

JVC

SERVICE MANUAL

COLOUR VIDEO MONITOR

**TM-A210G/c,
TM-A210G/u,
TM-A210G/e**

BASIC CHASSIS

T1B1

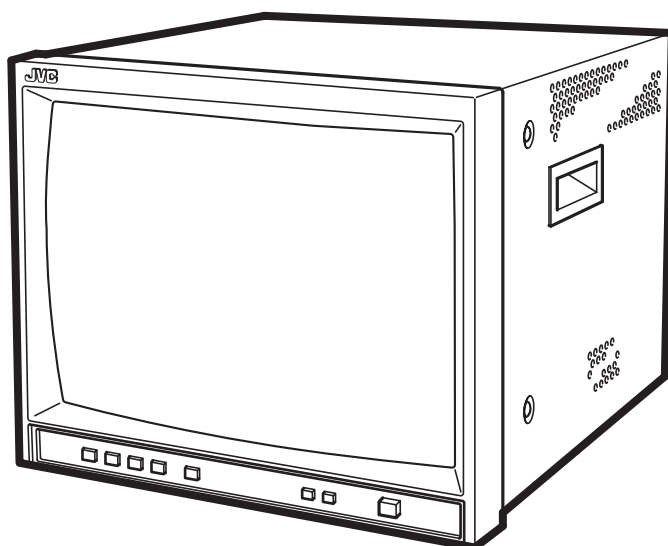


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SPECIFICATION

Item	Content	
Dimensions (W × H × D)	47.6cm × 40.8cm × 49.2cm (18-3/4" × 16-1/8" × 19-3/8")	
Mass	28.1kg (61.8lbs)	
Colour System	PAL / NTSC 3.58	
Environmental Conditions	Operation Temperature : 0°C~40°C (32°F~104°F) Operation Humidity : 20%~80% (non-condensing)	
Power Input	AC 220V-240V, 50Hz/60Hz [TM-A210G/C, TM-A210G/E] AC 120V, 60Hz [TM-A210G/U]	
Power Consumption	0.9A [TM-A210G/C, TM-A210G/E] 1.3A [TM-A210G/U]	
Picture Tube	Full-square type 90° deflection in-line gun Vertical line trio type phosphor stripe pitch 0.63mm / 0.64mm (H/V)	
Screen Size	Diagonal : 50.8cm (20") / W × H : 40.7cm × 30.5cm (16" × 12")	
High Voltage	27.0kV ± 1.3kV	
Speaker	8cm round × 1, 8Ω	
Audio Power Output	1W (Monaural)	
Signal Input / Output	VIDEO A	1V(p-p), 75Ω, negative sync, BNC connector × 2 Bridge connection output possible with automatic termination
	VIDEO B	1V(p-p), 75Ω, negative sync, BNC connector × 2 Bridge connection output possible with automatic termination
		Mini-Din 4-pin connector × 2 Bridge connection output possible with automatic termination Y:1V(p-p), 75 Ω, negative sync C:0.286V(p-p) (burst signal), 75 Ω [NTSC] / 0.3V(p-p) (burst signal), 75 Ω [PAL]
	AUDIO A	0.5V(rms), high-impedance, RCA pin jack × 2 Bridge connection output possible
	AUDIO B	0.5V(rms), high-impedance, RCA pin jack × 2 Bridge connection output possible
	REMOTE INPUT	RCA pin jack × 1
	REMOTE ASPECT	RCA pin jack × 1

SECTION 1 PRECAUTION

1.1 SAFETY PRECAUTIONS [EXCEPT FOR UK]

- (1) The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- (2) Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- (3) Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
- (4) **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (\perp) side GND, the ISOLATED (NEUTRAL) : (\perp) side GND and EARTH : (\oplus) side GND.
Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time with a measuring apparatus (oscilloscope etc.). If above note will not be kept, a fuse or any parts will be broken.
- (5) If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
- (6) The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
- (7) Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k Ω 2W resistor to the anode button.

- (8) When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

- (9) **Isolation Check (Safety for Electrical Shock Hazard)**
After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

a) Dielectric Strength Test

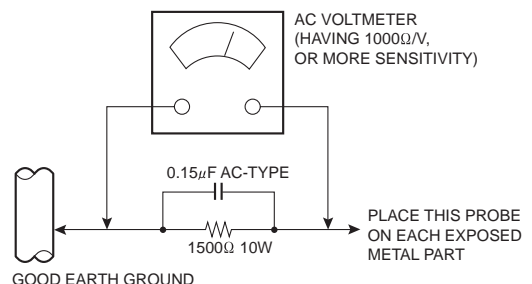
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second. (. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.) This method of test requires a test equipment not generally found in the service trade.

b) Leakage Current Check


Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.). However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 Ω per volt or more sensitivity in the following manner. Connect a 1500 Ω 10W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.). However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



1.2 SAFETY PRECAUTIONS [FOR UK]

- (1) The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- (2) Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- (3) Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessary be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by () on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the Parts List of Service Manual may cause shock, fire, or other hazards.
- (4) The leads in the products are routed and dressed with ties, clamps, tubing's, barriers and the like to be separated from live parts, high temperature parts, moving parts and / or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

WARNING

- (1) The equipment has been designed and manufactured to meet international safety standards.
- (2) It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
- (3) Repairs must be made in accordance with the relevant safety standards.
- (4) It is essential that safety critical components are replaced by approved parts.
- (5) If mains voltage selector is provided, check setting for local voltage.

1.3 SAFETY PRECAUTIONS [FOR US]

- (1) The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- (2) Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- (3) Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
- (4) **Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
- (5) **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED (NEUTRAL) : (≡) side GND and EARTH : (⊕) side GND.
Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time with a measuring apparatus (oscilloscope etc.). If above note will not be kept, a fuse or any parts will be broken.
- (6) If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
- (7) The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
- (8) Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.
- (9) When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

(10) Isolation Check (Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

a) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second. (. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

b) Leakage Current Check

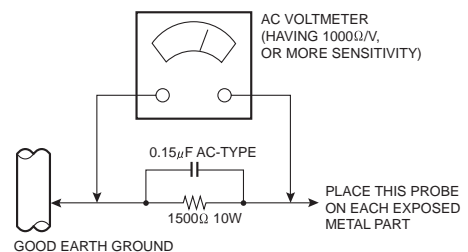
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

Alternate Check Method

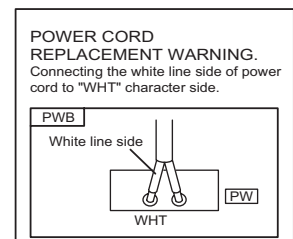
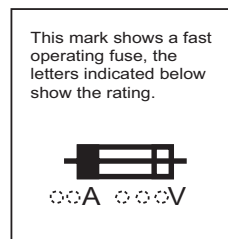
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000Ω per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



(11) High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly. See item "How to check the high voltage hold down circuit".



SECTION 2

SPECIFIC SERVICE INSTRUCTIONS

2.1 FEATURES

- High-resolution full square CRT is adopted. The excellent color reproducibility and the high resolution that are required of a wide range monitor's use are realized.
- It can respond to both NTSC and PAL signal system. The incoming signal was discriminated and the automatic selection function that changes the mode automatically is adopted.
- In intelligible adoption of OSD, a menu is chosen or a user's original setup can be performed easily. The buttons which were easy to use for a whole surface panel, and was put in order can adjust functions, such as CONTRAST, BRIGHT, CHROMA, and PHASE, easily. Moreover, the selected level is temporarily displayed on a screen.
- The metal cabinet is adopted which cannot be easily influenced of magnetic and strong.
- Two composite videos and one Y/C input are equipped, and bridge connection is possible respectively.
- With the OSD menu, the aspect ratio of a screen can be chosen as either 4:3 or 16:9.
- The remote terminal whose change of the aspect ratio (4:3 or 16:9) is enabled by remote control is equipped.
- The remote terminal whose change of the input (input A or B) is enabled by remote control is equipped.
- The high-quality speaker is built in with the compact of output 1W.

SECTION 3 DISASSEMBLY

3.1 DISASSEMBLY PROCEDURE

3.1.1 REMOVING THE TOP COVER

- (1) Pull out the power cord from AC inlet.
- (2) Remove the 10 screws **[A]** as shown in Fig.1.
- (3) Slightly spread the bottom of the TOP COVER.
- (4) Shift the TOP COVER rearward and raise it upward to remove it.

3.1.2 REMOVING THE REAR PANEL

- Remove the TOP COVER.
 - (1) Remove the 7 screws **[B]** as shown in Fig.1.
 - (2) Remove the 1 screw **[C]** as shown in Fig.1.
 - (3) Shift the top portion of the REAR PANEL slightly rearward and raise it upward to remove it.

3.1.3 REMOVING THE TERMINAL BRACKET AND FBT HOLDER

- Remove the TOP COVER.
- Remove the REAR PANEL.
 - (1) Remove the 6 screws **[D]** as shown in Fig.1.
 - (2) Remove the 1 screw **[E]** as shown in Fig.1.
 - (3) Remove the 3 screws **[G]** as shown in Fig.1.
 - (4) Remove the screw **[F]**. This screw attached the earth wires to TERMINAL BRACKET.
 - (5) Slightly shift the terminal bracket and FBT HOLDER rearward and raise them upward to remove.

3.1.4 REMOVING THE CHASSIS BASE

- Remove the TOP COVER.
- Remove the REAR PANEL.
- Remove the FBT HOLDER.
- Remove the TERMINAL BRACKET.
 - (1) Remove the 2 screws **[H]**, and withdraw the CHASSIS BASE toward you.

3.1.5 REMOVING THE SPEAKER

- Remove the TOP COVER.
 - (1) As shown in Fig.2, slightly spread the claws of the speaker holder, and pull up the SPEAKER to remove it.

3.1.6 CHECKING THE PWB

To check the PWB from back side.

CAUTION:

- (1) When erecting the chassis base, be careful so that there will be no contacting with the other PWB.
- (2) Before turning on power, make sure that the CRT earth wire and the other connectors are properly connected.

3.1.7 WIRE CLAMPING AND CABLE TYING

- (1) Be sure to clamp the wire.
- (2) Never remove the cable tie used for tying the wires together.
Should it be inadvertently removed, be sure to tie the wires with a new cable tie.

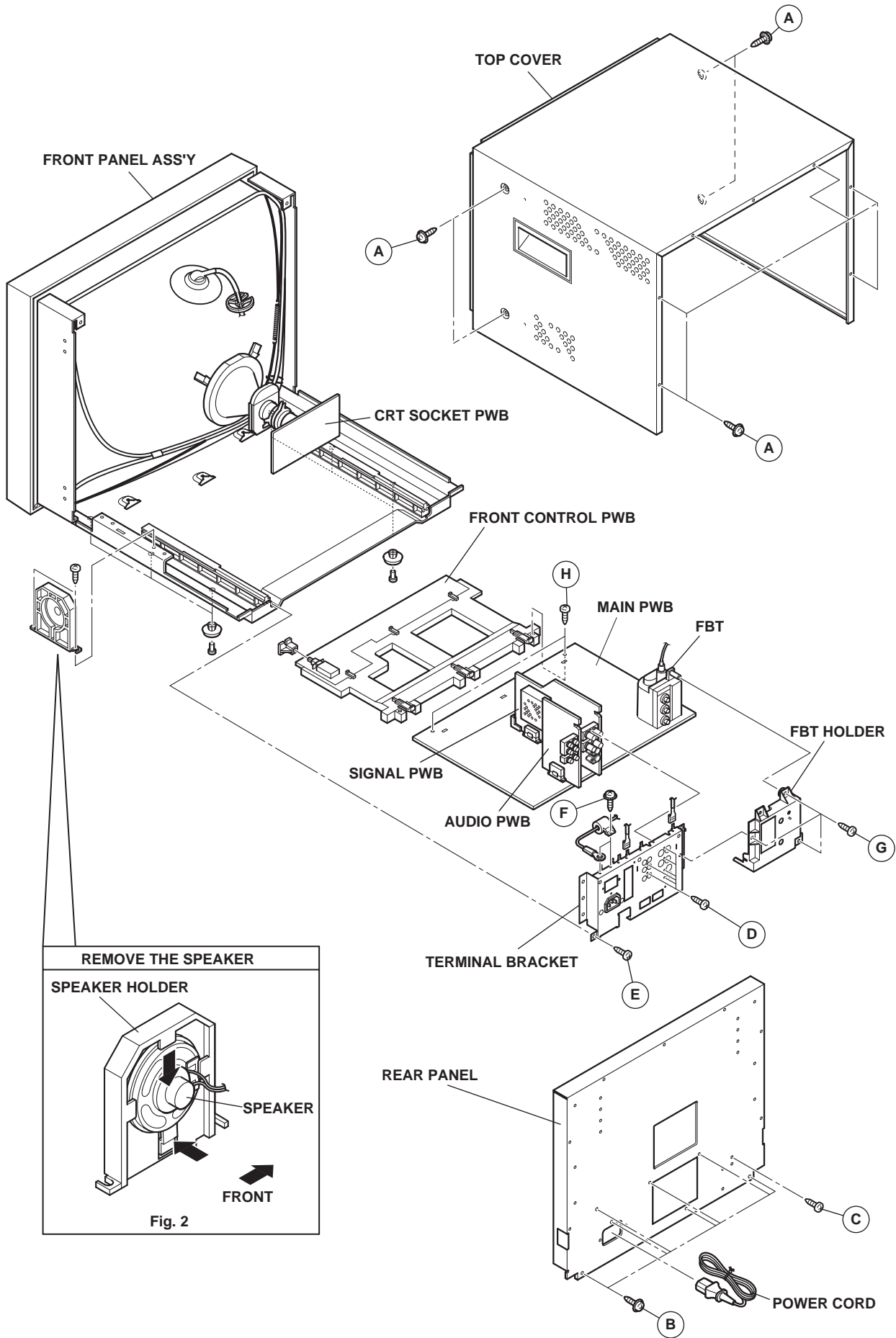


Fig.1

3.2 MEMORY IC REPLACEMENT

3.2.1 MEMORY IC

This monitor uses the memory IC.

In the memory IC, there are memorized data for correctly operating for the video and deflection circuits.

When replacing the memory IC, be sure to use IC written with the initial values of data.

3.2.2 MEMORY IC REPLACEMENT PROCEDURE

1. Power off

Turn the power off and unplug the power cord from cabinet.

2. Replace IC

Be sure to use the memory IC written with the initial setting data.

3. Power on

Connect the power cord and turn the power on.

4. Check and set MENU items

Press the [MENU] key and check the setting value of the each item. If the value is different, select the item and set the correct value.

5. Adjust the front control items

Adjust the CHROMA, PHASE, CONTRAST and BRIGHT.

Not all items can be adjusted as expected if the signal has not been input correctly in the adjustments.

6. Check and set the SET-UP MENU items

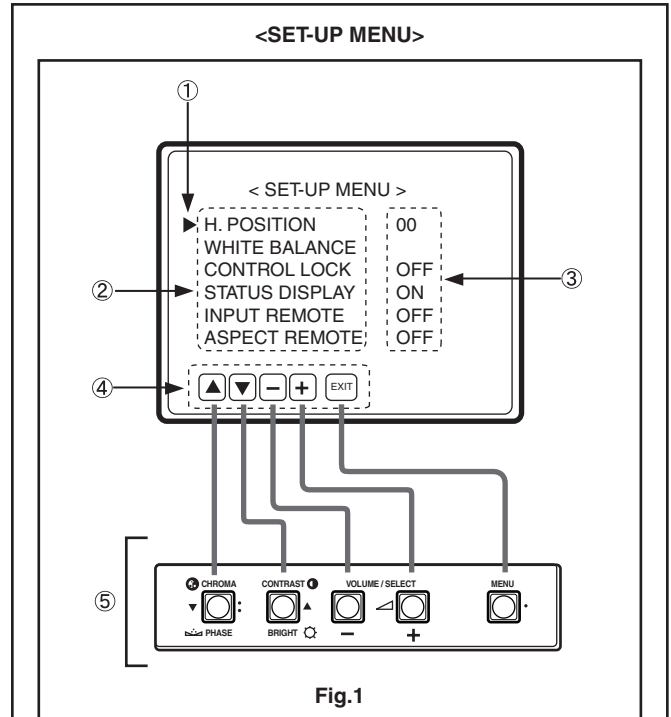
If the value of each item of < SET-UP MENU > set as value peculiar to this monitor is not correctly, operation of a microcomputer and the output of image do not become suitable. Please set up the value of each item correctly, according to the following description.

- (1) Press the [MENU] key and the [CHROMA/PHASE] key simultaneously.
- (2) The < SET-UP MENU > screen will be displayed.
- (3) Check the setting value of the each item of the < SET-UP MENU >. If the value is different, select the item and set the correct value.
- (4) Press the [MENU] key, and return to the normal screen.

7. Confirm the items of SERVICE MENU

Confirm the each item of the SERVICE MENU.

Refer to the corresponding page to operate the SERVICE MENU.



① CURSOR

Point out the current adjusting item. Operate with the [CHROMA/PHASE] key and [CONTRAST/BRIGHT] key.

② SETTING ITEM

The items of <SET-UP MENU>.

