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MODEL VM-906

MODEL VM-910

MODEL VM-129

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 protec-

tion afforded by them necessarily be obtained by using replacement components rated for higher voltage, etc.

Electrical components having such features are identified by an exclamation point within an equilateral triangle (\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 over-heating.
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 defective, 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 grounding 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.

CAUTION: HIGH VACUUM PICTURE TUBE

IS DANGEROUS TO HANDLE REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL.

EMPLOYS X RADIATION AND INTEGRAL IMPLOSION PROTECTION REPLACE WITH A TUBE OF THE SAME TYPE NO. AND SUFFIX FOR CONTINUED SAFETY.

X RADIATION WARNING

REPLACEMENT OF CRITICAL COMPONENTS OF THIS APPARATUS (PICTURE TUBE AND OTHERS) CAN RESULT IN EXCESSIVE X RADIATION, THESE COMPONENTS ARE MARKED IN THE SERVICE MANUAL BY A \triangle SIGN.

- REPLACE ONLY WITH CONFORM TYPES
- SEE SERVICE MANUAL FOR HIGH VOLTAGE ADJUSTMENT INSTRUCTIONS.

CAUTION: TO DETERMINE THE PRESENCE OF HIGH VOLTAGE, KINE HIGH VOLTAGE MUST BE DISCHARGED TO CHASIS.

FUSE REPLACEMENT

For continued protection against fire hazard.

- Replace with the same type of fuse.
- Refer replacement to qualified service personnel.

NOTE FOR USERS IN THE UNITED KINGDOM:

IMPORTANT:

The wires of the mains lead are coloured in accordance with the following code:

- Green and Yellow: EARTH
- Blue: NEUTRAL
- Brown: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \equiv or coloured green and yellow.
- The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured black.
- The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured red.

WARNING: The apparatus must be earthed.

NOTICE

This Service Manual describes the most typical product of this model. If there are any specific differences between this Manual and the servicing unit, please contact Hitachi Denshi sales office in your area.

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MODEL VM-906/910/129

VIDEO MONITOR

Service Manual

I. GENERAL

The Hitachi VM-906, VM-910 and VM-129 are high performance 9 and 12-inch video monitors designed to provide an excellent quality picture display of video signals from a CCTV camera or other video signal sources. VM-906, VM-910 and VM-129 feature high reliability IC and transistor circuitry.


PRODUCT SAFETY NOTICE

(1) X-RAY RADIATION

The primary source of X-ray radiation in this monitor is the picture tube. The tube used in this 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, Hitachi approved one.

(2) PRODUCT SAFETY NOTE

Many electrical and mechanical parts in this monitor have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded necessarily rated for higher voltages, wattage, etc. Electrical components having such features are identified by marking with a  on the schematic diagram and parts list in this manual.

The use of a substitute replacement component which the Hitachi recommended replacement one, shown in the parts list in this manual, may create shock, fire, X-radiation, or other hazards.

2. SPECIFICATIONS

	VM-906	VM-910	VM-129
Format	U, C type ... EIA 525 lines, E/K type ... CCIR 625 lines		
Sync System	Internal (can be modified for external sync)		
Input Signal	1.0 Vp-p composite video; sync negative		
Input Impedance	75 Ω or high impedance bridge connection		
DC Restoration Circuit	Switch selectable (no user serviceable)	Not included	Switch selectable (no user serviceable)
Effective Picture Size	182mm (7.17") x 136mm (5.35")		250 mm (9.84") x 188 mm (7.4")
CRT	9-inch, 90° deflection, 230 BRB4 or equivalent		310 FRB4 or equivalent
Power Requirement	U, C type ... 117V AC 60 Hz, E/K type ... 100/117/220/240V AC 50Hz		
	26W		30W
Ambient Temperature	-10 to +50°C (+14 to 122°F)		
Dimensions	219mm (W) x 219 (W) x 234 (D) mm (Approx. 8.62 x 8.62 x 9.21 in)		318 (W) x 284 (H) x 316 (D) mm (Approx. 12.5 x 11.2 x 12.4 in)
Weight	6.5 kg (14 lbs)	6 kg (12 lbs)	10 kg (22 lbs)
Electrical Performance Resolution	Horizontal: 700 lines Vertical: 350 lines	Horizontal: 500 lines Vertical: 300 lines	Horizontal: 700 lines Vertical: 350 lines
Video Gain	More than 35 dB: continuously		
Video Linearity	Within $\pm 5\%$ to 60 Vp-p output (APL 50 % staircase signal)		
Signal to Noise Ratio	Hum: better than 50 dB Synchronous: better than 40 dB		
Deflection Linearity	Within 1%	Within 2%	Within 2%
	(at center, with respect to picture height)		
Power Source Voltage	Abnormal operation shall not occur against +10% variation with respect to the rated AC input.		
Insulation Resistance	More than 10 M Ω (DC 500V) between AC input and chassis.		

* Design, specifications and performance are subject to change without notice due to improvement.

3. NAMES OF EACH SECTION

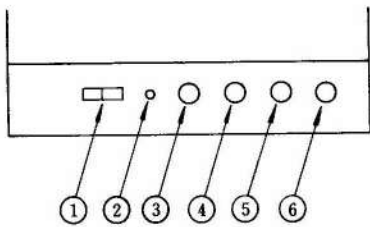


Fig. 1 Front Panel

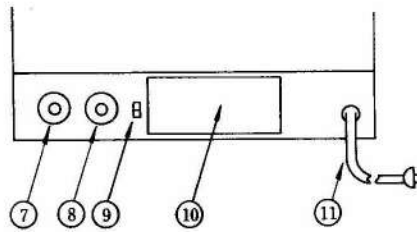


Fig. 2 Rear Panel
(VM-906/910)

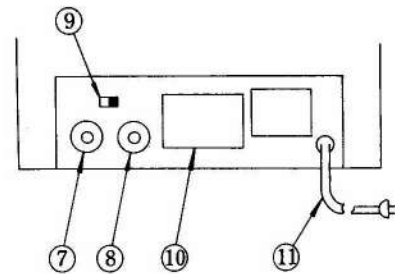


Fig. 3 Rear Panel
(VM-129)

- | | | |
|---|--------------------------|--|
| ① | POWER | Power supply ON/OFF switch. When set to ON, picture is obtained after a few seconds. |
| ② | Pilot Lamp (VM-906 only) | Lights when POWER switch is ON. |
| ③ | V. HOLD | Adjust control when picture rolls upwards or downwards. If picture rolls downwards, adjust control slowly until rolling stops.
At this position, since circuit free oscillator frequency and signal sync frequency are the same, set V. HOLD control to just slightly clockwise of this position. |
| ④ | H. HOLD | Adjust control when picture sync rolls toward left or right, or to slightly change the picture position toward the left or right. Normally, picture remains synchronized within full range of control. |
| ⑤ | BRIGHT | Control for adjusting picture brightness. |
| ⑥ | CONTR(CONT) | Control for adjusting picture contrast. |
| ⑦ | VIDEO IN | Use coaxial cable to connect video input signal to this connector. |

- ⑧ VIDEO OUT Employ when using "bridge through" connection of the input signal to other equipment (see following).
- ⑨ 75Ω ON-OFF Termination switch for input video signal. When VIDEO OUT ⑧ connector is not being used for bridge through connection, set this switch to ON. If video input signal is bridged through to other equipment, set this switch to OFF and terminate signal at the final unit in the signal line at 75Ω (see equipment operating instructions). In cases when this monitor is the final unit, set switch to ON.
- ⑩ Blank Panel Use this space for modifying video monitor to external sync type.
- ⑪ Power Cord Connect to commercial AC power source.

4. ADJUSTMENT PROCEDURE

4.1 B/W MAIN-1 PCB

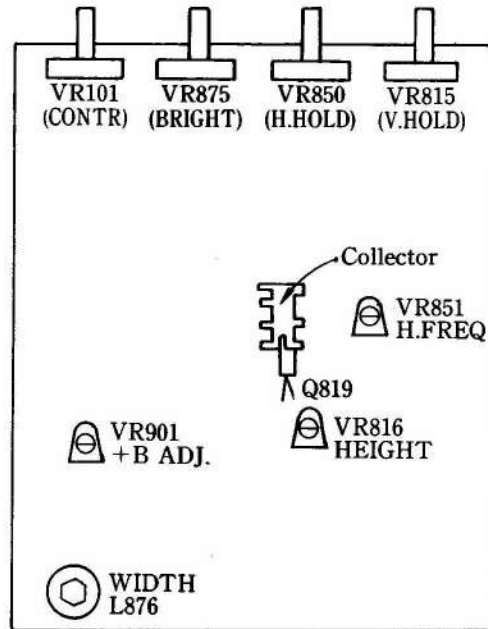


Fig. 4

1) +B Voltage (VR901)

Connect DC voltmeter between chassis (GND) and Q819 collector (heatsink) and with trimmer driver turn [+B ADJ] to adjust. This is normally adjusted for $12 \pm 0.5V$.

2) H. FREQ (VR851)

Adjust if picture rolls toward left or right. Set H FREQ (VR851) to position where picture does not roll with full range operation of H. HOLD control or when POWER switch is operated ON-OFF.

In this case, care must be taken for not touching a metal screwdriver to Q819 collector.

3) V. HOLD (VR815)

Turn control left and right. In center of range where upward or downward picture roll begins, set control to position where optimum interlace is obtained.

4) HEIGHT (VR816)

Adjusts vertical amplitude. Set to position where picture vertical amplitude completely fills CRT mask, but loss of raster does not occur. If vertical roll is obtained at this time, readjust V. HOLD (VR815).

5) WIDTH (L876)

Adjusts horizontal amplitude. Set to position where picture horizontal amplitude completely fills CRT mask, but loss of raster does not occur. Be sure to use a plastic hexagonal core driver for adjusting this coil. A metal tool (Allen wrench, etc.) can damage the core.

4.2 CRT-2 PCB

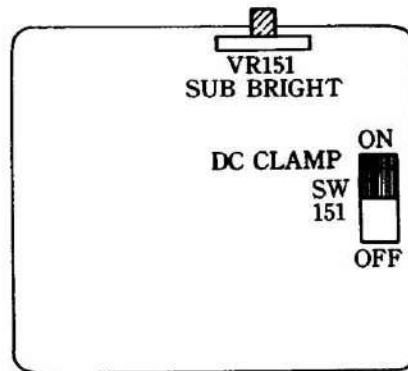


Fig. 5

1) SUB BRIGHT (VR151) (VM-906/129)

Adjust only when DC CLAMP switch (SW151) is ON. Set BRIGHT (VR875) control to maximum and CONTR (VR101) control to minimum, then adjust so that raster is slightly observable.

2) DC REST ON-OFF (SW151) (VM-906/129)

ON/OFF switch for DC restoration circuit. In standard sets, the switch has been preset as follows:

VM-906 U,C	OFF
VM-906 E/K	ON
VM-129 U,C	OFF
VM-129 E,K	ON

Since DC restoration circuit provides an effective function in cases when black level decline becomes a problem, employ according to application.

3) FOCUS(VR152) (VM-129)

Set BRIGHT and CONTR controls to normal operating positions, then adjust this control for best and uniform focus at center and edges of picture. Use adequate care when adjusting, since approx. 350V is present at this control.

4.3 CRT Section Adjustments

1) Picture Inclination

Deflection yoke can be turned by loosening clamp screw. When adjusting, press yoke toward CRT and observe vertical inclination condition near center of picture. Tighten deflection yoke clamp screw firmly after adjusting.

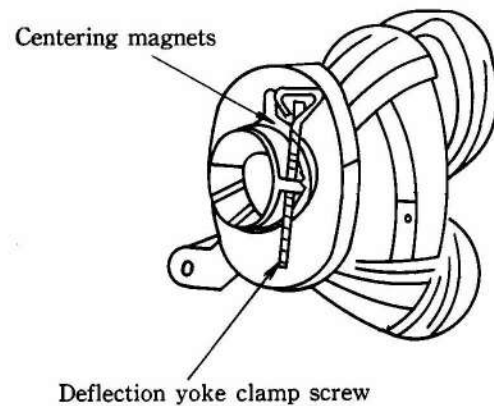


Fig. 6 Deflection yoke

2) Picture Position

Perform by mutually adjusting deflection yoke centering magnets (2 magnets). Magnetic field is strongest when both magnets are overlapped, at which position picture movement becomes greatest. Note that if picture position is changed excessively by using the centering magnets, deflection distortion and impaired linearity can occur. Some movement in horizontal direction can also occur when H. HOLD control is operated.

4.4 Adjustment Notes

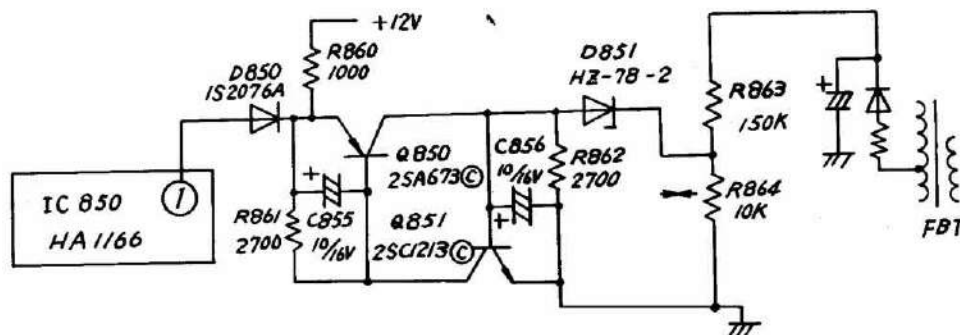


Fig. 7 X-ray prevention circuit

An X-ray prevention circuit is adopted in the horizontal deflection circuit. Note that in the following circumstances, horizontal oscillation stops and raster is not obtained.

- 1) Power supply voltage rises excessively above +12V.
- 2) H. Freq. is reduced sharply.
- 3) Breakdown of resonating capacitors C867 & C868.

In even oscillation stops, set POWER switch to OFF and inspect for above 3 items.

To re-establish oscillation:

- 1) Return above 3 items to normal operating mode.
- 2) Set POWER switch to OFF and wait several seconds before setting it to ON.

5. MODIFICATION PROCEDURE

Modification for External Sync Operation

1) Circuit diagram modification

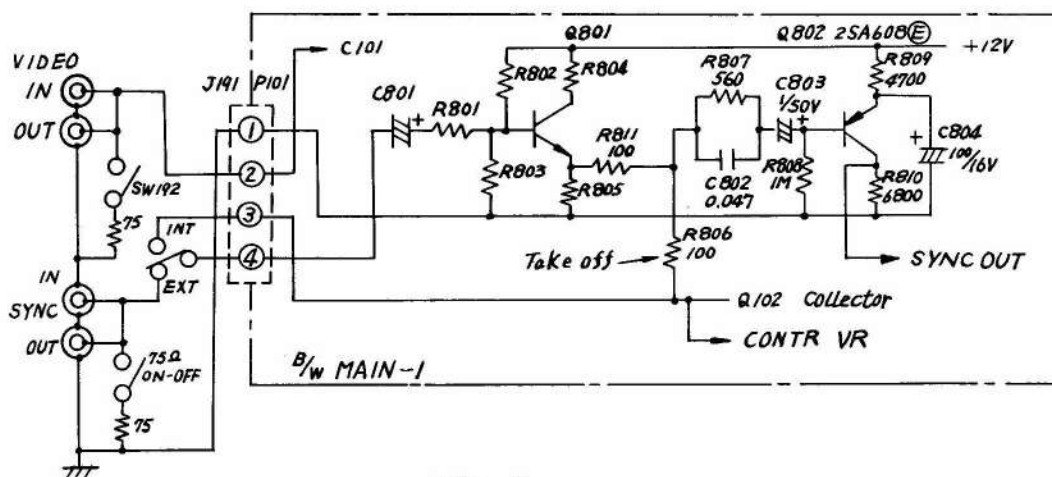


Fig. 8

2) Parts list

Symbol	Description	Qty	Part Code
	UHF type connector, S-I 9321	2	J45132020
	Slide switch, SS(F) 12-07	2	J32000045
	Carbon resistor R1/4W 75Ω ±5%	1	H51623750
	Terminal 29002#2	2	K17910021
Q 801	Transistor 2SC458 C	1	H23300017
R 801	Carbon resistor 1/4W 10kΩ ±5%	1	H51523103
802	" " " "	1	H51523103
803	" " " "	1	H51523103
804	" " " 100Ω	1	H51523101
805	" " " 2000Ω	1	H51523272
811	" " " 100Ω	1	H51523101
C 801	Elyc capacitor 33μF 16WV +50% -10%	1	H71131330

3) Assembly wiring

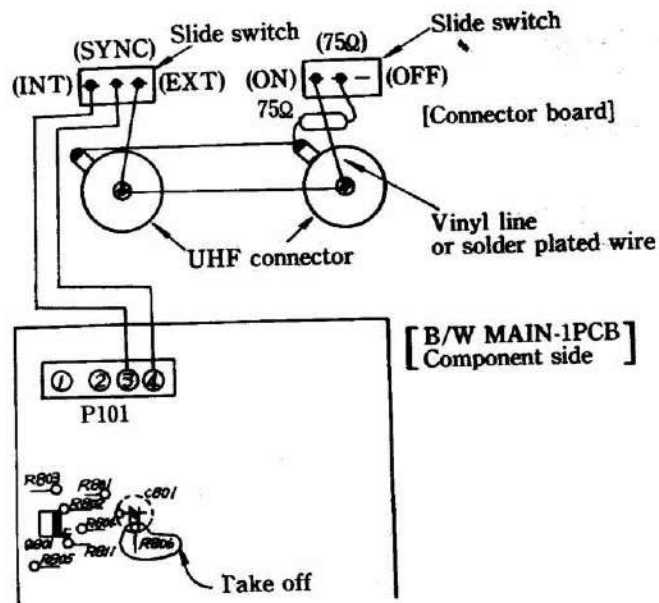


Fig. 9

4) Wiring steps

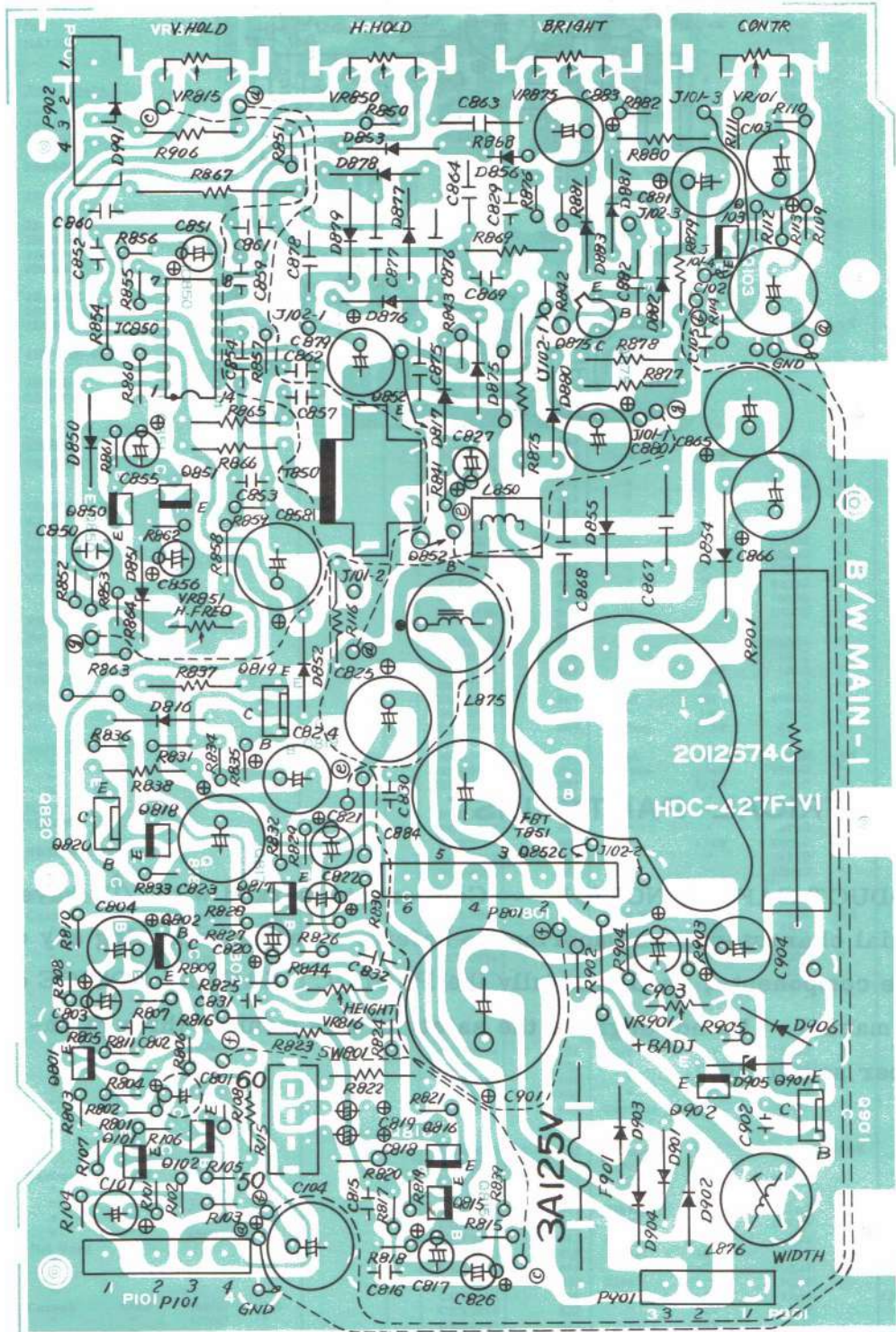
- Remove the blank panel.
- Install a UHF connector (and a slide switch) to the external sync connector panel.
- Make connection as illustrated in Fig. 9.
- Install the external sync connector panel instead of the blank panel.
- Remove R806 from B/W MAIN-1 PCB.
- Add Q801, R801-805, R811 and C801 onto B/W MAIN-1 PCB.

