

ISLETA 7/14  
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# **SERVICE AND OPERATION MANUAL**

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## **SE - M23V XX SERIES, 14 AND 20 INCH OPEN FRAME VGA COLOR MONITORS**

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**segai**®  
**VIDEO DISPLAY SYSTEMS**

This monitor has been designed and manufactured to deliver high performance video. For continued peak performance use and safe operation, only high quality Segai replacement parts or their exact specified equivalent when servicing.

## **SAFETY PRECAUTIONS AND WARNINGS**

### **Power-up Warning**

CAUTION: Prior to initial power-up, ensure jumper cable, P503, is connected to the appropriate jumper pin (refer to Operating Instructions) to correspond with the line voltage in your locality. Serious damage to display circuitry may result if line voltage is applied and jumper cable P503 is not on the correct jumper pin. The power supply of this display provides isolation so a separate isolation transformer is not required for normal operation.

### **Service Warning**

This display contains HIGH VOLTAGE capable of delivering LETHAL quantities of energy. Service should only be attempted by trained personnel familiar with the potential dangers inherent with voltage equipment.

### **Safety Related Component Warning**

Certain components used in Segai color monitors are critical for safe operation of the display. These parts numbers are marked by (  ) in the parts list and on the schematic diagram. It is essential that these safety critical components be replaced only with exact manufacturer specified components to prevent the possibility of excessive X-radiation emission, electrical shock, fire, or premature component failure. Modifying the original design without written approval from Segai is expressly forbidden, will void the original parts and labor warranty, and may result in creating a hazardous situation.

### **X-RADIATION WARNING**

COMPONENTS WHICH MAY AFFECT POTENTIAL EXCESS EMISSION OF X-RADIATION IN THE HORIZONTAL DEFLECTION AND HIGH VOLTAGE CIRCUITS (INCLUDING THE PICTURE TUBE) ARE INDICATED IN THE PARTS LIST BY A (  ). USE ONLY TYPE AND RATING OF REPLACEMENT COMPONENT AS SHOWN IN THE PARTS LIST.

1. The only potential source of X-radiation emission is the picture tube. When the high voltage and horizontal deflection circuits are operating correctly there is no possibility of excess X-radiation emission. NEVER attempt to modify these circuits.

2. Periodically check the high voltage with a reliably calibrated meter for values not in excess of manufactures recommendations. See High Voltage Shut-down Circuit, page 4, for further details.

### **CRT Warning**

All picture tubes used in Segai monitors are equipped with an integral implosion protection system. The picture tube is, however, a highly evacuated component whose outside surfaces are subject to strong external forces. Care must be exercised so as not to bump or scratch the tube during installation or servicing as this may cause the tube to implode, resulting in possible personal injury and property damage. Shatter-proof goggles must be worn by individuals while handling the CRT or installing the display in the cabinet. Do not handle the CRT by the neck.

1. Always ensure the high voltage at the anode cap is fully discharged prior to handling or service.
2. Replace picture tube only with same type and number.

### **Product Safety and Service Guidelines**

1. Service should be performed only after reading all of the warnings and precautions in this manual and as labeled on the CRT and chassis.
2. Where a short circuit has occurred, replace all components that indicate evidence of overheating. Also check for evidence of overheating or poor connection on all plastic connectors.
3. Inspect wiring for frayed leads and damaged insulation. When service is required, observe original lead dress assume lead dress is followed as from the factory, especially in the high voltage circuitry area.
4. Do not expose this display to rain or place in areas where the potential for exposure to moisture is high. Additionally, do not mount the remote VR PWB if so equipped outside the cabinet or in areas where there is a possibility of exposure to moisture.
5. All protective devices must be reinstalled per original design.

## PERFORMANCE AND OPERATING DATA

### 1. Power Supply

PWM type self-oscillating switch mode power supply, dual AC input range, jumper selectable.

### Vertical Scan

Frequency- 60/70Hz  
Capture Range- 47 ~ 85Hz  
Linearity-  $\pm 5\%$

### 2. Input Signal

Video-R G B analog, positive, 0.7 Vp-p.  
Impedance- 75 ohms, terminated.  
Rise Time- less than 25 nanoseconds.  
Bandwidth- DC to 25 MHz(at-3dB)  
typical, VGA Mode 3.

Resolution- Mode 1. 640 X 350 (70Hz refresh)  
2. 640 X 400 (70Hz refresh)  
3. 640 X 480 (60Hz refresh)

Sync- TTL, positive or negative. Monitor circuitry will automatically determine and adjust for three mode VGA operation.

### Horizontal Scan

Frequency- 31.5KHz nominal.  
Capture Range- 30.5~32.5KHz.  
Active video- full width display of video signals with active video from 25 to 28 $\mu$ sec.

Linearity -  $\pm 5\%$

### 3. Picture Size Regulation

2%

### 4. Geometric Distortion

$\pm 1.5\%$ (max)

### 5. Environmental Conditions

Temperature- 10°~55°C  
Humidity- 10 ~ 90%,no condensation

### 6. High Voltage

14"= 23KV, 20" = 25KV,with integral X-radiation shut- down protection.

