

LF 826/827

550MHz/1.3GHz FREQUENCY COUNTER

SERVICE MANUAL

<WARNING>

This service manual is for use by qualified personnel only. To avoid electrical shock, do not perform any service in this manual unless qualified to do so.

1st edition June, 1998

826/827

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1. SPECIFICATIONS

1.1 Frequency Measurement 1(INPUT A, FREQ)

Measurement Range

Reciprocal method: 0.1 Hz to 10MHz DC coupled

10 Hz to 10 MHz AC coupled

Direct counting method: 10 MHz to 100 MHz

Accuracy

< 10 MHz Time base accuracy + $\{(\text{trigger error} \pm \text{time base}) / (\text{input signal frequency} \times \text{gate time})\}$

≥ 10 MHz Time base accuracy ± 1 count

Gate Time: 10 ms, 0.1s, 1s, 10s

1.2 Frequency Measurement 2(INPUT B)

Measurement Range

Prescaler: LF 827 80 MHz to 1.3 GHz

LF 826 80 MHz to 550 MHz

Accuracy: Time base accuracy ± 1 count

Gate Time: 13 ms, 0.13 s, 1.3 s, 13 s

1.3 Period Measurement(INPUT A PERIOD)

Measurement Range: 100 ns to 10 s DC coupled

100 ns to 0.1 s AC coupled

Accuracy: Time base accuracy + period of input signal $\times \{(\text{trigger error} \pm \text{time base}) / \text{gate time}\}$

Gate Time: 10 ms, 0.1 s, 1 s, 10 s

1.4 RPM Measurement(INPUT A, RPM)

Measurement Range: 6 rpm to 600 Mrpm DC coupled

600 rpm to 600 Mrpm AC coupled

Accuracy: $[\text{Time base accuracy} \times \{(\text{trigger error} \pm \text{time base}) / ((\text{rpm}/60) \times \text{gate time})\}] \times 60$

Gate Time: 10 ms, 0.1 s, 1 s, 10 s

1.5 Totalize Measurement(INPUT A, TOTAL)

Measurement Range: DC to 10 MHz DC coupled

10Hz to 10 MHz AC coupled

Minimum Pulse Width: 50 ns

Accuracy: 1 count of gating

1.6 Input Section

Input A

Sensitivity: 15 mVrms (SENS. 15mV)

150 mVrms (SENS. 150mV)

! Maximum Input Voltage: 100 Vrms (≤ 400 Hz)

20 Vrms (400 Hz to 100 kHz)

5 Vrms (100 kHz to 100MHz)

Attenuator: 1, 1/10

Impedance: Approx. 1 M Ω
Filter: 100 kHz low pass filter, on/off
Coupling: AC, DC (AUTO mode: AC)
Trigger Level Variable Range
TRIGGER AC, DC: Approx. -0.5V to +0.5 V (SENS. 15 mV)
 Approx. -5V to +5 V (SENS. 150 mV)
AUTO: Automatic setting

Input B
Sensitivity: 10 mVrms
! Maximum Input Voltage: 5 Vrms
Impedance: Approx. 50 Ω
Coupling: AC

1.7 Computing Function

Comparator Function
(Except INPUT A, TOTAL): Compares input signal frequency with the preset upper and lower limits
 A lamp indicates the results (HI, GO, LO)

Relative Value Display
Function
(Except INPUT A, TOTAL): Displays the difference between the preset reference value and actual measurement value
 7 digits display

1.8 Time Base

Frequency: 10 MHz (crystal controlled)
Accuracy: $\pm 3 \times 10^{-6}$ (3 ppm, 0 $^{\circ}$ C to 40 $^{\circ}$ C)
Display: 7-segment 8-digit green LED

1.9 Environmental Conditions

Spec-guaranteed: Temperature: 0 $^{\circ}$ C to 40 $^{\circ}$ C
 Humidity: 30% to 85%RH

1.10 Power Requirements: 100/110/230 V AC $\pm 10\%$
 (250 V MAXIMUM), 50/60 Hz

1.11 Power Consumption: 18 VA $\pm 20\%$

1.12 Dimensions: 200(W)x80(H)x280(D)mm

1.13 Weight: Approx. 3kg

1.14 Factory Option
(LF 827 Only):

GPIB interface
 High stability time base: ± 0.03 ppm (0 $^{\circ}$ C to 40 $^{\circ}$ C)

2. TEST EQUIPMENT REQUIRED

The following test equipment are needed for the calibration and service of the LF 826/827.

To calibrate this model correctly, each test equipment must satisfy the minimum specifications described.

Test Equipment	Specification	Name of Style
Generator 1 Standard Signal Generator	100 kHz to 1.3 GHz	LEADER:LG 322G
Generator 2 Function Generator	1MHz 0.5V±0.125Vp-p (at DC Offset)	LEADER:LG 1301
Standard X'tal Oscillator	10 MHz less than ±0.03ppm	LEADER:J1G
Digital Multimeter	3.5 digits Display or more	LEADER:Model 85G
Oscilloscope	20 MHz ,5 mV/div or more	LEADER:LS 1020
50Ω Termination	DC~300MHz Feedthrough	LEADER:L1 2049
Mixed Wave Signal Generator	50Hz 150mVp-p + 1kHz 50mVp-p	LEADER:J1G

3. CALIBRATION PROCEDURE

3.1 Preparations Before Power-up

- (1) Confirm that the power source line doesn't touch GND before turning on a power source.

- (2) Confirm that the position of the a voltage selector and a regular fuse are being used.

- (3) Connect it in the regular power source line after you confirm that the power switch of the product is off.

- (4) 30 minutes and more warm-up is required under the condition that the unit is covered by case before you adjust it.
The measuring equipment used for the adjustment also need 30 minutes and more warm-up.

- (5) Use the Generator 1 and 2 for the Input A. And, use the terminating resistor of 50 Ω when a standard signal generator is connected.
The terminating resistor of 50 Ω isn't used for Input B.

3.2 Adjusting the Power Unit and Other Units
 Applicable board: Main Board T-5732

Step	Item	Measuring point	Setting	Adjustment point	Adjustment method
1	Power supply	Connect digital voltmeter to TP-202 TP-203 TP-204	+5V +12V -12V		Using the digital voltmeter, measure voltage to check they are within the following ranges: 4.75V~ 5.42V 10.8V~ 13.2V -10.7V~-13.2V
2	The ripple of power supply	Connect oscilloscope to TP-202 TP-203 TP-204	20mVp-p		Measure the ripple using the oscilloscope: less than 20mVp-p
3	Input A amplifier offset voltage	Connect digital voltmeter to TP-1	0V	VR1	Measure the voltage using the digital voltmeter: Adjust to 0V TRIGGER: AUTO INPUT A: 50Ω Termination
4	Compare voltage	Connect digital voltmeter to TP-100 TP-101	0V 0V	VR100 VR101	Measure the voltage using the digital voltmeter: Adjust to 0V TRIGGER: AUTO INPUT A: 50Ω Termination
5	Current of ICX0	Connect digital voltmeter to TP-200	0.1V	VR200	Adjust the VR for the adjustment little by little because the change in the voltage is slow against the change in the VR200. Adjust the VR for the adjustment again if the indication of the

Step	Item	Measuring point	Setting	Adjustment point	Adjustment method
5					digital electronic voltmeter becomes stable, and adjust it to be 0.11V from 0.09V. TRIGGER: AUTO INPUT A: 50Ω Termination
6	Time base oscillator	Connect standard x'tal oscillator to INPUT A Panel display	10MHz	VC200	Gate time set to 1S: Adjust to 9.999998MHz ~10.000002MHz

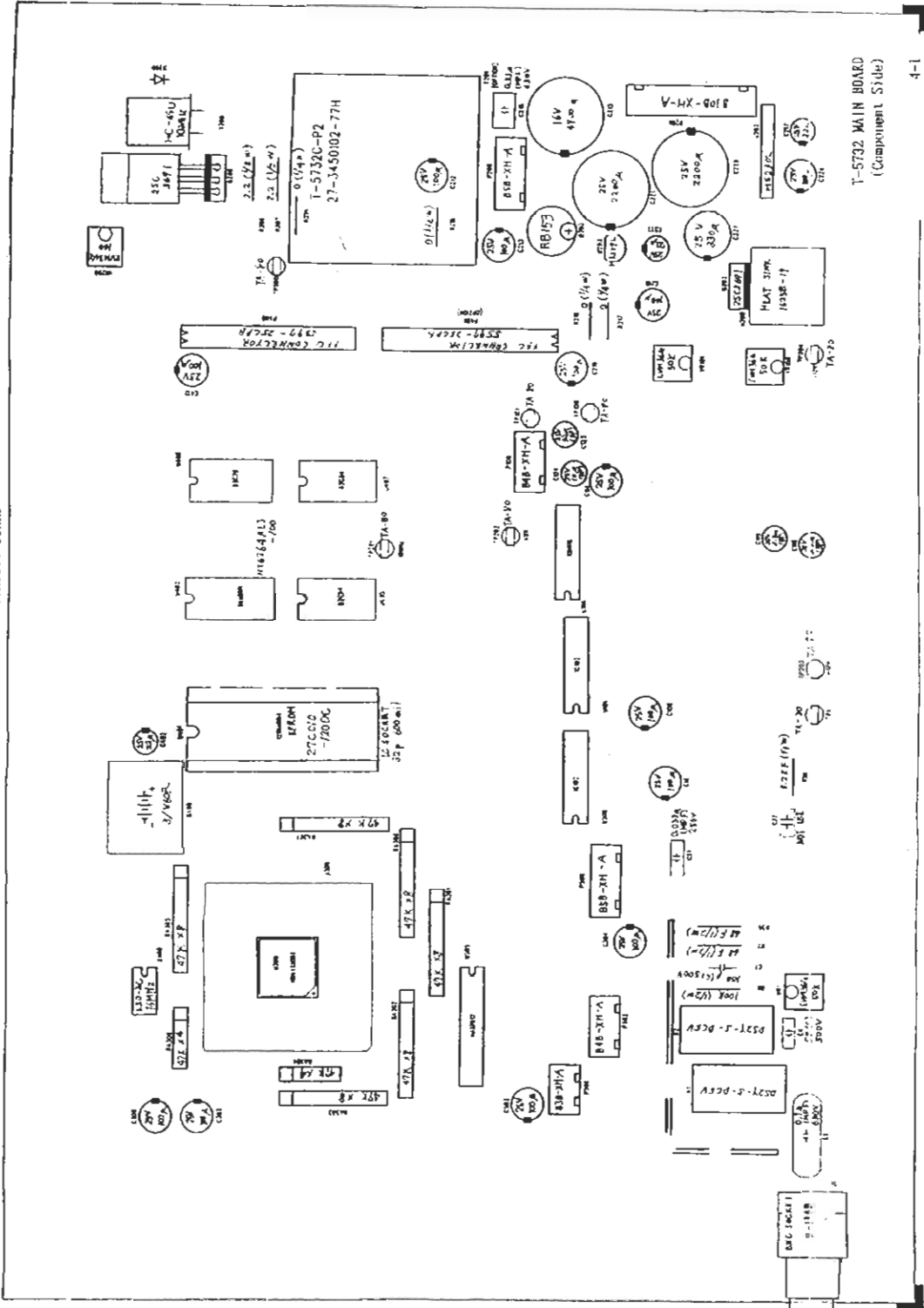
3.3 Checking the General Operation

Turn the power source on, and make it default condition with pushing [RELATIVE] and [DATA SET UP]key of panel when it is general operation.

Step	Item	Measuring method	Checking method
1	Reciprocal method and GATE LED	Input the signal of 100kHz 50mVrms(-13dBm) from the Generator 1 to Input A.	Confirm that it is counted Confirm that GATE LED is turned on
2	Direct method and GATE LED	Input the signal of 100kHz 50mVrms(-13dBm) from the Generator 1 to Input A.	Confirm that it is counted. Confirm that GATE LED is turned on.
3	GATE TIME	Input the signal of 1.1MHz 50mVrms(-13dBm) from the Generator 1 to Input A. Change GATE TIME.	A display column is to change as follows. GATE TIME 10ms 1.XXXX 0.1s 1.XXXXX 1s 1.XXXXXX 10s 1.XXXXXXX Note: any value of X is good
4	Prescaler method	In the case of LF827: Set the GATE TIME in 1s and select the Input B. Input the signal of 1.3GHz 50mVrms(-13dBm) from the Generator 1 to Input B. In the case of LF826: Set the GATE TIME in 1s and select the Input B. Input the signal of 550MHz 50mVrms(-13dBm) from the Generator 1 to Input B.	Confirm that it is counted. Confirm that it is counted.
5	TRIGGER AUTO	Input the mixed signals of 50Hz 150mVpp and 1kHz 50mVpp from Mixed Wave Signal Generator to Input A.	Confirm that 50Hz should be counted.

Step	Item	Measuring method	Checking method
6	TRIGGER LEVEL	<p>a) Set up TRIGGER in AC and TRIGGER LEVEL in centre. Input the signal of 1MHz 100mVrms(17dBm) from Generator 1 to Input A.</p> <p>b) Turn the TRIGGER LEVEL to fully CCW or CW.</p> <p>c) Adjust the input signal level for 1Vrms(13dBm).</p>	<p>Confirm that it is counted.</p> <p>Confirm that it is not counted.</p> <p>Confirm that it is counted at any position of TRIGGER LEVEL.</p>
7	TRIGGER AC/DC	<p>a) Set TRIGGER in AC, adjust the TRIGGER LEVEL for centre. Input the signal 1MHz, centre voltage 0.5V, 0.25 Vpp of sine wave form the Generator 2 to Input A.</p> <p>b) Set TRIGGER for DC</p>	<p>Confirm that it is counted.</p> <p>Confirm that it is not counted.</p>
8	LPF (Low Pass Filter)	<p>a) Set TRIGGER for AUTO. Input the signal of 1MHz 20mVrms(-21dBm) from the Generator 1 to Input A.</p> <p>b) Set LPF for ON.</p> <p>c) Set LPF OFF.</p>	<p>Confirm that it is counted.</p> <p>Stop counting it.</p> <p>Confirm that it is counted.</p>
9	The confirmation of SENS. (Sensitivity)	<p>a) INPUT the signals of 1MHz 20mVrms(-21dBm) from the Generator 1 to Input A.</p> <p>b) Set SENS. for 150mV.</p> <p>c) Adjust input level for 1Vrms (13dBm).</p>	<p>Confirm that it is counted.</p> <p>Stop counting it.</p> <p>Confirm that it is counted.</p>

