HITACHI

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

SERVICE MANUAL

Hitachi Denshi, Ltd.

SERVICE SAFETY PRECAUTIONS

X RADIATION

The primary source of X-ray radiation in this video monitor is the picture tube. The tube used in this video monitor is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be the same type as the original, the source approved one.

PRODUCT SAFETY NOTICE

Many parts in this video monitor have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, etc.
Electrical components having such features are identefied by an exclamation point within an equilateral triangle (⚠) on the schematic diagram, parts list and exploded view in this service manual. The use of replacement substitute component which does not have the same safety characteristics as the source recommended replacement one, shown in the parts list in this service manual, may create shock, fire, X-ray radiation or other hazards.

REPLACE WITH CONFORM TYPES ONLY!

NOTICE:

Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the receiver, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covershields, isolation resistor-capacitor, etc.
2. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacture's. Furthermore where a short circuit has occurred, replace those components that indicated evidence of overheating.
4. Before returning a instrument to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become detective, or inadvertently detected during servicing.

Therefore, the following checks should be performed for the continued protection of the customer and service technician.

GROUNDING CONTINUITY TEST

- remove mains plug from wall outlet.
- with an ohm-meter in its highest resistance range, measure resistance between the grounding prong of the mains plug and all accessible conductive parts.
  THE METER MUST READ ZERO OHM
- the mains plug still being removed from the wall outlet, switch on the instrument.
- with an ohm-meter in its highest resistance range, measure resistance between the grouding prong of the mains plug and the two other prongs of the mains plug.
  BOTH METER READINGS MUST BE MORE THAN 5 MEGA-OHM.

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE THE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND CORRECTIVE ACTION MUST BE TAKEN BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.

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CONTENTS

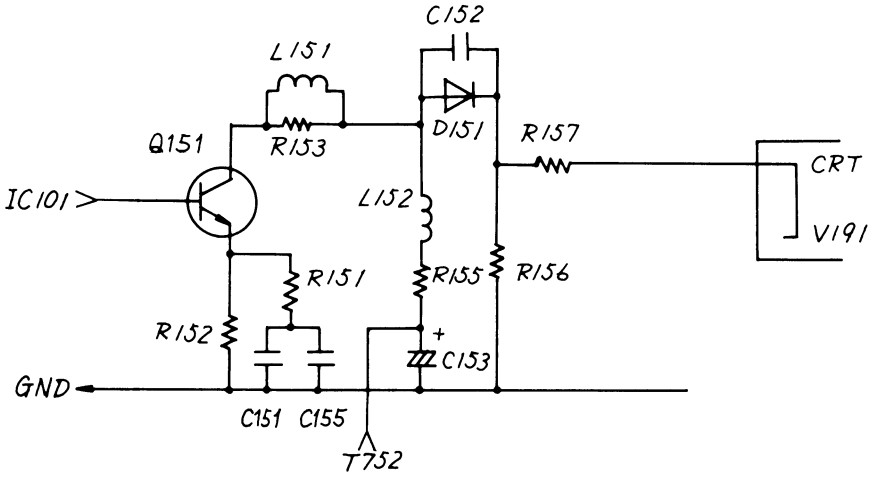
4) The output from pin ④ is fed to pin ⑤ for the VM-920/VM-1220 and are aperture-corrected for the VM-921/VM-1221.

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.

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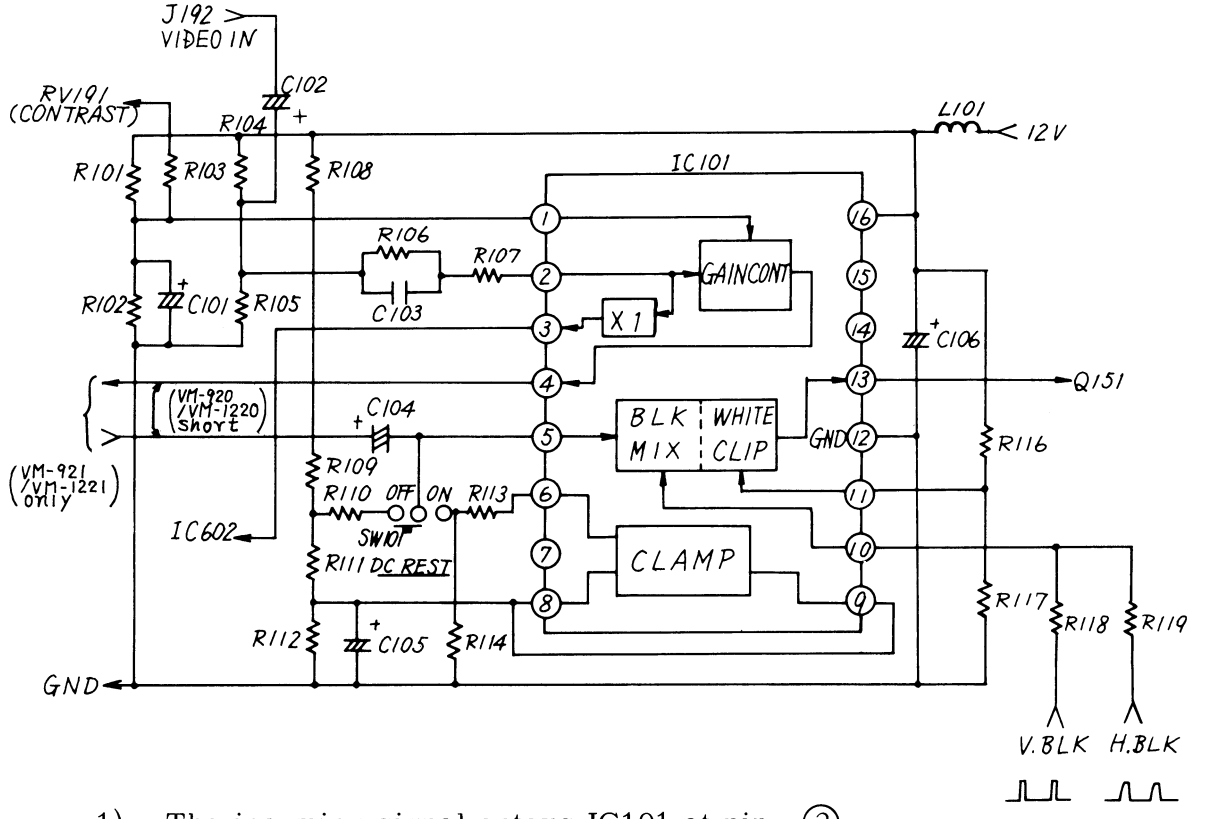
1. CIRCUIT DESCRIPTION

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

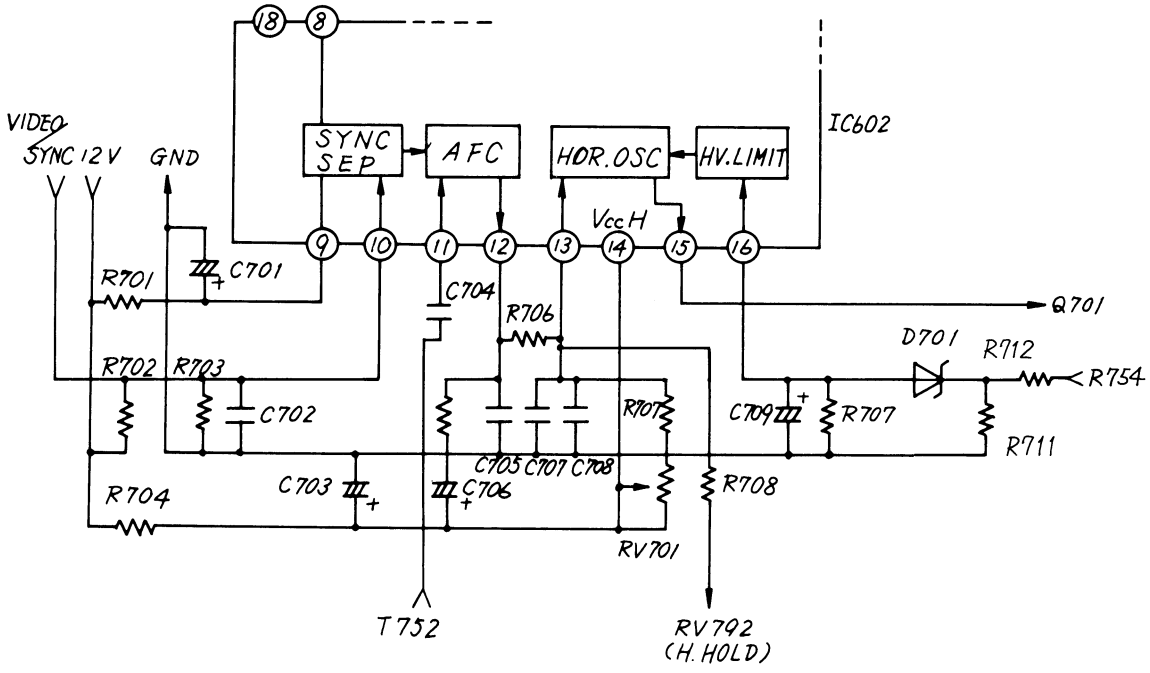
the DC voltage is zero volts, the output is a minimum (approximately zero). When it is 12 volts, the output is a maximum.

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.



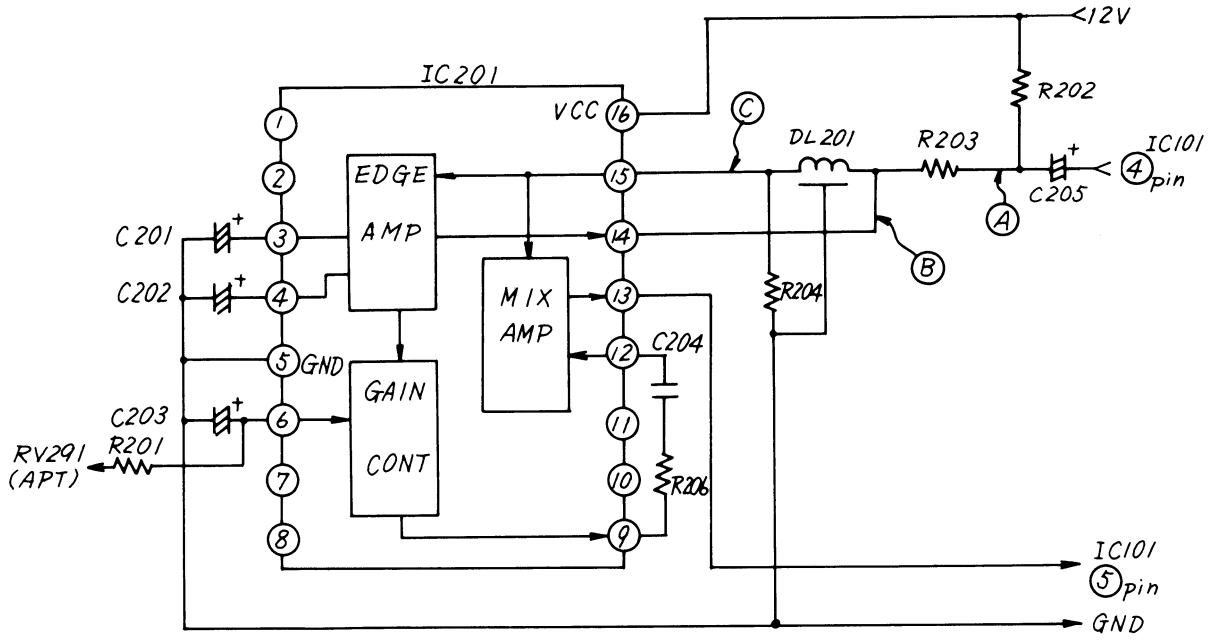
1) A sync component is separated from the composite video signal fed to pin ⑩ .

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 .

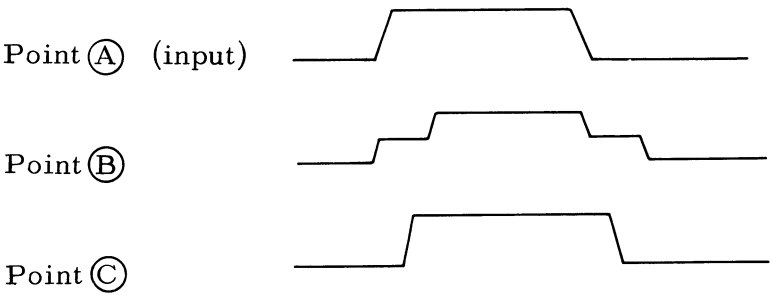
3) The HOR OSC circuit is controlled by the DC voltage from pin ⑫ and delivers a square wave from pin ⑮ .

4) When a high voltage increases excessively, D701 detect the excessive voltage and activate the HV LIMIT circuit to prevent

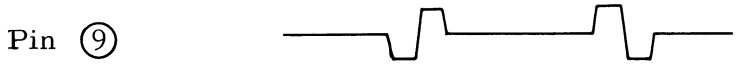
1.1.3 IC201 and its peripheral circuit (VM-921/VM-1221 only)



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

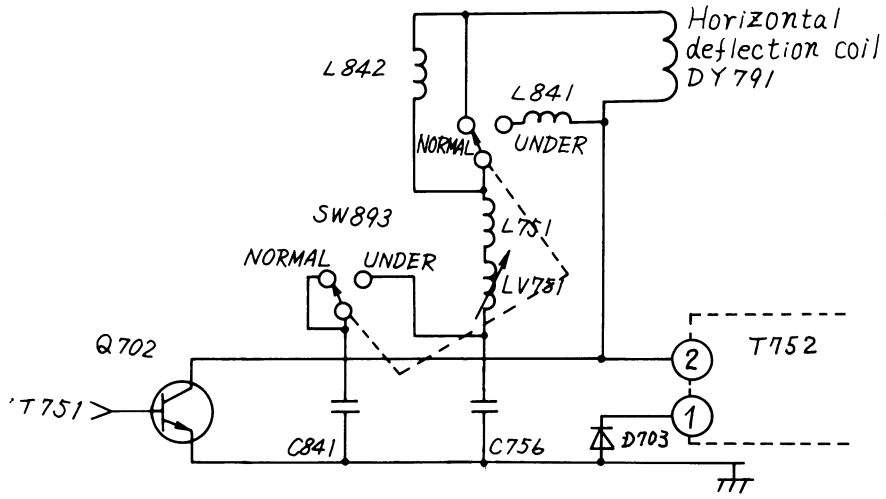


2) When an operation Ⓒ - Ⓑ is performed by the EDGE AMP, a contour signal as shown below is obtained at pin ⑨.



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

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.

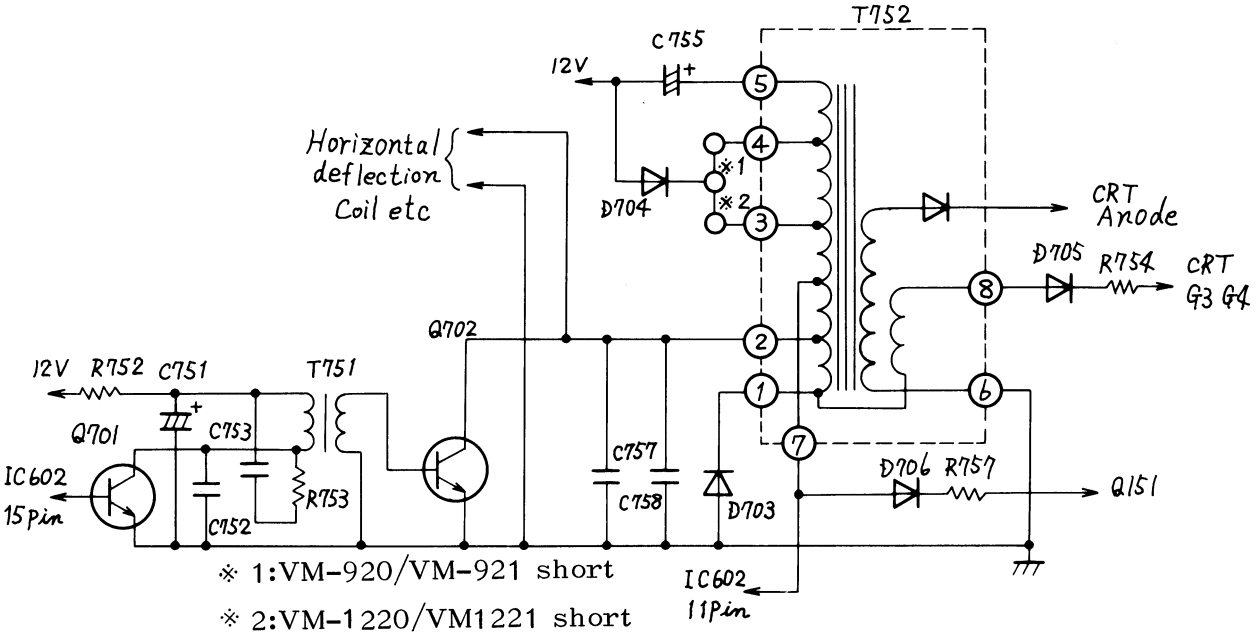
2) When SW893 is at the UNDER position, L841 is in between DY791 and L751. Consequently, the sawtooth current flowing to DY791 decreases and the horizontal amplitude of a picture reduces.

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.

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

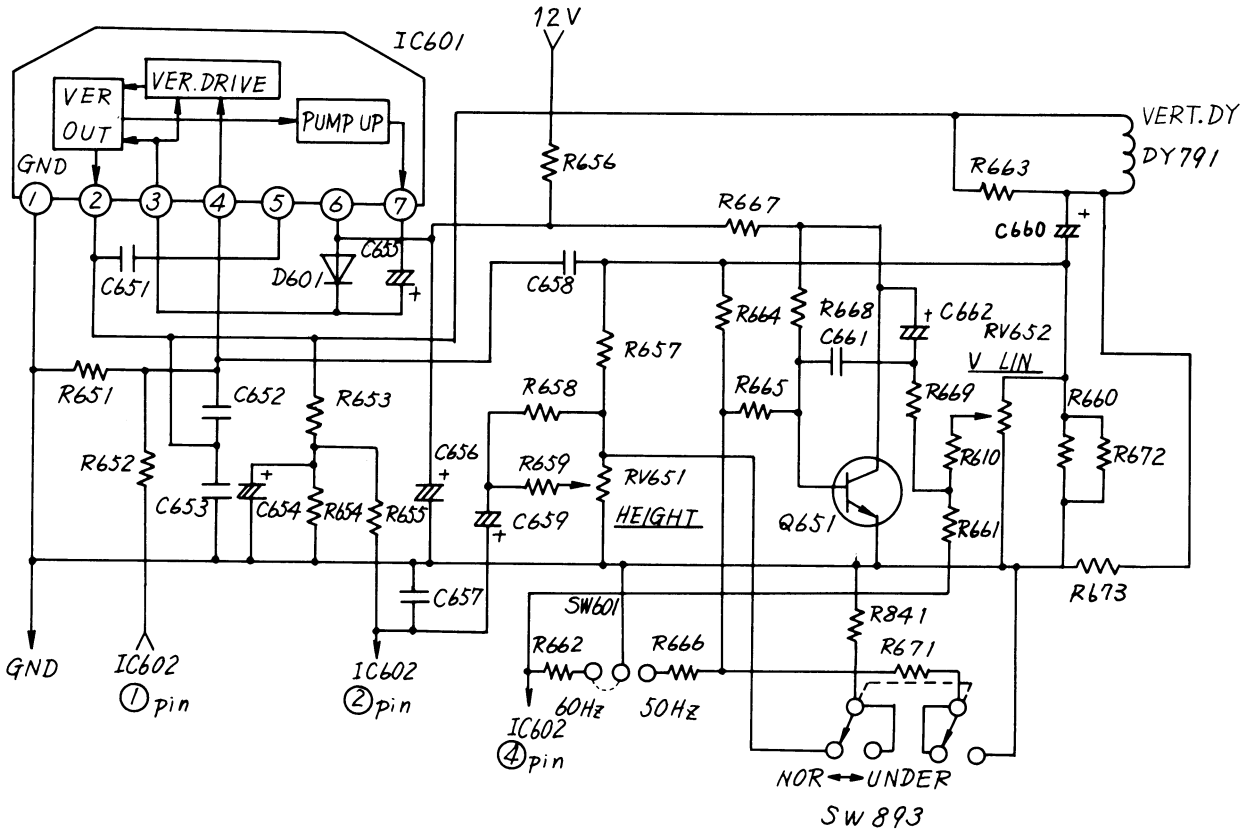


1) The output signal from pin (15) of IC602 is amplified by Q701 and drives Q702 via T751.