### 7. Degaussing

Automatic, operating at beginning of each power-up cycle, provided the monitor has been turned off for at least 20 minutes.

## OPERATING INSTRUCTIONS

1. Connect jumper cable, P503, to jumper pin corresponding to the line voltage in your locality - 120V, 98 ~132 VAC - VJ1  
230V, 196 ~ 264 VAC - VJ2

2. Apply line AC to the monitor via P501.

3. Apply signal source to the monitor via P201.

4. Set up user adjustable controls.

All controls are preset at the factory for optimum performance. If adjustment is necessary to suit program material, most adjustments can be made using only the controls on the remote VR PWB. Other controls in the monitor should be adjusted only if those controls have been tampered with or if major repairs were necessary on the monitor.

## USER ADJUSTABLE CONTROLS

### 1. Main PWB

Horizontal-Hold, VR301  
Vertical-Hold, VR201

### 2. Remote VR PWB

Bright, VR303  
Contrast, VR304  
Horizontal-Center, VR306  
Vertical-Center, VR 209  
Vertical-Size, VR208  
Horizontal-Size, VR305

### 3. Flyback Transformer

Focus

## ADDITIONAL CONTROLS

### 1. Main PWB

Video Gain Controls<sup>1</sup>  
Red, VR101  
Green, VR102  
Blue, VR103  
Vertical Balance<sup>2</sup> VR207  
Side Pincushion<sup>2</sup> VR206  
Vertical Linearity, VR205  
Screen, FBT<sup>1</sup>

Vertical-Size 1, VR202  
Vertical-Size 2, VR203  
Vertical-Size 3, VR204

### 2. Neck PWB

Cut off Controls<sup>1</sup>  
Red, VR106  
Green, VR105  
Blue, VR104

### 3. Power PWB

B<sup>+</sup> Adjust, VR501<sup>3</sup>  
OVP Adjust, VR502<sup>3</sup>

These controls have been preset at the factory and should not require further attention.  
<sup>1</sup>If adjustment of these controls becomes necessary, refer to White Balance procedure, page 12.

<sup>2</sup>Not on some Models.

<sup>3</sup>These controls are factory sealed.

## USER ADJUSTMENT PROCEDURE

The user adjustable controls, as shown below, may require adjustment, depending upon signal source, for proper horizontal or vertical position or picture intensity.

### 1. Horizontal-Hold Control

This monitor will lock onto signals with horizontal scan rates from 31.0 to 32.0KHz with no adjustment of horizontal hold control. Horizontal capture range can be increased to between 30.5 and 32.5KHz through adjustment of the Horizontal Hold Control. This should be necessary only in the case of very unique signal sources.

### 2. Brightness Control

Adjust this control such that illuminated objects are just extinguished from objects or areas on the screen which should be black.

### 3. Contrast Control

After proper adjustment of the Bright Control, adjust the Contrast control for desired picture intensity.

### 4. Focus Control

Adjust Focus for uniform screen sharpness and overall fine picture detail.

### 5. Horizontal-Size Control

This monitor utilizes unique circuitry such that the horizontal width of the display is regulated by volume control as opposed to variable inductance coils. Adjust the Horizontal-Size Control until the image attains the correct horizontal proportions (long dimension of the picture tube).

