Ikegami

OPERATING INSTRUCTIONS & SERVICE MANUAL

MODEL PM-950

PICTURE MONITOR

Rev. I

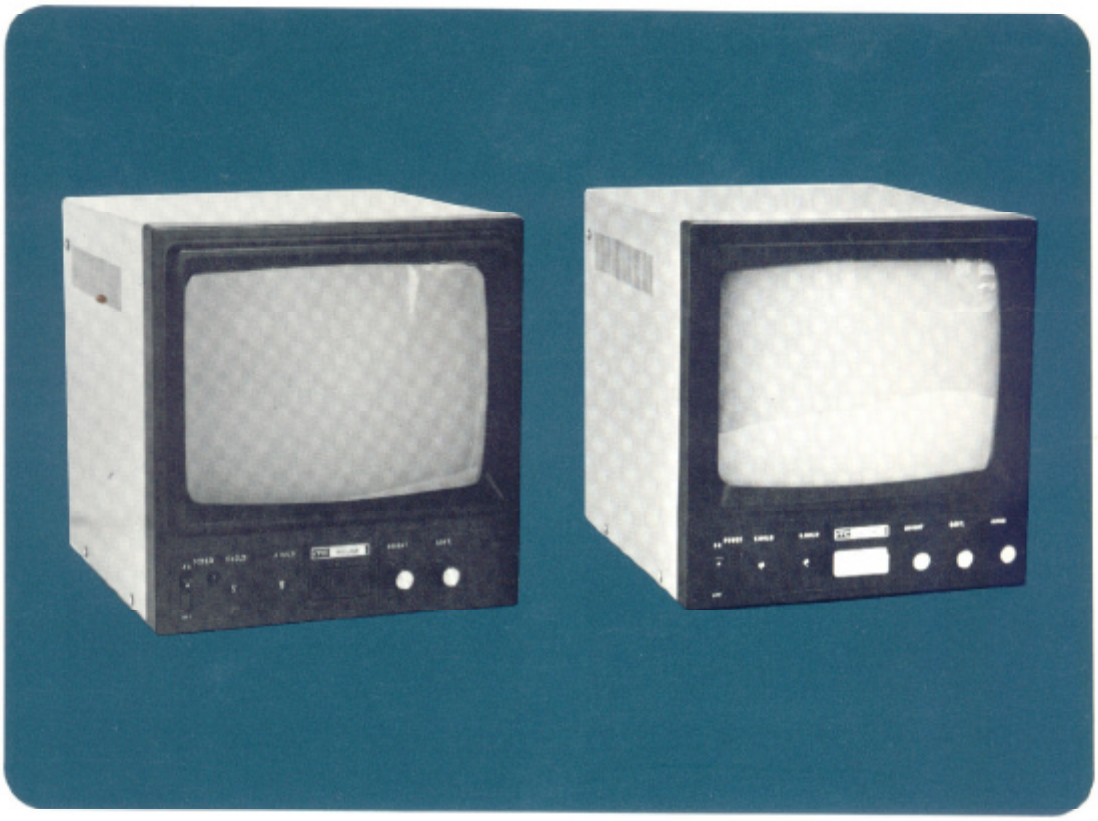

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Table of Contents:

OUTDOOR USE WARNING:
WARNING—TO PREVENT FIRE OR ELECTRIC SHOCK,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

PLEASE NOTE: The PM-950 is a finely adjusted, precision piece of equipment. To be assured of trouble-free operation, full performance capability and a long service life, we recommend that you check this manual completely, before attempting to assemble, install or operate this picture monitor.

PRELIMINARIES: When unpack after transit, set the packing carton down horizontally in an adequately spacious area, open and remove the inner packings and the equipment items with care, examining each for signs of transit damage. Verify that all standard supplied items are included, plus the accessories as ordered.

Careful handling of the picture monitor and accessories should be practiced at all times, avoiding unnecessary physical shocks and similar rough handling. And the picture monitor should be always be set up in a well ventilated area, and shielded from heat sources, high-powered light, strong magentic field and so on.

WARNING

Although this is a SOLID STATE UNIT with relatively low supply voltage rails, power or mains supply voltages are present on certain parts of the unit.
While these parts are not accessible under operating conditions, Extreme care should be taken when carrying out adjustment or maintenance as power or mains voltages can be LETHAL!

INTRODUCTION

The 9-inch picture monitor PM-950 is designed for industrial monitoring use, incorporating the latest technology and featuring the use of ICs and all silicon semi-conductors, great resistance to shock and vibration, and high reliability. The PM-950 consists of easy-to-handle plugin type circuit boards, an integrally built front panel of ABS plastic moding, and a housing having a rigid frame.
The frame ground and signal ground are located apart from each other.

The picture monitor has excellent electrical performance in high quality picture reproduction. A horizontal resolution of 650 TV lines or better in the center is provided by a high frequency band (8MHz$^{+\frac{1}{3}}_{-}$dB) video amplifier circuit. Linearity is good with a minimum of deflection distortion and raster distortion.

The front control panel is carefully designed for ease of control. It has only two control knobs, brightness and contrast. The H and V hold controls can be turned only with a screwdriver to prevent accidental turning.
The front control panel, finished entirely in black to prevent light reflection, has a power switch, and pilot lamps and may be fitted with an optional tally lamp panel.

Scan size selector, VTR select switch, internal sync - external sync selector, DC regenerator circuit, and automatic brightness control circuit (ABL) are provided.
The scan size selector may be used for selecting the 5% overscan mode or the 10% underscan mode so the picture monitor can be used for not only ordinary image monitoring but studio, instrument and many other applications.
The VTR select switch is designed for stabilized sync video reproduction even if VTR playback signals are imperfect.
The picture monitor has not only a composite video signal internal sync terminal but an external sync operation by setting the sync mode select switch to the external sync position.
The ABL circuit limits the CRT cathode current and brightness when video input signals which would extremely increase brightness are applied. This and other functions that are employed only in some expensive monitors are installed in the economically priced PM-950.

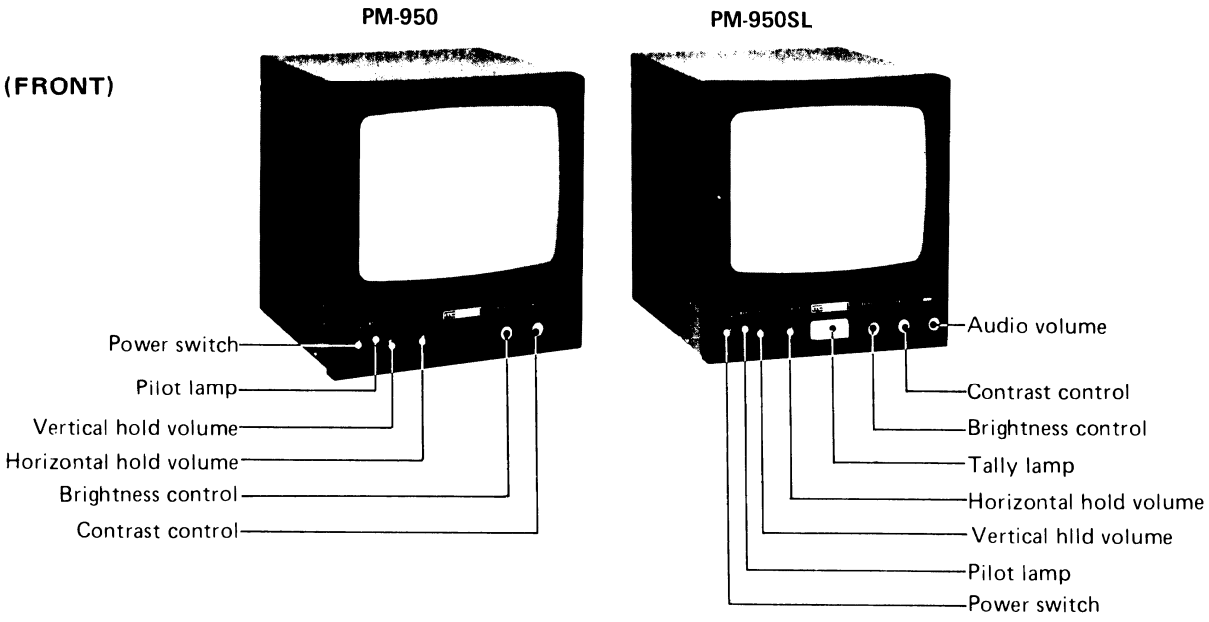
Options include a tally function that is necessary for studios, DC work specifications for operation on DC 12V, and an audio circuit.
A standard 19-inch rack mount panel and light hood are available for ease of use.

The picture monitor incorporates safety features, and is designed to correspond to the UL and CEE specifications. The power cord, power switch, power transformer, fuses and other power-related parts are made to specifications similar to the UL and CEE specifications.
The recently raised problem of X-ray radiation from the CRT has been solved by taking an effective safety measure to prevent it.

