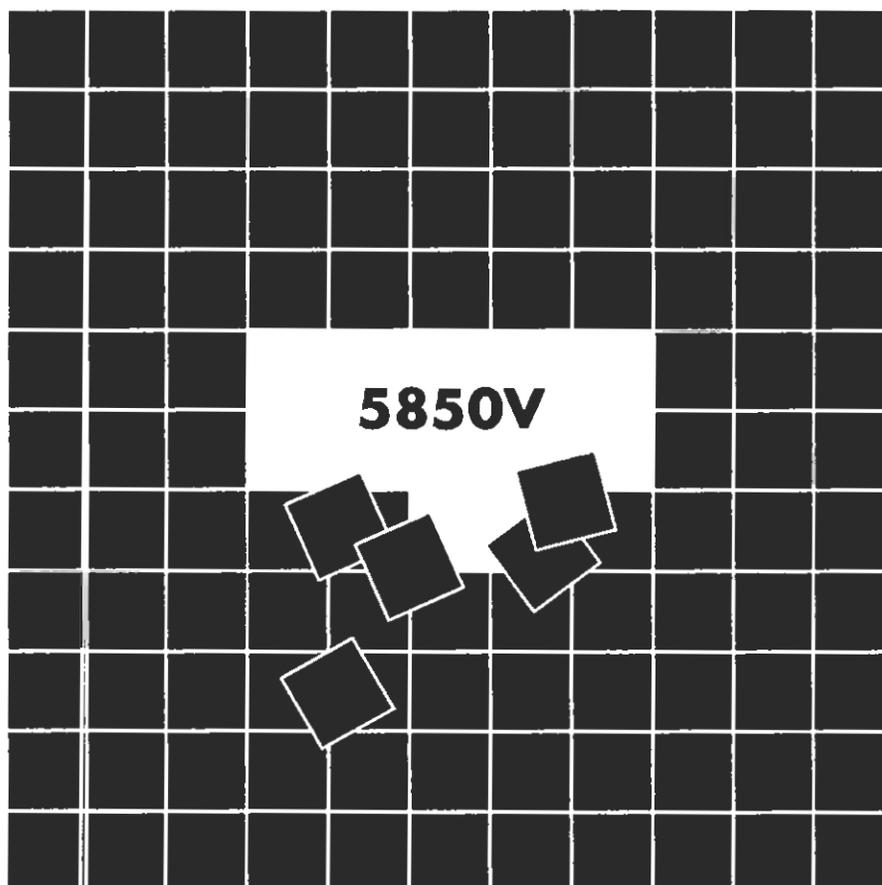


LEADER

NTSC VECTORSCOPE

INSTRUCTION MANUAL



LEADER ELECTRONICS CORP.

取扱説明書改訂

1 / 1頁
2005年(平成17年) 2月 4日

ヒューズを交換される際は、ご使用になる電源電圧に合わせてお使いください。

使用電圧範囲	ヒューズ定格	スペアヒューズ 弊社部品番号
90 ~ 132 V	1Aタイムラグ	436 3765 006
180 ~ 250 V	0.8Aタイムラグ	436 3760 006

MANUAL CHANGE INFORMATION

DESCRIPTION

Date : Feb. 4, 2005

This supplement contains important information for correcting manual errors and adapting the manual to instruments containing improvements made after the printing of the manual.

CHANGE :

1. Line Voltage and Fuse

Voltage Range	Fuse Rating	Leader Part Number
90 ~ 132 V	1A,time-lag	436 3765 006
180 ~ 250 V	0.8A,time-lag	436 3760 006

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GENERAL SAFETY SUMMARY

■ To Avoid Personal Injury

It is recommended that only qualified personnel with technical knowledge use this instrument only after reading and fully understanding all functions of the instrument described in this instruction manual.

This instrument is not designed and manufactured for consumers.

If you do not have enough knowledge on electricity, to avoid personal injury and prevent damage to this product, please be sure to use this product only under the supervision of an engineer who has sufficient knowledge about electronics.

■ Precautions on Contents

Should you find the contents in this manual and any of its technical terms confusing, please feel free to contact your local LEADER agent.

■ Symbols and Terms

Following terms and symbols indicate necessary warnings and cautions used in this manual and on the product are there for safe operation.

<p><Symbol></p> 	<p>The sections where this symbol is marked in this manual or instrument, if not correctly performed or practiced, could result in personal injury or cause serious danger to the instrument. Misuse could also produce unintentional movement to create an operational impediment on the instrument or other products that might be connected to it.</p> <p>Be sure to refer to the safety precautions in this manual to safely use the part of the instrument where the symbol is marked.</p>
<p><Term></p>  WARNING	<p>Warning statements identify warning conditions that if disregarded or not correctly performed or adhered to, could result in serious personal injury or even loss of life.</p>
<p><Term></p>  CAUTION	<p>Caution statements identify warning conditions if disregarded or not correctly performed or adhered to, could result in personal injury or damage to the instrument.</p>

GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid operator's injury and loss of life and prevent damage and deterioration to this instrument. To avoid potential hazards, use this product as specified.



WARNING

■ Warnings on the Cases and Panels of the Instrument

Operator should not remove any cases or panel for any reasons. If you touch inside the instrument it could result personal shock or fire hazard. Refrain from spilling any liquid on or inserting anything flammables or piece of metal into the ventilation of the instrument. Such actions could cause fire, shock, malfunction and be an accident hazard while the power is on.

■ Warnings on Power Line

- **Make sure to connect only to the rated power line voltage. Excess voltage may cause fire.**

Confirm the voltage of the commercial power line before connecting the AC power cord. The power frequency of the power line should be 50/60 Hz.