4. PRINTED CIRCUIT BOARD



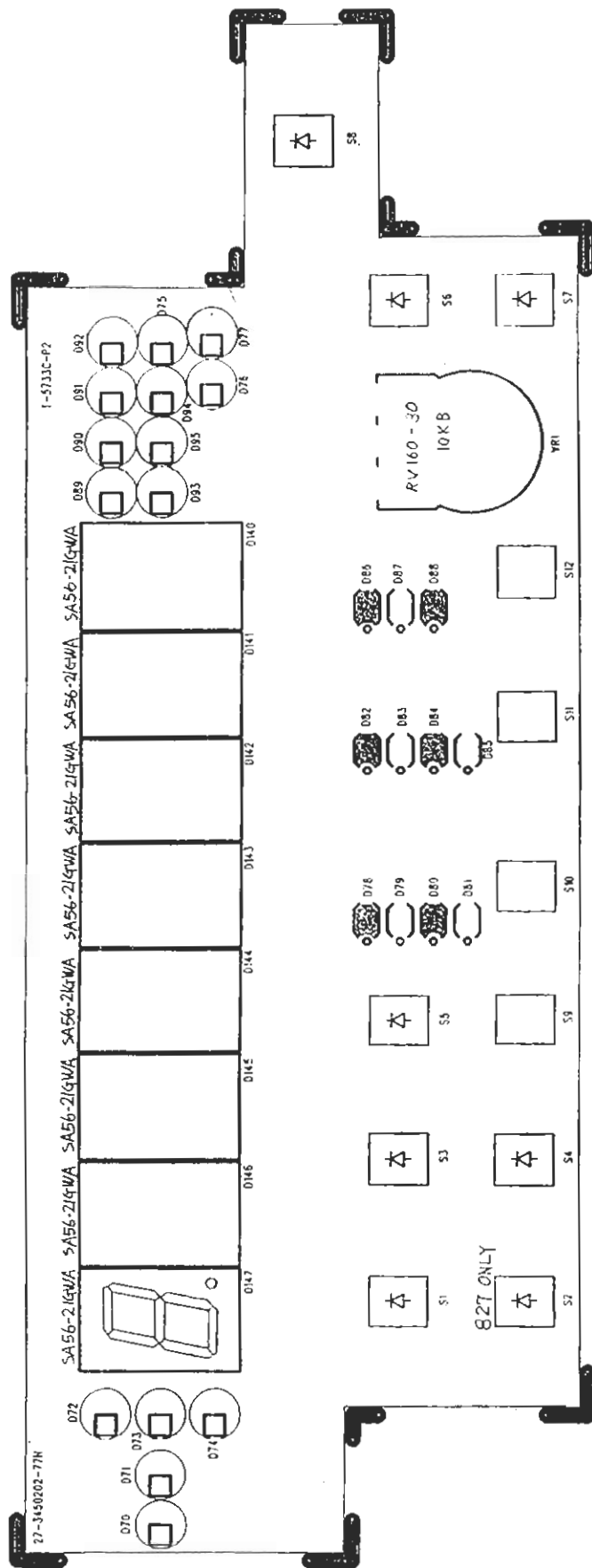
T-5732 MAIN BOARD
(Component Side)

27-3450102-77H

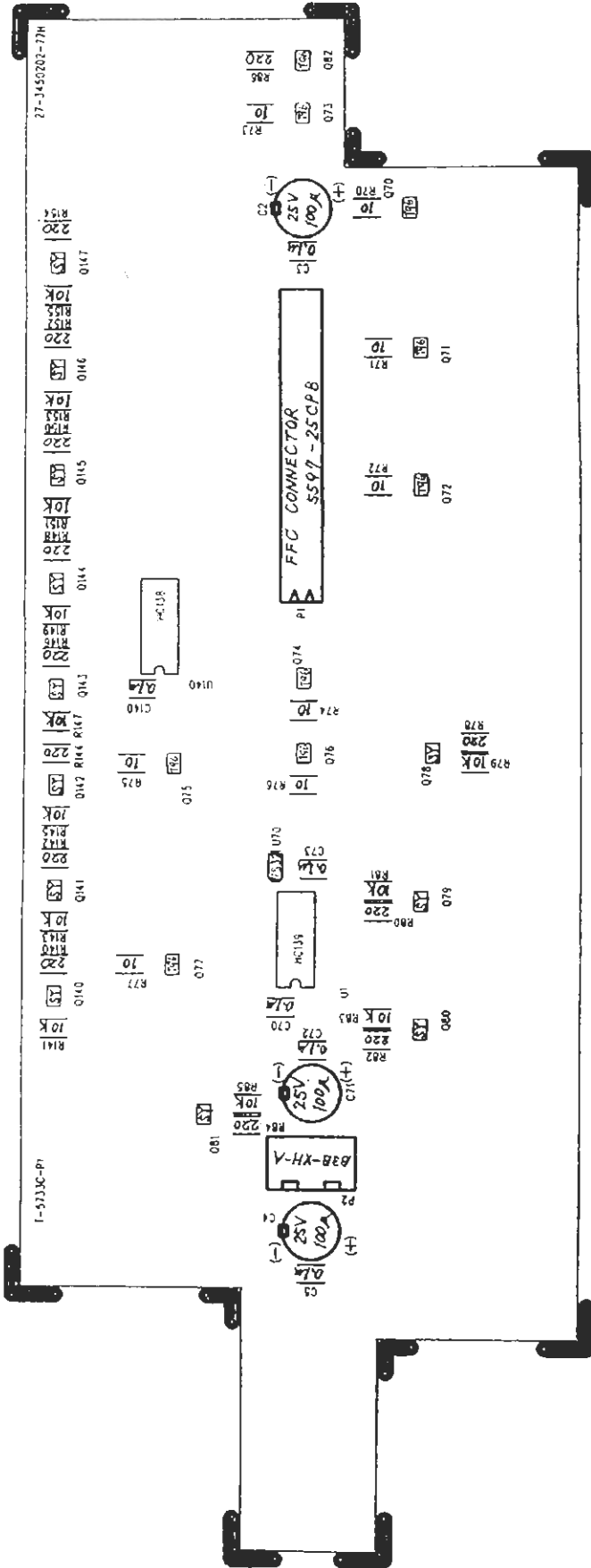
I-5732C-P1



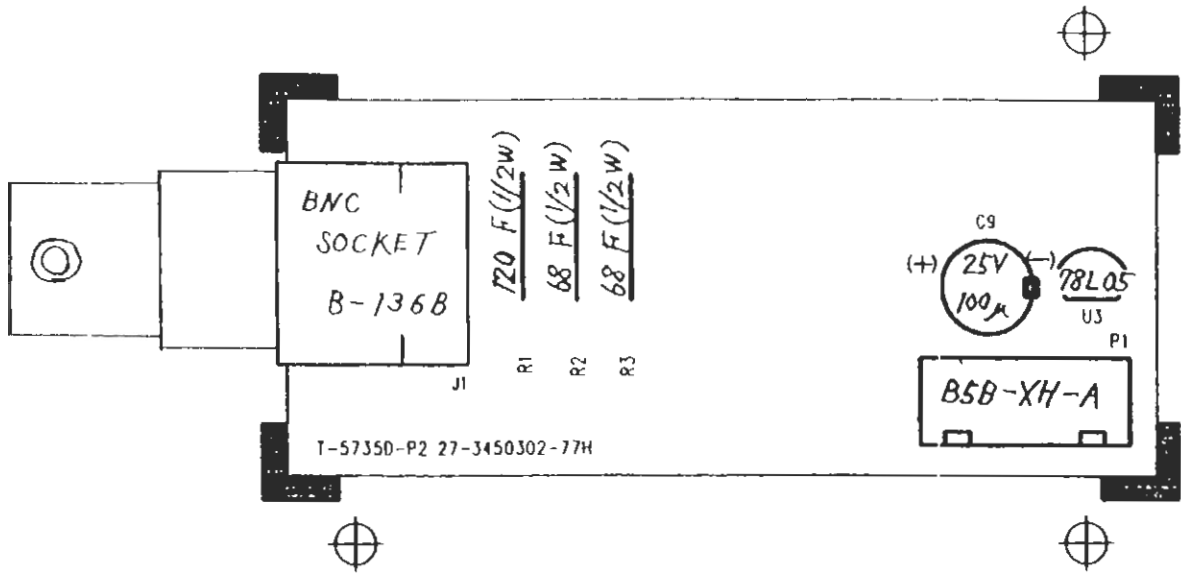
I-5732 MAIN BOARD
(Soldering Side)



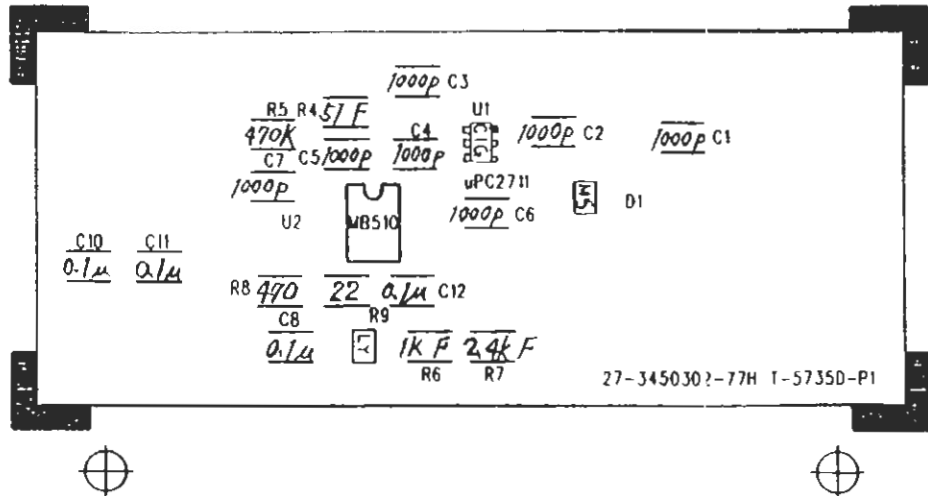
T-5733 PANEL BOARD
(Component Side)



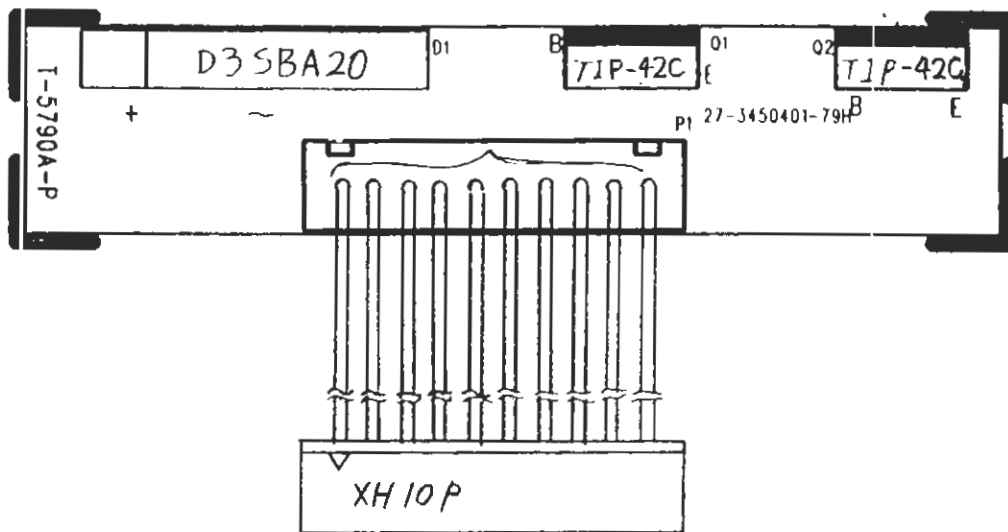
I-5733 PANEL BOARD
(Soldering Side)



T-5735 INPUT B BOARD
(Component Side)

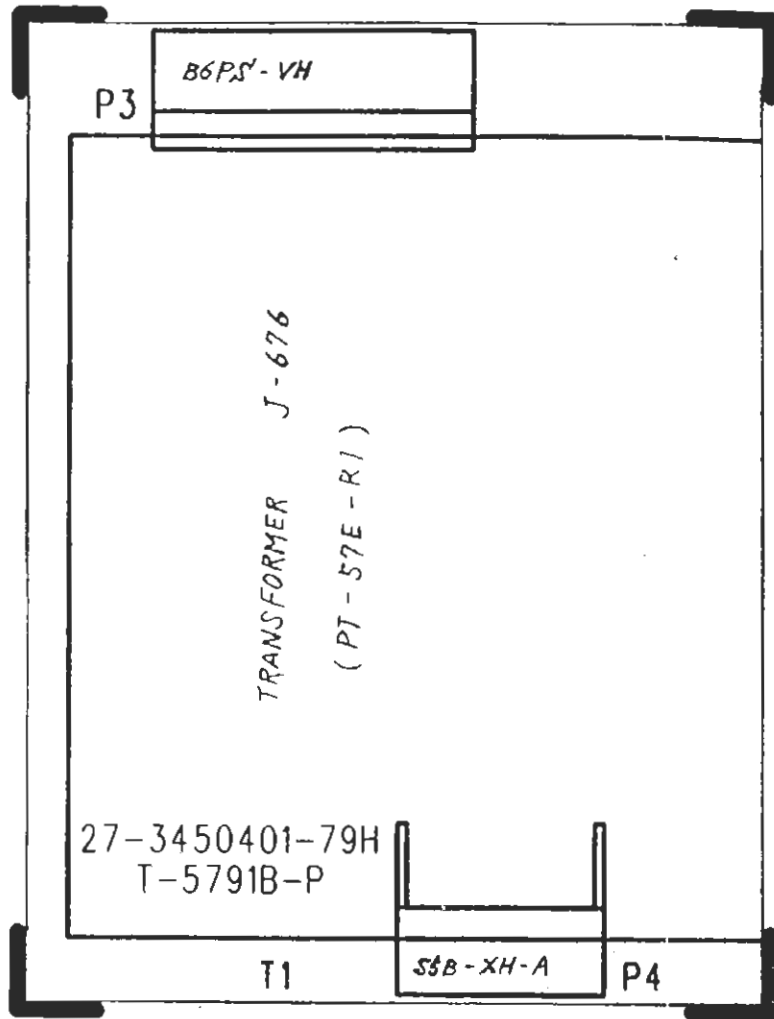


T-5735 INPUT B BOARD
(Soldering Side)