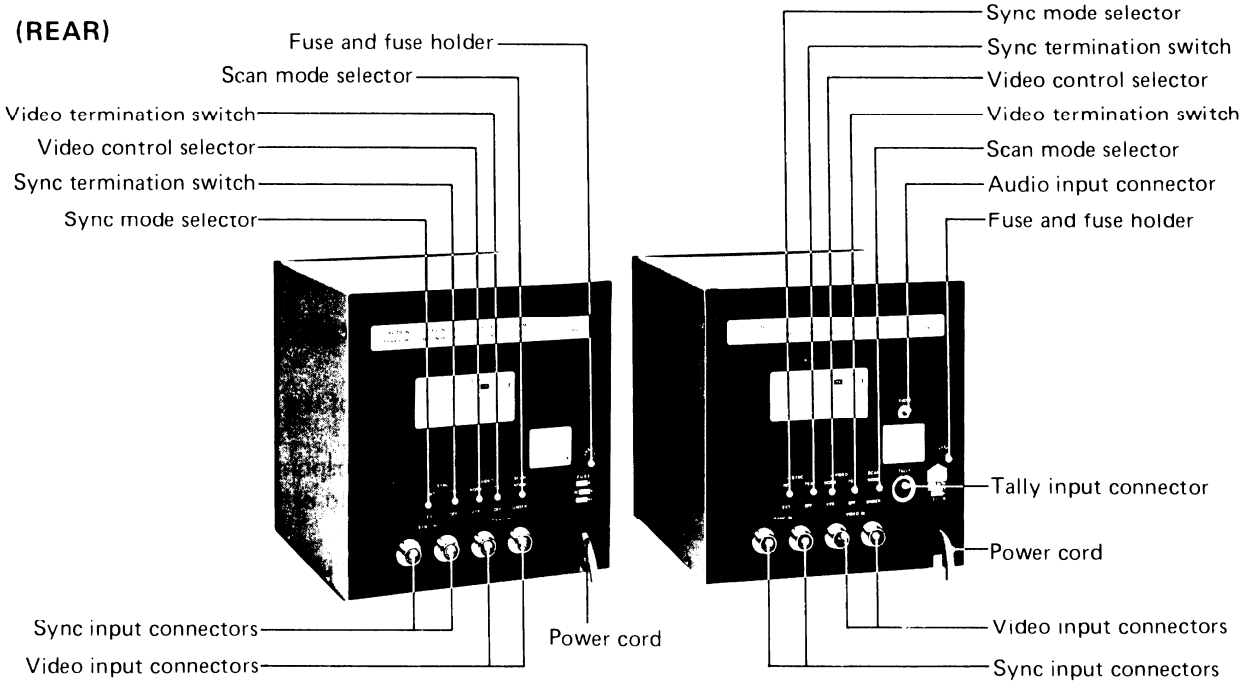
Although the PM-950 is carefully designed for maximum safety, it has dangerous components, such as the high-tension generator, so be sure to turn the power off or, if the power cannot be turned off, exercise utmost care when checking, adjusting or repairing the inside of the picture monitor.

NOMENCLATURE

(FRONT)

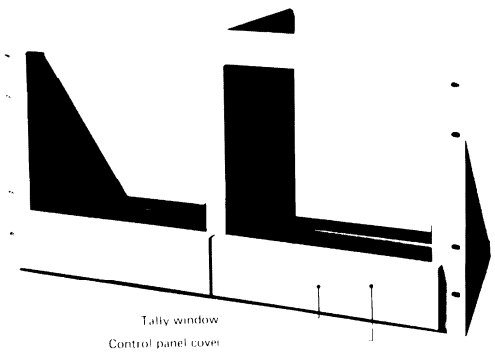


(REAR)



(ACCESSORIES)

SCREEN HOOD



RACK-MOUNTING PANEL

OPERATING INSTRUCTIONS

Cautions on operation

(1) This monitor can be placed at any desired position. By observing the following instructions, monitoring of stable pictures will always be possible.

   (1) Keep the monitor away from a source of vibration.

   (2) Avoid placing the monitor at places where its face is directly exposed to sunlight or other bright light.

   (3) When placing the monitor alongside some other equipment, provide a space of more than 50 mm around it, so as to assure good ventilation.

   (4) Try to keep the monitor free from moisture.

   (5) Also keep it free from dust.

   (6) Be sure that the monitor is kept away from any equipment which generates strong magnetic force.

   (7) Avoid places where the temperature is excessively high or low.

(2) The image on the screen will go out when the contrast adjustment knob (CONT) or the brightness adjustment knob (BRIGHT) is fully turned counterclockwise. This is not an indication of any defect.

(3) The monitor is available in two different field frequencies: 50 Hz and 60 Hz. A combination of different frequencies will cause changes in the vertical amplitude and linearity.

(4) Inside the monitor, there are some parts that generate 10 KV high voltage. Removal of the case, when necessary, should be done by qualified service personnel only.

CONNECTIONS

(1) Power source

Connect the AC plug to a power source which is within ±10% of the designated single phase AC source.
A picture will appear on the screen about 30 seconds after the power switch is turned ON.

(2) Video and synchronous signals

A. Connecting one monitor and one camera

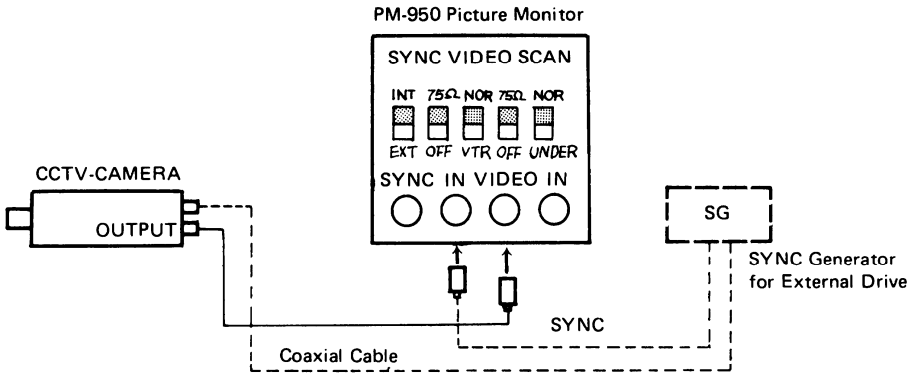


Fig. 1

* Connect the M type coaxial connector of the camera OUTPUT with the M type coaxial connector of the monitor's VIDEO IN, using a 75 ohm coaxial cable.

* Set the monitor VIDEO 75 ohms - OFF at 75 ohms.

* Set the monitor's SYNC INT-EXT at INT.

* When operating the monitor using external synchronous signals, set the SYNC INT-EXT at EXT and SYNC 75 ohms -OFF at 75 ohms. Then connect the SYNC OUT of the synchronous signal generator with the M type coaxial connector of the monitor's SYNC IN, using a 75 ohm coaxial cable.

* There are two VIDEO IN and SYNC IN input connectors each. They are paired, and therefore, no harm will be caused regardless of how they are connected.

B. Connecting one monitor with several cameras

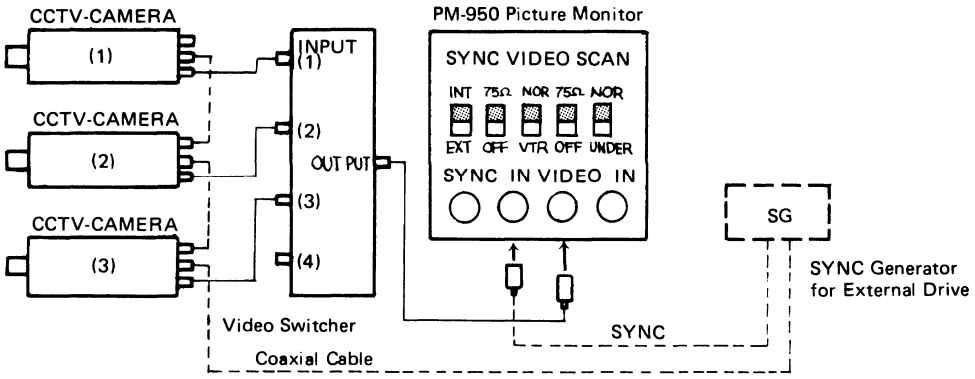


Fig. 2 Connecting one monitor with several cameras

* When monitoring pictures from several cameras using only one monitor, the video switcher can be used.

Connect the M type coaxial connector of the camera OUTPUT and the M type coaxial connector of the video switcher using a 75 ohm coaxial cable.

* Connect the M type coaxial connector of the video switcher's OUTPUT and M type coaxial connector of the monitor's VIDEO IN, using a 75 ohm coaxial cable.

* Set the VIDEO 75 ohms - OFF of the monitor at 75 ohms.

* Set the SYNC INT-EXT of the monitor at INT.

* When the monitor is operated using external synchronous signals, set the monitor's SYNC INT-EXT and SYNC 75 ohm - OFF at 75 ohms. Then connect the M type coaxial connectors of the SYNC OUT of the synchronous signal generator and of the monitor's SYNC IN, using a 75 ohm coaxial cable.

C. Connecting several monitors with one camera

C-1 Bridge connection of monitors

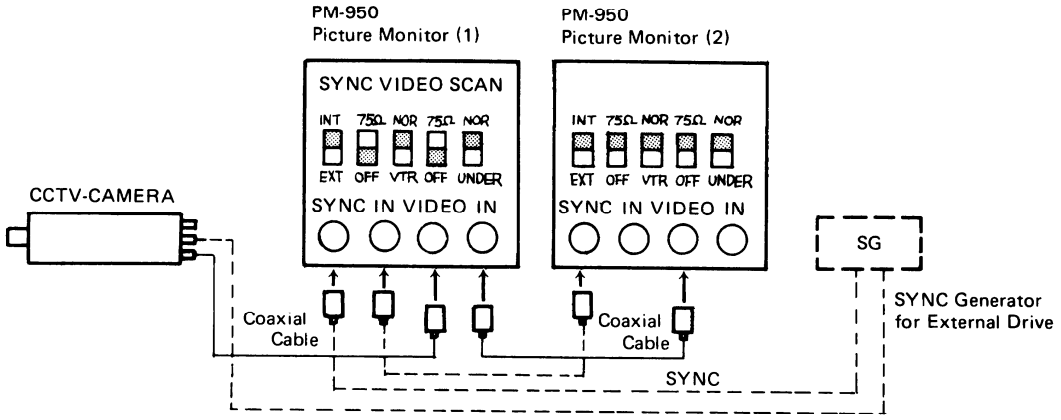


Fig. 3 Bridge connection of monitors with one camera

* Connect the M type coaxial connector of the camera OUTPUT and M type coaxial connector of the VIDEO IN of the monitor.

(1) using a 75 ohm coaxial cable.

* Connect the remaining M type coaxial connectors of the VIDEO IN of the monitor (1) with the VIDEO IN of the monitor (2), using a 75 ohm coaxial cable.

* Set the VIDEO 75 ohms - OFF of the monitor (1) at OFF and that of the monitor (2) at 75 ohms.

* When connecting more than 2 monitors, connect them in series starting with the first one, and set the last monitor at 75 ohms, leaving all the other switches OFF.

* Set the SYNC INT-EXT of the monitor at INT.

* When the monitor is operated using external synchronous signals, set the monitor SYNC INT-EXT at EXT and connect in series the M type connectors of the SYNC OUT of the synchronous signal generator and of the monitor SYNC IN using a 75 ohm coaxial cable, starting with the first monitor. Set the SYNC 75 ohms - OFF at 75 ohms at the last monitor, leave all the rest at OFF.

* When using more than 10 monitors in conjunction with one camera, use a video distributor.

* A synchronous distributor may be used when sharing SYNC with several monitors.

