

HITACHI

VM-920/VM-921
VM-1220/VM-1221
VIDEO MONITOR

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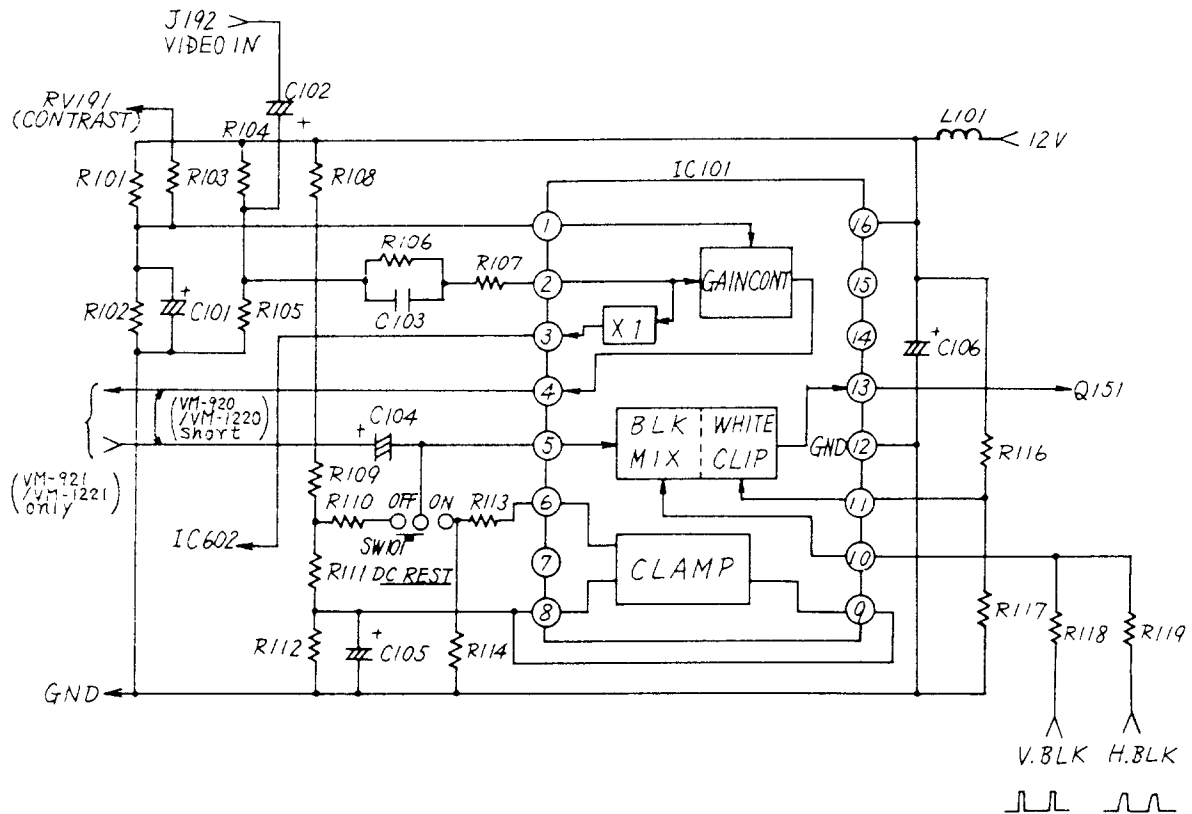
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VM-920/VM-921 · VM-1220/VM-1221
VIDEO MONITOR
SERVICE MANUAL

1. CIRCUIT DESCRIPTION

1.1 VIDEO AMP circuit (IC101, Q151, IC201)

1.1.1 IC101 and its peripheral circuit



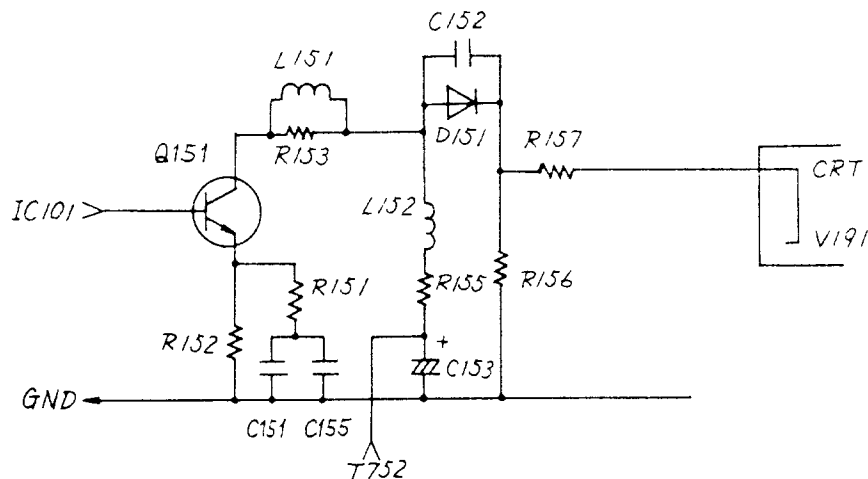
- 1) The incoming signal enters IC101 at pin ②.
- 2) The signal from pin ③ is supplied to IC602 as an internal sync signal.
- 3) The gain between pins ② and ④ is controlled by changing the DC voltage at pin ① by the Contrast control.

The resulting values are:

Voltage at pin ①	Gain
8 volts	2x
6 volts	1x
4 volts	0.03x

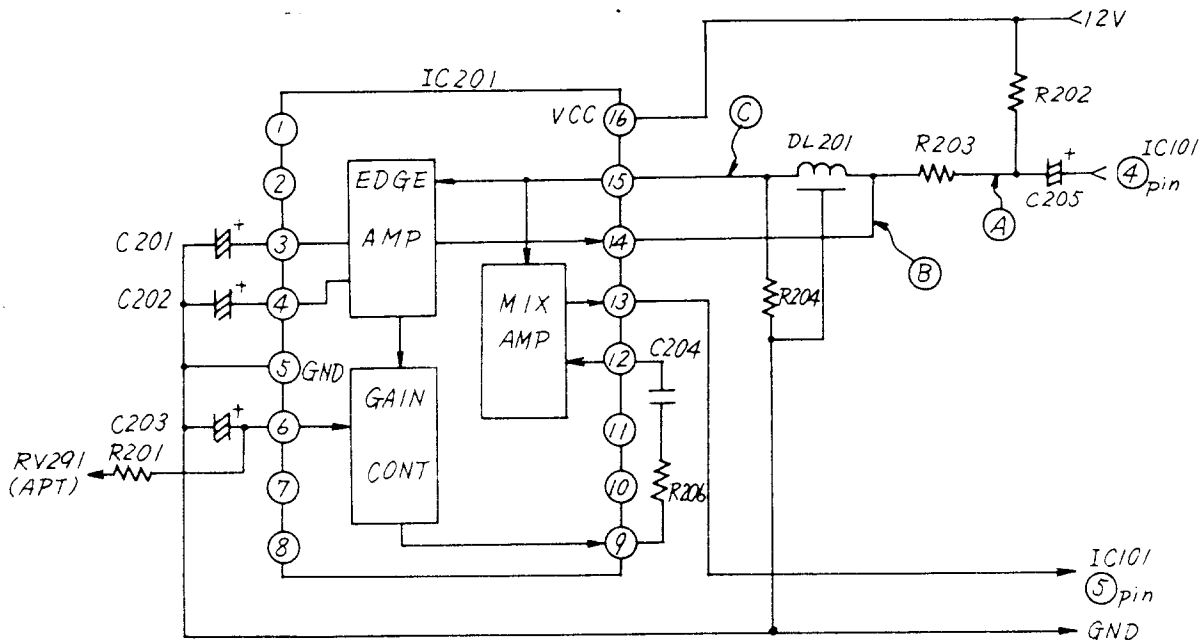
- 4) The output from pin ④ is fed to pin ⑤ for the VM-920/VM-1220 and are aperture-corrected for the VM-921/VM-1221.
- 5) The signal fed to pin ⑤ is ac biased when the DC REST switch (SW101) is OFF, and peak clamped by pin ⑥ when ON.
- 6) The vertical blanking signal and the horizontal blanking signal are mixed by R118 and R119 and fed to pin ⑩ to perform blanking.
- 7) The signal passing through the BLK MIX and WHITE CLIP circuits is fed out from pin ⑬ and drives Q151 (video output).

1.1.2 Q151 and its peripheral circuit

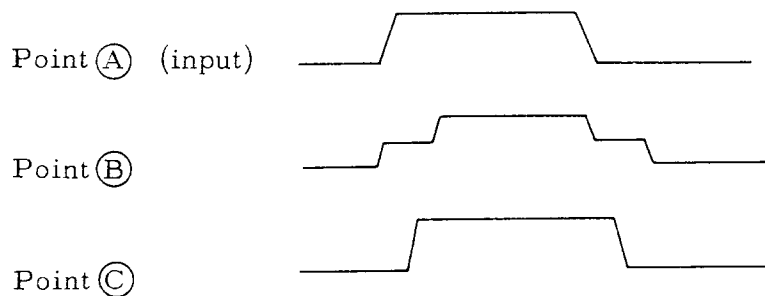


- 1) The signal from IC101 is amplified by Q151 and drives the cathode of the CRT.
- 2) D151 is bias in the forward direction when a cathode current is small. When an excessive cathode current is supplied in case of an excessive contrast or an excessive brightness, D151 is biased in the reverse direction and the increase in a cathode current is limited.

1.1.3 IC201 and its peripheral circuit (VM-921/VM-1221 only)



- 1) When the signal from pin ④ of IC101 is delayed and reflected by DL201, the following signals appear.



- 2) When an operation ③ - ② is performed by the EDGE AMP, a contour signal as shown below is obtained at pin ⑨.



- 3) The contour signal from pin ⑨ is gain-controlled by the DC voltage (variable by the Aperture control) from pin ⑥. When

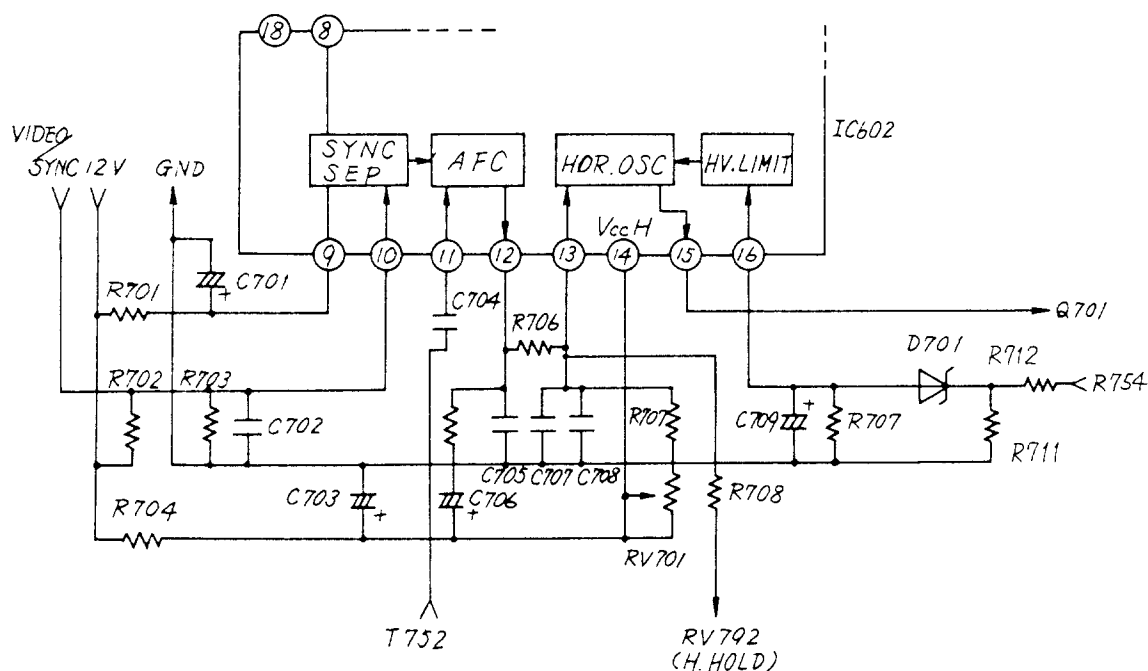
the DC voltage is zero volts, the output is a minimum (approximately zero). When it is 12 volts, the output is a maximum.

- 4) The signal from pin (15) and the contour signal are mixed by the MIX AMP. The mixed signal is routed to pin (5) of IC101 from pin (13).

1.2 Horizontal deflection circuit (IC602-1/2, Q701, Q702)

1.2.1 IC602 (horizontal oscillator) and its peripheral circuit

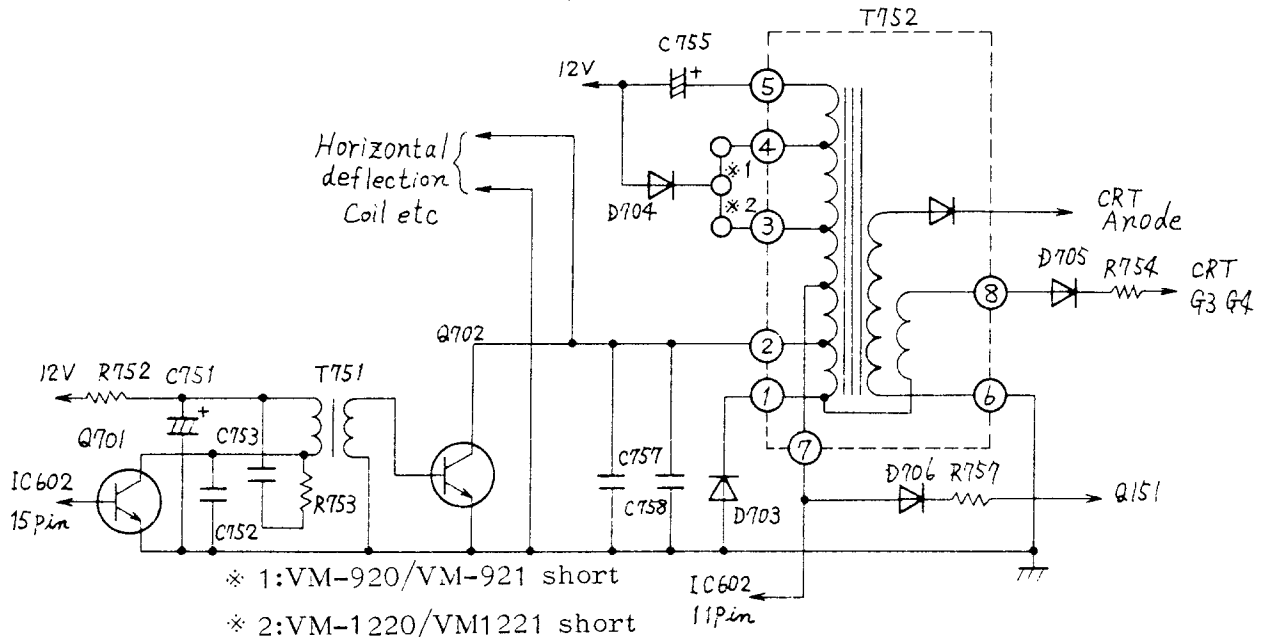
----- Refer to 1.3.1 for the vertical oscillator.



- 1) A sync component is separated from the composite video signal fed to pin (10).
- 2) The sync signal and the horizontal pulse (input at pin (11)) are compared by the AFC circuit and the error is converted into a DC voltage, which is fed to pin (12).
- 3) The HOR OSC circuit is controlled by the DC voltage from pin (12) and delivers a square wave from pin (13).
- 4) When a high voltage increases excessively, D701 detect the excessive voltage and activate the HV LIMIT circuit to prevent

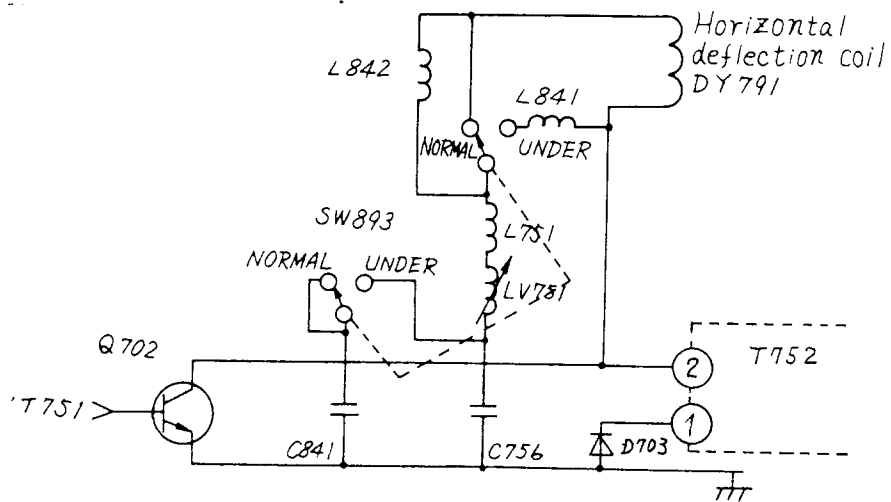
an X ray from being radiated from the CRT. When the HV LIMIT circuit activates, the HOR OSC circuit ceases the operation and accordingly the high voltage ceases. The HV LIMIT circuit continues to activate until the power supply is turned to off.

1.2.2 Q701 and Q702, and their peripheral circuit



- 1) The output signal from pin ⑮ of IC602 is amplified by Q701 and drives Q702 via T751.
- 2) One of the output of Q702 is supplied to the horizontal deflection coil and shaped to a sawtooth waveform, which scans the electron beams in a horizontal direction.
- 3) The other output is supplied to T752 and the voltages (an anode voltage and grid voltages) required for the picture tube are obtained from the secondary side.

1.2.3 Selection of the horizontal scan size (VM-921/VM-1221 only)

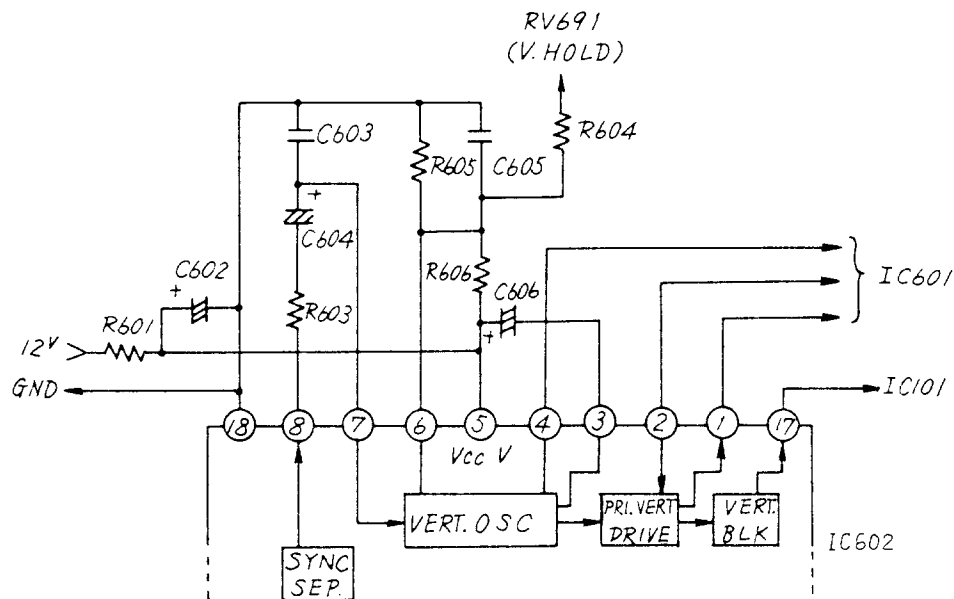


- 1) When the SCAN switch (SW893) is at the NORMAL position, a sawtooth current flows from DY791 to L751 to LV751 to C756.
- 2) When SW893 is at the UNDER position, L841 is in between DY791 and L751. Consequently, the sawtooth current flowing to DY791 decreases and the horizontal amplitude of a picture reduces.
- 3) L751 is a linearity correction coil, which corrects a linearity by using the sawtooth current. For this purpose, the sawtooth current is shunted by L841 to let the current remain unchanged in case of underscan.
- 4) C756 is provided for correcting S-shape distortion. In the underscan mode, C841 is connected to prevent an excessive correction.