③ SETTING VALUE

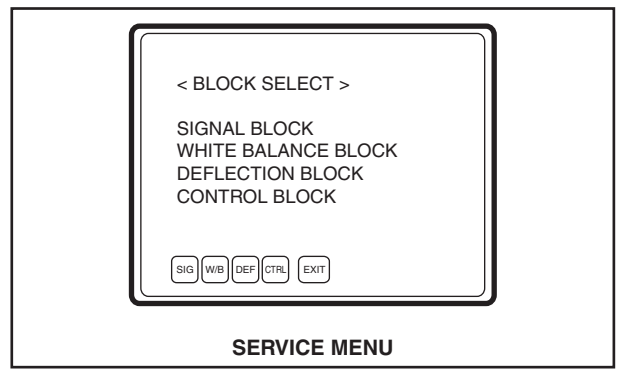
Adjust each item of SET-UP MENU with the [VOLUME/SELECT + (UP)] key or [VOLUME/SELECT - (DOWN)] key.

④ FUNCTION DISPLAY

When you move the cursor to select the item, the key function display changes the illustration.

⑤ OPERATION KEY ASSIGNMENT

In the SERVICE MENU, the original key operation by the front panel replaced with the displayed function.



3.2.3 FACTRY SETTING VALUE

■ INITIAL SETTING VALUE TABLE [SET-UP MENU]

Setting item	Setting content / Range		Initial setting value
H. POSITION	-05 ~ +05		0
WHITE BALANCE	CUTOFF (R / G / B)	-09 ~ +09	0
	DRIVE (R / B)	-09 ~ +09	0
CONTROL LOCK	ON / OFF		OFF
STATUS DISPLAY	ON / OFF		ON
INPUT REMOTE	ON / OFF		OFF
ASPECT REMOTE	ON / OFF		OFF

■ INITIAL SETTING VALUE TABLE [MENU]

Setting item	Setting content / Range		Initial setting value
SHARPNESS	00 ~ +05		03
COLOUR SYSTEM	AUTO / NTSC / PAL		AUTO
ASPECT RATIO	4-3 / 16-9		4-3
COLOR TEMP.	6500 / 9300		6500

■ INITIAL SETTING VALUE [FRONT PANEL CONTROLS]

Setting item	Setting content / Range		Initial setting value
INPUT SELECT	A / B		A
CHROMA	-20 ~+20		00
PHASE	-20 ~+20		00
CONTRAST	-20 ~+20		00
BRIGHT	-20 ~+20		00
VOLUME	00 ~ 50		20

3.2.4 SERVICE MENU SETTING ITEMS

■ SIGNAL BLOCK

Item No.	Setting content
S01	BRIGHT
S02	CONTRAST
S03	CHROMA(PAL)
S04	CHROMA(NTSC)
S05	CHROMA(SECAM)
S06	PHASE(NTSC)
S07	BRIGHT(16:9)
S08	CONTRAST(16:9)
S09	CONTRAST(9300)
S10	CHROMA(NTSC 9300)
S11	PHASE(NTSC 9300)

■ WHITE BALANCE BLOCK

Item No.	Setting content
W01	R CUTOFF
W02	G CUTOFF
W03	B CUTOFF
W04	R DRIVE(6500)
W05	B DRIVE(6500)
W06	R DRIVE(9300)
W07	B DRIVE(9300)

■ CONTROL BLOCK

Item No.	Setting content	Item No.	Setting content
C01	MODEL	C30	SECAM. S-FIELD
C02	BIRGHT(UP)	C31	SECAM. SDC.ATT
C03	BRIGHT(DOWN)	C32	SECAM. DEMP.F0
C04	CONT(UP)	C33	SECAM. V.ID.SW
C05	CONT(DOWN)	C34	SECAM. S.KILL
C06	CHROMA(UP)	C35	SECAM. BELL.F0
C07	CHROMA(DOWN)	C36	ABL.GAIN
C08	PHASE(UP)	C37	ABL.POINT
C09	PHASE(DOWN)	C38	TRAP SW(NT)
C10	OSD H POSITION	C40	TRAP SW(PAL)
C11	OSD V POSITION(50Hz)	C41	TRAP Q(NT)
C12	OSD V POSITION(60Hz)	C42	TRAP Q(PAL)
C13	VIDEO Y DELAY(NT)	C43	TRAP F0(NT)
C14	VIDEO Y DELAY(PAL)	C44	TRAP F0(PAL)
C15	VIDEO Y DELAY(SEC)	C45	TOF SW(NT)
C16	VIDEO Y DELAY(B/W)	C45	TOF SW(PAL)
C17	S Y DELAY(NT)	C46	TOF Q(NT)
C18	S Y DELAY(PAL)	C47	TOF Q(PAL)
C19	S Y DELAY(SEC)	C48	TOF F0(NT)
C20	S Y DELAY(B/W)	C49	TOF F0(PAL)
C21	SERVICE BRIGHT	C50	APA(V.NT)
C22	SHARP CENTER	C51	APA(V.PAL)
C23	V-GUARD	C52	APA(V.SEC)
C24	HOUR METER	C53	APA(Y/C,B/W)
C25	AFC MODE	C54	R-Y BLACK OFFSET
C26	BURST POSITION(N/P)	C55	B-Y BLACK OFFSET
C27	BURST POSITION(SEC)	C56	CONTRAST CONTROL
C28	SECAM SW.	C57	COLOR TEMP.SW
C29	REMOCON		

■ DEFLECTION BLOCK

Item No.	Setting content
D01	HORIZONTAL POSITION
D02	VERTICAL SIZE
D03	VERTICAL SIDE PIN CORRECTION
D04	VERTICAL CENTER
D05	VERTICAL LINEARITY

In addition to the ones listed above, the following DEFLECTION BLOCK are also available.

INPUT SIGNAL V. FREQ / ASPECT	SCREEN DISPLAY
50Hz / 4:3	D01~D05
60Hz / 4:3	DA1~DA5
50Hz / 16:9	DB1~DB5
60Hz / 16:9	DC1~DC5

3.3 REPLACEMENT OF CHIP COMPONENT

3.3.1 CAUTIONS

- (1) Avoid heating for more than 3 seconds.
- (2) Do not rub the electrodes and the resist parts of the pattern.
- (3) When removing a chip part, melt the solder adequately.
- (4) Do not reuse a chip part after removing it.

3.3.2 SOLDERING IRON

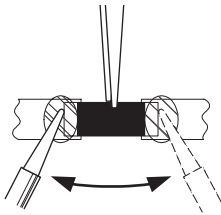
- (1) Use a high insulation soldering iron with a thin pointed end of it.
- (2) A 30w soldering iron is recommended for easily removing parts.

3.3.3 REPLACEMENT STEPS

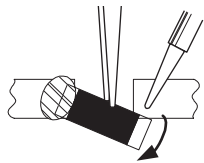
1. How to remove Chip parts

[Resistors, capacitors, etc.]

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.



- (2) Shift with the tweezers and remove the chip part.

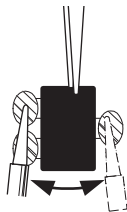


[Transistors, diodes, variable resistors, etc.]

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.



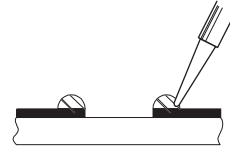
NOTE :

After removing the part, remove remaining solder from the pattern.

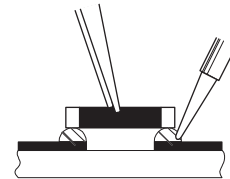
2. How to install Chip parts

[Resistors, capacitors, etc.]

- (1) Apply solder to the pattern as indicated in the figure.

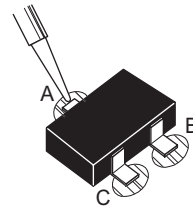


- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

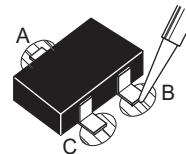


[Transistors, diodes, variable resistors, etc.]

- (1) Apply solder to the pattern as indicated in the figure.
- (2) Grasp the chip part with tweezers and place it on the solder.
- (3) First solder lead **A** as indicated in the figure.



- (4) Then solder leads **B** and **C**.



SECTION 4 ADJUSTMENT

4.1 ADJUSTMENT PREPARATION

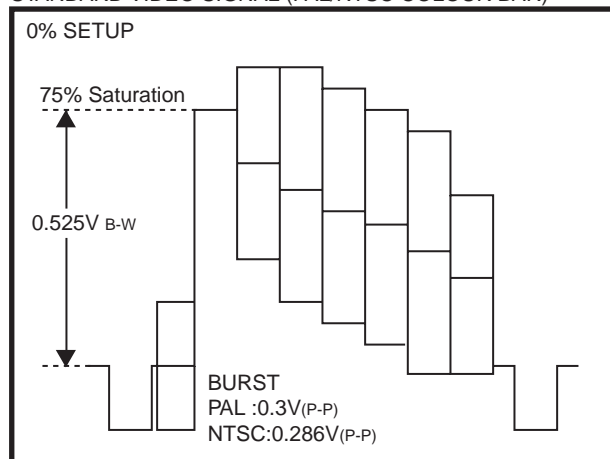
- (1) There are 2 ways of adjusting this unit: One is with the MENU as On-Screen-Display and the other is the conventional method using adjustment parts and components.
- (2) The adjustment using the On-Screen-Display is made on the basis of the initial setting values. The setting values which adjust the screen to the optimum condition can be different from the initial setting values.
- (3) Make sure that connection is correctly made AC to AC power source.
- (4) Turn on the power of the TV and measuring instruments for warming up for at least 30 minutes before starting adjustments.
- (5) If the receive or input signal is not specified, use the most appropriate signal for adjustment.
- (6) Never touch the parts (such as variable resistors, transformers and condensers) not shown in the adjustment items of this service adjustment.
- (7) Unless otherwise specified in the adjustment items, preset the values that < SET-UP MENU >, MENU and front controls to initial conditions.

4.2 MEASURING INSTRUMENT AND FIXTURES

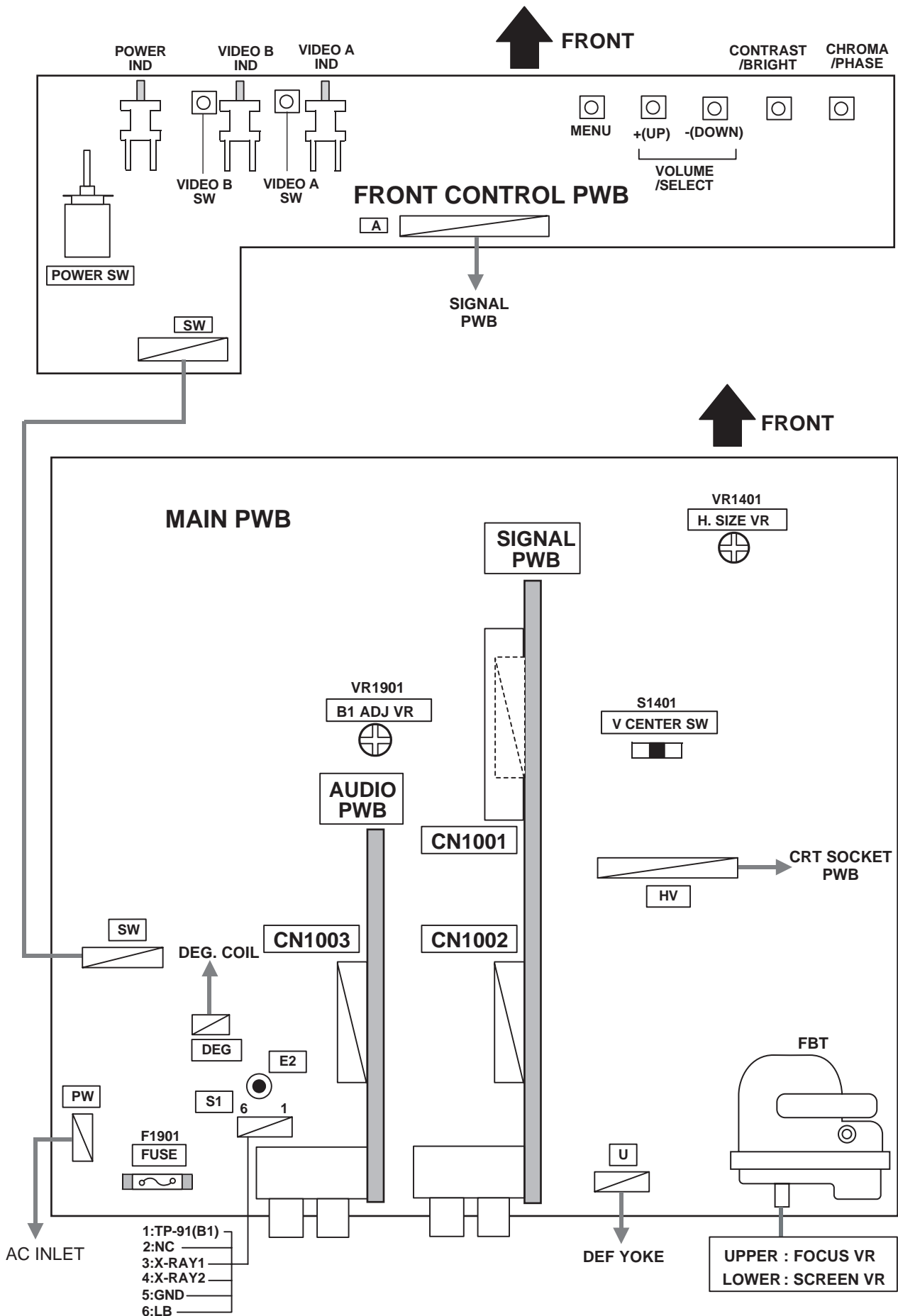
- (1) DC voltmeter (or digital voltmeter)
- (2) Oscilloscope
- (3) Colour analyser (Colour temperature meter)
- (4) Signal generator (Pattern generator) [PAL/NTSC]

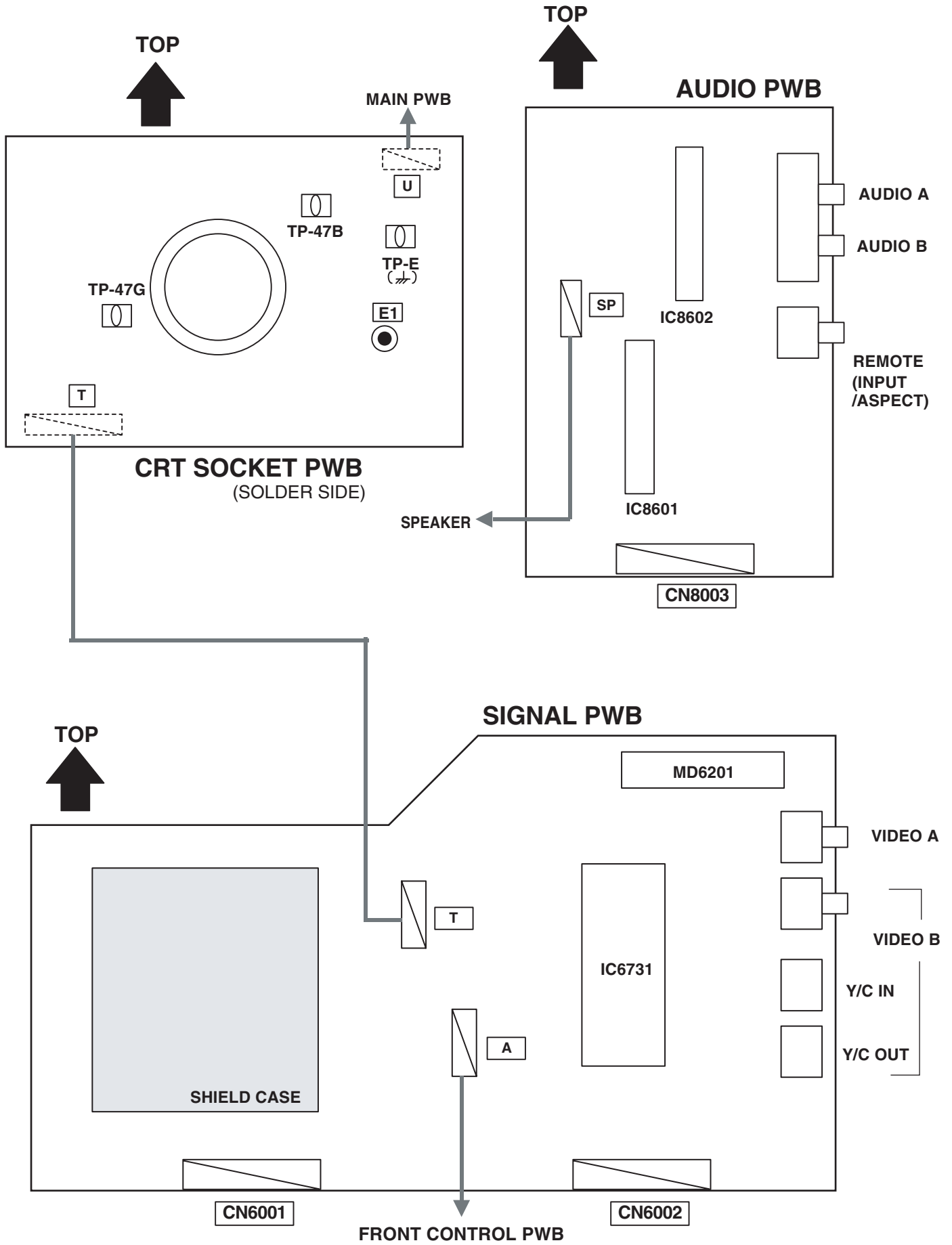
4.3 STANDARD SIGNAL FOR ADJUSTMENT ITEMS