5) Operating check

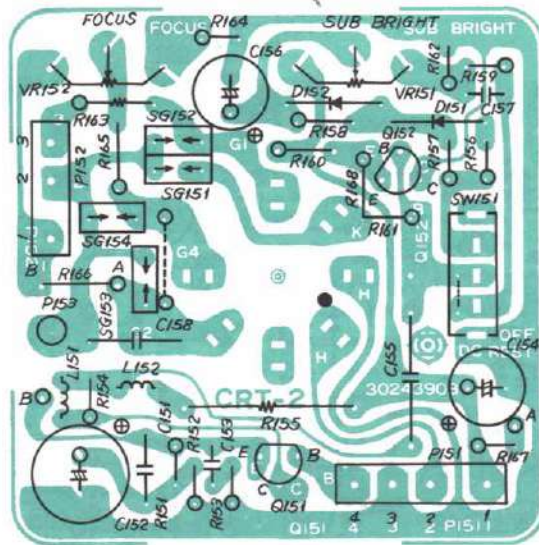
Apply specified signal (sync 4 \pm 2V) and confirm operation. If sync signal is lower than specification, change R801 value by approx. 1 k Ω .

6. ELECTRICAL PARTS ARRANGEMENT


B/W MAIN-I PCB



CRT-2 PCB



7. ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTICE --- Components marked with  have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this manual. Do not degrade the safety of this monitor through improper servicing.

7.1 MODEL VM-906
B/W MAIN-1 PCB

Part Code	Symbol	Description	Remarks
		<u>IC</u>	
ILH0073	IC 850	HA1166	
		<u>Transistors</u>	
HTC0148	Q 101	2SC458C	
HTA0085	102	2SA673C	
HTC0148	103	2SC458C	
HTA0152	802	2SA608E	
HTC0148	815	2SC458C	
"	816	"	
HTA0085	817	2SA673C	
HTC0148	818	2SC458C	
HTD0073	819	2SD726C	
HTB0069	820	2SB690C	
HTA0085	850	2SA673C	
HTC0057	851	2SC1213C	
HTC0424	852	2SC681ARD	
HTC0327	875	2SC1706-H	
HTD0073	901	2SD726C	
HTA0085	902	2SA673C	
		<u>Diodes</u>	
HDS0110	D 816	1S2076A	
"	817	"	
HDS0110	850	1S2076A	
HDH0124	851	HZ7B2	
HDS0110	852	1S2076A	
HDV0043	853	V09C	
HDV0014	854	U06C	
HDV0043	855	V09C	
"	856	"	
HDE0022	877	ERZ08DJK181	
HDE0022	878	Not Used	
"	879	"	
HDV0043	880	V09C	
HDS0110	881	1S2076A	
"	882	"	
HDV0043	883	V09C	
HDV0013	901	V03C	
"	902	"	
"	903	"	
"	904	"	
HDH0033	905	HZ6B	
HDS0110	906	1S2076A	
HDS0408	991	SR503D	
		<u>Resistors</u>	
RCE0138	R 101	Carbon 1/4W 1000Ω	+5%
RCE0177	102	" " 22kΩ	"
"	103	" " " "	"
RCE0139	104	" " 10kΩ	"
RCE0226	105	" " 560Ω	"
RCE0246	106	" " 820Ω	"
RCE0206	107	" " 390Ω	"
RCE0137	108	" " 100Ω	"
"	109	" " " "	"
RCE0177	110	" " 22kΩ	"
RCE0138	111	" " 1000Ω	"
RCE0139	112	" " 10kΩ	"
RCE0247	113	" " 8200Ω	"
RCE0138	114	" " 1000Ω	"
RCE3893	115	" " 100Ω	"
RCE3891	116	" " 8.2Ω	"
RCE0137	R 806	Carbon 1/4W 100Ω	+5%
RCE0226	807	" " 560Ω	"
RCE0198	808	" " 330kΩ	"
RCE0216	809	" " 4700Ω	"
RCE0238	810	" " 6800Ω	"
"	811	Not Used	
"	812	"	
"	813	"	
"	814	"	
RCE0227	815	Carbon 1/4W 5600Ω	+5%
RCE0216	816	" " 4700Ω	"
"	817	" " " "	"
RCE0217	818	" " 47kΩ	"
RCE0227	819	" " 5600Ω	"

Part Code	Symbol	Description	Remarks
RCE0196	R 820	Carbon 1/4W 3300Ω	+5%
RCE0167	821	" " 1800Ω	"
RCR3887	822	" " 3.3Ω	"
RCR3885	823	" " 2.2Ω	"
RCE0186	824	" " 2700Ω	"
RCE0177	825	" " 22kΩ	"
RCE0228	826	" " 56kΩ	"
RCE0177	827	" " 22kΩ	"
RCE0156	828	" " 1500Ω	"
RCE0174	829	" " 22Ω	"
RCE0147	830	" " 1200Ω	"
RCE0166	831	" " 180Ω	"
RCE0196	832	" " 3300Ω	"
RCE0225	833	" " 56Ω	"
RCE0175	834	" " 220Ω	"
"	835	" " " "	"
RCE0236	836	" " 68Ω	"
RCR8338	837	" 1/2W 1Ω	"
"	838	" " " "	"
RCE0138	839	" " " "	"
"	840	Not Used	
RCE0227	841	Carbon 1/4W 5600Ω	+5%
RCE0156	842	" " 1500Ω	"
RCE0137	843	" " 100Ω	"
RCE0228	844	" " 56kΩ	"
"	845	Not Used	
"	846	"	
"	847	"	
"	848	"	
"	849	"	
RCE0158	850	Carbon 1/4W 150kΩ	+5%
RCE0198	851	" " 330kΩ	"
RCE0157	852	" " 15kΩ	"
RCE0158	853	" " 150kΩ	"
"	854	" " " "	"
RCE0157	855	" " 15kΩ	"
RCE0247	856	" " 2800Ω	"
RCE0176	857	" " 2200Ω	"
RCE0196	858	" " 3100Ω	"
RCE0247	859	" " 8200Ω	"
RCE0138	860	" " 1000Ω	"
RCE0186	861	" " 2700Ω	"
"	862	" " " "	"
RCE0158	863	" " 150kΩ	"
RCE0139	864	" " 10kΩ	"
RCR3893	865	" 1/2W 100Ω	"
RCR3892	866	" " 10Ω	"
RMR2976	867	Metal 2W 4700Ω	"
RMR2951	868	" 1W 10kΩ	"
RCR3981	869	Carbon 1/2W 82kΩ	"
RMR2973	R 875	Metal 2W 33Ω	+5%
RCE0156	876	Carbon 1/4W 1500Ω	"
RCR3925	877	" 1/2W 22kΩ	"
"	878	" " " "	"
RCR3895	879	" " 10kΩ	"
RCR3957	880	" " 47kΩ	"
RCE0104	881	" 1/4W 560kΩ	"
RCE0217	882	" " 47kΩ	"
RCR4050	883	" " 100kΩ	"
RWE0001	R 901	Wire Wound 10W 27Ω	+5%
RCR3937	902	Carbon 1/2W 330Ω	"
RCE0176	903	" 1/4W 2200Ω	"
RCE0156	904	" " 1500Ω	"
RCE0136	905	" " 10Ω	"
RCR3979	906	" 1/2W 820Ω	"
		<u>Capacitors</u>	
CEX0184	C 101	Elyc 16V 33μF	
CEX0172	102	" 10V 330μF	
CEX0180	103	" 16V 100μF	
CEX0185	104	" 330μF	
CCT0098	105	Ceramic 50V 0.047μF	
CQA0013	C 802	Plastic 50V 0.047μF	+10%
CEX0218	803	Elyc " 1μF	"
CEX0180	804	" 16V 100μF	"
CQA0013	815	Plastic 50V 0.047μF	+10%
CQA0015	816	" " 0.1μF	"
CEX0218	817	Elyc " 1μF	"
CSC0173	818	Tantal 16V 10μF	+20%
CST0398	819	" 2.2μF	"
CEX0179	820	Elyc " 10μF	"
CEX0184	821	" 33μF	"
CEX0218	822	" 50V 1μF	"
CEX0185	823	" 16V 330μF	"
CEX0180	824	" 100μF	"
CEX0169	825	" 10V 1000μF	"
CEX0218	826	" 50V 1μF	"

J, E, K Type
J, U, C Type

Part Code	Symbol	Description	Remarks	
CEX0184	C 827	Elyc 16V 33μF	J, E, K Type	
	828	Not Used		
CEX0032	821	Elyc 25V 47μF ±20%		
CQA0003	829	Plastic 50V 0.001μF ±10%		
CQA0015	830	" " 0.1μF "		
"	832	" " " "		
CQA0020	850	" " 0.0033μF ±5%		
CEX0218	851	Elyc " 1μF "		
CQA0007	852	Plastic " 0.0047μF ±10%		
CCV0113	853	Ceramic " 560 pF ±5%		
"	854	" " " "		
CEX0179	855	Elyc 16V 10μF "		
"	856	" " " "		
CQA0011	857	Plastic 50V 0.022μF ±10%		
CEX0185	858	Elyc 16V 330μF "		
CQA0013	859	Plastic 50V 0.047μF ±10%		
"	860	" " " "		
"	861	Not Used		
CQA0005	862	Plastic 50V 0.0022μF ±10%		
CQT0023	863	" 250V 0.22μF ±20%		
CQT0010	864	" " 0.1μF "		
CEX0185	865	Elyc 16V 330μF "		
"	866	" " " "		
CQD0012	867	Plastic 630V 0.047μF ±10%		
CQD0006	868	" " 0.022μF "		
CMF0048	869	Mica 500V 470 pF ±5%		
CEX0238	C 880	Elyc 160V 3.3μF		
CEX0240	881	" " 10μF		
CQT0014	882	Plastic 400V 0.1μF ±20%		
CEX0237	883	Elyc 160V 1μF		
CEX0210	884	" 25V 4.7μF BP		
CEE0054	C 901	Elyc 25V 3300μF		±10%
CQA0009	902	Plastic 50V 0.01μF		
CEX0184	903	Elyc 16V 33μF		
CEX0180	904	" " 100μF		
<u>Var. Resistors</u>				
RDV0199	VR 816	Carbon B 10kΩ		
RDV0198	851	" B 5000Ω		
RDV0197	901	" B 1000Ω		
RDR0428	101	" B 1000Ω		
RDR0429	815	" B 5000Ω		
RDR0431	850	" B 50kΩ		
RDR0430	875	" B 500kΩ		
<u>Coils</u>				
TLF0041	L 850	27μH ±10%		
TLL0043	L 875	LC-0146		
TLL0050	876	LC-0168		
<u>Transformers</u>				
TTH0006	T 850	HD-T2		
TTT0226	851	TC-0448		
<u>Connectors</u>				
JBX0342	P 101	9952#3 (4P)		
JBX0344	P 801	9952#5 (6P)		
JBX0341	P 901	9952#2 (3P)		
JBX0368	J 101	34203#3 (UL, FR200, 4P)		
JBX0367	102	34202#3 (UL, FR200, 3P)		
<u>Miscellaneous</u>				
EFG0525	F 901	Fuse TLC-3A	J, E, K Type U, C Type	
EFL0140	901	" ST5-3A		
EFY0002	XF 901	Fuse Clip 85PN-0815	J, E, K Type 2 pcs	

Part Code	Symbol	Description	Remarks
ETS0122	XF 901	Terminal 9773	U, C Type 2 pcs
SSV0109	SW 801	Switch SSF8 12-07P	J Type
JYX0262	"	Pin 29002-2 (for J101)	4 pcs
"	"	" (for J102)	3 pcs
ETS0122	XR 901	Terminal 9773	2 pcs
"	"	Heat Sink 4054907 (for Q819 & 820)	2 pcs

CRT-2 PCB

Part Code	Symbol	Description	Remarks	
<u>Transistor</u>				
HTC0085	Q 151	2SC1514		
<u>Diodes</u>				
HDS0110	D 151	1S2076A		
"	151	"		
<u>Resistors</u>				
RCE0245	R 151	Carbono 1/4W 82Ω ±5%		
RCE0185	152	" " 270Ω "		
RCE0214	153	" " 47Ω "		
RCE0186	154	" " 2700Ω "		
RMR2976	155	Metal 2W 4700Ω		
RCE0139	156	Carbon 1/4W 10kΩ ±5%		
RCE0218	157	" " 470kΩ "		
"	158	" " " "		
RCE0209	159	" " 390kΩ "		
"	160	Not Used		
RCE0156	161	Metal 1/4W 1500Ω ±5%		
RCE0167	162	" " 1800Ω "		
RCE0176	163	" " 2200Ω "		
"	164	Not Used		
"	165	" " " "		
RCE0140	166	Carbon 1/4W 100kΩ ±5%		
"	167	" " " "		
<u>Capacitors</u>				
CCU0114	C 151	Ceramic 50V 390 pF ±5%		
CEX0172	152	Elyc 10V 330μF		
CCU0113	153	Ceramic 50V 560 pF ±5%		
CEX0238	154	Elyc 160V 3.3μF		
CQT0026	155	Plastic 250V 0.47μF ±20%		
CEX0240	156	Elyc 160V 10μF		
"	157	Not Used		
CQT0016	158	Plastic 400V 0.047μF ±20%		
<u>Coils</u>				
TLF0019	L 151	33μH ±10%		
TLF0038	152	68μH "		
<u>Var. Resistor</u>				
RDV0298	VR 151	Carbon B 100kΩ		
<u>Switch</u>				
SSV0109	SW 151	SSF812-07P		
<u>Connectors</u>				
JBX0342	P 151	9952#3 (4P)		
JBX0341	152	9952#2 (3P)		
ETP0069	153	GT Contact Pin		

Part Code	Symbol	Description	Remarks
		<u>Miscellaneous</u>	
EZZ0056	SG 151	Spark Gap AG20 2kV	
"	152	" "	
"	153	" "	
"	154	" "	
DYX0010	J 151	CRT Socket 1426#2	

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Part Code	Symbol	Description	Remarks
		<u>Transformers</u>	
TTT0116	T 991	TC-0444A	J Type
TTT0117	991	TC-0445 (UL)	U, C Type
TTT0130	991	TC-0464	E, K Type
		<u>Coil</u>	
TLL0113	DY 891	LC-0165B	
		<u>Switches</u>	
SSS0063	SW 991	SDE-4SB-2 (UL, SA) TV-3	
SSV0105	191	SS(F) 12-07	
		<u>Connectors</u>	
JBX0368	J 191	34203#3 (UL, FR200, 4P)	
JBX0374	194	34338 (1P)	
JBX0367	891	34205#3 (UL, FR200, 6P)	
JBX0370	991	34202#3 (UL, FR200, 3P)	
JYX0262		29002-2 (for J191)	4 pcs
"		" (for J891)	6 pcs
"		" (for J991)	3 pcs
JYX0169		29000 (for J194)	
JHS0022	J 195	UHF-Type S-19321	
"	196	" "	
		<u>Resistor</u>	
RCR4118	R 191	Carbon 1/4W 75Ω ±5%	
DPX0032	V 191	CRT 230BRB4	
		<u>Miscellaneous</u>	
BBZ0073	P 991	Code Set VM-1165B 2.5M	J Type
BBZ0060	991	" STV#18VM-033 8F VM-1	U Type
BBZ0055	991	" VM-0099 8F	E, K Type
BBZ0159	991	" S.JT#18 VM-0033 8F VM-1	C Type
EFL0089	F 991	Fuse SS1-1A UL	U, C, E, K Type
ETB0384		Pin ML-3182-5P	U, C, E, K Type