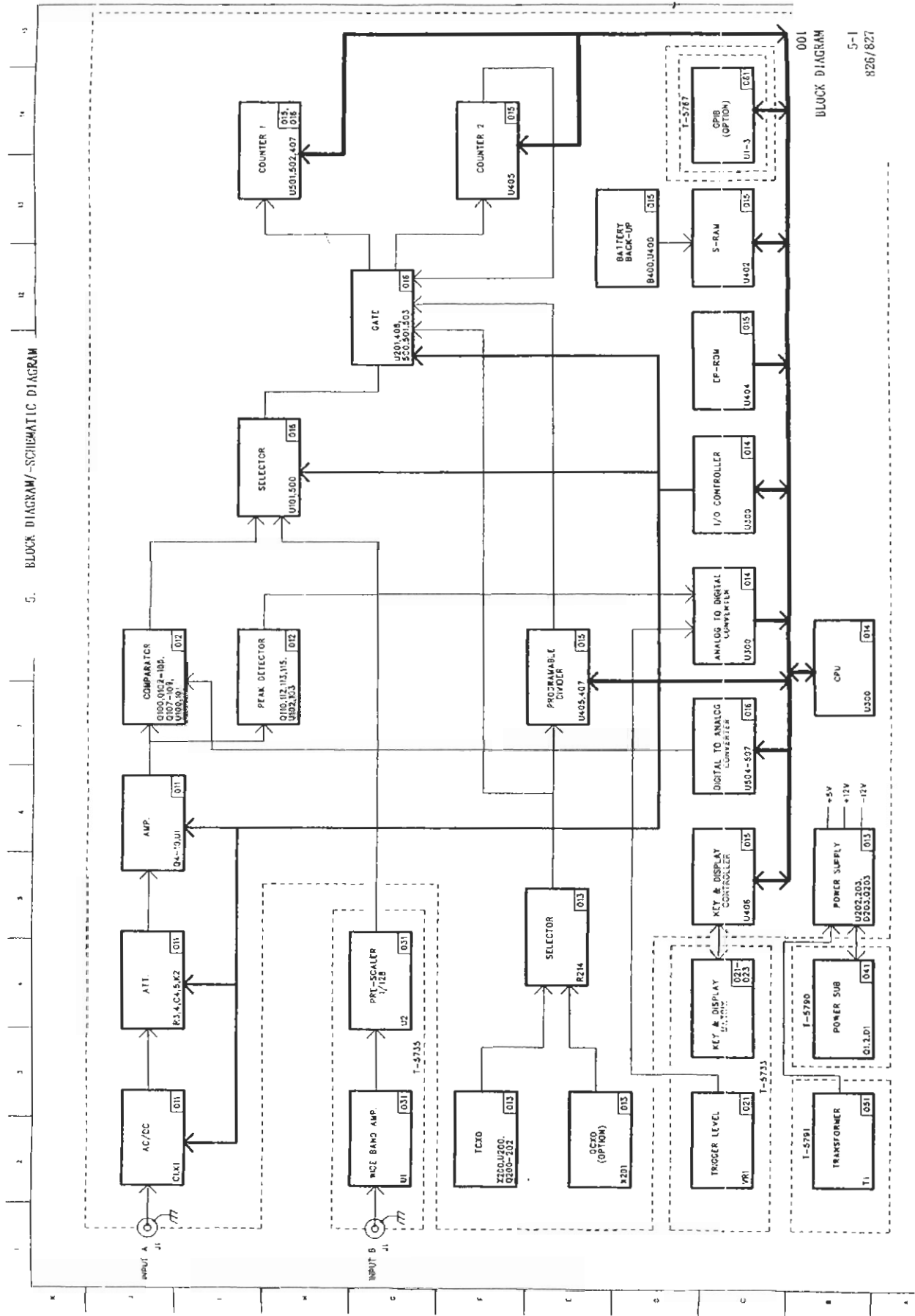
T-5790 POWER SUB BOARD

4-6
826/827



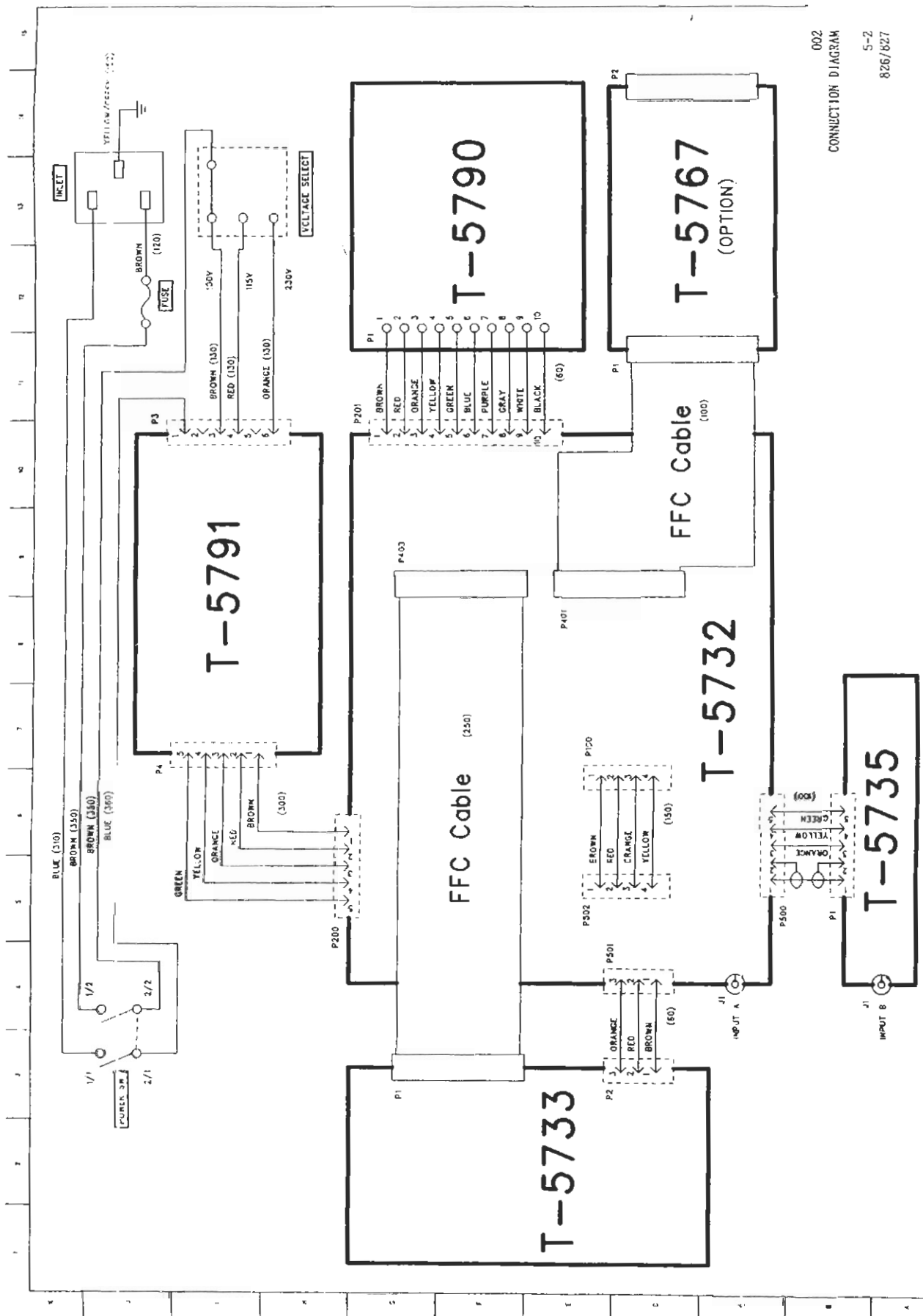
T-5791 TRANSFORMER BOARD

5. BLOCK DIAGRAM/SCHEMATIC DIAGRAM

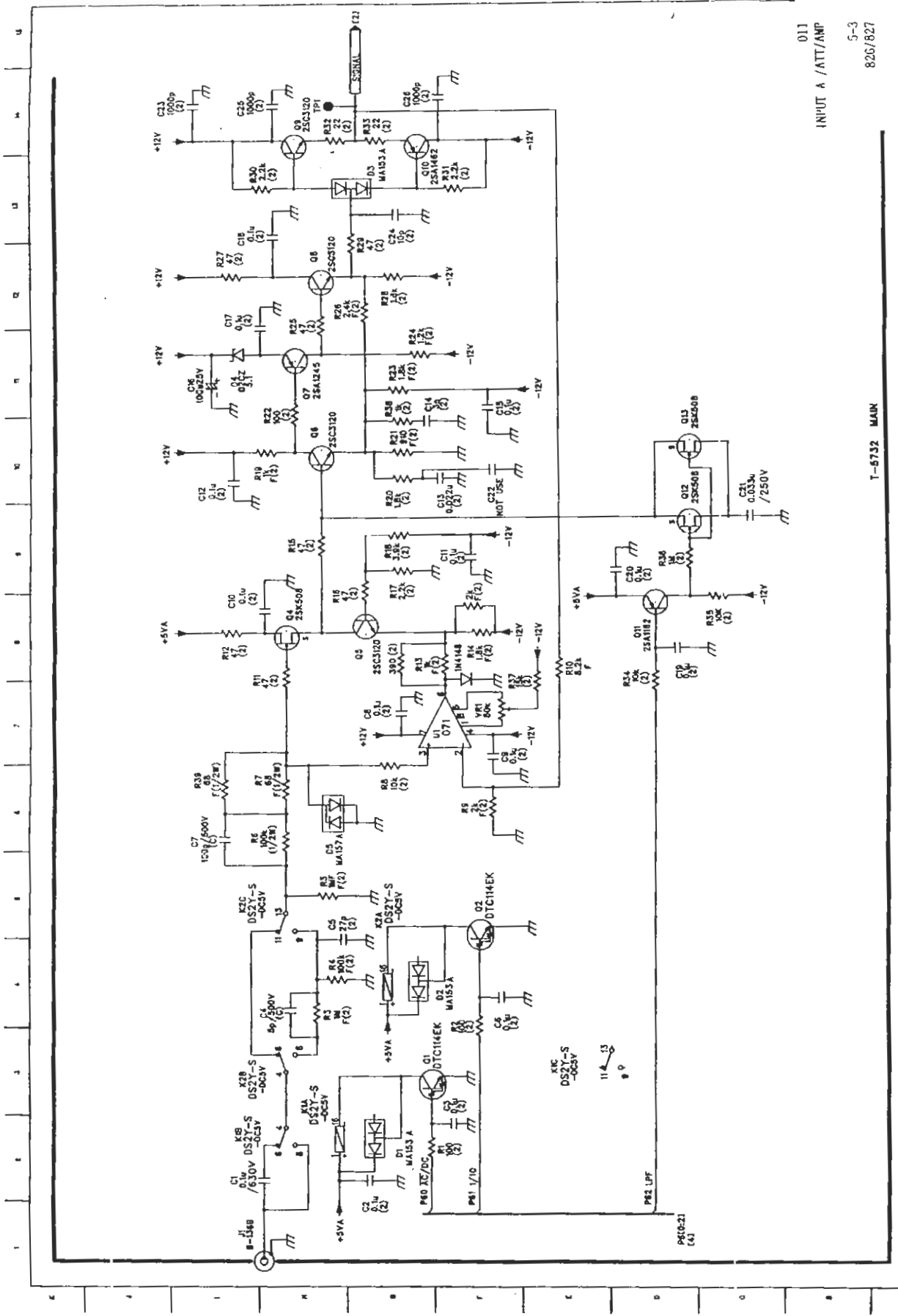


001
BLOCK DIAGRAM

5-1
826/827



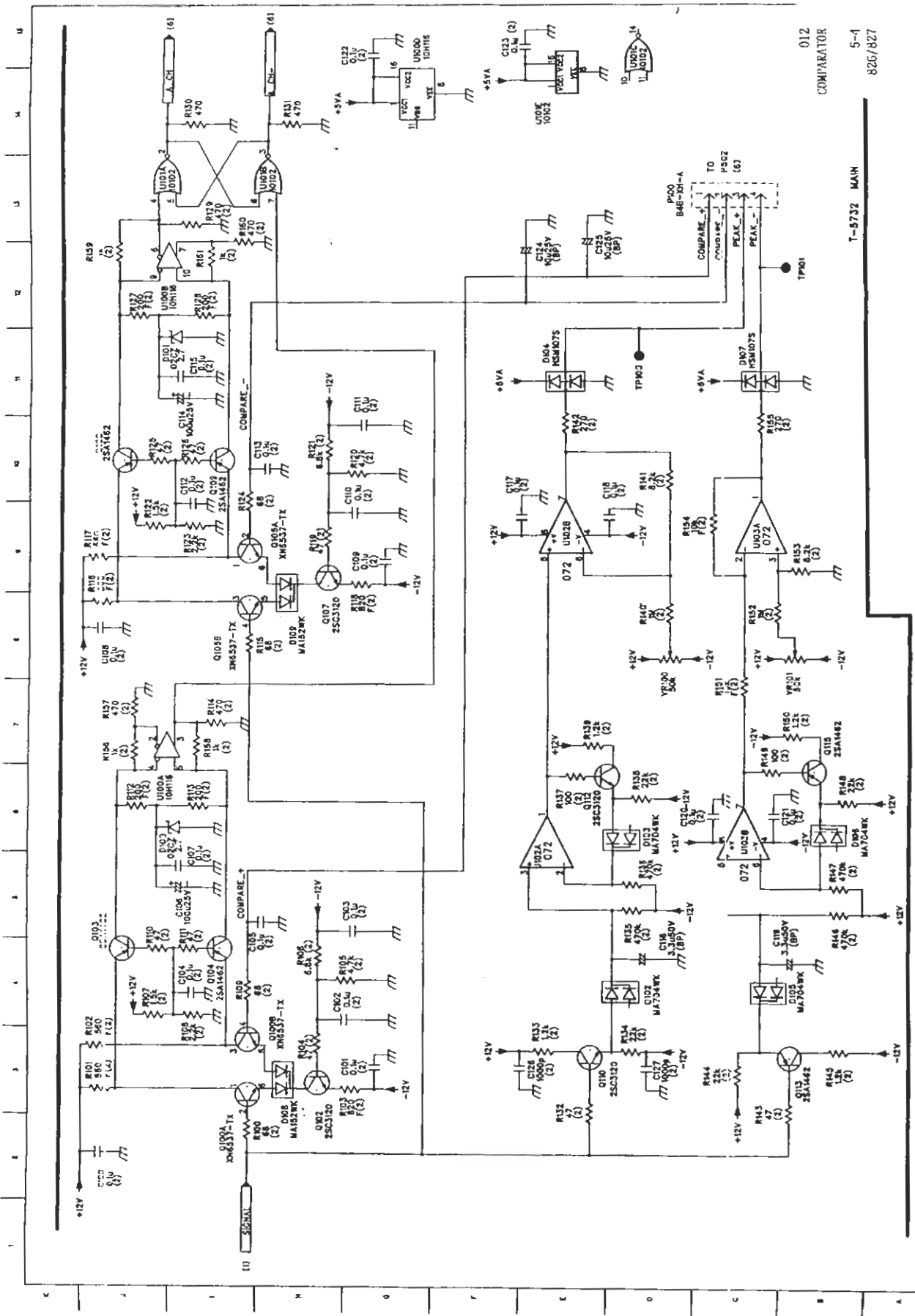
002
 CONNECTION DIAGRAM
 5-2
 826/827



011
INPUT A / ATT/AMP
5-3
826/827

T-5732 MAIN

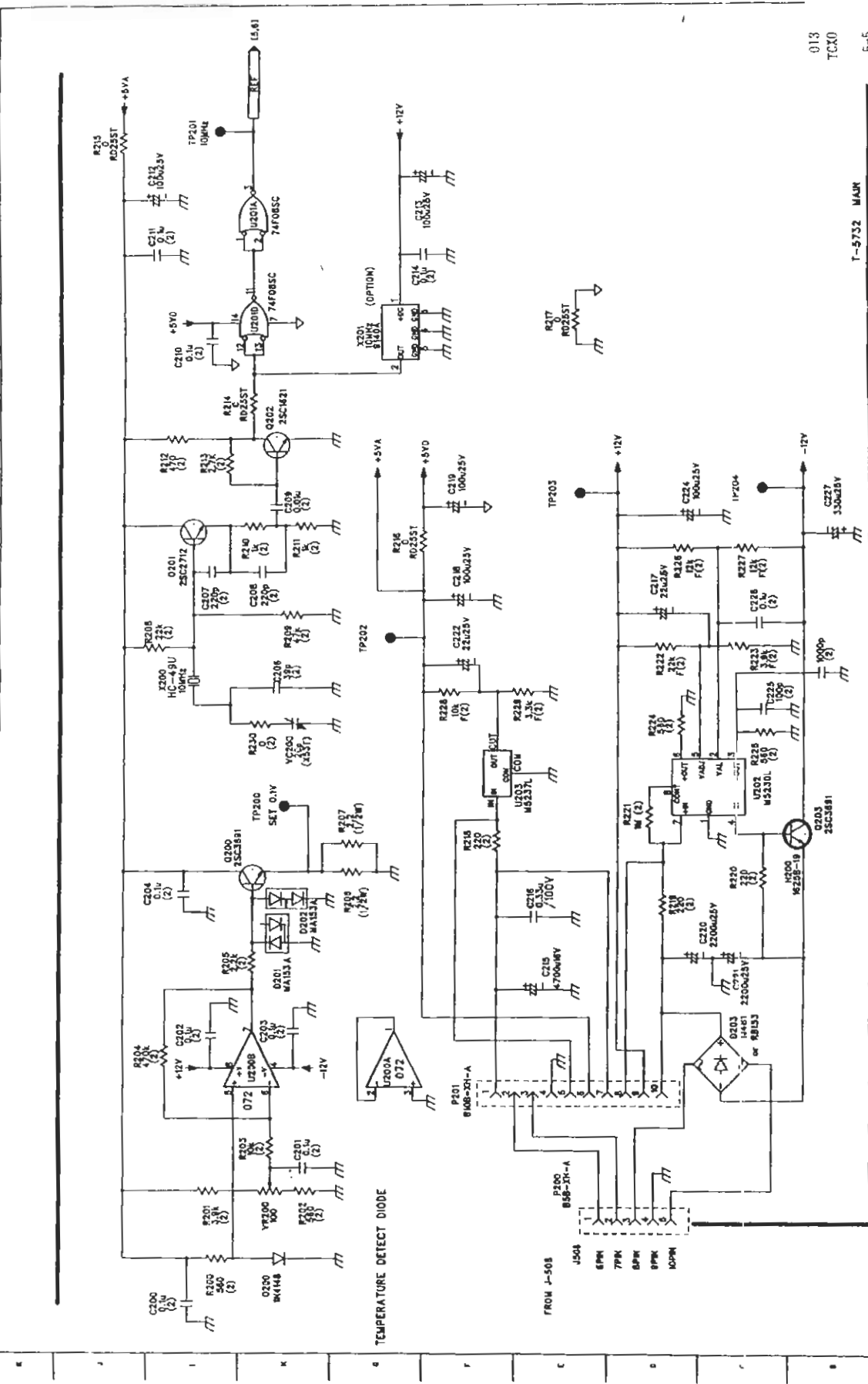
PK10(2)
(4)



012
COMPARATOR
5-4
826/827

T-5732 MAIN

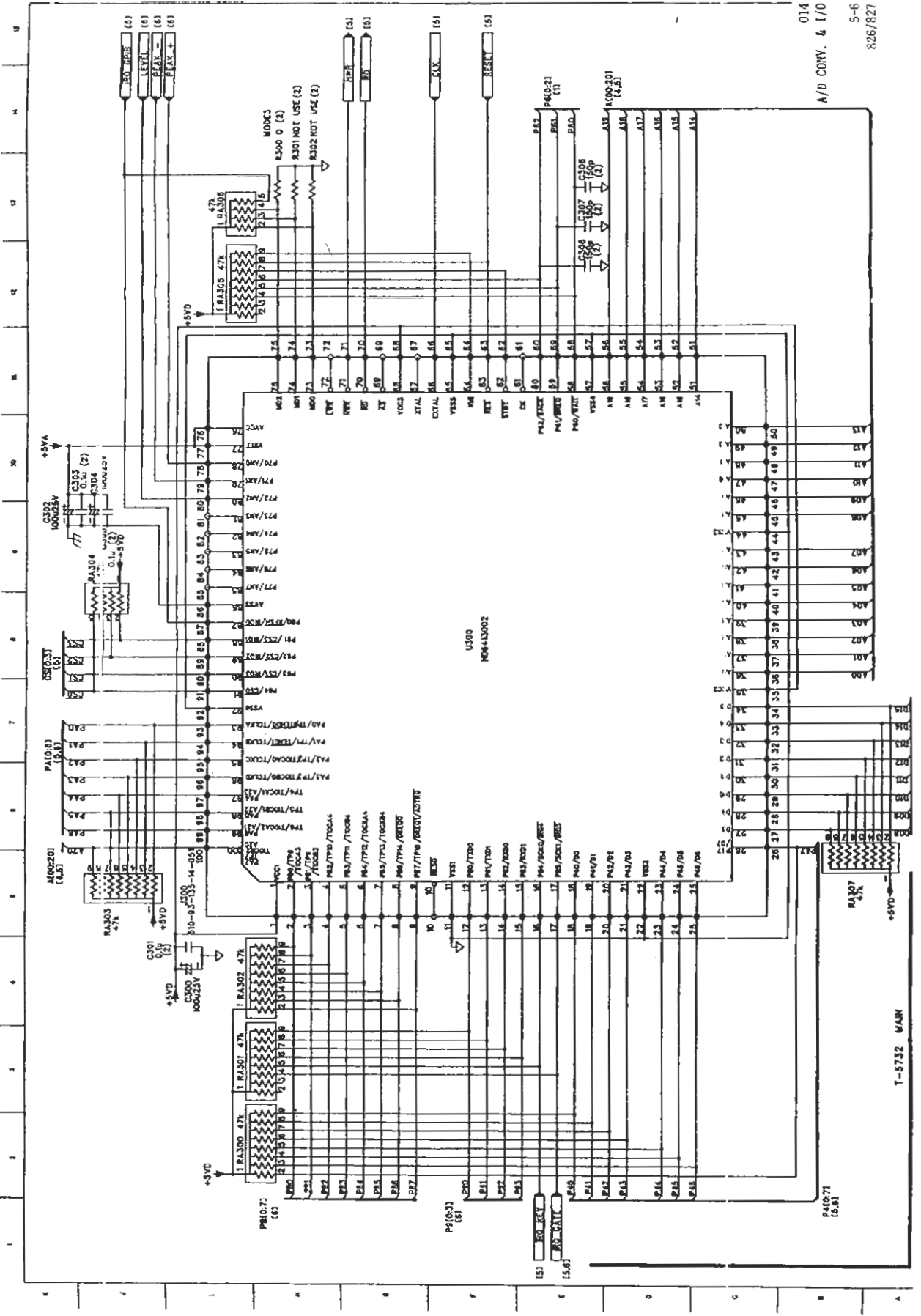
19
18
17
16
15
14
13
12
11
10
9
8
7
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5
4
3
2
1



