackhawk	Wells-Gardner
Bonniboy	Crosley Radio Corp.
Book Case	Crosley Radio Corp.
Bop	United Motors
Borgia	RCA Victor
Bosch	United American Bosch Corp.
Brandes	Brandes Products Corp.
Bremer-Tully	Bremer-Tully Mfg. Corp.
Brentwood	Grigsby-Grunow Mfg. Co.
Browning Drake	Browning Drake Corp.
Brucewood	Grigsby-Grunow Mfg. Co.
Brunswick	Brunswick-Balke Collender Co.
Brunswick	Brunswick Radio Corp.
Buccaneer	Crosley Radio Corp.
Buckingham	Buckingham Radio Corp.
Buddy	Crosley Radio Corp.
Bubby-Boy	Crosley Radio Corp.
Bulova	Bulova Watch Co.
Burley	Speigel May Stern Co.
Bush & Lane	Bush & Lane Piano Co.

C

Cable-Nelson	Howard Radio Corp.
Cabriolet	Crosley Radio Corp.
Capehart	Capehart Corp.
Captain-Kidd Chest	Pilot Radio & Tube Corp.
Caridal	Long Radio Co.
Carlile Table	Warwich Mfg. Co.
Carlton	U. S. Radio & Television Co.
Caroler	Crosley Radio Corp.
Carteret	Carteret Radio Labs
Caruso	Larehk Radio Mfg. Co.
Casa	Crosley Radio Corp.
Cascade	Kellogg Switchboard & Supply Co.
Case	Case Electric Corp.
Case	U. S. Radio & Television Co.
Cathay	Warwick Mfg. Co.
Cathedral Tone	Federated Purchaser
Cavalier	Montgomery Ward & Co.
Century	Century Radio Prod. Co.
Challenger	Montgomery Ward & Co.
Champion, Jr.	Gulbransen
Cheltenwood	Grigsby-Grunow Mfg. Co.
Cherio	Crosley Radio Corp.
Chevrolet	United Motors
Chief	Crosley Radio Corp.
Chieftain	All American Mohawk Corp.
Chum	Crosley Radio Corp.
Clarion	Transformer Corp. of America
Classmate	Crosley Radio Corp.
Clearodyne	Cleartone Co.
Climax	Federated Purchaser
Clipper	Crosley Radio Corp.
Com-Rad	Commonwealth Radio Mfg., Co.
Constitution	Crosley Radio Corp.
Coast-to-Coast	Silver Marshall, Inc.
Collegian	Montgomery Ward & Co.
Colonial	Colonial Radio Corp.
Columbia	Columbia Phonograph Co.
Columbia	Columbia Radio Corp.
Columbia	RCA Victor
Comet	Colin B. Kennedy Co.
Comet-Pro	Hammerlund Mfg. Co.
Commander	Hammerlund Mfg. Co.
Commander	Montgomery Ward & Co.
Commissioner	Crosley Radio Corp.
Commodore	Montgomery Ward & Co.
Compact	Howard Radio Co.
Companion	Crosley Radio Corp.
Congressman	Crosley Radio Corp.
Conqueror	Insuline Corp. of America
Cordova	Brunswick Radio Corp.
Coronet	Colin B. Kennedy Corp.
Coronado	Montgomery Ward & Co.
Corsair	Crosley Raidio Corp.
Cortez	Montgomery Ward & Co.
Counterphase	Bremer-Tully Mfg. Corp.
Courrier	United Reproducers Corp.
Cromwell	RCA Victor
Crony	Crosley Radio Corp.
Crosley	Crosley Radio Corp.
Crown	Custom Built Radio Mfg. Co.
Cruiser	Crosley Radio Corp.
Cruiser	United American Bosch Corp.

D

Day-Fan	General Motors
Dayrad	Radio Products Corp
DeForest	RCA Victor
DeForest Crosley	DeForest Crosley Co., Ltd.
Delco	Deco Appliance Corp.
Delco	United Motors Service
De Soto	Montgomery Ward & Co.
Detrola	Detrola Radio Co.
De Wald	Pierce Airo, Inc
Dictator	Montgomery Ward & Co.
Dinah	Warwick Mfg. Co.
Director	Crosley Radio Corp
Discover	Crosley Radio Corp.
Dragon	Pilot Radio & Tube Corp
Druid	Warwick Mfg. Co
Duet	Amrad Corp
Duo-Rectron	RCA Victor Co
Duo Symphonic	Wholesale Radio Serv. Co
Dynaphone	Ansley Radio Corp.

* Courtesy of K. Bradford, Capitol Radio Research Labs., Inc.

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E

Eagle ..... Wurlitzer Co.
Eagle ..... All American Mohawk Co., Inc.
Earl ..... Earl Radio Corp.
Echoette ..... Echophone Radio Mfg. Co.
Echophone ..... Echophone Radio Mfg. Co.
Edison ..... Thomas A. Edison, Inc.
Edison-Bell ..... Edison-Bell Radio & Phonograph Co.
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Electrola ..... RCA Victor
Electrostatic ..... United Reproducers Corp.
Elf ..... Crosley Radio Corp.
Ellswood ..... Grigsby-Grunow Co.
Emerson ..... Emerson Radio & Phonograph Corp.
Empire ..... Empire Electrical Production Co.
Envoy ..... Insuline Corp. of America
Envoyette ..... Insuline Corp. of America
Equiphase ..... Freshman Radio Co.
Erac ..... Freshman Radio Co.
Erla ..... Electrical Research Lab., Inc.
Espey ..... Espey Mfg. C., Inc.
Essex ..... United American Bosch Corp.
Eveready ..... National Carbon Co.

F

Fada ..... Fada Radio & Electric Co.
Fadalette ..... Fada Radio & Electric Co.
Fairbanks-Morse ..... Fairbanks-Morse Home Appliances, Inc.
Falck ..... Advance Electric Co.
Fantasy ..... Montgomery Ward & Co.
Fansteel ..... Balkeit Prod. Co.
Farrand ..... Farrand Mfg. Co.
Federal ..... Federal Radio Corp.
Fenway ..... Fenway Radio Co.
Ferranti ..... Ferranti, Inc.
Ferrodyne ..... Stewart Warner Corp.
First National ..... Balkeit Radio Co.
Fiver ..... Crosley Radio Corp.
Florenza ..... RCA Victor Co.
Ford-Majestic ..... Grigsby-Grunow Co.
Fordson ..... Fordson Radio, Inc.
Forty-five ..... Crosley Radio Corp.
Four ..... Crosley Radio Corp.
Fourteen (Dual) ..... Crosley Radio Corp.
Franklin ..... Franklin Radio Corp.
Freed ..... Freed Television & Radio Corp.
Freed-Eisemann ..... Freed Mfg. Co., Inc.
Freed Eiseman ..... Freed Television & Radio Corp.
French ..... Jessie French & Sons
Freshman ..... Charles Freshman Co., Inc.

G

Galleon ..... Crosley Radio Corp.
Garod ..... Garod Radio Corp.
Gembox ..... Crosley Radio Corp.
Gemchest ..... Crosley Radio Corp.
General ..... General Telephone & Radio Co.
General-Electric ..... General Electric Co.
General Motors Radio ..... General Motors
General Radio ..... General Radio Co.
Gilfillan ..... Gilfillan Bros., Inc.
Globe Trotter ..... Colin B. Kennedy
Gloriatone ..... U. S. Radio & Television Co.
Gloritone ..... Transformer Corp. of America
Goldcrest ..... Cleartone Radio Corp.
Goldentone ..... Fordson Radio Mfg. Co.
Governor ..... Crosley Radio Corp.
Grandfather Clock ..... Philco Radio & Television Co.
Graybar ..... Graybar Electric Co.
Grebe ..... A. H. Grebe
Green Diamond ..... Howard Radio Co.
Grunow ..... General Household Utilities Co.
Gulbranson ..... Gulbranson Co.
Gypsy ..... Kingston Radio Co.

H

Hallicrafters ..... The Hallicrafters
Halson ..... Halson Radio Mfg. Co., Inc.
Hammarlund ..... Hammarlund Mfg. Co., Inc.
Hammarlund Roberts ..... Hammarlund Roberts, Inc.
Happy Hour ..... Crosley Radio Corp.
Hatry ..... Hatry & Young
Havenwood ..... Grigsby-Grunow
Hawk ..... Hammarlund Mfg. Co.
H. F. L. ..... High Frequency Labs, Inc.
Hi-Q ..... Hammarlund-Roberts, Inc.
Hoodwin ..... Chas. Hoodwin Co.
Horn ..... Herbert H. Horn
Howard ..... Cable-Nelson
Howard ..... Howard Radio Co.
Hudson ..... Wells-Gardner
Hypermetron ..... Zenith Radio Corp.
Hyperion ..... RCA Victor
Hyper-Merton ..... Zenith Radio Corp.

