

VPH-722Q/1020Q

ADJUSTMENT MANUAL

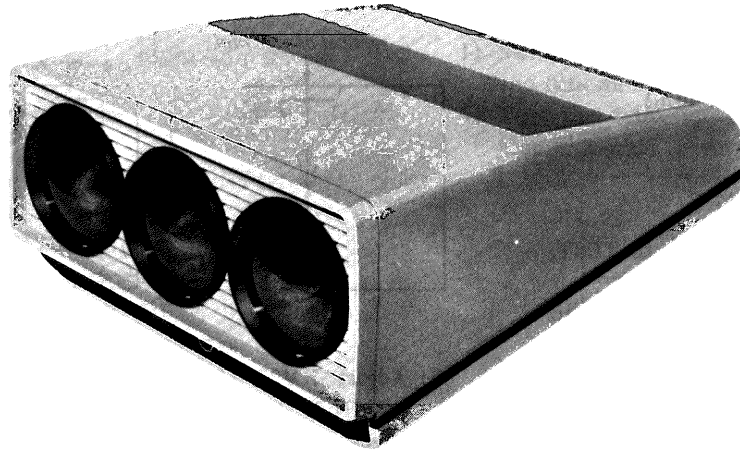
US Model

VPH-722Q

Chassis No. SCC-519A-A

VPH-1020Q

Chassis No. SCC-520A-A



June, 1984

Please use the Adjustment manual in conjunction with the Service Manual.

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COLOR VIDEO PROJECTOR
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SECTION 1 BASIC ADJUSTMENTS

1-1. Basic Adjustments

<Registration>

- 1) Degauss the entire chassis.
- 2) Set the variable resistor on the D board to mechanical center. Also, set the HB board H CENT and V CENT to mechanical center.
- 3) Adjust the knobs and switches on the set as follows:
 BRIGHT: fully clockwise (maximum)
 PICTURE: maximum
 Normal/test: test

1. Focus Adjustment

- 1) Switch the NORMAL/TEST switch to TEST, and the TEST switch to HATCH.
- 2) Turn the green and red CUT OFF switches to ON and adjust blue lens focus.
- 3) Adjust with the focus control for optimum focus.
- 4) Turn the green CUT OFF switch only OFF, switch the others to ON, and adjust green lens focus.
- 5) Turn the red CUT OFF switch only OFF, switch the others to ON, and adjust red lens focus.

2. Green Picture Adjustment

- 1) Turn the red and blue CUT OFF switches ON.
- 2) Turn the deflection yoke (green) so that the crosshatch pattern horizontal center line is level as shown in Figure 2
- 3) Line the picture up to the center with RV6 (H CENT (green)) and RV5 (V CENT (green)).

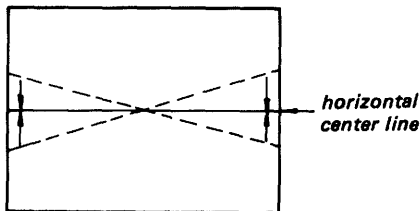


Figure 2

- 4) Tighten the deflection yoke screw.
- 5) Adjust the neck assembly and deflection yoke (green) relative rotation angle mechanically as shown in Figure 1, and tighten the screw.

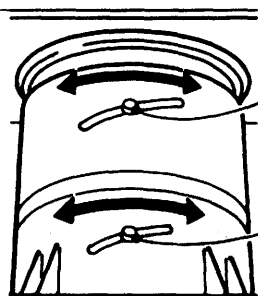


Figure 1

1) Loosen the screw and adjust the center focus, then tighten the screw again.

2) Loosen the screw and adjust the focus, then for the periphery tighten the screw again.

Adjust RV51 (PIN CENT) so that the horizontal center line does not move when RV38 is turned from 0 to 100%.

- 6) Adjust RV23 (H SKEW (green)) so that the crosshatch pattern vertical center line is as shown in Figure 3

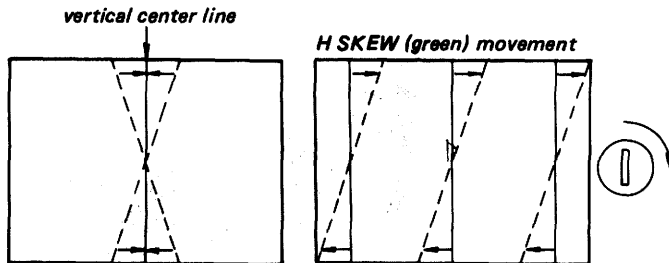


Figure 3

Figure 4

- 7) Adjust RV22 (MAIN H KEYS) and RV29 (MAIN H PIN) so that the vertical lines at the edges of the crosshatch pattern are vertical as shown in Figure 5

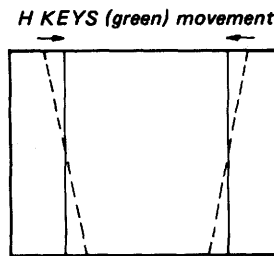


Figure 5

- 8) Switch the NORMAL/TEST switch to NORMAL and receive a broadcast.
- 9) Shrink the left and right sides of the picture slightly with RV12 (MAIN H SIZE).
- 10) Adjust RV6 (H CENT (green)) so that the lengths of a and b are equal as shown in Figure 6.

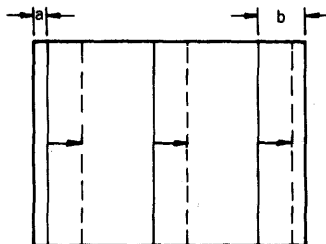


Figure 6

- 11) Adjust H SIZE with RV12 (MAIN H SIZE).

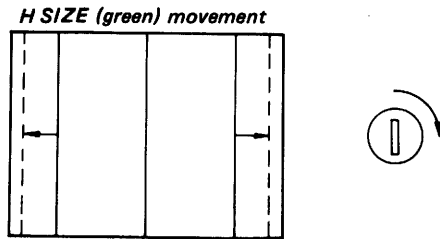


Figure 7

- 12) If necessary, adjust with RV6 (H CENT (green)) for the best point.
 13) Shrink the top and bottom of the picture slightly with RV11 (V SIZE (green)).
 14) Adjust RV17 (V LIN (green)) so that L1 and L2 are equal as shown in Figure 8 .

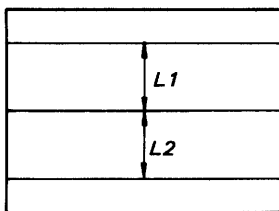


Figure 8

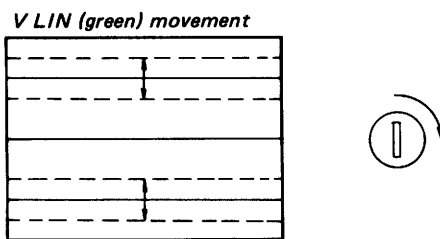


Figure 9

- 15) Adjust RV5 (V CENT (green)) so that a and b are equal as shown in Figure 10.

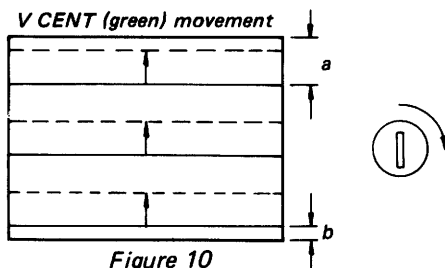


Figure 10

- 16) Adjust V SIZE with RV11 (V SIZE (green)).

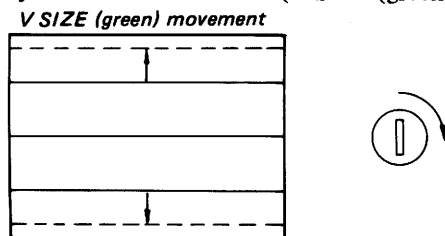


Figure 11

- 17) If necessary, adjust with RV5 (V CENT (green)) for the best point.

- 18) Do not touch RVs (H SIZE, H KEYS, V CENT (green), V SIZE (green), V LINE (green), H CENT (green) and H SKEW (green) after completing the above adjustments.

