

**SERVICE MANUAL**  
**MODEL 1701/1 702 MONITOR**

# ADJUSTMENTS – PURITY, CONVERGENCE AND WHITE BALANCE

## PICTURE TUBE

The picture tube is a precision in-line gun type. For this picture tube, dynamic convergence is carried out by a precision deflection yoke which eliminates the use of a convergence yoke and a convergence circuit. The adjustment of the picture tube is therefore made easier as only the adjustment of static convergence by using a magnet is enough. The deflection yoke and purity/convergence magnets assembly has been set at the factory and requires no field adjustments.

However, should the assembly be accidentally jarred or tampered with, some or all adjustment may be necessary.

## COLOR PURITY & VERTICAL CENTER

Loosen yoke retaining clamp (Fig. 2-1). With a sharp knife, cut between the picture tube and the wedge. Remove wedges completely and clean off dried adhesive from the picture tube. PAINT is used to lock the tabs of the purity/convergence magnet assembly in place (Fig. 2-1). The paint must be removed with the end of a screwdriver before any adjustments are attempted.

1. Inject a Video Signal (RASTER) to the Video input terminal.
  2. Let the purity tabs come in line horizontally as is shown in Fig. 2-3. A long tab should be in the same direction as the other short tab.
  3. Move the yoke slowly backward.
  4. Turn the green cut-off control to maximum and the red and blue cut-off controls to minimum. Then adjust the screen control so that the green band can be seen best. (Fig. 2-4)
  5. Rotate the two tabs in the opposite direction with them kept at an angle. Move them in either direction so that the green band is centered on the picture tube.
  6. Check the vertical center position by displaying a horizontal line. If incorrect, bring it to the center by rotating the two tabs, kept at an angle, together in either direction. (Fig. 2-5, 2-6)
  7. Repeat steps 5 and 6 alternately until the green band and the vertical centre are in line.
  8. Move the yoke slowly towards the bell of the tube so that the whole surface of the picture tube is filled with a pure green raster.
  9. Turning the red cut-off control to maximum and the green cut-off control to minimum, check for pure red raster.
  10. Turning the blue cut-off control to maximum and the green cut-off control to minimum, check for pure blue raster.
1. Secure yoke retaining clamp (do not install wedges at this time).

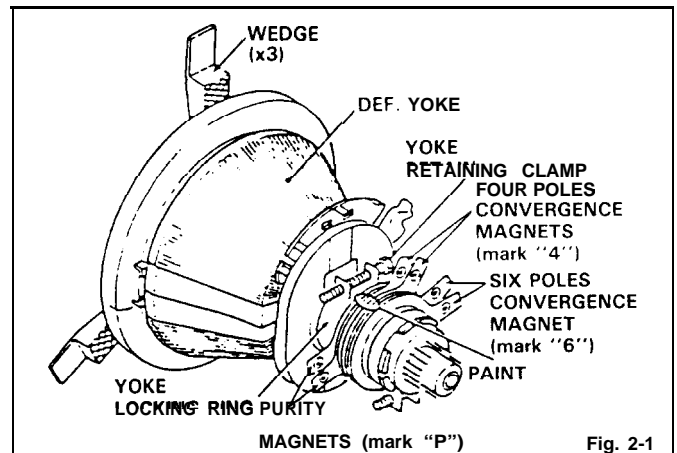
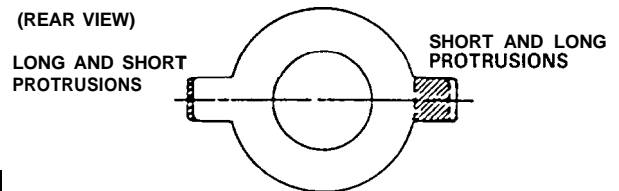
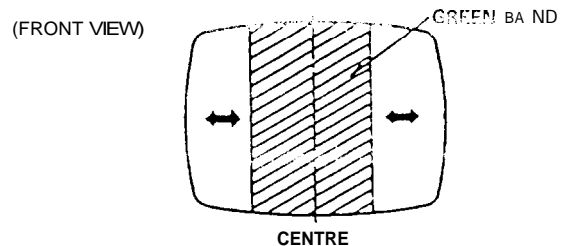


Fig. 2-1



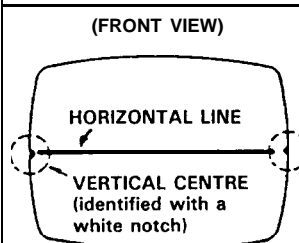
Let the protrusions come in line

Fig. 2-3



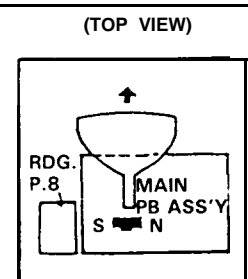
Bring the green band to the centre.

Fig. 2-4



Bring the horizontal line nearest to the white notches shown in the dotted circles.

Fig. 2-5



Select the cut-off service switch from N to S, and a horizontal line will appear.

Fig. 2-6

## STATIC CONVERGENCE & DYNAMIC CONVERGENCE

Static convergence is achieved by four magnets located on the neck, nearest the base of the picture tube. The front pair of magnetic rings (closest to the purity tabs) are adjusted to converge the red and blue crosshatch lines.

The rear pair of convergence rings (closest to the base of the picture tube) are adjusted to converge the magenta (Red/Blue) and green crosshatch lines.

Dynamic convergence is achieved by tilting the deflection yoke, Up-Down and Left-Right.

1. Inject Video Signal (CROSSHATCH) to the Video input terminal and adjust BRIGHTNESS and CONTRAST control for distinct pattern.
2. Adjust the convergence around the edges of the picture tube tilting the yoke, up-down and left-right. Temporarily install one wedge at the top of the yoke. (Fig. 2-9, 2-1 0, 2-1 1)
3. Rotate the front pair of tabs as a unit to minimize the separation of the red and blue lines around the center of the screen. To adjust the convergence of red and blue, vary the angle between the tabs.
4. Rotate the rear pair of tabs as a unit to minimize the separation of the magenta and green lines. (Fig. 2-8)
5. Adjust the spacing of the rear tabs to converge the magenta and green lines.
6. Apply paint to fix 6 magnets.
7. Remove the wedge installed temporarily on the yoke.
8. Tilting the angle of the yoke up, down and sideways, adjust the yoke so as to obtain the circumference convergence. (Fig. 2-10, 2-1 1)
9. Insert three wedges to the positions as shown in Fig. 2-1 2 to obtain the best circumference convergence.
10. Secure wedges in position with the adhesive backing provided or use a non-conductive silicon/rubber compound.
11. White balance adjustment (Black & White tracking) can now be performed.

## WHITE BALANCE ADJUSTMENT (Black and White Tracking)

1. Inject a Video Signal (RASTER) to the Video input terminal.
2. Set the red and green drive controls for their mechanical center.
3. Turn the red, green and blue cut off controls and the screen control fully counterclockwise.
4. Change the service switch as shown in Fig. 2-6, to the "S" position.
5. Turn screen control slowly clockwise until a very faint horizontal line appears.
6. Turn the cut off control of the color which has appeared first, clockwise by about  $10^\circ$  and then adjust the screen control again so that the color may shine faintly.
7. Turn the other color cut off controls slowly clockwise until a reasonable white line appears.
8. Return the service switch to normal (N) position. (Fig. 2-6)
9. Adjust the red and green drive controls for best white highlights.

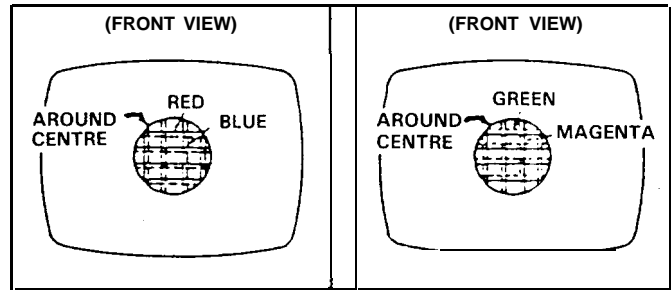


Fig. 2-7

Fig. 2-8

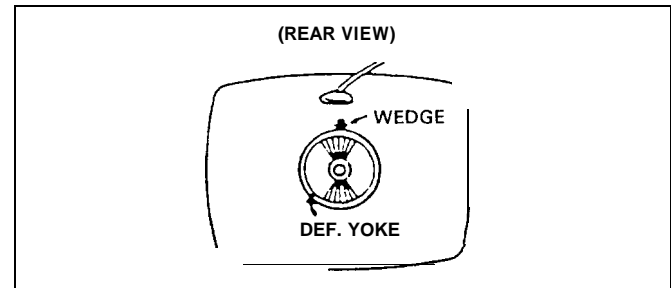


Fig. 2-9

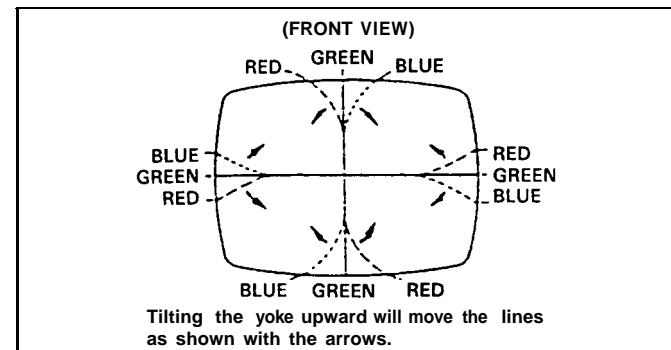


Fig. 2-10

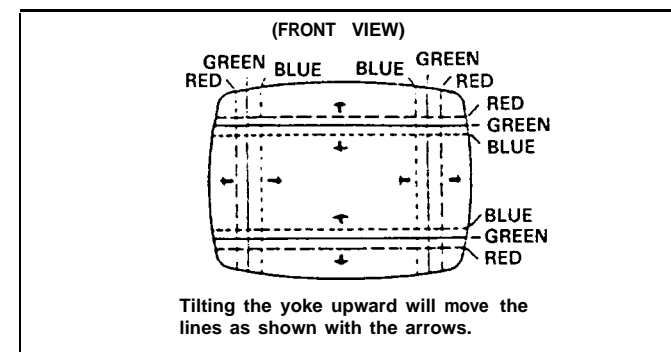


Fig. 2-11

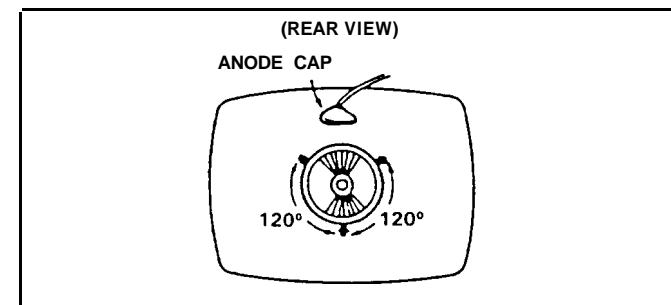


Fig. 2-12

NOTE: 1702 locations in (     ).

## **B<sub>1</sub> VOLTAGE – inject a video signal**

### **1701 (110V)**

Regulate VR, R109, for B, adjustment so that Dc voltage between TP-91 and earth is 110 volts.

### **1702 (125V.)**

Confirm that the voltage at TP-94 and IC901 pin 4 is 125 volts.

NOTE: Meter should be periodically calibrated at 20K ohms/volt.

## **FOCUS**

Adjust the FOCUS control for best overall definition and picture detail at normal brightness and contrast.

## **VERTICAL POSITION**

Adjust the V. center VR R428 (R429) to the optimum vertical picture position.

## **VERTICAL HEIGHT AND LINEARITY**

1. Display a pattern which allows easy confirmation of symmetry (such as a circle or crosshatch).
2. Reduce the vertical size with the V. HEIGHT VR.
3. Adjust the vertical linearity with the V. LIN. VR.
4. Readjust the vertical height, so that the picture extends to normal size.

## **HORIZONTAL WIDTH**

Adjust H. WIDTH control coil L503 (L522) by turning it with a hexagonal adjusting bar only if RIGHT and LEFT sides of picture can't be seen.

## **HORIZONTAL OSCILLATOR**

1. Set the H. FREQ. VR to the mechanical center position.
2. Connect a jumper clip between TP-33A and TP-33B.
3. While rotating the H. FREQ. VR, R504, keep the picture stationary or slowly moving.
4. Remove the jumper wire.
5. Make sure that the set maintains horizontal sync, when signals are switched.

### SUB TINT AND SUB COLOR

1. Display a picture and set the tint and color VRs on the control panel to the central click position.
2. Adjust the sub tint VR, R305 and sub color VR, R303 for the optimum display.

### SUB CONTRAST AND SUB BRIGHT

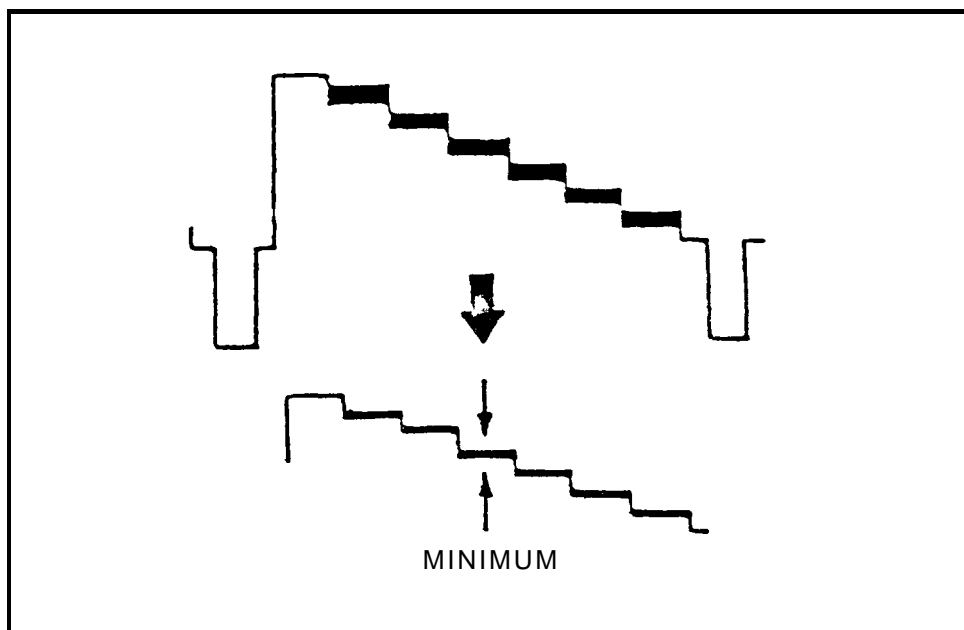
1. Display a picture and set the contrast and bright VRs on the control panel to the center click positions.
2. Adjust the sub contrast VR, R209 and sub bright VR, R22 (R863) for optimum display.

