NEC

MODEL JC-1203DHE

12" COLOR CHARACTER DISPLAY UNIT

SERVICE MANUAL

ORDER NO. 599910206

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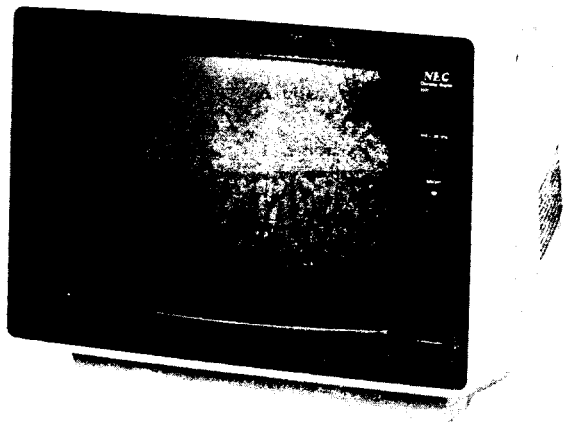


SPECIFICATIONS

Picture Tube	320CGB22 12" diagonal & 76° deflection Dot type black matrix
Input Signal	R.G.B. direct drive system
Video Signal	TTL level, Positive
Vertical Sync.	TTL level, Negative/Positive (Switchable)
Horizontal Sync.	TTL Level, Negative/Positive (Switchable)
Intensity	TTL level
Input Terminal	8-pin Connector
Scanning Frequency:	
Horizontal	15.75 kHz (63.5 μS)
Vertical	60 Hz (16.67 ms) 50 Hz (20.0 mS)
Active Video Period:	
Horizontal	48.0 μS max. 48.0 μS max.
Vertical	15.24 mS max. 17.78 mS max.
Resolution:	
Horizontal	690 dots 690 dts
Vertical	240 lines 280 lines
Active Display Area	215(W) x 160(H) mm
Misconvergence	Center: within 0.6 mm Circumference: within 1.1 mm
Display Colors (without intensity control)	Red, green, blue, yellow, cyan, magenta, black, white
Display Characters	80 characters with 25 rows –8 x 8 dots
Controls:	
Inside	H. width, V. height, H. center, V. center, Focus
Outside	Brightness, H. hold, V. hold
Operating Ambient Temperature	0° ~ +40°C
Power supply	220V or 240V AC (±10%) 60 Hz/50 Hz
Power Consumption	67W
Dimensions	378(W) x 307(H) x 413(D) mm
Weight	11.7 kg

NOTE: The above specifications are subject to change without notice for further improvement.

NEC Corporation
TOKYO, JAPAN

LOCATION OF CONTROLS

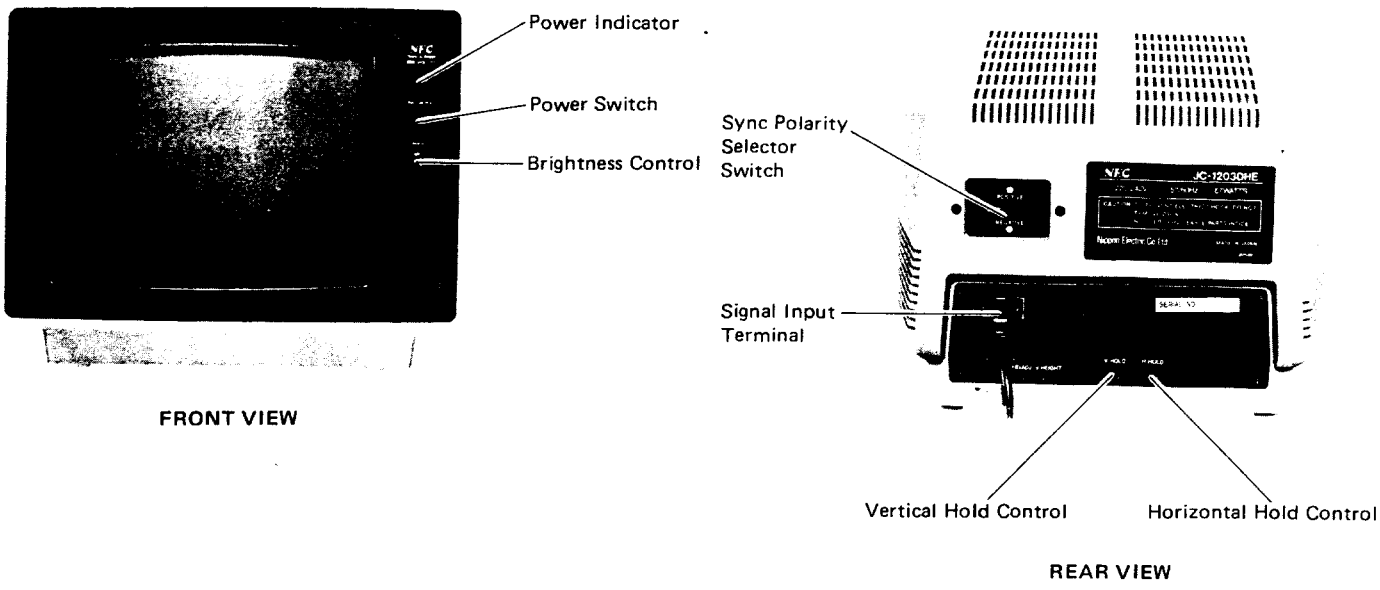


Fig. 1

DISASSEMBLY

BACK COVER REMOVAL

Remove three back cover mounting screws (A), (B) and (C), then take off back cover.

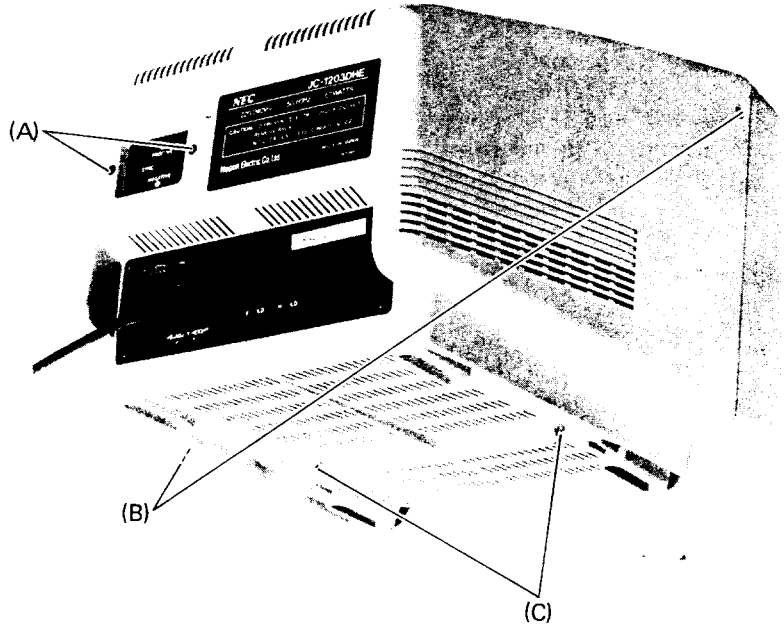


Fig. 2 Cabinet Rear View

PARTS LOCATION

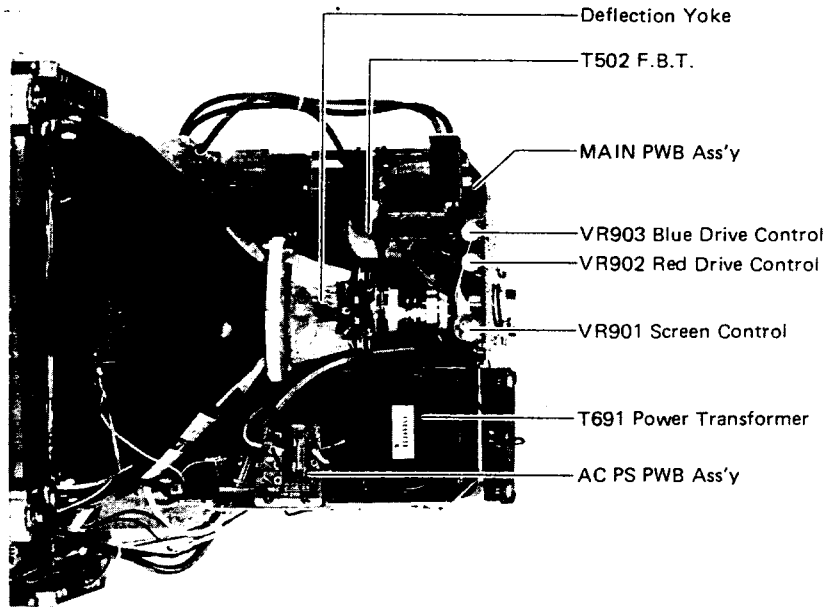


Fig. 3 Top View

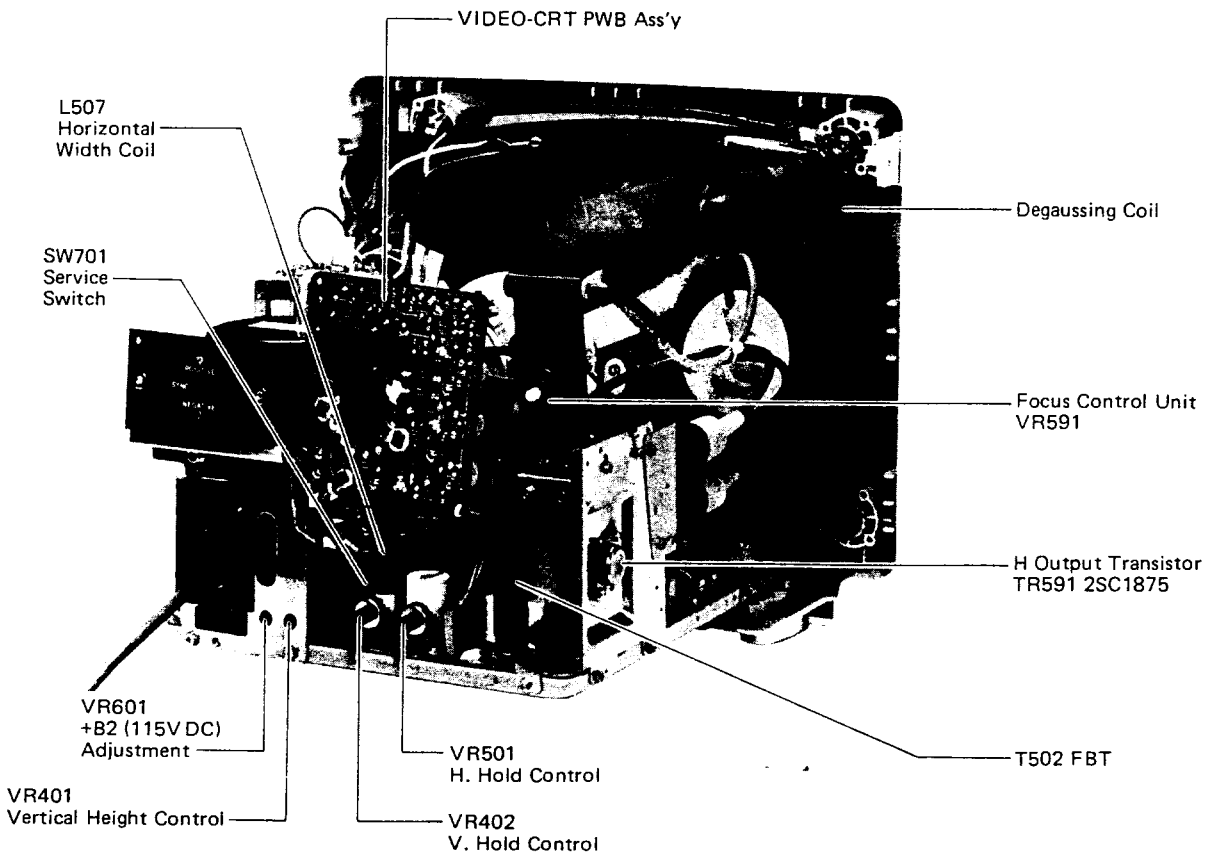


Fig. 4 Rear View

OPERATION OF EACH UNIT

1. Power Switch Knob (PULL ON)
   Pull knob to turn display "ON". Power indicator will illuminate. This display is equipped with Quick Start system Picture Tube. The display operates immediately the knob is pulled.
2. Brightness Control Knob (BRIGHT)
   This knob, turned clockwise, will make the screen brighter. Adjust the optimum level according to the ambient brightness.
3. Horizontal Hold Control Knob (H. HOLD)
   If horizontal stripes are seen in the picture, turn this H. Hold knob slowly and adjust it until the picture becomes stable.
4. Vertical Hold Control Knob (V. HOLD)
   If a picture rolls or flips, rotate the Vertical Hold Control to stabilize vertical movement.
5. Input Terminal (8-Pin Socket)
   This is used as the input terminal. An 8-Pin connector cable (optional see Fig. 8) must be used for connection.
6. Sync. Polarity Selector
   Select position "Negative" or "Positive" of Sync. Polarity Selector. The polarity of sync signal output is different for each type of computer or other equipment.
   ex. NEC PC-8001B : Negative
   IBM Personal Computer : Positive
7. Intensity Control
   The Intensity control signal is applied to Pin #1 of the 8-Pin connector.
   The brightness of screen is high when the intensity control (TTL Level) input is "High" or "Open".
   The brightness of screen is low (gray) when the intensity control input is "Low" or "Grounded".
8. Use the 60 Hz (16.67 ms) vertical frequency when vertical resolution of 240 lines is sufficient.
   If vertical resolution of 280 lines is required, use the 50 Hz (20.0 ms) frequency.
   The vertical hold is factory-preset at 60 Hz. Therefore, both vertical hold and vertical height must be readjusted when you operate at the 50 Hz vertical frequency.

Note 1. For normal use of displayed character or 8-color displayed graphics, Intensity control input should be "high" or "open-No Connection".

Note 2. When combined with the IBM Personal Computer, next command should be keyed in immediately after switching the power the IBM Personal Computer "ON". Because initial set up condition of intensity control output is "low", and brightness of screen is "dark", input the command COLOR 15, 0, 0.

HIGH-RESOLUTION COLOR DISPLAY TUBE 320CGB22

The 320CGB22 tube is a 76-degree deflection, 12-inch CRT with a neck diameter of 29.1 mm. Its electron guns are arranged in-line, and it does not require any convergence correction circuit because the guns are of the selfconverging type. The deflection yoke and other neck components are factory-adjusted.

The high resolution of this tube is achieved by increasing the number of phosphor dots on the screen to as many as 2,160,000 and by using high-precision high-resolution guns in the in-line guns. Moreover, a high degrees of brightness and contrast are assured by using a face plate of 85% transmittance over the black matrix screen of negative guard band type.

IMAGE INPUT SIGNALS

The following are the recommendable signal wave patterns and timing charts.

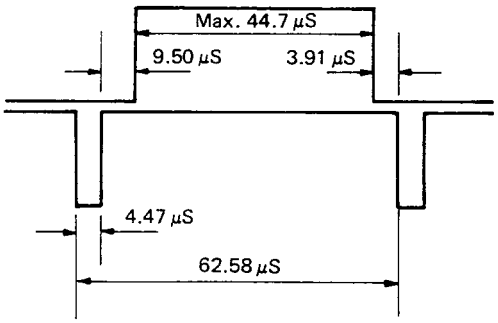


Fig. 5 Horizontal Synchronization

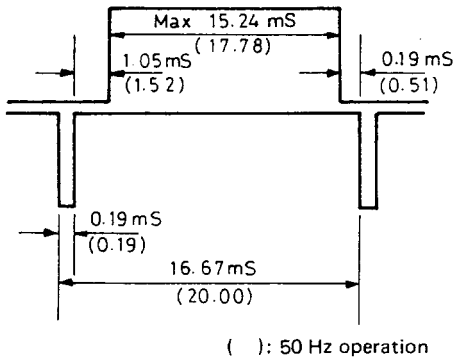


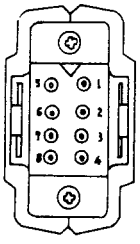
Fig. 6 Vertical Synchronization

METHOD OF CHANGING LINE VOLTAGE

Power supply is 220/240 volts. This set is factory preset for 220V operation.

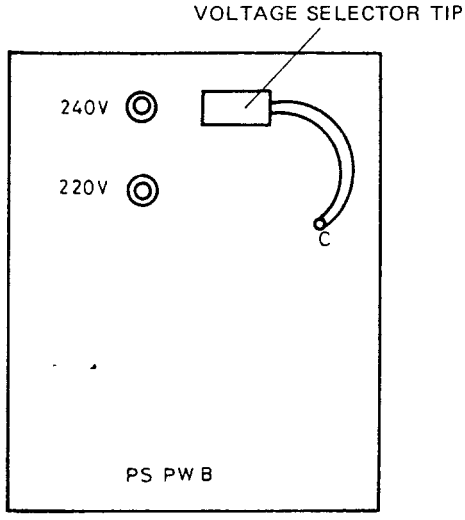
If your local power supply is 240V, reconnect the voltage selector tip as discribed.

1. Remove the back cover.
2. Disconnect the voltage selector tip from the 220V pin on the PS PWB.
3. Reinsert the voltage selector tip to the 240V pin on the PS PWB.

