

# VPH-722Q/1020Q

## SERVICE MANUAL

*US Model*

VPH-722Q

Chassis No. SCC-519A-A

VPH-1020Q

Chassis No. SCC-520A-A



September, 1983

### SPECIFICATIONS

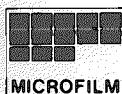
<b>Optical</b>	
Projection system	3 picture tubes, 3 lenses, direct projection system
Picture tube	5.5-inch high-brightness monochrome tubes, with coolant sealed
Projection lens	High-performance acrylic lenses F 1.0/130 mm
Projected picture size	VPH-722Q: 72 inches measured diagonally VPH-1020Q: 100 inches measured diagonally
Picture brightness (obtained with a curved screen of gain 12)	VPH-722Q: More than 130 fL VPH-1020Q: More than 65 fL
Throwing distance	VPH-722Q: Approx. 2,480 mm (97 <sup>3</sup> / <sub>4</sub> inches) VPH-1020Q: Approx. 3,368 mm (132 <sup>3</sup> / <sub>4</sub> inches)
Viewing distance	VPH-722Q: 3 to 20 m VPH-1020Q: 4 to 25 m
<b>General</b>	
Color system	PAL, SECAM, NTSC and NTSC <sub>4,43</sub> systems, switched automatically
Resolution	More than 600 TV lines (RGB inputs) More than 400 TV lines (video line inputs)
RGB inputs	Character display capacity: 2000 characters (80 letters × 25 lines) Horizontal frequency: 15.75 kHz Vertical frequency: 60 Hz
Test signal	Cross-hair/crosshatch test pattern generator is incorporated
Speaker	Approx. 5 × 9 cm (2 × 3 <sup>5</sup> / <sub>8</sub> inches), 2 units
Power requirements	VPH-722Q/1020Q: 120V ac, 60 Hz

Power consumption	VPH-722Q/1020Q: 165W (max.)
Dimensions	Approx. 508 × 258 × 582 mm (w/h/d) (20 × 10 <sup>1</sup> / <sub>4</sub> × 23 <sup>3</sup> / <sub>8</sub> inches) with the brackets pushed down, incl. projecting parts and controls
Weight	Approx. 26 kg (57 lb 5 oz)
Inputs	

Signal	Connector	Signal level	Remarks
Video input	[VTR] 8-pin (pins 2&6)	1V (p-p)±0.2 V	PAL/SECAM/ NTSC/NTSC <sub>4,43</sub> 75 ohms sync negative
	[VIDEO] BNC connector		
	[RGB IN] 5 BNC connectors	Non- composite RGB: 0.7V(p-p) ±0.15V or TTL level Sync: 0.5V(p-p) to 6V (p-p)	75 ohms, sync negative
Audio input	[VTR] 8-pin (pins 1&5)	-5 dBs (436 mV rms)	47 kilohms
	[AUDIO] minijack		

— Continued on next page —

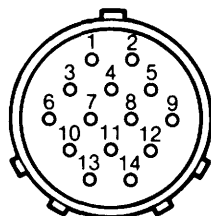
**COLOR VIDEO PROJECTOR**  
**SONY**®



**MON**

**REMOTE connector**

14-pin plug  
For connecting the  
VPR-722 remote controller




Pin No.	Signal	Pin. No.	Signal
1	Ground	8	Input select
2	+28V --- 60mA	9	Audio (incl. volume control)
3	Hue 1	10	Brightness
4	Hue 2	11	Sharpness
5	Hue 3	12	Color
6	Video	13	Picture
7	Ground (video)	14	Power ON: 12V OFF: 0V

Accessory supplid      AC power cord  
Optional units/accessories

- Remote controller VPR-722
- Projector pedestal SU-722
- Projector suspension support PSS-722
- Video screen VPS-100F1 (100" flat)
- VPS-72HG1 (72" curved)
- VPS-100HG1 (100" curved)
- Carrying case VLC-722
- CCQ cables

**SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

While the information given is true at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).  
Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

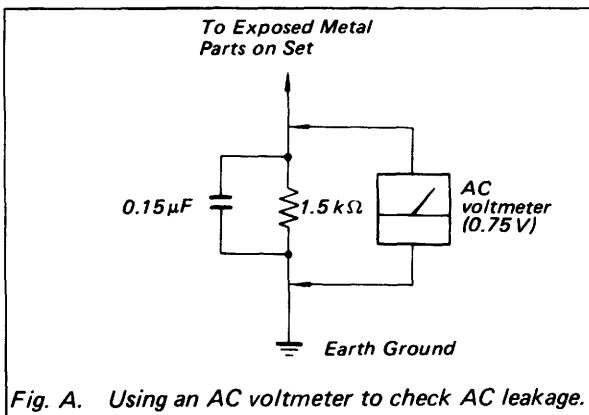


Fig. A. Using an AC voltmeter to check AC leakage.

## LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

## HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60–100 watt trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

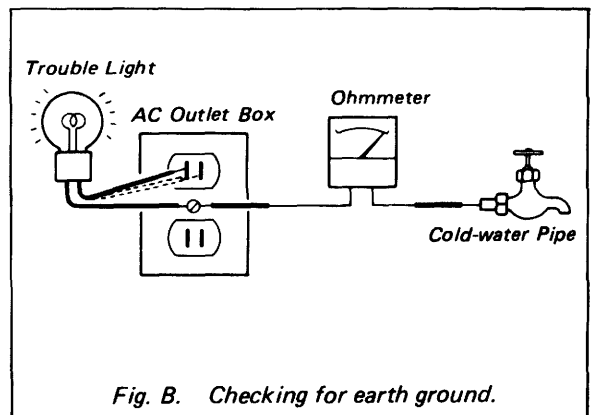
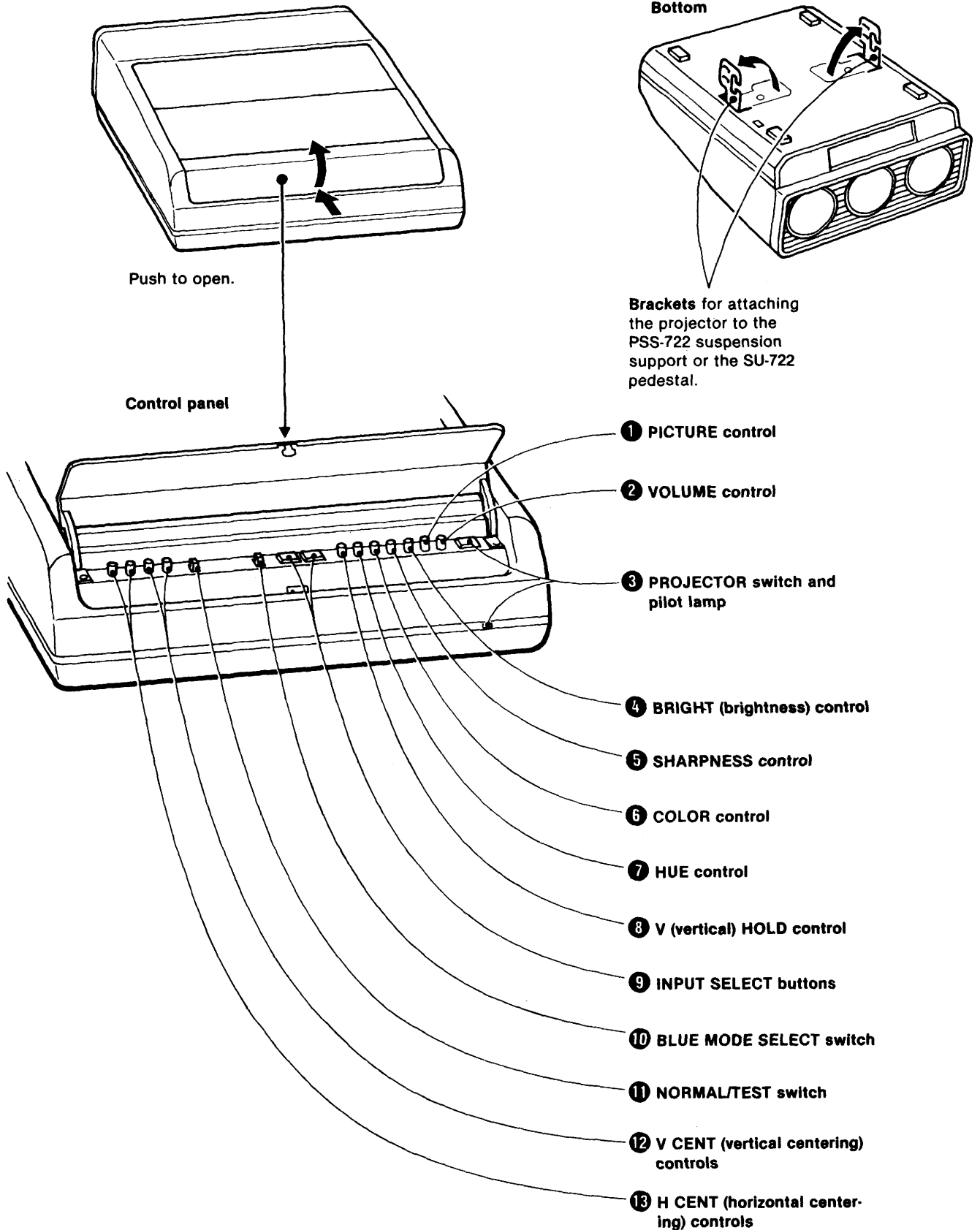


Fig. B. Checking for earth ground.

# SECTION 1 GENERAL

## 1-1. LOCATION AND FUNCTION OF CONTROLS



● **PICTURE control**

Adjusts the contrast, color intensity and brightness simultaneously in the proper ratio.

● **VOLUME control**

Adjusts the volume.

● **PROJECTOR switch**

Depress to turn the projector on. The green pilot lamp will light. To turn off, press the switch again.

● **BRIGHT (brightness) control**

Adjusts the brightness.

● **SHARPNESS control**

Adjusts the sharpness. Clockwise rotation makes the picture sharp; counterclockwise rotation makes it soft.

● **COLOR control**

Adjusts the color intensity. Clockwise rotation makes the picture vivid; counterclockwise rotation makes it pale.

● **HUE control**

This control is effective only for a program of the NTSC or NTSC<sub>4.43</sub> color system. Use to obtain the most natural skin tones. Clockwise rotation makes the skin tones greenish; counterclockwise rotation makes them purplish.

● **V (vertical) HOLD control**

If the picture rolls vertically, adjust this control until the picture stabilizes.

● **INPUT SELECT buttons**

Press to select the program source to be projected.

LINE: For inputs from the LINE IN connectors

RGB: For inputs from the RGB IN connectors

If audio signals are connected to the LINE IN, the sound will be heard.

● **BLUE MODE SELECT switches**

This switch is effective only for RGB inputs.

Usually set to NORMAL. Set to BB (blue background) to change the black background of the display to blue, and to CB (clear blue) to lighten blue part of the display.

The display should become easier to view.

● **NORMAL/TEST switch**

Usually set to NORMAL to project inputs from the LINE IN or RGB connectors.

Set to TEST to display the built-in cross-hair pattern on the screen for easier adjustments of the projector's position and registration.

● **V CENT (vertical centering) controls**

Adjust vertical registration of red and blue.

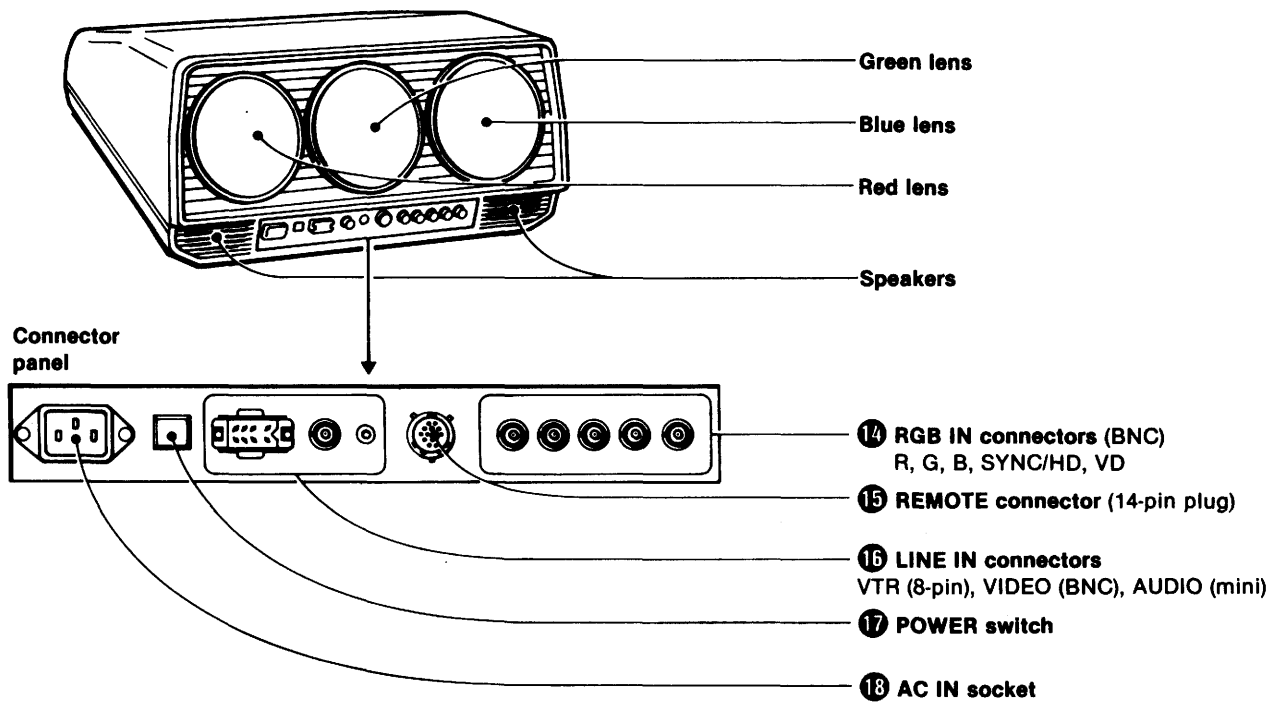
● **H CENT (horizontal centering) controls**

Adjust horizontal registration of red and blue.

● ● ● controls do not function for RGB inputs.

To project RGB inputs of TTL level in better condition, slightly darken the display by turning the PICTURE and BRIGHT controls counterclockwise.

● through ● do not function when the VPR-722 remote controller is connected to the REMOTE connector. The same controls on the VPR-722 are operative.



**14 RGB IN connectors (BNC)**

Allow a character generator, microcomputer, video camera or a special adaptor for future videotext/teletext having digital or analog RGB outputs to be connected.

R, G, B: to RGB outputs

SYNC/HD: to a composite sync or horizontal sync output

VD: to a vertical sync output

**15 REMOTE connector (14-pin plug)**

To remotely control the projector, for instance, when it is installed on the ceiling, connect the optional VPR-722 remote controller here using the optional CCQ connecting cable.

**16 LINE IN connectors**

Allow a video tape recorder, video camera, color receiver/monitor, etc. having video/audio line outputs to be connected.

VTR (8-pin): to an 8-pin TV connector on a VTR

VIDEO (BNC): to a video line output

AUDIO (mini): to an audio line output

**Caution:** Use either the VTR or VIDEO/AUDIO connectors, but not both simultaneously.

Do not connect a TV tuner or a color receiver/monitor equipped with an 8-pin connector to the VTR connector, because signal assignment is different.

**17 POWER switch**

Depress to turn the power on. When the VPR-722 remote controller is used, power will be supplied to the controller.

**18 AC IN socket**

Connect the supplied ac power (mains) cord here and to an ac (mains) outlet.

**WARNING for the customers in the United Kingdom**

**THIS APPARATUS MUST BE EARTHED** to your 3-pin plug in accordance with following instructions.

**Important**

The wires in the mains lead are coloured in accordance with the following code;

Green-and-yellow.....Earth (Safety earth)

Blue.....Neutral

Brown.....Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked with the letter E or by the safety earth symbol  $\perp$  or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

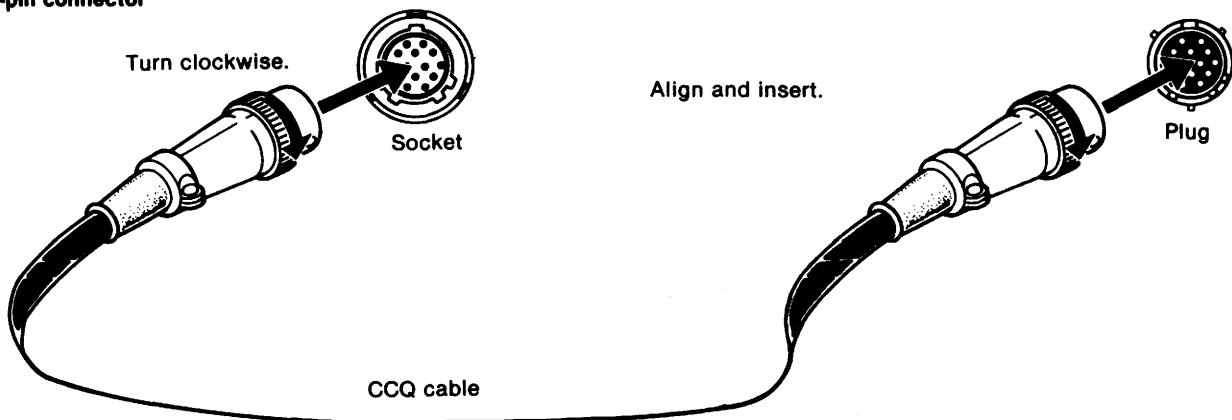
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

## 1-2. SYSTEM CONNECTIONS

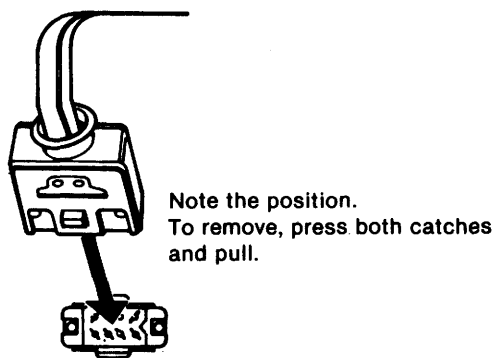
### CONNECTING NOTES

- First make sure that the power to each piece of equipment is turned off.
- Use suitable connecting cables according to the equipment to be connected.
- The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.

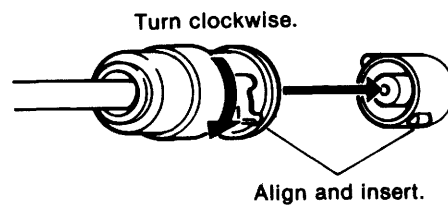
#### 14-pin connector



#### 8-pin connector



#### BNC connector

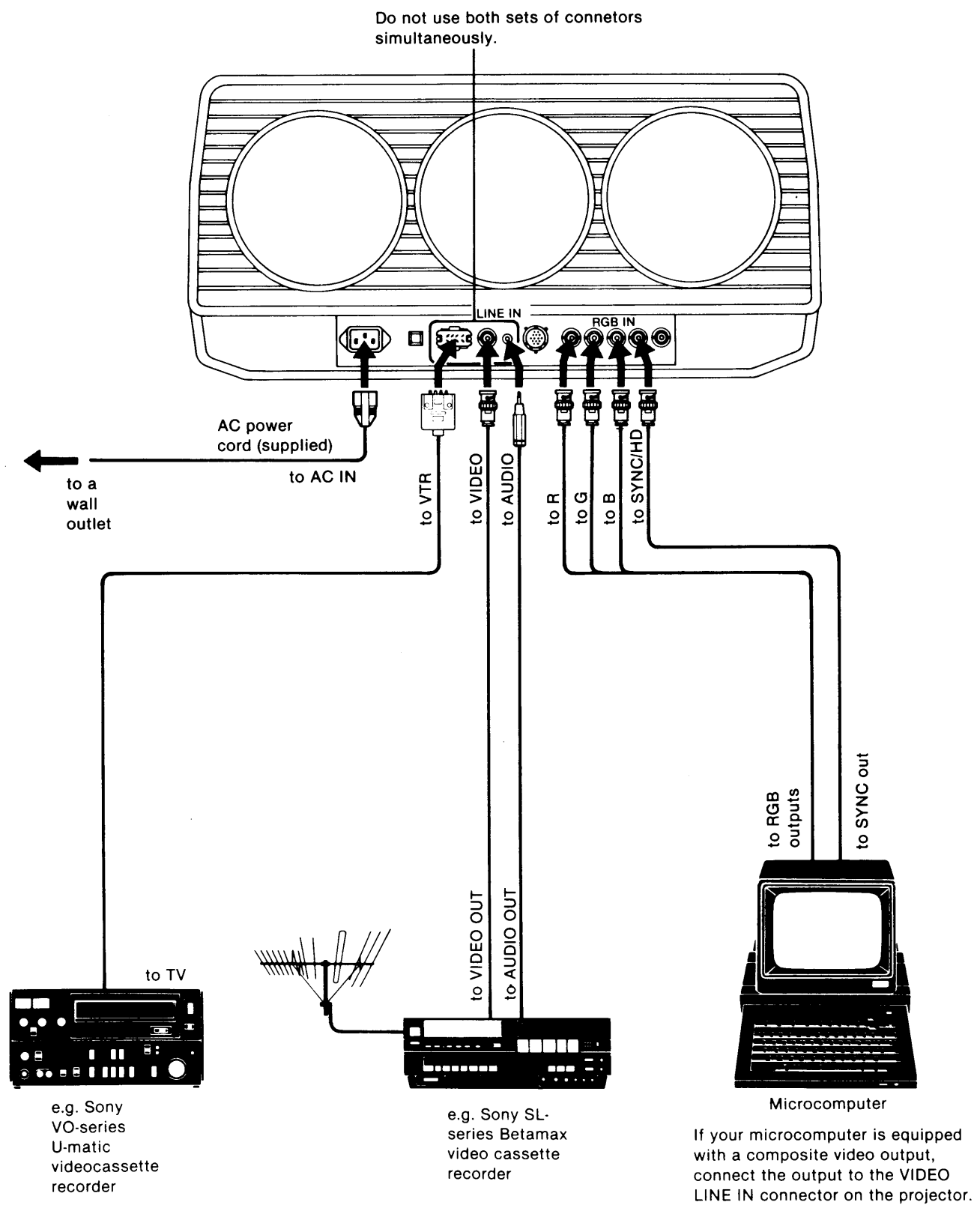


- The cable may be extended to max. 50m. If the connecting cable is too long (longer than 50 m), picture quality may be degraded somewhat.
- To disconnect the cable, pull it out by grasping the plug. Never pull the cable itself.
- Read the instruction manual of the equipment to be connected.

### EXAMPLES OF CONNECTIONS

Using the projector without the VPR-722 remote controller

Do not use both sets of connectors simultaneously.



e.g. Sony VO-series U-matic videocassette recorder

e.g. Sony SL-series Betamax video cassette recorder

Microcomputer

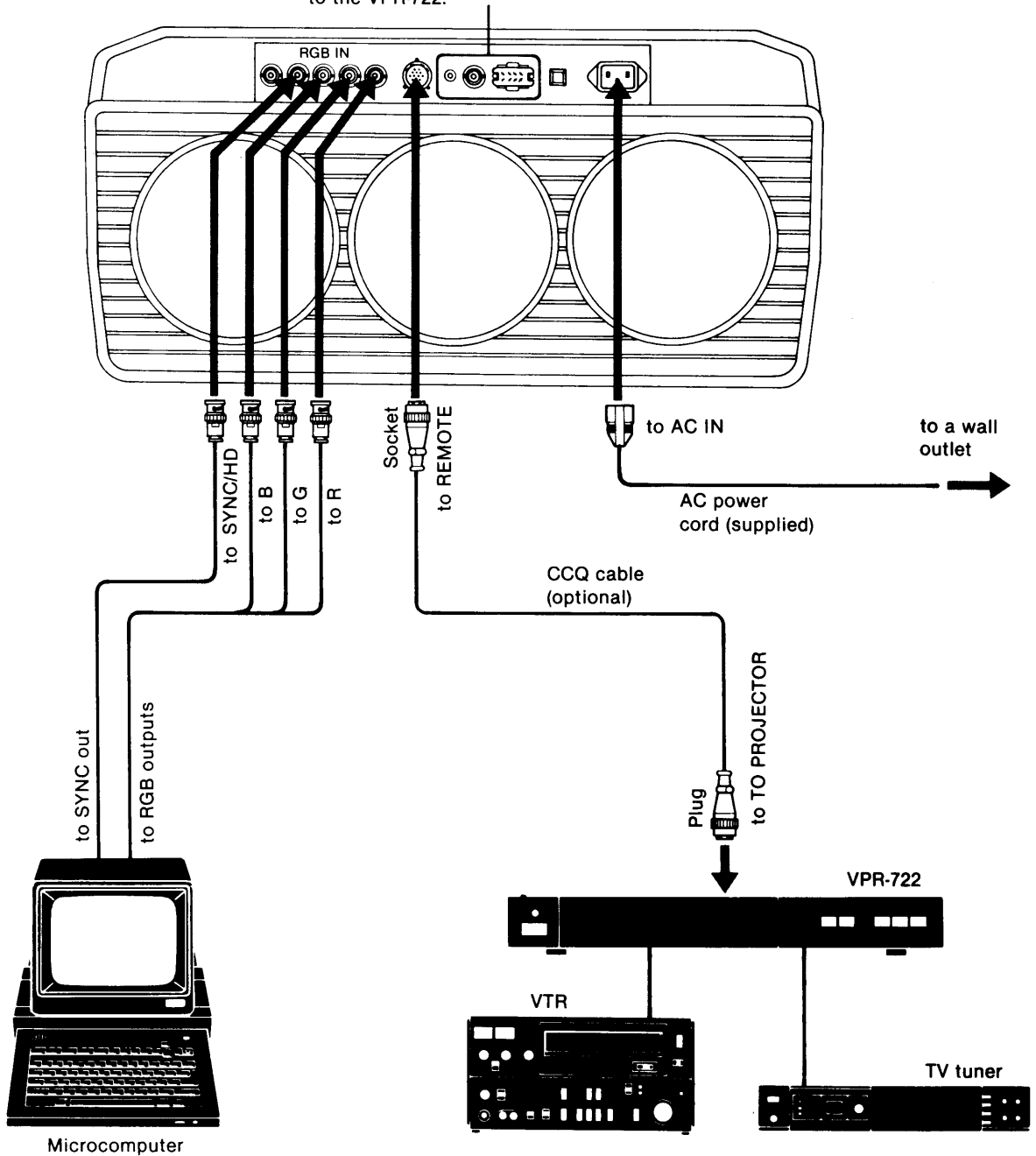
If your microcomputer is equipped with a composite video output, connect the output to the VIDEO LINE IN connector on the projector.



**Using the projector with the VPR-722 remote controller**

Use the optional VPR-722 remote controller when the projector is installed on the ceiling or at a distance from your seat. Power on/off, program selection and picture adjustments can be remotely controlled.

The LINE IN connectors will be disconnected automatically when the VPR-722 is connected. Connect a VTR, TV tuner, video camera, etc. to the VPR-722.



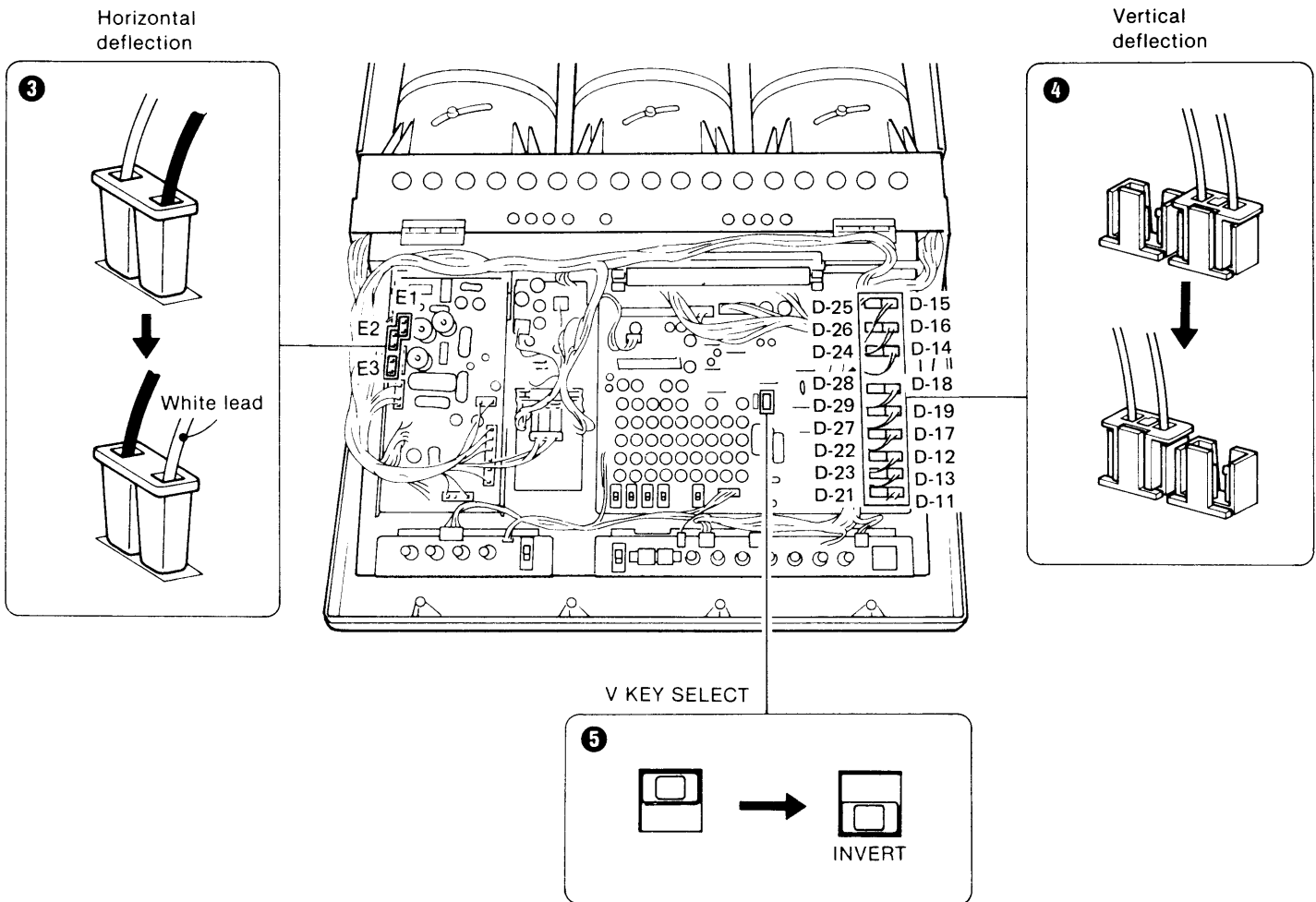
If your microcomputer is equipped with a composite video output, connect the output to the VIDEO LINE IN connector on the controller.