### COLOR SYNC

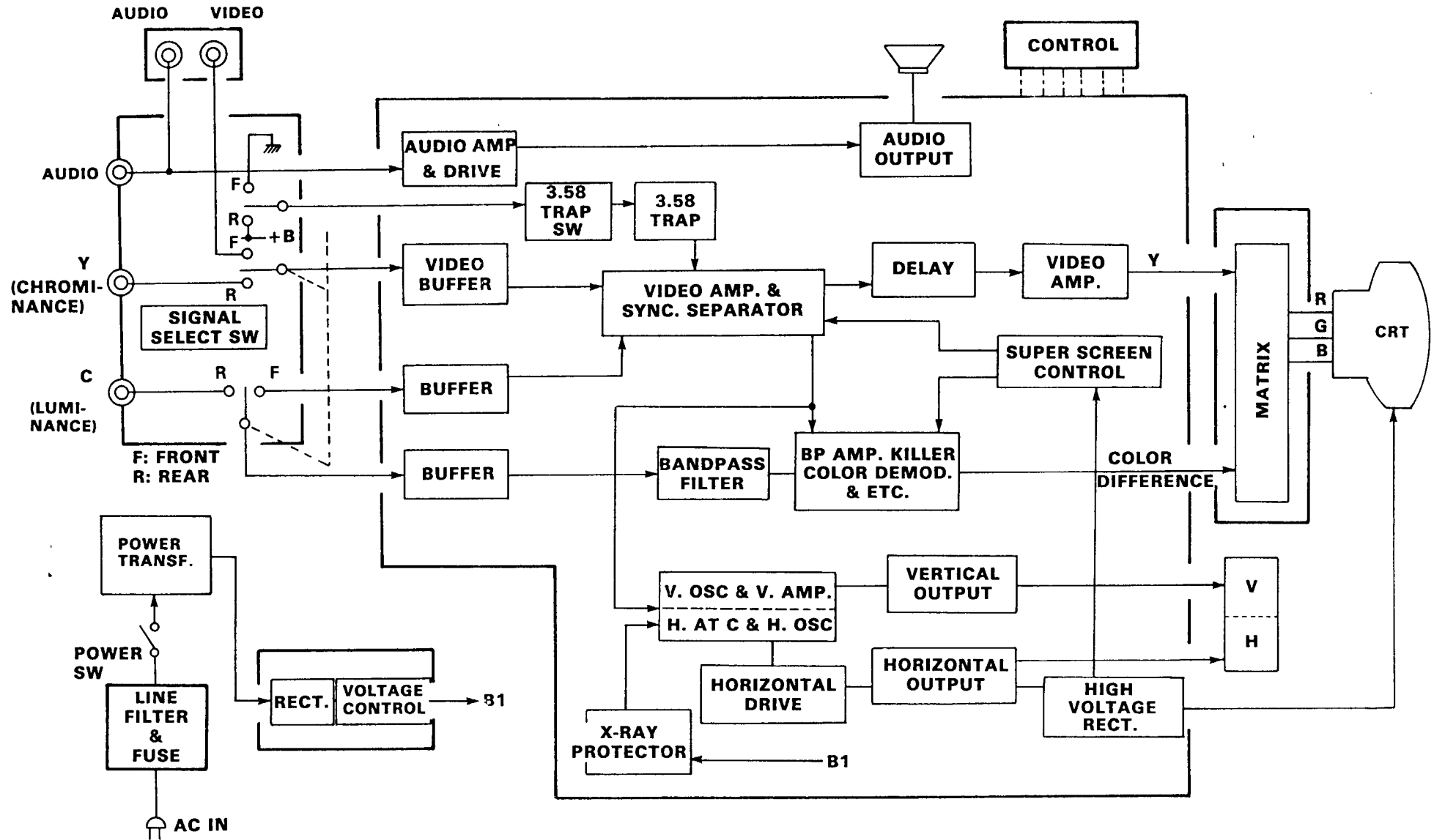
1. Display a color video signal.
2. Connect jumper clips between TP-40 and earth (TP-E) and between TP-51 and IC301 pin 15 (TP-51B).
3. Use a non-metallic screwdriver to turn trimmer capacitor C308.
4. Adjust so that the rolling color stripes become thick and the rolling slows or stops.
5. Remove jumper clips.
6. Confirm that color sync is not disrupted when signals are switched.

### 3.58 MHz TRAP

1. Receive a Video Signal into the Video input terminal.
2. Connect oscilloscope probe to DL201 (Delay Line) output side.
3. Turn the core of T201 so that that 3.58MHz signal is minimized.



# 1701/1702 BLOCK DIAGRAM



# TROUBLESHOOTING GUIDE

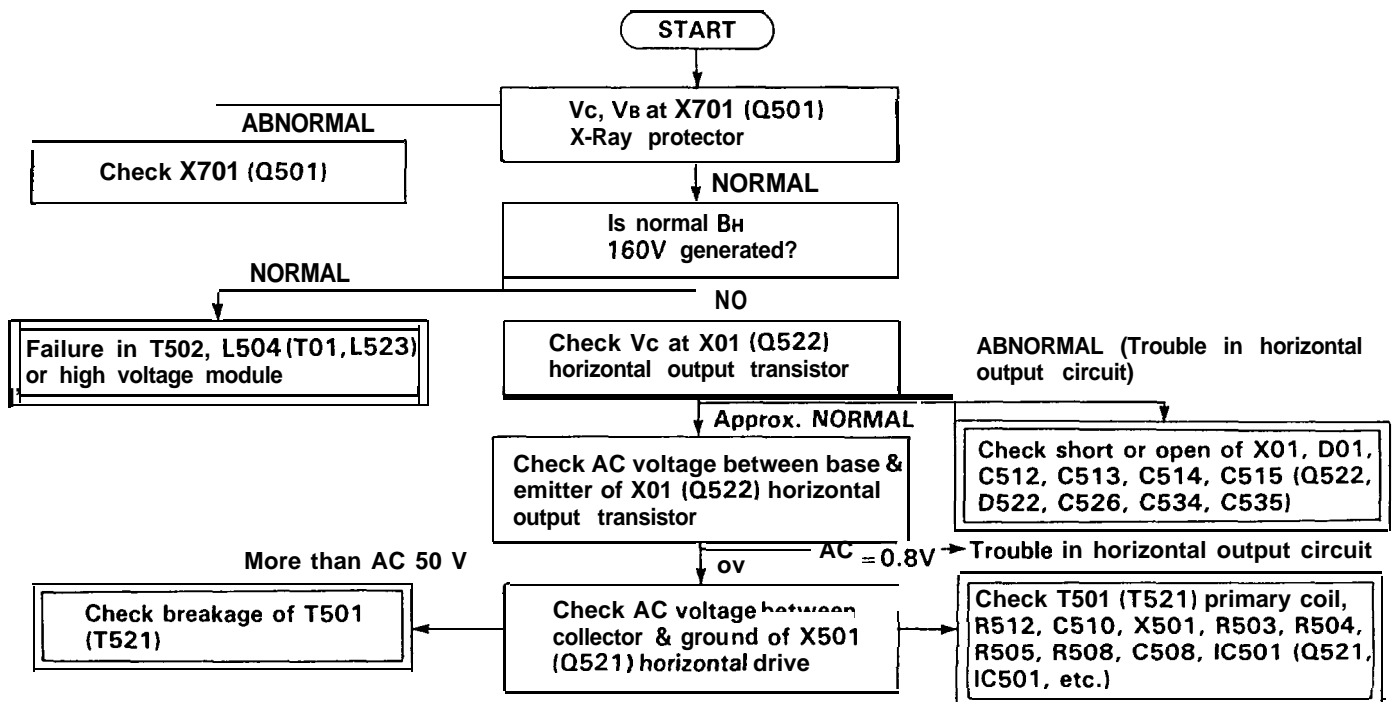
## No raster, **no** sound (**B<sub>1</sub>** is normal)

NOTE: 1702 locations in ( ).

[Cause] Horizontal deflection circuit

**Problems** in the horizontal deflection circuit hinder generation of high focusing voltage,  $B_H$  160V and  $B_2$  12V, resulting in no raster, no sound.

- As long as normal  $B_H$  160V is generated, the horizontal output circuit properly operates, producing pulses during the flyback period of the saw-tooth wave current passing through the horizontal deflection coil. If a problem is found with normal  $B_H$  voltage, the problem area should be the secondary coil of the flyback transformer.
- When the AC voltage between base and emitter of the horizontal output transistor X01 (Q522) is about 0.8V, it is supplied with input pulses. The problem is therefore in the horizontal output circuit. When, however, X01 (Q522) is shorted, this AC voltage is not indicated even if there are input pulses at X01 (Q522).
- AC voltage is measured between the collector and ground of X501 (Q521) horizontal drive as shown. When the specified voltage is shown on the meter, the horizontal output circuit is the problem; while, when there is no voltage indication, the trouble is in some element(s) preceding X501 (Q521). Check if those transistors and ICs are damaged using a voltage measurement.



# No raster, no sound (**B<sub>1</sub>** is abnormal)

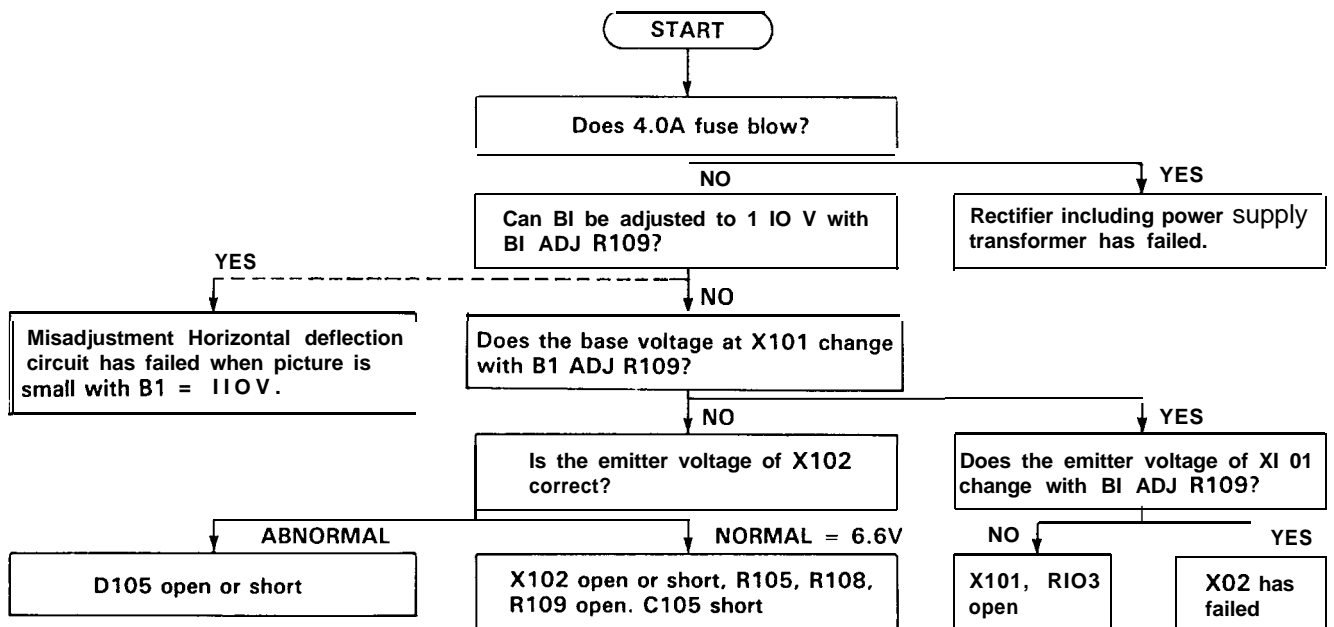
## NOTE

1702 locations in ( ). The regulator PCB assembly used in 1702 models differs from the 1701 power PCB assembly. The **B<sub>1</sub>** voltage circuits should be checked beginning with IC901.

[Cause]

Abnormal **B<sub>1</sub>** voltage indicates trouble in the power supply circuit. When **B<sub>1</sub>** voltage is not only low but also abnormally high, X701 (Q501) of the X-ray protector is turned on, setting the collector voltage to 0 V. The horizontal oscillator is then disabled resulting in no raster and no sound.

1. When D105, R105, R108, R109 are open, the base voltage of X101 and X102 rise to increase **B<sub>1</sub>** voltage to more than 130V. This causes the X-ray protector to work, resulting in no raster.
2. If the base voltage drops as when R103 is open or C105 is shorted, the **B<sub>1</sub>** voltage is reduced to less than 40 V. This will mostly result in no raster, no sound.
3. When the **B<sub>1</sub>** voltage drops to about 70 V, because R910 is open and D105 is shorted, the screen becomes dark and the raster size is reduced because of insufficient horizontal and vertical amplitude.





# No picture (no raster) with normal sound

NOTE: 1702 locations are in ( ).

[Cause] Malfunction of the video amplifier IC201, X202 (IC201, Q201)

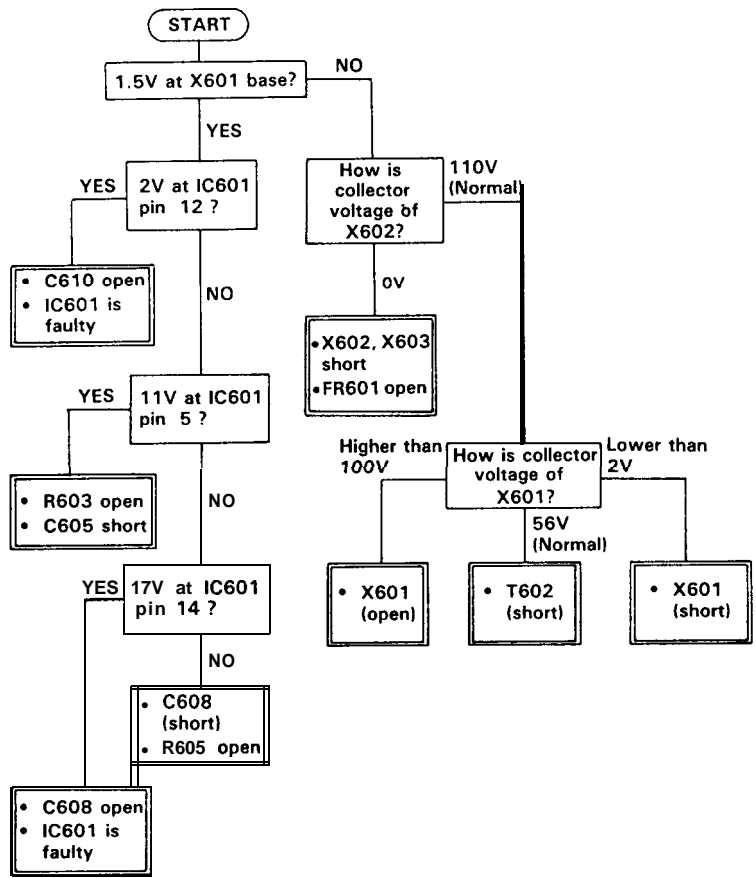
The video signal and the audio signal output are supplied respectively to the video amplifier IC201 and the audio circuit IC601. Sound is had but no picture; therefore, the faulty part is IC201 and its external elements. Since pin 16 of the IC201 to the cathode of CRT is connected by a DC-coupled amplifier, a fault raising the emitter voltage of X202 (Q201) will cause the three initial output transistors to cut off, resulting in no raster.