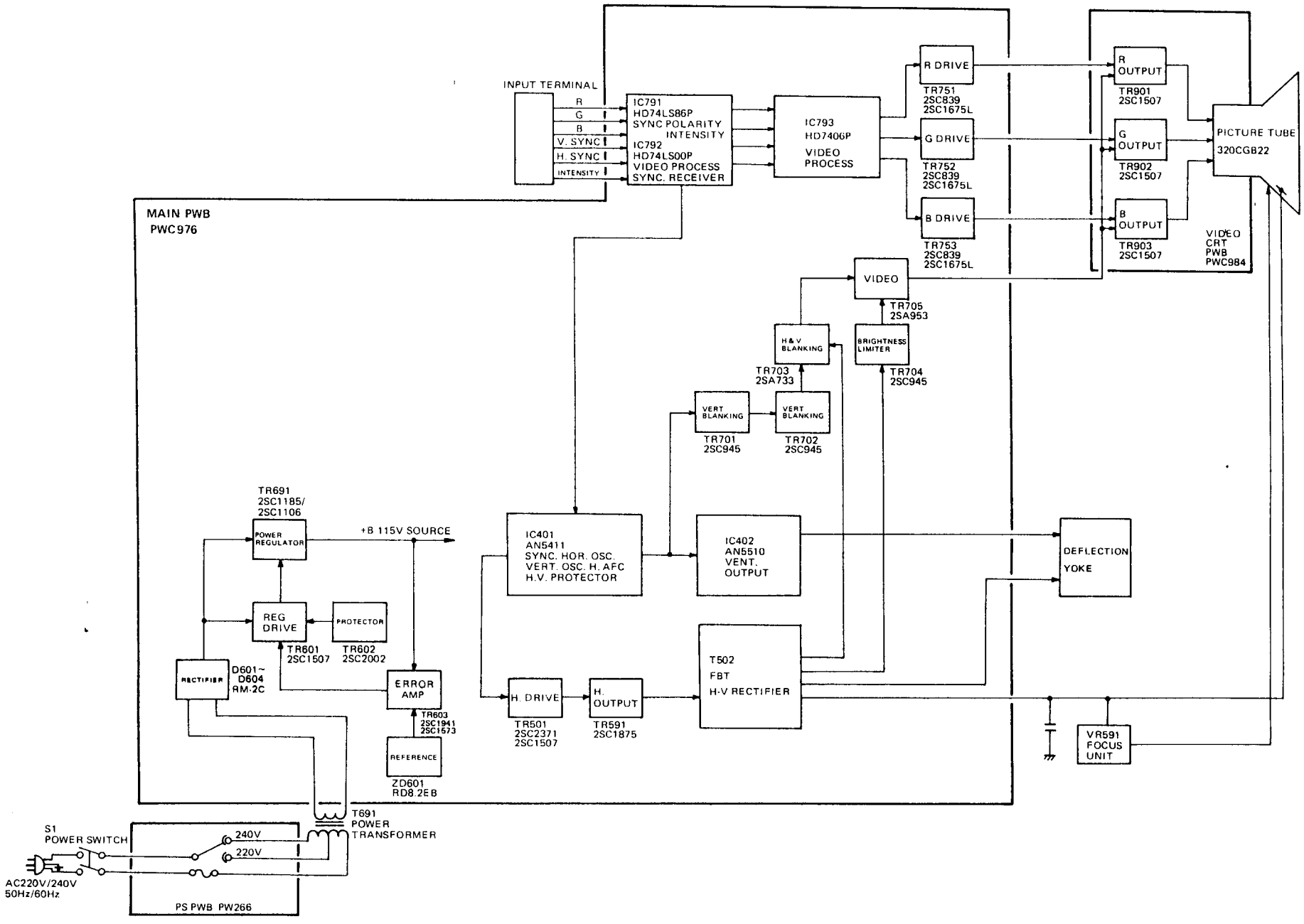


1. Intensity Control Input
2. Red INPUT
3. Green INPUT
4. Blue INPUT
5. GND
6. GND
7. Horizontal Sync. INPUT
8. Vertical Sync. INPUT

Fig. 7 Pin connection of 8-Pin connector cable



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Note: This is a basic description. Some values and/or circuites may be different in each models.

AC POWER SUPPLY

The AC line voltage is applied to the PS PWB (PWC-266) via terminals D and H, to the power transformer (T691). The power transformer steps down the AC line voltage to 115V for +B and the indicator lights.

A posistor (TH601) is in series with the degaussing coil which is across the AC line. Initially, when the receiver is turned "ON" and the resistance of the posistor is low, it causes current to flow through the degaussing coil and the demagnetizing action occurs. As the posistor heats, its resistance increases to the point that the current flow through the degaussing coil becomes negligible.

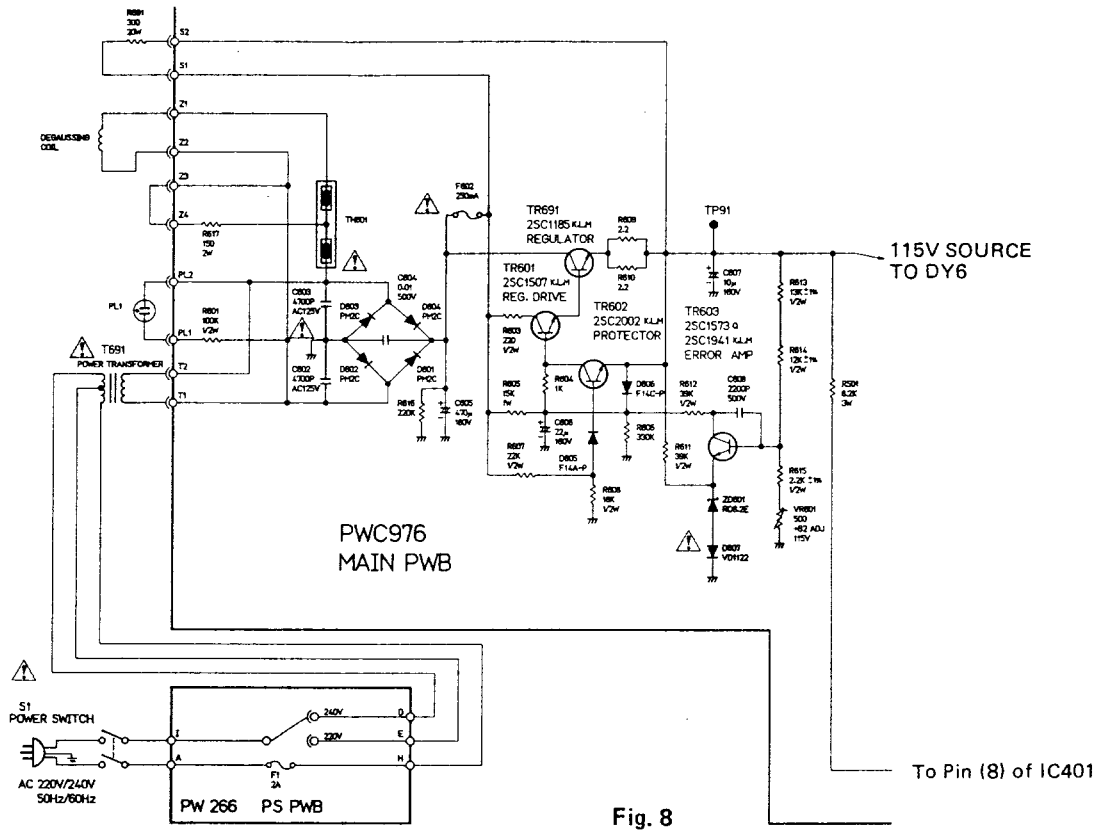


Fig. 8

DC POWER SUPPLY

1. The AC line voltage is applied to connectors "T_1" and "T_2" on the MAIN PWB (PWC-976) from the Power Transformer (T691). The AC line voltage is fed to the fullwave bridge (D601 ~ D604) and filter circuit. The rectified DC output is fed from the filter circuits through the series power regulator transistor (TR691). At the +B output, an electronic ripple filter assures clean DC output. The +B adjustment contol (VR601), in the base circuit of the error amplifier transistor (TR603), is adjusted to obtain a voltage reading of 115V DC at terminal "TP91". In the event of an increase or a decrease in the +B voltage at that terminal, the base voltage on TR603 will change resulting in a change of the collector current in TR603. The corresponding change in the TR603 collector voltage is applied to the base of the regulator drive transistor (TR601).

   The TR601 is the only path available by which to obtain base bias for the series regulator transistor and control its condition. In the case of a rise in the +B output, the following sequence of events occur. The base voltage of TR603 increases, increasing the collector current and therefore the collector voltage decreases. This decreasing voltage is applied to the base of the regulator drive transistor (TR601), reducing its conduction.

   TR601 is an emitter follower and when the base voltage decreases, the emitter voltage also decreases. This decreasing of emitter voltage is applied to the base of the series regulator transistor, reducing the current flow through it. The series regulator transistor is also an emitter follower and when its base voltage decreases, its emitter voltage also decreases.

VIDEO INPUT SECTION (See Fig. 10)

This section amplifies and intensity-controls the R, G, B, output signals of the character generator to a level high enough to drive the video output circuit. How this is accomplished will be explained by considering one of the three circuit for the RED, GREEN, and BLUE video signals. Since these three circuits are identical, let's consider the RED signal.

This input signal is a TTL level signal, positive in polarity. It enters IC792 at pin 5 and comes out, inverted, at pin 6. From pin 6 it is applied to pin 5 of IC793. IC793 is essentially an inverter with open collector. When its output pin 6 is HIGH, the base of TR751 will be at the collector voltage (10V) of this transistor; when pin 6 goes LOW, the base of TR751 will shift to 5V, a divided voltage through R752 and R751. Consequently, an amplified signal of approximately 5Vp-p shows up at the emitter of TR751. This amplified signal is applied to the VIDEO OUTPUT stage. This condition is based on the fact that pin 8 of IC793 is HIGH.

This video input circuit also has a means to control the amplitude of the output amplifiers in order to produce 15 colors at the CRT screen. We will now consider this intensity control circuit.

The intensity signal input is pin 1 of the 8 pin signal input connector, (terminal C2 on PWD-227). This signal is also a TTL level and enters IC791 and exclusive OR gate at pin 1 and outputs at pin 3 of IC791. From pin 3, it is applied to pin 9 of IC793. Pin 8 (open collector) is the output for the intensity control signal. When intensity control input is HIGH (pin 8 of IC793 is also HIGH), the 5Vp-p video signal described above appears at the emitter of TR751. This is the highest voltage swing available, therefore maximum drive to the CRT and maximum brightness of the screen.

When intensity control input is LOW and the video signal (RED) input is HIGH, the base voltage of TR751 becomes slightly smaller now, being a divided voltage through R752, R751, and R793. The emitter voltage of TR751 will not be approximately 3.6Vp-p (75% of max swing) and the brightness on the CRT screen will be approximately 50% of the maximum brightness level.

When the intensity control signal and video signal (RED) are both LOW no light output is available due to CRT cut off. When the intensity control input signal is "HIGH" and the video input signal is "LOW", pin 6 of IC793 will be LOW, therefore output pin 8 of IC793 will not have any control of the base voltage of TR751. The control of TR751 base will be from IC793 pin 6 at a low, therefore the CRT will be at cut off, and therefore no light output.

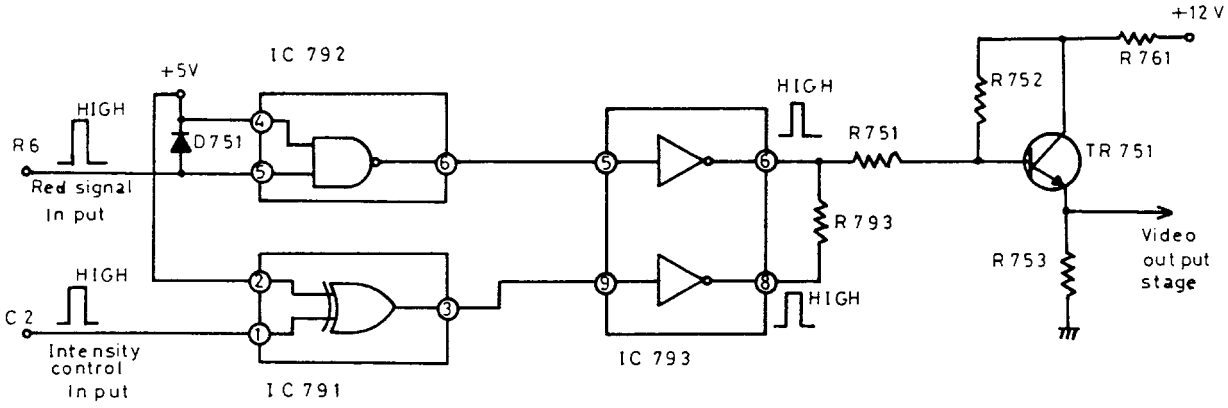
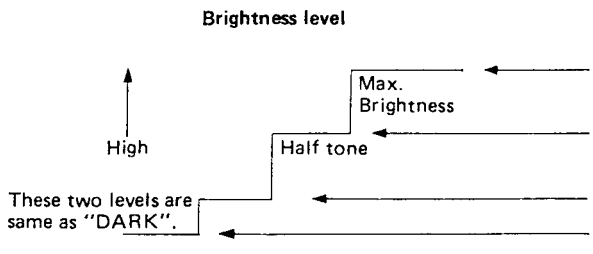


Fig. 10

VIDEO INPUT CIRCUIT & BRIGHTNESS LEVEL



W/Intensity Control		W/O Intensity Control	
Intensity Control	R/G/B Signal	Intensity Control	R/G/B Signal
HIGH	HIGH	OPEN (HIGH)	HIGH
LOW	HIGH	X	X
HIGH	LOW	OPEN (HIGH)	LOW
LOW	LOW	X	X

SYNC. RECEIVER (See Fig. 11)

The sync circuit receives a separate TTL level sync signal (HD) and vertical sync signal (VD), both of either positive or negative, polarity selectable with the sync polarity switch on the back panel of the cabinet.

When HD and VD are both positive sync signals, from the character generator/personal computer etc., the sync polarity selector should be positioned, "POSITIVE". The sync polarity selector switch is now open, and pin 9 and pin 13 of IC791 are HIGH. IC791 is an "EXCLUSIVE OR" gate and output pin 8 and pin 11 will both be negative pulses. These negative pulses are applied to input pin 13 and input pin 12 of IC792. Output pin 11 which will be composite sync pulses are applied through C758 and R778 to pin 24 of IC401 for sync processing. (Refer to sync/osc circuit description).

When VD and HD are both negative sync signals, from the character generator/personal computer. The sync polarity selector switch should be positioned "NEGATIVE" in this case the sync selector switch is "CLOSED" and pin 9 and pin 13 of IC791 are both grounded (LOW) and the output pulse polarity of pin 8 and pin 11 will both be negative. With negative pulses at the input of IC 792 the output will be positive composite sync applied through C758 and R778 to pin 24 of IC401 for sync processing. (Refer to sync/osc circuit description).

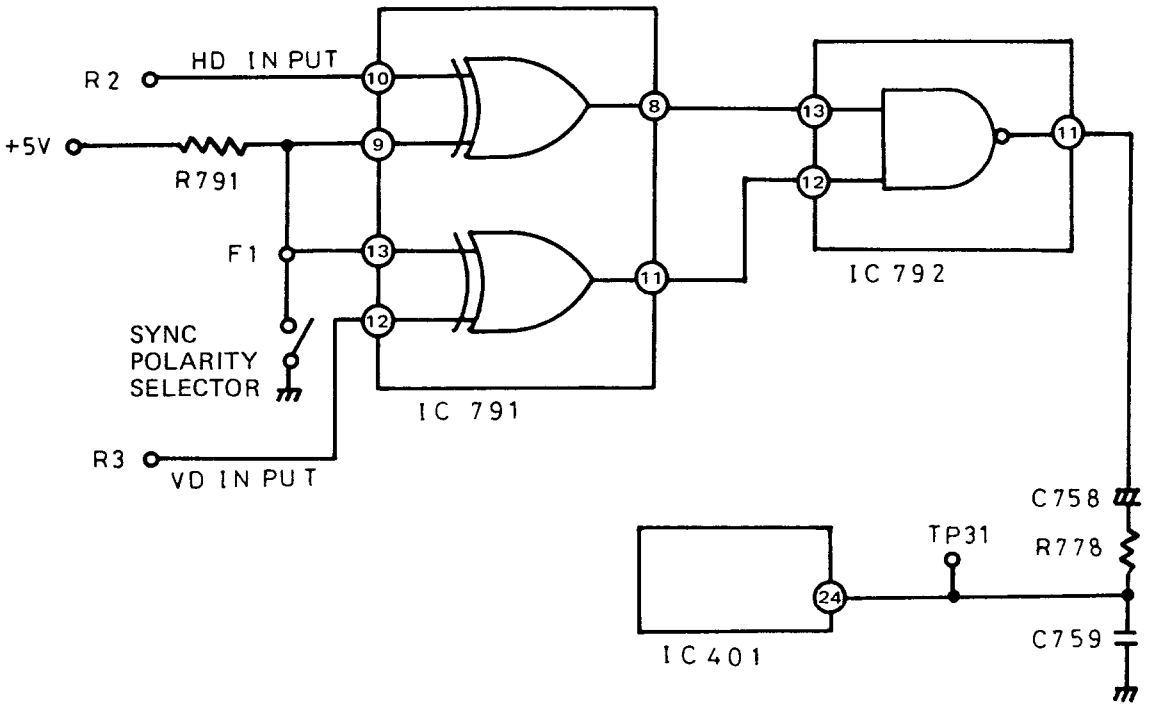


Fig. 11

SYNC. RECEIVER CIRCUIT

Input signal polarity	SYNC. POLARITY SELECTOR SWITCH	#8, #11 pin output of IC791	#11 pin output of IC792
POSITIVE	OPEN (#9, #13 pin of IC791 HIGH)	NEGATIVE	POSITIVE
NEGATIVE	CLOSED (#9, #13 pin of IC791 LOW)		

VIDEO OUTPUT

The voltage and signals required to operate the CRT are integrated on the VIDEO CRT PWB (PWC-984). The board contains three bias controls; RED bias (VR904), GREEN bias (VR905) and BLUE bias (VR906), and two drive controls; RED drive (VR902) and BLUE drive (VR903).