For details on the connections, see the instruction manual of the VPR-722.

1-3. POLARITY CHANGE

The projector is preadjusted at the factory to be used on the desk with the bracket side down. When the projector is installed on the ceiling with the bracket side up, the polarity should be changed.

- ❶ Make sure that the power is not connected.
- ❷ Open the cabinet.
- ❸ Reverse the polarity of connectors E1, E2 and E3.
- ❹ Move the connectors from the right D-11 through D-19 receptacles to the left D-21 through D-29 receptacles.
- ❺ Set the V KEY SELECT switch to INVERT.

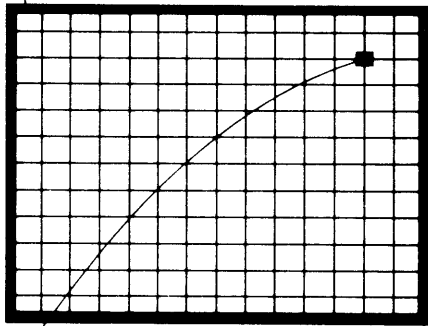


Check that the connectors are inserted firmly, then proceed with the lens focus adjustment with the projector's cabinet open.

**1-4. LENS FOCUS ADJUSTMENT**

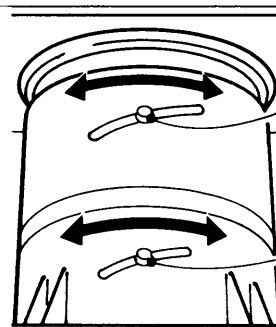
- 1 Open the cabinet.
- 2 Install the projector to the proper position on the floor or the ceiling.
- 3 Connect the power cord supplied to the AC IN socket and to an ac outlet, turn on the POWER switch on the connector panel, then turn the PROJECTOR switch on. The green lamp will light up.
- 4 Set the NORMAL/TEST switch to TEST and the TEST switch to HATCH. A cross hatch pattern will be displayed.
- 5 Check the following.

Does the screen fit inside the white frame? → If not, adjust the position of the projector.



Does a white marker appear here? → If not, the polarity change has not been properly made. Check the steps on page 10.

- 6 Set the G (green) and R (red) CUT OFF switches to ON, then adjust the focus of the blue lens.

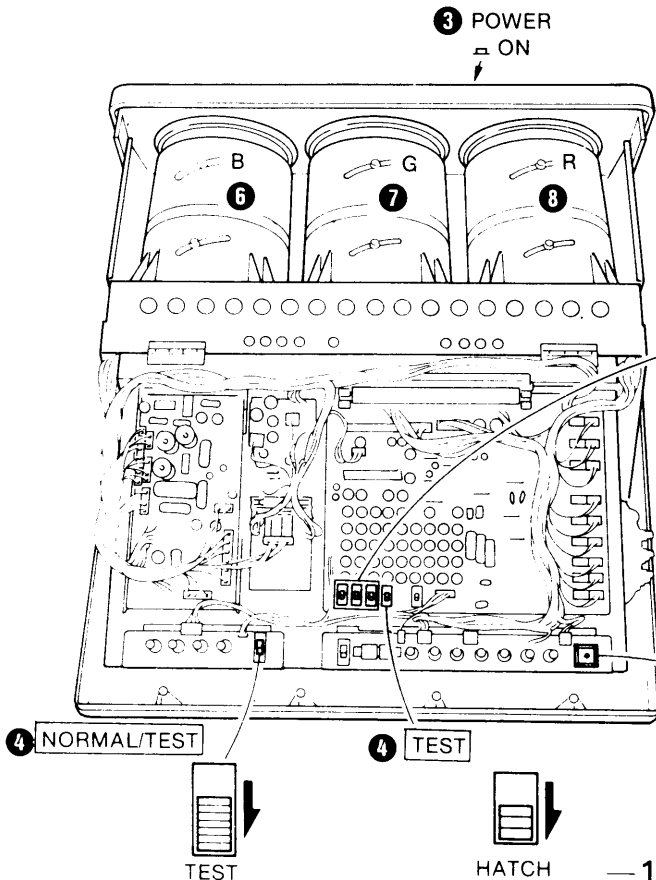


- 2) Loosen the screw, adjust the focus on the corners, then tighten the screw.
- 1) Loosen the screw, adjust the focus on the corners, then tighten the screw.

- 7 Set only the G CUT OFF switch to OFF and the other switches to ON, then adjust the focus of the green lens.
- 8 Set only the R CUT OFF switch to OFF and the other switches to ON, then adjust the focus of the red lens.
- 9 Close the cabinet.

**Caution**

Take care not to touch portions of the projector other than these indicated below because dangerous high voltages are present. To change the polarity, first turn the POWER switch off.



	B CUT OFF	G CUT OFF	R CUT OFF
6	[Switch OFF]	[Switch ON]	[Switch ON]
7	[Switch ON]	[Switch OFF]	[Switch ON]
8	[Switch ON]	[Switch ON]	[Switch OFF]

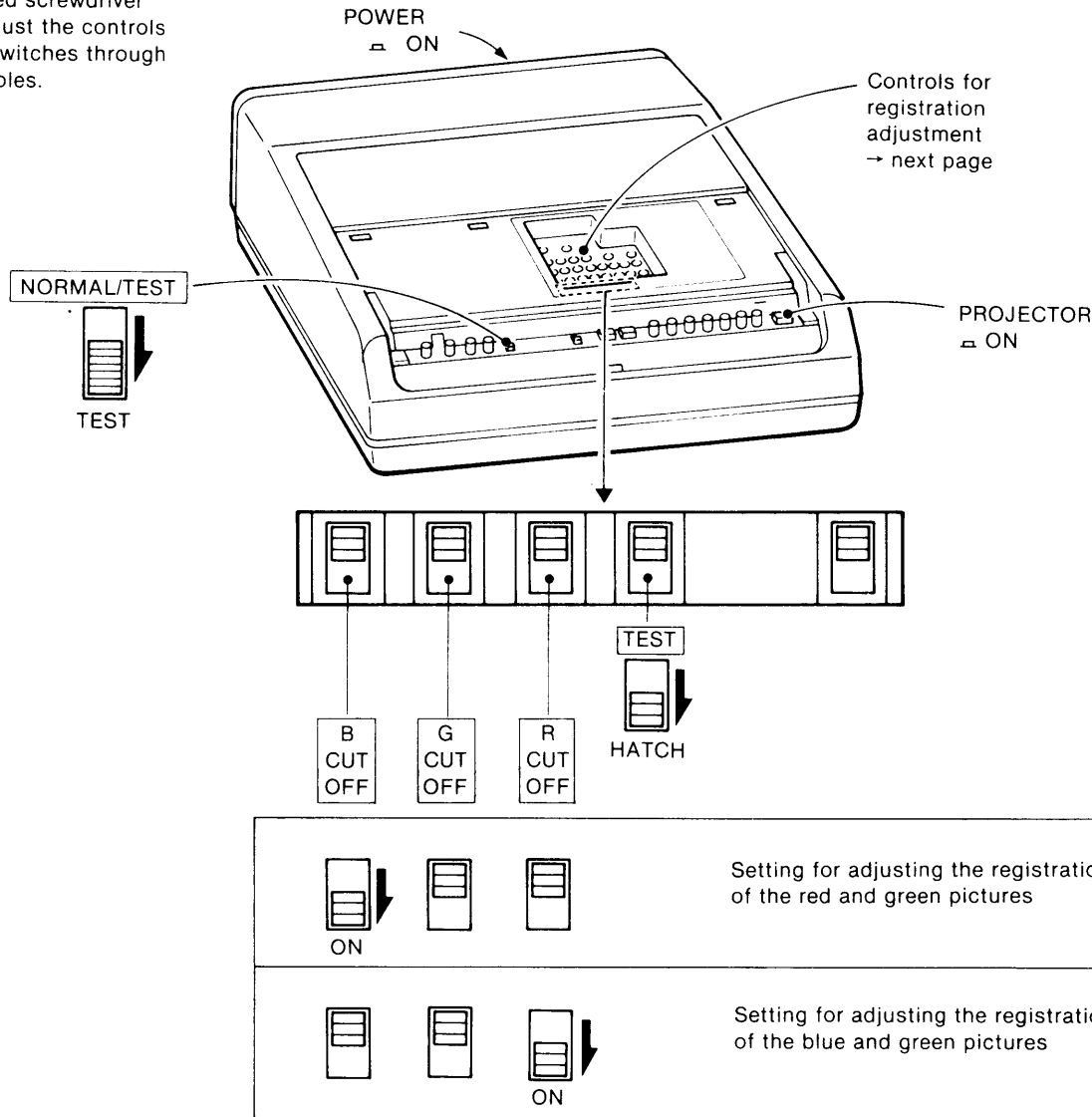
3 PROJECTOR ON

Proceed with the registration adjustment.

## 1-5. REGISTRATION ADJUSTMENT

### Location of controls

Use a small, flat-headed screwdriver to adjust the controls and switches through the holes.



For installation types ② and ④, check the cross hatch pattern referring to page 11.

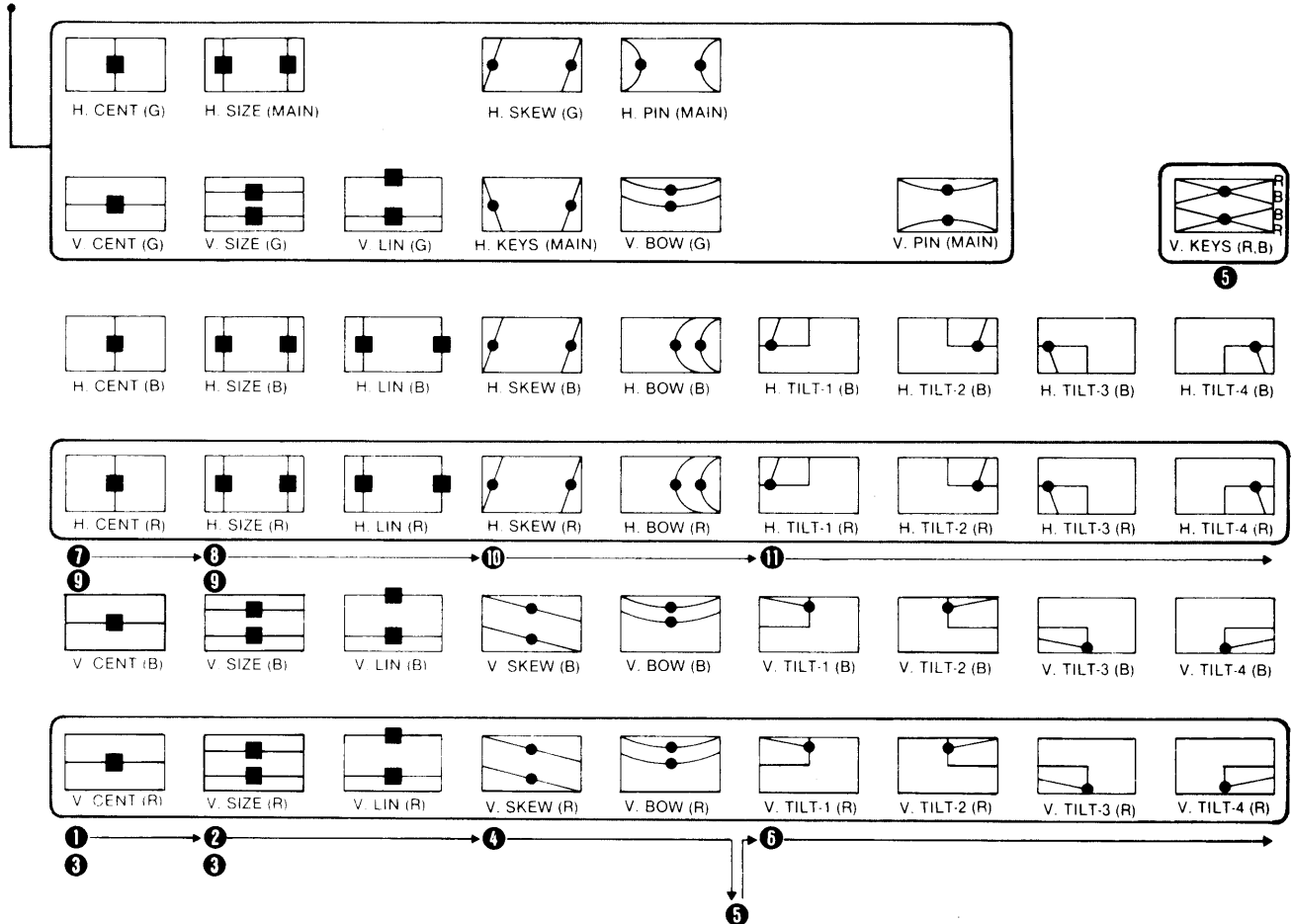
### Vertical registration of the red and green pictures

- ① Adjust the V. CENT (R) control so that the red horizontal lines and the green horizontal lines converge in the middle of the screen.
- ② Adjust the V. SIZE (R) and V. LIN (R) controls so that the red horizontal lines and the green horizontal lines converge at the upper and lower sides of the screen.
- ③ Repeat steps ① and ② as necessary.
- ④ Adjust the V. SKEW (R) and V. BOW (R) controls so that the red horizontal lines and the green horizontal lines converge in the middle of the screen.
- ⑤ Adjust the V. KEYS (R. B) control so that the red horizontal lines at the top and bottom of the screen are parallel.
- ⑥ Adjust the V. TILT-1 (R) to -4 (R) controls so that the red horizontal lines and the green horizontal lines converge in the corners of the screen.

### Horizontal registration of the red and green pictures

- ⑦ Adjust the H. CENT (R) control so that the red vertical lines and the green vertical lines converge in the middle of the screen.
- ⑧ Adjust the H. SIZE (R) and H. LIN (R) controls so that the red vertical lines and the green vertical lines converge at the right and left sides of the screen.
- ⑨ Repeat steps ⑦ and ⑧ as necessary.
- ⑩ Adjust the H. SKEW (R) and H. BOW (R) controls so that the red vertical lines and the green vertical lines converge in the middle of the screen.
- ⑪ Adjust the H. TILT-1 (R) to -4 (R) controls so that the red vertical lines and the green vertical lines converge at the corners of the screen.

These controls are used if the basic green picture must be adjusted. The H. SIZE (MAIN), H. KEYS (MAIN), H. PIN (MAIN) and V. PIN (MAIN) controls adjust the green, red and blue pictures simultaneously.



The numbered controls are used to adjust the registration of the red and green pictures. The numbers refer to the sequence of adjustment.

Proceed with the following adjustments in the same manner as with red and green registration except for the setting of the CUT OFF switches.

**Vertical registration of the blue and green pictures**

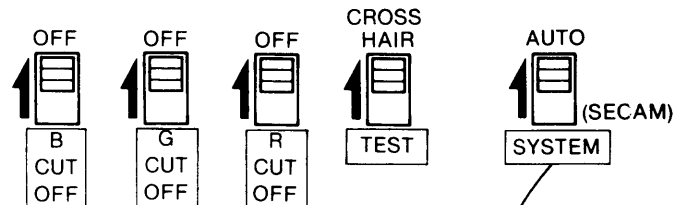
- 1 V. CENT (B) control
- 2 V. SIZE (B) and V. LIN (B) controls
- 3 Repeat steps 1 and 2.
- 4 V. SKEW (B) and V. BOW (B) controls
- 5 V. KEYS (R, B) control, if required
- 6 V. TILT-1 (B) to -4 (B) controls

**Horizontal registration of the blue and green pictures**

- 7 H. CENT (B) control
- 8 H. SIZE (B) and H. LIN (B) controls
- 9 Repeat steps 7 and 8.
- 10 H. SKEW (B) and H. BOW (B) controls
- 11 H. TILT-1 (B) to -4 (B) controls

**When registration is complete**

- 1 Set the switches to the following positions.



Set the SYSTEM switch to SECAM only when you connect a SECAM color source whose signal condition is poor.

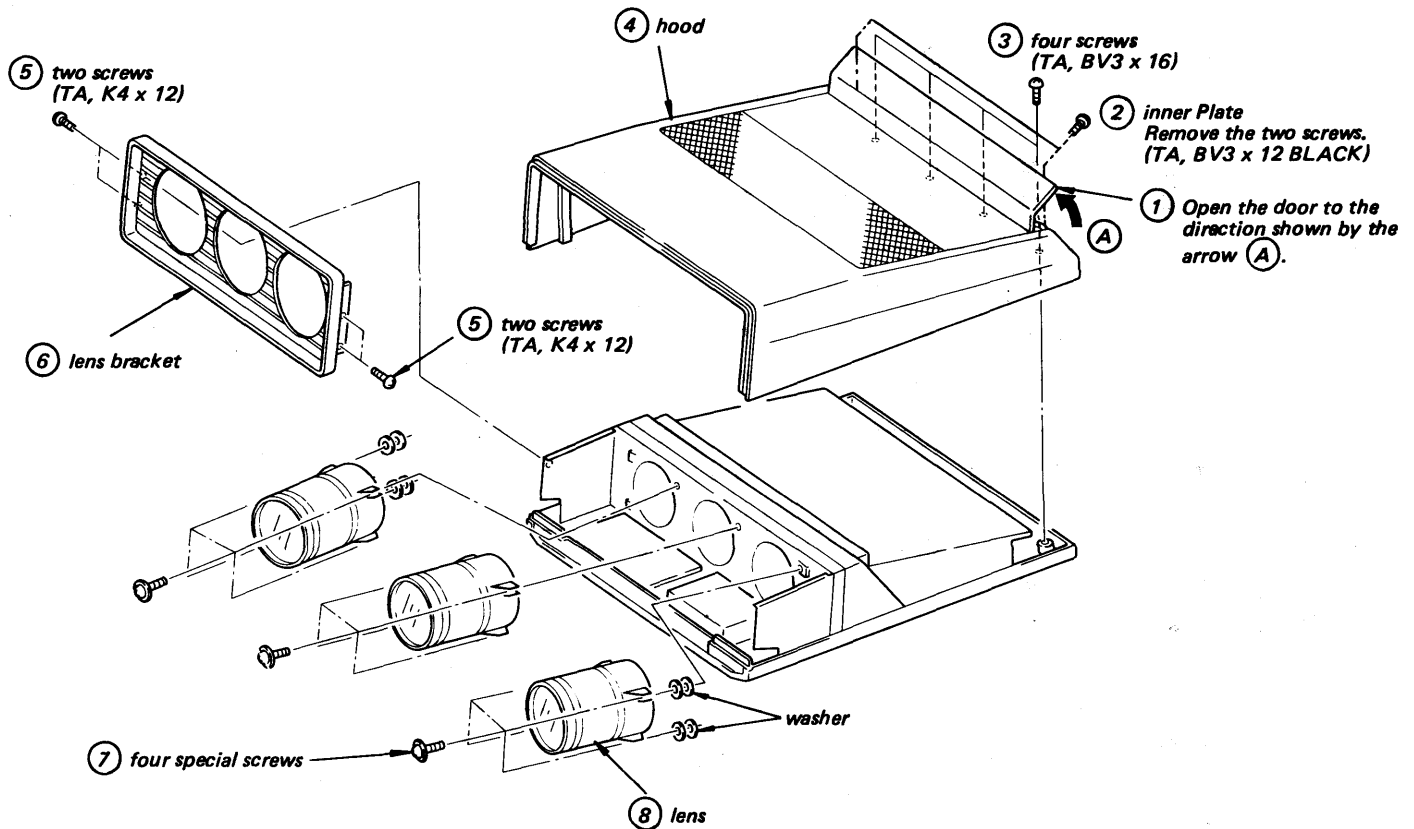
- 2 Replace the cover and tighten the two screws.

## SECTION 2 DISASSEMBLY (AND REPLACEMENT)

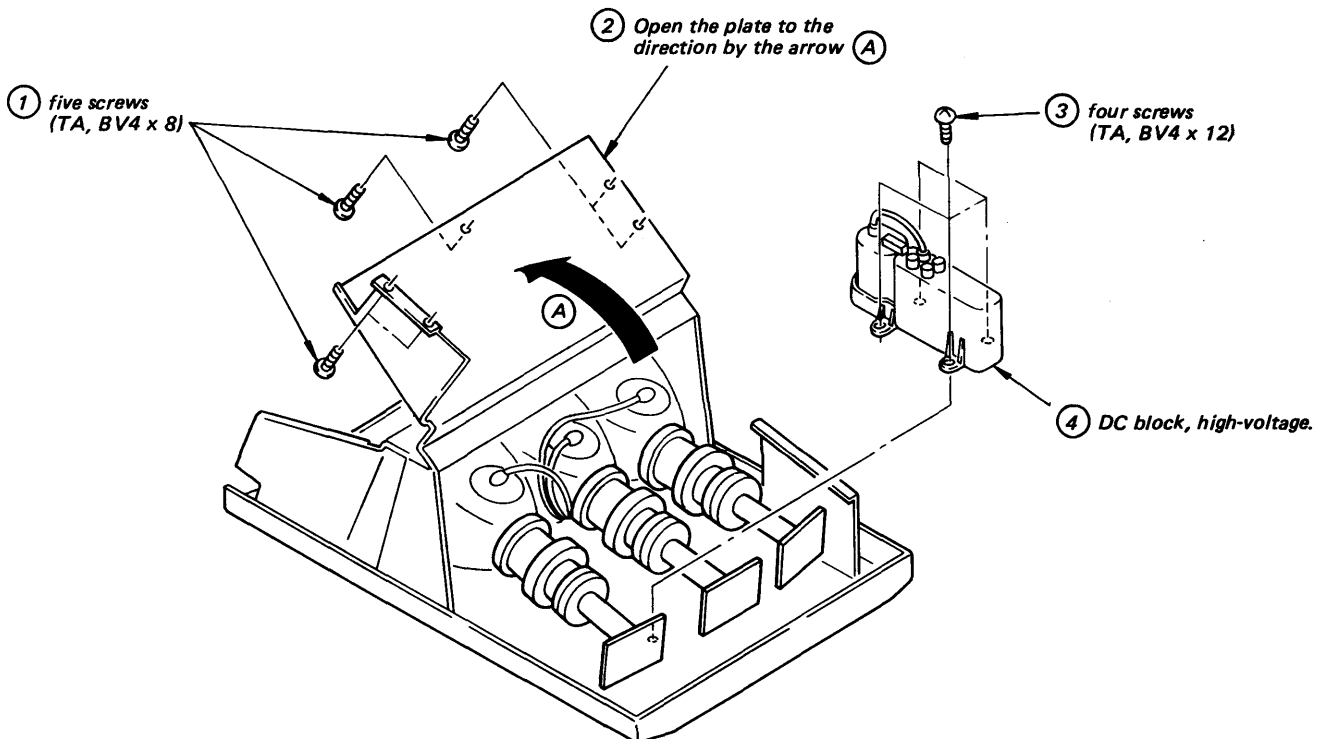
### 2-1. LENS REMOVAL

**Note:** Follow the disassembly procedure in the numerical order given.

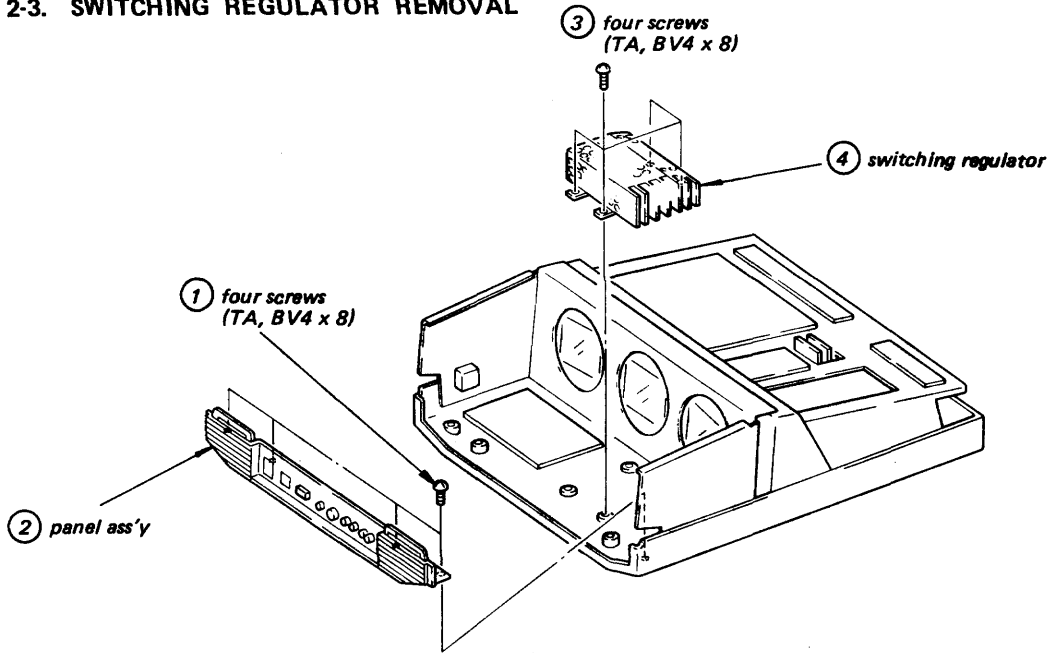
**Note:** Other two lenses are removed by the same way.



### 2-2. DC BLOCK, HIGH-VOLTAGE REMOVAL

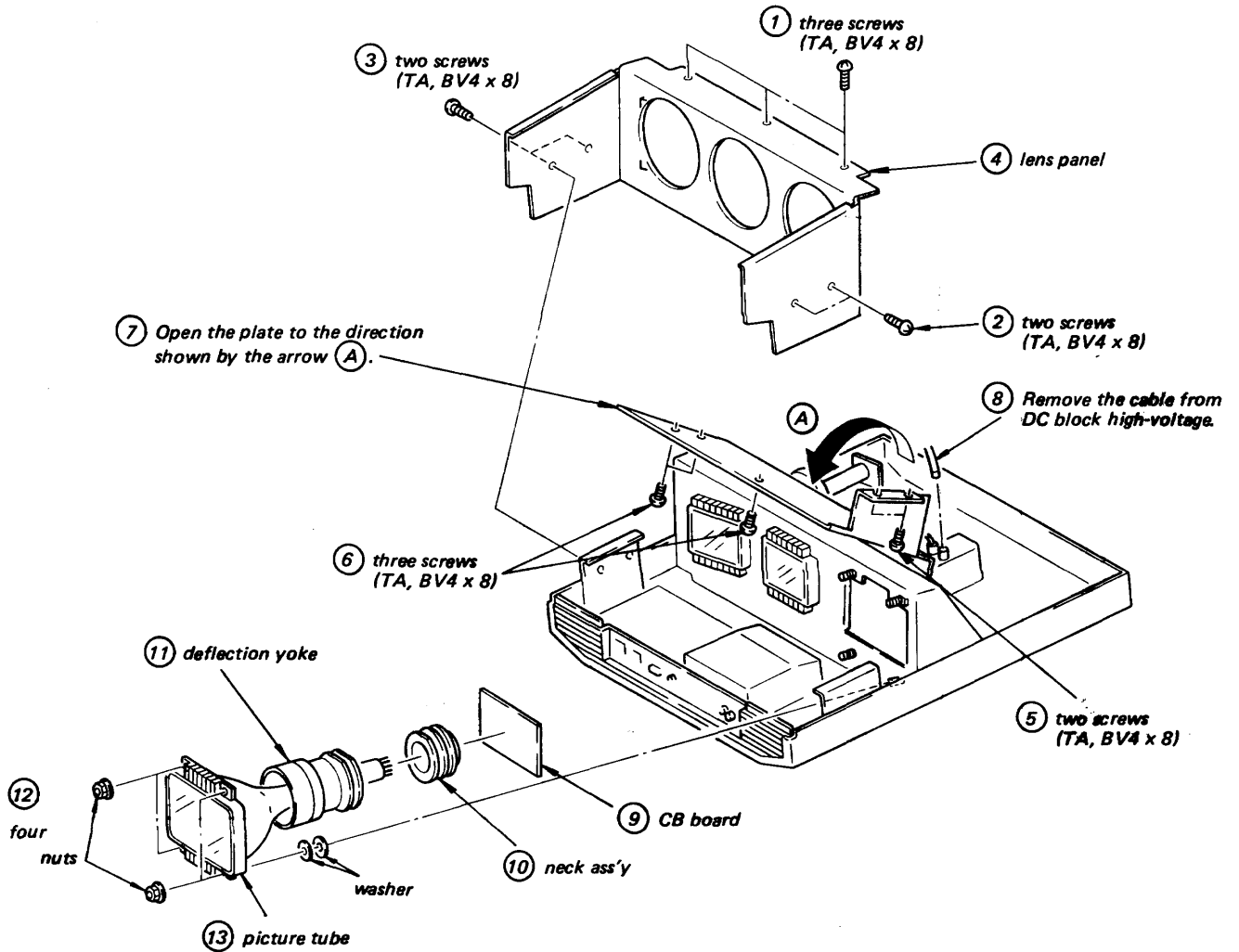


2-3. SWITCHING REGULATOR REMOVAL

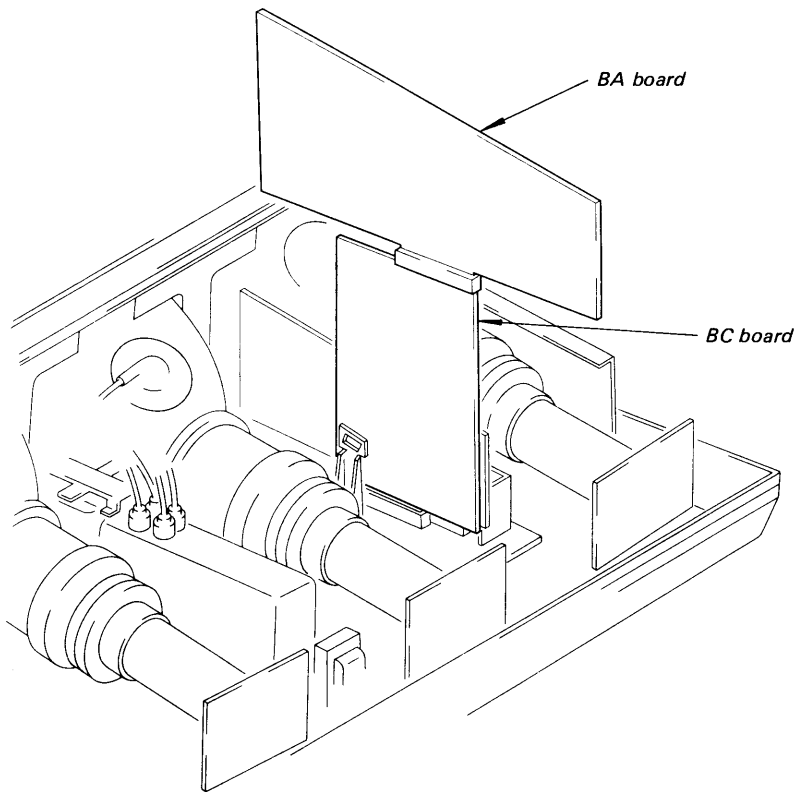


2-4. PICTURE TUBE REMOVAL

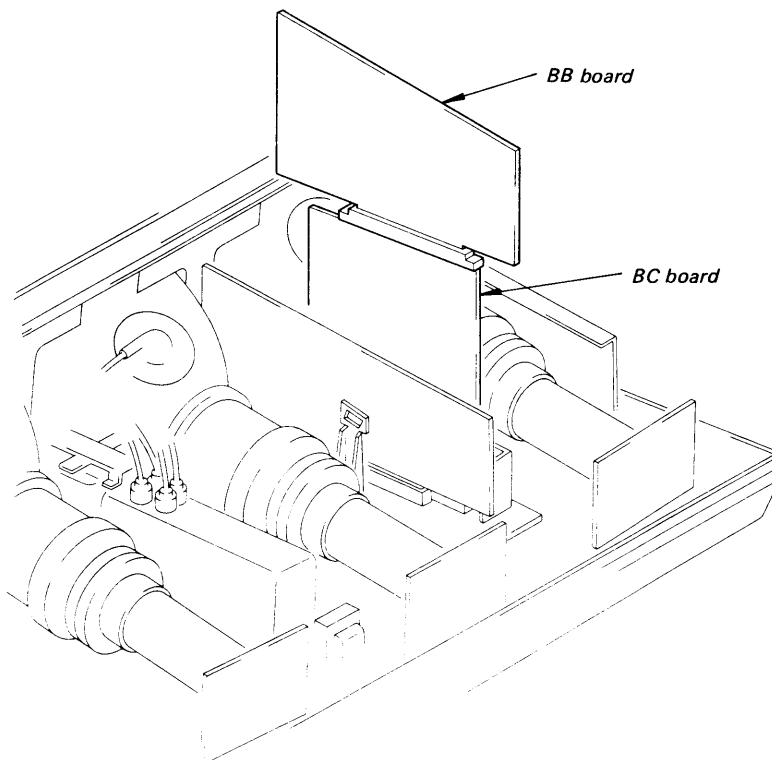
Note: Other two picture tubes are removed by the same way.