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.

1.3.2 IC601 and its peripheral circuit

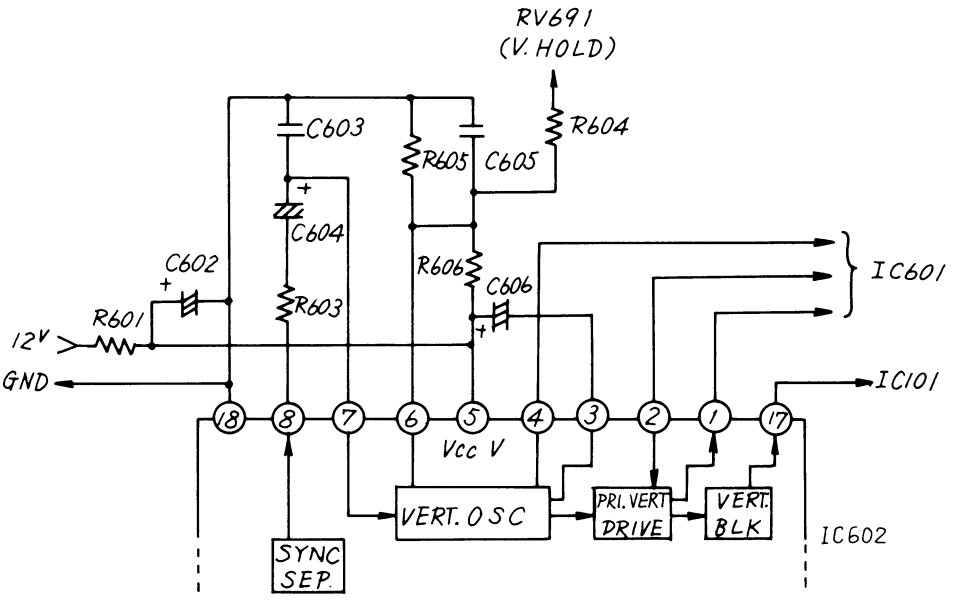


1) Pin ④ is an input terminal of IC601. IC601 is driven by IC602.
2) A vertical deflection current from pin ② flows from DY791 to C660 to R660 and R672.
3) The waveforms obtained at the both sides of R660 are used for the adjustment of a vertical size of a picture and the correction of a linearity.
4) 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).

1.3 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.)

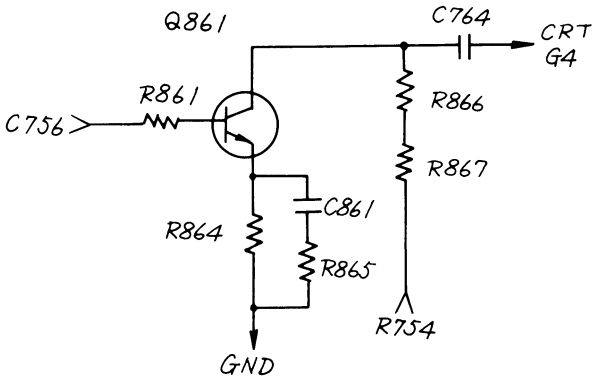


1) A sync signal is obtained at pin ⑧. The horizontal sync component is separated by R603 and C603. The resulting vertical sync signal is routed to pin ⑦.
2) The VERT OSC circuit synchronizes with the vertical sync signal and oscillates a sawtooth wave.
3) The sawtooth signal is supplied to the PRI VERT. 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.

2. SPECIFICATIONS

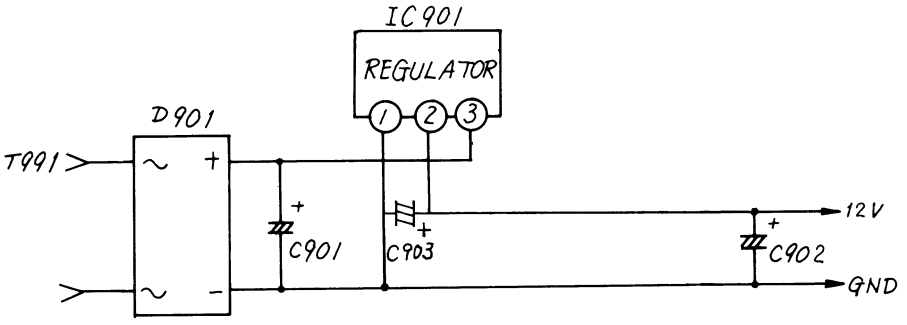
(1)	System	EIA (U, C types), CCIR (E, K types)
(2)	Input video signal	
	VM-920/VM-1220:	1.0 Vp-p composite video, sync negative
	VM-921/VM-1221:	1.0 Vp-p composite video, sync negative, or 0.7 Vp-p non-composite video
(3)	Sync system	
	VM-920/VM-1220:	Internal
	VM-921/VM-1221:	Internal or External
(4)	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

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.

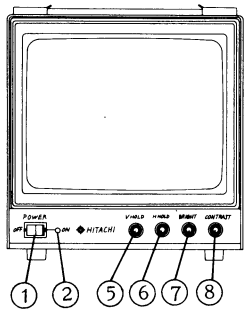
1.5 Power supply circuit (IC901 and IC902)



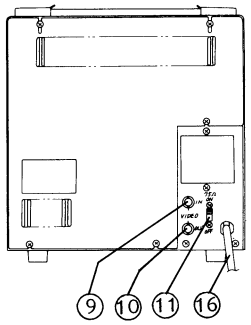
1) The output from the secondary side of the power transformer is rectified by D901.
2) IC901 is regulator with three terminal and 12-volt output is obtained.

3. NAMES OF EACH SECTION

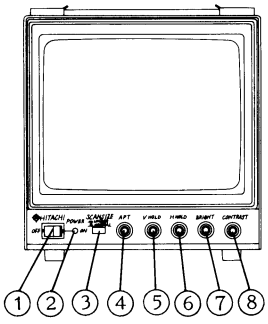
VM-920 (Front side)



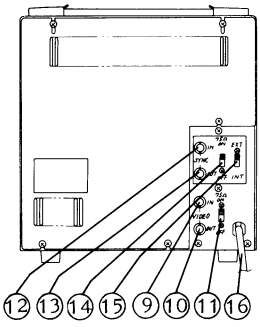
VM-920 (Rear side)



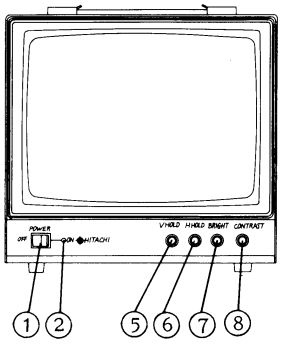
VM-921 (Front side)



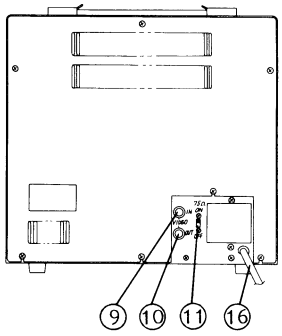
VM-921 (Rear side)



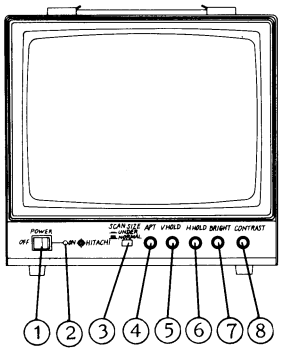
VM-1220 (Front side)



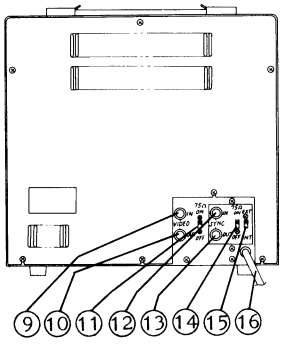
VM-1220 (Rear side)



VM-1221 (Front side)



VM-1221 (Rear side)



(12) Power supply

U, C types	117 V AC ±10 % 60 Hz
E type	220 V AC ±10 % 50 Hz
K type	240 V AC ±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.

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.

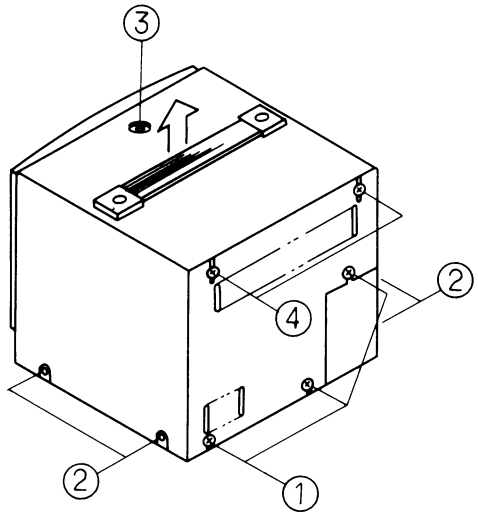


Fig.1

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.

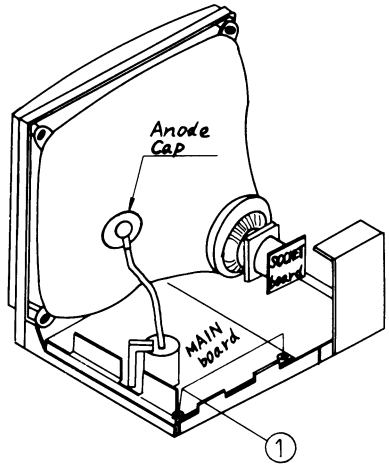


Fig.2

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	75Ω 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) 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.

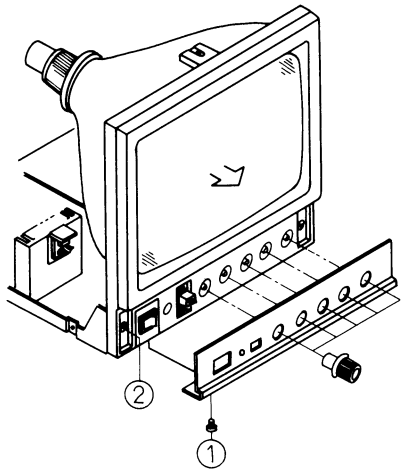


Fig.6

7. CRT

(Fig. 7.)

(1) Remove the Deflection yoke. (See Item 3.)

(2) Remove the Mask. (See Item 6.)

(3) Remove four screws ①.

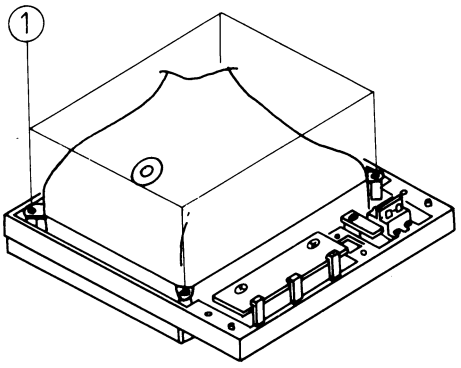


Fig.7

8. VOLUME board

(Fig. 8.)

(1) Remove the Mask. (See Item 6.)

(2) Remove two screws ①.

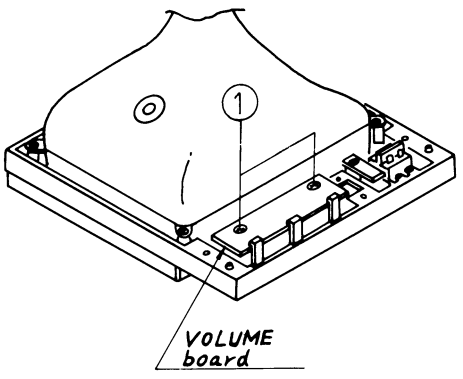


Fig.8

9. PL board

(Fig. 9.)

(1) Remove the Mask. (See Item 6.)

(2) Remove the screw ①.

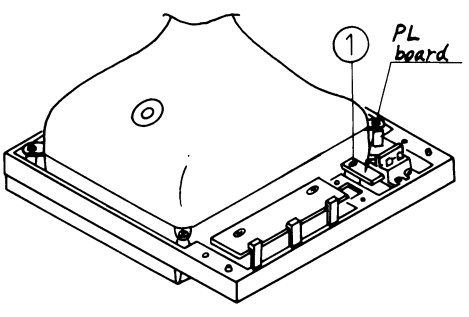


Fig.9

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.

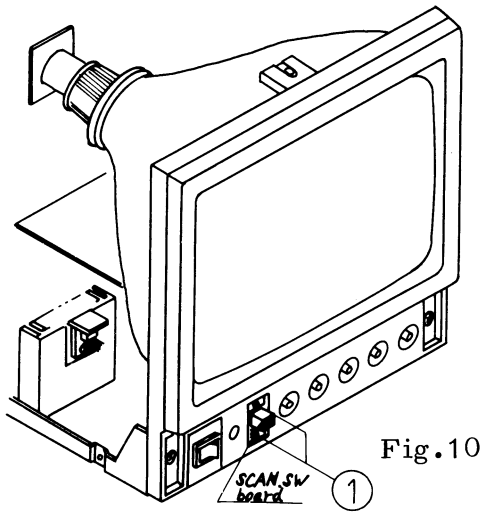


Fig.10

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 panel1. (See Item 3.)

(4) Remove the FUSE board from three spacers.

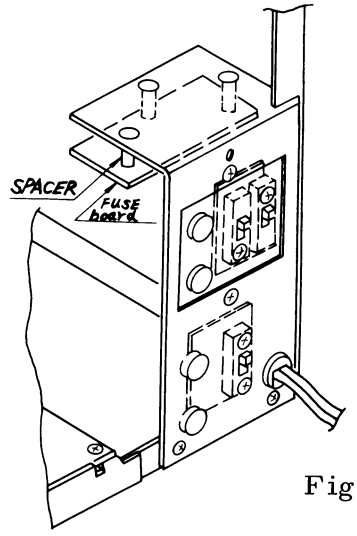


Fig.11

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.

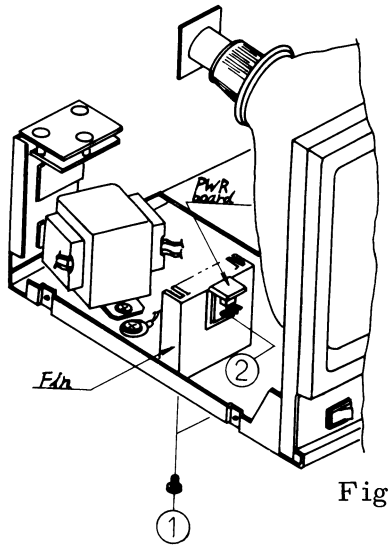


Fig.12

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.

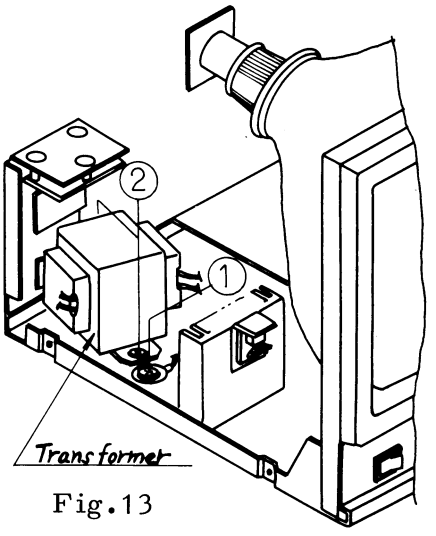


Fig.13

4.2 VM-1220/VM-1221 Video monitor

Notes:

(1) Before disassembling the monitor, be sure to disconnect the AC porew 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.

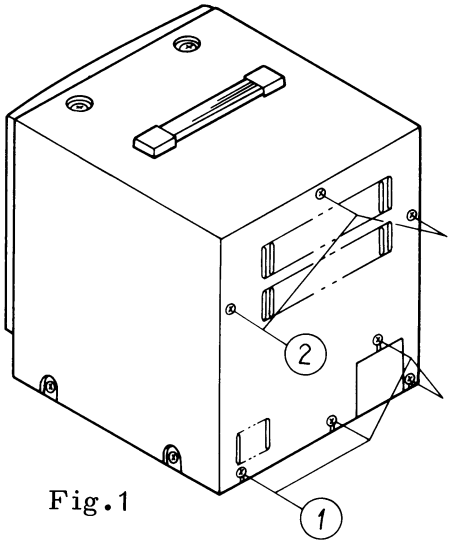


Fig.1

2. Cover

(Fig. 2.)

(1) Remove the Rear panel. (See Item 1.)

(2) Remove two screws ①.

(3) Remove four screws ②.

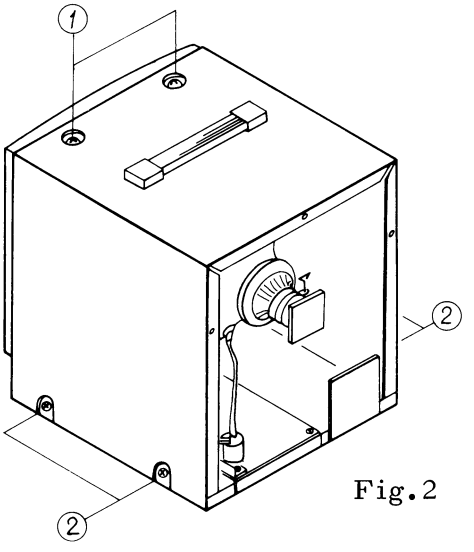


Fig.2

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.