The RED, GREEN and BLUE signals are directly coupled from R, B and G amplifiers on the MAIN PWB (PWC-976) and the luminance signal also directly coupled from the output of video output transistor (TR705) on the MAIN PWB (PWC-976).

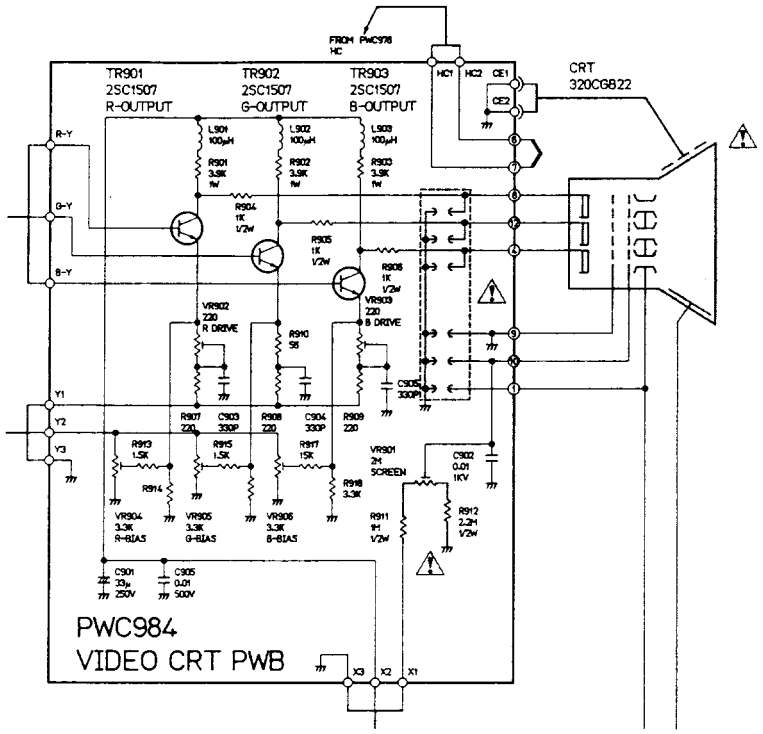


Fig. 12

DESCRIPTION OF IC401 (AN5411)

This IC contains all the circuits for sync separation, oscillations for horizontal and vertical deflections and AFC and HV protection. Its input is a composite sync signal, which is input through R778 and C758 to pin (24).

The input signal is first applied to the sync separation circuit, and the sync signals are separated and taken out for application to the horizontal AFC and vertical trigger pulse. C405, connected to pin (21), is an integrating capacitor for separating vertical sync pulses.

C401, R401 and VR402, connected to pin (19), provide the time constant of the vertical oscillation circuit: the frequency of this oscillation can be varied by adjusting VR402, C402, connected to pin (13), is the capacitor for the generation of sawtooth wave.

The time constant of the horizontal oscillation circuit is determined by C504 and C505, connected to pin (7), and R507, R506, R521 and VR501, connected to pin (6). The frequency of horizontal oscillation can be changed by means of VR501.

The 110 Vp-p pulses occurring in the secondary winding of FBT and available at pin (5) are input as pulses for sawtooth wave generation through C510 and pin (1) of IC401. These pulses after integration in C506 connected to pin (2), are applied as the comparison signal through C505 and pin (3) to the horizontal AFC circuit.

The voltage resulting from comparison and detection is taken out through pin (5), smoothed by C507, C508 and R508, and fed as the horizontal AFC voltage to the oscillation circuit through R505.

The X-ray protection circuit operates by shutting down the horizontal oscillator in reference to a voltage produced by rectifying the flyback pulse. This scheme, based on the fact that the flyback pulse and high voltage (anode voltage) are proportional works in the following manner: Flyback pulse with positive polarity are rectified by D2001 and C2003, and the resulting DC voltage is applied to pin (12) of IC401. When the high voltage exceeds the limit, the DC voltage will be so high as to shut down the horizontal oscillator. The loss of this oscillation results in the loss of raster, but the 115V DC power supply remains unaffected.

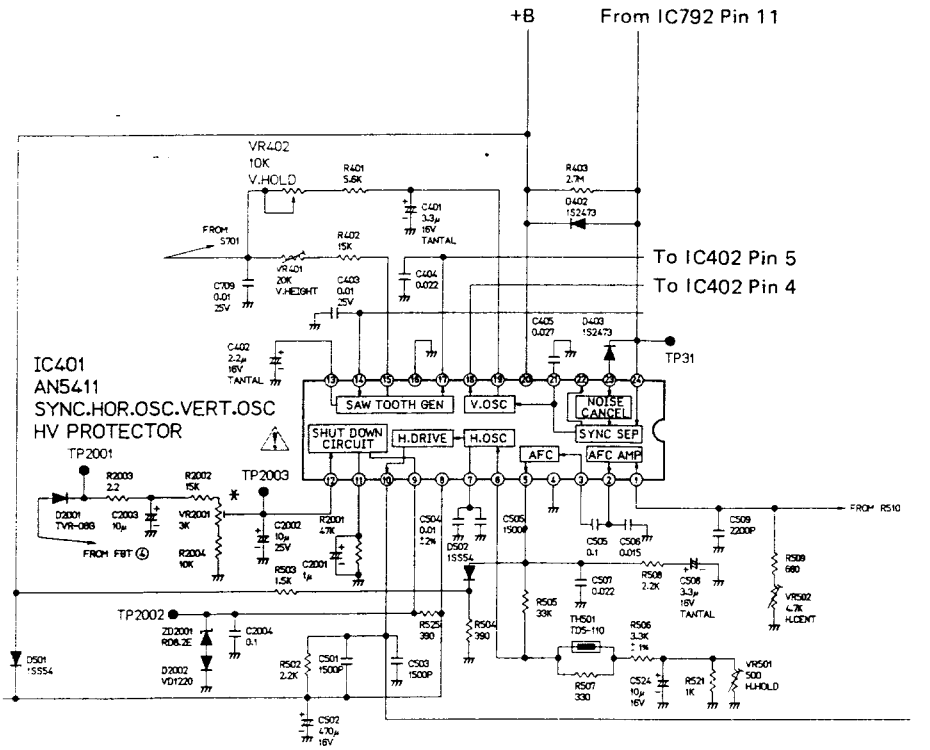


Fig. 13 SYNC, HOR. OSC, VERT. OSC, HV PROTECTOR, H. AFC

DESCRIPTION OF μPC1358H (AN5510)

The μPC1358H is an IC chip comprising two circuits: the push-pull OTL vertical output circuit and retrace suppression signal amplifier.

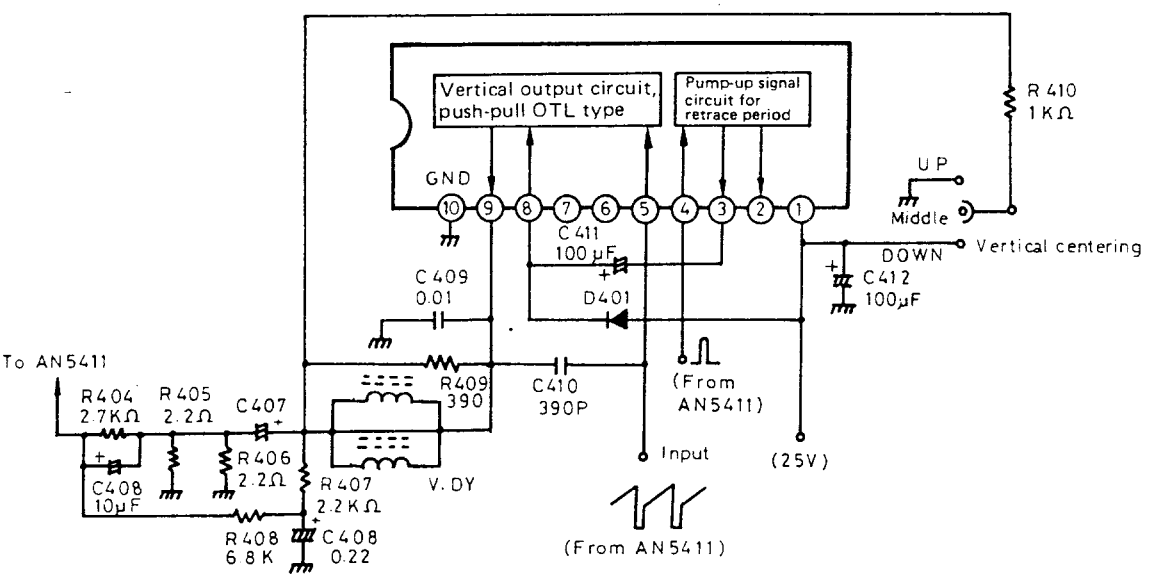


Fig. 14

The 60-Hz signal, originating in AN5411 (not shown in Fig. 12) an amplified, is fed to pin (5) and is then amplified further by the OTL push-pull circuit (vertical output circuit). The amplified 60 Hz signal goes out through pin (9) to the vertical deflection yoke, causing a sawtooth current to flow in the yoke coil.

R410 is the means of adjusting vertical centering: the direction of direct current in the deflection yoke can be changed for centering.

Vertical blanking pulses enter the pump-up circuit (retrace suppression signal amplifier) through pin (4).

Similarly, another pulse signal comes out through pin (3). This signal is a positive vertical pulse signal, which is fed through C411 and pin (8), the pin connected to the B terminal of the vertical output circuit in order to pump up (raise) the B voltage only during the retrace period: the object of this momentary voltage boosting is to improve the efficiency of amplification. The reason is that the input to the output circuit consists of sawtooth waves on which pulses are superimposed as shown, whereas the high B voltage is needed only during each retrace period. In other words, the signal coming in through pin (9) serves to momentarily raise the B voltage. D401, inserted in the path of this signal to prevent it from flowing backward.

POWER SUPPLY FROM SECONDARY WINDING OF FBT (12V and 25V)

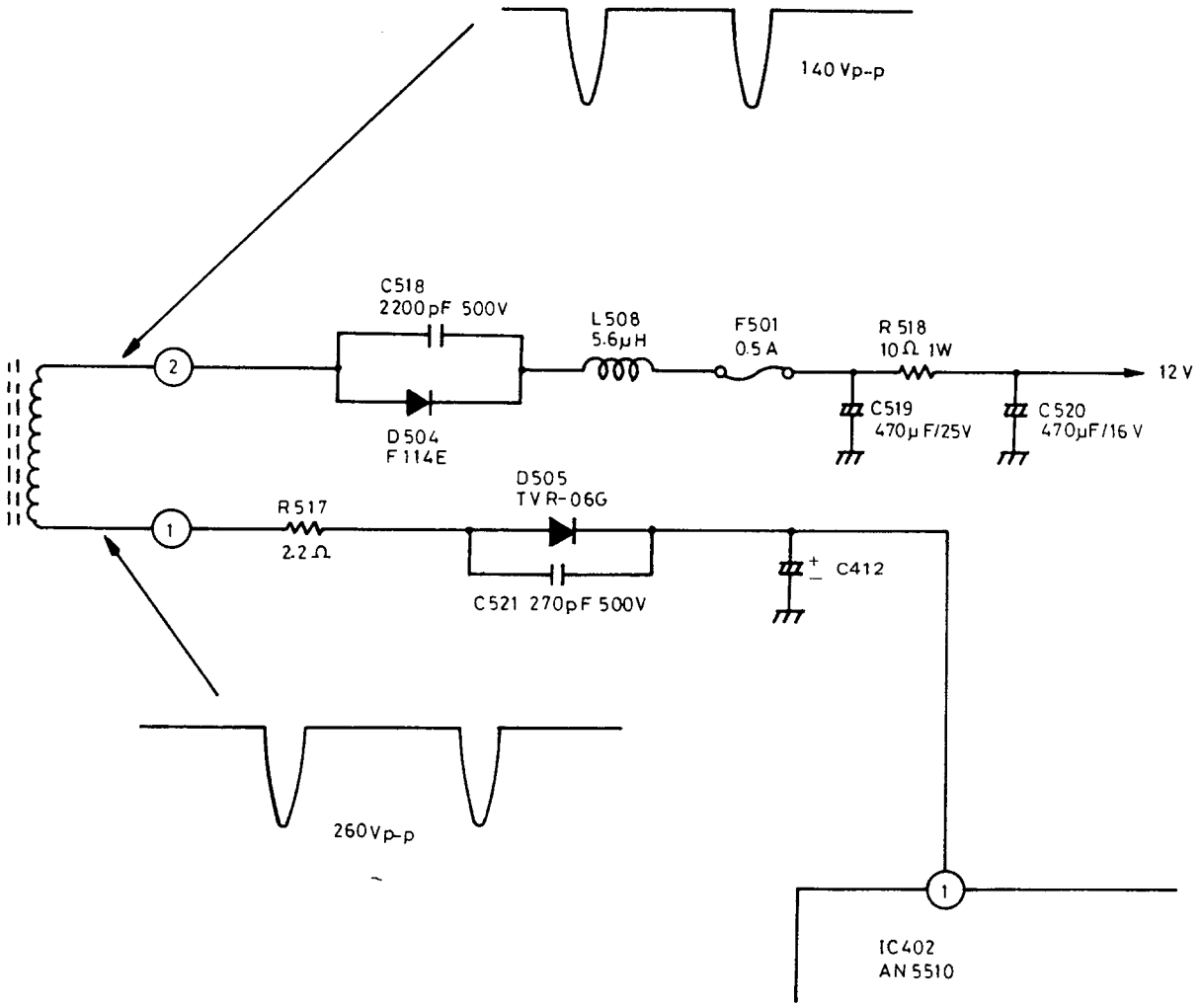


Fig. 15

The 140 Vp-p pulses appearing from secondary terminal (2) of the flyback transformer are converted to DC 12 volts through rectification by D504 and filtering by C519, 520 and R518. This DC 12 volts is supplied to transistors and ICs. Similarly, 260 Vp-p pulses emerging from terminal (1) are rectified by D505 and filtered to the DC 25 volts applied to pin (1) of IC402.

HORIZONTAL DRIVE CIRCUIT

This circuit is located between the oscillator circuit and output circuit, and serves to amplify the output of the oscillator and thereby drive the output transistor.

The nearly square pulse output of the oscillator is applied to the base of TR501 to turn on and off this transistor, thereby passing pulse current through the primary side of transformer, Fig. 15.

Each time the transistor turns on or turns off spiking occurs because of inductance. C512 and R512 are the circuit that absorbs the spikes to protect the transistor.

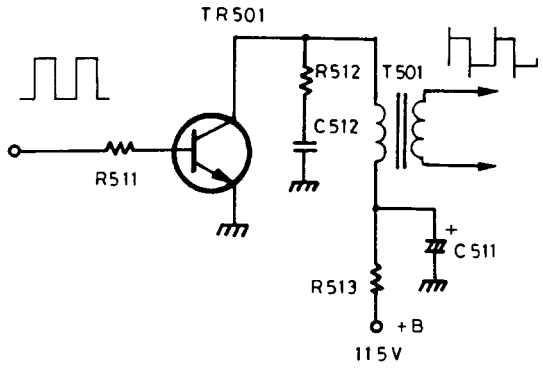


Fig. 16 Horizontal Drive Circuit

HORIZONTAL OUTPUT CIRCUIT

It will be recalled that, for vertical deflection, the output circuit amplifies sawtooth current to drive the coil: the sawtooth waveform is prepared in advance. This is not the case in horizontal deflection: as horizontal deflection is based on a different system.

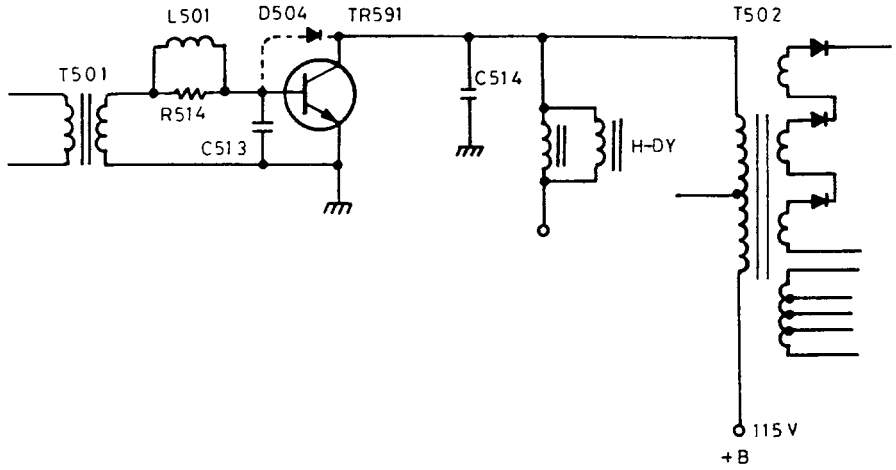


Fig. 17 Horizontal Output Circuit

The sawtooth wave is produced in the deflection coil as the sum effect of 1) the switching action of transistor TR591, 2) the damping action of diode D504, 3) the very large time constant of the L and R of the coil itself, and 4) an equally large time constant offered by D504 and L of the coil. Before discussing of the theory underlying this effect, remember that the horizontal deflection coil has to swing the beam 15,750 times a second, whereas the vertical coil has to deflect it 60 times a second. TR591 sess two parallel loads: the deflection coil H-DY and the horizontal output transformer.