7.2 MODEL VM-910

B/W MAIN-1 PCB

Part Code	Symbol	Description	Remarks
ILH0073	IC 850	<u>IC</u> HA1166	
		<u>Transistors</u>	
HTC0148	Q 101	2SC458C	
"	103	2SC458C	
HTA0152	802	2SA608E	
HTC0148	815	2SC458C	
"	816	"	
HTA0085	817	2SA673C	
HTC0148	818	2SC458C	
HTD0073	819	2SD726C	
HTB0069	820	2SB690C	
HTA0085	850	2SA673C	
HTC0057	851	2SC1213C	
HTC0424	852	2SC681ARD	
HTD0073	901	2SD726C	
HTA0085	902	2SA673C	
		<u>Diodes</u>	
HDS0110	D 816	1S2076A	
"	817	"	
HDS0110	D 850	1S2076A	
HDH0124	851	HZ7B2	
HDS0110	852	1S2076A	
HDV0043	853	V09C	
HDU0014	854	U06C	
HDV0043	855	V09C	
"	856	"	
HDV0043	D 880	V09C	
HDV0013	D 901	V03C	
"	902	"	
"	903	"	
"	904	"	
HDH0033	905	HZ6B	
HDS0110	906	1S2076A	
		<u>Resistors</u>	
RCE0138	R 101	Carbon 1/4W 1000Ω	+5%
RCE0177	" 102	" " 22kΩ	"
"	103	" " " "	"
RCE0139	" 104	" " 10kΩ	"
RCE0137	" 105	" " 100Ω	"
"	106	Not Used	
RCE0206	" 107	Carbon 1/4W 390Ω	+5%
"	108	Not Used	
RCE0137	" 109	Carbon 1/4W 100Ω	+5%
RCE0117	" 110	" " 22kΩ	"
RCE0138	" 111	" " 1000Ω	"
RCE0139	" 112	" " 10kΩ	"
RCE0247	" 113	" " 8200Ω	"
RCE0138	" 114	" " 1000Ω	"
RCR3893	" 115	1/2W 100Ω	"
RCR3891	" 116	" " 8.2Ω	"
RCE0137	R 806	Carbon 1/4W 100Ω	+5%
RCE0226	" 807	" " 560Ω	"
RCE0141	" 808	" " 1MΩ	"
RCE0216	" 809	" " 4700Ω	"
RCE0238	" 810	" " 6800Ω	"
RCE0227	R 815	Carbon 1/4W 5600Ω	+5%
RCE0216	" 816	" " 4700Ω	"
"	817	" " " "	"
RCE0217	" 818	" " 47kΩ	"
RCE0227	" 819	" " 5600Ω	"
RCE0196	" 820	" " 3300Ω	"
RCE0167	" 821	" " 1800Ω	"
RCR3899	" 822	1/2W 12Ω	"
RCR3885	" 823	" " 2.2Ω	"
RCE0186	" 824	1/4W 2700Ω	"
RCE0177	" 825	" " 22kΩ	"
RCE0228	" 826	" " 56kΩ	"
RCE0177	" 827	" " 22kΩ	"
RCE0156	" 828	" " 1500Ω	"
RCE0174	" 829	" " 22Ω	"
RCE0147	" 830	" " 1200Ω	"
RCE0196	" 831	" " 180Ω	"
RCE0166	" 832	" " 3300Ω	"
RCE0225	" 833	" " 56Ω	"

Part Code	Symbol	Description	Remarks
RCE0175	R 834	Carbon 1/4W 220Ω	+5%
"	835	" " " "	"
RCE0236	" 836	" " 68Ω	"
RCR3883	" 837	1/2W 1Ω	"
"	838	" " " "	"
RCE0138	" 839	1/4W 1000Ω	"
RCE0148	841	Carbon 1/4W 12kΩ	"
RCE0214	842	" " 47Ω	"
RCE0158	850	Carbon 1/4W 150kΩ	+5%
RCE0198	851	" " 330kΩ	"
RCE0157	852	" " 15kΩ	"
RCE0158	853	" " 150kΩ	"
"	854	" " " "	"
RCE0157	855	" " 15kΩ	"
RCE0247	856	" " 8200Ω	"
RCE0176	857	" " 2200Ω	"
RCE0196	858	" " 3300Ω	"
RCE0247	859	" " 8200Ω	"
RCE0138	860	" " 1000Ω	"
RCE0186	861	" " 2700Ω	"
"	862	" " " "	"
RCE0158	863	" " 150kΩ	"
RCE0139	864	" " 10kΩ	"
RCR3893	865	1/2W 100Ω	"
RZZ0029	866	" " 10Ω	"
RMR2976	867	Metal 2W 4700Ω	"
RMR2951	868	" 1W 10kΩ	"
RMR3002	869	" " 6800Ω	"
RMR2973	R 875	Metal 2W 33Ω	+5%
RCE0217	882	Carbon 1/4W 47kΩ	+5%
RWE0001	901	Wire Wound 10W 27Ω	+5%
RCR3937	902	Carbon 1/2W 330Ω	"
RCE0176	903	" 1/4W 2200Ω	"
RCE0156	904	" " 1500Ω	"
RCE0186	905	" " 10Ω	"
		<u>Capacitors</u>	
CEX0184	C 101	Elyc 16V 33μF	
CEX0172	102	" 10V 330μF	
CEX0180	103	" 16V 100μF	
CEX0185	104	" " 330μF	
CCT0098	105	Ceramic 50V 0.047μF	
CQA0013	C 802	Plastic 50V 0.047μF	+10%
CEX0218	803	Elyc " 1μF	"
CEX0180	804	" " 16V 100μF	"
CQA0013	C 815	Plastic 50V 0.047μF	+10%
CQA0015	816	" " 0.1μF	"
CEX0218	817	Elyc " 1μF	"
CSC0173	818	Tantal 16V 10μF	+20%
CST0398	819	" " 2.2μF	"
CEX0179	820	Elyc " 33μF	"
CEX0184	821	" " " "	"
CEX0218	822	" " 50V 1μF	"
CEX0185	823	" 16V 330μF	"
CEX0180	824	" " 100μF	"
CEX0169	825	" 10V 1000μF	"
CEX0218	826	" 50V 1μF	"
CEX0184	827	" 16V 33μF	"
"	828	Not Used	
"	829	"	
CQA0015	830	Plastic 50V 0.1μF	+10%
CQS0020	850	Plastic 50V 0.0033μF	+5%
CEX0218	851	Elyc " 1μF	"
CQA0007	852	Plastic " 0.0047μF	+10%
CCU0113	853	Ceramic " 560pF	+5%
"	854	" " " "	"
CEX0179	855	Elyc 16V 10μF	"
"	856	" " " "	"
CQA0011	857	Plastic 50V 0.022μF	+10%
CEX0185	858	Elyc 16V 330μF	"
CQA0013	859	Plastic 50V 0.001μF	+10%
"	860	" " " "	"
CQA0005	862	Plastic 50V 0.0022μF	+10%
CQT0023	863	" 250V 0.22μF	+20%
CQT0010	864	" " 0.1μF	"
CEX0185	865	Elyc 16V 330μF	"
"	866	" " " "	"
CQD0012	867	Plastic 630V 0.047μF	+10%
CQD0006	868	" " 0.22μF	"
CEX0238	880	Elyc 160V 3.3μF	"
"	881	Not Used	
"	882	"	

CRT-2 PCB

Part Code	Symbol	Description	Remarks
CEX0238	C 883	Elyc 160V 1 μ F	
CEX0210	884	" 25V 4.7 μ F BP	
CEE0054	901	Elyc 25V 3300 μ F	
CQA0009	902	Plastic 50V 0.01 μ F	$\pm 10\%$
CEX0184	903	Elyc 16V 33 μ F	
CEX0180	904	" " 100 μ F	
<u>Var. Resistors</u>			
RDR0432	VR 101	Carbon B 1000 Ω	
RDR0425	815	" B 5000 Ω	
RDV0198	816	" B "	
RDR0426	850	" B 50k Ω	
RDV0198	851	" B 5000 Ω	
RDR0433	875	" B 500k Ω	
RDV0197	901	" B 1000 Ω	
<u>Coils</u>			
TLF0041	L 850	27 μ H $\pm 10\%$	
TLL0050	876	LC-0168	
<u>Transformers</u>			
TTH0006	T 850	HD-12	
TTT0226	851	TC-0448	
<u>Switch</u>			
SSV0109	SW 801	SSFB 12-07P	J Type
<u>Connectors</u>			
JBX0342	P 101	9952#3 (4P) D#9406036	
JBX0344	P 801	9952#5 (6P) D#9406036	
JBX0341	P 901	9952#2 (3P) D#9406036	
JBX0368	J 101	34203#3 (UL, FR200, 4P)	
JBX0367	102	34202#3 (UL, FR200, 3P)	
<u>Miscellaneous</u>			
EFG0525	F 901	Fuse TLC-3A	J, E, K Type
EFL0140	901	" ST5-3A UL (3A 125V)	U, C Type
EFY0002	XF 901	Fuse Clip 85PN-0815	J, E, K Type
	901	Terminal 9773	2 pcs U, C Type
JYX0262	"	Pin 29002-2 (for J101)	2 pcs
"	"	" (for J102)	4 pcs
ETS0122	XR 901	Terminal 9773	2 pcs
EHX0023		Heat Sink (for Q819 & Q820)	2 pcs

Part Code	Symbol	Description	Remarks
<u>Transistor</u>			
HTC0085	Q 151	2SC1514	
<u>Resistors</u>			
RCE0225	R 151	Carbon 1/4W 56 Ω $\pm 5\%$	
RCE0215	152	" " 470 Ω "	
RCE0165	153	" " 18 Ω "	
RCE0186	154	" " 2700 Ω "	
RMR2980	155	Metal 2W 6800 Ω "	
	156	Not Used	
	157	"	
	158	"	
RCE0209	159	Carbon 1/4W 390k Ω $\pm 5\%$	
	160	Not Used	
RCE0156	161	Carbon 1/4W 1500 Ω $\pm 5\%$	
RCE0247	162	" " 8200 Ω "	
RCE0176	163	" " 2200 Ω "	
	164	Not Used	
	165	"	
	166	"	
RCE0140	167	Carbon 1/4W 100k Ω $\pm 5\%$	
	168	Not Used	
RCE0141	169	Carbon 1/4 W 1M Ω $\pm 5\%$	
RCR3896	VR 151	Carbon 1/2W 100k Ω $\pm 5\%$	
<u>Capacitors</u>			
CCU0109	C 151	Ceramic 50V 220pF $\pm 5\%$	
CEX0172	152	Elyc 10V 330 μ F	
CQA0005	153	Plastic 50V 0.0022 μ F $\pm 10\%$	
CEX0240	154	Elyc 160V 10 μ F	
CQT0026	155	Plastic 250V 0.47 μ F $\pm 20\%$	
	156	Not Used	
	157	"	
CQT0016	158	Plastic 400V 0.047 μ F $\pm 20\%$	
<u>Coils</u>			
TLF0068	L 151	120 μ H $\pm 10\%$	
TLF0067	152	100 μ H "	
<u>Connectors</u>			
JBX0342	P 151	9952#3 (4P) D#9406036	
JBX0341	152	9952#2 (3P) D#9406036	
ETP0069	153	Contact GT	
<u>Miscellaneous</u>			
EZZ0056	SG 151	Spark Gap AG20 2kV	
	152	Not Used	
EZZ0056	153	Spark Gap AG20 2kV	
DYX0010	J 151	CRT Socket 1426#2	

CHASSIS

Part Code	Symbol	Description	Remarks
DPX0032	V 191	CRT 230BRB4	
<u>Resistor</u>			
RCR4118	R 191	Carbon 1/4W 75 Ω $\pm 5\%$	
<u>Coil</u>			
TLL0113	DY 991	LC-0165B	
<u>Transformers</u>			
TTT0116	T 991	TC-0444A	J Type
TTT0117	991	TC-0445 (UL)	U, C Type
TTT0130	991	TC-0464	E, K Type

Part Code	Symbol	Description	Remarks
SSV0105 SSS0063	SW 191 991	<u>Switches</u> SS(F) 12-07 SDE-4SB-2 (UL, CSA)	
JBX0368	J 191	<u>Connectors</u> 34203#3 (UL, FR200, 4P)	
JBX0374 JHS0022 " "	J 194 195 196	34338 (1P) S-19321 (UHF-Type) " "	
JBX0370	891	34205#3 (UL, FR200, 6P)	
JBX0367	991	34202#3 (UL, FR200, 3P)	
JYX0262 " " " "		Pin 29002-2 (for J191) " " (for J891) " " (for J991)	4 pcs 6 pcs 3 pcs
JYX0169		P" 29000 (for J194)	
BBZ0073 BBZ0060 BBZ0055 BBZ0159	P 991 991 991 991	<u>Miscellaneous</u> Code Set VM-1165B " STV#18 VM-033 " VM-0099 " SJT#18 VM-0033	J type U type E, K type C type
EFL0089	F 991	Fuse SS1-1A	U, C, E, K type
ETB0384		Terminal ML-3182-5P	U, C, E, K type

7.3 MODEL VM-129 B/W MAIN-1 PCB

Part Code	Symbol	Description	Remarks
		<u>IC</u>	
ILH0073	IC 850	HA1166	
		<u>Transistors</u>	
HTC0148	Q 101	2SC458C	
HTA0085	102	2SA673C	
HTC0148	103	2SC458C	
HTA0152	802	2SA608E	
HTC0148	815	2SC458C	
"	816	"	
HTA0085	817	2SA673C	
HTC0148	818	2SC458C	
HTD0073	819	2SD726C	
HTB0069	820	2SB690C	
HTA0085	850	2SA673C	
HTC0057	851	2SC1213C	
HTC0424	852	2SC681ARD	
HTC0327	875	2SC1706H	
HTD0073	901	2SD726C	
HTA0085	902	2SA673C	
		<u>Diodes</u>	
HDM0069	D 815	MV-13	
HDS0110	816	1S2076A	
"	817	"	
HDS0110	850	1S2076A	
HDH0124	851	HZ7B2	
HDS0110	852	1S2076A	
HDV0043	853	V09C	
HDU0014	854	U06C	
HDV0043	855	V09C	
HDV0043	875	V09C	
"	876	"	
"	877	"	
"	878	"	
"	879	"	
"	880	"	
HDS0110	881	1S2076A	
"	882	"	
HDV0043	883	V09C	
HDV0013	901	V03C	
"	902	"	
"	903	"	
"	904	"	
HDH0033	905	HZ6B	
HDS0110	906	1S2076A	
		<u>Resistors</u>	
RCE0138	R 101	Carbon 1/4W 1000Ω	+5%
RCE0177	102	" " 22kΩ	"
"	103	" " " "	"
RCE0139	104	" " 10kΩ	"
RCE0226	105	" " 560Ω	"
RCE0246	106	" " 820Ω	"
RCE0206	107	" " 390Ω	"
RCE0137	108	" " 100Ω	"
"	109	" " " "	"
RCE0177	110	" " 22kΩ	"
RCE0138	111	" " 1000Ω	"
RCE0139	112	" " 10kΩ	"
RCE0247	113	" " 8200Ω	"
RCE0138	114	" " 1000Ω	"
RCE3893	115	" 1/2W 100Ω	"
RCR3891	116	" " 8.2Ω	"
RCE0137	806	Carbon 1/4W 100Ω	+5%
RCE0226	807	" " 560Ω	"
RCE0198	808	" " 330kΩ	"
RCE0216	809	" " 4700Ω	"
RCE0238	810	" " 6800Ω	"
RCE0227	815	Carbon 1/4W 5600Ω	+5%
RCE0216	816	" " 4700Ω	"
"	817	" " " "	"
RCE0228	818	" " 56kΩ	"
RCE0227	819	" " 5600Ω	"
RCE0191	820	" " 3000Ω	"
RCE0167	821	" " 1800Ω	"
RCR3899	822	" 1/2W 12Ω	"
RCR3885	823	" " 2.2Ω	"
RCE0186	824	" 1/4W 2700Ω	"

Part Code	Symbol	Description	Remarks
RCE0177	R 825	Carbon 1/4W 22kΩ	+5%
RCE0228	826	" " 56kΩ	"
RCE0177	827	" " 22kΩ	"
RCE0156	828	" " 1500Ω	"
RCE0174	829	" " 22Ω	"
RCE0147	830	" " 1200Ω	"
RCE0166	831	" " 180Ω	"
RCE0196	832	" " 3300Ω	"
RCE0225	833	" " 56Ω	"
RCE0175	834	" " 220Ω	"
"	835	" " " "	"
RCE0236	836	" " 68Ω	"
RCR3883	837	" 1/2W 1Ω	"
"	838	" " " "	"
RCE0138	839	" 1/4W 1000Ω	"
"	840	" " " "	"
RCE0216	841	" " 4700Ω	"
RCE0156	842	" " 1500Ω	"
RCE0137	843	" " 100Ω	"
RCE0158	850	Carbon 1/4W 150kΩ	+5%
RCE0198	851	" " 330kΩ	"
RCE0157	852	" " 15kΩ	"
RCE0158	853	" " 150kΩ	"
"	854	" " " "	"
RCE0157	855	" " 15kΩ	"
RCE0247	856	" " 8200Ω	"
RCE0176	857	" " 2200Ω	"
RCE0196	858	" " 3300Ω	"
RCE0247	859	" " 8200Ω	"
RCE0138	860	" " 1000Ω	"
RCE0186	861	" " 2700Ω	"
"	862	" " " "	"
RCE0158	863	" " 150kΩ	"
RCE0139	864	" " 10kΩ	"
RCR3893	865	" 1/2W 100Ω	"
RZ0029	866	" " 10Ω	"
RMR2976	867	Metal 2W 4700Ω	"
RMR2951	868	" 1W 10kΩ	"
RCR3981	869	Carbon 1/2W 82kΩ	"
RMR2973	875	Metal 2W 33Ω	+5%
RCE0156	876	Carbon 1/4W 1500Ω	"
RCR3925	877	" 1/2W 22kΩ	"
"	878	" " " "	"
RCR3895	879	" " 10kΩ	"
RCR3957	880	" " 47kΩ	"
RCE0104	881	" 1/4W 560kΩ	"
RCE0217	882	" " 47kΩ	"
RWE0001	901	Wire Wound 10W 27Ω	+5%
RCR3937	902	Carbon 1/2W 330Ω	"
RCE0176	903	" 1/4W 2200Ω	"
RCE0156	904	" " 1500Ω	"
RCE0136	905	" " 10Ω	"
RCR3979	906	" 1/2W 820Ω	"
		<u>Var. Resistors</u>	
RDR0428	VR 101	Carbon B 1000Ω	
RDR0429	815	" B 5000Ω	
RDV0198	816	" B "	
RDR0431	850	" B 50kΩ	
RDV0198	851	" B 5000Ω	
RDR0430	875	" B 500kΩ	
RDV0197	901	" B 1000Ω	
		<u>Capacitors</u>	
CEX0184	C 101	Elyc 16V 33μF	
CEX0172	102	" " 10V 330μF	
CEX0180	103	" " 16V 100μF	
CEX0185	104	" " 330μF	
CQA0013	105	Plastic 50V 0.047μF	+10%
CQA0013	802	Plastic 50V 0.047μF	+10%
CEX0218	803	Elyc 1μF	
CEX0180	804	" 16V 100μF	
CQA0013	815	Plastic 50V 0.047μF	+10%
CQA0015	816	" " 0.1μF	"
CEX0218	817	Elyc 1μF	
CSC0173	818	Tantal 16V 10μF	+20%
CST0398	819	" " 2.2μF	
CEX0179	820	Elyc " 10μF	
CEX0184	821	" " 33μF	
CEX0218	822	" 50V 1μF	
CEX0185	823	" 16V 330μF	