C-2 Use of video distributor

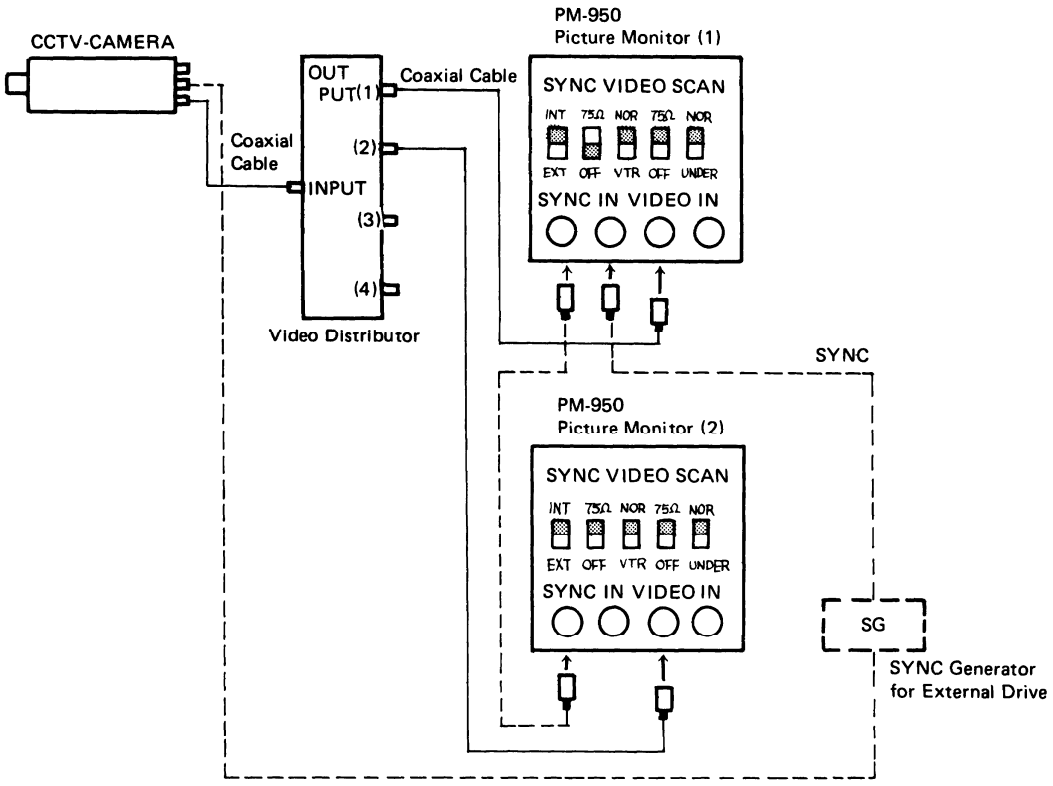


Fig. 4 Use of video distributor

* In connecting one camera with several monitors, a video distributor may be used as an alternative method besides the bridge connection method described in C-1.

This system eliminates the fear of the characteristics of monitors near the end of the bridge connection becoming inferior compared with those of the monitors close to the camera. The distributor corrects the characteristics of all the monitors, so that pictures of the same characteristics can be shown on all screens.

* Connect the M type coaxial connector of the camera OUTPUT with the M type coaxial connector of the picture distributor INPUT, using a 75 ohm coaxial cable.

* Connect the M type coaxial connector of the video distributor OUTPUT with the M type coaxial connector of the monitor VIDEO, using a 75 ohm coaxial cable.

* Set the monitor VIDEO 75 ohms - OFF at 75 ohms.

* Set the monitor SYNC INT- EXT at INT.

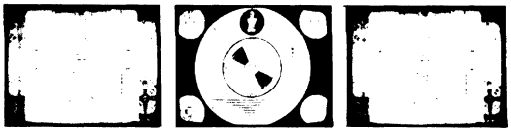
* When using external signals, set the monitor SYNC INT - EXT at EXT and connect the M type coaxial connectors of the synchronous signal generator SYNC OUT and the monitor SYNC IN in series starting with the first one, using a 75 ohm coaxial cable. Set the SYNC ohms - OFF at 75 ohms at the last monitor, and set all the remaining switches OFF.

* A synchronous distributor may be used when sharing SYNC with several monitors.

FRONT PANEL ARRANGEMENT & CONTROLS

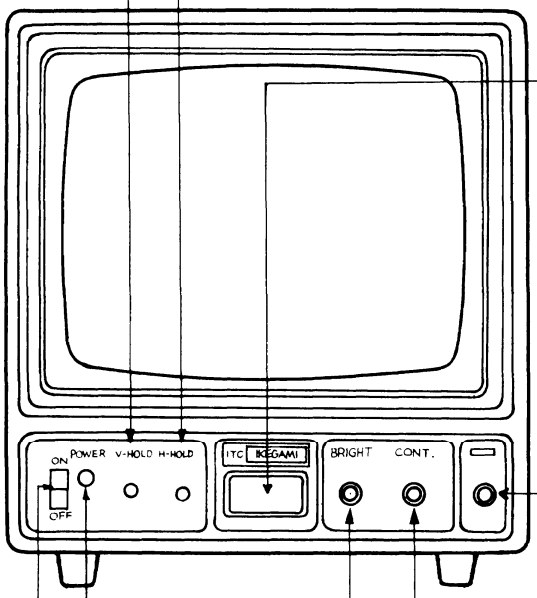
V·HOLD
Adjust this knob when the picture flows up or down.

H·HOLD
Adjust this knob when the picture flows sideways.



Good

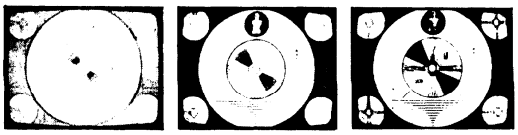
Good



TALLY LAMP (L TYPE ONLY)
lights when the power is supplied from tally input connector on rear panel.

AUDIO (S TYPE ONLY)
This adjusts volume. Volume is increased when the knob is turned clockwise.

Good



PILOT LAMP
lights when the power switch is put on.

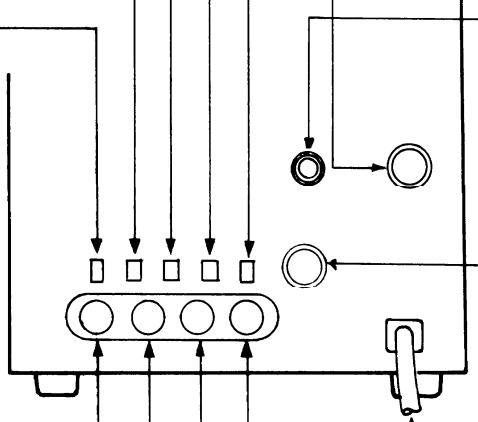
CONTRAST
This adjusts picture contrast. Contrast is increased when the knob is turned clockwise.

BRIGHT
Adjusts the brightness of the picture. The screen brightens when the knob is turned clockwise.

POWER SOURCE SWITCH
Turns the monitor power source ON and OFF.

Good

REAR PANEL ARRANGEMENT & CONTROLS



1) VTR switch
Set this switch at VTR when connecting this monitor to a VTR; stable picture will be obtained. Leave it set at NORM otherwise.

2) Synchronous signal termination switch
This switch is used to terminate external synchronous signals. The switch may be either at 75 ohms or at OFF when internal synchronous signals are used.

3) EXT-INT change-over switch
Set the switch as EXT when operating the monitor using external synchronous signals, and change it over to INT when internal synchronous signals are used. (Note: The picture will flow if the switch is set at EXT without feeding external synchronous signals to SYNC IN).

4) SYNC IN
Connect synchronous signals to either side when operating the monitor using external synchronous signals. Connect to the other connector in case of bridge connection of external synchronous signals.

5) VIDEO termination switch
This switch terminates picture signals. Set the switch at 75 ohms except in case of bridge connection.

6) SCAN SIZE switch
The screen size can be made smaller by setting this switch at UNDER.

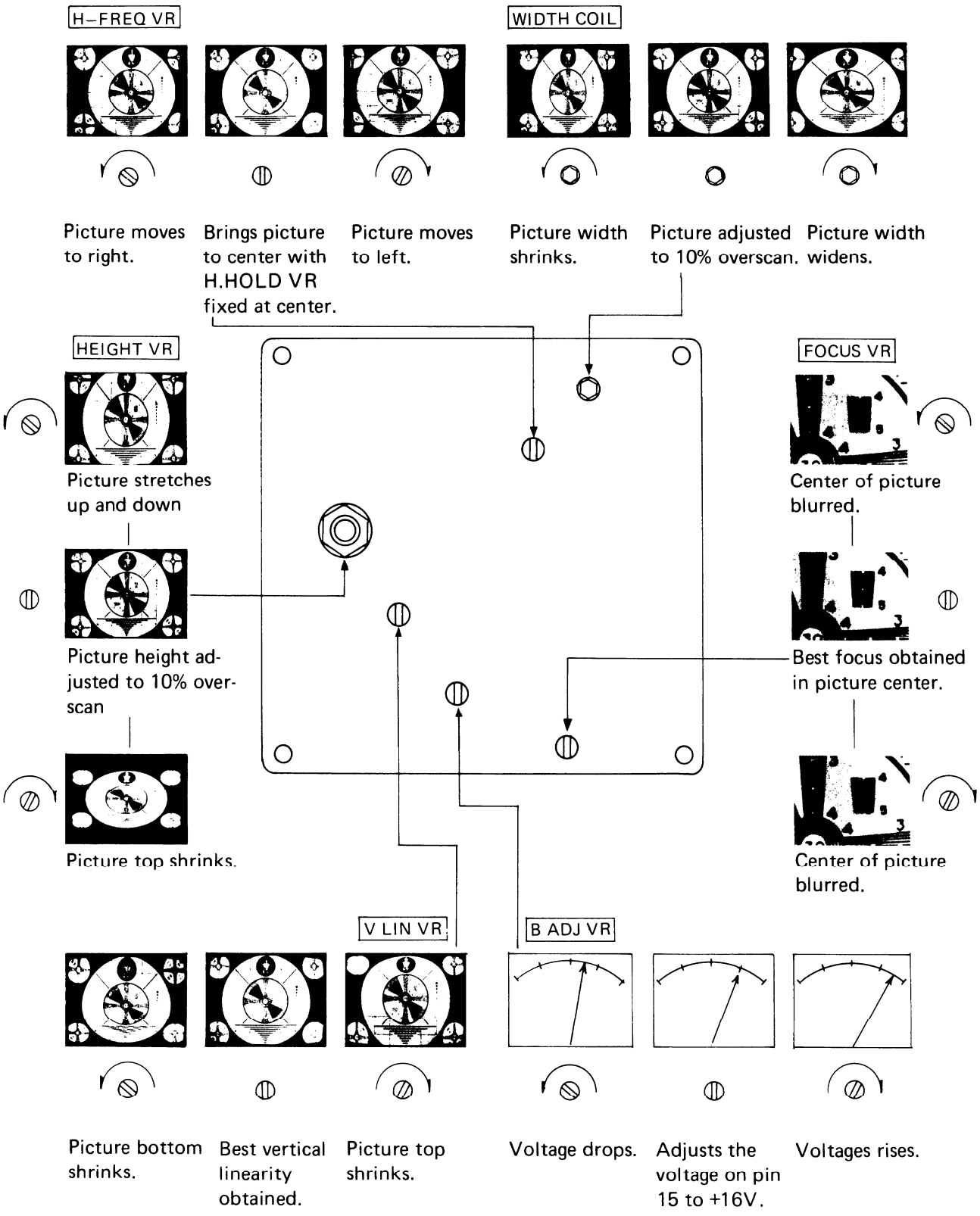
7) Fuse holder
Be sure to use a specified fuse for replacement.