T-5752 MAUR

013
TCX0

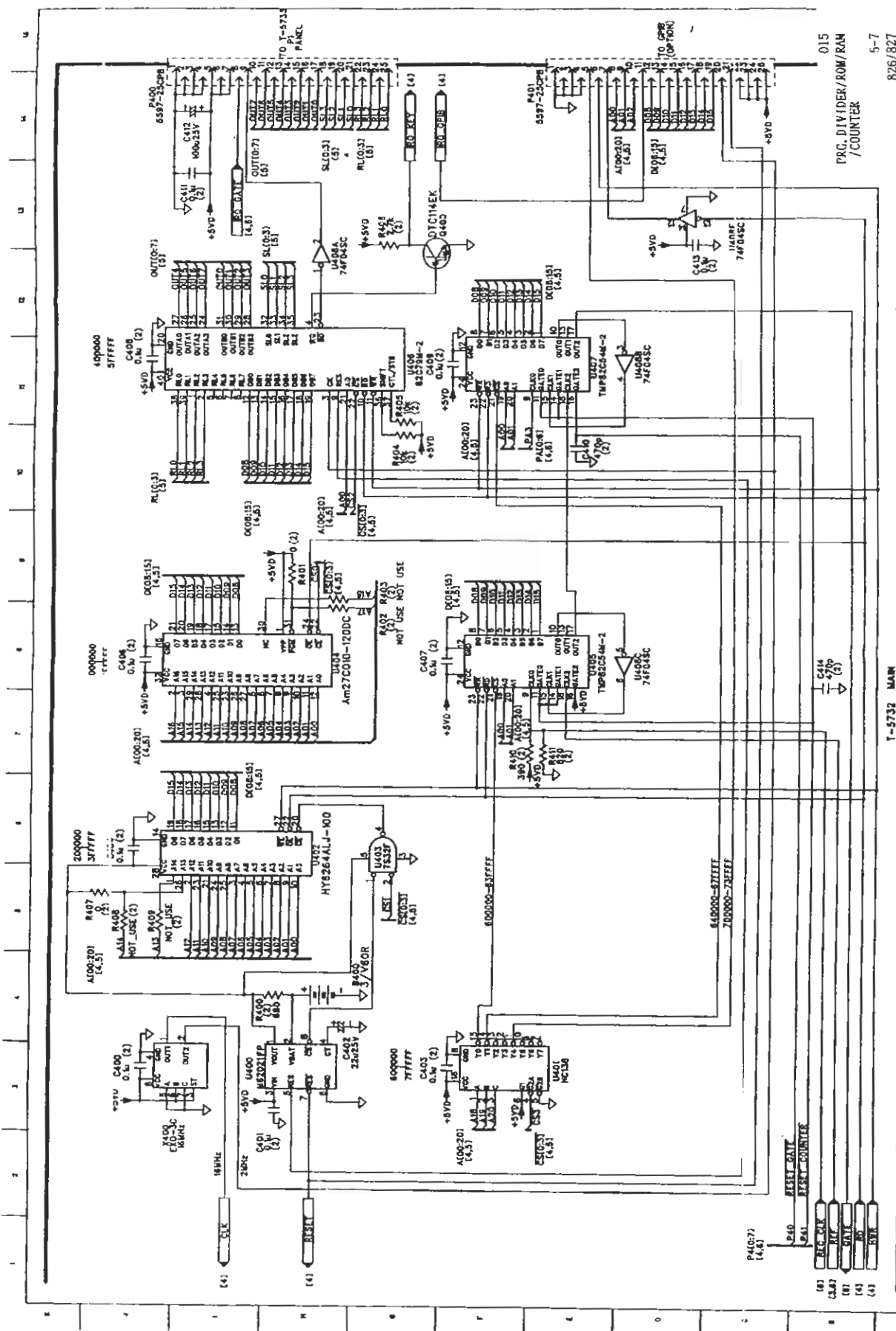
5-5
826/827



014
A/D CONV. & I/O

5-6
8/26/82

T-5732 MARK

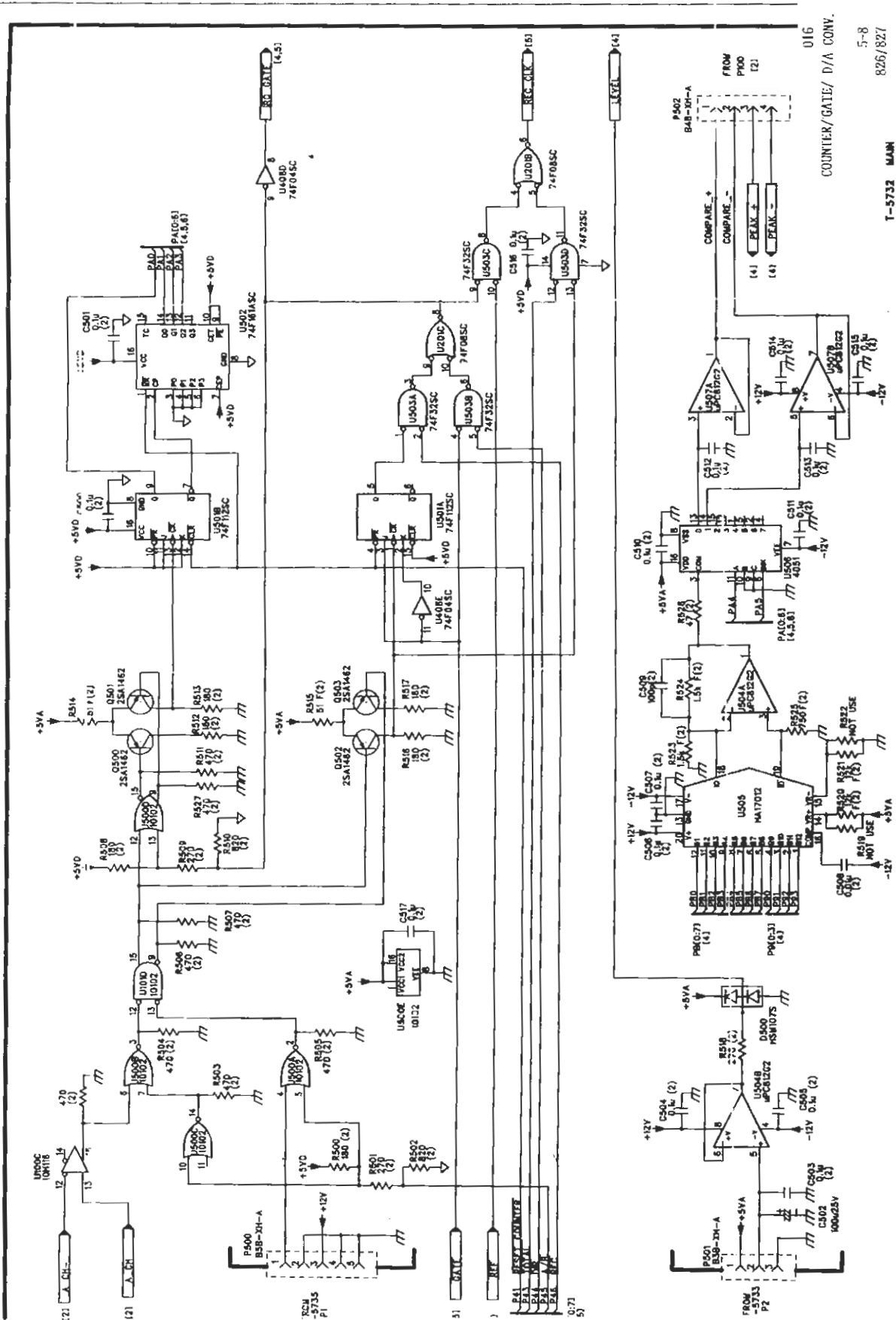


015
 PRG. DIVIDER/ROW/RAN
 7-COUNTER

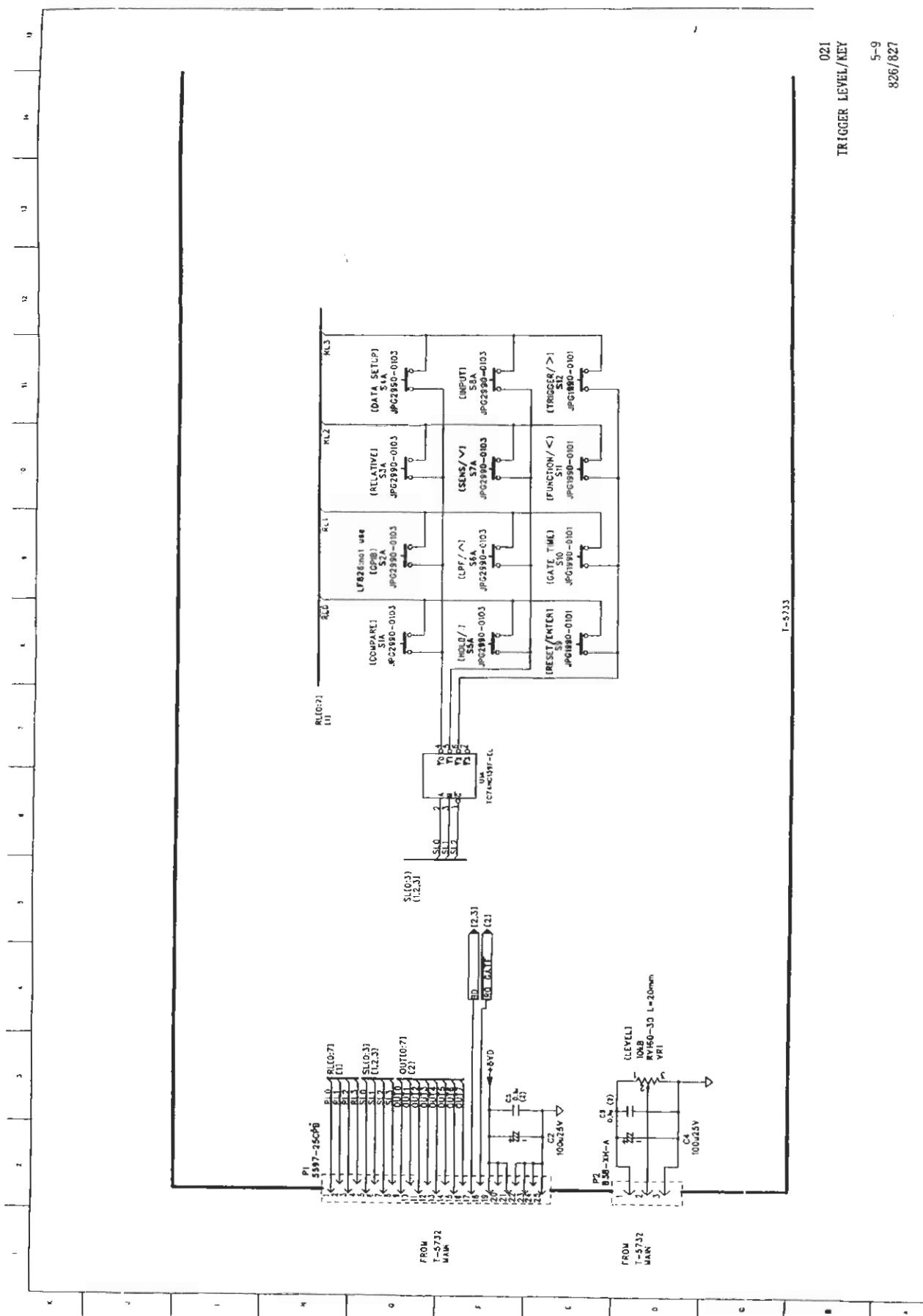
T-5732 MAIN

5-7
 826/827

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



U16
 COUNTER/GATE/ D/A CONV.
 T-5732 MAIN
 5-8
