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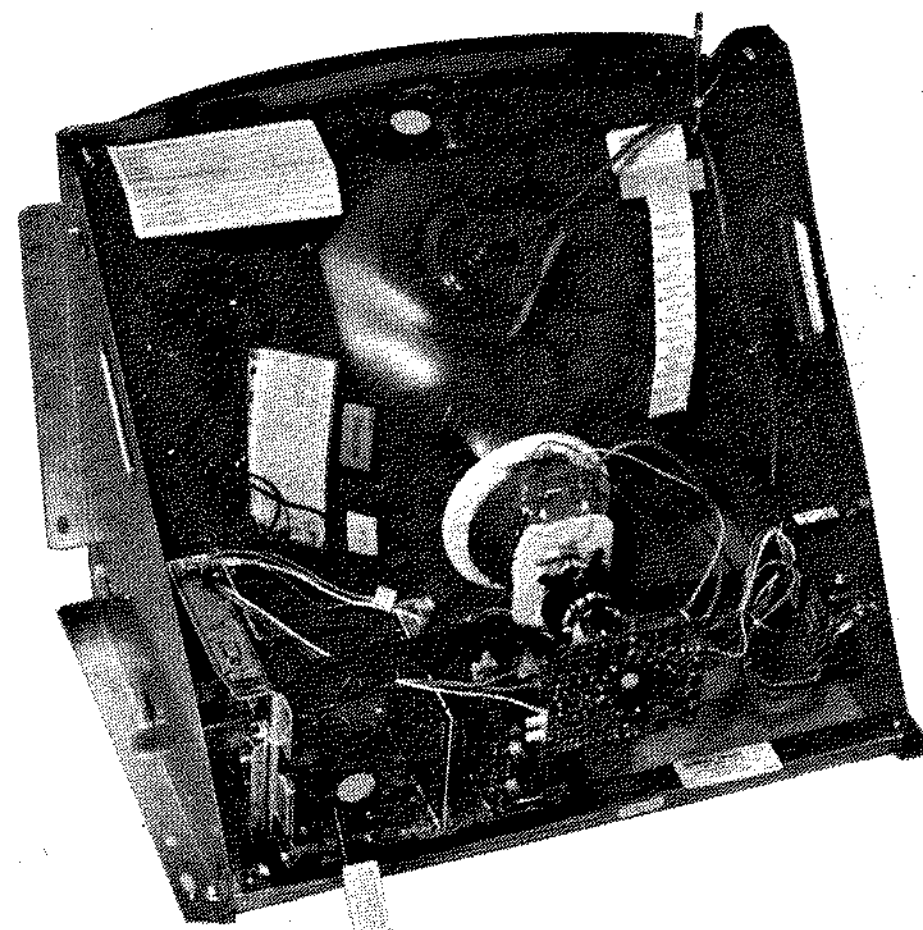
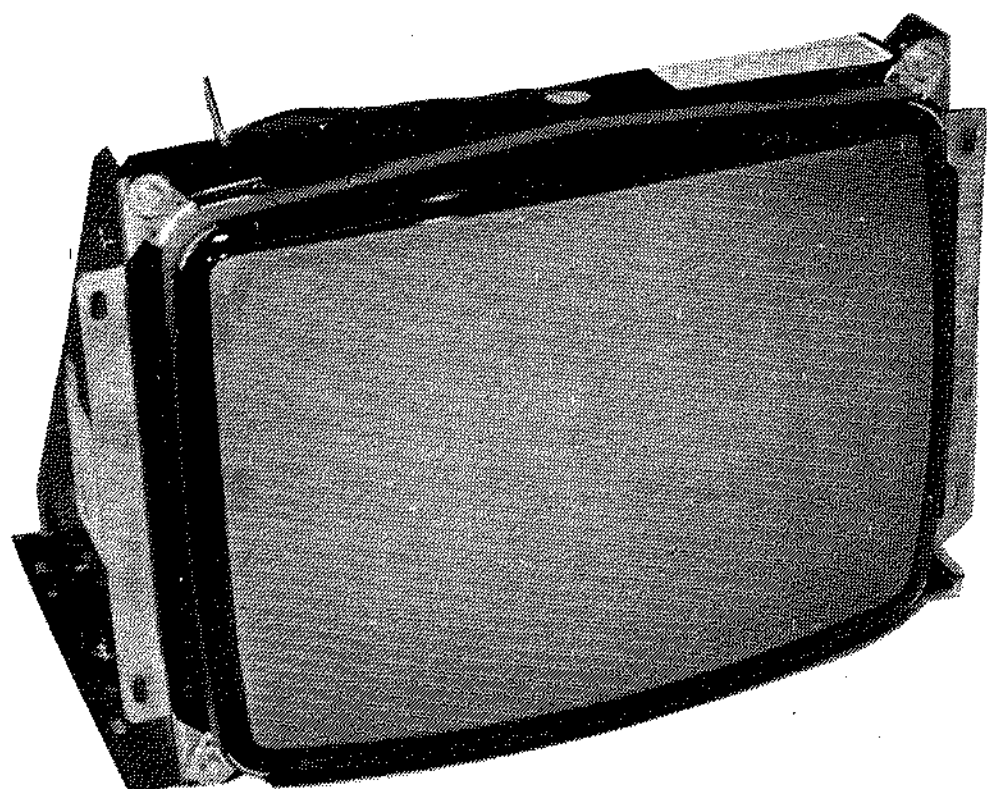
# **WELLS-GARDNER ELECTRONICS CORPORATION**

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## **19" IN LINE COLOR MONITORS**

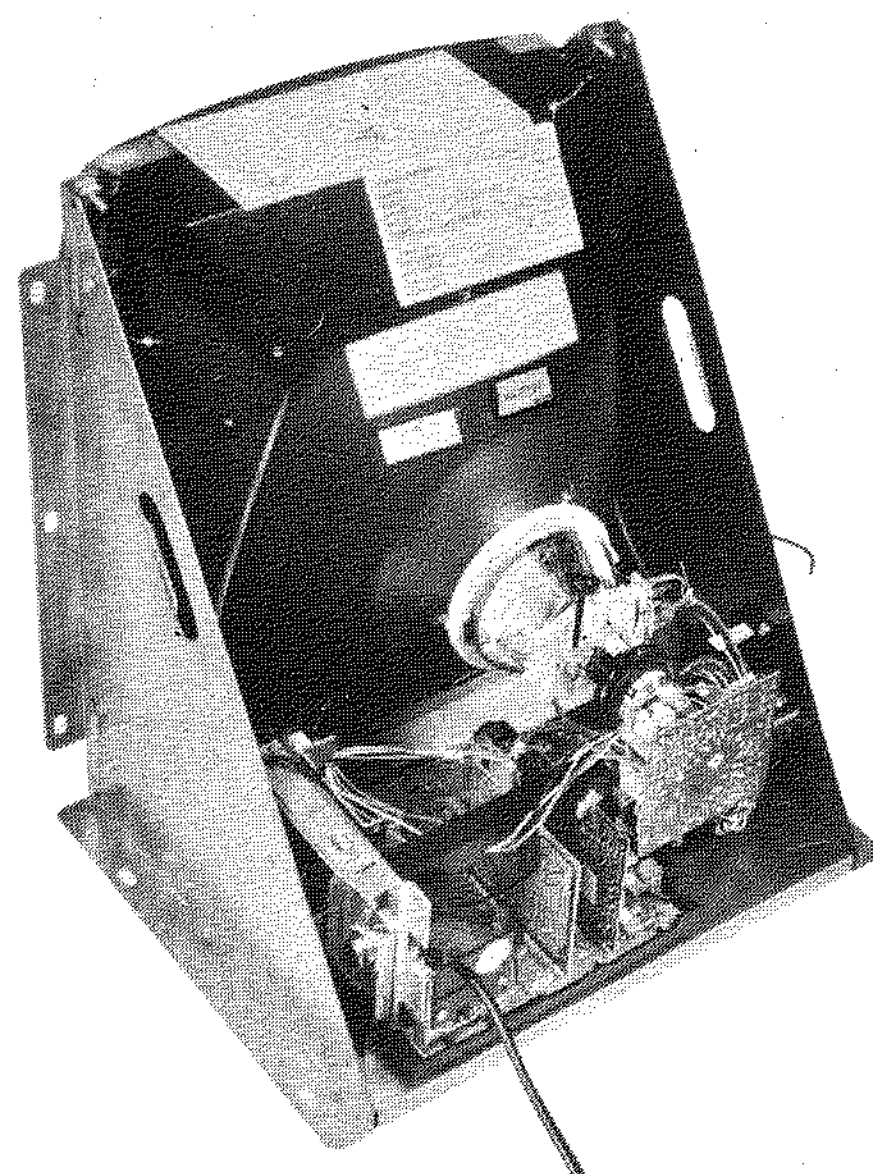
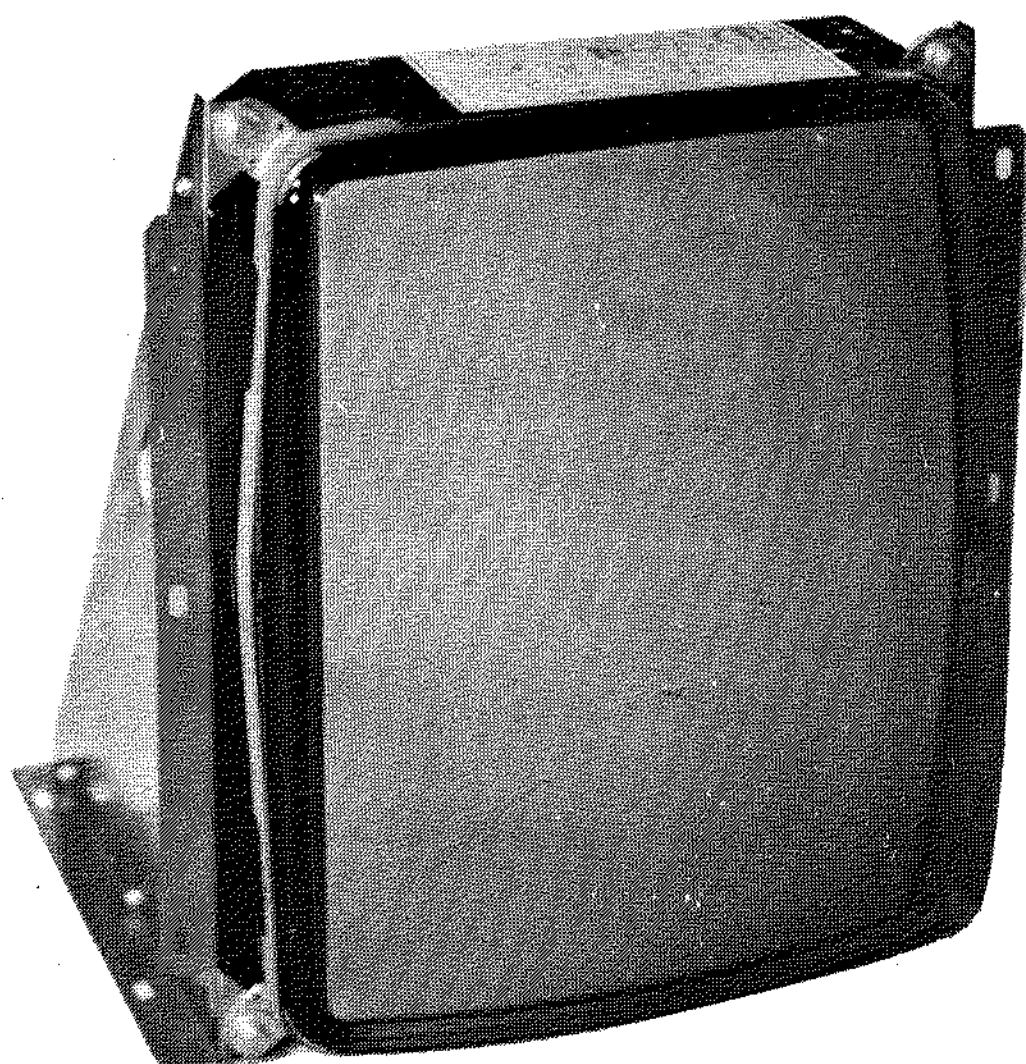
### **MODELS**

**19K4625  
19K4626**



### **MODELS**

**19K4675  
19K4676  
19K4677**



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**WELLS-GARDNER ELECTRONICS  
CORPORATION**

2701 NORTH KILDARE AVENUE  
CHICAGO, ILLINOIS 60639

## WARNINGS

### 1. Power Up Warning—

An isolation transformer must be used between the AC supply and the AC plug of the monitor before servicing or testing is performed since the chassis and the heat sink are directly connected to one side of the AC line which could present a shock hazard.

Before servicing is performed, read all the precautions labelled on the CRT and chassis.

### 2. **X-RAY RADIATION WARNING NOTICE**

**WARNING:** PARTS WHICH INFLUENCE X-RAY RADIATION IN HORIZONTAL DEFLECTION, HIGH VOLTAGE CIRCUITS AND PICTURE TUBE ETC. ARE INDICATED BY (★) IN THE PARTS LIST FOR REPLACEMENT PURPOSES. USE ONLY THE TYPE SHOWN IN THE PARTS LIST.

### 3. High Voltage—

This monitor contains HIGH VOLTAGES derived from power supplies capable of delivering LETHAL quantities of energy. Do not attempt to service until all precautions necessary for working on HIGH VOLTAGE equipment have been observed.

### 4. CRT Handling—

Care must be taken not to bump or scratch the picture tube as this may cause the picture tube to implode resulting in personal injury. Shatter proof goggles must be worn when handling the CRT. High voltage must be completely discharged before handling. Do not handle the CRT by the neck.

### 5. **PRODUCT SAFETY NOTICE**

**WARNING:** FOR CONTINUED SAFETY REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER RECOMMENDED PARTS. THESE PARTS ARE IDENTIFIED BY SHADING AND BY (Δ) ON THE SCHEMATIC DIAGRAM.