STANDARD VIDEO SIGNAL (PAL/NTSC COLOUR BAR)



4.4 ADJUSTMENT LOCATIONS





4.5 BASIC OPERATION OF SERVICE MENU

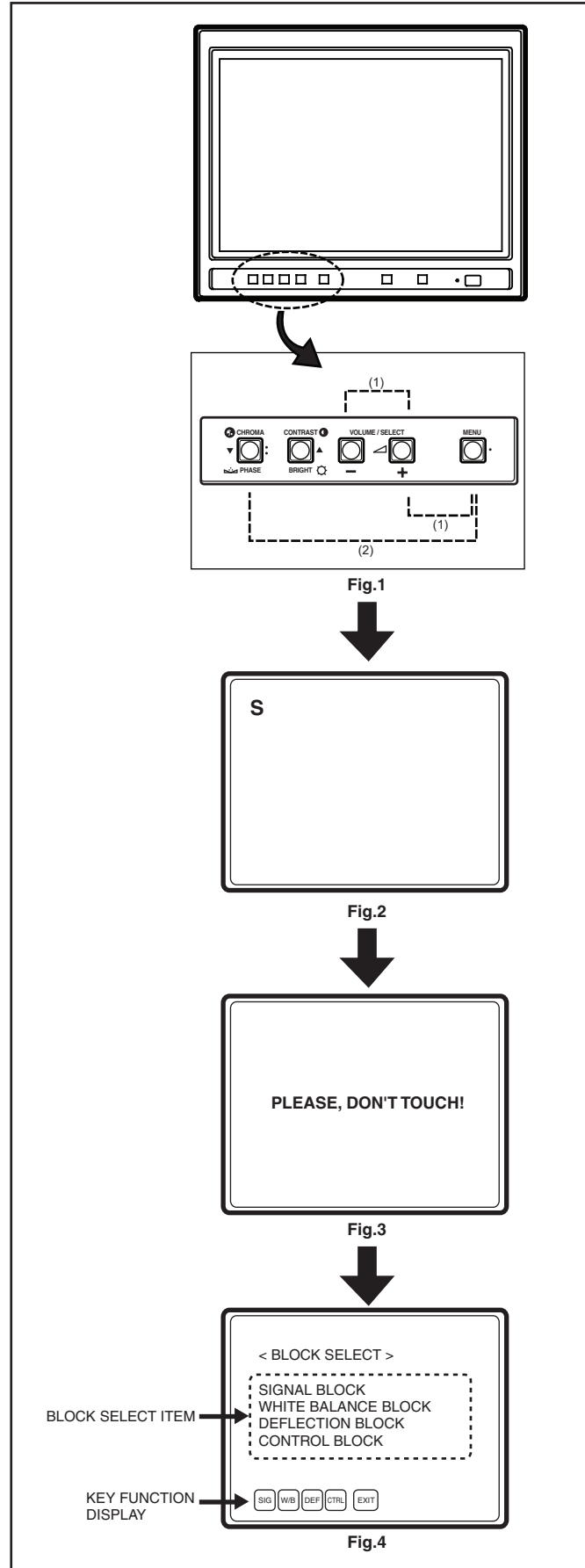
4.5.1 SERVICE MENU ITEMS

With the SERVICE MENU, various settings can be made, and they are broadly classified in the following items of adjustments. It is no requirement for adjustment the portion of the DEFLECTION BLOCK and CONTROL BLOCK.

SIGNAL BLOCK	This block adjusts the data of the various signal circuit controls.
WHITE BALANCE BLOCK	This block adjusts the data of the WHITE BALANCE adjustment.
DEFLECTION BLOCK	This block adjusts the data of the DEFLECTION circuit.
CONTROL BLOCK	This block adjusts the whole of the systems.

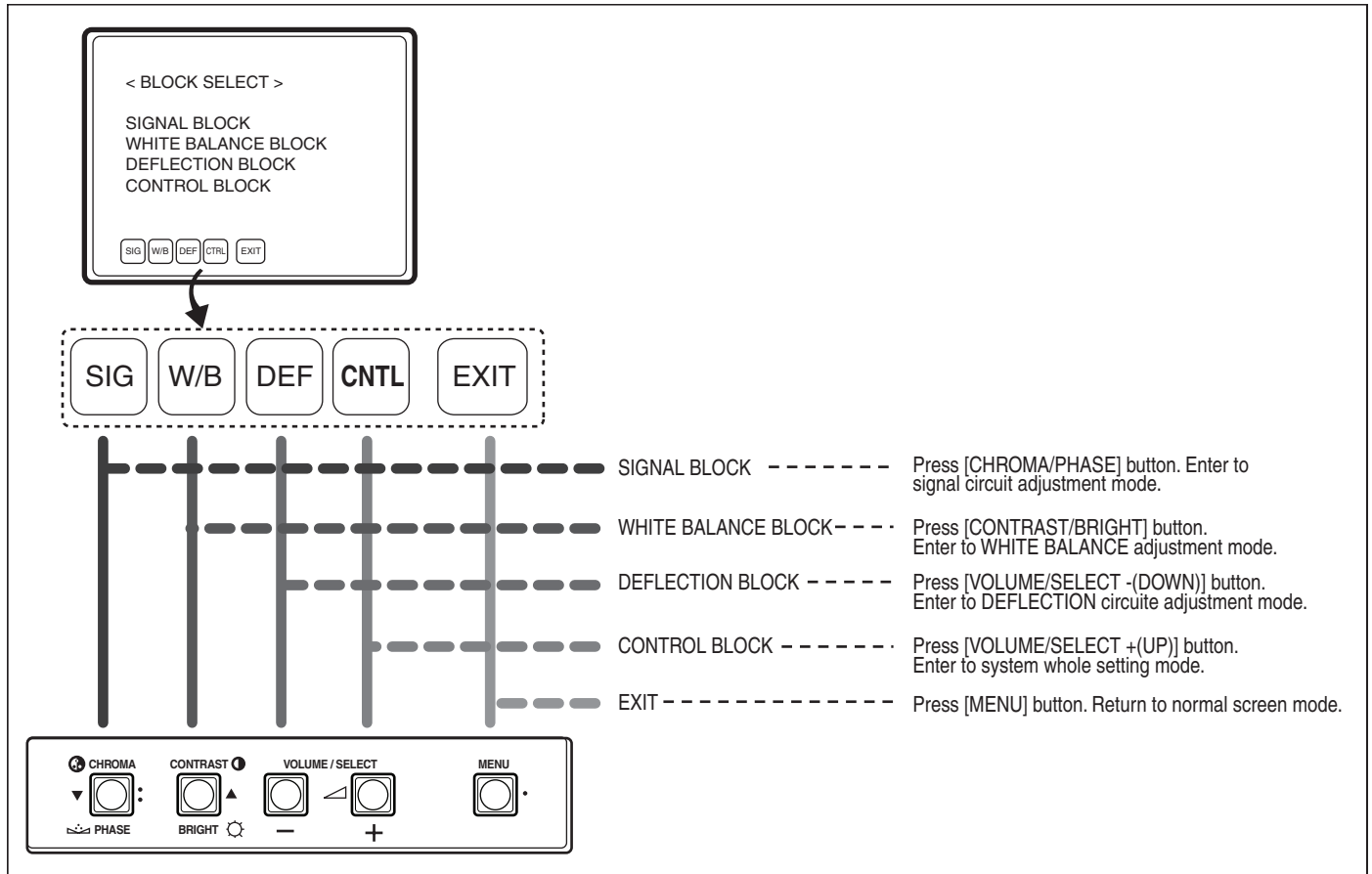
4.5.2 HOW TO ENTER THE SERVICE MENU

- (1) Press [MENU] button and [VOLUME/SELECT +(UP)] key simultaneously (Fig.1).
The letter "S" appears at the upper left of the screen (Fig. 2).
- (2) While displaying the letter "S", press [MENU] button and [CHROMA/PHASE] button simultaneously (Fig.1).
The screen displays "PLEASE DON'T TOUCH" (Fig. 3).
- (3) While displaying the letter above-mentioned, press [VOLUME/SELECT +(UP)] button or [-(DOWN)] button to display the SERVICE MENU as shown in Fig. 4.
If above-mentioned steps or state continues for more than 5 seconds without a further operation, the display extinguishes and the mode is released.



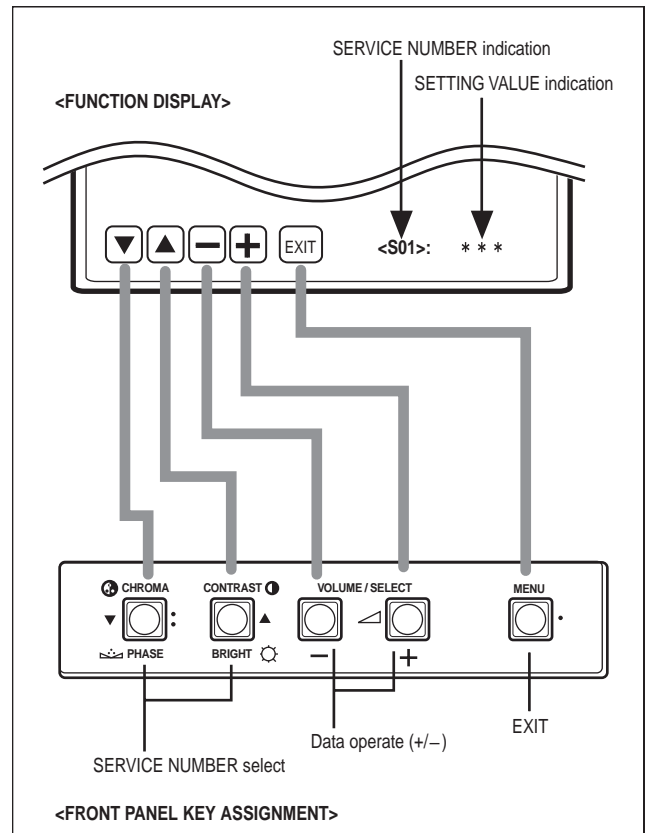
4.5.3 OPERATION OF < BLOCK SELECT > SCREEN

While the SERVICE MENU < BLOCK SELECT > screen is displaying, in accordance with "FUNCTION DISPLAY" at the lower side of the screen, be able to operate the various items.

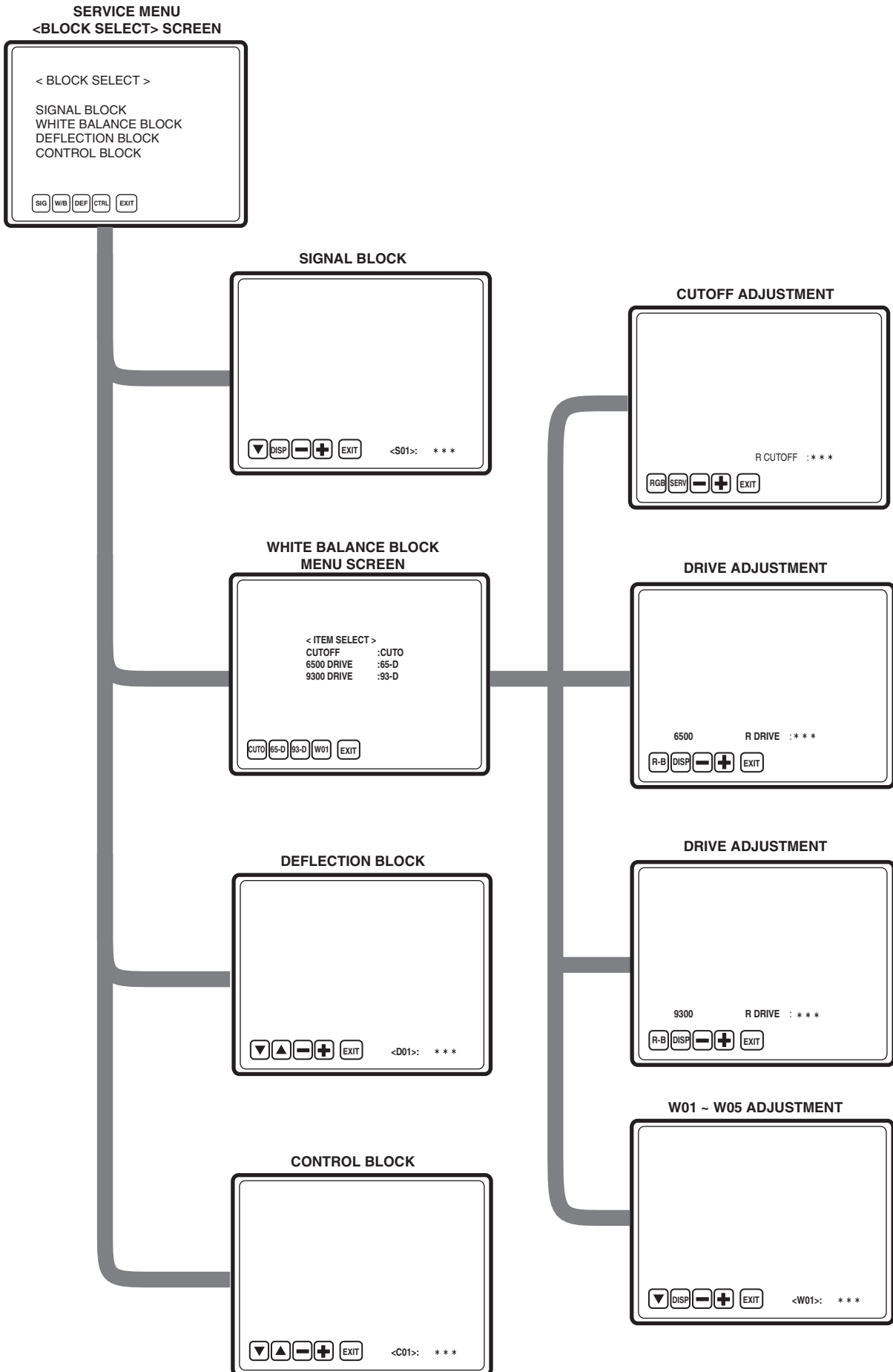


4.5.4 OPERATION EXAMPLE : SIGNAL BLOCK ADJUSTMENT

- (1) SELECT THE SIGNAL BLOCK
Press the [CHROMA/PHASE] button to select the signal block. Then enter to the SIGNAL BLOCK screen.
- (2) SELECT THE SERVICE NUMBER
Press the [CHROMA/PHASE] button or [CONTRAST/BRIGHT] button to select the service number one of < S01 >~< S11 >.
- (3) ADJUSTMENT DATA OPERATION
Press the [VOLUME/SELECT + (UP)] button to change the setting value in the + direction.
Press the [VOLUME/SELECT - (DOWN)] button to change the setting value in the - direction.
Adjustment value automatically memorize to the memory IC when release the buttons.
- (4) EXIT SERVICE MENU
When adjustments are completed, press [MENU] button. Then return to the BLOCK SELECT screen. Again press [MENU] button then return to the normal screen.



4.5.5 SERVICE MENU FLOW CHART



4.6 INITIAL SETTING VALUE OF SERVICE MENU

[SIGNAL BLOCK]

No.	Setting item	Variable range	Initial setting value
S01	BRIGHT	000~255	090
S02	CONTRAST	000~255	160
S03	CHROMA (PAL)	000~255	128
S04	CHROMA (NTSC)	000~255	128
S05	CHROMA (SECAM)	000~255	128
S06	PHASE (NTSC)	000~127	067
S07	BRIGHT (16:9)	-128~+127	-008
S08	CONTRAST (16:9)	-128~+127	-005
S09	CONTRAST (9300)	-128~+127	000
S10	CHROMA (NTSC 9300)	-128~+127	000
S11	PHASE (NTSC 9300)	-128~+127	000

[WHITE BALANCE BLOCK]

No.	Setting item	Variable range	Initial setting value
W01	R CUTOFF	000~255	050
W02	G CUTOFF	000~255	050
W03	B CUTOFF	000~255	050
W04	R DRIVE	000~255	150
W05	B DRIVE	000~255	080
W06	R DRIVE (9300)	000~255	130
W07	B DRIVE (9300)	000~255	120

[DEFLECTION BLOCK]

No.	Aspect ratio	Vertical frequency	Setting item	Variable range	Initial setting value
D01	4:3	50Hz	HORIZONTAL POSITION	000~031	005
D02			VERTICAL SIZE	000~031	080
D03			SIDE PIN CORRECTION	000~063	040
D04			VERTICAL CENTER	000~255	000
D05			VERTICAL LINEARITY	000~031	013
DA1	4:3	60Hz	HORIZONTAL POSITION	000~031	+003
DA2			VERTICAL SIZE	000~031	+003
DA3			SIDE PIN CORRECTION	000~063	+007
DA4			VERTICAL CENTER	000~255	000
DA5			VERTICAL LINEARITY	000~031	-004
DB1	16:9	50Hz	HORIZONTAL POSITION	-128~+127	000
DB2			VERTICAL SIZE	-128~+127	-035
DB3			SIDE PIN CORRECTION	-128~+127	000
DB4			VERTICAL CENTER	-128~+127	000
DB5			VERTICAL LINEARITY	-128~+127	000
DC1	16:9	60Hz	HORIZONTAL POSITION	-128~+127	000
DC2			VERTICAL SIZE	-128~+127	-035
DC3			SIDE PIN CORRECTION	-128~+127	-001
DC4			VERTICAL CENTER	-128~+127	000
DC5			VERTICAL LINEARITY	-128~+127	000

[CONTROL BLOCK] (This is a fixed value. Don't adjust it.)