AUDIO IN (S TYPE ONLY)
Supply audio signal by using phone jack.

TALLY IN (L TYPE ONLY)
Supply 24VAC power or 24VDC power from DIN connector.

8) Power source

9) VIDEO IN
Feed picture signals to one of these. Use the other for a bridge connection of picture signals.


H–FREQ VR
WIDTH COIL
Picture moves to right.
Brings picture to center with H.HOLD VR fixed at center.
Picture moves to left.
Picture width shrinks.
Picture adjusted to 10% overscan.
Picture width widens.
HEIGHT VR
FOCUS VR
Picture stretches up and down
Center of picture blurred.
Picture height adjusted to 10% overscan
Best focus obtained in picture center.
Picture top shrinks.
Center of picture blurred.
V LIN VR
B ADJ VR
Picture bottom shrinks.
Best vertical linearity obtained.
Picture top shrinks.
Voltage drops.
Adjusts the voltage on pin 15 to +16V.
Voltages rises.

MAINTENANCE

7.1 General

This device is designed to withstand long continuous service. For fully satisfactory performance, however, it is necessary to conduct periodical inspections according to the following instructions:

1) Check the knobs for correct positions and connections.
2) Check the connectors for good connection.
3) Check the input and output circuits for shortcircuiting.
4) Check internal temperature rises.
5) Check soldered portions.
6) Keep the interior of the device clean.

7.2 General instructions on operation

1) Never attach or remove connectors with the power source switch left turned on.
2) The anode of the monitor cathode ray tube is liable to cause discharging due to dust sticking to it, clean the anode after use and apply silicon oil for insulation.
3) When replacing the monitor cathode ray tube, be sure that the anode and the anode cap, which are often charged with a high voltage, have been discharged in advance.

7.3 Handling of transistors

Transistors are used for all the elements of this monitor except for the cathode ray tube. Special attention must, therefore, be paid to the following points:

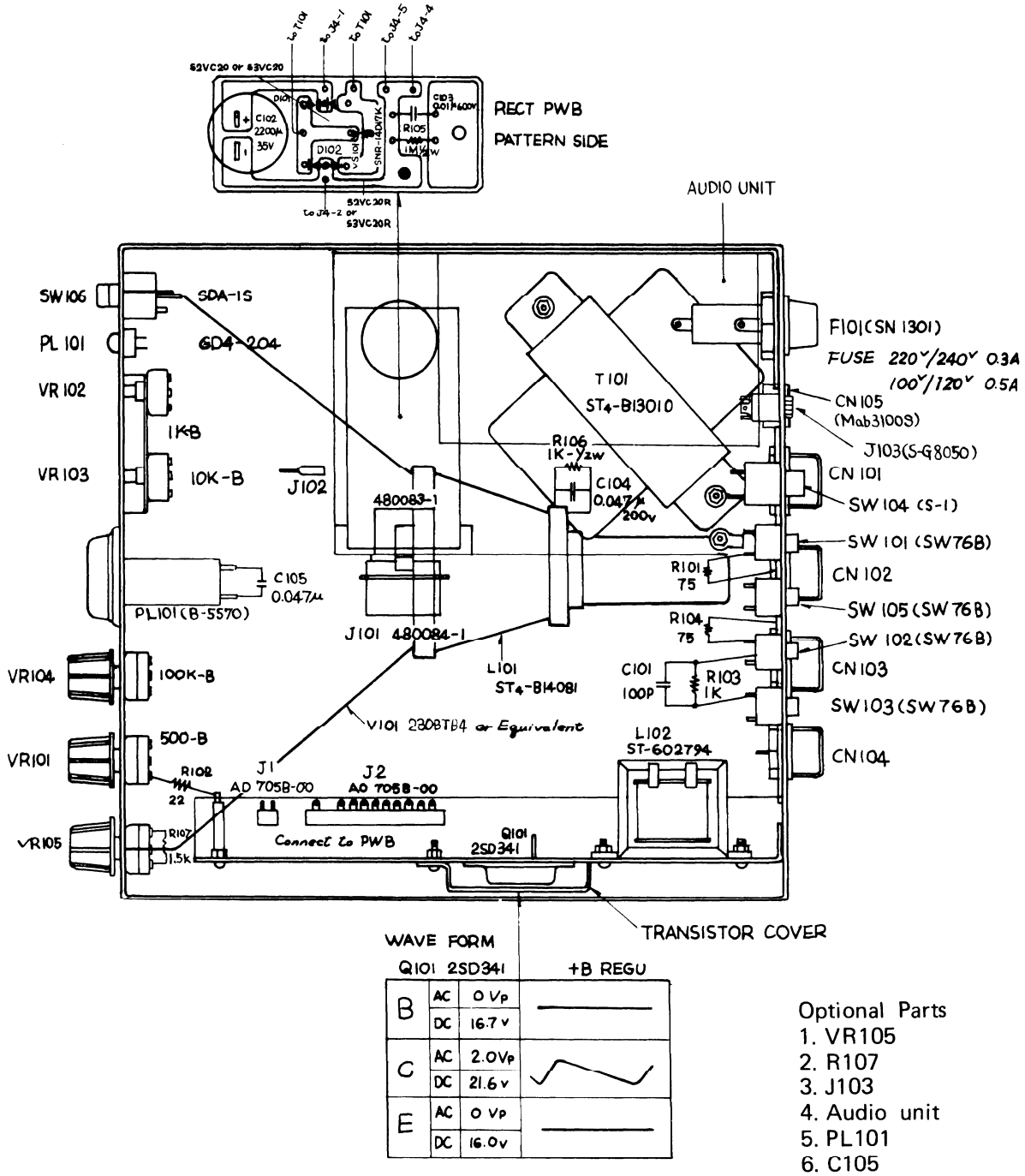
1) Transistors are strong against mechanical shock but weak against electric shock. Utmost care must be taken when checking circuits with the device left in operation. The circuits must never be shorted by using the tip of a tester lead.
2) Be sure to turn off the power source switch before installing or removing circuits.
3) Never connect condensors, particularly large scale ones, while the circuits are in operation. Connection of a large capacity, uncharged condensor to a circuit might damage not only that circuit but other circuits as well.
4) In soldering transistors, take care to prevent the heat from being unnecessarily transmitted to the transistors.
5) Never use a soldering iron with any AC leakage.
6) When using an oscilloscope for waveform inspection, be sure to use a high impedance terminal.
7) In measuring various parts of transistor circuits, it is desirable that a vacuum tube volt meter be used rather than a conventional tester.
8) In case it is feared that transistors have been damaged, it is advisable that the resistance between the collector and the emitter be checked using a tester or that "Ico" be measured using a transistor checker.

7.4 Cautions

1) The components marked with ★ in parts list and schematic diagram are critical ones of X-ray radiation emission.
   Replacement of these critical components should be made by adjusting + 16V line to + 16V ± 0.2 V.
2) This monitor provides integral protection type picture tube against implosion and X-ray radiation. Use the same type picture tube when replacing.
3) In case that the following parts are replaced by new ones, readjust +B voltage to 16.0V ±0.2V by a control +B ADJ (VR5) on the printed circuit board.