 826/827

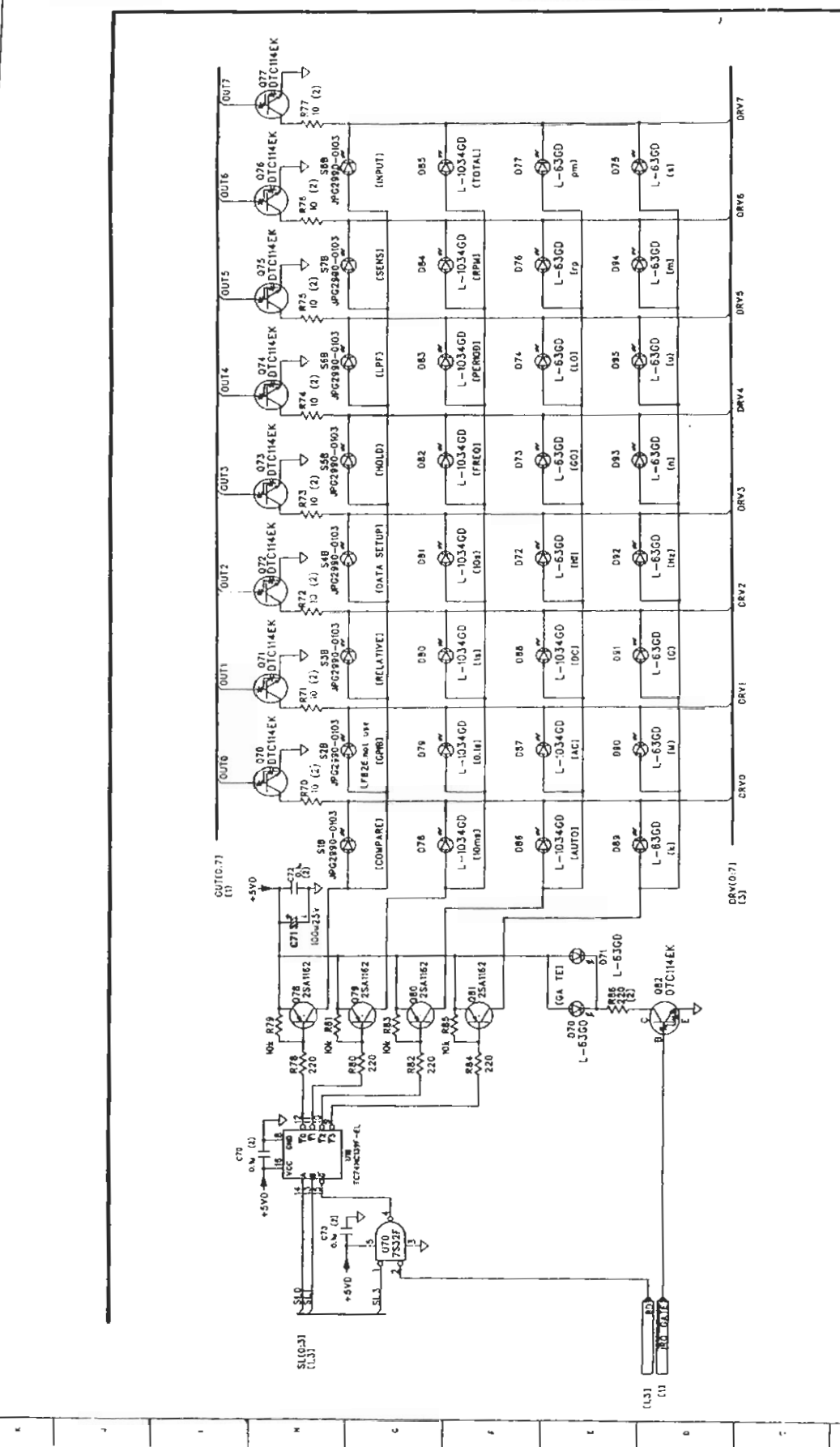


I-5333

021
TRIGGER LEVEL/KEY

5-9
826/827

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



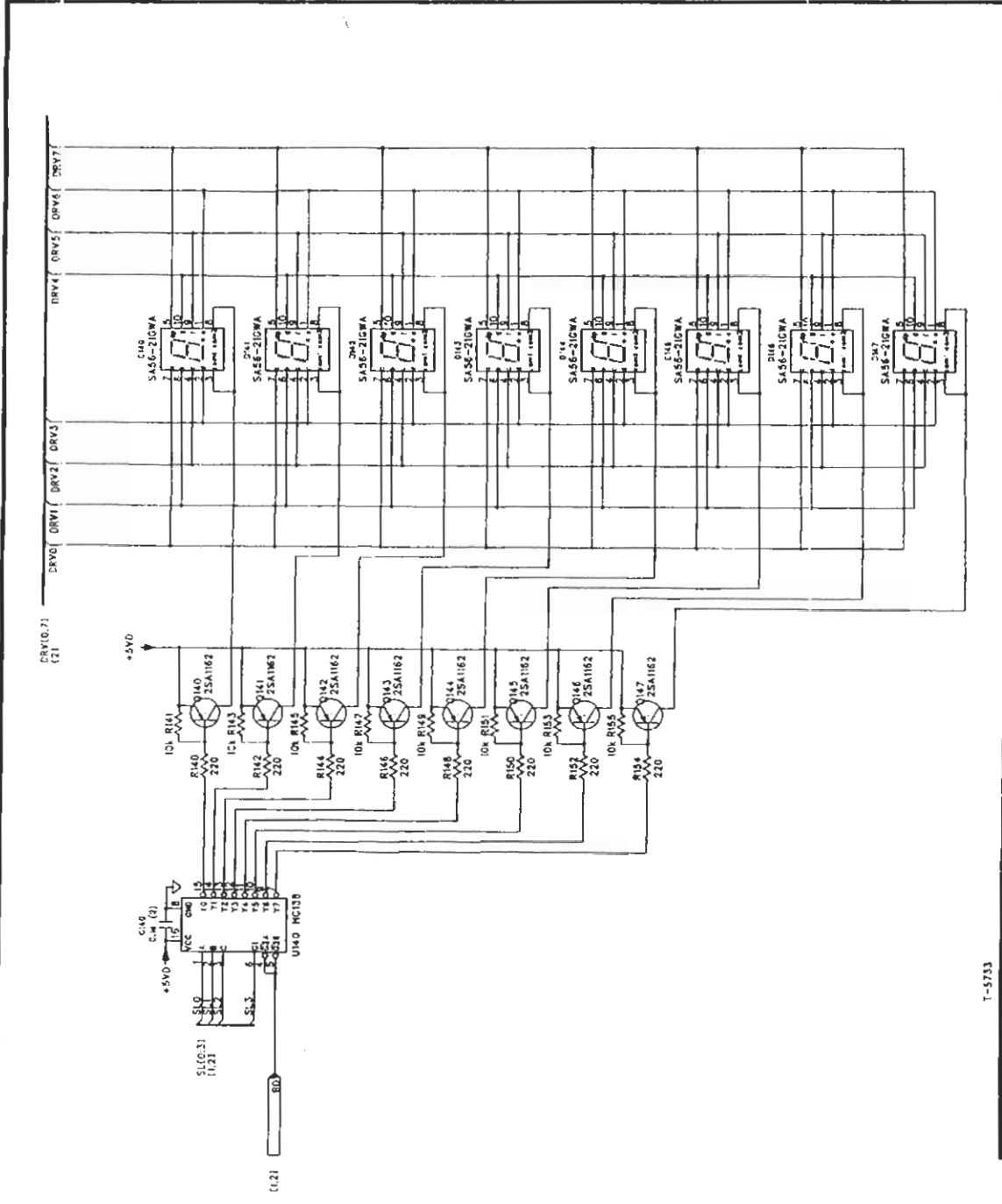
022

L-5233

5-10
826/827

LED/DRIVER

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



DRV0 DRV1 DRV2 DRV3
(21)

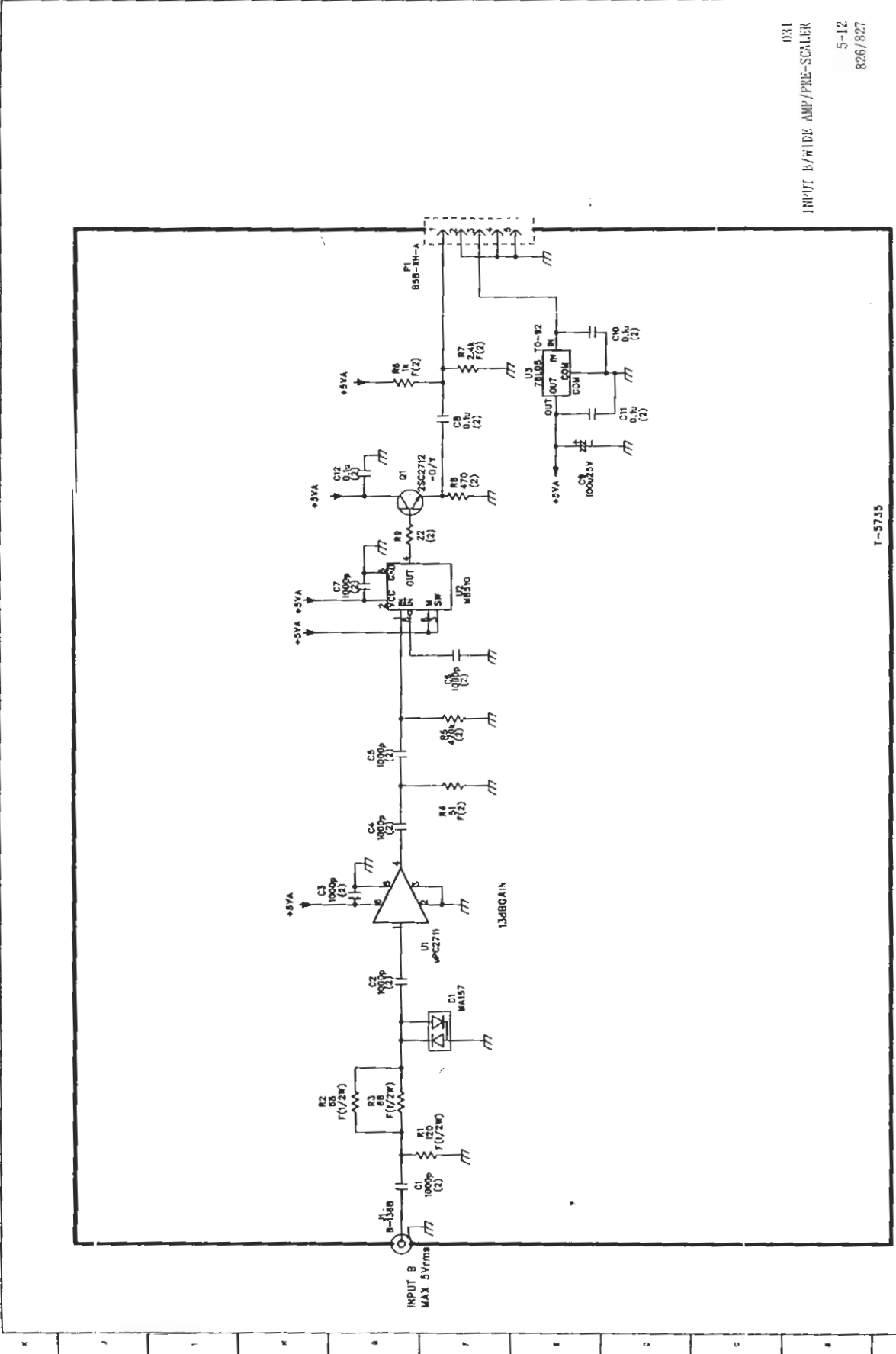
DRV4 DRV5 DRV6 DRV7
(21)