2-5. CHECKING FOR BA BOARD UP

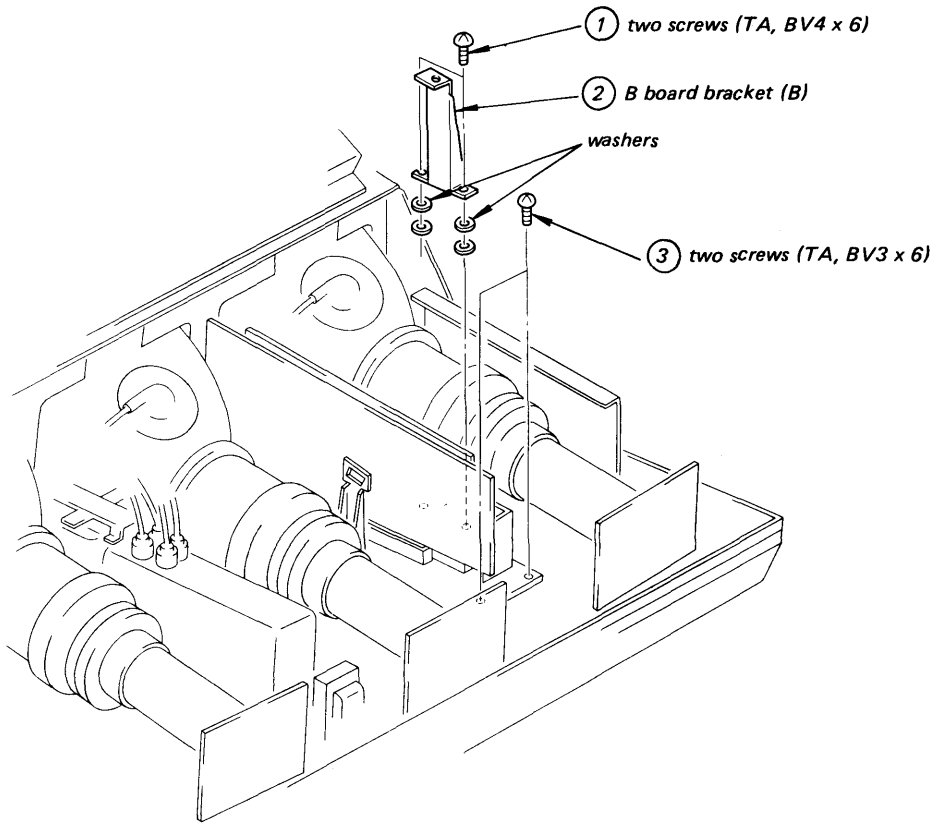


2-6. CHECKING FOR BB BOARD UP

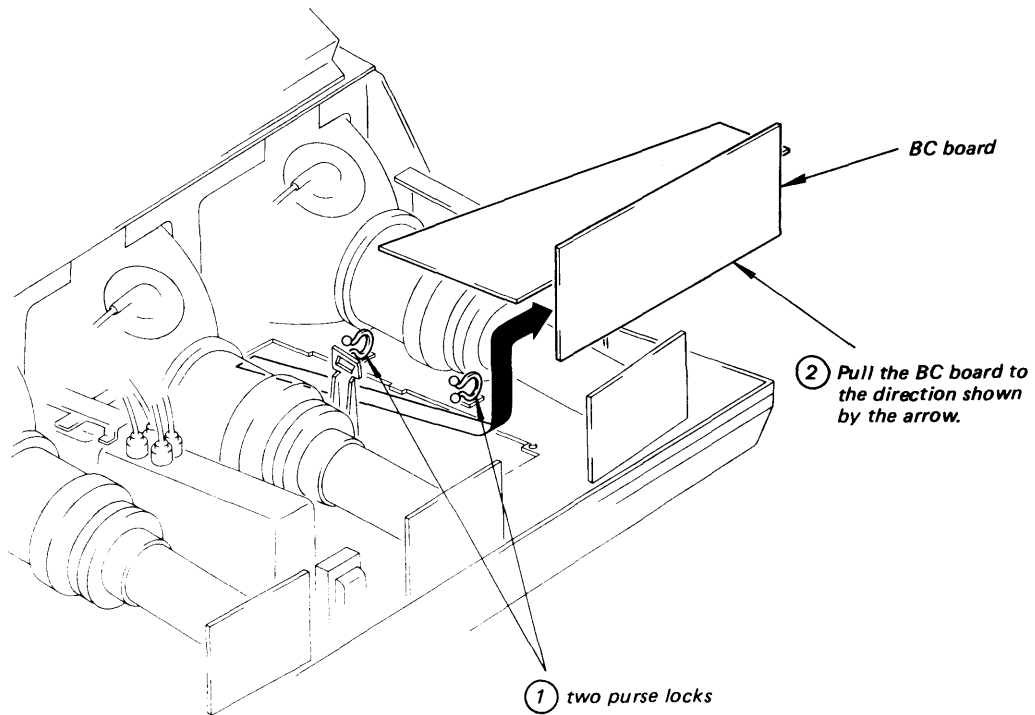




**2-7. BC BOARD REMOVAL (1)  
(CHECKING FOR BC BOARD UP)**



**BC BOARD REMOVAL (2)  
(CHECKING FOR BC BOARD UP)**



# MEMO

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A series of horizontal dotted lines for writing.

## SECTION 3

### SAFETY RELATED ADJUSTMENT

#### 3-1. 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 ..... in E board  
D15, D16, R25, 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 ..... in E board  
D7, D9, D10, R18 ..... in E board  
R19, R20, R21, C23 ..... in E board  
R22 ..... in E board  
E board complete.  
Q901, Q904

— When a high tension meter is available. —

#### R37, R38 HV HOLD DOWN Adjustment

- Confirm that the POWER switch is in OFF position.
- 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.

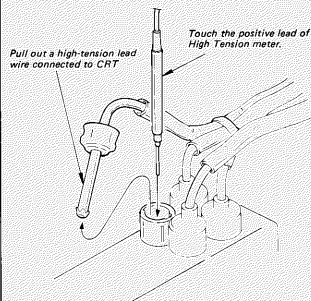
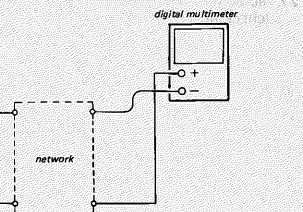
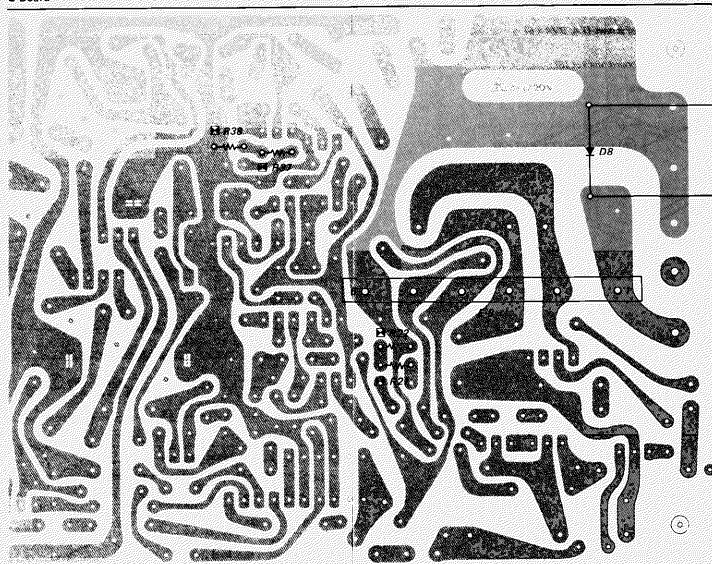


Fig. 3-1

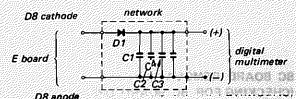
#### E Board



— When a high tension meter is not available —

#### R37, R38 HV HOLD DOWN Adjustment

- Confirm that the POWER switch is in OFF position.
- 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): 16,00 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

#### R21, R22 HV REG Adjustment

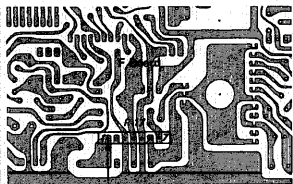
- Confirm that the POWER switch is in OFF position.
- Connect the positive lead of the high tension meter to the anode of the picture tube and the negative lead to the ground lug beside the heat sink.
- Feed in a white pattern from a color-bar/pattern generator and turn the BRIGHT and PICTURE controls for maximum beam current.  
(Be sure to synchronize the picture).
- 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  $\pm$  0.3 kV by connecting a resistor across R21 and R22. (HV HOLD DOWN circuit operates).
- If necessary, select R37 and R38 (1/4 W carbon resistor) and repeat above steps.
- Turn the POWER switch to OFF.
- Disconnect the resistor and mount it.
- Perform the HV REG adjustment from step 4.
- 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).
- Turn the POWER switch on ON and confirm that the voltage on the high tension meter is 30.8 kV  $\pm$  0.3 kV.
- If necessary, select R21 and R22 (1/4 W carbon resistor) and repeat above steps.
- Turn the POWER switch to OFF and disconnect the positive and negative leads of the electrostatic voltmeter.
- Disconnect the resistor and mount it.

**R21, R22 HV. REG Adjustment**

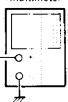
- (1) Confirm that the POWER switch is in OFF position.
- (2) Make the following network and connect a digital multimeter as shown in Fig. 3-2.
- (3) Feed in a white pattern from a color-bar/pattern generator and turn the BRIGHT and PICTURE controls for maximum beam current. (Be sure to synchronize the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

**+B MAX CHECK**

- (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.



digital multimeter



**3-2. CR, CG AND CB BOARD ADJUSTMENT**

**G2 MAX. ADJUSTMENT**

Be sure to perform the following adjustment after replacing the parts below (marked  $\Delta$  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 digital multi meter (A) indication is less than 1000 V ac.

**Note:**

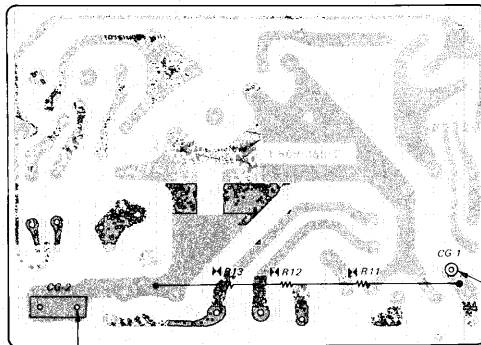
- When replacing the Focus Pack confirm on the each C board of R. G. B.
- When replacing the R11, R12, R13 confirm only about that board.

- (5) If this is not satisfied, change one of the R11, R12, R13 (15 M $\Omega$   $\rightarrow$  10 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.

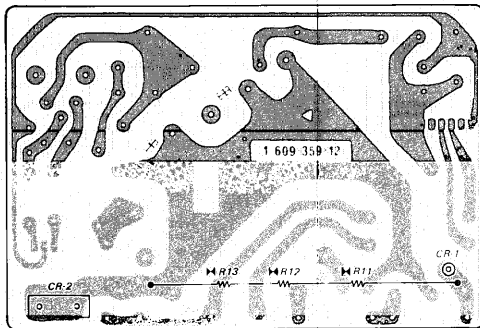
**CG Board**



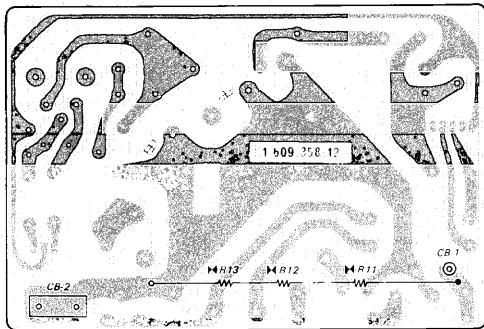
digital multimeter (A)



**CR Board**

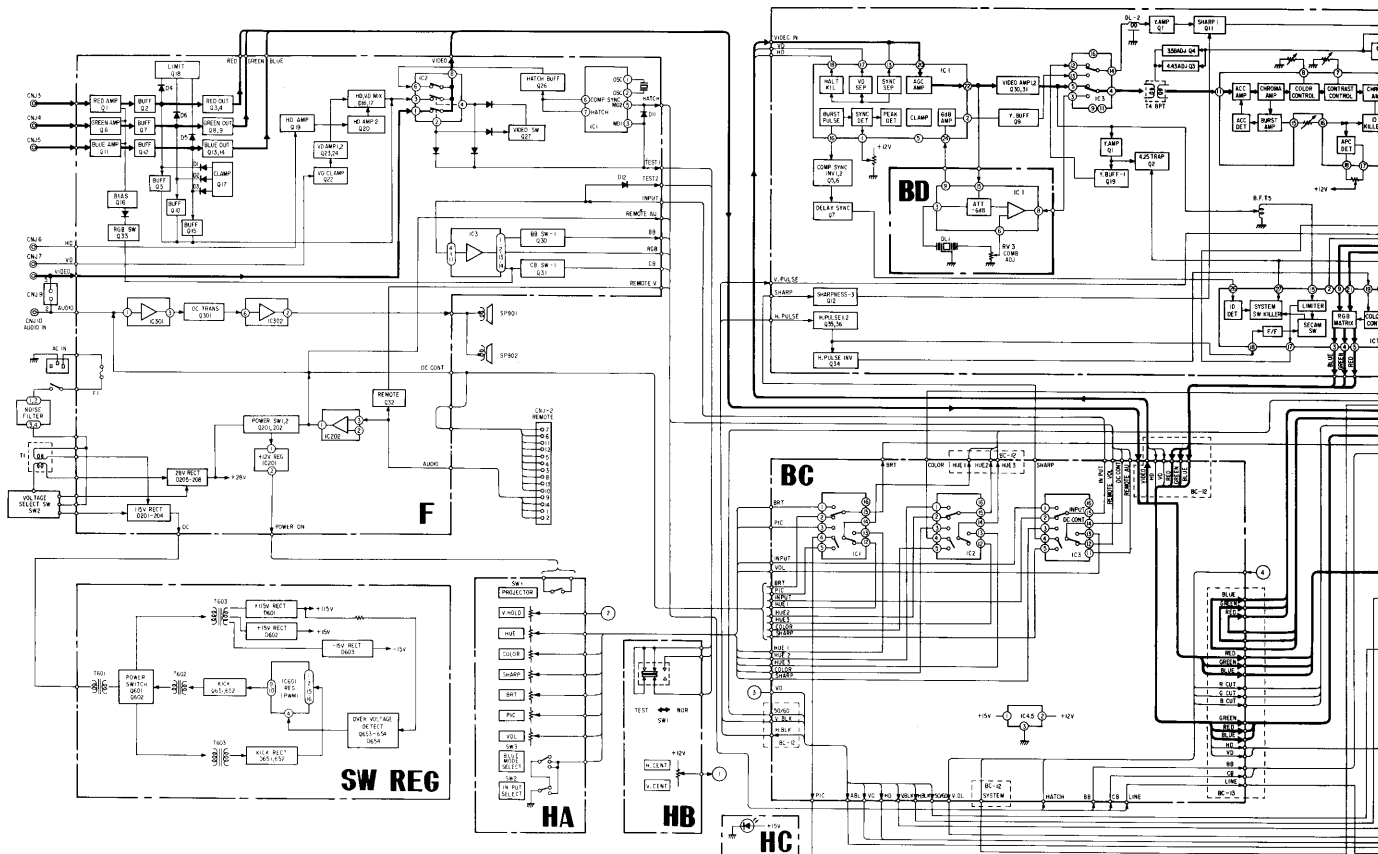


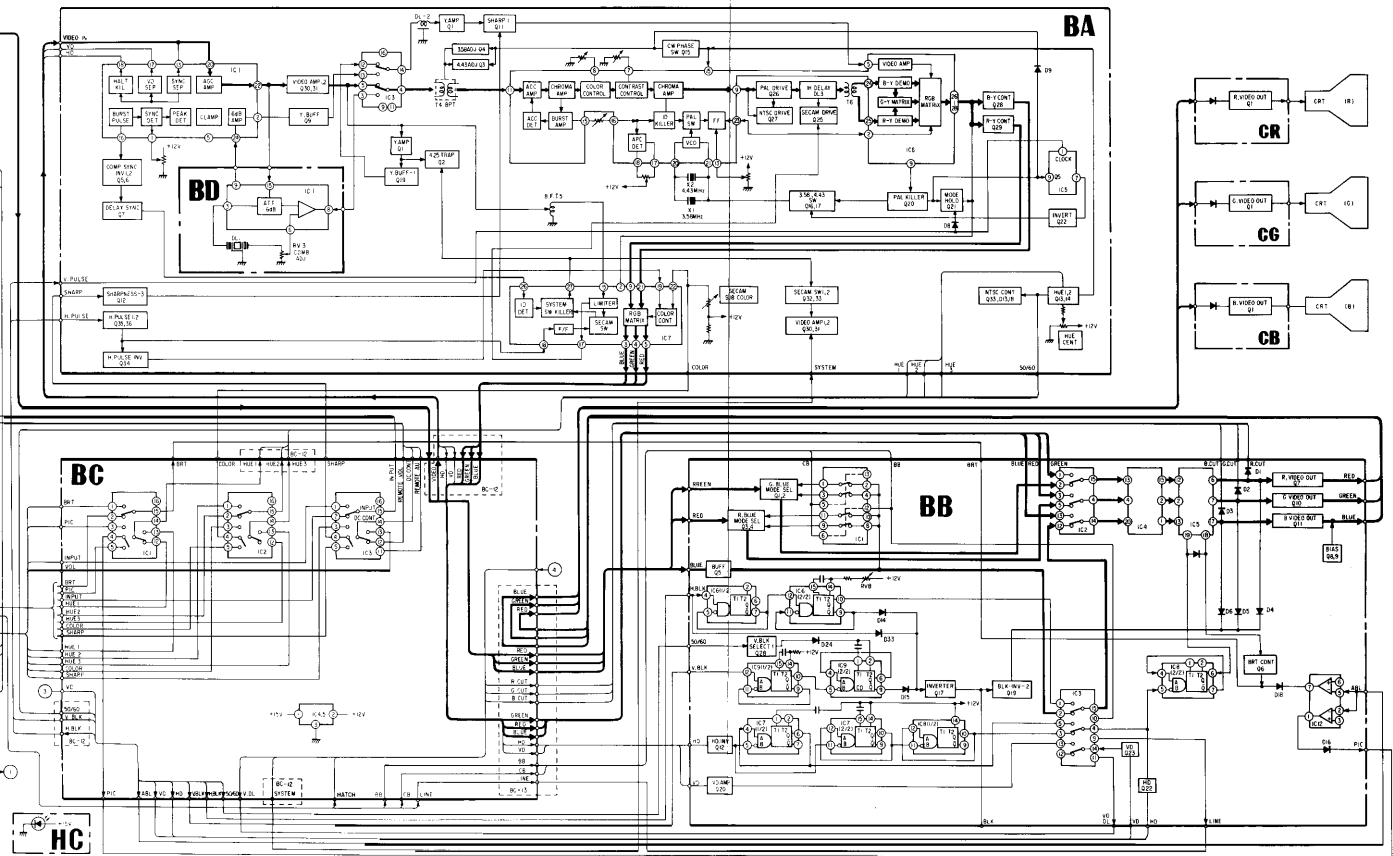
**CB Board**



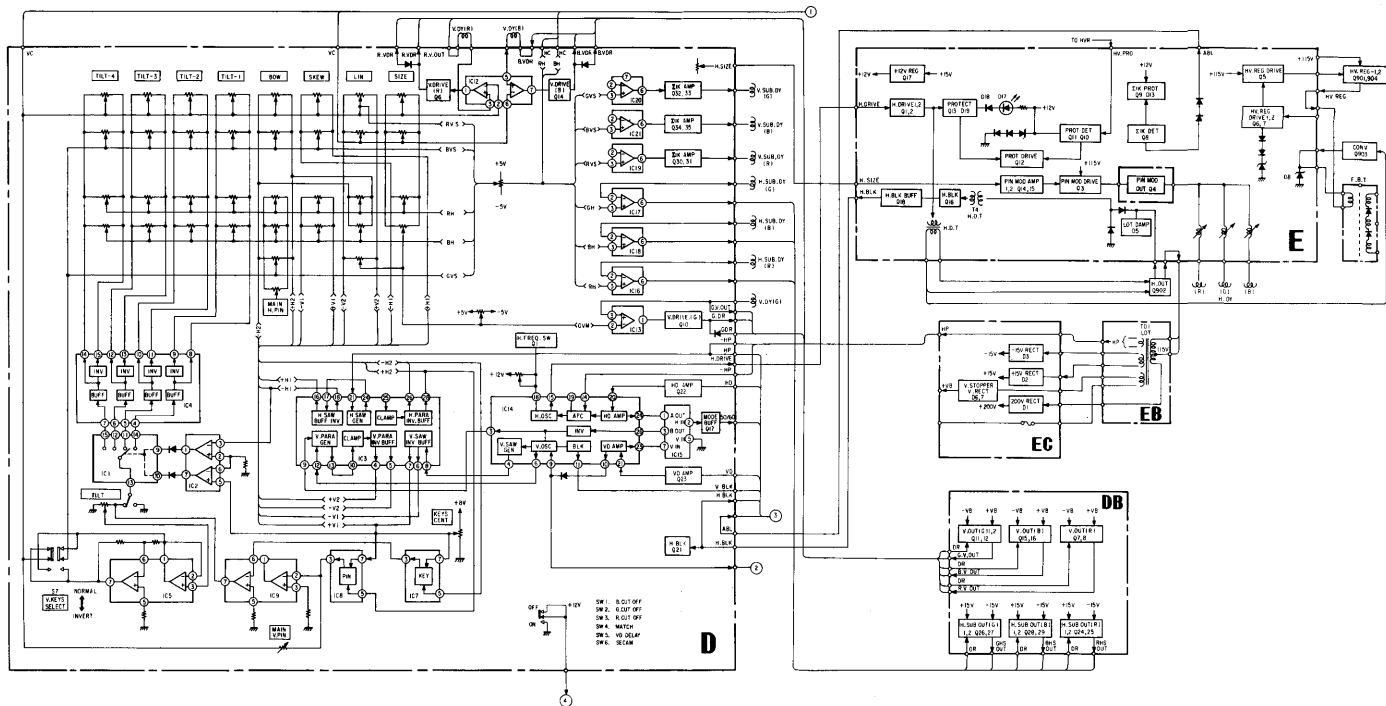
SECTION 4  
DIAGRAMS AND CIRCUIT BOARDS LOCATION

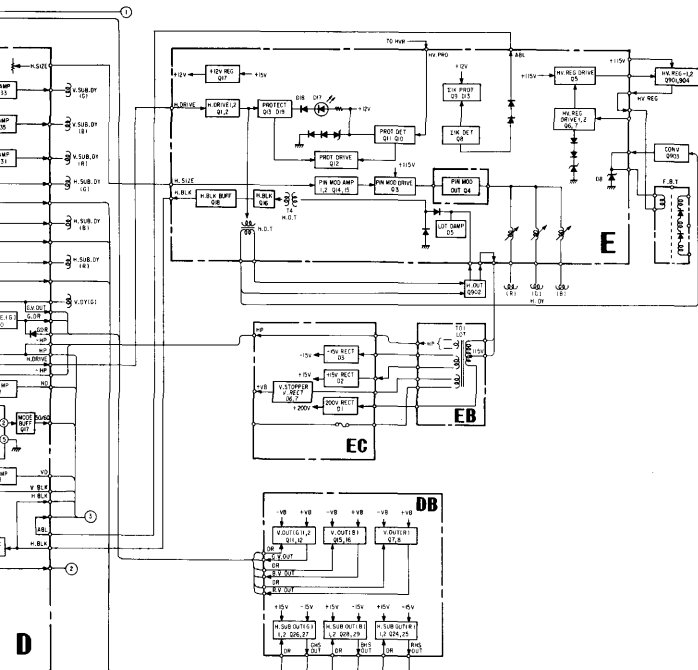
4-1. BLOCK DIAGRAM (1/2)



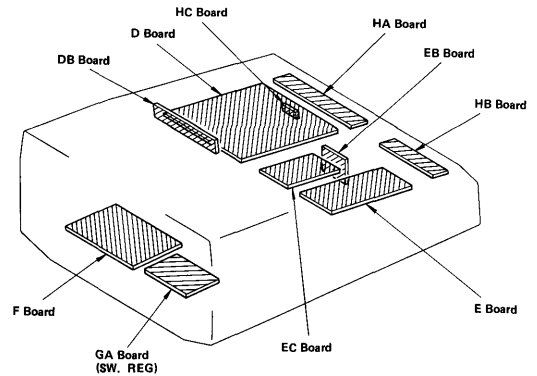


• BLOCK DIAGRAM (2/2)