1.3 Vertical deflection circuit (IC602-1/2, IC601, Q651)

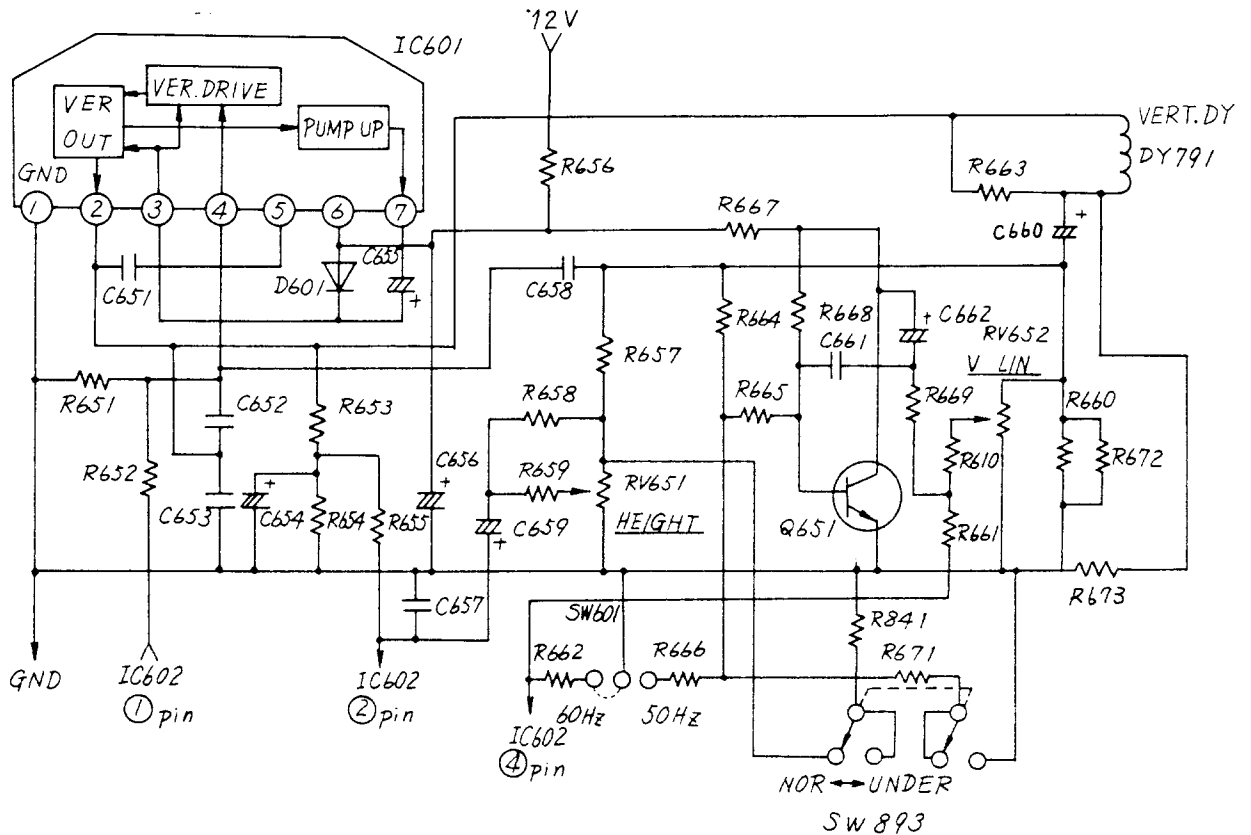
1.3.1 IC602 (vertical oscillator) and its peripheral circuit

----- (Refer to 1.2.1 for the horizontal oscillator.)



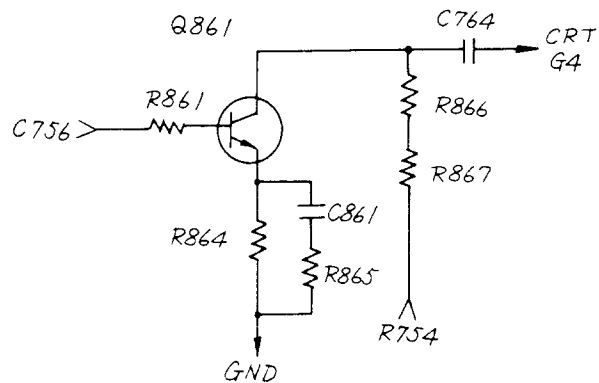
- 1) A sync signal is obtained at pin ⑧. The horizontal sync component is separated by R603 and C603. The resulting vertical sync signal is routed to pin ⑦.
- 2) The VERT OSC circuit synchronizes with the vertical sync signal and oscillates a sawtooth wave.
- 3) The sawtooth signal is supplied to the PRI VERT. DRIVE circuit and fed out from pin ① to drive IC601.
- 4) An error voltage which serves for a stable operation of IC601 is fed to pin ② from IC601.
- 5) A vertical blanking signal is fed to IC101 from pin ⑰.

1.3.2 IC601 and its peripheral circuit



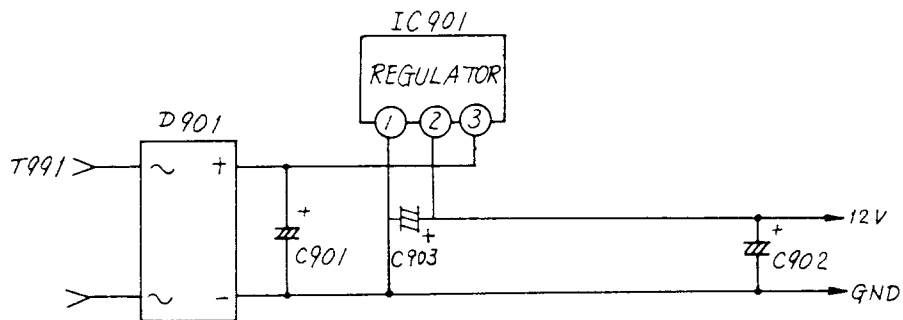
- 1) Pin (4) is an input terminal of IC601. IC601 is driven by IC602.
- 2) A vertical deflection current from pin (2) flows from DY791 to C660 to R660 and R672.
- 3) The waveforms obtained at the both sides of R660 are used for the adjustment of a vertical size of a picture and the correction of a linearity.
- 4) SW601 is used to select vertical field frequencies by replacing with a jumper wire. (50 - 60F)
- 5) Q651 is for linearity correction and generates a parabolic signal.
- 6) SW893 selects a scan size and the amount of linearity correction (VM-921/VM-1221 only).

1.4 Dynamic focus circuit (Q861) (VM-921/VM-1221 only)



To improve the focus on the left and right sides of the picture tube, this circuit amplifies the parabolic waveform from C756 (capacitor for the correction of S-shape distortion) by Q861 and superimposes the signal to G4 of the picture tube.

1.5 Power supply circuit (IC901 and IC902)



- 1) The output from the secondary side of the power transformer is rectified by D901.
- 2) IC901 is regulator with three terminal and 12-volt output is obtained.

2. SPECIFICATIONS

- | | |
|----------------------------|---|
| (1) System | EIA (U, C types), CCIR (E, K types) |
| (2) Input video signal | |
| VM-920/VM-1220: | 1.0 Vp-p composite video, sync negative |
| VM-921/VM-1221: | 1.0 Vp-p composite video, sync negative,
or 0.7 Vp-p non-composite video |
| (3) Sync system | |
| VM-920/VM-1220: | Internal |
| VM-921/VM-1221: | Internal or External |
| (4) Input sync signal | 4 Vp-p, negative (VM-921/VM-1221 only) |
| (5) Input impedance | 75 Ω or high (loop-through) |
| (6) Picture tube | |
| VM-920/VM-921 | 9" 90° deflection 230BTB4 or equivalent |
| VM-1220/VM-1221 | 12" 90° deflection C12M40P4 or equivalent |
| (7) Effective picture size | |
| VM-920/VM-921: | 183 x 140 mm |
| VM-1220/VM-1221 | 257 x 195 mm |
| (8) Scan size | |
| Overscan | 5 % |
| Underscan | -7 % (VM-921/VM-1221 only) |
| (9) Resolution (at center) | |
| Horizontal | 800 lines (Overscan mode for
VM-921/VM-1221) |
| Vertical | 350 lines |
| (10) Geometric distortion | Less than 1 % at center with respect to
picture height (Overscan mode for
VM-921/VM-1221) |
| (11) DC restoration | Switchable by the built-in DC REST
switch |
| | U, C types: OFF at factory |
| | E, K types: ON at factory |

(12) Power supply

U, C types	117 V AC $\pm 10\%$ 60 Hz
E type	220 V AC $\pm 10\%$ 50 Hz
K type	240 V AC $\pm 10\%$ 50 Hz

(13) Power consumption

VM-920/VM-921	28 W
VM-1220/VM-1221	32 W

(14) Ambient conditions

Operation temp.	-10 to 50°C (14 to 122°F)
Relative humidity	35 to 85%

(15) Dimensions

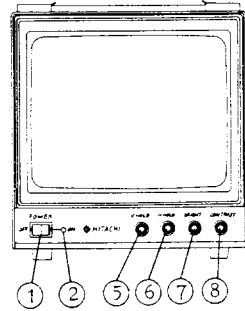
VM-920/VM-921	220(W) x 220(H) x 238(D) mm (8.7x8.7x9.4 in)
VM-1220/VM-1221	304(W) x 284(H) x 305(D) mm (12.0x11.2x12.0 in)

(16) Weight

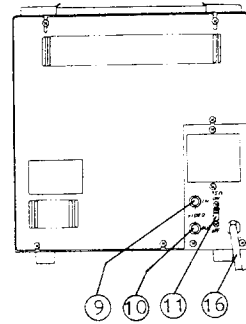
VM-920/VM-921	6.5 kg (14.3 lb) approx.
VM-1220/VM-1221	10 kg (22.0 lb) approx.

3. NAMES OF EACH SECTION

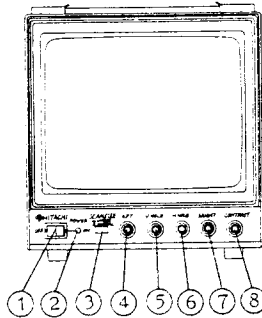
VM-920 (Front side)



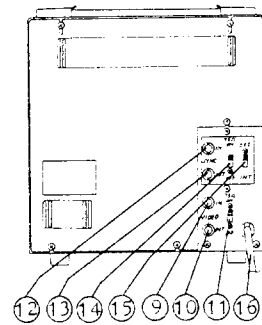
VM-920 (Rear side)



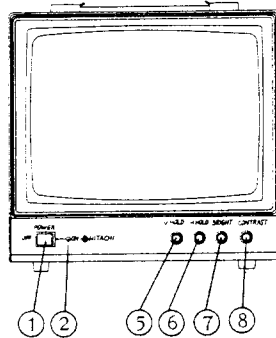
VM-921 (Front side)



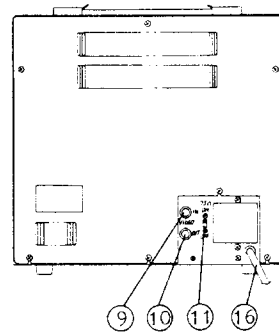
VM-921 (Rear side)



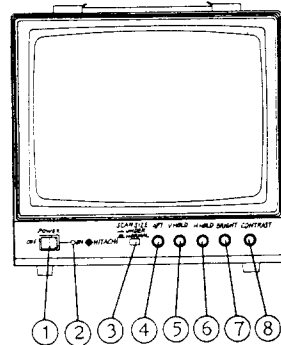
VM-1220 (Front side)



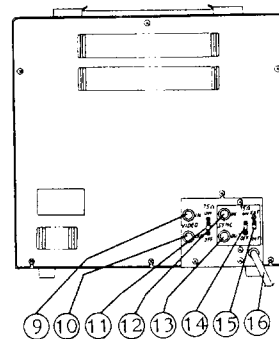
VM-1220 (Rear side)



VM-1221 (Front side)



VM-1221 (Rear side)



- ① POWER ON/OFF switch
- ② Pilot lamp Lights when the POWER ON/OFF switch is ON.
- ③ SCAN SIZE switch Press for the underscan and press again for the normal scan. (VM-921/VM-1221 only)
- ④ APT control Adjusts the contour of a picture. (VM-921/VM-1221 only)
- ⑤ V HOLD control Adjusts to hold a picture vertically.
- ⑥ H HOLD control Adjusts to hold a picture horizontally.
- ⑦ BRIGHT control Adjusts the brightness of a picture.
- ⑧ CONTRAST control Adjusts the contrast of a picture.
- ⑨ VIDEO IN connector Connect a video cable.
- ⑩ VIDEO OUT connector Connect a video cable for loop-through operation.
- ⑪ 75 Ω ON-OFF switch Turn OFF only when the VIDEO OUT connector is connected.
- ⑫ SYNC IN connector Connect a sync cable. (VM-921/VM-1221 only)
- ⑬ SYNC OUT connector Connect a sync cable for loop-through operation. (VM-921/VM-1221 only)
- ⑭ 75 Ω ON-OFF switch Turn OFF only when the SYNC OUT connector is connected. (VM-921/VM-1221 only)
- ⑮ INT-EXT switch Set to INT in the internal sync mode. Set to EXT when the SYNC IN connector is connected. (VM-921/VM-1221 only)
- ⑯ Power cord

4. Disassembling method

4.1 VM-920/VM-921 Video monitor

Notes:

- (1) Before disassembling the monitor, be sure to disconnect the AC power cord from the AC outlet.
- (2) Handle the connector cables with care.

1. Cover and Rear panel

(Fig. 1.)

- (1) Loosen three screws ①.
To remove only the rear panel, loosen two screws ④.
- (2) Remove four screws ②.
- (3) Remove the screw ③ and remove the cover in the direction of the arrow.

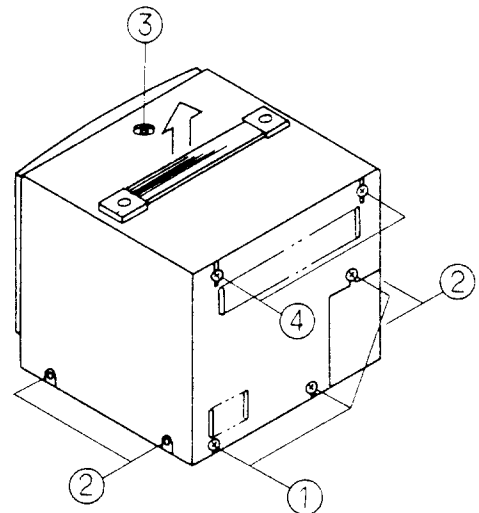


Fig.1

2. MAIN/SOCKET boards

(Fig. 2.)

- (1) Remove the cover.
(See Item 1.)
- (2) Disconnect connectors P101, P701, P751, P801*, P841*, P901, and P902 on the MAIN board.
(P801 and P841: VM-921 only)
- (3) Disconnect the high voltage cable with anode cap from the CRT.
- (4) Disconnect connector P151 (CRT ground wire) on the SOCKET board.
- (5) Remove the SOCKET board from the CRT.
- (6) Remove two screws ①.

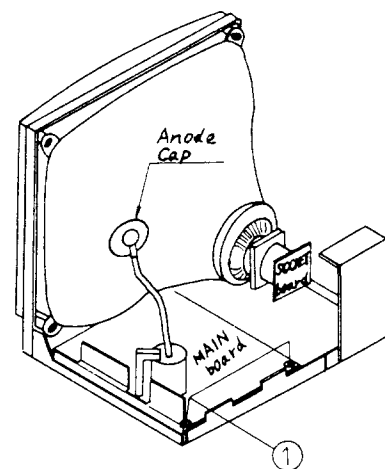
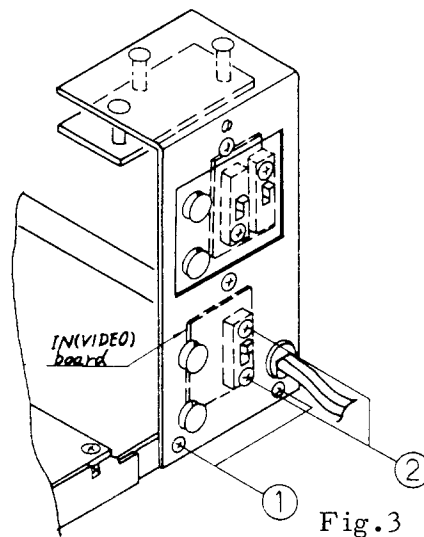


Fig.2

3. IN(VIDEO) board

(Fig. 3.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connector P101 on the MAIN board.
- (3) Remove two screws ① on the Connector panel 1.
- (4) Disconnect two VIDEO BNC connectors, and remove two screws ②.

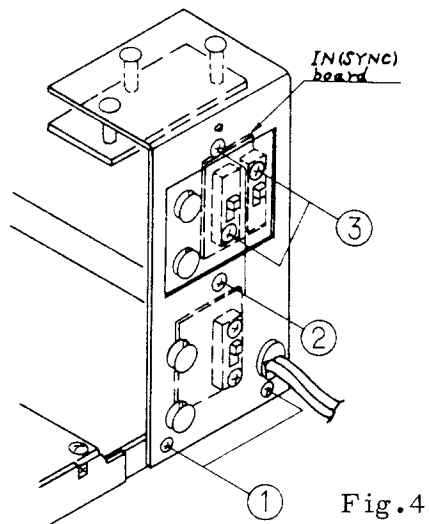


4. IN(SYNC) board

(Fig. 4.)

(VM-921 only)

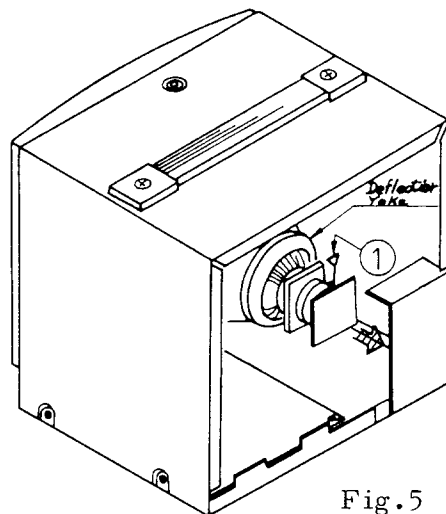
- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connector P801 on the MAIN board.
- (3) Remove two screws ① on the Connector panel 1.
- (4) Remove two screws ② on the Connector panel 2.
- (5) Disconnect two SYNC BNC connectors, and remove two screws ③.



5. Deflection yoke

(Fig. 5.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Remove the SOCKET board.
(See Item 2.)
- (3) Disconnect connector P751 on the MAIN board.



- (4) Remove the deflection yoke fixing screw ①.
- (5) Remove the Deflection yoke in the direction of the arrow.

6. MASK

(Fig. 6.)

- (1) Remove the Cover.
(See Item 1.)
- (2) Disconnect the high voltage cable with anode cap from the CRT. (See Item 2.)
- (3) Remove the SOCKET board.
(See Item 2.)
- (4) Disconnect connectors P701, P751, and P841 on the MAIN board.
(P841: VM-921 only)
- (5) Disconnect connector P151 on the SOCKET board.
- (6) Remove four knobs* on the front of monitor.
- (7) Remove two screws ① to remove the front panel.
- (8) Remove two screws ② to remove the Mask in the direction of the arrow.

Note*: VM-920 equipped with four knobs;
VM-921 equipped with five knobs.

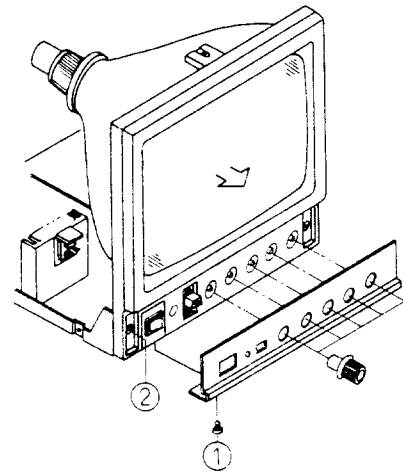


Fig.6

7. CRT

(Fig. 7.)

- (1) Remove the Deflection yoke.
(See Item 3.)
- (2) Remove the Mask. (See Item 6.)
- (3) Remove four screws ①.

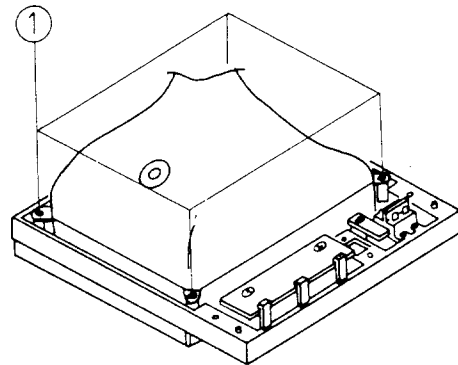


Fig.7

8. VOLUME board

(Fig. 8.)

- (1) Remove the Mask. (See Item 6.)
- (2) Remove two screws ①.

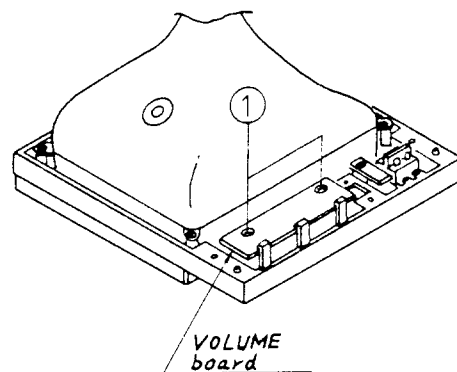


Fig.8

9. PL board

(Fig. 9.)

- (1) Remove the Mask. (See Item 6.)
- (2) Remove the screw ①.

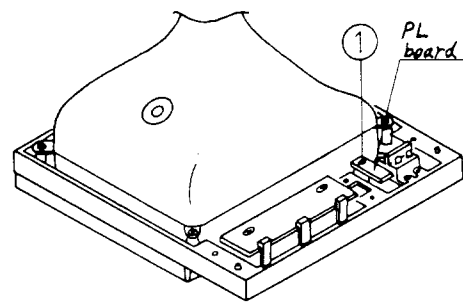


Fig.9

10. SCAN SW board (VM-921 only)

(Fig. 10.)

- (1) Remove the rear panel.
(See Item 1.)
- (2) Disconnect connector P841 on the MAIN board.
- (3) Remove the operation panel.
(See Item 6.)
- (4) Remove two screws ①.
- (5) Remove three screws ③.
- (6) Remove the front panel.
- (7) Remove two screws ④.