No.	Setting item	Variable range	Initial setting value
C01	MODEL	000-011	001
C02	BRIGHT POINT	UPPER	000-255
C03		LOWER	000-255
C04	CONTRAST POINT	UPPER	000-255
C05		LOWER	000-255
C06	CHROMA POINT	UPPER	000-255
C07		LOWER	000-255
C08	PHASE POINT	UPPER	000-127
C09		LOWER	000-127
C10	OSD HORIZONTAL POSITION	000-015	013
C11	OSD VERTICAL POSITION (50Hz)	000-007	002
C12	OSD VERTICAL POSITION (60Hz)	000-002	000
C13	VIDEO Y DELAY (NTSC)	000-007	001
C14	VIDEO Y DELAY (PAL)	000-007	001
C15	VIDEO Y DELAY (SECAM)	000-007	004
C16	VIDEO Y DELAY (BLACK AND WHITE)	000-007	001
C17	S Y DELAY (NTSC)	000-007	001
C18	S Y DELAY (PAL)	000-007	001
C19	S Y DELAY (SECAM)	000-007	001
C20	S Y DELAY (BLACK AND WHITE)	000-007	001
C21	SERVICE BRIGHT (VERTICAL)	000-255	085
C22	SHARP (CENTER VALUE)	000-063	011
C23	V-GUARD	000-001	001
C24	HOUR METER	001	001
C25	AFC MODE	000-003	000
C26	BURST POSITION (NTSC / PAL)	000-001	000
C27	BURST POSITION (SECAM)	000-001	000
C28	SECAM SW	000-001	000
C29	REMOCON	000-001	000
C30	SECAM S-FIELD	000-001	001
C31	SECAM SDC ATT	000-001	000
C32	SECAM DEMP F0	000-001	000
C33	SECAM V. ID. SW	000-001	000
C34	SECAM S. KILL	000-001	000
C35	SECAM BELL. F0	000-001	001
C36	ABL. GAIN	000-007	007
C37	ABL. POINT	000-007	004
C38	TRAP SW (NTSC)	000-001	001
C39	TRAP SW (PAL)	000-001	000
C40	TRAP Q (NTSC)	000-003	001
C41	TRAP Q (PAL)	000-003	001
C42	TRAP F0 (NTSC)	000-003	002
C43	TRAP F0 (PAL)	000-003	002
C44	TOF SW (NTSC)	000-001	000
C45	TOF SW (PAL)	000-001	000
C46	TOF Q (NTSC)	000-003	000
C47	TOF Q (PAL)	000-003	000
C48	TOF F0 (NTSC)	000-003	000
C49	TOF F0 (PAL)	000-003	000
C50	APA (V. NTSC)	000-003	001
C51	APA (V. PAL)	000-003	001
C52	APA (V. SECAM)	000-003	000
C53	APA (Y/C, B/W)	000-003	001
C54	R-Y BLACK OFFSET	000-015	008
C55	B-Y BLACK OFFSET	000-015	008
C56	CONTRAST CONTROL	001-003	003
C57	COLOR TEMP SW	000-001	001

4.7 ADJUSTMENT PROCEDURE

4.7.1 CHECK ITEM

Item	Measuring instrument	Test point	Adjustment part	Description
HIGH VOLTAGE	HV voltmeter	CRT anode	SCREEN VR [in FBT]	<ol style="list-style-type: none"> (1) Select WHITE BALANCE BLOCK with [CONTRAST/BRIGHT] button (< W/B >) from < BLOCK SELECT > SERVICE MENU screen. (2) Select CUTOFF adjustment mode with [CHROMA/ PHASE] button (< CUTO >). (3) Display the single horizontal line with [CONTRAST/ BRIGHT] button (< SERV >). (4) Adjust the SCREEN VR to disappear the single horizontal line. (5) Connect the HV voltmeter to the CRT anode and check it as $27.0kV \pm 1.3kV$. (6) Readjust the SCREEN VR to appear the horizontal line faintly, and cancel the single horizontal line with the [CONTRAST/BRIGHT] button (< SERV >). (7) Exit the WHITE BALANCE BLOCK with [MENU] button (< EXIT >).

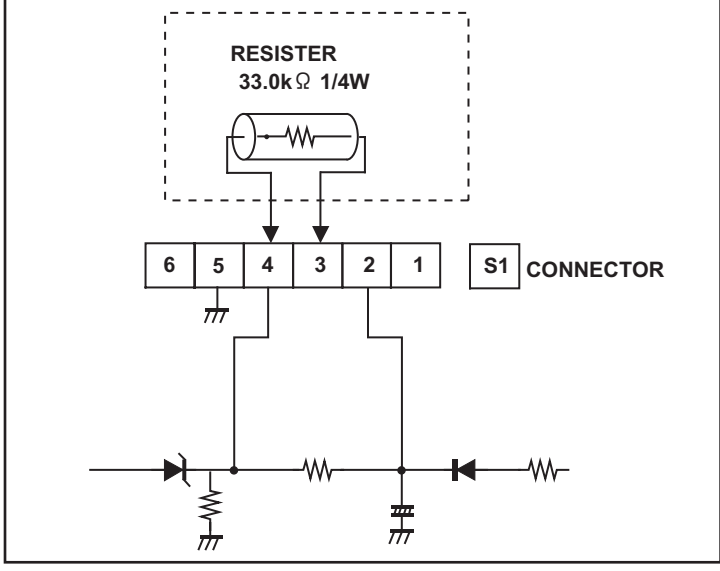
4.7.2 B1 VOLTAGE

Item	Measuring instrument	Test point	Adjustment part	Description
B1 VOLTAGE	DC voltmeter	TP-91(B1) [S1:1 pin] TP-E(GND) [S1:5 pin] [MAIN PWB]	B1 ADJ VR (VR1901) [MAIN PWB] SCREEN VR [in FBT]	<ol style="list-style-type: none"> (1) Select WHITE BALANCE BLOCK with [CONTRAST/BRIGHT] button (< W/B >) from < BLOCK SELECT > SERVICE MENU screen. (2) Select CUTOFF adjustment mode with [CHROMA/ PHASE] button (< CUTO >). (3) Display the single horizontal line with [CONTRAST/ BRIGHT] button (< SERV >). (4) Adjust the SCREEN VR to disappear the single horizontal line. (5) Check the B1 voltage as $115.0V \pm 2V$. (6) If B1 voltage is out of range, adjust it with B1 ADJ VR.

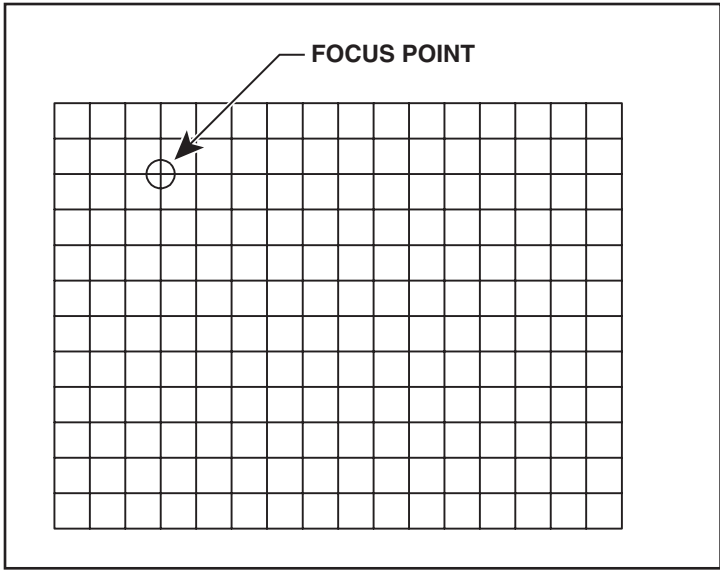
CUTOFF ADJUSTMENT MODE

Display single horizontal line switch Adjustment mode exit

4.7.3 HIGH VOLTAGE HOLD DOWN CIRCUIT CHECK

Item	Measuring instrument	Test point	Adjustment part	Description
HIGH VOLTAGE HOLD DOWN CIRCUIT	HV voltmeter Resistor (33.0kΩ, 1/4W)	X-RAY (S1 connector 3-pin, 4-pin) [MAIN PWB]		<ul style="list-style-type: none"> After repairing the high voltage hold down circuit, this circuit shall be checked to operate correctly. <ol style="list-style-type: none"> Turn the power switch to on. Refer to the figure, connect the resistor between S1 connector 3-pin and 4-pin. Make sure that the screen picture disappears. Disconnect the power plug. Remove the resistor. Again connect the power plug. Turn the power switch to on. Make sure that the normal picture is displayed on the screen.
				

4.7.4 FOCUS

Item	Measuring instrument	Test point	Adjustment part	Description
FOCUS	Signal generator		FOCUS VR [In FBT]	<ol style="list-style-type: none"> Input the crosshatch pattern signal. Adjust the FOCUS VR for optimum focus where moire is not apparent. Darken the picture and adjust the focus by turning counter-clockwise from the position where focus is poor. Alternately repeat the above steps to obtain the optimum position.
				

4.7.5 DEFLECTION CIRCUIT

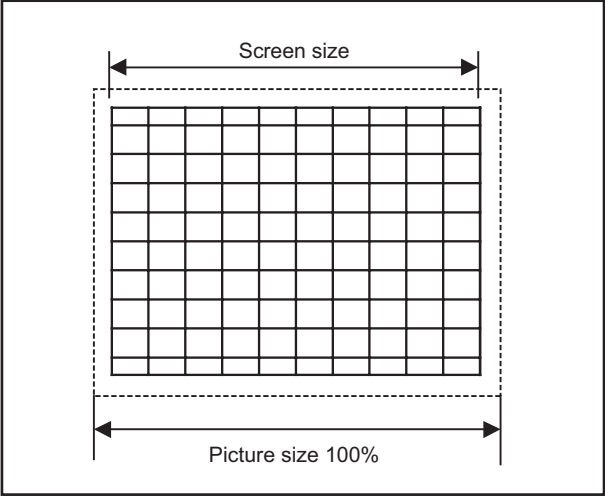
There are 4 modes of DEFLECTION adjustment depending upon the kind of input signals.

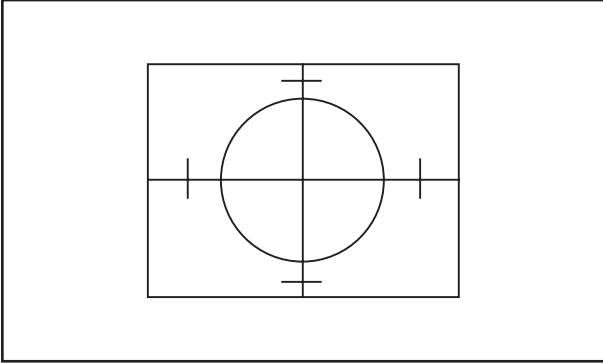
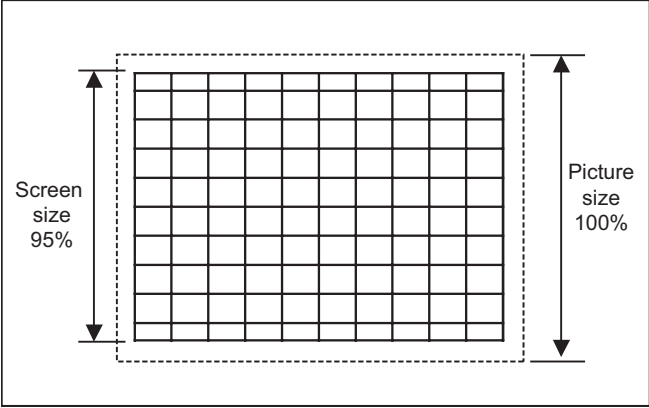
The adjustments must always be carried out in regular sequence given below.

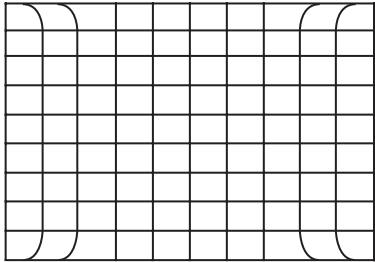
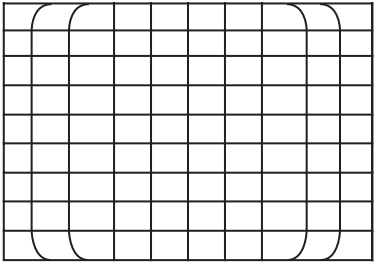
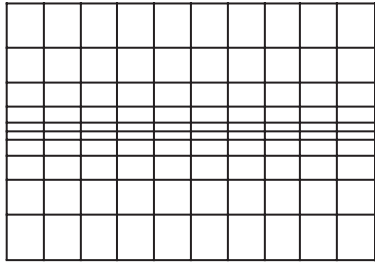
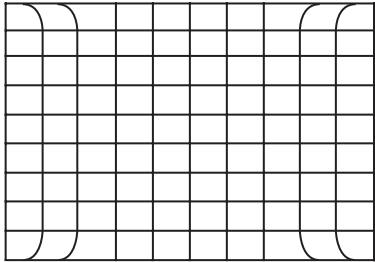
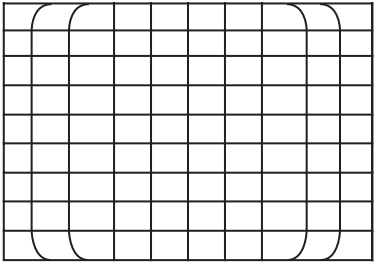
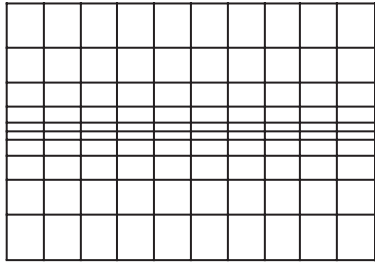
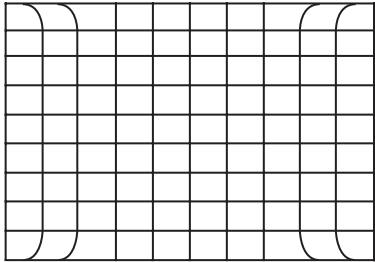
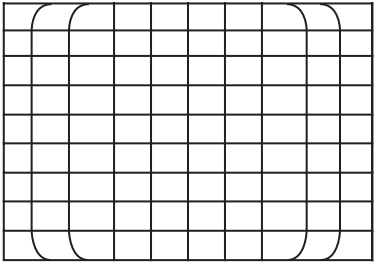
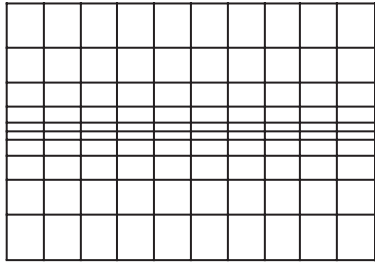
If you change the figures in the course of the adjustments by returning to the preceding steps, all adjustments come to nothing.

The screen aspect ratio 4:3 at 50Hz (PAL) is regarded as the reference value for all adjustments. The other values obtained in the adjustments using other signals become the offset values as opposed to the reference values.

Input signal		Item No.	Initial setting value
4:3	50Hz (PAL)	D0*	D0*
	60Hz (NTSC)	DA*	D0* + DA*
16:9	50Hz (PAL)	DB*	D0* + DB*
	60Hz (NTSC)	DC*	D0* + DA* + DC*

Item	Measuring instrument	Test point	Adjustment part	Description						
H. POSITION & H. SIZE	Signal generator		[DEFLECTION BLOCK] D01 (H.POSITION)	<ol style="list-style-type: none"> (1) Input the PAL (50Hz) crosshatch pattern signal. (2) Select DEFLECTION BLOCK with [VOLUME/SELECT - (DOWN)] button (< DEF >) from < BLOCK SELECT > SERVICE MENU screen. (3) Select < D01 >. (4) Adjust < D01 > to align the picture center with the CRT center. (5) Adjust H. SIZE VR to adjust horizontal size to the value in the table given below. (6) Repeat above step 4 and 5 to adjust correctly. 						
			H. SIZE VR (VR1401) [MAIN PWB]							
										
		<table border="1" style="width: 100%;"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><D01> H. POSITION</td> <td>005</td> </tr> </tbody> </table>			Item	Initial setting value	<D01> H. POSITION	005		
Item	Initial setting value									
<D01> H. POSITION	005									
		<table border="1" style="width: 100%;"> <thead> <tr> <th>H. SIZE</th> <th>Adjustment value</th> </tr> </thead> <tbody> <tr> <td>TM-A210G/c TM-A210G/E</td> <td>96%</td> </tr> <tr> <td>TM-A210G/u</td> <td>94%</td> </tr> </tbody> </table>			H. SIZE	Adjustment value	TM-A210G/c TM-A210G/E	96%	TM-A210G/u	94%
H. SIZE	Adjustment value									
TM-A210G/c TM-A210G/E	96%									
TM-A210G/u	94%									

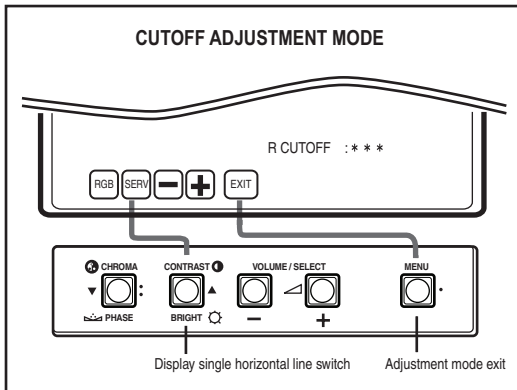
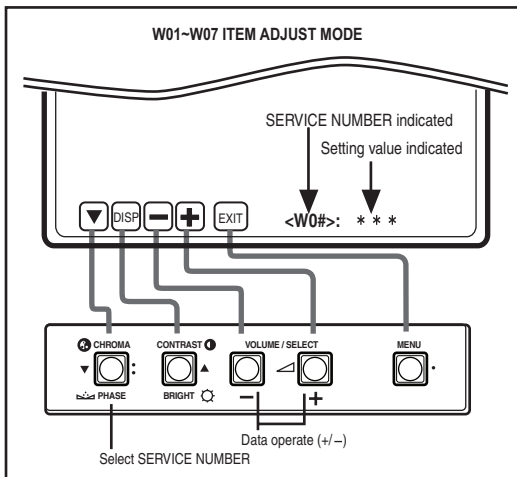
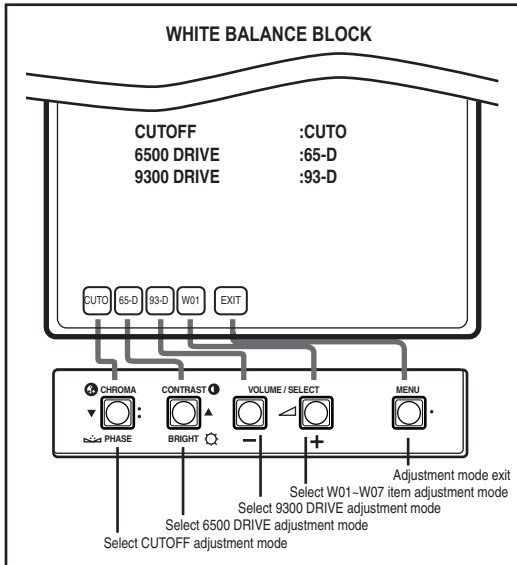
Item	Measuring instrument	Test point	Adjustment part	Description
V. POSITION	Signal generator		V. CENTER SW (S1401) [MAIN PWB]	(1) Input the circle pattern signal. (2) Adjust V. CENTER SW to agree with CRT center and signal center of vertical direction.
				