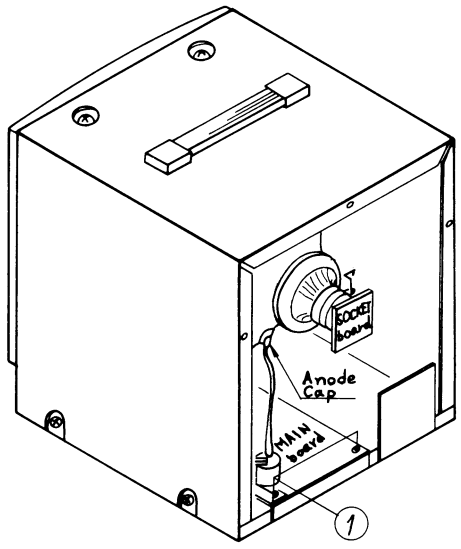


Fig.3

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.

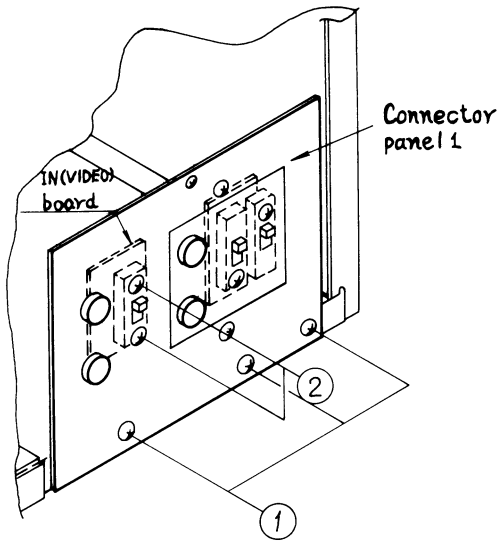


Fig.4

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.

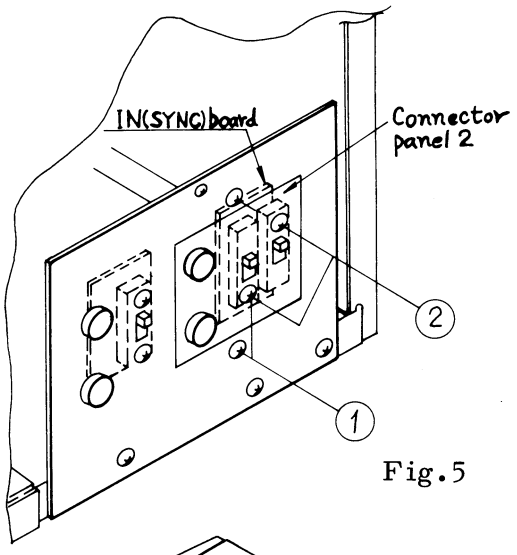


Fig.5

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.

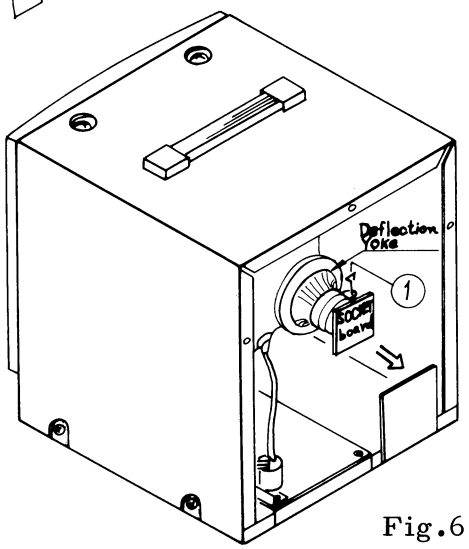


Fig.6

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.)

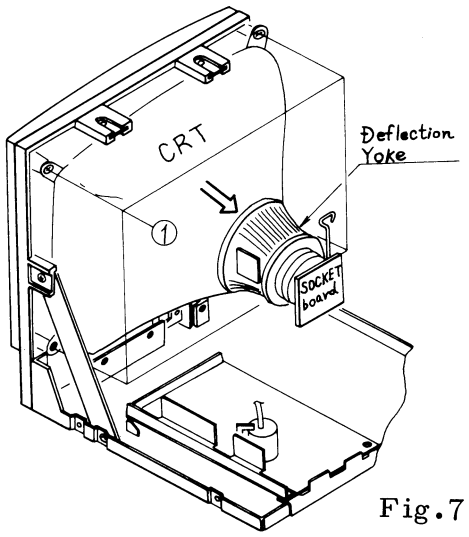


Fig.7

(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 thedirection 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.

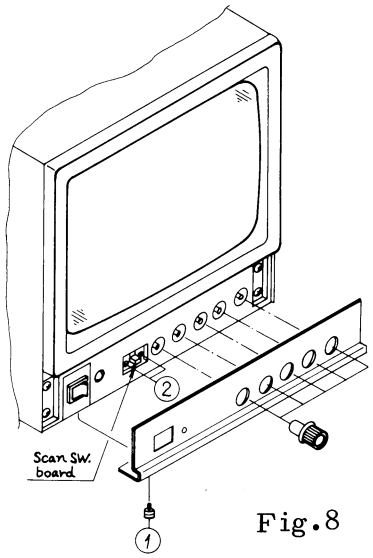


Fig.8

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.

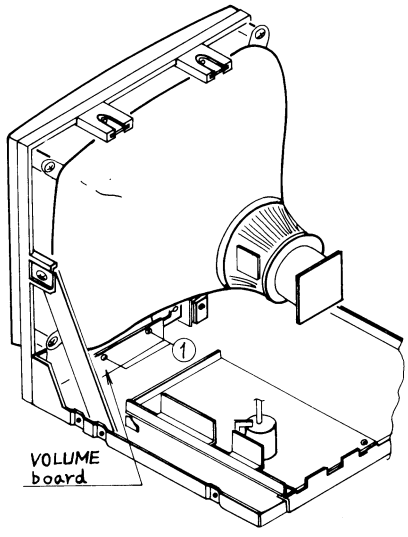


Fig.9

10. PL board

(Fig. 10.)

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

(2) Remove the screw ①.

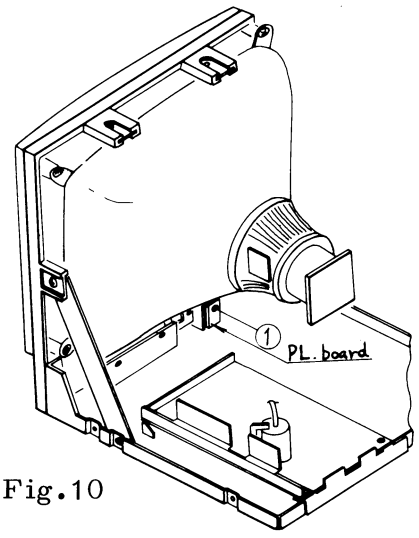


Fig.10

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.

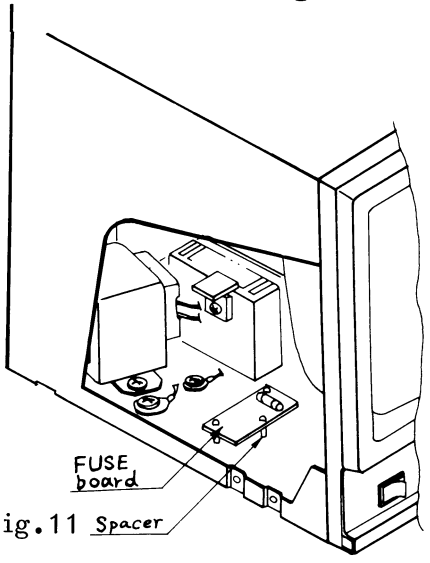


Fig.11

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.

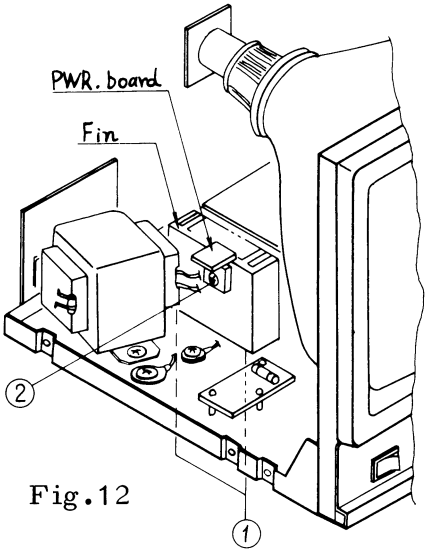


Fig.12

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.

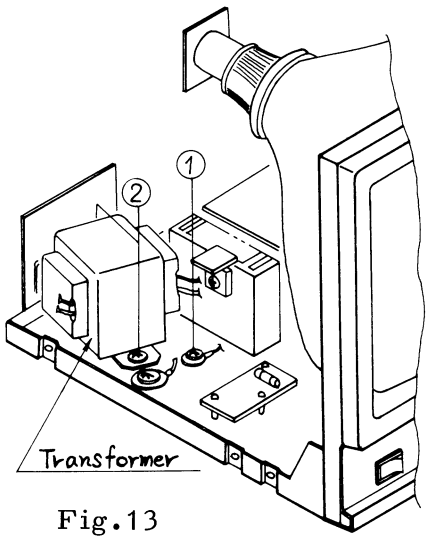
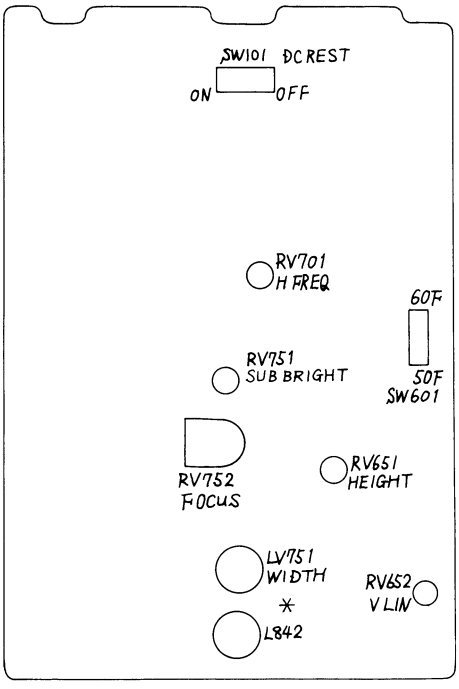


Fig.13

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

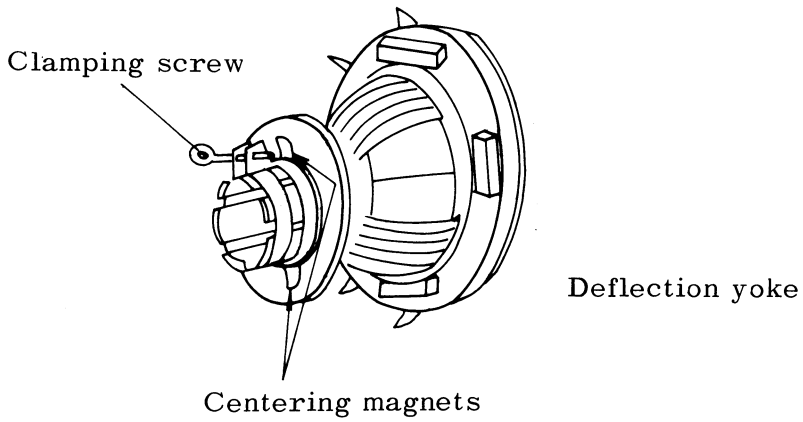
Adjust the BRIGHT and the CONTRAST controls for normal operating conditions and adjust RV752 (FOCUS) so that an optimum focus is obtained at the center of a picture.

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
			IC's				
ILB0017	IC	101	BM1102C				
ILB0018	IC	201	BM1103A				VM-921/ VM-1221
ILL0089	IC	601	LA7830				
ILH0111	IC	602	HA11423				
			Transistors				
HTC0148	Q	651	2SC458C				
HTC0057	Q	701	2SC1213C				
HTC0844	Q	702	2SC3175-YA				
HTC0845	Q	861	2SC2899				VM-921/ VM-1221
			Diodes				
HDS0437	D	101	1SS133				
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)				
			Resistors				
RCE0781	R	101	Carbon	1/4W	10kΩ	±5%	
RCE0781	R	102	Carbon	1/4W	10kΩ	±5%	
RCE0778	R	103	Carbon	1/4W	5600Ω	±5%	
RCE0787	R	104	Carbon	1/4W	33kΩ	±5%	
RCE0785	R	105	Carbon	1/4W	22kΩ	±5%	
RCE0769	R	106	Carbon	1/4W	1000Ω	±5%	
RCE0762	R	107	Carbon	1/4W	270Ω	±5%	
RCR3074	R	108	Carbon	1/4W	8200Ω	±5%	
RCE0771	R	109	Carbon	1/4W	1500Ω	±5%	
RCE0781	R	110	Carbon	1/4W	10kΩ	±5%	
RCE0764	R	111	Carbon	1/4W	390Ω	±5%	
RCE0775	R	112	Carbon	1/4W	3300Ω	±5%	
RCE0771	R	113	Carbon	1/4W	1500Ω	±5%	
RCE0793	R	114	Carbon	1/4W	100kΩ	±5%	
RCE0771	R	115	Carbon	1/4W	1500Ω	±5%	
RCE0780	R	116	Carbon	1/4W	8200Ω	±5%	
RCE0776	R	117	Carbon	1/4W	3900Ω	±5%	
RCE0773	R	118	Carbon	1/4W	2200Ω	±5%	
RCE0771	R	119	Carbon	1/4W	1500Ω	±5%	
RCE0753	R	120	Carbon	1/4W	47Ω	±5%	
RCE0784	R	121	Carbon	1/4W	18kΩ	±5%	
RCE0782	R	122	Carbon	1/4W	12kΩ	±5%	
RCE0770	R	123	Carbon	1/4W	1200Ω	±5%	
RCE0757	R	201	Carbon	1/4W	100Ω	±5%	VM-921/ VM-1221
RCE0783	R	202	Carbon	1/4W	15kΩ	±5%	VM-921/ VM-1221

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

Part Code	Symbol		Description				Symbol
RME0690	R	714	Metal	1/4W	221kΩ	±1%	VM-1220/ VM-1221
RME0690	R	714	Metal	1/4W	221kΩ	±1%	VM-920/ VM-921
RCE0757	R	751	Carbon	1/4W	100Ω	±5%	
RMR3848	R	752	Metal	2W	47Ω	±5%	VM-1220/ VM-1221
RMR3865	R	752	Metal	1W	47Ω	±5%	VM-920/ VM-921
RCE0698	R	753	Carbon	1/2W	270Ω	±5%	
RZZ0044	R	754	Fuse	1/4W	560Ω	±5%	
RMR3849	R	756	Metal	1/4W	10MΩ	±5%	VM-921/ VM-1221
RZZ0045	R	757	Fuse	1/4W	4.7Ω	±5%	
RCE0793	R	758	Carbon	1/4W	100kΩ	±5%	
RCE0798	R	759	Carbon	1/4W	330kΩ	±5%	VM-920/ VM-921
RCE0797	R	759	Carbon	1/4W	220kΩ	±5%	VM-1220/ VM-1221
RCE0797	R	760	Carbon	1/4W	220kΩ	±5%	
RCE0798	R	761	Carbon	1/4W	330kΩ	±5%	VM-920/ VM-921
RCE0800	R	761	Carbon	1/4W	470kΩ	±5%	VM-1220/ VM-1221
	R	762	Not Used				
RCE0713	R	763	Carbon	1/4W	4700Ω	±5%	
RCE0702	R	767	Carbon	1/2W	560Ω	±5%	
RCE0757	R	841	Carbon	1/4W	100Ω	±5%	VM-920/ VM-921 VM-1220
RCE0756	R	841	Carbon	1/4W	82Ω	±5%	VM-1221
RMR3862	R	842	Metal	1/4W	100kΩ	±5%	VM-921/ VM-1221
RCE0787	R	861	Carbon	1/4W	33kΩ	±5%	VM-921/ VM-1221
RCE0783	R	864	Carbon	1/4W	15kΩ	±5%	VM-921/ VM-1221
RCE0778	R	865	Carbon	1/4W	5600Ω	±5%	VM-921/ VM-1221
RCE0729	R	866	Carbon	1/2W	100kΩ	±5%	VM-921/ VM-1221
RCE0729	R	867	Carbon	1/2W	100kΩ	±5%	VM-921/ VM-1221
RZZ0045	R	951	Fuse	1/4W	4.7Ω	±5%	
			Var. Resistors				
RNH0023	RV	651	Metal	RHL0AS203A			
RNH0023	RV	652	Metal	RHL0AS203A			
RNH0026	RV	701	Metal	RHL0AS301A			
RNH0033	RV	751	Metal	RHL0A1602A			
RNE0079	RV	752	Metal	EVM-81U	10K		
			Capacitors				
CES0040	C	101	Elyc	50V	10μF		
CES0032	C	102	Elyc	25V	47μF		
CCC1449	C	103	Ceramic	50V	330pF	±5%	
CES0040	C	104	Elyc	50V	10μF		
CES0040	C	105	Elyc	50V	10μF		
CES0032	C	106	Elyc	25V	47μF		
CCD0339	C	107	Ceramic	500V	56pF	±5%	
CES0040	C	201	Elyc	50V	10μF		VM-920/ VM-1221
CES0040	C	202	Elyc	50V	10μF		VM-920/ VM-1221
CES0037	C	203	Elyc	50V	1μF		VM-920/ VM-1221
CQA0124	C	204	Plastic	50V	0.1μF	±10%	VM-920/ VM-1221
RCE0778	R	865	Carbon	1/4W	5600Ω		VM-921
RCE0773	R	865	Carbon	1/4W	2200Ω		VM-1221

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

Part Code	Symbol		Description		Remarks
			Coils		
TLL0190	L	101	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		
			Transformers		
TTH0006	T	751	HD-12		
TTT0364	T	752	TC-0530FBT UL	CSA	
			Switches		
SSV0109	SW	101	Slide	SSFB12-07P	
SSV0109	SW	601	Slide	SSFB12-07P	J Type only
			Connectors		
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		
			Miscellaneous		
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	

SOCKET board

Part Code	Symbol		Description				Remarks
			Transistor				
HTC0810	Q	151	2SC3468E				
			Diode				
HDS0530	D	151	1SS131				
			Resistors				
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%	
			Capacitors				
CCC1025	C	151	Ceramic	50V	100 pF		
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	56 pF		
			Coils				
TLL0188	L	151	LHL06TB330K				
TLL0190	L	152	LHL06TB470K				
			Connectors				
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
			Miscellaneous				
EZH0079	SG	151	Spark Gap		AG15PC152FB-K2M		
EZH0079	SG	152	Spark Gap		AG15PC152FB-K2M		

VOLUME board

Part Code	Symbol		Description				Remarks
			Resistors				
RCS0020	R	192	Carbon	1/2W	100Ω	±5%	
RCE0761	R	194	Carbon	1/2W	220Ω	±5%	
RCE0705	R	991	Carbon	1/2W	1000Ω	±5%	
			Var. Resistors				
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			
			Connectors				
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
			Resistor				
RCR3025	R	191	Carbon	1/4W	75Ω	±5%	
			Switch				
SSV0041	SW	191	Slide	SSB022		L=6	
			Connectors				
8464435A1	J	191	8464435-A1				
JHB0088	J	192	BNC 071				
JHB0088	J	193	BNC 071				

FUSE board

Part Code	Symbol		Description			Remarks
			Connectors			
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
			Miscellaneous			
EFL0164	F	991	Fuse	MT3-1A	(1A 250V)	

PWR board

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

PL board

Part Code	Symbol		Description		Remarks
			Diode		
HDS0407	PL	991	SR503D	(RED)	

SCAN board VM-921/VM-1221 ONLY

Part Code	Symbol	Description	Remarks
		Switch	
SSP0538	SW 893	Power SDDUA4 BLACK	
		Connector	
8453839G	J 892	8453839G	

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

Part Code	Symbol	Description	Remarks
		Resistors	
RCR3025	R 891	Carbon 1/4W 75Ω ±5%	
RCE0780	R 892	Carbon 1/4W 8200Ω ±5%	
RCE0773	R 893	Carbon 1/4W 2200Ω ±5%	
		Switches	
SSV0041	SW 894	Slide SSB022 L=6	
SSV0041	SW 895	Slide SSB022 L=6	
		Connectors	
JHB0088	J 893	BNC-071	
JHB0088	J 894	BNC-071	
8464435B1	J 895	8464435-B1	

CHASSIS

Part Code	Symbol	Description	Remarks
		Valve	
DPX0067	V 191	CRT 230BTB4	VM-920/ VM-921
DPC0026	V 191	CRT C12M40P4	VM-1220/ VM-1221
		Coil	
TLL0225	DY 791	DEF Yoke LC-0282	VM-920/ VM-921
TLL0226	DY 791	DEF Yoke LC-0283	VM-1220/ VM-1221
		Transformer	
TTT0365	T 991	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

Part Code	Symbol	Description	Remarks
		Switch	
SSS0112	SW 991	See Saw JWZ2120-0301	J,U,E,K Type
SSS0115	SW 991	See Saw SDDTA3-C-2 TV-5	C Type
		Connectors	
8464435L1	J 194	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	

CHASSIS

Part Code	Symbol	Description	Remarks
		Miscellaneous	
8443271A	P 991	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

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 4pcs: VM-921
XCA6308	106	Screw,Binding	M3 x 8 FE Nip	15pcs: VM-920JUE 17pcs: K VM-920C VM-921JUE 19pcs: K VM-921C
	107	Screw,Binding	M3 x 8 FE DNip	14 pcs
	108	Screw,Binding	M4 x 6 FE Nip	2pcs: J type 3pcs: 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

① — 3 — 013
No. VM-920-005
Issued Apr. 18, '91

DSGN	S. Hosoya
CHKD	〃
APPD	M. Negishi

Ⓐ	General Information
Ⓑ	Notice of Improvement
C	Other

TECHNICAL SERVICE NOTE

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

* Products (105xxxx) manufactured on and after May, 1991
REV: R4 (R1 for S#) (Changed on an ongoing basis.)