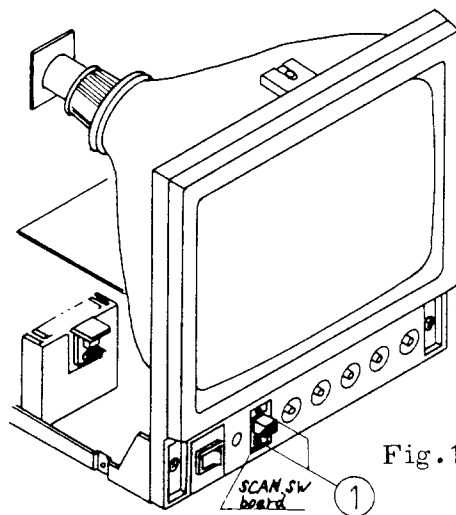


Fig.10

11. FUSE board

(Fig. 11.)

- (1) Remove the cover. (See Item 1.)
- (2) Disconnect two connectors between the FUSE board and the switch.
- (3) Remove the Connector panel 1.
(See Item 3.)
- (4) Remove the FUSE board from three spacers.

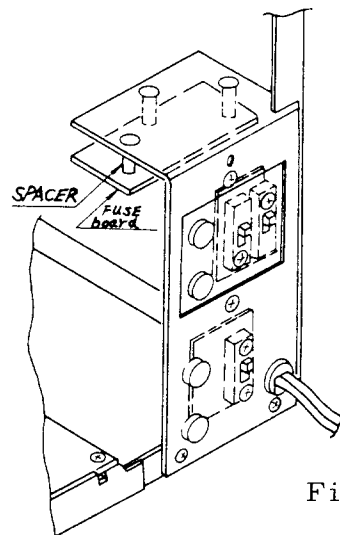


Fig.11

12. PWR board

(Fig. 12.)

- (1) Remove the Cover.
(See Item 1.)
- (2) Disconnect connector P902 on the MAIN board.
- (3) Remove two screws ① to remove the heat sink fin.
- (4) Remove the screw ②.

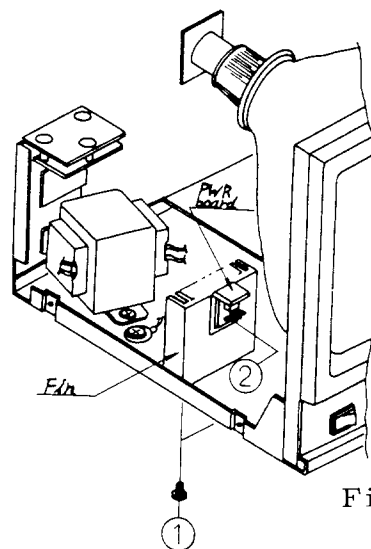


Fig.12

13. Transformer

(Fig. 13.)

- (1) Remove the Cover. (See Item 1.)
- (2) Disconnect connector P901 on the MAIN board.
- (3) Remove the screw ① fixing the grounding lead.
- (4) Disconnect two connectors between the transformer and the POWER switch.
- (5) Remove two screws ②.

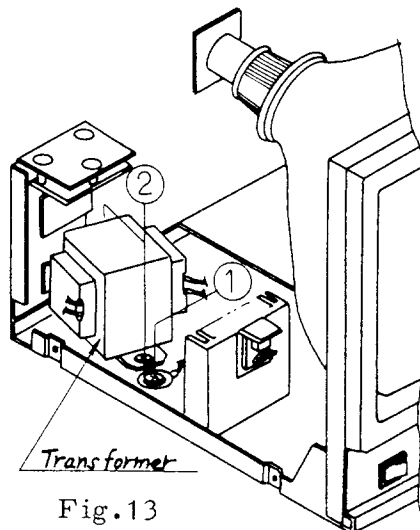


Fig.13

4.2 VM-1220/VM-1221 Video monitor

Notes:

- (1) Before disassembling the monitor, be sure to disconnect the AC power cord from the AC outlet.
- (2) Handle the connector cables with care.

1. Rear panel

(Fig. 1.)

- (1) Loosen four screws ①.
- (2) Remove three screws ②.

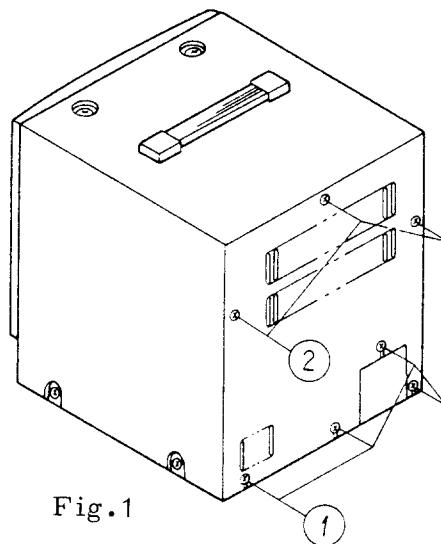


Fig.1

2. Cover

(Fig. 2.)

- (1) Remove the Rear panel. (See Item 1.)
- (2) Remove two screws ①.
- (3) Remove four screws ②.

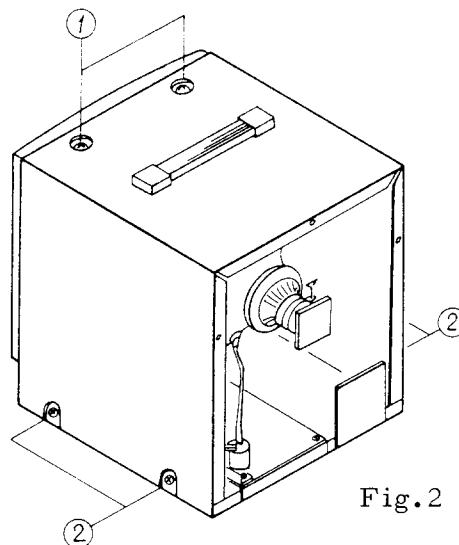


Fig.2

3. MAIN/SOCKET boards

(Fig. 3.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connectors P101, P701, P801*, P841*, P901, and P902 on the MAIN board.
(P801 and P841: VM-1221 only)
- (3) Disconnect the high voltage cable with anode cap from the CRT.
- (4) Disconnect connector P151 (CRT ground wire) on the SOCKET board.
- (5) Remove the SOCKET board from the CRT.
- (6) Remove two screws ①.

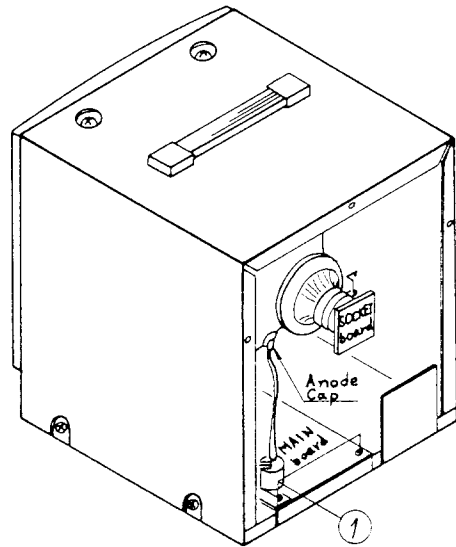


Fig.3

4. IN(VIDEO) board

(Fig. 4.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connector P101 on the MAIN board.
- (3) Remove three screws ① on the Connector panel 1.
- (4) Disconnect two VIDEO BNC connectors, and remove two screws ②.

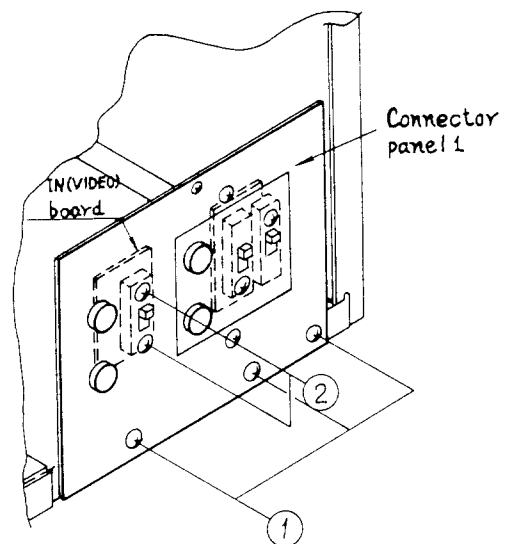


Fig.4

**5. IN(SYNC) board
(VM-1221 only)**

(Fig. 5.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connector P801 on the MAIN board.
- (3) Remove two screws ① on the Connector panel 2.
- (4) Disconnect two SYNC BNC connectors, and remove two screws ②.

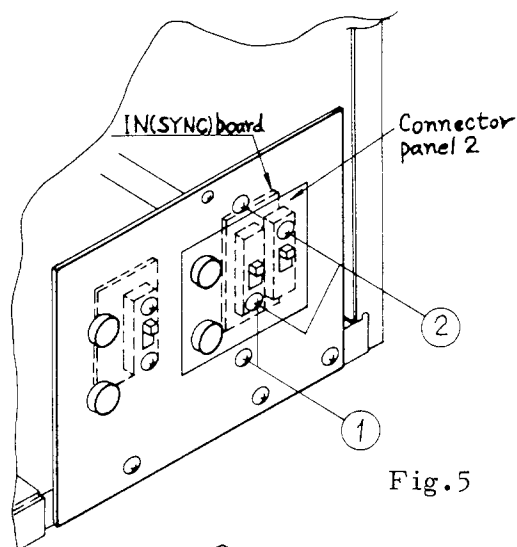


Fig.5

6. Deflection yoke

(Fig. 6.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Remove the SOCKET board.
(See Item 3.)
- (3) Disconnect connector P751 on the MAIN board.
- (4) Remove the deflection yoke fixing screw ①.
- (5) Remove the Deflection yoke in the direction of the arrow.

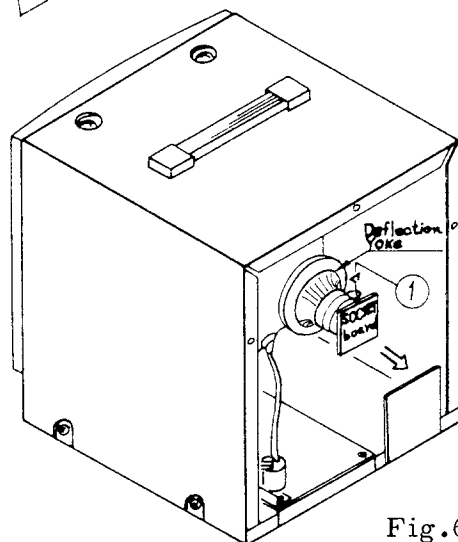


Fig.6

7. CRT

(Fig. 7.)

- (1) Remove the Cover.
(See Item 2.)
- (2) Disconnect the high voltage cable with anode cap from the CRT. (See Item 3.)

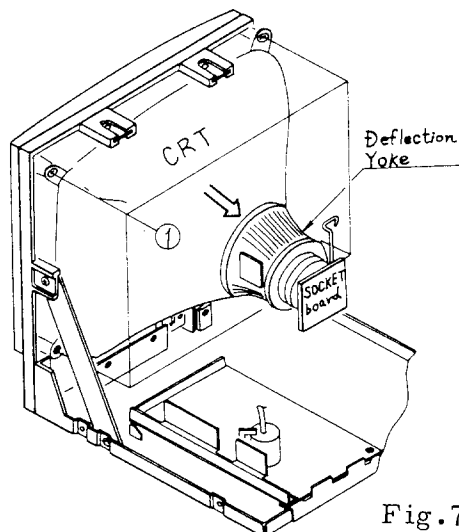


Fig.7

- (3) Remove the SOCKET board.
(See Item 3.)
- (4) Remove the Deflection yoke.
(See Item 6.)
- (5) Gripping the CRT neck, push out the CRT in the direction of the arrow.

**8. SCAN SW board
(VM-1221 only)**

(Fig. 8.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect connector P841 on the MAIN board.
- (3) Remove five knobs on the front of monitor.
- (4) Remove three screws ①.
- (5) Remove the front panel.
- (6) Remove two screws ②.

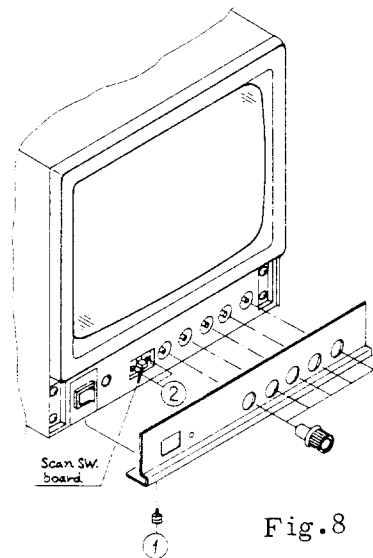


Fig.8

9. VOLUME board

(Fig. 9.)

- (1) Remove the cover.
(See Item 2.)
- (2) Remove four knobs* on the front of monitor. (See Item 8.)
- (3) Disconnect connector P701 on the MAIN board.
- (4) Remove two screws ①.

Note*:

VM-1220 equipped with four knobs;
VM-1221 equipped with five knobs.

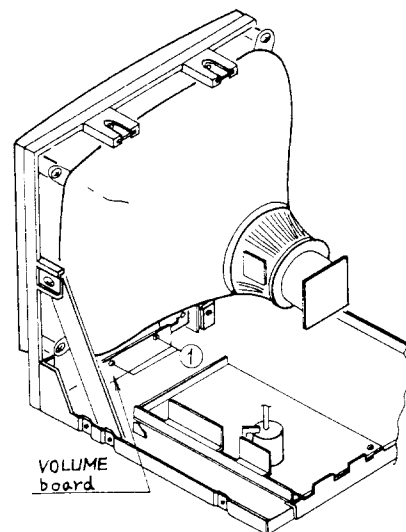


Fig.9

10. PL board

(Fig. 10.)

- (1) Remove the cover.
(See Item 2.)
- (2) Remove the screw ①.

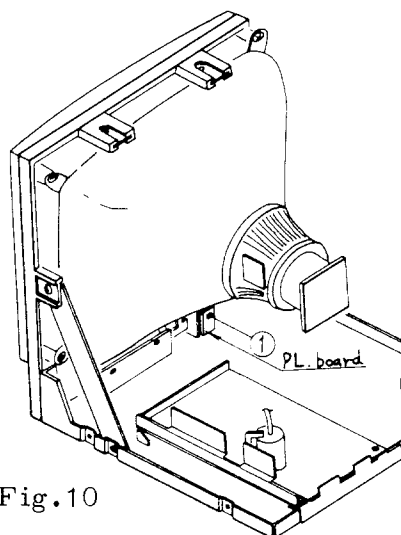


Fig.10

11. FUSE board

(Fig. 11.)

- (1) Remove the Rear panel.
(See Item 1.)
- (2) Disconnect two connectors between the FUSE board and the POWER switch.
- (3) Remove the FUSE board from three spacers.

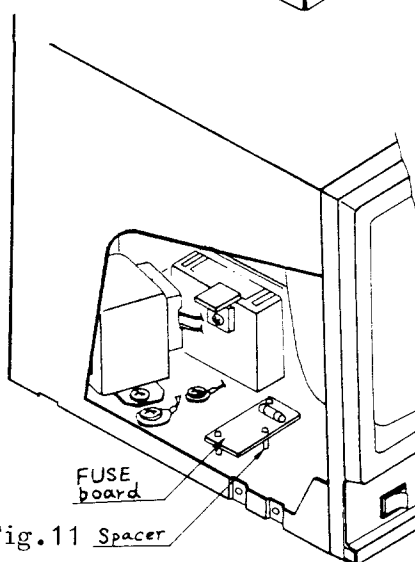


Fig.11 Spacer

12. PWR board

(Fig. 12.)

- (1) Remove the cover.
(See Item 2.)
- (2) Disconnect connector P902 on the MAIN board.
- (3) Remove two screws ①.
- (4) Remove the heat sink fin.
- (5) Remove the screw ②.

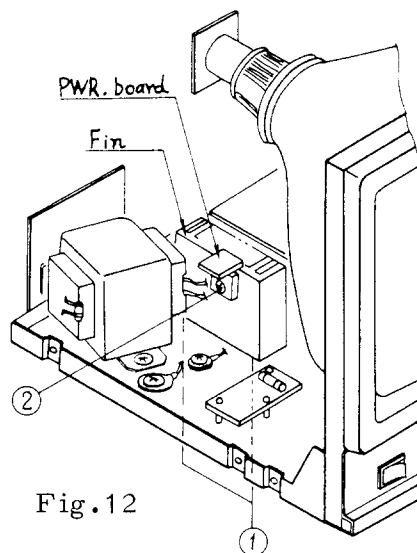


Fig.12

13. Transformer

(Fig..13.)

- (1) Remove the cover.
(See Item 2.)
- (2) Disconnect connector P901 on the MAIN board.
- (3) Remove the screw ① fixing the grounding lead.
- (4) Disconnect two connectors between the transformer and the POWER switch.
- (5) Remove two screws ②.

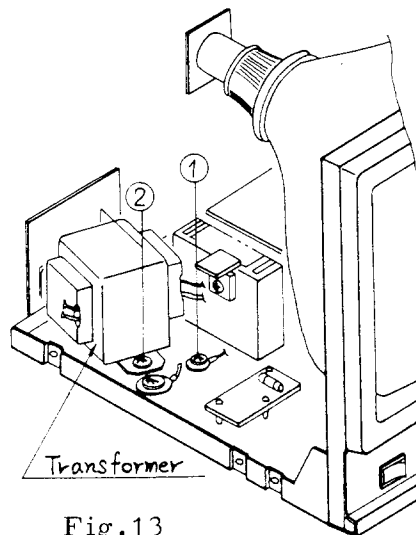
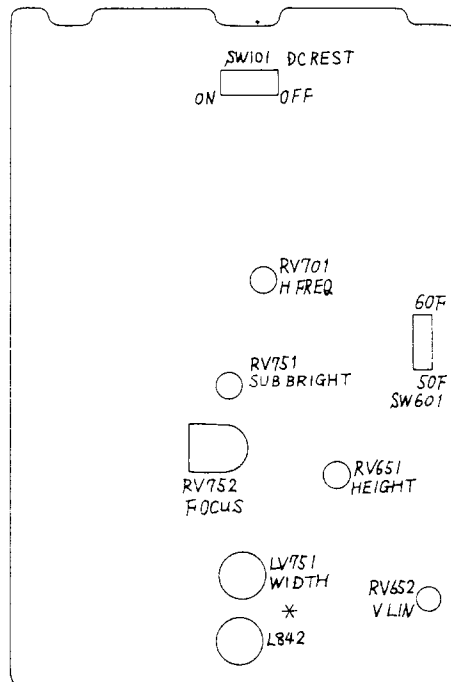


Fig.13

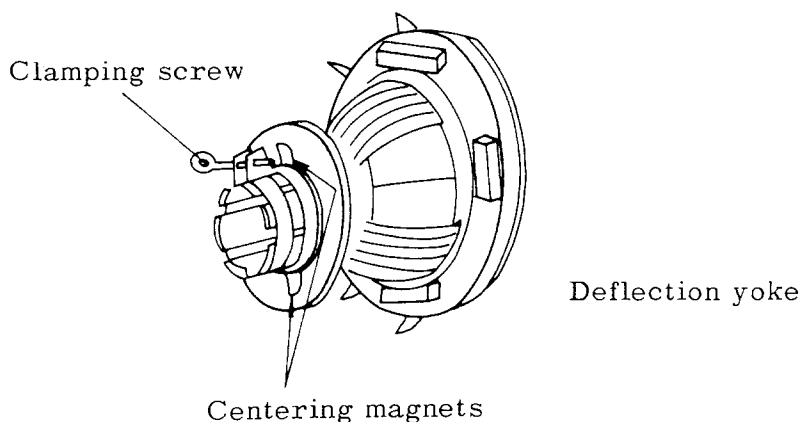
5. ADJUSTMENT



*: VM-921/VM-1221 only

- 1) Adjustment of the H FREQ control
Adjust H FREQ control RV701 for proper horizontal synchronization. After adjustment, turn the H HOLD control fully clockwise and counterclockwise and check that there is no or little disturbance of a picture in the upper portion. If disturbance is large, adjust RV701 again.
- 2) Adjustment of the WIDTH coil
Adjust the width of a picture by LV751. (Use a plastic core screw driver.)
Note; L842 is provided for the VM-921/VM-1221 only. When adjusting a picture width in the underscan mode, adjust L842.
- 3) Adjustment of the HEIGHT control
Adjust a picture height by RV651.
Note; 1) Select the field frequency by jumping SW601 (60F-50F).
2) In case of the VM-921/VM-1221, perform the adjustment in either the normal scan or the underscan mode, because it is impossible to perform the adjustment at each scan size.

- 4) Adjustment of the linearity (V LIN) control
Adjust the vertical linearity by RV652.
- 5) Adjustment of the SUB BRIGHT control
Set SW101 (DC REST) to ON. Set the CONTRAST control fully counterclockwise and the BRIGHT control fully clockwise. Adjust RV751 (SUB BRIGHT) so that a raster can be seen (not so bright). Then set SW101 to OFF, and the BRIGHT control fully counterclockwise, and check that the raster disappears.
Note; Normally set SW101 to OFF. Set it to ON for DC restoration.
- 6) Adjustment of the FOCUS control
Adjust the BRIGHT and the CONTRAST controls for normal operating conditions and adjust RV752 (FOCUS) so that an optimum focus is obtained at the center of a picture.
- 7) Adjustment of a rotated picture
The deflection yoke may be rotated by loosening a deflection yoke clamping screw. Depress and rotate the deflection yoke, watching the inclination around at the center. After completion of the adjustment, fasten the clamping screw.
- 8) Positioning adjustment
Adjust the two centering magnets alternately so that the picture positions at the center of the picture tube.



6. TROUBLESHOOTING

Check and repair circuits marked with X in accordance with troubles.