CRT-2 PCB

Part Code	Symbol	Description	Remarks
CEX0180	C 824	Elyc 16V 100μF	
CEX0169	825	" 10V 1000μF	
CEX0218	826	" 50V 1μF	
CEX0184	827	" 16V 33μF	
CEX0220	828	" 50V 3.3μF	
CQA0003	829	Plastic " 0.001μF	+10%
CQA0015	830	" " 0.1μF	"
CQA0051	850	Plastic 50V 0.0033μF	+5%
CEX0218	851	Elyc " 1μF	
CQA0007	852	Plastic " 0.0047μF	+10%
CCU0113	853	Ceramic " 560pF	±5%
"	854	" " "	"
CEX0179	855	Elyc 16V 10μF	
"	856	" " "	
CQA0011	857	Plastic 50V 0.022μF	+10%
CEX0185	858	Elyc 16V 330μF	
CQA0013	859	Plastic 50V 0.047μF	+10%
"	860	" " "	"
"	861	Not Used	
CQA0005	862	Plastic 50V 0.0022μF	+10%
CAT0023	863	" 250V 0.22μF	±20%
CQT0010	864	" " 0.1μF	"
CEX0185	865	Elyc 16V 330μF	
"	866	" " "	
CQD0012	867	Plastic 630V 0.047μF	+10%
CQD0006	868	" " 0.022μF	"
CMF0048	869	Mica 500V 47pF	+5%
CQT0012	875	Plastic 250V 0.047μF	+20%
"	876	" " "	"
"	877	" " "	"
"	878	" " "	"
CEX0248	879	Elyc 450V 1μF	
CEX0238	880	" 160V 3.3μF	
CEX0240	881	" " 10μF	
CQT0014	882	Plastic 400V 0.1μF	±20%
CEX0237	883	Elyc 160V 1μF	
CEX0212	884	" 25V 10μF	BP
CEE0054	901	Elyc 25V 3300μF	
CQA0009	902	Plastic 50V 0.01μF	+10%
CEX0184	903	Elyc 16V 33μF	
CEX0180	904	" " 100μF	
		<u>Coils</u>	
TLF0041	L 850	27μH ±10%	
TLL0065	875	LC-0169	
TLL0050	876	LC-0168	
		<u>Transformers</u>	
TTH0006	T 850	HD-12	
TTT0226	851	TC-0448	
		<u>Switch</u>	
SSV0109	SW 801	SSFB12-07P	J type
		<u>Connectors</u>	
JBX0342	P 101	9952#3 (4P) D#9406036	
JBX0344	801	9952#5 (6P) D#9406036	
JBX0341	901	9952#2 (3P) D#9406036	
JBA0075	902	A4-705B-00P (4P)	
JBX0368	J 101	34203#3 (UL, FR200, 4P)	
JBX0367	102	34202#3 (UL, FR200, 3P)	
JYX0262	"	Pin 29002-2 (for J101)	4 pcs
"	"	" (for J102)	3 pcs
ETZ0068	"	" Stopper (for P902)	
		<u>Miscellaneous</u>	
EFL0140	F 901	Fuse ST5-3A UL	U,C type
EPG0525	901	" TLC-3A	J,E,K type
EFY0002	XF 901	Fuse Clip 85PN-0815	J,E,K type
ETS0112	901	Terminal 9773	2 pcs
"	XR 901	" "	U,C type
"			2 pcs
EHX0023		Heat Sink 4054907 (for Q819 & Q820)	2 pcs

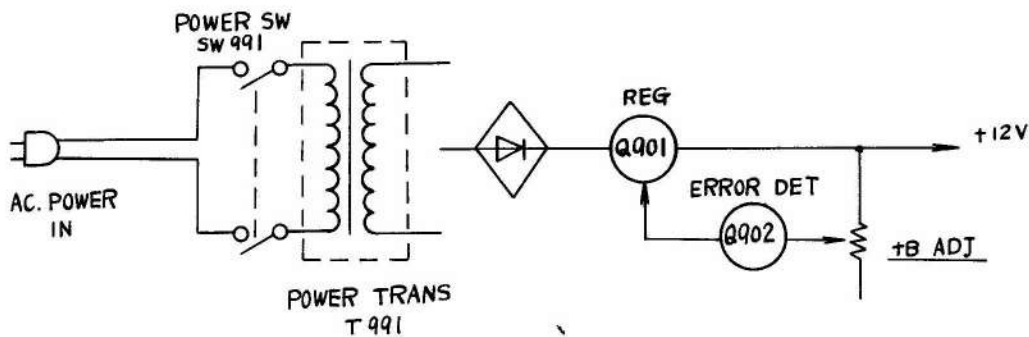
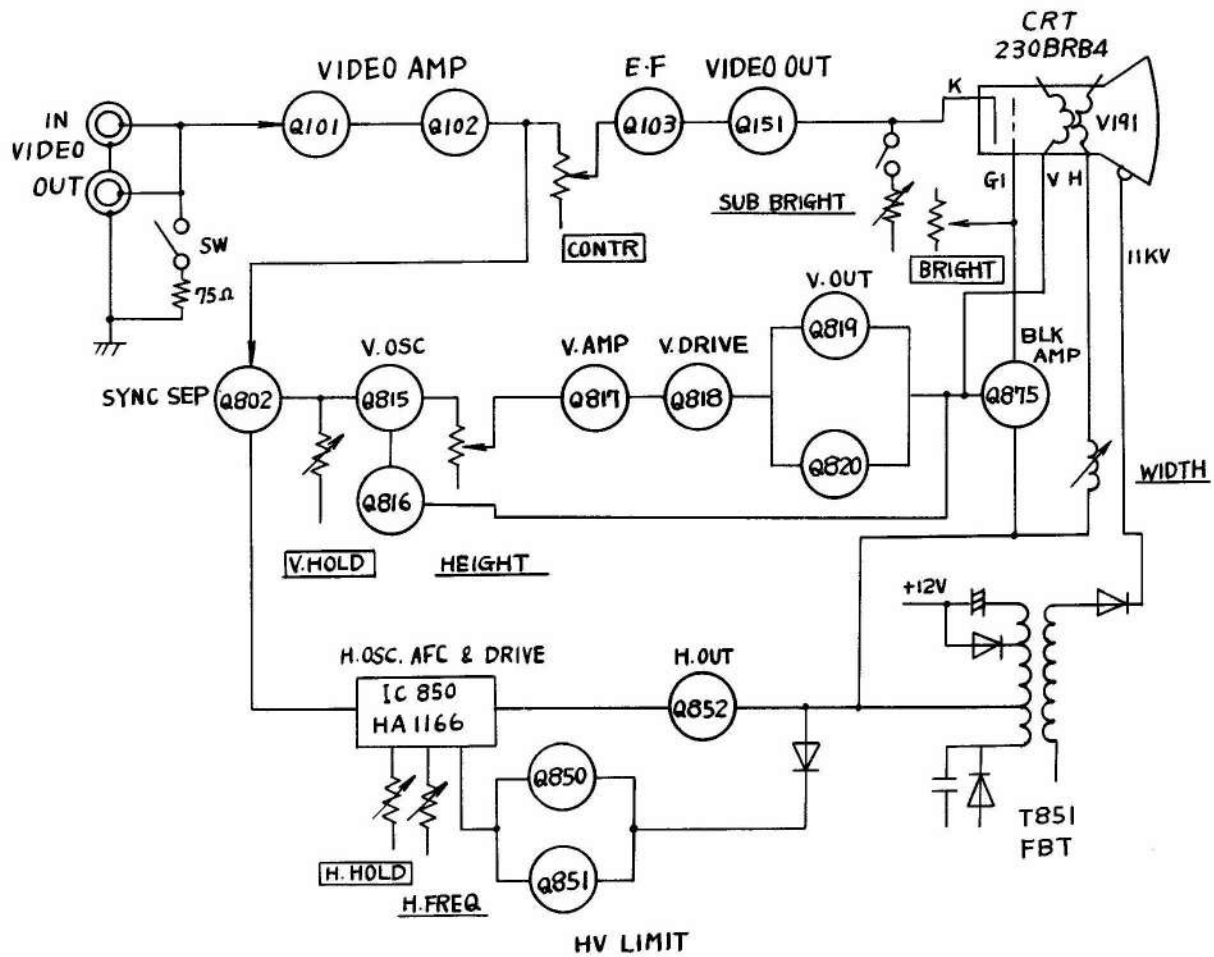
Part Code	Symbol	Description	Remarks
		<u>Transistor</u>	
HTC0085	Q 151	2SC1514	
		<u>Diodes</u>	
HDS0110	D 151	1S2076A	
"	152	"	
		<u>Resistors</u>	
RCE0245	R 151	Carbon 1/4W 82Ω	+5%
RCE0185	152	" " 270Ω	"
RCE0214	153	" " 47Ω	"
RCE0186	154	" " 2700Ω	"
RMR2976	155	Metal 2W 4700Ω	"
RCE0139	156	Carbon 1/4W 10kΩ	+5%
RCE0218	157	" " 470kΩ	"
"	158	" " "	"
RCE0188	159	" " 270kΩ	"
"	160	Not Used	
RCE0156	161	Carbon 1/4W 1500Ω	+5%
"	162	Not Used	
RCR4073	163	Carbon 1/4W 2200Ω	+5%
RCE0178	164	" " 220kΩ	"
RCE0140	165	" " 100kΩ	"
"	166	" " "	"
		<u>Var. Resistors</u>	
RDV0298	VR 151	Carbon B 100kΩ	
RDV0299	152	" " 1MΩ	
		<u>Capacitors</u>	
CCU0114	C 151	Ceramic 50V 390pF	+5%
CEX0172	152	Elyc 10V 330μF	"
CCU0113	153	Ceramic 50V 560pF	+5%
CEX0242	154	Elyc 250V 3.3μF	"
CQT0026	155	Plastic " 0.47μF	+20%
CEX0240	156	Elyc 160V 10μF	"
CQT0016	158	Plastic 400V 0.047μF	±20%
		<u>Coils</u>	
TLF0019	L 151	33μH ±10%	
TLF0038	152	68μH "	
		<u>Switch</u>	
SSV0109	SW 151	SSFB12-07P	
		<u>Connectors</u>	
JBX0342	P 151	9952#3 (4P) D#9406036	
JBX0341	152	9952#2 (3P) D#9406036	
ETP0069	153	GT Contact Pin	
		<u>Miscellaneous</u>	
DYX0010	J 151	CRT Socket	1426#2
EZZ0056	SG 151	Spart Gap AG20	2kV
"	152	" " "	
"	153	" " "	
"	154	" " "	

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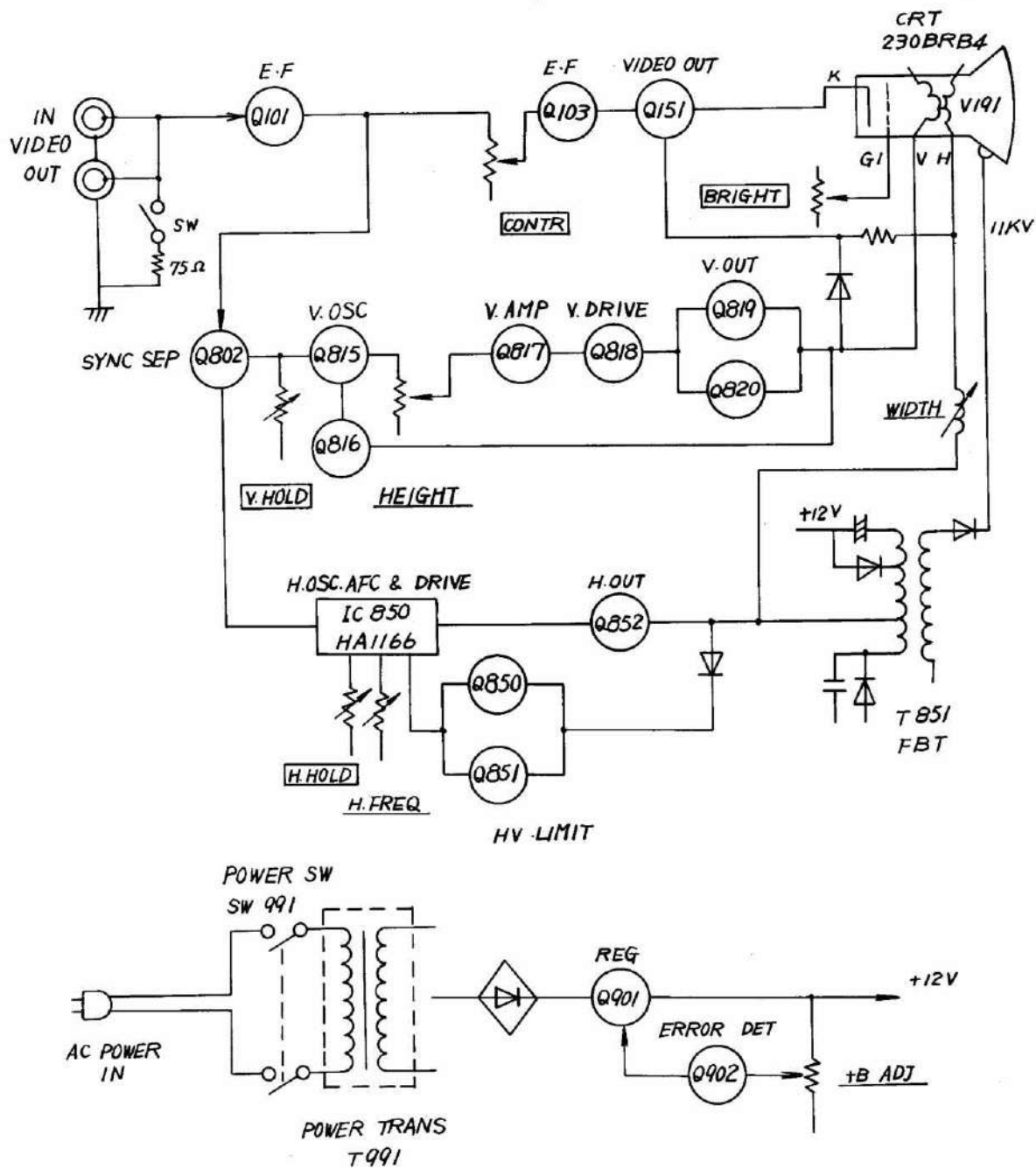
Part Code	Symbol	Description	Remarks
DPX0034	V 191	CRT 310FRB4	
TLL0115	DY 891	Coil LC-0165C	
		<u>Transformers</u>	
TLL0116	T 991	LC-0444A	J type
TTT0117	991	TC-0445 (UL)	U,C type
TTT0130	991	TC-0464	E,K type
		<u>Switches</u>	
SSV0105	SW 191	SS(F) 12-07	
SSS0063	991	SDE-4SB-2 (UL, CSA) TV-3	
		<u>Connectors</u>	
JBX0368	J 191	34203#3 (UL, FR200, 4P)	
JBX0374	194	34338 (1P)	
JBX0370	891	34205#3 (UL, FR200, 6P)	
JBX0367	991	34202#3 (UL, FR200, 3P)	
		<u>Miscellaneous</u>	
JYX0169		Pin 29000 (for J194)	
JYX0262		" 29002-2 (for J891)	6 pcs
"		" (for J991)	3 pcs
"		" (for J191)	4 pcs
BBZ0073	P 991	Code Set VM-1165B	J type
BBZ0060	991	" STV#18 VM-033	U type
BBZ0055	991	" VM-0099	E,K type
BBZ0159	991	" SJT#18 VM-033	C type