### 6. Vertical-Size Control

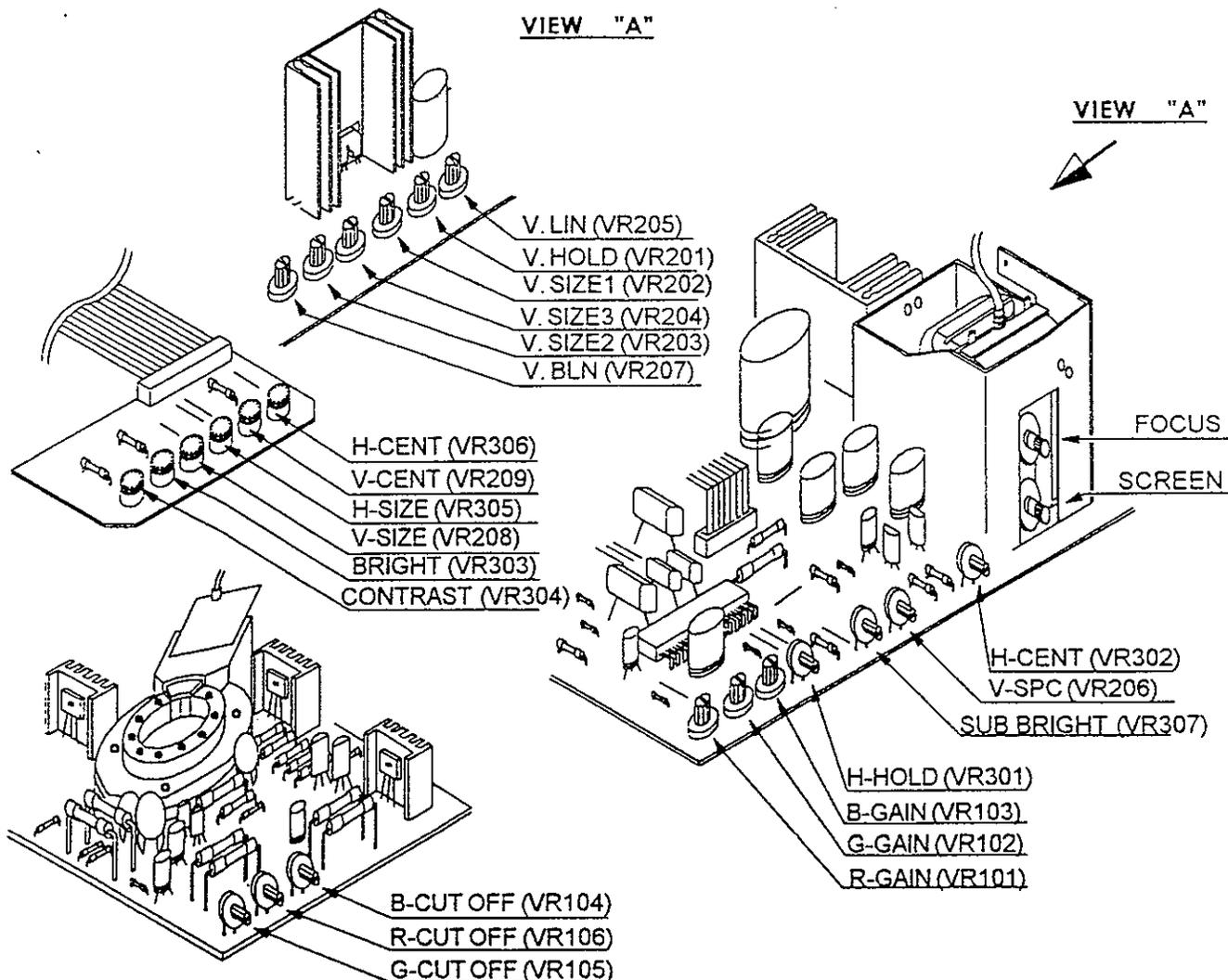
Adjust the Vertical-Size Control until the image attains the correct vertical proportions.

### 7. Horizontal-Center Control

Adjust the Horizontal-Center Control such that the image is centered horizontally.

### 8. Vertical-Center Control

Adjust the Vertical-Center Control such that the image is centered vertically.



## HIGH VOLTAGE SHUT-DOWN CIRCUIT

The chassis of this monitor has been designed to emit a minimum of soft X-radiation, in accordance with US DHHS rules 21 CFR, subchapter J, applicable at date of manufacture. A high voltage shut-down circuit, as shown below, guarantees horizontal oscillation shut-down should the high voltage exceed designed picture tube maximums. DO NOT ATTEMPT TO MODIFY THIS CIRCUIT.