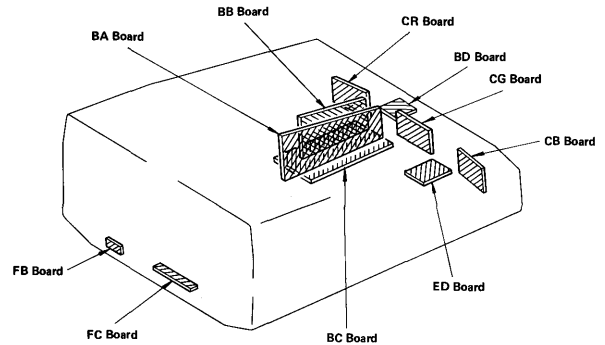




4.2. CIRCUIT BOARDS LOCATION (1/2)

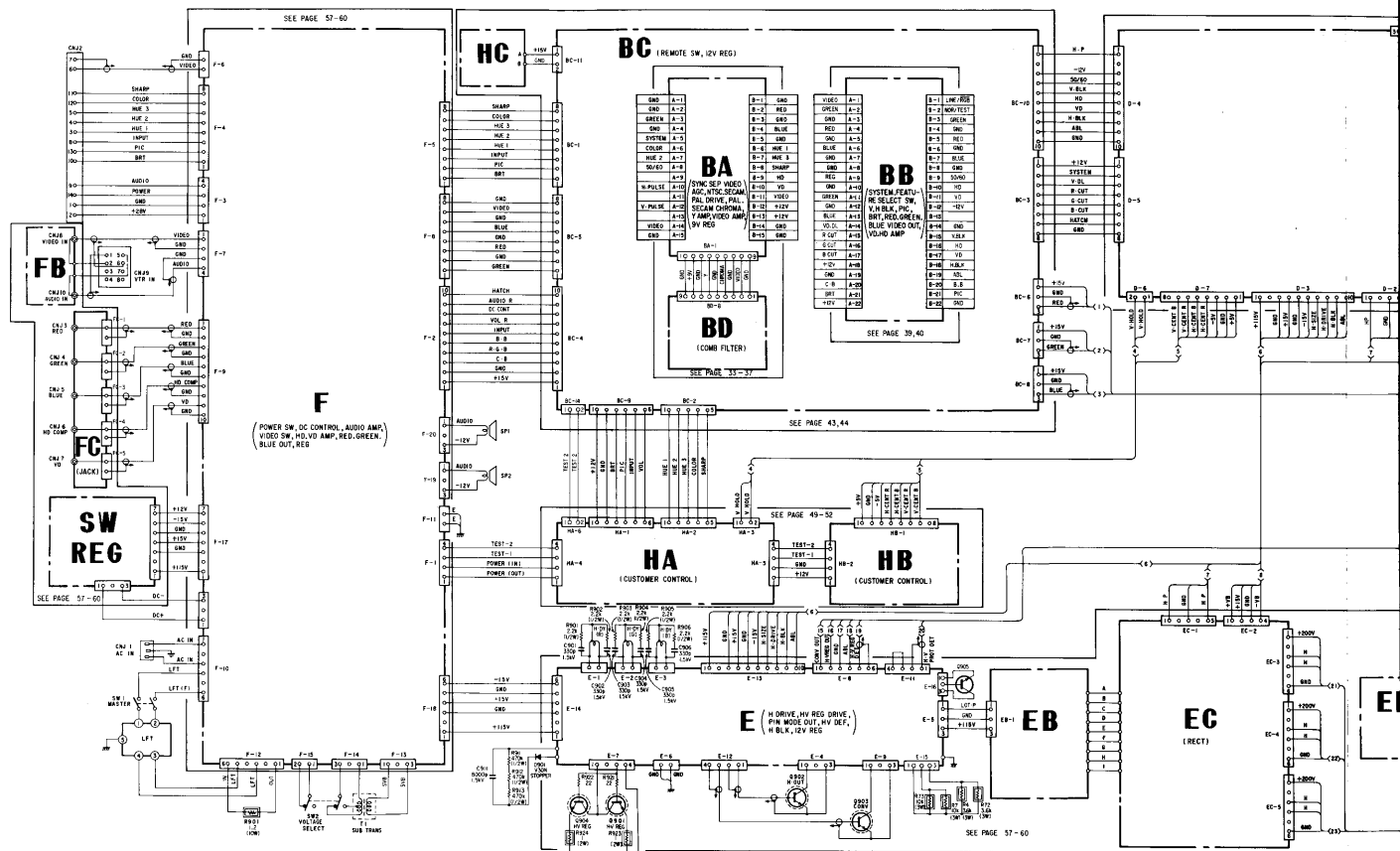


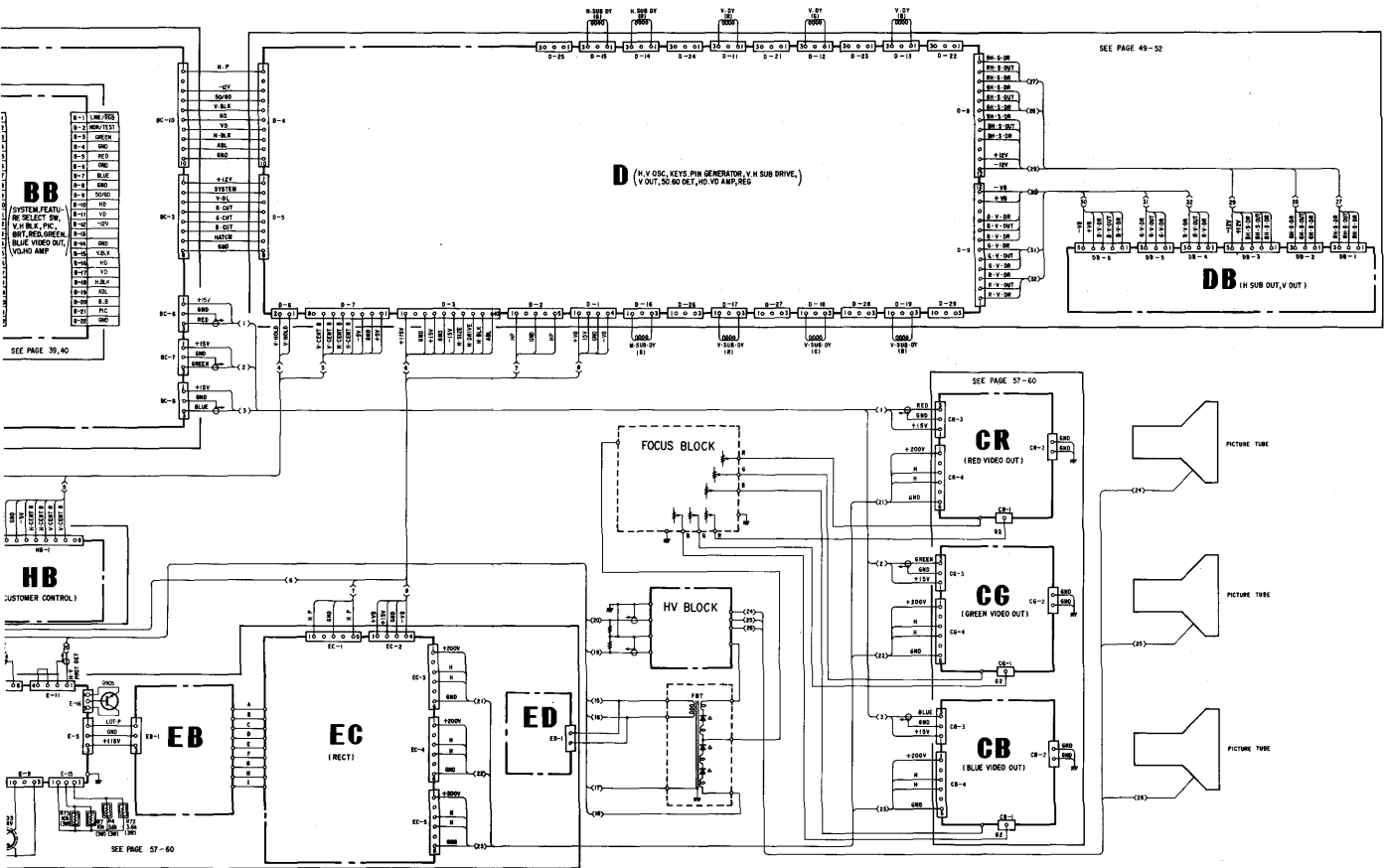
• CIRCUIT BOARDS LOCATION (2/2)





4-3. FRAME SCHEMATIC DIAGRAM





SEE PAGE 49-52

**D** (V.V. OSC, KEYS, PIN GENERATOR, V.H SUB DRIVE)  
(V OUT, 50 GO DET, HD VO AMP, REG)

**DB** (A SUB OUT, V OUT)

SEE PAGE 57-60

**EC**  
(RECT)

**CR**  
(RED VIDEO OUT)

**CG**  
(GREEN VIDEO OUT)

**CB**  
(BLUE VIDEO OUT)

PICTURE TUBE

PICTURE TUBE

PICTURE TUBE

4.4. SCHEMATIC DIAGRAM

Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

Note:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted; pF:  $\mu\text{F}$  50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{2}$  W unless otherwise noted (and D board resistors are  $\frac{1}{4}$  W).
- k: 1000  $\Omega$ , M: 1000 k $\Omega$ .
- **□**: nonflammable resistor.
- **□**: internal component.
- **□**: panel designation.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- The components identified by **⊠** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation.

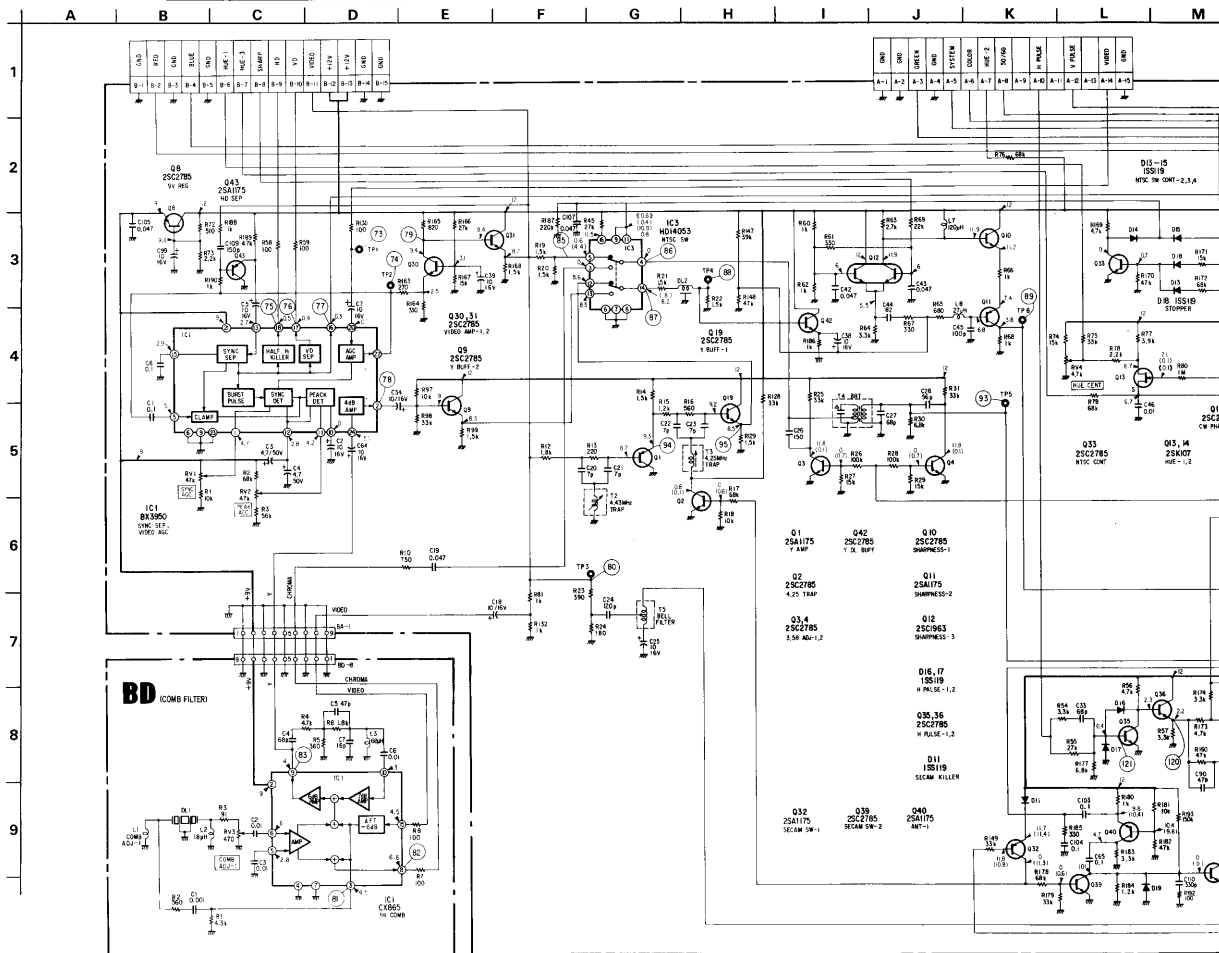
Select the resistance value according to SAFETY RELATED ADJUSTMENT.

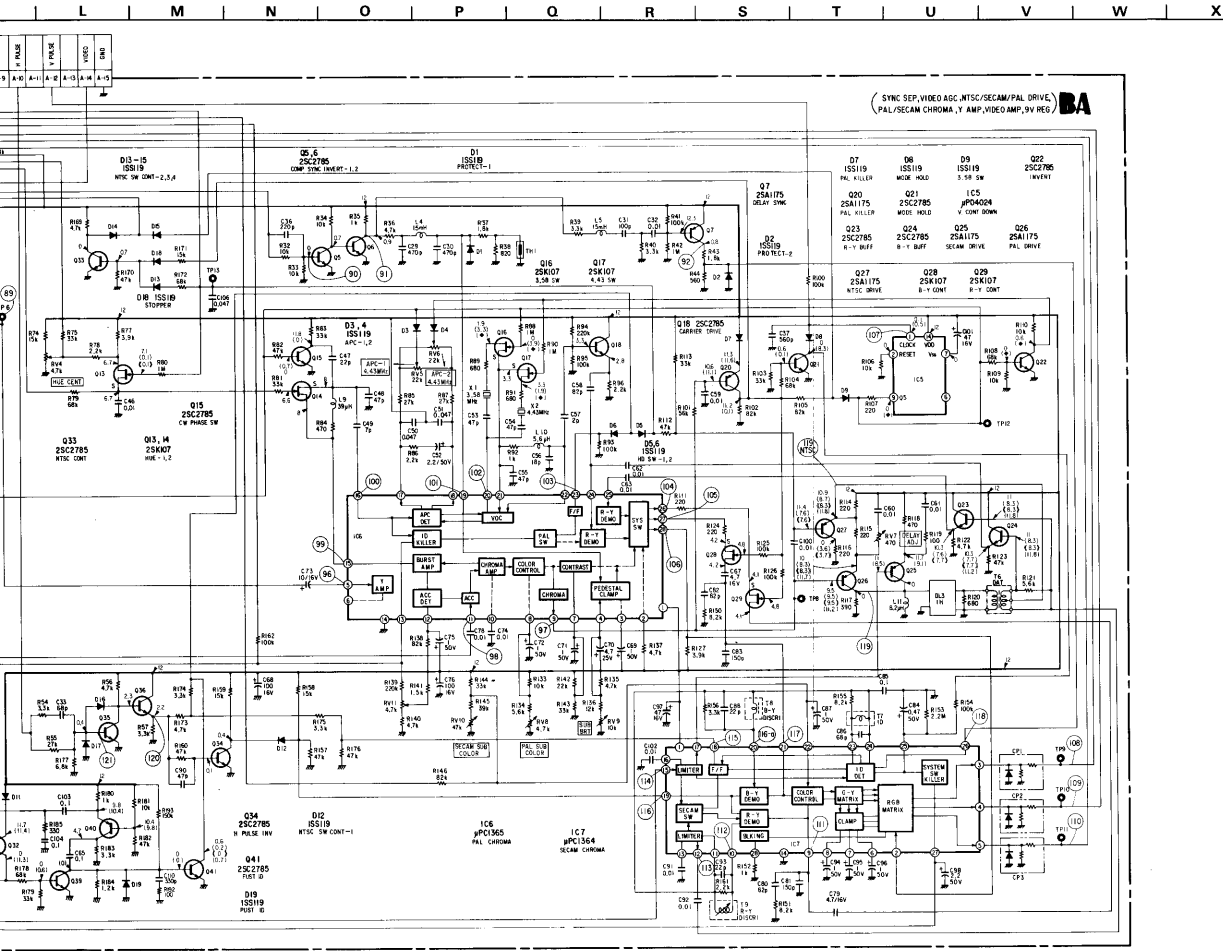
- When replacing components identified by **⊠**, make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by **⊠** and repeat the adjustment until the specified value is achieved. (Refer to R11, 12, 13, R21, 22 and R37, 38 adjustment on page 19-22).

When replacing the part in below table, be sure to perform the related adjustment.

Part replaced ( <b>⊠</b> )	Adjustment ( <b>⊠</b> )
Q5, Q6, Q7, Q10, Q11, C901, C904	
D6, D7, D9, D10, D14, D15, D16, C20, R18, R19, R20, R21, R22, R35, R36, R37, R38, R39, R951	R11, 12, 13, R21, 22 and R37, 38 adjustment
E board complete, FOCUS PACK	

- All voltages are in V.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10 M $\Omega$  digital multimeter.
- Readings are taken with a color-bar signal input.
- **—**: B + bus.
- **---**: B - bus.
- Voltage variations may be noted due to normal production tolerances.
- **⊠**: adjustment for repair.
- No mark: PAL mode
- **<**: NTSC 4.43 mode
- **>**: NTSC 3.58 mode
- **( )**: SECAM mode
- If the part marked **+** is replaced, the hold down adjustment should be made.





(SYNC SEP, VIDEO AGC, NTSC/SECAM/PAL DRIVE)  
(PAL/SECAM CHROMA, Y AMP, VIDEO AMP, SV REG)



• Voltage table of IC6

Pin	Mode		NTSC 3.58	NTSC 4.43
	PAL	SECAM		
1	12	12	12	12
2	11.8	11.8	11.8	11.8
3	8.5	8.5	8.5	8.5
4	8.5	8.5	8.5	8.5
5	2.8	2.8	2.8	2.8
6	2	2.1	2.2	2.2
7	7.4	7.4	7.4	7.4
8	5.4	5.4	5.4	5.4
9	9.5	11.2	9.5	9.5
10	2	2	2	2
11	1.3	1.3	1.3	1.3
12	9.2	9.4	9.1	9.3
13	6.1	6.1	6.1	6.1
14	0	0	0	0
15	8	8	8	8
16	4.4	4.4	4.4	4.4
17	7.7	7.8	7.9	7.8
18	7.7	7.8	7.8	7.8
19	0.2	0.2	0.3	0.3
20	9.3	9.3	9.3	9.3
21	3.3	3.3	3.3	3.3
22	3.3	3.3	3.3	3.3
23	0.6	0.6	0.2	0.2
24	2.8	2.8	2.8	2.8
25	2.8	2.8	2.8	2.8
26	4.1	4.1	4.1	4.1
27	4.2	4.2	4.2	4.2
28	10	10	10	10

• Voltage table of IC7

Pin	Mode		NTSC 3.58	NTSC 4.43
	PAL	SECAM		
1	12	12	12	12
2	10	10	10	10
3	3	3.3	2.7	2.6
4	2.9	2.6	2.6	2.6
5	2.9	2.6	2.6	2.6
6	1.6	1.8	1.6	1.6
7	1.2	1.2	1.2	1.2
8	1.6	1.6	1.6	1.6
9	9.5	9.5	9.5	9.5
10	2.3	2.3	2.3	2.3
11	2.3	2.3	2.3	2.3
12	2.3	2.3	2.3	2.3
13	2.3	2.3	2.3	2.3
14	0	0	0	0
15	2.3	2.3	2.3	2.3
16	2.3	2.3	2.3	2.3
17	11	8.5	11	11
18	0.5	0.5	0.5	0.5
19	7.3	7.3	7.3	7.3
20	2.3	2.3	2.3	2.3
21	9.5	9.5	9.5	9.5
22	6.9	6.9	6.9	6.9
23	2.3	2.3	2.3	2.3
24	2.3	2.3	2.3	2.3
25	6.2	6.2	6.2	6.2
26	0.2	0.2	0.2	0.2
27	11.8	10.8	11.8	11.8
28	0	0	0	0

4.5. PRINTED WIRING BOARD  
Conductor Side

BA

SYNC SEP VIDEO AGC, NTSC, SECAM, PAL DRIVE,  
PAL, SECAM CHROMA, Y AMP, VIDEO AMP,  
9V REG

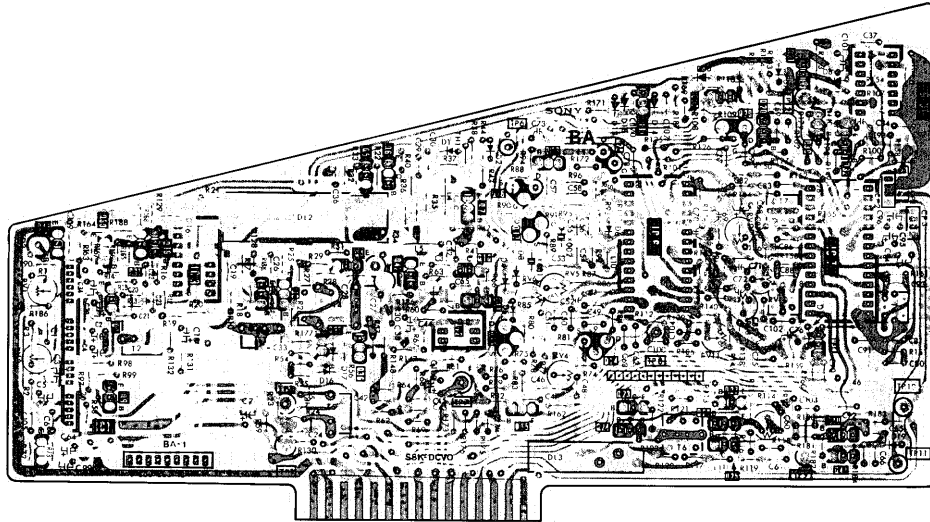
Bd

(1H COMB)

A B C D E F G H I J K L M N O

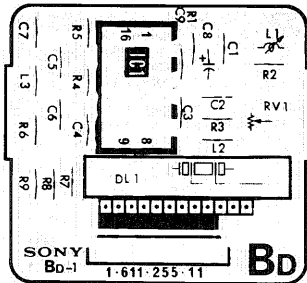
- BA Board -

1  
2  
3  
4  
5  
6  
7  
8  
9  
10



IC, Q	D	ADJ	TP
21	7		
22	9 8		
23	12.5	5	2
	3	8 14	
29	20		
32	1		
18	28	2	6
5	6		
	16		
	7		
40	7	6	RV3
50	51 19		2
108	12	3	4
103	4 42 0		
2	3	1	RV1 RV2
		5	RV6
	1		RV8
	2		
01	15 4 34	2	RV2 RV1
	35 36	7	
		16	RV4
9	27		7
5	23		0
			5
24	40		RV7
8	25	19	
	41		1
			9

- Bd Board -





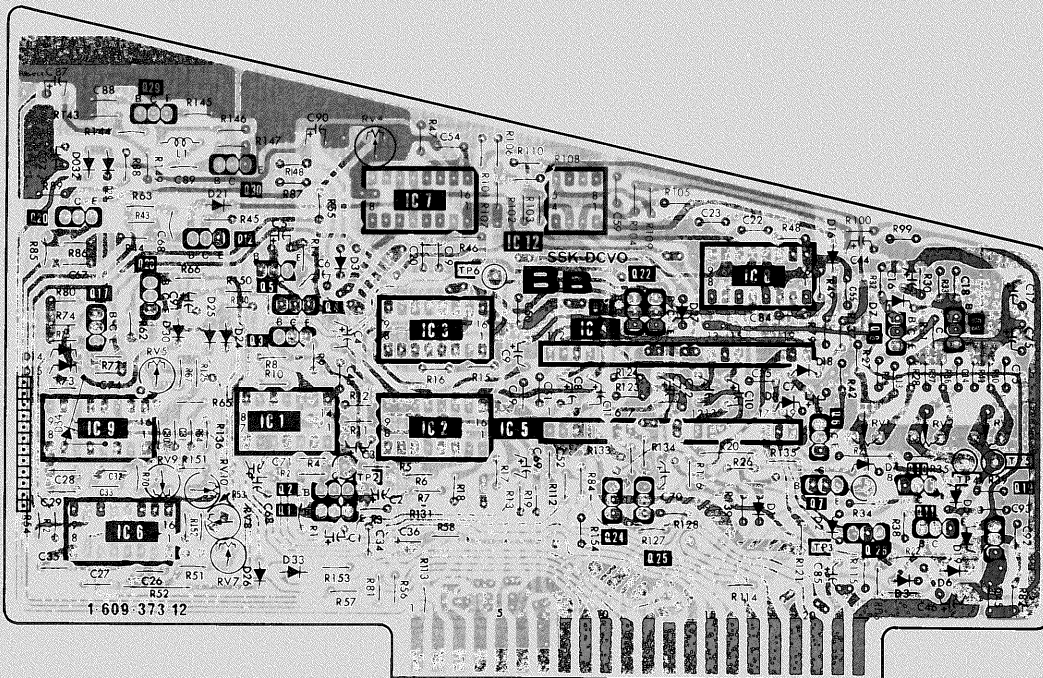
**BB**

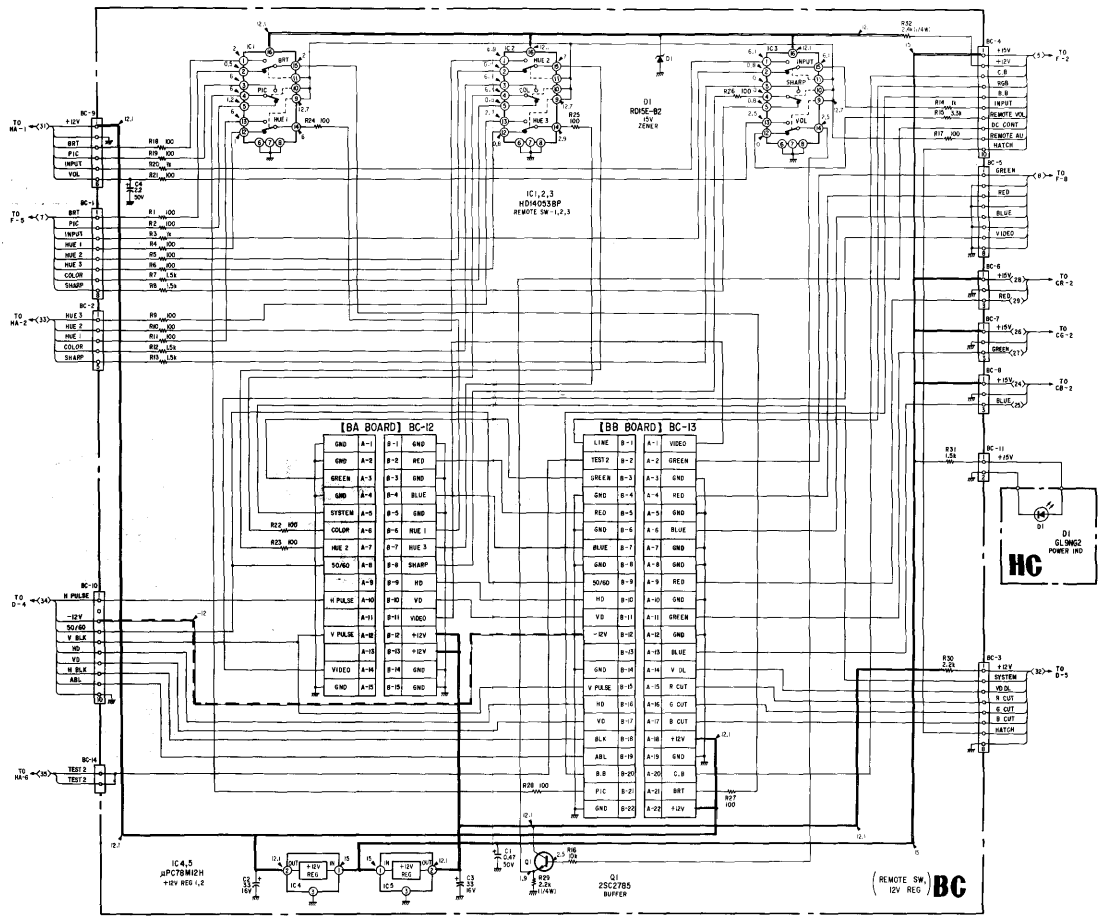
SYSTEM FEATURE SELECT SW, V.H BLK. PIC. BRT.  
RED. GREEN. BLUE VIDEO OUT. VD.HD AMP

A B C D E F G H I J K L M N O

- BB BOARD -

Q, IC	20 IC9	17 C6	29 C6	12	30	5	4 IC1	2	IC7 IC3 IC2	IC12	23,22	IC4 IC5	IC8	6 7	8	10 11	9 19	Q, IC					
D	14 15	32,29 34		30	21 25,24	26		31			24	25		1	8,18	16	2	4	7 3	5	6	19	D
ADJ			RV5 RV9		RV10 RV8,RV7			RV4										RV1	RV2	RV3			ADJ
T.P								2		6								3		4	5		TP

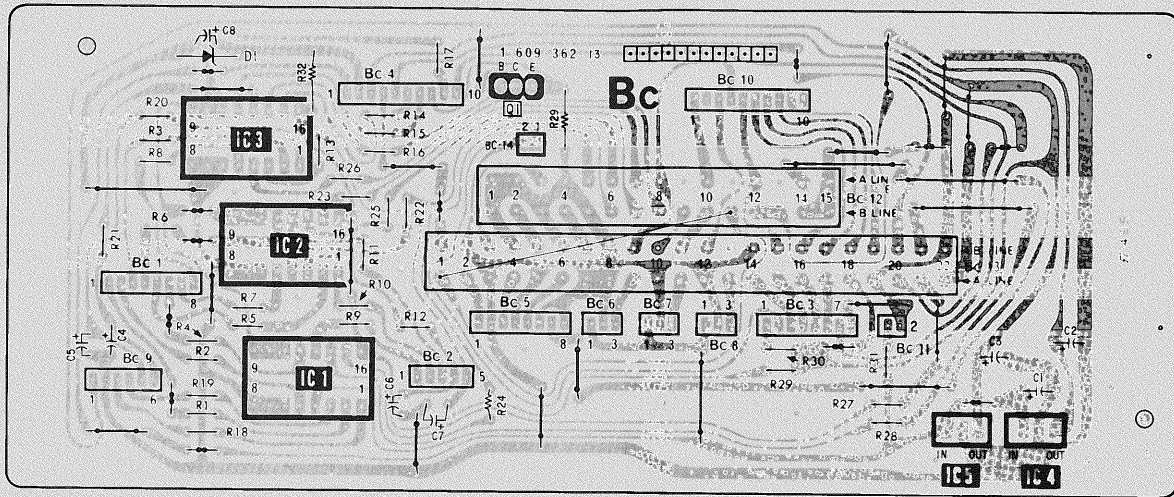




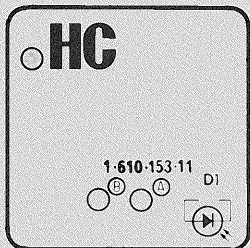


A B C D E F G H I J K L M N O

- BC BOARD -



- HC Board -



1-610-153-11

4-6. SEMICONDUCTORS

BX1113  
BX1114  
BX1222  
BX3950-1



(Marking side view)