D15	Diode
R78	Resistor
R79	Resistor
VR5	Variable resistor

OVERALL & RECTIFIER BOARD

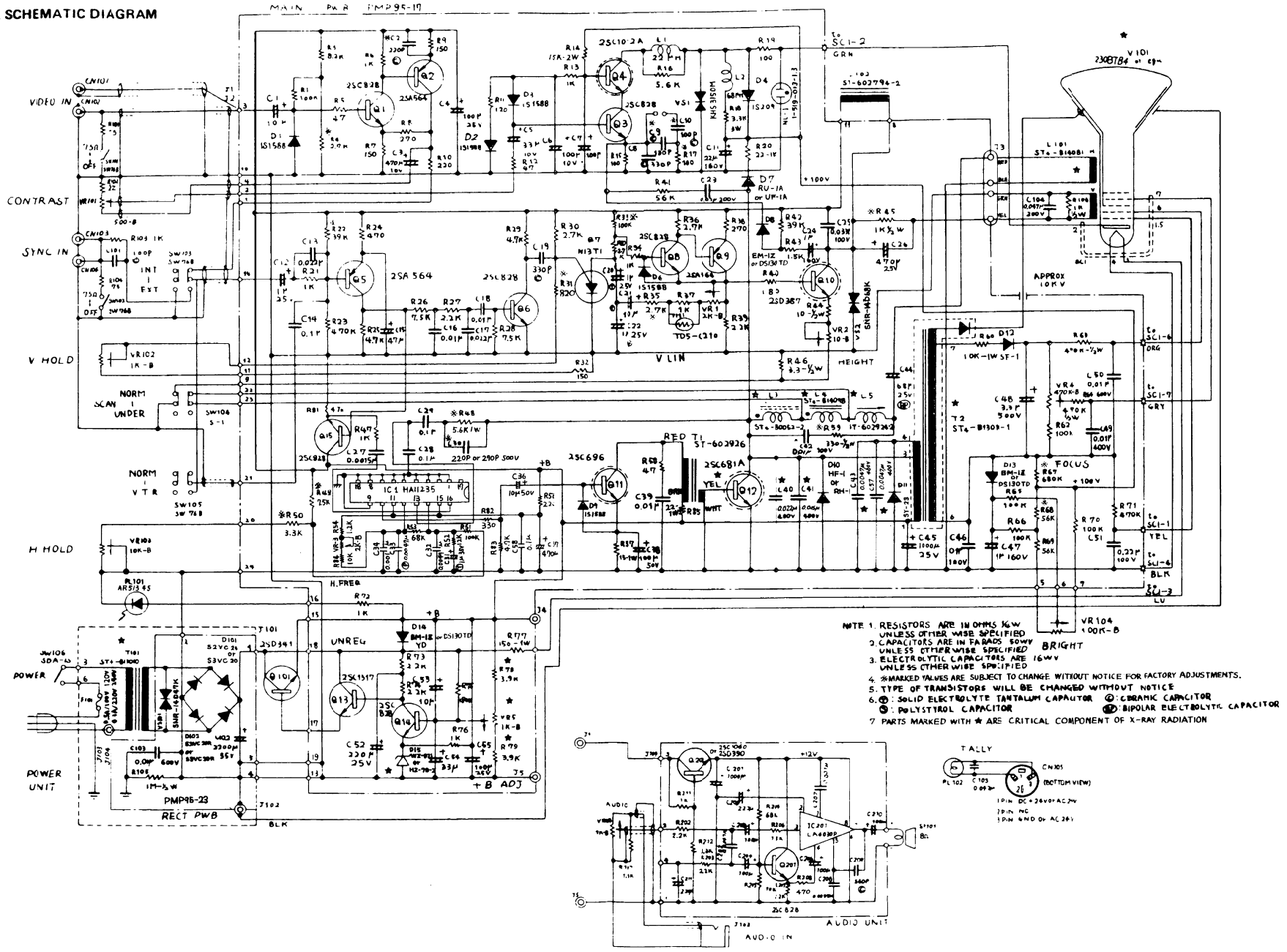


WAVE FORM

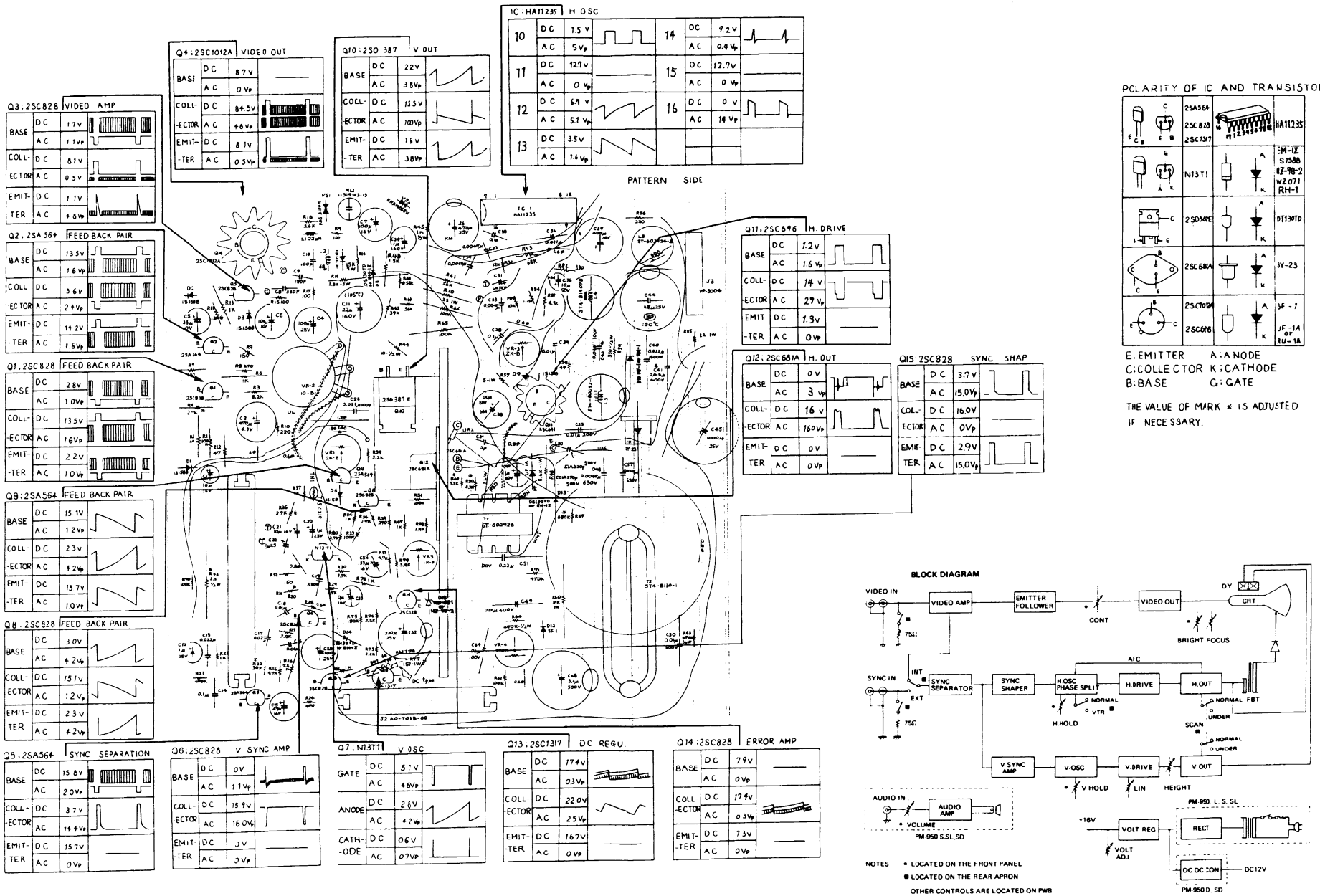
		Q101 2SD341	+B REGU
B	AC	0 Vp	
	DC	16.7 v	
C	AC	2.0Vp	
	DC	21.6 v	
E	AC	0 Vp	
	DC	16.0v	

Optional Parts
1. VR105
2. R107
3. J103
4. Audio unit
5. PL101
6. C105
7. CN105

OVERALL SCHEMATIC DIAGRAM

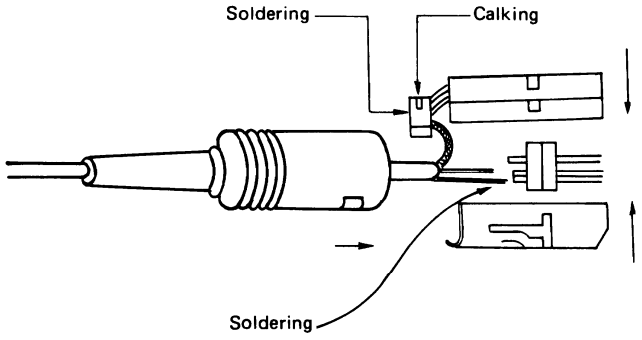


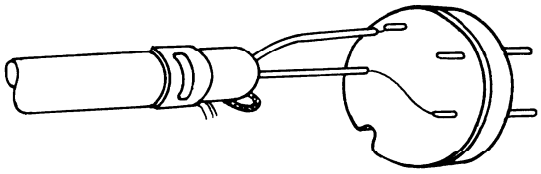
MAIN BOARD PARTS LOCATION



TALLY PROVISION & AUDIO PROVISION

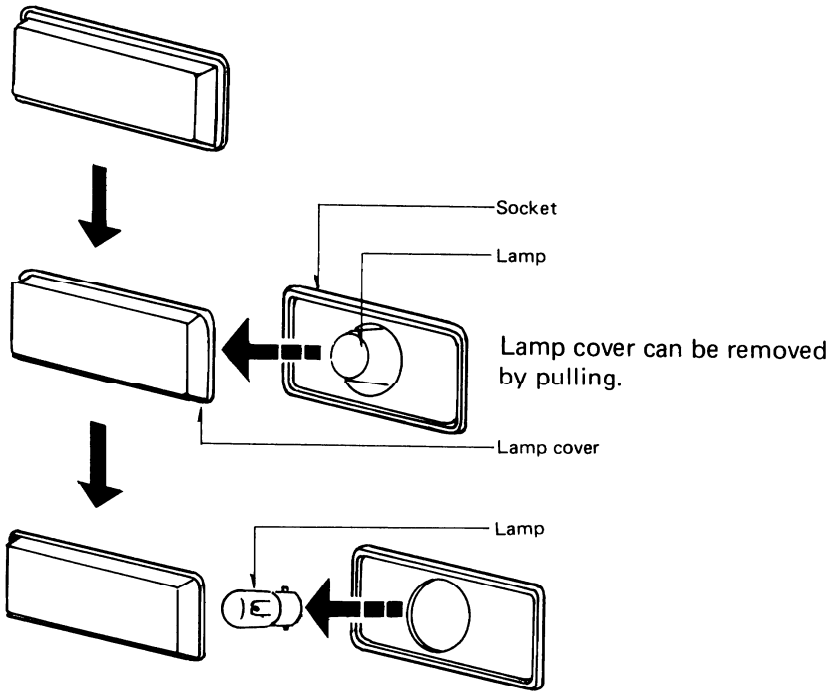
(1) Connection of Connector attached to Tally