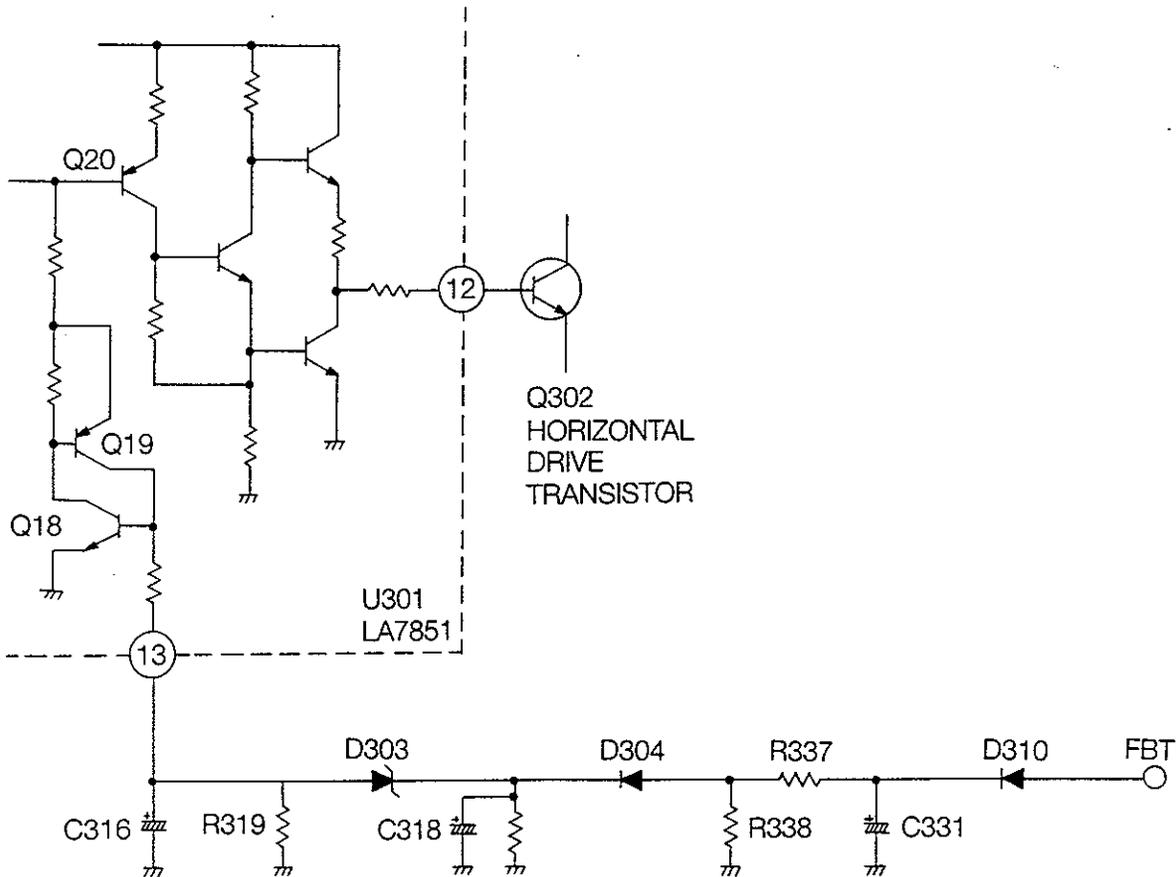
### Circuit Description

A flyback pulse is generated at pin 8 of the flyback transformer. This pulse is fed via resistive divider network to pin 13, IC U301. The resistive divider is

such that the value of resistors R337 and R338 is set so that zener diode D303 will conduct when the flyback pulse becomes abnormally high.

A reference voltage is maintained by IC U301 internal circuitry. When D303 is conducting and flyback pulse becomes equal to or greater than the reference voltage within IC U301, internal IC circuitry will act to shut off drive transistor Q302. Thus horizontal oscillation, and therefore high voltage, will be effectively shut down.

The protective circuit is released by turning off the monitor and reapplying power. If this circuit is working to shut down the monitor, then immediate service is required.



## HIGH VOLTAGE CIRCUIT CHECK

Periodically check the high voltage with a reliably calibrated meter for values not in excess of manufactures recommendations-14"=23KV/20"=25KV. High voltage must not exceed 30KV at zero beam current at rated voltage.

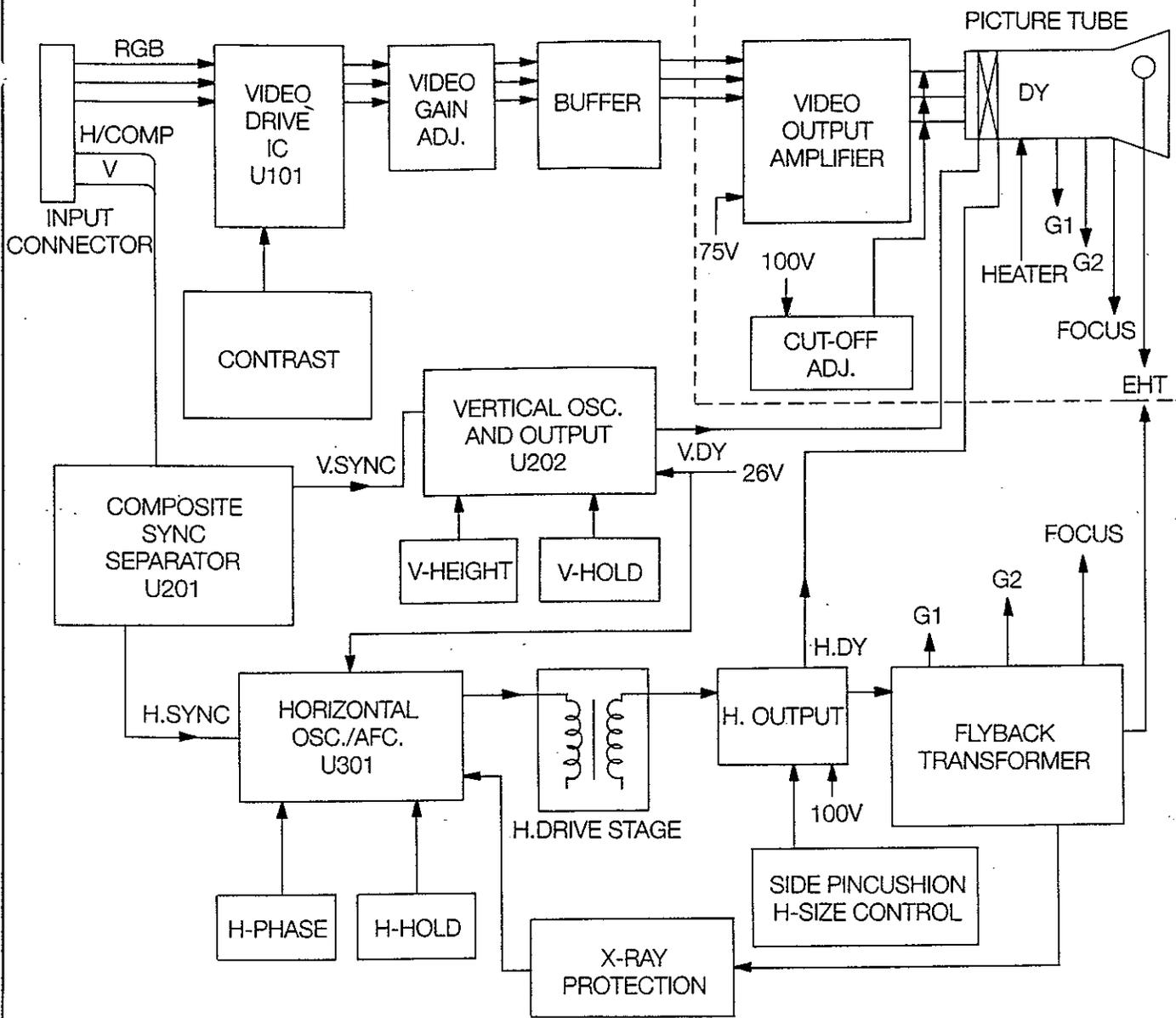
The following steps describe how to measure the high voltage using a high impedance high voltage meter.