I

I. C. A. ..... I. C. A. Export Co.
I. C. A. ..... Insuline Corp. of America
Imperial ..... King Mfg. Co.
Imperial ..... Tyrman Radio Co.
Inductrol ..... Amrad Corp.
Insullette ..... Insuline Corp. of America
International ..... Kolster Radio Corp.
I. R. C. ..... International Radio Corp.
Isotone ..... High Frequency Laboratories

J

Jackson Bell ..... Jackson Bell Co., Ltd.
Jenkins ..... J. E. Jenkins & S. E. Adair
Jewelbox ..... Crosley Radio Corp.
Jewelcase ..... Crosley Radio Corp.
Jewell ..... Emerson Rado. & Phono. Co.
Jewell ..... International (Kadette)
Jewell ..... Sparks-Withington Co.
Johnny Smoker ..... Crosley Radio Corp.
J. Matheson Bell ..... Wells-Gardner
Judge ..... Crosley Radio Corp.
Jumbo ..... Pilot Radio & Tube Corp.
Justice ..... Crosley Radio Corp.

K

Kadette ..... Emerson Rado. & Phone. Co.
Kadette ..... International Radio Corp.
Karadio ..... Karadio Corp.
Keller-Fuller ..... Keller-Fuller Mfg. Co.
Kellogg ..... Kellogg Switchboard & Supply Co.
Kennedy ..... Colin B. Kennedy Corp.
King ..... King Mfg. Corp.
Kingston ..... Kingston Radio Co.
Knight ..... Allied Radio Corp.
Kolster ..... Kolster Radio Corp.
Kolster-Columbia ..... Kolster Radio Corp.
Kylectron ..... United Reproducers Corp.

L

Lacault ..... R. E. Lacault Co.
Lafayette ..... Wells-Gardner & Co.
LaFayette ..... Wholesale Radio Service, Inc.
Lang ..... Lang Radio Corp.
Lazy X ..... Philco Radio & Television Corp.
Leader ..... Crosley Radio Corp.
Leader-D ..... Crosley Radio Corp.
Legislator ..... Crosley Radio Corp.
Leutz ..... C. R. Leutz, Inc.
Lexington ..... Wells-Gardner & Co.
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Lincoln Super ..... Ozarka Radio Co.
Lincoln Symphonic ..... Lincoln Radio Corp.
Litlefella ..... Crosley Radio Corp.
Litlboy ..... Crosley Radio Corp.
Little General ..... General Motors
Loftin-White ..... Electrad, Inc.
L. Tatro ..... L. Tatro Products Corp.
Lyric ..... All American Mohawk Corp.

M

Macy ..... R. H. Macy & Co.
Madison-Moore ..... Madison-Moore Co.
Magicolor ..... I. C. A. Export
Magnavox ..... The Magnavox Co.
Majestic ..... Grigsby-Grunow Co.
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Mascot ..... Insuline Corp. of America
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Masterpiece ..... McMurdo Silver, Inc.
Mastertone ..... High Frequency Labs.
Mate ..... Crosley Radio Corp.
May ..... May Radio & Refrigeration Corp.
Mayor ..... Crosley Radio Corp.
McMillan ..... McMillan Radio Co.
McMurdo Silver ..... McMurdo Silver, Inc.
Melburn ..... Melburn Radio Mfg. Corp.
Merrimac ..... Crosley Radio Corp.
Merrymaker ..... Crosley Radio Corp.
Mickey-Mouse ..... Emerson Radio & Phonograph Co.
Mid-West ..... Mid-West Radio Corp.
Mighty Atom ..... Wholesale Radio Service Co.
Mighty Midget ..... Master Radio & Mfg. Co.
Minstrel ..... Crosley Radio Corp.
Minstrel ..... Montgomery Ward & Co.
Minuette ..... Amrad Corp.
Miraco ..... Mid-West Radio Corp.
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Monarch ..... King Mfg. Co.
Monotrad ..... Crosley Radio Corp.
Monroe-Marvelo ..... Radolek Co.
Motorola ..... Galvin Mfg. Co.
Motomaster ..... Motomaster Radio Co.
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Motoset ..... Fada Radio Co.
Multiple-Record Phonograph ..... Stromberg-Carlson
Murdock ..... Wm. J. Murdock Co.
Music Master ..... Sleeper Radio Corp.
Musique ..... All-Wave Radio Corp.

N

Nassau ..... Nassau Radio Co.
National ..... National Co., Inc.
Navajo ..... All American Mohawk Corp.
Navigator ..... A. C. Dayton Co.
Navy ..... Experimenters' Information Service
New Buddy ..... Crosley Radio Corp.
New Pup ..... Crosley Radio Corp.
New Travo ..... Crosley Radio Corp.
New Yorker ..... David Grimes
Norden-Hauck ..... Norden-Hauck Radio Co.
Noveo ..... Noveo Mfg. Co.

O

Olympia ..... Crosley Radio Corp.
One-Spot ..... Madison-Moore Co.
Oracle ..... Crosley Radio Corp.
Operadio ..... Operadio Corp.
Ozarka ..... Ozarka Radio Corp.

P

Packard ..... Packard Radio Co.

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This Manual contains over a thousand pages—yet it is only 1¼ inches thick because it is printed on a special Bible stock which is an exceptionally good stock, yet one of the thinnest and most durable papers. This 1935 Manual is the most authentic and elaborate service guide ever used in the radio industry.

Contents of the 1935 Manual

Over 1,000 pages full of diagrams and essential information of manufactured receivers—only data of real use in servicing is included. This new Manual is really portable since it is extremely thin and light as well. ● Volume V. continues where the preceding manual left off. ● Many circuits of old sets are included. ● Service Men know every set has certain weak points which are really the cause of trouble. Wherever the information could be obtained, these weaknesses with their cures are printed right with the circuits. This is an entirely new and valuable addition to the Manual. ● All the latest receivers are included—all-wave sets, short-wave sets, auto-radio sets, midget and cigar-box sets, etc., as well as P.A. Amplifiers and equipment, and commercial servicing instruments. ● The cumulative index is even more complete than before; including cross-references to sets sold under different names and type numbers. ● Volume V includes resistance data; socket layouts; I.F. data; and voltage data. ● Tube data on latest tubes. ● Free question and answer service—as included in our last three manuals.

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SET SERVICING
Service information found in the Manuals covers all types of radio receivers. The material is extremely valuable to Dealers and Service Men. On many diagrams appear voltage readings of tubes, socket connections, transformer data, alignment details, and other service notes.

PUBLIC ADDRESS
The pages on P.A. Installation will be helpful to Service Men and P.A. specialists. Such prominent features as class A and B amplifiers—single and dual channel systems — attenuators, and mixers — superpower stages—preamplifiers and other commercial devices for P.A. work are included.

ALL-WAVE RECEIVERS
Information relative to short-wave receivers have found their way into the Manuals. For these standard manufactured sets, wherever possible, complete aligning details for all wave bands are included in addition to the service material listed for other sets.

AUTO-RADIO RECEIVERS
All available service information on new auto-radio sets has been included. From this data alone Service Men could derive sufficient knowledge to venture in a specialty field—that of servicing only auto-radios.

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Q

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R

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S

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Standard . . . . . Plaza Music Co
Standard . . . . . Standard Radio Corp.
Star . . . . . Wells-Gardner & Co.
Star Raider . . . . . Continental Radio Co.
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Sterling . . . . . Sterling Mfg. Co.
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St. Regis . . . . . International Radio Corp.
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Super-Merton . . . . . Zenith Radio Corp.
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Super-Zenith . . . . . Zenith Radio Corp.
Symphony . . . . . Crosley Radio Co.
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T

Tatro . . . . . L'Tatro
Tea Table . . . . . Warwick Mfg. Co.
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Templetone . . . . . Temple Corp.
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Travo . . . . . Crosley Radio Corp.
Treasure Chest . . . . . Grisby-Grunow Co.
Tridyn . . . . . Crosley Radio Corp.
Troubadour . . . . . Crosley Radio Corp.
Troy . . . . . Troy Mfg. Co.
Truetone . . . . . Wells-Gardner & Co.
True Value . . . . . Wells-Gardner & Co.
Tuscany . . . . . RCA Victor
Twelve . . . . . Crosley Radio Corp.
Twentieth Century . . . . . Pilot Radio & Tube Corp.
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U

Ultradyne . . . . . R. E. Lacault
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United Motors . . . . . United Motors Co.
Universal . . . . . Wells-Gardner & Co.
Universal Companion . . . . . I. C. A. Export Co., Inc.

V

Vagabond . . . . . Crosley Radio Corp.
Valley . . . . . Valley Electric Co.
Victor . . . . . RCA Victor
Victoreen . . . . . Geo. W. Walker Co.
Viking . . . . . Crosley Radio Corp.
Viking . . . . . Ozarka, Inc.
Vitatone . . . . . Zaney-Gill Corp.