**AVERTISSEMENT:** POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

For replacement purposes, use the same type or specified type of wire and cable, assuring the positioning of the wires is followed (especially for H.V. and power supply circuits). Use of alternative wiring or positioning could result in damage to the monitor or in a shock or fire hazard.

## PERFORMANCE AND OPERATING DATA

1. Apply a suitable power source to the monitor through an isolation transformer.
2. Apply a suitable signal source to the monitor PCB by means of P205.
3. Set Up Controls.

All controls are preset at the factory, but may be adjusted to suit program material.

### 1.0 Supply

|           |                 |
|-----------|-----------------|
| Voltage   | 108 VAC-132 VAC |
| Frequency | 50 Hz-60 Hz     |

Note: Apply supply voltage through an isolation transformer with 1 Amp. minimum capability.

### 2.0 High Voltage (EHT)

|                 |                           |
|-----------------|---------------------------|
| For 19"V models | 25.5 ± 0.8 K.V. at 0 Beam |
|-----------------|---------------------------|

Note: Condition for above 1 (beam) = 0  
A.C. = 120V

### 3.0 Service Set-Up Controls

#### POWER PC BOARD

- 3.1 Voltage Adjustment, VR501 (Set for 127V DC)

#### VERT/HORIZ PC BOARD

- 3.2 Vertical Hold Control, VR301  
3.3 Vertical Size Control, VR302  
3.4 Horizontal Oscillator Coil, L351  
3.5 Horizontal Hold Control, VR351

#### MAIN PC BOARD

- 3.6 Vertical Raster Position Adjustment, J604  
(3 positions)  
3.7 Horizontal Raster Position Adjustment, J608  
(3 positions)

#### INTERFACE PC BOARD

- 3.8 Black Level Control, VR201  
3.9 Horizontal Video Position Control, VR202

#### NECK PC BOARD

- 3.10 Video Drive Controls, Red VR401  
Green VR402  
3.11 CRT Cut Off Controls, Red VR403  
Green VR404  
Blue VR405  
3.12 Screen Control, VR406

#### CHASSIS

- 3.13 Focus Control, VR702  
3.14 Horizontal Width Coil, L702

## SERVICE INSTRUCTIONS

**NOTE:** All monitors are equipped with automatic degaussing coils (L701) which demagnetize the picture tube every time the monitor is turned on after being off for a minimum of 5 minutes. Should any part of the chassis become magnetized it will be necessary to degauss the affected area with a manual degaussing coil. Move the coil slowly around the CRT face area then slowly withdraw for a distance of 6 feet before turning off.

### 1.0 +127V ADJUSTMENT (See Fig. 1)

The +127V adj. control (VR501) is adjusted at the factory. However, if readjustment should be required, proceed as follows.

- 1.1 Operate monitor for at least 15 minutes at 120V AC line.
- 1.2 Connect Positive lead of V.T.V.M. to blue lead of TR502 negative lead to chassis ground.
- 1.3 Adjust VR501 to obtain +127V reading.
- 1.4 After adjustment VR501 must be locked with a sealing varnish.

### 2.0 BLACK LEVEL CONTROL ADJUSTMENT

This control has been set at the factory and should not need further attention, however, when the game is connected a slight adjustment of VR201 may be necessary to obtain the proper black level (the black portion of the picture just extinguished).

### 3.0 VERTICAL SIZE (HEIGHT)

The vertical height control is a screw-driver adjustment. Location of this control is shown in Fig. 2. This control must be adjusted slowly, if necessary, until the picture or test pattern attains the correct vertical proportions.

### 4.0 CIRCUIT PROTECTION

A 3.0A pigtail fuse, mounted on the Main Board has been provided to protect the Power Output Circuit.

### 5.0 FOCUS

Adjust the Focus control (VR702), located on the HV unit(T701), for maximum over-all definition and fine picture detail.

### 6.0 HORIZONTAL OSC. ALIGNMENT (See Fig. 2)

A warm-up period of at least five minutes should be allowed before alignment is carried out. With the monitor being driven from the game signal, set VR351 to its mechanical center and short the lower end of R328 (TP32) to ground. Adjust L351 until picture stops sliding horizontally. Remove the short.

### 7.0 HORIZONTAL VIDEO POSITION

If the video is off center on the raster some compensation can be made by adjusting this control.

### 8.0 VERTICAL RASTER POSITION ADJUSTMENT

If the video is off center vertically, (short dimension of picture tube) some compensation can be made by moving J604 to either No.1 or No. 3 of P604. Position No. 1 moves raster up and position No.3 moves raster down.

### 9.0 HORIZONTAL RASTER POSITION ADJUSTMENT

If the video is off center horizontally (long dimension of picture tube) some compensation can be made by moving J608 to either No. 1 or No.3 of P608. Position No. 1 moves raster to the left and position No. 3 moves raster to the right.

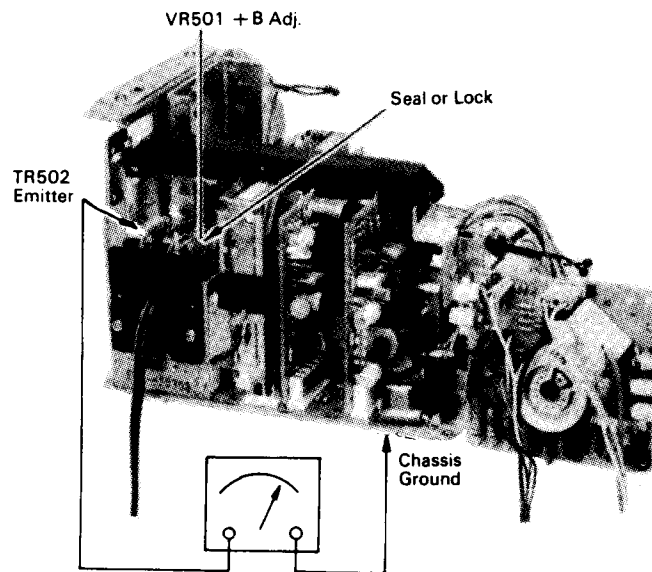


FIGURE 1

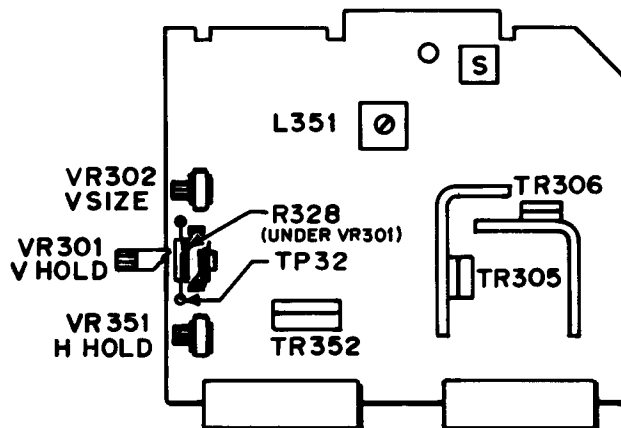


FIGURE 2

VERT./HORIZ. BOARD

# INSTALLATION AND SERVICE INSTRUCTIONS

## OUTLINE OF CONVERGENCE AND SET-UP PROCEDURE

- 1.0 Degaussing-Demagnetize shadow mask with external degaussing coil.
  - 2.0 Purity and Vertical Centering—Adjust purity magnet and yoke position.
  - 3.0 Static Convergence-Converge Red and Blue on Green in center of screen.
  - 4.0 Dynamic Convergence-Converge Red and Blue at edges of screen.
  - 5.0 White Balance-Set Gray and White brightness tracking.
- NOTE: Number 2.0 and 3.0 adjustments interact.

### 1.0 DEGAUSSING

The monitor is equipped with an automatic degaussing circuit. However, if the CRT shadow mask has become excessively magnetized, it may be necessary to degauss it with manual coil. Do not switch the coil OFF while the raster shows any effect from the coil.

### 2.0 COLOR PURITY AND VERTICAL CENTERING ADJUSTMENT

- 2.1 For best results, it is recommended that the purity adjustment be made in the final monitor location. If the monitor will be moved, perform this adjustment with it facing west or east. The monitor must have been operating 15 minutes prior to this procedure and the faceplate of the CRT must be at room temperature.
- 2.2 Set the converger assembly on the CRT neck with the center line (of the Purity Adjustment Magnet) over the gap between grids no. 3 & 4. (See Figure 3).
- 2.3 Make certain that the magnetic ring-pairs are in their correct positions before starting procedure. This produces a zero-correction state and helps facilitate adjustments.
- 2.4 Models which have vertical raster position adjustment, J604 must be in position #2 (center) of P604.
- 2.5 Remove R-G-B signal from monitor.
- 2.6 Turn Green Cut off Control (VR404) on the Neck Board fully CCW. (See Fig. 4)
- 2.7 Turn Red and Blue Cut off Control (VR405) fully CW.
- 2.8 Pull the Deflection Yoke backward so that the Magenta belt will appear. (See Fig. 5)
- 2.9 Move the two Purity Magnets and bring the Magenta belt to the mechanical center of the screen.
- 2.10 Push the Deflection Yoke forward gradually and fix it at the place where the Magenta screen becomes uniform throughout.
- 2.11 Turn Cut off Control, and Drive Control and confirm that each color is uniform.
- 2.12 If the color is not uniform, re-adjust it moving Purity Magnets slightly.
- 2.13 Move a pair of Purity Magnets at the same time (do not change the angle of the pair), and adjust the vert. center to center of screen.
- 2.14 Obtain the three colors and confirm whether white uniformity is balanced.
- 2.15 Insert the temporary wedge as shown in Fig. 5 and adjust the angle of Deflection Yoke.

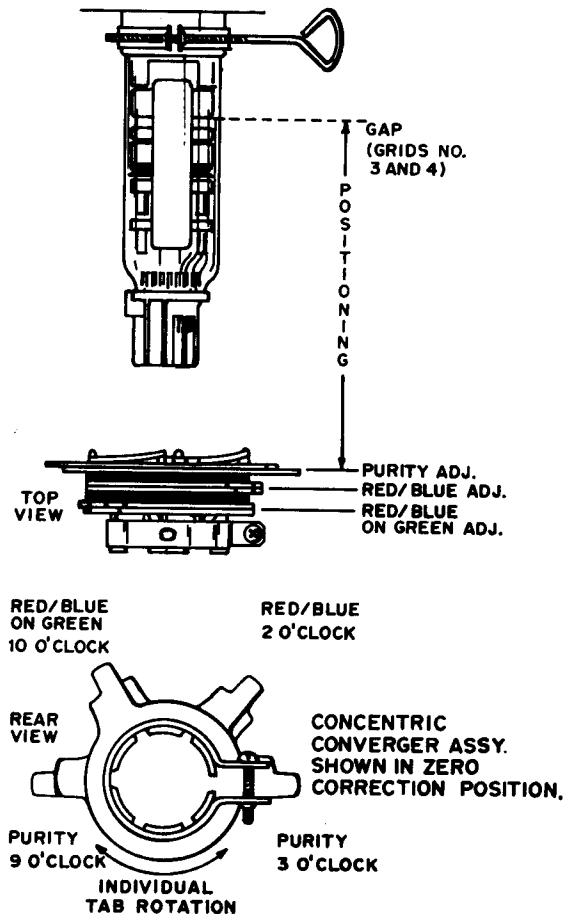


FIGURE 3

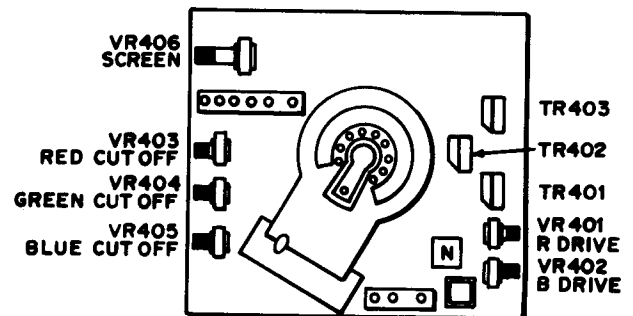


FIGURE 4

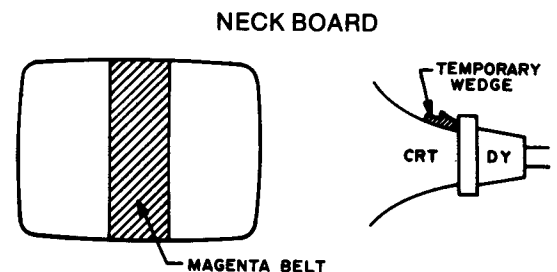


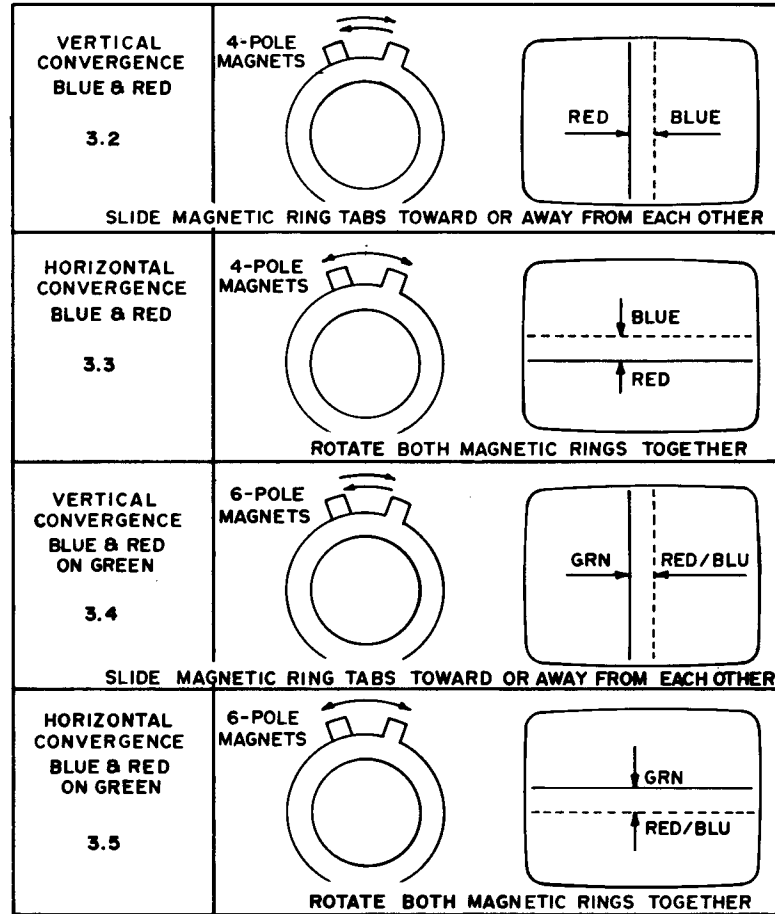
FIGURE 5

### 3.0 STATIC CONVERGENCE ADJUSTMENT

A recently developed Deflection Yoke and Electron Guns construction has been used on this equipment in combination with In-Line Guns and Black Stripe Screen to make a barrel-type magnetic field distribution for vertical deflection and a pin-cushion-type magnetic field for horizontal deflection with which a self-converging system can be obtained. This type is different from conventional unity-magnetic field distribution type deflection yoke. 4-Pole Magnets and 6-Pole Magnets are employed for static convergence instead of a Convergence Yoke.