BX1120  
BX1121



(Marking side view)

CX7916  
NJM4590B  
μPC582C  
μPC4558C



CX7948



CX865  
HD14052BP  
HD14053BP  
HD14638BP  
TC4052BP  
TC4053BP



CX894



HD14086BP  
TC4024BP  
μPC336C  
μPD4024BC



LA2600



MS214L  
μPC1037H



MS218L



μPC1277H



123456789 101112

μPC1364C2  
μPC1365C



(Top view)

μPC7808H  
μPC7812H  
μPC78M12H



μPC7908H  
μPC7912H



μPC78L12



2SA1015  
2SA733  
2SC1363  
2SC1364  
2SC1815  
2SC945



2SA1026



2SA1175  
2SA1175F  
2SC2785



2SB856  
2SB961  
2SC1061  
2SD1138  
2SD478



2SC1413A



2SC1963



2SC2278



2SC2383



2SC2458  
2SC4035P  
2SC2603  
2SC6345P



2SC2959



2SC403C



2SD669A



2SK107



1SS119  
1SS120  
1SS148



1SS133  
EM12



ERD28-08S  
RD15E-82  
RD5.1E-82  
RD5.6E-82  
RD5.6E-L3



CR02AM-4



EQA01-05T1



ERB12-02RK  
GP08D



ERC28-15S



GL9NG2



MV11VS



S15H



SEL2110R  
TLG124A

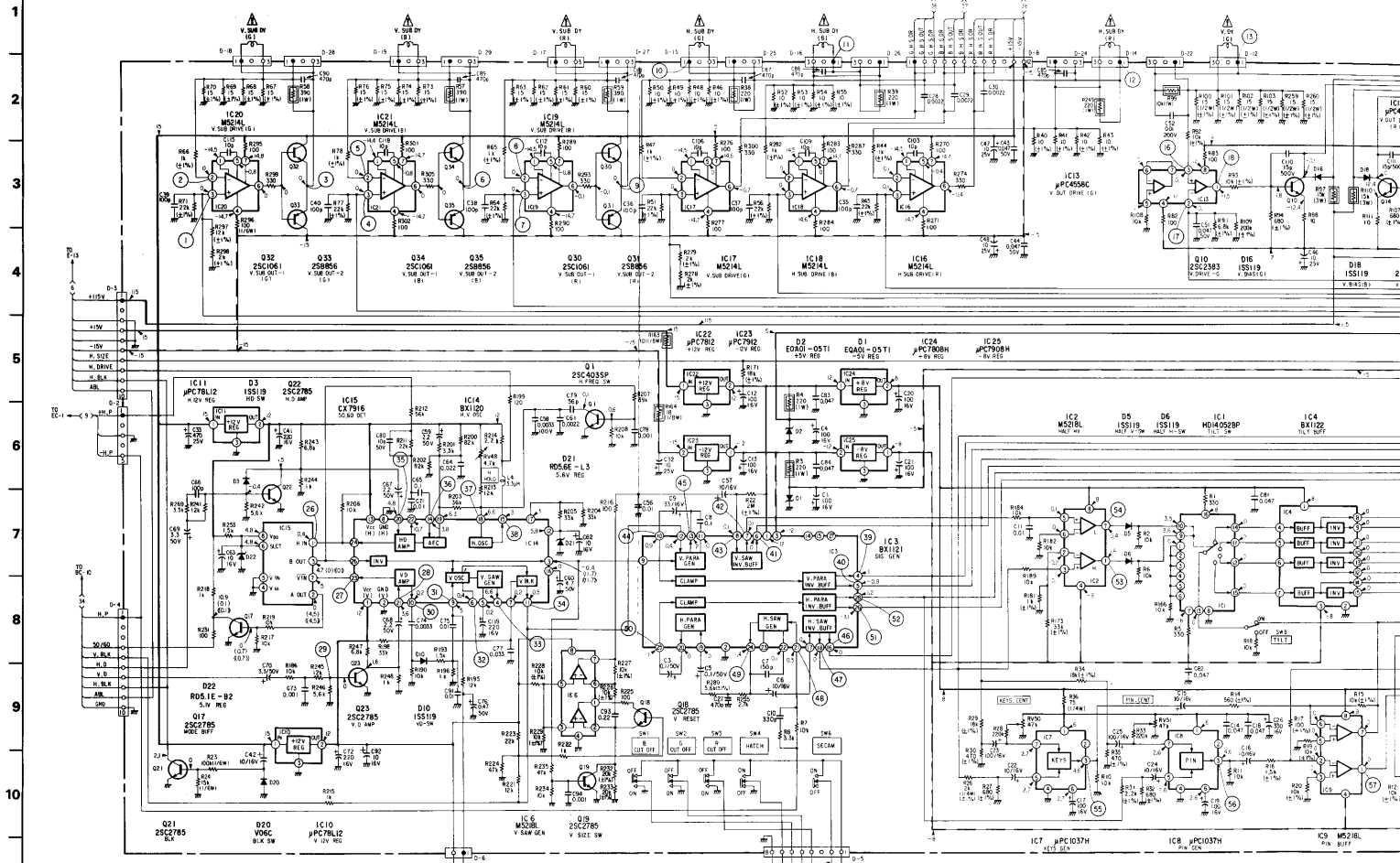


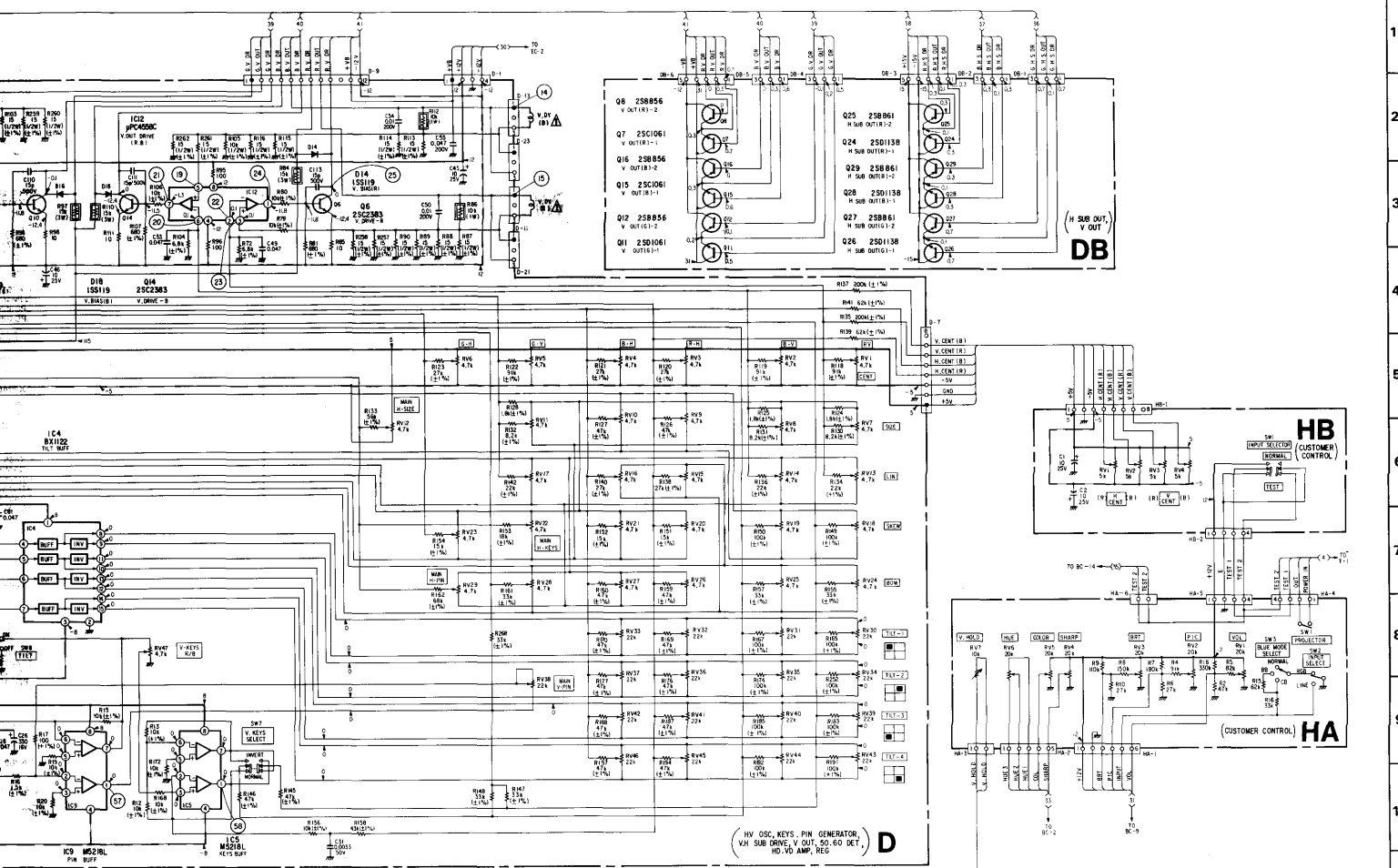
SIB01-02  
V06C



U06E  
V11N





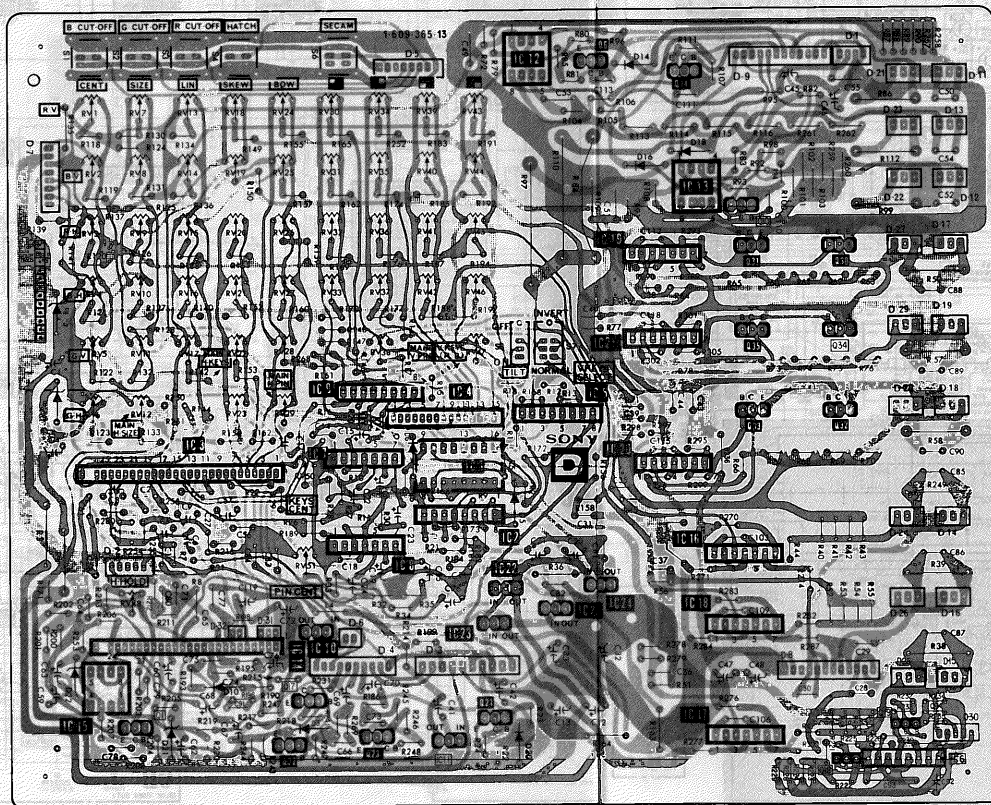


(V OSC. KEYS: PIN GENERATOR,  
 V.H. SUB DRIVE; V. OUT. SO. SO. DET.,  
 HD. VD AMP. REG.)

**D** [H.V. OSC, KEYS. PIN GENERATOR, V.H. SUB DRIVE, V. OUT,  
L50.60 DET., HD. VD AMP, REG

A B C D E F G H I J K L M N O

- D Board -



IC, Q	D	ADJ
IC12	6	14
	4	
		RV1, RV7, RV3, RV8, RV24 RV30, RV34, RV38, RV43
	18	
	16	RV22, RV6, RV4, RV10, RV25 RV31, RV35, RV40, RV44
ICB		
		RV3, RV5, RV15, RV20, RV26 RV32, RV36, RV41, RV45
31	30	
IC19		
		RV4, RV10, RV6, RV21, RV27 RV33, RV37, RV42, RV46
	1	
IC21	30	34
		RV5, RV11, RV7, RV22, RV28 RV38, RV47
	IC9	
		RV6, RV2, RV23, RV29
	IC4, IC5, IC3, IC2	
IC7	IC1	
	IC2	
		RV30
	5	
	IC8	
	IC16	
		RV5
	IC22	IC24
		RV49
	IC25	
	IC23	
IC10	IC14	
	IC15	
		22
	17	
		3
	IC17	19
		21
	22	23
	IC16	
IC, Q	D	ADJ

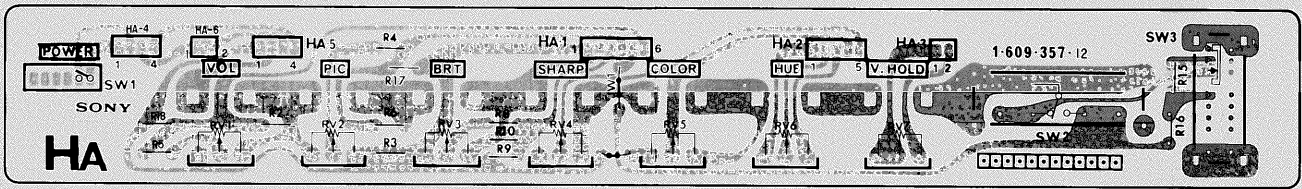
**HA** [CUSTOMER CONTROL]

**DB** [H SUB OUT, V OUT]

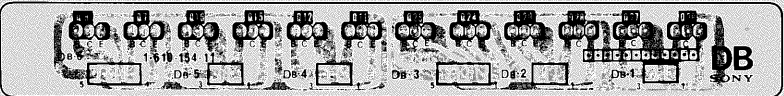
**HB** [CUSTOMER CONTROL]

P | Q | R | S | T | U | V | W | X | Y | Z | A1 | B1 | C1 | D1

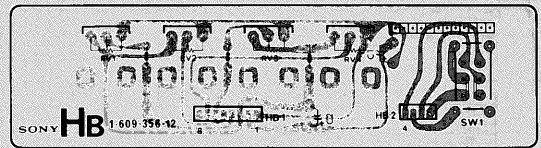
- HA Board -



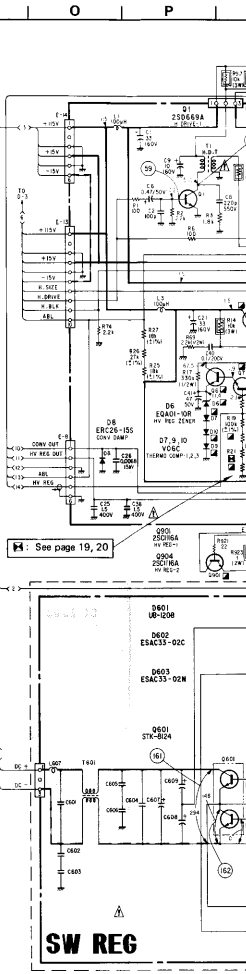
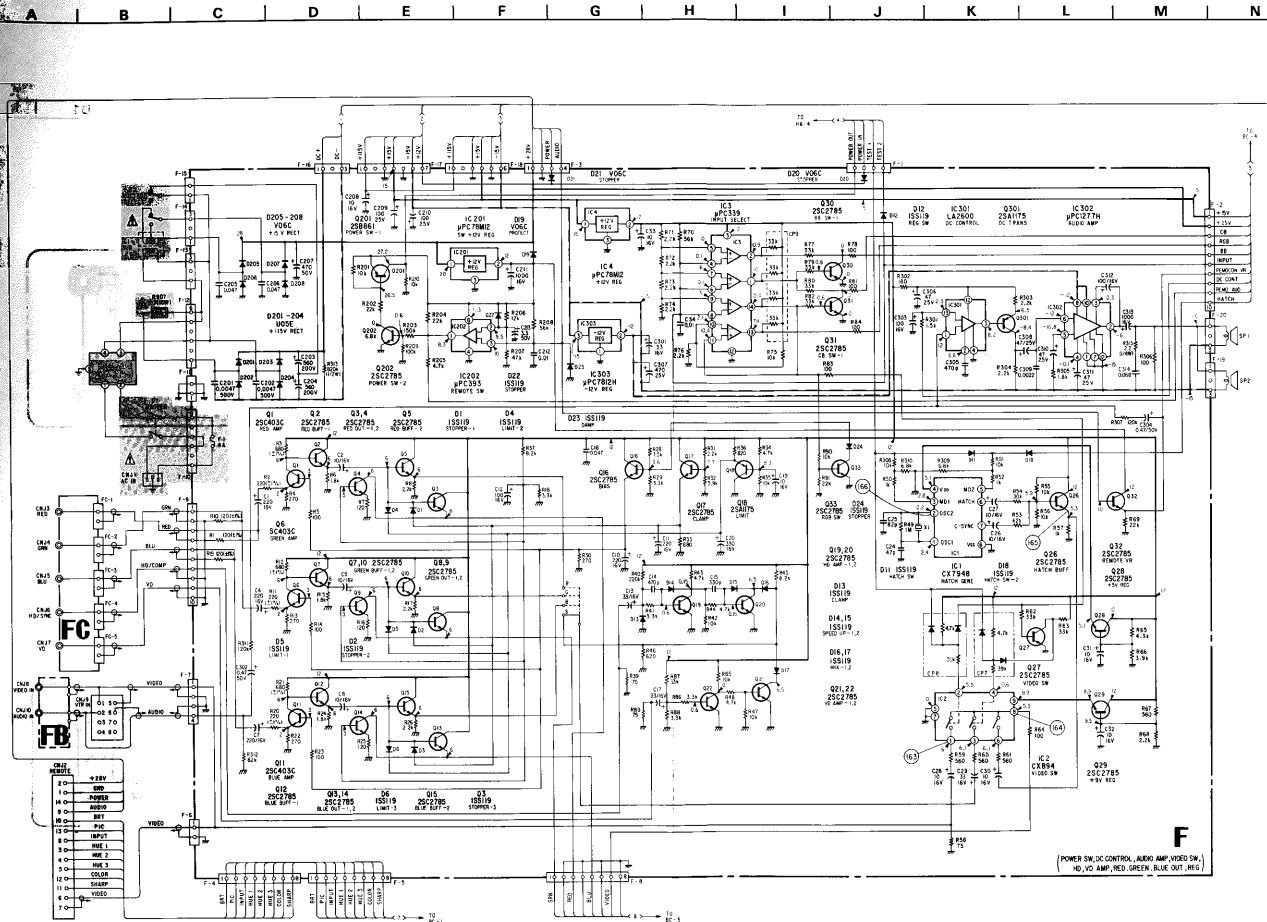
- DB Board -



- HB Board -



1  
2  
3  
4  
5  
6  
7  
8  
9  
10



2  
3  
4  
7  
6  
7  
8  
9  
10

SW REG

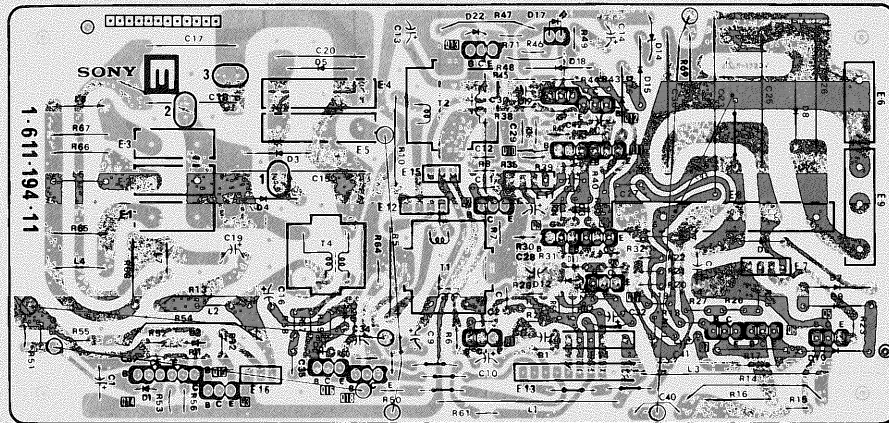






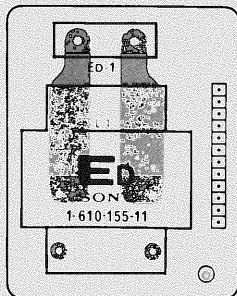
O | P | Q | R | S | T | U | V | W | X | Y | Z | A1 | B1 | C1 | D1

- E Board -

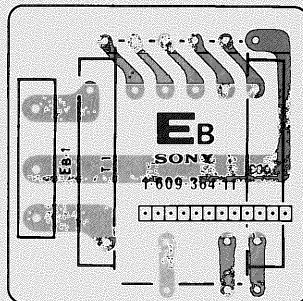


0	D
13	22 17 14
12	5 18 15
10,11	19 16
2	3
8,9	4 13
17	11 12
14,15	20 9
3	1 7,6,5
	2 21 10
0	D

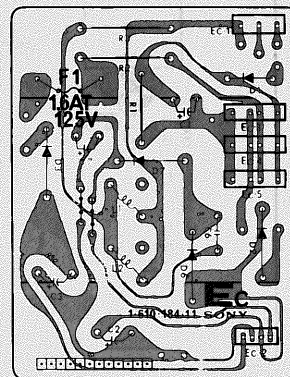
- ED Board -



- EB Board -



- EC Board -



1  
2  
3  
4  
5  
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8  
9  
10

**CR** [RED VIDEO OUT]

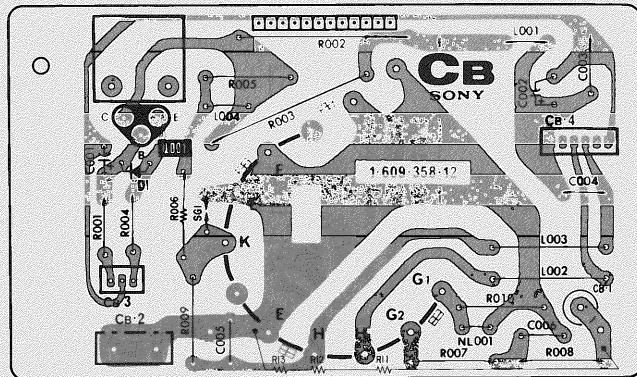
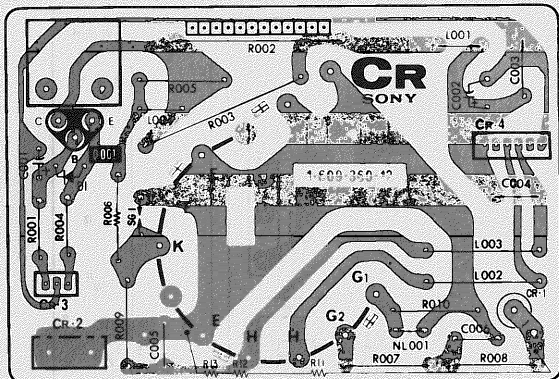
**CG** [GREEN VIDEO OUT]

**CB** [BLUE VIDEO OUT]

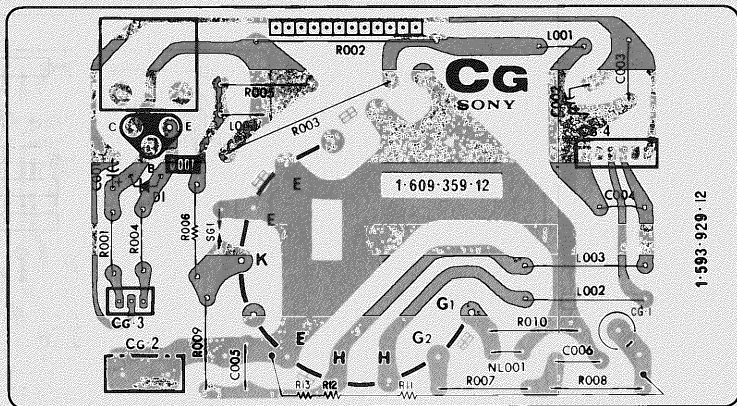
A B C D E F G H I J K L M N O

- CR Board -

- CB Board -



- CG Board -



## 4.7. WAVEFORM



1 2 0.48Vp-p (V)



3 5.6Vp-p (V)



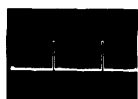
4 5 0.76Vp-p (V)



6 24Vp-p (V)



33 2.5Vp-p (V)



34 12Vp-p (V)



35 1.6Vp-p (H)



36 1Vp-p (H)



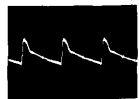
7 8 0.72Vp-p (V)



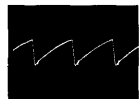
9 26Vp-p (V)



10 2Vp-p (H)



11 8.6Vp-p (H)



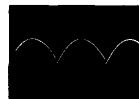
37 4.4Vp-p (H)



38 3.3Vp-p (H)



39 2.9Vp-p (V)



40 2.9Vp-p (V)



12 6Vp-p (H)



13 14 15 34Vp-p (V)



16 17 1.4Vp-p (V)



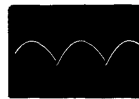
18 2Vp-p (V)



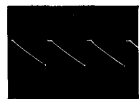
41 2.5Vp-p (V)



42 43 2.5Vp-p (V)



44 45 2.9Vp-p (V)



46 3.2Vp-p (H)



19 20 1.4Vp-p (V)



21 2Vp-p (V)



22 23 1.4Vp-p (V)



24 2Vp-p (V)



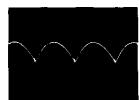
47 3Vp-p (H)



48 1.6Vp-p (H)



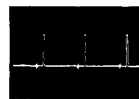
49 3Vp-p (H)



50 51 3.2Vp-p (H)



25 34Vp-p (V)



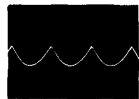
26 6Vp-p (H)



27 5Vp-p (V)



28 1.75Vp-p (V)



52 3Vp-p (H)



53 14Vp-p (H)



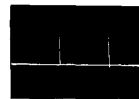
54 14Vp-p (V)



55 0.3Vp-p (V)



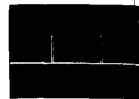
29 0.7Vp-p (V)



30 5.6Vp-p (V)



31 3.2Vp-p (V)



32 11Vp-p (V)



56 0.34Vp-p (V)



57 3Vp-p (H)



58 3.2Vp-p (V)



59 1.8Vp-p (H)



60 125Vp-p (H)



61 1.8Vp-p (H)



62 125Vp-p (H)



63 5.3Vp-p (V)



64 27Vp-p (V)



65 1.3Vp-p (H)



66 13Vp-p (H)



67 15Vp-p (H)



70 800Vp-p (H)



71 15Vp-p (H)



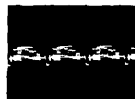
72 900Vp-p (H)



73, 74 0.9Vp-p (H) PAL



73, 74 0.9Vp-p (H)  
SECAM



73, 74 0.8Vp-p (H)  
NTSC3.58  
NTSC4.43



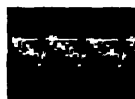
75 4.6Vp-p (H)



76 4.4Vp-p (H)



77 4.4Vp-p (H)



78 2.3Vp-p (H) PAL



78 2.3Vp-p (H) SECAM



78 2Vp-p (H) NTSC3.58  
NTSC4.43



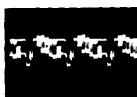
79 2.3Vp-p (H) PAL



79 2.3Vp-p (H) SECAM



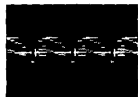
79 2Vp-p (H) NTSC3.58  
NTSC4.43



80 2.5Vp-p (H) PAL



80 2.4Vp-p (H) SECAM



80 2Vp-p (H) NTSC3.58  
NTSC4.43



81 0.7Vp-p (H) PAL



81 0.7Vp-p (H) SECAM



81 0.56Vp-p (H) NTSC3.58  
0.6Vp-p (H) NTSC4.43



82 0.6Vp-p (H) PAL



82 0.6Vp-p (H) SECAM



82 0.48Vp-p (H)  
NTSC3.58



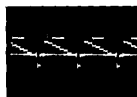
82 0.36Vp-p (H) NTSC4.43



83 1.4Vp-p (H) PAL



83 1.4Vp-p (H) SECAM



83 1.2Vp-p (H) NTSC3.58



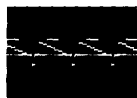
83 1.2Vp-p (H) NTSC4.43



84 2.5Vp-p (H) PAL



84 2.3Vp-p (H) SECAM



84 2Vp-p (H) NTSC3.58  
NTSC4.43



85 0.36Vp-p (H) PAL



85 1Vp-p (H) NTSC3.58



85 0.24Vp-p (H) NTSC4.43



86 0.24Vp-p (H) PAL



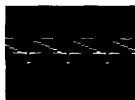
86 0.24Vp-p (H) NTSC3.58



86 0.14Vp-p (H)  
NTSC4.43



87 2Vp-p (H) PAL



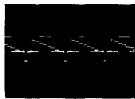
87 2Vp-p (H) SECAM

87 2Vp-p (H) NTSC3.58  
NTSC4.43

88 1Vp-p (H) PAL



88 1Vp-p (H) SECAM

88 1Vp-p (H) NTSC3.58  
NTSC4.43

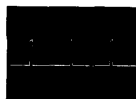
89 0.8Vp-p (H) PAL



89 0.8Vp-p (H) SECAM

89 0.8Vp-p (H) NTSC3.58  
NTSC4.43

90 2Vp-p (H)



91 11Vp-p (H)



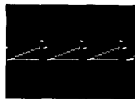
92 12Vp-p (H)