1. Connect meter lead (-) to chassis.

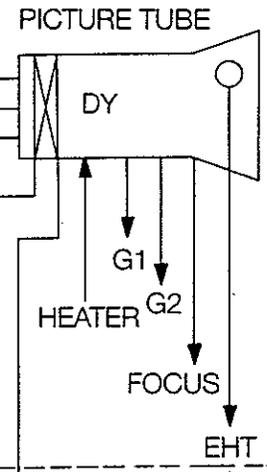
2. Connect meter lead (+) to the CRT anode button.
3. Turn the Bright Control, VR303, to maximum clockwise.
4. Measure the high voltage. The meter should indicate factory recommended values.
5. If the meter indication exceeds the maximum value, 30KV, immediate service is required to prevent the possibility of excess X-radiation emission.

# BLOCK DIAGRAM

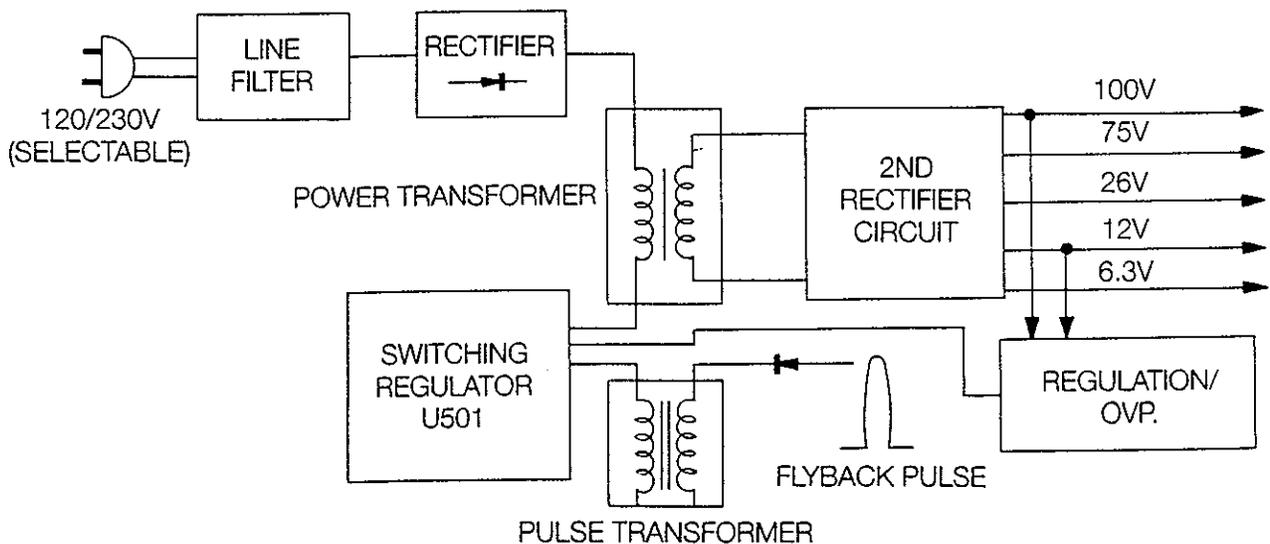