- 3.1 A cross hatch signal should be connected to the monitor.
- 3.2 A pair of 4-Pole Convergence Magnets are provided and adjusted to converge the blue and red beams. When the Pole opens to the left and right 45° symmetrically, the magnetic field maximizes. Red and blue beams move to the left and right oppositely (See Fig. 6) Variation of the angle between the tabs adjusts the convergence of red and blue vertical lines.
- 3.3 When both 4-Pole Convergence Magnet Tabs are rotated as a pair, the convergence of the red and blue horizontal lines is adjusted.
- 3.4 A pair of 6-Pole Convergence Magnets are also provided and adjusted to converge the magenta (red + blue) to green beams. When the Pole opens to the left and right 30° symmetrically, the magnetic field is maximized. Red and blue beams both move to the left and right (See Fig. 6). Variation of the opening angle adjusts the convergence of magenta to green vertical lines.
- 3.5 When both 6-Pole Convergence Magnet Tabs are rotated as a pair the convergence of magenta to green horizontal lines is adjusted.

GREEN GUN IS THE CENTER GUN.  
CONVERGE THE RED AND BLUE.  
THEN CONVERGE RED AND BLUE ON GREEN.



REPEAT 3.2 & 3.3 IF ALL LINES ARE NOT CONVERGED AT CENTER

5827

FIGURE 6

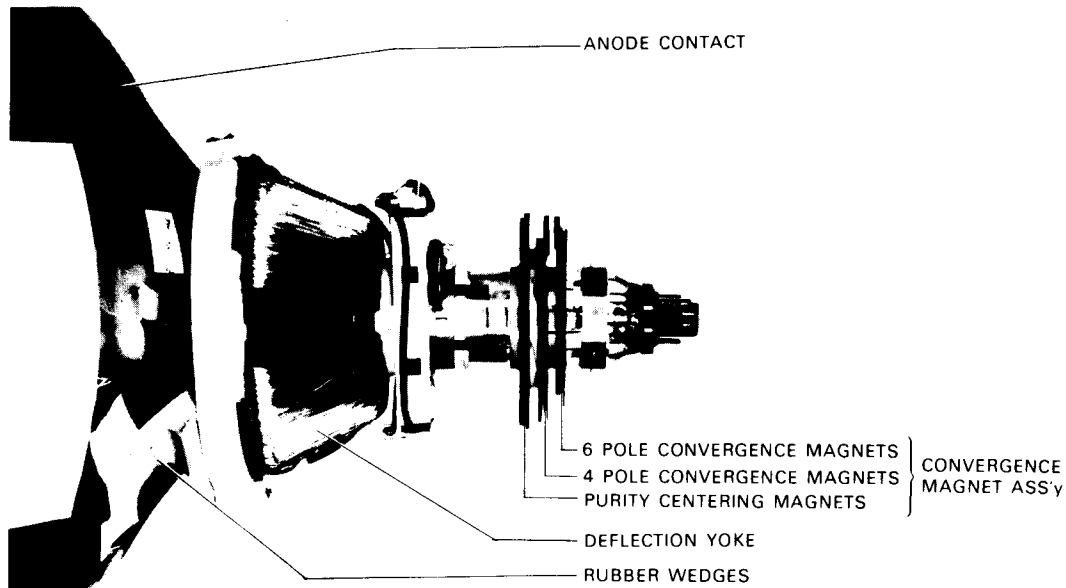


FIGURE 7

## 4.0 PRECISE ADJUSTMENT OF DYNAMIC CONVERGENCE (See Fig. 9 and 10)

- 4.1 Feed a cross hatch signal to the monitor.
- 4.2 Insert the temporary wedge and fix Deflection Yoke so as to obtain the best circumference convergence (See Fig. 9 and 10)

**NOTE:**

The temporary wedges may need to be moved during adjustments.

- 4.3 Insert three rubber wedges to the position as shown in Fig. 8 to obtain the best circumference convergence.

**NOTE:**

- 1) Tilting the angle of the yoke up and down adjusts the crossover of both vertical and horizontal red and blue lines. See Fig. 9 (a) and (b).
- 2) Tilting the angle of the yoke sideways adjusts the parallel convergence of both horizontal and vertical lines at the edges of the screen. See Fig. 10 (a) and (b).
- 3) Use three rubber wedges (thick and thin rubber wedges are used for a purpose).
- 4) The angle of each rubber wedge is shown in Fig. 8.
- 5) After three rubber wedges have been inserted, pull out the temporary wedge.
- 6) Fix the rubber wedges with chloroprene rubber adhesive.

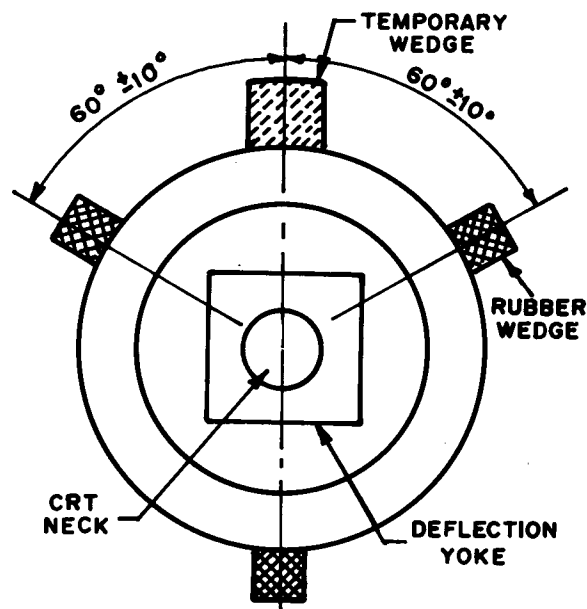


FIGURE 8

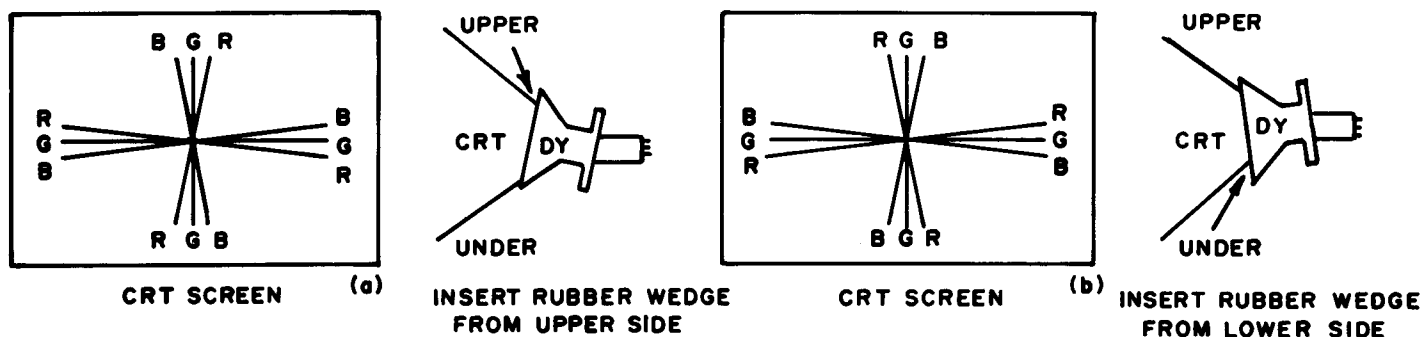


FIGURE 9

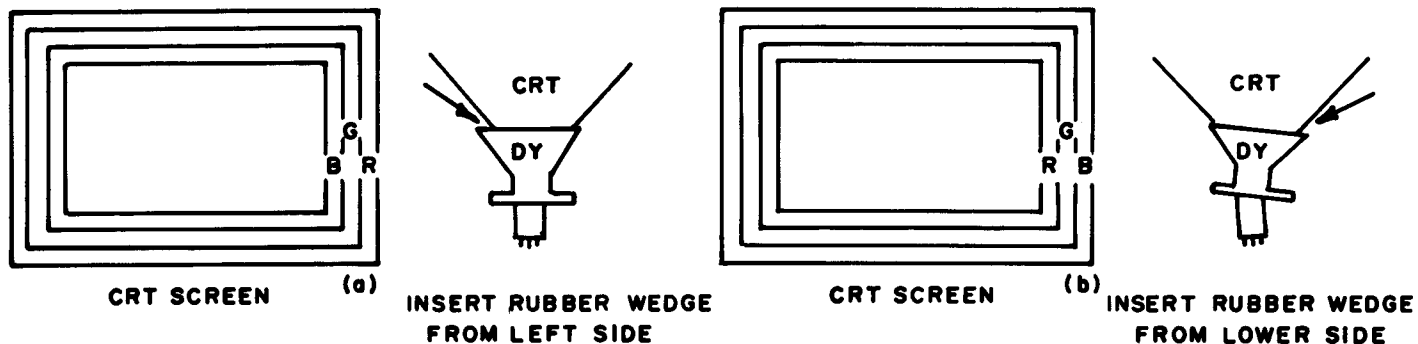
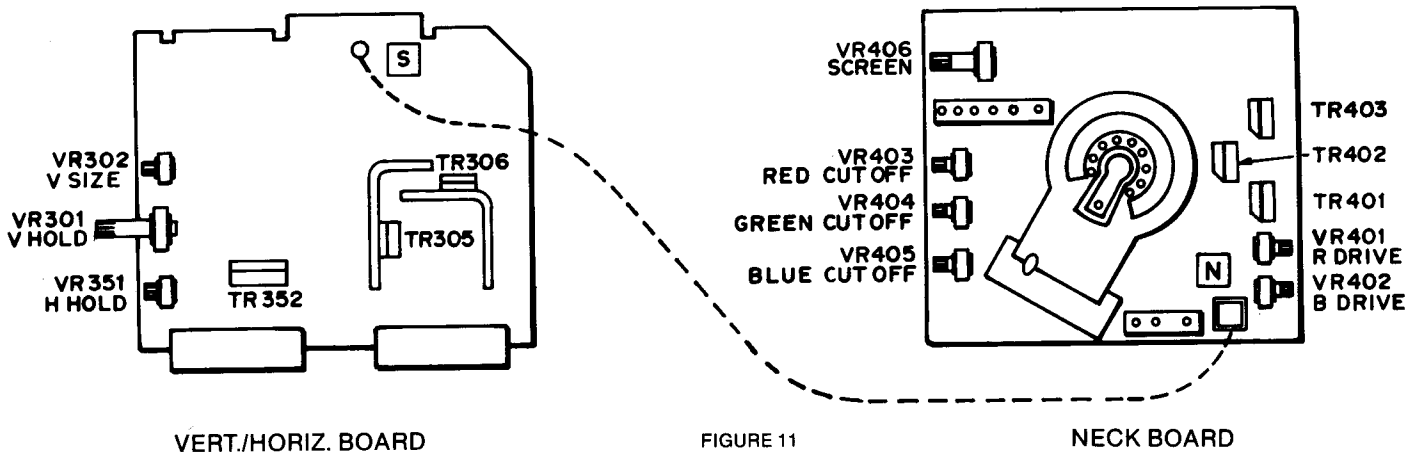


FIGURE 10

## 5.0 WHITE BALANCE

- 5.1 Refer to Fig. 11. and do the following in subdued light.
- 5.2 Ground the R/G/B inputs.
- 5.3 Set the R/B drive controls to their mechanical center.
- 5.4 Set the screen and R/G/B cutoff controls to minimum (fully CCW).
- 5.5 Insert service tip "N" on Neck PCB to "S" on Vert/ Horiz. PCB (see Fig. 11).
- 5.6 Slowly turn the screen control (CW) until the first faint line appears. Do not touch the associated cutoff control—it will stay fully CCW.
- 5.7 Slowly turn up the two remaining cutoff controls to match the first. This should result in a white line.
- 5.8 Replace the Service Tip "N" to the Neck PCB.
- 5.9 Adjust the Black Level Control for dim raster. Touch up the cutoff controls for best gray uniformity.
- 5.10 Adjust the Black Level Control for a bright White Raster. Adjust the R/B Drive Controls if necessary for best neutral white.
- 5.11 Repeat steps 5.9 and 5.10 until good tracking of white balance is achieved.



## 6.0 HIGH VOLTAGE PROTECT

- 6.1 The AUTO PROTECT circuit prevents the high voltage from reaching dangerous levels should a defect such as a short circuit occur between collector and emitter of the voltage regulator transistor.
- 6.2 When the + 127V DC exceeds approx. + 141V DC the horizontal oscillator is shut down.
- 6.3 When the defect is removed the oscillator will not restart until the power is removed momentarily.