- **Warning on the Power Cord**

Use only the optional power cord that is attached to this instrument. The use of the power cord other than that attached could cause fire hazard.

If the attached cord is damaged stop using it and contact your local LEADER agent. Should you use a damaged cord, it could cause a shock or create a fire hazard. When you pull out the cord be sure to hold it by plug and pull from the socket not by holding the cord wire.

■ Warning on Fuse

When the fuse is melted the instrument stops operation. If the fuse melted, turn off the power switch and disconnect the power plug from the socket. If you change the fuse while the cord is connected to the socket, it could cause a shock hazard. Only use the specified type and rated current and voltage fuses.

If the cause for melting fuse is unclear or if you suspect there is damage to the instrument or if you have no proper fuse at hand please contact your local LEADER agent.

GENERAL SAFETY SUMMARY



WARNING

■ Warning on Installation Environments

- **About the Guaranteed Operating Temperature Range**

Operate the instrument between the temperature range of 0 to 40 °C. Operating the instrument at higher temperatures could cause a fire hazard.

Rapid changes of temperatures from cold to warm can create internal moisture or condensation and could damage the instrument. If there is a possibility of moisture condensation allow the instrument to sit for 30 minutes without the power on.

- **About the Guaranteed Operating Humidity Range**

Operating humidity range is ≤ 90 % RH.

Do not operate the instrument with wet hands, This could cause a shock and fire hazard.

- **About the Operation in the Presence of Gasses**

Operating the instrument in and near the presence or storage locations of flammable, explosive gasses or fumes could create an explosion and fire hazard. Do not operate the instrument anywhere near such environments.

- **Avoid Insertions**

Do not insert metals or flammable objects or drop liquid on or into the instrument. To do so could cause fire, shock, malfunction and create a dangerous accident hazard.

■ Warning while Operating

While operating the instrument in smoke, fire, or a bad smell, occurs, turn off the instrument at once for it could cause a fire hazard. When such a case occurs, turn off the power switch and pull the plug of the cord from the plug socket. Contact your local Leader agent after confirming there is no fire.

■ Warning about Ground

The instrument has a ground terminal to avoid electric shock hazard and to protect the instrument from damage. Ensure that the product is properly grounded for safe operation.

GENERAL SAFETY SUMMARY



CAUTION

■ Caution on Input/Output Terminals

Input Terminals are rated with a maximum input. Do not supply an input over the specified rating in the standard section of the instruction manual. Also, do not supply external power to Output terminal, this could cause the instrument to malfunction.

■ Caution when Not to Using Instrument the for a Long Time

Make sure to disconnect the power cord from the socket when you do not use the instrument for a long time.

Please conform to the above warnings and cautions for safe operation. There are cautions in each area of in this instruction manual, so please conform to each caution. If you have any questions about this manual, please feel free to contact your local Leader agent.

INTRODUCTION

Thank you for purchasing Leader's measuring instruments.

Please read this instruction manual carefully to ensure correct and safe operation.

If you have any difficulties or questions on how to use the instrument after you have read this manual, please feel free to contact your local Leader agent.

1.1 Scope of Warranty

This Leader instrument has been manufactured under the strictest quality control guidelines. Leader shall not be obligated to furnish free service during the warranty period under the following conditions:

1. Repair of malfunction or damages resulting from fire, natural calamity, or improper voltage applied by the user.
2. Repair of an instrument that has been improperly repaired, adjusted or modified by personnel other than a factory-trained Leader representative.
3. Repair of malfunctions or damages resulting from improper use.
4. Repair of malfunctions caused by devices other than this instrument.
5. Repair of malfunctions or damages without the presentation of a proof of purchase or receipt bill for the instrument.

1.2 Operating Precautions

WARNING

1.2.1 Line Voltage and Fuse

Confirm that the power line voltage is correct before connecting the power cord.

The voltage range and fuse rating are indicated on the rear panel.

The instrument must be connected to the rated line voltage and line frequency of 50Hz or 60Hz.

When replacing the fuse, turn the power switch off and disconnect the power cord from the outlet.

When replacing the fuse, use the correct fuse that matches the line voltage.

Rating	Voltage range	Fuse rating	Leader parts number
100 V	190 to 110 V	1A	436 3765 015
120 V	108 to 132 V	Time lag	
220 V	198 to 242 V	0.5A	436 3750 003
240 V	216 to 250 V	Time lag	

※Fuse replacement

The 5850V can operate from four different voltage ranges through 100 V and 120 V serial and parallel tap changes in the power transformer. Observe the fuse rating as well.

⚠ CAUTION

1.2.2. Maximum Allowable Input Voltage

The maximum allowable input voltage to the input connectors is shown in the table below. Do not apply excessive voltage to prevent damage to the instrument.

Refer to Installation Category I (IEC 1010-1, Annex J).

Input Connector	Maximum Allowable Input Voltage
INPUT A/B	± 20 V (DC + peak AC)
EXT REF	± 20 V (DC + peak AC)

The maximum input voltage of " ± 20 V (DC + peak AC)" is as shown in Figure 1-1.

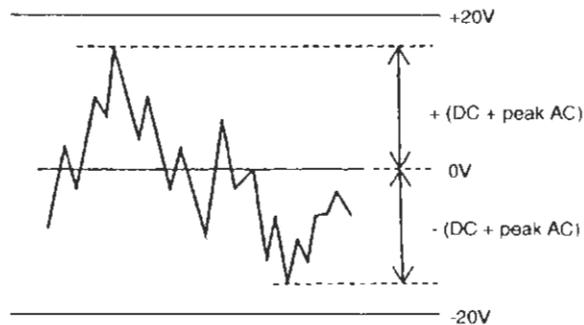


Figure 1-1 DC + Peak AC

⚠ CAUTION

1.2.3 Installation

Do not use the instrument in the following environments.