W

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RAYTHEON TUBE TYPE INDEX

TYPE	FOUND IN BLOCK	FIL OR HTR VOLTS	DESCRIPTION AND USE
0Z3	j	..	Full wave gaseous rectifier
0Z4	j	..	Full wave gaseous rectifier
1A4	b	2.0	VariMu tetrode amplifier or det.
1A6	b	2.0	Electron coupled osc. & mixer
1B4/951	b	2.0	Tetrode amplifier or detector
1B5/25S	b	2.0	Diode detector & triode amplifier
1C6	b	2.0	Electron coupled osc. & mixer
1F4	b	2.0	Pentode power amplifier
2A3	c	2.5	Triode power amplifier
2A3H	c	2.5	Triode power amplifier
2A5	c	2.5	Pentode power amplifier
2A6	c	2.5	Diode detector & triode amplifier
2A7	c	2.5	Electron coupled osc. & mixer
2A7S	k	2.5	Electron coupled osc. & mixer
2B7	c	2.5	Duo diode det. & pentode ampli.
2Z2/G84	k	2.5	Half wave filament rectifier
5Y3*	j	5.0	Full wave vacuum rectifier
5Z3	j	5.0	Full wave vacuum rectifier
5Z4	j	5.0	Full wave vacuum rectifier
6A3	f	6.3	Triode power amplifier
6A4/LA	f	6.3	Pentode power amplifier
6A6	f	6.3	Twin triode class B power ampli.
6A7	f	6.3	Electron coupled osc. & mixer
6A7S	k	6.3	Electron coupled osc. & mixer
6A8,6A8G*	f	6.3	Electron coupled osc. & mixer
6B5	f	6.3	Dual triode power amplifier
6B7	f	6.3	Duo diode det. & pentode ampli.
6B7S	k	6.3	Duo diode det. & pentode ampli.
6C5,6C5G*	f	6.3	Triode amplifier or osc.
6C6	f	6.3	Pentode amplifier & detector
6C7	k	6.3	Diode detector & triode amplifier
6D6	f	6.3	VariMu pentode amplifier & det.
6D7	k	6.3	Pentode amplifier & detector
6E5	f	6.3	Cathode ray tuning indicator
6E6	f	6.3	Twin triode class A power ampli.
6E7	k	6.3	VariMu pentode amplifier & det.
6F5,6F5G*	f	6.3	Triode amplifier or detector
6F6,6F6G*	f	6.3	Pentode power amplifier
6F7	f	6.3	Triode & pentode osc. & detector
6F7S	k	6.3	Triode & pentode osc. & detector
6G5	f	6.3	Cathode ray tuning indicator
6H6,6H6G*	f	6.3	Twin diode detector
6J7,6J7G*	f	6.3	Pentode amplifier or detector
6K7,6K7G*	f	6.3	VariMu pentode amplifier or det.
6L7,6L7G*	f	6.3	Heptode mixer or amplifier
6N7G*	f	6.3	Twin triode class B amplifier
6Q7,6Q7G*	f	6.3	Diode detector & triode amplifier
6R7,6R7G*	f	6.3	Diode detector & triode amplifier
6X5,6X5G*	j	6.3	Full wave vacuum rectifier
6Y5	k	6.3	Full wave vacuum rectifier
6Z4/84	j	6.3	Full wave vacuum rectifier
6Z5	k	6.3/12.6	Full wave vacuum rectifier
12A5	f	12.6/6.3	Pentode power amplifier
12A7	h	12.6	Power pentode & rectifier
12Z3	j	12.6	Half wave vacuum rectifier
25A6,25A6G*	h	25.0	Pentode power amplifier
25Z5	j	25.0	Voltage doubling vacuum rectifier
25Z6,25Z6G*	j	25.0	Voltage doubling vacuum rectifier
200A	e	5.0	Triode detector
01A	e	5.0	Triode amplifier or detector
1-V	j	6.3	Half wave vacuum rectifier
2S/4S	k	2.5	Duo diode detector
10	g	7.5	Triode power amplifier or osc.
WD-11	a	1.1	Triode amplifier or detector
WX-12	a	1.1	Triode amplifier or detector
12A	e	5.0	Triode amplifier or detector
15	k	2.0	Tetrode amplifier or detector
19	b	2.0	Twin triode class B power ampli.
20	d	3.3	Triode power amplifier
22	d	3.3	Tetrode amplifier
24A	c	2.5	Tetrode amplifier or detector
24S	k	2.5	Tetrode amplifier or detector
26	c	1.5	Triode ac filament amplifier
27	c	2.5	Triode amplifier or detector
27S	k	2.5	Triode amplifier or detector
30	b	2.0	Triode amplifier or detector
31	b	2.0	Triode power amplifier
32	b	2.0	Tetrode amplifier or detector
33	b	2.0	Pentode power amplifier
34	b	2.0	Pentode tetrode amplifier or det.
35/51	c	2.5	VariMu tetrode amplifier or det.
35/51S	k	2.5	VariMu tetrode amplifier or det.
36	f	6.3	Tetrode amplifier or detector
37	f	6.3	Triode amplifier or detector
38	f	6.3	Pentode power amplifier
39/44	f	6.3	VariMu pentode amplifier or det.
40	e	5.0	Triode amplifier
41	f	6.3	Pentode power amplifier
42	f	6.3	Pentode power amplifier
43	h	25.0	Pentode power amplifier
45	c	2.5	Triode power amplifier
46	c	2.5	Dual purpose power triode
47	c	2.5	Pentode power amplifier
48	h	30.0	Pentode power amplifier
49	b	2.0	Dual purpose power triode
50	g	7.5	Triode power amplifier
52	f	6.3	Dual purpose power triode
53	c	2.5	Twin triode class B power ampli.
55	c	2.5	Diode detector & triode amplifier
55S	k	2.5	Diode detector & triode amplifier
56	c	2.5	Triode amplifier or detector
56S	k	2.5	Triode amplifier or detector
57	c	2.5	Pentode amplifier or detector
57S	k	2.5	Pentode amplifier or detector
57AS	k	6.3	Pentode amplifier or detector
58	c	2.5	VariMu pentode amplifier or det.
58S	k	2.5	VariMu pentode amplifier or det.
58AS	k	6.3	VariMu pentode amplifier or det.
59	c	2.5	Triple purpose power amplifier
71A	e	5.0	Triode power amplifier
75	f	6.3	Diode detector & triode amplifier
75S	k	6.3	Diode detector & triode amplifier
76	f	6.3	Triode amplifier or detector
77	f	6.3	Pentode amplifier or detector
78	f	6.3	VariMu pentode amplifier or det.
79	f	6.3	Twin triode class B power ampli.
80	j	5.0	Full wave vacuum rectifier
81	j	7.5	Half wave vacuum rectifier
82	j	2.5	Full wave mercury rectifier
83	j	5.0	Full wave mercury rectifier
83V	j	5.0	Full wave vacuum rectifier
84	j	6.3	See 6Z4/84
85	f	6.3	Diode detector & triode amplifier
85AS	k	6.3	Diode detector & triode amplifier
89	f	6.3	Triple purpose power amplifier
V-99	d	3.3	Triode amplifier or detector
X-99	d	3.3	Triode amplifier or detector
182B	k	5.0	Triode power amplifier
183	k	5.0	Triode power amplifier
485	k	3.0	Triode amplifier or detector
950	k	2.0	Pentode power amplifier
BA	j	..	Full wave gaseous rectifier
BH	j	..	Full wave gaseous rectifier
BR	j	..	Half wave gaseous rectifier
LA	f	6.3	See 6A4/LA

***INTERMEDIATE OR "G" TYPE TUBES**

This line of tubes is made with standard size glass bulbs and with octal bases. These tubes have the same characteristics as the corresponding metal types and in general they are interchangeable with them except in some cases for space requirements and the necessity for providing external shields. Types 5Y3 and 6N7G (listed in the characteristic section of this chart) although they do not have metal equivalents are based with octal bases and are used with the above "G" types.