Circuits Symptoms	VIDEO AMP	Hor. deflection	Vert. deflection	Dynamic focus	Power supply
No raster	X Check collector Q151.	X Check electrode voltage of CRT.			X
No picture (Raster appears.)	X				
Picture is shrunk or extended		X	X		X
Out of sync	X Check pin ③ of IC101.	X Check pin ⑩ of IC602.	X Check pin ⑧ of IC602.		
A single horizontal line			X		
A single vertical line		X			
Retrace appears.	X Check pin ⑩ of IC101.	X	X		
A picture is out of focus at corners.				X (VM-921/ VM-1221 only)	
Remark	When the HV LIMIT circuit in IC602 is energized, the horizontal oscillation ceases and the raster disappears.		Check the voltage of +12V. The current limiter is activated when this circuit is overloaded due to some trouble of other circuit(s).		

7. ELECTRICAL PARTS LIST

MAIN board

Part Code	Symbol	Description	Remarks	
<u>IC's</u>				
ILB0017	IC 101	BM1102C	VM-921/ VM-1221	
ILB0018	IC 201	BM1103A		
ILL0089	IC 601	LA7830		
ILH0111	IC 602	HA11423		
<u>Transistors</u>				
HTC0148	Q 651	2SC458C	VM-921/ VM-1221	
HTC0057	Q 701	2SC1213C		
HTC0844	Q 702	2SC3175-YA		
HTC0845	Q 861	2SC2899		
<u>Diodes</u>				
HDS0437	D 101	1SS133	VM-921/ VM-1221	
HDH0200	D 102	HZS7.5EB3		
HDD0145	D 601	DS135D FA3		
HDH0200	D 701	HZS7.5EB3		
	D 702	Not Used		
HDE0063	D 703	EU2		
HDR0215	D 704	RU3AMLF-B1		
HDE0052	D 705	ES1F		
HDE0050	D 706	EU-1Z		
HDS0250	D 707	1SS83		
HDS0250	D 708	1SS83		
HDE0063	D 709	EU2		
HDR0219	D 901	RBV-402 (200 V 4A)		
<u>Resistors</u>				
RCE0781	R 101	Carbon 1/4W 10k Ω $\pm 5\%$		VM-921/ VM-1221
RCE0781	R 102	Carbon 1/4W 10k Ω $\pm 5\%$		
RCE0778	R 103	Carbon 1/4W 5600 Ω $\pm 5\%$		
RCE0787	R 104	Carbon 1/4W 33k Ω $\pm 5\%$		
RCE0785	R 105	Carbon 1/4W 22k Ω $\pm 5\%$		
RCE0769	R 106	Carbon 1/4W 1000 Ω $\pm 5\%$		
RCE0762	R 107	Carbon 1/4W 270 Ω $\pm 5\%$		
RCE0781	R 108	Carbon 1/4W 8200 Ω $\pm 5\%$		
RCE0771	R 109	Carbon 1/4W 1500 Ω $\pm 5\%$		
RCE0781	R 110	Carbon 1/4W 10k Ω $\pm 5\%$		
RCE0764	R 111	Carbon 1/4W 390 Ω $\pm 5\%$		
RCE0775	R 112	Carbon 1/4W 3300 Ω $\pm 5\%$		
RCE0771	R 113	Carbon 1/4W 1500 Ω $\pm 5\%$		
RCE0793	R 114	Carbon 1/4W 100k Ω $\pm 5\%$		
RCE0771	R 115	Carbon 1/4W 1500 Ω $\pm 5\%$		
RCE0780	R 116	Carbon 1/4W 8200 Ω $\pm 5\%$		
RCE0776	R 117	Carbon 1/4W 3900 Ω $\pm 5\%$		
RCE0773	R 118	Carbon 1/4W 2200 Ω $\pm 5\%$		
RCE0771	R 119	Carbon 1/4W 1500 Ω $\pm 5\%$		
RCE0753	R 120	Carbon 1/4W 47 Ω $\pm 5\%$		
RCE0784	R 121	Carbon 1/4W 18k Ω $\pm 5\%$		
RCE0782	R 122	Carbon 1/4W 12k Ω $\pm 5\%$		
RCE0770	R 123	Carbon 1/4W 1200 Ω $\pm 5\%$		
RCE0757	R 201	Carbon 1/4W 100 Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0783	R 202	Carbon 1/4W 15k Ω $\pm 5\%$	VM-921/ VM-1221	

Part Code	Symbol	Description	Remarks	
RCE0768	R 203	Carbon 1/4W 820 Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0781	R 204	Carbon 1/4W 10k Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0777	R 205	Carbon 1/4W 4700 Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0771	R 206	Carbon 1/4W 1500 Ω $\pm 5\%$	VM-921/ VM-1221	
RCS0020	R 601	Carbon 1/2W 100 Ω $\pm 5\%$	VM-921/ VM-1221	
	R 602	Not Used		
RCE0783	R 603	Carbon 1/4W 15k Ω $\pm 5\%$		
RCE0788	R 604	Carbon 1/4W 39k Ω $\pm 5\%$	VM-920/ VM-921	
RCE0782	R 605	Carbon 1/4W 12k Ω $\pm 5\%$		
RCE0785	R 606	Carbon 1/4W 22k Ω $\pm 5\%$		
RCE0769	R 651	Carbon 1/4W 1000 Ω $\pm 5\%$		
RCE0757	R 652	Carbon 1/4W 100 Ω $\pm 5\%$		
RCE0780	R 653	Carbon 1/4W 8.2k Ω $\pm 5\%$		
RCE0785	R 654	Carbon 1/4W 22k Ω $\pm 5\%$		
RCE0789	R 655	Carbon 1/4W 47k Ω $\pm 5\%$		
RZZ0045	R 656	Fuse 1/4W 4.7 Ω $\pm 5\%$		
RCE0745	R 657	Carbon 1/4W 10 Ω $\pm 5\%$		
RCE0771	R 658	Carbon 1/4W 1500 Ω $\pm 5\%$		
RCE0773	R 659	Carbon 1/4W 2200 Ω $\pm 5\%$		VM-920/ VM-921
RCE0679	R 660	Carbon 1/2W 4.7 Ω $\pm 5\%$		
RCE0786	R 661	Carbon 1/4W 27k Ω $\pm 5\%$		
RCE0810	R 662	Carbon 1/4W 120k Ω $\pm 5\%$		
RCE0757	R 663	Carbon 1/4W 100 Ω $\pm 5\%$		
RCE0757	R 664	Carbon 1/4W 100 Ω $\pm 5\%$		
RCE0761	R 664	Carbon 1/4W 220 Ω $\pm 5\%$		
RCE0783	R 665	Carbon 1/4W 15k Ω $\pm 5\%$		
RCE0745	R 666	Carbon 1/4W 10 Ω $\pm 5\%$		
RCE0777	R 667	Carbon 1/4W 4700 Ω $\pm 5\%$		
RCE0797	R 668	Carbon 1/4W 220k Ω $\pm 5\%$		
RCE0786	R 669	Carbon 1/4W 27k Ω $\pm 5\%$	VM-920/ VM-921	
RCE0789	R 669	Carbon 1/4W 47k Ω $\pm 5\%$	VM-1220/ VM-1221	
RCE0775	R 670	Carbon 1/4W 3.3k Ω $\pm 5\%$	VM-920/ VM-921	
RCE0775	R 670	Carbon 1/4W 3.3k Ω $\pm 5\%$	VM-1220/ VM-1221	
RCE0769	R 671	Carbon 1/4W 1k Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0750	R 671	Carbon 1/4W 27 Ω $\pm 5\%$	VM-1221	
RCE0680	R 672	Carbon 1/2W 6.8 Ω $\pm 5\%$	VM-921/ VM-1221	
RCE0699	R 673	Carbon 1/2W 330 Ω $\pm 5\%$		
RCE0791	R 701	Carbon 1/4W 68k Ω $\pm 5\%$		
RCE0802	R 702	Carbon 1/4W 1M Ω $\pm 5\%$		
RCE0802	R 703	Carbon 1/4W 1M Ω $\pm 5\%$		
RCS0020	R 704	Carbon 1/2W 100 Ω $\pm 5\%$		
RCE0780	R 705	Carbon 1/4W 8200 Ω $\pm 5\%$		
RCE0791	R 706	Carbon 1/4W 68k Ω $\pm 5\%$		
RCE0781	R 707	Carbon 1/4W 10k Ω $\pm 5\%$		
RCR3105	R 708	Carbon 1/4W 680k Ω $\pm 5\%$		
RCE0781	R 709	Carbon 1/4W 10k Ω $\pm 5\%$		
RCE0717	R 710	Carbon 1/2W 10k Ω $\pm 5\%$		
RME1084	R 711	Metal 1/4W 10k Ω $\pm 1\%$		
RME1100	R 712	Metal 1/4W 221k Ω $\pm 1\%$		
RME1100	R 713	Metal 1/4W 221k Ω $\pm 1\%$		

Part Code	Symbol	Description	Symbol
RME0690	R 714	Metal 1/4W 221k Ω $\pm 1\%$	VM-1220/ VM-1221
RME0690	R 714	Metal 1/4W 221k Ω $\pm 1\%$	VM-920/ VM-921
RCE0757	R 751	Carbon 1/4W 100 Ω $\pm 5\%$	
RMR3848	R 752	Metal 2W 47 Ω $\pm 5\%$	VM-1220/ VM-1221
RMR3865	R 752	Metal 1W 47 Ω $\pm 5\%$	VM-920/ VM-921
RCE0698	R 753	Carbon 1/2W 270 Ω $\pm 5\%$	
RZZ0044	R 754	Fuse 1/4W 560 Ω $\pm 5\%$	
RMR3849	R 756	Metal 1/4W 10M Ω $\pm 5\%$	VM-921/ VM-1221
RZZ0045	R 757	Fuse 1/4W 4.7 Ω $\pm 5\%$	
RCE0793	R 758	Carbon 1/4W 100k Ω $\pm 5\%$	
RCE0798	R 759	Carbon 1/4W 330k Ω $\pm 5\%$	VM-920/ VM-921
RCE0797	R 759	Carbon 1/4W 220k Ω $\pm 5\%$	VM-1220/ VM-1221
RCE0797	R 760	Carbon 1/4W 220k Ω $\pm 5\%$	
RCE0798	R 761	Carbon 1/4W 330k Ω $\pm 5\%$	VM-920/ VM-921
RCE0800	R 761	Carbon 1/4W 470k Ω $\pm 5\%$	VM-1220/ VM-1221
	R 762	Not Used	
RCE0713	R 763	Carbon 1/4W 4700 Ω $\pm 5\%$	
RCE0702	R 767	Carbon 1/2W 560 Ω $\pm 5\%$	
RCE0757	R 841	Carbon 1/4W 100 Ω $\pm 5\%$	VM-920/ VM-921 VM-1220
RCE0756	R 841	Carbon 1/4W 82 Ω $\pm 5\%$	VM-1221
RMR3862	R 842	Metal 1/4W 100k Ω $\pm 5\%$	VM-921/ VM-1221
RCE0787	R 861	Carbon 1/4W 33k Ω $\pm 5\%$	VM-921/ VM-1221
RCE0783	R 864	Carbon 1/4W 15k Ω $\pm 5\%$	VM-921/ VM-1221
RCE0778	R 865	Carbon 1/4W 5600 Ω $\pm 5\%$	VM-921/ VM-1221
RCE0729	R 866	Carbon 1/2W 100k Ω $\pm 5\%$	VM-921/ VM-1221
RCE0729	R 867	Carbon 1/2W 100k Ω $\pm 5\%$	VM-921/ VM-1221
RZZ0045	R 951	Fuse 1/4W 4.7 Ω $\pm 5\%$	
<u>Var. Resistors</u>			
RNH0023	RV 651	Metal RHLOAS203A	
RNH0023	RV 652	Metal RHLOAS203A	
RNH0026	RV 701	Metal RHLOAS301A	
RNH0033	RV 751	Metal RHL0A1602A	
RNE0079	RV 752	Metal EVM-81U 10K	
<u>Capacitors</u>			
CES0040	C 101	Elyc 50V 10 μ F	
CES0032	C 102	Elyc 25V 47 μ F	
CCC1449	C 103	Ceramic 50V 330pF $\pm 5\%$	
CES0040	C 104	Elyc 50V 10 μ F	
CES0040	C 105	Elyc 50V 10 μ F	
CES0032	C 106	Elyc 25V 47 μ F	
CCD0339	C 107	Ceramic 500V 56pF $\pm 5\%$	
CES0040	C 201	Elyc 50V 10 μ F	VM-920/ VM-1221
CES0040	C 202	Elyc 50V 10 μ F	VM-920/ VM-1221
CES0037	C 203	Elyc 50V 1 μ F	VM-920/ VM-1221
CQA0124	C 204	Plastic 50V 0.1 μ F $\pm 10\%$	VM-920/ VM-1221
RCE0778	R 865	Carbon 1/4W 5600 Ω	VM-921
RCE0773	R 865	Carbon 1/4W 2200 Ω	VM-1221

Part Code	Symbol	Description	Remarks
CES0029	C 205	Elyc 10V 100 μ F	VM-920/ VM-1221
CEX0230	C 601	Elyc 50V 1 μ F	VM-920/ VM-1221
CES0156	C 602	Elyc 16V 470 μ F	
CQA0121	C 603	Plastic 50V 0.033 μ F $\pm 10\%$	
CES0037	C 604	Elyc 50V 1 μ F	
CQA0126	C 605	Plastic 50V 0.0068 μ F $\pm 10\%$	
CST0478	C 606	Tantal 35V 1 μ F	
CEX0230	C 607	Elyc 50V 1 μ F	VM-920/ VM-1221
CCC1015	C 651	Ceramic 50V 56pF $\pm 5\%$	
CQA0119	C 652	Plastic 50V 0.0022 μ F $\pm 10\%$	
CQA0121	C 653	Plastic 50V 0.033 μ F $\pm 10\%$	
CST0478	C 654	Tantal 35V 1 μ F	
CES0032	C 655	Elyc 25V 47 μ F	
CES0318	C 656	Elyc 16V 1000 μ F	
CQA0126	C 657	Plastic 50V 0.0068 μ F $\pm 10\%$	
CQA0122	C 658	Plastic 50V 0.047 μ F $\pm 10\%$	
CST0478	C 659	Tantal 35V 1 μ F	
CES0354	C 660	Elyc 16V 2200 μ F	
CQA0124	C 661	Plastic 50V 0.1 μ F $\pm 10\%$	
CES0040	C 662	Elyc 50V 10 μ F	
CES0040	C 701	Elyc 50V 10 μ F	
CCC1025	C 702	Ceramic 50V 100pF	
CES0032	C 703	Elyc 25V 47 μ F	
CQA0128	C 704	Plastic 50V 0.015 μ F $\pm 10\%$	VM-920/ VM-921
CQA0128	C 704	Plastic 50V 0.015 μ F $\pm 10\%$	VM-1220/ VM-1221
CQA0126	C 705	Plastic 50V 0.0068 μ F $\pm 10\%$	
CES0038	C 706	Elyc 50V 2.2 μ F	
CQA0119	C 707	Plastic 50V 0.0022 μ F $\pm 10\%$	
CQD0048	C 708	Plastic 100V 3300pF $\pm 5\%$	
CES0040	C 709	Elyc 50V 10 μ F	
CQA0129	C 710	Plastic 50V 0.022 μ F $\pm 10\%$	
CEK0091	C 751	Elyc 25V 47 μ F	
CQA0119	C 752	Plastic 50V 0.0022 μ F $\pm 10\%$	
CQA0126	C 753	Plastic 50V 0.0068 μ F $\pm 10\%$	
CES0355	C 754	Elyc 25V 1500 μ F	
CES0355	C 755	Elyc 25V 1500 μ F	
CQE0111	C 756	Plastic 100V 4.7 μ F $\pm 10\%$	
CQD0051	C 757	Plastic 630V 0.022 μ F $\pm 5\%$	
CQD0008	C 758	Plastic 630V 0.0068 μ F $\pm 10\%$	
CQM0430	C 759	Plastic 630V 0.047 μ F $\pm 10\%$	
CEK0165	C 760	Elyc 160V 47 μ F	
CQM0435	C 761	Plastic 250V 0.1 μ F $\pm 10\%$	
CQM0435	C 762	Plastic 250V 0.1 μ F $\pm 10\%$	
CQM0433	C 764	Plastic 630V 0.01 μ F $\pm 10\%$	VM-921/ VM-1221
CQD0051	C 765	Plastic 630V 0.022 μ F $\pm 10\%$	VM-1220/ VM-1221
CQE0078	C 841	Plastic 100V 1.2 μ F $\pm 5\%$	VM-921/ VM-1221
CQA0120	C 861	Plastic 50V 0.0033 μ F $\pm 10\%$	VM-921/ VM-1221
CEE0226	C 901	Elyc 25V 4700 μ F	
CES0032	C 902	Elyc 25V 47 μ F	

SOCKET board

Part Code	Symbol	Description	Remarks
TLL0190	L 101	<u>Coils</u> LHL06TB470K	
TLL0175	L 751	LC-0237E	
TLL0174	L 752	LC0243	
TLL0190	L 753	LHL06TB470K	
TLL0224	L 841	LC-0262C	VM-921/ VM-1221
TLL0050	L 842	LC-0168	VM-921/ VM-1221
TLL0050	LV 751	LC-0168	
<u>Transformers</u>			
TTH0006	T 751	HD-12	
TTT0364	T 752	TC-0530FBT UL CSA	
<u>Switches</u>			
SSV0109	SW 101	Slide SSFB12-07P	
SSV0109	SW 601	Slide SSFB12-07P	J Type only
<u>Connectors</u>			
JBB0027	P 101	B2B-XH-A	
JBB0023	P 701	B8B-XH-A	
JBX0344	P 751	9952#5 (6P)	
JBB0021	P 801	B3B-XH-A	VM-921/ VM-1221
JBB0058	P 841	B12B-XH-A	VM-921/ VM-1221
JBX0341	P 901	9952#2 (3P)	
JBB0028	P 902	B4B-XH-A	
<u>Miscellaneous</u>			
EDL0004	DL 201	Delay Line LC-0264	VM-921/ VM-1221
EFG0694	F 901	Fuse TSC UL 125V 2.5A	
EFH0251	XF 901	Fuse Clip H-0011-1	2 pcs
HYF0001	XQ 702	Spacer F4022BSS	

Part Code	Symbol	Description	Remarks
HTC0810	Q 151	<u>Transistor</u> 2SC3468E	
<u>Diode</u>			
HDS0530	D 151	1SS131	
<u>Resistors</u>			
RCE0747	R 151	Carbon 1/4W 15Ω ±5%	VM-920/ VM-921
RCE0747	R 151	Carbon 1/4W 15Ω ±5%	VM-1220/ VM-1221
RCE0766	R 152	Carbon 1/4W 560Ω ±5%	VM-920/ VM-921
RCE0765	R 152	Carbon 1/4W 470Ω ±5%	VM-1220/ VM-1221
RCE0775	R 153	Carbon 1/4W 3300Ω ±5%	VM-920
RCE0778	R 153	Carbon 1/4W 5600Ω ±5%	VM-921
RCE0775	R 153	Carbon 1/4W 3300Ω ±5%	VM-1220
RCE0782	R 153	Carbon 1/4W 12kΩ ±5%	VM-1221
	R 154	Not Used	
RMR3871	R 155	Metal 1W 8200Ω ±5%	
RCE0802	R 156	Carbon 1/4W 1MΩ ±5%	
RCE0769	R 157	Carbon 1/4W 1000Ω ±5%	
RCE0781	R 158	Carbon 1/4W 10kΩ ±5%	
RCE0793	R 159	Carbon 1/4W 100kΩ ±5%	
RCE0781	R 160	Carbon 1/4W 10kΩ ±5%	
<u>Capacitors</u>			
CCC1025	C 151	Ceramic 50V 100pF	
CQA0131	C 152	Plastic 50V 0.22μF ±10%	
CES0202	C 153	Elyc 160V 10μF	
CQA0037	C 154	Plastic 250V 0.01μF ±10%	
CCC1034	C 155	Ceramic 50V 56pF	
<u>Coils</u>			
TLL0188	L 151	LHL06TB330K	
TLL0190	L 152	LHL06TB470K	
<u>Connectors</u>			
JBB0027	P 151	B2B-XH-A	
DYX0010	P 152	1426 #2 CRT	
8464435E1	J 151	8464435 E1	VM-920/ VM-921
8464435E2	J 151	8464435 E2	VM-1220/ VM-1221
8464435 I1	J 152	8464435 I1	VM-920/ VM-921
8464435 I2	J 152	8464435 I2	VM-1220/ VM-1221
8464435 J1	J 153	8464435 J1	VM-920/ VM-921
8464435 J2	J 153	8464435 J2	VM-1220/ VM-1221
<u>Miscellaneous</u>			
EZH0079	SG 151	Spark Gap AG15PC152FB-K2M	
EZH0079	SG 152	Spark Gap AG15PC152FB-K2M	

VOLUME board

Part Code	Symbol	Description	Remarks
<u>Resistors</u>			
RCS0020	R 192	Carbon 1/2W 100Ω ±5%	
RCE0761	R 194	Carbon 1/2W 220Ω ±5%	
RCE0705	R 991	Carbon 1/2W 1000Ω ±5%	
<u>Var. Resistors</u>			
RDV0531	RV 191	Carbon V012L-PV20F-B10K	
RDV0531	RV 291	Carbon V012L-PV20F-B10K	VM-921/ VM-1221
RDV0531	RV 691	Carbon V012L-PV20F-B10K	
RDV0532	RV 701	Carbon V012L-PV20F-B100K	
RDV0531	RV 792	Carbon V012L-PV20F-B10K	
<u>Connectors</u>			
8464435F1	J 791	8464435-F1	VM-920/ VM-921
8464435F2	J 791	8464435-F2	VM-1220/ VM-1221
8453839H	J 911	8453839H	