1-2. Preparations for Blue and Green Registration Adjustment

- 1) Switch the NORMAL/TEST switch to TEST and turn on SW3 (RED CUT OFF).
 2) Turn the deflection yoke (blue) and make the blue and green horizontal center lines parallel.

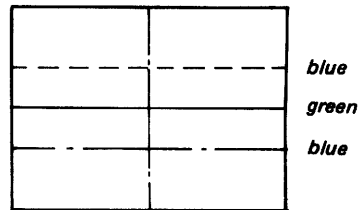
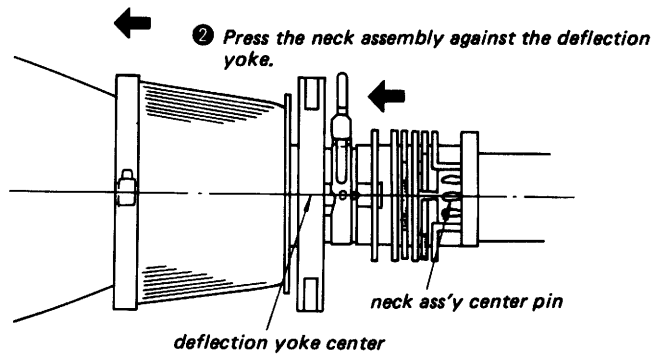


Figure 12

- 3) Adjust the neck assembly as shown below.

① Press the deflection yoke forward.



- 4) Line up the blue horizontal center line to the green with RV2 (V CENT).
 5) Line up the blue vertical center line to the green with RV4 (H CENT).
 6) Line up the vertical and horizontal blue lines to the green ones with RV14 (V LIN) and RV16 (H LIN).

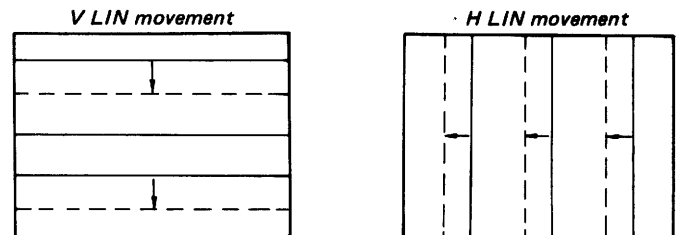


Figure 13

- 7) Adjust RV25 (V BOW) so that the blue horizontal center line is straight.

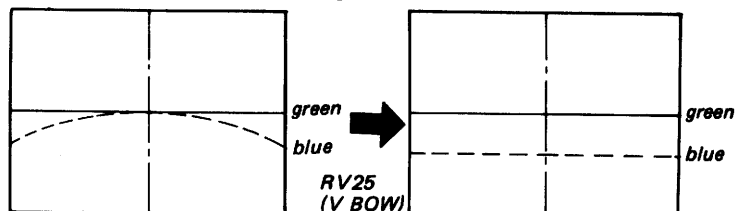


Figure 14

1-3. Preparations for Red and Green Registration Adjustment

- 1) Switch the NORMAL/TEST switch to TEST and turn on SW1 (BLUE CUT OFF).
- 2) Turn the deflection yoke (red) and make the red and green horizontal center lines parallel.

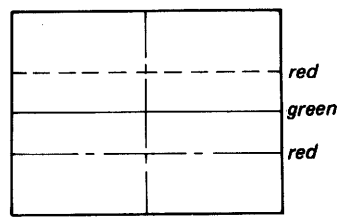


Figure 15

- 3) Adjust the neck assembly as shown below.

① Press the deflection yoke against the CRT funnel.

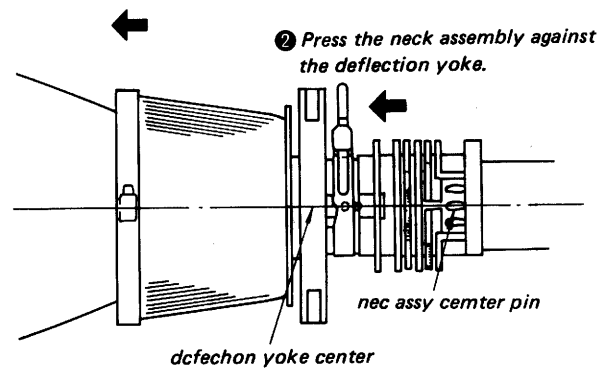


Figure 16

- 4) Line up the red horizontal center line to the green with RV1 (V CENT).
- 5) Line up the red vertical center line to the green with RV3 (H CENT).
- 6) Line up the vertical and horizontal red lines to the green ones with RV13 (V LIN) and RV15 (H LIN).

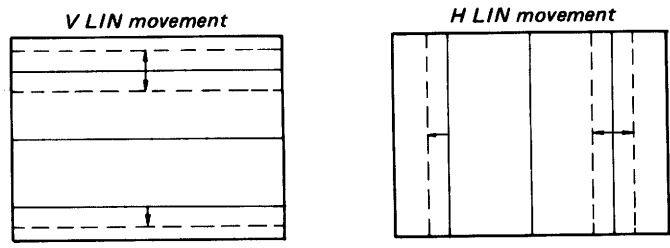


Figure 17

- 7) Adjust RV24 (V BOW) so that the red horizontal center line is straight.

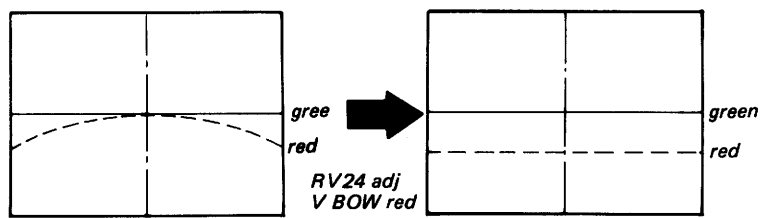


Figure 18

1-4. Red and Green Picture Vertical Registration

- 1) Adjust with RV1 (V CENT (R)) so that the red and green horizontal lines overlap in the center of the screen.

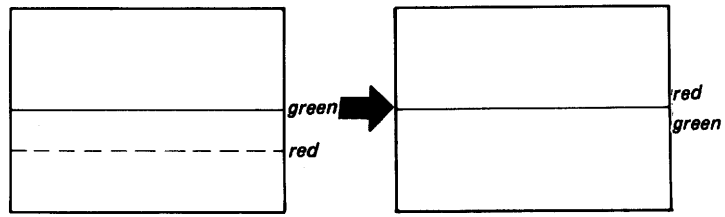


Figure 19

- 2) Adjust with RV7 (V SIZE (R)) and RV13 (V LINE (R)) so that the red and green horizontal lines overlap at the top and bottom of the screen.

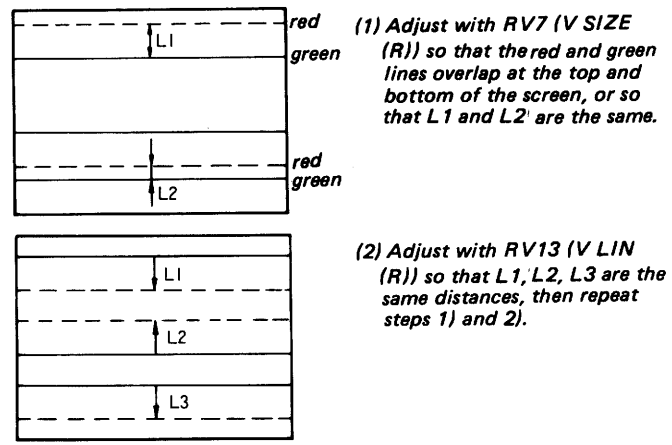


Figure 20

- 3) Adjust RV18 (V SKEW (R)) and RV24 (V BOW (R)) so that the red and green horizontal lines overlap in the center of the screen.

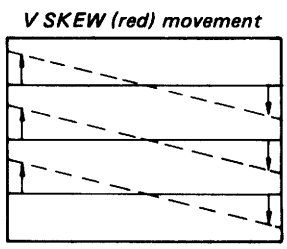
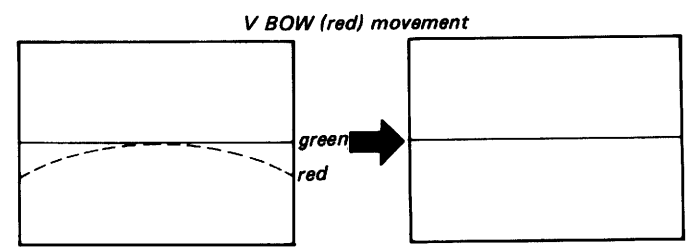


Figure 21

- 4) Adjust RV47 (V KEYS (R/B)) so that the red horizontal lines at the top and bottom edges of the screen are parallel.