Check also the screen grid circuit for igniting the CRT heater and the high voltage module.

# No sound (with normal picture)

NOTE: 1701 — Flowchart  
1702 — Audio circuit has been reduced to IC601.

[Cause] Trouble in the audio circuit IC601, X601, X603 or X604 are faulty.



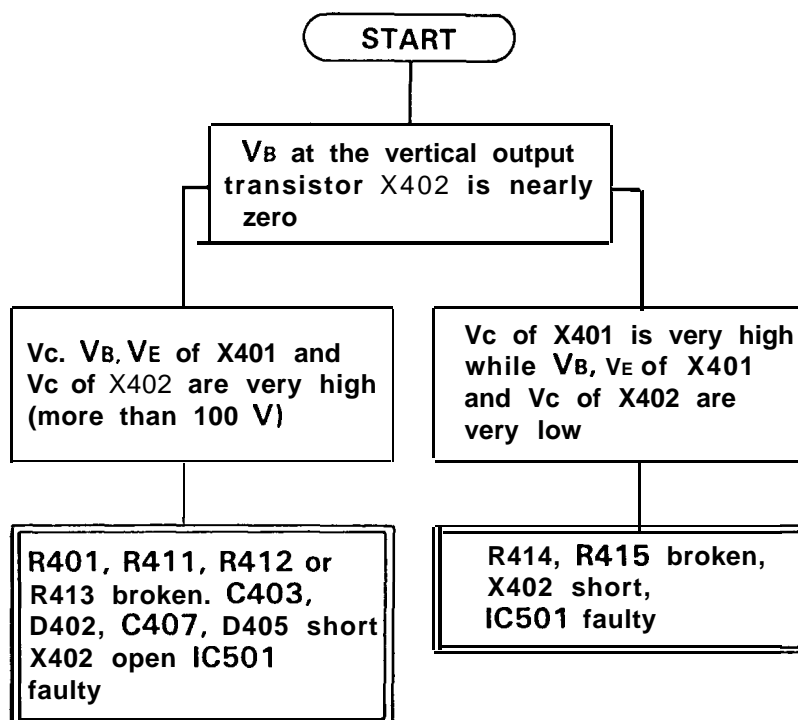
## Only single horizontal line, normal sound

**NOTE: 1701** — First check if FR401 is broken or not. If this is broken, the trouble is due to short of X401 or break of D401.  
1702 — Circuits in 1702 monitor differ but the operation remains the same. Check vertical controls/deflection circuits.

[Cause] Malfunction of the vertical deflection circuit. When the vertical deflection circuit is faulty, saw-tooth current is not applied to the vertical deflection coil, resulting in a single horizontal line. During troubleshooting, reduce brightness contrast to prevent an ion spot on the CRT.

1. R401 broken, C403, D402, C413 short: B2 12V is not supplied, disabling IC501.
2. R411, R412 broken, C407 short: the voltage at IC501 pin 3 is set to zero disabling the V-amplifier and the voltage at pin 2 is set to zero to turn off X402.
3. R414, R415 are broken:  $V_B$  of X401 is zero disabling X401 and X402.
4. Also check if C402 is short or open.
5. Too high  $V_B$  of X402 is because of C401 short or failure in IC501 or X402.

Note: When the voltage generator fails to supply B212V to the secondary coil of the flyback transformer of the horizontal output circuit due to malfunction, a single horizontal line and no sound will result.



[Faulty parts and problems other than described]

<b>X401 open D401 short C408 short</b>	<b>Vertical amplitude small (6- 8 cm) Picture appears only on the lower half of the screen</b>
<b>R403 faulty</b>	<b>A single thick (ca. 5 mm) horizontal line</b>
<b>R404 faulty</b>	<b>When turning V. HOLD, a black belt (V blanking signal) appears at the center of screen. The whole screen is dark and flickers.</b>
<b>R405 faulty</b>	<b>A single horizontal line. A picture flashing at about 1 second interval appears on the upper half of the screen.</b>
<b>R407 faulty</b>	<b>A picture of about 4 cm at the center of the screen. About 25 irregular lines appear on the upper half of the screen.</b>
<b>R408 and R409 faulty</b>	<b>Vertical amplitude small (about 15 cm)</b>
<b>R410 faulty</b>	<b>Vertical amplitude small (about 2 cm). Picture goes slightly up and down and flickers.</b>
<b>R416 faulty C409 open</b>	<b>Vertical flyback line appears.</b>
<b>R419 faulty</b>	<b>Small number of irregular lines</b>

# Improper horizontal or vertical synchronization

NOTE: 1701 and 1702 locations are the same.

[Cause]

1) Defective horizontal and vertical sync:

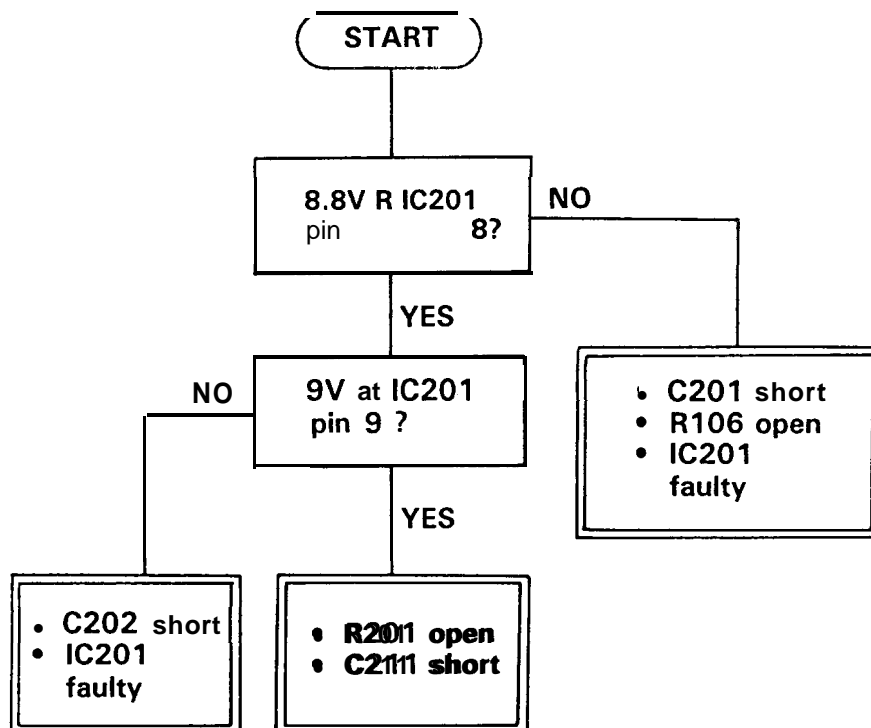
The sync separator and amplifier consists of an IC(IC201). The main cause of failure is often a failure of the IC itself. It is also necessary to be careful of a possible failure of the external components. Because the change of voltage at each pin of the IC is extremely small, it is very difficult to discover a failed element by measuring voltage.

2) Defective horizontal sync:

This is due to a failure of IC501 or the horizontal AFC circuit.

3) Defective vertical sync:

This is due to a failure of either the separator and amplifier for the vertical synchronous signal, or the vertical oscillator IC501 and its peripheral elements.



Monitor parts may be secured locally. JVC part numbers have been provided for your convenience. ONLY Commodore part numbers (C314-xxx-xx) will be available from Commodore at this time.

### 1701 CHASSIS PARTS

LOCATION	DESCRIPTION	JVC PART #	COM PART #
DY01	Deflection Yoke	* CJZ6 134-00A	* C 314916-01
JO1	Pin Jack Vid In	C39Z27-224	
JO2	Pin Jack Aud In	C39Z27-223	
L21	Deg. Coil	* A39477-T	
R05	Nonflammable Res. 220 ohm, 25W, ± 10%	* QRF258K-22 1	* c 314917-01
so1	Power Switch	* CEX40097-002	* C 314918-01
SP01	Speaker	EAS-1 0P225S	
T01	Power Transformer	* CE30074-B0A	* c 314919-01
T502	HV Module	* CJ26107-00A	* c 314920-01
V01	Picture Tube	* 370FVB22(E) Sub: * 370ESB22(E)	
X01	Transistor	* 2SD869 Sub: * 2SD898	* c 314921-01
X02	Regulator	* 2SC1106A	* c 314922-01

\*SAFETY COMPONENTS — Use EXACT replacement ONLY.

### 1701 CABINET PARTS

LOCATION	DESCRIPTION	JVC PART #	COM PART #
1701 /1702	Front Cabinet		c 314900-01
1701/1702	Front Cntrl Panel Door		c 314901-01
1701 /1702	Power Button		c 314902-01
1701	Front Model I.D. Plate		c 314903-01
1701/1702	RT Side Handle		c 3 14904-01
1701 /1702	LT Side Handle		c 3 14905-01
1701 /1702	Rear Cabinet		C 314906-01
1701 /1702	Rear AV Terminal Assy		c 314907-01
1701/1702	Top Cabinet Panel		C 314908-01
1701/1702	Replacement AC Cord	* QMP1460-244K	* c 314909-01
1701	Users Manual		c 314910-01
1701 /1702	Namplate (Logo)		c 31491 I-01

\*SAFETY COMPONENTS — Use EXACT replacement ONLY.

# TROUBLESHOOTING GUIDE — 1702

Additional information to aid in the troubleshooting of the 1702 monitor has become available from our technical support group. It has been collated into chart form and is being provided to facilitate repairs on this model. The 1702 is the most common monitor in the field at this time.

## CHART TERMINOLOGY:

CHECKPOINTS	.....	Point of circuit to be tested
CAUSE	.....	Possible reason for INCORRECT signal or voltage
POSSIBLE SOLUTION	.....	Most likely failure
MISSING	.....	Signal or voltage not present or INCORRECT
PATH	.....	COMPONENTS or TRACES directly related to that portion of the circuit being checked

## TIPS:

- When testing IC circuits, always check for proper BIAS and B+ voltages on all legs of the chip.
- An open horizontal oscillator or driver circuit will cause the B1, 125 volt line, to raise to 158 VDC. To troubleshoot this failure, use the DEAD SET, B+ ABNORMAL Chart.
- An improperly regulated B1 will cause a BLOOMING effect. Use the DEAD SET, B+ ABNORMAL to troubleshoot this SYMPTOM.
- When the horizontal oscillator is triple firing, the monitor makes a BUZZING sound and may blow the 1A. FUSE. The horizontal/vertical oscillator chip, IC 501, is the most common problem.
- If the monitor blows the 1A. fuse, it may short out the horizontal output transistor. A common problem is that the 2 matched diodes, D523, test good but actually are shorted.
- A wavy picture and weak video are often repaired by replacing C1 01, the 470 $\mu$ F, 6.3V. cap.

# TROUBLESHOOTING GUIDE

## Dead Set, B+ Abnormal

**NOTE:** DC Voltages may be LOWERED due to open ELECTROLYTIC CAPACITORS.

When more than one possible cause is given, follow each DC path back to its SCANNED RECTIFIED SOURCE.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is F901 open? (4 amp fuse)	Possible short in bridge rectifiers.	Check for shorted diode(s) D901-904, T901 or D905.
Is F902 open? (1 amp fuse)	Possible short in high voltage or excessive load.	Check for shorted 0522, D523 or scan voltage source.
Is voltage at pin 1 of IC901 148 VDC? (voltage regulator)	Possible open path from bridge to regulator.	Check for open R902, R907, or C904 or F902.
Is voltage at pin 2 of IC901 126 VDC? (voltage regulator)	Possible open reference circuit.	Check for open R904, R908, R906 or C907.
Is voltage at pin 4 of IC901 125 VDC? (voltage regulator)	Possible open feed back path or defective chip.	Check for open R901 or IC901.
Is voltage at positive side of C905 18 VDC?	Possible defective bridge.	Check for open or shorted 0905.
<p>If the DC fuse (902) is open and no SHORTED parts are readily apparent, then TEMPORARILY jump it out with a 100 watt 125 volt LIGHT BULB. This will absorb MOST OF THE OVER CURRENT ON THE (125) B1 LINE. EXTREME caution should be used in this operation, as some resistors on the scan voltage lines may start to burn due to shorted components.</p>		
<p><b>LIGHT BULB GLOWS AT 75% INTENSITY</b></p>		
Is voltage at pin 4 of IC901 or 125 VDC?	High resistance short or short on secondary side of Flyback.	Check Q522 for leakage — CONTINUE to next line.
Is voltage on cathode side of D422 25 VDC?	Defective diode or short on 125V line.	Check D422 for a short or open — CONTINUE to next line.
Is R421 open or BURNING?	Short in 25.8 VDC line.	Check IC421 for a short.

## Dead Set, B+ Abnormal (Continued)

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is voltage on cathode side of D522 13 VDC?	Short on 13.8 VDC line.	Open legs on 13.8 volt line until short clears.
Is voltage on cathode side of D551 12 VDC?	Defective diode.	Check D551 for a short or open.
	Short on 12.5 VDC line.	CONTINUE to next line.
Is R551 open or BURNING?	Short on 12.5 VDC line.	Check IC601 for a short.
Is voltage on cathode side of 0521 200 VDC?	Defective diode.	Check D521 for a short or open.
	Short on 200 VDC line.	Check line for shorted parts.
NOTE: The above chart may also be used without the light bulb to isolate missing scan voltages.		

## No Raster, Sound Normal, High Voltage Normal

NOTE: Make sure that the heaters in the CRT are lit before using this chart.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is Video signal present at terminal C4?	Improper bias to R-G-B amplifiers.	REFER TO NO VIDEO CHART.
Is 200 VDC at positive side of C351?	No scan voltage.	Check D521 for open or short, L523 for open.
Is 171 VDC at collectors of 0351, Q352, Q353?	Open path from C351 to R-G-B amplifiers.	Check L351, R359, R358 and R357 for open.
Is 400 VDC at pin 8 of CRT?	Missing screen voltage.	Check for open R363, HV bleeder resistor or shorted C352.



# No Raster, No Sound, B+ Normal

**NOTE:** Q501 (X-RAY PROTECTOR) should be checked for proper operation before STARTING with flow chart.

When more than one possible cause is given, follow each DC path back to its SCANNED RECTIFIED SOURCE.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is Horizontal sawtooth at pin 10 of IC501?	Missing 12.2 DCV pin 11.	Check for proper DC Voltage.
	Possible open IC501.	Replace chip IC501.
Is Horizontal sawtooth at base of Q521?	Missing 0.3 DCV bias.	Check for proper DC Voltage.
	Open bias resistors.	Check R521, R522.
	Open or shorted Transistor.	Check Q521.
Is Horizontal sawtooth at collector of Q521?	Missing 9.5 VDC.	Check for proper DC Voltage. Check T521, R511 or Q521.
	Open or shorted Transistor.	
Is Horizontal sawtooth at base of Q522?	Improper bias reference.	Check for open T521, R524 or Q522
	Open or shorted Transistor.	
Is Horizontal sawtooth at collector of Q522?	Missing 126 VDC.	Check for proper DC Voltage. Check T523 pin 1 & 8, or Q522.
	Open or shorted Transistor.	