IN(VIDEO) board

Part Code	Symbol	Description	Remarks
<u>Resistor</u>			
RCR3025	R 191	Carbon 1/4W 75Ω ±5%	
<u>Switch</u>			
SSV0041	SW 191	Slide SSB022 L=6	
<u>Connectors</u>			
8464435A1	J 191	8464435-A1	
JHB0088	J 192	BNC 071	
JHB0088	J 193	BNC 071	

FUSE board

Part Code	Symbol	Description	Remarks
<u>Connectors</u>			
8464435K1		8464435-K1 (WHT)	VM-920/ VM-921
8464435K2		8464435-K2 (BLK)	VM-920/ VM-921
8464435K3		8464435-K3 (WHT)	VM-1220/ VM-1221
8464435K4		8464435-K4 (BLK)	VM-1220/ VM-1221
<u>Miscellaneous</u>			
EFL0164	F 991	Fuse MT3-1A (1A 250V)	

PWR board

Part Code	Symbol	Description	Remarks
<u>IC</u>			
ILS0073	IC 901	SI-3122V (12V 2A)	
<u>Capacitor</u>			
CEK0091	C 903	Elyc 25V 47μF	
<u>Connector</u>			
8464435C1	J 901	8464435-C1	
<u>Miscellaneous</u>			
HYX0019		Spacer 30T-TO-3PF	

PL board

Part Code	Symbol	Description	Remarks
<u>Diode</u>			
HDS0407	PL 991	SR503D (RED)	

SCAN board VM-921/VM-1221 ONLY

Part Code	Symbol	Description	Remarks
SSP0538	SW 893	<u>Switch</u> Power SDDU4 BLACK	
8453839G	J 892	<u>Connector</u> 8453839G	

Part Code	Symbol	Description	Remarks
SSS0112	SW 991	<u>Switch</u> See Saw JWZ2120-0301	J, U, E, K Type
SSS0115	SW 991	See Saw SDDTA3-C-2 TV-5	C Type
8464435L1	J 194	<u>Connectors</u> 8464435-L1	VM-920/ VM-921
8464435L2	J 194	8464435-L2	VM-1220/ VM-1221
JYX0156	XJ 993	29002#2	2 pcs
8464435N1		8464435-N1	

IN(SYNC) board VM-921/VM-1221 ONLY

Part Code	Symbol	Description	Remarks
RCR3025	R 891	<u>Resistors</u> Carbon 1/4W 75.2 ±5%	
RCE0780	R 892	Carbon 1/4W 8200.2 ±5%	
RCE0773	R 893	Carbon 1/4W 2200.2 ±5%	
SSV0041	SW 894	<u>Switches</u> Slide SSB022 L=6	
SSV0041	SW 895	Slide SSB022 L=6	
JHB0088	J 893	<u>Connectors</u> BNC-071	
JHB0088	J 894	BNC-071	
8464435B1	J 895	8464435-B1	

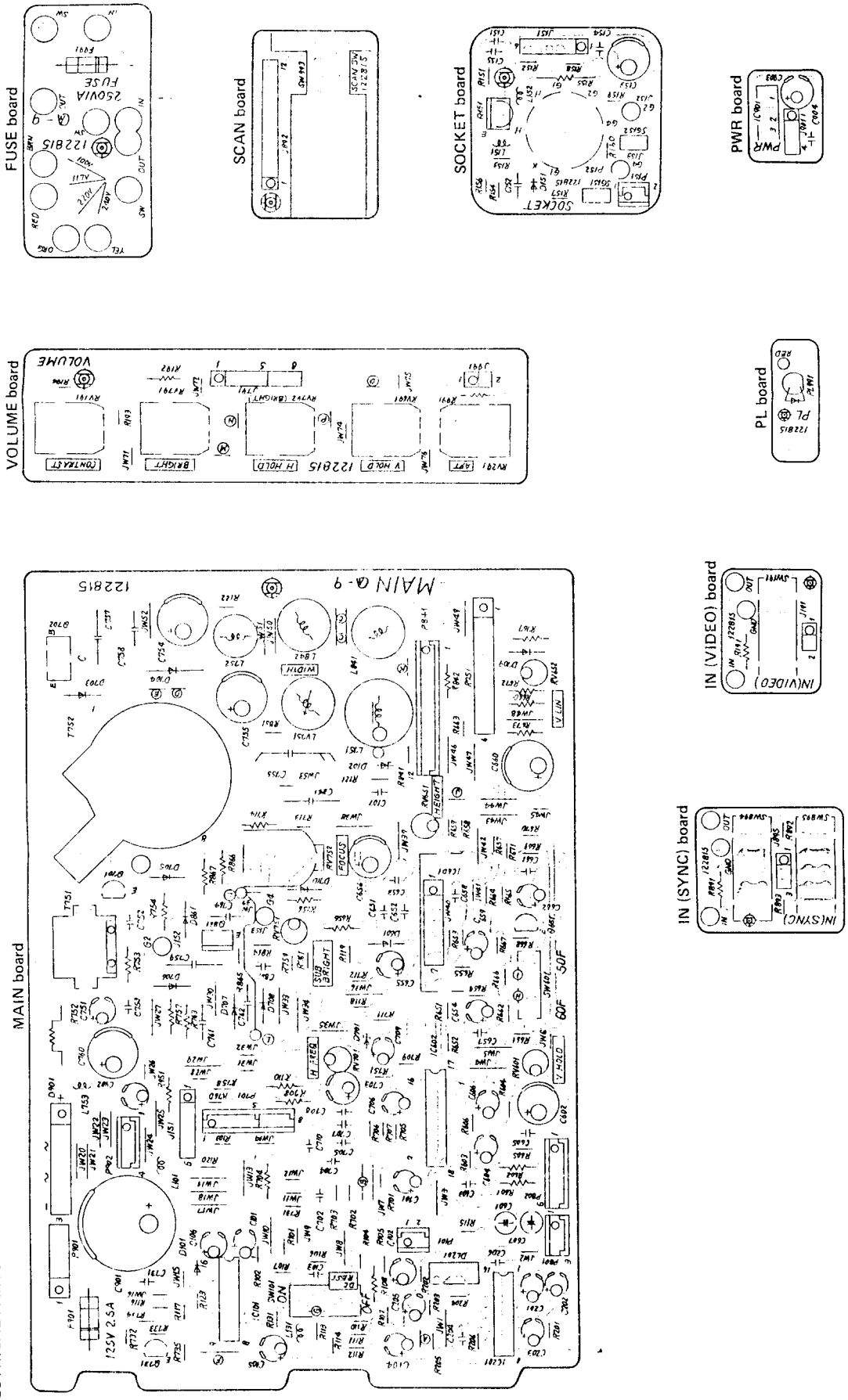
CHASSIS

Part Code	Symbol	Description	Remarks
8443271A	P 991	<u>Miscellaneous</u> Code Set VM1165B 2.5M Black	J Type
8443271B	P 991	Code Set SVT#18 0033 8F GRY	U Type
8443271C	P 991	Code Set SJT#18 0033 8F GRY	C Type
8443271D	P 991	Code Set VM0099 8F GRY	E Type
8443271E	P 991	Code Set NR BS CORD 2.5M	K Type

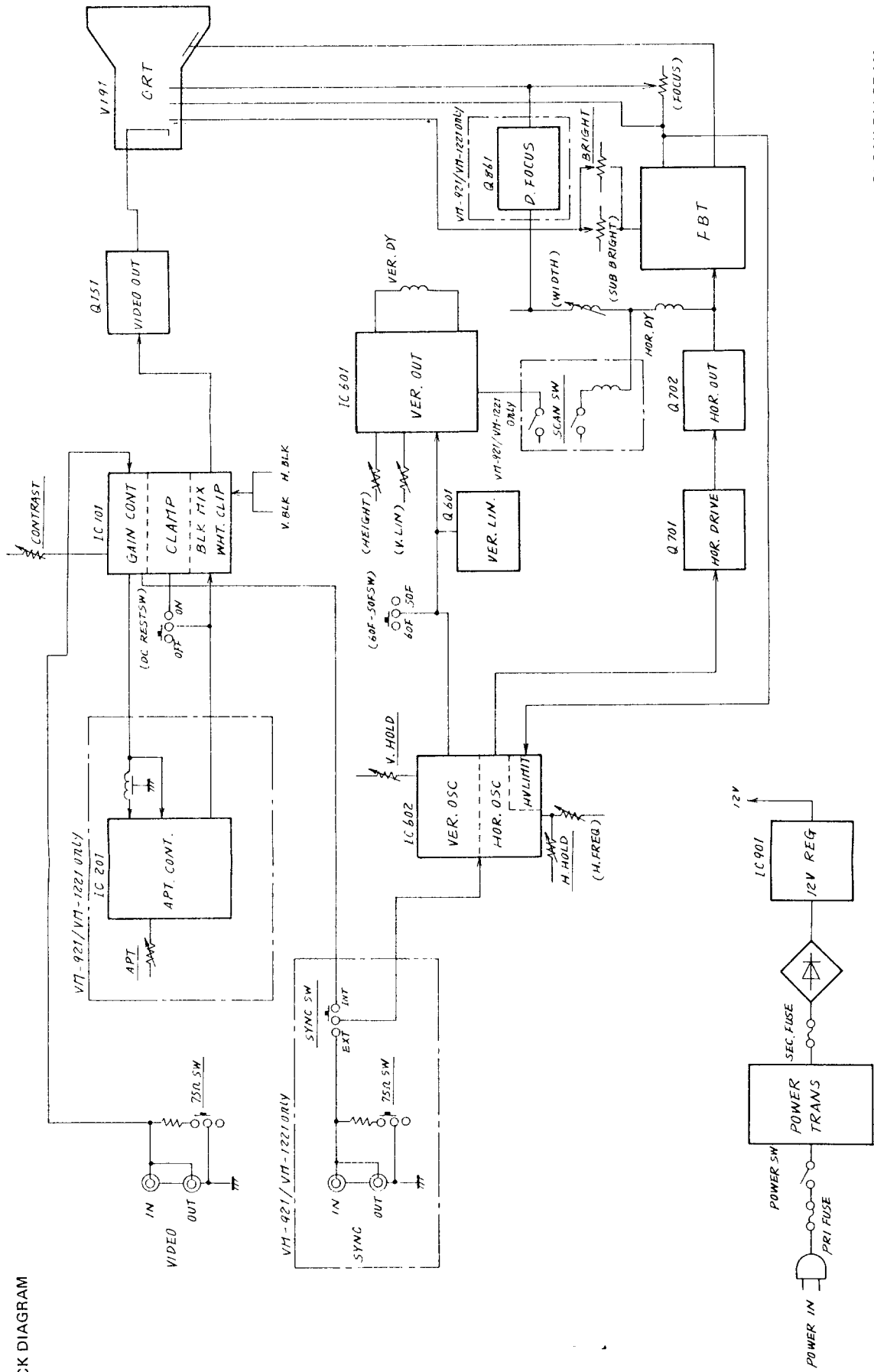
CHASSIS

Part Code	Symbol	Description	Remarks
DPX0067	V 191	<u>Valve</u> CRT 230BTB4	VM-920/ VM-921
DPC0026	V 191	CRT C12M40P4	VM-1220/ VM-1221
TLL0225	DY 791	<u>Coil</u> DEF Yoke LC-0282	VM-920/ VM-921
TLL0226	DY 791	DEF Yoke LC-0283	VM-1220/ VM-1221
TTT0365	T 991	<u>Transformer</u> TC-0534 AC100V	J Type
TTT0366	T 991	TC-0535 AC117V	U, C Type
TTT0367	T 991	TC-0536 AC220V	E Type
TTT0368	T 991	TC-0537 AC240V	K Type

8. ELECTRICAL PARTS ARRANGEMENT



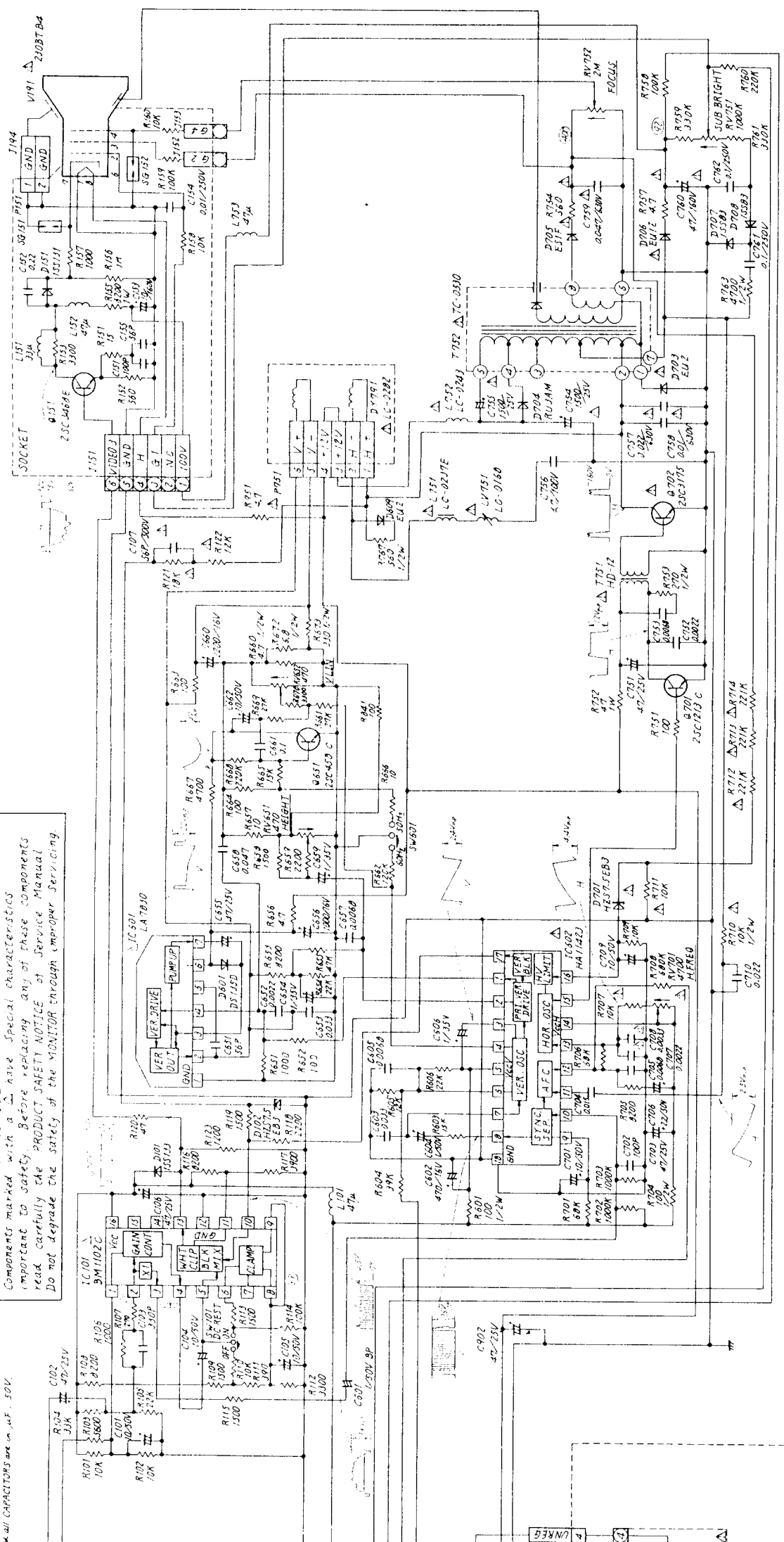
9. BLOCK DIAGRAM



BLOCK DIAGRAM

PRODUCT SAFETY NOTICE
Components marked with a Δ have special characteristics important to safety. Before replacing any of these components read carefully the **PRODUCT SAFETY NOTICE** of Service Manual. Do not degrade the safety of the monitor through improper servicing.

Δ 1/2 WATT RESISTORS are 5% OHMS, 1/4 WATT.
 Δ 1/2 WATT CAPACITORS are in μ F, 50V.

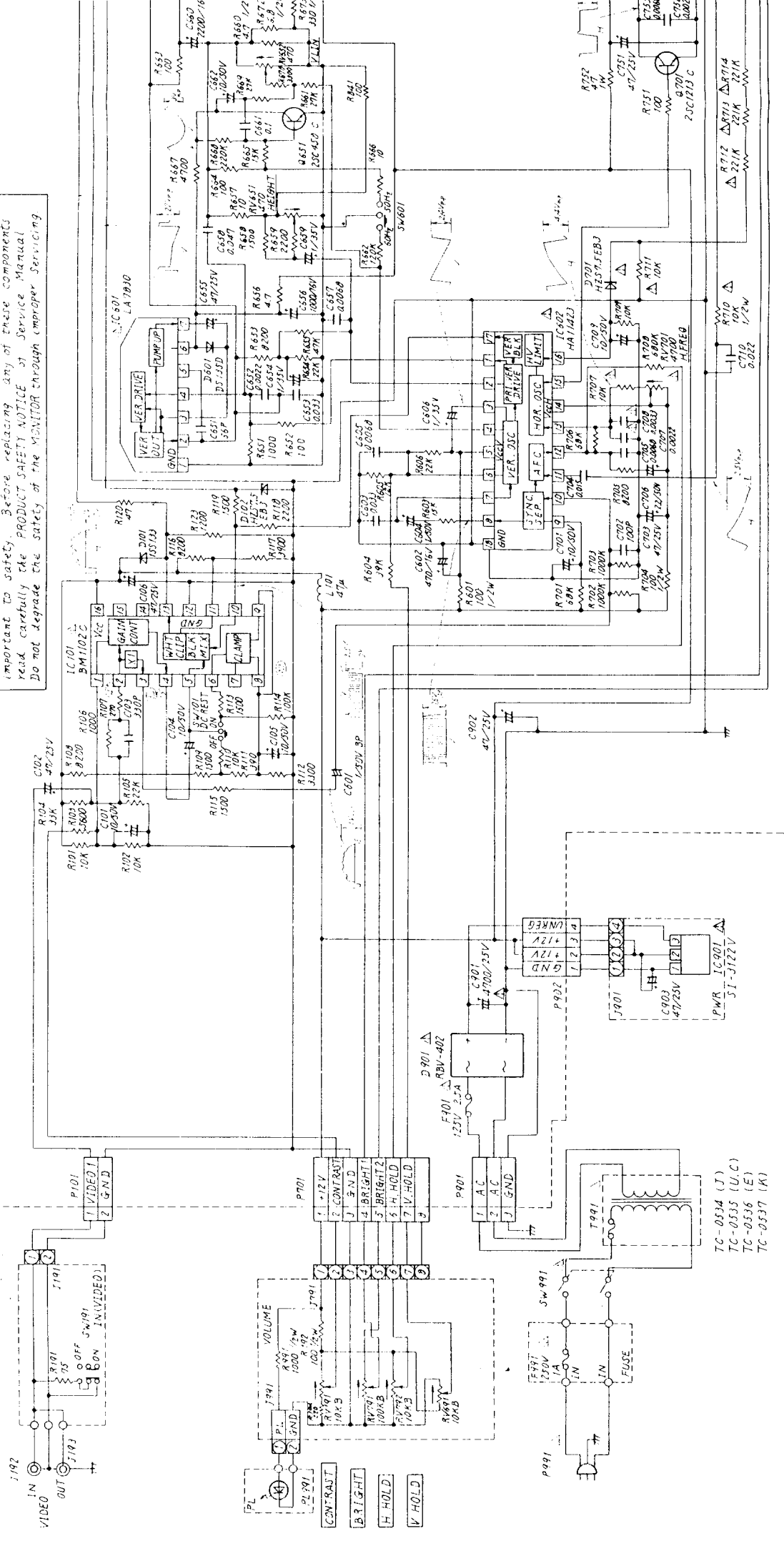


VM-920 SCHEMATIC DIAGRAM

10. SCHEMATIC DIAGRAM AND WAVEFORMS

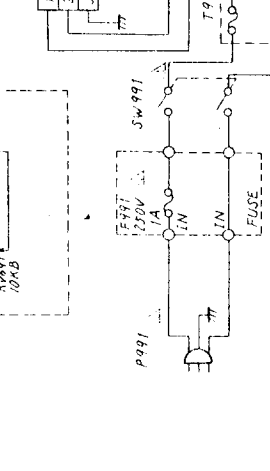
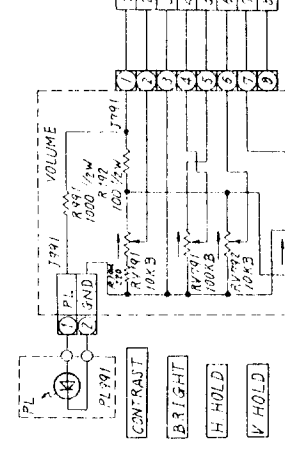
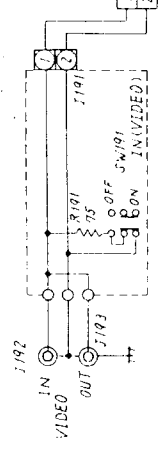
NOTES : 1. Unless otherwise specified all resistors are in OHMS, 1/4 WATT.
 2. Unless otherwise specified all capacitors are in μ F., 50V.