- High temperature environments

Do not place the instrument under direct sunlight or near a heater (e.g., stove).

Avoid using the instrument in a way that leads to drastic changes in temperature such as moving the instrument from a cold environment to a hot environment; this may cause condensation.

Operating temperature range: 0 to 40°C

- High humidity environments

Do not place the instrument in a high humidity environment (e.g., bathroom, near a humidifier).

Operating humidity range: ≤ 90 % RH (without condensation)

- Dusty environments
- Strong magnetic fields

Do not place the instrument near a strong magnetic source (e.g., high-power transformer).

Waveform distortion and tilted lines may occur.

CAUTION

1.2.4. CRT

Do not leave the instrument with the intensity set too high or displaying sharp spots. This can cause burn-in on the CRT or shorten its life.

In addition, do not apply strong shock to the instrument. A strong shock can damage the CRT or degrade the accuracy.

1.2.5. Cabinet

For your safety and avoidance of EMI, do not remove the cabinet.

1.2.6. Calibration

When calibration or service is required, contact your local Leader agent.

1. GENERAL

The Model 5850V vectorscope displays vector of the amplitude and phase of the chrominance component included in NTSC TV system composite video signals. The accelerating voltage of 12

kV ensures bright, sharp luminescent spot display on the CRT. This compact, light instrument is housed in a half rack in inch size.

2. SPECIFICATIONS

2.1 CRT

Display area:	8 (V) x 10 (H) cm, rectangular
Accelerating voltage:	12kV/2kV
Graticule:	Internal scale Allowable frame; $\pm 20\% / \pm 10^\circ$ of standard color bar, circle, angle, R-Y axis, B-Y axis, I axis, Q axis, and DG and DP, ± 2.5 IRE $\pm 2.5^\circ$ of standard color bar, and $\pm 20\% / \pm 10^\circ$ of burst signal

2.2 Composite Video Signal Input

Sensitivity:	Input A, input B Calibrated value: Color saturating; 75%, 100%, full scale Amplitude; 1Vp-p, 1.24Vp-p Variable range; Approx. 0.5 to 5 times as large as the calibrated value EXT. REF: Subcarrier; 2Vp-p ± 6 dB Black burst; 0.43Vp-p ± 6 dB
Input A:	Rear panel loop-through BNC connector Input impedance: Approx. 2 M Ω
Input B:	Rear panel loop-through BNC connector Input impedance: Approx. 2M Ω
EXT REF:	Rear panel loop-through BNC connector for sub-carrier Input impedance: Approx. 10k Ω

2.3 Blanking Input

Sensitivity:	DC ± 1 V
Polarity:	Bright at positive

2.4 Chrominance

Bandwidth:	Center: Fsc = 3.579545 MHz High band: Fsc + approx. 500 kHz Low band: Fsc - approx. 500 kHz
Phase accuracy:	$\pm 2^\circ$
Amplitude accuracy:	$\pm 3\%$
Differential phase:	$\pm 1^\circ$
Differential gain:	$\pm 1\%$

2.5 Measurement Items

Vector measurement:	Phase and amplitude of; 75% or 100% color single saturation of chrominance on color bar signal
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2.6 Horizontal Synchronization

Input:	Synchronization by the horizontal Sync signal of composite video signal from input A or B.
Sync polarity:	Negative
Sync level range:	0.286Vp-p \pm 6dB

2.7 Subcarrier Signal Synchronization

Synchronization by burst signal (of composite video signal)

Sync level range:	0.286Vp-p \pm 6dB
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Synchronization by external subcarrier signal (which is applied to the EXT REF input)

Subcarrier signal sync level range:	2Vp-p \pm 6dB
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Synchronization by black burst signal (which is applied to the EXR REF input)

Black burst sync level range:	0.43Vp-p \pm 6dB
-------------------------------	--------------------

Note: The external subcarrier signal is switched to and from the black burst signal internally.

Subcarrier frequency:	3.579545 MHz
Sync capture range:	\pm 50 Hz (0°C to 40°C)
Phase adjustment range:	360°, continuously variable

2.8 Calibration

Test circle:	Set the chrominance signal applied from the input connector in asynchronous mode.
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2.9 General Specifications

Power voltage:	100V, 120V, 200V or 240V: switchable by changing internal wiring
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Power consumption:	40W max.
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Environmental conditions

Operation Temperature:	0 to 40°C
Operation Humidity:	\leq 90 % RH (without condensation)
Spec-Guaranteed Temperature:	10 to 35°C
Spec-Guaranteed Humidity:	\leq 80 % RH (without condensation)
Operating Environment:	Indoor use
Operating Altitude:	up to 2,000m
Overvoltage Category:	II
Pollution degree:	2

Size and weight:	215 (W) x 132 (H) x 429 (D) mm, approx. 6kg
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Accessories:	Illumination lamp 5
	Cover, inlet stopper 1
	Screw, rack mounting (inch size) 2
	Power cord 1
	Instruction manual 1

3. PANEL DESCRIPTIONS

The Model 5850V operations on the panel are described in the order of the circled numbers given in Figs. 3-1 and 3-2. Note that letters in [] are indicated on the panel. Mark ■ denotes that

a push-button switch being depressed **ON** and mark □ denotes that the switch being released **OFF**.