V. SIZE	Signal generator		[DEFLECTION BLOCK] D02 (V.SIZE)	(1) Input the crosshatch signal. (2) Select < D02 >, and adjust it to the vertical scan size to 95%.
				
Item		Initial setting value		
<D02> V. SIZE		080		

Item	Measuring instrument	Test point	Adjustment part	Description						
SIDE PIN CORRECTION & V. LINEARITY	Signal generator		[DEFLECTION BLOCK] D03 (SIDE PIN CORRECTION) D05 (V. LINEARITY)	<ul style="list-style-type: none"> Should not adjustment except for in case of under the condition that remarkably bad about vertical linearity, <ol style="list-style-type: none"> Input the crosshatch pattern signal. Adjust the < D03 > to the all square in the crosshatch screen become true square. Adjust the < D05 > to the top-and-bottom balance become equal. 						
					<table border="1"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><D03> SIDE PIN CORRECT</td> <td>040</td> </tr> <tr> <td><D05> V. LINEARITY</td> <td>013</td> </tr> </tbody> </table>	Item	Initial setting value	<D03> SIDE PIN CORRECT	040	<D05> V. LINEARITY
Item	Initial setting value									
<D03> SIDE PIN CORRECT	040									
<D05> V. LINEARITY	013									
<table border="1" style="width: 100%;"> <tbody> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> <tr> <td style="text-align: center;">Side pincushion (Reel)</td> <td style="text-align: center;">Side pincushion (Barel)</td> <td style="text-align: center;">Vertical linearity</td> </tr> </tbody> </table>								Side pincushion (Reel)	Side pincushion (Barel)	Vertical linearity
										
Side pincushion (Reel)	Side pincushion (Barel)	Vertical linearity								
If necessary, repeat the above DEFLECTION adjustment steps many times. And improve the adjustment level.										

4.7.6 VIDEO CIRCUIT

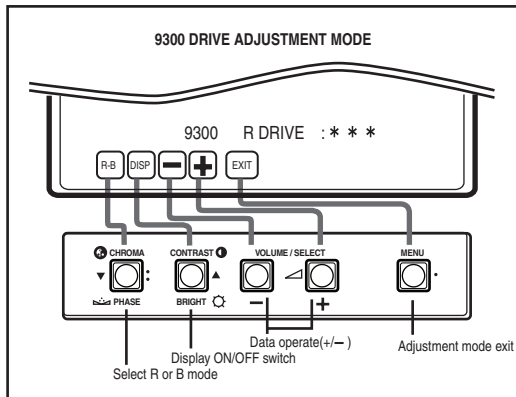
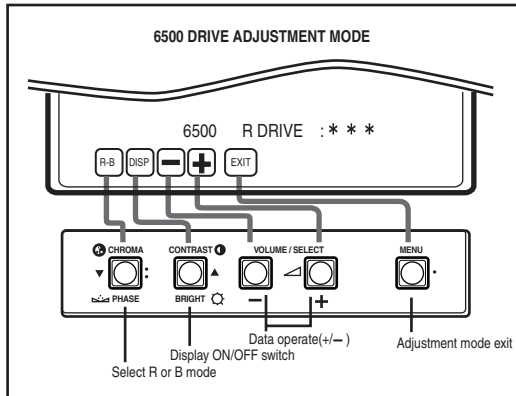
When you perform WHITE BALANCE adjustment, be sure to input a video composite signal. Moreover, set the aspect ratio to 4:3. It is no requirement to adjust in 16:9 mode.

Item	Measuring instrument	Test point	Adjustment part	Description
WHITE BALANCE (LOW LIGHT)	Signal generator		SCREEN VR [in FBT] [WHITE BALANCE BLOCK] W01 (R CUTOFF) W02 (G CUTOFF) W03 (B CUTOFF)	<ul style="list-style-type: none"> After checking that the voltage of B1 power supply voltage is right. <ol style="list-style-type: none"> Input the black-and-white signal (Included 100% white). Select the WHITE BALANCE BLOCK with [CONTRAST/BRIGHT] button (< W/B >) from < BLOCK SELECT > SERVICE MENU screen. Select the W01~W07 item adjust mode with [VOLUME/SELECT + (UP)] button (< W01 >). Confirm that the initial setting value of < W01 >, < W02 > and < W03 >. Exit the W01~W07 item adjust mode with [MENU] button (< EXIT >). Select the CUTOFF adjustment mode with [CHROMA/PHASE] button (< CUTO >) from < WHITE BALANCE BLOCK > screen. Display the single horizontal line with [CONTRAST/BRIGHT] button (< SERV >). Carefully adjust the SCREEN VR to horizontal line appears faintly, not to shine much. Gradually turn the SCREEN VR from the left to the right direction to bring one of the red, green and blue colours faintly visible. Then select R, G or B colour with [CHROMA/PHASE] button (< RGB >) that colour except for appears first, and adjusting 2 colours CUTOFF values, and make horizontal line visible white. Readjust the SCREEN VR to appear the horizontal line faintly. Cancel the single horizontal line with [CONTRAST/PHASE] button (< SERV >). Exit the WHITE BALANCE BLOCK with [MENU] button (< EXIT >).



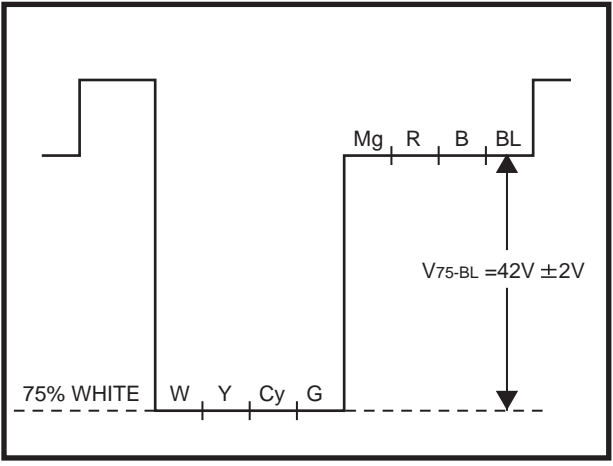
Item	Initial setting value
<W01> R CUTOFF	50
<W02> G CUTOFF	50
<W03> B CUTOFF	50

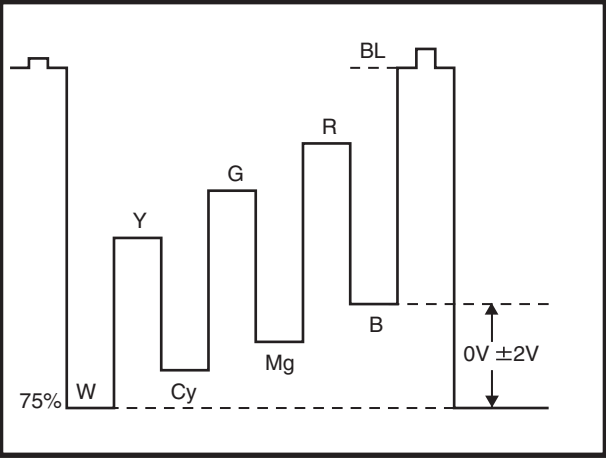
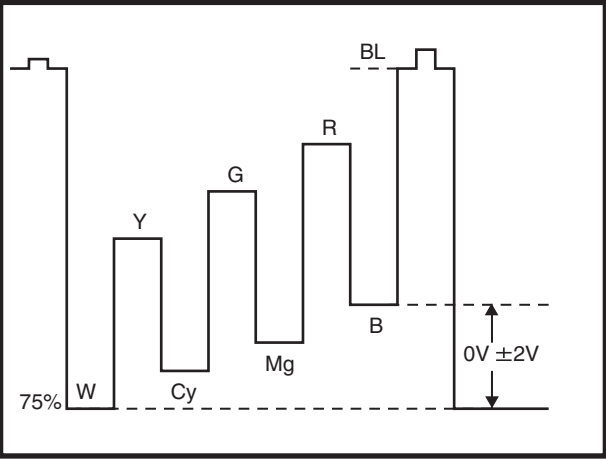
Item	Measuring instrument	Test point	Adjustment part	Description
WHITE BALANCE (HIGH LIGHT) 6500K & 9300K	Signal generator Colour analyser (Colour temperature meter)		[WHITE BALANCE BLOCK] 6500 R DRIVE 6500 B DRIVE 9300 R DRIVE 9300 B DRIVE	<ul style="list-style-type: none"> Check the LOW LIGHT adjustment has been finished correctly before performing HIGH LIGHT adjustment. <ol style="list-style-type: none"> Input the black-and-white signal (Included 100% white). Select the WHITE BALANCE BLOCK mode with [CONTRAST/BRIGHT] button (< W/B >) from < BLOCK SELECT > SERVICE MENU screen. Select the 6500 DRIVE adjustment mode with [CONTRAST/BRIGHT] button (< 65-D >). Apply the sensor of the colour analyser to the CRT surface, portion of the 100% white. Adjust the < 6500 R DRIVE > or < 6500 B DRIVE > to setting 6500K (x=0.313, y=0.329) by pressing [CHROMA/PHASE] button (< R-B >) alternately. Select the 9300 DRIVE adjustment mode. Apply the sensor of the colour analyser to the CRT surface, portion of the 100% white. Adjust the < 9300 R DRIVE > or < 9300 B DRIVE > to setting 9300K (x=0.283, y=0.297) by pressing [CHROMA/PHASE] button (< R-B >) alternately. Exit the WHITE BALANCE BLOCK with [MENU] button (< EXIT >).

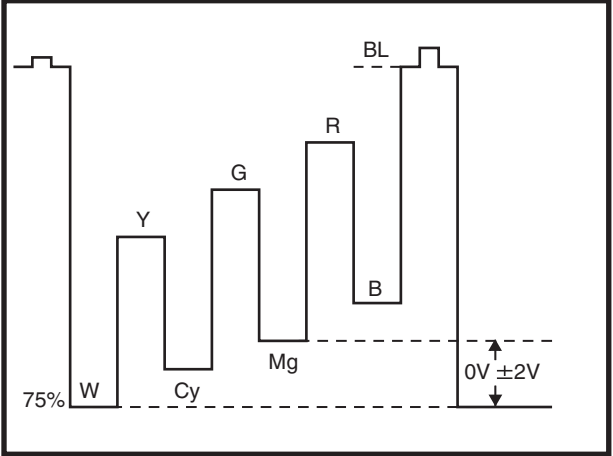


ITEM	INITIAL SETTING VALUE
<W04> R DRIVE	150
<W05> B DRIVE	080

Item	Initial setting value
<W06> R DRIVE	130
<W07> B DRIVE	120

Item	Measuring instrument	Test point	Adjustment part	Description			
SUB BRIGHT	Signal generator		[SIGNAL BLOCK] S01 (BRIGHT)	<ul style="list-style-type: none"> Under the condition that Low light adjustment has been correctly finished. <ol style="list-style-type: none"> Input the black and white signal (included 0% black). Select the SIGNAL BLOCK with [CHROMA/PHASE] button (< SIG >) from < BLOCK SELECT > SERVICE MENU screen. Select < S01 >. Adjust the < S01 > to where the 0% black part component faintly brightens. Check the BRIGHT adjustment by alternately turning the screen display in WHITE BALANCE BLOCK CUTOFF mode. 			
<table border="1"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><S01> BRIGHT</td> <td>090</td> </tr> </tbody> </table>					Item	Initial setting value	<S01> BRIGHT
Item	Initial setting value						
<S01> BRIGHT	090						
SUB CONTRAST	Signal generator Oscilloscope	TP-47G TP-E [CRT SOCKET PWB]	[SIGNAL BLOCK] S02 (CONTRAST)	<ol style="list-style-type: none"> Input the full colour bar signal (included 75% white signal). Connect the oscilloscope to TP-47G and TP-E. Select the SIGNAL BLOCK with [CHROMA/PHASE] button (< SIG >) from < BLOCK SELECT > SERVICE MENU screen. Select the < S02 >. Adjust the < S02 > to become the voltage different between 75% white and 0% black to $42V \pm 2V$ as shown in figure. 			
 <table border="1"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><S02> CONTRAST</td> <td>160</td> </tr> </tbody> </table>					Item	Initial setting value	<S02> CONTRAST
Item	Initial setting value						
<S02> CONTRAST	160						

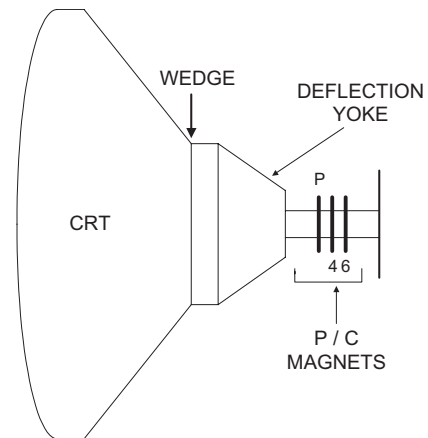
Item	Measuring instrument	Test point	Adjustment part	Description				
PAL CHROMA	Signal generator Oscilloscope	TP-47B TP-E [CRT SOCKET PWB]	[SIGNAL BLOCK] S03(PAL CHROMA)	<ol style="list-style-type: none"> (1) Input the PAL full colour bar signal (included 75% white signal). (2) Connect the oscilloscope probe to TP-47B and TP-E. (3) Select the SIGNAL BLOCK with [CHROMA/PHASE] button (< SIG >) from < BLOCK SELECT > SERVICE MENU screen. (4) Select the < S03 >. (5) Adjust the < S03 > to become the voltage different between 75% white and blue to $0V \pm 2V$ as shown in figure. 				
 <table border="1" data-bbox="230 856 849 1003" style="margin: 10px auto;"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><S03> PAL CHROMA</td> <td>128</td> </tr> </tbody> </table>					Item	Initial setting value	<S03> PAL CHROMA	128
Item	Initial setting value							
<S03> PAL CHROMA	128							
NTSC 3.58 CHROMA	Signal generator Oscilloscope	TP-47B TP-E [CRT SOCKET PWB]	[SIGNAL BLOCK] S04 (NTSC CHROMA)	<ol style="list-style-type: none"> (1) Input the NTSC 3.58 full colour bar signal (included 75% white signal). (2) Connect the oscilloscope probe to TP-47B and TP-E. (3) Select the SIGNAL BLOCK with [CHROMA/PHASE] button (< SIG >) from < BLOCK SELECT > SERVICE MENU screen. (4) Select the < S04 >. (5) Adjust the < S04 > to become the voltage different between 75% white and blue to $0V \pm 2V$ as shown in figure. 				
 <table border="1" data-bbox="230 1703 849 1850" style="margin: 10px auto;"> <thead> <tr> <th>Item</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td><S04> NTSC CHROMA</td> <td>128</td> </tr> </tbody> </table>					Item	Initial setting value	<S04> NTSC CHROMA	128
Item	Initial setting value							
<S04> NTSC CHROMA	128							

Item	Measuring instrument	Test point	Adjustment part	Description				
NTSC 3.58 PHASE	Signal generator Oscilloscope	TP-47B TP-E [CRT SOCKET PWB]	[SIGNAL BLOCK] S06 (NTSC PHASE)	<ol style="list-style-type: none"> (1) Input the NTSC 3.58 full colour bar signal (included 75% white signal). (2) Connect the oscilloscope probe to TP-47B and TP-E. (3) Select the SIGNAL BLOCK with [CHROMA/PHASE] button (< SIG >) from < BLOCK SELECT > SERVICE MENU screen. (4) Select the < S06 >. (5) Adjust the S06 to become the voltage different between 75% white and magenta to $0V \pm 2V$ as shown in figure. 				
<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;">  </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="155 861 448 934">Item</th> <th data-bbox="448 861 773 934">Initial setting value</th> </tr> </thead> <tbody> <tr> <td data-bbox="155 934 448 1003"><S06> NTSC PHASE</td> <td data-bbox="448 934 773 1003">067</td> </tr> </tbody> </table>				Item	Initial setting value	<S06> NTSC PHASE	067	
Item	Initial setting value							
<S06> NTSC PHASE	067							

4.8 PURITY AND CONVERGENCE

■ PURITY ADJUSTMENT

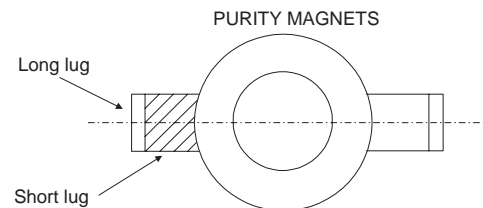
- (1) Demagnetize CRT with the demagnetizer.
- (2) Loosen the retainer screw of the deflection yoke.
- (3) Remove the wedges.
- (4) Input a green raster signal from the signal generator, and turn the screen to green raster.
- (5) Move the deflection yoke backward.
- (6) Bring the long lug of the purity magnets on the short lug and position them horizontally. (Fig.2)
- (7) Adjust the gap between two lugs so that the GREEN RASTER will come into the center of the screen. (Fig.3)
- (8) Move the deflection yoke forward, and fix the position of the deflection yoke so that the whole screen will become green.
- (9) Insert the wedge to the top side of the deflection yoke so that it will not move.
- (10) Input a crosshatch signal.
- (11) Verify that the screen is horizontal.
- (12) Input red and blue raster signals, and make sure that purity is properly adjusted.