NOTE:

The damper diode D504 is not provided in the circuit; the junction of the collector base of TR591 takes its place. Fig. 19 shows a basic output circuit (a) and its equivalent (b) in order to facilitate analysis of the action of producing the sawtooth current.

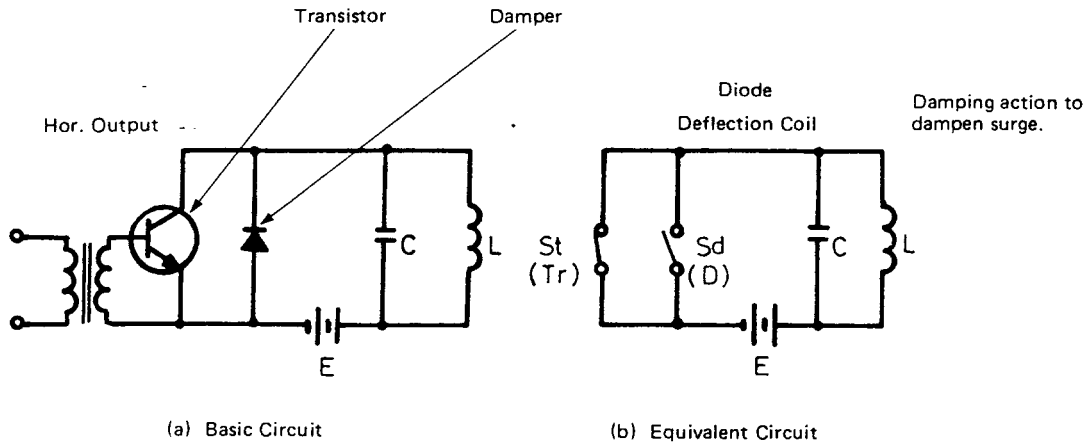


Fig. 18 Basic Horizontal Output Circuit and its Equivalent

1. Consider the duration from t_1 to t_2 in Fig. 19 and refer to the equivalent circuit (b) in Fig. 18, above.
   Pulse voltage is applied to the base of transistor: When this voltage is on, the transistor conducts is saturated. This condition is equivalent to when switch "St" is closed, Fig. 19 Consequently, current flows through the coil from source E and, because of the large time constant (L/r_L), r_L being the resistance of the coil (DY), the current increases gradually until the transistor switches off at t_2.

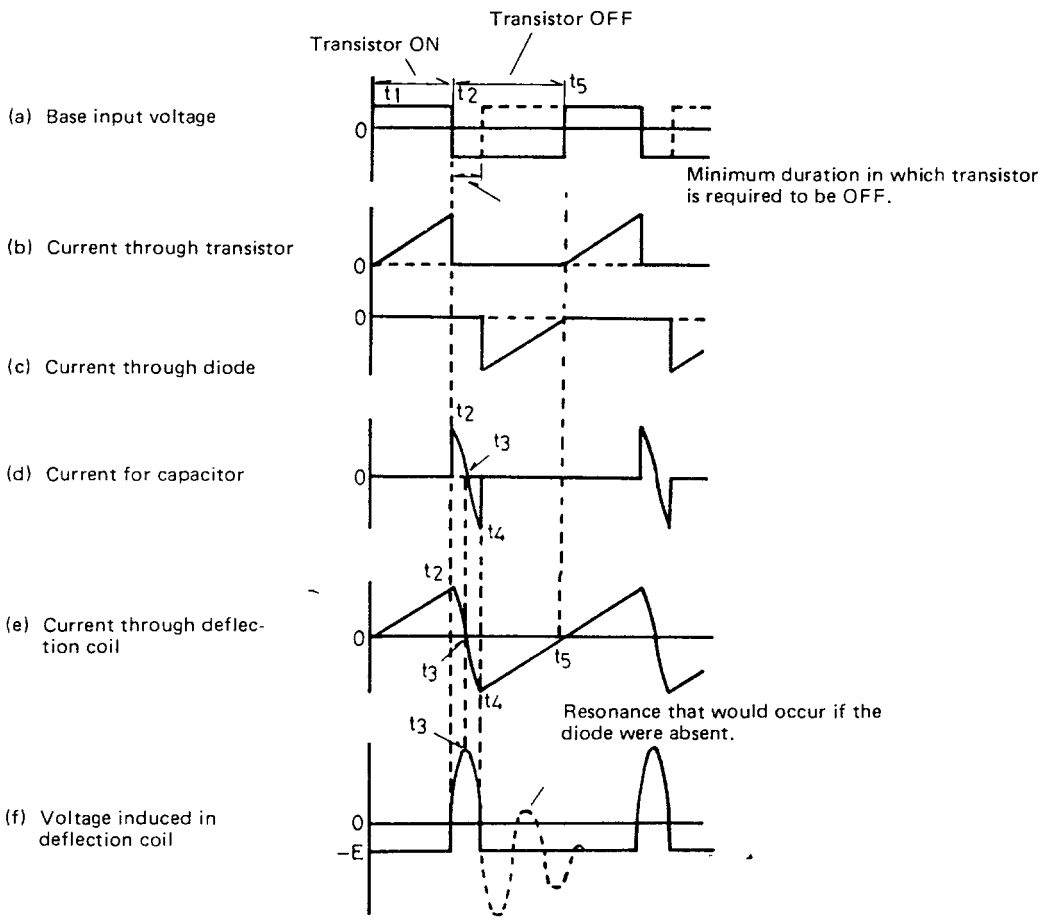
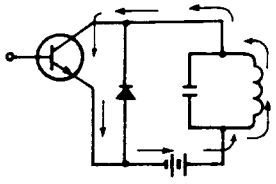


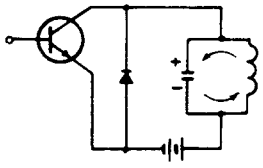
Fig. 19 Waveforms Involved in the Operation of Horizontal Output Circuit

It should be pointed out here that the values of the C (capacitor) L (coil) that they are a resonant circuit, in which an amount of energy cyclically shifts between elements C element and L.

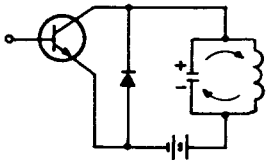
2. From t_2 to t_3, the base voltage is off and the transistor remains switched off: this is equivalent to switch "St" being open.
   At moment t_2, current is interrupted sharply but a current due to the counter-emf of the coil occurs as if the transistor were still conducting. (Refer to two diagrams (a) for $t_1 - t_2$ and (b) for $t_2 - t_3$ of Fig. 20.)



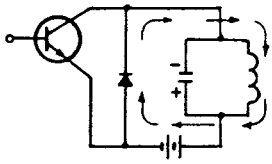
(a) Second half of scanning period ($t_1 - t_2$)



(b) First half of retrace ($t_2 - t_3$) (Capacitor is charged)



(c) Second half of retrace ($t_3 - t_4$) (Capacitor is discharged)



(d) First half of scanning period ($t_4 - t_5$)

Fig. 20 Directions of Current Flow through Coil

When the transistor is off, self-induced current flows into the capacitor and, at moment t_3, charges it (see waveform (d), Fig. 19) as a result, the voltage across C becomes maximum. This voltage peaking is referred to as the "flyback pulse".

3. From t_3 to t_4:
   At moment t_3, the capacitor starts discharging, and discharging current flows in the reverse direction through the coil. (See diagram (c) of Fig. 20, and waveform (d) of Fig. 19). The reverse current increases as the capacitor voltage falls; when the voltage reaches zero at t_4, this current is maximum and begins to charge the capacitor in the reverse direction. In other words, the reverse voltage of the capacitor begins to rise at t_4.
4. From t_4 to t_5:
   Slightly after t_4, the rising reverse voltage exceeds the emf of source E, and the reverse current flows not into C but through diode D: the capacitor ceases to be charged (in the reverse direction). Because of the damping action, this current dies down gradually. D forms a short-circuit for the LC resonance circuit. The slow current decrease is due to the large time constant due to L/r_D, r_D being the internal resistance of the diode.

   At t_5, the current is zero and the transistor is switched on and starts to conduct again, thus resuming the next cycle of producing the next sawtooth wave, as shown by waveform (e). Note that the current decreases linearly in $t_1 - t_2$ and also in $t_4 - t_5$ because of very large values of L/r_L and L/r_D, and that the sum of the two currents flowing through the deflection coil has the shape of a sawtooth.

The power that the output transistor handles is very large and consequently it generates a large amount of heat. For this reason, it is attached to a heat sink. It has to be capable of switching off sharply and also of withstanding the stress due to the flyback pulses, each occurring during every retrace period, and has to have excellent frequency characteristics.

Specifically, the pulse voltage occurring during each retrace period peaks to a level nearly 8 times the +B voltage, which is in this case 115 volts. Thus the output transistor must be capable of withstanding at least 1,000 volts.

The damper diode, too, must be capable of withstanding the same voltage peak. Its frequency characteristic must be just as good as that of the transistor, and it must be capable of passing large current with a small internal resistance.

ADJUSTMENT OF SEMI-FIXED CONTROLS

1. +B Voltage Adjustment: VR601 115V Adjustment

Connect the DC voltmeter (with a range of 150V) between TP91 on the MAIN PW board and the Ground, and adjust VR601 so that the voltage is 115V.

2. Horizontal Hold Adjustment: VR501

Connect TP31 on the printed wiring board to the Ground and cut the synchronizing signal. Next, turn VR501 (H. Hold) and adjust it until the synchronization comes in the center. Remove the connection between TP31 and the Ground, turn the power switch on and off, and thus confirm the stability of synchronization.

3. Vertical Hold Adjustment: VR402

Turn VR402 (V. Hold) and adjust it until synchronization is secured.

4. Vertical Height Adjustment: VR401

Display a character signal (for instance the character H) to fill the screen of the CRT, and adjust VR401 until the best vertical height is obtained.

5. Horizontal Positioning Control: VR502

This is to control on the left-right movement of the center of the picture. Adjust it until the center of the picture comes to the center of the screen.

6. Horizontal Width: L507

Adjust core of Horizontal Width Coil L507 to obtain proper width of horizontal scanning.

The adjustment described in 7, 8, 9 and 10 below should be dove when focus or white balance is extremely bad due to replacement of the picture tube or aging causing the characteristics of the picture tube to deteriorate.

7. Focus Adjustment: VR591

Turn VR591 and adjust it until the best focus is obtained.

8. White Balance Adjustment

NOTE:

Prior to white balance adjustment, be sure to check the condition of #1 pin of 8-pin signal input connector (ie. Intensity control input terminal). #1 pin of above Input connector should be;

OPEN . . . . . in case of connecting PC–8001 or another non-intensity controlled signal generator.

"HIGH" Level . . . in case of connecting the IBM Personal Computer or another intensity controlled signal generator.

VR901 (screen), VR904 (red bias), VR905 (green bias), VR906 (blue bias) VR902 (red drive), VR903 (blue drive), SW701 (service switch).

(1) Receive input signal of white Raster Pattern.
(2) Turn VR901 fully counterclockwise and set VR904, VR905, VR906, VR902 and VR903 to their mechanical centers.
(3) Set SW701 to the SERVICE side and turn VR901 gradually clockwise so as to obtain horizontal line.
(4) Turn the color bias VR. which light for the first time, out of the three colors; red, green and blue counterclockwise and eliminate the horizontal line of that color.
(5) Turn VR901 slightly clockwise so that the horizontal line of the color which appears last lights slightly.
(6) Then turn VR901 clockwise gradually and rotate the bias VR of the color which appears second, so to eliminate the horizontal line of that color.
(7) Adjust to obtain horizontal lines of the same brightness for red, green and blue by turning the bias VRs of the colors, which emitted light first and second.
(8) Then position SW701 at NORMAL and adjust to get white with VR902 and VR903.
(9) Lastly confirm that white color is obtained in both bright and dark by turning the brightness control.

9. Purity

NOTE:

Allow 10 minutes of warm-up before attempting the following adjustment procedure.

(1) Degauss picture tube.
(2) Receive a white raster pattern.
(3) Position the Magnet Assembly, and tabs of magnets as shown below. (Fig. 21, Fig. 22)
(4) Disconnect the "G" connector on the MAIN PWB, and adjust the Brightness Control for a bright picture.
(5) Loosen the Deflection Yoke Clamp and slide the Deflection Yoke backward against the Magnet Assembly.
(6) Adjust the Purity Magnet (front pair) by moving their tabs the same distance in opposite directions. Adjust them so that the magneta color mass is at the center of the screen.
(7) Move the Deflection Yoke forward and position it where the best purity is obtained. Tighten the yoke clamp. Place a "Temporary" wedge between the upper side of the Deflection Yoke and the CRT, if necessary, to keep the yoke straight. Position the wedge so that no purity shift occurs.
(8) Reconnect the "G" connector. If necessary, adjust the Red (VR751), Blue (VR753) and Green Bias (VR752) control on the main PWB for proper color temperature.
(9) Set the Service Switch (SW401) to the "Service" position, and rotate the yoke, if necessary, to "level" the horizontal line.
With the Vertical Centering Control (VR405) on the MAIN PWB on the center position, confirm that the horizontal line is within +5 mm from the geometrical

center of the CRT (CRT marks on edge). It not, rotate both purity magnets together until it is centered. Be careful not to change the relationship between the two magnets.

(10) Set the Service Switch (SW401) to the "Normal" position, and confirm purity.
(11) Tighten yoke clamp.

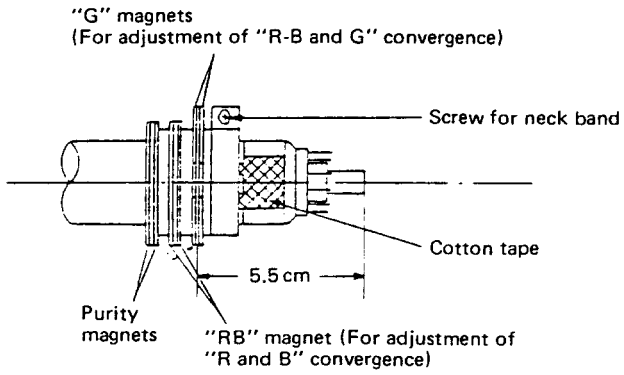


Fig. 21

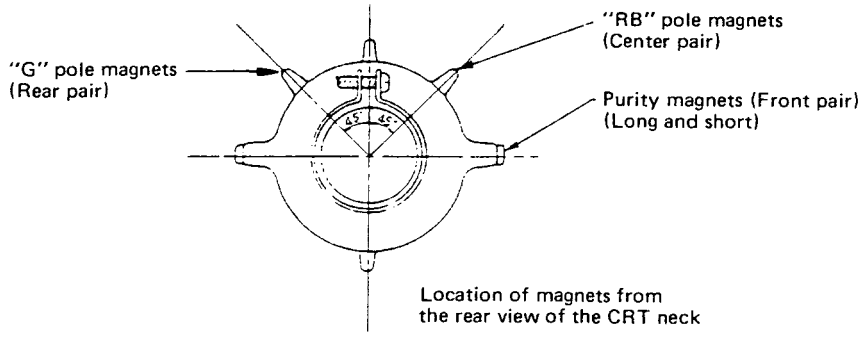


Fig. 22

10. Convergence Adjustment

NOTE:

Allow 10 minutes of warm-up before attempting the following adjustment procedure.

(1) Receive a cross hatch pattern.
(2) Adjust focus at maximum brightness.
(3) Disconnect the "G" connector on the MAIN PWB.
(4) Adjust the "R-B" Magnet (center pair) to converge the red and blue lines at the center of the screen, as shown in Fig. 23.
(5) Reconnect the "G" connector. Adjust the "G" Magnets (rear pair) to converge the magneta and green lines at the center of the screen, as shown Fig. 23.