8. BLOCK DIAGRAMS

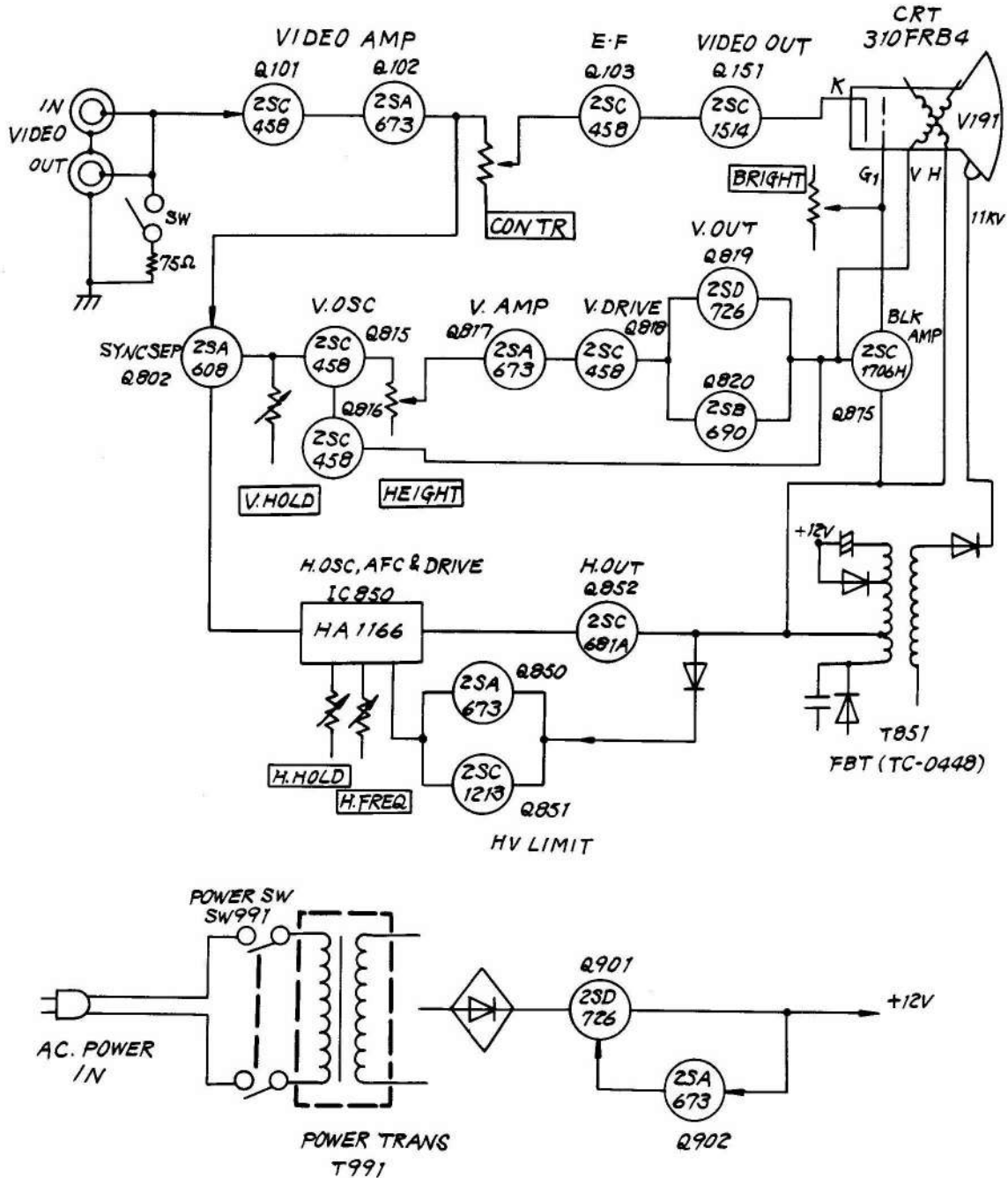
8.1 MODEL VM-906



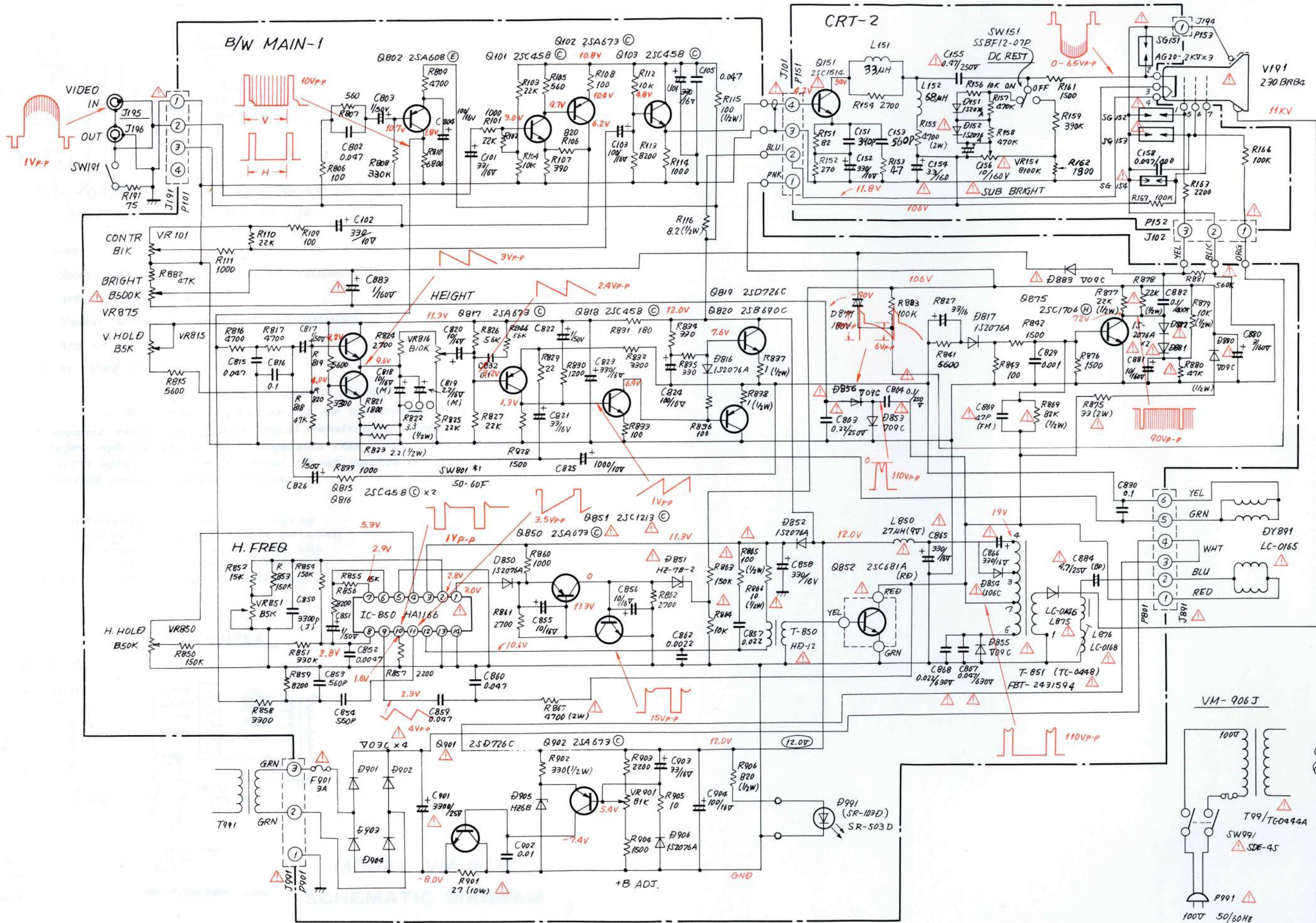
8.2 MODEL VM-910

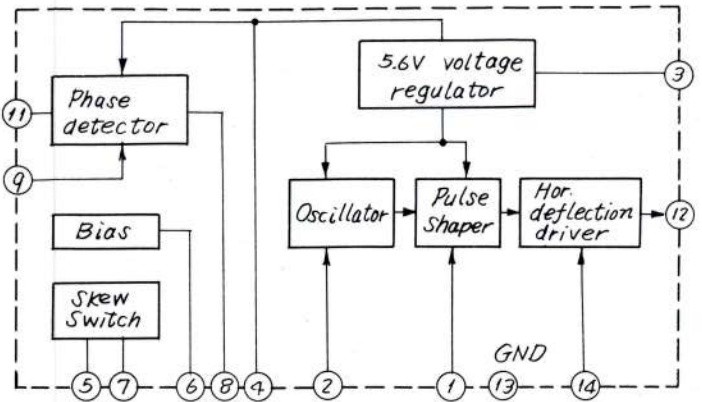
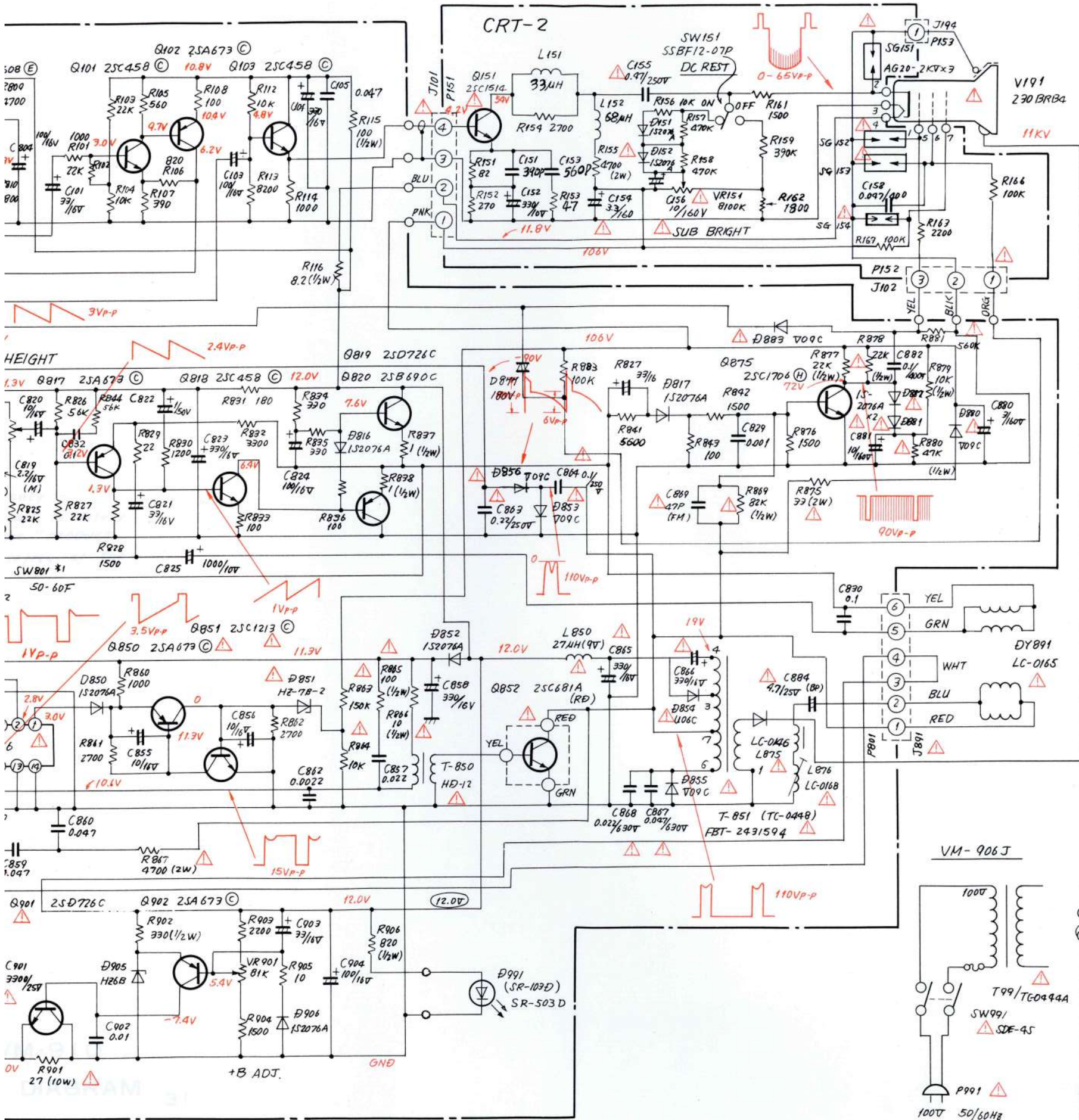


8.3 MODEL VM-129



9. SCHEMATIC DIAGRAMS





Block diagram for IC 850 HA 1166

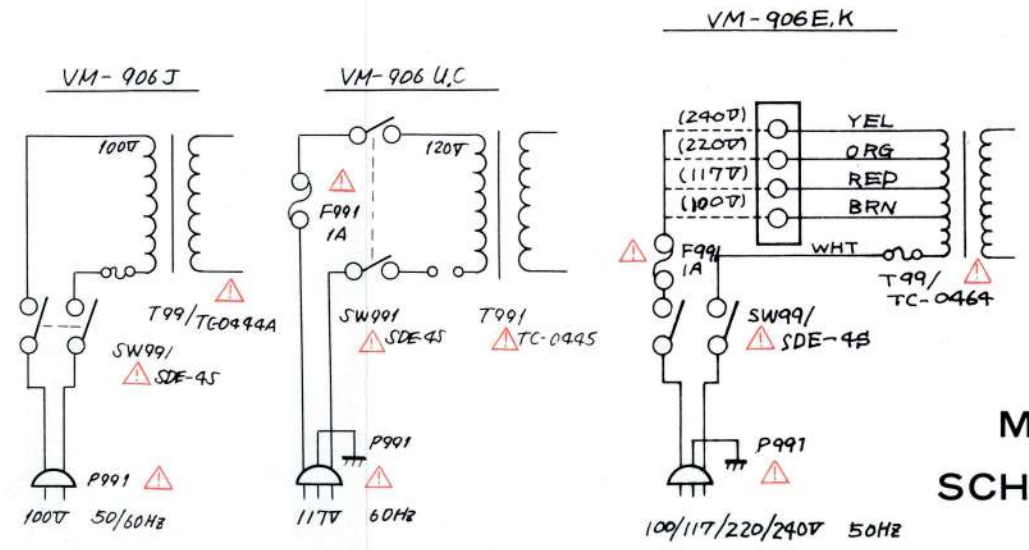
Notes

1. Unless otherwise specified, all resistors are in ohms, 1/4 watt.
2. Unless otherwise specified, all capacitors are in μF .
3. *1 Used only for J type.

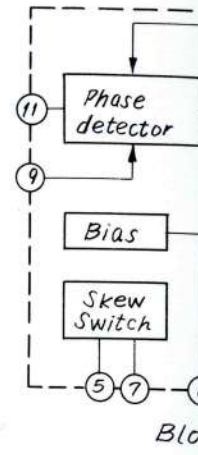
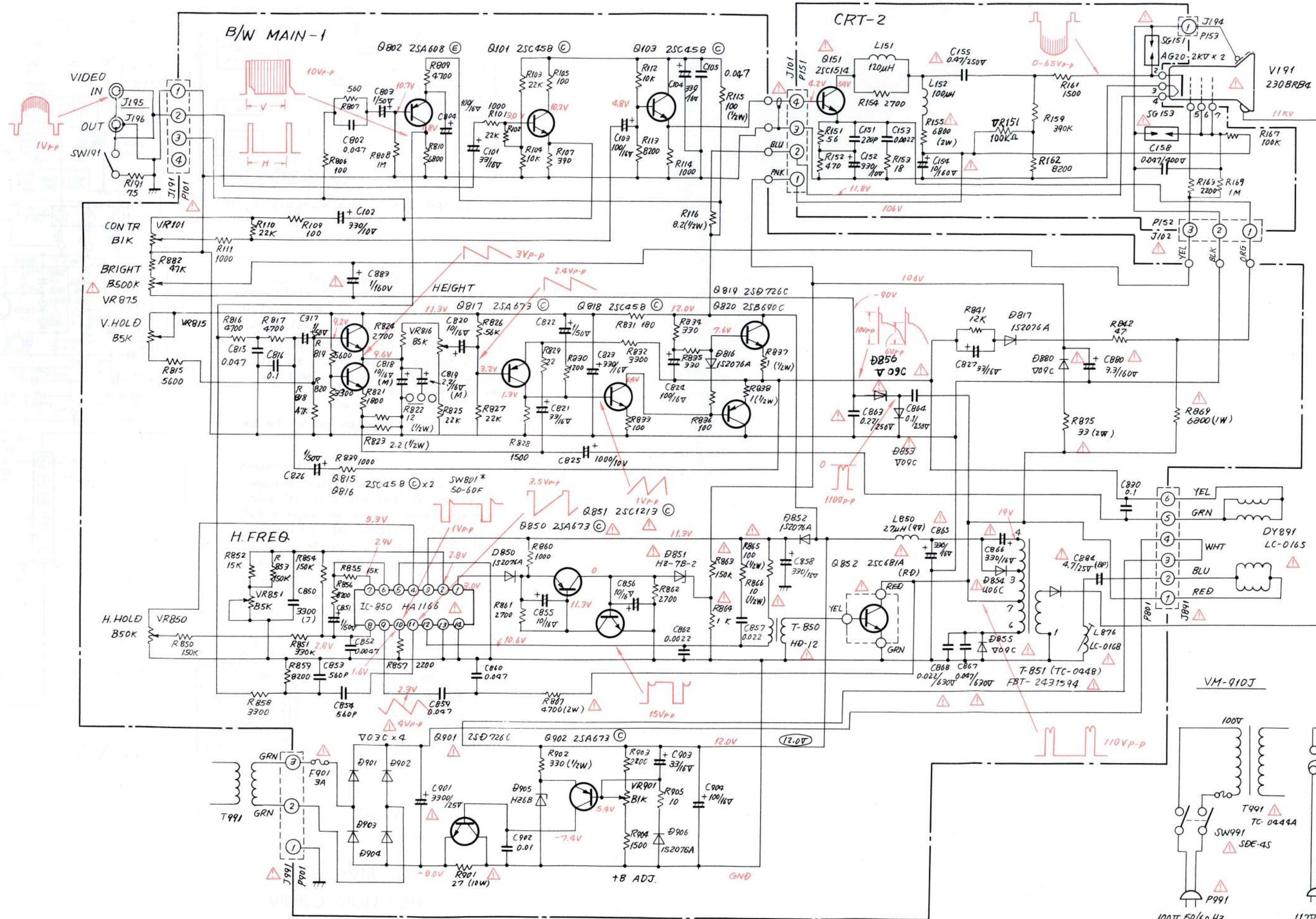
PRODUCT SAFETY NOTICE

- This schematic diagram is for serviceman only -
 Component 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.

Fundamental schematic diagram differences may be found between this schematic diagram and the servicing unit due to various improvements made hereafter.



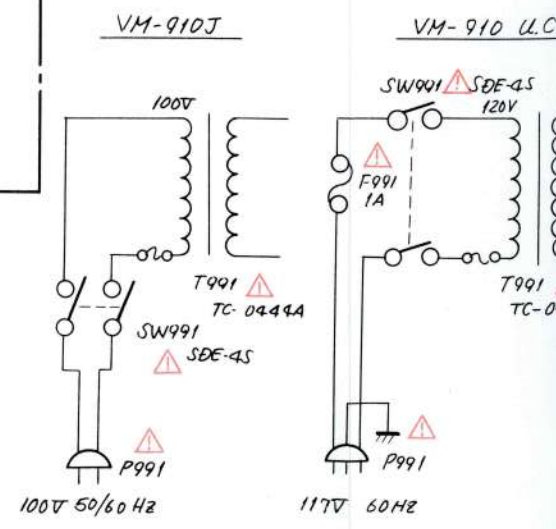
MODEL VM-906 SCHEMATIC DIAGRAM

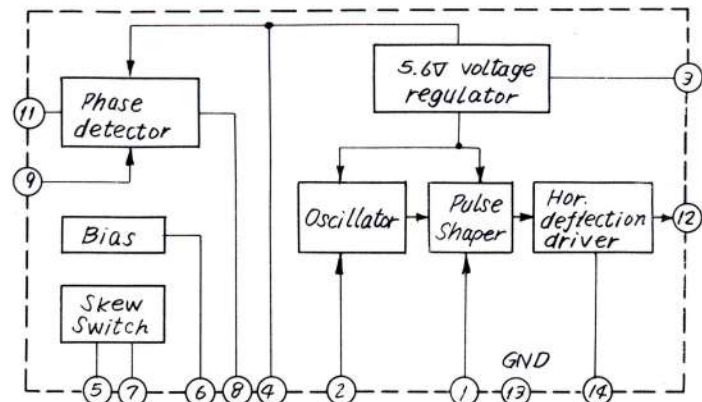
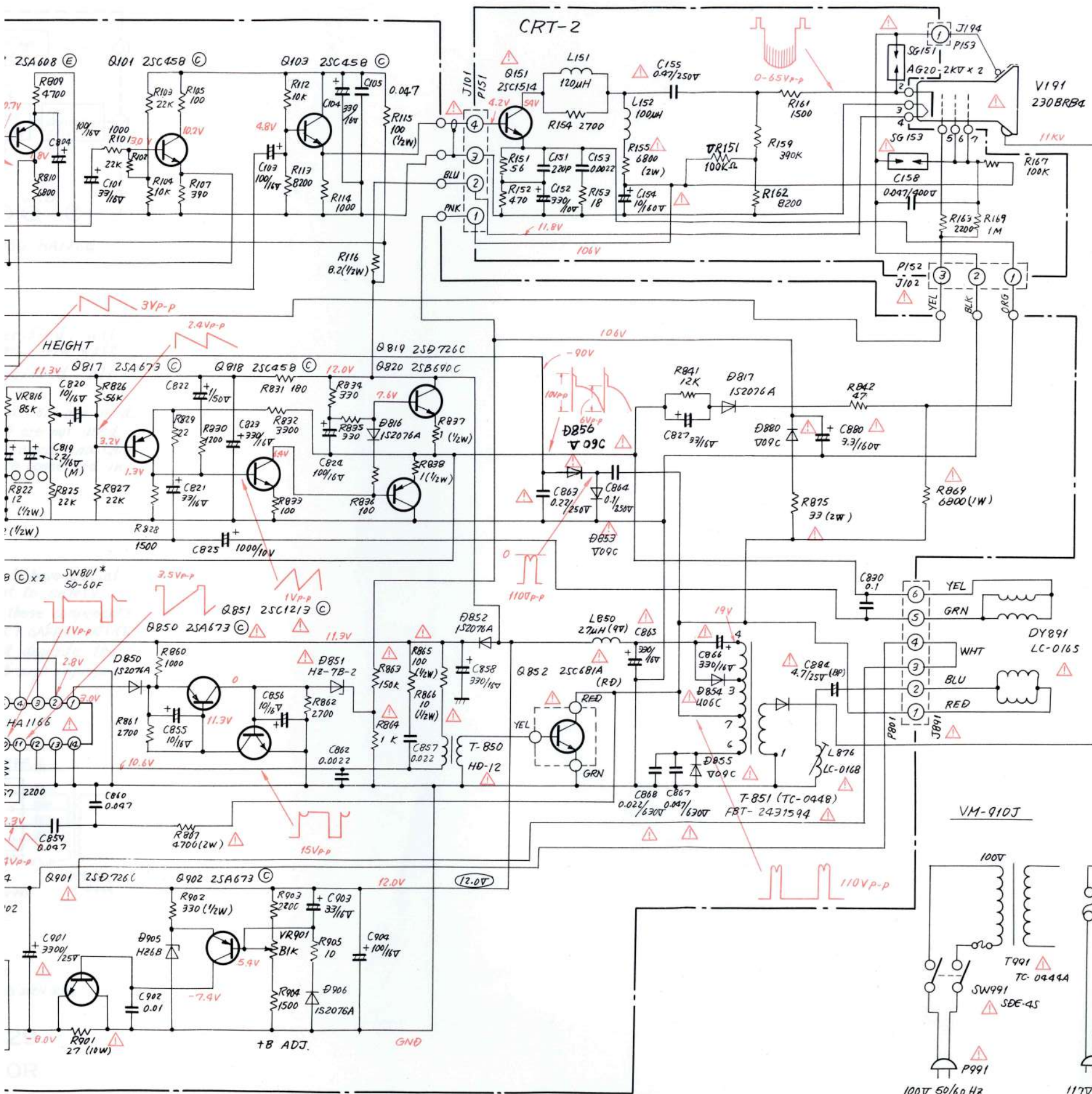