RAYTHEON RADIO TUBE CHART

BLOCK-a — 1.1 VOLT DC DETECTOR AND AMPLIFIER TUBES

TYPE NO.	DESCRIPTION: USE	TYPE	CATHODE	BASING SEE VIEW AT RIGHT	MAX. DIMEN. OVERALL: HEIGHT	DIAM.	FIL. CURR. AMPS.	CAPACITANCES MICRO-MICRO-FARADS: GRID PLATE	INPUT	OUTPUT	OPERATING CONDITIONS AND CHARACTERISTICS: WHEN USED AS	PLATE SUPPLY VOLTS	SCR. GRID VOLTS	GRID BIAS VOLTS	PLATE CURRENT M.A.	AMPL. FACTOR	PLATE RESIS. OHMS	MUT. COND. UMHOS	MAX. UNDIST. OUTPUT WATTS	RECOMM. LOAD RES. OHMS	CUT-OFF BIAS VOLTS
WD-11	DETECTOR AMPLIFIER	TRIODE	FIL.	4F SPEC. 4 PIN	4 1/8	1 3/16	0.25	3.3	2.5	2.5	GRID LEAK DETECT.	45		+A							
WX-12				4D MED. 4 PIN	4 11/16	1 7/16					AMPLIFIER	90		4.5	2.5	6.6	15500	425	0.007	15000	
												135		10.5	3.0	6.6	15000	440	0.040	15000	

BLOCK-b — 2.0 VOLT DC DETECTOR AND AMPLIFIER TUBES

30	DETECTOR AMPLIFIER	TRIODE	FIL.	4D SM. 4 PIN	4 1/4	1 9/16	0.060	6.0	3.7	2.1	BIAS DETECTOR	180		18							
											AMPLIFIER	135		9	3	9.3	10300	900	0.07	20000	
												180		13.5	3.1	9.3	10300	900	0.13	20000	
31	POWER AMPLIFIER	TRIODE	FIL.	4D SM. 4 PIN	4 1/4	1 9/16	0.130				AMPLIFIER	135		22.5	8	3.8	4100	925	0.185	7000	
												180		30	12.3	3.8	3600	1050	0.375	5700	
32	DETECTOR AMPLIFIER	TETRODE	FIL.	4K MED. 4 PIN	5 1/32	1 3/16	0.060	0.015 MAX.	6.0	11.7	DETECTOR	180	67.5	6						0.15 MΩ	
											AMPLIFIER	135	67.5	3	1.7	610	.95 MΩ	640			9
												180	67.5	3	1.7	780	1.2 MΩ	650			9
33	POWER AMPLIFIER	PENTODE	FIL.	5K MED. 5 PIN	4 11/16	1 3/16	0.260				AMPLIFIER	100	100	8	10.5	60	50000	1200	0.30	7000	
												135	135	13.5	14.5	70	50000	1450	0.70	7000	
34	DETECTOR AMPLIFIER	REMOTE CUT-OFF PENTODE	FIL.	4M MED. 4 PIN	5 1/32	1 3/16	0.060	0.015 MAX.	6.0	12.6	1ST. DETECTOR	67.5 TO 180	67.5	5							
											AMPLIFIER	135	67.5	3	2.8	360	0.6 MΩ	600			27
												180	67.5	3	2.8	620	1.0 MΩ	620			27
49	POWER AMPLIFIER	DOUBLE GRID TRIODE	FIL.	5C MED. 5 PIN	4 11/16	1 3/16	0.120				CLASS A	135		20	5.7	4.5	4000	1125	0.17	11000	
											CL. B (AVG. 2 TUBES)	180		0	4 TO 30				3.0	9000 MIN	
19	POWER AMPLIFIER	TWIN TRIODE	FIL.	6C SM. 6 PIN	4 1/4	1 9/16	0.260				COMPLETE CL. A (BOTH SECTIONS)	135		0	10 TO 35				2.1	10000	
												135		3	4 TO 35				1.9	10000	
1A4	DETECTOR AMPLIFIER	TETRODE	FIL.	4K SM. 4 PIN	4 17/32	1 9/16	0.060	0.007 MAX.	4.6	11	AMPLIFIER	180	67.5	3	2.3	720	0.90 MΩ	750			20
1A6	OSCILLATOR DETECTOR	HEPTODE	FIL.	6L SM. 6 PIN	4 17/32	1 9/16	0.060	0.8	5	6	OSCILLATOR SECT	135		@ 50000Ω & 20000Ω	2.3						
								0.25	10.5	9	MIXER SECTION	(a) 180	67.5	3	1.3		0.5 MΩ	300	CONVERSION	R_{c2} 0.02 MΩ	22.5
												(b) 180	45	-F	1.2		0.6 MΩ	250	CONDUCTANCE		11
1B4 951	DETECTOR AMPLIFIER	TETRODE	FIL.	4K SM. 4 PIN	4 17/32	1 9/16	0.060	0.007 MAX.	4.6	11	1ST. DETECTOR	180	67.5	6							
											AMPLIFIER	180	67.5	3	1.7	780	1.0 MΩ	650			9
1B5 25S	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	FIL.	6M SM. 6 PIN	4 1/2	1 9/16	0.060	3.6	2	3	DIODE DETECTOR TRIODE AMPLIFIER	135		3	0.8	20.0	35000	575			
1C6	OSCILLATOR DETECTOR	HEPTODE	FIL.	6L SM. 6 PIN	4 17/32	1 9/16	0.120	1.5	6	6	OSCILLATOR SECT.	180		0.05 MΩ	3.3					R_{c2} 0.02 MΩ	
								0.3	10	10	MIXER SECTION	180	67.5	3	1.5		0.75 MΩ	325	CONVERSION CONDUCTANCE		14
1F4	POWER AMPLIFIER	PENTODE	FIL.	5K MED. 5 PIN	4 11/16	1 3/16	0.120				AMPLIFIER	135	135	4.5	8.0	340	0.2 MΩ	1700	0.34	16000	

BLOCK-c — 2.5 VOLT AC DETECTOR AND AMPLIFIER TUBES

24A	DETECTOR AMPLIFIER	TETRODE	HEATER	5E MED. 5 PIN	5 1/32	1 3/16	1.75	0.007 MAX.	5.0	10.5	DETECTOR	250	45	5						0.25 MΩ	
											A.F. AMPLIFIER	250	25	1	0.5	1000	2.0 MΩ	500		0.1 MΩ	
											R.F. AMPLIFIER	180	90	3	4.0	400	0.4 MΩ	1000			15
												250	90	3	4.0	630	0.6 MΩ	1050			15
26	AMPLIFIER	TRIODE	1.5 V AC FIL.	4D MED. 4 PIN	4 11/16	1 3/16	1.5 V 1.05 A	8.1	3.5	2.2	AMPLIFIER	135		10	5.5	8.3	7600	1100	0.08	8800	
												180		14.5	6.2	8.3	7300	1150	0.18	10500	
27	DETECTOR AMPLIFIER	TRIODE	HEATER	5A SM. 5 PIN	4 1/4	1 9/16	1.75	3.3	3.5	3.0	BIAS DETECTOR	250		30							
											AMPLIFIER	135		9	4.5	9	9000	1000	0.08	13000	
												180		13.5	5.0	9	9000	1000	0.165	19000	
												250		21	5.2	9	9250	975	0.30	34000	
35 51	DETECTOR AMPLIFIER	REMOTE CUT-OFF TETRODE	HEATER	5E MED. 5 PIN	5 1/32	1 3/16	1.75	0.007 MAX.	5.0	10.5	1ST. DETECTOR	250	90	7 APP.							
											AMPLIFIER	180	90	3	6.3	305	0.3 MΩ	1020			50
												250	90	3	6.5	420	0.4 MΩ	1050			50
45	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 3/16	1.50				SINGLE AMPLIFIER	180		31.5	31	3.5	1650	2125	0.82	2700	
												275		56	36	3.5	1700	2050	2.0	4600	
											PUSH PULL (AVG. 2 TUBES)	300		70	44 TO 70				10	9000	
46	POWER AMPLIFIER	DOUBLE GRID TRIODE	FIL.	5C MED. 5 PIN	5 3/8	2 1/16	1.75				CLASS A	250		33	22	5.6	2400	2350	1.25	6400	
											CL. B (AVG 2 TUBES)	300		0	8 TO 70				16	5000 MIN	
												400		0	12 TO 75				20	5500 MIN	
47	POWER AMPLIFIER	PENTODE	FIL.	5B MED. 5 PIN	5 3/8	2 1/16	1.75				AMPLIFIER	250	250	16.5	31	150	60000	2500	2.7	7000	
53	POWER AMPLIFIER	TWIN TRIODE	HEATER	7B MED. 7 PIN LG. PIN CIRCLE	4 11/16	1 3/16	2.0				CL. A (PARALLEL CONN)	294		6	7	35	11000	3200	0.37	35000	
											COMPLETE CLASS B (BOTH SECTIONS)	250		0	28 TO 50				8	8000	
												300		0	35 TO 50				10	10000	
55	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	6G SM. 6 PIN	4 17/32	1 9/16	1.0	2.0	2.0	4.0	DIODE DETECTOR	180		13.5	6	8.3	8500	975	0.16	20000	
											TRIODE AMPLIFIER	250		20	8	8.3	7500	1100	0.35	20000	
56	DETECTOR AMPLIFIER	TRIODE	HEATER	5A SM. 5 PIN	4 1/4	1 9/16	1.0	3.2	3.2	2.2	BIAS DETECTOR	250		20							
											AMPLIFIER	250		13.5	5.0	13.8	9500	1450	0.26	47000	
57	DETECTOR AMPLIFIER	PENTODE	HEATER	6F SM. 6 PIN	4 15/16	1 9/16	1.0	0.007 MAX.	5.0	6.5	DETECTOR	250	100	3.8						0.25 MΩ	
											AMPLIFIER	250	100	3	2.0	2000	2.0 MΩ	1225			7
58	DETECTOR AMPLIFIER	REMOTE CUT-OFF PENTODE	HEATER	6F SM. 6 PIN	4 15/16	1 3/16	1.0	0.007 MAX.	5.0	6.5	1ST. DETECTOR	250	100	10							
											AMPLIFIER	250	100	3	8.2	1280	0.8 MΩ	1600			50
59	POWER AMPLIFIER	TRIPLE GRID	HEATER	7A MED. 7 PIN LG. PIN CIRCLE	5 3/8	2 1/16	2.0				CLASS A TRIODE	250		28	26	6	2400	2600	1.25	5000	
											CLASS A PENTODE	250	250	18	35	100	40000	2500	3	6000	
											CL. B TRIODE (AV. 2 TUBES)	400		0	25 TO 75				20	6000 MIN	
2A3	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	5 3/8	2 1/16	2.5				SINGLE AMPLIFIER	250		45	60	4.2	800	5250	3.5	2500	
2A3H			HEATER	4Q			2.8				CLASS AB (2 TUBES)	300	SELF BIAS	62	80 TO 100				10	5000	
												300	FIXED BIAS	62	80 TO 150				15	3000	
2A5	POWER AMPLIFIER	PENTODE	HEATER	6B MED. 6 PIN	4 11/16	1 3/16	1.75	#2 GR. TO PL. CLASS AB TRIODE 2 TUBES			PENTODE	250	250	16.5	34	220	0.1 MΩ	2300	3	7000	
												350		38	42 TO 90				18	8000	
2A6	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	6G SM. 6 PIN	4 17/32	1 9/16	0.8	2.0	2.0	4.0	DIODE DETECTOR	250		2	0.8	100	91000	1100			
											TRIODE AMPLIFIER	250		2	0.1					0.25 MΩ	
2A7	OSCILLATOR DETECTOR	HEPTODE	HEATER	7C SM. 7 PIN	4 17/32	1 9/16	0.8	1.0	7	5.5	OSC. SECTION	250		50000Ω	4					R_{c2} 0.02 MΩ	
								0.3	8.5	9	MIXER SECTION	250	100	3	4		0.36 MΩ	520	CONVERSION CONDUCTANCE		45
2B7	DETECTOR AMPLIFIER	DUPLEX DIODE PENTODE	HEATER	7D SM. 7 PIN	4 17/32	1 9/16	0.8	0.010 MAX.	3.3	10	DIODE DETECTOR	100	100	3	5.8	285	0.3 MΩ	950			17
											R. F. AMPLIFIER	250	100	3	6.0	800	0.8 MΩ	1000			17
											DIO. DET. & A.F. AMPLIFIER	250	50	4.5	0.65					0.20 MΩ	