1. Removal of handle

As it is hard to control the material of UL Recognized component handle, the handel is removed.

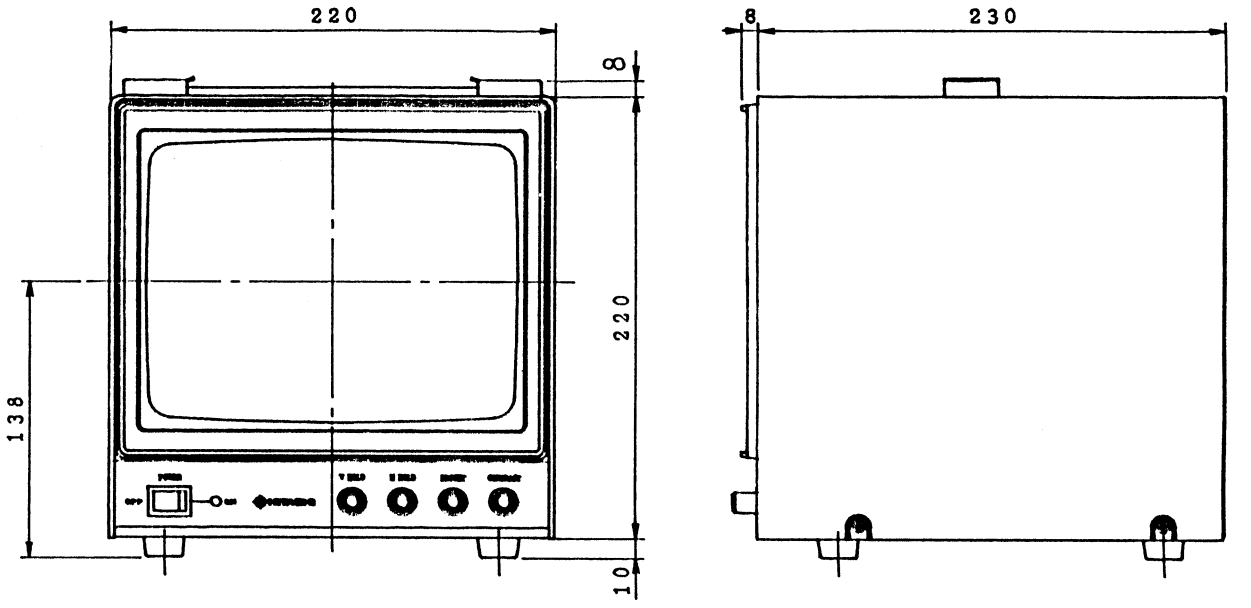
1) New external view drawings

VM-920 D#3206545
VM-921 D#3206546
VM-1220 D#3206560
VM-1221 D#3206561

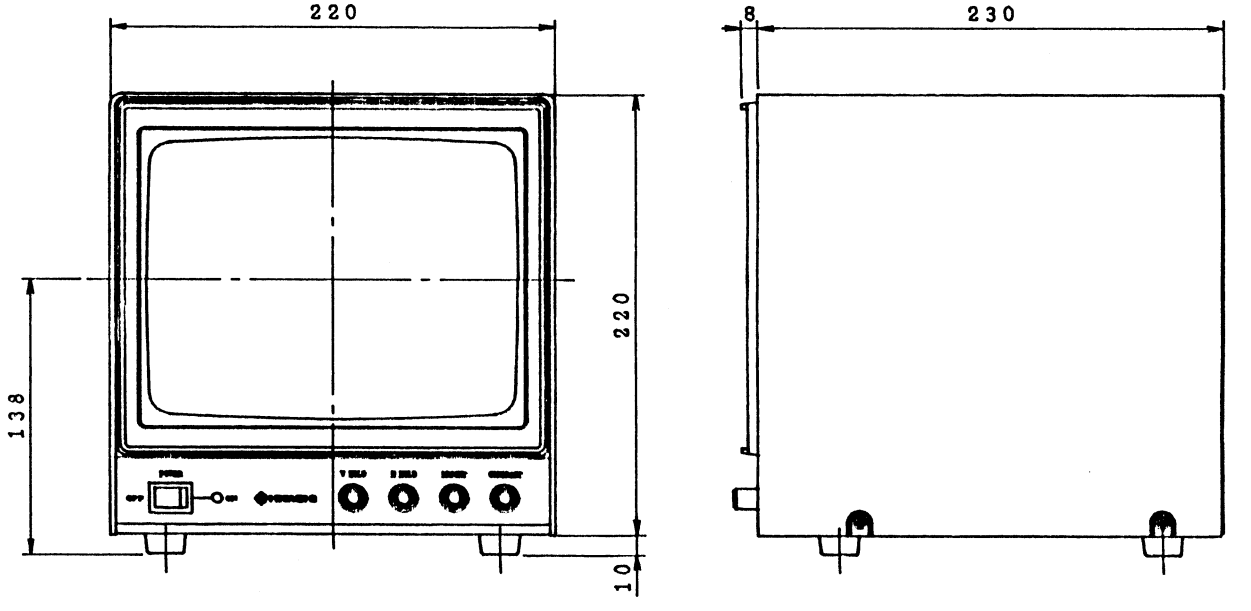
2) New parts codes

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)

sent to
H D A
HDLC
HDUK
HDEG
直販
検査
控

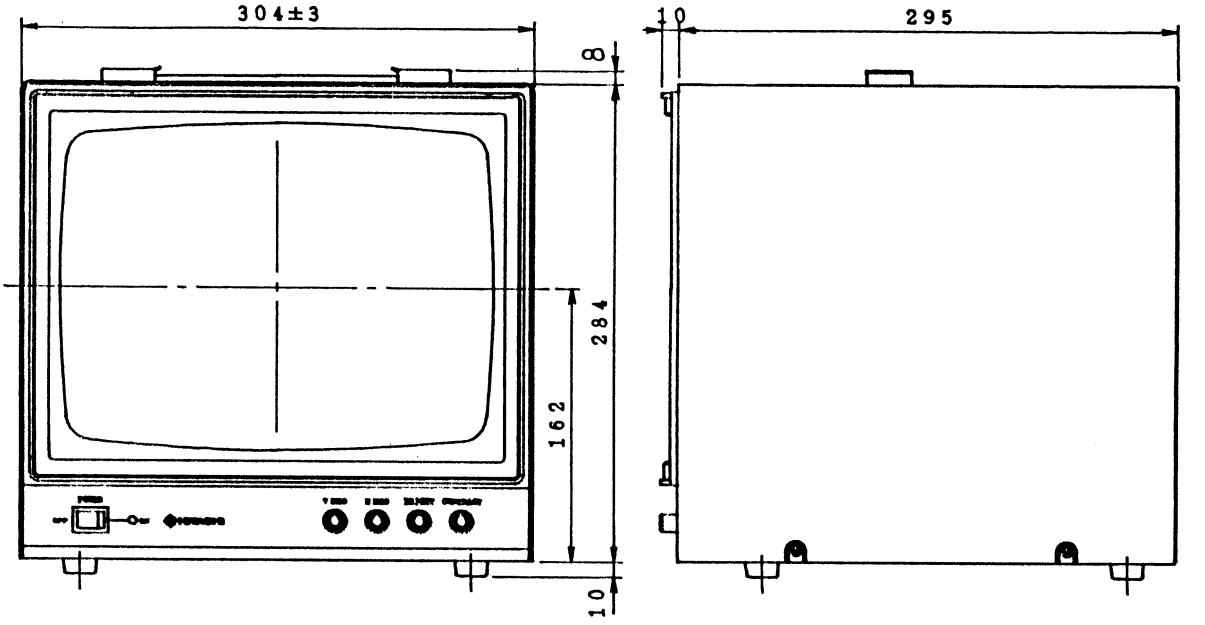


Before change

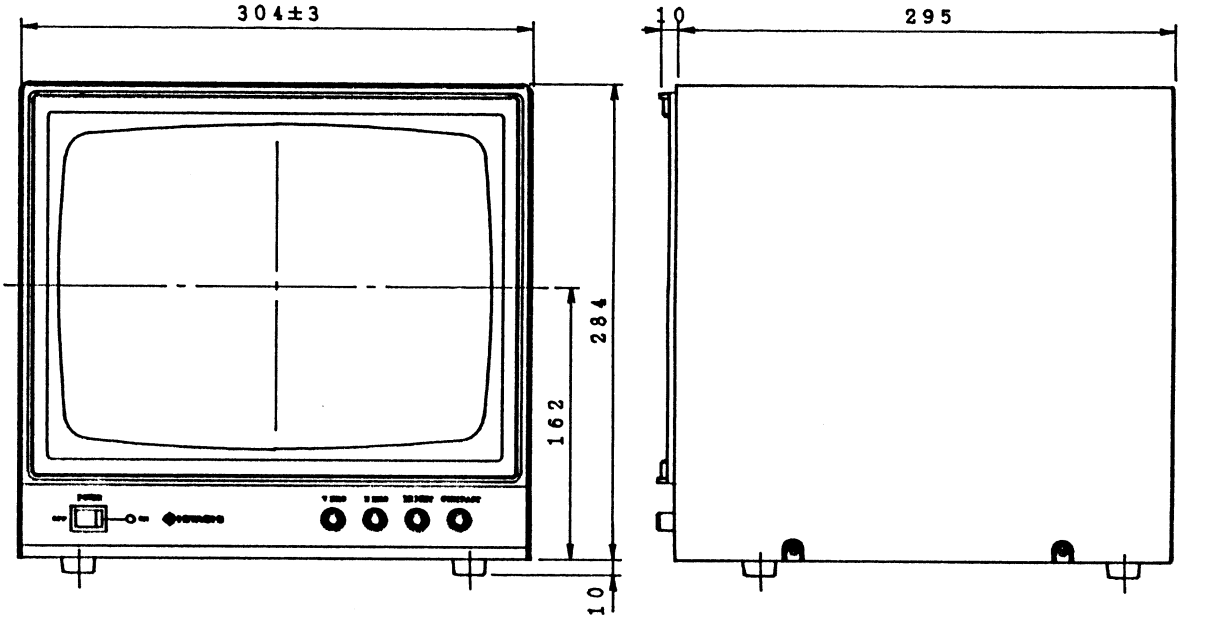


After change

Note:Similar to VM-921 series



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 peoduced.

2-1 Content of part change

(1) Common: T752, C757

Symbol	Part name	Before chagne	After change
		Spec. (Part code)	Spec. (Part code)
T752	FBT	TC-0530 (TTT0364) GND terminal ⑥ pin	TC-0562 (TTT0419) GND terminal ⓪ pin
C757	C,film	630V 0.022μF ±5% (CQD0051)	630V 0.056μF ±5% (CQD0062)

(2) Not common: C758

① VM-920/VM-921

C758	C,film	630V 0.01μF ±10% (CQD0005)	630V 0.0068μF ±10% (CQD0008)

② VM-1220/VM-1221

C758	C,film	630V 0.0068μF ±10% (CQD0008)	630V 0.0022μF ±10% (CQD0023)

③ Customized models

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

C758	C,film	630V 0.01μF ±10% (CQD0005)	630V 0.0068μF ±10% (CQD0008)

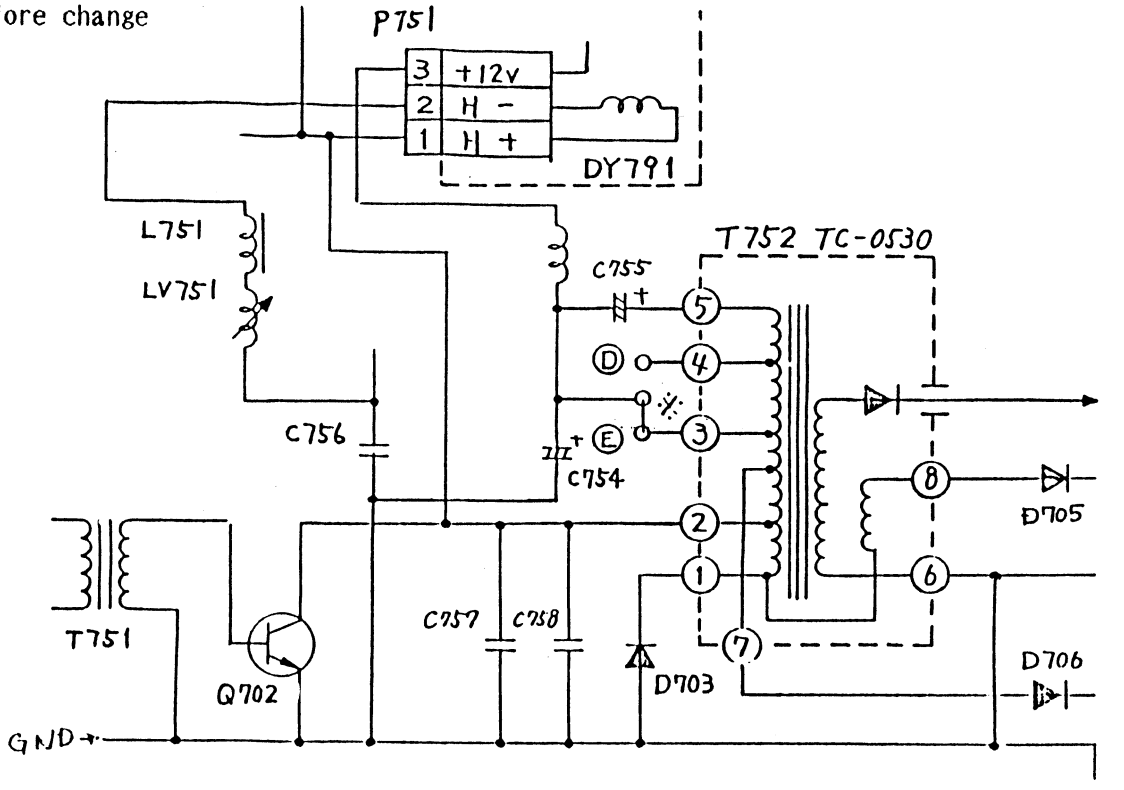
VM-1220-S8/VM-1220-S9 ····· Same as VM-1220

C758	C,film	630V 0.0068μF ±10% (CQD0008)	630V 0.0022μF ±10% (CQD0023)

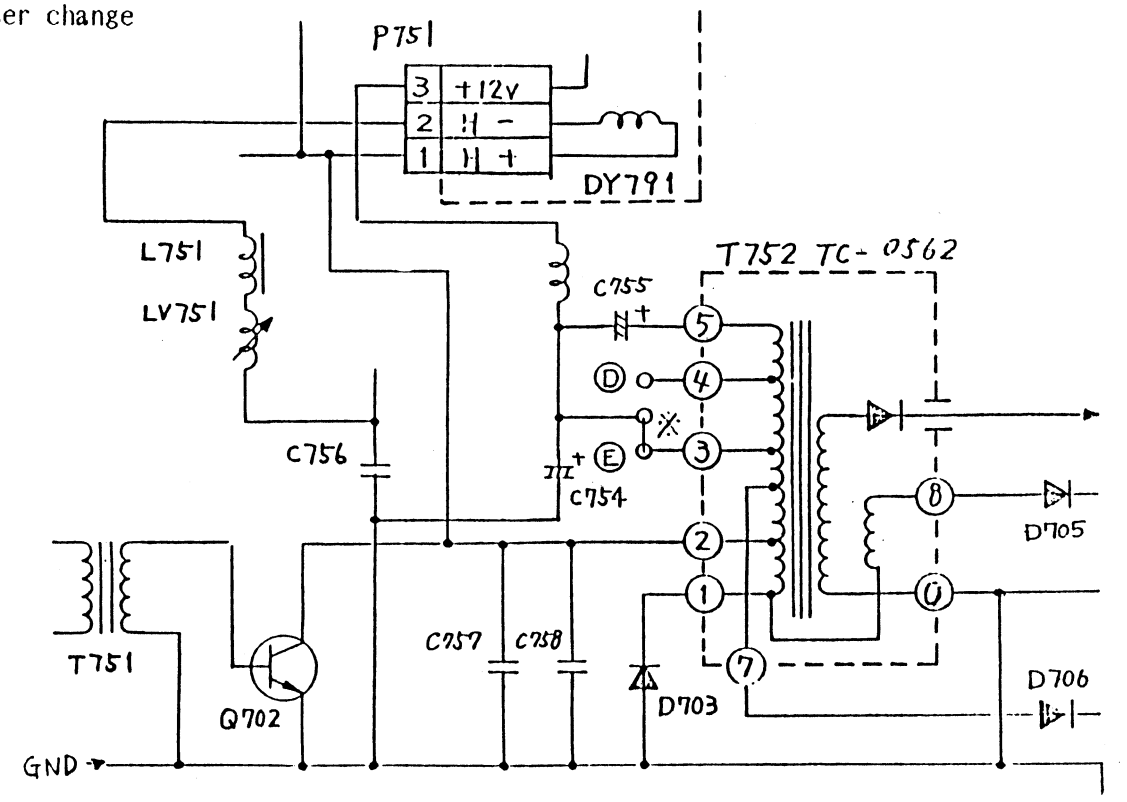
▒▒ indicates that this model is no longer being produced.