3.1 Front panel

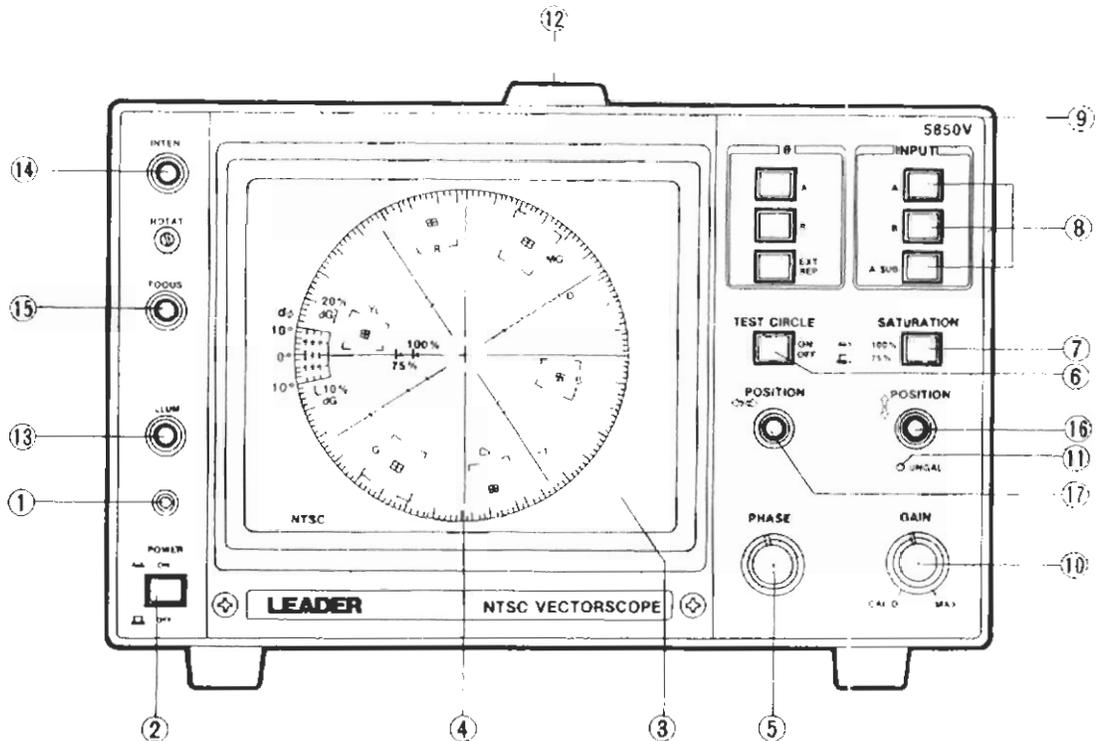


Figure 3-1

- | | |
|---|---|
| <p>① Pilot lamp
Comes on when power is supplied.</p> <p>② POWER (Power Switch)
A push-button power switch. Push in this switch to turn power on.</p> <p>③ CRT
A rectangular CRT, 8 cm (V) x 10 cm (H)</p> <p>④ Scale
A vector scale having demodulation axes Q, I, R-Y and B-Y and the accuracy divisions in every two degrees alongside its circle. Also indicated are the allowable frame of $\pm 20\%$, ± 2.5 IRE, $\pm 10^\circ$, $\pm 2.5^\circ$ of standard color bar, and the scale for differential phase and differential gain measurements. Refer to section "3.3 Vector Scale" for the details.</p> | <p>⑤ PHASE
A phase adjuster to change the vector phase. A full rotation changes the phase by 360 degrees. Use this control so that the vector can be adjusted to the scale.</p> <p>⑥ TEST CIRCLE
Set this control as follows:
• TEST CIRCLE: ON
The test circle appears when the vector is rotated while the chrominance signal applied to input A or B, is set in asynchronous mode. If a perfect circle is drawn, it means that the Model 5850V has been adjusted correctly. If the circle is duplicated, then it indicates the instrument should be adjusted again. (For details about adjustment see Chapter 5.)</p> |
|---|---|

- ⑦ **[SATURATION]**
Select 100% or 75% saturation color bar. Push in this button to select 100%.
- ⑧ **[INPUT]**
Selects the chrominance component of the composite video input applied from input A or B. Press A to display the vector of the chrominance signal applied to input A. Press B to display the vector of the chrominance signal applied to input B.
[A SUB] is used to measure the vector of the continuous subcarrier signal applied to input A. Because the amplitude range for normal operation is 2Vp-p, the gain can be reduced to approx. 1/3 of the signal from input A, then displayed within the CRT.
- ⑨ **[φ]** (Synchronization Switch)
Press **[A]** to synchronize the internal subcarrier oscillator with the Sync signal and burst signal of the composite video signal applied from input A.
Press **[B]** to synchronize the oscillator with the Sync signal and burst signal of the composite video signal applied from input B on the rear panel.
Press **[EXT REF]** to demodulate the chrominance signal applied to input A or B, by using the subcarrier signal applied from **[EXT REF]**.
- ⑩ **[GAIN]** (Amplitude Adjustment)
Changes the amplitude of the chrominance signal applied to input A or B. When this control is set to the **[CAL'D]** position, the amplitude display of color bar signal (with 7.5% setup, an amplitude of Vp-p, 75% saturation) is displayed at the center of the allowable scale frame. The variable range is approx 0.5 to 5 times as large as the calibrated value.
- ⑪ **[UNCAL]** (Uncalibration Lamp)
Comes to the indicate that the instrument is uncalibrated when the amplitude adjuster is put in variable state.
- ⑫ Grip
Used to carry the instrument.
- ⑬ **[SCALE ILLUM]**
Controls the scale illumination.
- ⑭ **[INTEN]**
Controls the intensity.
- ⑮ **[FOCUS]**
Controls the focus.
- ⑯ **[↑]** (Vertical Position Control)
Controls the vertical position.
- ⑰ **[↔]** (Horizontal Position Control)
Controls the horizontal position.