## P.C. BOARD LAYOUT

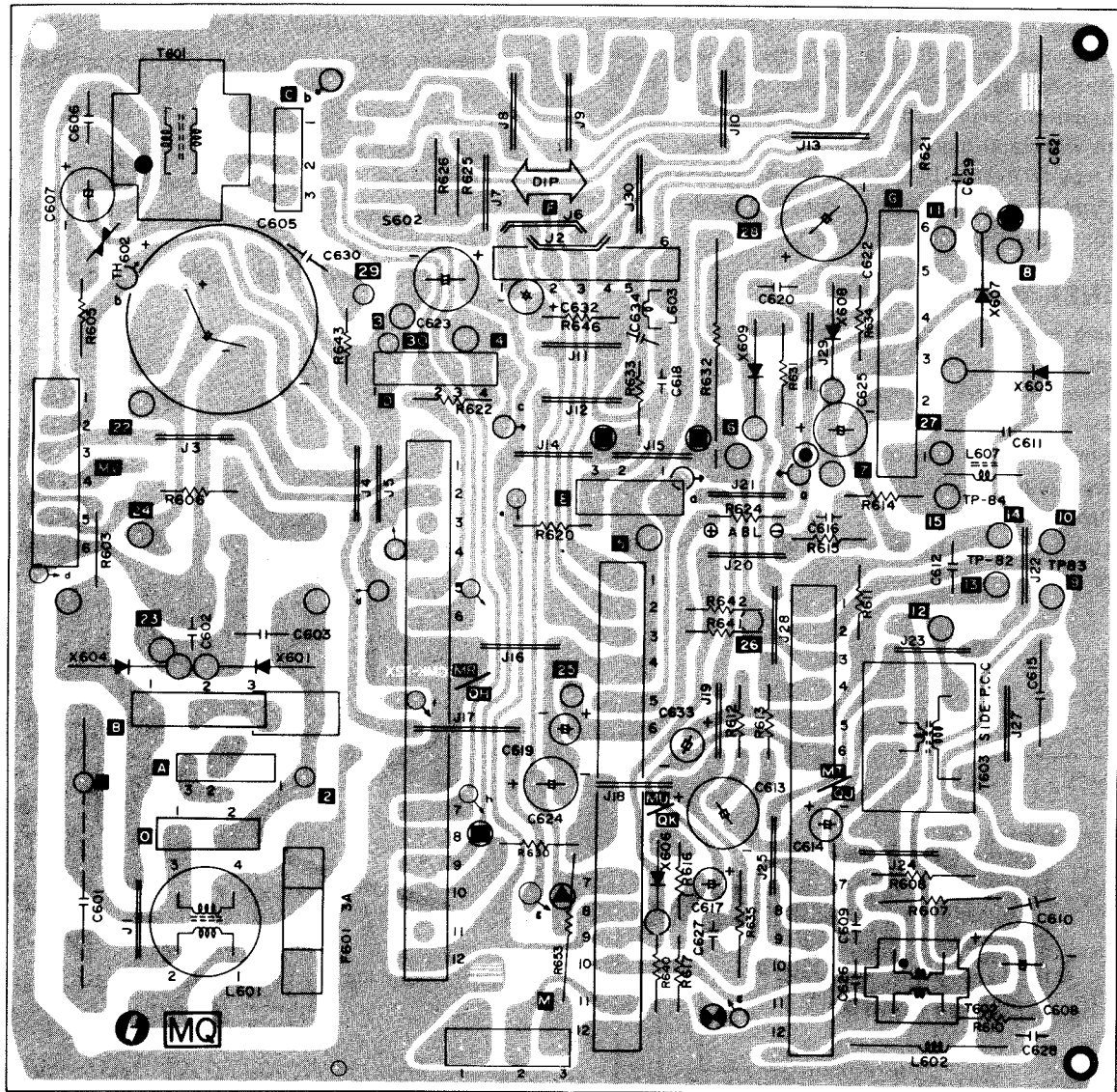


FIGURE 12. MAIN P.C. BOARD

## P.C. BOARD LAYOUT

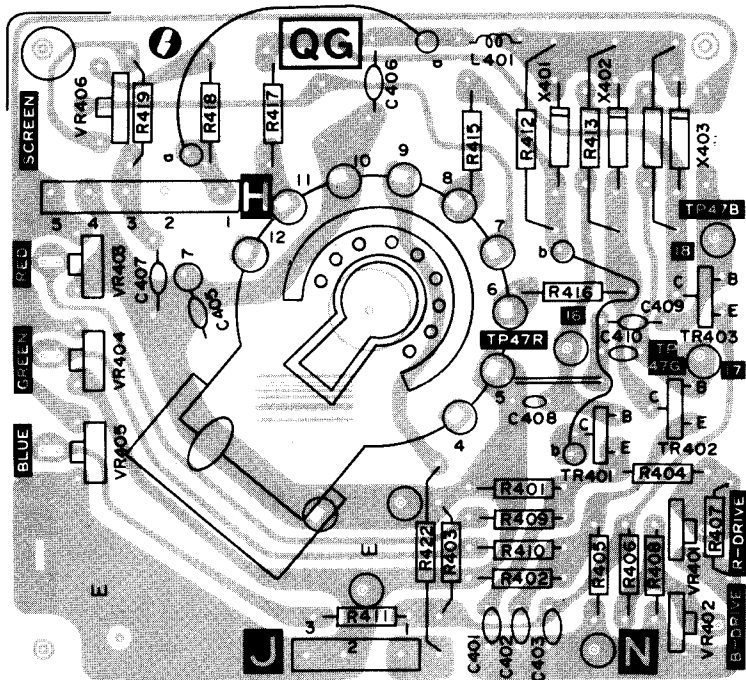


FIGURE 13. NECK P.C. BOARD

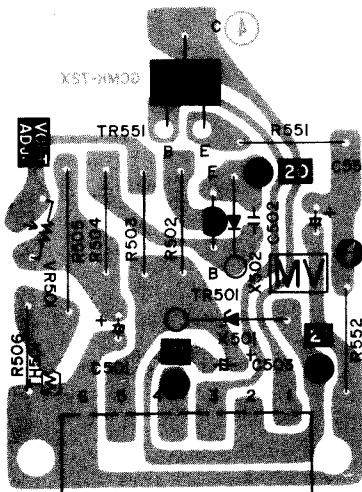


FIGURE 14. POWER P.C. BOARD

# P.C. BOARD LAYOUT

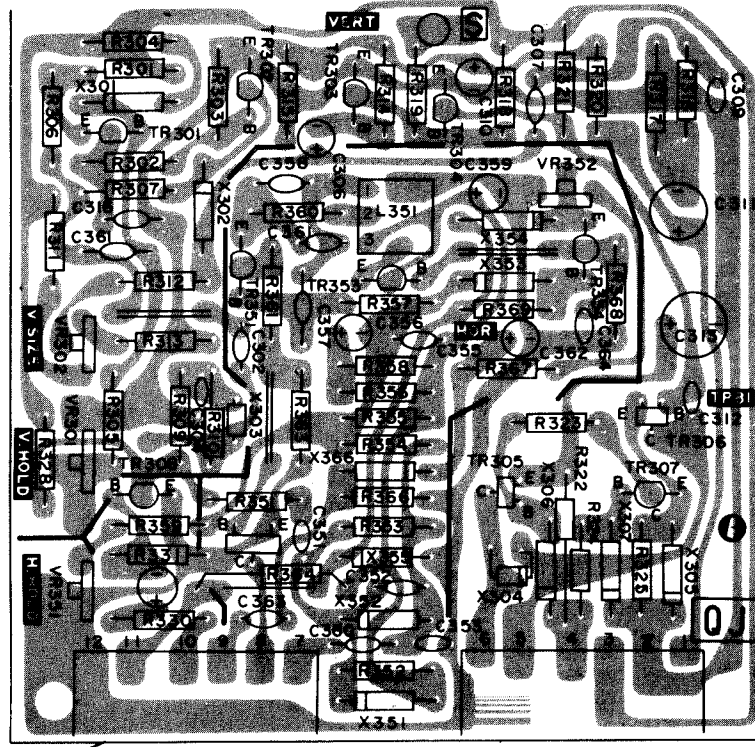


FIGURE 15. HORIZ/VERT P.C. BOARD

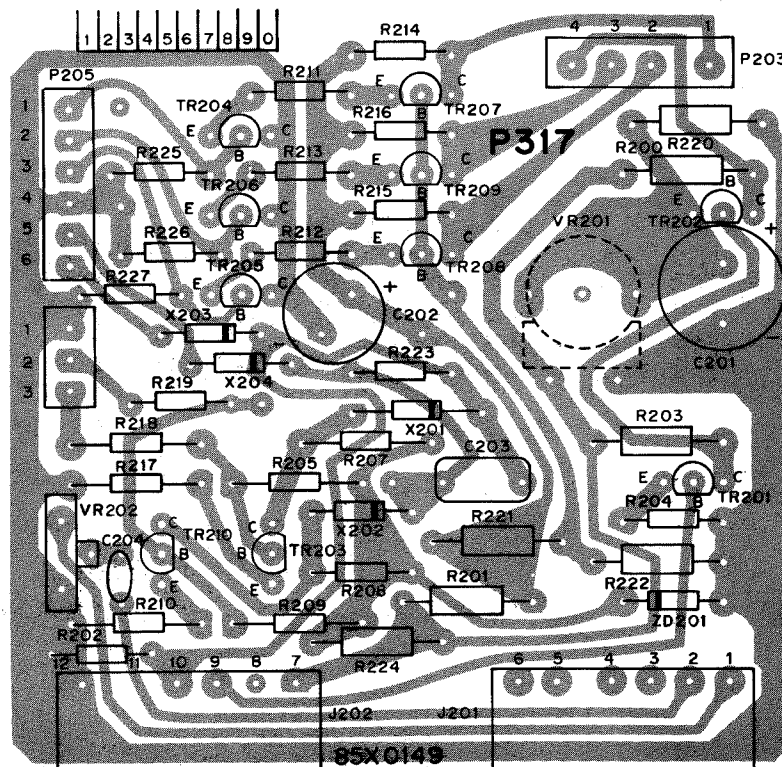


FIGURE 16. INTERFACE BOARD (P317 AND P318)

# REPLACEMENT PARTS LIST

This monitor contains circuits and components included specifically for safety purposes.

For continued protection no changes should be made to the original design, and components shown in shaded areas of schematic, or  $\Delta$  ★ on parts list should be replaced with exact factory replacement parts.

The use of substitute parts may create a shock, fire, radiation or other hazard. Service should be performed by qualified personnel only.