How to replace Tally Lamp

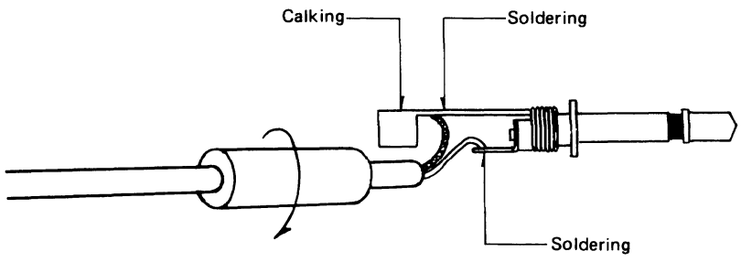
(1) Remove Lamp Cover

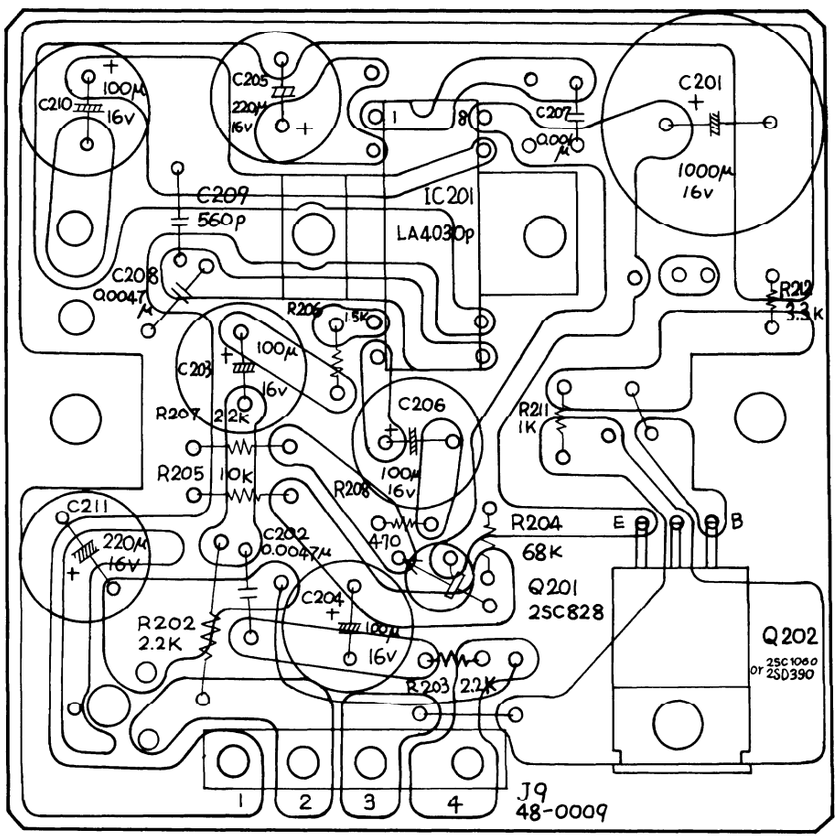


(2) Remove Lamp

(3) To install Lamp, do in the reverse order

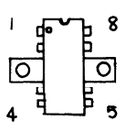
(1) Connection of Connector attached to AUDIO





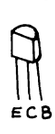
IC Polarity

LA4030P

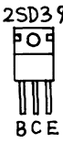


Traisistor Polarity

2SC828



2SC1060 or 2SD390



PM-950 Parts List

No		Parts	Description
A) GENERAL			
V101	*	Cathode Ray Tube	230BTB4 or equivalent
SW101		Switch, Slide	SW76B
SW102		Switch, Slide	SW76B
SW103		Switch, Slide	SW76B
SW104		Switch, Slide	S 1
SW105		Switch, Slide	SW 76B
SW106		Switch, Power	SDA 1S
CN101		Receptacle, Coaxial, Panel	UHF, bulkhead (UG 2661V or equivalent)
CN102		Receptacle, Coaxial, Panel	"
CN103		Receptacle, Coaxial, Panel	"
CN104		Receptacle, Coaxial, Panel	"
J1		Pin Connector, Socket	AD 705B (J)
J2		Pin Connector, Socket	AO-705B (J)
J3		Mini Connector, Socket	W A50041N-02
J101		AMP Lock Connector	480084 1
J102		GT Jack	SZ 0002 129
PL101		Diode, Light Emitting	AR5134S
R101		Resistor, Fixed, Carbon Film	75 ohms 1/4W ±5%
R102		Resistor, Fixed, Carbon Film	22 ohms 1/4W ±5%
R103		Resistor, Fixed, Carbon Film	1k " " "
R104		Resistor, Fixed, Carbon Film	75 " " "
R106		Resistor, Fixed, Carbon Film	1k " 1/2W "
C101		Capacitor, Ceramic	100PF 50V
C104		Polyester Film	0.047μF 200V
Q101		Transistor, Silicon	2SD341
VR101		Resistor, Variable, Carbon Film	500 ohms 1in taper
VR102		Resistor, Variable, Carbon Film	1k " "
VR103		Resistor, Variable, Carbon Film	10k " "
VR104		Resistor, Variable, Carbon Film	100k " "
L101	*	Deflection Yoke	ST4 B14081
L102		Coil, Choke	ST 602794
B) POWER UNIT			
T101	*	Transformer, Power	ST4 B13010
F101		Fuse, Standard	0.3A,220V/240V AC 0.5A,100V/240V AC
		Holder, Fuse	SN1301
D101		Diode, Silicon, Rectifier	S2VC20 or S3VC20
D102		Diode, Silicon, Rectifier	S2VC20R or S3VC20R
VS101		Varistor	SNR-14D47K
R105		Resistor, Fixed, Carbon Film	1M ohms 1/2W ±5%
C102		Capacitor, Electrolytic	2200μF 35V
C103		Capacitor, Polypropylene Film	0.01μF 600V
J101		AMP Lock Connector	480083 1
J102		GT Pin	SZ 0010 29
		AC Cord	SJT 18 3cores or CEE 3cores
C) MAIN PWB			
IC 1		Integrated Circuit	HA11235
C1		Transistor, Silicon	2SC828
Q2		Transistor, Silicon	2SA564
Q3		Transistor, Silicon	2SC828
Q4		Transistor, Silicon	2SC1012A
Q5		Transistor, Silicon	2SA564
Q6		Transistor, Silicon	2SC828
Q7		PUT	N13T1
Q8		Transistor, Silicon	2SCR2R
Q9		Transistor, Silicon	2SA564
Q10		Transistor, Silicon	2SC387
Q11		Transistor, Silicon	2SC696
Q12	*	Transistor, Silicon	2SC681A
Q13		Transistor, Silicon	2SC1317
Q14		Transistor, Silicon	2SC828
Q15		Transistor, Silicon	2SC828
D1		Diode, Silicon	1S1588
D2		Diode, Silicon	1S1588
D3		Diode, Silicon	1S1588
D4		Diode, Silicon	1S2091
D5		NOT USED	
D6		Diode, Silicon	1S1588
D7		Diode, Silicon	UF 1A
D8		Diode, Silicon	EM-1Z or DS130TD
D9		Diode, Silicon	1S1588
D10		Diode, Silicon	HF 1 or RH-1
D11		Diode, Silicon	SY 23
D12		Diode, Silicon	SF 1
D13		Diode, Zener	EM-1Z or DS130TD
D14		Diode, Silicon	EM-1Z or DS130TD
D15	*	Diode, Zener	WZ 071 or HZ-7B 2
VS1		Varistor	KHS3150M
VS2		Varistor	SNR-14D68K

R1		Resistor, Fixed, Carbon Film	100K	ohms	1 4W	±5%
R2		NOT USED				
R3		Resistor, Fixed, Carbon Film	8 2k	"	"	"
R4		Resistor, Fixed, Carbon Film	2 7k	"	"	"
R5		Resistor, Fixed, Carbon Film	47	"	"	"
R6		Resistor, Fixed, Carbon Film	1k	"	"	"
R7		Resistor, Fixed, Carbon Film	150	"	"	"
R8		Resistor, Fixed, Carbon Film	270	"	"	"
R9		Resistor, Fixed, Carbon Film	150	"	"	"
R10		Resistor, Fixed, Carbon Film	220	"	"	"
R11		Resistor, Fixed, Carbon Film	120	"	"	"
R12		Resistor, Fixed, Carbon Film	47	"	"	"
R13		Resistor, Fixed, Carbon Film	1k	"	"	"
R14		Resistor, Fixed, Metal Film	15k	ohms	2W	±5%
R15		Resistor, Fixed Carbon Film	100	ohms	1 4W	"
R16		Resistor, Fixed, Carbon Film	5 6k	"	"	"
R17		Resistor, Fixed, Carbon Film	100	"	"	"
R18		Resistor, Fixed, Metal Oxide Film	3 3k	"	3W	"
R19		Resistor, Fixed, Carbon Film	100	"	1 4W	"
R20		Resistor, Fixed, Carbon Film	22	"	1W	"
R21		Resistor, Fixed, Carbon Film	1k	"	1/4W	"
R22		Resistor, Fixed, Carbon Film	39k	"	"	"
R23		Resistor, Fixed, Carbon Film	470k	"	"	"
R24		Resistor, Fixed, Carbon Film	470	"	"	"
R25		Resistor, Fixed, Carbon Film	4 7k	"	"	"
R26		Resistor, Fixed, Carbon Film	7 5k	"	"	"
R27		Resistor, Fixed, Carbon Film	2 2k	"	"	"
R28		Resistor, Fixed, Carbon Film	7 5k	"	"	"
R29		Resistor, Fixed, Carbon Film	4 7k	"	"	"
R30		Resistor, Fixed, Carbon Film	2 7k	"	"	"
R31		Resistor, Fixed, Carbon Film	820	"	"	"
R32		Resistor, Fixed, Carbon Film	150	"	"	"
R33		Resistor, Fixed, Carbon Film	100k	"	"	"
R34		Resistor, Fixed, Carbon Film	1k	"	"	"
R35		Resistor, Fixed, Carbon Film	2 7k	"	"	"
R36		Resistor, Fixed, Carbon Film	2 7k	"	"	"
R37		Resistor, Fixed, Carbon Film	1k	"	"	"
R38		Resistor, Fixed, Carbon Film	270	"	"	"
R39		Resistor, Fixed, Carbon Film	2 2k	"	"	"
R40		Resistor, Fixed, Carbon Film	180	"	"	"
R41		Resistor, Fixed, Carbon Film	56k	"	"	"
R42		Resistor, Fixed, Carbon Film	39k	"	"	"
R43		Resistor, Fixed, Carbon Film	1.5k	"	"	"
R44		Resistor, Fixed, Carbon Film	10	"	1/2W	"
R45		Resistor, Fixed, Carbon Film	1k	"	"	"
R46		Resistor, Fixed, Carbon Film	3 3	"	"	"
R47		Resistor, Fixed, Carbon Film	1k	"	1/4W	"
R48		Resistor, Fixed, Metal Film	5.6k	"	1W	"
R49		Resistor, Fixed, Carbon Film	7.5k	"	1/4W	"
R50		Resistor, Fixed, Carbon Film	3.3k	"	"	"
R51		Resistor, Fixed, Carbon Film	100k	"	"	"
R52		Resistor, Fixed, Carbon Film	12k	"	"	"
R53		Resistor, Fixed, Carbon Film	68k	"	"	"
R54		Resistor, Fixed, Carbon Film	1.2k	"	"	"
R55		NOT USED				
R56		Resistor, Fixed, Carbon Film	220	"	"	"
R57		Resistor, Fixed, Carbon Film	15	"	1W	"
R58		Resistor, Fixed, Carbon Film	47	"	1/4W	"
R59		Resistor, Fixed, Carbon Film	330	"	1/2W	"
R60		Resistor, Fixed, Carbon Film	10k	"	1W	"
R61		NOT USED				
R62		Resistor, Fixed, Carbon Film	100k	"	1/2W	"
R63		Resistor, Fixed, Carbon Film	470k	"	"	"
R64		Resistor, Fixed, Carbon Film	470k	"	"	"
R65		Resistor, Fixed, Carbon Film	100k	"	1/4W	"
R66		Resistor, Fixed, Carbon Film	"	"	"	"
R67		Resistor, Fixed, Carbon Film	680k	"	"	"
R68		Resistor, Fixed, Carbon Film	56k	"	"	"
R69		Resistor, Fixed, Carbon Film	"	"	"	"
R70		Resistor, Fixed, Carbon Film	100k	"	"	"
R71		Resistor, Fixed, Carbon Film	470k	"	"	"
R72		Resistor, Fixed, Carbon Film	1k	"	"	"
R73		Resistor, Fixed, Carbon Film	2 2k	"	"	"
R74		Resistor, Fixed, Carbon Film	"	"	"	"
R75		Resistor, Fixed, Carbon Film	180k	"	"	"
R76		Resistor, Fixed, Carbon Film	1k	"	"	"
R77		Resistor, Fixed, Carbon Film	150	"	1W	"
R78	*	Resistor, Fixed, Carbon Film	3 9k	"	1 4W	"
R79	*	Resistor, Fixed, Carbon Film	3 9k	"	"	"
R80		Resistor, Fixed, Carbon Film	2 7k	"	"	"
R81		Resistor, Fixed, Carbon Film	4 7k	"	"	"
R82		Resistor, Fixed, Carbon Film	330	"	"	"
R83		Resistor, Fixed, Carbon Film	4.7k	"	"	"
R84		Resistor, Fixed, Carbon Film	10k	"	"	"
R85		Resistor, Fixed, Metal Oxide Film	22	ohms	1W	±5%