BLOCK-d — 3.3 VOLT DC DETECTOR AND AMPLIFIER TUBES

20	POWER AMPLIFIER	TRIODE	FIL.	4D SM. 4 PIN	4 1/8	1 3/16	0.132				AMPLIFIER	135		22.5	6.5	3.3	6300	525	0.110	6500	
V-99 X-99	DETECTOR AMPLIFIER	TRIODE	FIL.	4F SPEC. 4 PIN 2D SMALL 4 PIN	3 1/2 4 1/8	1 1/16 1 3/16	0.063	3.3	2.5	2.5	GRID LEAK DETECT.	45		+A	1.5	6.6	17000	370			
											AMPLIFIER	90		4.5	2.5	6.6	15500	425	0.007	15500	
22	AMPLIFIER	SCREEN GRID	FIL.	4K MED. 4 PIN	5 1/32	1 3/16	0.132	0.020 MAX.	3.3	12	R.F. AMPLIFIER	135	67.5	1.5	3.7	160	0.32 MΩ	500			7.5
											AUDIO AMPLIFIER	180	22.5	0.75	0.3	350	2.0 MΩ	175		0.25 MΩ	

RAYTHEON RADIO TUBE CHART

BLOCK-e 5.0 VOLT DC DETECTOR AND AMPLIFIER TUBES

TYPE NO.	DESCRIPTION: USE	TYPE	CATHODE	BASING SEE VIEW AT RIGHT	MAX. DIMEN. OVERALL: HEIGHT	DIAM.	FIL. CURR. AMPS.	CAPACITANCES MICRO-MICRO-FARADS: GRID PLATE	INPUT	OUTPUT	OPERATING CONDITIONS AND CHARACTERISTICS: WHEN USED AS	PLATE SUPPLY VOLTS	SCR. GRID VOLTS	GRID BIAS VOLTS	PLATE CURRENT M.A.	AMPL. FACTOR	PLATE RESIS. OHMS	MUT. COND. UMHOS	MAXIMUM OUTPUT WATTS	RECOMM. LOAD RES. OHMS	CUT-OFF BIAS VOLTS
12A	AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 13/16	0.25	8.0	4.0	2.0	AMPLIFIER	135		22.5 as fc	6.2	8.5	5100	1650	0.13	9000	
												180		13.5	7.7	8.5	4700	1800	0.285	10700	
71A	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 13/16	0.25				AMPLIFIER	135		71.0 as fc	17.3	3.0	1820	1650	0.40	3000	
												180		90.5 as fc	20	3.0	1750	1700	0.79	4800	
200A	DETECTOR	Cs VAPOR TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 13/16	0.25	8.5	3.2	2.0	GRIDLEAK DETECT.	45		-A	1.5	20	30000	670			
01A	DETECTOR AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 13/16	0.25	8.1	3.1	2.2	GRID LEAK DETECT.	45		+A	1.8	8.0	12000	670			
											AMPLIFIER	90		4.5	2.5	8.0	11000	725	0.015	25000	
												135		9	3.0	8.0	10000	800	0.055	20000	
40	DETECTOR AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	4 11/16	1 13/16	0.25	8.8	3.4	1.5	BIAS DETECTOR	180		4.5	0.1					0.25 MΩ	
											AUDIO AMPLIFIER	180		3	0.2	30	0.15 MΩ	200		0.25 MΩ	