U140 MC10B
+5V
C140
C141
C142
R140
R141
R142
R143
R144
R145
R146
R147
R148
R149
R150
R151
R152
R153
R154
R155

023
7 SEGMENT DISPLAY/DRIVER
5-11
826/827

T-5733

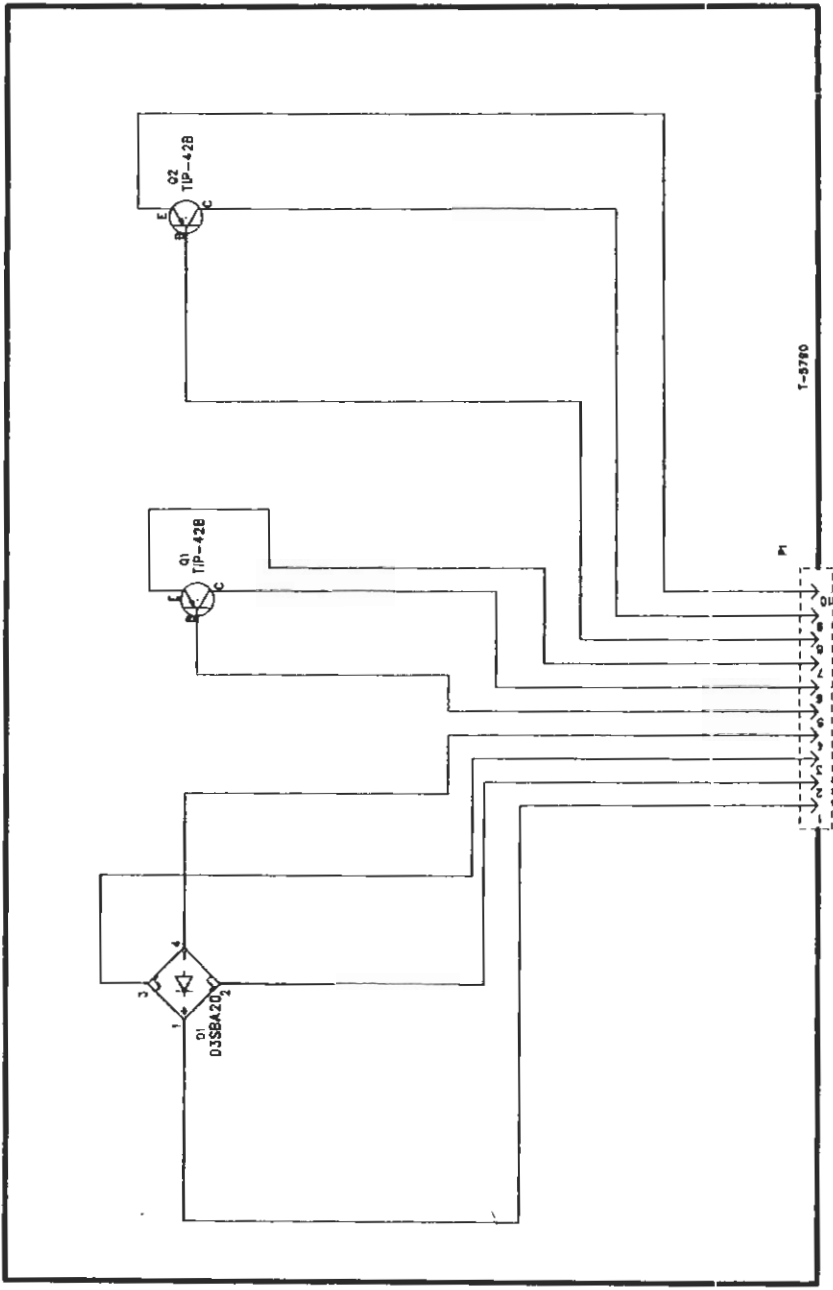
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



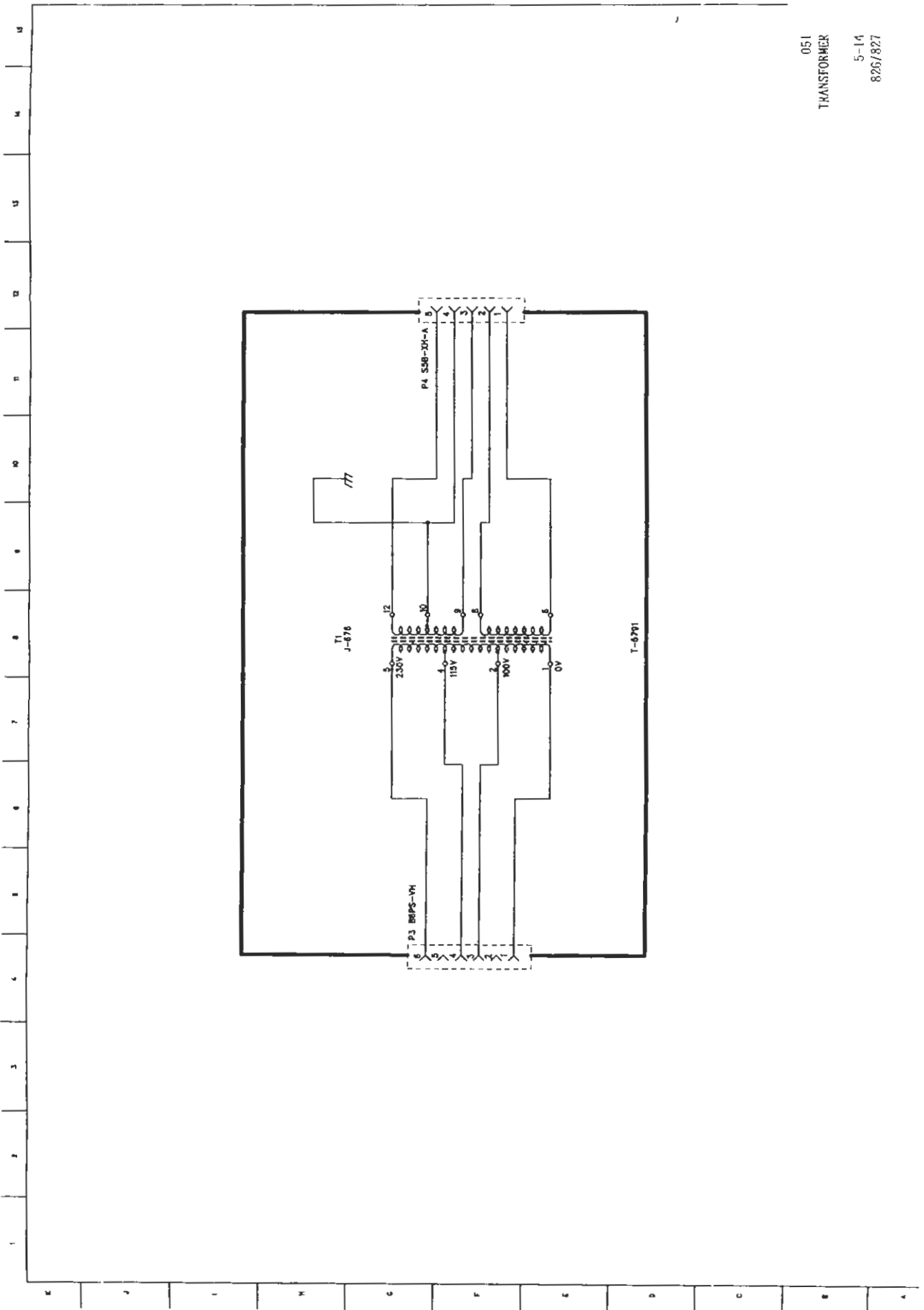
031
INPUT BUFFER/AMP/PRE-SCALER
5-12
826/827

T-5735

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



041
POWER SUB
5-13
826/827



051
TRANSFORMER

5-14
826/827

No.	LDR PARTS No.	DESCRIPTION
*** MAIN FRAME ***		
-SWITCHES-		
	35-100104-0000B	VOLTAGE SELECTOR SWITCH 100-115-230V
	35-400201-0000A	POWER SWITCH SDDJE3-A-2
-MISCELLANEOUS-		
	44-1502203-00TK	LINE FILTER ZUB2203H-L
	59-050033-0000EC	FUSE HOLDER, FH-033
	61-03225190-01P	FUSE 250V 250MA 20MM SLOW BLOW FOR /C230V
	61-03240190-01P	FUSE 250V 400MA 20MM SLOW BLOW FOR /C100/115V
	11-345030-01	KEY TOP 6X2.5-ASAHI KASEI DELPET 80N
	11-345040-01	ROTARY KNOB - ABS (N110)
	44-2303345-01PS	CABLE ASSY 3-PIN T-5732 P501 TO T-5733 P2
	44-2304345-01PS	CABLE ASSY 4-PIN T-5732 P502 TO T-5732 P100
	44-2305345-01PS	CABLE ASSY 5-PIN T-5732 P200 TO T-5791 P4
	44-2305345-02PS	CABLE ASSY 5-PIN T-5732 P500 TO T-5735 P1
	44-2306345-01PS	CABLE ASSY 6-PIN T-5791 P3 TO V. SEL. SW
	44-2310345-01PS	CABLE ASSY 10-PIN T-5732 P201 TO T-5790 P1
	56-25122Y-8AL	FLEXIBLE FLAT CABLE 25-PIN T-5732:P400
	39-126320-0001JS	POWER CORD WITH EU PLUG AND POWER INLET
	39-170220-0001HI	POWER CORD WITH S PLUG AND POWER INLET
	39-116320-0001C	POWER CORD WITH UA PLUG AND POWER INLET
	11-345010-01	FRONT FRAME - ABS (PA757-N110), LF826
	11-345010-02	FRONT FRAME - ABS (PA757-N110), LF827
	11-345050-01	CORD FOOT (SMALL SIZE, N130), LF826
	11-345060-01	HANDLE - ABS (N110), LF826
	11-345070-01	HANDLE PRESSER - ABS(N110), LF826
	11-345080-01	FILTER, PLASTIC (FOR FRONT PANEL) LF826
	12-322060-01	GROUND TERMINAL - C3604 NICKEL PLATED
	12-345010-01	TOP CABINET - SECC, LF826, 827
	12-345022-01	BOTTOM CABINET - SECC, LF826, 827
	12-345062-01	SUB PANEL, FRONT - SECC, LF826, 827
	12-345071-01	REAR SUB PANEL - A5052P, LF826, 827
	12-345080-01	METAL NET - C5102P 0.1THK
	12-345090-01	GP1B PANEL - SECC, LF826, 827
*** MAIN BOARD [T-5732] ***		
-RESISTORS-		
R	54-247135-23K0A	RESISTOR 470 OHM J 1/2W 5% GND to U100-P15
R1	54-210195-85E	SMD RESISTOR 0805 100 OHM J 0.1W 5%
R10	54-6820131-23K0A	RESISTOR METAL FILM 8.2K OHM F 1/4W 1%
R100	54-268095-85E	SMD RESISTOR 0805 68 OHM J 0.1W 5%
R101	54-2560091-85E	SMD RESISTOR 0805 560 OHM F 0.1W 1%
R102	54-2560091-85E	SMD RESISTOR 0805 560 OHM F 0.1W 1%
R103	54-2820091-85E	SMD RESISTOR 0805 820 OHM F 0.1W 1%

No.	LDR PARTS No.	DESCRIPTION
R104	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R105	54-247295-85E	SMD RESISTOR 0805 4.7K OHM J 0.1W 5%
R106	54-268295-85E	SMD RESISTOR 0805 6.8K OHM J 0.1W 5%
R107	54-215295-85E	SMD RESISTOR 0805 1.5K OHM J 0.1W 5%
R108	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R109	54-268095-85E	SMD RESISTOR 0805 68 OHM J 0.1W 5%
R11	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R110	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R111	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R112	54-2200091-85E	SMD RESISTOR 0805 200 OHM F 0.1W 1%
R113	54-2200091-85E	SMD RESISTOR 0805 200 OHM F 0.1W 1%
R114	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R115	54-268095-85E	SMD RESISTOR 0805 68 OHM J 0.1W 5%
R116	54-2560091-85E	SMD RESISTOR 0805 560 OHM F 0.1W 1%
R117	54-2560091-85E	SMD RESISTOR 0805 560 OHM F 0.1W 1%
R118	54-2820091-85E	SMD RESISTOR 0805 820 OHM F 0.1W 1%
R119	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R12	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R120	54-247295-85E	SMD RESISTOR 0805 4.7K OHM J 0.1W 5%
R121	54-268295-85E	SMD RESISTOR 0805 6.8K OHM J 0.1W 5%
R122	54-215295-85E	SMD RESISTOR 0805 1.5K OHM J 0.1W 5%
R123	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R124	54-268095-85E	SMD RESISTOR 0805 68 OHM J 0.1W 5%
R125	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R126	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R127	54-2200091-85E	SMD RESISTOR 0805 200 OHM F 0.1W 1%
R128	54-2200091-85E	SMD RESISTOR 0805 200 OHM F 0.1W 1%
R129	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R13	54-2100191-85E	SMD RESISTOR 0805 1K OHM F 0.1W 1%
R13//	54-239195-85E	SMD RESISTOR 0805 390 OHM J 0.1W 5%
R130	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R131	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R132	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R133	54-212295-85E	SMD RESISTOR 0805 1.2K OHM J 0.1W 5%
R134	54-222395-85E	SMD RESISTOR 0805 22K OHM J 0.1W 5%
R135	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R136	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R137	54-210195-85E	SMD RESISTOR 0805 100 OHM J 0.1W 5%
R138	54-222395-85E	SMD RESISTOR 0805 22K OHM J 0.1W 5%
R139	54-212295-85E	SMD RESISTOR 0805 1.2K OHM J 0.1W 5%
R14	54-2180191-85E	SMD RESISTOR 0805 1.8K OHM F 0.1W 1%
R14//	54-2200191-85E	SMD RESISTOR 0805 2K OHM F 0.1W 1%
R140	54-210595-85E	SMD RESISTOR 0805 1M OHM J 0.1W 5%
R141	54-282295-85E	SMD RESISTOR 0805 8.2K OHM J 0.1W 5%
R142	54-227195-85E	SMD RESISTOR 0805 270 OHM J 0.1W 5%
R143	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R144	54-222395-85E	SMD RESISTOR 0805 22K OHM J 0.1W 5%

No.	LDR PARTS No.	DESCRIPTION
R145	54-212295-85E	SMD RESISTOR 0805 1.2K OHM J 0.1W 5%
R146	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R147	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R148	54-222395-85E	SMD RESISTOR 0805 22K OHM J 0.1W 5%
R149	54-210195-85E	SMD RESISTOR 0805 100 OHM J 0.1W 5%
R15	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R150	54-212295-85E	SMD RESISTOR 0805 1.2K OHM J 0.1W 5%
R151	54-2100291-85E	SMD RESISTOR 0805 10K OHM F 0.1W 1%
R152	54-210595-85E	SMD RESISTOR 0805 1M OHM J 0.1W 5%
R153	54-282295-85E	SMD RESISTOR 0805 8.2K OHM J 0.1W 5%
R154	54-2100291-85E	SMD RESISTOR 0805 10K OHM F 0.1W 1%
R155	54-227195-85E	SMD RESISTOR 0805 270 OHM J 0.1W 5%
R156	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R157	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R158	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R159	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R16	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R160	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R161	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R17	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R18	54-239295-85E	SMD RESISTOR 0805 3.9K OHM J 0.1W 5%
R19	54-2100191-85E	SMD RESISTOR 0805 1K OHM F 0.1W 1%
R2	54-210195-85E	SMD RESISTOR 0805 100 OHM J 0.1W 5%
R20	54-218295-85E	SMD RESISTOR 0805 1.8K OHM J 0.1W 5%
R200	54-256195-85E	SMD RESISTOR 0805 560 OHM J 0.1W 5%
R201	54-239295-85E	SMD RESISTOR 0805 3.9K OHM J 0.1W 5%
R202	54-256195-85E	SMD RESISTOR 0805 560 OHM J 0.1W 5%
R203	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R204	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R205	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R206	54-222945-23K0A	RESISTOR 2.2 OHM J 1/2W 5%
R207	54-222945-23K0A	RESISTOR 2.2 OHM J 1/2W 5%
R208	54-222395-85E	SMD RESISTOR 0805 22K OHM J 0.1W 5%
R209	54-247395-85E	SMD RESISTOR 0805 47K OHM J 0.1W 5%
R21	54-2910091-85E	SMD RESISTOR 0805 910 OHM F 0.1W 1%
R210	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R211	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R212	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R213	54-227295-85E	SMD RESISTOR 0805 2.7K OHM J 0.1W 5%
R214	56-100229-69	BARE JUMPER WIRE, D=0.6, LENGTH=5+10+5MM
R215	56-100229-69	BARE JUMPER WIRE, D=0.6, LENGTH=5+10+5MM
R216	56-100229-69	BARE JUMPER WIRE, D=0.6, LENGTH=5+10+5MM
R217	56-100229-69	BARE JUMPER WIRE, D=0.6, LENGTH=5+10+5MM
R218	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R219	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R22	54-210195-85E	SMD RESISTOR 0805 100 OHM J 0.1W 5%
R220	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%