2-2 Schematic diagram

Before change



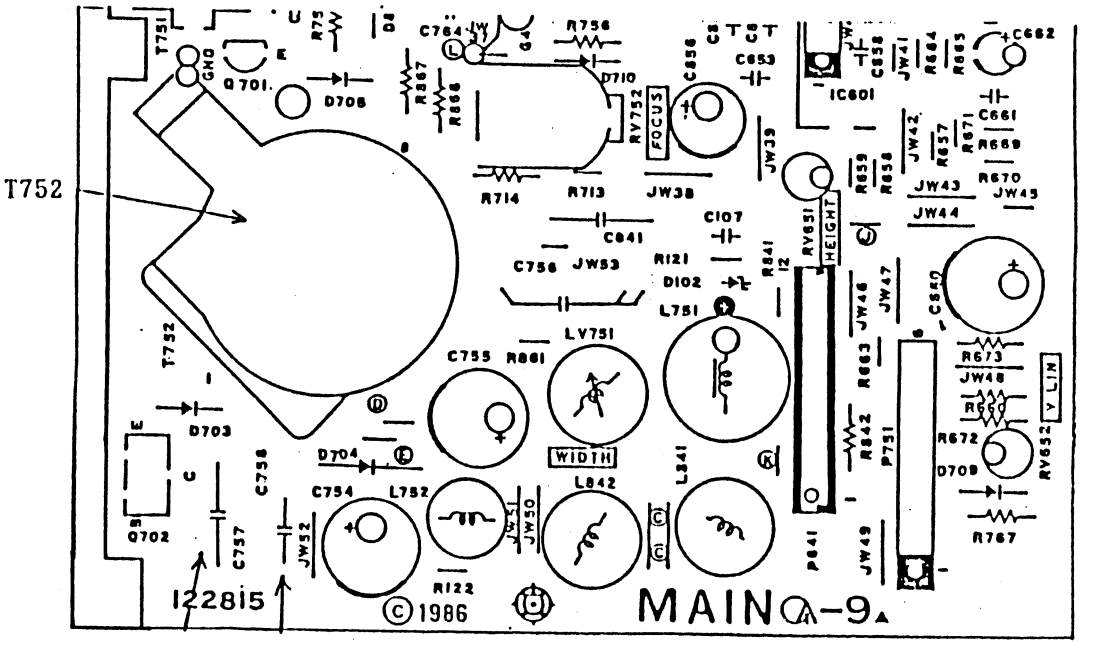
After change



* 9-inch video monitor: Jumper Ⓓ
12-inch video monitor: Jumper Ⓔ

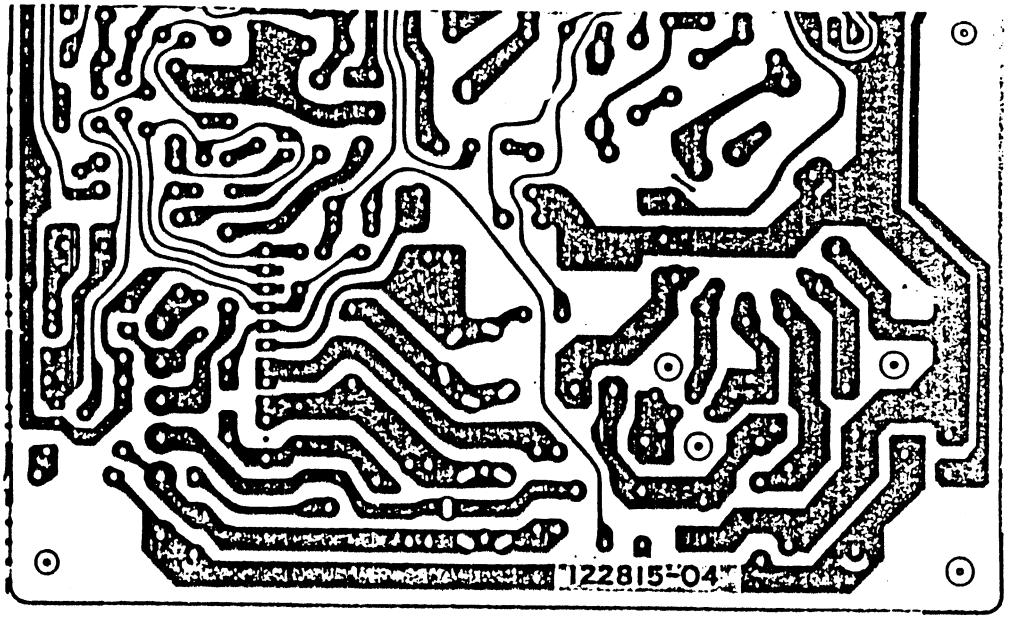
2-3 Components layout (PC board history: 122815-04 and after)

MAIN board A side



C757 C758

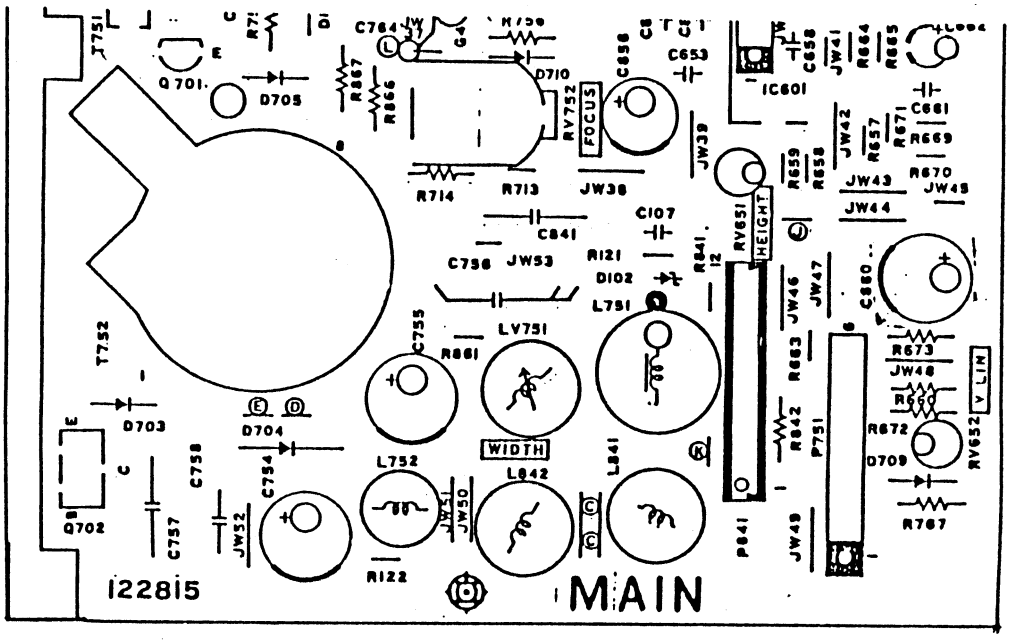
B side



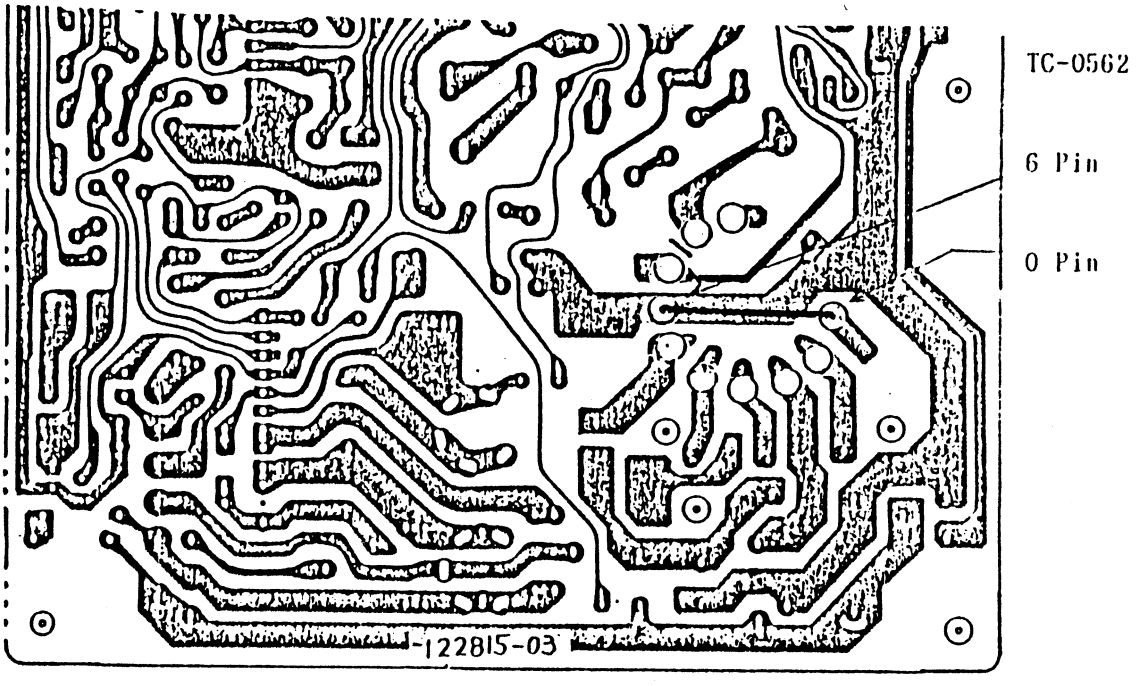
2-4 Components layout (PC board history: Until 122815-03)

Note) To install TC-0562, connect a jumper wire between pins ⑥ and ⓪ because the GND terminal is not connected.