BLOCK-f 6.3 VOLT AC OR DC DETECTOR AND AMPLIFIER TUBES

36	DETECTOR AMPLIFIER	TETRODE	HEATER	5E SM. 5 PIN	4 7/32	1 9/16	0.30	0.007 MAX.	3.7	9.2	DETECTOR	180	67.5	6						0.25 MΩ	
											AMPLIFIER	100	55	1.5	1.8	470	0.55 MΩ	850			7
												250	90	3	3.2	595	0.55 MΩ	1050			7
37	DETECTOR AMPLIFIER	TRIODE	HEATER	5A SM. 5 PIN	4 1/4	1 9/16	0.30	2.0	3.5	2.2	BIAS DETECTOR	180		20							
											AMPLIFIER	90		6	2.5	9.2	11500	800	0.03	17500	
												250		18	7.5	9.2	8400	1100	0.34	20000	
38	POWER AMPLIFIER	PENTODE	HEATER	5F SM. 5 PIN	4 7/32	1 9/16	0.30				AMPLIFIER	100	100	9	7	80	85000	950	0.27	13500	
												135	135	13.5	9	100	0.1 MΩ	1000	0.525	13500	
												250	250	25	22	120	0.1 MΩ	1200	2.5	10000	
39/44	DETECTOR AMPLIFIER	REMOTE CUT-OFF PENTODE	HEATER	5F SM. 5 PIN	4 7/32	1 9/16	0.30	0.007 MAX.	3.5	10	1st. DETECTOR	90 TO 250	90	7 MΩ							
											AMPLIFIER	90	90	3	5.6	360	0.375 MΩ	960			42
												250	90	3	5.8	1050	1.0 MΩ	1050			42
41	POWER AMPLIFIER	PENTODE	HEATER	6B SM. 6 PIN	4 1/4	1 9/16	0.40				AMPLIFIER	180	180	13.5	16.5	150	81000	1850	1.5	9000	
												250	250	18	32	150	68000	2200	3.4	7600	
42	POWER AMPLIFIER	PENTODE	HEATER	6B MED. 6 PIN	4 11/16	1 13/16	0.70				PENTODE AMPLIFIER	250	250	16.5	34	185	79000	2350	3	7000	
												315	315	22	42	230	0.1 MΩ	2300	5	7000	
											#2 GR TO PL. CLASS AB TRIODE (2 TUBES)	350		36	42 TO 90				18	8000	
52	POWER AMPLIFIER	DOUBLE GRID TRIODE	FIL.	5C MED. 5 PIN	4 11/16	1 13/16	0.30				CLASS A	110		0	43	5.2	1750	3000	1.5	2000	
											CL.B (TWO 2 TUBES)	180		0	6 TO 40				6	9000 MIN	
75	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	6G SM. 6 PIN	4 7/32	1 9/16	0.30	2.0	2.0	4.0	DIODE DETECTOR	250		2	0.8	100	91000	1100			
											TRIODE AMPLIFIER	250		2	0.1					0.25 MΩ	
76	OSCILLATOR AMPLIFIER	TRIODE	HEATER	5A SM. 5 PIN	4 1/4	1 9/16	0.30	2.8	3.5	2.5	OSCILLATOR	90		0							
											AMPLIFIER	250		13.5	5.0	13.8	9500	1450	0.25	50000	
77	DETECTOR AMPLIFIER	PENTODE	HEATER	6F SM. 6 PIN	4 7/32	1 9/16	0.30	0.007 MAX.	4.0	11	DETECTOR	250	100	4.3							
											AMPLIFIER	250	100	3	2.3	1500	1.5 MΩ	1250			7.5
78	DETECTOR AMPLIFIER	REMOTE CUT-OFF PENTODE	HEATER	6F SM. 6 PIN	4 7/32	1 9/16	0.30	0.007 MAX.	4.0	11	1st. DETECTOR	250	100	10							
											AMPLIFIER	250	100	3	7.0	1160	0.8 MΩ	1450			42
79	POWER AMPLIFIER	TWIN TRIODE	HEATER	6H SM. 6 PIN	4 7/32	1 9/16	0.60				COMPLETE CL.B (BOTH SECTIONS)	250		0	20 TO 60				8	14000	
85	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	6G SM. 6 PIN	4 7/32	1 9/16	0.30	2.0	2.0	4.0	DIODE DETECTOR	180		13.5	6	8.3	8500	975	0.16	20000	
											TRIODE AMPLIFIER	250		20	8	8.3	7500	1100	0.35	20000	
89	POWER AMPLIFIER	TRIPLE GRID	HEATER	6F SM. 6 PIN	4 7/32	1 9/16	0.40				CLASS A TRIODE	250		31	32	4.7	2600	1800	0.9	5500	
											CL. A PENTODE	250	250	25	32	125	70000	1800	3.4	6750	
											CL.B TRIODE (TWO 2 TUBES)	250		0	6 TO 50				5	10000 MIN	
6A3	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	5 3/8	2 1/16	1.0				SINGLE AMPLIFIER	250		45	60	4.2	800	5250	3.3	2500	
											CLASS AB (2 TUBES)	325	1st fixed bias	63	130 TO 150				10	5000	
												325	fixed bias	63	140 TO 200				15	3000	
6A4/LA	POWER AMPLIFIER	PENTODE	FIL.	5B MED. 5 PIN	4 9/16	1 13/16	0.30				AMPLIFIER	180	180	12	22	100	4500	2200	1.4	8000	
											CL. AB (2 TUBES)	230	230	22	32	SELF BIAS-R_{cc} 700Ω			4.2	16000	
12A5	POWER AMPLIFIER	PENTODE	HEATER	7F SM. 7 PIN	4 1/8	1 9/16	6.3-0.6a 12.6-0.3a	8.5	4	2	AMPLIFIER	100	100	15	17			1700	0.65	4500	
												180	180	27	38			2300	2.6	3800	
6A6	POWER AMPLIFIER	TWIN TRIODE	HEATER	7B MED. 7 PIN 16 PIN CIRCLE	4 11/16	1 9/16	0.8				CL.A (PARALLEL COMN)	294		6	7	35	11000	3200	0.37	35000	
											COMPLETE CLASS B (BOTH SECTIONS)	250		0	28 TO 50				8	8000	
												300		0	35 TO 50				10	10000	
6A7	OSCILLATOR DETECTOR	HEPTODE	HEATER	7C SM. 7 PIN	4 7/32	1 9/16	0.30	1.0	7	5.5	OSC. SECTION	250		50000Ω	4					R_{cc} 0.02 MΩ	
								0.3	8.5	9	MIXER SECTION	250	100	3	4		0.36 MΩ	520	CONVERSION CONDUCTANCE		45
M 6A8	OSCILLATOR DETECTOR	HEPTODE	HEATER	8A OCTAL 8 PIN	3 1/8	1 5/16	0.3	1	7	4.5	OSC. SECTION	250		50000Ω	4						
								0.05	13	13.0	MIXER SECTION	250	100	3	4		0.36 MΩ	520	CONVERSION CONDUCTANCE		
6B5	POWER AMPLIFIER	DUAL TRIODE	HEATER	6D MED. 6 PIN	4 11/16	1 13/16	0.80				SINGLE TUBE	300		0	45 8	58	24000	2400	4	7000	15
												" 325		0	51 9				5.2	7000	17
											TWO TUBES	" 250		0	33 6.5				8.5	10000	38
												" 325		0	51 9				13.5	10000	42
6B7	DETECTOR AMPLIFIER	DUPLEX DIODE PENTODE	HEATER	7D SM. 7 PIN	4 7/32	1 9/16	0.30	0.010 MAX.	3.3	10	DIODE DETECTOR	100	100	3	5.8	285	0.3 MΩ	950			17
											R.F. AMPLIFIER	250	100	3	6.0	800	0.8 MΩ	1000			17
											DIO.DET.& R.F. AMPLI.	250	50	4.5	0.65					0.2 MΩ	
M 6C5	OSCILLATOR AMPLIFIER	TRIODE	HEATER	6Q OCTAL 6 PIN	2 5/8	1 5/16	0.30	2.0	4.5	14	OSCILLATOR	90		0							
											AMPLIFIER	250		8	8	20	10000	2000			
6C6	DETECTOR AMPLIFIER	PENTODE	HEATER	6F SM. 6 PIN	4 15/16	1 9/16	0.30	0.007 MAX.	5.2	6.8	DETECTOR	250	100	3.8						0.25 MΩ	
											AMPLIFIER	250	100	3	2.0	2500	2.0 MΩ	1225			7
6D6	DETECTOR AMPLIFIER	REMOTE CUT-OFF PENTODE	HEATER	6F SM. 6 PIN	4 15/16	1 9/16	0.30	0.007 MAX.	5.2	6.8	1st DETECTOR	250	100	10							
											AMPLIFIER	250	100	3	8.2	1280	0.8 MΩ	1600			50
6E5	TUNING INDICATOR	CATHODE RAY	HEATER	6R SM. 6 PIN	4 1/4	1 9/16	0.30				TUNING INDICATOR	WITH PLATE 250V (THRU 1 MΩ), TARGET 250V, I_b = 0.25 ma & SHADOW ANGLE IS 90° AT E_c = 0V; ANGLE IS ZERO AT E_c = -8V APPROX.										
6E6	POWER AMPLIFIER	TWIN TRIODE	HEATER	7B MED. 7 PIN	4 11/16	1 13/16	0.60				COMPLETE CLASS A (BOTH SECTIONS)	180		20	23	6.0	2150	2800	0.75	15000	
												250		27.5	36	6.0	1750	3400	0.6	14000	
M 6F5	AMPLIFIER	TRIODE	HEATER	5M OCTAL 5 PIN	3 1/8	1 5/16	0.30				AMPLIFIER	250		2	0.9	100	66000	1500			
												250		2	0.1					0.25 MΩ	
M 6F6	POWER AMPLIFIER	PENTODE	HEATER	7S OCTAL 7 PIN	3 1/4	1 5/16	0.70				PENTODE AMPLI.	250	250	16.5	34	185	79000	2350	3	7000	
											TRIODE (G_2 TO P)	250		20	31	6.2	2700	2300	0.85	4000	
											CLASS AB PENT.	375	250	300 fixed	54				19	10000	
											AMPLI. (2 TUBES)	375	250	26 fixed	34				19	10000	
6F7	OSCILLATOR DETECTOR	TRIODE PENTODE	HEATER	7E SM. 7 PIN	4 7/32	1 9/16	0.30	2.0	2.5	3.0	TRIODE AMPLIFIER	100		3	3.5	8	18000	500			
								0.008 MAX.	3.2	12	PENTODE 1st. DET.	250	100	10							
											PENTODE AMPLI.	250	100	3	6.5	900	0.85 MΩ	1100			50
6G5	TUNING INDICATOR	CATHODE RAY	HEATER	6R SM. 6 PIN	4 1/4	1 9/16	0.30				TUNING INDICATOR	WITH PLATE 250V (THRU 1 MΩ), TARGET 250V, I_b = 0.25 ma AND SHADOW ANGLE IS 90° AT E_c = 0V · ANGLE IS ZERO AT E_c = -22V APPROX										
M 6H6	DETECTOR	TWIN DIODE	HEATER	7Q OCTAL 7 PIN	1 5/8	1 5/16	0.30				DIODE DETECTOR	100 MAX. AC			2 MAX. EACH DIODE						
M 6J7	DETECTOR AMPLIFIER	PENTODE	HEATER	7R OCTAL 7 PIN	3 1/8	1 5/16	0.30	0.002	8	12	DETECTOR	250	100	3.8						0.25 MΩ	
											AMPLIFIER	250	125	3	4			1550			9
												250	100	3	2	2500	2.0 MΩ	1225			7
M 6K7	DETECTOR AMPLIFIER	PENTODE	HEATER	7R OCTAL 7 PIN	3 1/8	1 5/16	0.30	0.002	8	12	1st. DETECTOR	250	100	10							
											AMPLIFIER	250	125	3	10.5	990	0.6 MΩ	1650			52
												250	100	3	7	1160	0.8 MΩ	1450			42
M 6L7	MIXER AMPLIFIER	HEPTODE	HEATER	7T OCTAL 7 PIN	3 1/8	1 5/16	0.30	G_1 0.001	G_1 6.5 G_3 11.5	13	MIXER	250	150	G_2 1/8 G_3 3	3.3	I_{c2} = 8.3	2.0 MΩ	350	CONVERSION CONDUCTANCE		G_1 45 G_3 13
											AMPLIFIER	250	100	G_2 3	5.3	880	0.8 MΩ	1100			
	6N7G	POWER AMPLIFIER	TWIN TRIODE	HEATER	8B OCTAL MED. SHELL 8 PIN	4 5/8	1 13/16	0.80								SAME	AS	6A6				
M	6Q7	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	7V OCTAL 7 PIN	3 1/8	1 5/16	0.30	1.2	6	4.5	DIODE DETECTOR	100		1.5	0.35	70	0.87 MΩ	800			
												TRIODE AMPLIFIER	250		3	1.1	70	0.58 MΩ	1200		0.25 MΩ	
M	6R7	DETECTOR AMPLIFIER	DUPLEX DIODE TRIODE	HEATER	7V OCTAL 7 PIN	3 1/8	1 5/16	0.30	2.0	6	4.5	DIODE DETECTOR TRIODE AMPLIFIER	250		90	9.5	16	8500	1900	0.28	15000	