No.	LDR PARTS No.	DESCRIPTION
R221	54-210595-85E	SMD RESISTOR 0805 1M OHM J 0.1W 5%
R222	54-2220291-85E	SMD RESISTOR 0805 22K OHM F 0.1W 1%
R223	54-2390191-85E	SMD RESISTOR 0805 3.9K OHM F 0.1W 1%
R224	54-256195-85E	SMD RESISTOR 0805 560 OHM J 0.1W 5%
R225	54-256195-85E	SMD RESISTOR 0805 560 OHM J 0.1W 5%
R226	54-2120291-85E	SMD RESISTOR 0805 12K OHM F 0.1W 1%
R227	54-2120291-85E	SMD RESISTOR 0805 12K OHM F 0.1W 1%
R228	54-2100291-85E	SMD RESISTOR 0805 10K OHM F 0.1W 1%
R229	54-2330191-85E	SMD RESISTOR 0805 3.3K OHM F 0.1W 1%
R23	54-2180191-85E	SMD RESISTOR 0805 1.8K OHM F 0.1W 1%
R230	54-2000098-85E	SMD RESISTOR 0805 JMPER 0 OHM CJ21
R24	54-2120191-85E	SMD RESISTOR 0805 1.2K OHM F 0.1W 1%
R25	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R26	54-2240191-85E	SMD RESISTOR 0805 2.4K OHM F 0.1W 1%
R27	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R28	54-218295-85E	SMD RESISTOR 0805 1.8K OHM J 0.1W 5%
R29	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R3	54-2100491-85E	SMD RESISTOR 0805 1M OHM F 0.1W 1%
R30	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R300	54-2000098-85E	SMD RESISTOR 0805 JMPER 0 OHM CJ21
R31	54-222295-85E	SMD RESISTOR 0805 2.2K OHM J 0.1W 5%
R32	54-222095-85E	SMD RESISTOR 0805 22 OHM J 0.1W 5%
R33	54-222095-85E	SMD RESISTOR 0805 22 OHM J 0.1W 5%
R34	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R35	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R36	54-210595-85E	SMD RESISTOR 0805 1M OHM J 0.1W 5%
R37	54-215395-85E	SMD RESISTOR 0805 15K OHM J 0.1W 5%
R38	54-210295-85E	SMD RESISTOR 0805 1K OHM J 0.1W 5%
R39	54-6680941-11E	RESISTOR METAL FILM 68 OHM F 1/2W 1%
R4	54-2100391-85E	SMD RESISTOR 0805 100K OHM F 0.1W 1%
R400	54-268195-85E	SMD RESISTOR 0805 680 OHM J 0.1W 5%
R401	54-2000098-85E	SMD RESISTOR 0805 JMPER 0 OHM CJ21
R402	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R403	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R404	54-227295-85E	SMD RESISTOR 0805 2.7K OHM J 0.1W 5%
R407	54-2000098-85E	SMD RESISTOR 0805 JMPER 0 OHM CJ21
R410	54-239195-85E	SMD RESISTOR 0805 390 OHM J 0.1W 5%
R411	54-282195-85E	SMD RESISTOR 0805 820 OHM J 0.1W 5%
R5	54-2100491-85E	SMD RESISTOR 0805 1M OHM F 0.1W 1%
R500	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R501	54-227195-85E	SMD RESISTOR 0805 270 OHM J 0.1W 5%
R502	54-282195-85E	SMD RESISTOR 0805 820 OHM J 0.1W 5%
R503	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R504	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R505	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R506	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R507	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%

No.	LDR PARTS No.	DESCRIPTION
R508	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R509	54-227195-85E	SMD RESISTOR 0805 270 OHM J 0.1W 5%
R510	54-282195-85E	SMD RESISTOR 0805 820 OHM J 0.1W 5%
R511	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R512	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R513	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R514	54-2510991-85E	SMD RESISTOR 0805 51 OHM F 0.1W 1%
R515	54-2510991-85E	SMD RESISTOR 0805 51 OHM F 0.1W 1%
R516	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R517	54-218195-85E	SMD RESISTOR 0805 180 OHM J 0.1W 5%
R518	54-227195-85E	SMD RESISTOR 0805 270 OHM J 0.1W 5%
R520	54-2120291-85E	SMD RESISTOR 0805 12K OHM F 0.1W 1%
R521	54-2120291-85E	SMD RESISTOR 0805 12K OHM F 0.1W 1%
R523	54-2150191-85E	SMD RESISTOR 0805 1.5K OHM F 0.1W 1%
R524	54-2150191-85E	SMD RESISTOR 0805 1.5K OHM F 0.1W 1%
R525	54-2750091-85E	SMD RESISTOR 0805 750 OHM F 0.1W 1%
R526	54-247095-85E	SMD RESISTOR 0805 47 OHM J 0.1W 5%
R527	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R6	54-210445-23K0A	RESISTOR 100K OHM J 1/2W 5%
R7	54-6680941-11E	RESISTOR METAL FILM 68 OHM F 1/2W 1%
R8	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R9	54-2200191-85E	SMD RESISTOR 0805 2K OHM F 0.1W 1%

-RESISTOR ARRAYS-

RA300	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE
RA301	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE
RA302	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE
RA303	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE
RA304	54-947325-04SE	RESISTOR NETWORK 47K OHM J 5-PINS 4-ELE
RA305	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE
RA306	54-947325-04SE	RESISTOR NETWORK 47K OHM J 5-PINS 4-ELE
RA307	54-947325-08SE	RESISTOR NETWORK 47K OHM J 9-PINS 8-ELE

-VARIABLE RESISTORS-

VR1	34-060503-000P	CERMET SEMI-FIXED RESI. EVM36G 50K OHM
VR100	34-060503-000P	CERMET SEMI-FIXED RESI. EVM36G 50K OHM
VR101	34-060503-000P	CERMET SEMI-FIXED RESI. EVM36G 50K OHM
VR200	34-060101-000P	CERMET SEMI-FIXED RESI. EVM36G 100 OHM B

-CAPACITORS-

C1	55-5104E5-11NS00	CAPACITOR, METALIZED 104 630V 5%
C10	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C100	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C101	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C102	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C103	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C104	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V

No.	LDR PARTS No.	DESCRIPTION
C105	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C106	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C107	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C108	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C109	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C11	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C110	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C111	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C112	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C113	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C114	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C115	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C116	55-033567-22N	CAPACITOR NON-POLAR 3.3UF 50V
C117	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C118	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C119	55-033567-22N	CAPACITOR NON-POLAR 3.3UF 50V
C12	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V-
C120	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C121	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C122	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C123	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C124	55-010647-22N	CAPACITOR NON-POLAR 10UF 25V 20%
C125	55-010647-22N	CAPACITOR NON-POLAR 10UF 25V 20%
C126	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C127	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C13	55-122368-C6TY	SMD CAPACITOR 0805 223Z 50V
C14	55-130966-C6TY	SMD CAPACITOR 0805 030C 50V +/-0.25P
C15	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C16	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C17	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C18	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C19	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C2	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C20	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C200	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C201	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C202	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C203	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C204	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C206	55-139066-C6TY	SMD CAPACITOR 0805 390K 50V
C207	55-122166-C6TY	SMD CAPACITOR 0805 221K 50V
C208	55-122166-C6TY	SMD CAPACITOR 0805 221K 50V
C209	55-110366-C6TY	SMD CAPACITOR 0805 103K 50V 10%
C21	55-533395-11NS00	CAPACITOR, METALIZ 333J 250VDC 5%
C210	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C211	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C212	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%

No.	LDR PARTS No.	DESCRIPTION
C213	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C214	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C215	55-247837-22N	CAPACITOR, ELECT 4700UF 16V
C216	55-533485-11NS00	CAPACITOR, METALIZ 334 100V 5%
C217	55-222647-22N	CAPACITOR, ELECT 22UF 25V 20%
C218	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C219	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C220	55-222847-22N	CAPACITOR, ELECT 2200UF 25V
C221	55-222847-22N	CAPACITOR, ELECT 2200UF 25V
C222	55-222647-22N	CAPACITOR, ELECT 22UF 25V 20%
C224	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C225	55-110166-C6TY	SMD CAPACITOR 0805 101K 50V
C225//	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C226	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C227	55-233747-22N	CAPACITOR, ELECT 330UF 25V
C23	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C24	55-110065-C6TY	SMD CAPACITOR 0805 100D 50V
C25	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C26	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C3	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C300	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C301	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C302	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C303	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C304	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C305	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C306	55-115166-C6TY	SMD CAPACITOR 0805 151K 50V
C307	55-115166-C6TY	SMD CAPACITOR 0805 151K 50V
C308	55-115166-C6TY	SMD CAPACITOR 0805 151K 50V
C4	55-1509D5-11C14	CAPACITOR, CERAMIC 5PF 500V 5% NPC
C400	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C401	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C402	55-222647-22N	CAPACITOR, ELECT 22UF 25V 20%
C403	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C404	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C406	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C407	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C408	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C409	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C410	55-147166-C6TY	SMD CAPACITOR 0805 471K 50V
C411	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C412	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C413	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C414	55-147166-C6TY	SMD CAPACITOR 0805 471K 50V
C5	55-127066-C6TY	SMD CAPACITOR 0805 270K 50V
C500	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C501	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V

No.	LDR PARTS No.	DESCRIPTION
C502	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C503	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C504	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C505	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C506	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C507	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C508	55-110366-C6TY	SMD CAPACITOR 0805 103K 50V 10%
C509	55-110166-C6TY	SMD CAPACITOR 0805 101K 50V
C510	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C511	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C512	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C513	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C514	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C515	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C516	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C517	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C6	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C7	55-1101FG-12CE0	CAPACITOR, CERAMIC, 101 500V 10%
C8	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C9	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V

-VARIABLE CAPACITOR-

VC200 36-450200-0000PA TRIMMER CAPACITOR, TOP-ADJ 20PF, 20X53T

-TRANSISTORS-

Q1	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q10	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q100	30-206537-TX00CC	SMD DUAL NPN TRANSISTOR XN6537-TX
Q102	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q103	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q104	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q105	30-206537-TX00CC	SMD DUAL NPN TRANSISTOR XN6537-TX
Q107	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q108	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q109	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q11	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q110	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q112	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q113	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q115	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q12	30-500508-K510CC	SMD FET 2SK508-K51 N-CHANNEL
Q13	30-500508-K510CC	SMD FET 2SK508-K51 N-CHANNEL
Q2	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q200	30-203691-L000CC	POWER TRANSISTOR 2SC3691-L
Q201	30-212712-0000T	SMD TRANSISTOR 2SC2712-0
Q202	30-211621-3000CC	SMD TRANSISTOR 2SC1621-3
Q203	30-203691-L000CC	POWER TRANSISTOR 2SC3691-L

No.	LDR PARTS No.	DESCRIPTION
Q4	30-500508-K510CC	SMD FET 2SK508-K51 N-CHANNEL
Q400	30-210114-0000RO	SMD TRANSISTOR DTC114EK
Q5	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q500	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q501	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q502	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q503	30-111462-Y330CC	SMD TRANSISTOR 2SA1462-Y33
Q6	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q7	30-111245-0000CC	SMD TRANSISTOR 2SA1245 TOSHIBA
Q8	30-213120-0000T	SMD TRANSISTOR 2SC3120
Q9	30-213120-0000T	SMD TRANSISTOR 2SC3120

-DIODES-

D	31-2304148-02RH	DIODE 1N4148 AXIAL LEAD U1-P6(Anode) to GND
D1	31-260153-AOTXPA	SMD DIODE MA153A-TX
D100	31-4630279-HZH	SMD ZENER DIODE HZM2.7NB2
D101	31-4630279-HZH	SMD ZENER DIODE HZM2.7NB2
D102	31-260704-WKTXP	SMD DIODE MA704WK-TX
D103	31-260704-WKTXP	SMD DIODE MA704WK-TX
D104	31-260107-STLOH	SMD DIODE HSM107S-TL
D105	31-260704-WKTXP	SMD DIODE MA704WK-TX
D106	31-260704-WKTXP	SMD DIODE MA704WK-TX
D107	31-260107-STLOH	SMD DIODE HSM107S-TL
D108	31-260152-WKTXPA	SMD DIODE MA152WK-TX
D109	31-260152-WKTXPA	SMD DIODE MA152WK-TX
D2	31-260153-AOTXPA	SMD DIODE MA153A-TX
D200	31-2304148-02RH	DIODE 1N4148 AXIAL LEAD GLASS BODY
D201	31-260153-AOTXPA	SMD DIODE MA153A-TX
D202	31-260153-AOTXPA	SMD DIODE MA153A-TX
D203	31-3000153-00R	DIODE BRIDGE RECTIFIER RB153
D3	31-260153-AOTXPA	SMD DIODE MA153A-TX
D4	31-4630519-HZH	SMD ZENER DIODE HZM5.1NB3
D5	31-260157-AOTXPA	SMD DIODE MA157A-TX
D500	31-260107-STLOH	SMD DIODE HSM107S-TL

-INTEGRATED CIRCUITS-

U1	29-100071-CPS01	SMD IC TL071CPS OP-AMP WIDE-SOP
U100	29-510116-0000CC	IC ECL MC10H116, DIP, MOTOROLA
U101	29-510102-0000CC	IC ECL MC10I02L, DIP, MOTOROLA
U102	29-100072-CPS01	SMD IC TL072CPS OP-AMP WIDE-SOP
U103	29-100072-CPS01	SMD IC TL072CPS OP-AMP WIDE-SOP
U200	29-100072-CPS01	SMD IC TL072CPS OP-AMP WIDE-SOP
U201	29-507408-00001	IC TTL 74F08 WIDE-SOP
U202	29-305230-L000MB	IC REGULATOR SIP M5230L
U203	29-305237-L000MB	IC REGULATOR TO-92L M5237L
U300	29-564130-F160CC	SMD IC CPU HD6413002F16QFP
U400	29-062061-FR00MB	SMD IC M62021FP SYSTEM RESET SOP