93 0.46Vp-p (H) PAL

93 0.42Vp-p (H) NTSC3.58  
0.2Vp-p (H) NTSC4.43

94 95 2Vp-p (H) PAL

94 95 2Vp-p (H)  
SECAM94 95 2Vp-p (H)  
NTSC3.58  
NTSC4.43

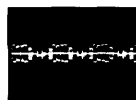
96 0.9Vp-p (H) PAL



96 0.8Vp-p (H) SECAM

96 0.8Vp-p (H)  
NTSC3.58  
NTSC4.43

97 0.32Vp-p (H) PAL

97 0.21Vp-p (H) NTSC3.58  
0.17Vp-p (H) NTSC4.43

98 0.48Vp-p (H) PAL

98 0.41Vp-p (H)  
NTSC3.58  
0.2Vp-p (H)  
NTSC4.43



99 2.4Vp-p (H) PAL



99 1.8Vp-p (H) NTSC3.58  
1.5Vp-p (H) NTSC4.43



100 1.2Vp-p (H) PAL



100 1Vp-p (H) NTSC3.58  
0.8Vp-p (H) NTSC4.43



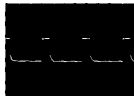
101 2.9Vp-p (H)



102 2Vp-p (4.43MHz) PAL



102 2Vp-p (3.58MHz) NTSC  
NTSC3.58  
2Vp-p (4.43MHz)  
NTSC4.43



103 2.7Vp-p (H) PAL,  
SECAM



103 0.5Vp-p (H) NTSC3.58  
NTSC4.43



104 0.7Vp-p (H) PAL



104 0.48Vp-p (H) NTSC3.58  
0.44Vp-p (H) NTSC4.43



105 0.75Vp-p (H) PAL



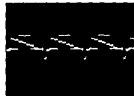
105 0.6Vp-p (H) NTSC3.58  
0.56Vp-p (H) NTSC4.43



106 0.5Vp-p (H) PAL



106 0.6Vp-p (H) SECAM



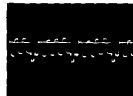
106 0.54Vp-p (H)  
NTSC3.58  
NTSC4.43



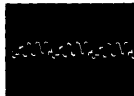
107 0.56Vp-p (H) PAL  
NTSC3.58  
NTSC4.43



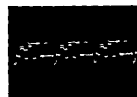
107 10Vp-p (H) SECAM



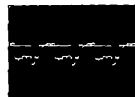
108 2.8Vp-p (H) PAL



108 3.6Vp-p (H)  
SECAM



108 2.4Vp-p (H) NTSC3.58  
NTSC4.43



109 2.6Vp-p (H) PAL



109 3Vp-p (H) SECAM

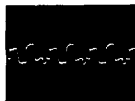


109 2.4Vp-p (H)  
NTSC3.58  
NTSC4.43

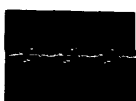




110 2.8Vp-p (H) PAL



110 3.2Vp-p (H) SECAM

110 2.4Vp-p (H) NTSC3.58  
NTSC4.43

111 0.7Vp-p (H) PAL

111 0.44Vp-p (H) NTSC3.58  
0.4Vp-p (H) NTSC4.43

112 0.6Vp-p (H) PAL



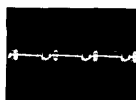
112 0.6Vp-p (H) SECAM

112 0.6Vp-p (H) NTSC3.58  
NTSC4.43

113 0.18Vp-p (H) PAL



113 0.2Vp-p (H) SECAM

113 0.2Vp-p (H) NTSC3.58  
NTSC4.43

114 0.9Vp-p (H) PAL



114 0.28Vp-p (H) SECAM



114 0.2Vp-p (H) NTSC3.58



114 0.32Vp-p (H) NTSC4.43

115 2.8Vp-p (H) PAL  
2.6Vp-p (H) SECAM  
2.2Vp-p (H) NTSC3.58  
NTSC4.43116 9Vp-p (H) PAL  
8Vp-p (H) SECAM  
NTSC3.58  
NTSC4.43

116-a 0.6Vp-p (H) PAL



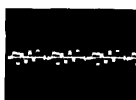
116-a 0.8Vp-p (H) SECAM

116-a 0.8Vp-p (H)  
NTSC3.58

116-a 0.6Vp-p (H) NTSC4.43



117 0.75Vp-p (H) PAL

117 0.6Vp-p (H) NTSC3.58  
0.5Vp-p (H) NTSC4.43

118 2.6Vp-p (H)



119 0.4Vp-p (H) PAL



119 0.5Vp-p (H) SECAM



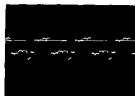
119 0.2Vp-p (H) NTSC3.58  
NTSC4.43



120 11Vp-p (H)



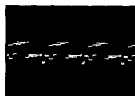
121 1.3Vp-p (H)



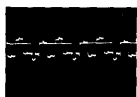
122 2.5Vp-p (H) PAL



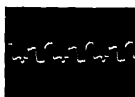
122 2.5Vp-p (H) SECAM



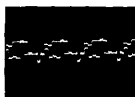
122 2.2Vp-p (H) NTSC3.58  
2.4Vp-p (H) NTSC4.43



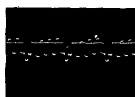
123 2.8Vp-p (H) PAL



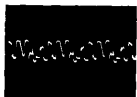
123 3Vp-p (H) SECAM



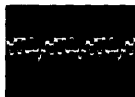
123 2.2Vp-p (H) NTSC3.58  
2.3Vp-p (H) NTSC4.43



124 2.6Vp-p (H) PAL



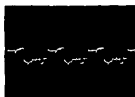
124 3.4Vp-p (H) SECAM



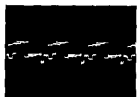
124 2.2Vp-p (H) NTSC3.58  
2.4Vp-p (H) NTSC4.43



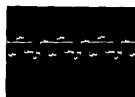
125 2.5Vp-p (H) PAL



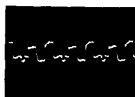
125 2.5Vp-p (H) SECAM



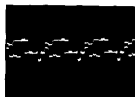
125 2.2Vp-p (H) NTSC3.58  
2.4Vp-p (H) NTSC4.43



126 2.8Vp-p (H) PAL



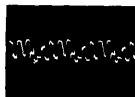
126 3Vp-p (H) SECAM



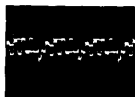
126 2.2Vp-p (H) NTSC3.58  
2.3Vp-p (H) NTSC4.43



127 2.6Vp-p (H) PAL



127 3.4Vp-p (H) SECAM



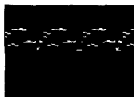
127 2.2Vp-p (H) NTSC3.58  
2.4Vp-p (H) NTSC4.43



128 3.4Vp-p (H) PAL



128 3.8Vp-p (H) SECAM



128 2.7Vp-p (H) NTSC3.58  
NTSC4.43



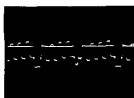
129 3Vp-p (H) PAL



129 3Vp-p (H) SECAM



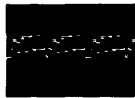
129 2.6Vp-p (H) NTSC3.58  
NTSC4.43



130 3.2Vp-p (H) PAL



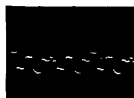
130 4.4Vp-p (H) SECAM



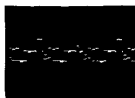
130 2.5Vp-p (H) NTSC3.58  
NTSC4.43



131 3.2Vp-p (H) PAL



131 3.4Vp-p (H) SECAM



131 2.6Vp-p (H) NTSC3.58  
NTSC4.43



132 3.4Vp-p (H) PAL



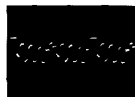
132 3.4Vp-p (H) SECAM



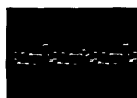
132 2.9Vp-p (H) NTSC3.58  
NTSC4.43



133 3.3Vp-p (H) PAL



133 4Vp-p (H) SECAM



133 2.8Vp-p (H) NTSC3.58  
NTSC4.43



134 1.4Vp-p (H)



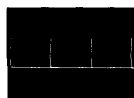
135 12Vp-p (H)



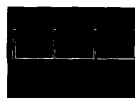
136 12Vp-p (H)



137 12Vp-p (H)



138 12Vp-p (H)



139 12Vp-p (H)



140 13Vp-p (H)



(141) 12V<sub>p-p</sub> (1/2H)



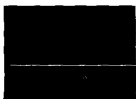
(142) 12V<sub>p-p</sub> (H)



(143) 10V<sub>p-p</sub> (V)



(144), (145) 12V<sub>p-p</sub> (V)



(146) 11V<sub>p-p</sub> (V)



(147) 12V<sub>p-p</sub> (V)



(148) 9.5V<sub>p-p</sub> (V)



(149) 12V<sub>p-p</sub> (V)



(150) 12V<sub>p-p</sub> (V)



(151) 12V<sub>p-p</sub> (V)



(152) 12V<sub>p-p</sub> (V)



(153) 4.4V<sub>p-p</sub> (V) PAL



(153) 4.4V<sub>p-p</sub> (V) SECAM



(153) 4.4V<sub>p-p</sub> (V) NTSC3.58



(154) 11V<sub>p-p</sub> (1/2H)



(155) 115V<sub>p-p</sub> (H) PAL



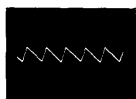
(156) 120V<sub>p-p</sub> (H) PAL



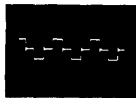
(157) 120V<sub>p-p</sub> (H)



(158), (159), (160) 20V<sub>p-p</sub> (H)



(161) 8V<sub>p-p</sub> (10m Sec)



(162) 300V<sub>p-p</sub> (38 μ Sec)



(163), (164) 0.9V<sub>p-p</sub> (H) PAL



(165) 1V<sub>p-p</sub> (H)



(166) TEST 6.2V<sub>p-p</sub>  
(3.58 MHz)

## SECTION 5 EXPLODED VIEWS

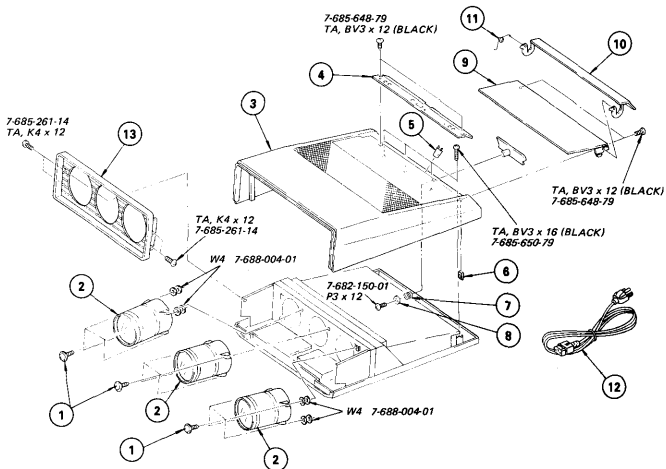
**NOTE:**

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

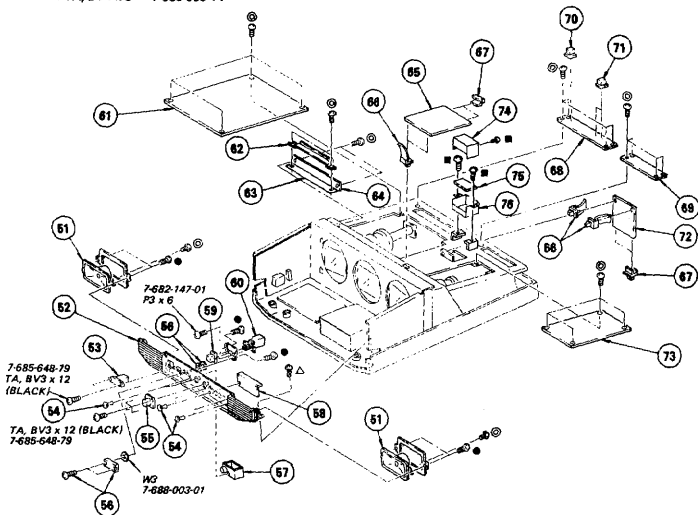
**(1) LENS**



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	4-302-934-00	HEAD, WASHER, TAPPING SCREW		8	4-812-554-00	WASHER	
2	4-362-801-00	LENS, DELTA 2-D		9	4-362-814-00	PLATE, TOP	
3	X-4362-807-0	HOOD ASSY		10	X-4362-805-0	DOOR ASSY	
4	X-4362-803-0	PLATE ASSY, INNER	5, 6, 7, 8	11	4-333-719-21	SPRING (B)	
5	4-352-034-00	CATCHER, PUSH		12	▲ 1-551-812-00	CORD, POWER	
6	4-303-407-00	NUT, SPECIAL PLATE		13	4-362-824-00	PANEL, LENS	
7	▲ 3-480-044-00	SPRING, COMPRESSION					

## (2) PANEL ASSY

- ⊙ : TA, BV3 x 6 7-685-645-71  
 ■ : TA, BV3 x 8 7-685-646-71  
 ● : TA, BV3 x 12 7-685-648-71  
 △ : TA, BV4 x 8 7-685-659-14



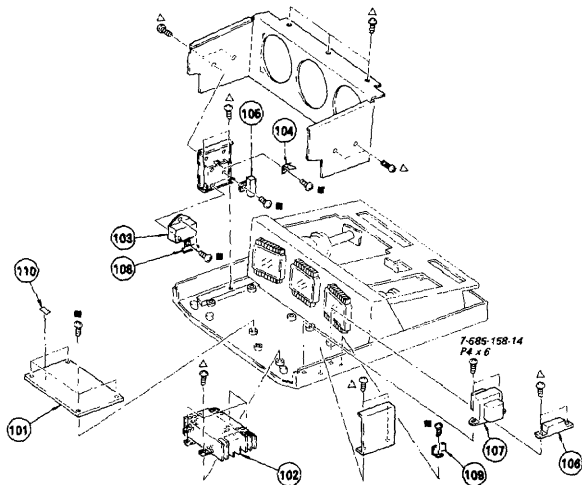
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	1-503-255-00	SPEAKER		63	4-362-829-00	SPACER (A), MICA	
52	X-4362-806-00	PANEL ASSY, CONNECTOR		64	▲1-610-154-00	DB BOARD	
53	▲3-509-547-00	CONNECTOR, AC I/K		65	▲1-610-184-00	EC BOARD	
54	3-531-576-31	RIVET (DIA. 3), NYLON		66	▲3-703-141-00	HOLDER, PCB	
55	1-556-937-00	CONNECTOR ASSY, MULTI		67	▲3-703-072-00	HOLDER, PCB	
56	1-509-095-00	BP MULTI SOCKET		68	▲1-609-357-00	HA BOARD	
57	▲1-610-419-00	F8 BOARD		69	▲1-609-356-00	MB BOARD	
58	▲1-610-420-00	F7 BOARD		70	4-352-808-00	BUTTON, POWER	
59	4-362-811-00	BUTTON, MAIN POWER		71	4-352-809-00	BUTTON, SELECT	
60	▲1-553-410-00	SWITCH, PUSH (POWER)		72	▲1-609-364-00	EI BOARD	
61	▲A-1340-560-A	D BOARD, COMPLETE		73	▲A-1340-578-A	E BOARD, COMPLETE	
62	▲4-362-828-00	RETAINER (A), TRANSFORMER		74	▲4-363-156-00	CAP (A), SHIELD	
				75	▲1-611-255-00	SD BOARD	
				76	▲4-363-155-00	CASE (A), SHIELD, D.L	

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

### (3) F BOARD

■ : TA, 8V3 x 8 7-685-646-71

△ : TA, 8V4 x 8 7-685-659-14

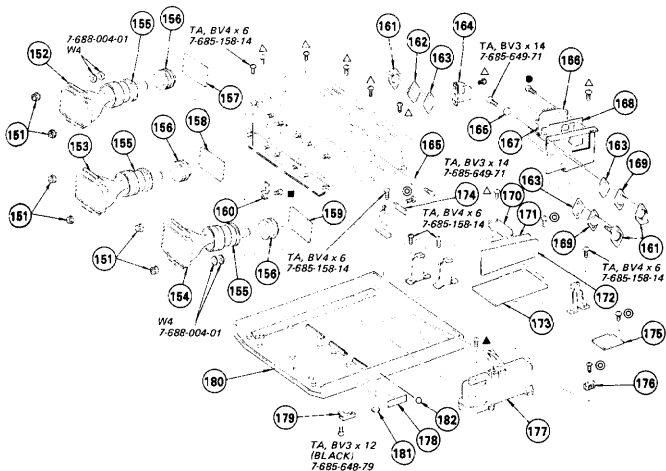


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
101	▲:A-1240-477-A	F BOARD, COMPLETE		106	▲:1-552-536-00	SWITCH, POWER WOLTAIC CHANGE	
102	▲:1-413-152-21	SWITCHING REGULATOR (TK-03)		107	▲:1-447-612-00	TRANSFORMER, POWER	
103	▲:1-235-219-00	FILTER, NOISE (L.F.T)		108	1-536-378-XX	L-TYPE TERMINAL STRIP	
104	▲:4-303-790-00	TERMINAL, GROUP		109	1-536-401-XX	L-TYPE TERMINAL STRIP	
105	▲:1-217-182-00	RES, WIREWOUND 2.7		110	▲:3-701-946-26	LABEL, FUSE	

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

#### (4) BASE ASSY

- ◎ : TA, BV3 x 6 7-685-645-71
- : TA, BV3 x 8 7-685-646-71
- : TA, BV3 x 12 7-685-648-71
- △ : TA, BV4 x 8 7-685-659-14
- ▲ : TA, BV4 x 12 7-685-661-14



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	4-304-749-00	NUT, FLANGE		167	▲ 4-352-848-00	SPACER (B)	
152	▲ 8-736-053-05	CRT SD-133(R)		168	▲ 4-362-830-00	SPACER	
153	▲ 8-736-051-05	CRT SD-133(G)		169	8-729-301-32	TRANSISTOR 25C1413A	
154	▲ 8-736-052-05	CRT SD-133(B)		170	▲ 4-362-846-00	MULTIPLIER PC BOARD	
155	▲ 1-455-243-11	DEFLECTION YOKE (SY-130K)		171	▲ A-1130-224-A	BB BOARD, COMPLETE	
156	▲ 1-452-302-00	CRT NECK ASSEMBLY		172	▲ A-1135-232-A	BA BOARD, COMPLETE	
157	▲ A-1330-400-A	CR BOARD, COMPLETE		173	▲ 1-609-362-00	BC BOARD	
158	▲ A-1330-409-A	CG BOARD, COMPLETE		174	▲ 1-610-153-00	HC BOARD	
159	▲ A-1330-410-A	CD BOARD, COMPLETE		175	▲ 1-610-155-00	ED BOARD	
160	4-332-239-00	SPRING		176	▲ 4-309-674-00	TERMINAL, EARTH	
161	▲ 4-314-938-01	RETAINER (T0-3), TRANSISTOR		177	▲ 1-453-095-12	DC BLOCK, HIGH-VOLTAGE (FBY)	
162	8-729-301-62	TRANSISTOR 25C116A		178	▲ 4-362-873-00	LABEL, MODEL NUMBER (VPH-10200 ONLY)	
163	3-701-353-00	SPACER, mica		▲ 4 362 872 00	LABEL, MODEL NUMBER (VPH-7220 ONLY)		
164	▲ 4-362-849-00	INSULATOR		179	▲ 4-362-810-00	COVER	
165	3-701-453-00	BUSHING (1), TR		180	X-4362-808-00	BASE ASSY	179, 181
166	▲ 1-230-089-21	RESISTOR ASSY, HIGH-VOLTAGE (FOCUS BLOCK)		181	2-205-702-01	SPACER	
				182	3-701-953-01	BASE ASSY	

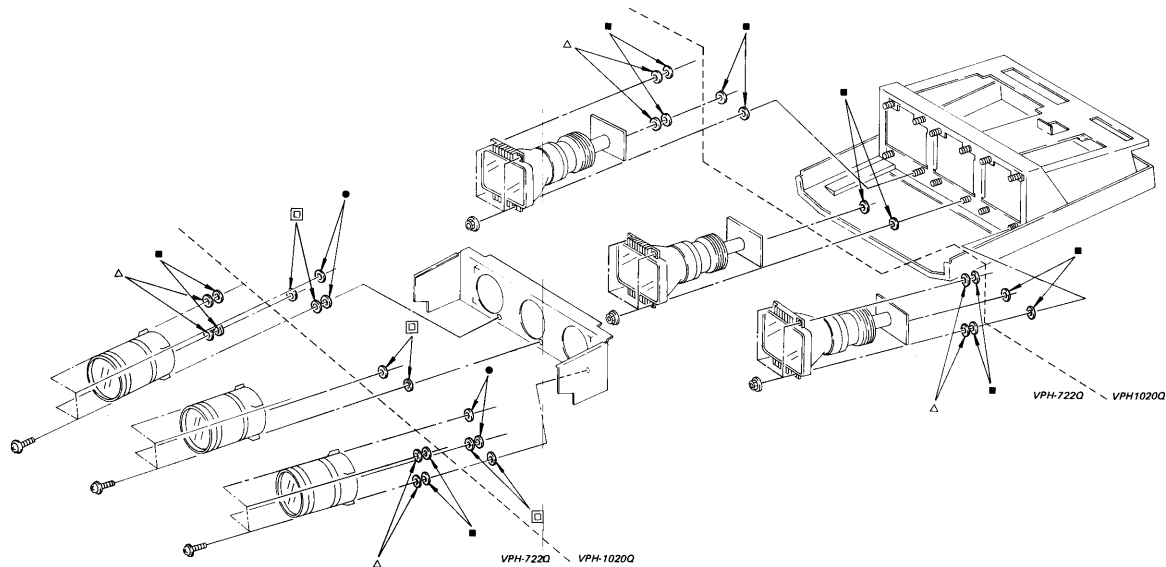
The components identified by shading and mark are critical for safety. Replace only with part number specified.



(5) WASHERS FOR LENSES & CRTS

- :  $\phi$ 2 mm WASHER 3-669-117-61
- $\Delta$  :  $\phi$ 0,5 mm WASHER 3-639-647-01
- :  $\phi$ 0,8 mm WASHER 7-688-004-01
- :  $\phi$ 1,0 mm WASHER 4-844-815-11

**Note:**  
This diagram is used for both VPH-722Q and VPH-1020Q,  
but the mounting washers are different for each model.  
Ensure the correct washers are ordered as shown, if replacement is necessary.



F

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R3	1-214-128-00	METAL	680 1% 1/4W	R59	1-247-825-00	CARBON	560 5% 1/6W
R4	1-247-817-00	CARBON	270 5% 1/6W	R60	1-247-835-00	CARBON	560 5% 1/6W
R5	1-247-807-00	CARBON	100 5% 1/6W	R61	1-247-825-00	CARBON	560 5% 1/6W
R6	1-247-837-00	CARBON	1.8K 5% 1/6W	R62	1-247-867-00	CARBON	33K 5% 1/6W
R7	1-247-809-00	CARBON	120 5% 1/6W	R63	1-247-867-00	CARBON	33K 5% 1/6W
R8	1-247-839-00	CARBON	2.2K 5% 1/6W	R64	1-247-807-00	CARBON	100 5% 1/6W
R10	1-214-110-00	METAL	120 1% 1/4W	R65	1-247-846-00	CARBON	4.3K 5% 1/6W
R11	1-214-116-00	METAL	220 1% 1/4W	R66	1-247-845-00	CARBON	3.9K 5% 1/6W
R12	1-214-128-00	METAL	680 1% 1/4W	R67	1-247-825-00	CARBON	560 5% 1/6W
R13	1-247-817-00	CARBON	270 5% 1/6W	R68	1-247-839-00	CARBON	2.2K 5% 1/6W
R14	1-247-807-00	CARBON	100 5% 1/6W	R69	1-247-863-00	CARBON	22K 5% 1/6W
R15	1-247-837-00	CARBON	1.8K 5% 1/6W	R70	1-247-873-00	CARBON	56K 5% 1/6W
R16	1-247-809-00	CARBON	120 5% 1/6W	R71	1-247-839-00	CARBON	2.2K 5% 1/6W
R17	1-247-839-00	CARBON	2.2K 5% 1/6W	R72	1-247-839-00	CARBON	2.2K 5% 1/6W
R19	1-214-110-00	METAL	120 1% 1/4W	R73	1-247-839-00	CARBON	2.2K 5% 1/6W
R20	1-214-116-00	METAL	220 1% 1/4W	R74	1-247-839-00	CARBON	2.2K 5% 1/6W
R21	1-214-128-00	METAL	680 1% 1/4W	R75	1-247-855-00	CARBON	10K 5% 1/6W
R22	1-247-817-00	CARBON	270 5% 1/6W	R76	1-247-839-00	CARBON	2.2K 5% 1/6W
R23	1-247-807-00	CARBON	100 5% 1/6W	R77	1-247-867-00	CARBON	33K 5% 1/6W
R24	1-247-837-00	CARBON	1.8K 5% 1/6W	R78	1-247-807-00	CARBON	100 5% 1/6W
R25	1-247-809-00	CARBON	120 5% 1/6W	R79	1-247-867-00	CARBON	33K 5% 1/6W
R26	1-247-839-00	CARBON	2.2K 5% 1/6W	R80	1-247-867-00	CARBON	33K 5% 1/6W
R28	1-247-852-00	CARBON	7.5K 5% 1/6W	R81	1-247-807-00	CARBON	100 5% 1/6W
R29	1-247-843-00	CARBON	3.3K 5% 1/6W	R82	1-247-867-00	CARBON	33K 5% 1/6W
R30	1-247-817-00	CARBON	270 5% 1/6W	R83	1-247-807-00	CARBON	100 5% 1/6W
R31	1-247-839-00	CARBON	2.2K 5% 1/6W	R84	1-247-807-00	CARBON	100 5% 1/6W
R32	1-247-845-00	CARBON	3.9K 5% 1/6W	R85	1-247-855-00	CARBON	10K 5% 1/6W
R33	1-247-827-00	CARBON	680 5% 1/6W	R86	1-247-843-00	CARBON	3.3K 5% 1/6W
R34	1-247-847-00	CARBON	4.7K 5% 1/6W	R87	1-247-867-00	CARBON	33K 5% 1/6W
R35	1-247-855-00	CARBON	10K 5% 1/6W	R88	1-247-843-00	CARBON	3.3K 5% 1/6W
R36	1-247-829-00	CARBON	820 5% 1/6W	R89	1-247-804-00	CARBON	75 5% 1/6W
R37	1-247-853-00	CARBON	8.2K 5% 1/6W	R90	1-247-855-00	CARBON	10K 5% 1/6W
R38	1-247-843-00	CARBON	3.3K 5% 1/6W	R91	1-247-839-00	CARBON	2.2K 5% 1/6W
R39	1-247-804-00	CARBON	75 5% 1/6W	R201	1-247-855-00	CARBON	10K 5% 1/6W
R40	1-247-887-00	CARBON	220K 5% 1/6W	R202	1-247-851-00	CARBON	6.8K 5% 1/6W
R41	1-247-843-00	CARBON	3.3K 5% 1/6W	R203	1-247-883-00	CARBON	150K 5% 1/6W
R42	1-247-855-00	CARBON	10K 5% 1/6W	R204	1-247-863-00	CARBON	22K 5% 1/6W
R43	1-247-847-00	CARBON	4.7K 5% 1/6W	R205	1-247-847-00	CARBON	4.7K 5% 1/6W
R44	1-247-847-00	CARBON	4.7K 5% 1/6W	R206	1-247-857-00	CARBON	12K 5% 1/6W
R45	1-247-853-00	CARBON	8.2K 5% 1/6W	R207	1-247-871-00	CARBON	47K 5% 1/6W
R46	1-247-831-00	CARBON	620 5% 1/6W	R208	1-247-873-00	CARBON	56K 5% 1/6W
R47	1-247-855-00	CARBON	10K 5% 1/6W	R209	1-247-879-00	CARBON	100K 5% 1/6W
R48	1-247-847-00	CARBON	4.7K 5% 1/6W	R210	1-247-855-00	CARBON	10K 5% 1/6W
R49	1-247-903-00	CARBON	1M 5% 1/6W	R301	1-247-835-00	CARBON	1.5K 5% 1/6W
R50	1-247-831-00	CARBON	1K 5% 1/6W	R302	1-247-813-00	CARBON	180 5% 1/6W
R51	1-247-855-00	CARBON	10K 5% 1/6W	R303	1-247-839-00	CARBON	2.2K 5% 1/6W
R52	1-247-831-00	CARBON	1K 5% 1/6W	R304	1-247-839-00	CARBON	2.2K 5% 1/6W
R53	1-247-874-00	CARBON	62K 5% 1/6W	R305	1-247-837-00	CARBON	1.8K 5% 1/6W
R54	1-247-866-00	CARBON	30K 5% 1/6W	R306	1-247-807-00	CARBON	100 5% 1/6W
R55	1-247-855-00	CARBON	10K 5% 1/6W	R307	1-247-881-00	CARBON	120K 5% 1/6W
R56	1-247-855-00	CARBON	10K 5% 1/6W	R308	1-247-855-00	CARBON	10K 5% 1/6W
R57	1-247-831-00	CARBON	1K 5% 1/6W	R309	1-247-851-00	CARBON	6.8K 5% 1/6W
R58	1-247-804-00	CARBON	75 5% 1/6W	R310	1-247-851-00	CARBON	6.8K 5% 1/6W