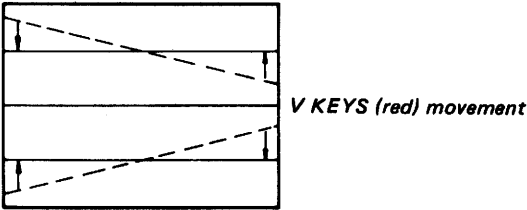


Figure 22

5) TILT Adjustment

- (1) Set the TILT VRs as shown below.
- (2) Turn SW8 (TILT SW) ON.
- (3) Receive an all-white signal.
- (4) Adjust RV50 (KEY CENT) so that red or green retrace line cannot be seen on the horizontal center line. (Note 1)

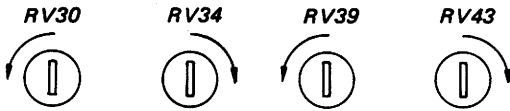


Figure 23

- (5) Turn SW8 (TILT SW) OFF.
- (6) Set RV30, 34, 39, 43, to 50%.
- (7) Switch the NORMAL/TEST switch to TEST.
- (8) Adjust RV47 (V KEY (R/B)) for minimum discrepancy between the corner green and red horizontal lines. (Note 2)

Note 1: Do not move this VR after KEY CENT adjustment.

Note 2: Do not move this VR after V KEYS (R/B) adjustment.

1-5. Red and Green Picture Horizontal Registration

- 1) Adjust RV3 (H CENT (R)) so that the red and green vertical lines overlap at the center of the screen.

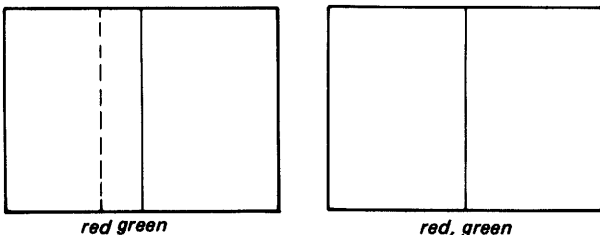
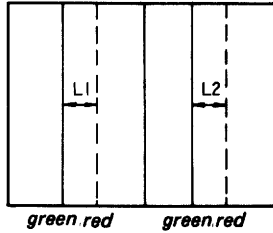
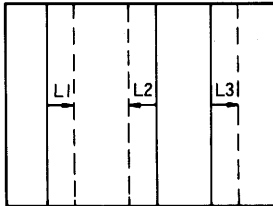


Figure 24

- 2) Adjust RV9 (H SIZE (R)) and RV15 (H LIN (R)) so that the red and green vertical lines overlap at the left and right sides of the screen.



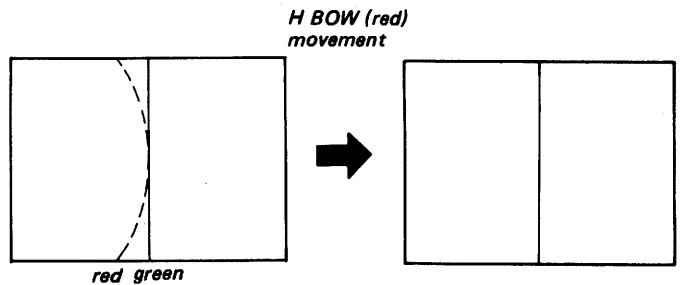
(1) Adjust RV9 (H SIZE (R)) so that the red and green vertical lines overlap at the left and right sides of the screen, or so that L1 and L2 are the same distances.



(2) Adjust RV15 (H LINE (R)) so that L1, L2, L3 are the same distances, then repeat steps 1) and 2).

Figure 25

- 3) Adjust RV20 (H SKEW (R)) and RV26 (H BOW (R)) so that the red and green vertical lines overlap at the center of the screen.



H BOW (red) movement

H SKEW (red) movement
H. SKEW

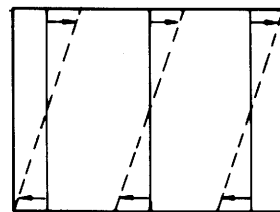
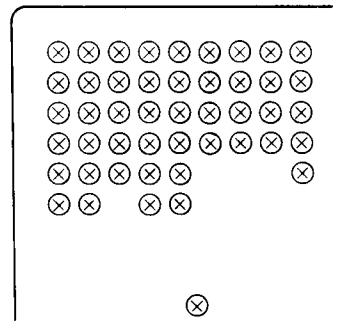
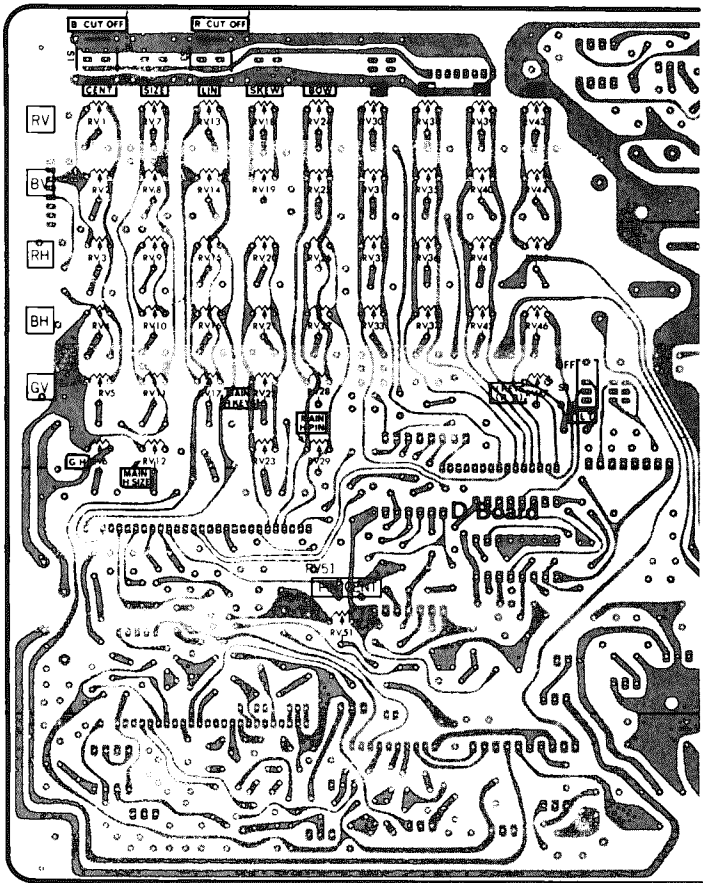
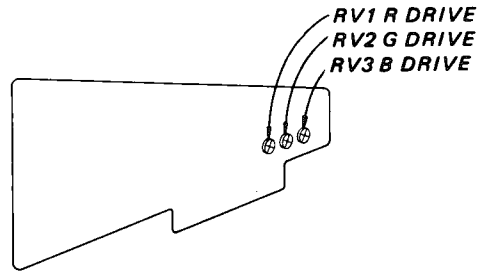
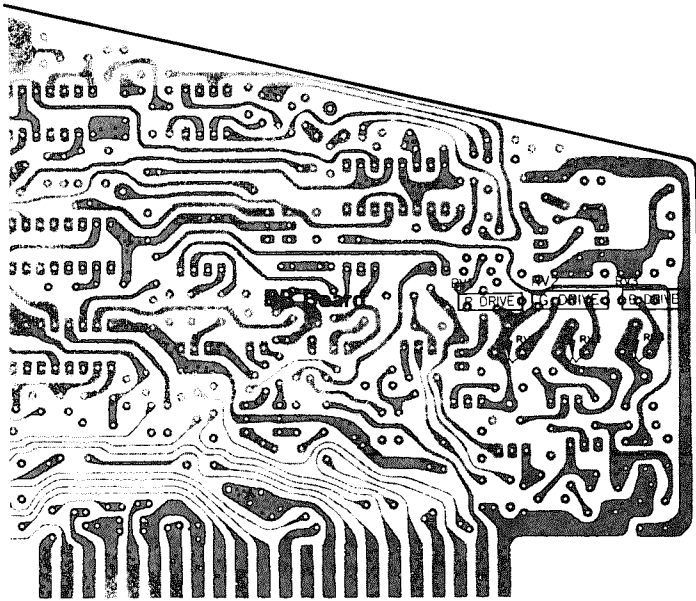


Figure 26

4) H TILT Adjustment

- (1) Turn SW8 (TILT SW) on.
- (2) Line up the red horizontal line corners to the green with RV TILT 1-4 (RV30, 34, 39, 43).
- (3) Line up the red vertical line corners to the green with RH TILT 1-4 (RV32, 36, 41, 45).