Notes
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Block diagram for IC 850 HA 1166

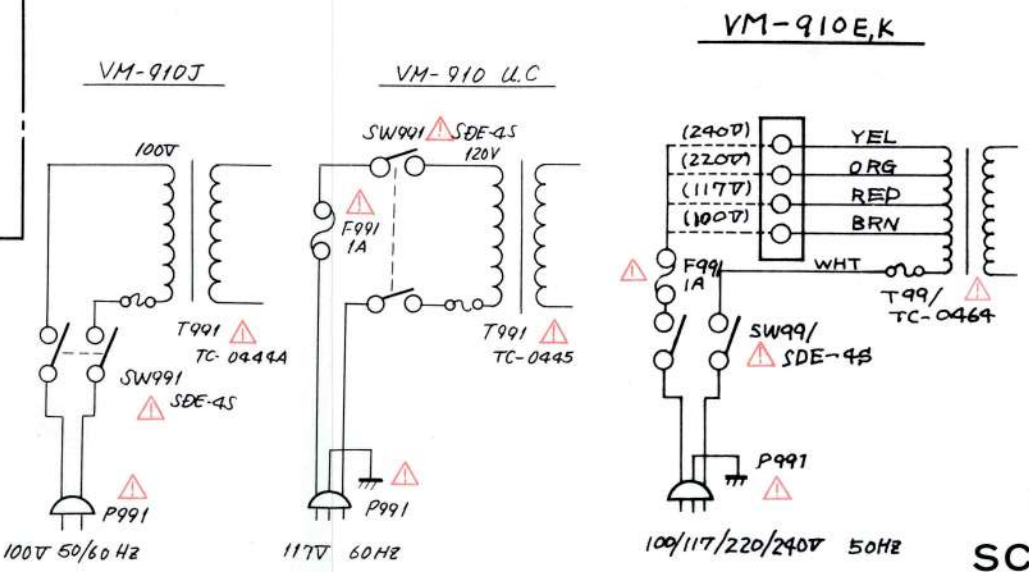
Notes

1. Unless otherwise specified, all resistors are in ohms, 1/4 watt.
2. Unless otherwise specified, all capacitors are in μF .
3. * Used only for J type.

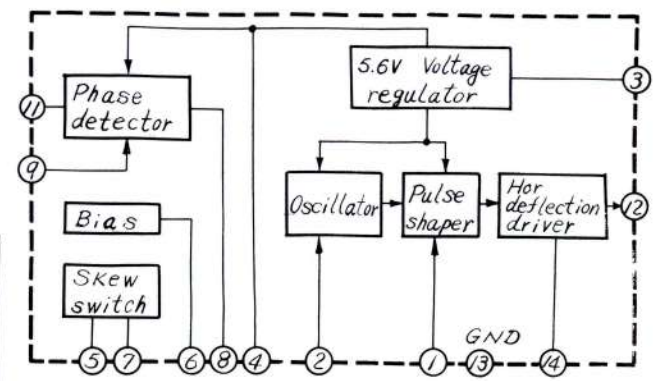
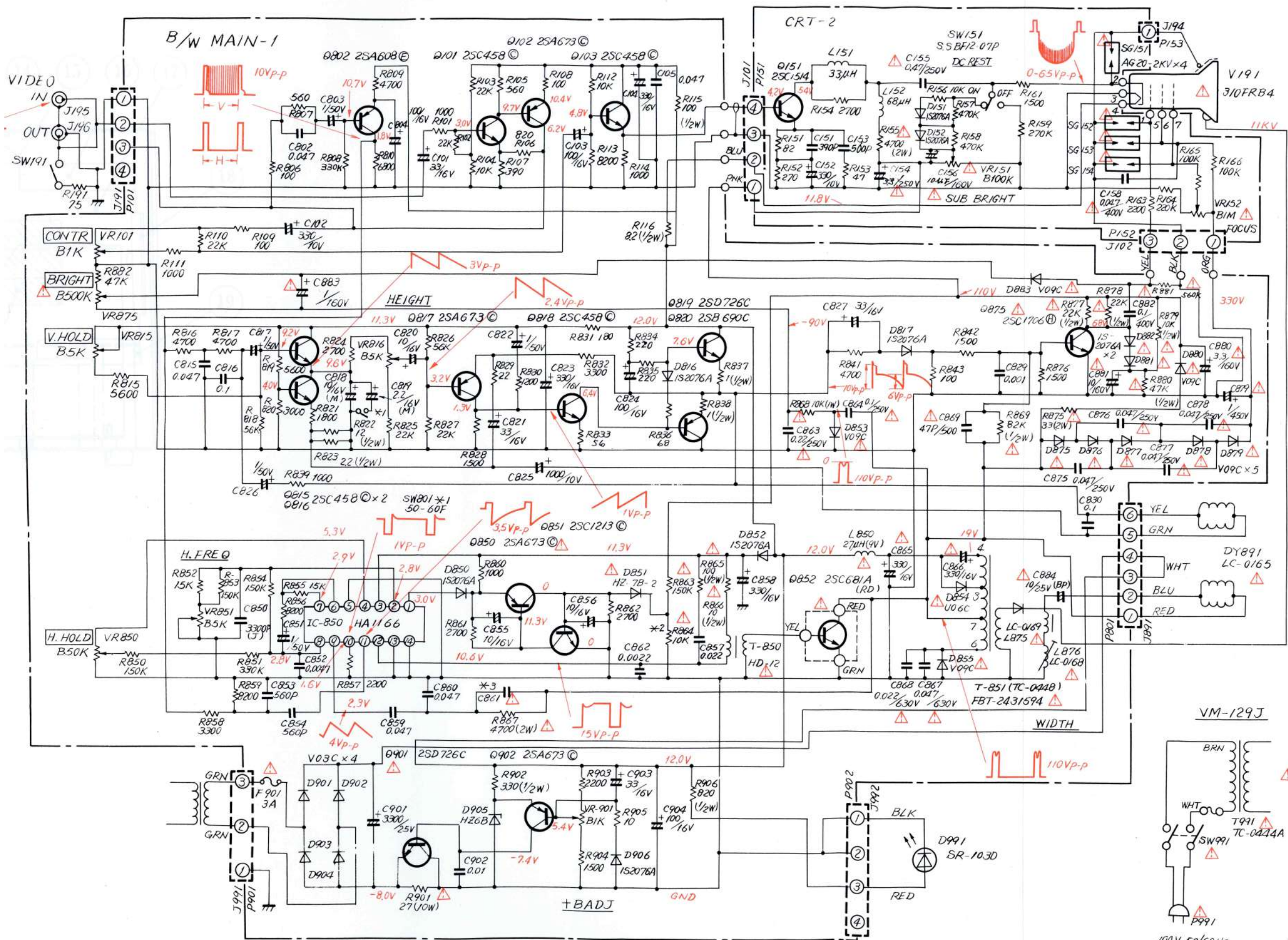
PRODUCT SAFETY NOTICE

- This schematic diagram is for serviceman only -
 Component 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.

Fundamental schematic diagram differences may be found between this schematic diagram and the servicing unit due to various improvements made hereafter.



MODEL VM-910
 SCHEMATIC DIAGRAM 31



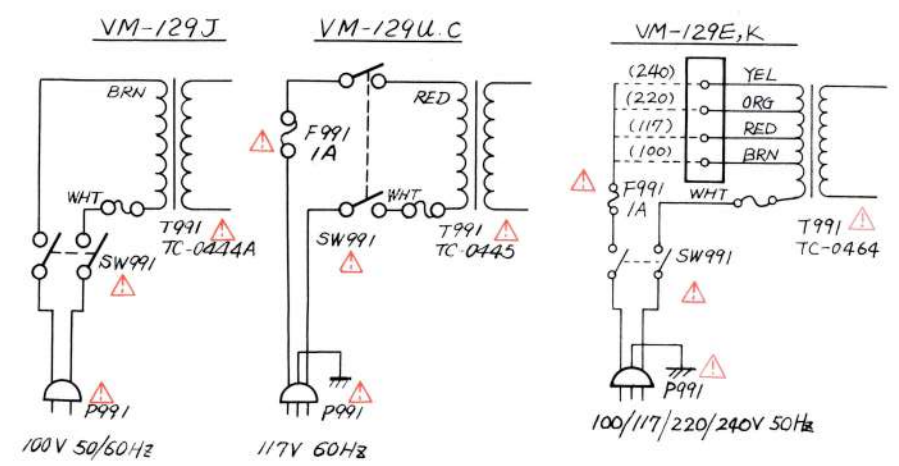
Block diagram for IC 850 HA1166

Notes

1. Unless otherwise specified, all resistors are in ohms, 1/4 watt.
2. Unless otherwise specified, all capacitors are in μF .
3. *1. J type: SW801, C818 and C819 are used.
U type: SW801 and C819 are not used.
E/K type: SW801 is not used, and C818 and C819 are connected in parallel.
4. *2, *3 Factory adjusted.

Product safety note

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.



MODEL VM-129
VIDEO MONITOR
SCHEMATIC DIAGRAM 33

10. MECHANICAL PARTS LIST AND EXPLODED VIEW

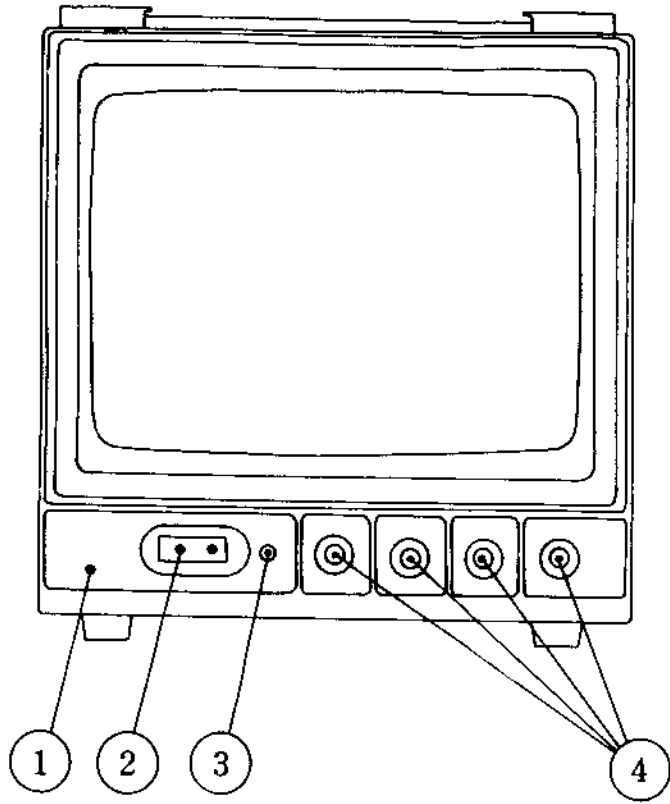
10.1 MODEL VM-906

- 1) CRT replacement
 1. Remove 4 control knobs (4).
 2. Take out 2 screws from both sides of front mask (1) and remove front mask.
 3. Take out 2 screws each from top and bottom of rear cover (24) and remove rear cover.
 4. Remove deflection yoke (13) and CRT-2PC board (18).
 5. Remove 4 CRT mounting nuts.
 6. Remove CRT from front of unit and replace.
 7. Reassembly by reversing above steps.

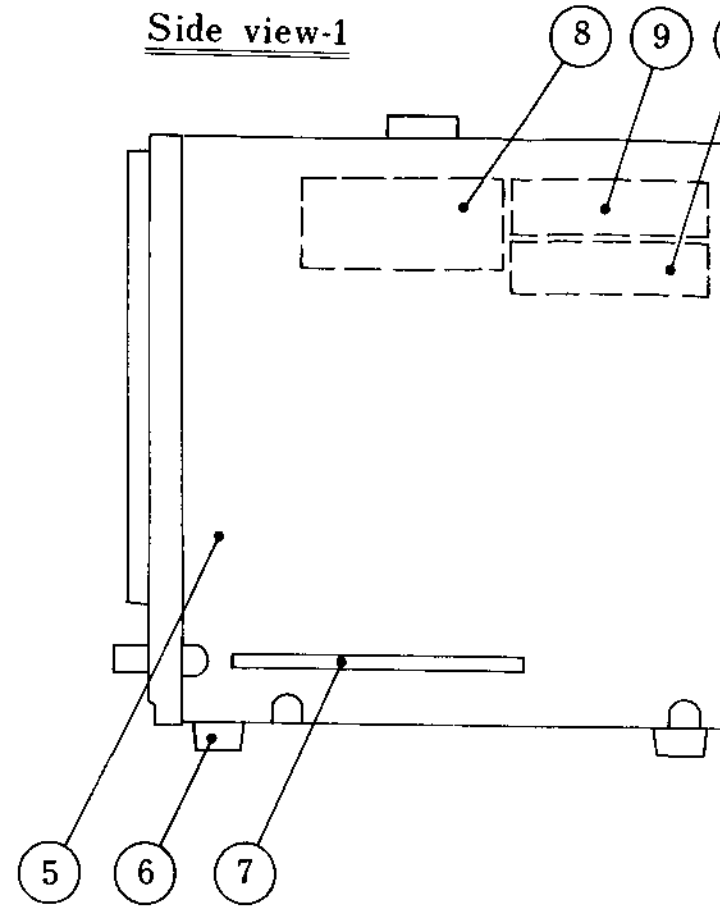
Symbol	Description	Remarks	Stock No.
1	Mask, Front		1002995D
2	Power Switch		
3	Lamp Cover		
4	Knob, Var. Resistor		4052871A
5	Cabinet		4C44957A
6	Foot		201370HB
7	Label, Side	U,C type	3022087A
8	" , CSA	C type	4058987A
9	" , Fuse	U,C type	4058742A
10	" , CSA, Fuse	C type	4052915A
11	Picture Tube		4055106A
12	Heat Sink		3024612A
13	Deflection Yoke		
14	Handle		4053616A
15	Nut, Plate		4053596C
16	Label, X-Ray	E type	4054315A
17	" , UL	U,C type	4057777A
18	CRT-2 PCB		
19	Label, CRT	U,C type	4058284B
20	Switch		
21	Blank Panel	U,C type	4058789B
22	"	E,K type	4058789C
23	Name Plate		
24	Bush, Power Cord	U,C type	4054721B
25	"	E,K type	4054721C
26	Cover, Rear		3024848A
27	Protector		
28	Label, CSA	C type	4054278A
29	" , U1, CSA	U,C type	4054275A
30	Chassis		2012726A
31	Lug C5		4044797E
32	Power Transformer	U,C type	
33	"	E,K type	
34	PCB Holder		4053815A
35	"		4056872A

- 2) B/W MAIN PC board replacement
 1. Remove 4 control knobs (4).
 2. Take out 2 screws from both sides of front mask (1) and remove front mask.
 3. Take out 2 screws each from top and bottom of rear cover (24) and remove rear cover.
 4. Place monitor on its side and take out 4 screws from both sides of cabinet
 5. Place chassis (28) in the normal position.
 6. Disconnect connectors of B/W MAIN-1 PC board.
 7. Take out 2PC board mounting screws [at side of heatsink (12)].
(At opposite side held by PC board holder.)
 8. Remove PC board and replace.
 9. Reassemble by reversing above steps.