**NOTE:** Continuous shorting of Q522 may be caused by a shorted Flyback transformer or open damping capacitors C526, C534 and C535.

# No Chroma, Sound Normal, Black & White Tracking Normal

**NOTE:** This chart was written with the FIVE PIN cable installed in the front ports.

When more than one possible cause is given, follow each DC path back to its SCANNED RECTIFIED SOURCE.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is Chroma signal at pin 7 of IC201?	Missing 7.2 VDC.	Check for proper DC voltage.
	Open IC201.	Replace IC201.
Is Chroma signal at base of Q341?	Missing 5.8 VDC.	Check for proper DC voltage.
	Open path from pin 7 of IC201.	Check R341, R342, C341 or Q341.
Is Chroma signal at emitter of Q341?	Missing 5.1 VDC.	Check for proper DC voltage.
	Open or shorted Q341.	Check DCV at emitter & collector R343.
Is Chroma signal at base of Q342?	Missing 6.2 VDC.	Check for proper DC voltage.
	Open or shorted Q342. Open path from Q341.	Check R346, R347, R345, C343 or AV Switch.
Is Chroma signal at emitter of Q342?	Missing 5.5 VDC.	Check for proper DC voltage.
	Open or shorted Q342.	Check R348. Replace Q342.
Is Chroma signal at pin 9 of IC301?	Missing 12 VDC pin 13.	Check for proper DC voltage.
	Open path from Q342.	Check C301, R324, T301 or R301. Replace IC301.
Is ADJUSTABLE 5.5 VDC at pin 12 of IC301?	Open Chroma or sub Chroma controls or DC voltages.	Check voltages from control PCB assembly.
	Open path from AV PCB.	Check R303, R302 or IC301.
Is horizontal keying pulse at pin 8 of IC301?	Open path from pin 11 of T523.	Check for open D301, R228, R529, R537 or C533.
Is 3.58 MHz signal at pin 5 of IC301?	Open oscillator circuit.	Check for open X301, C308, C309, C307, R307, R308 and R309 or replace IC301.
Are Chroma signals at bases of Q351, Q352 and Q353?	Open path from IC301.	Check for open L301, L302, L303, R310, R311, R312, R373, R374, R375 or shorted C311, C312 and C313.
	Defective output IC301.	Check IC301.

# No Video, Sound Normal, Raster Normal

**NOTE:** A common error made is that the AV slide switch is in the wrong position.

When more than one possible cause is given, follow each DC path back to its SCANNED RECTIFIED SOURCE.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is video signal at emitter of Q101?	Open path from AV terminal.	Check for open C101, R101, R102.
Is video signal at collector of Q101?	Missing 7.6 VDC.	Check for proper DC voltage.
	Open or shorted component transistor circuit.	Check R106, R107, C103 or Q101.
	Open or shorted transistor.	Check Q101.
Is video signal at pin 8 of IC201?	Open path from Q101 to IC201.	Check C201 for open.
Is video signal at pin 2 of IC201?	Missing 9 VDC.	Check for proper DC voltage.
	Open IC201.	Replace IC201.
Is video signal at pin 15 of IC201?	Missing 10 VDC.	Check for proper DC voltage.
	Open path from pin 2 of IC201.	Check for open DL201, C204.
Is Horizontal blanking pulse on pin 13 of IC201?	Open path from pin 11 of Flyback Transformer.	Check for open R206, R228, R529, R537 and C533.
Is video signal at pin 16 of IC201?	Improper voltages on pin 14 of IC201.	Check voltages from control PCB assembly.
	Open IC201.	Replace IC201.
Is video signal at base of Q201?	Open path from pin 16 of IC201.	Check for open R210 and R230.
Is video signal at emitter of Q201?	Missing emitter voltage or base bias voltage.	Check for proper DC voltages.
	Open Q201.	Replace Q201.
Is video signal at point C4 on CRT PCB?	Open path from emitter of Q201 to terminal C4.	Check for open service switch or wire.

## No Sound, Video Normal

When more than one possible cause is given, follow each DC path back to its SCANNED RECTIFIED SOURCE.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is audio signal at pin 2 of IC601?	Missing 5.4 VDC.	Check IC601.
	Open path from AV terminal.	Open R601 and C601.
Is (ADJUSTABLE) 3 VDC at pin 4 of IC601?	Missing 3 VDC.	Check for proper DC voltage.
	Open path from control PCB assembly.	Open R608, R871 or R872.
Is audio signal at pin 8 of IC601?	Missing 12.5 VDC pin 9.	Check for proper DC voltage.
	Missing 11.8 VDC pin 1.	Check for proper DC voltages.
	Defective filter/feed back circuit.	Check for open R604, R606 or open or shorted C603, C604 or C605.
	Defective IC601.	Check IC601.
Is audio signal at point M1?	Open path from IC601 to speaker.	Check open or shorted C607 or open or shorted speaker.

## No Vertical Sweep

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is vertical signal at pin 5 of IC501?	Missing 11.3 VDC on pin 6	Check for proper DC voltage.
	Possible open chip.	Replace chip.
Is vertical signal at pin 2 of IC501?	Open feed back path from IC421.	Check for proper DC voltage at IC421.
	Defective IC421.	Replace IC421 or IC501.
Is vertical signal at pin 2 of IC421?	Missing 26 VDC pin 3 or 25.8 VDC pin 7.	Check for proper DC voltage.
	Defective IC421.	Replace IC421.
Is vertical signal at V1 and V2?	Open path from output of IC421 to ground.	Check for open yoke or C424, R422, R410.

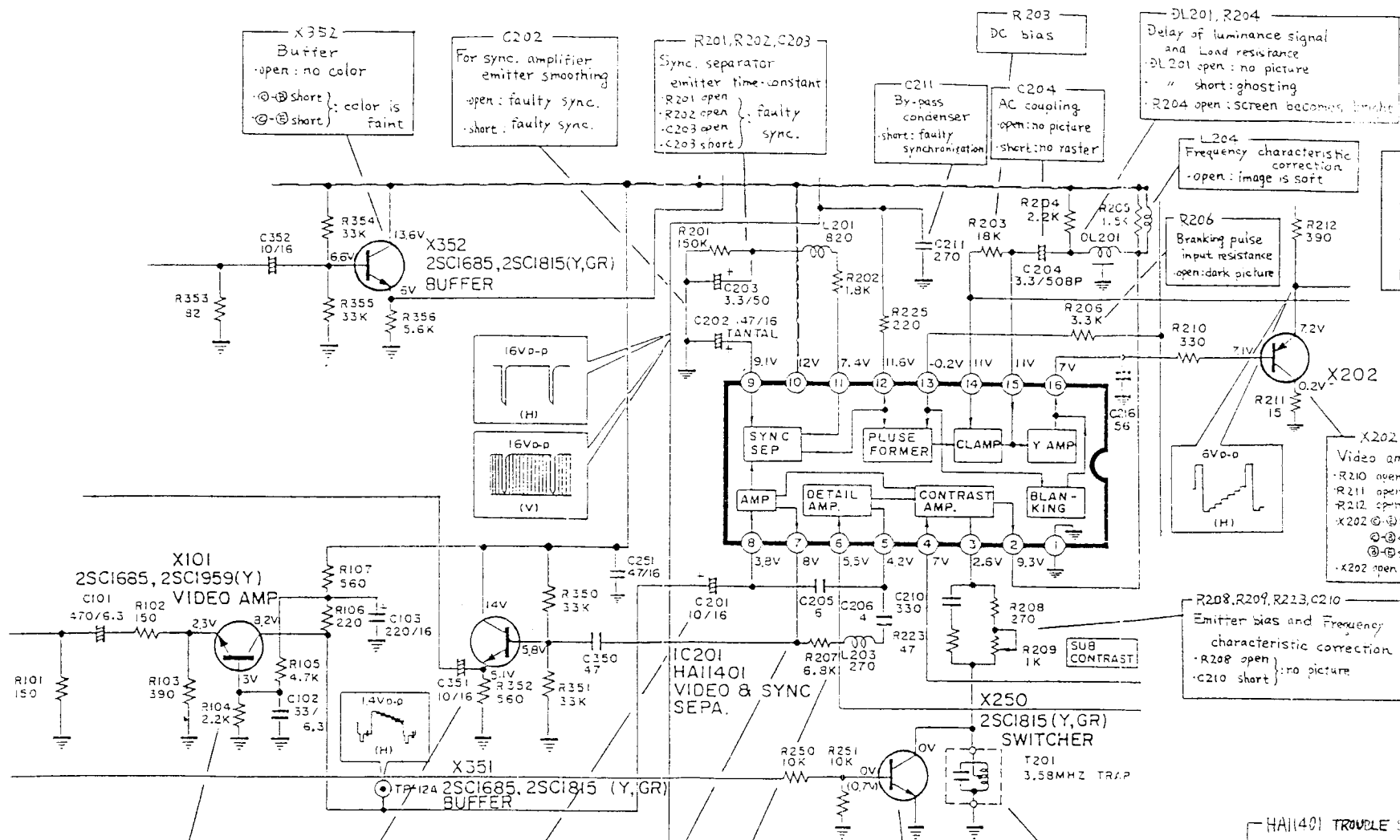
**NOTE:** The vertical amplifier in IC501 is supported by a feed back signal from pin 2 of IC421 to pin 3 of IC501. If this signal is not present, the vertical amp in IC501 will not bias on. Check feed back resistors and capacitors carefully.

# Cannot Set Black & White Tracking

**NOTE:** Improper color will be evident in this condition.

CHECKPOINT	CAUSE	POSSIBLE SOLUTION
Is video signal present at terminal C4?	Improper bias to R-G-B amplifiers.	REFER TO NO VIDEO CHART.
Is 6.9 VDC at bases of Q351, Q352 & Q353?	Open path from IC301.	REFER TO NO CHROMA CHART.
	Open or shorted transistors.	Replace defective transistor.
Is 171 +/- VDC at collectors of Q351, Q352, Q353?	Open path from C351 to R-G-B amplifiers.	Check L351, R359, R358, R357 and C351 for open.
Is 140 VDC at pins 3, 7 and 9 of the CRT?	Improper cathode bias.	Check for open R360, R361 and R362.
Is 200 VDC at positive side of C351?	No scan voltage.	REFER TO NO RASTER CHART.

# VIDEO CIRCUIT



**CIRCUIT NOTES**  
 Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.

**X352**  
 Buffer  
 -open: no color  
 -⊕-⊕ short: color is faint  
 -⊕-⊕ short: color is faint

**C202**  
 For sync. amplifier emitter smoothing  
 -open: faulty sync.  
 -short: faulty sync.

**R201, R202, C203**  
 Sync. separator emitter time-constant  
 -R201 open } faulty  
 -R202 open } sync.  
 -C203 open }  
 -C203 short }

**C211**  
 By-pass condenser  
 -short: faulty synchronization

**R203**  
 DC bias

**C204**  
 AC coupling  
 -open: no picture  
 -short: no raster

**DL201, R204**  
 Delay of luminance signal and Load resistance  
 -DL201 open: no picture  
 " short: ghosting  
 -R204 open: screen becomes bright

**L204**  
 Frequency characteristic correction  
 -open: image is soft

**R206**  
 Braking pulse input resistance  
 -open: dark picture

**X202**  
 Video amp.  
 -R210 open } no raster  
 -R211 open } no picture  
 -R212 open } no picture  
 -X202 ⊕-⊕ short: screen is abnormally bright and flyback line appears.  
 -⊕-⊕ short: bright and flyback line appears.  
 -X202 open } no raster

**R208, R209, R223, C210**  
 Emitter bias and Frequency characteristic correction  
 -R208 open } no picture  
 -C210 short }

**HA11401 TROUBLE SYMPTOM OF PRESUME**  
 -no raster, no sound } faulty sync.  
 -no picture } raster is bright and flyback line appears  
 -screen is too bright } image quality is unsatisfactory  
 -screen is dark }

**X101**  
 Video amp.  
 -open } no picture  
 -⊕-⊕ short } no picture  
 -⊕-⊕ short } no picture  
 -⊕-⊕ short: screen is dark

**X351**  
 Buffer  
 -open } no color  
 -⊕-⊕ short } no color  
 -⊕-⊕ short } no color  
 -⊕-⊕ short: color is faint

**C201**  
 AC coupling  
 -open: no picture  
 -short: faulty synchronization

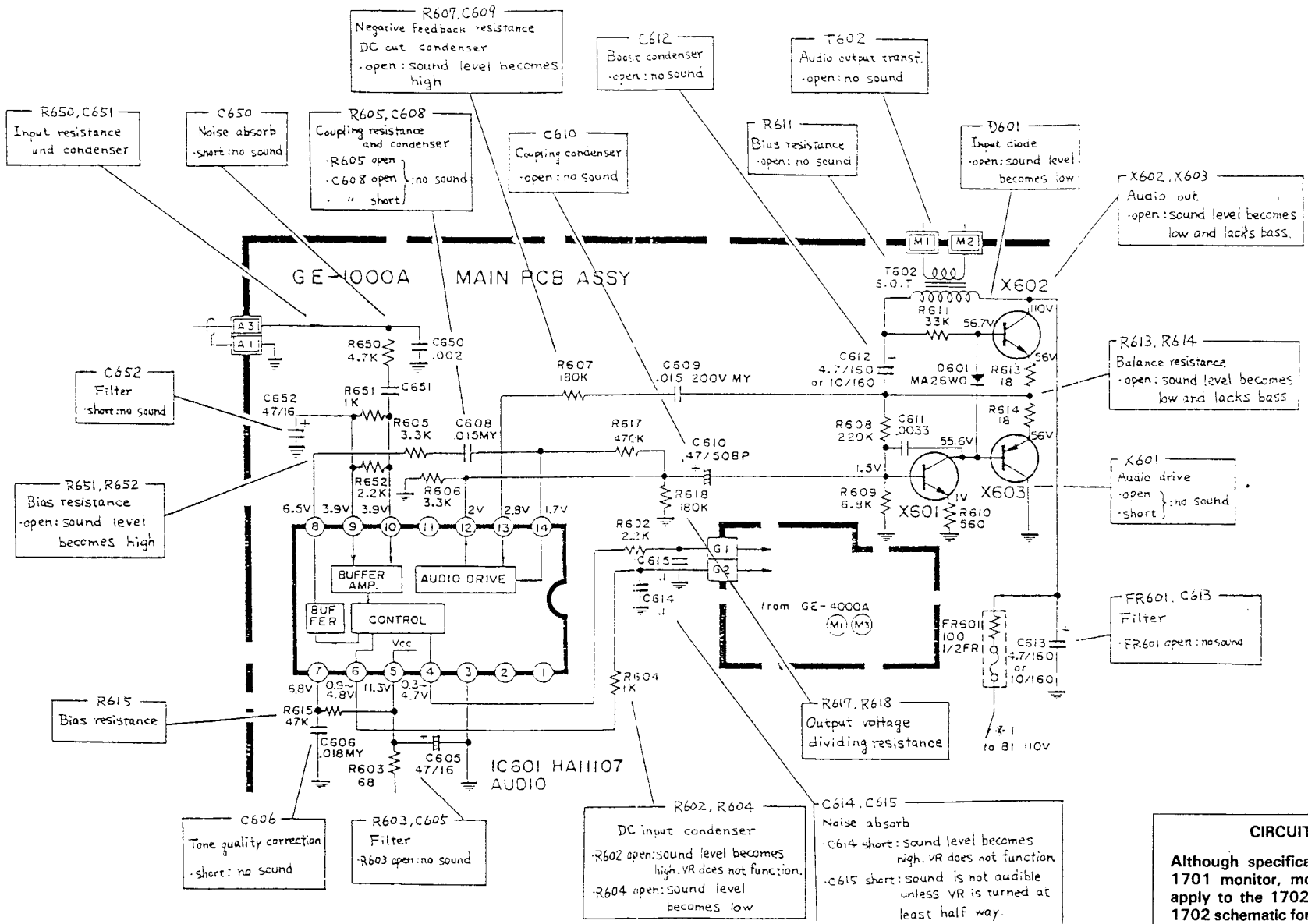
**C205**  
 Differential (aperture compensation: mainly preshooting)  
 -open: image is sharp  
 -short: screen is dark.