3.2 Rear Panel



Figure 3-2

18 **A INPUT**

A pair of input connectors for composite video signals. These two connectors adopt a loop-through configuration. The input impedance is approx. 2 M Ω . The loop-through connectors are connected as shown in Fig. 3-3.

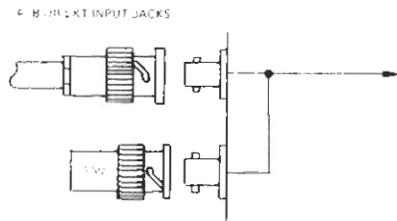


Figure 3-3

Supply signals to either of the two connectors; the other connector is terminated with a 75 Ω terminator or connected to a 75 Ω system equipment.

Use a cable with a characteristic impedance of 75 Ω .

19 **EXT REF** (External Subcarrier or Black Burst Input)

A pair of input connectors for external subcarrier signals. These two connectors adopt a loop-through configuration. The input impedance is approx. 10k Ω . These input connectors are applied continuous subcarrier signals, with which the instrument should be synchronized with the chrominance signal of the measured composite signal. Supply signals to either of these connectors; the other connector is terminated with a 75 Ω terminator or connected to a video equipment with a 75 Ω input impedance.

The external subcarrier range is from 1Vp-p to 4Vp-p, and the black burst signal range from 0.2Vp-p to 0.8Vp-p. The black burst input is set up at shipment from factory.

20 **B INPUT**

A pair of input connectors for composite video signals. These connectors adopt a loop-through configuration. For how to connect signals to these connectors, see **INPUT A**. The signal source is selectable from input A to B by operating the **INPUT** (input selector) on the front panel. Then, the selected vector display will appear on the CRT. The synchronization mode is switchable by operating the **ϕ** 9 to synchronize with signal from either input A or input B.

21 **Power cord**

Connect this cord to the power inlet. The voltage is selectable from 100V, 120V, 200V or 240V by changing the internal wiring.

22 **Fuse**

Time lag fuse whose fuse rating is 1A for a voltage of 100V to 120V; 0.5A for a voltage of 200V to 240V.

23 **BLANKING**

Input connector for external intensity control. +1V sets up the maximum intensity and -1V sets up the minimum intensity.

3.3 Vector Scale

The vector scale appears in Fig. 3-4.

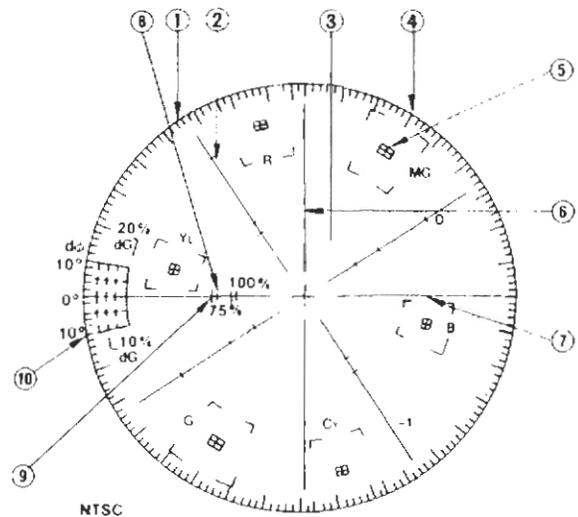


Figure 3-4

1 Circle of the graticule with a fixed amplitude. To set up this amplitude, the chrominance signal amplitude of inputs A and B must be 0.752Vp-p. The two scales on the circle are the main scale in 10 degrees, and the sub-scale in 2 degrees. These scales are used to measure the vector phase difference.

2 Indicates the angle of IN PHASE on the I axis. The I axis a broad band color difference axis, and its angle is 123° from the B-Y axis. A 0.286Vp-p amplitude scale is inserted at the medial point.

4. USING THE 5850V

CAUTION

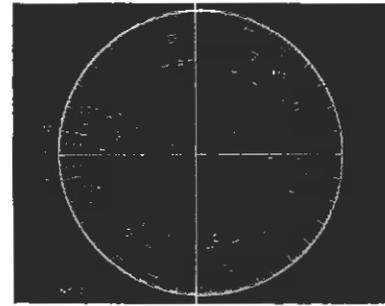
4.1 Precautions

- (1) Use the instrument with $\pm 10\%$ of the rated AC or DC power. Applying excessive power may damage the Model 5850V or insufficient power may cause it to malfunction. With a rated power of 240V, the maximum input voltage is 250V.
- (2) Do not apply excessive voltage to each input connector:
For input A and B: Signal voltage of 5Vp-p and a DC voltage within $\pm 20V$ of the rated voltage.
For EXT REF: Signal voltage of 5Vp-p and a DC voltage within $\pm 20V$ of the rated voltage.
For BLANKING: The maximum sum of AC and DC voltages is within $\pm 100Vp-p$ of the rated voltage.
- (3) To prevent damage to the CRT and crystal oscillator, be careful not to subject these units to extreme mechanical shock.
- (4) When mounting the instrument on a rack, place it to a well-ventilated place to maintain an internal rack temperature under $40^{\circ}C$. Mount a fan on the instrument for air cooling where temperatures above $40^{\circ}C$ are expected.
- (5) When testing or adjusting a TV receiver, VRT, or other piece of TV equipment, refer to the Service Manual prepared by the manufacturer. Before connecting the input connectors inside the Model 5850V, be sure to disconnect the power cord from the AC line to prevent accidents due to electrical shock. In particular, be sure to wear voltage-protective gloves when handling the built-in high-voltage circuit of the TV receiver.
- (6) For more accurate measurements, supply power to the instrument about 20 minutes before operation to stabilize the internal temperature.
- (7) Without any input signal applied (where luminescent point appears on the CRT), make sure that the luminescent point moves in horizontal direction when the H.POS control is turned to the right and to the left. If it does not move horizontally, adjust **ROTAT** so it can move horizontally.