P/C MAGNETS

- P : PURITY MAGNET
- 4 : 4 POLES (convergence magnets)
- 6 : 6 POLES (convergence magnets)

Fig.1



Bring the long lug over the short lug and position them horizontally.

Fig.2

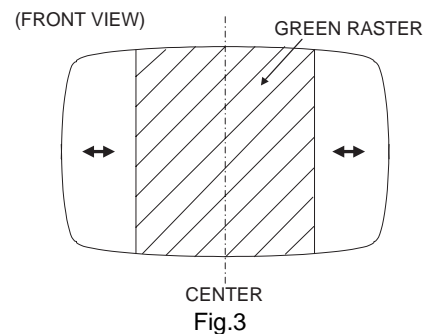
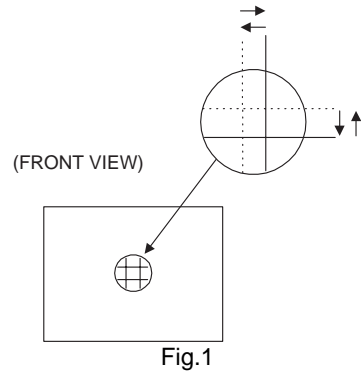


Fig.3

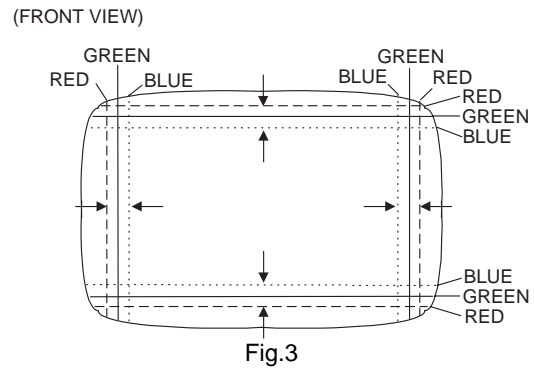
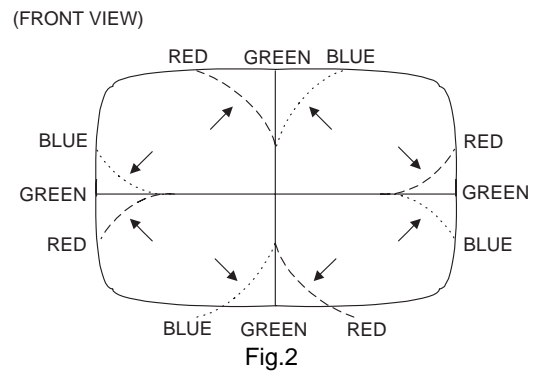
■ STATIC CONVERGENCE ADJUSTMENT

- (1) Input a crosshatch signal.
- (2) Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen (Fig.1) and turn them to magenta (red/blue).
- (3) Using 6-pole convergence magnets, overlap the magenta (red/blue) and green lines in the center of the screen and turn them to white.
- (4) Repeat 2 and 3 above, and make best convergence.



■ DYNAMIC CONVERGENCE ADJUSTMENT

- (1) Move the deflection yoke up and down and overlap the lines in the periphery. (Fig. 2)
 - (2) Move the deflection yoke left to right and overlap the lines in the periphery. (Fig. 3)
 - (3) Repeat 1 and 2 above, and make best convergence.
- After adjustment, fix the wedge at the original position. Fasten the retainer screw of the deflection yoke. Fix the 6 magnets with glue.



SECTION 5 TROUBLE SHOOTING

5.1 OUTLINE

This model includes a SELF DIAGNOSIS FUNCTION that checks the circuit operating status and in event of malfunction, displays and stores the data in a memory. The data are stored in memory.

Fault detection starts with the I²C bus and is performed according to the input states of the control lines connected to the MAIN CPU.

SELF DIAGNOSIS SCREEN

PROTECTION	
B1	:x 3
X-RAY	:O
P-CHK	:O
V-NECK	:x 3
BUS	
MEMORY	:O
TV-PRO	:O

5.2 SAGE

SELF DIAGNOSIS FUNCTION mode entry

- (1) Press the [MENU] button and [CONTRAST/BRIGHT] button simultaneously, and push the MAIN POWER switch on.
- (2) Then it will display the SELF DIAGNOSIS FUNCTION screen. The screen displays the check items. When in event a malfunction at RASTER not display, at this time POWER LED flashes.

5.3 CONTENTS

Check item	Detected contents	Detection method	Cause
B1	The over-current of B1 line is checked.	It will be detect the B1-PRO port in IC6731 15-pin on SIGNAL PWB.	Destruction of a resonance capacitor (C1521, C1522, C1523) or FBT can be considered.
X-RAY	The unusual rise of CRT anode voltage is checked.	It will be detect the X-RAY port in IC6731 46-pin on SIGNAL PWB.	Destruction of a level oscillation transistor Q1502 can be considered.
P-CHK	The abnormal output of a regulator IC (IC1961, IC1962, IC1963) are checked.	It will be detect the P-CHK port in IC6731 17-pin on SIGNAL PWB.	Since there are some output voltage has fallen by either of three regulators, please check the line.
V-NECK	The abnormal oscillations by the deviation of a perpendicular are checked.	It will be detect the V-GUARD port in IC6201 on SIGNAL PWB.	The abnormal operation of the perpendicular output IC1421 of a MAIN PWB can be considered.
MEMORY	It is confirmed whether IC6732 of a SIGNAL PWB and the data communications of a microcomputer are normal.	It will be detect main microcomputer.	The abnormalities of each IC which is carrying out the exchange of a main microcomputer and data can be considered.
TV-PRO	It is confirmed whether IC6201 (Video Chroma) of a SIGNAL PWB and the data communications of a microcomputer are normal.	It will be detect main microcomputer.	The abnormalities of IC6201 (Video-Chroma) can be considered.

Fault history

exceeds nine, the display remains at nine. The fault history remains stored in the memory until deleted.

SELF DIAGNOSIS FUNCTION mode release

Turn the power switch to off or disconnect the power cord from AC outlet. In this way, not to clear the error counts.

Reset the error count

Press the [MENU] button and [VOLUME/SELECT - (DOWN)] button simultaneously in this mode screen. Then reset each error count. Turn the power off to return to the normal screen.

Cause	LED flashing cycle
X-RAY PROTECTION	Quickly (0.1 sec on / 0.1 sec off cycles)
B1 OVER CURRENT PROTECTION	Slowly (1.0 sec on / 1.0 sec off cycles)



JVC

VICTOR COMPANY OF JAPAN, LIMITED

AV & MULTIMEDIA COMPANY VIDEO DISPLAY CATEGORY 12, 3-chome, Moriya-cho, kanagawa-ku, Yokohama, kanagawa-prefecture, 221-8528, Japan

(No.52119)



Printed in Japan
WPC

PARTS LIST

CAUTION

- The parts identified by the Δ symbol are important for the safety . Whenever replacing these parts, be sure to use specified ones to secure the safety.
- The parts not indicated in this Parts List and those which are filled with lines --- in the Parts No. columns will not be supplied.
- P. W. Board Ass'y will not be supplied, but those which are filled with the Parts No. in the Parts No. columns will be supplied.

ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
CR	Carbon Resistor	C CAP.	Ceramic Capacitor
FR	Fusible Resistor	E CAP.	Electrolytic Capacitor
PR	Plate Resistor	M CAP.	Mylar Capacitor
VR	Variable Resistor	CH CAP.	Chip Capacitor
HV R	High Voltage Resistor	HV CAP.	High Voltage Capacitor
MF R	Metal Film Resistor	MF CAP.	Metalized Film Capacitor
MG R	Metal Glazed Resistor	MM CAP.	Metalized Mylar Capacitor
MP R	Metal Plate Resistor	MP CAP.	Metalized Polystyrol Capacitor
OM R	Metal Oxide Film Resistor	PP CAP.	Polypropylene Capacitor
CMF R	Coating Metal Film Resistor	PS CAP.	Polystyrol Capacitor
UNF R	Non-Flammable Resistor	TF CAP.	Thin Film Capacitor
CH V R	Chip Variable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH MG R	Chip Metal Glazed Resistor	TAN. CAP.	Tantalum Capacitor
COMP. R	Composition Resistor	CH C CAP.	Chip Ceramic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
		CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
		CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Tantalum Bi-Polar Electrolytic Capacitor

RESISTORS									
F	G	J	K	M	N	R	H	Z	P
±1%	±2%	±5%	±10%	±20%	±30%	+30% -10%	+50% -10%	+80% -20%	+100% -0%

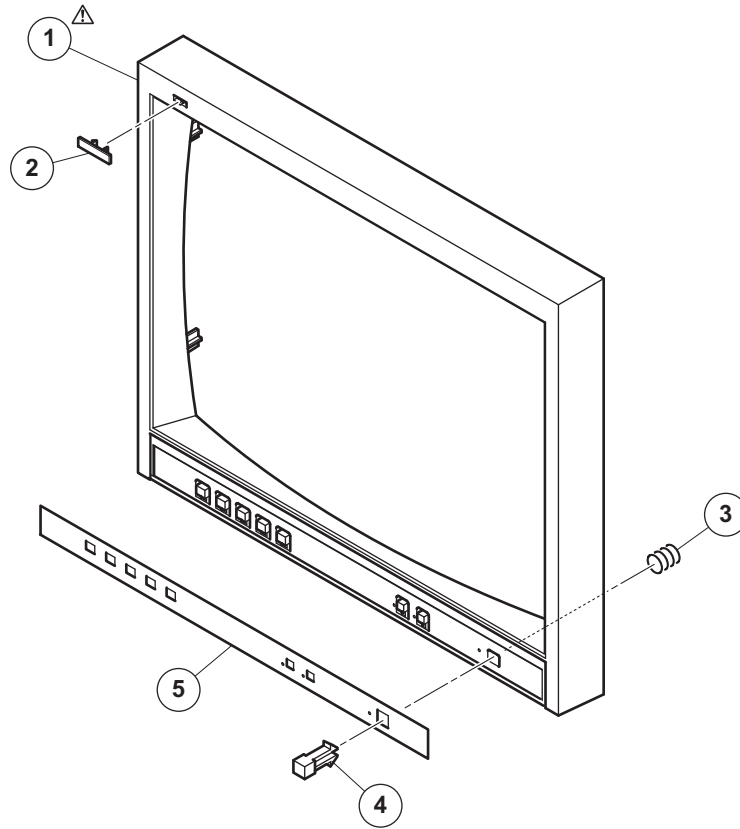
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EXPLODED VIEW PARTS LIST -1

△ Ref.No.	Part No.	Part Name	Description	Local
△ 1	CM12970-005-MH	FRONT PANEL		
2	CM48149-A01	JVC MARK		
3	CM46757-001-H	SPRING		
4	CM46756-A01	POWER KNOB		
5	LC21251-001B-H	CONTROL SHEET		

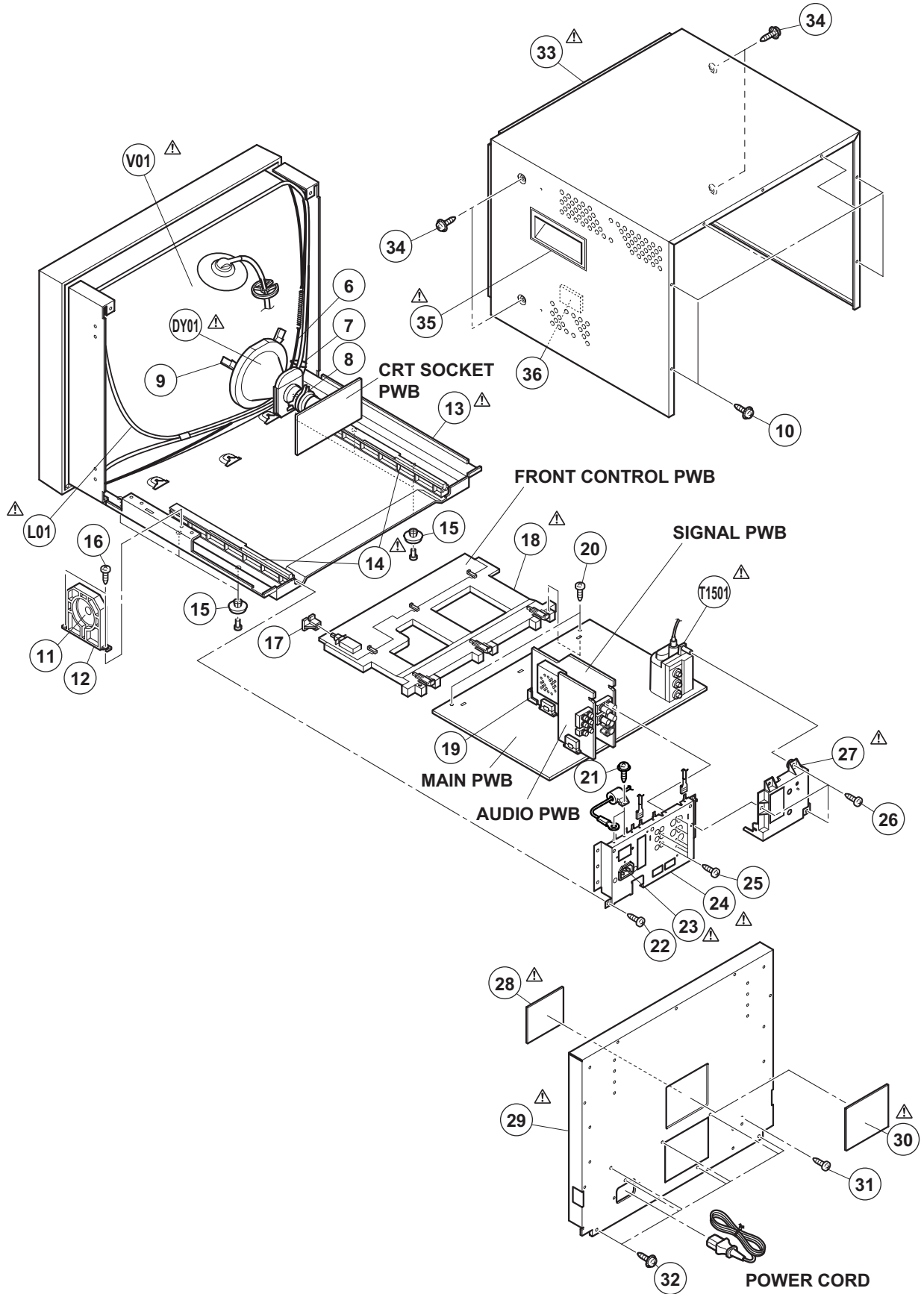
EXPLODED VIEW -1



EXPLODED VIEW PARTS LIST -2

△ Ref.No.	Part No.	Part Name	Description	Local
△ V01	A51LEC095X	PICTURE TUBE		
△ L01	QQW0170-001	DEG COIL		
△ DY01	QQD0098-001	DEF YOKE		
△ T1501	QQH0157-001	FB TRANSF		
6	CHGB0029-0D	BRAIDED ASSY		
7	CHGB0017-0C	BRAIDED SUB ASSY		
8	A75034-B	PC MAGNET		
9	CE40764-00A	WEDGE ASSY	(x3)	
10	CM44287-00C	ASSY SCREW	(x6)	
11	CEBSS08P-01KJ2	SPEAKER		
12	CM23137-B01-H	SPEAKER HOLDER		
△ 13	CM12980-B01-H	BOTTOM BASE		
△ 14	CM23164-C01-VH	CHASSIS RAIL	(x2)	
15	CM47686-00A	FOOT	(x6)	
16	QYSBSF4012Z	TAP SCREW	4mm x 12mm(x2)	
17	CM48241-001-H	KNOB CAP		
△ 18	CM12968-A01-H	CONNECT BASE		
19	CM47653-001	PCB HOLDER		
20	QYSBSB3010M	TAP SCREW	3mm x 10mm(x2)	
21	CM44287-00E	ASSY SCREW	(x2)	
22	QYSBSF4012Z	TAP SCREW	4mm x 12mm	
△ 23	QMCB004-001	AC INLET		
△ 24	LC11568-001A-H	TERMINAL BRACKET		
25	QYSBSB3010M	TAP SCREW	3mm x 10mm(x6)	
26	QYSBSF4012Z	TAP SCREW	4mm x 12mm(x3)	
△ 27	LC11569-001A-H	FBT HOLDER		
△ 28	LC30475-008A-H	WARNING LABEL		TM-A210G/E, TM-A210G/U
△ 29	LC11570-001A-C	REAR PANEL		
△ 30	LC21304-001A-OL	ROLL R LABEL		TM-A210G/C
△ 30	LC21283-001A-OL	ROLL R LABEL		TM-A210G/E, TM-A210G/U
31	QYSBSF4012Z	TAP SCREW	4mm x 12mm	
32	CM44287-00C	ASSY SCREW	(x7)	
△ 33	CM12975-008-H	TOP COVER		
34	CM44287-00C	ASSY SCREW	(x4)	
△ 35	LC20914-001B-H	HANDLE	(x2)	
36	CM42321-A08	CUSHION		