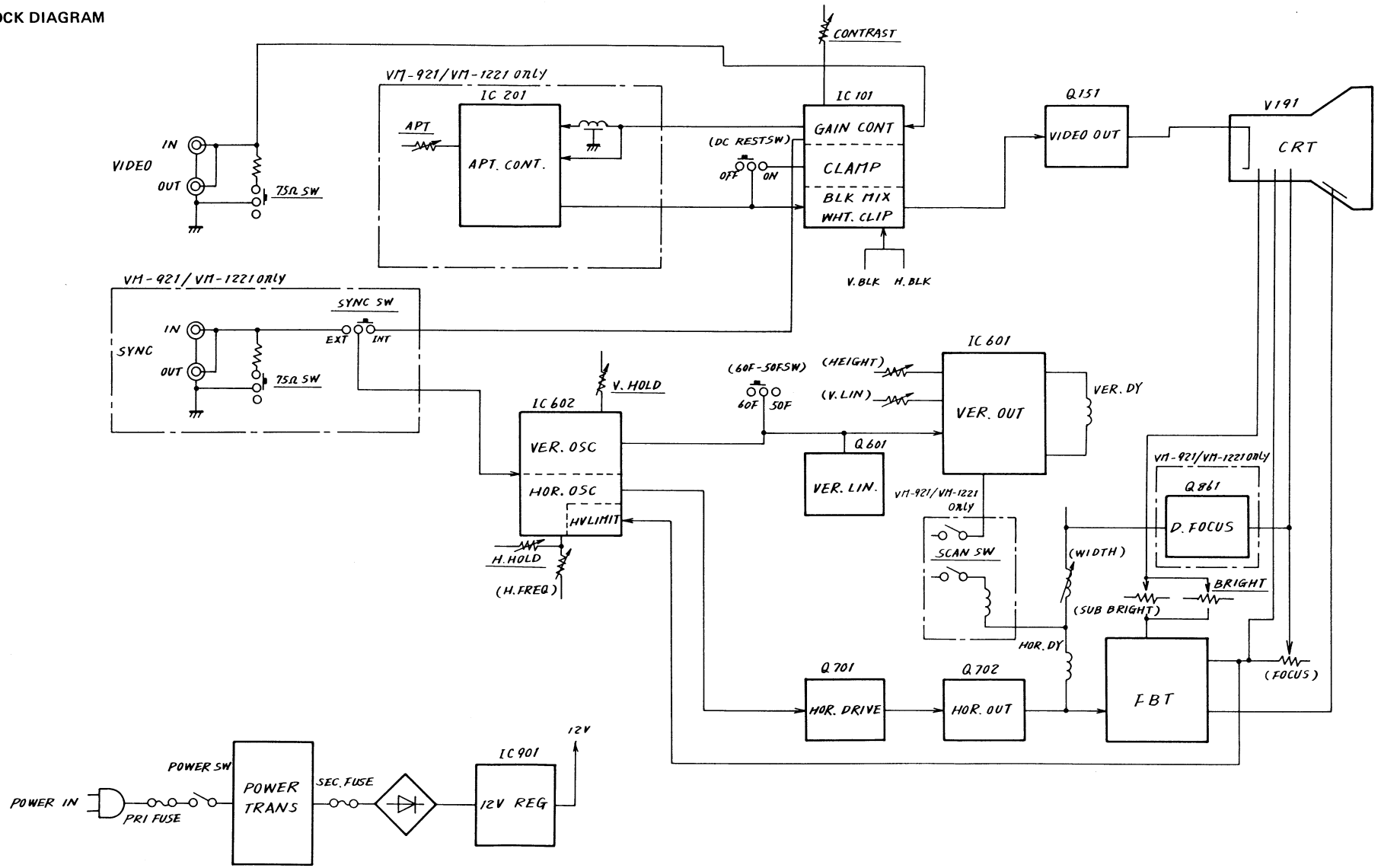
MAIN board A side



B side



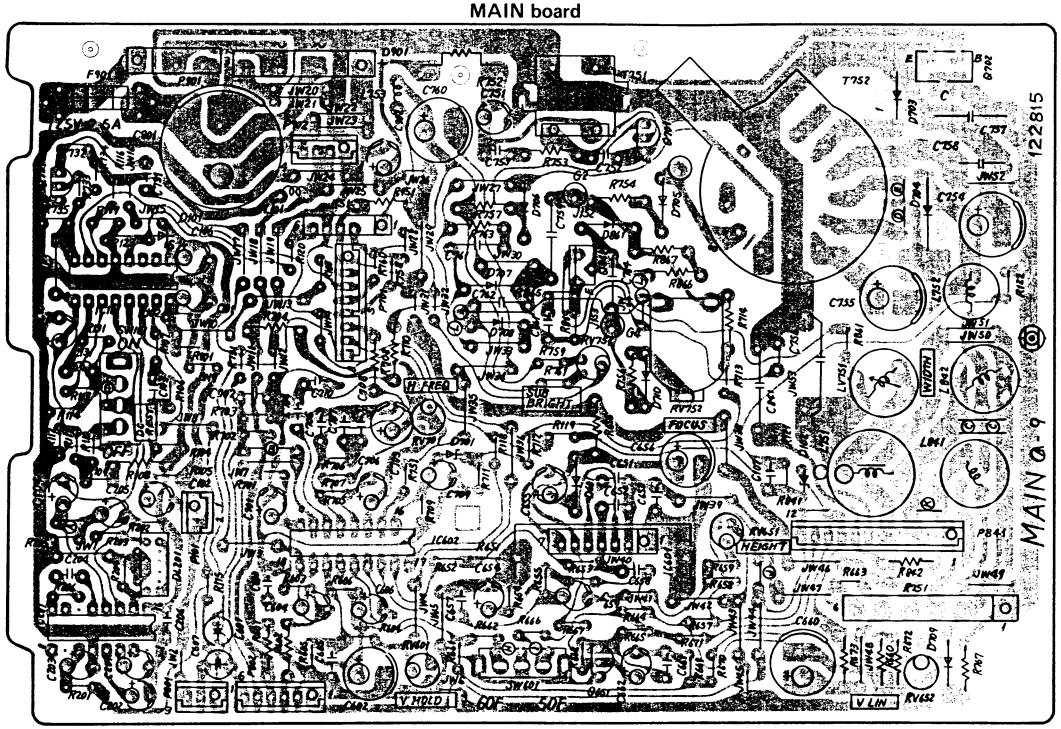
9. BLOCK DIAGRAM



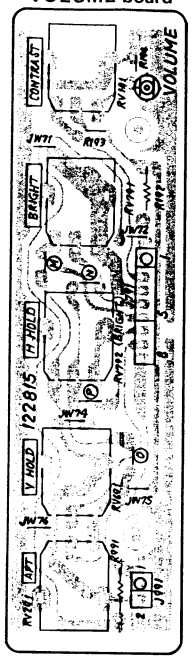
BLOCK DIAGRAM

8. ELECTRICAL PARTS ARRANGEMENT

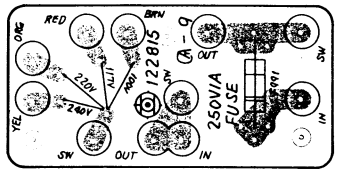
MAIN board



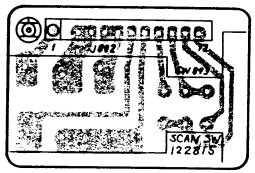
VOLUME board



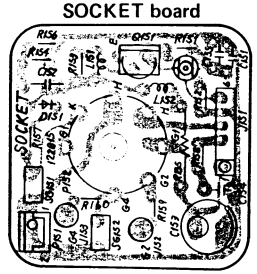
FUSE board



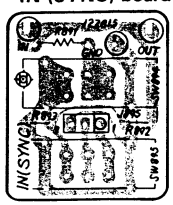
SCAN board



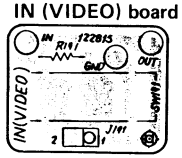
SOCKET board



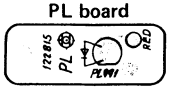
IN (SYNC) board



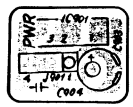
IN (VIDEO) board

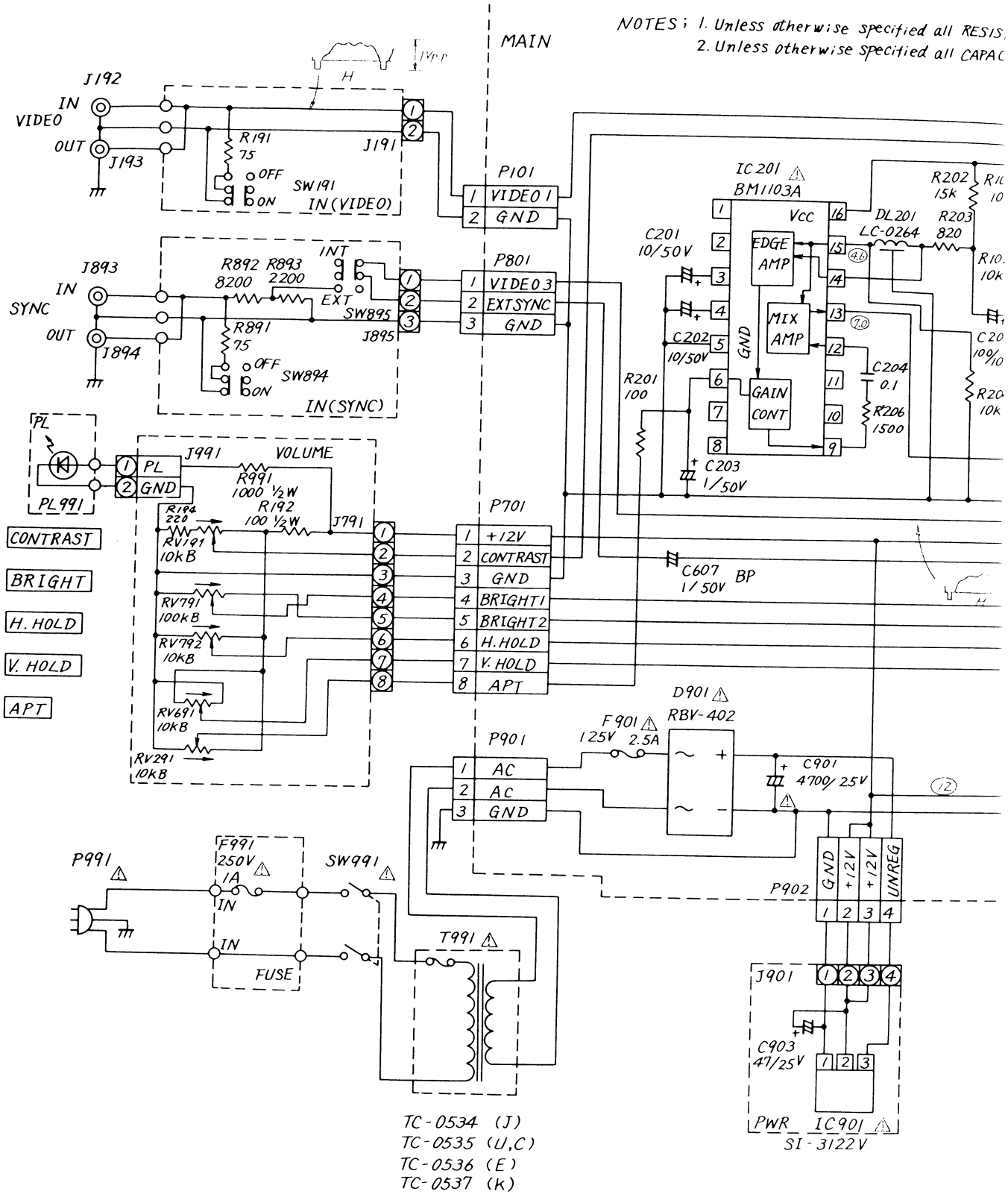


PL board



PWR board

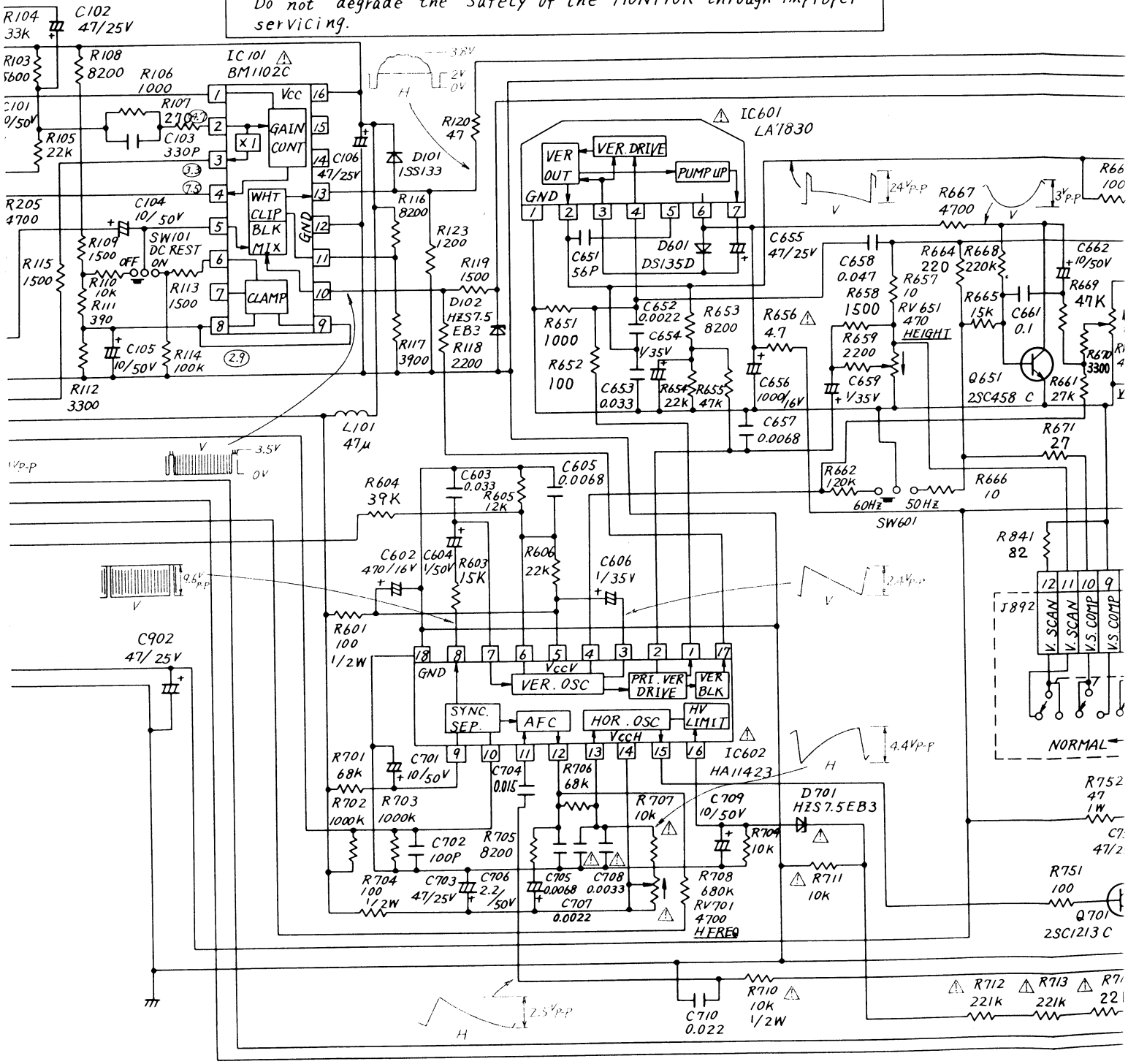


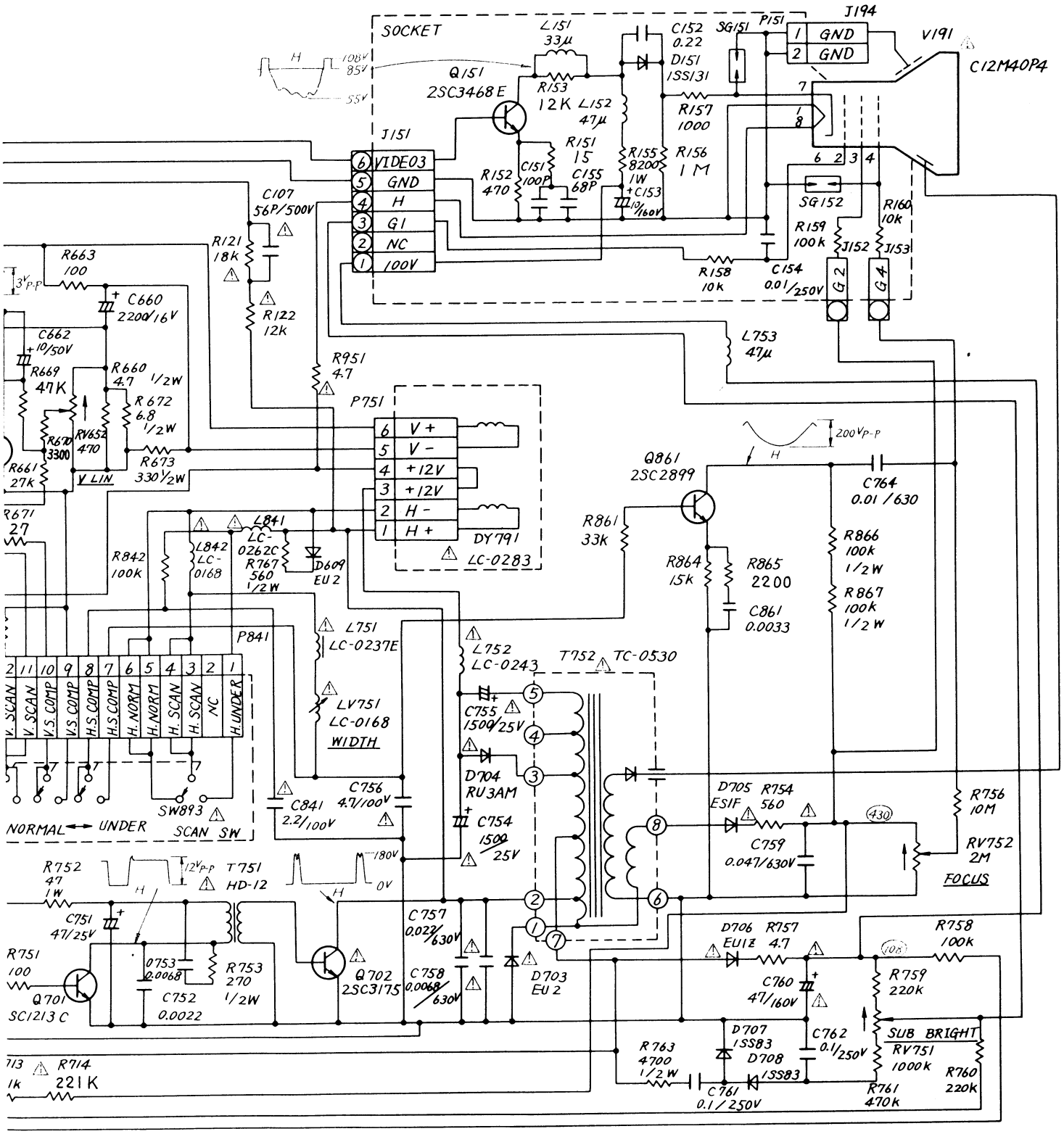

NOTES ; 1. Unless otherwise specified all RESIS
2. Unless otherwise specified all CAPAC
MAIN
J192
IN
VIDEO
OUT
J193
R191
75
OFF
ON
SW191
IN(VIDEO)
J191
P101
1 VIDEO 1
2 GND
J893
IN
SYNC
OUT
J894
R892 8200
R893 2200
INT
EXT
SW895
R891
75
OFF
ON
SW894
IN(SYNC)
J895
P801
1 VIDEO 3
2 EXTSYNC
3 GND
IC 201
BM1103A
Vcc
EDGE AMP
MIX AMP
GAIN CONT
GND
C201 10/50V
C202 10/50V
C203 1/50V
C204 0.1
R201 100
R202 15k
R203 820
R206 1500
DL201 LC-0264
PL
PL
GND
PL991
J991
VOLUME
R991 1000 1/2W
R192 100 1/2W
R194 220
RV191 10kB
RV791 100kB
RV792 10kB
RV691 10kB
RV291 10kB
CONTRAST
BRIGHT
H. HOLD
V. HOLD
APT
J791
P701
1 +12V
2 CONTRAST
3 GND
4 BRIGHT1
5 BRIGHT2
6 H. HOLD
7 V. HOLD
8 APT
C607 1/50V BP
D901
RBV-402
F901 125V 2.5A
P901
1 AC
2 AC
3 GND
C901 4700/25V
P991
F991 250V 1A
SW991
IN
IN
FUSE
T991
P902
GND
+12V
+12V
UNREG
J901
C903 47/25V
PWR IC901
SI-3122V
TC-0534 (J)
TC-0535 (U,C)
TC-0536 (E)
TC-0537 (K)

ve in OHMS, 1/4 WATT.
are in μF, 50V.

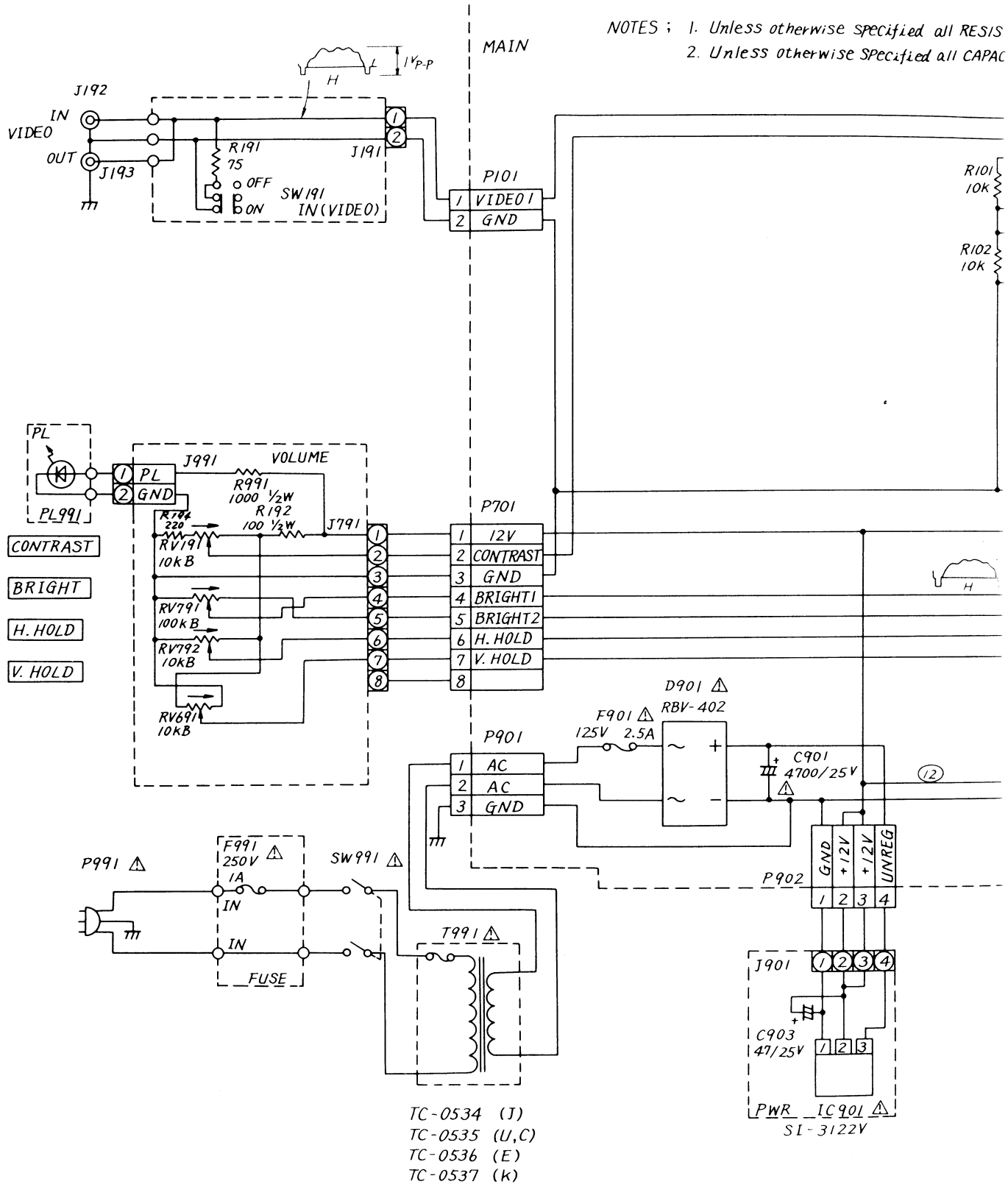
PRODUCT SAFETY NOTICE

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.





VM-1221 SCHEMATIC DIAGRAM


NOTES ; 1. Unless otherwise specified all RESIS
2. Unless otherwise specified all CAPAC
MAIN
1Vp-p
H
J192
IN
VIDEO
OUT
J193
R191
75
OFF
ON
SW191
IN(VIDEO)
J191
P101
1 VIDEO1
2 GND
R101
10K
R102
10K
PL
PL991
J991
VOLUME
1 PL
2 GND
R991
1000 1/2W
R192
100 1/2W
R784
220
J791
RV191
10kB
RV791
100kB
RV792
10kB
RV691
10kB
CONTRAST
BRIGHT
H. HOLD
V. HOLD
P701
1 12V
2 CONTRAST
3 GND
4 BRIGHT1
5 BRIGHT2
6 H. HOLD
7 V. HOLD
8
D901 ⚠
RBV-402
F901 ⚠
125V 2.5A
P901
1 AC
2 AC
3 GND
C901
4700/25V
12
P991 ⚠
F991 ⚠
250V
1A
IN
IN
FUSE
SW991 ⚠
T991 ⚠
P902
GND
+12V
+12V
UNREG
1 2 3 4
J901
1 2 3 4
C903
47/25V
1 2 3
PWR IC901 ⚠
SI-3122V
TC-0534 (J)
TC-0535 (U,C)
TC-0536 (E)
TC-0537 (k)

S are in OHMS. ¼ WATT.
RS are in μF , 50V.