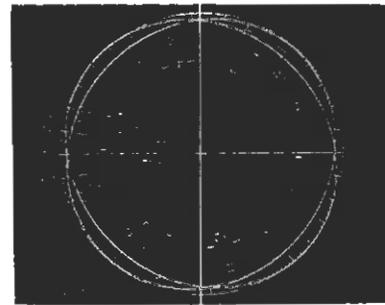
4.2 Self-inspection with Test Circle

The Model 5850V has a self-inspection capability by using the test circle. This circle is used to check if the amplitude and phase of the 5850V decoder have been adjusted correctly. They are measured by displaying the circle on the CRT after setting the chrominance signal applied to input A or B, in asynchronous mode.

Figure 4-1 shows a correct waveform and irregularly-adjusted waveform.



Correct



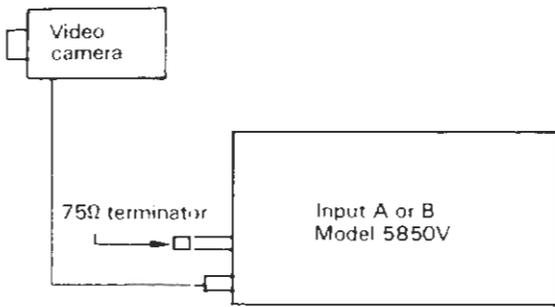
Irregularly-adjusted

Figure 4-1

No extreme deviation of the quadrature phase will be observed in normal operation. But, in case that the phase deviates due to secular change or parts replacement, it need be adjusted again. For details, see Chapter 5.

4.3 Connections and Measurements

4.3.1 Example connections



4.3.2 Adjustments and inspections before measurement

Before observation, the intensity and focus should be adjusted. For horizontal and vertical position adjustments, adjust them so the center of vector is centered at the scale. Then, inspect the quadrature phase using the test circle.

4.3.3 Measuring method

- (1) For measuring the vector of the chrominance signal of a single composite video input:
 - (a) Connect the signal for measuring to either input A or input B.
 - (b) Select A if input A is selected during [INPUT] and ϕ setting; select B if input B is selected accordingly.
 - (c) Select a 75% or 100% saturation according to the type of signal.
 - (d) Set the [amplitude adjuster] to CAL'D position.
 - (e) Adjust the burst signal to the $-(B-Y)$ axis by using the [amplitude adjuster].
 - (f) Measure the vector phase and amplitude by comparing them with the respective scales to check that they comply with the target allowable values.

Figure 4-2 shows an example measurement display.

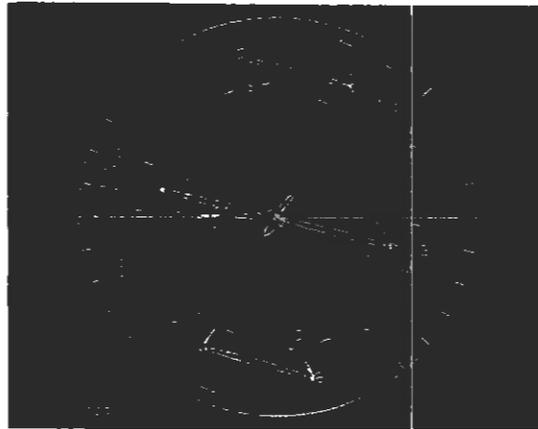


Figure 4-2

- (2) For measuring the phase difference between two signals:

The chrominance signals of both composite video signals should be synchronized to each other. Figure 4-3 shows an example connection.

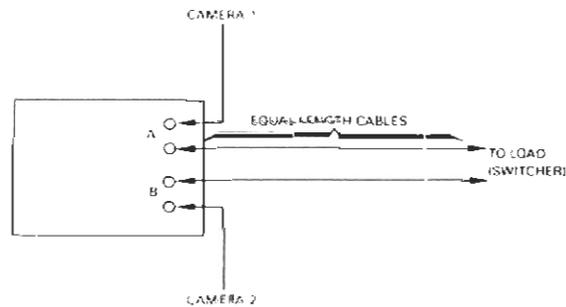


Figure 4-3

For example when the chrominance signal phases from two TV cameras do not match, a color mismatch may occur when the camera is switched to another. Therefore, the cable between cameras 1 and 2 must be adjusted.

- (a) Connect the composite video signals of cameras 1 and 2 to inputs A and B of the Model 5850V respectively.
- (b) Select a 75% or 100% saturation according to the type of signal.
- (c) Set the amplitude control to CAL'D position.
- (d) Adjust the synchronization switch according to the camera (camera 1 here) defined as the base camera.
- (e) Set the input to A and adjust the amplitude adjuster control so that the burst amplitude will touch the circle.
- (f) Adjust the burst phase to the $-(B-Y)$ axis by using the phase adjuster.
- (g) Set the input switch to B and measure the burst phase of camera 2 with the scale on the circle. The portion off from the $-(B-Y)$ axis is the phase difference from camera 1.

The allowable error in the phase difference between inputs A and B is within 1° .

Do not operate the amplitude adjuster during measurements because any amplitude change will also change the phase.

- (3) For measuring the chrominance signal without Sync or burst signal:

Some TV equipment send the video images with composite video signals and others send the Sync and video signals separately. And other TV equipment do not send burst signals. In such a case, the equipment sends subcarrier signals separately. Since synchronized black burst signals are available here, it can be used to synchronized with the instrument. The Model 5850V is set up at shipment so it will be synchronized with black burst signals. To use the external subcarrier signals for this purpose, switch the synchronization mode by referencing Section (5).