## MAIN BOARD



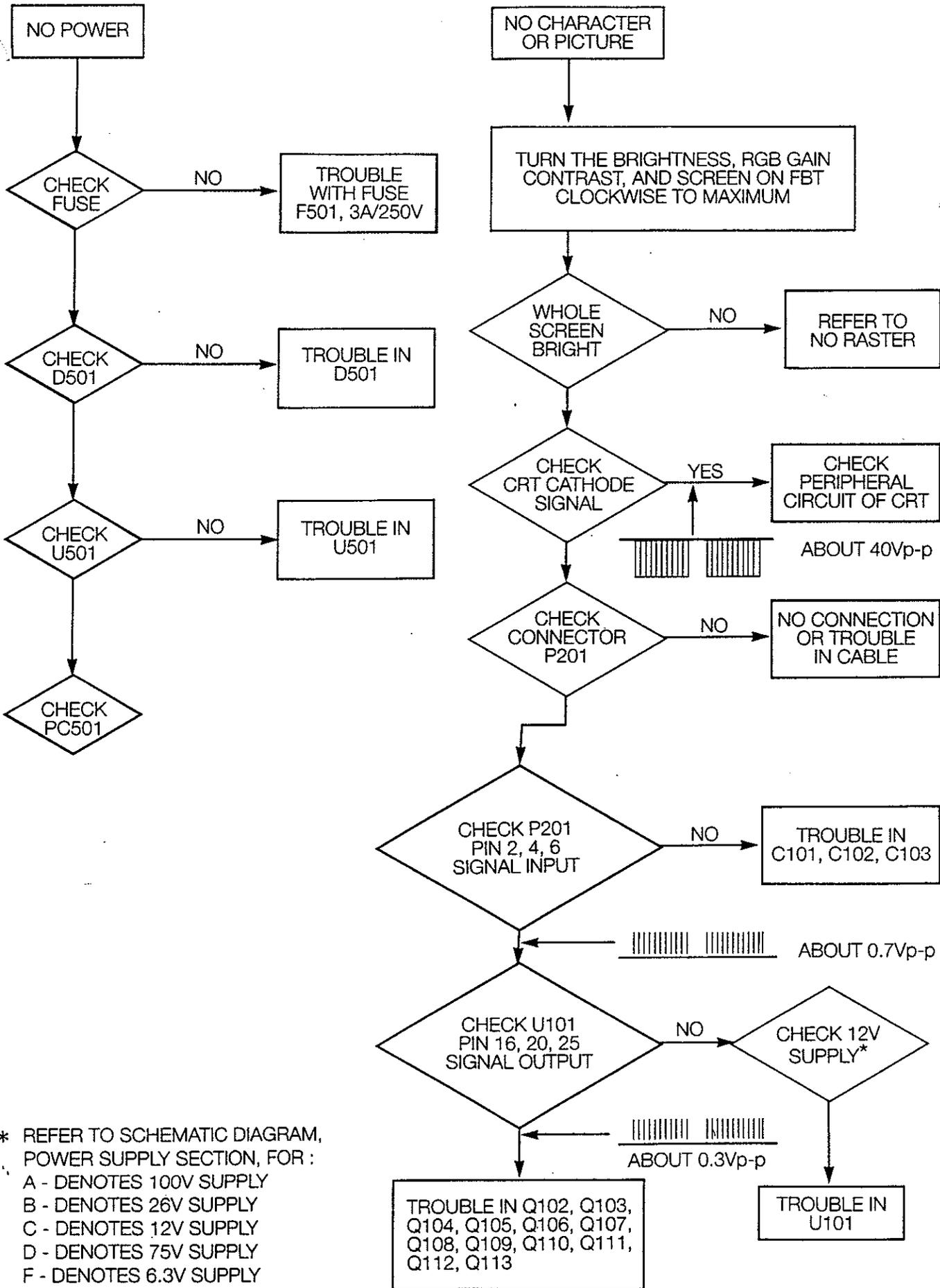
## SOCKET BOARD



## POWER BOARD



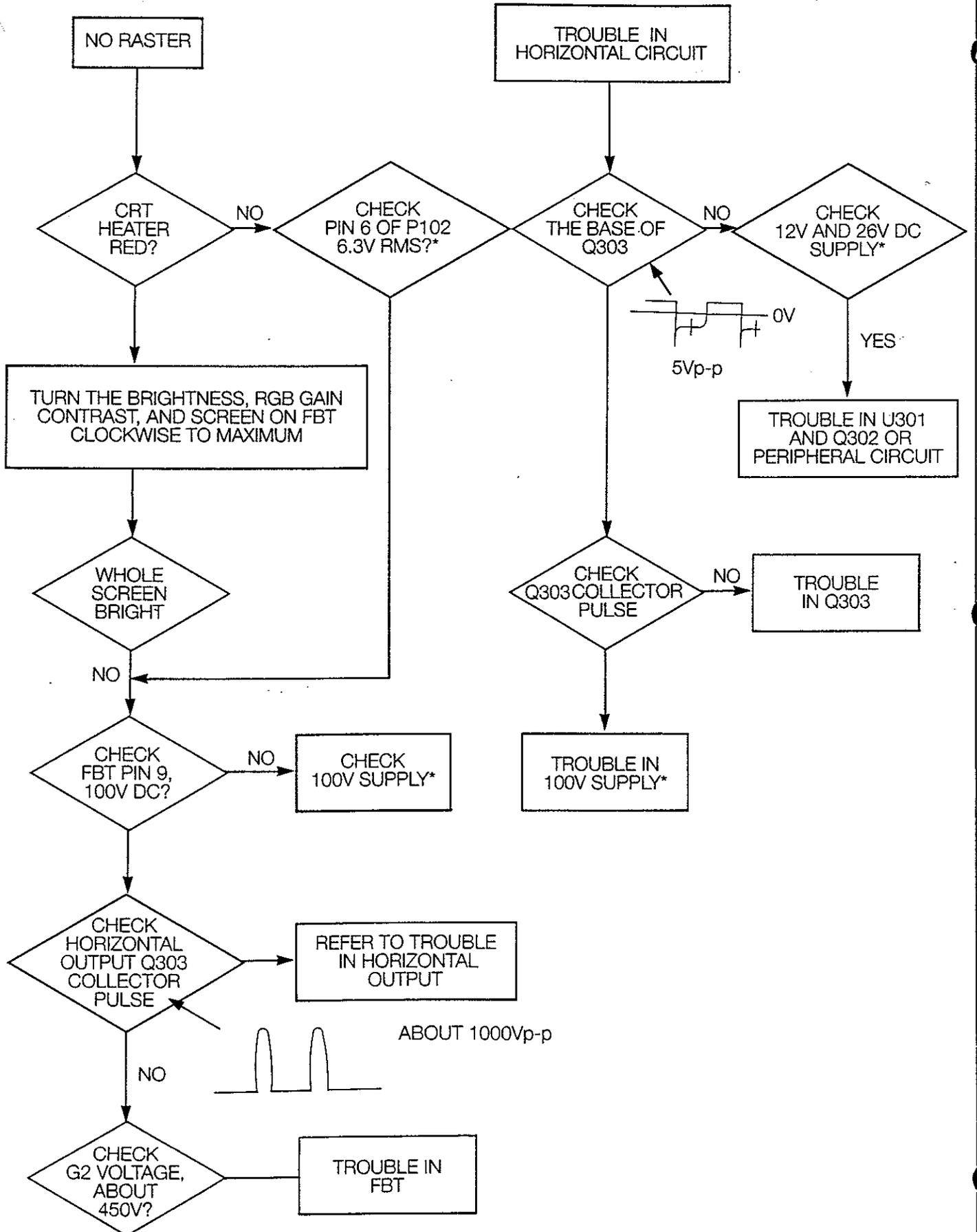
# TROUBLE SHOOTING CHART



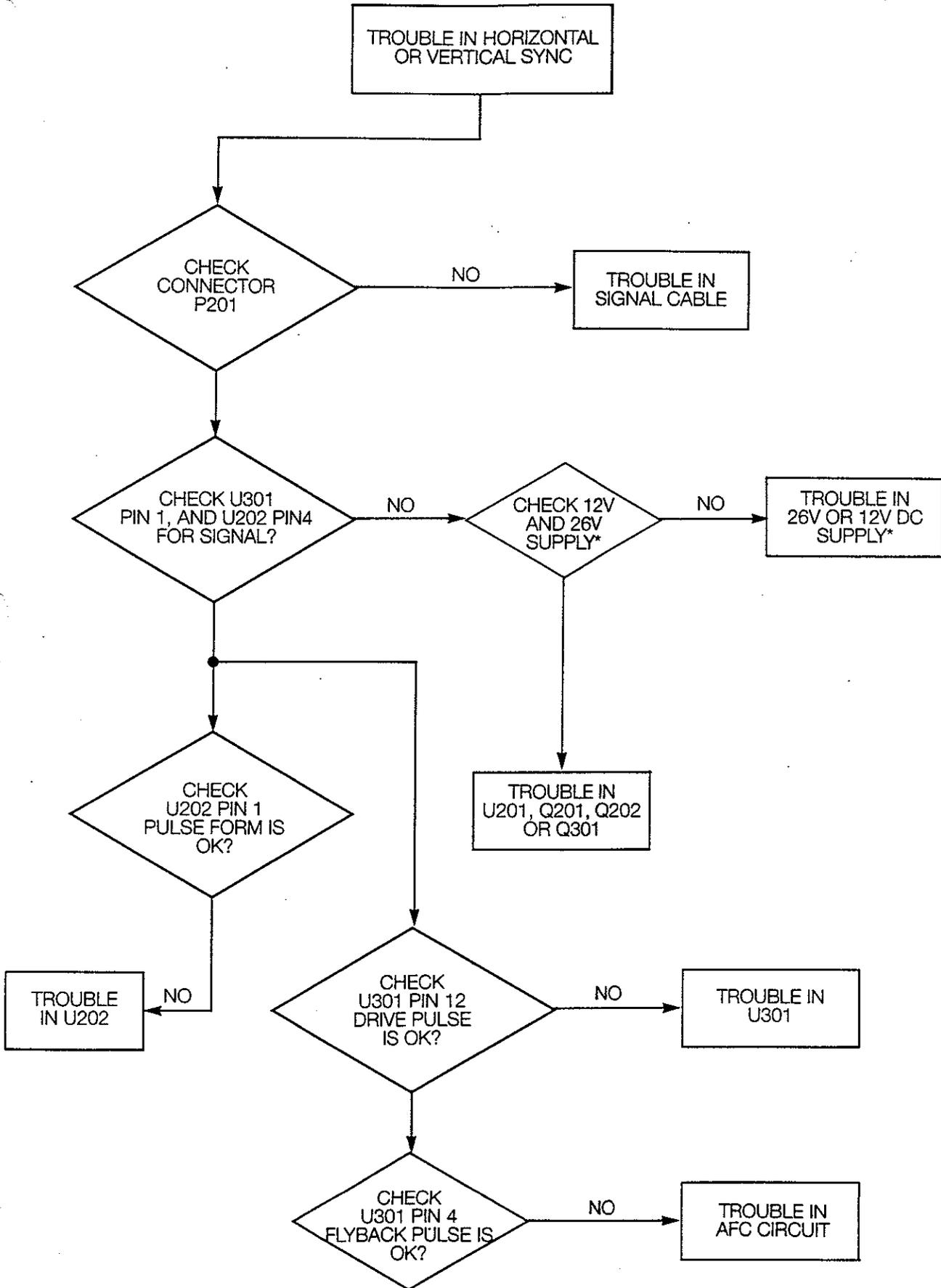
\* REFER TO SCHEMATIC DIAGRAM, POWER SUPPLY SECTION, FOR :