## MAIN BOARD

| Ref. No.                        | Part No.     | Description                        | Ref. No.             | Part No.     | Description                        |
|---------------------------------|--------------|------------------------------------|----------------------|--------------|------------------------------------|
| <b>RESISTORS</b>                |              |                                    | <b>CAPACITORS</b>    |              |                                    |
| R603                            | 340X3334-944 | 330k Ohm, $\pm 10\%$ , 1/2W Carbon | $\Delta$ C601        | 203X1800-451 | 0.1 uF, 125V, $\pm 20\%$ MM        |
| R606                            | 204X1425-021 | 470 Ohm, $\pm 10\%$ , 5W W.W.      | C602                 | 80X0096-038  | 2200 pF, Z5F, $\pm 10\%$ Ceramic   |
| $\Delta$ ★ R607                 | 204X1450-508 | 2.7k Ohm, $\pm 10\%$ , 5W W.W.     | $\Delta$ C603        | 202X7810-214 | 2200 pF, 125V Ceramic              |
| R608                            | 203X9014-603 | 1.2k Ohm, $\pm 5\%$ , 1W M.O.      | C604                 | 80X0096-038  | 2200 pF, Z5F, $\pm 10\%$ Ceramic   |
| R610                            | 203X6500-246 | 22 Ohm, $\pm 5\%$ , 1/8W Carbon    | C605                 | 203X0220-043 | 330 uF, 200V Electrolytic          |
| R611                            | 203X6700-562 | 1k Ohm, $\pm 5\%$ , 1/2W Carbon    | C608                 | 203X0040-052 | 47 uF, 160V Electrolytic           |
| R612                            | 340X3471-944 | 470 Ohm, $\pm 10\%$ , 1/2W Carbon  | C609                 | 202X7050-366 | .0033 uF, 500V, $\pm 10\%$ Ceramic |
| R613                            | 203X9010-757 | 1.2k Ohm, $\pm 5\%$ , 1W M.O.      | C610                 | 202X7050-483 | .01 uF, 500V, $\pm 10\%$ Ceramic   |
| R614                            | 203X5202-320 | 680k Ohm, $\pm 5\%$ , 1/2W Comp.   | C611                 | 202X8140-022 | 100 pF, 3KV, $\pm 10\%$ Ceramic    |
| R615                            | 203X5602-156 | 270k Ohm, $\pm 5\%$ , 1/2W Comp.   | C612                 | 203X1201-047 | .022 uF, 200V, $\pm 10\%$ PP       |
| R616                            | 203X6500-741 | 2.7k Ohm, $\pm 5\%$ , 1/8W Carbon  | C613                 | 203X0015-035 | 220 uF, 25V Electrolytic           |
| R617                            | 203X6501-088 | 68k Ohm, $\pm 5\%$ , 1/8W Carbon   | C614                 | 203X0015-006 | 33 uF, 25V Electrolytic            |
| R624                            | 203X6205-843 | 1k Ohm, $\pm 5\%$ , 1/2W Carbon    | C615                 | 203X1201-288 | 0.39 uF, 200V, $\pm 10\%$ PP       |
| R631                            | 203X9015-087 | 2.2 Ohm, $\pm 10\%$ , 5W M.O.      | C616                 | 202X8065-499 | 47 pF, 500V Ceramic                |
| R632                            | 340X8121-731 | 120 Ohm, $\pm 5\%$ , 5W Carbon     | C617                 | 203X0025-019 | 1 uF, 50V Electrolytic             |
| R634                            | 203X6000-002 | 2.2 Ohm, $\pm 5\%$ , 1/8W Carbon   | C619                 | 203X0025-019 | 1 uF, 50V Electrolytic             |
| R635                            | 340X3682-944 | 6.8 Ohm, $\pm 5\%$ , 1/2W Carbon   | C620                 | 203X1107-038 | 0.1 uF, 100V, $\pm 10\%$ Mylar     |
| R641                            | 203X6501-002 | 33k Ohm, $\pm 5\%$ , 1/8W Carbon   | C621                 | 202X9040-155 | 0.1 uF, 1.5KV, $\pm 20\%$ Paper    |
| R642                            | 203X6500-927 | 15k Ohm, $\pm 5\%$ , 1/8W Carbon   | C622                 | 203X0020-099 | 1000 uF, 35V Electrolytic          |
| R647                            | 340X5150-841 | 15 Ohm, $\pm 10\%$ , 2W Carbon     | C623                 | 203X0015-053 | 470 uF, 25V Electrolytic           |
| R649                            | 340X3182-944 | 1.8k Ohm, $\pm 10\%$ , 1/2W Carbon | C624                 | 203X0015-021 | 100 uF, 25V Electrolytic           |
| R650                            | 340X3271-944 | 270 Ohm, $\pm 10\%$ , 1/2W Carbon  | C625                 | 203X0040-020 | 10 uF, 160V Electrolytic           |
| R651                            | 340X5241-743 | 240 Ohm, $\pm 10\%$ , 2W Carbon    | C626                 | 202X7050-009 | 100 pF, 500V, $\pm 10\%$ Ceramic   |
| R652                            | 340X3682-944 | 6.8k Ohm, $\pm 10\%$ , 1/2W Carbon | C627                 | 202X8065-461 | 39 pF, 500V, $\pm 10\%$ Ceramic    |
| <b>SEMICONDUCTORS</b>           |              |                                    | C628                 | 202X7000-327 | 2200 pF, 500V, $\pm 10\%$ Ceramic  |
| TR601                           | 200X3189-304 | Transistor, 2SC1893                | ★ C629               | 203X1270-470 | 6900 pF, 1.5KV, $\pm 5\%$ PP       |
| X601                            | 201X3130-109 | Rectifier, (SI) RM-2AV 600V        | C633                 | 203X0315-033 | 2.2 uF, 50V Electrolytic           |
| X602                            | 201X3130-109 | Rectifier, (SI) RM-2AV 600V        | C637                 | 202X8105-014 | 3 pF, 2kV, $\pm 0.5$ pF Ceramic    |
| X603                            | 201X3130-109 | Rectifier, (SI) RM-2AV 600V        | C638                 | 342X5632-040 | .056 uF, 10% Mylar                 |
| X604                            | 201X3130-109 | Rectifier, (SI) RM-2AV 600V        | <b>MISCELLANEOUS</b> |              |                                    |
| X605                            | 200X8130-171 | Diode (HS) SB-2CGL 1200V min.      | $\Delta$ F601        | 204X7120-062 | Fuse (UL/CSA) 3A-125               |
| X606                            | 201X2010-144 | Diode (SI) IS2473-772              | J607                 | 206X5003-960 | Socket, 6 Pin                      |
| X607                            | 201X2100-119 | Diode (HS) RC-2V 0.8 US            | P602                 | 204X9600-260 | Plug, 3 Pin (GT)                   |
| X608                            | 201X2130-234 | Diode (HS) RU-2V                   | P604                 | 204X9600-298 | Plug, 4 Pin (NM)                   |
| X609                            | 201X2130-234 | Diode (HS) RU-2V                   | P607                 | 204X9600-380 | Plug, 6 Pin (GT)                   |
| X610                            | 66X0023-009  | Rectifier, Power (SI) 500V PIV     | P608                 | 204X9600-254 | Plug, 3 Pin (NM)                   |
| X611                            | 66X0023-009  | Rectifier, Power (SI) 500V PIV     | P611                 | 204X9600-670 | Plug, 2 Pin (NM)                   |
| X612                            | 66X0023-009  | Rectifier, Power (SI) 500V PIV     | TH601                | 201X011-034  | Thermistor                         |
| <b>TRANSFORMERS &amp; COILS</b> |              |                                    | P201                 | 204X9601-195 | Plug, 6 Pin                        |
| $\Delta$ L601                   | 201X6000-112 | Coil, Line Filter R-3              | P202                 | 204X9601-195 | Plug, 6 Pin                        |
| L602                            | 201X4600-042 | Coil, Filter, 10 uH                |                      |              |                                    |
| T602                            | 201X1300-080 | Transformer, Hor. Drive            |                      |              |                                    |
| T603                            | 202X1210-191 | Transformer, Side PC               |                      |              |                                    |
| L702                            | 9A2795-003   | Width Coil                         |                      |              |                                    |

## VERT/HOR BOARD

|                  |              |                                   |                          |              |                                   |
|------------------|--------------|-----------------------------------|--------------------------|--------------|-----------------------------------|
| <b>RESISTORS</b> |              |                                   | <b>RESISTORS (CONT.)</b> |              |                                   |
| R301             | 203X6500-628 | 820 Ohm, $\pm 5\%$ , 1/8W Carbon  | R316                     | 203X6500-420 | 120 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R302             | 203X6500-902 | 12k Ohm, $\pm 5\%$ , 1/8W Carbon  | R317                     | 203X6206-441 | 2.2 Ohm, $\pm 5\%$ , 1/2W Carbon  |
| R303             | 203X6500-927 | 15k Ohm, $\pm 5\%$ , 1/8W Carbon  | R318                     | 203X6501-002 | 33k Ohm, $\pm 5\%$ , 1/4W Carbon  |
| R304             | 203X6500-886 | 10k Ohm, $\pm 5\%$ , 1/8W Carbon  | R319                     | 203X6500-169 | 10 Ohm, $\pm 5\%$ , 1/8W Carbon   |
| R305             | 203X6501-241 | 330k Ohm, $\pm 5\%$ , 1/8W Carbon | R320                     | 203X6500-927 | 15k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R306             | 203X6500-645 | 1k Ohm, $\pm 5\%$ , 1/8W Carbon   | R321                     | 203X6700-509 | 560 Ohm, $\pm 5\%$ , 1/2W Carbon  |
| R307             | 203X6500-689 | 1.5k Ohm, $\pm 5\%$ , 1/8W Carbon | R322                     | 203X9100-121 | 22 Ohm, $\pm 5\%$ , 2W M.O.       |
| R309             | 203X6500-724 | 2.2k Ohm, $\pm 5\%$ , 1/8W Carbon | R323                     | 203X6500-689 | 1.5 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R310             | 203X6501-285 | 470k Ohm, $\pm 5\%$ , 1/8W Carbon | R324                     | 203X6500-988 | 27k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R311             | 203X6501-065 | 56k Ohm, $\pm 5\%$ , 1/8W Carbon  | R325                     | 203X6500-326 | 47 Ohm, $\pm 5\%$ , 1/8W Carbon   |
| R312             | 203X6501-126 | 100k Ohm, $\pm 5\%$ , 1/8W Carbon | R328                     | 203X6500-628 | 820 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R313             | 203X6001-326 | 10k Ohm, $\pm 5\%$ , 1/8W Carbon  | R330                     | 203X6500-886 | 10 k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R314             | 203X6001-044 | 47k Ohm, 5%, 1/8W Carbon          | R331                     | 203X6501-209 | 220k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R315             | 203X6500-628 | 820 Ohm, $\pm 5\%$ , 1/8W Carbon  | R351                     | 203X6500-724 | 2.2k Ohm, $\pm 5\%$ , 1/8W Carbon |

# VERT/HOR BOARD (CONT.)

| Ref. No.                 | Part No.     | Description                       |
|--------------------------|--------------|-----------------------------------|
| <b>RESISTORS (CONT.)</b> |              |                                   |
| R352                     | 203X6500-927 | 15k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R353                     | 203X6500-944 | 18k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R354                     | 203X6500-783 | 3.9k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R355                     | 203X6500-902 | 12k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R356                     | 203X6500-561 | 470 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R357                     | 203X6500-724 | 2.2k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R358                     | 203X6500-666 | 1.2k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R359                     | 203X6501-088 | 68k Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R360                     | 203X5500-471 | 27 Ohm, $\pm 5\%$ , 1/4W Carbon   |
| R361                     | 203X6000-998 | 1.2k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R363                     | 203X6500-666 | 1.2k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R364                     | 203X9014-988 | 47k Ohm, $\pm 5\%$ , 1W M.O.      |
| R365                     | 203X6700-989 | 56k Ohm, $\pm 5\%$ , 1/2W Carbon  |
| R366                     | 203X6001-148 | 3.3k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R367                     | 340X2222-734 | 2.2k Ohm, $\pm 5\%$ , 1/2W Carbon |
| R368                     | 203X6500-785 | 3.9k Ohm, $\pm 5\%$ , 1/8W Carbon |
| R369                     | 203X6500-762 | 3.3k Ohm, $\pm 5\%$ , 1/4W Carbon |
| R370                     | 302X6100-961 | 1k Ohm, $\pm 5\%$ , 1/4W Carbon   |
| R371                     | 203X6104-751 | 2.7k Ohm, $\pm 5\%$ , 1/4W Carbon |
| R383                     | 340X2222-934 | 2.2k Ohm, $\pm 5\%$ , 1/4W Carbon |
| R384                     | 340X2822-934 | 8.2k Ohm, $\pm 5\%$ , 1/4W Carbon |
| VR301                    | 204X2122-093 | Varistor, 250k Ohm, Vert. Hold    |
| VR302                    | 204X2114-065 | Varistor, 20k Ohm, Vert. Size     |
| VR351                    | 204X2114-059 | Varistor, 50k Ohm, Hor. Hold      |

## CAPACITORS

|      |              |                                    |
|------|--------------|------------------------------------|
| C301 | 203X1100-928 | 0.15 uF, 50V, $\pm 10\%$ Mylar     |
| C302 | 203X1100-573 | 0.022 uF, 50V, $\pm 10\%$ Mylar    |
| C304 | 203X1100-858 | 0.1 uF, 50V, $\pm 10\%$ Mylar      |
| C306 | 203X0025-026 | 2.2 uF, 50V, Electrolytic          |
| C307 | 203X1100-928 | 0.15 uF, 50V, $\pm 10\%$ Mylar     |
| C309 | 203X1100-858 | 0.1 uF, 50V, $\pm 10\%$ Mylar      |
| C310 | 203X0010-011 | 22 uF, 16V Electrolytic            |
| C311 | 203X0020-099 | 1000 uF, 35V Electrolytic          |
| C312 | 202X7000-469 | 0.0082 uF, 50V, $\pm 10\%$ Ceramic |
| C313 | 203X0025-087 | 47 uF, 50V Electrolytic            |
| C315 | 203X0015-082 | 10 uF, 25V Electrolytic            |
| C316 | 203X1100-220 | 3300 uF, 50V, $\pm 10\%$ Mylar     |
| C317 | 202X8000-616 | 100 pF, 50V, $\pm 10\%$ Ceramic    |
| C351 | 202X7000-281 | 1500 pF, 50V, $\pm 10\%$ Ceramic   |
| C352 | 202X7000-247 | 1000 pF, 50V, $\pm 10\%$ Ceramic   |
| C353 | 203X1100-573 | 0.022 uF, 50V, $\pm 10\%$ Mylar    |
| C355 | 203X1100-858 | 0.1 uF, 50V, $\pm 10\%$ Mylar      |
| C356 | 203X0015-105 | 4.7 uF, 25V Electrolytic           |
| C357 | 203X1201-013 | 0.015 uF, 200V, $\pm 10\%$ PP      |
| C358 | 203X1201-034 | 0.018 uF, 200V, $\pm 10\%$ PP      |

## POWER BOARD

### RESISTORS

|        |              |                                   |
|--------|--------------|-----------------------------------|
| ★ R501 | 204X1725-052 | 180 Ohm, $\pm 10\%$ , 15W WW      |
| R502   | 203X6000-608 | 100 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R503   | 203X6000-960 | 1k Ohm, $\pm 5\%$ , 1/8W Carbon   |
| R504   | 203X6000-879 | 560 Ohm, $\pm 5\%$ , 1/8W Carbon  |
| R505   | 203X9014-965 | 39k Ohm, $\pm 5\%$ , 1W M.O.      |
| R506   | 203X6500-842 | 6.8k Ohm, $\pm 5\%$ , 1/8W Carbon |
| VR501  | 204X2050-001 | Varistor Volt Adj.                |

### CAPACITORS

|      |              |                                  |
|------|--------------|----------------------------------|
| C501 | 203X0040-020 | 10 uF, 160V Electrolytic         |
| C502 | 202X7000-281 | 1500 pF, 50V, $\pm 10\%$ Ceramic |
| C503 | 203X0010-011 | 22 uF, 16V Electrolytic          |