- (a) Connect video signal or chrominance signal to input A or B of the Model 5850V.

- (b) Connect the subcarrier or black burst signal to [EXT REF]. The subcarrier amplitude may range from 1Vp-p to 4Vp-p. The black burst signal may range from 0.2Vp-p to 0.8Vp-p.
- (c) Select a 75% or 100% saturation according to the type of signal.
- (d) Set the synchronization switch to [EXT REF].
- (e) Select the input connector to which [INPUT] is connected.
- (f) For normal operation, set the amplitude adjuster to the CAL'D position. Change it, if necessary.
- (g) By using the phase adjuster, adjust the vector to the scale for measurements. Select [EXT REF] to select the demodulation subcarrier signal or black burst signal, and to change the input source from input A or B to [EXT REF].

- (4) Measuring differential gain (DG) and differential phase (DP).

The differential gain and differential phase of a TV equipment can be measured by using the staircase where subcarrier is superimposed on.

- (a) Connect the staircase signal from the device to be measured, to input A or B of the Model 5850V.
- (b) Select 75% or 100% saturation according to the type of signal.
- (c) Select the sync and input modes according to the input connector to which the signal is connected.
- (d) With the amplitude adjuster, adjust the outer-most vector so it can touch the circle. See Fig. 4-4.

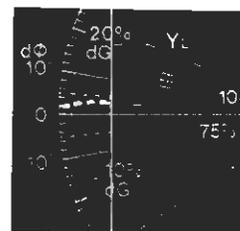


Figure 4-4

- (e) With the phase adjuster, adjust the vector (d) to the 180° axis.
- (f) Measure the DP and DG from the scale.

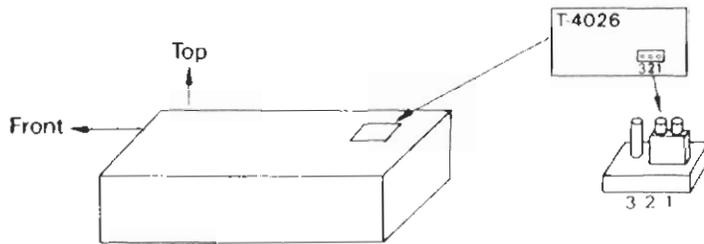
(5) Changing the EXT REF input

The EXT REF input of the Model 5850V may be synchronized either with subcarrier signal or with black burst signal. The input level of black burst signal is within $0.4V_{p-p} \pm 6dB$. And, that of subcarrier signal ranges from $1V_{p-p}$ to $4V_{p-p}$. At shipment, the instrument is setup so it can be synchronized with a black burst signal. To synchronize with subcarrier signal, the internal setting need be changed.

How to set up the input mode (how to mount a connector)

Subcarrier input: Between pins 1 and 2
Black burst input: Between pins 2 and 3

The instrument is synchronized with the subcarrier signal while it is in the black burst input mode. This, however, causes the phases of inputs A and B to change.



5. MAINTENANCE

This well-designed Model 5850V operates stably and rarely causes troubles under normal handlings. But, in case of a deviation due to the aged parts or an irregular operation, contact the shop where you bought the instrument or our Service Department for repair.

This chapter explains the adjusting method required for using the Model 5850V more accurately.

Here, you will have to touch the inside of the Model 5850V. Therefore, be careful not to receive an electric shock because the AC line voltage and high-voltage are generated from the inside of the instrument.

Figure 5-1 indicates the dangerous places where high-voltages are generated.

Before taking off the case, be sure to turn off the power switch and disconnect the AC power cord from the AC line inlet. The capacitor in the circuit may be still charged with high voltages while the power is turned off. Therefore, do not touch any internal circuits and conductors.

The case of the Model 5850V can be removed from the mainframe by unscrewing four each of the top and bottom screws and four each of each side screws. After adjustment, immediately mount the case on the mainframe to cover the dangerous high-voltage section.

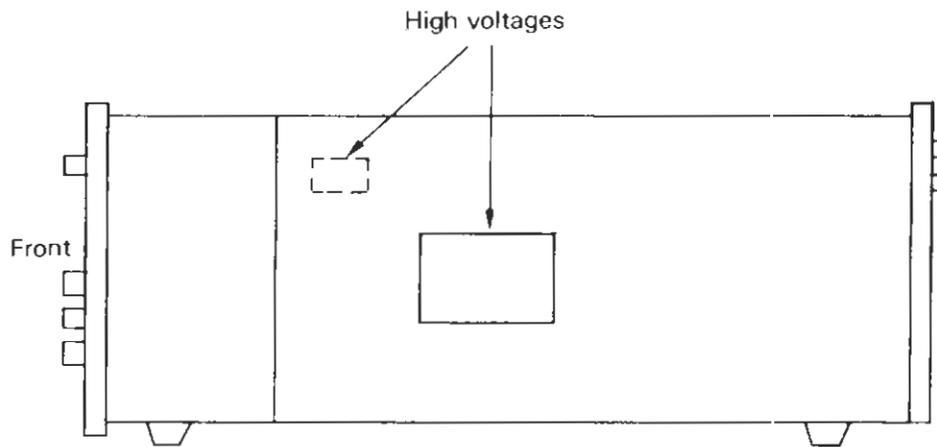
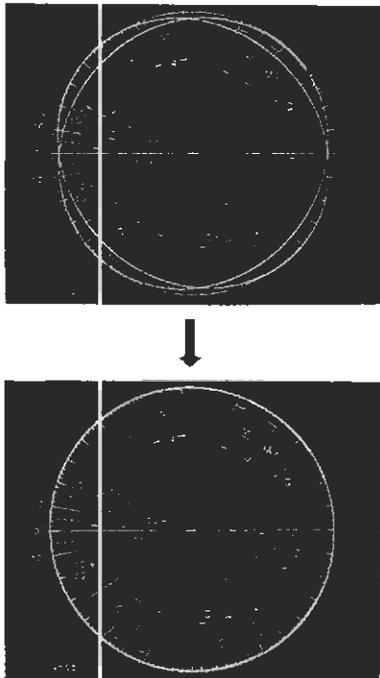