EXPLODED VIEW -2



PRINTED WIRING BOARD PARTS LIST

MAIN P.W.BOARD ASS'Y (FX-1184A-H2)

△Ref No.	Part No.	Part Name	Description Local
IC1421	LA78041	IC	
IC1461	BA10358	IC	
IC1921	STR-F6653	IC(HYBRID)	
IC1961	L7805CP	IC	
IC1962	L7812CP	IC	
IC1963	L7809CP	IC	
Q1401	2SC3311A/QR/-T	TRANSISTOR	
Q1402	2SC3311A/QR/-T	TRANSISTOR	
Q1425	2SA1309A/QR/-T	TRANSISTOR	
Q1426	2SC3311A/QR/-T	TRANSISTOR	
Q1461	2SD1408/OY/-LB	POW TRANSISTOR	
Q1462	2SA1309A/QR/-T	TRANSISTOR	
Q1463	2SC3311A/QR/-T	TRANSISTOR	
Q1501	BSN304-T	MOS FET	
Q1502	2SC5902-RL	POW TRANSISTOR	
Q1921	2SA1309A/QR/-T	TRANSISTOR	
Q1951	2SA966/OY/-T	TRANSISTOR	
Q1952	2SC3311A/QR/-T	TRANSISTOR	
Q1971	2SC2229/Y/	TRANSISTOR	
Q1972	2SC3311A/QR/-T	TRANSISTOR	
Q1973	2SC2229/Y/	TRANSISTOR	
Q1981	2SA949/Y/Z1	TRANSISTOR	
Q1982	2SC3311A/QR/-T	TRANSISTOR	
D1401	1SS133-T2	SI DIODE	
D1425	MTZJ5.1B-T2	Z DIODE	
D1451	RGP10J-5025-T3	SI DIODE	
D1452	RGP10J-5025-T3	SI DIODE	
D1521	RH3G-F1	SI DIODE	
D1522	RU30-F1	SI DIODE	
D1523	RGP10J-5025-T3	SI DIODE	
D1551	RGP10J-5025-T3	SI DIODE	
D1552	RGP10J-5025-T3	SI DIODE	
D1591	MTZJ7.5S-T2	Z DIODE	
D1592	1SR35-400A-T2	SI DIODE	
△D1901	D3SB60	BRIDGE DIODE	
D1921	RU1C-LFC4	SI DIODE	
D1922	MTZJ6.8C-T2	Z DIODE	
D1923	1SS133-T2	SI DIODE	
D1924	RGP10J-5025-T3	SI DIODE	
D1925	RGP10J-5025-T3	SI DIODE	
D1926	1SS133-T2	SI DIODE	
D1927	MTZJ15B-T2	Z DIODE	
D1928	MTZJ10A-T2	Z DIODE	
D1951	RU3YX-LFC4	SI DIODE	
D1952	RU3YX-LFC4	SI DIODE	
D1953	RU3AM-LFC4	SI DIODE	
D1954	1SS133-T2	SI DIODE	
D1955	RU3AM-LFC4	SI DIODE	
D1971	MTZJ6.2B-T2	Z DIODE	
D1973	1SS133-T2	SI DIODE	
D1974	MA4068N/Z1/-T2	Z DIODE	
D1981	MTZJ7.5S-T2	Z DIODE	
D1982	1SS133-T2	SI DIODE	
D1983	1SS133-T2	SI DIODE	
D1984	1SS133-T2	SI DIODE	
D1985	1SS133-T2	SI DIODE	
D1986	1SS133-T2	SI DIODE	
D1987	1SS133-T2	SI DIODE	
D1988	1SS133-T2	SI DIODE	
D1989	MTZJ7.5S-T2	Z DIODE	
△PC1921	PC123Y22	PHOTO COUPLER	
C1401	QFLC2AJ-393Z	M CAPACITOR	0.039uF 100V J
C1402	QFLC1HJ-333Z	M CAPACITOR	0.033uF 50V J
C1403	QEHR1HM-226Z	E CAPACITOR	22uF 50V M
C1406	QTM1VM-228	E CAPACITOR	2200uF 35V M
C1407	QEHR1HM-105Z	E CAPACITOR	1uF 50V M
C1408	QFLC2AJ-103Z	M CAPACITOR	0.01uF 100V J
C1409	QFLC1HJ-103Z	M CAPACITOR	0.01uF 50V J
C1410	QFLC2AJ-104Z	M CAPACITOR	0.1uF 100V J
C1411	QCS31HJ-331Z	C CAPACITOR	330pF 50V J
C1412	QFLC1HJ-333Z	M CAPACITOR	0.033uF 50V J
C1452	QTM1VM-228	E CAPACITOR	2200uF 35V M
C1454	QECQ1VM-477	E CAPACITOR	470uF 35V M
C1455	QETN1HM-226Z	E CAPACITOR	22uF 50V M
C1457	QFVF1HJ-105Z	MF CAPACITOR	1uF 50V J
C1461	QEZ0195-475Z	BP E CAPACITOR	4.7uF 50V M
C1462	QCS31HJ-101Z	C CAPACITOR	100pF 50V J
C1463	QEHR1HM-106Z	E CAPACITOR	10uF 50V M

△Ref No.	Part No.	Part Name	Description Local
C1464	QEHR1HM-226Z	E CAPACITOR	22uF 50V M
C1465	QCS31HJ-101Z	C CAPACITOR	100pF 50V J
C1466	QEHR1HM-226Z	E CAPACITOR	22uF 50V M
C1501	QCB32HK-151Z	C CAPACITOR	150pF 500V K
C1502	QCB32HK-102Z	C CAPACITOR	1000pF 500V K
C1503	QEHR2CM-335Z	E CAPACITOR	3.3uF 160V M
C1504	QEHR2CM-335Z	E CAPACITOR	3.3uF 160V M
△C1521	QFZ0196-302	MPP CAPACITOR	3000pF 1.5kV H
△C1522	QFZ0196-502	MPP CAPACITOR	5000pF 1.5kV H
C1523	QFP32GJ-273	PP CAPACITOR	0.027uF 400V J
C1524	QFZ0197-514	MPP CAPACITOR	0.51uF 250V J
C1526	QEHR2EM-106Z	E CAPACITOR	10uF 250V M
C1527	QFN32AK-472Z	M CAPACITOR	4700pF 100V K
C1551	QEZ0203-227	E CAPACITOR	220uF 160V M
C1553	QEHR2EM-106Z	E CAPACITOR	10uF 250V M
C1554	QFVF1HJ-104Z	MF CAPACITOR	0.1uF 50V J
C1591	QETN1CM-227Z	E CAPACITOR	220uF 16V M
C1592	QETN2AM-106Z	E CAPACITOR	10uF 100V M
C1593	QCS31HJ-560Z	C CAPACITOR	560pF 50V J
△C1901	QFZ9036-104	MF CAPACITOR	0.1uF AV250V M
△C1902	QFZ9036-104	MF CAPACITOR	0.1uF AV250V M
△C1903	QFZ9036-104	MF CAPACITOR	0.1uF AV250V M
△C1904	QCZ9078-102	C CAPACITOR	1000pF AC250V M
△C1905	QCZ9078-102	C CAPACITOR	1000pF AC250V M
△C1906	QCZ9078-102	C CAPACITOR	1000pF AC250V M
△C1907	QCZ9078-102	C CAPACITOR	1000pF AC250V M
C1908	QEZ0550-337	E CAPACITOR	330uF 400V
C1921	QCZ0334-103	C CAPACITOR	0.01uF 500V P
C1922	QCZ0325-271	C CAPACITOR	270pF 2kV K
C1923	QCZ0325-391	C CAPACITOR	390pF 2kV K
C1924	QEHR1VM-107Z	E CAPACITOR	100uF 35V M
C1925	QCZ0325-391	C CAPACITOR	390pF 2kV K
C1926	QFLC1HJ-471Z	M CAPACITOR	470pF 50V J
C1929	QFLC1HJ-102Z	M CAPACITOR	1000pF 50V J
C1930	QFLC1HJ-122Z	M CAPACITOR	1200pF 50V J
C1931	QFLC1HJ-103Z	M CAPACITOR	0.01uF 50V J
C1952	QCZ0325-271	C CAPACITOR	270pF 2kV K
C1953	QCZ0122-561	C CAPACITOR	560pF 2kV K
C1954	QEZ0203-227	E CAPACITOR	220uF 160V M
C1955	QTM1VM-108	E CAPACITOR	1000uF 35V M
C1956	QTMN1EM-337Z	E CAPACITOR	330uF 25V M
C1957	QEHR1EM-107Z	E CAPACITOR	100uF 25V M
C1958	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C1961	QEHR1VM-476Z	E CAPACITOR	47uF 35V M
C1962	QEHR1AM-228Z	E CAPACITOR	2200uF 10V M
C1963	QEHR1VM-476Z	E CAPACITOR	47uF 35V M
C1964	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C1965	QEHR1VM-476Z	E CAPACITOR	47uF 35V M
C1966	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C1971	QCB32HK-102Z	C CAPACITOR	1000pF 500V K
C1972	QCB32HK-391Z	C CAPACITOR	390pF 500V K
C1981	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C1982	QEHR1HM-105Z	E CAPACITOR	1uF 50V M
△C1991	QCZ9079-471	C CAPACITOR	470pF AC250V K
△C1992	QCZ9079-471	C CAPACITOR	470pF AC250V K
△C1994	QCZ9079-222	C CAPACITOR	2200pF AC250V M
R1402	QRE141J-333Y	C RESISTOR	33kΩ 1/4W J
R1404	QRE141J-221Y	C RESISTOR	220Ω 1/4W J
R1405	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J
R1408	QRE141J-332Y	C RESISTOR	3.3kΩ 1/4W J
R1409	QRE141J-332Y	C RESISTOR	3.3kΩ 1/4W J
R1410	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1412	QRE141J-563Y	C RESISTOR	56kΩ 1/4W J
R1413	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1414	QRE141J-333Y	C RESISTOR	33kΩ 1/4W J
R1415	QRT029J-R82	MF RESISTOR	0.82Ω 2W J
R1417	QRE121J-331Y	C RESISTOR	330Ω 1/2W J
R1419	QRE141J-183Y	C RESISTOR	18kΩ 1/4W J
R1420	QRE121J-102Y	C RESISTOR	1kΩ 1/2W J
R1421	QRE121J-102Y	C RESISTOR	1kΩ 1/2W J
R1422	QRE141J-102Y	C RESISTOR	1kΩ 1/4W J
R1424	QRE141J-153Y	C RESISTOR	15kΩ 1/4W J
R1425	QRE141J-223Y	C RESISTOR	22kΩ 1/4W J
R1426	QRE121J-681Y	C RESISTOR	680Ω 1/2W J
R1427	QRE141J-153Y	C RESISTOR	15kΩ 1/4W J
△R1451	QRZ9021-1R0	FUSI RESISTOR	1Ω 1W J
R1452	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1453	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1454	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1455	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1456	QRE141J-103Y	C RESISTOR	10kΩ 1/4W J
R1457	QRE141J-472Y	C RESISTOR	4.7kΩ 1/4W J
R1461	QRG039J-220	OMF RESISTOR	22Ω 3W J

△Ref No.	Part No.	Part Name	Description Local
R3330	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3331	NRSA63J-680X	MG RESISTOR	68Ω 1/16W J
R3333	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3334	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3335	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3336	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3337	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R3341	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
R3343	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
R3345	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
R3347	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J

L3302	QQL244J-151Z	COIL	150uH J
L3304	QQL244J-151Z	COIL	150uH J
L3306	QQL244J-151Z	COIL	150uH J

CN300T	QGA2501C5-07Z	CONNECTOR	W-B (1-7)
CN300U	QGA2501C5-04Z	CONNECTOR	W-B (1-4)
CN30E1	CE41507-001P	LV CONNECTOR	
CN30SC	QGZ0017C1-01Z	CONNECTOR	(1-1)
H3301	CEHP00N-001QS	HEAT SINK	
H3302	CEHP00N-001QS	HEAT SINK	
H3303	CEHP00N-001QS	HEAT SINK	
△SK3001	CE42446-001	CRT SOCKET	

FRONT CONTROL P.W.BOARD ASS'Y (FX-4091A-H2)

△Ref No.	Part No.	Part Name	Description Local
Q4801	DTA144TKA-X	DIGI TRANSISTOR	
Q4802	DTA144TKA-X	DIGI TRANSISTOR	
Q4803	DTA144TKA-X	DIGI TRANSISTOR	

D4801	GL2EG6	LED	INPUT B
D4802	GL2EG6	LED	INPUT A
D4803	GL2EG6	LED	POWER

R4801	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R4802	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R4803	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R4804	NRSA63J-681X	MG RESISTOR	680Ω 1/16W J
R4805	NRSA63J-681X	MG RESISTOR	680Ω 1/16W J
R4806	NRSA63J-152X	MG RESISTOR	1.5kΩ 1/16W J
R4807	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R4808	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J
R4809	NRSA63J-562X	MG RESISTOR	5.6kΩ 1/16W J
R4810	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R4811	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J
R4812	NRSA63J-562X	MG RESISTOR	5.6kΩ 1/16W J
R4813	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R4814	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J
R4815	NRSA63J-562X	MG RESISTOR	5.6kΩ 1/16W J

CN400A	QGA2501F1-08	CONNECTOR	W-B (1-8)
CN40SW	QGA7901F1-04	CONNECTOR	W-B (1-4)
S4801	QSW0619-003Z	TACT SWITCH	CHROMA/PHASE
S4804	QSW0619-003Z	TACT SWITCH	CONTRAST/BRIGHT
S4805	QSW0619-003Z	TACT SWITCH	MENU
S4806	QSW0619-003Z	TACT SWITCH	DOWN
S4807	QSW0619-003Z	TACT SWITCH	UP
S4808	QSW0619-003Z	TACT SWITCH	INPUT B
S4809	QSW0619-003Z	TACT SWITCH	INPUT A
S4901	QSP4K21-C01	PUSH SWITCH	POWER

SIGNAL P.W.BOARD ASS'Y (FX-6140A-H2)

△Ref No.	Part No.	Part Name	Description Local
MD6201	CE42599-002	COMB FILTER MOD	
IC6201	TB1226EN	IC	
IC6202	LA7016	IC	
IC6203	LA7016	IC	
IC6204	LA7016	IC	
IC6205	LA7016	IC	
IC6701	L78LR05E-MA	IC	
IC6731	M37212M6-212SP	MICON IC	
IC6732	AT24C04-TMA210	IC	(SERVICE)

Q6101	2SA1037AK/QR/-X	TRANSISTOR	
Q6121	2SA1037AK/QR/-X	TRANSISTOR	
Q6141	2SA1037AK/QR/-X	TRANSISTOR	
Q6142	2SA1037AK/QR/-X	TRANSISTOR	
Q6201	2SC2412K/QR/-X	TRANSISTOR	

△Ref No.	Part No.	Part Name	Description Local
Q6203	2SC2412K/QR/-X	TRANSISTOR	
Q6220	2SC2412K/QR/-X	TRANSISTOR	
Q6221	2SA1037AK/QR/-X	TRANSISTOR	
Q6222	DTC124EKA-X	DIGI TRANSISTOR	
Q6223	DTC124EKA-X	DIGI TRANSISTOR	
Q6250	2SC2412K/QR/-X	TRANSISTOR	
Q6350	2SC2412K/QR/-X	TRANSISTOR	
Q6405	DTC124EKA-X	DIGI TRANSISTOR	
Q6591	2SC2785/JH/-T	SI TRANSISTOR	
Q6592	DTC124EKA-X	DIGI TRANSISTOR	
Q6736	2SC2412K/QR/-X	TRANSISTOR	
Q6737	DTC124EKA-X	DIGI TRANSISTOR	