## NECK BOARD

### RESISTORS

|      |              |                                |
|------|--------------|--------------------------------|
| R401 | 203X6500-709 | 1.8k Ohm $\pm 5\%$ 1/8W Carbon |
| R402 | 203X6500-709 | 1.8k Ohm $\pm 5\%$ 1/8W Carbon |
| R403 | 203X6500-709 | 1.8k Ohm $\pm 5\%$ 1/8W Carbon |
| R404 | 203X6500-447 | 150 Ohm $\pm 5\%$ 1/8W Carbon  |
| R405 | 203X6500-481 | 220 Ohm $\pm 5\%$ 1/8W Carbon  |
| R406 | 203X6500-447 | 150 Ohm $\pm 5\%$ 1/8W Carbon  |
| R407 | 340X2391-934 | 390 Ohm $\pm 5\%$ 1/4W Carbon  |
| R408 | 340X2391-934 | 390 Ohm $\pm 5\%$ 1/4W Carbon  |
| R409 | 203X6500-800 | 4.7k Ohm $\pm 5\%$ 1/8W Carbon |

| Ref. No.                  | Part No.     | Description                      |
|---------------------------|--------------|----------------------------------|
| <b>CAPACITORS (CONT.)</b> |              |                                  |
| C359                      | 203X0040-013 | 4.7 uF, 160V Electrolytic        |
| C360                      | 202X7000-482 | 0.01 uF, 50V, $\pm 10\%$ Ceramic |
| C361                      | 203X1100-509 | 0.015 uF, 50V, $\pm 10\%$ Mylar  |
| C362                      | 203X0025-058 | 10 uF, 50V Electrolytic          |
| C363                      | 203X1205-487 | 0.01 uF, 630V, $\pm 10\%$ PP     |
| C364                      | 202X7000-482 | 0.01 uF, 50V, $\pm 10\%$ Ceramic |

## SEMICONDUCTORS

|       |              |                           |
|-------|--------------|---------------------------|
| TR301 | 200X4082-614 | Transistor, 2SA826Q       |
| TR302 | 200X3174-006 | Transistor, 2SC1740Q      |
| TR303 | 200X3174-006 | Transistor, 2SA1740Q      |
| TR304 | 200X3174-006 | Transistor, 2SC1740Q      |
| TR305 | 200X4049-081 | Transistor, 2SA490YLBGLI  |
| TR306 | 200X3162-538 | Transistor, 2SC1625YLBGLI |
| TR307 | 200X3174-014 | Transistor, 2SC1740R      |
| TR308 | 200X3174-006 | Transistor, 2SC1740Q      |
| TR351 | 200X4085-415 | Transistor, 2SA854Q       |
| TR352 | 200X3172-208 | Transistor, 2SC1722BKS    |
| TR353 | 200X3174-006 | Transistor, 2SC1740Q      |
| TR354 | 200X4082-614 | Transistor, 2SA826Q       |
| X301  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X302  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X303  | 200X8000-026 | Diode (GE), IN60TVGL      |
| X304  | 200X8010-165 | Diode (Si) ISS81          |
| X305  | 201X2010-165 | Diode (Si) ISS81          |
| X306  | 201X2010-165 | Diode (Si) 1SS81          |
| X307  | 200X8010-102 | Diode (Si) MA26W          |
| X308  | 200X8010-094 | Diode (Si) IS2473         |
| X351  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X352  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X353  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X354  | 201X2010-144 | Diode (Si) IS2473-T72     |
| X355  | 200X8220-851 | Diode (Zener) RD10EBI     |
| X366  | 200X8100-130 | Diode (HS) RU-1 0.3 US    |

## MISCELLANEOUS

|       |              |               |
|-------|--------------|---------------|
| J301  | 204X9300-958 | Socket, 6 Pin |
| J302  | 204X9300-958 | Socket, 6 Pin |
| P301  | 204X9601-195 | Plug, 6 Pin   |
| P302  | 204X9601-195 | Plug, 6 Pin   |
| TH301 | 201X0000-534 | Thermistor    |

## TRANSFORMERS & COILS

|      |              |                   |
|------|--------------|-------------------|
| L351 | 201X5200-091 | Coil, Horiz. Osc. |
|------|--------------|-------------------|

## SEMICONDUCTORS

|         |              |                             |
|---------|--------------|-----------------------------|
| TR501   | 200X3174-006 | Transistor, 2SC1740Q        |
| ★ TR502 | 200X3145-404 | Transistor, 2SC1454         |
| X501    | 201X2230-042 | Diode, (Si) Zener EQB01-06V |
| X502    | 201X2010-144 | Diode, (Si) IS2473-T72      |

## MISCELLANEOUS

|       |              |               |
|-------|--------------|---------------|
| J501  | 204X9300-958 | Socket, 6 Pin |
| P501  | 204X9601-195 | Plug, 6 Pin   |
| TH501 | 201X0000-618 | Thermistor    |

## RESISTORS (CONT.)

|      |              |                                    |
|------|--------------|------------------------------------|
| R410 | 203X6500-800 | 4.7k Ohm $\pm 5\%$ 1/8W Carbon     |
| R411 | 203X6500-800 | 4.7k Ohm $\pm 5\%$ 1/8W Carbon     |
| R412 | 203X9104-809 | 12k Ohm $\pm 5\%$ 2.0W Metal Oxide |
| R413 | 203X9104-809 | 12k Ohm $\pm 5\%$ 2.0W Metal Oxide |
| R414 | 203X9104-809 | 12k Ohm $\pm 5\%$ 2.0W Metal Oxide |
| R415 | 203X5601-313 | 2.7k Ohm $\pm 10\%$ 1/2W Comp.     |
| R416 | 203X5601-313 | 2.7k Ohm $\pm 10\%$ 1/2W Comp.     |
| R417 | 203X5601-313 | 2.7k Ohm $\pm 10\%$ 1/2W Comp.     |
| R418 | 203X5602-254 | 470k Ohm $\pm 10\%$ 1/2W Comp.     |

# 19" COLOR MONITOR SCHEMATIC

## MODELS 19K4625, 19K4626, 19K4627

### Power Supply Voltage and Symbols

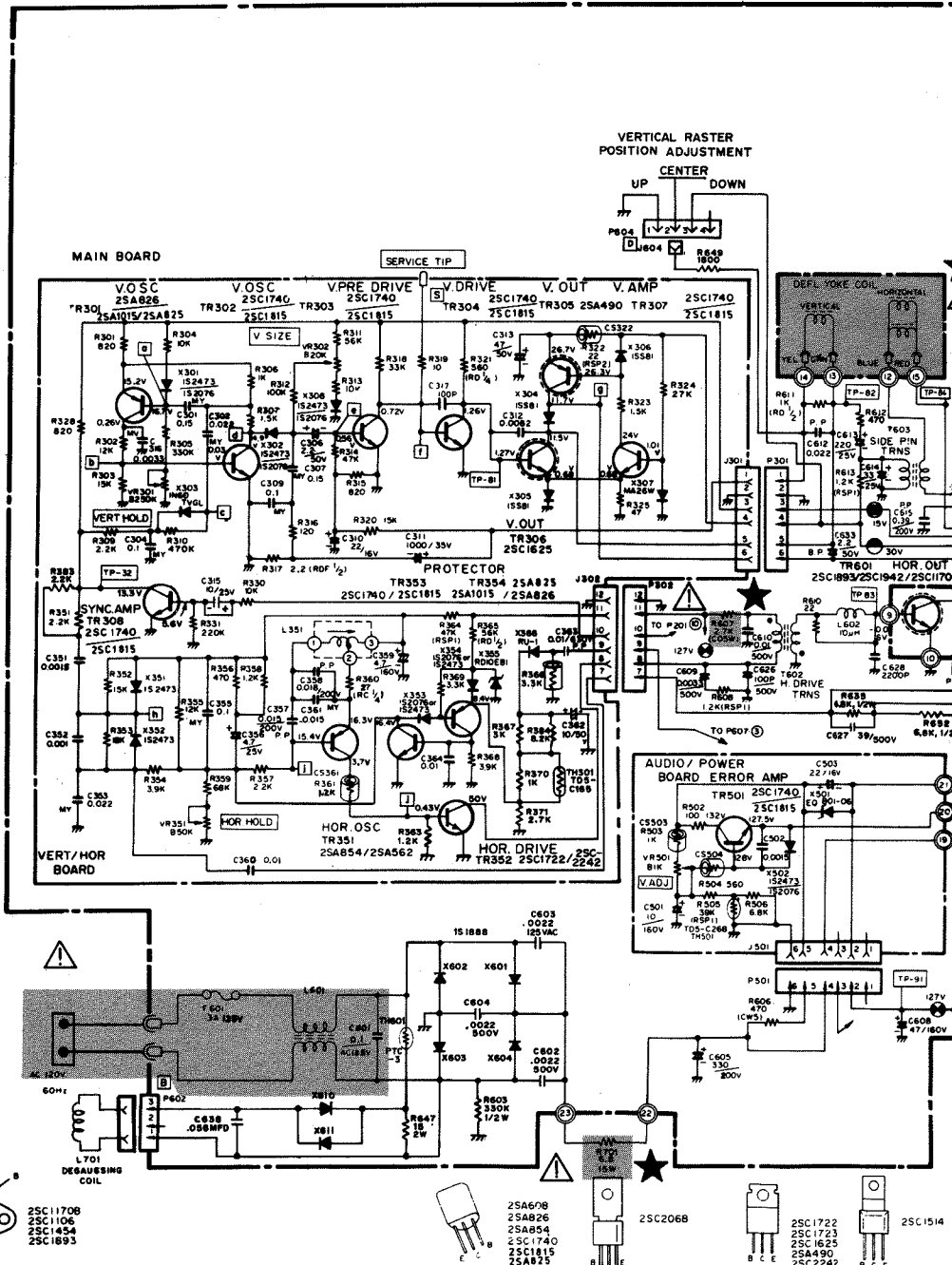
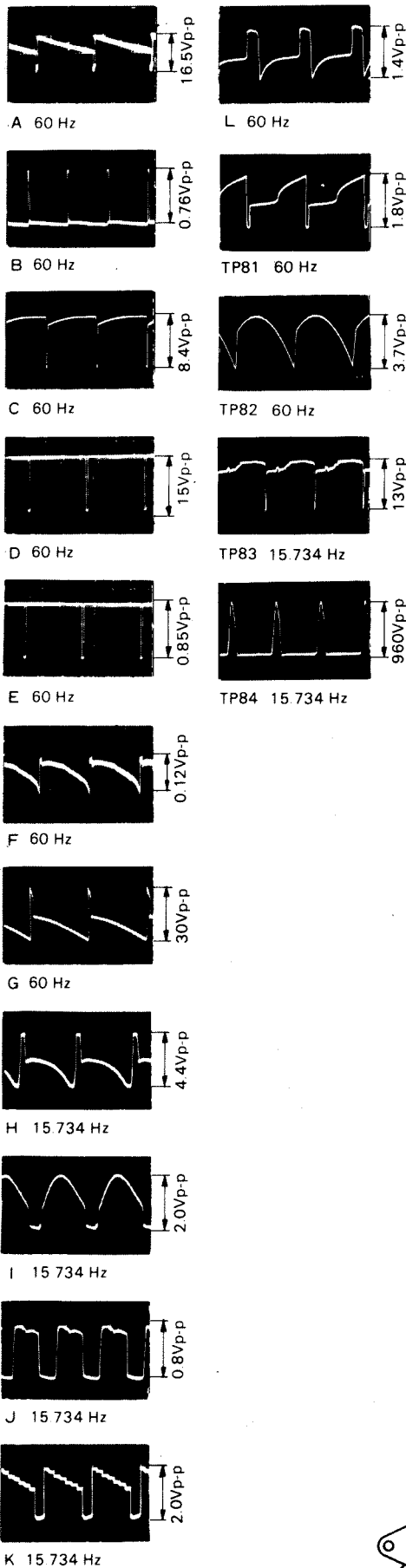
| Symbols | Line Voltage | Working Circuit                                  |
|---------|--------------|--------------------------------------------------|
|         | 15V          | Vert. — Drive stage<br>ABL — Bias<br>CRT Cut-Off |
|         | 30V          | Vert. Output<br>Side pin Trans. — Bias           |
|         | 127V         | Horiz. Osc.<br>Horiz. Drive<br>Horiz. Output     |
|         | 160V         | Video Output                                     |
|         | 890V         | Screen-Bias                                      |



### SERVICE TECHNICIAN WARNING

#### X-RAY RADIATION PRECAUTIONS

THIS PRODUCT CONTAINS CATHODE RAY TUBES (CRTs) WHICH PRODUCE X-RAY RADIATION. ELECTRICAL AND MECHANICAL SAFETY PRECAUTIONS ARE ESSENTIAL FOR X-RAY RADIATION PROTECTION. FOR REPLACEMENT PURPOSES, ONLY TYPE PARTS SHOWN IN THIS PARTS LIST.