Figure 5-1

5.1 Quad-phase Adjustments

To adjust the quadrature phase, do:

- (1) Apply subcarrier or chrominance signal to input A. The input amplitude should be 0.15Vp-p to 3.5Vp-p.
- (2) Set the input switch to A.
- (3) With the amplitude adjuster, adjust the vector so its amplitude will touch the circle. If the input signal is too large to fit the circle, change the input switch to A SUB to adjust the signal to the circle.
- (4) Turn the scale ON.
- (5) Turn the test circle ON.
- (6) Center the circle by horizontal and vertical positioning
- (7) Use the VC401 (see Fig. 5-3) so the circle will be a perfect circle. See Fig. 5-2.



Correct waveform

Figure 5-2

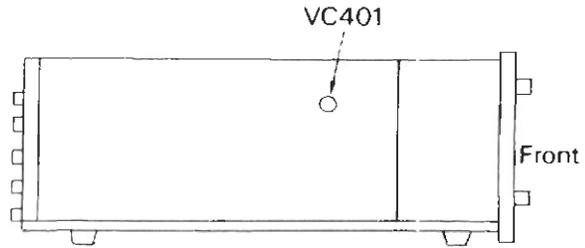


Figure 5-3

5.2 Setup Switch

At shipment, the Model 5850V has been set up for measuring signals with 0% setup. When measuring a signal with 7.5% setup, the internal setup switch need be changed. The setup switch is mounted on the location shown in Fig. 5-4. Before switching, be sure to turn off the power.

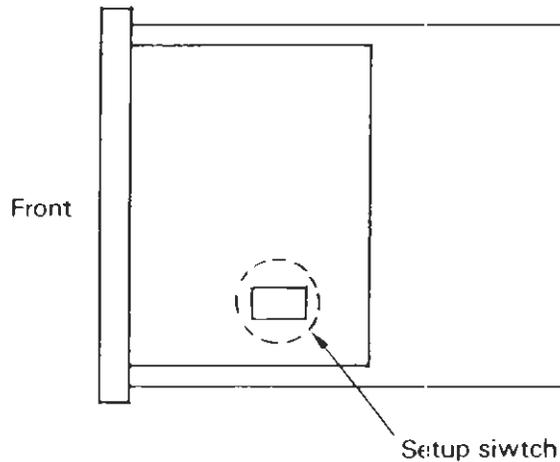
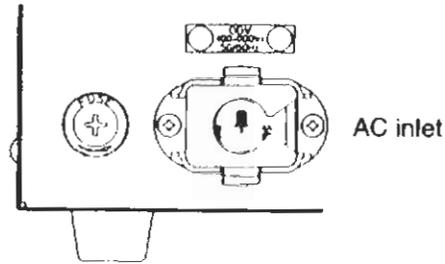


Figure 5-4

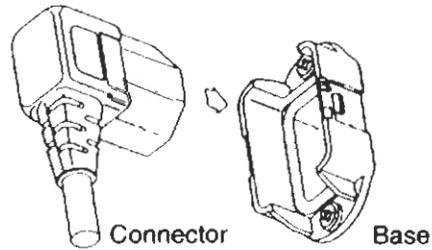
6. CONNECTING THE POWER CORD

The newly designed AC inlet is used for this model to prevent power cord disconnection. Refer to the following procedure when connecting the supplied power cord.

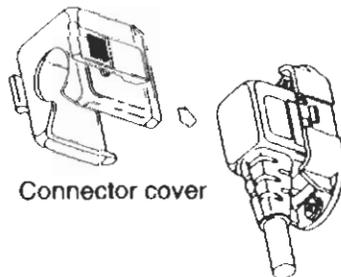


6.1 Connecting the Power Cord

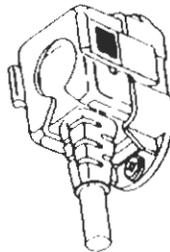
- (1) Insert the power cord connector into the AC inlet.



- (2) Place the connector cover on top of the connector as shown in the Figure below.



- (3) Press the cover until it clicks into place.



- (4) Confirm that the connector cover is locked to the base.

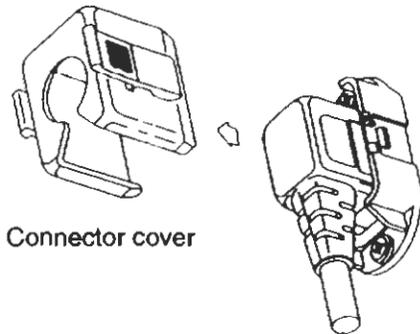
6.2 Disconnecting the Power Cord

(1) Press the levers on the connector cover with your fingers to release.



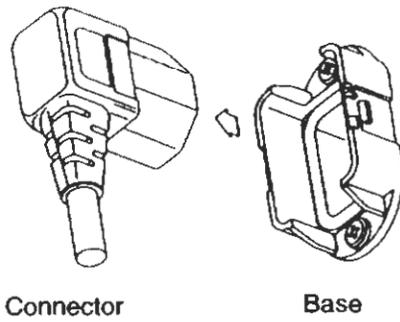
Connector cover (side view)

(2) Remove the connector cover from the base.



Connector cover

(3) Disconnect the power cord connector from the AC inlet.



Connector

Base



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