- A - DENOTES 100V SUPPLY
- B - DENOTES 26V SUPPLY
- C - DENOTES 12V SUPPLY
- D - DENOTES 75V SUPPLY
- F - DENOTES 6.3V SUPPLY

# TROUBLE SHOOTING CHART

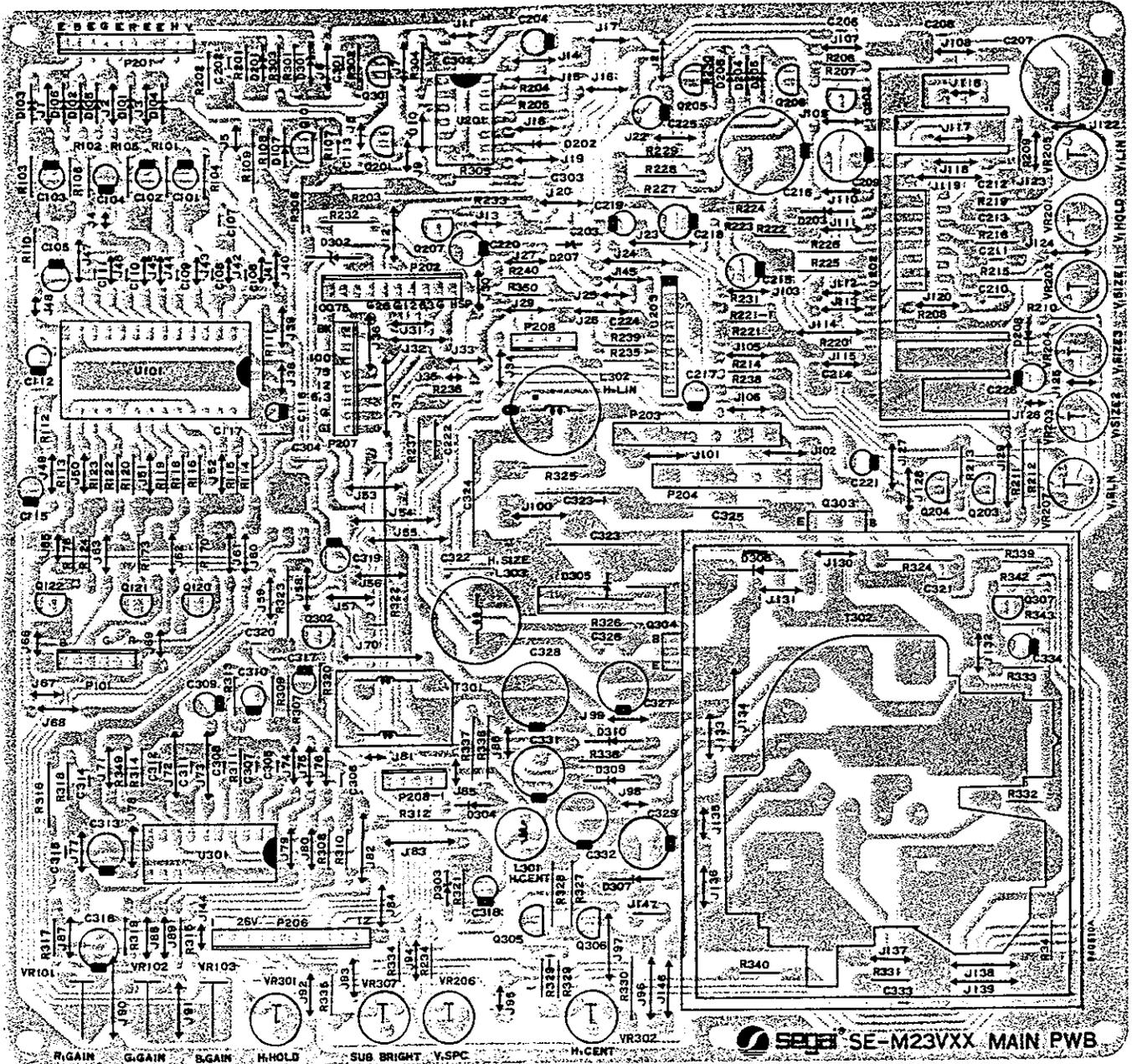


# TROUBLE SHOOTING CHART



# COMPONENT LAYOUT MAIN PWB AND VR PWB

## MAIN PWB



## VR PWB