Ref.No.	Part No.	Description	Remark
R311	1-247-881-00	CARBON 120K 5% 1/6W	
R312	1-247-877-00	CARBON 82K 5% 1/6W	
R313	1-244-943-00	CARBON 820K 5% 1/2W	
R315	1-247-005-00	CARBON 100 5% 1/4W F	
<u>CRYSTAL</u>			
X1	1-527-396-00	CRYSTAL, OSC	
*****			
♣	1-510-419-00	FB BOARD *****	
	1-536-799-00	TERMINAL BOARD, INPUT/OUTPUT B	
*****			
♣	1-610-420-00	FC BOARD *****	
	1-536-798-00	TERMINAL BOARD, INPUT/OUTPUT A	
*****			
♣	A-1330-408-A	CR BOARD, COMPLETE *****	
♣	1-609-360-00	CR BOARD	
	1-526-767-00	SOCKET, CRT	
	1-556-880-51	LEAD ASSY, HIGH-VOLTA GE	
<u>CAPACITOR</u>			
C2	1-123-028-00	ELECT 2.2MF	350V
C3	1-102-050-00	CERAMIC 0.01MF	500V
C4	1-102-155-00	CERAMIC 330PF	20% 2KV
C5	1-102-155-00	CERAMIC 330PF	20% 2KV
C6	1-102-155-00	CERAMIC 330PF	20% 2KV
<u>CONNECTOR</u>			
CR1	♣:1-508-784-00	1P PLUG	
CR2	♣:1-508-786-00	2P PLUG (M)	
CR3	♣:1-560-466-00	PIN, CONNECTOR 3P	
CR4	♣:1-560-469-00	PIN, CONNECTOR 6P	
<u>DIODE</u>			
D1	8-719-911-19	DIODE ISS119	
<u>COIL</u>			
L1	1-407-701-00	MICRO INDUCTOR 47UH	
L2	1-407-364-00	COIL, SPOOK CHOKE	
L3	1-407-364-00	COIL, SPOOK CHOKE	
L4	1-407-694-00	MICRO INDUCTOR 12UH	
<u>NEON LAMP</u>			
NL1	1-519-013-13	DISCHARGE TUBE	

Ref.No.	Part No.	Description	Remark
<u>TRANSISTOR</u>			
Q1	8-729-322-78	TRANSISTOR 2SC2278	
<u>RESISTOR</u>			
R1	1-247-107-00	CARBON 100 5% 1/4W	
R2	1-206-751-00	METAL OXIDE 12K 5% 3W F	
R3	1-206-751-00	METAL OXIDE 12K 5% 3W F	
R4	1-247-107-00	CARBON 100 5% 1/4W	
R5	1-202-836-00	SOLID 56K 10% 1/2W	
R6	1-202-557-00	SOLID 220 5% 1/2W	
R7	1-202-823-11	SOLID 2.7K 10% 1/2W	
R8	1-202-847-00	SOLID 560K 10% 1/2W	
R9	1-202-842-11	SOLID 220K 10% 1/2W	
R10	1-202-818-00	SOLID 1K 10% 1/2W	
R11	♣:1-508-784-00	SOLID	1/2W
R12	♣:1-508-786-00	SOLID	1/2W
R13	♣:1-560-466-00	SOLID	1/2W
<u>SPARK GAP</u>			
SG1	1-519-063-XX	DISCHARGING GAP	
*****			
♣	A-1330-409-A	CG BOARD, COMPLETE *****	
♣	1-609-359-00	CG BOARD	
	1-526-767-00	SOCKET, CRT	
	1-556-880-51	LEAD ASSY, HIGH-VOLTA GE	
<u>CAPACITOR</u>			
C2	1-123-028-00	ELECT 2.2MF	350V
C3	1-102-050-00	CERAMIC 0.01MF	500V
C4	1-102-155-00	CERAMIC 330PF	20% 2KV
C5	1-102-155-00	CERAMIC 330PF	20% 2KV
C6	1-102-155-00	CERAMIC 330PF	20% 2KV
<u>CONNECTOR</u>			
CG1	♣:1-508-784-00	1P PLUG	
CG2	♣:1-508-786-00	2P PLUG (M)	
CG3	♣:1-560-466-00	PIN, CONNECTOR 3P	
CG4	♣:1-560-469-00	PIN, CONNECTOR 6P	
<u>DIODE</u>			
D1	8-719-911-19	DIODE ISS119	
<u>COIL</u>			
L1	1-407-701-00	MICRO INDUCTOR 47UH	
L2	1-407-364-00	COIL, SPOOK CHOKE	
L3	1-407-364-00	COIL, SPOOK CHOKE	
L4	1-407-694-00	MICRO INDUCTOR 12UH	

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>NEON LAMP</u>				<u>NEON LAMP</u>			
NL1	1-519-013-13	DISCHARGE TUBE		L4	1-407-694-00	MICRO INDUCTOR 12UH	
<u>TRANSISTOR</u>				<u>TRANSISTOR</u>			
Q1	8-729-322-78	TRANSISTOR 2SC2278		Q1	8-729-322-78	TRANSISTOR 2SC2278	
<u>RESISTOR</u>				<u>RESISTOR</u>			
R1	1-247-107-00	CARBON	100 5% 1/4W	R1	1-247-107-00	CARBON	100 5% 1/4W
R2	1-206-751-00	METAL OXIDE	12K 5% 3W F	R2	1-206-751-00	METAL OXIDE	12K 5% 3W F
R3	1-206-751-00	METAL OXIDE	12K 5% 3W F	R3	1-206-751-00	METAL OXIDE	12K 5% 3W F
R4	1-247-107-00	CARBON	100 5% 1/4W	R4	1-247-107-00	CARBON	100 5% 1/4W
R5	1-202-836-00	SOLID	56K 10% 1/2W	R5	1-202-836-00	SOLID	56K 10% 1/2W
R6	1-202-557-00	SOLID	220 5% 1/2W	R6	1-202-557-00	SOLID	220 5% 1/2W
R7	1-202-823-11	SOLID	2.7K 10% 1/2W	R7	1-202-823-11	SOLID	2.7K 10% 1/2W
R8	1-202-847-00	SOLID	560K 10% 1/2W	R8	1-202-847-00	SOLID	560K 10% 1/2W
R9	1-202-842-11	SOLID	220K 10% 1/2W	R9	1-202-842-11	SOLID	220K 10% 1/2W
R10	1-202-818-00	SOLID	1K 10% 1/2W	R10	1-202-818-00	SOLID	1K 10% 1/2W
☒ R11 ▲.		SOLID	1/2W	R11 ▲.☒		SOLID	1/2W
☒ R12 ▲.		SOLID	1/2W	R12 ▲.☒		SOLID	1/2W
☒ R13 ▲.		SOLID	1/2W	R13 ▲.☒		SOLID	1/2W
<u>SPARK GAP</u>				<u>SPARK GAP</u>			
SG1	1-519-063-XX	DISCHARGING GAP		SG1	1-519-063-XX	DISCHARGING GAP	
*****				*****			
♣:A-1330-410-A	CB BOARD, COMPLETE			♣:1-609-364-00	EB BOARD		
*****				*****			
♣:1-609-358-00	CB BOARD						
1-526-767-00	SOCKET, CRT						
1-556-880-51	LEAD ASSY, HIGH-VOLTA GE						
<u>CAPACITOR</u>				<u>CONNECTOR</u>			
C2	1-123-028-00	ELECT	2.2MF 350V	EB1	♣:1-506-348-XX	3P PLUG (L)	
C3	1-102-050-00	CERAMIC	0.01MF 500V	<u>TRANSFORMER</u>			
C4	1-102-155-00	CERAMIC	330PF 20% 2KV	T1	▲.1-439-316-00	TRANSFORMER, FERRITE (LOT)	
C5	1-102-155-00	CERAMIC	330PF 20% 2KV	*****			
C6	1-102-155-00	CERAMIC	330PF 20% 2KV	♣:1-610-184-00	EC BOARD		
				*****			
				♣:1-533-146-00	HOLDER, FUSE		
<u>CONNECTOR</u>				<u>CAPACITOR</u>			
CB1	♣:1-508-794-00	1P PLUG		C1	1-123-028-00	ELECT	2.2MF 350V
CB2	♣:1-508-786-00	2P PLUG (M)		C2	1-123-325-00	ELECT	2200MF 20% 16V
CB3	♣:1-560-466-00	PIN, CONNECTOR 3P		C3	1-123-974-00	ELECT	2200MF 20% 16V
CB4	♣:1-560-469-00	PIN, CONNECTOR 6P		C5	1-106-216-00	MYLAR	0.068MF 10% 100V
				C6	1-106-216-00	MYLAR	0.068MF 10% 100V
<u>DIODE</u>							
D1	8-719-911-19	DIODE ISS119		C7	1-108-429-00	MYLAR	0.047MF 10% 200V
<u>COIL</u>							
L1	1-407-701-00	MICRO INDUCTOR 47UH					
L2	1-407-364-00	COIL, SPOOK CHOKE					
L3	1-407-364-00	COIL, SPOOK CHOKE					

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EC

DB

ED

D

Ref.No.	Part No.	Description	Remark
<u>DIODE</u>			
D1	8-719-901-19	DIODE V11N	
D2	8-719-301-51	DIODE S-15H	
D3	8-719-301-51	DIODE S-15H	
D6	8-719-301-51	DIODE S-15H	
D7	8-719-301-51	DIODE S-15H	
<u>CONNECTOR</u>			
EC1	♣:1-560-468-00	PIN, CONNECTOR 5P	
EC2	♣:1-560-467-00	PIN, CONNECTOR 4P	
EC3	♣:1-560-469-00	PIN, CONNECTOR 6P	
EC4	♣:1-560-469-00	PIN, CONNECTOR 6P	
EC5	♣:1-560-469-00	PIN, CONNECTOR 6P	
<u>FUSE</u>			
F1	△.1-532-555-00	FUSE, GLASS TUBE 1.6A 125V	
<u>COIL</u>			
L1	1-459-104-00	COIL, DUST CORE	
L2	1-459-104-00	COIL, DUST CORE	
<u>RESISTOR</u>			
R1	1-244-937-00	CARBON 470K 5% 1/2W	
R2	1-206-449-00	METAL OXIDE 2.7 5% 2W F	
R3	1-206-692-00	METAL OXIDE 15K 5% 2W F	
*****			
	♣:1-610-154-00	DB BOARD	*****
<u>CAPACITOR</u>			
C1	1-106-367-00	MYLAR 0.01MF 10% 200V	
C2	1-108-579-00	MYLAR 0.01MF 5% 50V	
<u>CONNECTOR</u>			
DB1	♣:1-941-013-05	CONNECTOR ASSY, BOARD IN	
DB2	♣:1-941-013-05	CONNECTOR ASSY, BOARD IN	
DB4	♣:1-941-013-06	CONNECTOR ASSY, BOARD IN	
DB5	♣:1-941-013-06	CONNECTOR ASSY, BOARD IN	
<u>TRANSISTOR</u>			
Q7	8-729-313-82	TRANSISTOR 2SD1138	
Q8	8-729-386-12	TRANSISTOR 2SB861	
Q11	8-729-313-82	TRANSISTOR 2SD1138	
Q12	8-729-386-12	TRANSISTOR 2SB861	
Q15	8-729-313-82	TRANSISTOR 2SD1138	
Q16	8-729-386-12	TRANSISTOR 2SB861	
Q24	8-729-316-16	TRANSISTOR 2SC1061	
Q25	8-729-315-63	TRANSISTOR 2SB856	
Q26	8-729-316-16	TRANSISTOR 2SC1061	
Q27	8-729-315-63	TRANSISTOR 2SB856	
Q28	8-729-316-16	TRANSISTOR 2SC1061	

Ref.No.	Part No.	Description	Remark
Q29	8-729-315-63	TRANSISTOR 2SB856	
*****			
	♣:1-610-155-00	ED BOARD	*****
<u>CONNECTOR</u>			
ED1	♣:1-506-371-00	2P PLUG (L)	
<u>COIL</u>			
L1	△.1-421-591-00	COIL, CHOKE	
*****			
	♣:A-1340-560-A	D BOARD, COMPLETE	*****
<u>CAPACITOR</u>			
C1	1-123-333-00	ELECT 100MF 20% 16V	
C3	1-123-586-00	ELECT 0.1MF 20% 50V	
C4	1-123-333-00	ELECT 100MF 20% 16V	
C5	1-123-586-00	ELECT 0.1MF 20% 50V	
C6	1-123-356-00	ELECT 10MF 20% 16V	
C7	1-101-361-00	CERAMIC 150PF 5% 50V	
C8	1-108-603-00	MYLAR 0.1MF 5% 50V	
C9	1-123-318-00	ELECT 33MF 20% 16V	
C10	1-102-820-00	CERAMIC 330PF 5% 50V	
C11	1-108-579-00	MYLAR 0.01MF 5% 50V	
C12	1-123-333-00	ELECT 100MF 20% 16V	
C13	1-123-333-00	ELECT 100MF 20% 16V	
C14	1-101-006-00	CERAMIC 0.047MF 50V	
C15	1-123-356-00	ELECT 10MF 20% 16V	
C16	1-123-356-00	ELECT 10MF 20% 16V	
C17	1-123-333-00	ELECT 100MF 20% 16V	
C18	1-101-006-00	CERAMIC 0.047MF 50V	
C19	1-123-333-00	ELECT 100MF 20% 16V	
C20	1-123-333-00	ELECT 100MF 20% 16V	
C21	1-123-333-00	ELECT 100MF 20% 16V	
C22	1-123-356-00	ELECT 10MF 20% 16V	
C23	1-123-333-00	ELECT 100MF 20% 16V	
C24	1-123-356-00	ELECT 10MF 20% 16V	
C25	1-123-333-00	ELECT 100MF 20% 16V	
C26	1-123-322-00	ELECT 330MF 20% 16V	
C27	1-102-824-00	CERAMIC 470PF 5% 50V	
C28	1-106-180-00	MYLAR 0.0022MF 5% 50V	
C29	1-106-180-00	MYLAR 0.0022MF 5% 50V	
C30	1-106-180-00	MYLAR 0.0022MF 5% 50V	
C31	1-106-184-00	MYLAR 0.0033MF 5% 50V	
C32	1-123-356-00	ELECT 10MF 20% 25V	
C33	1-123-336-00	ELECT 470MF 20% 25V	
C35	1-102-973-00	CERAMIC 100PF 5% 50V	
C36	1-102-973-00	CERAMIC 100PF 5% 50V	
C37	1-102-973-00	CERAMIC 100PF 5% 50V	

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Ref.No.	Part No.	Description		Remark	Ref.No.	Part No.	Description		Remark		
C38	1-102-973-00	CERAMIC	100PF	5%	50V	C92	1-123-356-00	ELECT	10MF	20%	16V
C39	1-102-973-00	CERAMIC	100PF	5%	50V	C93	1-108-820-00	MYLAR	0.22MF	5%	50V
C40	1-102-973-00	CERAMIC	100PF	5%	50V	C94	1-106-172-00	MYLAR	0.001MF	5%	50V
C41	1-123-321-00	ELECT	220MF	20%	16V	C103	1-102-947-00	CERAMIC	10PF	5%	50V
C43	1-101-006-00	CERAMIC	0.047MF		50V	C106	1-102-947-00	CERAMIC	10PF	5%	50V
C44	1-101-006-00	CERAMIC	0.047MF		50V						
C45	1-123-356-00	ELECT	10MF	20%	25V	C110	1-102-316-00	CERAMIC	15PF	5%	500V
C46	1-123-356-00	ELECT	10MF	20%	25V	C111	1-102-316-00	CERAMIC	15PF	5%	500V
C47	1-123-356-00	ELECT	10MF	20%	25V	C113	1-102-316-00	CERAMIC	15PF	5%	500V
C48	1-123-356-00	ELECT	10MF	20%	25V	C115	1-102-947-00	CERAMIC	10PF	5%	50V
C49	1-108-595-00	MYLAR	0.047MF	5%	50V	C118	1-102-947-00	CERAMIC	10PF	5%	50V
C50	1-106-367-00	MYLAR	0.01MF	10%	200V	C119	1-123-321-00	ELECT	220MF	20%	16V
C51	1-108-595-00	MYLAR	0.047MF	5%	50V						
C52	1-106-367-00	MYLAR	0.01MF	10%	200V	<u>DIODE</u>					
C53	1-108-595-00	MYLAR	0.047MF	5%	50V	D1	8-719-999-53	DIODE	EQA01-05T1		
C54	1-106-367-00	MYLAR	0.01MF	10%	200V	D2	8-719-999-53	DIODE	EQA01-05T1		
C55	1-121-246-00	ELECT	4.7MF		160V	D3	8-719-911-19	DIODE	ISS119		
C56	1-108-579-00	MYLAR	0.01MF	5%	50V	D5	8-719-911-19	DIODE	ISS119		
C57	1-131-371-00	TANTALUM	10MF	10%	16V	D6	8-719-911-19	DIODE	ISS119		
C58	1-106-184-00	MYLAR	0.0033MF	5%	50V	D10	8-719-911-19	DIODE	ISS119		
C59	1-123-381-00	ELECT	2.2MF	20%	50V	D14	8-719-911-19	DIODE	ISS119		
C60	1-123-369-00	ELECT	4.7MF	20%	50V	D16	8-719-911-19	DIODE	ISS119		
C61	1-130-022-00	FILM	0.0022MF	5%	50V	D18	8-719-911-19	DIODE	ISS119		
C62	1-123-356-00	ELECT	10MF	20%	16V	D20	8-719-911-55	DIODE	U05G		
C63	1-123-356-00	ELECT	10MF	20%	16V	D21	8-719-101-59	DIODE	RD5.6E-L3		
C64	1-108-587-00	MYLAR	0.022MF	5%	50V	D22	8-719-100-30	DIODE	RD5.1E-B2		
C65	1-108-603-00	MYLAR	0.1MF	5%	50V						
C66	1-102-973-00	CERAMIC	100PF	5%	50V	<u>CONNECTOR</u>					
C67	1-123-381-00	ELECT	2.2MF	20%	50V	D1	◆:1-560-467-00	PIN, CONNECTOR	4P		
C68	1-123-381-00	ELECT	2.2MF	20%	50V	D2	◆:1-560-468-00	PIN, CONNECTOR	5P		
C69	1-123-382-00	ELECT	3.3MF	20%	50V	D3	◆:1-560-224-00	PLUG, CONNECTOR	(2.5MM) 10P		
C70	1-123-382-00	ELECT	3.3MF	20%	50V	D4	◆:1-560-471-00	PIN, CONNECTOR	10P		
C71	1-108-579-00	MYLAR	0.01MF	5%	50V	D5	◆:1-560-470-00	PIN, CONNECTOR	8P		
C72	1-123-321-00	ELECT	220MF	20%	16V	D6	◆:1-560-456-00	PIN, CONNECTOR	2P		
C73	1-108-579-00	MYLAR	0.01MF	5%	50V	D7	◆:1-560-470-00	PIN, CONNECTOR	8P		
C74	1-106-184-00	MYLAR	0.0033MF	5%	50V	D8	◆:1-560-472-00	PIN, CONNECTOR	12P		
C75	1-108-579-00	MYLAR	0.01MF	5%	50V	D9	◆:1-560-472-00	PIN, CONNECTOR	12P		
C76	1-123-379-00	ELECT	0.47MF	20%	50V	D11	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C77	1-108-591-00	MYLAR	0.033MF	5%	50V	D12	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C78	1-106-172-00	MYLAR	0.001MF	5%	50V	D13	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C79	1-102-523-00	CERAMIC	56PF	5%	50V	D14	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C80	1-102-971-00	CERAMIC	82PF	5%	50V	D15	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C81	1-101-006-00	CERAMIC	0.047MF		50V	D16	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C82	1-101-006-00	CERAMIC	0.047MF		50V	D17	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C83	1-101-006-00	CERAMIC	0.047MF		50V	D18	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM PITCH)		
C84	1-101-006-00	CERAMIC	0.047MF		50V	D19	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C85	1-102-824-00	CERAMIC	470PF	5%	50V	D21	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C86	1-102-824-00	CERAMIC	470PF	5%	50V	D22	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C87	1-102-824-00	CERAMIC	470PF	5%	50V	D23	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C88	1-102-824-00	CERAMIC	470PF	5%	50V	D24	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C89	1-102-824-00	CERAMIC	470PF	5%	50V	D25	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C90	1-102-824-00	CERAMIC	470PF	5%	50V	D26	◆:1-560-123-00	PLUG, CONNECTOR	(2.5MM) 3P		
C91	1-108-579-00	MYLAR	0.01MF	5%	50V						



Ref.No.	Part No.	Description	Remark
D27	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P	
D28	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P	
D29	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P	

IC

IC1	8-759-240-52	IC TC4052BP	
IC2	8-759-600-02	IC M5218L	
IC3	8-749-911-21	IC 8X1121	
IC4	8-741-112-20	IC BX1122	
IC5	8-759-600-02	IC M5218L	
IC6	8-759-600-02	IC M5218L	
IC7	8-759-110-37	IC UPC1037H	
IC8	8-759-110-37	IC UPC1037H	
IC9	8-759-600-02	IC M5218L	
IC10	8-759-178-12	IC UPC78L12	
IC11	8-759-178-12	IC UPC78L12	
IC12	8-759-145-58	IC UPC4558C	
IC13	8-759-145-58	IC UPC4558C	
IC14	8-749-911-20	IC BX1120	
IC15	8-759-979-16	IC C7916	
IC16	8-759-652-14	IC M5214L	
IC17	8-759-652-14	IC M5214L	
IC18	8-759-652-14	IC M5214L	
IC19	8-759-652-14	IC M5214L	
IC20	8-759-652-14	IC M5214L	
IC21	8-759-652-14	IC M5214L	
IC22	8-759-171-12	IC UPC7812H	
IC23	8-759-179-12	IC UPC7912H	
IC24	8-759-171-08	IC UPC7808H	
IC25	8-759-179-08	IC UPC7908H	

COIL

L4	1-407-687-00	MICRO INDUCTOR 3.3UH	
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TRANSISTOR

Q1	8-729-603-50	TRANSISTOR 2SC4035P	
Q6	8-729-238-32	TRANSISTOR 2SC2383	
Q10	8-729-238-32	TRANSISTOR 2SC2383	
Q14	8-729-238-32	TRANSISTOR 2SC2383	
Q17	8-729-178-54	TRANSISTOR 2SC2785	
Q18	8-729-178-54	TRANSISTOR 2SC2785	
Q19	8-729-178-54	TRANSISTOR 2SC2785	
Q21	8-729-245-83	TRANSISTOR 2SC2458	
Q22	8-729-245-83	TRANSISTOR 2SC2458	
Q23	8-729-245-83	TRANSISTOR 2SC2458	
Q30	8-729-316-16	TRANSISTOR 2SC1061	
Q31	8-729-315-63	TRANSISTOR 2SB856-	
Q32	8-729-316-16	TRANSISTOR 2SC1061	
Q33	8-729-315-63	TRANSISTOR 2SB856-	
Q34	8-729-316-16	TRANSISTOR 2SC1061	
Q35	8-729-315-63	TRANSISTOR 2SB856-	

Ref.No.	Part No.	Description	Remark
<u>RESISTOR</u>			
R1	1-247-819-00	CARBON 330 5%	1/6W
R2	1-247-855-00	CARBON 10K 5%	1/6W
R3	1-213-135-00	METAL OXIDE 220 5%	1W F
R4	1-213-135-00	METAL OXIDE 220 5%	1W F
R5	1-247-819-00	CARBON 330 5%	1/6W
R6	1-247-855-00	CARBON 10K 5%	1/6W
R7	1-247-855-00	CARBON 10K 5%	1/6W
R8	1-247-843-00	CARBON 3.3K 5%	1/6W
R10	1-247-855-00	CARBON 10K 5%	1/6W
R11	1-247-855-00	CARBON 10K 5%	1/6W
R12	1-214-156-00	METAL 10K 1%	1/4W
R13	1-214-156-00	METAL 10K 1%	1/4W
R14	1-214-126-00	METAL 560 1%	1/4W
R15	1-214-156-00	METAL 10K 1%	1/4W
R16	1-214-136-00	METAL 1.5K 1%	1/4W
R17	1-214-108-00	METAL 100 1%	1/4W
R18	1-247-855-00	CARBON 10K 5%	1/6W
R19	1-214-156-00	METAL 10K 1%	1/4W
R20	1-214-156-00	METAL 10K 1%	1/4W
R22	1-214-971-00	METAL 2M 1%	1/4W
R23	1-247-879-00	CARBON 100K 5%	1/6W
R24	1-247-859-00	CARBON 15K 5%	1/6W
R26	1-214-139-00	METAL 2K 1%	1/4W
R27	1-214-128-00	METAL 680 1%	1/4W
R28	1-247-887-00	CARBON 220K 5%	1/6W
R29	1-214-162-00	METAL 18K 1%	1/4W
R30	1-214-124-00	METAL 470 1%	1/4W
R31	1-214-140-00	METAL 2.2K 1%	1/4W
R32	1-214-128-00	METAL 680 1%	1/4W
R33	1-247-887-00	CARBON 220K 5%	1/6W
R34	1-214-162-00	METAL 18K 1%	1/4W
R35	1-214-124-00	METAL 470 1%	1/4W
R36	1-247-104-00	CARBON 75 5%	1/4W
R38	1-213-135-00	METAL OXIDE 220 5%	1W F
R39	1-213-135-00	METAL OXIDE 220 5%	1W F
R40	1-214-084-00	METAL 10 1%	1/4W
R41	1-214-084-00	METAL 10 1%	1/4W
R42	1-214-084-00	METAL 10 1%	1/4W
R43	1-214-084-00	METAL 10 1%	1/4W
R44	1-214-132-00	METAL 1K 1%	1/4W
R45	1-214-164-00	METAL 22K 1%	1/4W
R46	1-214-084-00	METAL 10 1%	1/4W
R47	1-214-132-00	METAL 1K 1%	1/4W
R48	1-214-084-00	METAL 10 1%	1/4W
R49	1-214-084-00	METAL 10 1%	1/4W
R50	1-214-084-00	METAL 10 1%	1/4W
R51	1-214-164-00	METAL 22K 1%	1/4W
R52	1-214-084-00	METAL 10 1%	1/4W
R53	1-214-084-00	METAL 10 1%	1/4W
R54	1-214-084-00	METAL 10 1%	1/4W
R55	1-214-084-00	METAL 10 1%	1/4W

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R56	1-214-164-00	METAL	22K 1% 1/4W	R109	1-214-784-00	METAL	200K 1% 1/4W
R57	1-213-138-00	METAL OXIDE	390 5% 1W F	R110	1-206-753-00	METAL OXIDE	15K 5% 3W F
R58	1-213-138-00	METAL OXIDE	390 5% 1W F	R111	1-247-783-00	CARBON	10 5% 1/6W F
R59	1-213-138-00	METAL OXIDE	390 5% 1W F	R112	1-213-155-00	METAL OXIDE	10K 5% 1W F
R60	1-214-088-00	METAL	15 1% 1/4W	R113	1-212-489-00	METAL	15 1% 1/2W
R61	1-214-088-00	METAL	15 1% 1/4W	R114	1-212-489-00	METAL	15 1% 1/2W
R62	1-214-088-00	METAL	15 1% 1/4W	R115	1-212-489-00	METAL	15 1% 1/2W
R63	1-214-088-00	METAL	15 1% 1/4W	R116	1-212-489-00	METAL	15 1% 1/2W
R64	1-214-164-00	METAL	22K 1% 1/4W	R118	1-214-179-00	METAL	91K 1% 1/4W
R65	1-214-132-00	METAL	1K 1% 1/4W	R119	1-214-179-00	METAL	91K 1% 1/4W
R66	1-214-132-00	METAL	1K 1% 1/4W	R120	1-214-166-00	METAL	27K 1% 1/4W
R67	1-214-088-00	METAL	15 1% 1/4W	R121	1-214-166-00	METAL	27K 1% 1/4W
R68	1-214-088-00	METAL	15 1% 1/4W	R122	1-214-179-00	METAL	91K 1% 1/4W
R69	1-214-088-00	METAL	15 1% 1/4W	R123	1-214-166-00	METAL	27K 1% 1/4W
R70	1-214-088-00	METAL	15 1% 1/4W	R124	1-214-138-00	METAL	1.8K 1% 1/4W
R71	1-214-164-00	METAL	22K 1% 1/4W	R125	1-214-138-00	METAL	1.8K 1% 1/4W
R72	1-214-152-00	METAL	6.8K 1% 1/4W	R126	1-214-172-00	METAL	47K 1% 1/4W
R73	1-214-088-00	METAL	15 1% 1/4W	R127	1-214-172-00	METAL	47K 1% 1/4W
R74	1-214-088-00	METAL	15 1% 1/4W	R128	1-214-138-00	METAL	1.8K 1% 1/4W
R75	1-214-088-00	METAL	15 1% 1/4W	R130	1-214-154-00	METAL	8.2K 1% 1/4W
R76	1-214-088-00	METAL	15 1% 1/4W	R131	1-214-154-00	METAL	8.2K 1% 1/4W
R77	1-214-164-00	METAL	22K 1% 1/4W	R132	1-214-154-00	METAL	8.2K 1% 1/4W
R78	1-214-132-00	METAL	1K 1% 1/4W	R133	1-214-174-00	METAL	56K 1% 1/4W
R79	1-214-156-00	METAL	10K 1% 1/4W	R134	1-214-164-00	METAL	22K 1% 1/4W
R80	1-214-156-00	METAL	10K 1% 1/4W	R135	1-214-784-00	METAL	200K 1% 1/4W
R81	1-214-128-00	METAL	680 1% 1/4W	R136	1-214-164-00	METAL	22K 1% 1/4W
R82	1-247-807-00	CARBON	100 5% 1/6W	R137	1-214-784-00	METAL	200K 1% 1/4W
R83	1-247-807-00	CARBON	100 5% 1/6W	R138	1-214-166-00	METAL	27K 1% 1/4W
R84	1-206-753-00	METAL OXIDE	15K 5% 3W F	R139	1-214-175-00	METAL	62K 1% 1/4W
R85	1-247-783-00	CARBON	10 5% 1/6W	R140	1-214-166-00	METAL	27K 1% 1/4W
R86	1-213-155-00	METAL OXIDE	10K 5% 1W F	R141	1-214-175-00	METAL	62K 1% 1/4W
R87	1-212-489-00	METAL	15 1% 1/2W	R142	1-214-164-00	METAL	22K 1% 1/4W
R88	1-212-489-00	METAL	15 1% 1/2W	R145	1-214-172-00	METAL	47K 1% 1/4W
R89	1-212-489-00	METAL	15 1% 1/2W	R146	1-214-172-00	METAL	47K 1% 1/4W
R90	1-212-489-00	METAL	15 1% 1/2W	R147	1-214-168-00	METAL	33K 1% 1/4W
R91	1-214-152-00	METAL	6.8K 1% 1/4W	R148	1-214-168-00	METAL	33K 1% 1/4W
R92	1-214-156-00	METAL	10K 1% 1/4W	R149	1-214-180-00	METAL	100K 1% 1/4W
R93	1-214-156-00	METAL	10K 1% 1/4W	R150	1-214-180-00	METAL	100K 1% 1/4W
R94	1-214-128-00	METAL	680 1% 1/4W	R151	1-214-160-00	METAL	15K 1% 1/4W
R95	1-247-807-00	CARBON	100 5% 1/6W	R152	1-214-160-00	METAL	15K 1% 1/4W
R96	1-247-807-00	CARBON	100 5% 1/6W	R153	1-214-162-00	METAL	18K 1% 1/4W
R97	1-206-753-00	METAL OXIDE	15K 5% 3W F	R154	1-214-160-00	METAL	15K 1% 1/4W
R98	1-247-783-00	CARBON	10 5% 1/6W	R155	1-214-168-00	METAL	33K 1% 1/4W
R99	1-213-155-00	METAL OXIDE	10K 5% 1W F	R156	1-214-156-00	METAL	10K 1% 1/4W
R100	1-212-489-00	METAL	15 1% 1/2W	R157	1-214-168-00	METAL	33K 1% 1/4W
R101	1-212-489-00	METAL	15 1% 1/2W	R158	1-214-171-00	METAL	43K 1% 1/4W
R102	1-212-489-00	METAL	15 1% 1/2W	R159	1-214-172-00	METAL	47K 1% 1/4W
R103	1-212-489-00	METAL	15 1% 1/2W	R160	1-214-172-00	METAL	47K 1% 1/4W
R104	1-214-152-00	METAL	6.8K 1% 1/4W	R161	1-214-168-00	METAL	33K 1% 1/4W
R105	1-214-156-00	METAL	10K 1% 1/4W	R162	1-214-176-00	METAL	68K 1% 1/4W
R106	1-214-156-00	METAL	10K 1% 1/4W	R163	1-247-783-00	CARBON	10 5% 1/8W F
R107	1-214-128-00	METAL	680 1% 1/4W	R164	1-247-030-00	CARBON	18 5% 1/8W F
R108	1-247-855-00	CARBON	10K 5% 1/6W	R165	1-214-180-00	METAL	100K 1% 1/4W