1-6. Blue and Green Picture Vertical Registration

- 1) Adjust RV2 (V CENT) so that the blue and green horizontal lines overlap at the center of the screen.
- 2) Adjust RV8 (V SIZE) and RV14 (V LIN) so that the blue and green horizontal lines overlap at the top and bottom of the screen.
- 3) Repeat steps 1) and 2) if necessary.
- 4) Adjust RV19 (V SKEW) and RV25 (V BOW) so that the blue and green horizontal lines overlap at the center of the screen.
- 5) Adjust RV47 (V KEYS R/B) so that the blue horizontal lines at the top and bottom of the screen are parallel.
- 6) Adjust V TILT (RV31, 35, 40, 44) so that the blue and green horizontal lines overlap at the four corners of the screen.

1-7. Blue and Green Picture Horizontal Registration

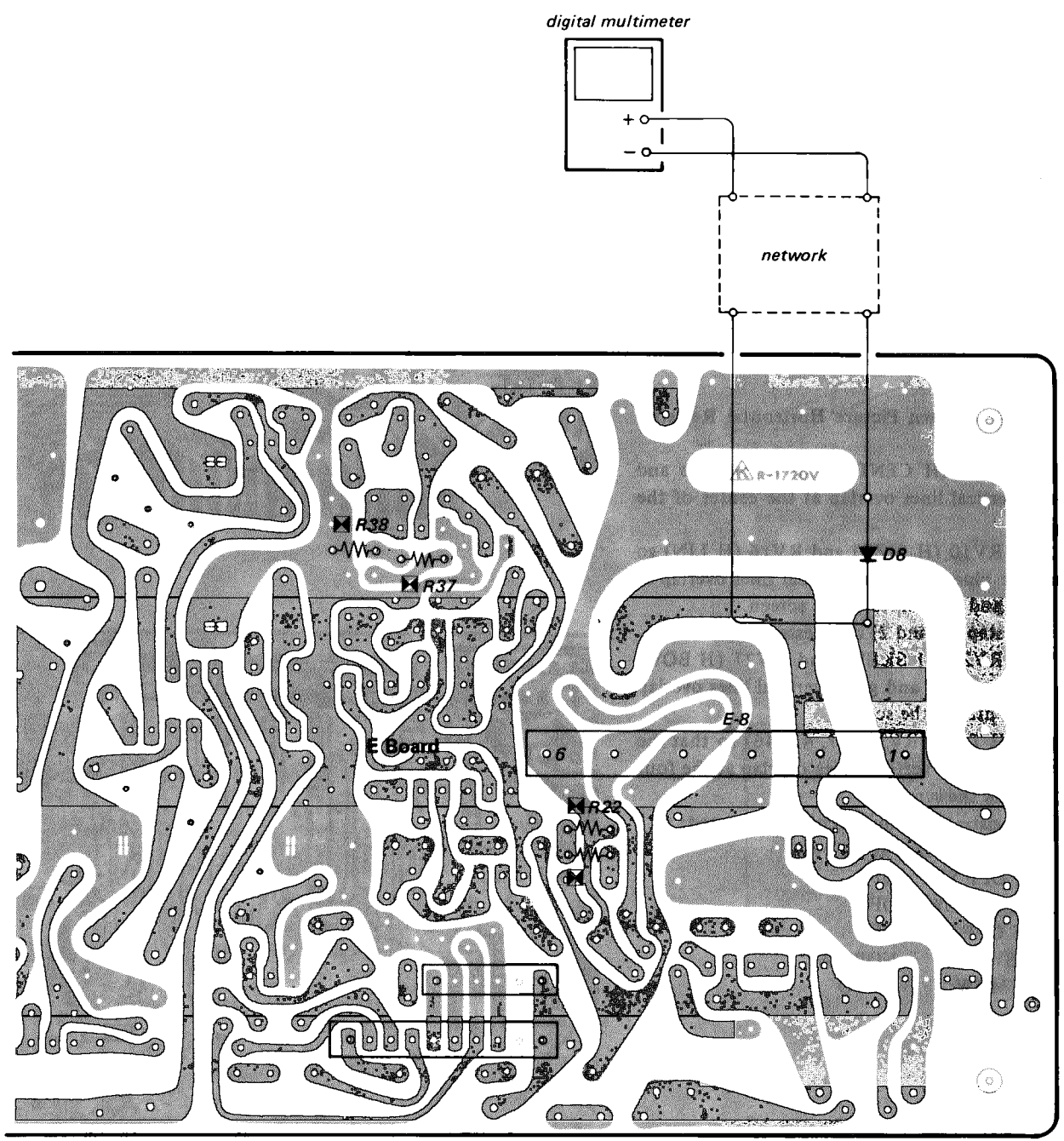
- 1) Adjust RV4 (H CENT) so that the blue and green vertical lines overlap at the center of the screen.
- 2) Adjust RV10 (H SIZE) and RV16 (H LIN) so that the blue and green vertical lines overlap at the left and right sides of the screen.
- 3) Repeat steps 1) and 2) if necessary.
- 4) Adjust RV21 (H SKEW) and RV27 (H BOW) so that the blue and green vertical lines overlap at the center of the screen.
- 5) Adjust H TILT (RV33, 37, 42, 46) so that the blue and green vertical lines overlap at the four corners of the screen.
- 6) After registration adjustment is completed:
Switch the switches as follows.
B CUT OFF SW: OFF
G CUT OFF SW: OFF
R CUT OFF SW: OFF
TEST SW: NORMAL
SYSTEM SW: AUTO

1-8. White Balance Adjustment

- 1) Set the focus pack R, G, B, G2 VR to minimum.
- 2) Set the PIC control to minimum and the BRT control to 50%.
- 3) Adjust the focus pack green G2 so that green glows faintly on the screen.
- 4) Set PIC and BRT to minimum (counterclockwise).
- 5) Adjust cut off white balance with focus pack G2 (R,B).
- 6) Set PIC and BRT to maximum (clockwise).
- 7) Set BB board RV2 (G DRIVE) to maximum.
- 8) Adjust BB board RV1,3 (B,R DRIVE) for white balance at white peak.

SECTION 2 SAFETY RELATED ADJUSTMENT

2-1. E BOARD ADJUSTMENT



2-1. E BOARD ADJUSTMENT

When replacing the following components, make the HV HOLD DOWN and HV REG adjustments.

E board with the parts mounted.

E board complete.

- R951 in high tension DC block
- Q11, Q10, D14
- D15, D16, R35, R36, R39 } in E board
- R37, R38

When replacing the following components, make the HV REG adjustment.

- R952 in high tension DC block
- Q5, Q6, Q7, D6
- D7, D9, D10, R18
- R19, R20, R21, C23 } in E board
- R22

E board complete.

Q901, Q904

When replacing the following components, make the G2 MAX adjustment.

R11, R12, R13

VPH-722Q . . R11, R12, R13 can not placed at the set on rare occasion when SER No. 391 and later.

VPH-1020Q . R11, R12, R13 can not placed at the set on rare occasion when SER No. 1651 and later.

— When a high tension meter is available. —

R37, R38 HV HOLD DOWN Adjustment

- (1) Confirm that the POWER switch is in OFF position.
- (2) Connect the positive lead of the high tension meter to the HV. DC block and the negative lead to the ground lug beside the heat sink as shown in Fig. 3-1.
- (3) Feed in a color-bar pattern from a color-bar/pattern generator and turn the BRIGHT and PICTURE controls for maximum beam current. (Be sure to synchronize the picture).