PRODUCT SAFETY NOTICE
 Components marked with a Δ have special characteristics important to safety. Before replacing any of these components read carefully the PRODUCT SAFETY NOTICE in Service Manual. Do not replace the safety of the MONITOR through improper servicing.



T991 TC-0534 (J)
 T992 TC-0535 (U.C.)
 T993 TC-0536 (E)
 T994 TC-0537 (A)

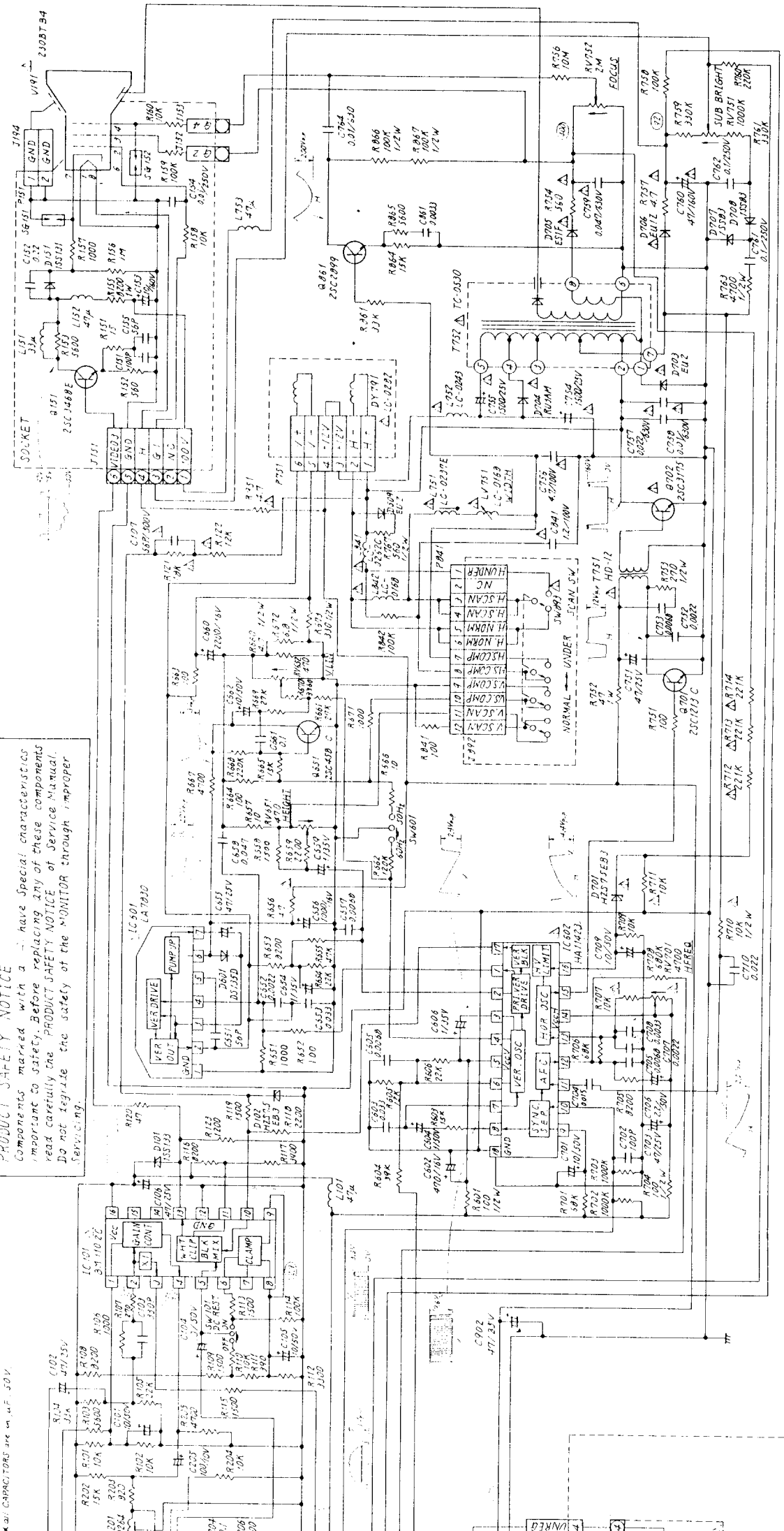
MAIN



PL
 PL 301
 PL 302

ALL RESISTORS ARE UNLESS OTHERWISE SPECIFIED 1/4 WATT.
ALL CAPACITORS ARE UNLESS OTHERWISE SPECIFIED.

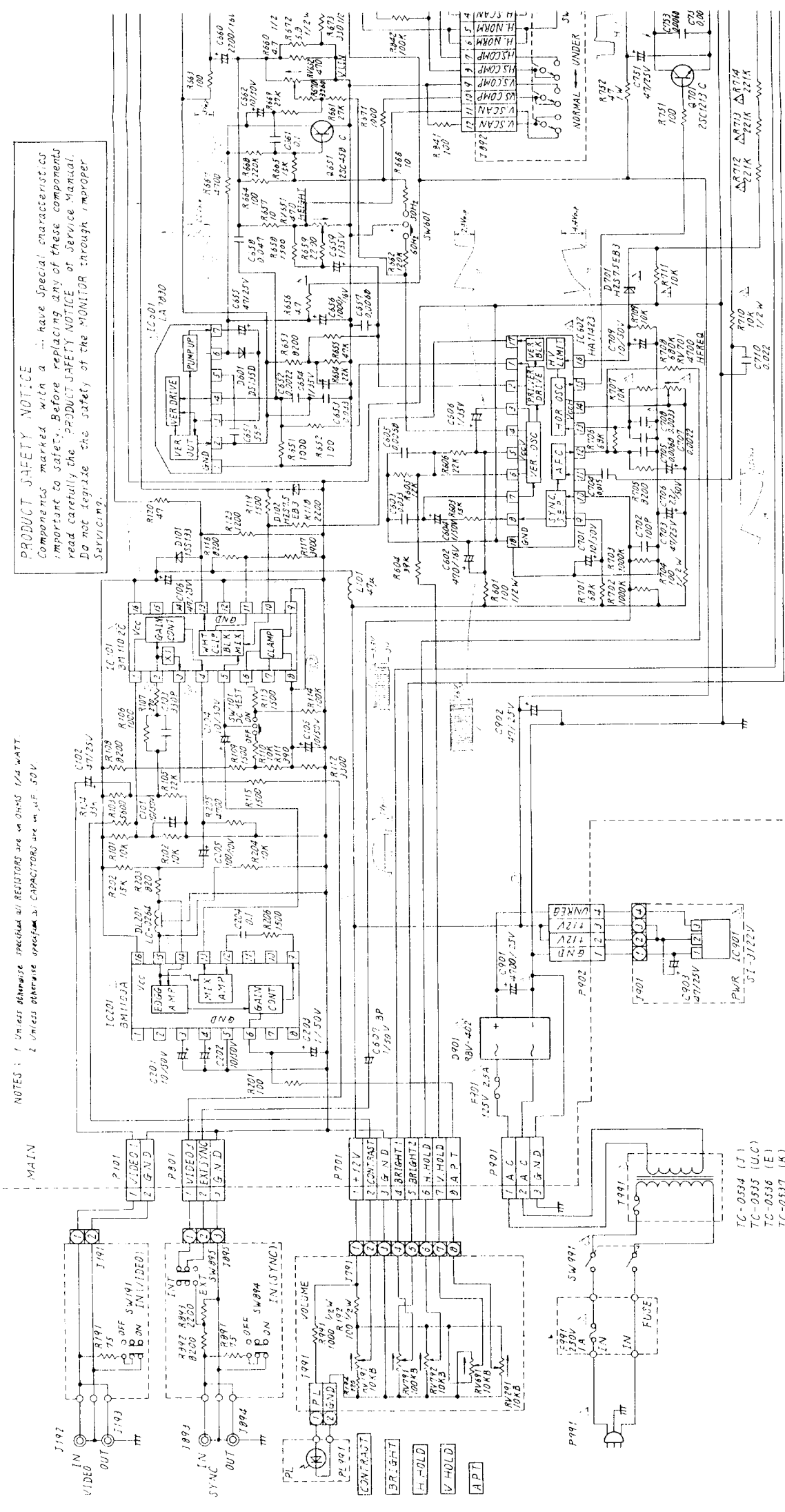
PRODUCT SAFETY NOTICE
Components marked with a Δ have special characteristics important to safety. Before replacing any of these components read carefully the PRODUCT SAFETY NOTICE of Service Manual. Do not ignore the safety of the MONITOR through improper servicing.



VM-921 SCHEMATIC DIAGRAM

PRODUCT SAFETY NOTICE
 Components marked with a special characteristic are important to safety. Before replacing any of these components read carefully the "PRODUCT SAFETY NOTICE" or Service Manual. Do not regrade the safety of the MONITOR through improper servicing.

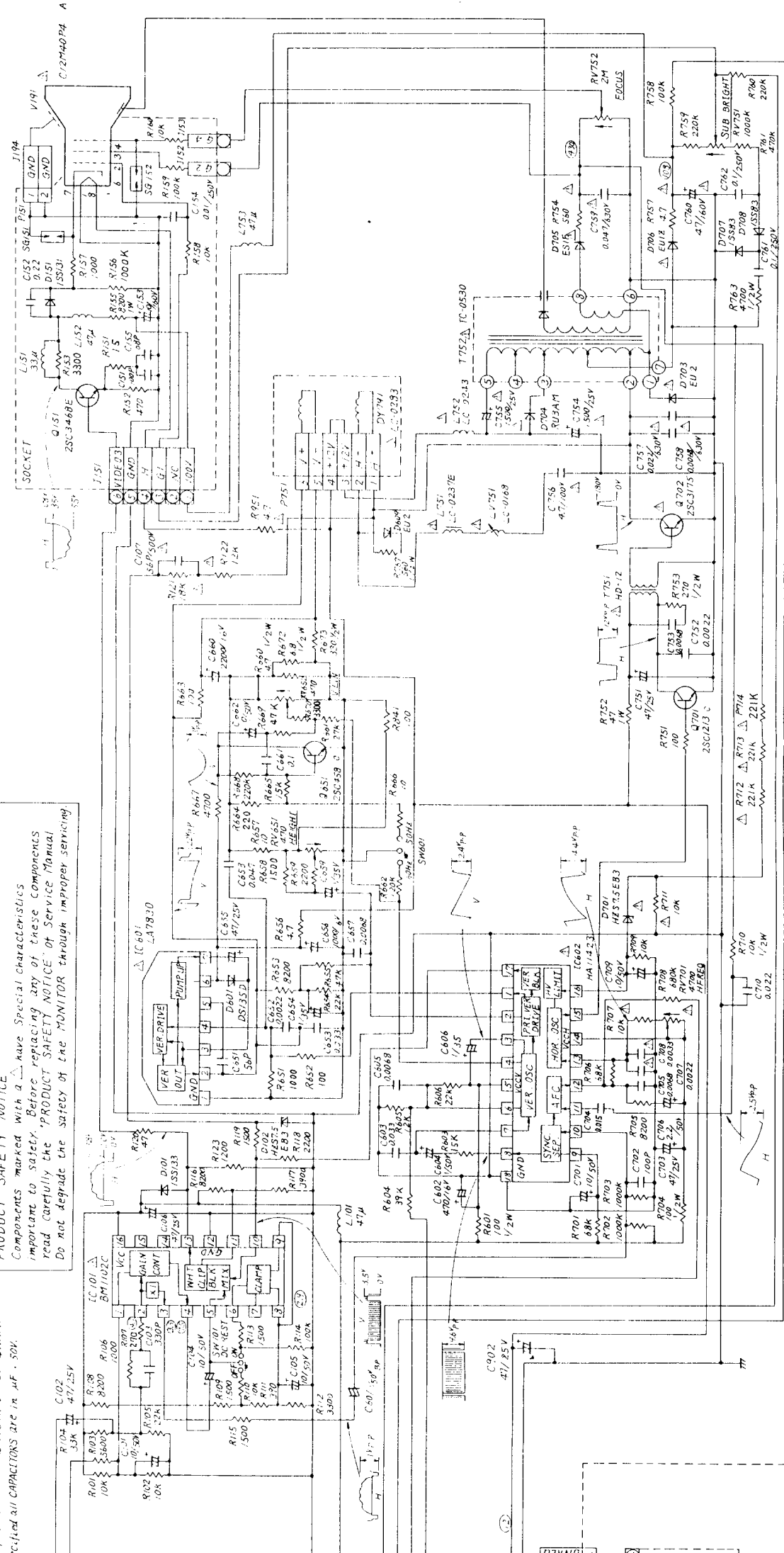
NOTES: 1. Unless otherwise specified all RESISTORS are on OHMS 1/4 WATT.
 2. Unless otherwise specified all CAPACITORS are in μF 50V.



TC-0534 (T1)
 TC-0535 (U1C)
 TC-0536 (E1)
 TC-0537 (A)

Specified all RESISTORS are in OHMS, unless noted.
Specified all CAPACITORS are in MICROFARADS.

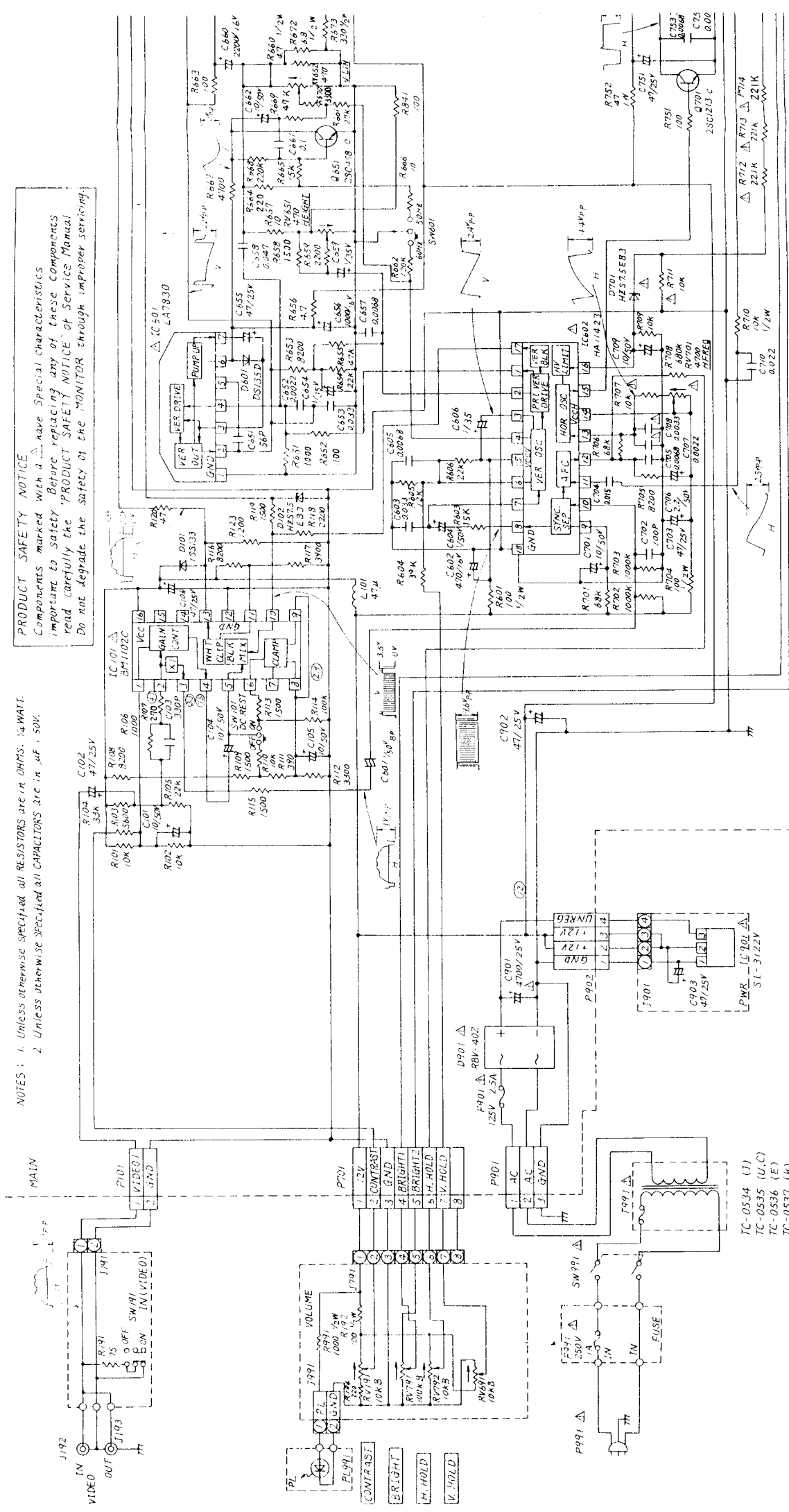
PRODUCT SAFETY NOTICE
Components marked with a triangle have special characteristics important to safety. Before replacing any of these components read carefully the 'PRODUCT SAFETY NOTICE' of Service Manual. Do not degrade the safety of the MONITOR through improper servicing.



VM-1220 SCHEMATIC DIAGRAM

PRODUCT SAFETY NOTICE
 Components marked with a Δ have Special characteristics important to safety. Before replacing any of these components read carefully the "PRODUCT SAFETY NOTICE" of Service Manual. Do not degrade the safety of the MONITOR through improper servicing.

NOTES: 1. Unless otherwise specified, all RESISTORS are in OHMS, 1/4 WATT.
 2. Unless otherwise specified, all CAPACITORS are in μ F, 50V.

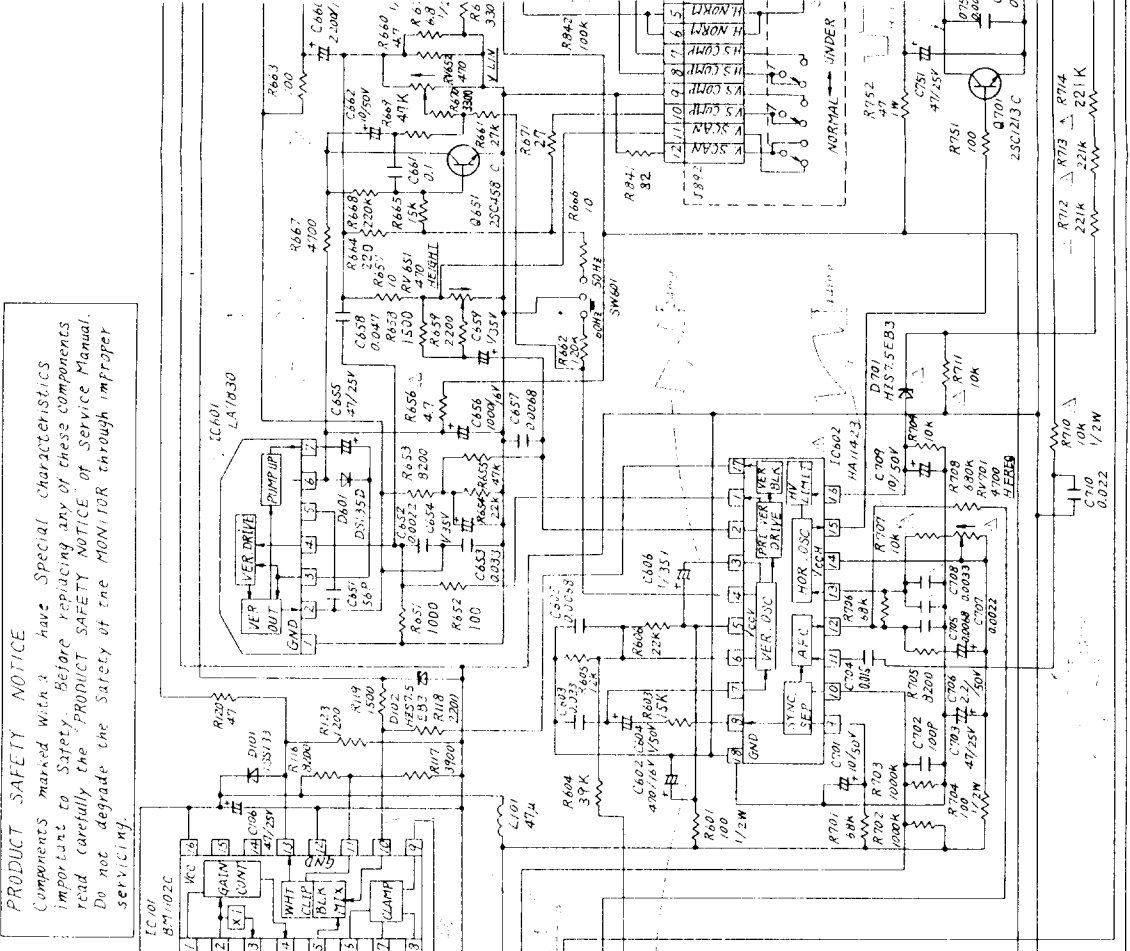
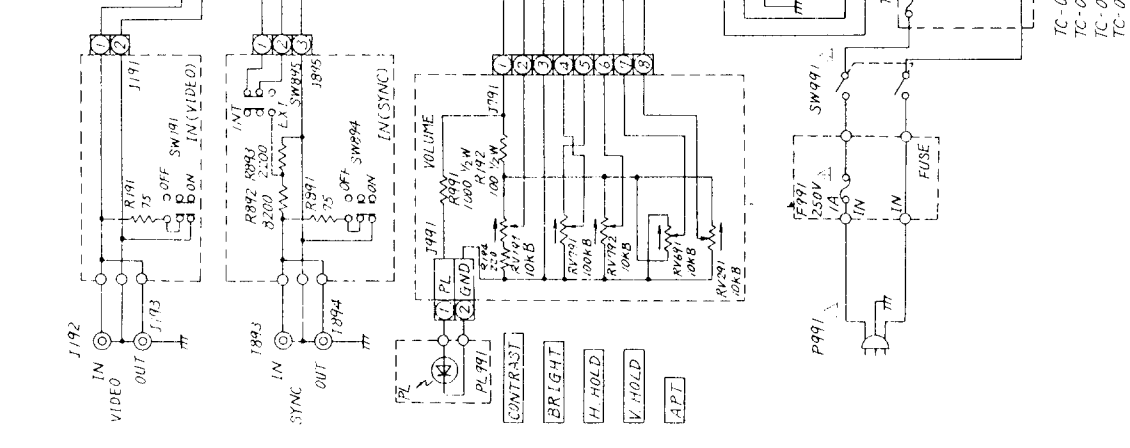


TC-0534 (1)
 TC-0535 (U.C)
 TC-0536 (E)
 TC-0537 (K)

PRODUCT SAFETY NOTICE
 Components marked with a **have Special Characteristics** important to Safety. Before replacing any of these components read carefully the **PRODUCT SAFETY NOTICE** of Service Manual. Do not degrade the Safety of the MONITOR through improper servicing.