# SCHEMATIC DIAGRAM

K4626, 19K4675, 19K4676

## CAUTION WARNING PRECAUTION:

CONTAINS CRITICAL  
MECHANICAL PARTS  
X-RAY RADIATION

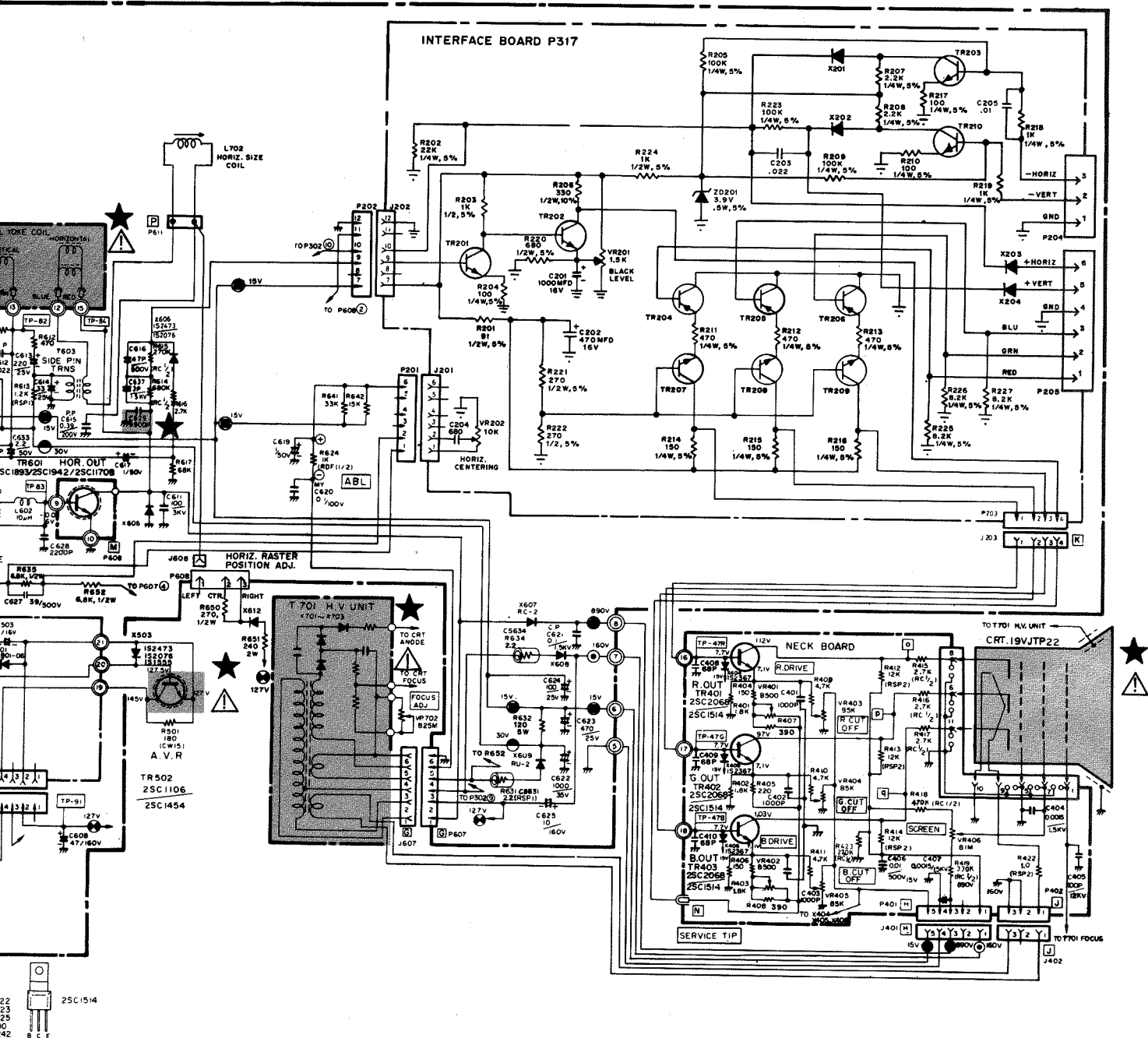
FOR PURPOSES, USE  
AS SHOWN IN THE

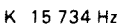
**CAUTION: FOR CONTINUED SAFETY,  
REPLACE SAFETY CRITICAL COM-  
PONENTS ONLY WITH MANUFAC-  
TURER'S RECOMMENDED PARTS.**  
**AVERTISSEMENT: POUR MAINTENIR  
LE DEGRE DE SECURITE DE L'APPAREIL  
NE REMPLACER LES COMPOSANTS  
DONT LE FONCTIONNEMENT EST  
CRITIQUE POUR LA SECURITE QUE PAR  
DES PIECES RECOMMANDEES PAR LE  
FABRICANT.**

## OSCILLOSCOPE WAVEFORM PATTERN

The waveforms shown are as observed on the wide band oscilloscope with the monitor turned to a reasonably strong signal and a normal picture. The voltages shown on each waveform are the approximate peak amplitudes. The frequency accompanying each waveform indicates the repetition rate of waveform not the sweep rate of the oscilloscope.

If the waveforms are observed on the oscilloscope with a poor high frequency response, the corner of the pulses will tend to be more rounded than those shown and the amplitude of any high frequency pulse will tend to be less.

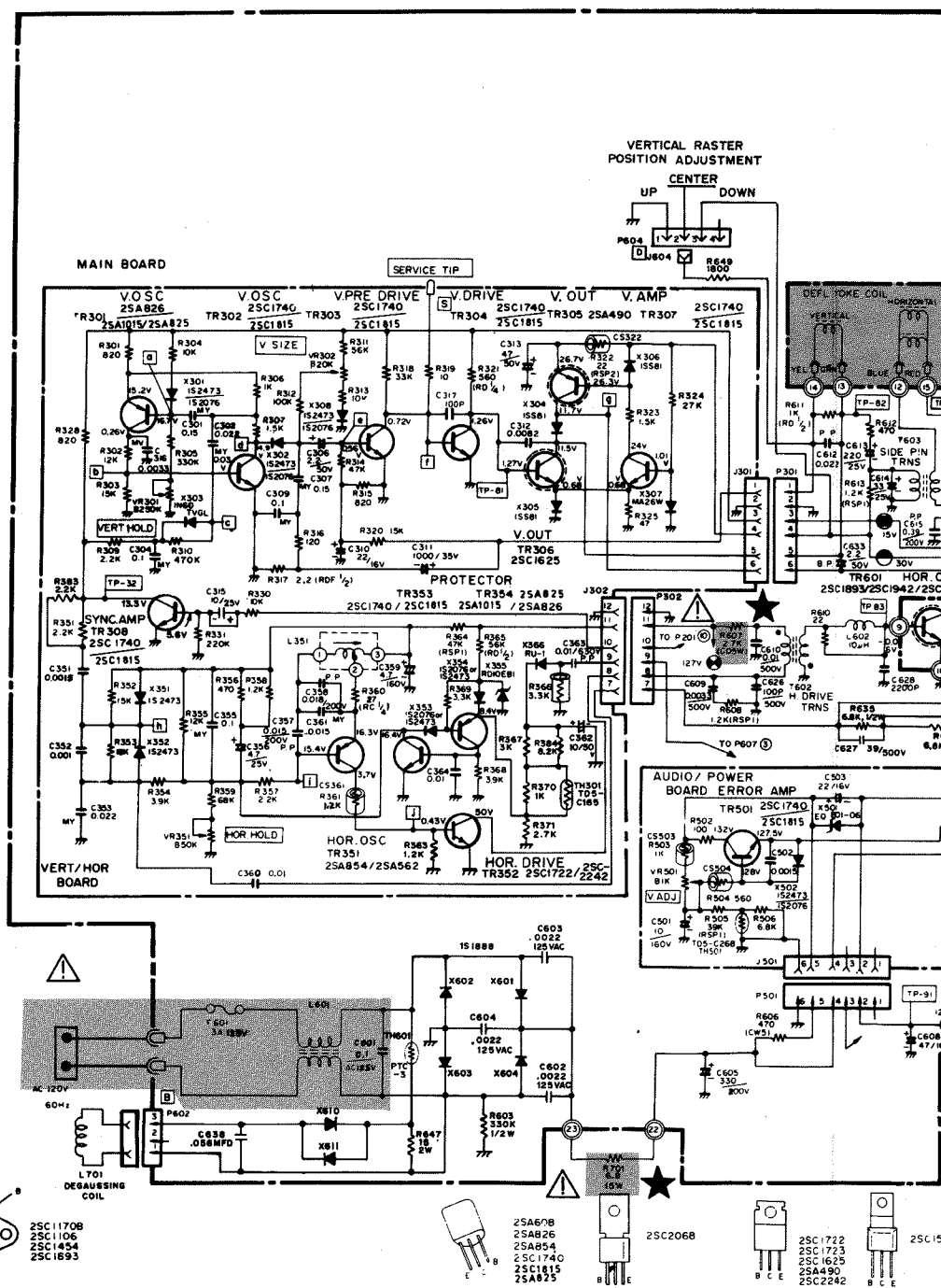




★

| Symbols                                                                           | Line Voltage | Working Circuit                                  |
|-----------------------------------------------------------------------------------|--------------|--------------------------------------------------|
|  | 15V          | Vert. — Drive stage<br>ABL — Bias<br>CRT Cut-Off |
|  | 30V          | Vert. Output<br>Side pin Trans. — Bias           |
|  | 127V         | Horiz. Osc.<br>Horiz. Drive<br>Horiz. Output     |
|  | 160V         | Video Output                                     |
|  | 890V         | Screen-Bias                                      |

THIS PRODUCT CONTAINS C  
ELECTRICAL AND MECHANICAL  
ESSENTIAL FOR X-RAY RAD  
PROTECTION.  
FOR REPLACEMENT PURPOSE  
ONLY TYPE PARTS SHOWN  
PARTS LIST.

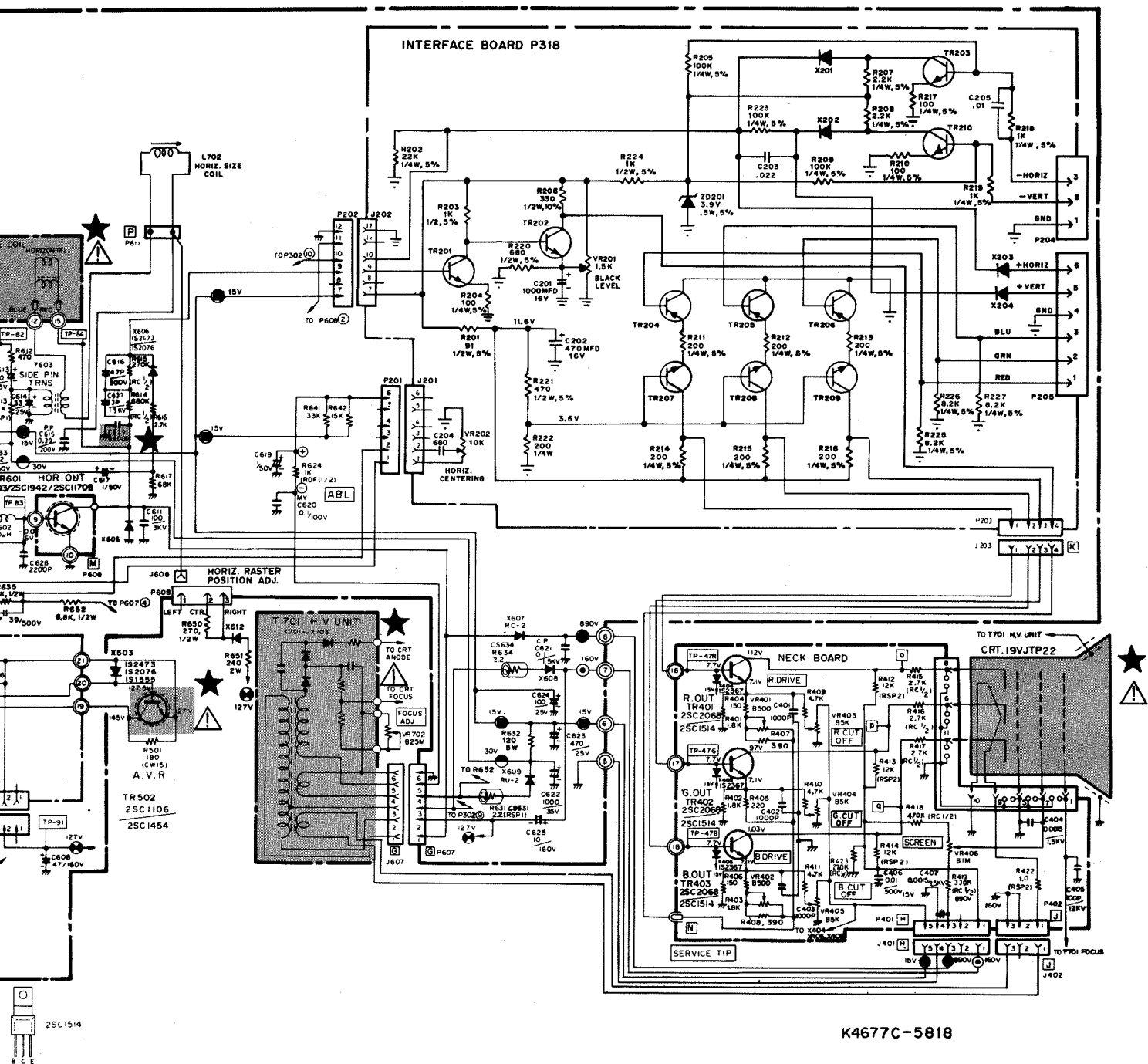


WARNING  
PRECAUTION:CONTAINS CRITICAL  
MECHANICAL PARTS  
MAY RADIATIONFOR PURPOSES, USE  
SHOWN IN THE**CAUTION:** FOR CONTINUED SAFETY,  
REPLACE SAFETY CRITICAL  
COMPONENTS ONLY WITH MANUFAC-  
TURER'S RECOMMENDED PARTS.**AVERTISSEMENT:** POUR MAINTENIR  
LE DEGRE DE SECURITE DE L'APPAREIL  
NE REMPLACER LES COMPOSANTS  
DONT LE FONCTIONNEMENT EST  
CRITIQUE POUR LA SECURITE QUE PAR  
DES PIECES RECOMMANDEES PAR LE  
FABRICANT.

## OSCILLOSCOPE WAVEFORM PATTERN

The waveforms shown are as observed on the wide band oscilloscope with the monitor turned to a reasonably strong signal and a normal picture. The voltages shown on each waveform are the approximate peak amplitudes. The frequency accompanying each waveform indicates the repetition rate of waveform not the sweep rate of the oscilloscope.

If the waveforms are observed on the oscilloscope with a poor high frequency response, the corner of the pulses will tend to be more rounded than those shown and the amplitude of any high frequency pulse will tend to be less.