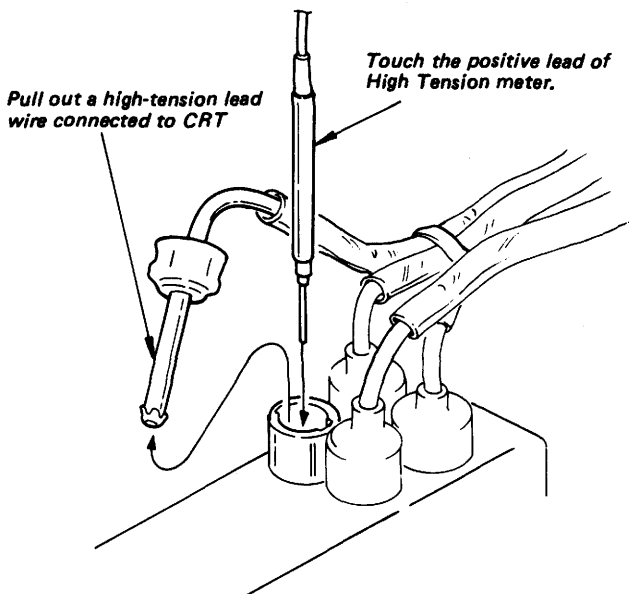


Fig. 3-1

- (4) Turn the POWER switch to ON and confirm that the power is automatically turned off just when the voltage on the high tension meter is 32.5 kV ±0.3 kV by connecting a resistor across R21 and R22. (HV HOLD DOWN circuit operates).
- (5) If necessary, select R37 and R38 (1/8W carbon resistor) and repeat above steps.
- (6) Turn the POWER switch to OFF.
- (7) Disconnect the resistor and mount it.
- (8) Perform the HV REG adjustment from step 4.

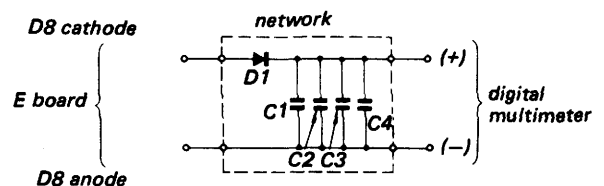
R21, R22 HV REG Adjustment

- (1) Confirm that the POWER switch is in OFF position.
- (2) Connect the positive lead of the high tension meter to the HV. DC block and the negative lead to the ground lug beside the heat sink.
- (3) Feed in a color-bar pattern from a color-bar/pattern generator and G2 control in minimum, R.G.B cut OFF switch. (Be sure to synchronize the picture).
- (4) Turn the POWER switch on ON and confirm that the voltage on the high tension meter is 31.0 kV ±0.3 kV.
- (5) If necessary, select R21 and R22 (1/8W carbon resistor) and repeat above steps.
- (6) Turn the POWER switch to OFF and disconnect the positive and negative leads of the high tension.
- (7) Disconnect the resistor and mount it.

— When a high tension meter is not available —

R37, R38 HV HOLD DOWN Adjustment

- (1) Confirm that the POWER switch is in OFF position.
- (2) Make the following network and connect a digital multimeter as shown in Fig. 3-2.



Diode (D1): V-11N (8-719-901-19)

Capacitors (C1-C4): 1,600 pF/1.5 kV polyethylene (1-129-924-00)

Digital multimeter: Capable of measuring the voltages is more than 1,100 V.

Fig. 3-2

- (3) Feed in a white pattern from a color-bar/pattern generator and turn the BRIGHT and PICTURE controls for maximum beam current. (Be sure to synchronize the picture).
- (4) Turn the POWER switch to ON and confirm that the power is automatically turned off just when the voltage on the digital multimeter is 955 ± 5 V dc by connecting a resistor across R37 and R38. (HV HOLD DOWN circuit operates).
- (5) If necessary, select R37 and R38 ($1/6$ W carbon resistor) and repeat above steps.
- (6) Turn the POWER switch to OFF.
- (7) Disconnect the resistor.
- (8) Perform the HV REG adjustment from step 4.

R21, R22 HV REG Adjustment

- (1) Confirm that the POWER switch is in OFF position.
- (2) Make the following network and connect a digital multimeter as shown in Fig. 3-2.
- (3) Feed in a white pattern from a color-bar/pattern generator and turn the BRIGHT and PICTURE controls for maximum beam current. (Be sure to synchronize the picture).
- (4) Turn the POWER switch to ON and confirm that the voltage on the digital multimeter is $914 \text{ V} \pm 5 \text{ V}$ dc.
- (5) If necessary, select R21 and R22 ($1/6$ W carbon resistor) and repeat above steps.
- (6) Turn the POWER switch to OFF and disconnect the network and the digital multimeter.

O. V. L Operation Checking

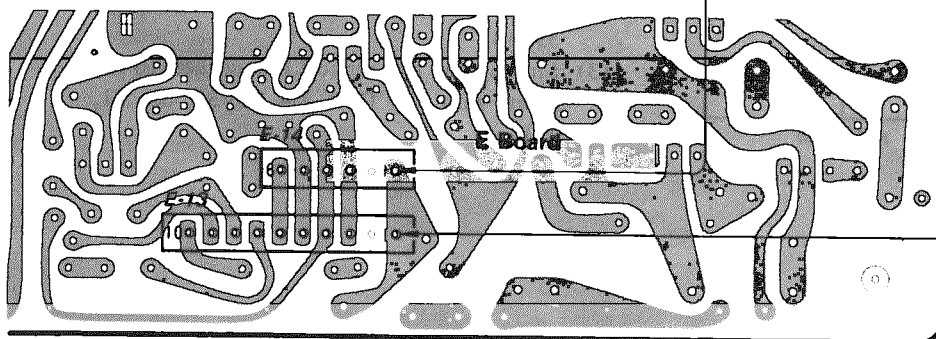
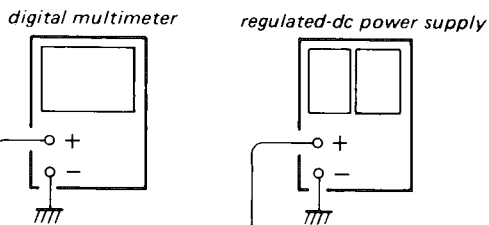
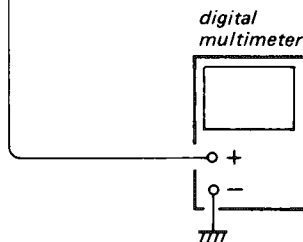
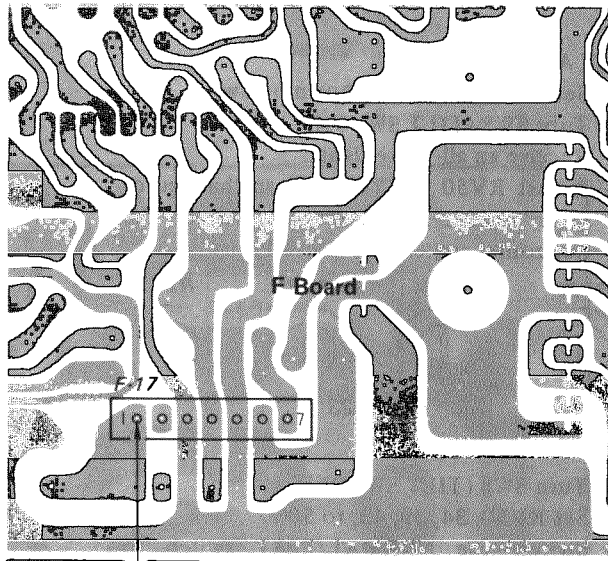
Replace the SW. REG. confirm O. V. L circuit operate. If this is not satisfied change the SW. REG.

- (1) Supply DC Voltage to with regulated-dc power supply.
- (2) Set the G2 control to minimum, and R. G. B cut OFF switch to ON.
- (3) Confirm that the O. V. L circuit operation when less than 130 V dc.