NOTES: 1. Unless otherwise specified all RESISTORS are in OHMS. 1/2 WATT.
 2. Unless otherwise specified all CAPACITORS are in μ F. 50V.

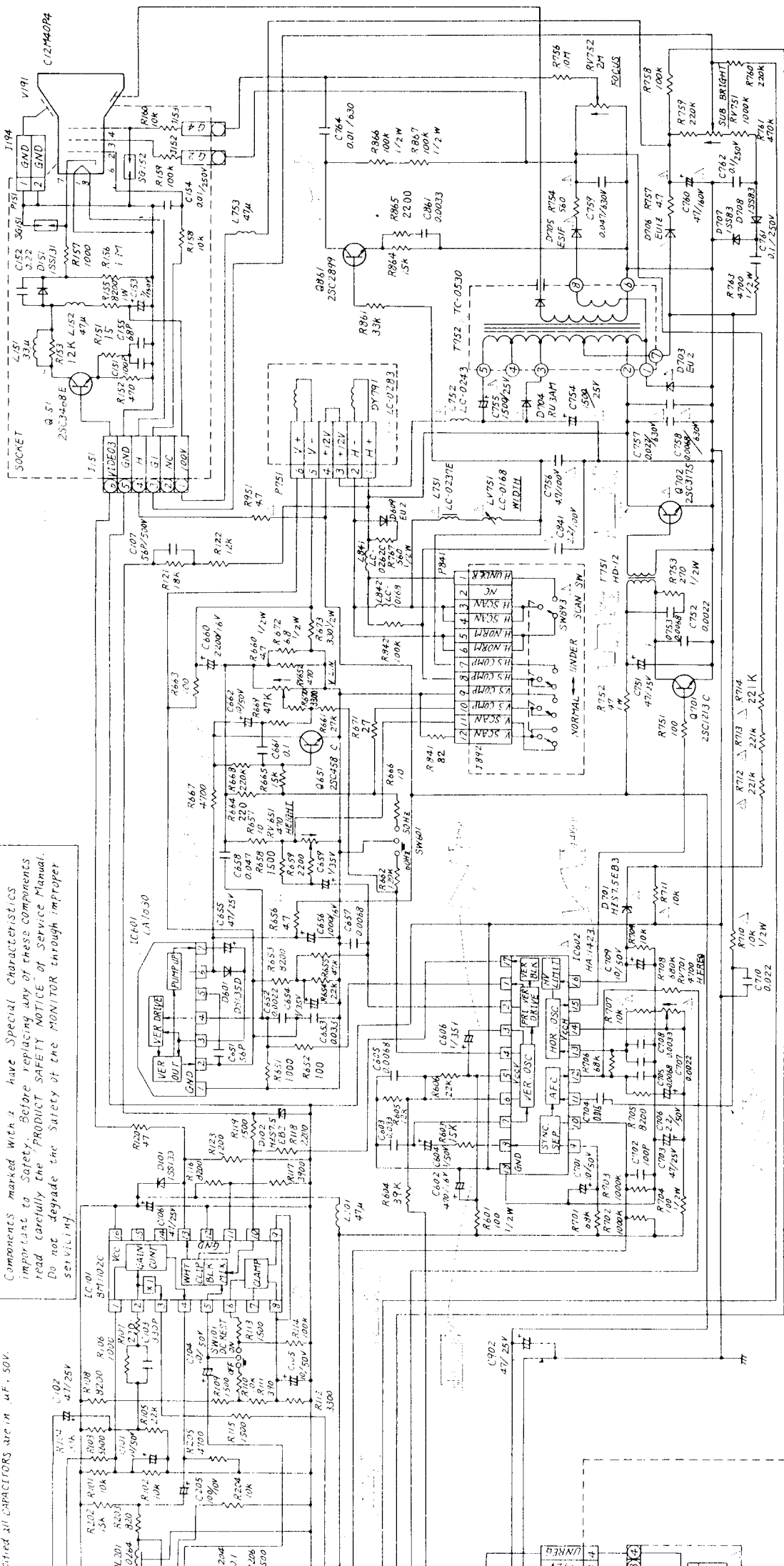
MAIN



- TC-0534 (J)
- TC-0535 (U/C)
- TC-0536 (E)
- TC-0537 (K)

Resistors marked with a 1/2 have Special Characteristics important to safety. Before replacing any of these components read carefully the "PRODUCT SAFETY NOTICE" of Service Manual. Do not degrade the safety of the MONITOR through improper servicing.

PRODUCT SAFETY NOTICE
 Components marked with a 1/2 have Special Characteristics important to safety. Before replacing any of these components read carefully the "PRODUCT SAFETY NOTICE" of Service Manual. Do not degrade the safety of the MONITOR through improper servicing.

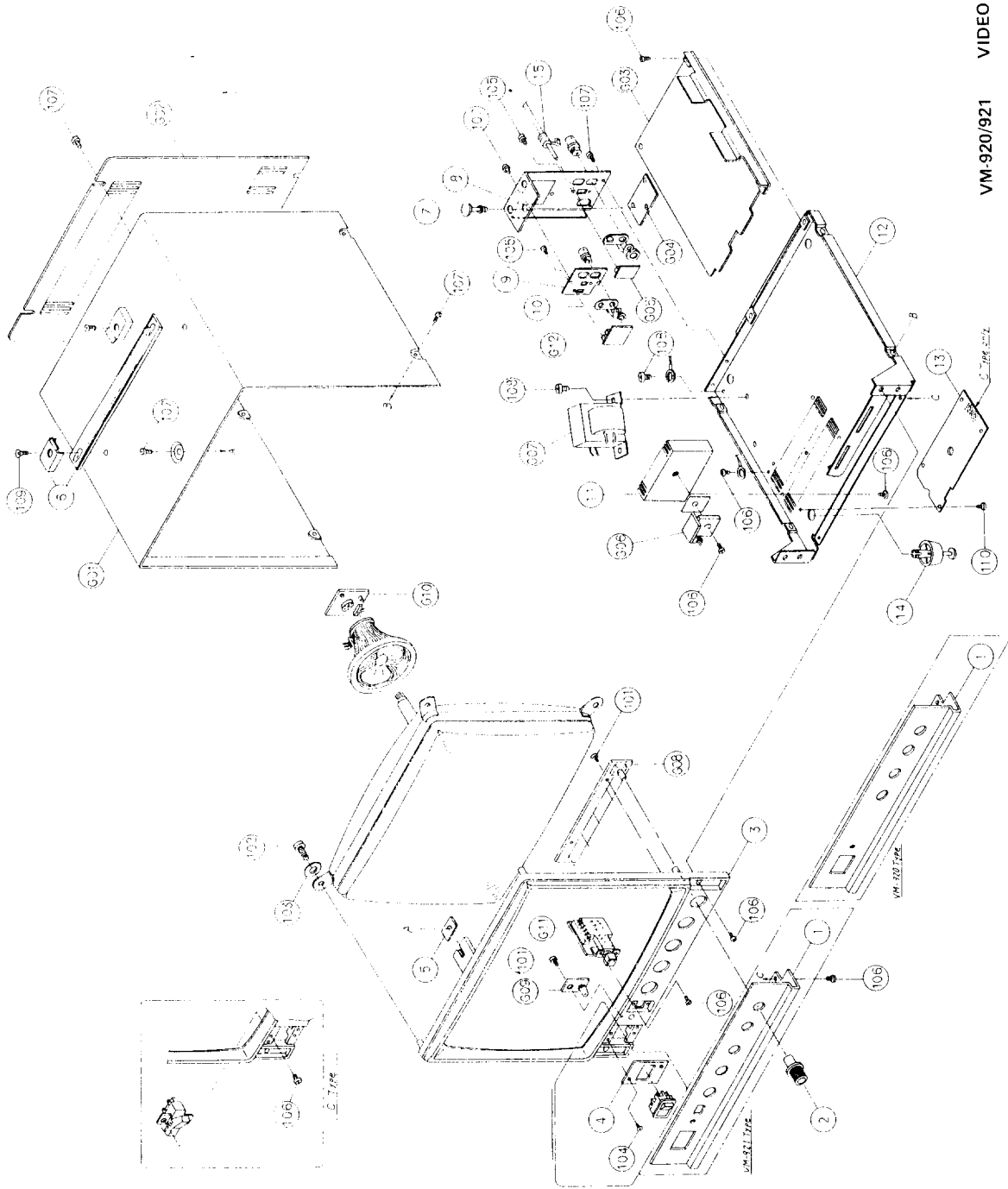


VM-1221 SCHEMATIC DIAGRAM

11. MECHANICAL PARTS LIST AND EXPLODED VIEW
VM-920/921

Part Code	Symbol	Description	Remarks
3206529A	1	Front Panel	VM-920 J,U,E,K types
3206529B	1	Front Panel	VM-921 J,U,E,K types
3206529C	1	Front Panel	VM-920 C type
3206529D	1	Front Panel	VM-921 C type
8453068A	2	VR Knob	4 pcs: VM-920 5 pcs: VM-921
124128A	3	Mask	
8467788A	4	Switch Panel	J,U,E,K types
8464142A	5	Nut	2 pcs
4053616A	6	Handle	
8441088E	7	Spacer	3 pcs
3204955A	8	Connector Panel 1	J,U,E,K types
3204955B	8	Connector Panel 1	C type
8455968B	9	Connector Panel 2	VM-920 type
8455968A	9	Connector Panel 2	VM-921 type
8453021A	10	Earth Bracket	
8467825A	11	Fin	
2119031A	12	Chassis	
8468094A	13	Bottom Plate	C type only
3022087A	14	Foot	4 pcs
4054721A	15	Bushing, Cord	J type
4054721B	15	Bushing, Cord	U type
4054721C	15	Bushing, Cord	E,K,C types
26M0017	G01	Cover Assy	J type
26M0018	G01	Cover Assy	U type
26M0019	G01	Cover Assy	C type
26M0020	G01	Cover Assy	E type
26M0021	G01	Cover Assy	K type
26M0022	G02	Rear Panel Assy	VM-920 J type
26M0023	G02	Rear Panel Assy	VM-920U type
26M0024	G02	Rear Panel Assy	VM-920C type
26M0025	G02	Rear Panel Assy	VM-920E type
26M0026	G02	Rear Panel Assy	VM-920K type
26M0027	G02	Rear Panel Assy	VM-921J type
26M0028	G02	Rear Panel Assy	VM-921U type
26M0029	G02	Rear Panel Assy	VM-921C type
26M0030	G02	Rear Panel Assy	VM-921E type
26M0031	G02	Rear Panel Assy	VM-921K type
26X0014	G03	MAIN Board Assy	VM-920J type
26X0015	G03	MAIN Board Assy	VM-920U, E,K,C types
26X0016	G03	MAIN Board Assy	VM-921J types
26X0017	G03	MAIN Board Assy	VM-921U, E,K,C types

Part Code	Symbol	Description	Remarks
26E0031	G04	Fuse Board	
26E0025	G05	IN(VIDEO) Board Assy	
26E0030	G06	POWER Board Assy	
26E0035	G07	TRANSFORMER Assy	J type
26E0036	G07	TRANSFORMER Assy	U,C types
26E0037	G07	TRANSFORMER Assy	E type
26E0038	G07	TRANSFORMER Assy	K type
26E0020	G08	VOLUME Board Assy	VM-920 type
26E0021	G08	VOLUME Board Assy	VM-921 type
26E0039	G09	PL Board Assy	
26E0026	G10	SOCKET Board Assy	VM-920 type
26E0027	G10	SOCKET Board Assy	VM-921 type
26E0033	G11	SCAN SW Board Assy	VM-921 type only
26E0024	G12	SCAN SW Board Assy	VM-921 type only
8364158L	101	Screw, Tapping M3 x 10 FE Nip	3 pcs
8447887D	102	Screw, Tapping M4 x 20 FE Nip	4 pcs
XCA1857	103	Washer	4 pcs
8468174A	104	Screw, Tapping M2.6 x 8 FE Nip	2 pcs
8409090A	105	Screw, Binding M2.6 x 4 FE DNip	2 pcs: VM-920 4 pcs: VM-921
XCA6308	106	Screw, Binding M3 x 8 FE Nip	15 pcs: VM-320JUE 17 pcs: K VM-920C VM-921JUE 19 pcs: K VM-921C
	107	Screw, Binding M3 x 8 FE DNip	14 pcs
	108	Screw, Binding M4 x 6 FE Nip	2 pcs: J type 3 pcs: U, E, K, C Types
XCA7416	109	Screw, Flat HD M4 x 16 FE Nip	2 pcs
XCA6306	110	Screw, Binding M3 x 6 FE Nip	4 pc: C type

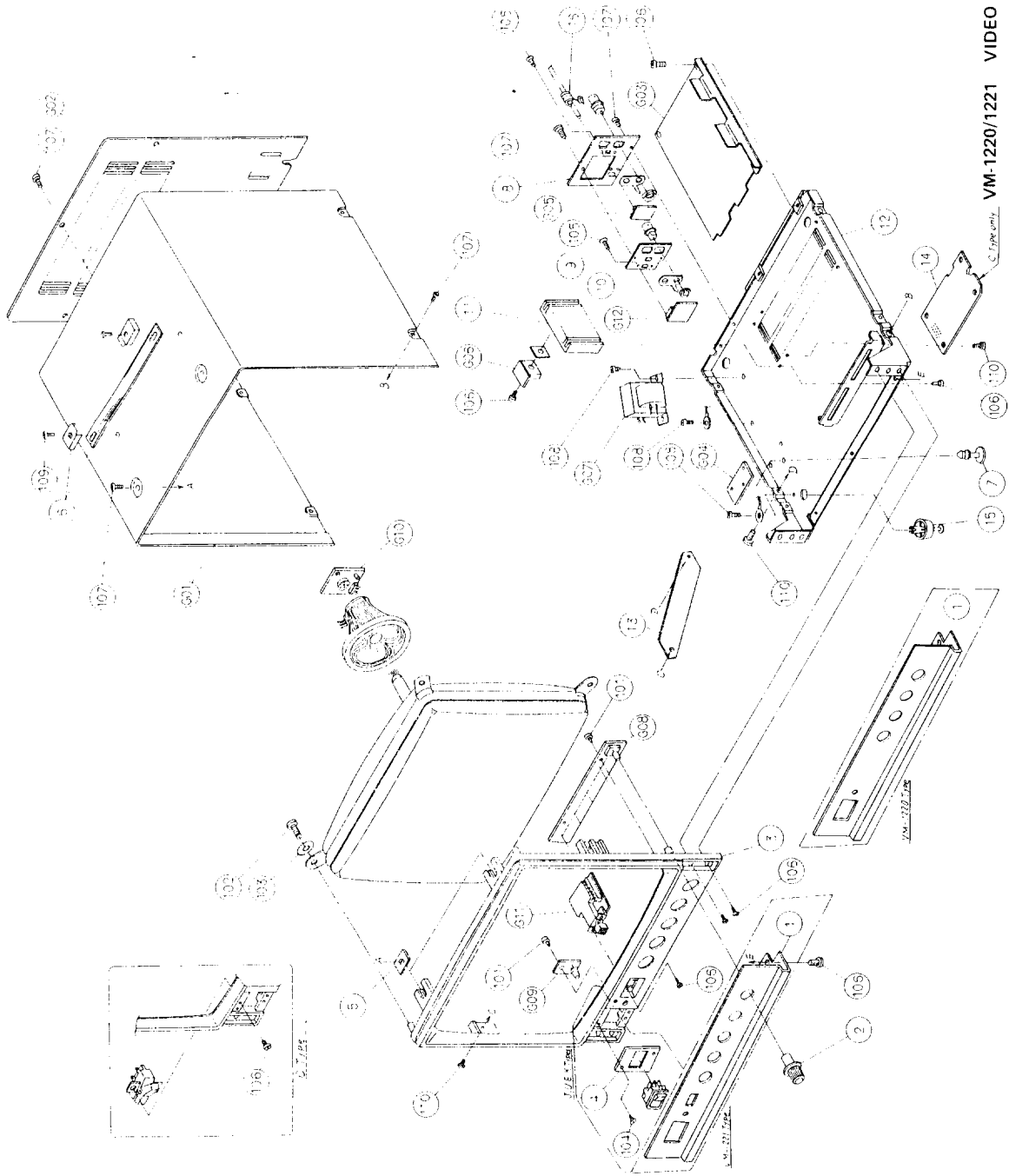


VM-920/921 VIDEO MONITOR

VM-1220/1221

Part Code	Symbol	Description	Remarks
3206982A	1	Front Panel	VM-1220 J, U, E, K types
3206982B	1	Front Panel	VM-1221 J, U, E, K types
3206982C	1	Front Panel	VM-1220 C type
3206982D	1	Front Panel	VM-1221 C type
8453068A	2	VR Knob	4 pcs: VM-1220 5 pcs: VM-1221
124477A	3	Mask	
8467788A	4	Switch Panel	J, U, E, K types
8464142A	5	Nut	2 pcs
4053616A	6	Handle	
8441083E	7	Spacer	3 pcs
3203010A	8	Connector Panel 1	J, U, E, K types
3203010B	8	Connector Panel 1	C type
8455968B	9	Connector Panel 2	VM-920 type
8455968A	9	Connector Panel 2	VM-921 type
8453021A	10	Earth Bracket	
8467825A	11	Fin	
124140A	12	Chassis	
8468084A	13	Reinforcement Plate	2 pcs
8468094A	14	Bottom Plate	C type only
3022087A	15	Foot	4 pcs
4054721A	16	Bushing, Cord	J type
4054721B	16	Bushing, Cord	U type
4054721C	16	Bushing, Cord	E, K, C types
26M0032	G01	Cover Assy	J type
26M0033	G01	Cover Assy	U type
26M0034	G01	Cover Assy	C type
26M0035	G01	Cover Assy	E type
26M0036	G01	Cover Assy	K type
26M0037	G02	Rear Panel Assy	VM-1220J type
26M0038	G02	Rear Panel Assy	VM-1220U type
26M0039	G02	Rear Panel Assy	VM-1220C type
26M0040	G02	Rear Panel Assy	VM-1220E type
26M0041	G02	Rear Panel Assy	VM-1220K type
26M0042	G02	Rear Panel Assy	VM-1221J type
26M0043	G02	Rear Panel Assy	VM-1221U type
26M0044	G02	Rear Panel Assy	VM-1221C type
26M0045	G02	Rear Panel Assy	VM-1221E type
26M0046	G02	Rear Panel Assy	VM-1221K type
26X0018	G03	MAIN Board Assy	VM-1220J type
26X0019	G03	MAIN Board Assy	VM-1220 U, E, K, C types
26X0020	G03	MAIN Board Assy	VM-1221J type
26X0021	G03	MAIN Board Assy	VM-1221 U, E, K, C types

Part Code	Symbol	Description	Remarks
26E0032	G04	FUSE Board Assy	
26E0025	G05	IN (VIDEO) Board Assy	
26E0030	G06	POWER Board Assy	
26E0035	G07	TRANSFORMER Assy	J type
26E0036	G07	TRANSFORMER Assy	U, C types
26E0037	G07	TRANSFORMER Assy	E type
26E0038	G07	TRANSFORMER Assy	K type
26E0022	G08	VOLUME Board Assy	VM-1220 type
26E0023	G08	VOLUME Board Assy	VM-1221 type
26E0039	G09	PL Board Assy	
26E0028	G10	SOCKET Board Assy	VM-1220 type
26E0029	G10	SOCKET Board Assy	VM-1221 type
26E0034	G11	SCAN SW Board Assy	VM-1221 type only
26E0024	G12	IN (SYNC) Board Assy	VM-1221 type only
8464158L	101	Screw, Tapping M3 x 10 FE Nip	3 pcs
8447387E	102	Screw, Tapping M5 x 25 FE Nip	4 pcs
XCA1858	103	Washer	4 pcs
8468174A	104	Screw, Tapping M2.6 x 8 FE Nip	2 pcs
8409090A	105	Screw, Binding M2.6 x 4 FE DNip	4 pcs: VM-1221 Type 2pcs VM-1220 Type
XCA6308	106	Screw, Binding M3 x 8 FE Nip	18 pcs: VM-1220 J, U, E, K 20pcs: VM-1221 JUEK VM-1220C 22pcs: VM-1221C
XCA1818	107	Screw, Binding M3 x 8 FE DNip	17 pcs
XCA6406	108	Screw, Binding M4 x 6 FE Nip	2 pcs: J type 3 pcs: U, E, K, C types
XCA7416	109	Screw, Flat HD M4 x 16 FE Nip	2 pcs
XCA6306	110	Screw, Binding M3 x 6 FE Nip	8 pcs: C type 4 pcs: J, U, E, K types