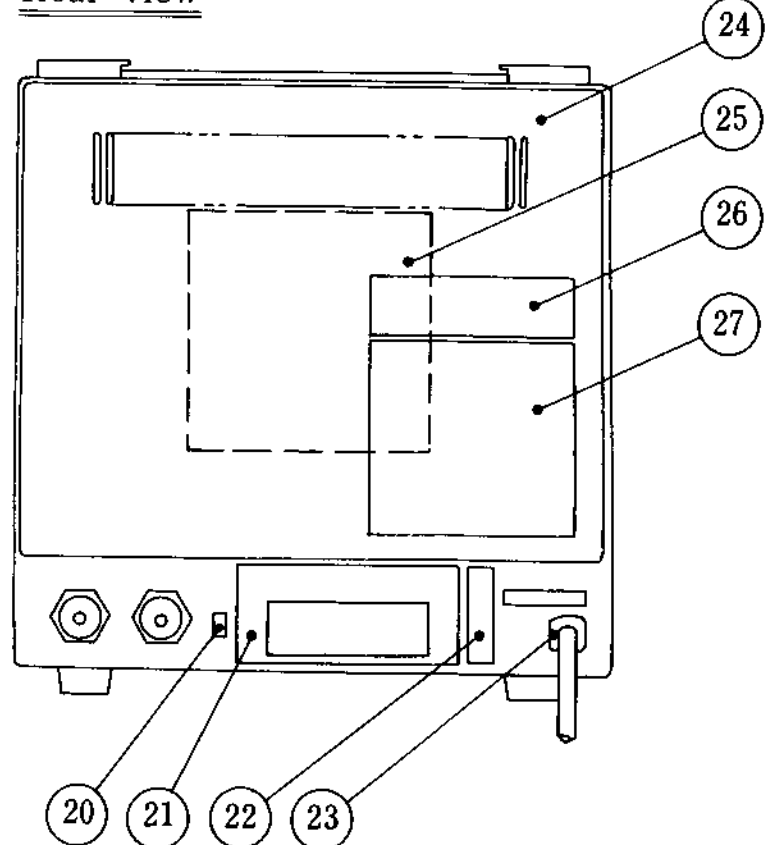
Front view



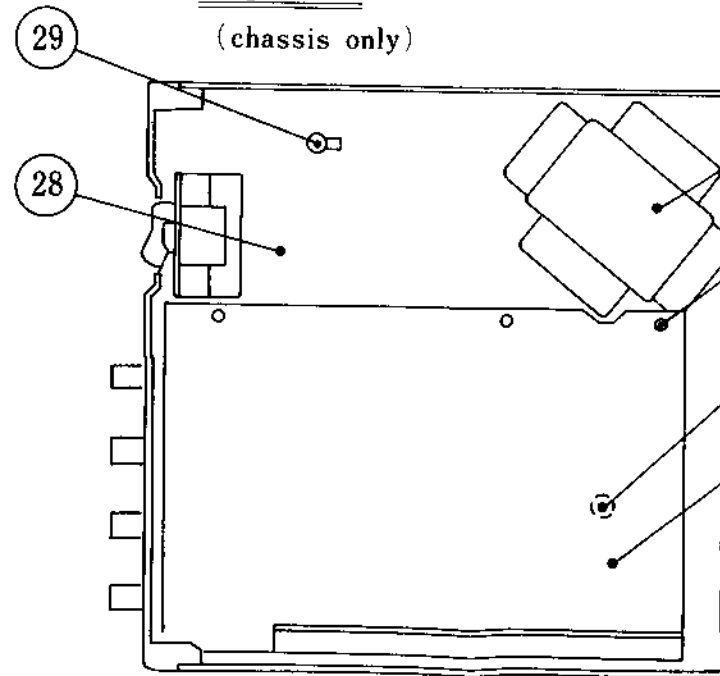
Side view-1



Rear view

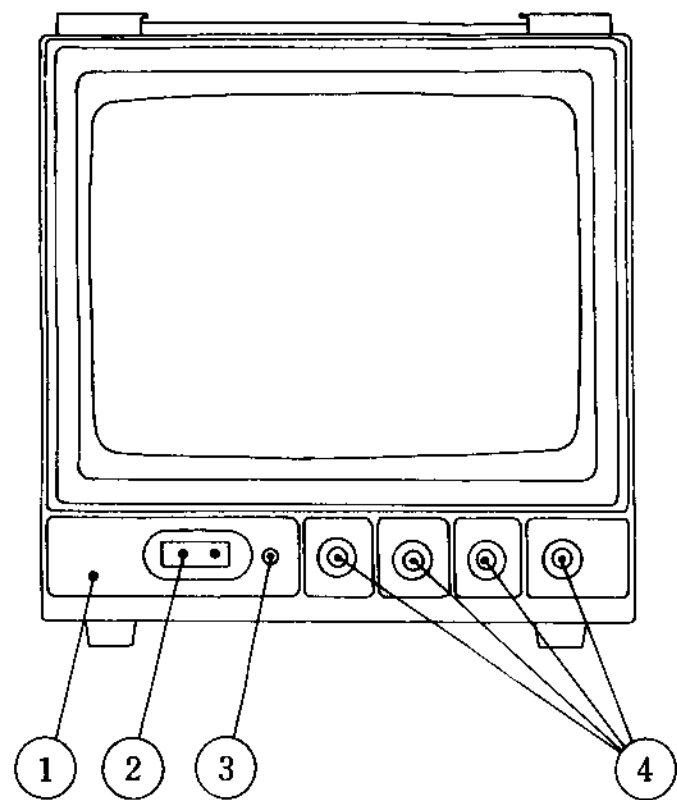


Top view

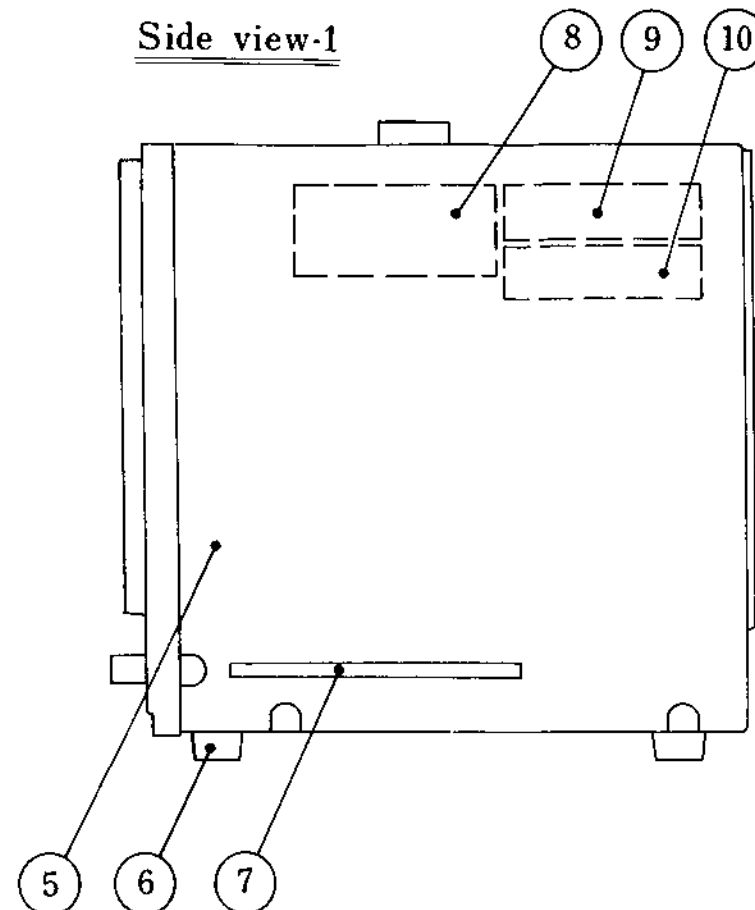


Description	Remarks	Stock No.
Front Panel		1002995D
Power Switch		4052871A
Top Cover		40514957A
Var. Resistor		2012708B
Resistor set		3022087A
Left Side Panel	U, C type	4058587A
Right Side Panel	C type	4058742A
Fuse	U, C type	4052915A
CSA, Fuse	C type	4055106A
Power Tube		7021612A
Choke		4051616A
Deflection Yoke		4053596C
IC Plate		4054315A
UL X-Ray	E type	4057777A
UL PCB	U, C type	4058284B
CRT	U, C type	4058789B
Chassis Panel	U, C type	4058789C
IC Plate	E, K type	4054721B
Power Cord	U, C type	4054721C
Right Rear Panel	E, K type	3024848A
Color Selector	C type	4054278A
UL CSA	U, C type	4054275A
Resistor set		2012726A
Transformer		4044797E
Holder	U, C type	4051815A
Holder	F, K type	4056872A
MAIN-1 PCB		

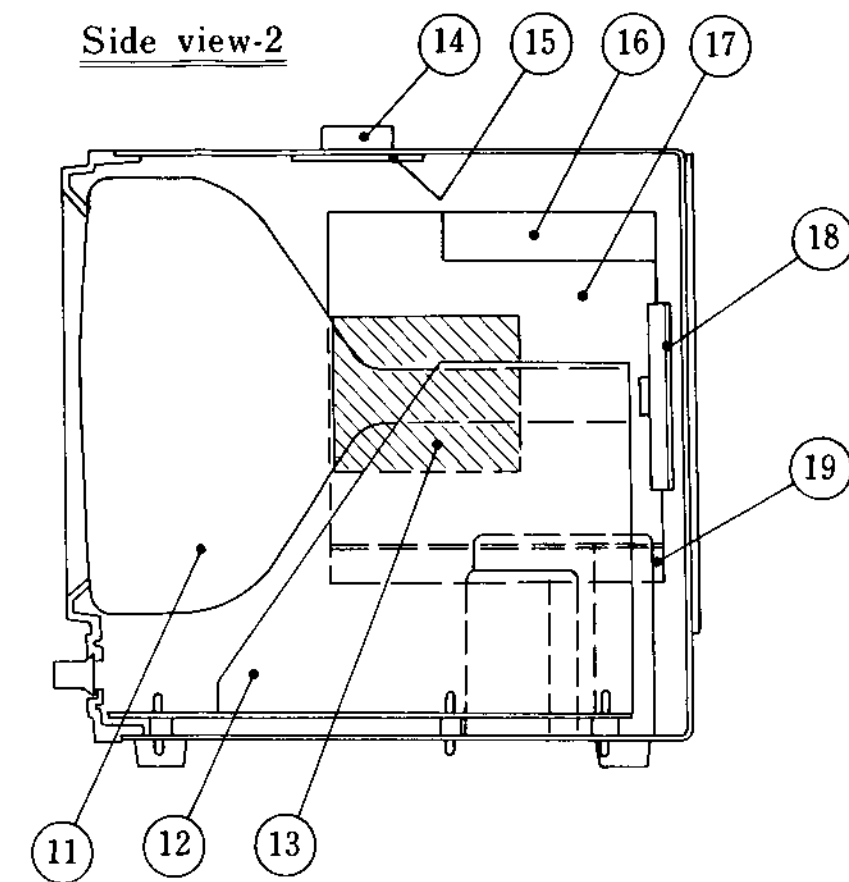
Front view



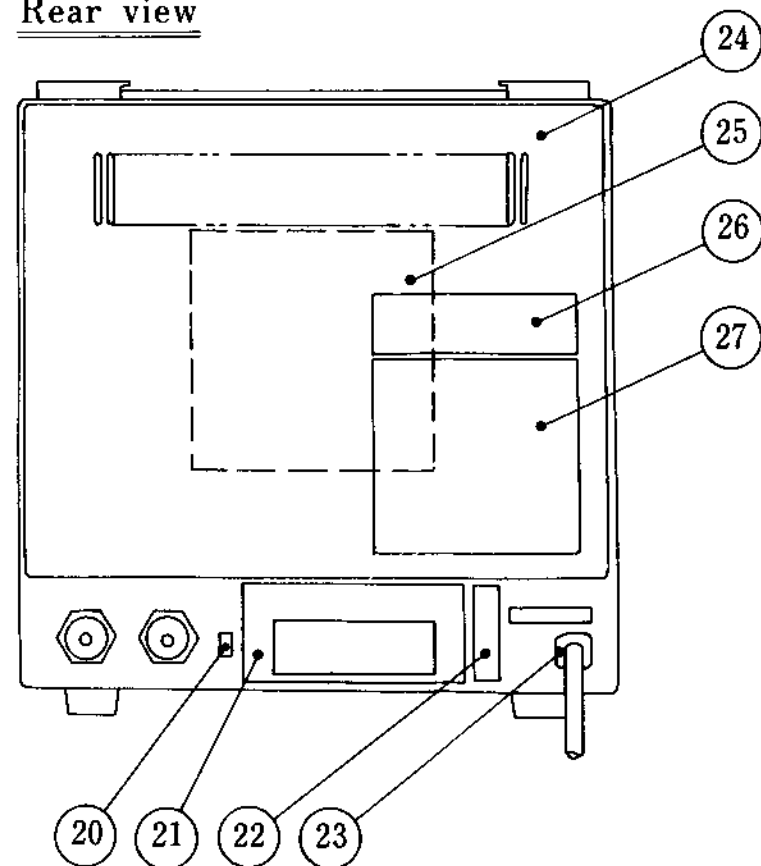
Side view-1



Side view-2

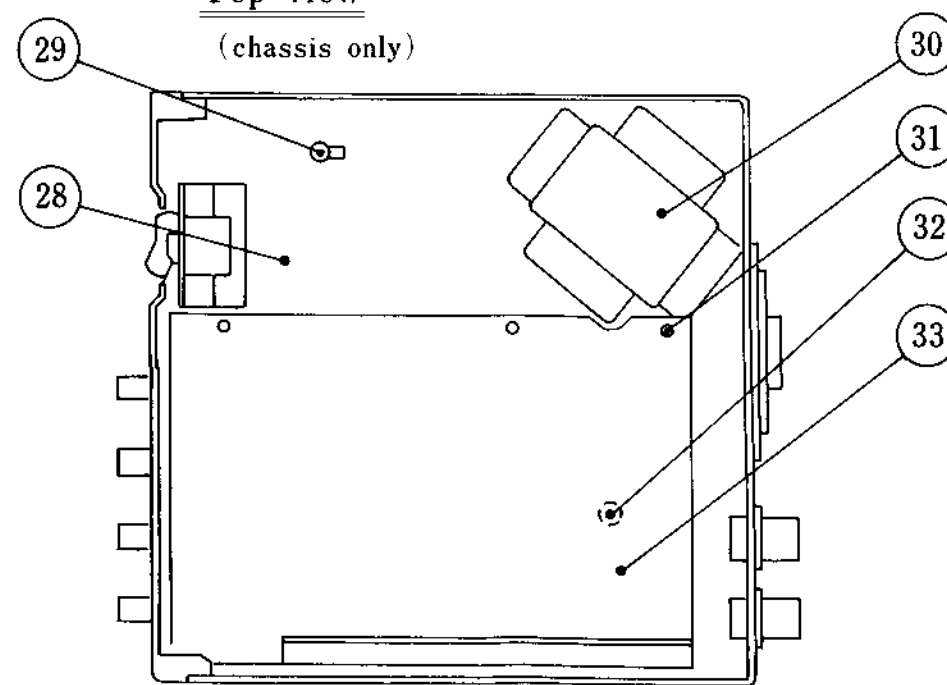


Rear view



Top view

(chassis only)



MODEL VM-906
EXTERNAL VIEW

10.2 MODEL VM-910

1) CRT replacement

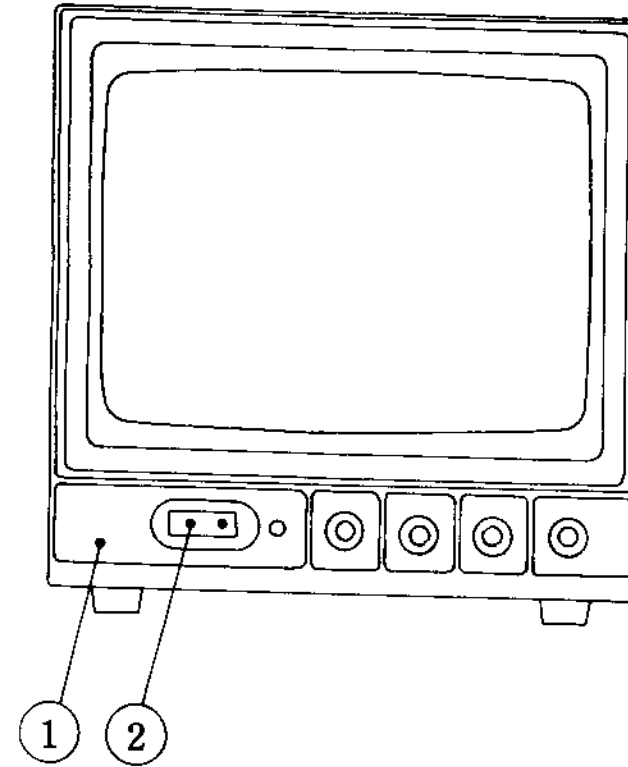
1. Take out 2 screws from both sides of front mask (1) and remove front mask.
2. Take out 2 screws each from top and bottom of rear cover (20) and remove rear cover.
3. Remove deflection yoke (11) and CRT-2PC board (14).
4. Remove 4 CRT mounting nuts.
5. Remove CRT from front of unit and replace.
6. Reassemble by reversing above steps.

Symbol	Description	Remarks	Stock No.
1	Mask, Front		1002993C
2	Power Switch		
3	Cabinet		2012708A
4	Foot		3022087A
5	Label, Side	U, C type	4058587A
6	" , CSA	C type	4058742A
7	" , Fuse	U, C type	4052915A
8	" , CSA Fuse	C type	4055106A
9	Picture Tube		
10	Heat Sink		3024612A
11	Deflection Yoke		
12	Label, X-Ray	E type	4054315A
13	" , UL	U, I. type	4057777A
14	CRT-2PCB		
15	Label, CRT	U, C type	4058284B
16	Switch		
17	Blank Panel		
18	Nameplate		
19	Bush, Power cord	U, C type	4054721B
	"	E, K type	4054721C
20	Cover, Rear		3024844A
21	Protector		4058790A
22	Label, CSA	C type	4054278A
23	" , UL, CSA	U, I. type	4054275A
24	Chassis		2012706A
25	Lug, CS		3041797E
26	Power Transformer	U, C type	
	"	I, K type	
27	PCB Holder		4053815A
28	"		4056872A
29	B/W MAIN 1 PCB		

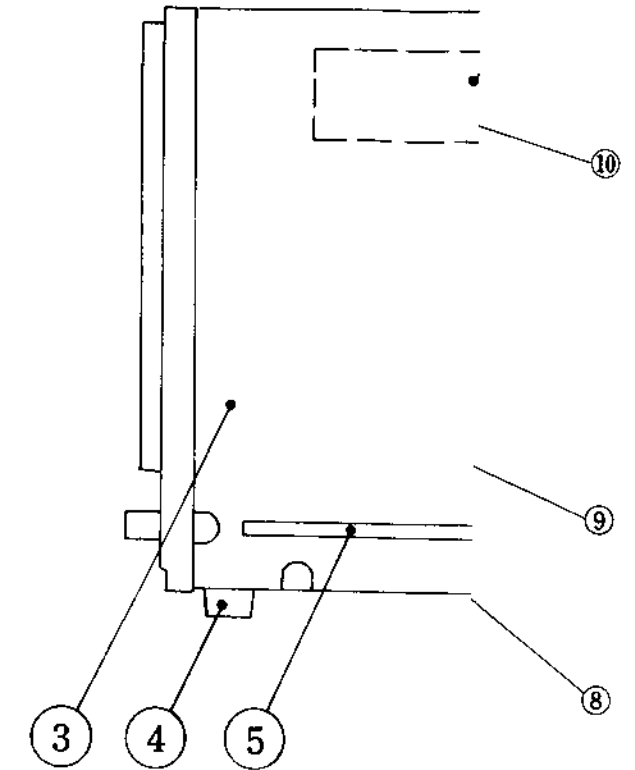
2) B/W MAIN PC board replacement

1. Take out 2 screws from both sides of front mask (1) and remove front mask.
2. Take out 2 screws each from top and bottom of rear cover (20) and remove rear cover.
3. Place monitor on its side and take out 4 screws from both sides of cabinet (3).
4. Place chassis (24) in the normal position.
5. Disconnect connectors of B/W MAIN-1 PC board.
6. Take out 2 PC board mounting screws [at side of heat sink (10)].
(At opposite side held by PC board holder.)
7. Remove PC board and replace.
8. Reassemble by reversing above steps.