+B MAX CHECK

Replace the SW. REG. confirm +B voltage. If this not satisfied change the SW. REG.

- (1) Supply 130 V ac to with variable auto-transformer.
- (2) Feed in a color bar signal.
- (3) Set the G2 control (Focus Pack) to minimum, and R. G. B cut OFF switch (D BOARD) to ON.
- (4) Confirm the voltage on digital multimeter is 115 ± 1 V dc.



2-2. CR, CG AND CB BOARD ADJUSTMENT

G2 MAX ADJUSTMENT

Be sure to perform the following adjustment after replacing the parts below (marked \square on the schematic diagram).
Focus Pack, R11, R12, R13

- (1) Confirm that the POWER switch is in OFF position.
- (2) Set the G2 control at the minimum.
- (3) Power switch is in ON position and G2 control in maximum, and R. G. B cut OFF switch (D BOARD) to ON.
- (4) Confirm that the high tension meter indication is less than 1.3 kV ac. . . . VPH-722Q SER NO 39 and later
VPH-1020Q SER NO 165 and later

Confirm that the high tension meter indication is less than 1.0 kV ac. . . . VPH-722Q until SER NO 390
VPH-1020Q until SER NO 1659

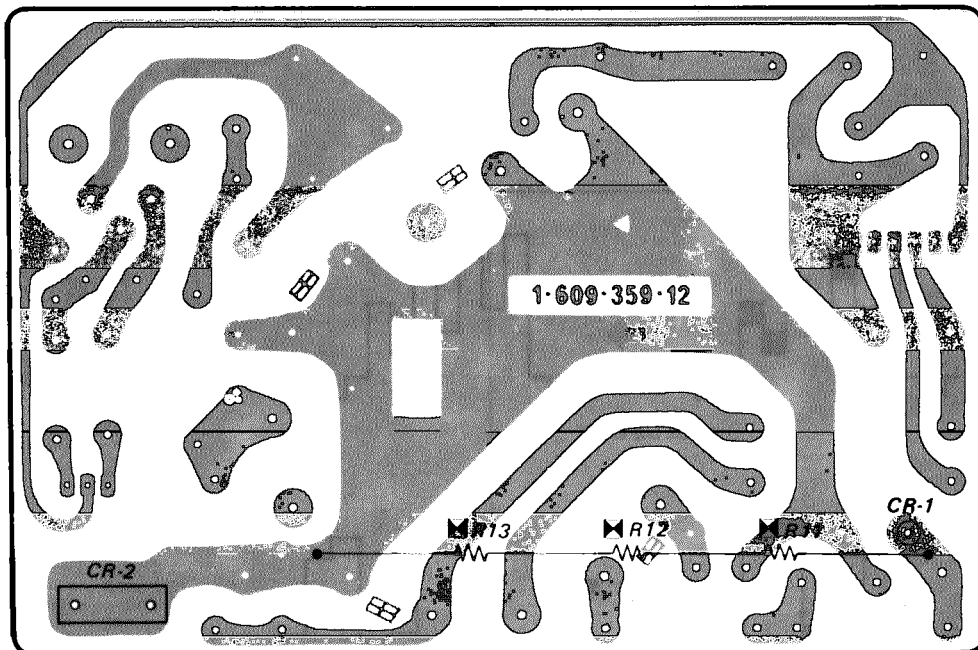
Note:

- When replacing the Focus Pack confirm on the each C board of R. G. B.
 - When replacing the R11, R12, R13 confirm only about that board.
- (5) If this is not satisfied, change one of the R11, R12, R13 ($15\text{ M}\Omega \rightarrow 10\text{ M}\Omega$) resistance value.
 - (6) Confirm that it is less than 1000 V.

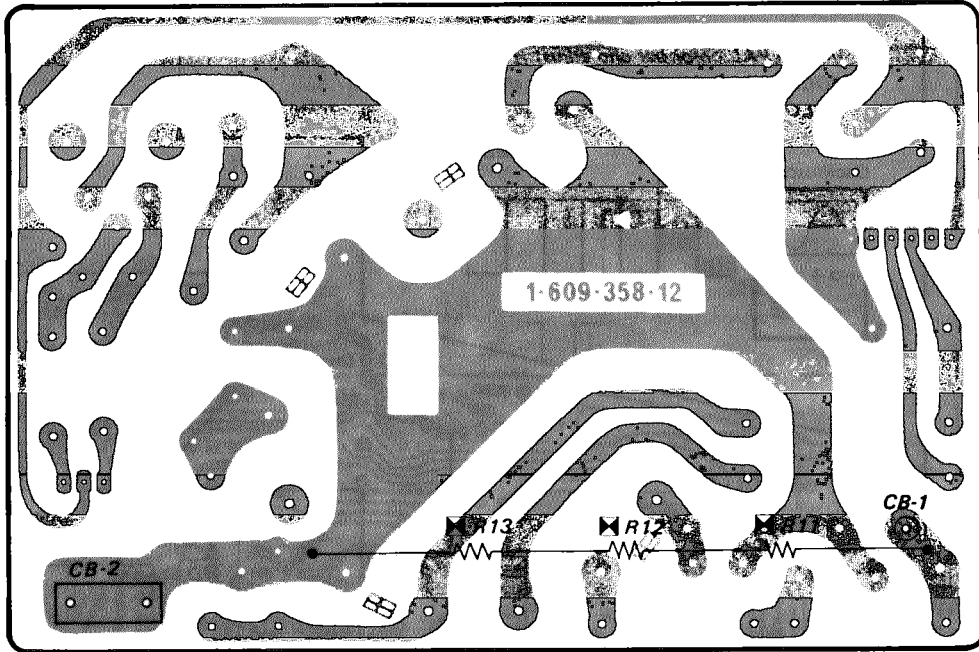
• H. V. HOLD DOWN OPERATION CHECKING

1. Turn the Power switch ON.
2. Confirm that the raster does appear.
3. Disconnect the E-11 connector from E Board.
4. Confirm that the HV. HOLD DOWN operate and confirm that the raster does disappear.
5. Turn the POWER switch OFF.
6. Connect the E-11 connector.