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RAYTHEON RADIO TUBE CHART

BLOCK-g 7.5 VOLT AC POWER AMPLIFIER TUBES

TYPE NO.	DESCRIPTION: USE	TYPE	CATHODE	BASING SEE VIEW AT RIGHT	MAX. DIMEN. OVERALL: HEIGHT	DIAM.	FIL. CURR. AMPS.	CAPACITANCES MICRO-MICRO-FARADS: GRID PLATE	INPUT	OUTPUT	OPERATING CONDITIONS AND CHARACTERISTICS: WHEN USED AS	PLATE SUPPLY VOLTS	SCR. GRID VOLTS	GRID BIAS VOLTS	PLATE CURRENT M.A.	AMPL. FACTOR	PLATE RESIS. OHMS	MUT. COND. μMHOS	MAX. UNDIST. OUTPUT WATTS	RECOMM. LOAD RES. OHMS	CUT-OFF BIAS VOLTS
10	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	5 5/8	2 1/16	1.25				AMPLIFIER	350		31	16	8.0	5150	1550	0.9	11000	
												425		39	18	8.0	5000	1600	1.6	10000	
50	POWER AMPLIFIER	TRIODE	FIL.	4D MED. 4 PIN	6 1/4	2 7/16	1.25				AMPLIFIER	350		63	45	3.8	1900	2000	2.4	4100	
												450		84	55	3.8	1800	2100	4.6	4350	

BLOCK-h SERIES FILAMENT POWER AMPLIFIER TUBES

	TYPE NO.	DESCRIPTION: USE	TYPE	CATHODE	BASING SEE VIEW AT RIGHT	MAX. DIMEN. OVERALL: HEIGHT	DIAM.	FIL. CURR. AMPS.	CAPACITANCES MICRO-MICRO-FARADS: GRID PLATE	INPUT	OUTPUT	OPERATING CONDITIONS AND CHARACTERISTICS: WHEN USED AS	PLATE SUPPLY VOLTS	SCR. GRID VOLTS	GRID BIAS VOLTS	PLATE CURRENT M.A.	AMPL. FACTOR	PLATE RESIS. OHMS	MUT. COND. μMHOS	MAX. UNDIST. OUTPUT WATTS	RECOMM. LOAD RES. OHMS	CUT-OFF BIAS VOLTS
	43	POWER AMPLIFIER	PENTODE	HEATER	6B MED. 6 PIN	4 1/16	1 13/16	0.3A 25 V				AMPLIFIER	95	95	15	20	90	45000	2000	0.9	4500	
													180	135	20	38	100	40000	2500	2.75	5000	
	48	POWER AMPLIFIER	PENTODE	HEATER	6B MED. 6 PIN	5 3/8	2 1/16	0.4A 30 V				AMPLIFIER	96	96	19	52			3800	2.0	1500	
													125	100	22.5	56			3900	2.5	1500	
	12A7	POWER AMPL. & RECTIFIER	PENTODE & DIODE	HEATER	7K SM. 7 PIN	4 17/32	1 9/16	0.3A 12.6V				AMPLIFIER	135	135	13.5	9	100	0.1 MΩ	975	0.55	13500	
												RECTIFIER	125 RMS			30 MAX						
M	25A6	POWER AMPLIFIER	PENTODE	HEATER	7S OCTAL 7 PIN	3 1/4	1 5/16	0.3A 25.0V				AMPLIFIER	95	95	15	20	90	45000	2000	0.9	4500	
													180	135	20	38	100	40000	2500	2.75	5000	

BLOCK-j RECTIFIER TUBES

	TYPE NO.	DESCRIPTION: USE	TYPE	CATHODE	BASING SEE VIEW AT RIGHT	MAX. DIMEN. OVERALL: HEIGHT	DIAM.	FIL. AMPS.	FIL. VOLTS	MAX. AC VOLTS PER ANODE	MAX. DC OUT. CURR. (AMPS)	MAX. PEAK INVERSE VOLTS	MAX. PEAK PLATE CURR.	MIN. CHOKE BEFORE FILTER CONDENSER	MAX. HEATER CATHODE BIAS	MAX. DC VOLTS DEL. TO FILTER (NOM): CONDENSER INPUT	CHOKE INPUT
	8A	FULL WAVE	GAS	COLD	4J MED. 4 PIN	5 5/8	2 7/16	—	—	350	0.350	1000	1.00				300
	8H	FULL WAVE	GAS	COLD	4J MED. 4 PIN	4 5/8	1 13/16	—	—	350	0.125	1000	0.40				300
	8R	HALF WAVE	GAS	COLD	4H MED. 4 PIN	3 3/4	1 9/16	—	—	300	0.050	850	0.20			300	
	1-V	HALF WAVE	HIGH VACUUM	HEATER	4G SM. 4 PIN	4 1/4	1 9/16	0.3	6.3	350	0.050	1000	0.20		500	400	
	80	FULL WAVE	HIGH VACUUM	FIL.	4C MED. 4 PIN	4 11/16	1 13/16	2.0	5.0	350	0.125	1000	0.40			300	225
										400	0.110	1100	0.35			370	275
										550	0.135	1500	0.30	20 HENRIES			425
	81	HALF WAVE	HIGH VACUUM	FIL.	4B MED. 4 PIN	6 1/4	2 7/16	1.25	7.5	700	0.085	2000	0.60 FULL WAVE			750	550
	82	FULL WAVE	MERCURY VAPOR	FIL.	4C MED. 4 PIN	4 11/16	1 13/16	3.0	2.5	500	0.125	1400	0.40			590	425
	83	FULL WAVE	MERCURY VAPOR	FIL.	4C MED. 4 PIN	5 3/8	2 1/16	3.0	5.0	500	0.250	1400	0.80			530	400
	83V	FULL WAVE	HIGH VACUUM	HEATER	4L MED. 4 PIN	4 11/16	1 13/16	2.0	5.0	500	0.250	1400	0.80			510	385
	0Z3	FULL WAVE	GAS	COLD	5N SM. 5 PIN	4 1/8	1 9/16	—	—	350	0.075 MAX 0.030 MIN	1250	0.20			425	300
M	0Z4	FULL WAVE	GAS	COLD	4R OCTAL 4 PIN	2 5/8	1 5/16	—	—	350	0.075 MAX 0.030 MIN	1250	0.20			425	300
	5Y3	FULL WAVE	HIGH VACUUM	FIL.	5L OCTAL MED. SHELL 5 PIN	4 5/8	1 13/16	2.0	5.0		SAME	AS	TYPE	80			
	5Z3	FULL WAVE	HIGH VACUUM	FIL.	4C MED. 4 PIN	5 3/8	2 1/16	3.0	5.0	500	0.250	1400	0.70			480	360
M	5Z4	FULL WAVE	HIGH VACUUM	HEATER	5L OCTAL 5 PIN	3 1/4	1 5/16	2.0	5.0	400	0.125	1100	0.50			425	275
M	6X5	FULL WAVE	HIGH VACUUM	HEATER	6S OCTAL 6 PIN	3 1/4	1 5/16	0.6	6.3	350	0.075	1250	0.25		500	400	
	6Z4/84	FULL WAVE	HIGH VACUUM	HEATER	5D SM. 5 PIN	4 1/8	1 9/16	0.5	6.3	350	0.060	1000	0.20		500	425	300
	12Z3	HALF WAVE	HIGH VACUUM	HEATER	4G SM. 4 PIN	4 1/8	1 9/16	0.3	12.6	250	0.060	700	0.30		350	310	
	25Z5	RECTIFIER DOUBLER	HIGH VACUUM	HEATER	6E SM. 6 PIN	4 1/8	1 9/16	0.3	25.0	125	0.200	700	0.40	RECTIFIER	350	200	
											0.100	700	0.20	DOUBLER		120	
M	25Z6	RECTIFIER DOUBLER	HIGH VACUUM	HEATER	7Q OCTAL 7 PIN	3 1/8	1 5/16	0.3	25.0	125	0.170	700	0.35	RECTIFIER	350	225	
											0.085	700	0.17	DOUBLER		115	