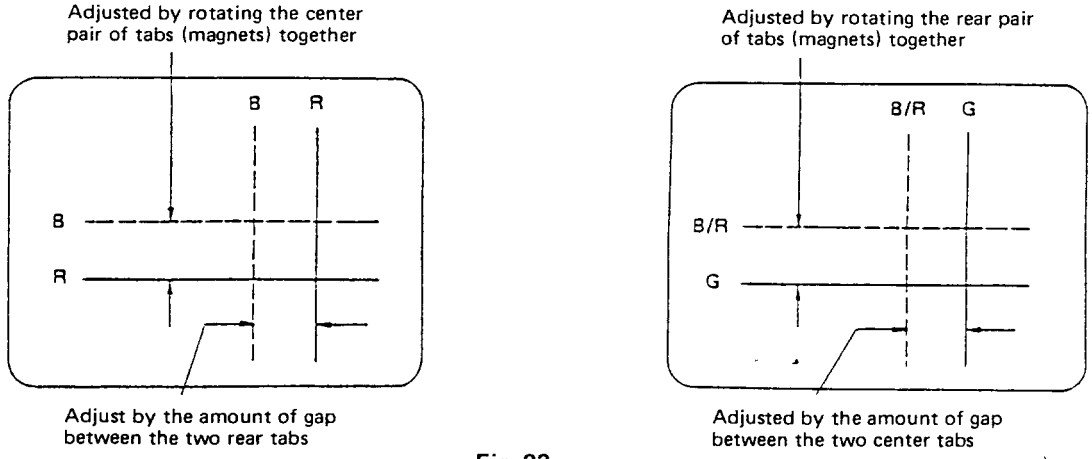


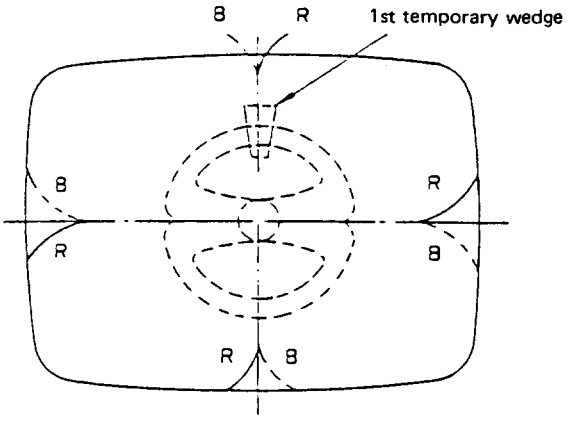
Fig. 23

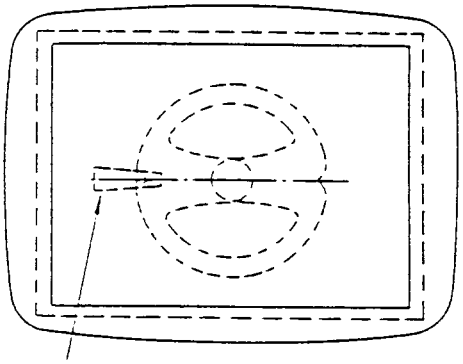
(6) Readjust purity, if necessary.

(7) Refer to Fig. 24 and converge areas shown by filting the Deflection Yoke UP or DOWN. Insert a "temporary" wedge to hold in position.

(8) Refer to the Fig. 24 below, and insert a second "Temporary" wedge between the right or left side of the Deflection Yoke and the CRT.
Tilt the Deflection Yoke for best convergence of areas shown.

(9) Put the ferrite sheet (rubber) on CRT funnel to obtain the best convergence on circumference, if necessary.





Insertion of 2nd temporary wedge

If B is on the outside and R is on the inside, insert second "Temporary" Wedge from the right side.

If R is on the outside and B is on the inside insert second "Temporary" Wedge from the lift side.

Fig. 24

(10) Insert the first "permanent" wedge between the bottom of the Deflection Yoke and the CRT, the second wedge at the 2 o'clock position, and the third wedge at the 10 o'clock position as shown in Fig. 25.

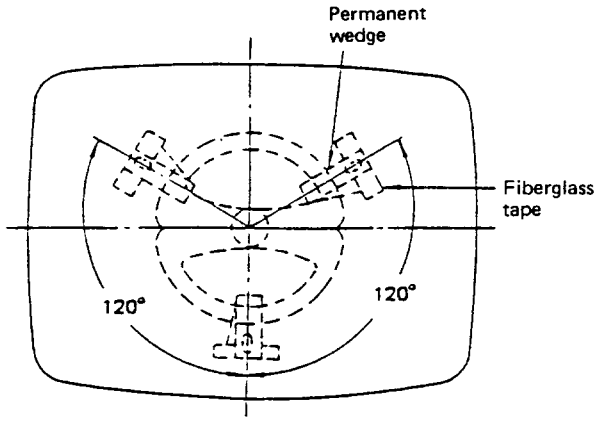


Fig. 25

(11) Apply a suitable adhesive (GE RTV162 or equivalent) between the permanent wedge and CRT Funnel as shown in the Fig. 26 below.

(12) Remove the "Temporary" wedges. With special attention to maintain the exact yoke position, push the three permanent wedges into stablize the yoke.

(13) Apply a fiberglass tape (Scotch 69 or equivalent) to the wedges and CRT funnel as shown in the Fig. 25.

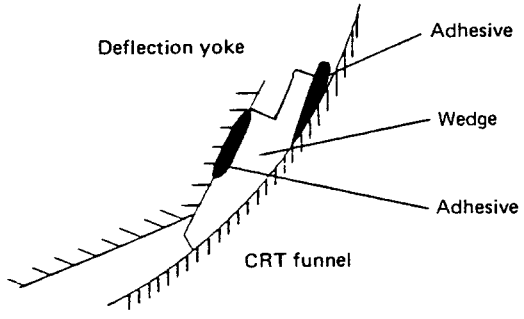


Fig. 26

(14) Apply an adhesive to the Magnet Assembly to prevent any slippage of the magnet.

(15) Leave the unit until the adhesive becomes dry.

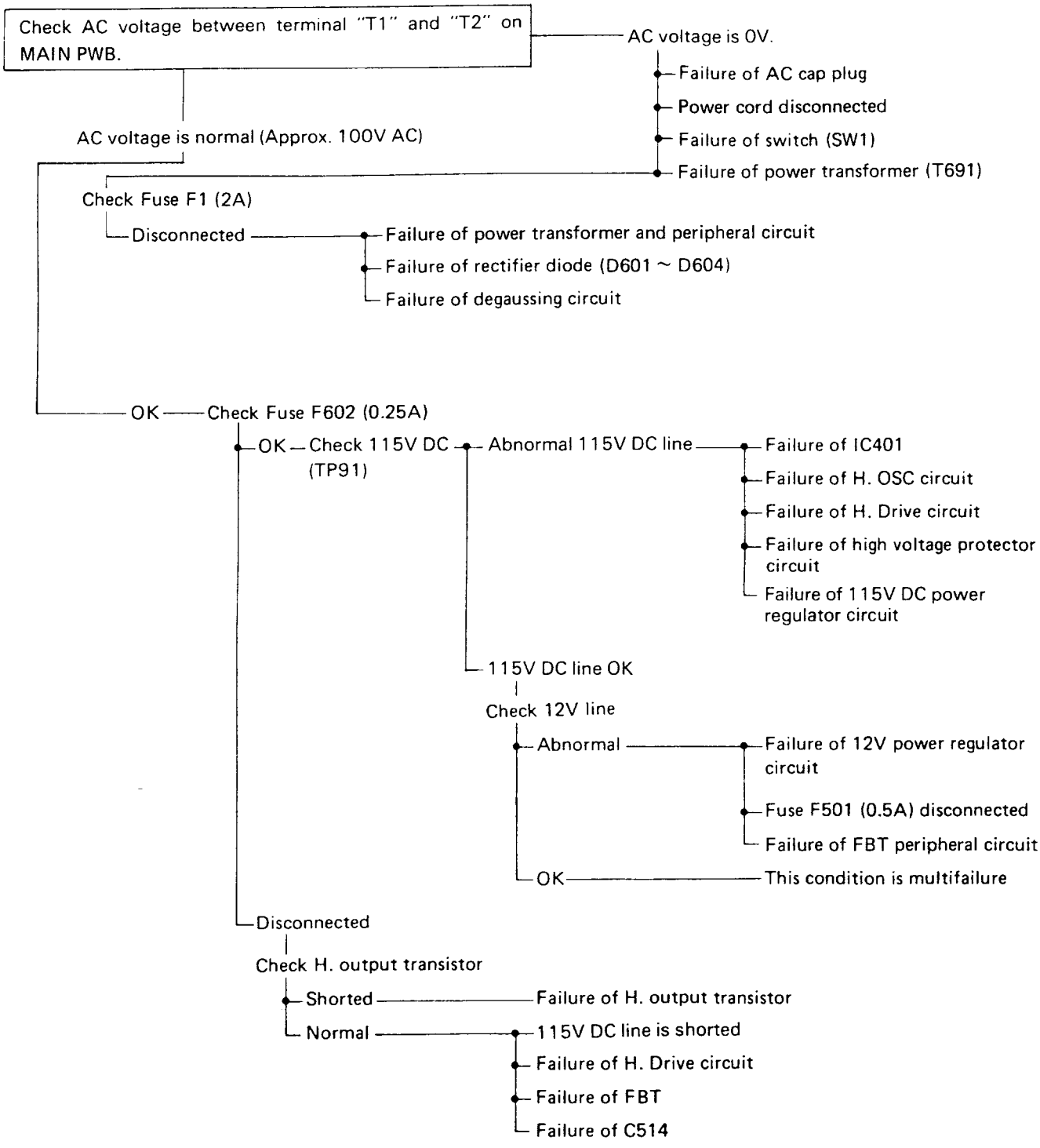
11. High Voltage Protector Adjustment

Do not attempt to adjust VR2001.

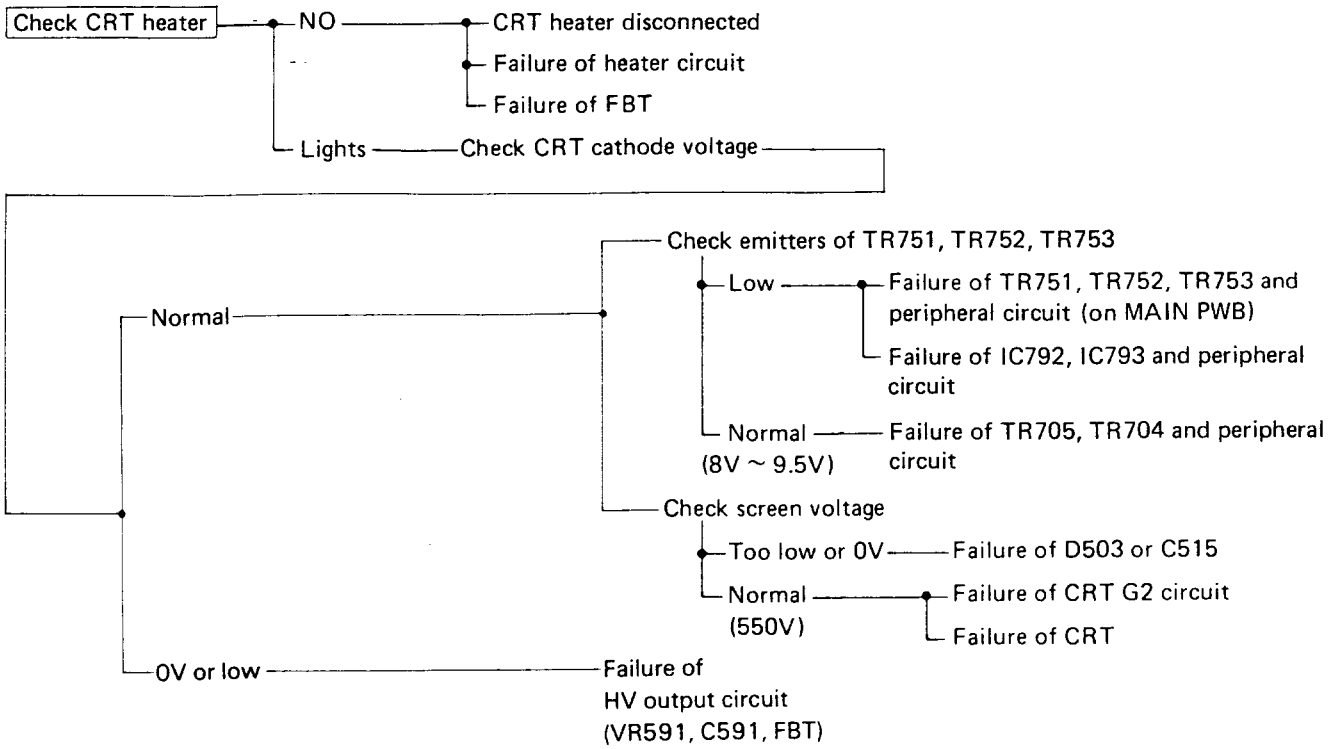
This circuit is adjusted and sealed at the factory. The adjustment in the field is prohibited by requirements of DHHS.

TROUBLESHOOTING

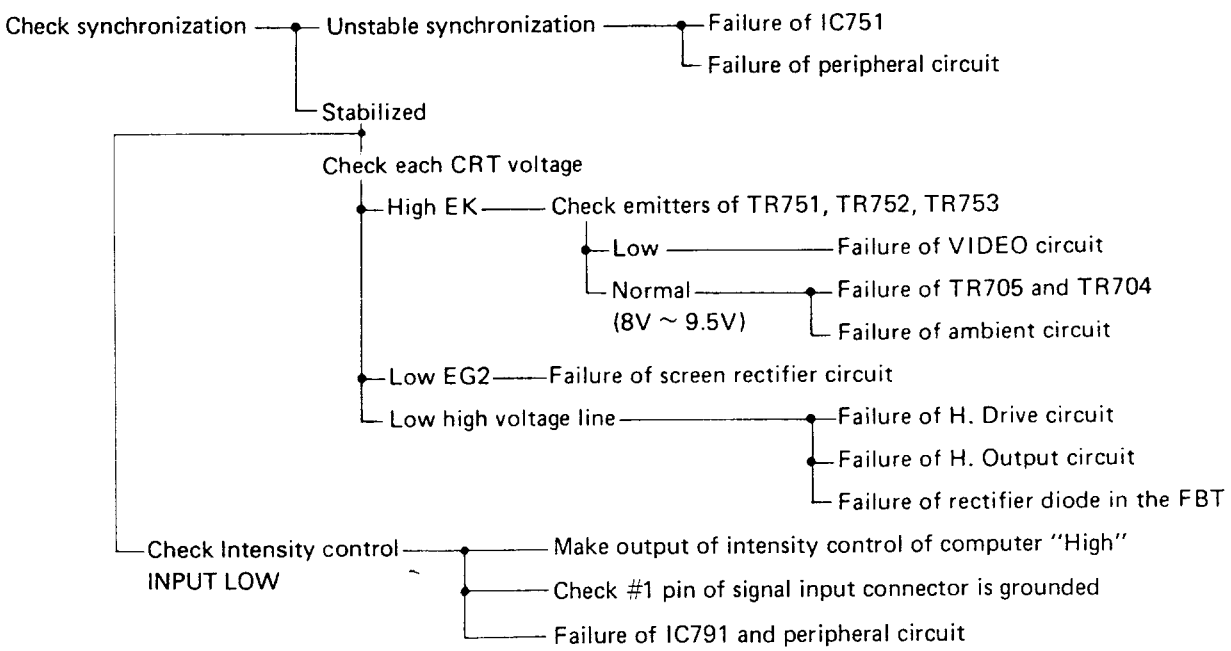
1. No Raster



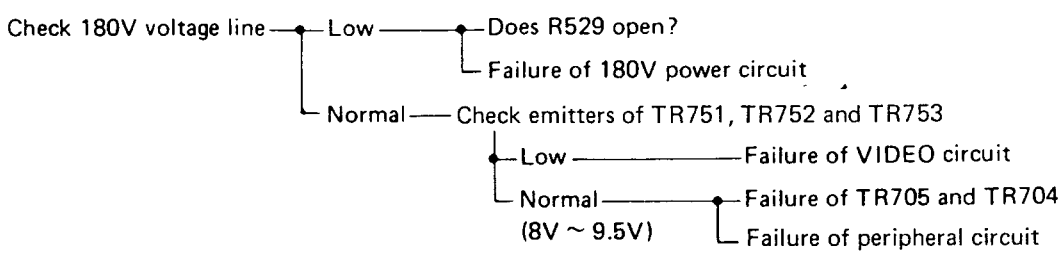
2. No Raster



3. Dark Raster



4. Abnormal Brightness of Screen



5. Normal Raster, Picture Abnormal

NOTE: Apply positive (high) signals as input for R, G, B and Intensity.

- Check pins 3, 6 and 8 of IC792
  - High → Failure of IC792 and peripheral components
  - Low → Check pins 4, 6, 10, 2, 8 and 12 of IC793
    - Low → Failure of IC793 and peripheral components
    - High → Failure of TR751, TR752 and TR753 and peripheral components

6. No Vertical Sweep

- Check +B 25V voltage on rectifier circuit (#1 pin of IC402)
  - Low voltage or 0V → Failure of 25V rectifier circuit
  - Normal → Apply 22 pin sync signal to 17 pin of IC401 through capacitor
    - No effect → Failure of IC401
      - Failure of DY (When AC signal obtained at 9 pin of IC402)
    - Vertical gets higher → Failure of IC401

7. Failure of White Balance

- Readjust white balance
  - OK
  - NO → Check CRT cathode voltage
    - Abnormal → Failure of VIDEO output transistor TR901, TR902 or TR903
      - Failure of VIDEO output transistor peripheral circuit
      - Failure of VIDEO circuit
    - Normal → Failure of CRT

8. Unstable Vertically

- Check frequency variation rotating V-Hold
  - 60 Hz appears but is unstable → Failure of C405
  - Oscillation frequency shifts → Failure of IC401
    - Failure of C401

9. Unstable Horizontally

- Check frequency variation by rotating H-Hold
  - Lack of Horizontal Sync. → Failure of IC401
  - Oscillation frequency shifts → Failure of C504 or C525
    - Failure of IC401

10. Unstable Horizontally & Vertically

- Check position of sync. polarity selector → Change position of sync. polarity selector
  - NO
    - Unstable horizontally and vertically → Failure of IC791 and peripheral circuit
    - Unstable horizontally only → Go to Item 10
    - Unstable vertically only → Go to Item 9
  - OK

REPLACEMENT PARTS LIST

Note: The components identified by ⚠ mark are critical for safety Replace only with Parts Number Specified.