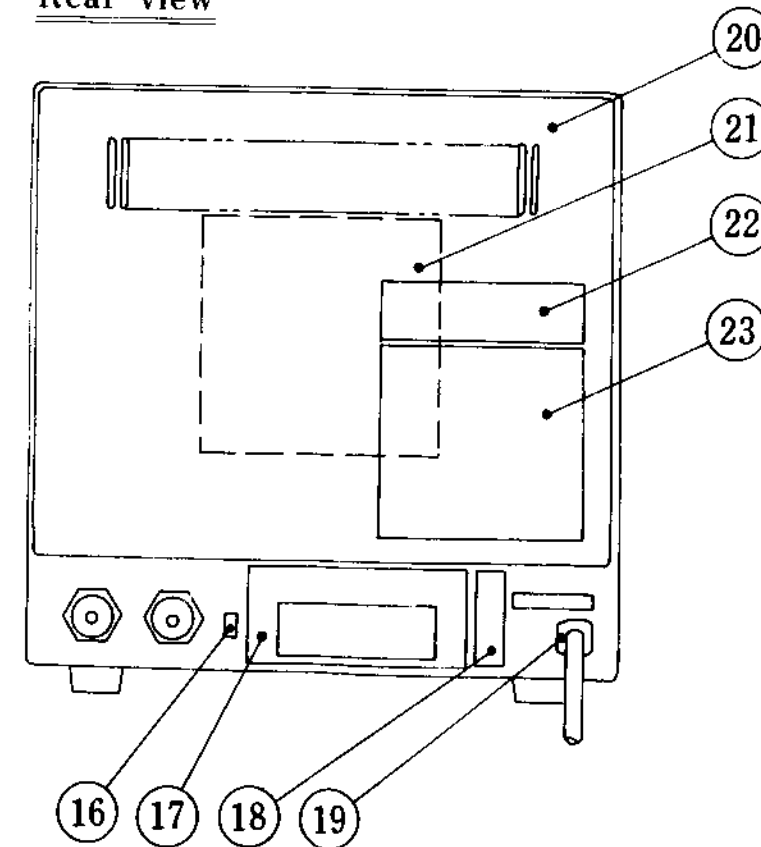
Front view



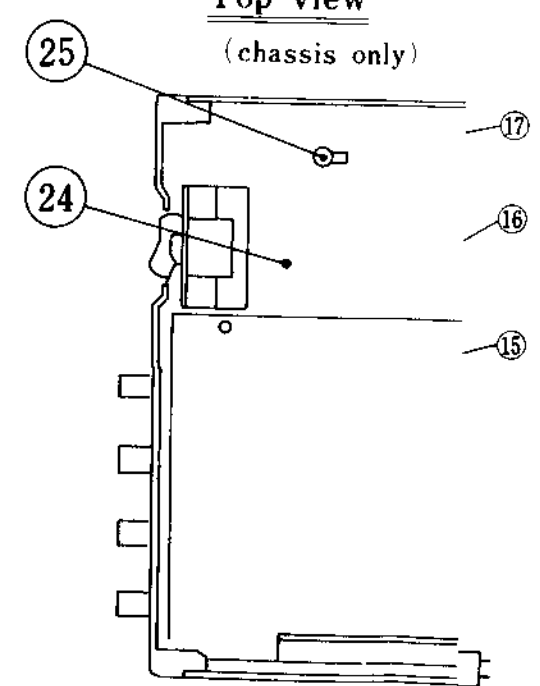
Side view-1



Rear view

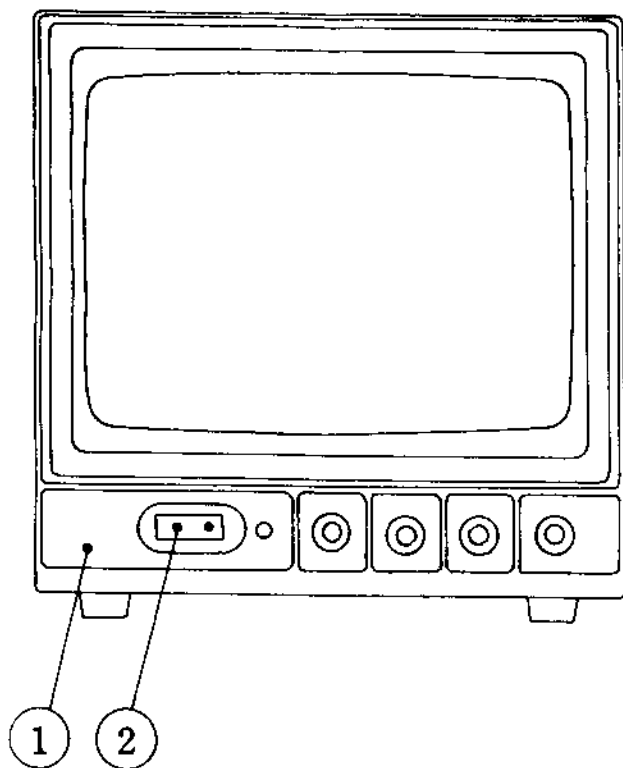


Top view

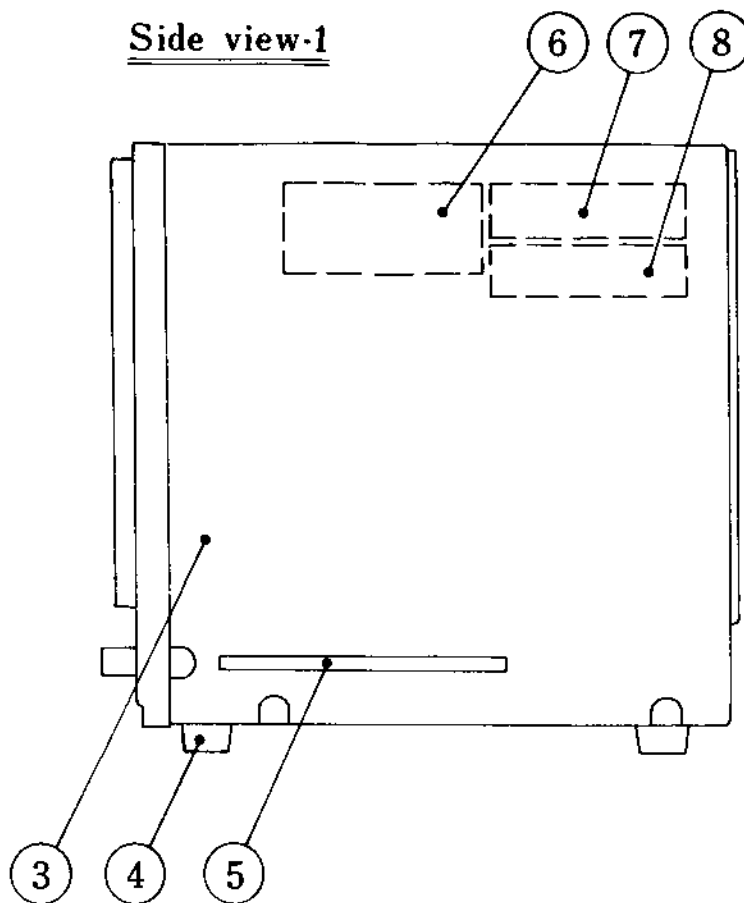


Description	Remarks	Stock No.
Front Switch		1002995C
Panel		2012708A
Side Panel	U, C type	3022087A
CSA	C type	4058587A
Fuse	U, C type	4058742A
CSA Fuse	C type	4052915A
Tube		4055106A
Yoke		3024612A
Yoke		
X-Ray	E type	4054315A
UL	U, I type	4057777A
PCB		
CRT	U, C type	4058284B
Power card	U, C type	4054721B
Power card	F, K type	4054721C
Rear Panel		3024444A
CSA	C type	4058790A
UL CSA	U, I type	4054278A
5		4054275A
Transformer	U, C type	2012756A
Transformer	F, K type	4044797E
older		4053815A
older		4056872A
AIN 1 PCB		

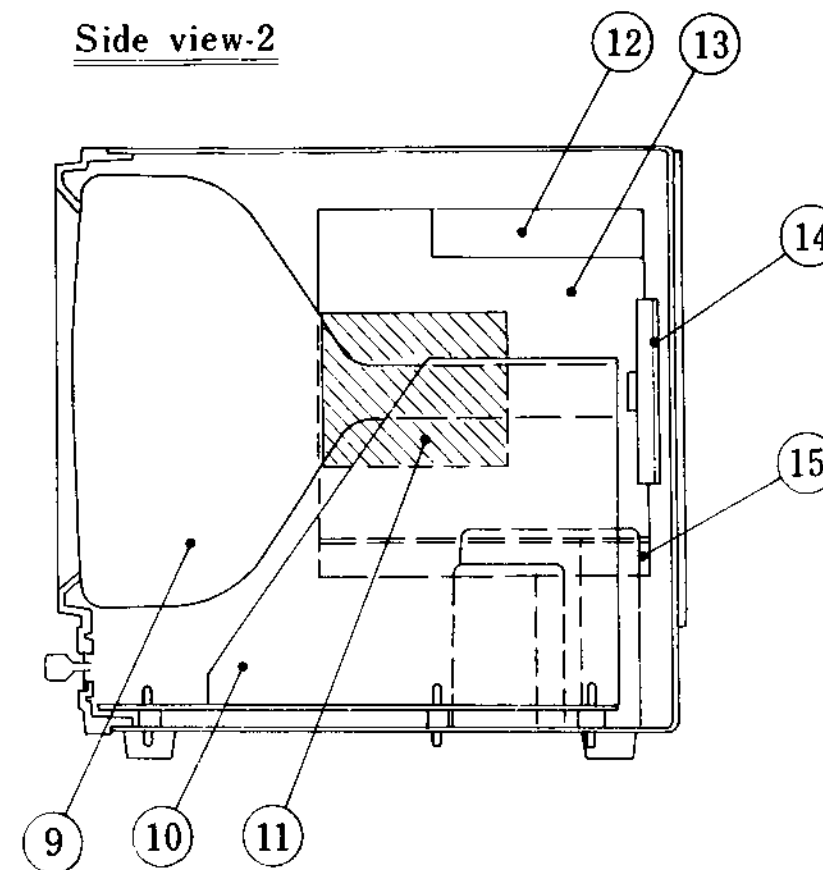
Front view



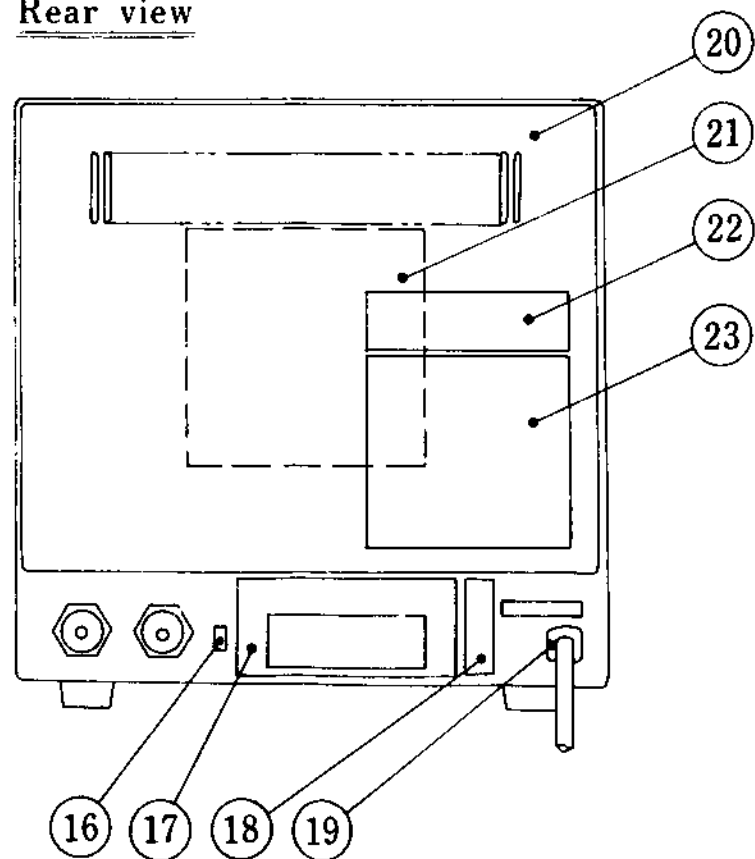
Side view-1



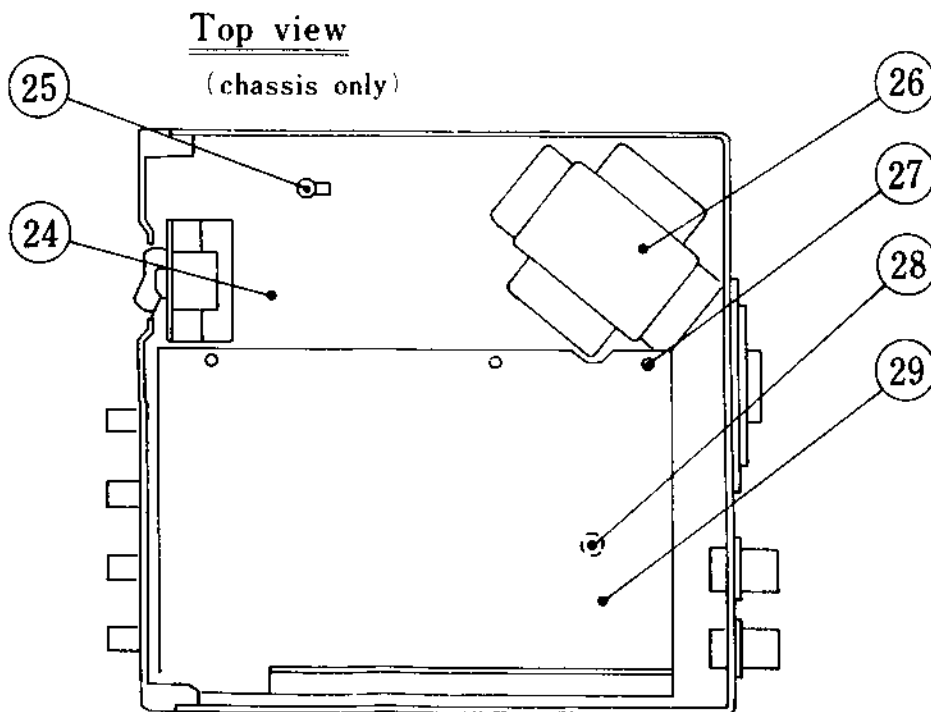
Side view-2



Rear view



Top view



MODEL VM-910
EXTERNAL VIEW

10.3 MODEL VM-129

1) CRT replacement

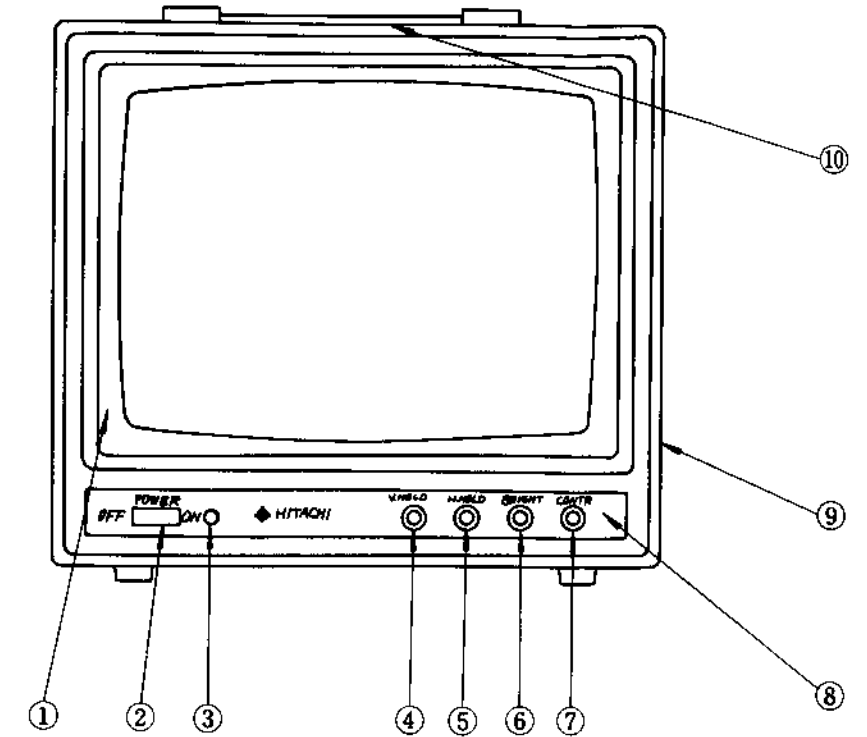
1. Remove control knobs ④ ⑤ ⑥ ⑦ .
2. Take out 2 screws of both sides of front mask ① and remove front mask.
3. Take out 2 screws each from top and bottom of rear panel ⑱ and remove rear panel.
4. Remove deflection yoke ⑳ and CRT-2 PC board ㉓ .
5. Remove 4 CRT mounting nuts.
6. Remove CRT from front of unit and replace.
7. Reassembly by reversing above steps.

2) B/W MAIN PC board replacement

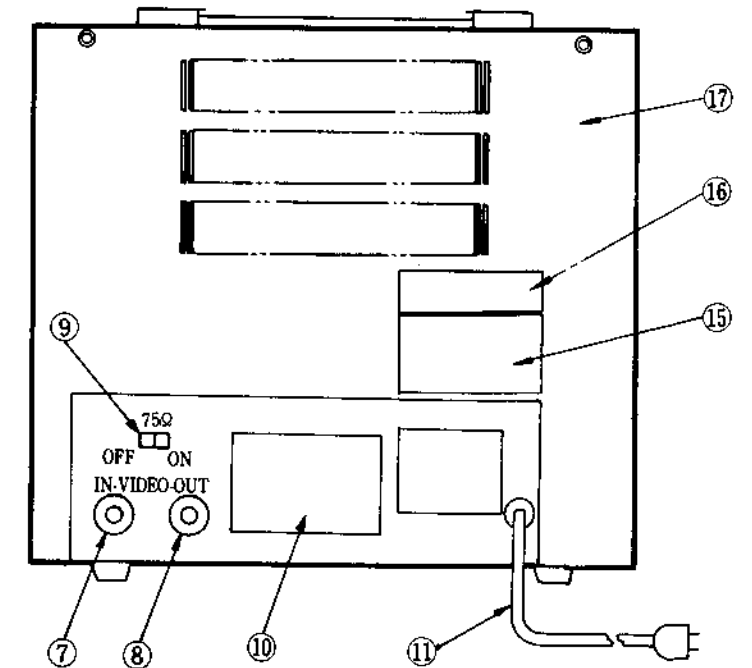
1. Remove control knobs ④ ⑤ ⑥ ⑦ .
2. Take out 2 screws from both sides of front mask ① and remove mask.
3. Remove pilot lamp connector J992.
4. Take out 2 screws each from top and bottom of rear panel and remove panel.
5. Place monitor on its side and take out 6 screws from bottom panel of cabinet ⑨ .
6. Place chassis ㉑ in the normal position.
7. Disconnect connectors of B/W MAIN-1 PC board.
8. Take out 2 PC board mounting screws [at side of heatsink ⑲] .
(At opposite side held by PC board holder.)
9. Remove PC board and replace.
10. Reassemble by reversing above steps.

Symbol	Description	Remarks	Part Code
1	Mask		1003248A
2	Power Switch SDE-4SB-2	SW991	(J31020008)
3	Pilot lamp SR-101D RED	D991	(H22100004)
4	Knob, Var. Resistor		4C44957A
5	"		"
6	"		"
7	"		"
8	Front panel		3024807A
9	Cabinet		1003072A
10	Handle		4053616A
12	Foot		3022087A
13	Bush, Power Cord	U,C type	4054727B
		E,K type	4054721C
14	Switch SS(F) 12-07	SW191	(J32000045)
15	UL, CSA, Label		4054275A
16	CSA Label		4054278A
17	Rear cover		3024611A
18	Picture Tube 310FRB1		(H16112004)
19	Heat Sink		3024612A
20	Transistor 2SC681 ARD	Q852	(H23300015)
21	X-Ray Label	E type	4054315A
22	UL Label	U,C type	4057777A
23	CRT-2 PCB		(3024390)
24	Deflection Yoke LC-0165(2440801)	DY891	(K62620025)
25	Lug C5		4044797E
26	PCB Holder		4055078A
27	B/W MAIN-1 PCB		(2012674)
28	CSA Fuse Label	C type	4055106A
29	Fuse Label	U,C type	4052915A
30	Power Transformer TC-0445	U,C type	(J12110071)
	" TC-0446	E,K type	(J12110072)
31	Chassis		2012658A

Front view



Rear view





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