**R207, C206**  
 Differential (aperture compensation: mainly overshooting)  
 -R207 open } image is  
 -C207 open } soft  
 " short }

**X250**  
 Switcher  
 -⊕-⊕ short: color error  
 -⊕-⊕ short: screen becomes bright and vertical stripes

**T201**  
 3.58MHz trap coil  
 -open: no picture  
 -short: 3.58MHz trap dot interference

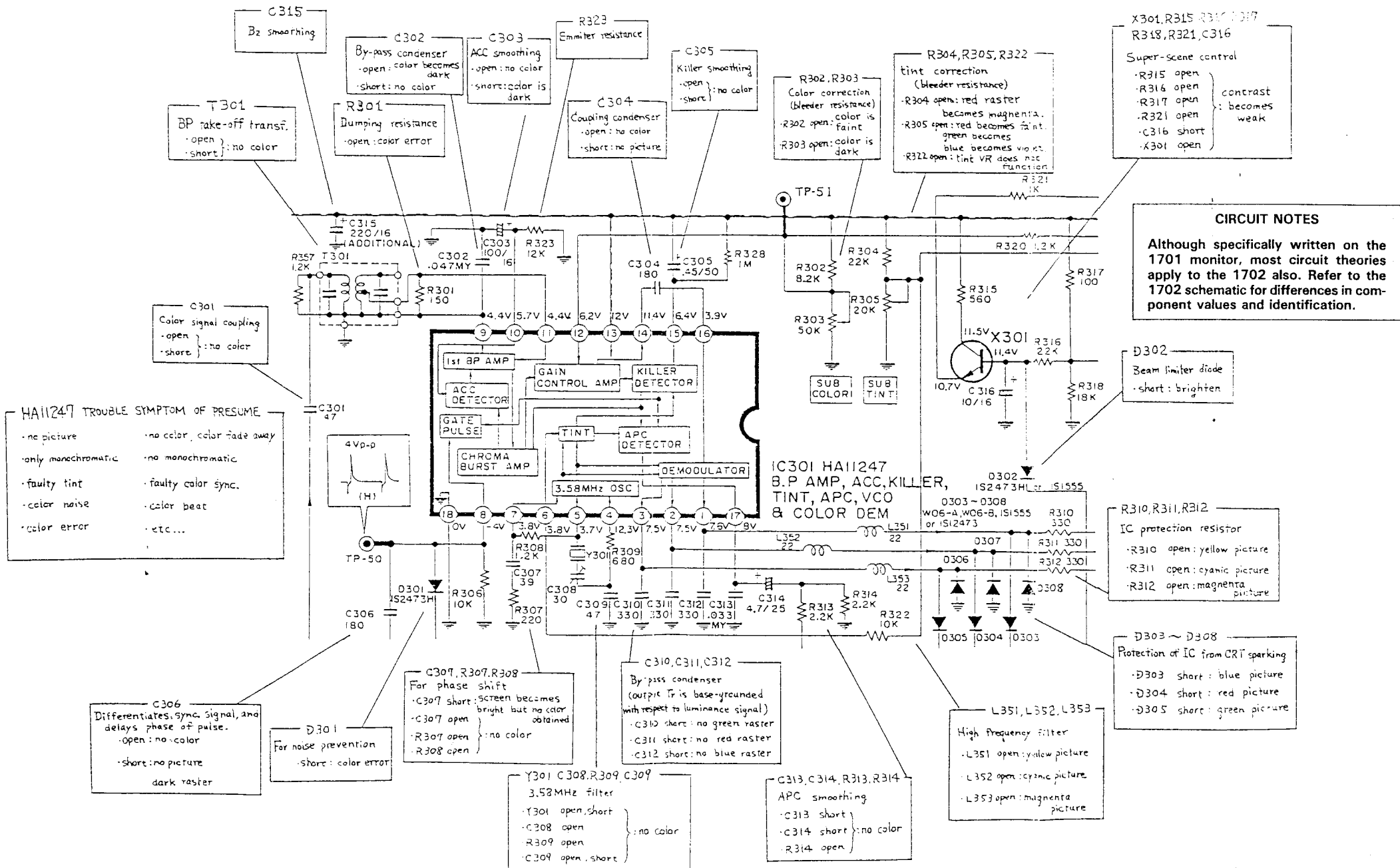
# AUDIO CIRCUIT



**CIRCUIT NOTES**

Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.

# COLOR DEM. CIRCUIT



**CIRCUIT NOTES**

Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.



# CHROMA OUTPUT CIRCUIT

	X101	X102	X103
⊖-⊖ Short	blue raster	red raster	green raster
⊖-⊕ Short	no blue raster	no red raster	no green raster
⊕-⊕ open			

R112, R113, R114  
Output Tr collector load resistor  
 - R112 open: screen of blue  
 - R113 open: screen of red  
 - R114 open: screen of green

R115, R116, R117  
CRT cathod resistor and resistor for protecting output Tr from CRT sparking  
 - R115 open: no blue raster  
 - R116 open: no red raster  
 - R117 open: no green raster

R123, R122, R124  
L103, L102, L104  
Frequency characteristic correction  
(Image quality correction)

R125, R126, R127  
Input resistance of base  
 - R125 open: no blue raster  
 - R126 open: no green raster  
 - R127 open: no red raster

R121, R109, R111  
Drive adjustment  
 - R121 open: no blue raster  
 - R109 open: no red raster  
 - R111 open: no green raster

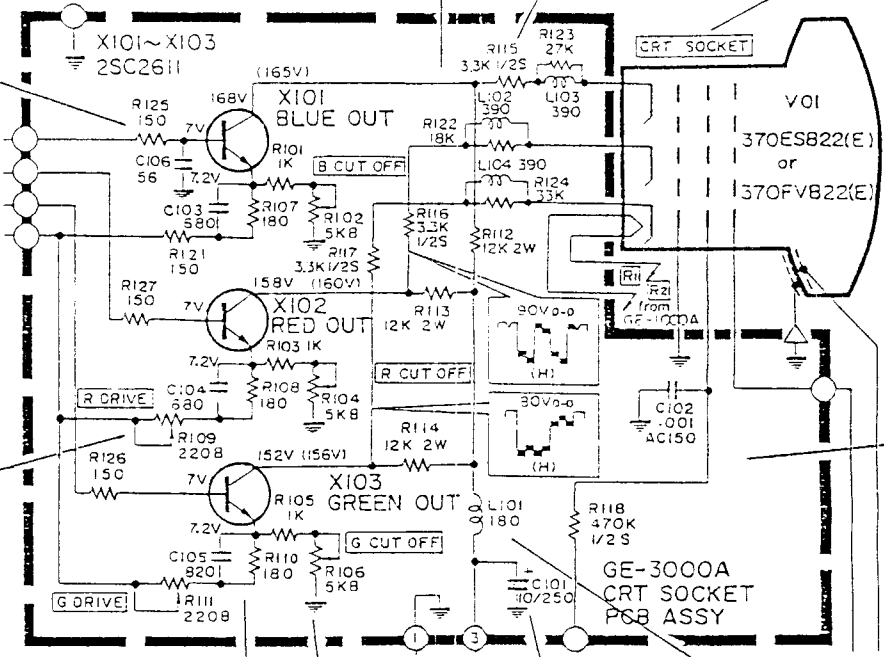
R118, C102  
Screen voltage smoothing

R107, R108, R110  
C103, C104, C105  
Emmitter resistance  
Frequency characteristic correction  
 - R107 open: no blue raster  
 - R108 open: no red raster  
 - R110 open: no green raster  
 - C103 short: screen of blue saturate  
 - C104 short: screen of red saturate  
 - C105 short: screen of green saturate

R101, R103, R105  
R102, R104, R106  
Emmitter resistance  
Cut off adjustment  
 - R101 open: weaken  
 - R102 open: blue raster  
 - R103 open: weaken  
 - R104 open: red raster  
 - R105 open: weaken  
 - R106 open: green raster

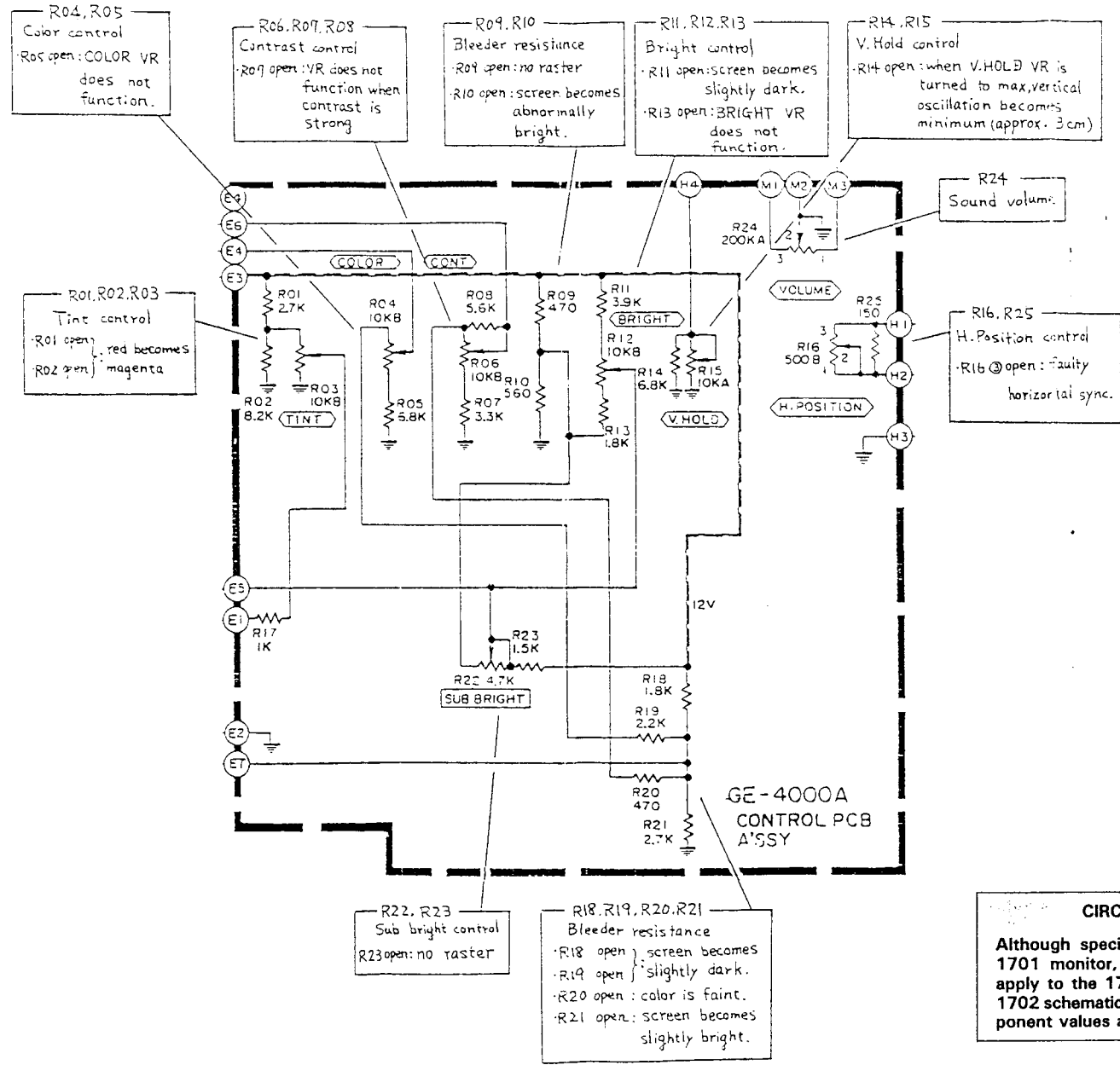
C101  
HB smoothing  
 - open: screen is bright and drags tail to right.

L101  
High frequency filter  
 - open: screen is bright and drags tail to right.