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** CRT & TUNER ***			
⚠	33012017	CRT-320CGB22(S)(DISPLAY)	1
*** ICS ***			
IC402	37006006	IC AN5510	1
⚠IC401	37009012	IC AN5411 (HOR)	1
IC791	37051450	IC HD74LS86P (EX-OR)	1
IC792	37051451	IC HD74LS00P (NAND)	1
IC793	37051452	IC HD7406P (INVERTER)	1
*** TRANSISTOR ***			
TR703	35003517	TR,2SA733/733A Q	1
TR705	35004312	TR,2SA953 L	1
TR691	35046917	TR,2SC1106 Q	1
TR704	35047216	TR,2SC945 P	1
TR701 TR702	35047217	TR,2SC945Q	2
TR601 TR901 TR902 TR903	35050512	TR,2SC1507 L	4
TR591	35052000	TR,2SC1875	1
TR603	35053012	TR,2SC1941 L	1
TR602	35053213	TR,2SC2002 M	1
TR501	35053812	TR,2SC2371 (8) L	1
TR751 TR752 TR753	35056112	TR,2SC1675 L	3
*** DIODES ***			
D402 D403 D701 D702	360K1009	DIODE,SI.1S2473	4
D502 D703 D704 D751 D752 D753 D754 D755 D756 D757 D758 D759 D760 D761	360K1015	DIODE,SI.1SS54	14
D501	36001010	DIODE,SI.1S-2472	1
ZD2001⚠ZD601	36003034	DIODE,ZENER RD8.2F	2
ZD751	36003100	DIODE RD5.1EB-2	1
⚠D2001 D505 D506	361K7160	RECTIFIER,SI.TVR-06G	3
D401	36107075	RECTIFIER,SI.F14A-P	1
D606	36107076	RECTIFIER,SI.F14C-P	1
D601 D602 D603 D604	36107079	RECTIFIRE,SI RM-2C	4
D605	36107085	RECTIFIER,SI.1SR-35-100	1
D504	36107263	RECTIFIER,SI.F114E	1

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** DIODES ***			
D503	36107281	RECTIFIER,SI SM-05-16FR	1
⚠D607	38005010	VARISTER,VD1122	1
D2002	38005011	VARISTER,VD1220	1
TH501	38102015	THERMISTOR,TD5-110	1
⚠TH601	38112015	THERMISTOR,POSITIVE	1
*** TRANSFORMES ***			
⚠	45099038	TRANS POWER	1
T501	45803004	TRANS,H DRIVE	1
⚠T502	47105098	F.B.T	1
⚠T401	47502029	TRANS.PIN CUSHION	1
*** VALIABLE RESISTOR ***			
⚠C591	39510002	HV CAPCACITOR	1
VR591	39604901	UNIT,FOCUS CONTROL	1
VR1	41053004	R,VARIABLE 10K	1
⚠VR901	41056107	R,VARIABLE 2M 0.5W	1
VR501	41057553	R.VARIABLE 500K 0.1W	1
VR402	41057554	R.VARIABLE 10K 0.1W	1
⚠VR2001	41067027	R,VARIABLE 3K 0.1W	1
⚠VR601	41067104	R,VARIABLE 500H 0.1W	1
VR902 VR903	41067202	R,VARIABLE 220H 0.1W	2
VR904 VR905 VR906	41067207	R,VARIABLE 3.3K 0.1W	3
VR401	41067210	R,VARIABLE 20K 0.1W	1
VR502	41067358	R,VARIABLE 4.7K 0.1W	1
*** SWITCHES ***			
SW701	65105101	SWITCH,SLIDE	1
⚠S1	65351007	SWITCH PUSH	1
*** COILS & FILTERS ***			
⚠L507	60908011	WIDTH COIL	1
⚠L506	60917022	COIL,H.LIN	1
L501 L508	61006014	COIL,FILTER 5.6UH	2
L503	61005004	COIL,FILTER 5.6UH	1
L504	61005008	COIL,FILTER 120UH 37MHZ	1
L502	61011018	COIL,CHOKE	1
L901 L902 L903	61013025	COIL,FILTER 100UH	3
L505	61064006	COIL FILTER 50UH	1
L491	61067019	COIL,FILTER 150UH	1

SYMBOL	PARTS NO	DESCRIPTION	QTY

*** COILS & FILTERS ***

	61301096	COIL,DEGAUSSING	1

*** PWB ASSY ***

	94T25F01	MAIN PWB ASSY	1
	94Y03G01	VIDEO CRT PWB ASSY	1
	94Y06A01	PS PWR ASSY	1
	94Y96S02	SYNC PWB ASSY	1

*** MISCELLANEOUS PARTS ***

⚠	48007077	DEFLECTION YOKE	1
	49005007	MAGNET CPC	1
⚠F602	66652059	FUSE 0.25A,U	2
⚠F501	66671001	FUSE 0.5A	2
⚠F1	66671005	FUSE2AT 250V SEMKO 20MM	2
SG901 SG902 SG903	66705001	SPARK GAP 1.2KV	3
PL1	67108001	NEON LAMP	1
	70032021	SG/CRT,SOCKET	1
	70051003	SOCKET CN-1208DJFS	1
	70101015	SOCKET,TR	1
	70102009	SOKET,IC 24PIN	1
	70102104	SOCKET,IC 10PIN	1
	70102212	IC SOKET 14P	2
⚠	70800011	LINE CORD	1
SW591	71110173	TERMINAL BOARD(W/SW)	1
	71205036	HOLDER,FUSE	2
	71205037	FUSE HOLDER	2

*** APPEARANCE PARTS ***

	25300611	CABINET BACK	1
	25301951	CABINET FRONT	1

*** KNOB & PUSH BUTTONS ***

	24461091	KNOB,CONTROL	2

*** PACKING MATERIALS ***

	24806961	BAG,POLYETHYLENE	1
	24807631	BAG,POLYETHYLENE	1
	24815552	FILLER-L,CARTON	1

SYMBOL	PARTS NO	DESCRIPTION	QTY

*** PACKING MATERIALS ***

	24815562	FILLER-R,CARTON	1
	25803772	CARTON BOX	1
	78110801	INSTRUCTION BOOK	1
	78160621	LABEL SCHEMATIC DIAGRUM	1

*** RESISTOR ***

R514			400K3512	R,SOLID 8.2H 10% 1/2W	1
R411			400K3527	R,SOLID 150H 10% 1/2W	1
R603			400K3529	R,SOLID 220H 10% 1/2W	1
R409			400K3532	R,SOLID 390H 10% 1/2W	1
R410	R412		400K3537	R,SOLID 1.0K 10% 1/2W	2
R512			400K3545	R,SOLID 4.7K 10% 1/2W	1
R510			400K3549	R,SOLID 10K 10% 1/2W	1
R608			400K3552	R,SOLID 18K 10% 1/2W	1
R611	R612		400K3556	R,SOLID 39K 10% 1/2W	2
R516	R601	R706	400K3561	R,SOLID 100K 10% 1/2W	3
R520			40003031	R,SOLID 330H 10% 1/2W	1
R904	R905	R906	40003037	R,SOLID 1.0K 10% 1/2W	3
R607			40003053	R,SOLID 22K 10% 1/2W	1
⚠R911			40023245	R,SOLID 1.0M 5% 1/2W	1
⚠R912			40023253	R,SOLID 2.2M 5% 1/2W	1
⚠R912			40099003	R,SOLID 820K 10% 1/2W	1
R405	R406	R609	401C6609	R,CARBON 2.2H 5% 1/4W	4
R610					
R511			401C6643	R,CARBON 56H 5% 1/4W	1
R710			401C6649	R,CARBON 100H 5% 1/4W	1
R507			401C6661	R,CARBON 330H 5%1/4W	1
R504	R525	R751	401C6663	R,CARBON 390H 5% 1/4W	9
R752	R753	R756			
R757	R758	R759			
R713			401C6667	R,CARBON 560H 5% 1/4W	1
R509			401C6669	R,CARBON 680H 5% 1/4W	1
R521	R604	R778	401C6673	R,CARBON 1.0K 5% 1/4W	3
⚠R503	R701	R703	401C6677	R,CARBON 1.5K 5% 1/4W	4
R708					
R707			401C6679	R,CARBON 1.8K 5% 1/4W	1
R407	R502	R508	401C6681	R,CARBON 2.2K 5% 1/4W	3
R404	R709		401C6683	R,CARBON 2.7K 5% 1/4W	2
R401			401C6691	R,CARBON 5.6K 5% 1/4W	1
R408	R711		401C6693	R,CARBON 6.8K 5% 1/4W	2
⚠R2004	R705		401C6697	R,CARBON 10K 5% 1/4W	2
R702			401C6699	R,CARBON 12K 5% 1/4W	1
⚠R2002			401C6701	R,CARBON 15K 5% 1/4W	1

SYMBOL	PARTS NO	DESCRIPTION	QTY

*** RESISTOR ***

R402	R704		401C6703	R,CARBON 18K 5% 1/4W	2
R505			401C6709	R,CARBON 33K 5% 1/4W	1
⚠R2001	R712		401C6713	R,CARBON 47K 5% 1/4W	2
R714	R715		401C6721	R,CARBON 100K 5% 1/4W	2
R616			401C6729	R,CARBON 220K 5% 1/4W	1
R606			401C6733	R,CARBON 330K 5% 1/4W	1
R716			401C6741	R,CARBON 680K 5% 1/4W	1
R910			40102143	R,CARBON 56H 5% 1/3W	1
R907	R908	R909	40102157	R,CARBON 220H 5% 1/3W	3
R913	R915	R917	40102177	R,CARBON 1.5K 5% 1/3W	3
R914	R916	R918	40102185	R,CARBON 3.3K 5% 1/3W	3
R754	R755		40106163	R,CARBON 390H 5% 1/3W	2
R792	R793	R794	40106182	R,CARBON 2.4K 5% 1/3W	3
R791			40106185	R,CARBON 3.3K 5% 1/3W	1
R403			40106255	R,CARBON 2.7M 5% 1/3W	1
R795			40136221	R,CARBON 100K 5% 1/4W	1
⚠R517			40177109	R,CARBON 2.2H 5% 1/4W	1
⚠R529			40177117	R,CARBON 4.7H 5% 1/4W	1
R515			40177173	R,CARBON 1.0K 5% 1/4W	1
R691			40215312	R,WIRE 300H 5% 20W	1
R518			40351125	R,METAL 10H 5% 1W	1
R761			40351133	R,METAL 22H 5%	1
R760			40351151	R,METAL 120H 5% 1W	1
R901	R902	R903	40351187	R,METAL 3.9K 5% 1W	3
R605			40351201	R,METAL 15K 5% 1W	1
R519			40352103	R,METAL 1.2H 5% 2W	1
R617			40352153	R,METAL 150H 5% 2W	1
R513			40353183	R,METAL 2.7K 5% 3W	1
R501			40353195	R,METAL 8.2K 5% 3W	1
⚠R615			40402681	R,METAL 2.2K 1% 1/4W	1
R506			40402685	R,METAL 3.3K 1% 1/4W	1
⚠R614			40403099	R,METAL 12K 1% 1/2W	1
⚠R613			40403700	R,METAL 13K 1% 1/2W	1
⚠R2003			40405109	R,METAL 2.2H 5% 1/4W	1

*** CAPACITORS ***

C608			4201J567	C,CERAMIC 500V 2200PF	1
C604			4201J575	C,CERAMIC 500V 0.01UF	1
C902			42019625	C,CERAMIC 1KV 0.01UF	1
C521			4203J556	C,CERAMIC 500V 270PF	1
C512			4203J560	C,CERAMIC 500V 560PF	1
C510	C518	C526	4203J567	C,CERAMIC 500V 2200PF	4

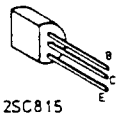
SYMBOL	PARTS NO	DESCRIPTION	QTY

*** CAPACITORS ***

C703			4203J567	C,CERAMIC 500V 2200PF	4
C513			4203J569	C,CERAMIC 500V 3300PF	1
C906			4203J575	C,CERAMIC 500V 0.01UF	1
⚠C602	⚠C603		42099029	C,CERAMIC 125V 4700PF	2
C403	C409	C709	4210I025	C,CERAMIC 25V 0.01UF	3
C903	C904	C905	4213K207	C,CERAMIC 50V 330PF	3
C410			4213K208	C,CERAMIC 50V 390PF	1
C708			4213K213	C,CERMIC 50V 1000PF	1
C501	C503		4213K215	C,CERMIC 50V 1500PF	2
C509	C701		4213K217	C,CERMIC 50V 2200PF	2
C751	C791		4213K225	C,CERAMIC 50V 0.01UF	2
C2004			4219J002	C,CERAMIC 50V 0.1UF	1
C711			42399002	C,CERAMIC 500V 15PF	1
⚠C514			42702067	C,FILM 1.5KV 4000PF	1
⚠C522			42705901	C,FILM 400V 0.33UF	1
C404	C507		4275D009	C,FILM 50V 0.022UF	2
C525			4275D053	C,FILM 50V 1500PF	1
C759			4275D061	C,FILM 50V 6800PF	1
C506			4275D065	C,FILM 50V 0.015UF	1
C405	C702		4275D074	C,FILM 50V 0.082UF	2
C505			4275D075	C,FILM 50V 0.1UF	1
C515			42760273	C,FILM 1KV 6800PF	1
C504			4279J034	C,FILM 50V 0.01UF	1
C517			42839022	C,METAL FILM 250V 0.1UF	1
C511			4300E116	C,ELEC 160V 1UF	1
C527	C607		4300E120	C,ELEC 160V 10UF	2
C606			4300E121	C,ELEC 160V 22UF	1
C516			4300E125	C,ELEC 160V 47UF	1
C901			43005126	C,ELEC 250V 1UF	1
C519			4301A050	C,ELEC 25V 470UF	1
C407			4301B037	C,ELEC 16V 2200UF	1
C408			4301D101	C,ELEC 50V 0.22UF	1
⚠C2001			4301D105	C,ELEC 50V 1UF	1
C792			4301J018	C,ELEC 10V 330UF	1
C524			4301J025	C,ELEC 16V 10UF	1
C414			4301J026	C,ELEC 16V 22UF	1
C753			4301J030	C,ELEC 16V220UF	1
C502	C520		4301J032	C,ELEC 16V 470UF	2
C707			4301J037	C,ELEC 25V 4.7UF	1
⚠C2002	C406	C704	4301J038	C,ELEC 25V 10UF	3
C705	C710		4301J040	C,ELEC 25V 33UF	2
C413			4301J042	C,ELEC 25V 100UF	1
C411	C412		4301J054	C,ELEC 35V 100UF	2

SYMBOL	PARTS NO	DESCRIPTION	QTY
*** CAPACITORS ***			
⚠C2003	4301J065	C,ELEC 50V 10UF	1
C491	43019030	C,ELEC 16V 220UF	1
C605	43104076	C,ELEC 180V 470UF	1
C706 C758	43311023	C,ELEC 25V 10UF	2
C402	43515051	C,TANTALUM 16V 2.2UF	1
C401 C508	43515052	C,TANTALUM 16V 3.3UF	2

NOTE: E : EMITTER
B : BASE
C : COLLECTOR
K : CATHODE
G : GATE
A : ANODE



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2SA539
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2SC388A
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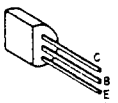

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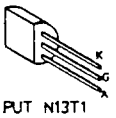

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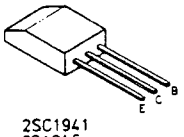

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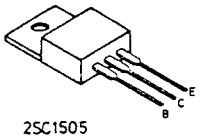

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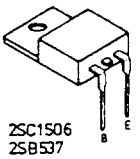

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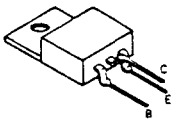

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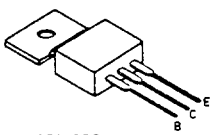

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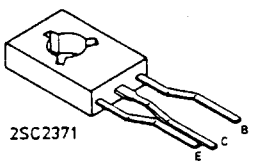

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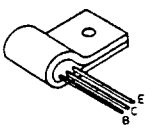
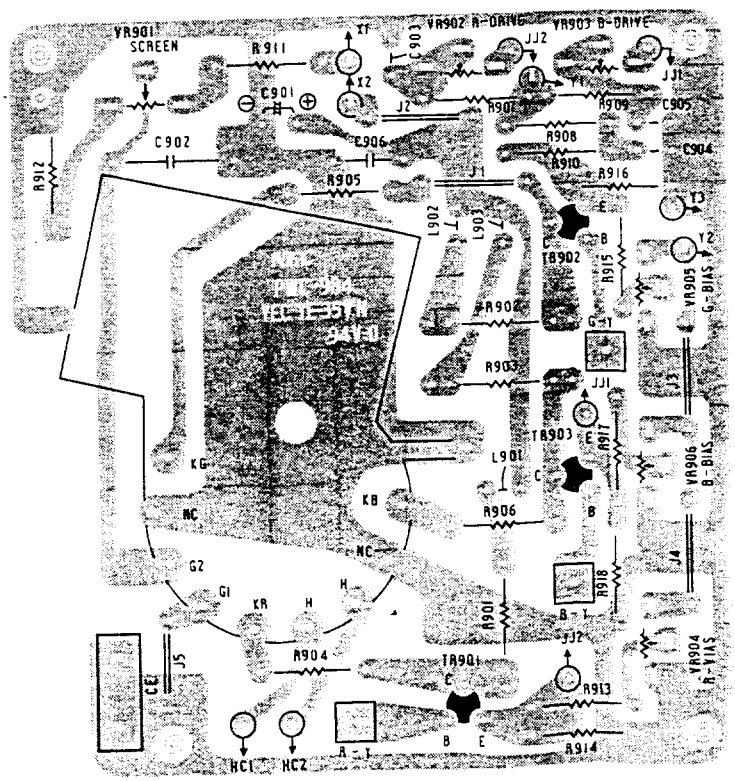