PRODUCT SAFETY NOTICE

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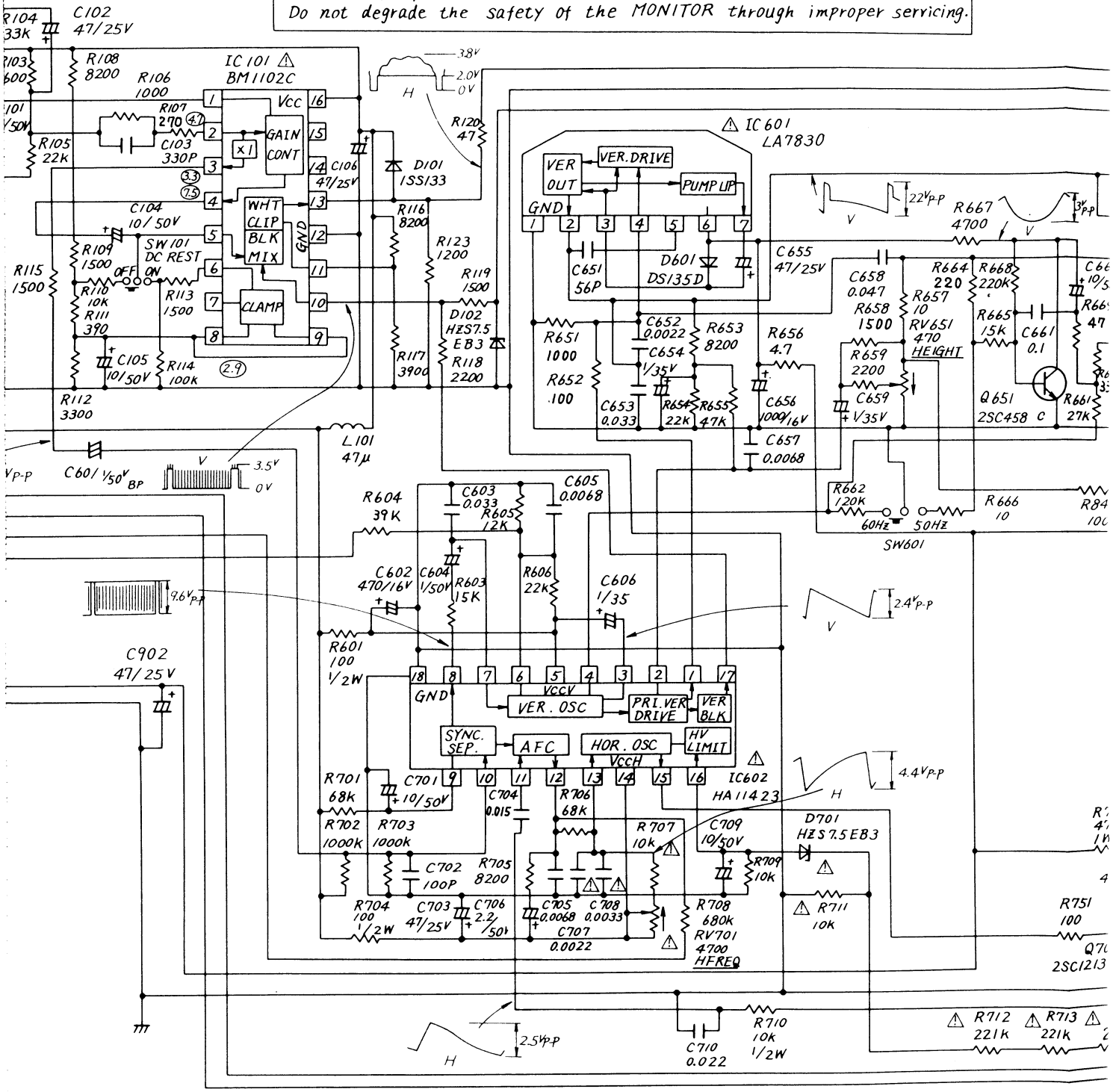
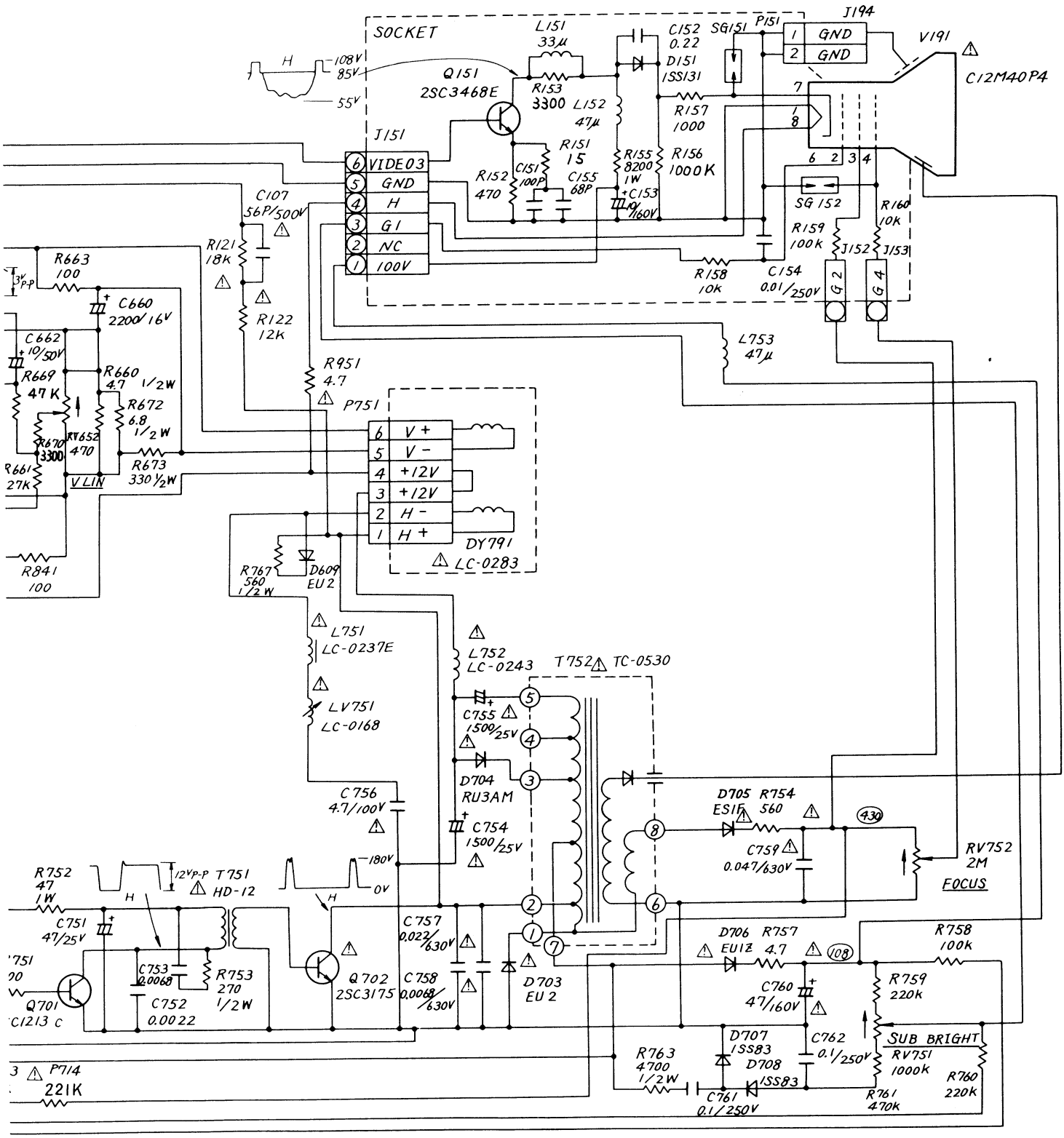
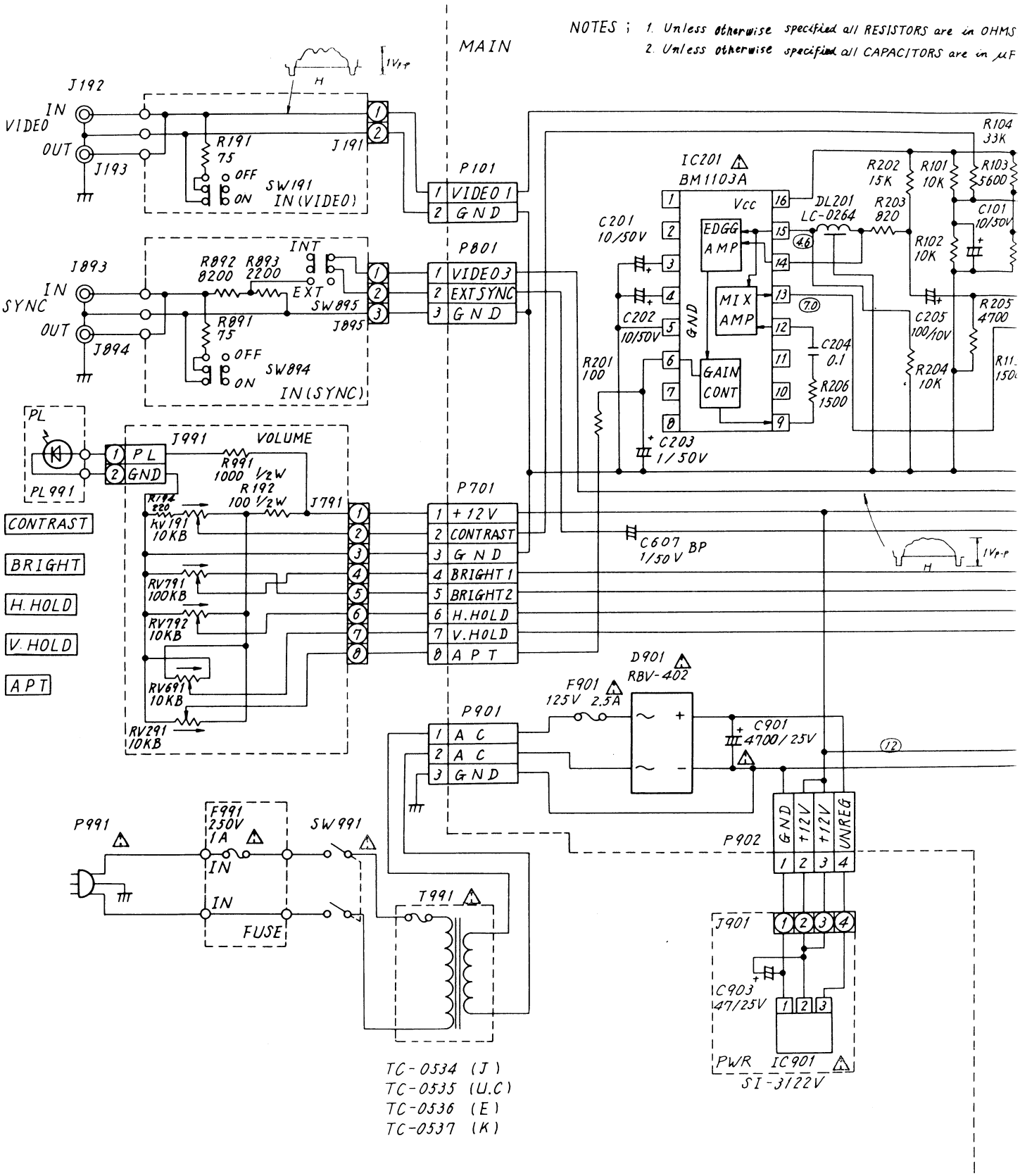




VM-1220 SCHEMATIC DIAGRAM


NOTES ; 1. Unless otherwise specified all RESISTORS are in OHMS
2. Unless otherwise specified all CAPACITORS are in μF
MAIN
J192
IN VIDEO
OUT
J193
R191 75
OFF ON SW191 IN(VIDEO)
J191
P101
1 VIDEO 1
2 GND
J893
IN SYNC
OUT
J894
R892 8200
R893 2200
INT
EXT
SW895
J895
R891 75
OFF ON SW894
IN(SYNC)
P801
1 VIDEO 3
2 EXTSYNC
3 GND
PL
PL991
J991
VOLUME
1 PL
2 GND
R991 1000 1/2W
R192 100 1/2W
R192 220
RV191 10KB
RV791 100KB
RV792 10KB
RV691 10KB
RV291 10KB
CONTRAST
BRIGHT
H.HOLD
V.HOLD
APT
J791
P701
1 +12V
2 CONTRAST
3 GND
4 BRIGHT1
5 BRIGHT2
6 H.HOLD
7 V.HOLD
8 APT
IC201
BM1103A
Vcc
EDGG AMP
MIX AMP
GAIN CONT
GND
C201 10/50V
C202 10/50V
C203 1/50V
R201 100
C204 0.1
R206 1500
DL201 LC-0264
R202 15K
R203 820
R101 10K
R102 10K
R103 5600
R104 33K
C101 10/50V
C205 100/10V
R205 4700
R204 10K
C607 BP 1/50V
H
1Vp-p
D901
RBV-402
F901 125V 2.5A
P901
1 AC
2 AC
3 GND
C901 4700/25V
P902
GND
+12V
+12V
UNREG
J901
C903 47/25V
PWR IC901
SI-3122V
P991
F991 250V 1A
IN
IN
FUSE
SW991
T991
TC-0534 (J)
TC-0535 (U.C)
TC-0536 (E)
TC-0537 (K)

MS, 1/4 WATT.
uF, 50V.

PRODUCT SAFETY NOTICE

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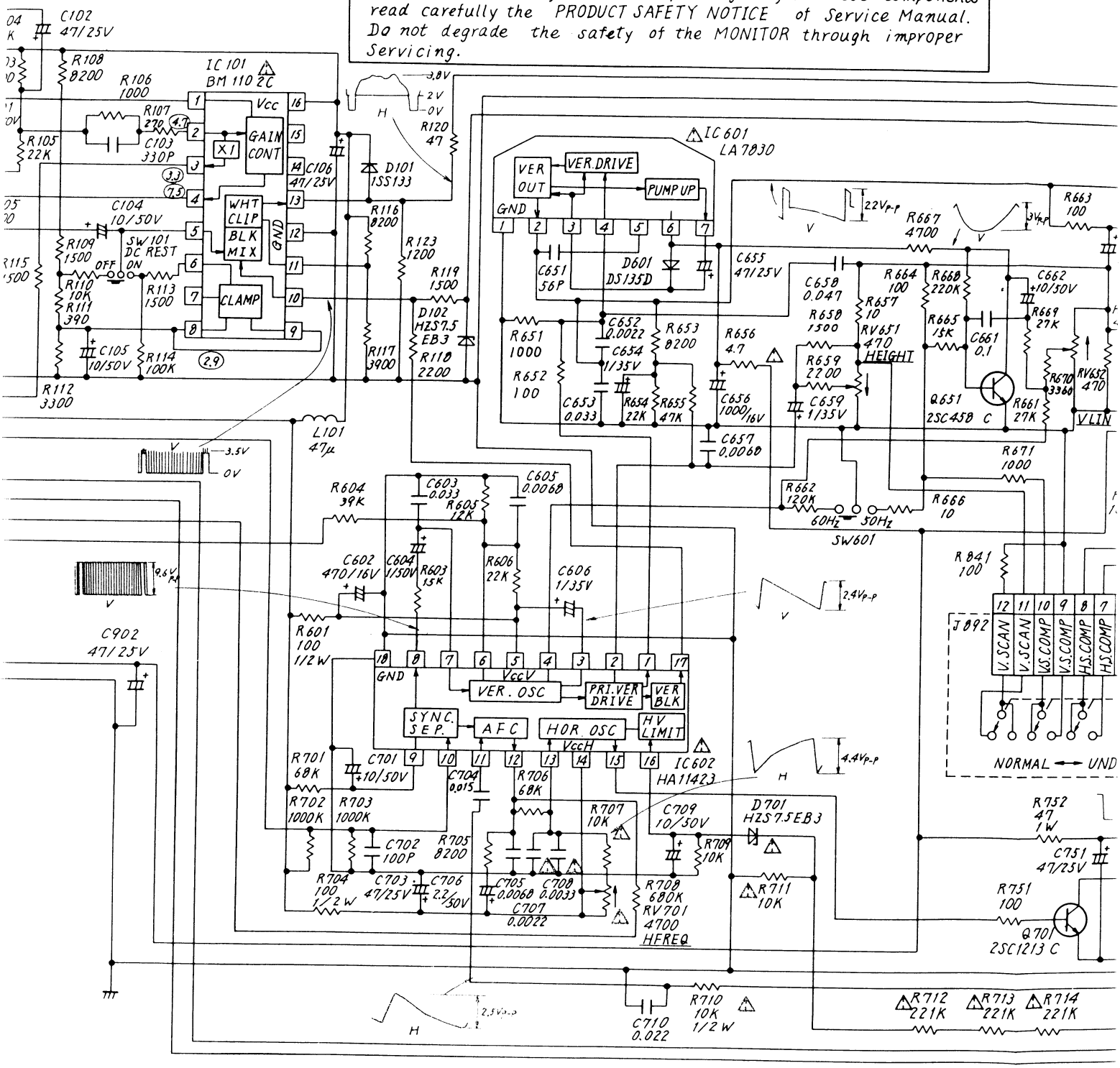
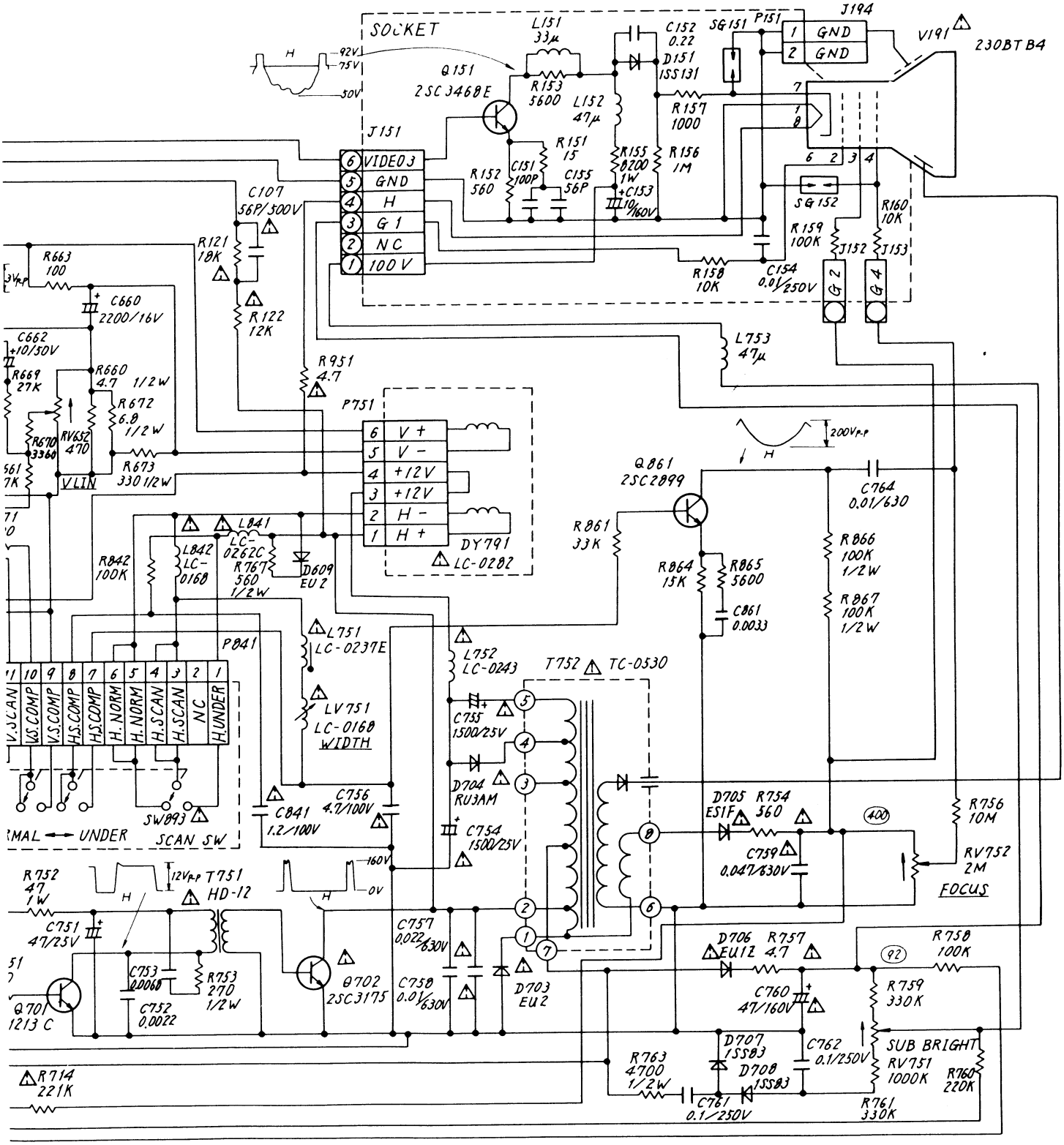
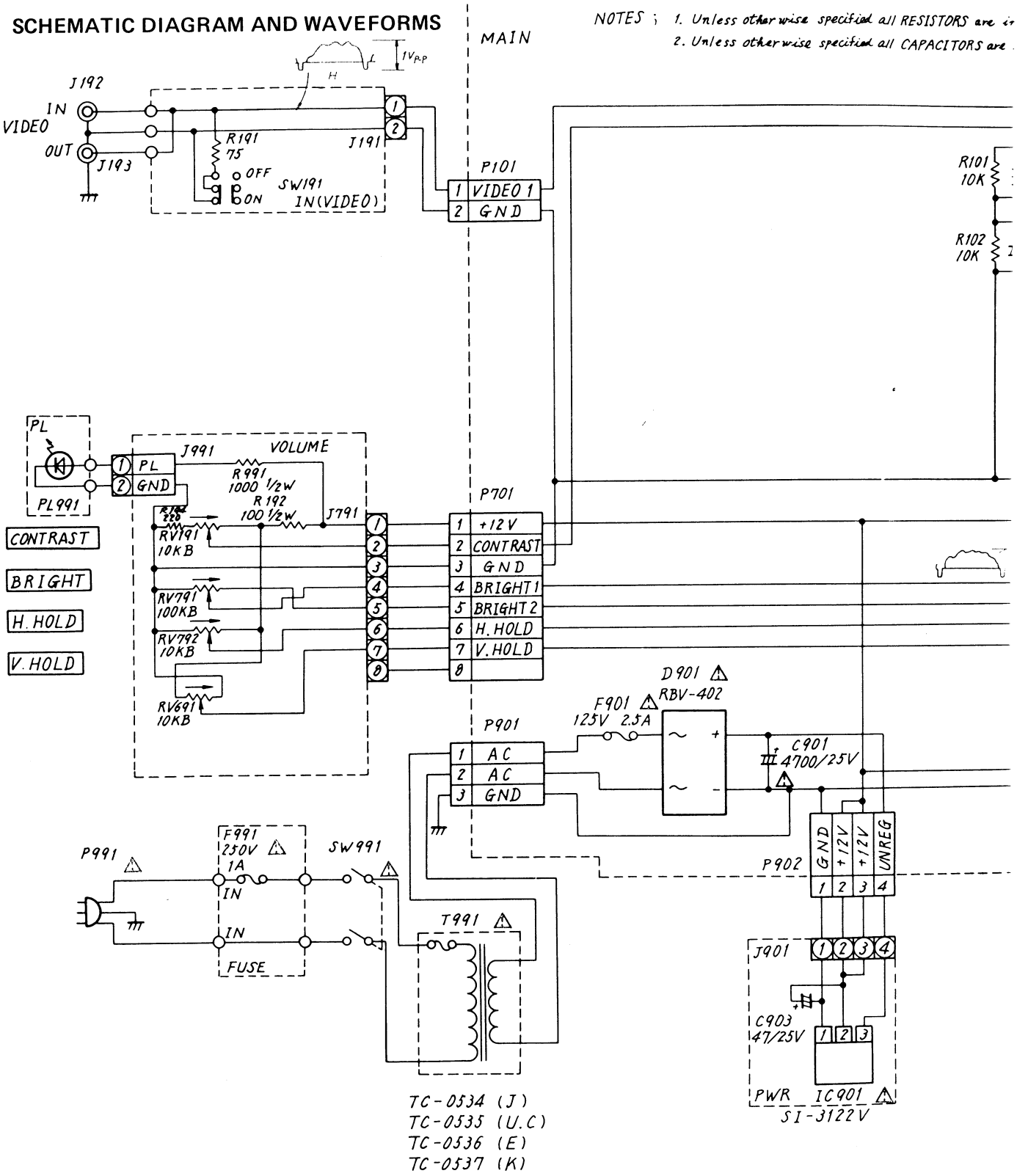