No.	LDR PARTS No.	DESCRIPTION
U401	29-574138-00001	SMD IC 74HC138 WIDE-SOP
U402	29-506264-ALJOHY	SMD IC SRAM 8KX8 HY6264ALJ-10
U403	29-500732-F000T	SMD IC L-MOS TC7S32F TE85R SOP
U404	29-527010-0000AM	EPROM 128KX8 AM27C010-120DC
U405	29-508254-M000CC	SMD IC TMP82C54M-2 TIMER, SOP, TOSHIBA
U406	29-508279-M000CC	SMD IC TMP82C79M-2 KBD/DISPLAY INTF, SOP,
U407	29-508254-M000CC	SMD IC TMP82C54M-2 TIMER, SOP, TOSHIBA
U408	29-507404-00001	IC TTL 74F04 WIDE-SOP
U500	29-510102-0000CC	IC ECL MC10102L, DIP, MOTOROLA
U501	29-574112-00001	SMD IC TTL 74F112 WIDE-SOP
U502	29-574161-00001	SMD IC TTL 74F161A WIDE-SOP
U503	29-507432-00001	IC TTL 74F32 WIDE-SOP
U504	29-108122-E200CC	SMD IC UPC812G2-E2 DUAL OP-AMP
U505	29-517012-PB00MB	IC 12-BIT D/A CONV. HA17012PB
U506	29-504051-BF00T	SMD IC CMOS TC4051BF WIDE-SOP
U507	29-108122-E200CC	SMD IC UPC812G2-E2 DUAL OP-AMP

-CONNECTOR-

J1	44-1800136-00AX	BNC SOCKET PCB TYPE B-136B
P100	44-3304322-00T	HEADER, 4 PINS STRAIGHT B4B-XH-A
P200	44-3305322-00T	HEADER, 5 PINS STRAIGHT, B5B-XH-A
P201	44-3310322-00T	HEADER, 10 PINS STRAIGHT, B10B-XH-A
P400	44-7505597-00M0	CONNECTOR 5597-25CPB
P401	44-7505597-00M0	CONNECTOR 5597-25CPB
P500	44-3305322-00T	HEADER, 5 PINS STRAIGHT, B5B-XH-A
P501	44-3303322-00T	HEADER, 3 PINS STRAIGHT B3B-XH-A
P502	44-3304322-00T	HEADER, 4 PINS STRAIGHT B4B-XH-A
	44-1000600-00CS	IC SOCKET, 32-PIN 600MIL SN-32P FOR U404

-PC BOARD-

T-5732	27-3450102-77K	PCB, MAIN BOARD T-5732C 1.6MM FR4
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-MISCELLANEOUS-

B400	60-136060-3V60VA	NICD BATTERY 3.6V
K1	49-120533-0000PA	RELAY DS2Y-S-DC5V 2P2T
K2	49-120533-0000PA	RELAY DS2Y-S-DC5V 2P2T
X200	42-391005-0000KS	CRYSTAL 5PPM HC-49U 10MHZ
X400	42-391605-0000KS	QUARTZ OSCILLATOR 100PPM EXO-3C 16MHZ
H200	12-322080-01	HEATSINK 1625B-19 COLOR BLACK

*** PANEL BOARD [T-5733] ****

-RESISTORS-

R140	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
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No.	LDR PARTS No.	DESCRIPTION
R141	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R142	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R143	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R144	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R145	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R146	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R147	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R148	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R149	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R150	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R151	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R152	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R153	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R154	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R155	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R70	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R71	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R72	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R73	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R74	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R75	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R76	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R77	54-210095-85E	SMD RESISTOR 0805 10 OHM J 0.1W 5%
R78	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R79	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R80	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R81	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R82	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R83	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R84	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%
R85	54-210395-85E	SMD RESISTOR 0805 10K OHM J 0.1W 5%
R86	54-222195-85E	SMD RESISTOR 0805 220 OHM J 0.1W 5%

-VARIABLE RESISTOR-

VR1 34-132103-000N POTENTIOMETER V16L4 B10K

-CAPACITOR-

C140	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C2	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C3	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C4	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C5	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C70	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C71	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
C72	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C73	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V

No.	LDR PARTS No.	DESCRIPTION
-TRANSISTORS-		
Q140	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q141	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q142	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q143	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q144	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q145	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q146	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q147	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q70	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q71	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q72	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q73	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q74	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q75	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q76	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q77	30-210114-0000R0	SMD TRANSISTOR DTC114EK
Q78	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q79	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q80	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q81	30-111162-0000T	SMD TRANSISTOR 2SA1162-0
Q82	30-210114-0000R0	SMD TRANSISTOR DTC114EK
-DIODES-		
D140	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D141	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D142	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D143	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D144	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D145	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D146	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D147	28-1202156-00KB	LED 8-SEGMENT DISPLAY GREEN SA56-21GWA
D70	31-5500063-00KB	LED 5MM GREEN, L-63GD
D71	31-5500063-00KB	LED 5MM GREEN, L-63GD
D72	31-5500063-00KB	LED 5MM GREEN, L-63GD
D73	31-5500063-00KB	LED 5MM GREEN, L-63GD
D74	31-5500063-00KB	LED 5MM GREEN, L-63GD
D75	31-5500063-00KB	LED 5MM GREEN, L-63GD
D76	31-5500063-00KB	LED 5MM GREEN, L-63GD
D77	31-5500063-00KB	LED 5MM GREEN, L-63GD
D78	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D79	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D80	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D81	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D82	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D83	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D84	31-5501034-00KB	LED 2MM GREEN, L-1034GD

No.	LDR PARTS No.	DESCRIPTION
D85	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D86	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D87	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D88	31-5501034-00KB	LED 2MM GREEN, L-1034GD
D89	31-5500063-00KB	LED 5MM GREEN, L-63GD
D90	31-5500063-00KB	LED 5MM GREEN, L-63GD
D91	31-5500063-00KB	LED 5MM GREEN, L-63GD
D92	31-5500063-00KB	LED 5MM GREEN, L-63GD
D93	31-5500063-00KB	LED 5MM GREEN, L-63GD
D94	31-5500063-00KB	LED 5MM GREEN, L-63GD
D95	31-5500063-00KB	LED 5MM GREEN, L-63GD

-INTEGRATED CIRCUITS-

U1	29-574139-00001	SMD IC 74HC139 WIDE-SOP
U140	29-574138-00001	SMD IC 74HC138 WIDE-SOP
U70	29-500732-F000T	SMD IC L-MOS TC7S32F TE85R SOP

-SWITCHES-

S1	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S10	35-200101-0001B	KEY SWITCH NO LED, JPG1990-0101
S11	35-200101-0001B	KEY SWITCH NO LED, JPG1990-0101
S12	35-200101-0001B	KEY SWITCH NO LED, JPG1990-0101
S2	35-200101-0000B	KEY SWITCH WITH LED, GREEN, LF 827 ONLY USED
S3	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S4	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S5	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S6	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S7	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S8	35-200101-0000B	KEY SWITCH WITH LED, GREEN, JPG2990-0103
S9	35-200101-0001B	KEY SWITCH NO LED, JPG1990-0101

-PC BOARD-

T-5730	27-3450202-77K	PCB, PANEL FOR DISPL T-5733C 1.6MM FR4
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-CONNECTORS-

P1	44-7505597-00M0	CONNECTOR 5597-25CPB
P2	44-3303322-00T	HEADER, 3 PINS STRAIGHT B3B-XH-A

*** INPUT BOARD [T-5735] ***

-RESISTORS-

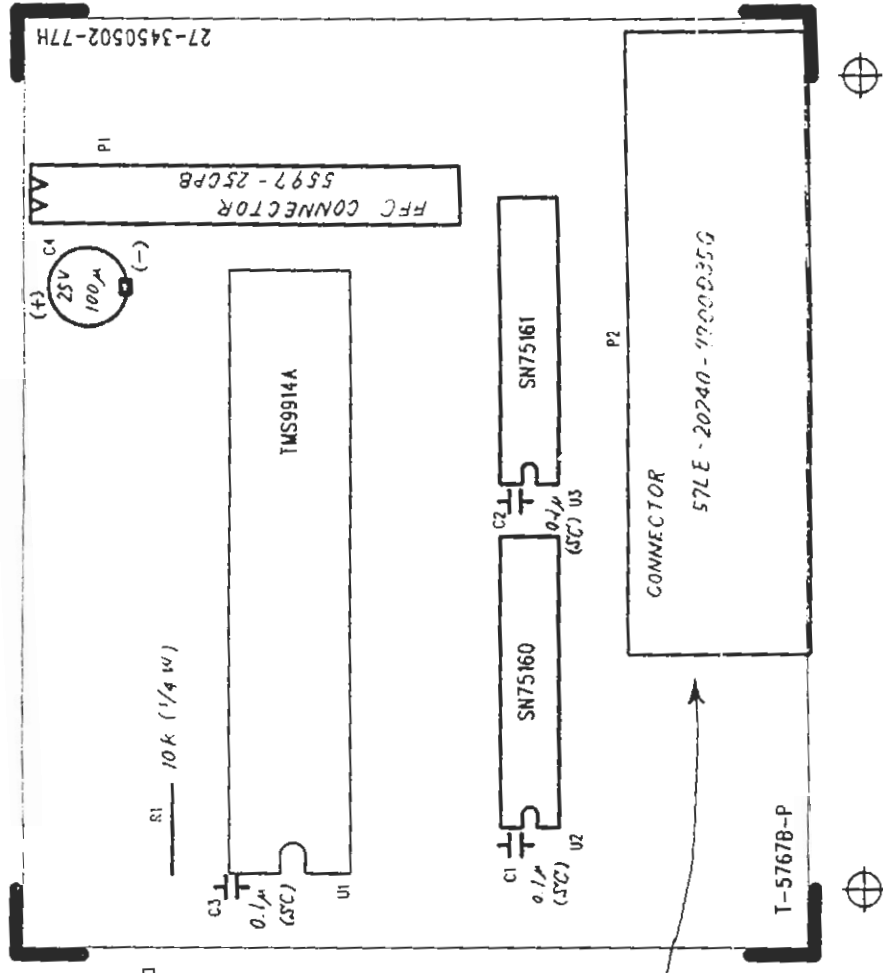
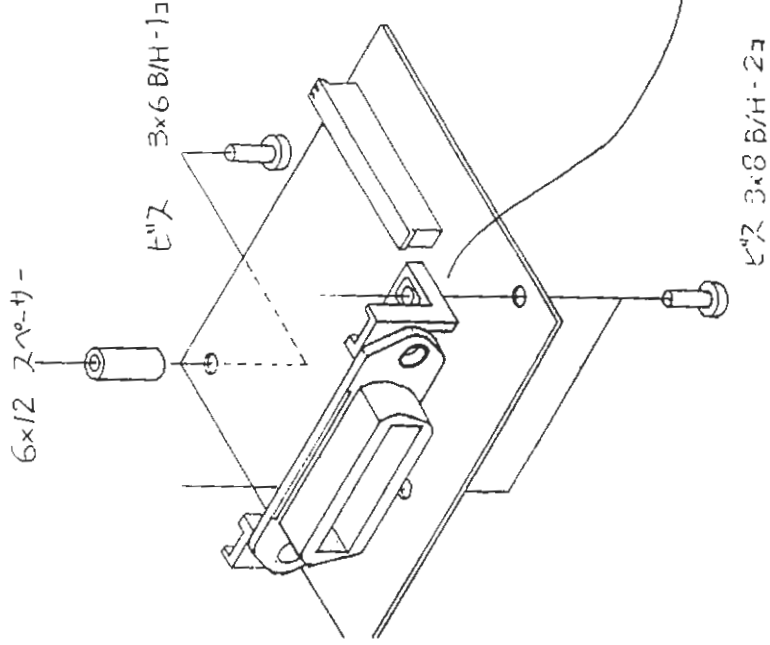
R1	54-6120041-11E	RESISTOR MF 120 OHM F 1/2W 1% 12.5MM
R2	54-6680941-11E	RESISTOR METAL FILM 68 OHM F 1/2W 1%
R3	54-6680941-11E	RESISTOR METAL FILM 68 OHM F 1/2W 1%
R4	54-2510991-85E	SMD RESISTOR 0805 51 OHM F 0.1W 1%
R5	54-247495-85E	SMD RESISTOR 0805 470K OHM J 0.1W 5%
R6	54-2100191-85E	SMD RESISTOR 0805 1K OHM F 0.1W 1%
R7	54-2240191-85E	SMD RESISTOR 0805 2.4K OHM F 0.1W 1%

No.	LDR PARTS No.	DESCRIPTION
R8	54-247195-85E	SMD RESISTOR 0805 470 OHM J 0.1W 5%
R9	54-222095-85E	SMD RESISTOR 0805 22 OHM J 0.1W 5%
-CAPACITORS-		
C1	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C1C	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C11	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C12	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C2	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C3	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C4	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C5	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C6	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C7	55-110266-C6TY	SMD CAPACITOR 0805 102K 50V
C8	55-110468-C6TY	SMD CAPACITOR 0805 104Z 50V
C9	55-210747-22N	CAPACITOR, ELECT 100UF 25V 20%
-TRANSISTOR-		
Q1	30-212712-0000T	SMD TRANSISTOR 2SC2712-0
-D ODE-		
D1	31-260157-AOTXPA	SMD DIODE MA157A-TX
-INTEGRATED CIRCUITS-		
U1	29-102711-TE30CC	IC UPC2711T-E3 WIDEBAND AMP
U2	29-500510-PF00FT	SMD IC PRESCALER MB510PF-G-BND
U3	29-307805-01ST	IC REGULATOR +5V TO-92 78L05
-CONNECTORS-		
J1	44-180013G-00AX	BNC SOCKET PCB TYPE B-136B
P1	44-3305322-00T	HEADER, 5 PINS STRAIGHT, B5B-XH-A
-PC BOARD-		
T-5735	27-3450302-77H	PCB PANEL, INPUT B T-5735D, 1.6MM FR4
*** POWER SUB BOARD [T-5790] ***		
-TRANSISTORS-		
Q1	30-100042-C000M	POWER TRANSISTOR TIP-42C, TO-220
Q2	30-100042-C000M	POWER TRANSISTOR TIP-42C, TO-220
-DIODE-		
D1	31-3100020-00SD	BRIDGE, SHINDENGEN D3SBA20
-PC BOARD-		
T-5790	27-3450401-79H	PCB PANEL FOR XFMR, RECTIFIER, 1.6MM

No.	LDR PARTS No.	DESCRIPTION
*** TRANSFORMER BOARD [T-5791] ***		
-CONNECTORS-		
P3	44-3906322-00T	CONNECTOR B6PS-VH 3.96MM PITCH, SIDE
P4	44-3305322-01T	HEADER, 5 PINS SIDE ENTRY, S5B-XH-A
-TRANSFORMER-		
T1	38-010057-0002M	TRANSFORMER PT-57E-RI J-676, LF826/827
-PC BOARD-		
T-5791	27-3450401-79H	PCB PANEL FOR XFMR, RECTIFIER, 1.6MM

LF 827 GPIB OPTION

T-5767B-P



27-3450102-77H

T-5732C-P1