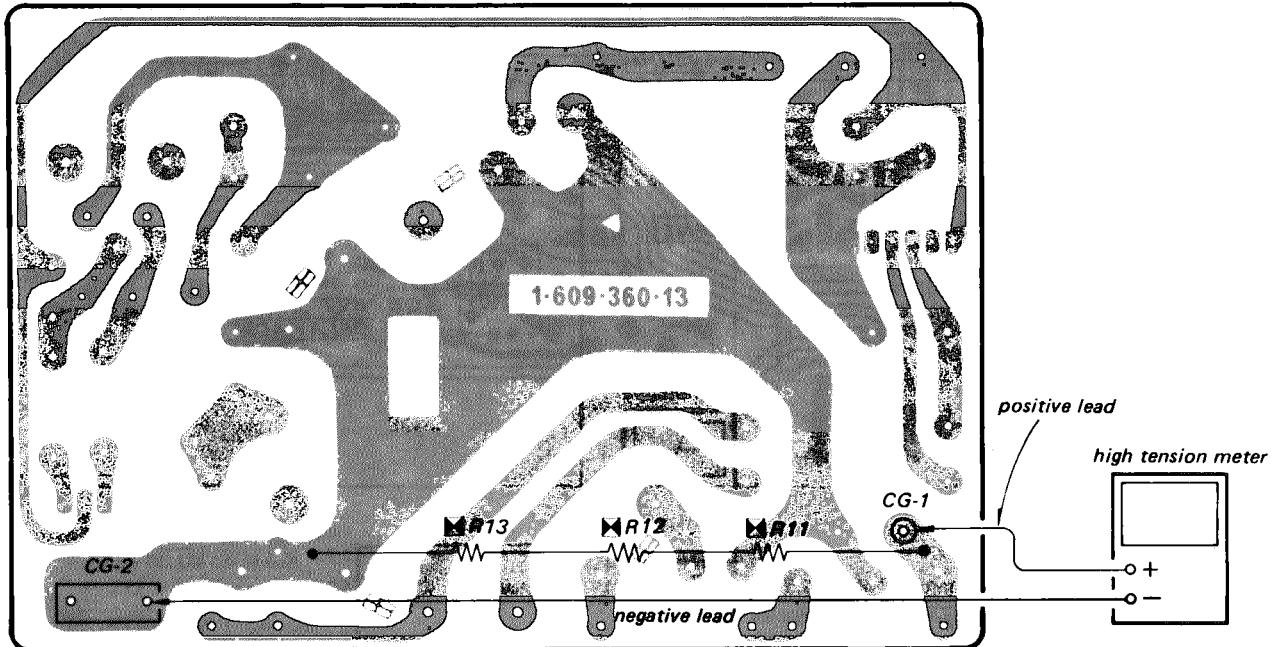
CR Board



CG Board

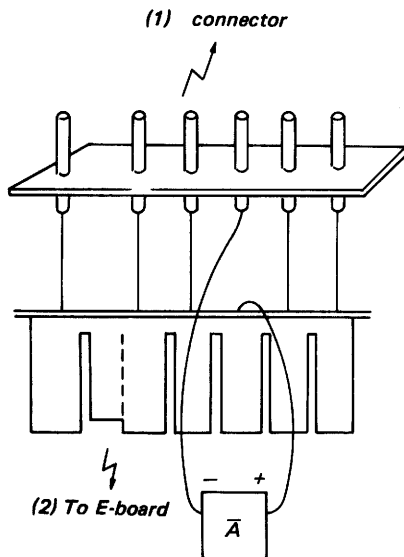


CB Board



— When a DC ammeter is available. —

- (1) Confirm that the power is turned off.
- (2) Disconnect the E-8 connector on the E board and install the tool shown in the figure. Connect a DC ammeter (3 mA range) with the E board side connected plus (+) side.
- (3) Set the G2 VR (for the screen) at MIN and turn on the power. (In this case, set BRT, PIX at MAX and input the colour bar signal.)
- (4) When the voltage at G2 is gradually increased, the current flow may stop temporarily (near 2.6 mA) due to ABL operation. If the current flow exceeds 2.6 mA, turn off the power and R13 (in series at 22 M Ω RC (1/2W)) as shown in the figure.
- (5) Confirm that the Ampere on the Ammeter is less than 2.6 mA.
- (6) If necessary select R11, R12 and R13 and repeat above steps.
- (7) Adjust other G2 VRs in the same way as described above.
- (8) Turn off the power and reconnected the E-8 connector.



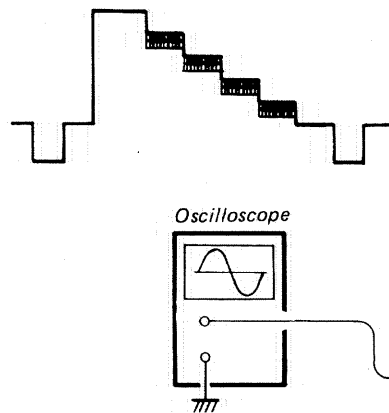
INFORMATION

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3-1. BA BOARD ADJUSTMENT

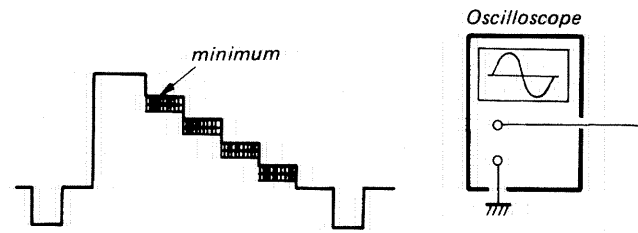
Y. TRAP

1. Input a PAL color bar.
2. Observe DL2 output on the oscilloscope.
3. Turn T2 (4.43MHz TRAP) core and adjust so that the 4.43MHz carrier component is minimum.
4. Input a SECAM color bar.
5. Turn T3 (4.25MHz TRAP) core and adjust so that the 4.25MHz carrier component is minimum.



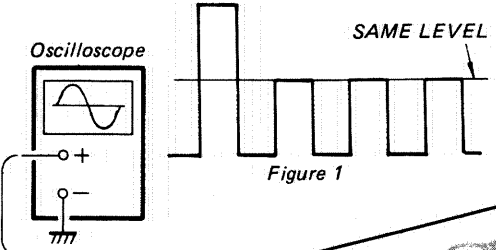
1H COMB Adjustment

1. Input an NTSC color bar.
2. Observe DL2 output on the oscilloscope.
3. While tracking with BD board T1 and RV3, adjust the 3.58MHz carrier component so that it is minimum.



COLOR Adjustment

1. Input a SECAM color bar.
2. Set the COLOR VR to center.
3. Adjust RV10 (SECAM SUB COLOR) so that blue output is as shown in Figure 1.
4. Input a PAL color bar and adjust RV8 (PAL SUB COLOR) so that blue output is as shown in Figure 1. COLOR VR center = 6.72V DC

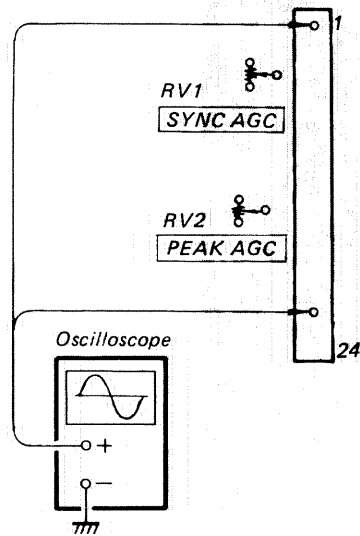


PAL MATRIX

1. Input a PAL color bar.
2. Observe blue output and red output waveforms.
3. Set COLOR VR to minimum.
4. While tracking with T6 (DAT) and RV7 (DELAY ADJ VR), adjust so that blue output and red output waveforms are both as shown in Figure 2.
5. Fine adjust ANTI-PAL after completing.

VIDEO AGC

1. Input a PAL color bar.
2. Turn the PEAK AGC VR (RV2) counterclockwise and make IC1 pin 22 signal level maximum.
3. Turn the SYNC AGC VR (RV1) so that IC1 pin 22 signal is 1.1Vp-p.
4. Turn the PEAK AGC VR (RV2) counterclockwise and set at the point where output starts to drop.
5. Adjust the SYNC AGC VR (RV1) so that IC1 pin 22 signal is $1.0 \pm 0.05Vp-p$.



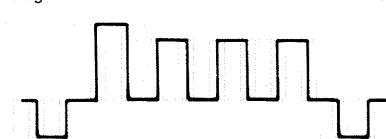
SECAM COLOR

1. Input a SECAM color bar.
2. Turn T17 (ID) core so that IC7 pin 25 DC level is maximum.
3. While observing the blue output waveform, adjust T5 (BELL FILTER) so that the output waveform peak portions are flat. (Figure A)

4. DISCRI Adjustment

- (1) Adjust T8 (B-Y DISCRI) so that the blue output waveform valleys are the same level.
- (2) Adjust T9 (R-Y DISCRI) so that red output waveform valleys are the same level. (Figure A)
- (3) After completing (1) and (2), fine adjust so that color components do not appear in the color bar black portion and white portion.