VM-921 SCHEMATIC DIAGRAM

10. SCHEMATIC DIAGRAM AND WAVEFORMS



OHMS, 1/4 WATT.
μF, 50V.

PRODUCT SAFETY NOTICE

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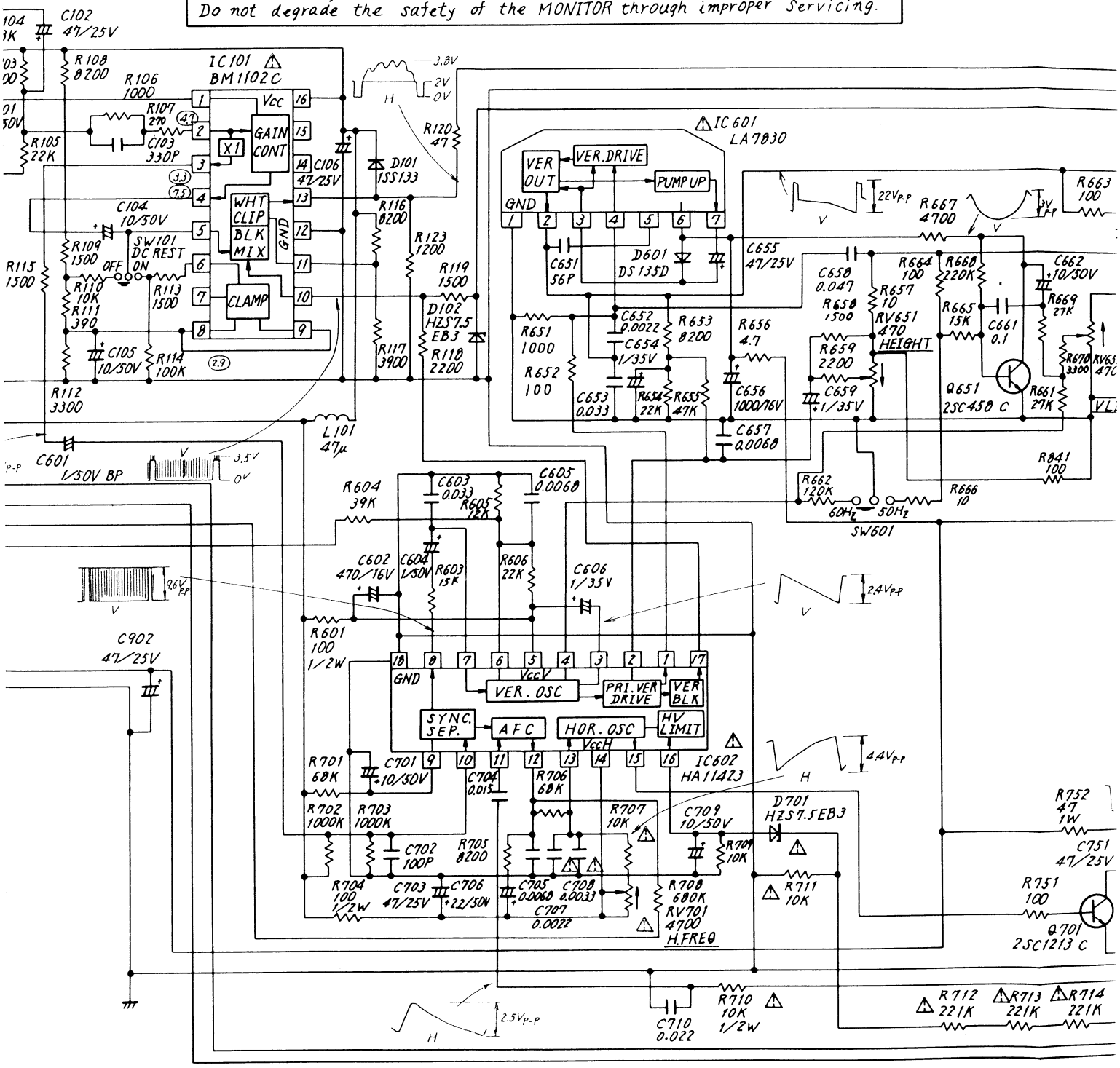
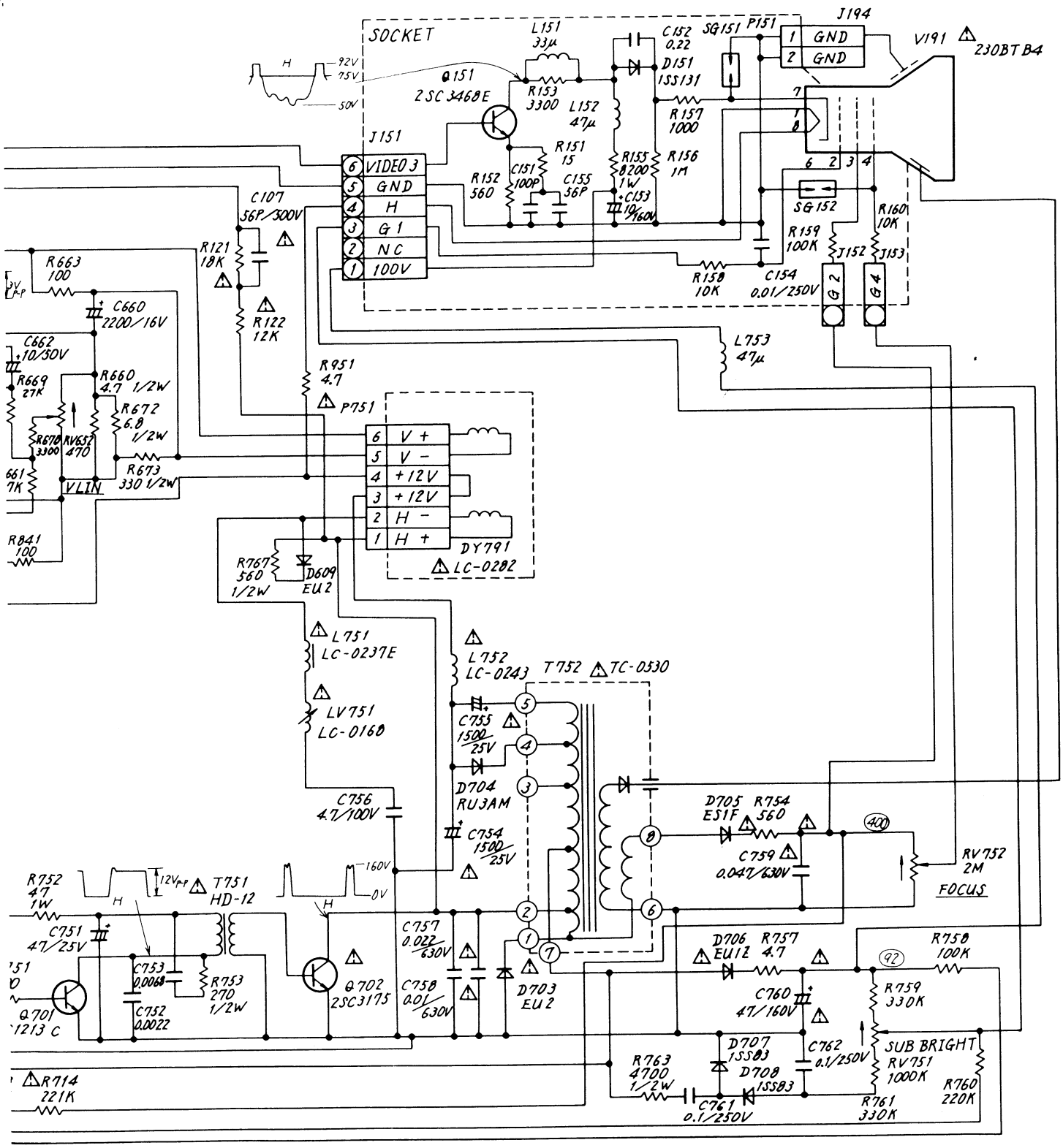


10.

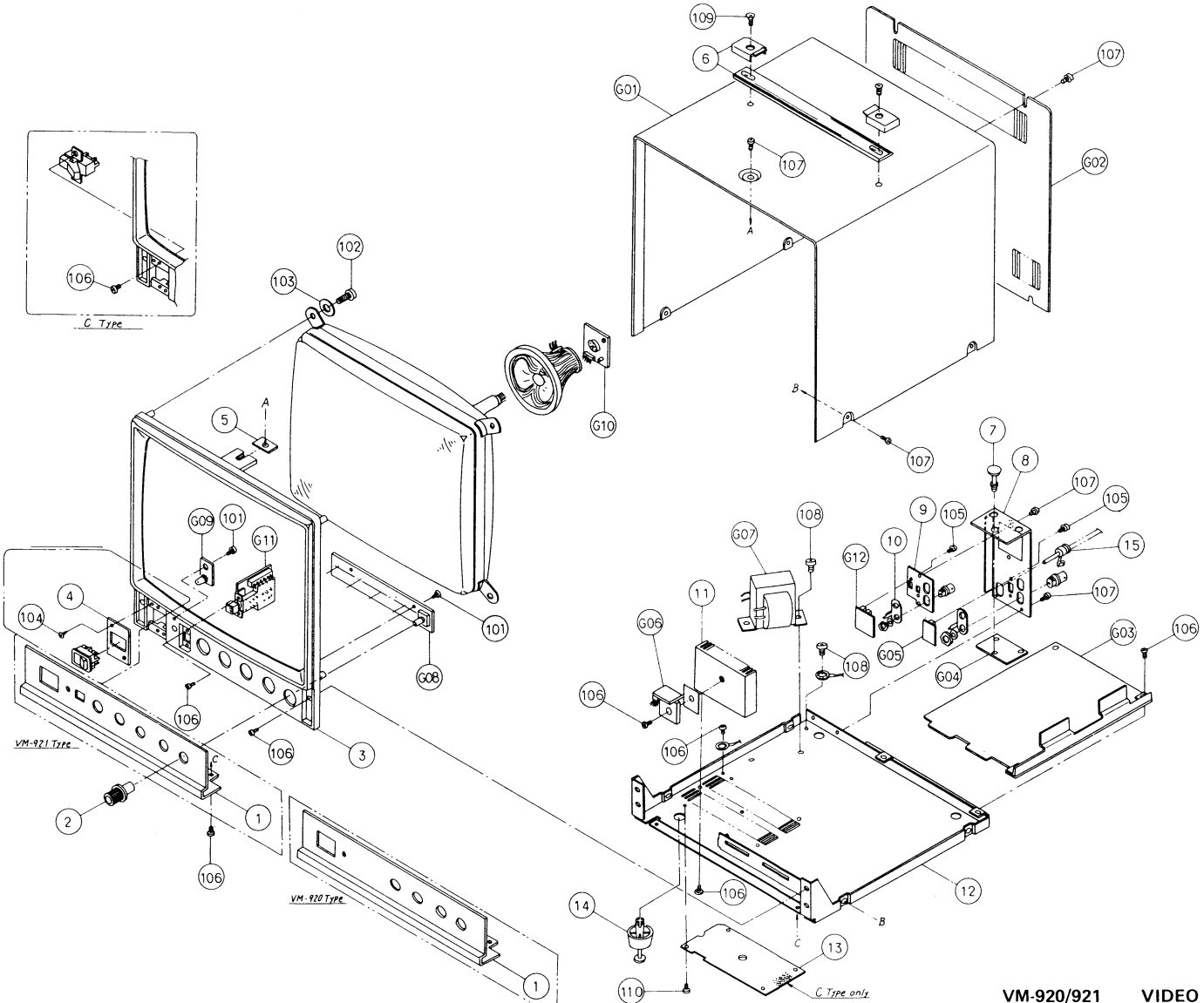


VM-920 SCHEMATIC DIAGRAM

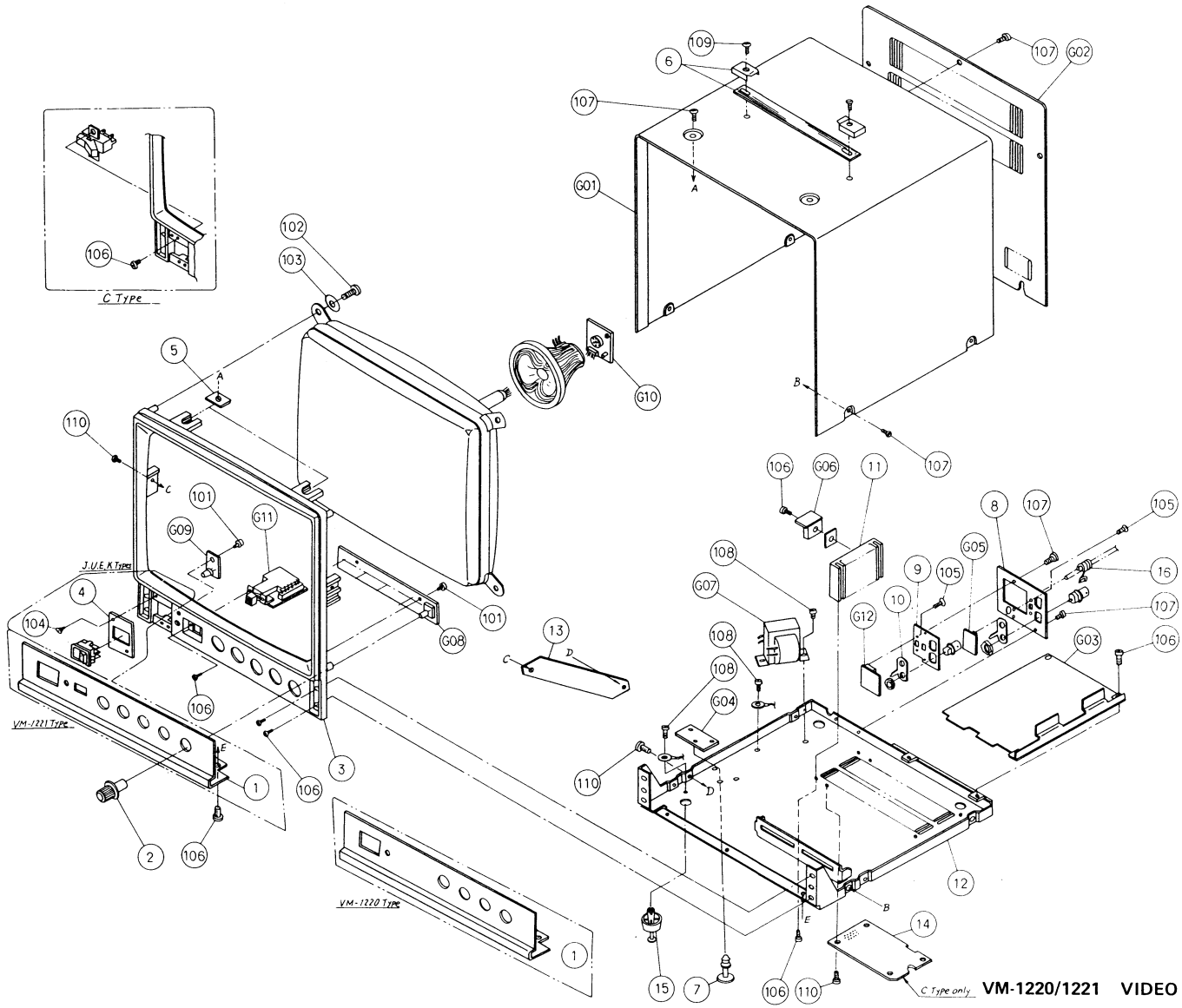
VM-1220/1221

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	
8441088E	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
8447887E	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 2pces 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-920/921 VIDEO MONITOR



VM-1220/1221 VIDEO MONITOR