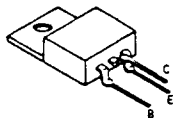
2SA545

VIDEO CRT PWB
(Solder Si



MAIN PWB ASS'Y (PWC976)
(Solder Side)

NOTE: E : EMITTER
B : BASE
C : COLLECTOR
K : CATHODE
G : GATE
A : ANODE



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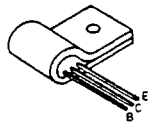

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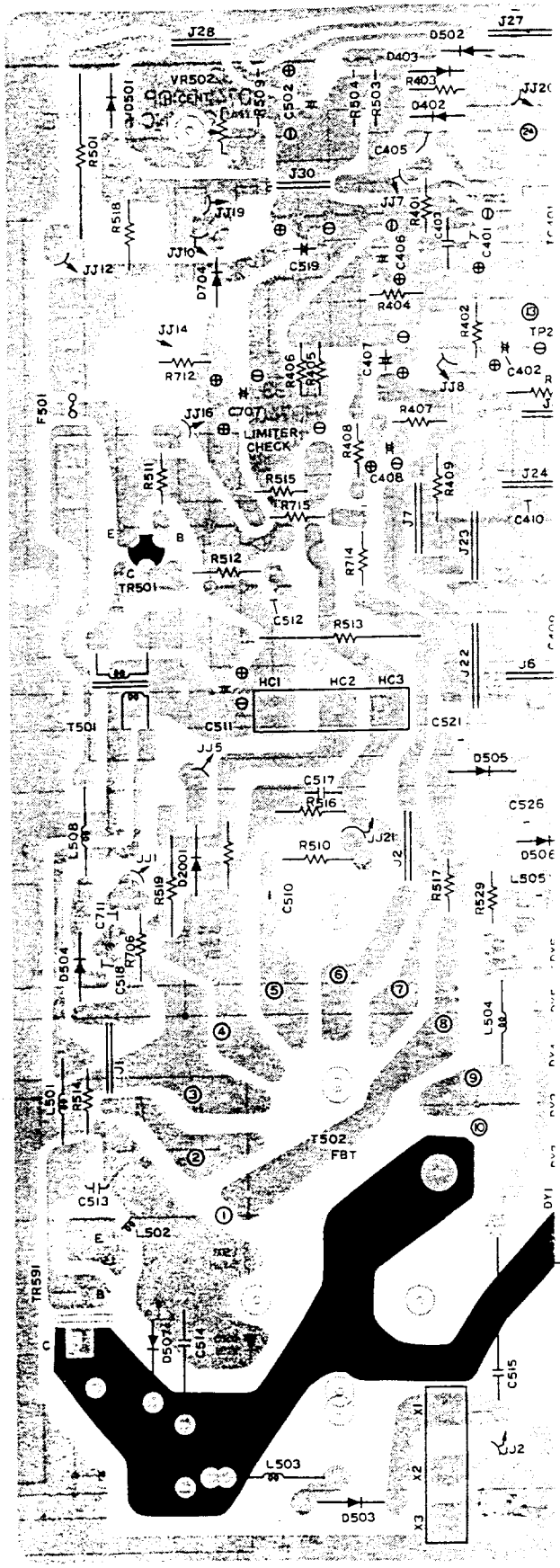
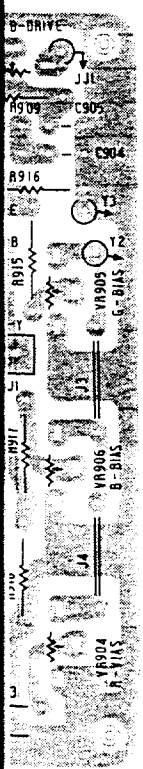
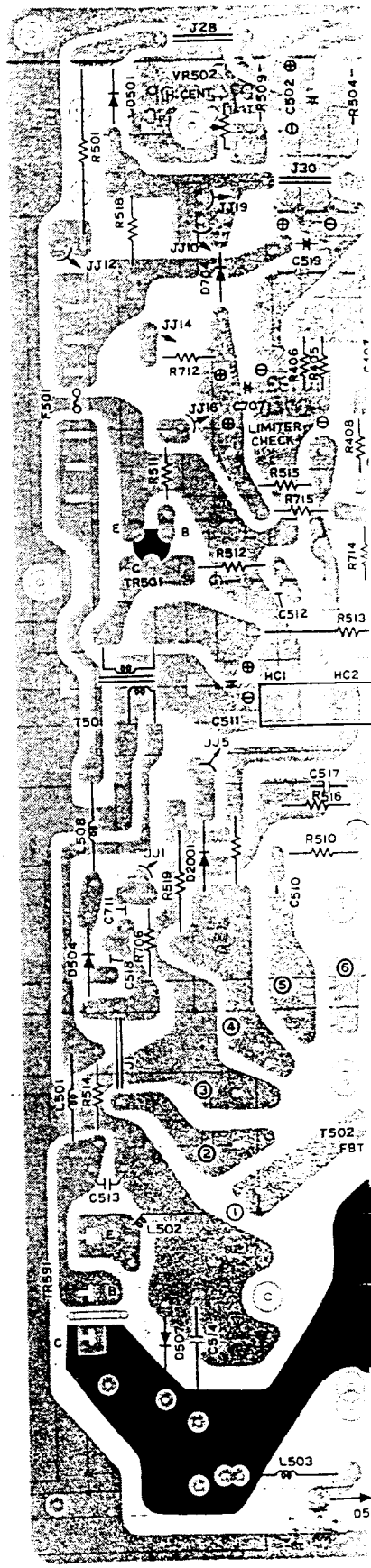


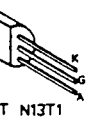
VIDEO CRT PWB ASS'Y (PWC984)
(Solder Side)



MAIN PWB ASS'Y (PWC976)
(Solder Side)



NOTE
E : EMITTER
B : BASE
C : COLLECTOR
K : CATHODE
G : GATE
A : ANODE



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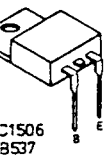

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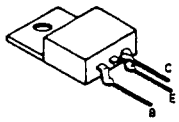
B537
B547
D289



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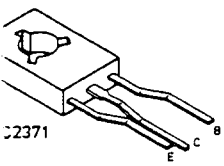
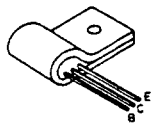
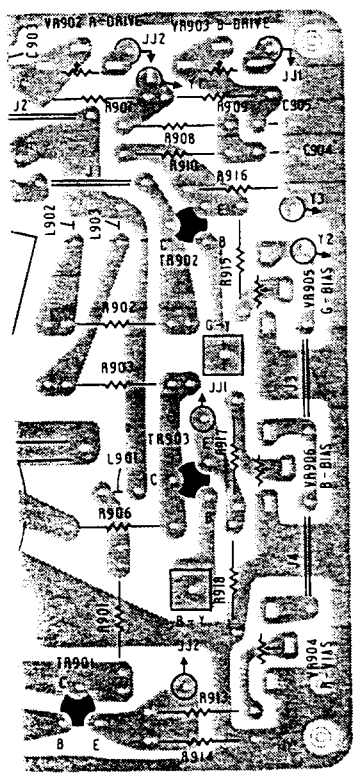


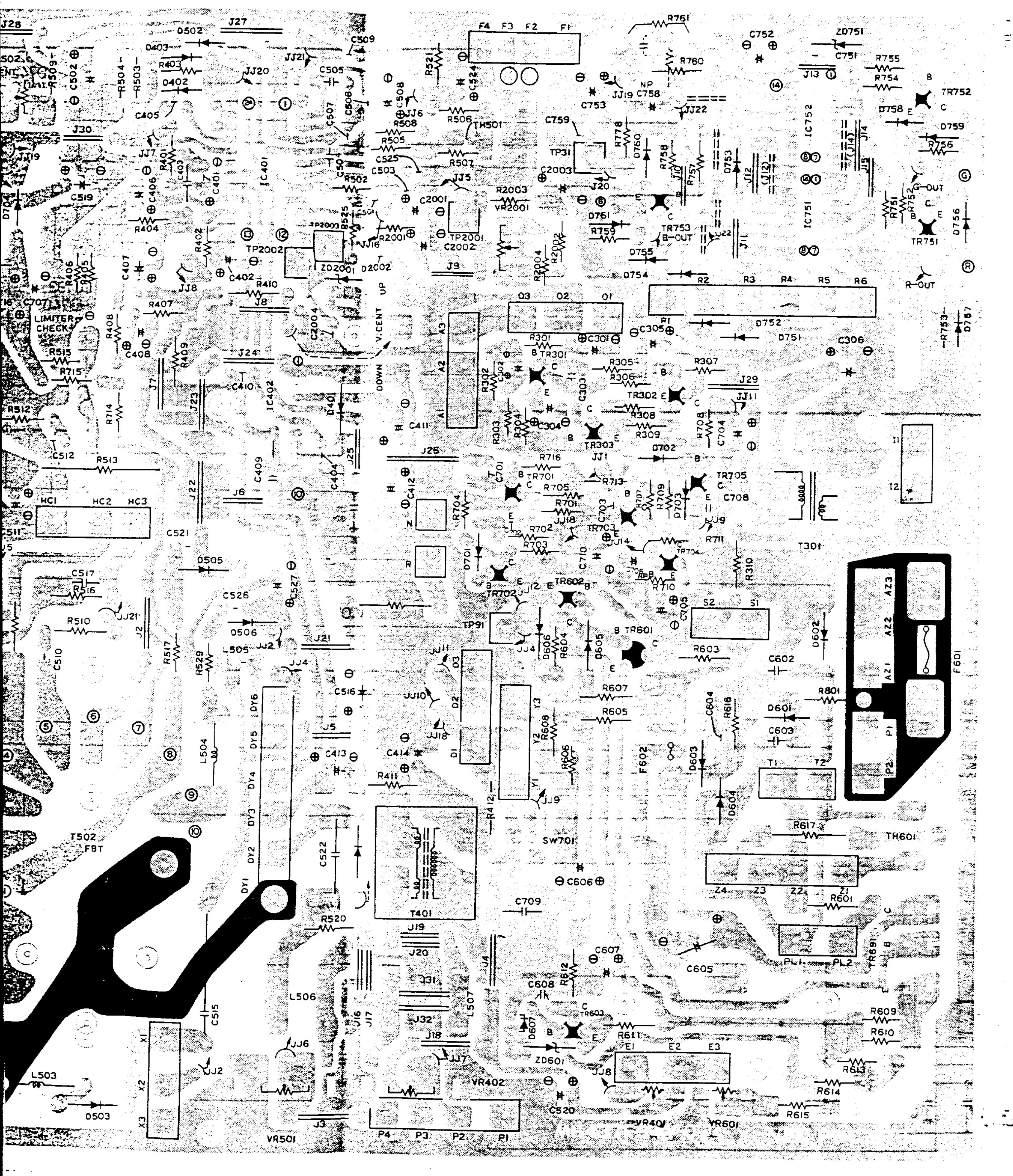
C2371



2SA545

VIDEO CRT PWB ASS'Y (PWC984)
(Solder Side)





J28
J27
D502
D403
R403
D402
C405
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JJ21
C509
C505
C506
C507
C502
R504
R503
J30
JJ19
JJ7
R401
C403
C401
IC401
C406
C519
D704
R404
R402
TP2002
TP2003
ZD2001
D2002
R525
C501
JJ16
R2001
R406
R405
C407
JJ8
C402
R410
J8
C707
LIMITER
CHECK
R407
R408
C408
R409
J24
R515
R715
C410
IC402
J7
J23
R714
R512
C512
R513
C409
J22
J6
C404
D401
C411
J25
J26
C412
HC1
HC2
HC3
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C526
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D506
JJ2
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C510
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R529
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DY1
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C414
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JJ11
JJ18
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D2
D3
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Y3
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JJ17
JJ6
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X3
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R507
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R760
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TR751
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JJ12
TR602
R710
C705
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D602
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AZ2
AZ1
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R604
D605
TR601
R603
C602
R607
R605
R801
C604
R616
D601
C603
P1
P2
R608
R606
F602
D603
D604
T1
T2
JJ9
SW701
R617
TH601
C606
Z4
Z3
Z2
Z1
R601
C607
C605
PL1
PL2
TR891
R612
C608
TR603
D607
R611
ZD601
E1
E2
E3
JJ8
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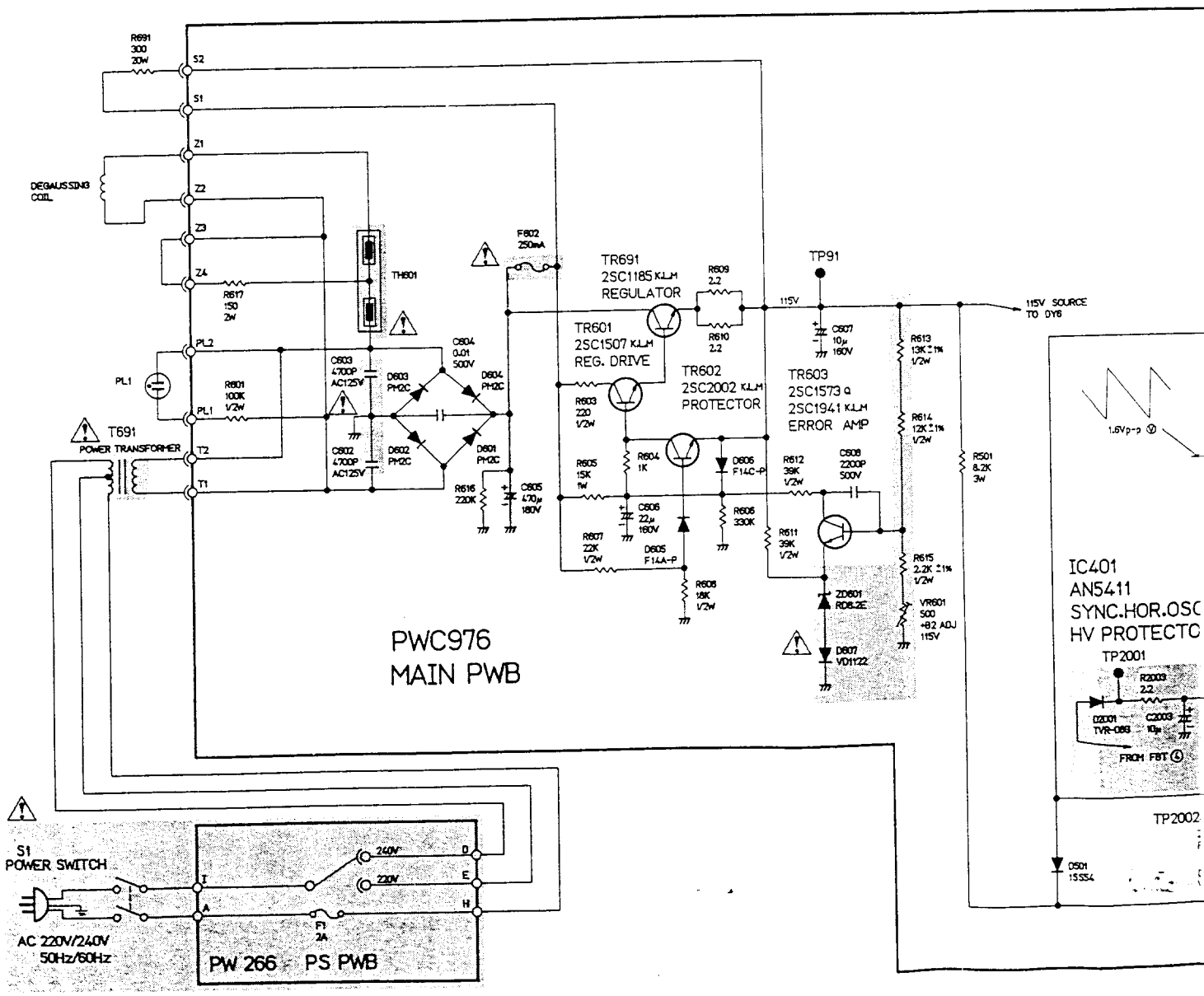
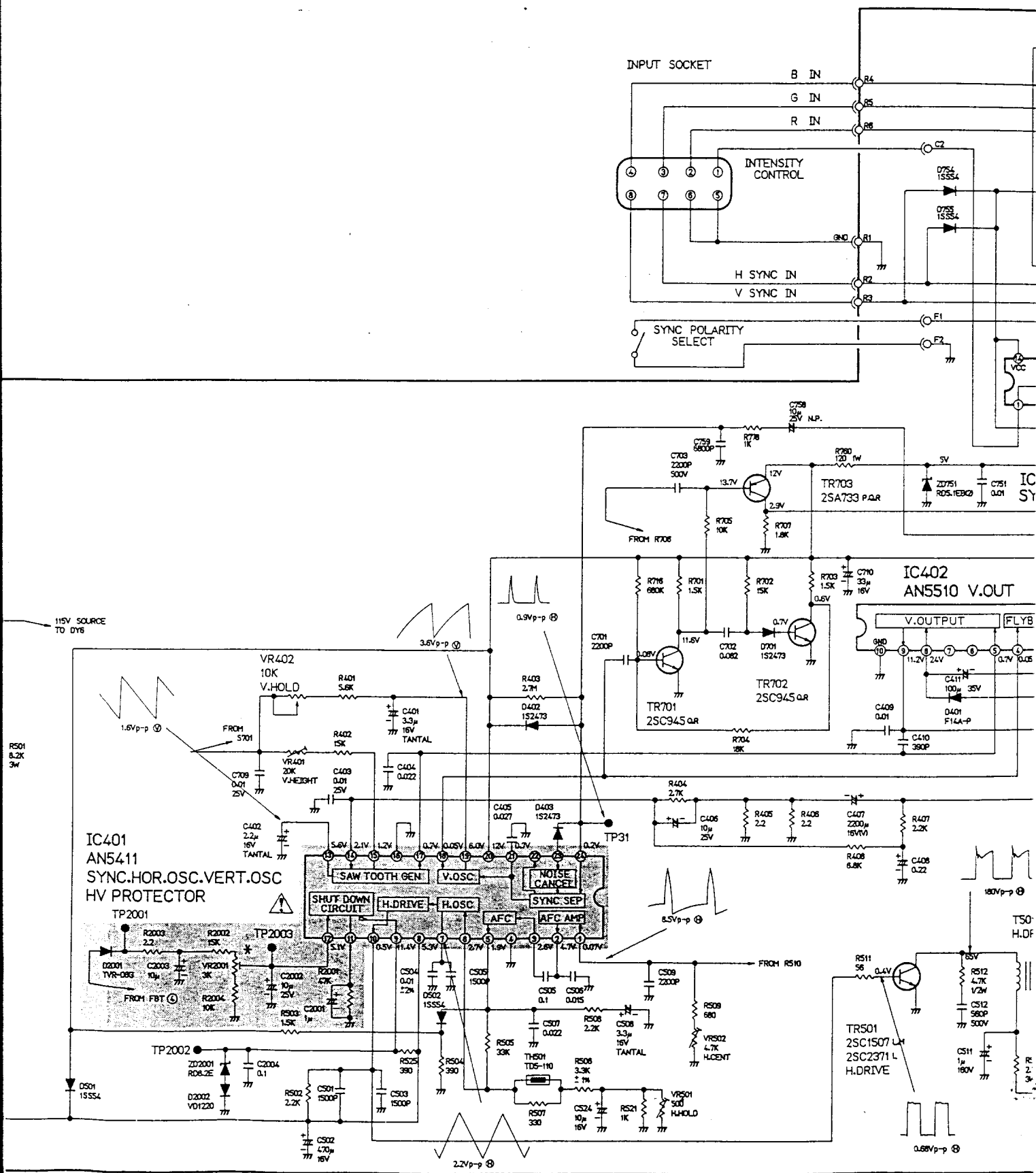
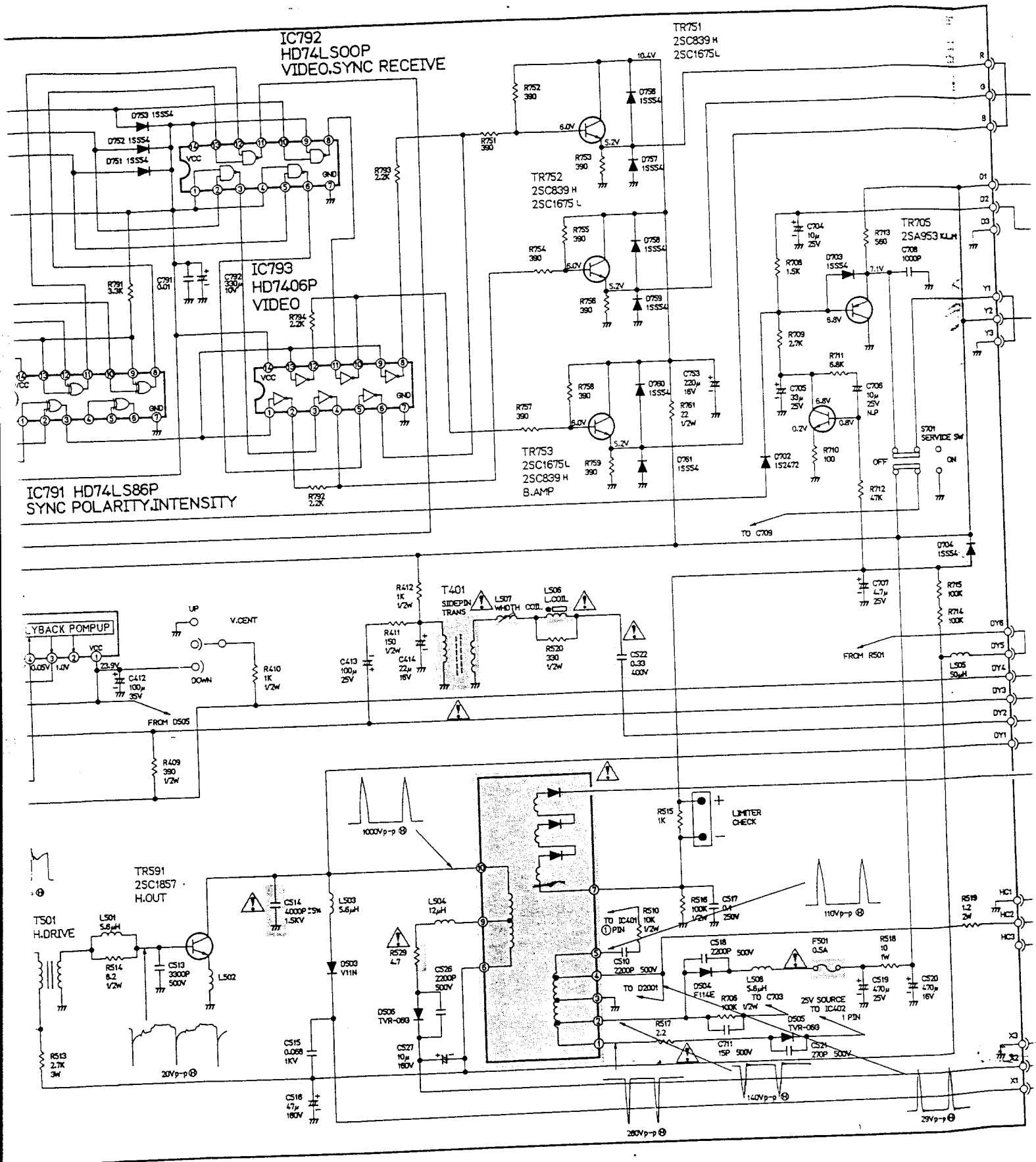
R610
R613
R614
R615
C520
VR401
VR601