## NECK BOARD (CONT.)

| Ref. No.                 | Part No.     | Description                       |
|--------------------------|--------------|-----------------------------------|
| <b>RESISTORS (CONT.)</b> |              |                                   |
| R419                     | 203X5602-185 | 330k Ohm $\pm 10\%$ 1/2W Comp.    |
| R422                     | 203X9105-117 | 1.0 Ohm $\pm 10\%$ 2W Metal Oxide |
| R423                     | 203X5102-155 | 270 Ohm $\pm 5\%$ 1/4W Carbon     |
| VR401                    | 204X2115-014 | 500 Ohm Varistor R Drive          |
| VR402                    | 204X2115-014 | 500 Ohm Varistor B Drive          |
| VR403                    | 204X2115-006 | 5k Ohm Varistor R Cutoff          |
| VR404                    | 204X2115-006 | 5k Ohm Varistor G Cutoff          |
| VR405                    | 204X2115-006 | 5k Ohm Varistor B Cutoff          |
| VR406                    | 204X2000-025 | 1M Ohm Varistor Screen            |

### CAPACITORS

|      |              |                                  |
|------|--------------|----------------------------------|
| C401 | 202X7000-247 | 1000 pF, 50V, 10% Ceramic        |
| C402 | 202X7000-247 | 1000 pF, 50V, 10% Ceramic        |
| C403 | 202X7000-247 | 1000 pF, 50V, 10% Ceramic        |
| C404 | 202X7100-019 | 1500 pF, 2kV $\pm 10\%$ Ceramic  |
| C405 | 202X7150-018 | 100 pF, 12kV, $\pm 10\%$ Ceramic |
| C406 | 202X7050-483 | .01 uF, 500V, $\pm 10\%$ Ceramic |
| C407 | 202X7110-019 | 1500 pF, 2kV, $\pm 10\%$ Ceramic |
| C408 | 202X8000-550 | 68 pF, 50V, $\pm 10\%$ Ceramic   |
| C409 | 202X8000-550 | 68 pF, 50V, $\pm 10\%$ Ceramic   |
| C410 | 202X8000-550 | 68 pF, 50V, $\pm 10\%$ Ceramic   |

| Ref. No.              | Part No.     | Description                             |
|-----------------------|--------------|-----------------------------------------|
| <b>SEMICONDUCTORS</b> |              |                                         |
| TR401                 | 200X3206-800 | Transistor, 2SC2068, 2SC1514 (R output) |
| TR402                 | 200X3206-800 | Transistor, 2SC2068, 2SC1514 (G output) |
| TR403                 | 200X3206-800 | Transistor, 2SC2068, 2SC1514 (B output) |
| X404                  | 201X2100-126 | Diode, IS2367 (protector)               |
| X405                  | 201X2100-126 | Diode, IS2367 (protector)               |
| X406                  | 201X2100-126 | Diode, IS2367 (protector)               |

### MISCELLANEOUS

|      |              |               |
|------|--------------|---------------|
| J401 | 206X5003-729 | Socket, 5 Pin |
| J402 | 206X5003-983 | Socket, 3 Pin |
| P401 | 204X9600-329 | Plug, 5 Pin   |
| P402 | 204X9600-254 | Plug, 3 Pin   |

### ★ 297X2000-072 HIGH VOLTAGE ASSEMBLY (T701)

|        |              |                                     |              |
|--------|--------------|-------------------------------------|--------------|
| ★ R701 | 204X1625-058 | 6.8 Ohm, $\pm 10\%$ 15W WW Resistor | Part of T701 |
| VR702  | 204X3901-125 | Focus Control                       |              |
| X701   |              | Diode (SI HV)                       |              |
| X702   |              | Diode (SI HV)                       |              |
| X703   |              | Diode (SI HV)                       |              |

### FINAL ASSEMBLY PARTS

|                |                                       |
|----------------|---------------------------------------|
| ★ 88X-0129-506 | 19VJTP22 Pix Tube                     |
| 38A5554-000    | Assy. Purity Shld/Degaussing          |
| 205X9800-256   | Lateral/Purity Assembly               |
| ★ 202X1110-810 | Yoke, Deflection                      |
| 208X2000-946   | CRT Socket                            |
| 297X2000-072   | HV Unit (T701)                        |
| 6A0396-001     | Plug, Line Cord (K4625, K4675, K4677) |
| 6A0402-001     | Plug, Line Cord (K4626, K4676)        |
| 9A2753-003     | Degaussing Coil (L701)                |

## INTERFACE FACE BOARD (P317)

### RESISTORS

|       |              |                                  |
|-------|--------------|----------------------------------|
| R201  | 340X3910-934 | 91 Ohm $\pm 5\%$ , 1/2W Carbon   |
| R202  | 340X2223-934 | 22k Ohm $\pm 10\%$ , 1/4W Carbon |
| R203  | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R204  | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R205  | 340X2104-934 | 100k Ohm $\pm 5\%$ , 1/4W Carbon |
| R206  | 340X3331-944 | 330 Ohm $\pm 10\%$ , 1/2W Carbon |
| R207  | 340X2222-934 | 2.2k Ohm $\pm 5\%$ , 1/4W Carbon |
| R208  | 340X2222-934 | 2.2k Ohm $\pm 5\%$ , 1/4W Carbon |
| R209  | 340X2104-934 | 100k Ohm $\pm 5\%$ , 1/4W Carbon |
| R210  | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R211  | 340X2471-934 | 470 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R212  | 340X2471-934 | 470 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R213  | 340X2471-934 | 470 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R214  | 340X2151-934 | 150 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R215  | 340X2151-934 | 150 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R216  | 340X2151-934 | 150 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R217  | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R218  | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R219  | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R220  | 340X3681-934 | 680 Ohm, 5%, 1/2W Carbon         |
| R221  | 340X3271-934 | 270 Ohm, 5%, 1/2W Carbon         |
| R222  | 340X3271-934 | 270 Ohm, 5%, 1/2W Carbon         |
| R223  | 340X2104-934 | 100k Ohm, 5%, 1/4W Carbon        |
| R224  | 340X3102-934 | 1k Ohm, 5%, 1/2W Carbon          |
| R225  | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R226  | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R227  | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R228  | 340X3391-934 | 390 Ohm, 5%, 1/2 W Carbon        |
| VR201 | 40X0641-005  | 1.5k Ohm Black Level Control     |
| VR202 | 40X0641-006  | 10k Ohm Horizontal Centering     |

### CAPACITORS

|      |              |                           |
|------|--------------|---------------------------|
| C201 | 45X0524-038  | 1000 uF, 16V Electrolytic |
| C202 | 45X0524-053  | 470 uF, 16V Lytic         |
| C203 | 349X2232-109 | .022 uF, 10%, 100V        |
| C204 | 80X0099-020  | 680 pF, 10%, Z5F          |
| C205 | 349X1032-109 | .01 uF, 10%, 100V         |

### SEMICONDUCTORS

|       |             |                                     |
|-------|-------------|-------------------------------------|
| TR201 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR202 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR203 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR204 | 86X0066-001 | Transistor (PNP) MPS-A70            |
| TR205 | 86X0066-001 | Transistor (PNP) MPS-A70            |
| TR206 | 86X0066-001 | Transistor (PNP) MPS-A70            |
| TR207 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR208 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR209 | 86X0113-001 | Transistor (NPN) 2N3904             |
| TR210 | 86X0113-001 | Transistor (NPN) 2N3904             |
| X201  | 66X0046-001 | Diode Silicon FDH-444               |
| X202  | 66X0046-001 | Diode Silicon FDH-444               |
| X203  | 66X0046-001 | Diode Silicon FDH-444               |
| X204  | 66X0046-001 | Diode Silicon FDH-444               |
| ZD201 | 66X0040-019 | Diode, Zener 3.9V, 5%, 0.5W IN5228B |

### MISCELLANEOUS

|      |              |               |
|------|--------------|---------------|
| J201 | 204X9300-958 | Socket, 6 Pin |
| J202 | 204X9300-958 | Socket, 6 Pin |
| P203 | 204X9600-845 | Plug, 4 Pin   |
| P204 | 6A393-003    | Plug, 3 Pin   |
| P205 | 6A0393-006   | Plug, 6 Pin   |

# INTERFACE BOARD (P318)

| Ref. No.         | Part No.     | Description                      |
|------------------|--------------|----------------------------------|
| <b>RESISTORS</b> |              |                                  |
| R201             | 340X3910-934 | 91 Ohm $\pm 5\%$ , 1/2W Carbon   |
| R202             | 340X2223-934 | 22k Ohm $\pm 10\%$ , 1/4W Carbon |
| R203             | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R204             | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R205             | 340X2104-934 | 100k Ohm $\pm 5\%$ , 1/4W Carbon |
| R206             | 340X3331-944 | 330 Ohm $\pm 10\%$ , 1/2W Carbon |
| R207             | 340X2222-934 | 2.2k Ohm $\pm 5\%$ , 1/4W Carbon |
| R208             | 340X2222-934 | 2.2k Ohm $\pm 5\%$ , 1/4W Carbon |
| R209             | 340X2104-934 | 100k Ohm $\pm 5\%$ , 1/4W Carbon |
| R210             | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R211             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R212             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R213             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R214             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R215             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R216             | 340X2201-934 | 200 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R217             | 340X2101-934 | 100 Ohm $\pm 5\%$ , 1/4W Carbon  |
| R218             | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R219             | 340X3102-934 | 1k Ohm $\pm 5\%$ , 1/2W Carbon   |
| R220             | 340X3102-934 | 1k Ohm, 5%, 1/2W Carbon          |
| R221             | 340X3471-934 | 200 Ohm, 5%, 1/2W Carbon         |
| R222             | 340X2201-934 | 200 Ohm, 5%, 1/2W Carbon         |
| R223             | 340X2104-934 | 100k Ohm, 5%, 1/4W Carbon        |
| R224             | 340X3681-934 | 680k Ohm, 5%, 1/2W Carbon        |
| R225             | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R226             | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R227             | 340X2822-934 | 8.2k Ohm, 5%, 1/4W Carbon        |
| R228             | 340X3391-934 | 390 Ohm, 5%, 1/2W Carbon         |
| VR201            | 40X0641-005  | 1.5k Ohm Black Level Control     |
| VR202            | 40X0641-006  | 10k Ohm Horizontal Centering     |

| Ref. No.              | Part No.     | Description                            |
|-----------------------|--------------|----------------------------------------|
| <b>CAPACITORS</b>     |              |                                        |
| C201                  | 45X0524-038  | 1000 uF, 16V Electrolytic              |
| C202                  | 45X0524-053  | 470 uF, 16V Lytic                      |
| C203                  | 349X2232-109 | .022 uF, 10%, 100V                     |
| C204                  | 80X0099-020  | 680 pF, 10%, Z5F                       |
| C205                  | 349X1032-109 | .01 uF, 10%, 100V                      |
| <b>SEMICONDUCTORS</b> |              |                                        |
| TR201                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR202                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR203                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR204                 | 86X0066-001  | Transistor (PNP) MPS-A70               |
| TR205                 | 86X0066-001  | Transistor (PNP) MPS-A70               |
| TR206                 | 86X0066-001  | Transistor (PNP) MPS-A70               |
| TR207                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR208                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR209                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| TR210                 | 86X0113-001  | Transistor (NPN) 2N3904                |
| X201                  | 66X0046-001  | Diode Silicon FDH-444                  |
| X202                  | 66X0046-001  | Diode Silicon FDH-444                  |
| X203                  | 66X0046-001  | Diode Silicon FDH-444                  |
| X204                  | 66X0046-001  | Diode Silicon FDH-444                  |
| ZD201                 | 66X0040-019  | Diode, Zener 3.9V, 5%, 0.5W<br>IN5228B |
| <b>MISCELLANEOUS</b>  |              |                                        |
| J201                  | 204X9300-958 | Socket, 6 Pin                          |
| J202                  | 204X9300-958 | Socket, 6 Pin                          |
| P203                  | 204X9600-845 | Plug, 4 Pin                            |
| P204                  | 6A393-003    | Plug, 3 Pin                            |
| P205                  | 6A0393-006   | Plug, 6 Pin                            |

## REAR CHASSIS CONTROLS

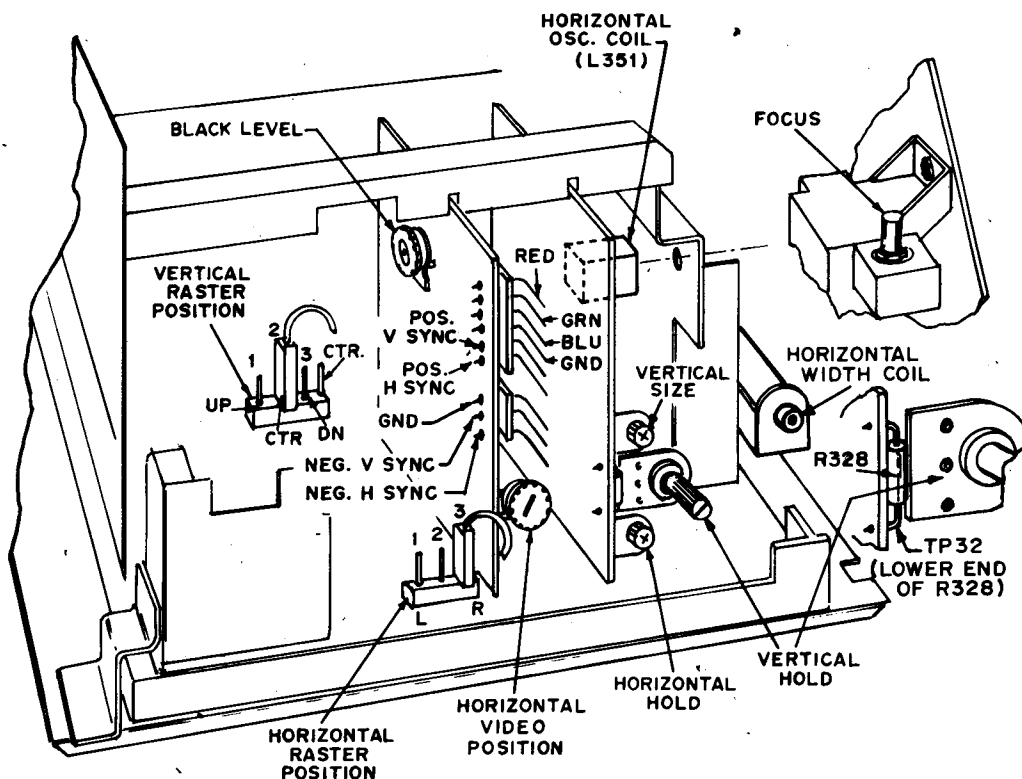


FIGURE 17