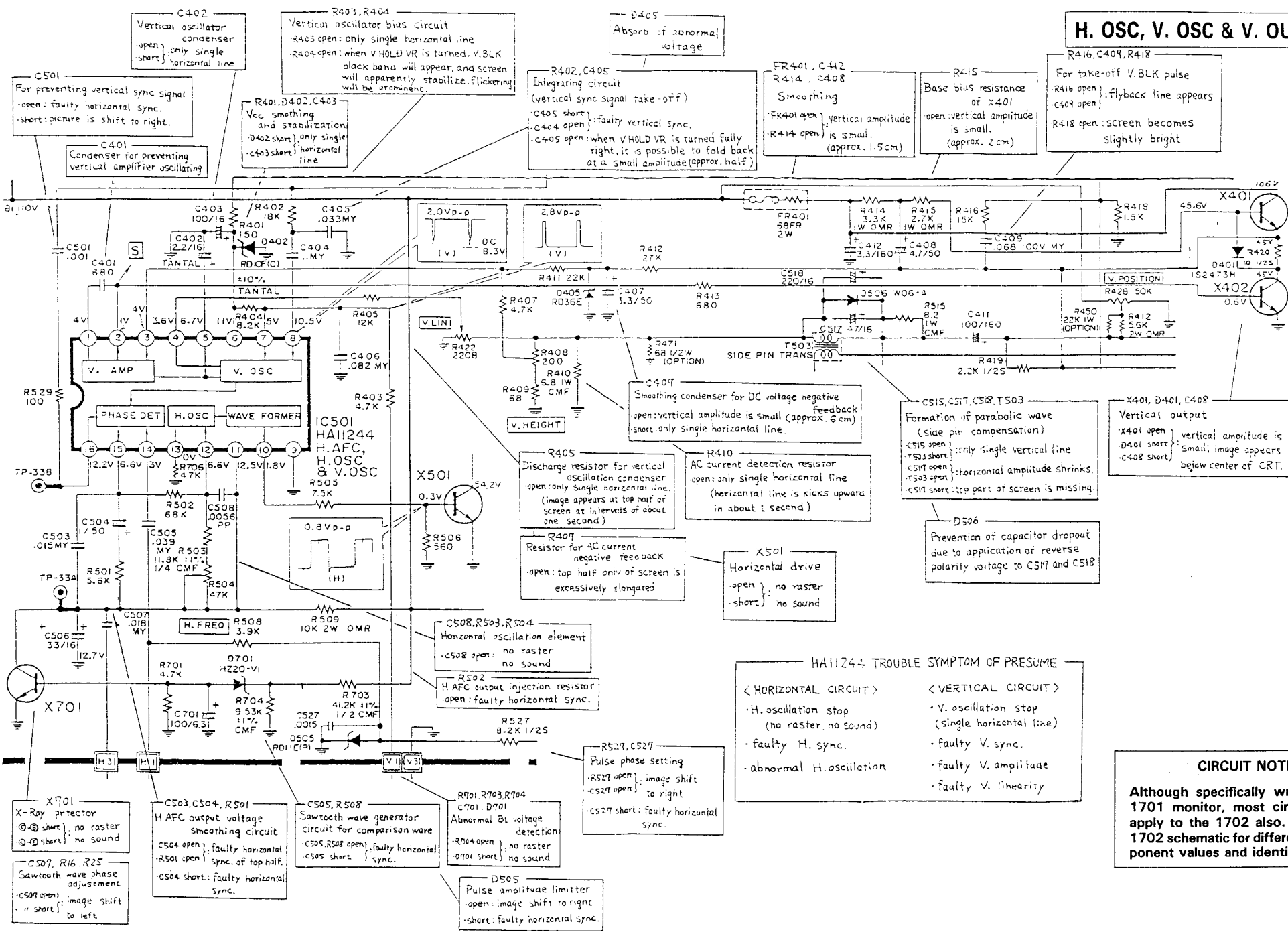


**CIRCUIT NOTES**  
 Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.

# CONTROL



# H. OSC, V. OSC & V. OUT CIRCUIT



C402  
Vertical oscillator  
condenser  
-open: only single  
horizontal line  
-short: picture is shift to right.

R403, R404  
Vertical oscillator bias circuit  
-R403 open: only single horizontal line  
-R404 open: when V HOLD VR is turned, V.BLK  
black band will appear, and screen  
will apparently stabilize, flickering  
will be prominent.

D405  
Absorb of abnormal  
voltage

R416, C404, R418  
For take-off V.BLK pulse  
-R416 open: flyback line appears  
-C404 open: screen becomes  
slightly bright

C501  
For preventing vertical sync signal  
-open: faulty horizontal sync.  
-short: picture is shift to right.

R401, D402, C403  
Vcc smoothening  
and stabilization  
-D402 short: only single  
horizontal line  
-C403 short:

R402, C405  
Integrating circuit  
(vertical sync signal take-off)  
-C405 short: faulty vertical sync.  
-C404 open:  
-C405 open: when V HOLD VR is turned fully  
right, it is possible to fold back  
at a small amplitude (approx. half)

FR401, C412  
R414, C408  
Smoothing  
-FR401 open: vertical amplitude  
R414 open: is small.  
(approx. 1.5cm)

R415  
Base bias resistance  
of X401  
open: vertical amplitude  
is small.  
(approx. 2cm)

C401  
Condenser for preventing  
vertical amplifier oscillating

C407  
Smoothing condenser for DC voltage negative  
feedback  
-open: vertical amplitude is small (approx. 6cm)  
-short: only single horizontal line

X401, D401, C408  
Vertical output  
-X401 open: vertical amplitude is  
small; image appears  
below center of CRT.  
-D401 short:  
-C408 short:

R410  
AC current detection resistor  
-open: only single horizontal line  
(horizontal line is kicks upwards  
in about 1 second)

R405  
Discharge resistor for vertical  
oscillation condenser  
-open: only single horizontal line.  
(image appears at top half of  
screen at intervals of about  
one second)

X501  
Horizontal drive  
-open: no raster  
-short: no sound

D506  
Prevention of capacitor dropout  
due to application of reverse  
polarity voltage to C517 and C518

HA11244 TROUBLE SYMPTOM OF PRESUME

< HORIZONTAL CIRCUIT >	< VERTICAL CIRCUIT >
- H. oscillation stop (no raster, no sound)	- V. oscillation stop (single horizontal line)
- faulty H. sync.	- faulty V. sync.
- abnormal H. oscillation	- faulty V. amplitude
	- faulty V. linearity

**CIRCUIT NOTES**  
Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.

X701  
X-Ray protector  
- @ @ short: no raster  
- @ D short: no sound  
- C507, R16, R25  
Sawtooth wave phase  
adjustment  
- C507 open: image shift  
to left

C503, C504, R501  
H AFC output voltage  
smoothing circuit  
- C504 open: faulty horizontal  
sync. of top half.  
- R501 open:  
- C504 short: faulty horizontal  
sync.

C505, R508  
Sawtooth wave generator  
circuit for comparison wave  
- C505, R508 open: faulty horizontal  
sync.  
- C505 short:

D505  
Pulse amplitude limiter  
- open: image shift to right  
- short: faulty horizontal sync.

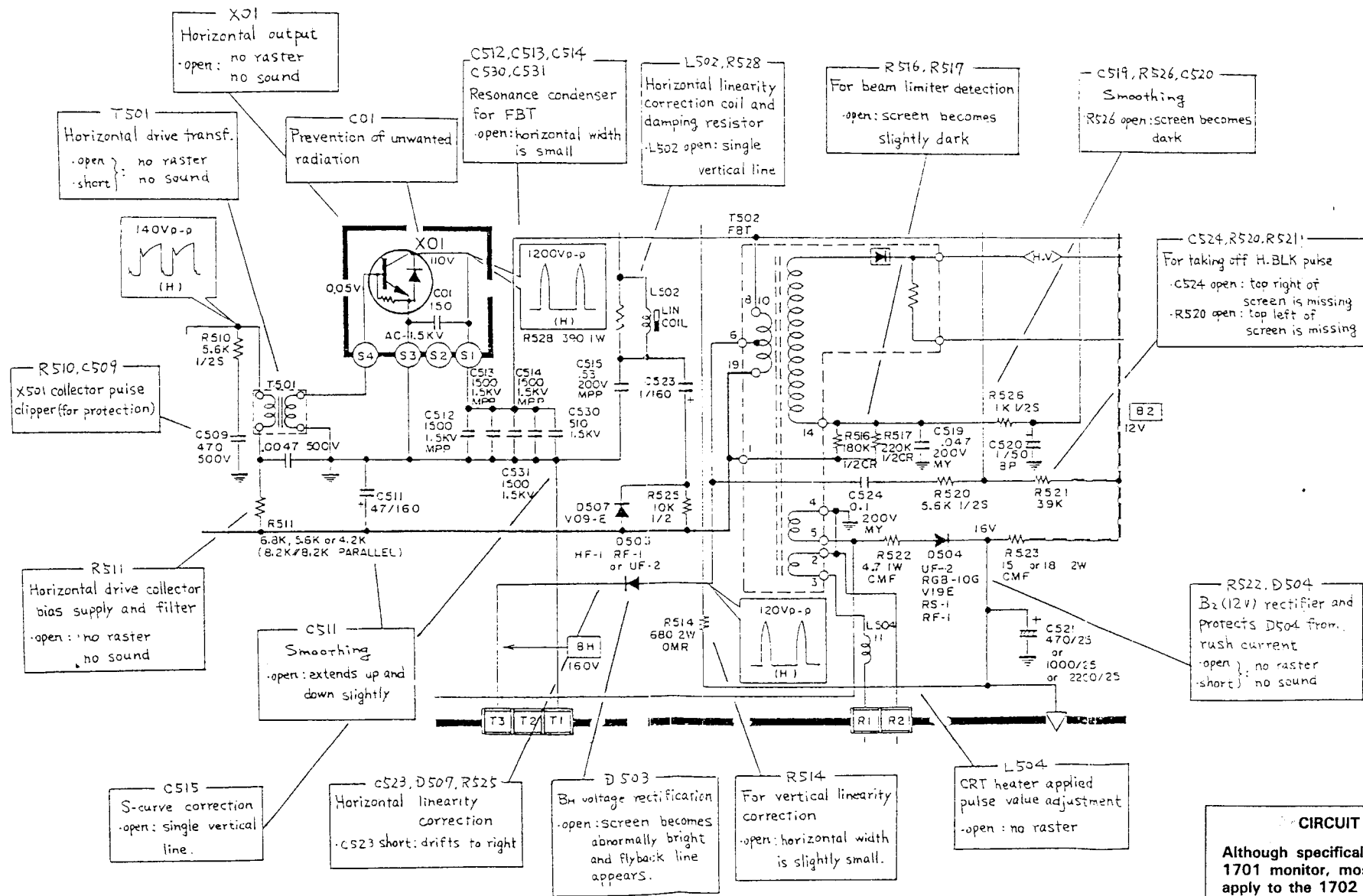
R701, R703, R704  
C701, D701  
Abnormal B1 voltage  
detection  
- R704 open: no raster  
- D701 short: no sound

R527, C527  
Pulse phase setting  
- R527 open: image shift  
to right  
- C527 open:  
- C527 short: faulty horizontal  
sync.

C508, R503, R504  
Horizontal oscillation element  
- C508 open: no raster  
no sound

R502  
H AFC output injection resistor  
- open: faulty horizontal sync.