Figure A

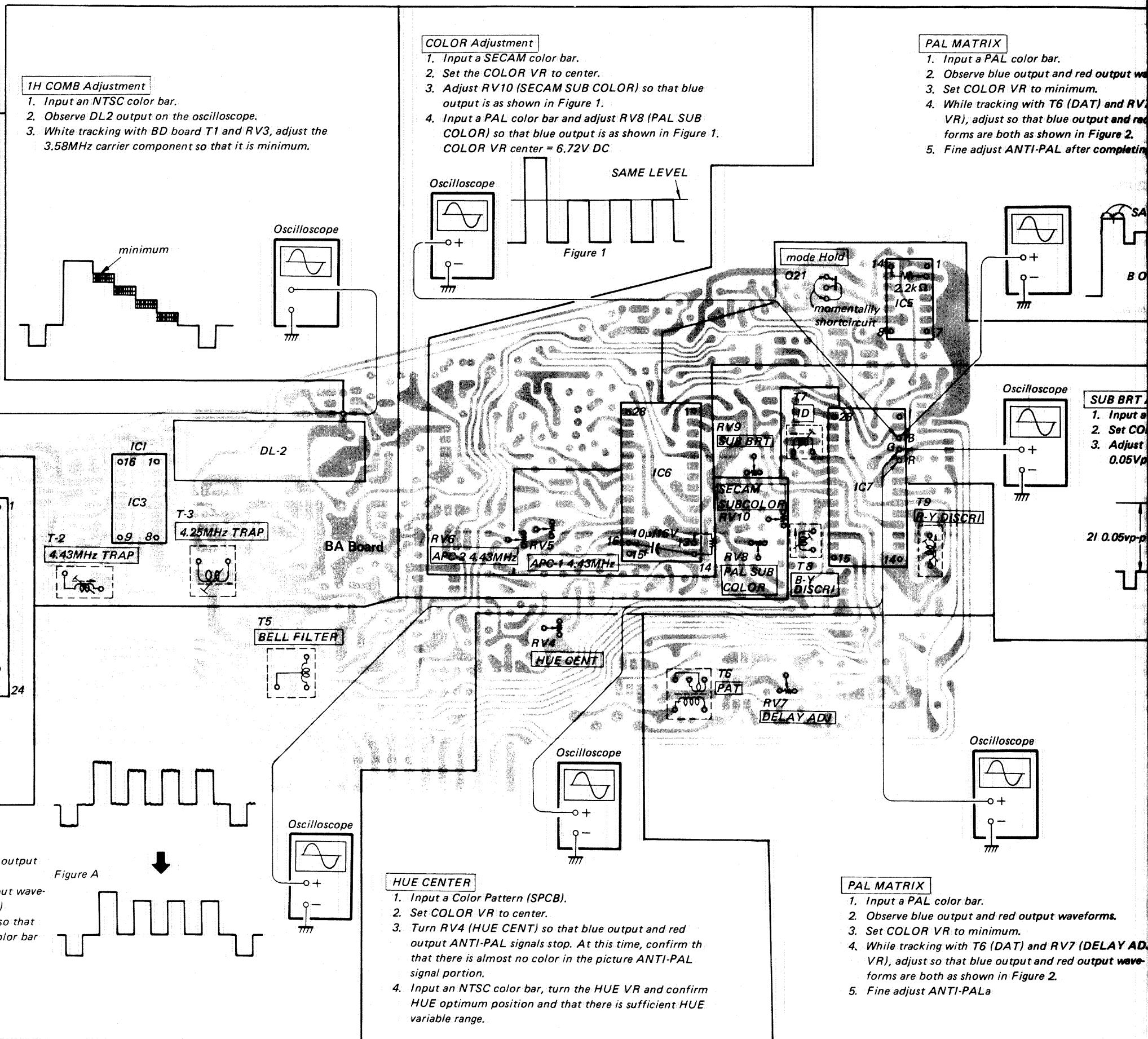


HUE CENTER

1. Input a Color Pattern (SPCB).
2. Set COLOR VR to center.
3. Turn RV4 (HUE CENT) so that blue output and red output ANTI-PAL signals stop. At this time, confirm that there is almost no color in the picture ANTI-PAL signal portion.
4. Input an NTSC color bar, turn the HUE VR and confirm HUE optimum position and that there is sufficient HUE variable range.

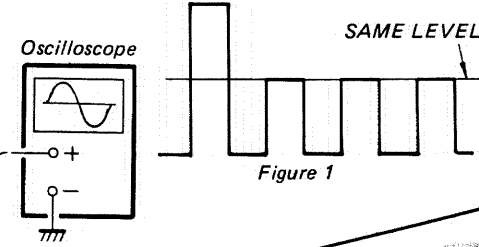
PAL MATRIX

1. Input a PAL color bar.
2. Observe blue output and red output waveforms.
3. Set COLOR VR to minimum.
4. While tracking with T6 (DAT) and RV7 (DELAY ADJ VR), adjust so that blue output and red output waveforms are both as shown in Figure 2.
5. Fine adjust ANTI-PALa



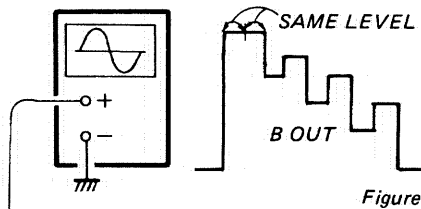
COLOR Adjustment

1. Input a SECAM color bar.
2. Set the COLOR VR to center.
3. Adjust RV10 (SECAM SUB COLOR) so that blue output is as shown in Figure 1.
4. Input a PAL color bar and adjust RV8 (PAL SUB COLOR) so that blue output is as shown in Figure 1. COLOR VR center = 6.72V DC



PAL MATRIX

1. Input a PAL color bar.
2. Observe blue output and red output waveforms.
3. Set COLOR VR to minimum.
4. While tracking with T6 (DAT) and RV7 (DELAY ADJ VR), adjust so that blue output and red output waveforms are both as shown in Figure 2.
5. Fine adjust ANTI-PAL after completing the adjustment.

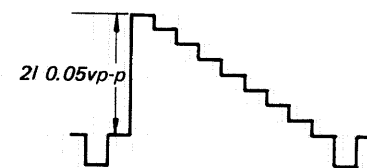


PAL Color Sync Fine Adjustment

1. Input a PAL color bar.
2. Put a 100kΩ resistor between IC6 pin (13) and ground and release killer.
3. Put a 10μF/16V electrolytic capacitor between IC6 pin 16 and ground and cut the burst signal.
4. Connect IC5 pin (2) to the +12V line via a 2.2kΩ resistor and get 4.43MHz mode.
5. Adjust RV6 (APC-2 4.43MHz) to get color sync.
6. Remove the 2.2kΩ resistor in step 4.
7. Input an NTSC color bar.
8. Ground Q21 base momentarily and get 3.58MHz mode. (Repeat two or three times if it does not change the first time.)
9. Adjust RV5 (APC-1 4.43MHz) to get color sync.

SUB BRT Adjustment

1. Input a PAL color bar.
2. Set COLOR VR to minimum.
3. Adjust RV9 (SUB BRT) so that the blue output is 2 ± 0.05Vp-p. from the pedestal level.



HUE CENTER

1. Input a Color Pattern (SPCB).
2. Set COLOR VR to center.
3. Turn RV4 (HUE CENT) so that blue output and red output ANTI-PAL signals stop. At this time, confirm that there is almost no color in the picture ANTI-PAL signal portion.
4. Input an NTSC color bar, turn the HUE VR and confirm HUE optimum position and that there is sufficient HUE variable range.

PAL MATRIX

1. Input a PAL color bar.
2. Observe blue output and red output waveforms.
3. Set COLOR VR to minimum.
4. While tracking with T6 (DAT) and RV7 (DELAY ADJ VR), adjust so that blue output and red output waveforms are both as shown in Figure 2.
5. Fine adjust ANTI-PALa

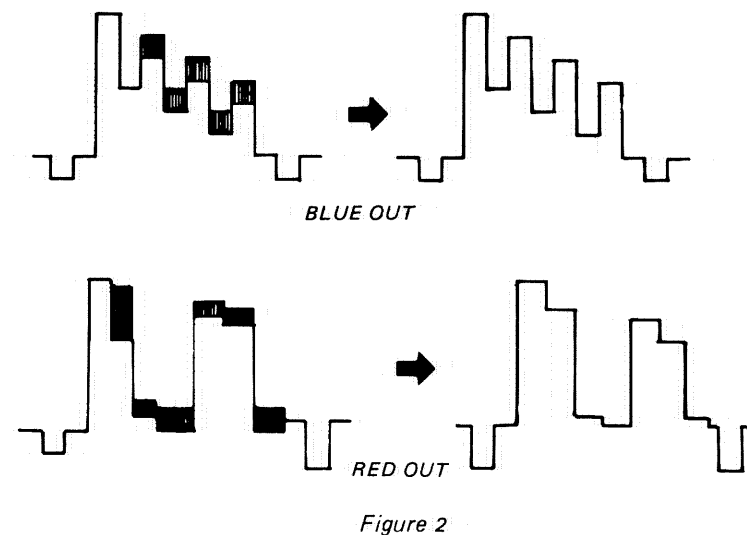


Figure 2