MODEL JC-1203DH E
SCHEMATIC DIAGRAM .



THIS SCHEMATIC DIAGRAM IS FUNDAMENTAL AND SUBJECT TO CHANGE.


INPUT SOCKET
B IN
G IN
R IN
INTENSITY CONTROL
H SYNC IN
V SYNC IN
SYNC POLARITY SELECT
IC401
AN5411
SYNC.HOR.OSC.VERT.OSC
HV PROTECTOR
IC402
AN5510 V.OUT
TR701
2SC945 Q,R
TR702
2SC945 Q,R
TR703
2SA733 P,Q,R
TR501
2SC1507 L
2SC2371 L
H.DRIVE
VR402
10K
V.HOLD
VR401
20K
V.HEIGHT
SAW TOOTH GEN
V.OSC
NOISE CANCEL
SYNC SEP
AFC
AFC AMP
H.DRIVE
H.OSC
SHUT DOWN CIRCUIT
V.OUTPUT
TP31
TP2001
TP2002
TP2003
115V SOURCE TO DY6
FROM R510
FROM FBT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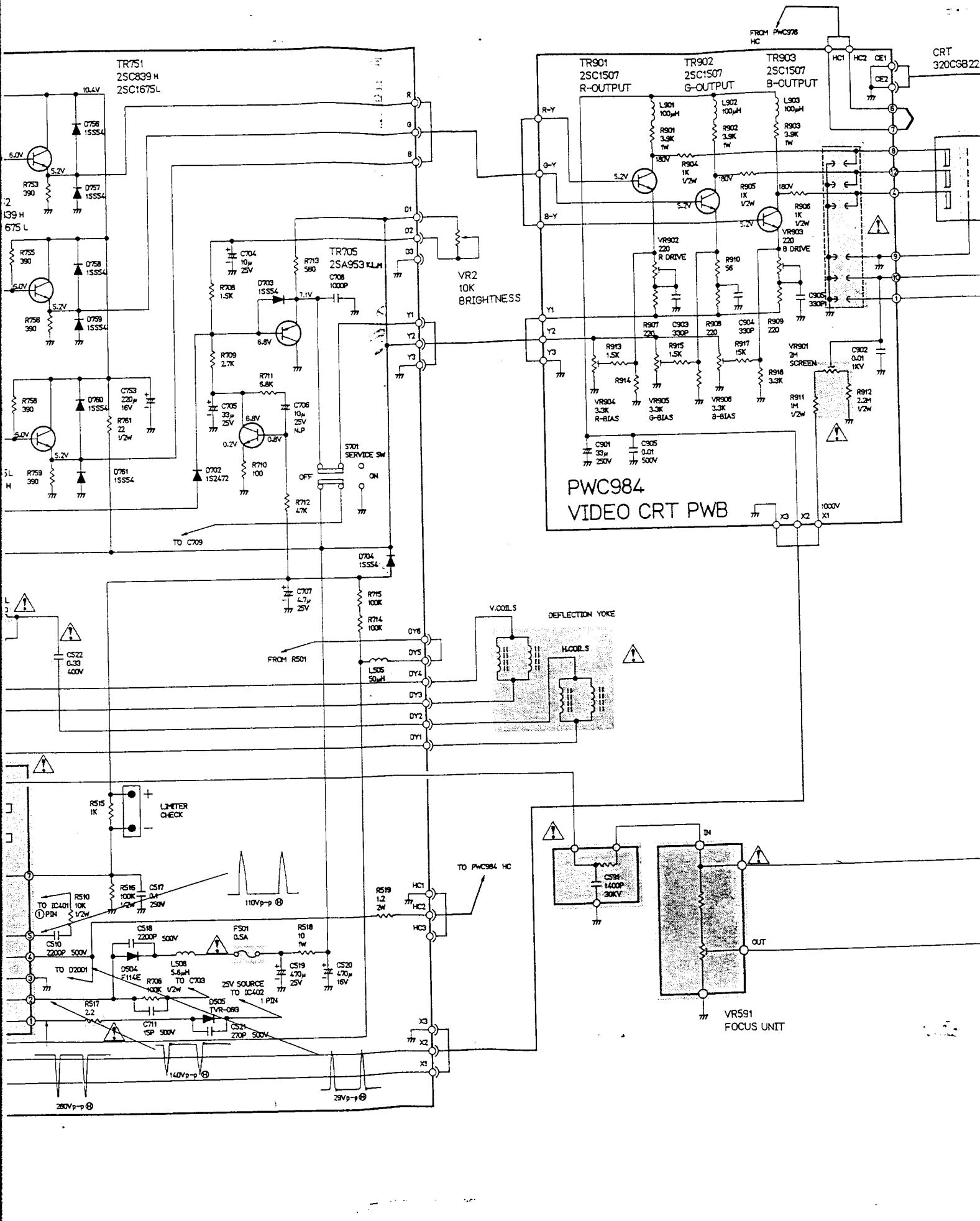
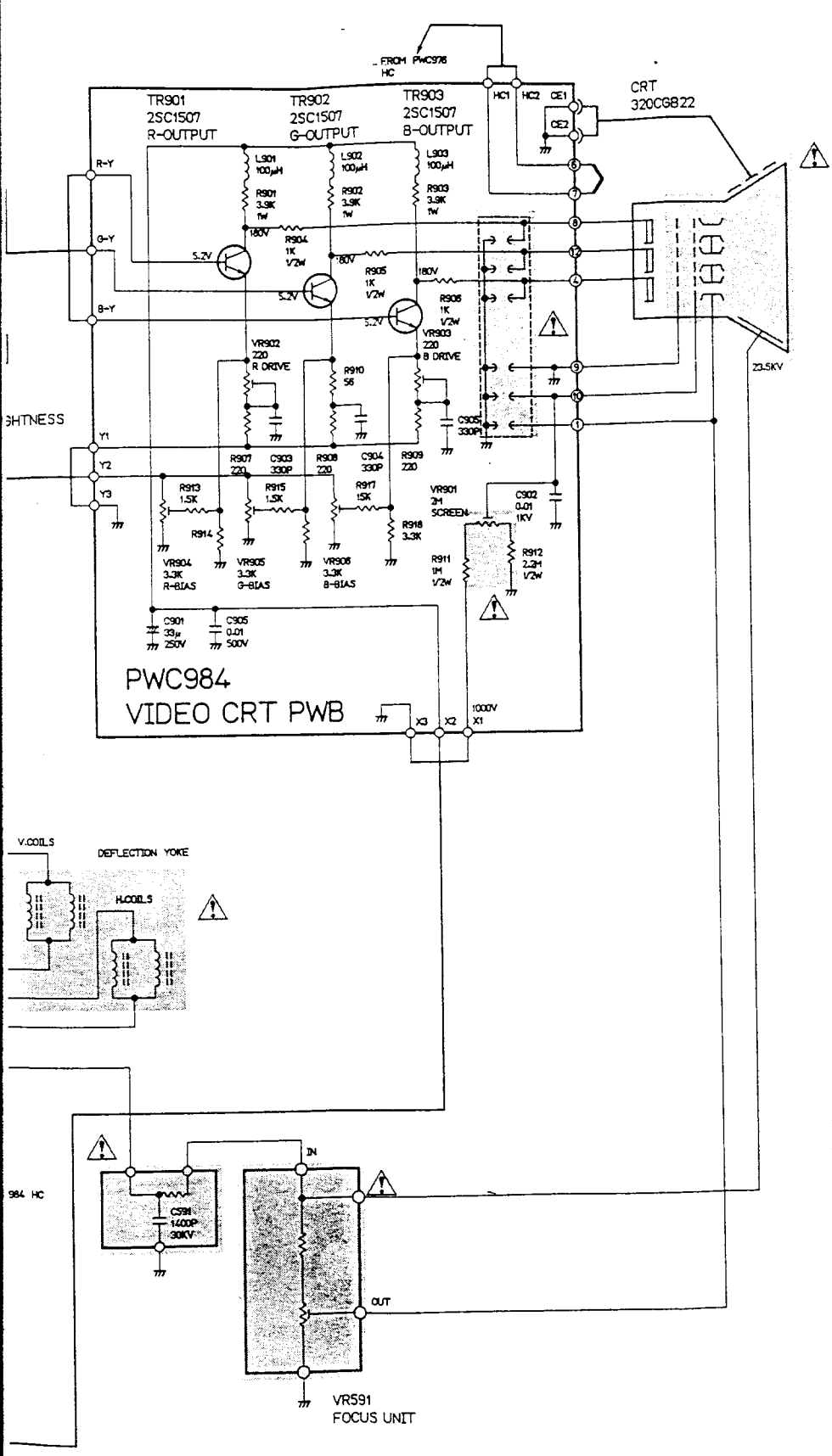
HD74LS00P
VIDEO.SYNC RECEIVE
IC793
HD7406P
VIDEO
IC791 HD74LS86P
SYNC POLARITY.INTENSITY
TR751
2SC839 H
2SC1675L
TR752
2SC839 H
2SC1675 L
TR753
2SC1675L
2SC839 H
B.AMP
TR705
2SA953 K,L,M
S701
SERVICE SW
ON
OFF
TO C709
FROM R501
FLYBACK POMPUP
UP
DOWN
V.CENT
FROM D505
T401
SIDEPIN
TRANS
WIDTH COIL
L.COIL
TR591
2SC1857
H.OUT
T501
H.DRIVE
LIMITER
CHECK
TO IC401
1 PIN
TO D2001
TO C703
25V SOURCE
TO IC402
1 PIN
1000Vp-p
110Vp-p
20Vp-p
140Vp-p
280Vp-p
29Vp-p


TR751
2SC839 H
2SC1675 L
TR705
2SA953 K,L,M
TR901
2SC1507
R-OUTPUT
TR902
2SC1507
G-OUTPUT
TR903
2SC1507
B-OUTPUT
VR2
10K
BRIGHTNESS
PWC984
VIDEO CRT PWB
CRT
320CGB22
S701
SERVICE SW
OFF
ON
TO C709
FROM R501
V.COILS
DEFLECTION YOKE
H.COILS
LIMITER
CHECK
TO PWC984 HC
FROM PWC976
HC
IN
OUT
VR591
FOCUS UNIT
TO IC401
PIN
TO D2001
TO C703
25V SOURCE
TO IC402
1 PIN
110Vp-p
140Vp-p
260Vp-p
29Vp-p
1000V

SAVE THIS SCHEMATIC DIAGRAM FOR LATER SERVIC



NOTES

1. RESISTOR VALUES ARE IN Ω (OHM) K=1,000Ω M=1,000,000Ω
2. ALL RESISTORS ARE 1/4WATT EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED. P=
4. ALL CAPACITORS RATE 50VOLTS EXCEPT WHERE OTHERWISE INDICATEI
5. WAVEFORMS ARE TAKEN WITH PERSONAL COMPUTER PC-8001
6. ⊕---- HORIZONTAL RATE. Ⓥ---- VERTICAL RATE.

WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS ARE IDENTIFIED BY ⚠ SHADING ON THE SCHEMATIC REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS.
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

CONTROL (S) MARKED ✳ IS PERMANENTLY FROZEN.
DO NOT ATTEMPT TO DEFEAT OR IMPROPERLY REPLACE.

MODEL JC-1203OH E
SCHEMATIC DIAGRAM

7816062 □ 1/3

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