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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R166	1-247-855-00	CARBON	10K 5% 1/6W	R226	1-214-156-00	METAL	10K 1% 1/4W
R167	1-214-180-00	METAL	100K 1% 1/4W	R227	1-214-156-00	METAL	10K 1% 1/4W
R168	1-214-156-00	METAL	10K 1% 1/4W	R228	1-214-156-00	METAL	10K 1% 1/4W
R169	1-214-172-00	METAL	47K 1% 1/4W	R229	1-214-156-00	METAL	10K 1% 1/4W
R170	1-214-172-00	METAL	47K 1% 1/4W	R230	1-214-784-00	METAL	200K 1% 1/4W
R171	1-214-162-00	METAL	18K 1% 1/4W	R231	1-247-807-00	CARBON	100 5% 1/6W
R172	1-214-156-00	METAL	10K 1% 1/4W	R232	1-214-163-00	METAL	20K 1% 1/4W
R173	1-214-168-00	METAL	33K 1% 1/4W	R233	1-214-163-00	METAL	20K 1% 1/4W
R174	1-214-180-00	METAL	100K 1% 1/4W	R234	1-247-855-00	CARBON	10K 5% 1/6W
R176	1-214-172-00	METAL	47K 1% 1/4W	R235	1-247-871-00	CARBON	47K 5% 1/6W
R177	1-214-172-00	METAL	47K 1% 1/4W	R236	1-210-859-00	CARBON	1.2 5% 1/8W F
R181	1-214-132-00	METAL	1K 1% 1/4W	R237	1-210-859-00	CARBON	1.2 5% 1/8W F
R182	1-247-855-00	CARBON	10K 5% 1/6W	R241	1-247-857-00	CARBON	12K 5% 1/6W
R183	1-214-180-00	METAL	100K 1% 1/4W	R242	1-247-849-00	CARBON	5.6K 5% 1/6W
R184	1-247-855-00	CARBON	10K 5% 1/6W	R243	1-247-851-00	CARBON	6.8K 5% 1/6W
R185	1-214-180-00	METAL	100K 1% 1/4W	R244	1-247-831-00	CARBON	1K 5% 1/6W
R186	1-247-851-00	CARBON	6.8K 5% 1/6W	R245	1-247-857-00	CARBON	12K 5% 1/6W
R187	1-214-172-00	METAL	47K 1% 1/4W	R246	1-247-849-00	CARBON	5.6K 5% 1/6W
R188	1-214-172-00	METAL	47K 1% 1/4W	R247	1-247-851-00	CARBON	6.8K 5% 1/6W
R189	1-247-855-00	CARBON	10K 5% 1/6W	R248	1-247-831-00	CARBON	1K 5% 1/6W
R190	1-247-855-00	CARBON	10K 5% 1/6W	R249	1-213-135-00	METAL OXIDE	220 5% 1W F
R191	1-214-180-00	METAL	100K 1% 1/4W	R252	1-214-180-00	METAL	100K 1% 1/4W
R192	1-214-180-00	METAL	100K 1% 1/4W	R253	1-247-835-00	CARBON	1.5K 5% 1/6W
R193	1-247-835-00	CARBON	1.5K 5% 1/6W	R255	1-247-841-00	CARBON	2.7K 5% 1/6W
R194	1-214-172-00	METAL	47K 1% 1/4W	R257	1-212-489-00	METAL	15 1% 1/2W
R195	1-247-857-00	CARBON	12K 5% 1/6W	R258	1-212-489-00	METAL	15 1% 1/2W
R196	1-247-831-00	CARBON	1K 5% 1/6W	R259	1-212-489-00	METAL	15 1% 1/2W
R197	1-214-172-00	METAL	47K 1% 1/4W	R260	1-212-489-00	METAL	15 1% 1/2W
R198	1-247-867-00	CARBON	33K 5% 1/6W	R261	1-212-489-00	METAL	15 1% 1/2W
R199	1-247-809-00	CARBON	120 5% 1/6W	R262	1-212-489-00	METAL	15 1% 1/2W
R200	1-247-877-00	CARBON	82K 5% 1/6W	R268	1-214-168-00	METAL	33K 1% 1/4W
R201	1-247-843-00	CARBON	3.3K 5% 1/6W	R269	1-247-843-00	CARBON	3.3K 5% 1/6W
R202	1-247-877-00	CARBON	82K 5% 1/6W	R270	1-247-817-00	CARBON	270 5% 1/6W
R203	1-247-868-00	CARBON	36K 5% 1/6W	R271	1-247-817-00	CARBON	270 5% 1/6W
R204	1-247-867-00	CARBON	33K 5% 1/6W	R274	1-247-819-00	CARBON	330 5% 1/6W
R205	1-247-867-00	CARBON	33K 5% 1/6W	R276	1-247-817-00	CARBON	270 5% 1/6W
R206	1-247-855-00	CARBON	10K 5% 1/6W	R277	1-247-817-00	CARBON	270 5% 1/6W
R207	1-247-869-00	CARBON	39K 5% 1/6W	R278	1-214-139-00	METAL	2K 1% 1/4W
R208	1-247-855-00	CARBON	10K 5% 1/6W	R279	1-214-139-00	METAL	2K 1% 1/4W
R211	1-247-863-00	CARBON	22K 5% 1/6W	R280	1-214-150-00	METAL	5.6K 1% 1/4W
R212	1-247-873-00	CARBON	56K 5% 1/6W	R282	1-214-132-00	METAL	1K 1% 1/4W
R213	1-247-857-00	CARBON	12K 5% 1/6W	R283	1-247-817-00	CARBON	270 5% 1/6W
R214	1-247-839-00	CARBON	2.2K 5% 1/6W	R284	1-247-817-00	CARBON	270 5% 1/6W
R215	1-247-831-00	CARBON	1K 5% 1/6W	R287	1-247-819-00	CARBON	330 5% 1/6W
R216	1-247-807-00	CARBON	100 5% 1/6W	R289	1-247-817-00	CARBON	270 5% 1/6W
R217	1-247-855-00	CARBON	10K 5% 1/6W	R290	1-247-817-00	CARBON	270 5% 1/6W
R218	1-247-831-00	CARBON	1K 5% 1/6W	R293	1-247-819-00	CARBON	330 5% 1/6W
R219	1-247-855-00	CARBON	10K 5% 1/6W	R295	1-247-817-00	CARBON	270 5% 1/6W
R221	1-247-857-00	CARBON	12K 5% 1/6W	R296	1-247-817-00	CARBON	270 5% 1/6W
R222	1-247-831-00	CARBON	1K 5% 1/6W	R297	1-214-158-00	METAL	12K 1% 1/4W
R223	1-247-863-00	CARBON	22K 5% 1/6W	R298	1-214-139-00	METAL	2K 1% 1/4W
R224	1-247-871-00	CARBON	47K 5% 1/6W	R299	1-247-819-00	CARBON	330 5% 1/6W
R225	1-247-807-00	CARBON	100 5% 1/6W	R300	1-247-819-00	CARBON	330 5% 1/6W



Ref.No.	Part No.	Description			
R301	1-247-817-00	CARBON	270	5%	1/6W
R302	1-247-817-00	CARBON	270	5%	1/6W
R305	1-247-819-00	CARBON	330	5%	1/6W

VARIABLE RESISTOR

RV1	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV2	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV3	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV4	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV5	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV6	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV7	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV8	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV9	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV10	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV11	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV12	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV13	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV14	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV15	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV16	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV17	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV18	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV19	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV20	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV21	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV22	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV23	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV24	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV25	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV26	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV27	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV28	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV29	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV30	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV31	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV32	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV33	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV34	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV35	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV36	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV37	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV38	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV39	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV40	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV41	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV42	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV43	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV44	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV45	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV46	1-224-253-XX	RES, ADJ, METAL GLAZE	22K		
RV47	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		
RV48	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K		

Ref.No.	Part No.	Description	Remark
RV50	1-224-254-XX	RES, ADJ, METAL GLAZE	47K
RV51	1-224-254-XX	RES, ADJ, METAL GLAZE	47K

SWITCH

SW1	1-553-537-00	SWITCH, SLIDE	
SW2	1-553-537-00	SWITCH, SLIDE	
SW3	1-553-537-00	SWITCH, SLIDE	
SW4	1-553-537-00	SWITCH, SLIDE	
SW6	1-553-537-00	SWITCH, SLIDE	
SW7	1-554-320-00	SWITCH, SLIDE	
SW8	1-554-319-00	SWITCH, SLIDE	

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♣:A-1340-578-A E BOARD, COMPLETE  
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CAPACITOR

C1	1-124-494-00	ELECT	33MF	20%	160V
C4	1-123-337-00	ELECT	1000MF	20%	25V
C6	1-123-379-00	ELECT	0.47MF	20%	50V
C7	1-102-973-00	CERAMIC	100PF	5%	50V
C8	1-102-244-00	CERAMIC	220PF	10%	500V
C9	1-121-999-00	ELECT	10MF		160V
C10	1-123-379-00	ELECT	0.47MF	20%	50V
C11	1-102-973-00	CERAMIC	100PF	5%	50V
C12	1-102-244-00	CERAMIC	220PF	10%	500V
C13	1-121-999-00	ELECT	10MF		160V
C14	1-123-253-00	ELECT	22MF		160V
C15	♣.1-130-001-00	FILM	0.009MF	5%	1.5KV
C16	1-124-493-00	ELECT	1MF	20%	160V
C17	1-130-330-00	FILM	1.4MF	5%	200V
C18	1-130-330-00	FILM	1.4MF	5%	200V
C19	1-123-985-51	ELECT	1000MF	20%	16V
C20	♣.1-129-911-00	FILM	0.001MF	5%	1.5KV
C21	1-123-024-00	ELECT	33MF		160V
C23	1-108-907-00	MYLAR	2.2MF	10%	200V
C25	♣.1-108-546-00	MYLAR	1.5MF	10%	400V
C26	♣.1-129-886-00	FILM	0.0068MF	5%	1.5KV
C27	1-125-195-00	ELECT	4.7MF		100V
C28	1-124-041-51	ELECT	220MF	20%	16V
C29	1-106-180-00	MYLAR	0.0022MF	5%	50V
C30	1-124-039-51	ELECT	10MF	20%	16V
C31	1-123-973-00	ELECT	100MF	20%	16V
C32	1-123-356-00	ELECT	10MF	20%	25V
C33	1-108-583-00	MYLAR	0.015MF	5%	50V
C34	1-124-035-00	ELECT	47MF	20%	16V
C35	1-102-947-00	CERAMIC	10PF	5%	50V
C36	1-123-356-00	ELECT	10MF	20%	16V
C38	♣.1-108-546-00	MYLAR	1.5MF	10%	400V
C39	1-108-694-61	MYLAR	0.015MF	10%	200V
C40	1-108-433-00	MYLAR	0.1MF	10%	200V
C41	1-123-359-00	ELECT	47MF	20%	50V

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E

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C42	1-123-318-00	ELECT	33MF 20%	16V	L7	1-459-295-00	COIL, FERRITE (HLC)
C43	1-108-646-00	MYLAR	0.47MF 10%	100V			
<u>DIODE</u>				<u>NEON LAMP</u>			
D1	8-719-911-19	DIODE	1SS119	NL1	1-519-013-13	DISCHARGE TUBE	
D2	8-719-911-19	DIODE	1SS119	<u>TRANSISTOR</u>			
D3	8-719-305-15	DIODE	GH3F	Q1	8-729-306-92	TRANSISTOR	2SD669A
D4	8-719-928-08	DIODE	ERD28-08S	Q2	8-729-306-92	TRANSISTOR	2SD669A
D5	8-719-305-15	DIODE	GH3F	Q3	8-729-306-92	TRANSISTOR	2SD669A
D6	8-719-100-57	DIODE	RD10E-B2	Q5	8-729-306-92	TRANSISTOR	2SD669A
D7	8-719-300-45	DIODE	EM1Z	Q6	8-729-238-32	TRANSISTOR	2SC2383
D8	8-719-305-15	DIODE	GH3F	Q7	8-729-238-32	TRANSISTOR	2SC2383
D9	8-719-300-45	DIODE	EM1Z	Q8	8-729-245-83	TRANSISTOR	2SC2458
D10	8-719-300-45	DIODE	EM1Z	Q9	8-729-117-54	TRANSISTOR	2SA1175
D11	8-719-911-19	DIODE	1SS119	Q10	8-729-245-83	TRANSISTOR	2SC2458
D12	8-719-911-19	DIODE	1SS119	Q11	8-729-117-54	TRANSISTOR	2SA1175
D13	8-719-911-19	DIODE	1SS119	Q12	8-729-245-83	TRANSISTOR	2SC2458
D14	8-719-100-35	DIODE	RD5.6E-B2	Q13	8-729-313-82	TRANSISTOR	2SD1138
D15	8-719-300-45	DIODE	EM1Z	Q14	8-729-238-32	TRANSISTOR	2SC2383
D16	8-719-300-45	DIODE	EM1Z	Q15	8-729-238-32	TRANSISTOR	2SC2383
D17	8-719-812-41	DIODE	TLR124	Q16	8-729-245-83	TRANSISTOR	2SC2458
D18	8-719-300-45	DIODE	EM1Z	Q17	8-729-245-83	TRANSISTOR	2SC2458
D19	8-719-000-28	THYRISTOR	CROZAM	Q18	8-729-245-83	TRANSISTOR	2SC2458
D20	8-719-911-19	DIODE	1SS119	<u>RESISTOR</u>			
D21	8-719-911-19	DIODE	1SS119	R1	1-247-807-00	CARBON	100 5% 1/6W
D22	8-719-911-19	DIODE	1SS119	R2	1-247-839-00	CARBON	2.2K 5% 1/6W
<u>CONNECTOR</u>				R3	1-247-837-00	CARBON	1.8K 5% 1/6W
E1	♣:1-506-371-00	2P PLUG (L)		R5	1-206-439-00	METAL OXIDE	1 5% 2W F
E2	♣:1-506-371-00	2P PLUG (L)		R6	1-247-807-00	CARBON	100 5% 1/6W
E3	♣:1-506-371-00	2P PLUG (L)		R7	1-247-839-00	CARBON	2.2K 5% 1/6W
E4	1-506-348-XX	3P PLUG (L)		R8	1-247-837-00	CARBON	1.8K 5% 1/6W
E5	1-506-348-XX	3P PLUG (L)		R10	1-206-439-00	METAL OXIDE	1 5% 2W F
E6	♣:1-506-371-00	2P PLUG (L)		R11	1-247-831-00	CARBON	1K 5% 1/6W
E7	♣:1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P		R12	1-247-831-00	CARBON	1K 5% 1/6W
E8	1-506-348-XX	6P PLUG		R13	1-206-479-00	METAL OXIDE	47 5% 2W F
E9	1-506-348-XX	3P PLUG (L)		R14	1-206-749-00	METAL OXIDE	10K 5% 3W F
E11	♣:1-560-124-00	PLUG, CONNECTOR (2.5MM PITCH)		R15	1-247-805-00	CARBON	82 5% 1/6W
E12	♣:1-560-124-00	PLUG, CONNECTOR (2.5MM PITCH)		R16	1-247-252-00	CARBON	3.3K 5% 1/2W
E13	♣:1-560-224-00	PLUG, CONNECTOR (2.5MM) 10P		R17	1-244-933-00	CARBON	330K 5% 1/2W
E14	♣:1-560-125-00	PLUG, CONNECTOR (2.5MM) 6P		R18	1-247-831-00	CARBON	1K 5% 1/6W
E15	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM PITCH)		R19	1-214-180-00	METAL	100K 1% 1/4W
E16	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P		R20	1-214-180-00	METAL	100K 1% 1/4W
E16	♣:1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P		R21	♣:1-247-831-00	CARBON	1K 5% 1/6W
<u>COIL</u>				R21	♣:1-247-831-00	CARBON	1K 5% 1/6W
L1	1-407-720-00	CHOKE COIL		R23	1-247-791-00	CARBON	22 5% 1/6W
L2	1-407-689-00	MICRO INDUCTOR 4.7UH		R24	1-212-680-00	METAL	12K 1% 1/2W
L3	1-407-720-00	CHOKE COIL		R25	1-214-162-00	METAL	18K 1% 1/4W
L4	1-459-523-11	COIL, VAR, FERRITE (HWC)		R26	1-214-166-00	METAL	27K 1% 1/4W
L5	1-459-524-11	COIL, VAR, FERRITE (HWC)		R27	1-214-162-00	METAL	18K 1% 1/4W
L6	1-459-525-11	COIL, VAR, FERRITE (HWC)		R28	1-247-855-00	CARBON	10K 5% 1/6W
				R29	1-247-855-00	CARBON	10K 5% 1/6W

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The components identified by shading and mark ♣ are critical for safety. Replace only with part number specified.

**E**    **DYR**    **DYG**    **DRB**

2U		Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R30		1-247-855-00	CARBON	10K	5%	1/6W			
R31		1-247-863-00	CARBON	22K	5%	1/6W			
R32		1-247-855-00	CARBON	10K	5%	1/6W			
R33		1-247-853-00	CARBON	8.2K	5%	1/6W			
R34		1-247-853-00	CARBON	8.2K	5%	1/6W			
R35		1-247-831-00	CARBON	1K	5%	1/6W			
R36		1-214-174-00	METAL	56K	1%	1/4W			
R37	▲		CARBON			1/6W			
R38	▲		CARBON			1/6W			
R39		1-247-861-00	CARBON	18K	5%	1/6W			
R40		1-247-819-00	CARBON	330	5%	1/6W			
R41		1-247-863-00	CARBON	22K	5%	1/6W			
R42		1-247-863-00	CARBON	22K	5%	1/6W			
R43		1-247-839-00	CARBON	2.2K	5%	1/6W			
R44		1-247-833-00	CARBON	1.2K	5%	1/6W			
R45		1-247-831-00	CARBON	1K	5%	1/6W			
R46		1-247-837-00	CARBON	1.8K	5%	1/6W			
R47		1-206-700-00	METAL OXIDE	33K	5%	2W	F		
R48		1-244-927-00	CARBON	180K	5%	1/2W			
R49		1-247-811-00	CARBON	150	5%	1/6W			
R50		1-247-831-00	CARBON	1K	5%	1/6W			
R51		1-247-895-00	CARBON	470K	5%	1/6W			
R52		1-247-839-00	CARBON	2.2K	5%	1/6W			
R53		1-247-863-00	CARBON	22K	5%	1/6W			
R54		1-206-751-00	METAL OXIDE	12K	5%	3W	F		
R55		1-247-825-00	CARBON	560	5%	1/6W			
R56		1-247-863-00	CARBON	22K	5%	1/6W			
R57		1-247-865-00	CARBON	27K	5%	1/6W			
R58		1-247-843-00	CARBON	3.3K	5%	1/6W			
R59		1-247-851-00	CARBON	6.8K	5%	1/6W			
R60		1-247-847-00	CARBON	4.7K	5%	1/6W			
R61		1-247-133-00	CARBON	1.2K	5%	1/4W			
R62		1-247-829-00	CARBON	820	5%	1/6W			
R63		1-247-846-00	CARBON	4.3K	5%	1/6W			
R64		1-247-845-00	CARBON	3.9K	5%	1/6W			
R65		1-247-137-00	CARBON	1.8K	5%	1/4W	F		
R66		1-247-137-00	CARBON	1.8K	5%	1/4W	F		
R67		1-247-137-00	CARBON	1.8K	5%	1/4W	F		
R68		1-213-141-00	METAL OXIDE	680	5%	1W	F		
R69		1-247-248-00	CARBON	2.2K	5%	1/2W			
R70		1-247-831-00	CARBON	1K	5%	1/6W			
R71		1-247-831-00	CARBON	1K	5%	1/6W			
R74		1-247-839-00	CARBON	2.2K	5%	1/6W			
<u>TRANSFORMER</u>									
T1	▲	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE						
T2	▲	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE						
T4	▲	1-439-137-00	TRANSFORMER, HORIZONTAL OUTPUT						
						◆:1-611-916-11 DYR BOARD *****			
						<u>CAPACITOR</u>			
C901		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
C902		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
						<u>RESISTOR</u>			
R901		1-202-822-00	SOLID	2.2K		1/2W			
R902		1-202-822-00	SOLID	2.2K		1/2W			
						<u>SPARK GAP</u>			
SG1		1-519-063-XX	DISCHARGING GAP						
SG2		1-519-063-XX	DISCHARGING GAP						
*****									
						◆:1-611-917-11 DYG BOARD *****			
						<u>CAPACITOR</u>			
C903		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
C904		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
						<u>RESISTOR</u>			
R903		1-202-822-00	SOLID	2.2K		1/2W			
R904		1-202-822-00	SOLID	2.2K		1/2W			
						<u>SPARK GAP</u>			
SG3		1-519-063-XX	DISCHARGING GAP						
SG4		1-519-063-XX	DISCHARGING GAP						
*****									
						◆:1-611-918-11 DRB BOARD *****			
						<u>CAPACITOR</u>			
C905		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
C906		1-102-327-00	CERAMIC	330PF	15%	1.5KV			
						<u>RESISTOR</u>			
R905		1-202-822-00	SOLID	2.2K		1/2W			
R906		1-202-822-00	SOLID	2.2K		1/2W			
						<u>SPARK GAP</u>			
SG5		1-519-063-XX	DISCHARGING GAP						
SG6		1-519-063-XX	DISCHARGING GAP						

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**HA**

**HB**

**HC**

Ref.No.	Part No.	Description	Remark
♣:1-609-357-00	HA BOARD	*****	
♣:1-560-455-00	PIN, CONNECTOR 2P		
<u>CONNECTOR</u>			
HA1	♣:1-560-462-00	PIN, CONNECTOR 6P	
HA2	♣:1-560-461-00	PIN, CONNECTOR 5P	
HA3	♣:1-560-455-00	PIN, CONNECTOR 2P	
HA4	♣:1-560-450-00	PIN, CONNECTOR 4P	
<u>RESISTOR</u>			
R2	1-247-862-00	CARBON 20K 5% 1/6W	
R4	1-247-878-00	CARBON 91K 5% 1/6W	
R5	1-247-875-00	CARBON 68K 5% 1/6W	
R6	1-247-865-00	CARBON 27K 5% 1/6W	
R8	1-247-887-00	CARBON 220K 5% 1/6W	
R9	1-247-881-00	CARBON 120K 5% 1/6W	
R10	1-247-865-00	CARBON 27K 5% 1/6W	
R15	1-247-874-00	CARBON 62K 5% 1/6W	
R16	1-247-867-00	CARBON 33K 5% 1/6W	
R17	1-247-885-00	CARBON 180K 5% 1/6W	
R18	1-247-881-00	CARBON 120K 5% 1/6W	
<u>VARIABLE RESISTOR</u>			
RV1	1-228-938-00	RES, VAR, CARBON 20K	
RV2	1-228-938-00	RES, VAR, CARBON 20K	
RV3	1-228-937-00	RES, VAR, CARBON 20K	
RV4	1-228-937-00	RES, VAR, CARBON 20K	
RV5	1-228-937-00	RES, VAR, CARBON 20K	
RV6	1-228-938-00	RES, VAR, CARBON 20K	
RV7	1-228-936-00	RES, VAR, CARBON 10K	
<u>SWITCH</u>			
SW1	1-552-737-00	SWITCH, PUSH	
SW2	1-554-499-00	SWITCH, PUSH (2 KEY)	
SW3	1-514-633-00	SLIDE SWITCH	
*****			
♣:1-609-356-00	HB BOARD	*****	
<u>CAPACITOR</u>			
C1	1-123-620-00	ELECT 10MF 20% 25V	
C2	1-123-620-00	ELECT 10MF 20% 25V	
<u>CONNECTOR</u>			
HB1	♣:1-560-463-00	PIN, CONNECTOR 8P	
<u>VARIABLE RESISTOR</u>			
RV1	1-230-145-00	RES, VAR, CARBON 5K	
RV2	1-230-145-00	RES, VAR, CARBON 5K	

Ref.No.	Part No.	Description	Remark
RV3	1-230-145-00	RES, VAR, CARBON 5K	
RV4	1-230-145-00	RES, VAR, CARBON 5K	
<u>SWITCH</u>			
SW1	1-516-970-00	SWITCH, SLIDE	
*****			
♣:1-610-153-00	HC BOARD	*****	
♣:4-362-612-00	HOLDER (B), LED		
<u>DIODE</u>			
D1	8-719-909-20	DIODE GL-9NG2	
*****			
<u>MISCELLANEOUS</u>			
*****			
♣:1-230-089-00	RESISTOR ASSY, HIGH-VOLTAGE (FOCUS PACK)		
1-235-225-00	FILTER, NOISE		
♣:1-413-152-21	SWITCHING REGULATOR (TK-03)		
♣:1-451-243-00	DEFLECTION YOKE (SY-130A)		
♣:1-452-302-00	CRT NECK ASSEMBLY		
♣:1-453-095-00	DC BLOCK, HIGH-VOLTAGE; FBT		
1-536-378-XX	L-TYPE TERMINAL STRIP		
1-536-401-XX	C-TYPE 1L1 LUG TERMINAL STRIP		
♣:8-736-051-01	CRT SD-130(G)		
♣:8-736-052-01	CRT SD-130(B)		
♣:8-736-053-01	CRT SD-130(R)		
C911	1-130-645-00	CAP, FILM 0.008MF	
CNJ1	♣:1-509-547-00	3P INLET	
CNJ2	♣:1-556-937-00	CONNECTOR ASSY, MULTI	
CNJ9	1-509-095-00	8P MULTI SOCKET	
D911	8-719-903-09	DIODE V30N	
Q4	8-729-311-42	TRANSISTOR 2SC1114	
Q901	8-729-301-62	TRANSISTOR 2SC1116A	
Q902	8-729-302-32	TRANSISTOR 2SC1413A	
Q903	8-729-302-32	TRANSISTOR 2SC1413A	
Q904	8-729-301-62	TRANSISTOR 2SC1116A	
R907	♣:1-217-183-00	RES, WIREWOUND 2.7	
R911	1-202-846-00	RES, SOLID 470K	
R912	1-202-846-00	RES, SOLID 470K	
R913	1-202-846-00	RES, SOLID 470K	
R917	1-206-749-00	RES, METAL OXIDE FILM 10.00K	
R918	1-206-749-00	RES, METAL OXIDE FILM 10.00K	
R919	1-206-738-00	RES, METAL OXIDE FILM 3.60K	
R920	1-206-738-00	RES, METAL OXIDE FILM 3.60K	
R921	1-247-091-00	RES, CARBON 22	
R922	1-247-091-00	RES, CARBON 22	
R923	1-206-439-00	RES, METAL OXIDE FILM 1.00	
R924	1-206-439-00	RES, METAL OXIDE FILM 1.00	
S1	♣:1-553-330-21	SWITCH, PUSH (POWER)	
S2	♣:1-552-535-00	SWITCH, POWER VOLTAGE CHANGE	

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<u>Ref.No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
SP1	1-503-255-00	SPEAKER	
SP2	1-503-255-00	SPEAKER	
T1	<b>△</b> 1-447-612-00	TRANSFORMER, POWER	

\*\*\*\*\*  
 ACCESSORIES AND PACKING MATERIALS  
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<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
<b>△</b> 1-534-698-XX	CORD, POWER	
3-701-630-00	BAG, POLYETHYLENE	
4-362-853-00	LABEL, VOLTA GE	
4-362-863-00	INDIVIDUAL CARTON	
4-362-870-00	CUSHION (UPPER) (ASSY)	
4-362-871-00	CUSHION (LOWER) (ASSY)	
4-491-697-11	MANUAL, INSTRUCTION	
4-493-829-21	MANUAL, INSTRUCTION	
4-349-251-00	BAG, PROTECTION	

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