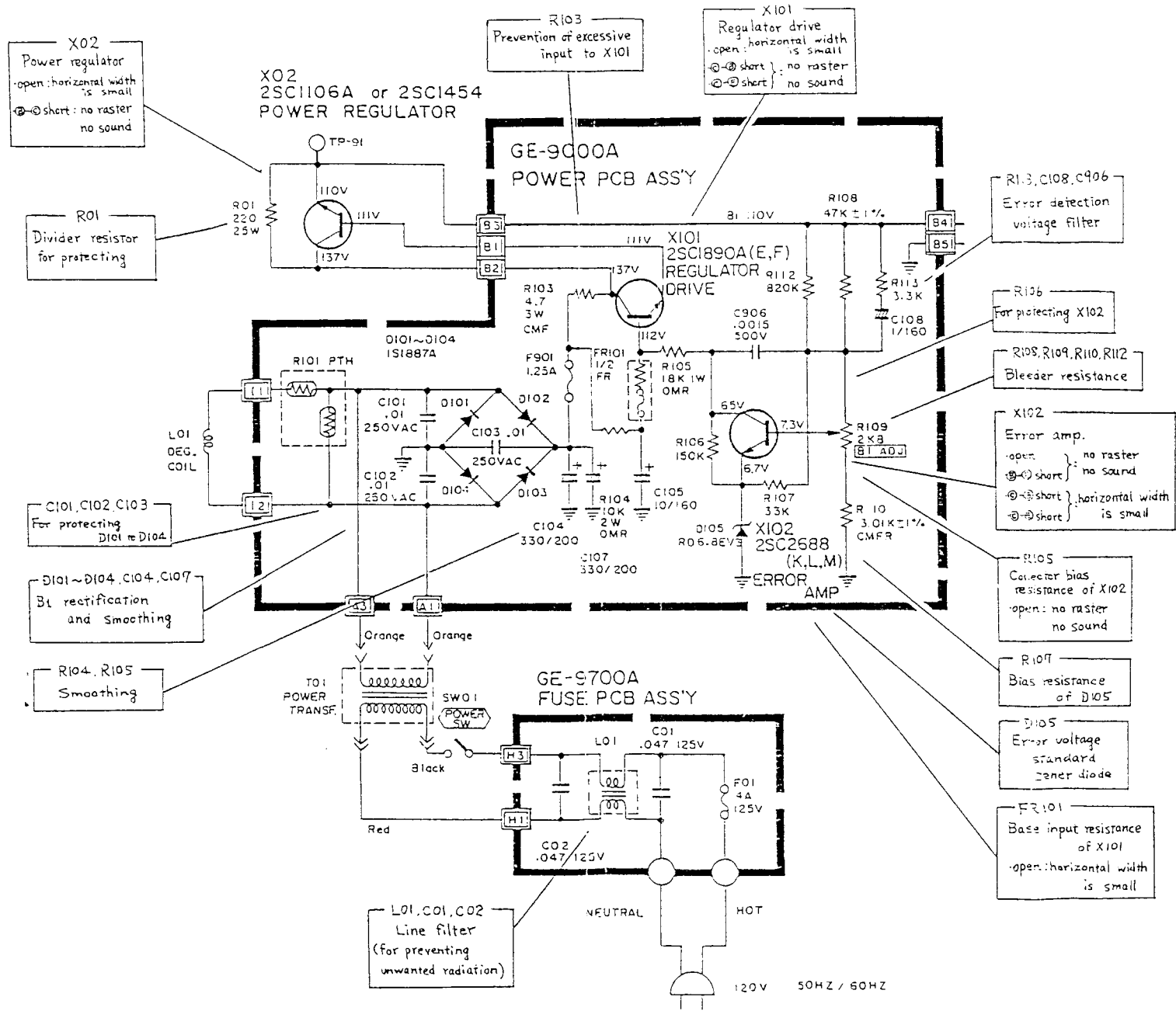
# HORIZONTAL OUTPUT CIRCUIT



**CIRCUIT NOTES**

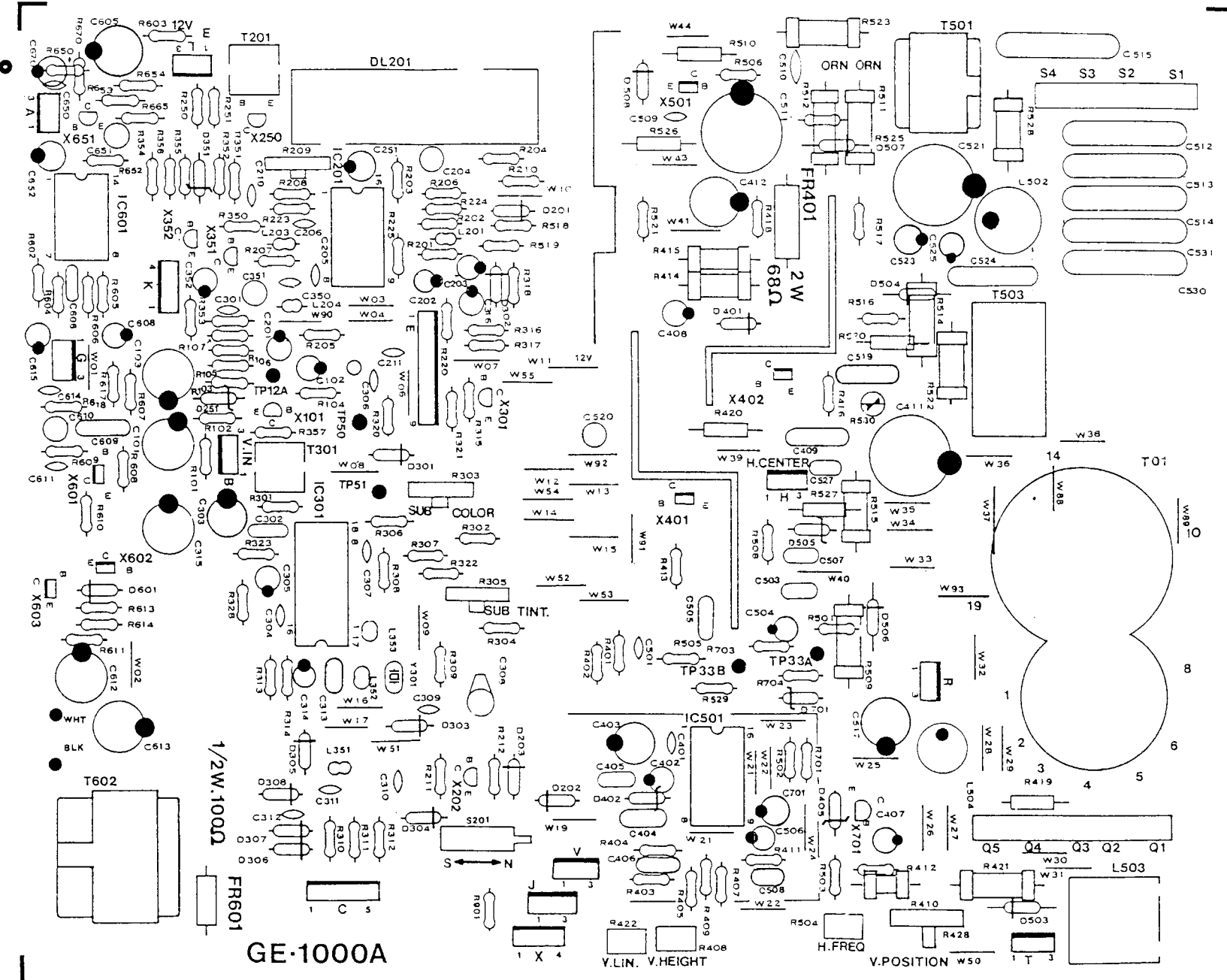
Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.

# POWER CIRCUIT



**CIRCUIT NOTES**

Although specifically written on the 1701 monitor, most circuit theories apply to the 1702 also. Refer to the 1702 schematic for differences in component values and identification.



GE-1000A

V.LIN. V.HEIGHT

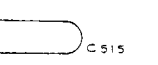
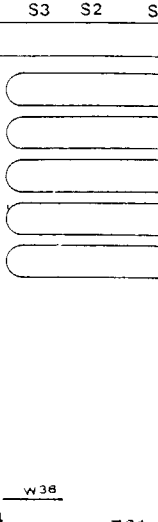
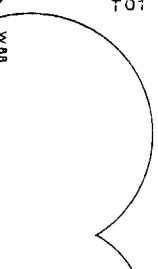
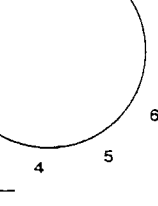
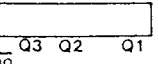
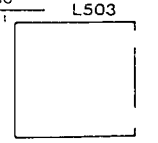
H.FREQ V.POSITION

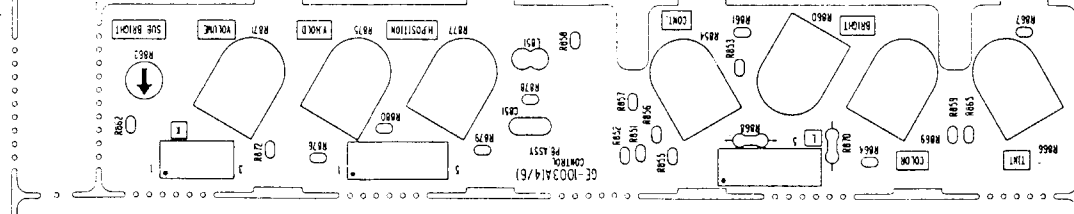
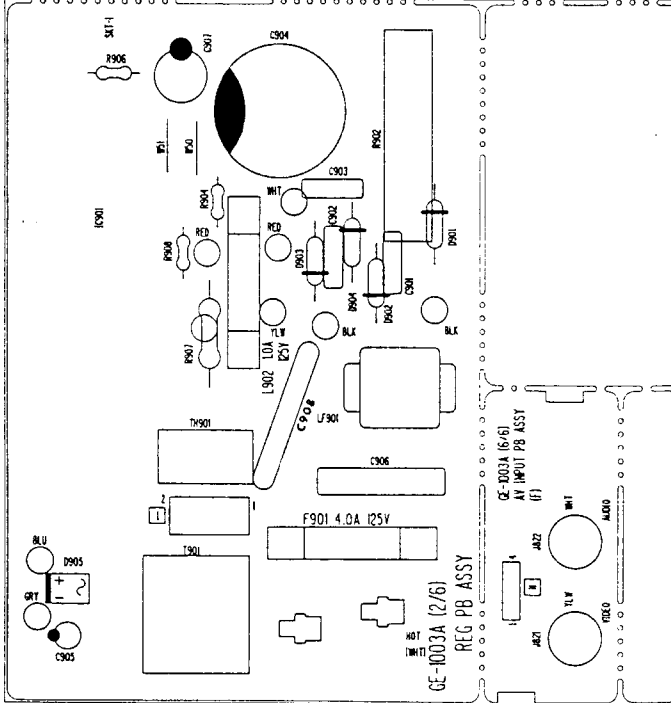
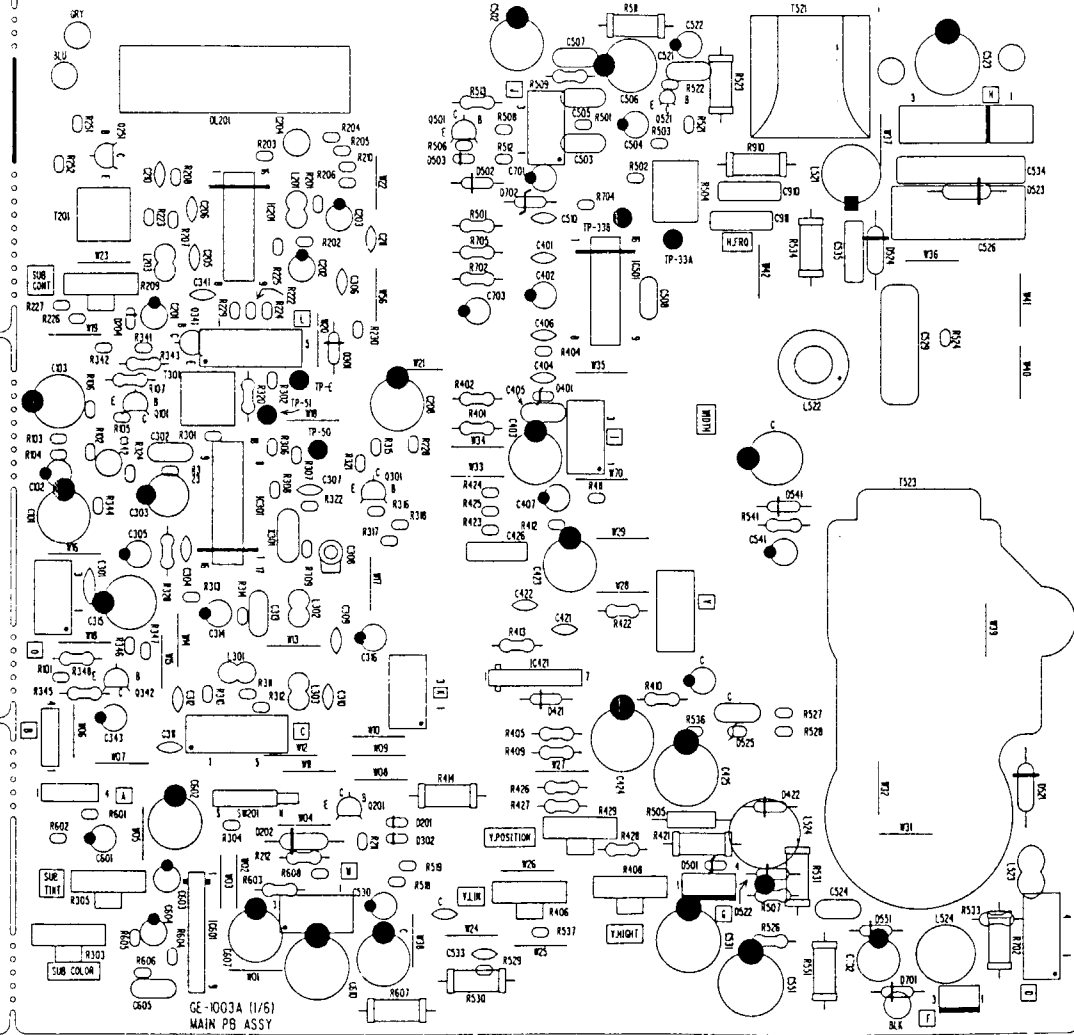
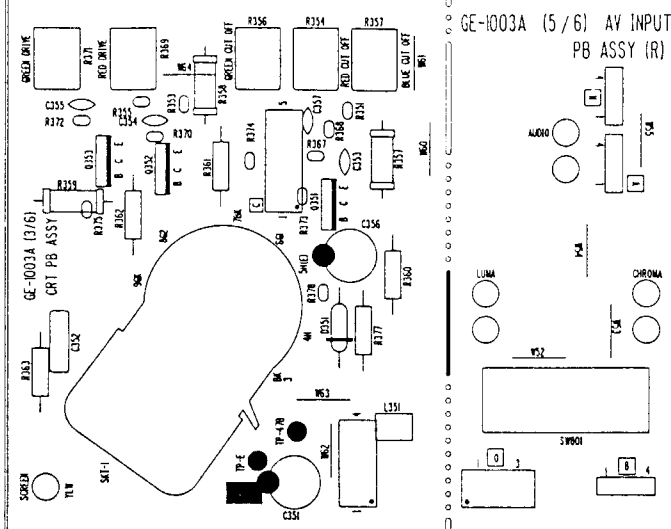
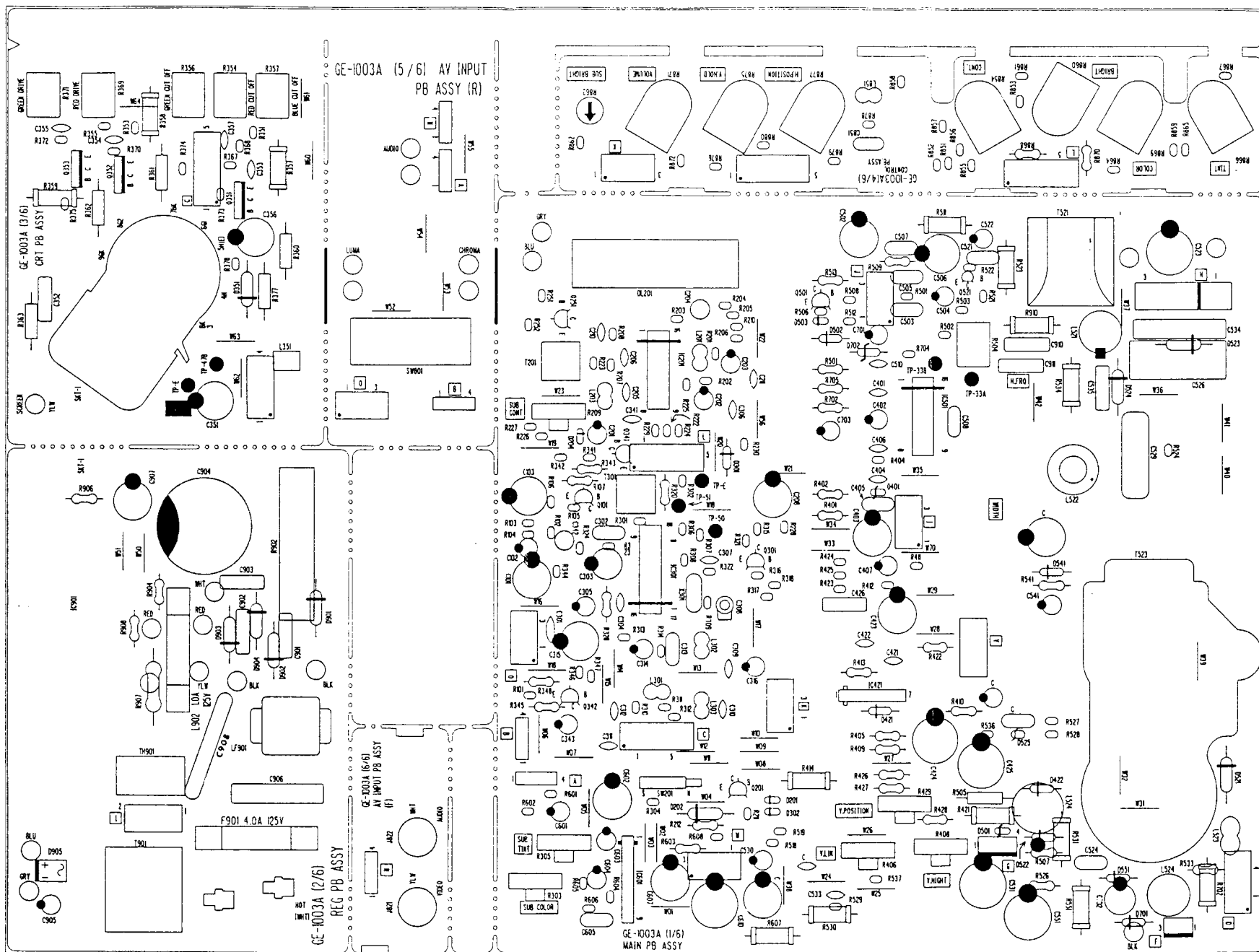
1/2W.100Ω