VM-1220/1221 VIDEO MONITOR



TECHNICAL SERVICE NOTE

① — 3 — 013

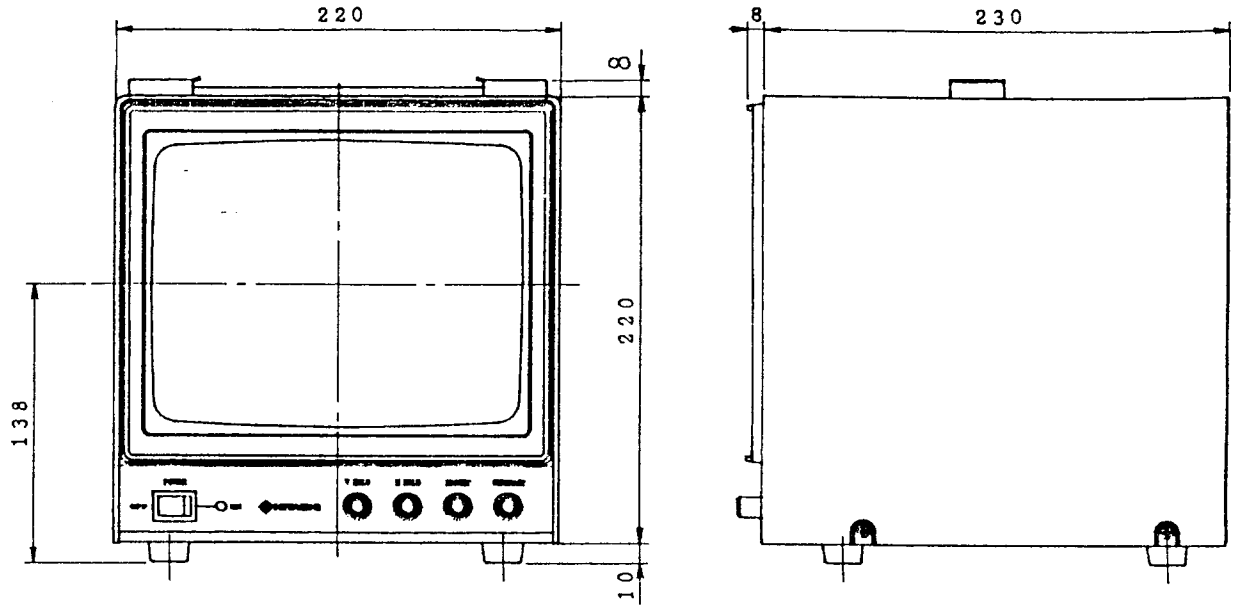
No VM-920-005

Issued Apr. 18, '91

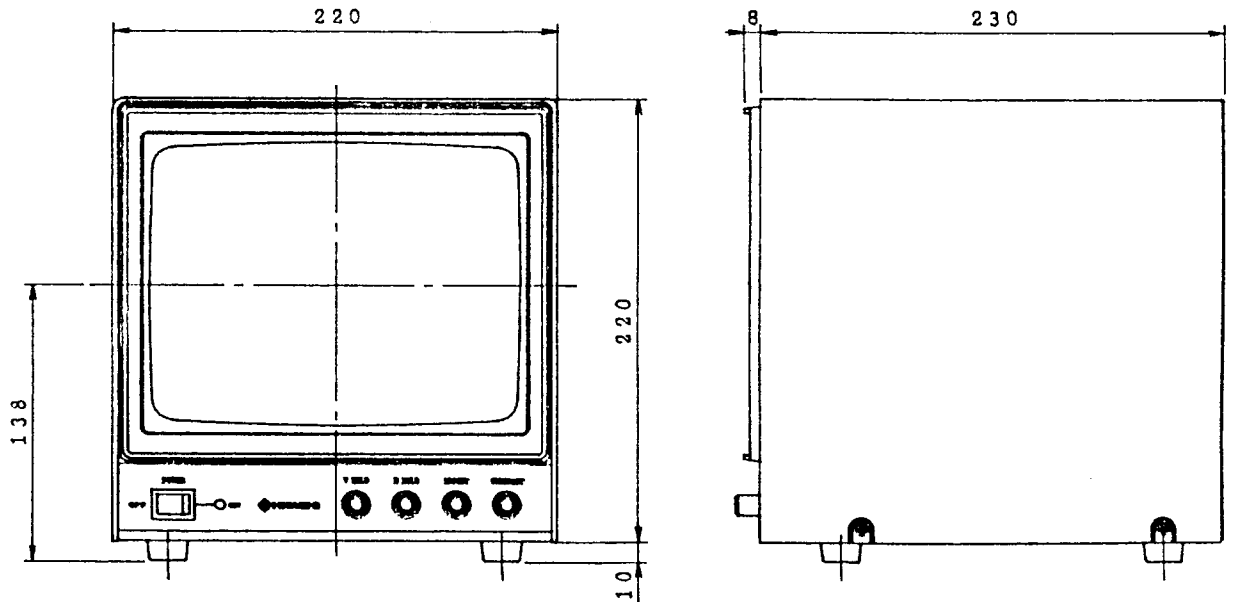
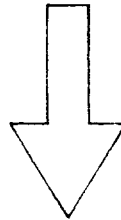
DSGN	S. Hosooya
CHKD	"
APPD	M. Nagishi
Ⓐ	General Information
Ⓑ	Notice of Improvement
C	Other

Applicable to :		Refer to : Service Manual																							
Model	VM-920/921/1220/1221 and S#																								
Ser. NO(s).	See below*	Pages : 1 of 7 pages																							
Subject																									
<p>* Products (105xxxx) manufactured on and after May, 1991 REV: R4 (R1 for S#) (Changed on an ongoing basis.)</p> <p>1. Removal of handle</p> <p>As it is hard to control the material of UL Recognized component handle, the handel is removed.</p> <p>1) New external view drawings</p> <table> <tr> <td>VM-920</td> <td>D#3206545</td> </tr> <tr> <td>VM-921</td> <td>D#3206546</td> </tr> <tr> <td>VM-1220</td> <td>D#3206560</td> </tr> <tr> <td>VM-1221</td> <td>D#3206561</td> </tr> </table> <p>2) New parts codes</p> <table border="1"> <thead> <tr> <th>Model</th> <th>Name</th> <th>Part code</th> </tr> </thead> <tbody> <tr> <td>VM-920/921</td> <td>Cover</td> <td>124129B</td> </tr> <tr> <td>VM-1220/1221</td> <td>Cover</td> <td>124471B</td> </tr> <tr> <td>Common</td> <td>Handle</td> <td>Not used (Old 4053616A)</td> </tr> <tr> <td>Common</td> <td>Screw, machine, flat hd.</td> <td>Not used (Old XCA7416)</td> </tr> </tbody> </table>			VM-920	D#3206545	VM-921	D#3206546	VM-1220	D#3206560	VM-1221	D#3206561	Model	Name	Part code	VM-920/921	Cover	124129B	VM-1220/1221	Cover	124471B	Common	Handle	Not used (Old 4053616A)	Common	Screw, machine, flat hd.	Not used (Old XCA7416)
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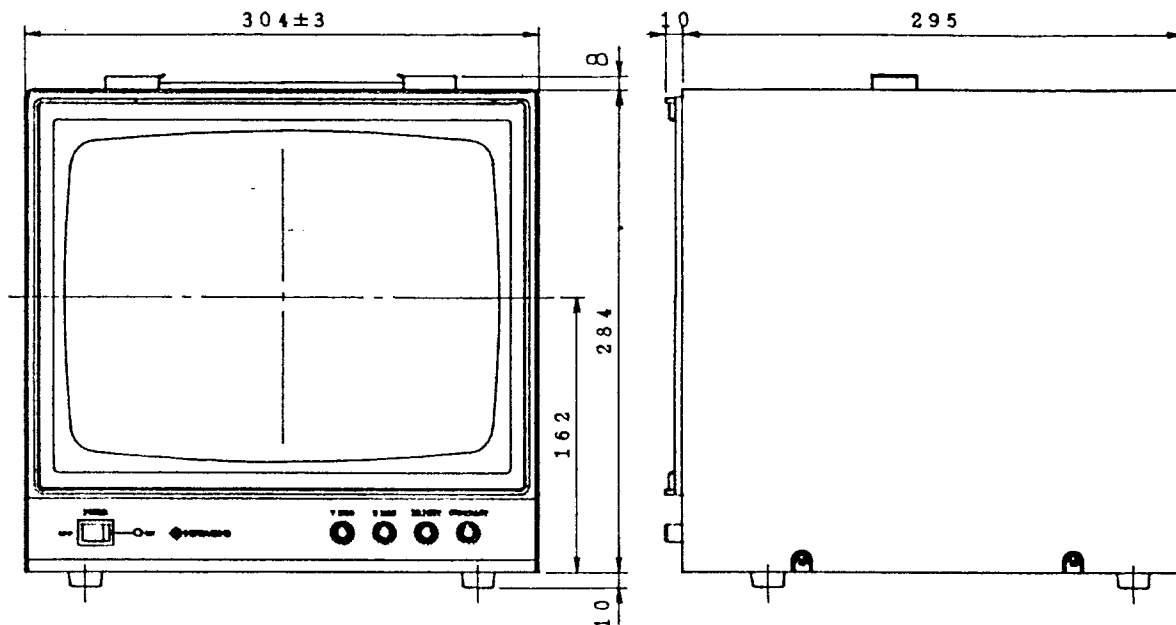
Before change



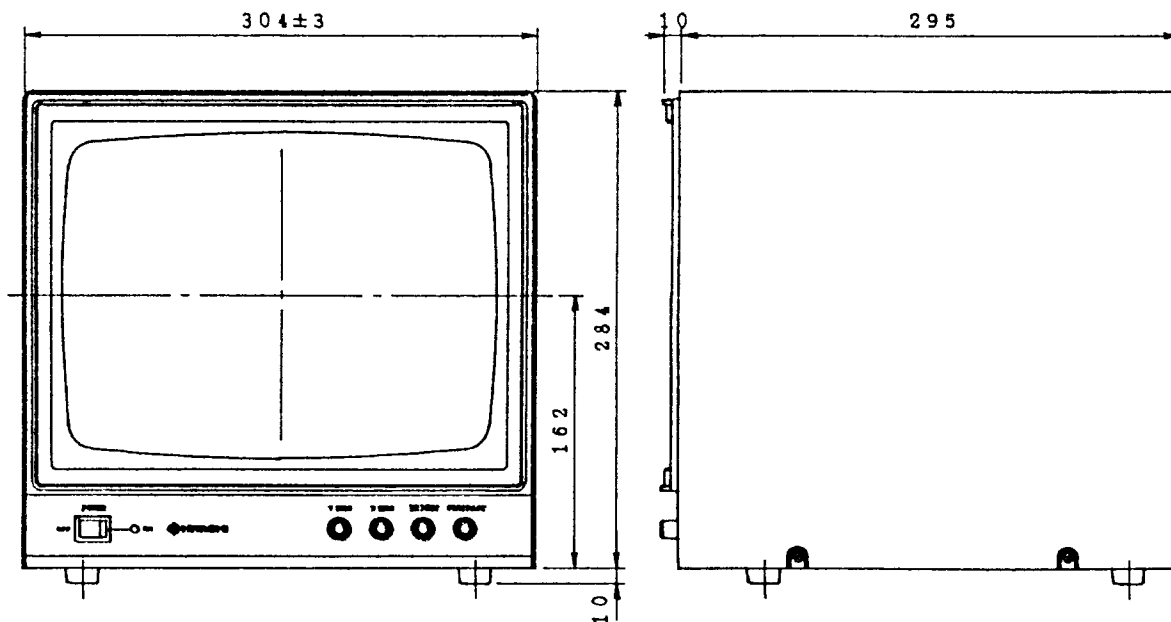
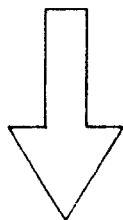
After change

Note: Similar to VM-921 series

(4) Outline of change (VM-1220series)



Before change



After change

Note: Similar to VM-1221 series

2. A new substitute flyback transformer (FBT) is used hereafter because the conventional FBT is no longer being produced.

2-1 Content of part change

(1) Common: T752, C757

Symbol	Part name	Before change	After change
		Spec. (Part code)	Spec. (Part code)
T752	FBT	TC-0530 (TTT0364) GND terminal ⑥ pin	TC-0562 (TTT0419) GND terminal ⑩ pin
C757	C, film	630V 0.022 μ F \pm 5% (CQD0051)	630V 0.056 μ F \pm 5% (CQD0062)

(2) Not common: C758

① VM-920/VM-921

C758	C, film	630V 0.01 μ F \pm 10% (CQD0005)	630V 0.0068 μ F \pm 10% (CQD0008)
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② VM-1220/VM-1221

C758	C, film	630V 0.0068 μ F \pm 10% (CQD0008)	630V 0.0022 μ F \pm 10% (CQD0023)
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③ Customized models

~~VM-920-S8~~/VM-920-S9/MM-500 Same as VM-920

C758	C, film	630V 0.01 μ F \pm 10% (CQD0005)	630V 0.0068 μ F \pm 10% (CQD0008)
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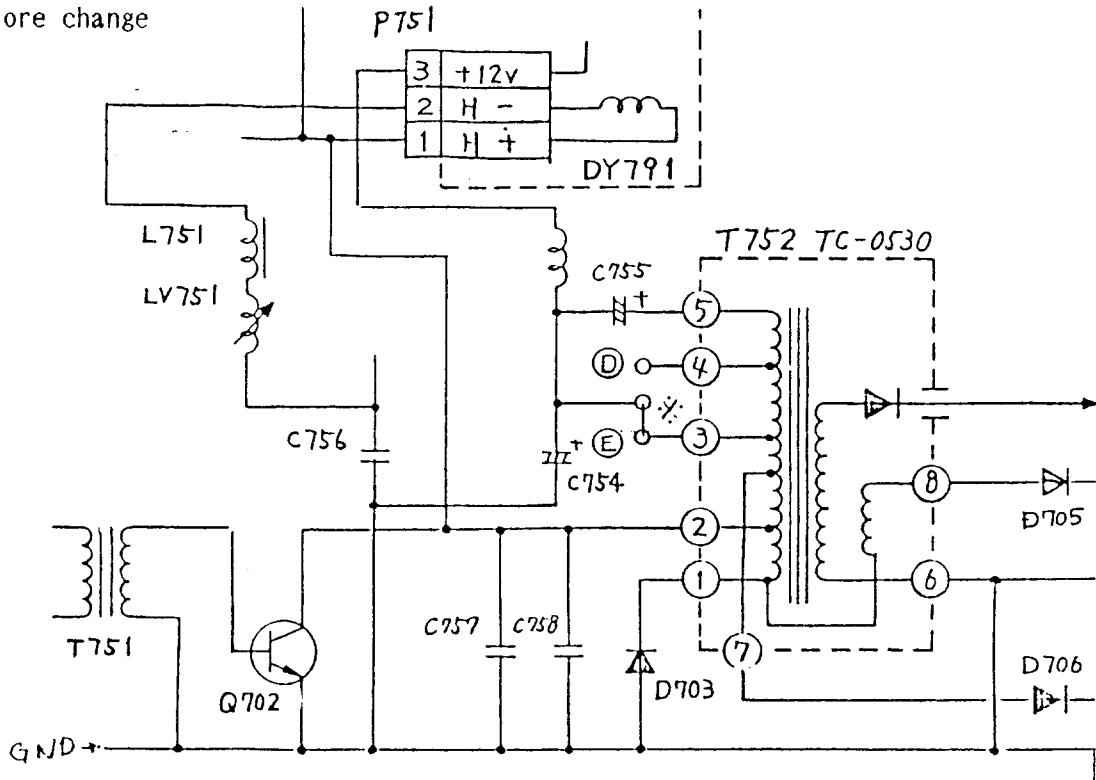
~~VM-1220-S8~~/VM-1220-S9 Same as VM-1220

C758	C, film	630V 0.0068 μ F \pm 10% (CQD0008)	630V 0.0022 μ F \pm 10% (CQD0023)
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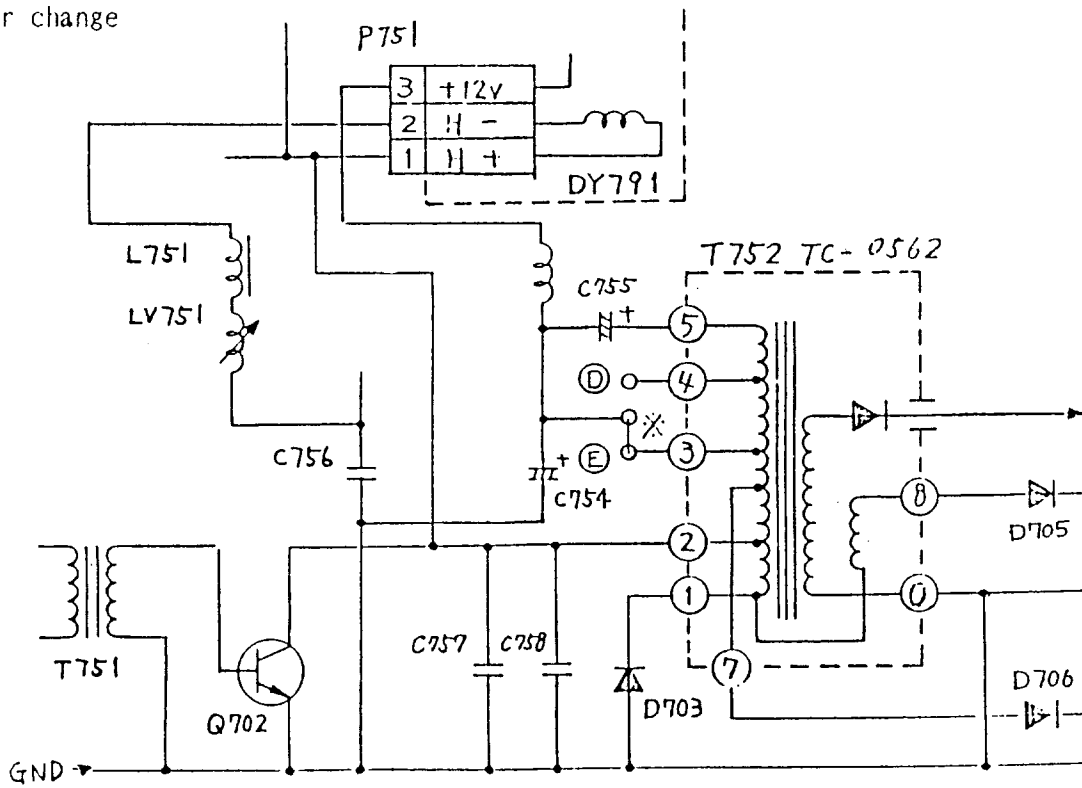
..... indicates that this model is no longer being produced.

2-2 Schematic diagram

Before change



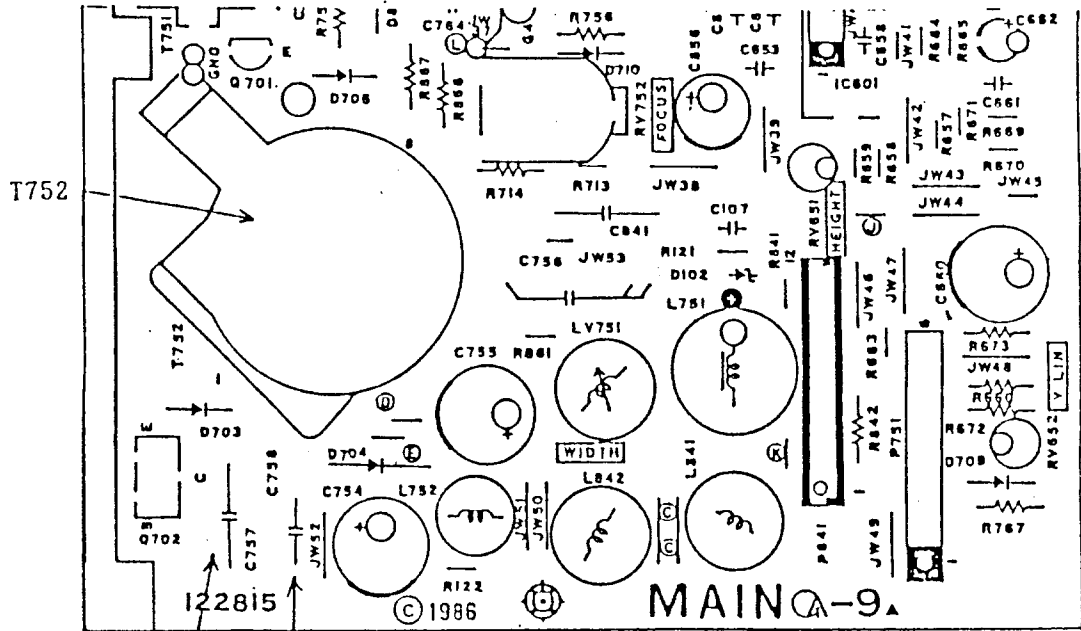
After change



- * 9-inch video monitor: Jumper ①
- 12-inch video monitor: Jumper ②

2-3 Components layout (PC board history: 122815-04 and after)

MAIN board A side



C757 C758

B side