C1		Capacitor, Electrolytic	10μF	16V
C2		Capacitor, Ceramic	220pF	50V
C3		Capacitor, Electolytic	470μF	10V
C4		Capacitor, Electrolytic	100μF	25V
C5		Capacitor, Electrolytic	33μF	10V
C6		Capacitor, Electrolytic	100μF	10V
C7		Capacitor, Electrolytic	100μF	10V
C8		Capacitor, Ceramic	330pF	50V
C9		Capacitor, Ceramic	180pF	50V
C10		Capacitor, Ceramic	100pF	50V
C11		Capacitor, Electrolytic	22μF	160V
C12		Capacitor, Electrolytic	1μF	25V
C13		Capacitor, Polyester Film	0.022μF	50V
C14		Capacitor, Polyester Film	0.1μF	50V
C15		Capacitor, Electrolytic	47μF	16V
C16		Capacitor, Polyester Film	0.01μF	50V
C17		Capacitor, Polyester Film	0.022μF	50V
C18		Capacitor, Polyester Film	0.01μF	50V
C19		Capacitor, Ceramic	330pF	50V
C20		Capacitor, Tantalum	1μF	25V
C21		Capacitor, Tantalum	10μF	25V
C22		Capacitor, Tantalum	1μF	25V
C23		Capacitor, Polyester Film	0.01μF	200V
C24		Capacitor, Electrolytic	1μF	160V
C25		Capacitor, Polyester Film	0.033μF	100V
C26		Capacitor, Electrolytic	470μF	25V
C27		Capacitor, Polyester Film	0.0015μF	50V
C28		Capacitor, Polyester Film	0.1μF	50V
C29		Capacitor, Polyester Film	0.1μF	50V
C30		Capacitor, Ceramic	220pF	500V
C31		Capacitor, Tantalum	1μF	35V
C32		Capacitor, Polyester Film	0.0047μF	50V
C33		Capacitor, Polypropylene Film	0.0047μF	100V
C34		Capacitor, Polyester Film	0.001μF	50V
C35		NOT USED		
C36		Capacitor, Electrolytic	10μF	50V
C37		Capacitor, Electrolytic	470μF	16V
C38		Capacitor, Electrolytic	100μF	25V
C39		Capacitor, Polyester Film	0.01μF	50V
C40	*	Capacitor, Polypropylene Film	0.022μF	400V
C41	*	Capacitor, Polypropylene Film	0.015μF	400V
C42		Capacitor, Polyester Film	0.01μF	100V
C43	*	Capacitor, Polypropylene Film	0.0047μF	400V
C44		Capacitor, Bi Polar Electrolytic	6.8μF	25V
C45		Capacitor, Electrolytic	1000μF	25V
C46		Capacitor, Polyester Film	0.1μF	100V
C47		Capacitor, Electrolytic	1μF	160V
C48		Capacitor, Electrolytic	3.3μF	500V
C49		Capacitor, Polypropylene Film	0.01μF	400V
C50		Capacitor, Polypropylene Film	0.01μF	600V
C51		Capacitor, Polyester Film	0.22μF	100V
C52		Capacitor, Electrolytic	220μF	25V
C53		Capacitor, Electrolytic	10μF	16V
C54		Capacitor, Electrolytic	33μF	16V
C55		Capacitor, Electrolytic	100μF	25V
C56		NOT USED		
C57		Capacitor, Polypropylene Film	0.0047μF	400V
VR1		Resistor, Variable, Metal Film	2kΩ, Lin. taper	
VR2		Resistor, Variable, Wire Wound	10Ω, Lin. taper	
VR3		Resistor, Variable, Metal Film	5kΩ, Lin. taper	
VR4		Resistor, Variable, Metal Film	500kΩ, Lin. taper	
VR5	*	Resistor, Variable, Metal Film	1kΩ, Lin. taper	
L1		Coil, Peaking	22μH	
L2		Coil, Peaking	68μH	
L3	*	Coil, Choke, H. Linearity	ST4 800522	
L4	*	Coil, Choke, H. Scan Size	ST 4B14078	
L5	*	Coil, Choke, H. Width	ST4 602924 2	
L6		NOT USED		
T1		Transformer, H. Drive	ST 602926	
T2	*	Transformer, Flyback	ST4 B13011 1	
TH1		Themister	TD5 C210	
NL1		Neon Lamp	1 519 013 1.3	
J1		Pin Connector, Plug	AD-705B 00 (P)	
J2		Pin Connector, Plug	AD-705B 00 (P)	
J3		Mini Connector, Plug	W P3004 02	
J6		Connector Pin	RT 01T 1.3B	
J7		Connector Pin	RT 01T 1.3B	
SC1		CRT Socket	S7 502B 40	

NOTE PARTS AND VALUES ARE SUBJECT TO CHANGE WITHOUT NOTICE.
PARTS MARKED WITH * ARE CRITICAL COMPONENT OF X RAY RADIATION

SPEAKER UNIT COMPONENTS (TYPE S ONLY)

IC201	Integrated Circuit	LA4030P		
0201	Transistor	2SC828		
0202	Transistor	2SC1060 or 2SD390		
R201	NOT USED			
R202	Resistor, Fixed, Carbon Film	2.2kΩ	1/4W	±5%
R203	Resistor, Fixed, Carbon Film	2.2kΩ	"	"
R204	Resistor, Fixed, Carbon Film	68kΩ	"	"
R205	Resistor, Fixed, Carbon Film	10kΩ	"	"
R206	Resistor, Fixed, Carbon Film	1.5kΩ	"	"
R207	Resistor, Fixed, Carbon Film	2.2kΩ	"	"
R208	Resistor, Fixed, Carbon Film	470Ω	"	"
R209	NOT USED			
R210	NOT USED			
R211	Resistor, Fixed, Carbon Film	1kΩ	"	"
R212	Resistor, Fixed, Carbon Film	3.3kΩ	"	"
C201	Capacitor, Electrolytic	1000μF	16V	
C202	Capacitor, Polyester Film	0.0047μF	50V	
C203	Capacitor, Electrolytic	100μF	16V	
C204	Capacitor, Electrolytic	"	"	
C205	Capacitor, Electrolytic	220μF	"	
C206	Capacitor, Electrolytic	100μF	16V	
C207	Capacitor, Polyester Film	0.001μF	50V	
C208	Capacitor, Polyester Film	0.0047μF	50V	
C209	Capacitor, Ceramic	560pF	50V	
C210	Capacitor, Electrolytic	100μF	16V	
C211	Capacitor, Electrolytic	220μF	16V	
VR105	Resistor, Variable	1kΩ Lin. taper		
R107	Resistor, Fixed, Carbon Film	1.5kΩ	1/4W	±5%
SP101	Speaker	12SEP 02 8Ω		
H105	Phone Jack	SG-8050		
J106	Connector	W A5004 IN 02		
J4	1 Pin Connector	SMF 01T 1.3		
J106P	Connector Plug	W P3004 02		