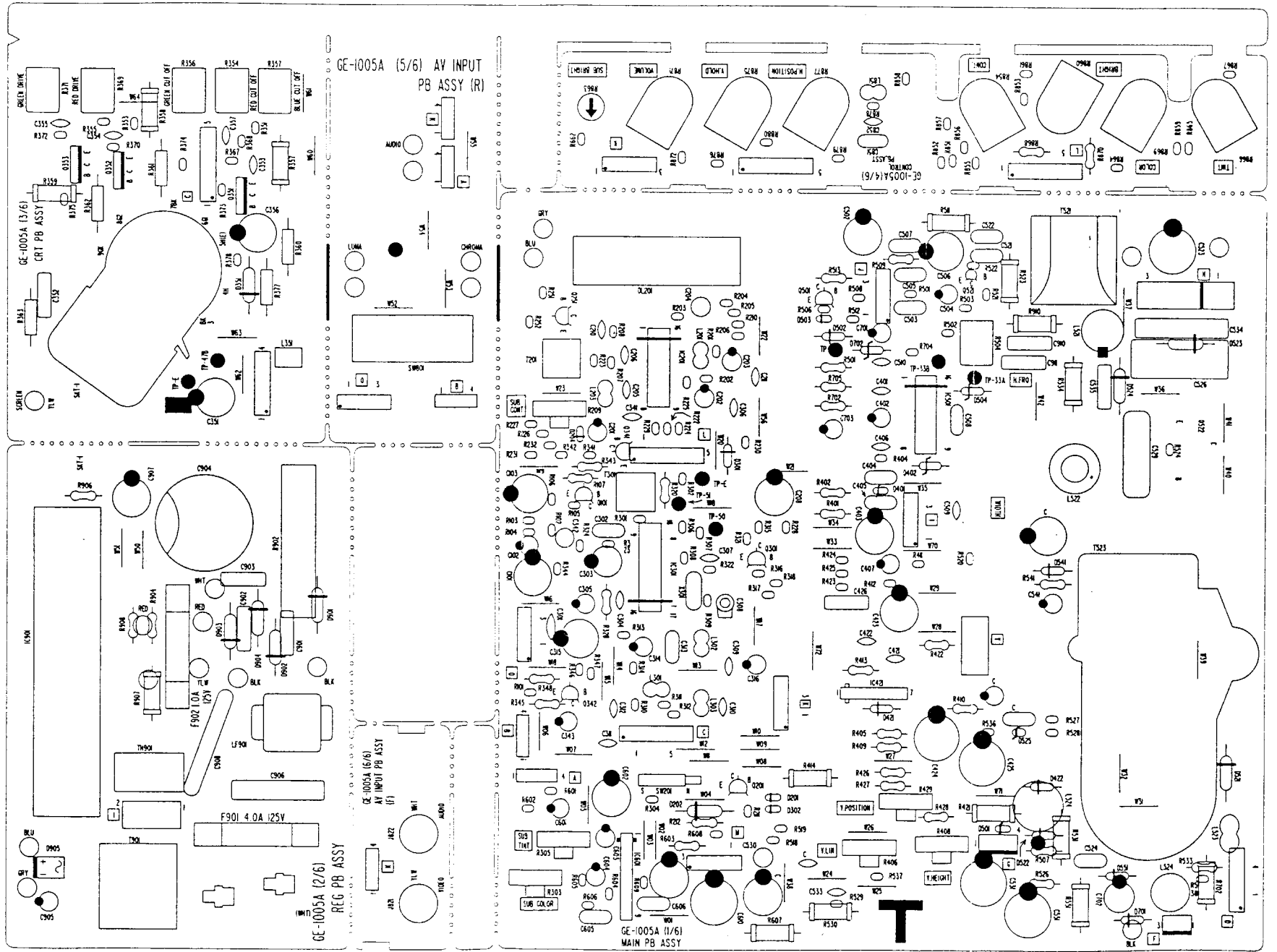
FR601

1 X 4

1 T 3







GE-1005A (5/6) AV INPUT  
PB ASSY (R)

GE-1005A (3/6)  
CRT PB ASSY

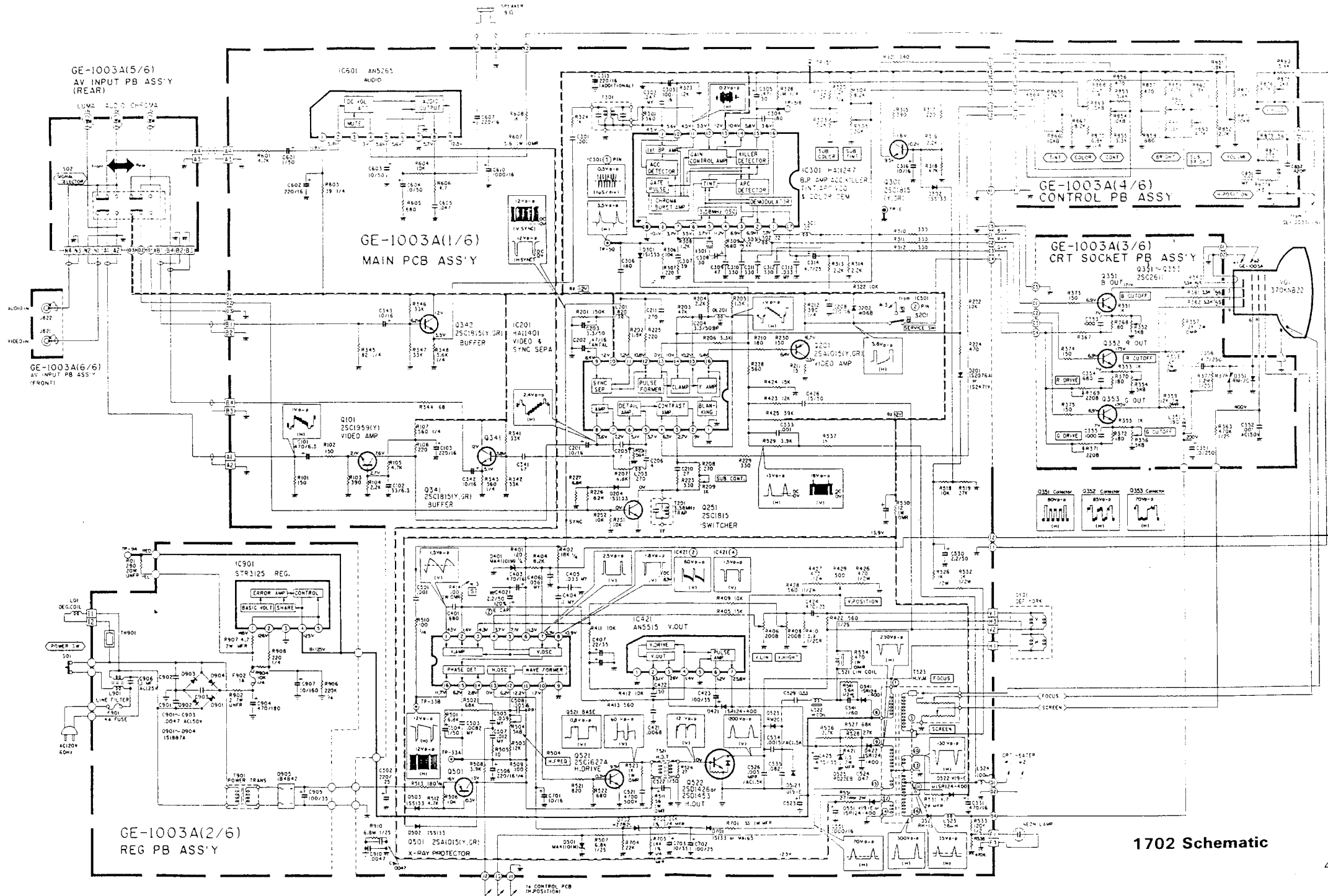
GE-1005A (6/6)  
AV INPUT PB ASSY

GE-1005A (2/6)  
REG PB ASSY

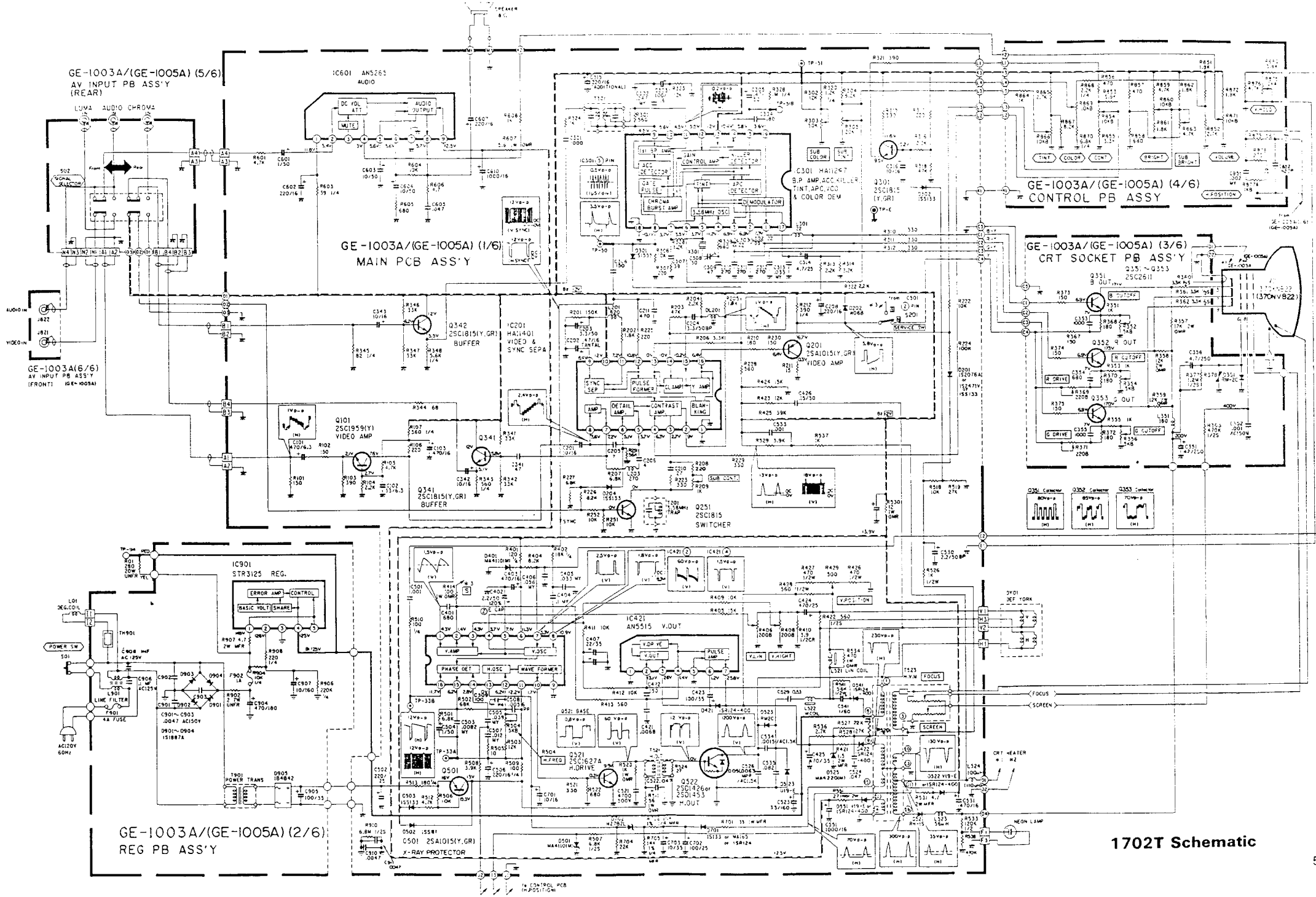
GE-1005A (1/6)  
MAIN PB ASSY

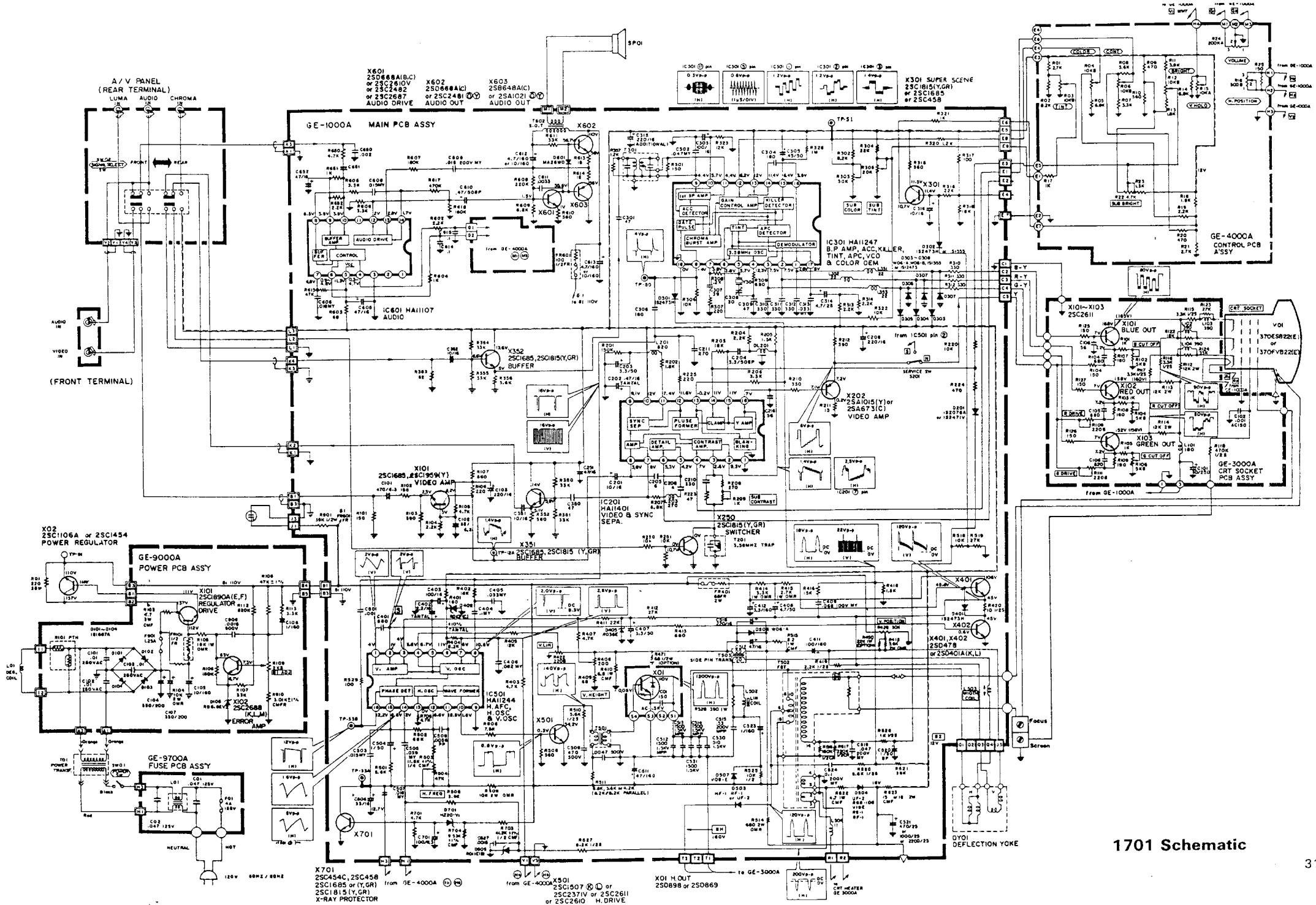
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1702 Schematic





1701 Schematic