BLOCK-k RAYTHEON SPECIAL TUBES

(SUPPLIED FOR REPLACEMENT USE ONLY)

TYPE NO.	FILAMENT: VOLTS	AMPS.	BASING: VIEW	SHIELD CONN. TO	CHARACTERISTICS, USE & DIMEN.	TYPE NO.
2S/0S	2.5	1.35	5D	CATHODE PIN	APPROXIMATELY 40 MA. ON EACH DIODE PLATE AT 90 VOLTS DC. DUPLEX DIODE DETECTOR	2S/0S
15	2.0	0.22	5F	NO SHIELD	USED IN SIMILAR TO 36 EXCEPT MUT COND = 750, PLATE CURR. = 8.5 MA, PLATE VOLTS = 135, SCREEN GRID = 67.5 MAX. CONT GRID BIAS = 1.5	15
24S	2.5	1.75	5E	CATHODE PIN	SAME AS 24A	24S
27S	2.5	1.75	5E	CATHODE PIN	SAME AS 27	27S
35/51S	2.5	1.75	5E	CATHODE PIN	SAME AS 35	35/51S
55S	2.5	1.0	6G	CATHODE PIN	SAME AS 55	55S
56S	2.5	1.0	5A	CATHODE PIN	SAME AS 56	56S
57S	2.5	1.0	6F	CATHODE PIN	SAME AS 57	57S
57AS	6.3	0.4	6F	CATHODE PIN	SAME AS 6C6, EXCEPT HEATER AMPS.	57A S
58S	2.5	1.0	6F	CATHODE PIN	SAME AS 58	58S
58A S	6.3	0.4	6F	CATHODE PIN	SAME AS 6D6, EXCEPT HEATER AMPS.	58A S
75 S	6.3	0.3	6G	CATHODE PIN	SAME AS 75	75 S
85A S	6.3	0.3	6G	HEATER PIN ADJACENT TO CATHODE PIN	SIMILAR TO 85 EXCEPT AMP. FACTOR = 20; MUTUAL COND. = 1250; PLATE CURRENT = 5.5 MA.; PLATE VOLTS = 250, GRID BIAS = -9	85A S
182 B	5.0	1.25	4D	NO SHIELD	SIM. TO 45 EXCEPT FIL. VOLTS, AMP. FACTOR = 5.0 MUTUR COND. = 1800, PLATE CURRENT = 18 MA., PLATE VOLTS = 250, GRID BIAS = -35	182 B
183	5.0	1.25	4D	NO SHIELD	SIMILAR TO 45 EXCEPT FIL VOLTS, AMP FACTOR = 5.0, MUT COND = 1500, PLATE CURR. = 20 MA, PLATE VOLTS = 250, GRID BIAS = -50	183
485	3.0	1.25	5A	NO SHIELD	SIMILAR TO 27 EXCEPT HEATER VOLTS, AMP FACTOR = 12.8, MUT COND = 1300, PLATE CURR. = 5.2 MA, PLATE VOLTS = 180, GRID BIAS = -10	485
950	2.0	0.12	5K	NO SHIELD	SIMILAR TO 33 EXCEPT FIL AMPS., PLATE CURRENT = 7 MA., POWER OUTPUT = 0.05 WATTS, PLATE & SCREEN VOLTS = 135 MAX., CONTROL GRID BIAS = -16.5	950

TYPE NO.	FILAMENT: VOLTS	AMPS.	BASING: VIEW	SHIELD CONN. TO	CHARACTERISTICS, USE & DIMEN.
2A7S	2.5	1.0	7C	CATHODE PIN	SAME AS 2A7
22/684	2.5	1.5	4B	NO SHIELD	SIMILAR TO 1-V
6A7S	6.3	0.3	7C	CATHODE PIN	SAME AS 6A7
6B7S	6.3	0.3	7D	CATHODE PIN	SAME AS 6B7
6C7	6.3	0.3	7G	SEPARATE PIN	SAME AS 85A-S
6D7	6.3	0.3	7H	SEPARATE PIN	SAME AS 6C6
6E7	6.3	0.3	7H	SEPARATE PIN	SAME AS 6D6
6F7S	6.3	0.3	7E	CATHODE PIN	SAME AS 6F7
6Y5	6.3	0.8	6J	SEPARATE PIN	SIMILAR TO 6Z4/84
6Z5	12.6/6.3	0.4/0.8	6K	NO SHIELD	SIMILAR TO 6Z4/84

'M' ON LEFT MARGIN INDICATES METAL TUBE TYPES.

THIS CHART HAS BEEN SO DIVIDED, THAT IT MAY BE CUT INTO TWO SECTIONS. TUBE TYPE INDEX MAY BE FOUND BY TURNING UP LOWER PAGE.

BASING VIEWS LOOKING AT BOTTOM OF SOCKET

REPLACEMENT TUBE TYPES

Raytheon tubes can be used as replacement for tubes of other manufacturers as follows:

A. Tube types having the same RMA type numbers (with a letter between two numbers—as 6A7) are interchangeable.

B. On standard tube types with two or three figure type numbers, the last two figures form the significant type numbers regardless of letter prefixes. For example, the Raytheon 45 will replace UX-245, CX-345, or SX-245 tubes.

C. Types differing in number by the suffix letters "A", "G", "H", "MG", or "V" are interchangeable in general, regardless of this letter. For example the 12A may replace a 112 or 112A, the 2A3 may replace a 2A3H, and the 6A8 may replace a 6A8G or 6A8MG.

D. Shielded types distinguished by the added letter "S" may or may not be interchangeable with types without this letter suffix.

E. Exceptions to the above tubes are types RA-1, RE-1, SO-1, KR-20, KR-22, 43MG, 59B, 132B, Kellog 401, 482A, 482B, 484, 484A and 25Z5MG which do not correspond with types 1-V 20, 22, etc. The 01A (201A) is not interchangeable with the 1-V or 1, and the WX-12 is not interchangeable with the 12A (112A). Types 57AS, 58AS, 183, and 485 may be replaced only by Raytheon tubes bearing the same full type numbers.

F. The following table lists the obsolete and non-standard tube types with the standard types which normally may be used for replacement.

TYPE NO.	NORMALLY REPLACEABLE BY RAYTHEON TYPES
2A3H	2A3
5Y3 ***	5Z4 ***
5Z4MG	5Z4
6A8MG	6A8
6B6	6Q7
6B6MG	6Q7
6C5MG	6C5
6F5MG	6F5
6F6MG	6F6
6H6MG	6H6
6J7MG	6J7
6K7MG	6K7
6L7MG	6L7
6Q7MG	6Q7
6R7MG	6R7
6X5MG	6X5
6Z3	1-V
25Z5MG	25Z6
14Z3	12Z3
1	1-V
RE-1	80
RE-2	81
SO-2	50
G-2	2S/4S
G-2S	2S/4S
G-1	2S/4S
G-4S	2S/4S
KR-5	6A4/LA
WD-12	WX-12
25S	1B5/25S
27-HM	56
43MG	25A6
44	39/44
64 **	36
64A	36
65 **	39/44
65A	39/44
67 **	37
67A	37
68 **	38
68A	38
83	83V
84	6Z4/84
G-84	2Z2/G84
95	2A5
KR-98	6Z4/84
112	12A
112A	12A
120	20
171	71A
171A	71A
171AC	71A
171B	71A
182A	71A
182B	183 †
V-199	V-99
X-199	X-99
200	200A
201	01A
201A	01A
210	10
213	80
216	81
216B	81
220	20
222	22
224	24A
224A	24A
226	26
227	27
230	30
231	31
232	32
233	33
234	34
235	35/51
236	36
238	38
239	39/44
240	40
245	45
247	47
250	50
280	80
280M	83V
281	81
288	83V
C-299	V-99
X-299	X-99
482A	71A
551	35/51
585	50
586	50
P-861	6Z4/84
951	1B4/951
986	83
AD	1-V
AF	82
AG	83
LA	6A4/LA
PZ	47
PZH	2A5

*** See chart for difference in output voltage. ** In automobile sets only. † Where both power tubes are changed together.