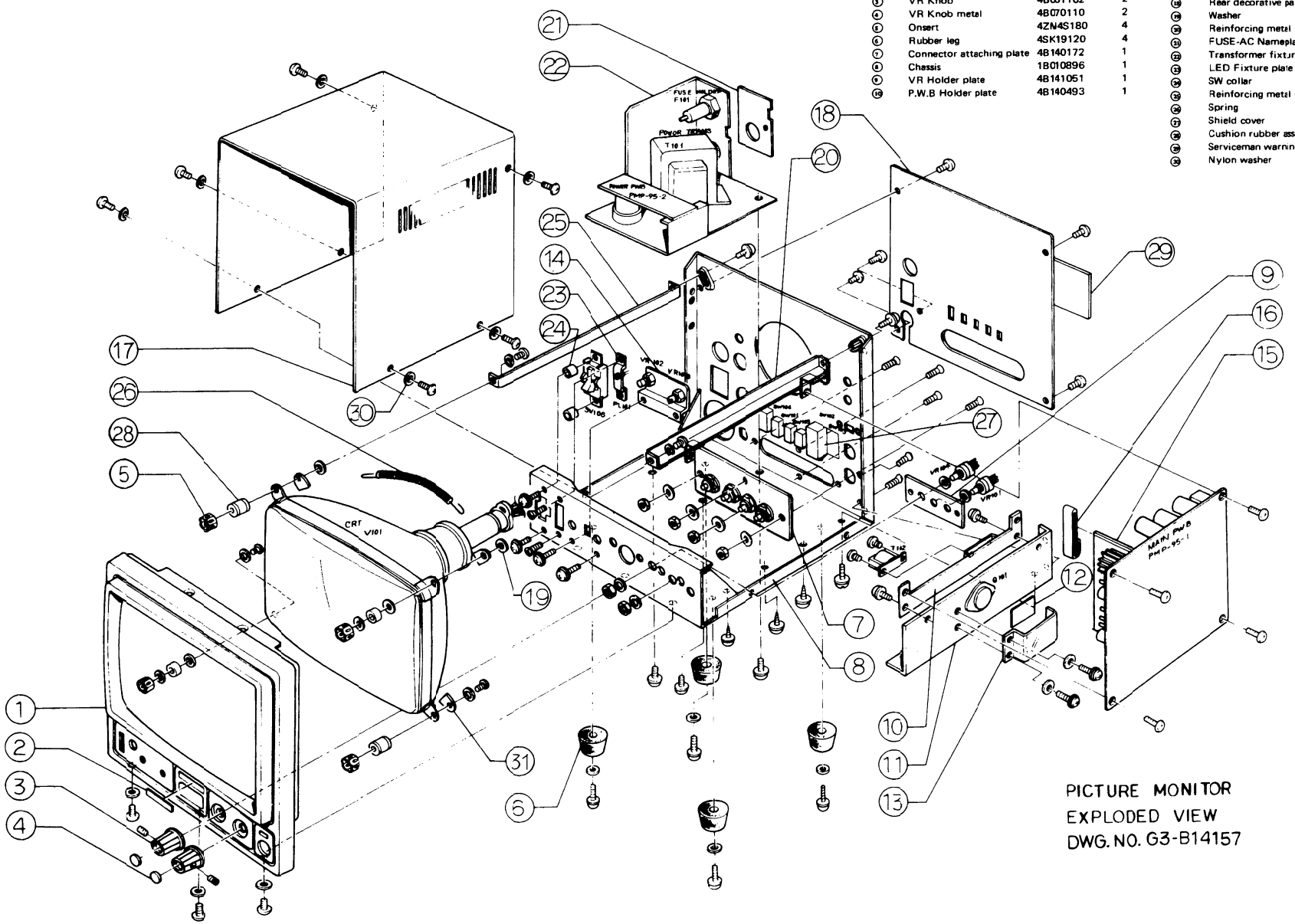
TALLY SYSTEM COMPONENTS (TYPE L ONLY)

PL102BKT	Bracket	B-5570		
PL102	Lamp	RM 10 228V80BA		
C105	Capacitor, Polyester Film	0.047μF	50V	
CN105	Connector	Mab 3100S		

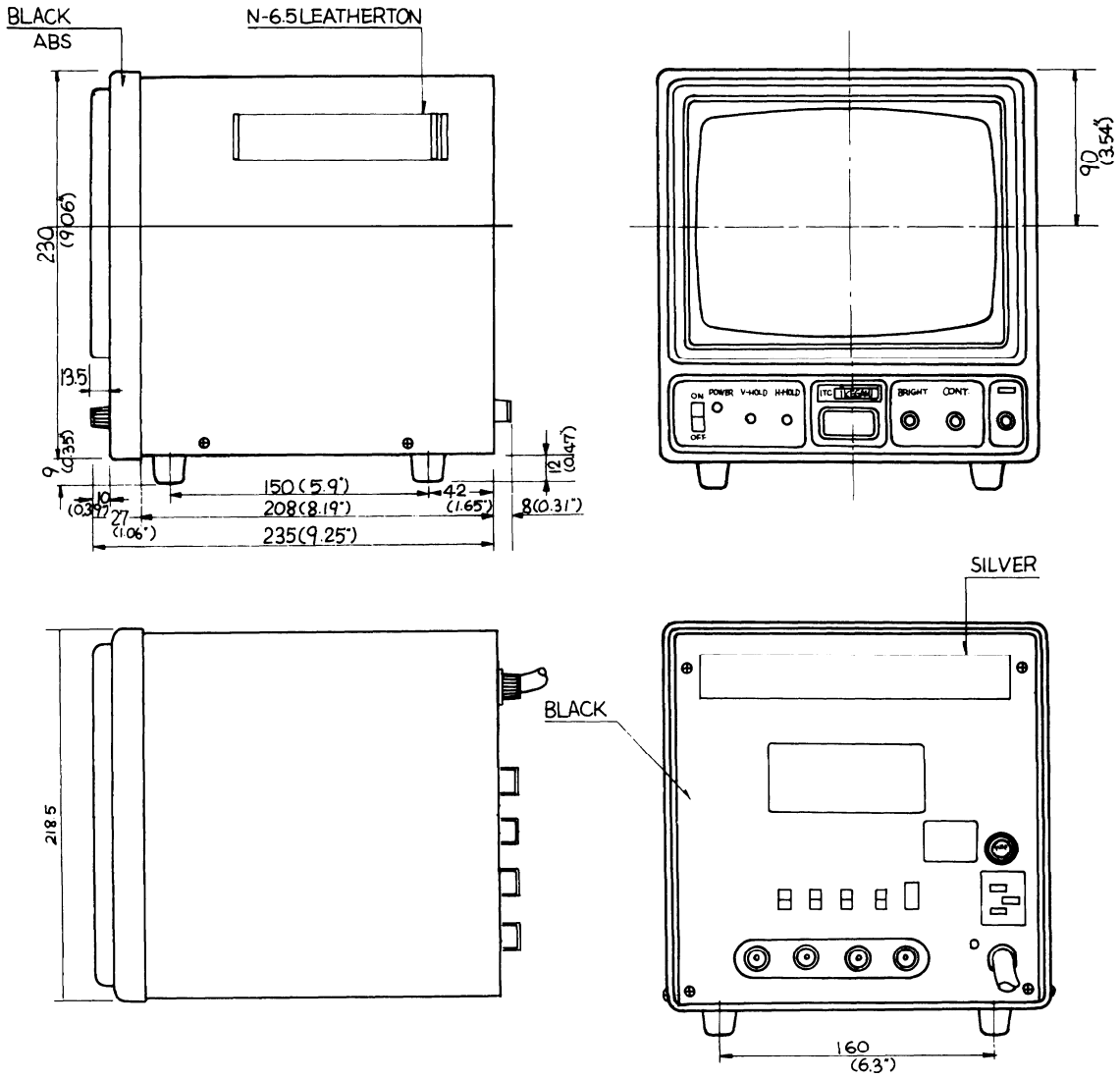
EXPLODED VIEW & MECHANICAL PARTS

PICTURE MONITOR (DWG. No. G3-B14157)

Code No.	Parts Name	Stock No.	Q'ty
①	Escutcheon	1B140248	1
②	Brand nameplate	4C071041	1
③	VR Knob	4B001162	2
④	VR Knob metal	4B070110	2
⑤	Onsert	4ZN4S180	4
⑥	Rubber leg	4SK19120	4
⑦	Connector attaching plate	4B140172	1
⑧	Chassis	1B010896	1
⑨	VR Holder plate	4B141051	1
⑩	P.W.B Holder plate	4B140493	1
⑪	Radiator plate (1)	3B010854	1
⑫	Insulation	4B014161	1
⑬	Transistor cover	4B140911	1
⑭	VR Fixture plate (1)	4B140180	1
⑮	Radiation plate (2)	4B160361	1
⑯	Short ring	4B100200	1
⑰	Case	3B140203	1
⑱	Rear decorative panel	2B140228	1
⑲	Washer	4B140920	2
⑳	Reinforcing metal (R)	3B140214	1
㉑	FUSE-AC Nameplate	4B140164	1
㉒	Transformer fixture plate	3B140235	1
㉓	LED Fixture plate	4B140252	1
㉔	SW collar	4B140451	2
㉕	Reinforcing metal (L)	3B140563	1
㉖	Spring	4B110223	1
㉗	Shield cover	4B141031	1
㉘	Cushion rubber assembly	4B140264	4
㉙	Serviceman warning label	000M0520	1
㉚	Nylon washer	4B141260	1



APPEARANCE


BLACK
ABS
N-6.5 LEATHERTON
230 (9.06")
13.5
9 (0.35")
10 (0.39")
27 (1.06")
150 (5.9")
208 (8.19")
235 (9.25")
42 (1.65")
12 (0.47")
8 (0.31")
90 (3.54")
ON
POWER
V-HOLD
H-HOLD
OFF
BRIGHT
CONT.
SILVER
BLACK
218.5
160 (6.3")

SPECIFICATIONS

PICTURE TUBE:	23cm (9") diagonal, Implosion protected Type 230BTB4
VIDEO INPUT LEVEL:	VS composite 1.0Vp-p or V 0.7Vp-p
VIDEO INPUT IMPEDANCE:	75Ω or high (switchable)
SYNC INPUT LEVEL	4.0Vp-p (negative)
SYNC INPUT IMPEDANCE:	75Ω or high (switchable)
DC RESTORATION:	built-in
VIDEO FREQUENCY RESPONSE:	8.0MHz, ±3dB
VIDEO OUTPUT LEVEL:	30V p-p
HORIZONTAL RESOLUTION:	700 lines or better at center
SIGNAL-TO-NOISE RATIO:	55dB or better (except sync noise)
LINEARITY:	2% or less (of picture height)
ENVIRONMENTAL TEMPERATURE:	−5°C ~ +45°C
POWER REQUIREMENT:	100/120V, 60Hz or 220/240V, 50Hz
POWER CONSUMPTION:	32 watts approx. (PM-950 Standard)
DIMENSIONS (W.H.D)	218x239x235mm
WEIGHT:	6.3Kg (PM-950 Standard)

- **For PM-950S with Sound provision**

AUDIO INPUT LEVEL:	0dBm
INPUT IMPEDANCE:	600Ω
OUTPUT LEVEL:	0.25W
FREQUENCY RESPONSE:	±1dB or better (300 ~ 3,000Hz) [below 300Hz, orver 3,000Hz, declining]
GAIN:	30dB or better

- **For PM-950L with Tally provision**

ADDITIONAL POWER REQD.	24V (AC or DC) 65mA

Design and specifications are subject to change for improvement.

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