D6101	MA3120/M/-X	Z DIODE	
D6121	MA3120/M/-X	Z DIODE	
D6141	MA3120/M/-X	Z DIODE	
D6142	MA3120/M/-X	Z DIODE	
D6224	MA111-X	SI DIODE	
D6225	MA111-X	SI DIODE	
D6241	MA111-X	SI DIODE	
D6291	MA3051/M/-X	Z DIODE	
D6292	MA3051/M/-X	Z DIODE	
D6501	MA3091/M/-X	Z DIODE	
D6733	MA111-X	SI DIODE	
D6734	MA111-X	SI DIODE	
D6735	MA111-X	SI DIODE	
D6736	MA111-X	SI DIODE	
D6737	MA111-X	SI DIODE	
D6741	MA111-X	SI DIODE	
D6742	MA111-X	SI DIODE	
D6743	MA111-X	SI DIODE	
D6744	MA111-X	SI DIODE	
D6745	MA111-X	SI DIODE	
D6746	MA111-X	SI DIODE	
D6747	MA111-X	SI DIODE	

C6101	QETN1HM-106Z	E CAPACITOR	10uF 50V M
C6102	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C6103	QETN1CM-107Z	E CAPACITOR	100uF 16V M
C6104	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6106	QETN1CM-107Z	E CAPACITOR	100uF 16V M
C6121	QETN1HM-106Z	E CAPACITOR	10uF 50V M
C6122	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C6123	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6141	QETN1HM-106Z	E CAPACITOR	10uF 50V M
C6142	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C6143	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C6144	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C6147	QETN1CM-107Z	E CAPACITOR	100uF 16V M
C6201	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6202	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6205	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6209	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C6211	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
C6220	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6221	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6224	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6225	QEHR1VM-476Z	E CAPACITOR	47uF 35V M
C6226	QENC1CM-476Z	BP E CAPACITOR	47uF 16V M
C6227	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6228	QTNC1CM-476Z	E CAPACITOR	47uF 16V M
C6229	QETN1CM-476Z	E CAPACITOR	47uF 16V M
C6241	QEHR1HM-106Z	E CAPACITOR	10uF 50V M
C6257	NCB31CK-104X	C CAPACITOR	0.1uF 16V K
C6258	QEHR1HM-475Z	E CAPACITOR	4.7uF 50V M
C6261	QEHR1HM-106Z	E CAPACITOR	10uF 50V M
C6262	NCB31CK-104X	C CAPACITOR	0.1uF 16V K
C6263	NCB31CK-104X	C CAPACITOR	0.1uF 16V K
C6265	NCB31CK-104X	C CAPACITOR	0.1uF 16V K
C6266	QEHR1HM-225Z	E CAPACITOR	2.2uF 50V M
C6267	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C6268	NCB31HK-473X	C CAPACITOR	0.047uF 50V K
C6269	NCB31CK-104X	C CAPACITOR	0.1uF 16V K
C6291	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C6292	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C6351	NDC31HJ-470X	C CAPACITOR	47pF 50V J
C6352	NDC31HJ-220X	C CAPACITOR	22pF 50V J
C6354	NDC31HJ-220X	C CAPACITOR	22pF 50V J
C6355	NDC31HJ-120X	C CAPACITOR	12pF 50V J
C6356	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C6357	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C6358	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C6359	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C6360	QETN1CM-107Z	E CAPACITOR	100uF 16V M
C6401	QEHR1HM-105Z	E CAPACITOR	1uF 50V M
C6402	QEM61HK-225Z	E CAPACITOR	2.2uF 50V K
C6403	NCB31HK-223X	C CAPACITOR	0.022uF 50V K

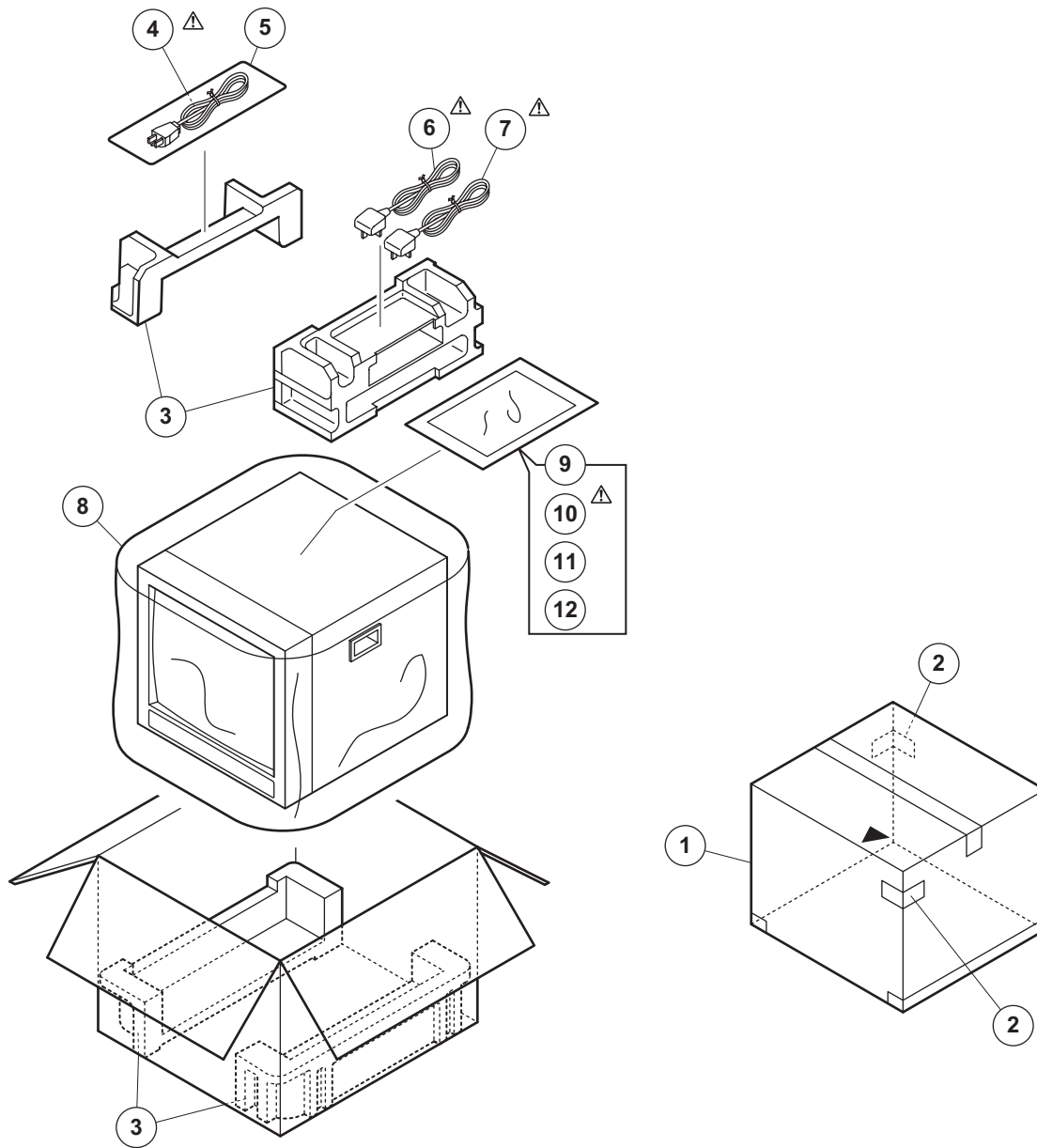
△Ref No.	Part No.	Part Name	Description Local	△Ref No.	Part No.	Part Name	Description Local
C6404	QEHR1HM-335Z	E CAPACITOR	3.3uF 50V M	R6507	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
C6405	NCB31HK-102X	C CAPACITOR	1000pF 50V K	R6710	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J
C6440	NCB31HK-221X	C CAPACITOR	220pF 50V K	R6712	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J
C6441	NDC31HJ-390X	C CAPACITOR	39pF 50V J	R6714	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J
C6442	NCB31HK-221X	C CAPACITOR	220pF 50V K	R6716	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J
C6501	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6718	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J
C6502	QEHR1HM-105Z	E CAPACITOR	1uF 50V M	R6719	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J
C6503	QETN1EM-476Z	E CAPACITOR	47uF 25V M	R6720	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J
C6504	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6721	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
C6505	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6722	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
C6506	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6723	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
C6507	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6724	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
C6508	QETN1EM-476Z	E CAPACITOR	47uF 25V M	R6725	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J
C6701	QEHR1VM-476Z	E CAPACITOR	47uF 35V M	R6726	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
C6702	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z	R6727	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
C6703	QEHR1HM-105Z	E CAPACITOR	1uF 50V M	R6728	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
C6704	QEHR1CM-107Z	E CAPACITOR	100uF 16V M	R6729	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J
C6705	QEHR1CM-107Z	E CAPACITOR	100uF 16V M	R6731	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6706	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z	R6733	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6707	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6734	NRSA63J-823X	MG RESISTOR	82kΩ 1/16W J
C6708	QETN1CM-107Z	E CAPACITOR	100uF 16V M	R6735	NRSA63J-561X	MG RESISTOR	560Ω 1/16W J
C6709	QETN1CM-107Z	E CAPACITOR	100uF 16V M	R6736	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6710	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z	R6737	NRSA63J-561X	MG RESISTOR	560Ω 1/16W J
C6714	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6738	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
C6715	QETN1EM-476Z	E CAPACITOR	47uF 25V M	R6739	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
C6716	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6740	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
C6717	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6741	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
C6718	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6744	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
C6719	QEHR1HM-475Z	E CAPACITOR	4.7uF 50V M	R6745	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6720	NCB31HK-221X	C CAPACITOR	220pF 50V K	R6752	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6721	NCB31HK-221X	C CAPACITOR	220pF 50V K	R6753	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6733	NDC31HJ-560X	C CAPACITOR	56pF 50V J	R6754	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
C6734	NDC31HJ-680X	C CAPACITOR	68pF 50V J	R6756	QRB089J-682	NET RESISTOR	6.8kΩ J
C6736	NCB31HK-103X	C CAPACITOR	0.01uF 50V K	R6758	QRB089J-682	NET RESISTOR	6.8kΩ J
C6741	QEHR1HM-105Z	E CAPACITOR	1uF 50V M	R6773	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
R6001	NRSA02F-750X	MG RESISTOR	75Ω 1/10W F	R6774	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
R6002	NRSA02F-750X	MG RESISTOR	75Ω 1/10W F	R6775	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
R6005	NRSA02F-750X	MG RESISTOR	75Ω 1/10W F	R6776	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
R6006	NRSA02F-750X	MG RESISTOR	75Ω 1/10W F	R6791	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J
R6101	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	R6792	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R6102	NRSA63J-124X	MG RESISTOR	120kΩ 1/16W J	R6793	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J
R6103	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J	L6202	QLL26AK-220Z	COIL	22uH K
R6104	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	L6350	QLL244K-4R7Z	COIL	4.7uH K
R6121	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	L6351	QLL26AM-4R7Z	COIL	4.7uH M
R6122	NRSA63J-124X	MG RESISTOR	120kΩ 1/16W J	L6701	QLL244K-4R7Z	COIL	4.7uH K
R6123	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J	L6730	QLL244K-8R2Z	COIL	8.2uH K
R6124	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	CN6001	QGB1505K1-15	CONNECTOR	B-B (1-15)
R6141	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	CN6002	QGB1505K1-15	CONNECTOR	B-B (1-15)
R6142	NRSA63J-124X	MG RESISTOR	120kΩ 1/16W J	CN600A	QJB003-084033	SIN ID C-B WIRE	
R6143	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J	CN600T	QJB003-073226	SIN ID C-B WIRE	
R6144	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	CN60E3	QUB130-18CSEP	SIN TWIST WIRE	
R6145	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J	J6001	CEMB021-002	BNC CONNECTOR	VIDEO A IN OUT
R6146	NRSA63J-124X	MG RESISTOR	120kΩ 1/16W J	J6002	CEMB021-002	BNC CONNECTOR	VIDEO B IN OUT
R6147	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J	J6003	QMD2B04-001	MINI CONNECTOR	Y/C IN
R6148	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J	J6004	QMD2B04-001	MINI CONNECTOR	Y/C OUT
R6201	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J	X6351	QAX0354-001Z	CRYSTAL	
R6202	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J	X6731	QAX0667-001Z	C RESONATOR	8.000MHz
R6212	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J				
R6215	NRSA63J-152X	MG RESISTOR	1.5kΩ 1/16W J				
R6216	NRSA63J-222X	MG RESISTOR	2.2kΩ 1/16W J				
R6221	NRSA63J-683X	MG RESISTOR	68kΩ 1/16W J				
R6223	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J				
R6224	NRSA63J-183X	MG RESISTOR	18kΩ 1/16W J				
R6225	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J				
R6235	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J				
R6241	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J				
R6250	NRSA63J-152X	MG RESISTOR	1.5kΩ 1/16W J				
R6251	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J				
R6259	NRSA63J-224X	MG RESISTOR	220kΩ 1/16W J				
R6261	NRSA63J-273X	MG RESISTOR	27kΩ 1/16W J				
R6263	NRSA63J-471X	MG RESISTOR	470Ω 1/16W J				
R6264	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J				
R6291	NRSA63J-391X	MG RESISTOR	390Ω 1/16W J				
R6292	NRSA63J-391X	MG RESISTOR	390Ω 1/16W J				
R6350	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J				
R6351	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J				
R6352	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J				
R6401	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J				
R6425	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J				
R6431	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J				
R6501	NRSA63J-822X	MG RESISTOR	8.2kΩ 1/16W J				
R6502	NRSA63J-101X	MG RESISTOR	100Ω 1/16W J				
R6503	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J				
R6504	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J				
R6505	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J				
R6506	NRSA63J-0R0X	MG RESISTOR	0Ω 1/16W J				
				D8141	MA111-X	SI DIODE	
				D8142	MA111-X	SI DIODE	
				D8151	MA111-X	SI DIODE	
				D8152	MA111-X	SI DIODE	
				D8161	MA3120/M-X	Z DIODE	
				D8181	MA3120/M-X	Z DIODE	
				D8601	MA3082/M-X	Z DIODE	
				D8732	MA111-X	SI DIODE	

AUDIO P.W.BOARD ASS'Y (FX-8032A-H2)

△Ref No.	Part No.	Part Name	Description Local
IC8601	AN5265	IC	
IC8602	LA7016	IC	
Q8141	2SA1037AK/QR/-X	TRANSISTOR	
Q8151	2SA1037AK/QR/-X	TRANSISTOR	
Q8161	2SC2412K/QR/-X	TRANSISTOR	
Q8601	2SC2412K/QR/-X	TRANSISTOR	
Q8602	2SA1037AK/QR/-X	TRANSISTOR	
Q8730	2SC2412K/QR/-X	TRANSISTOR	
Q8732	2SC2412K/QR/-X	TRANSISTOR	
Q8733	2SC2412K/QR/-X	TRANSISTOR	
Q8734	DTC124EKA-X	DIGI TRANSISTOR	
D8141	MA111-X	SI DIODE	
D8142	MA111-X	SI DIODE	
D8151	MA111-X	SI DIODE	
D8152	MA111-X	SI DIODE	
D8161	MA3120/M-X	Z DIODE	
D8181	MA3120/M-X	Z DIODE	
D8601	MA3082/M-X	Z DIODE	
D8732	MA111-X	SI DIODE	

△Ref No.	Part No.	Part Name	Description Local
D8733	MA3091/M-X	Z DIODE	
C8001	NCB31HK-391X	C CAPACITOR	390pF 50V K
C8002	NCB31HK-391X	C CAPACITOR	390pF 50V K
C8144	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C8145	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C8146	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C8161	QENC1HM-105Z	BP E CAPACITOR	1uF 50V M
C8162	QEHR1HM-105Z	E CAPACITOR	1uF 50V M
C8163	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C8164	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C8181	QENC1HM-105Z	BP E CAPACITOR	1uF 50V M
C8182	QEHR1HM-105Z	E CAPACITOR	1uF 50V M
C8601	QEHR1EM-108Z	E CAPACITOR	1000uF 25V M
C8602	NCB31HK-104X	C CAPACITOR	0.1uF 50V K
C8603	QTNC1HM-225Z	E CAPACITOR	2.2uF 50V M
C8604	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C8605	QEHR1HM-475Z	E CAPACITOR	4.7uF 50V M
C8606	QFVF1HJ-224Z	MF CAPACITOR	0.22uF 50V J
C8607	QECR1EM-227Z	E CAPACITOR	220uF 25V M
C8608	QEHR1HM-106Z	E CAPACITOR	10uF 50V M
C8609	QFLC1HJ-473Z	M CAPACITOR	0.047uF 50V J
C8610	QEHQ1EM-228	E CAPACITOR	2200uF 25V M
C8611	QEHR1EM-108Z	E CAPACITOR	1000uF 25V M
C8612	QEHR1CM-107Z	E CAPACITOR	100uF 16V M
C8613	NCF31CZ-104X	C CAPACITOR	0.1uF 16V Z
C8731	NCB31HK-103X	C CAPACITOR	0.01uF 50V K
C8732	QEHR1HM-225Z	E CAPACITOR	2.2uF 50V M
C8733	QEHR1EM-107Z	E CAPACITOR	100uF 25V M
C8734	NCB31HK-104X	C CAPACITOR	0.1uF 50V K
R8141	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
R8142	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
R8151	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
R8152	NRSA63J-682X	MG RESISTOR	6.8kΩ 1/16W J
R8161	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J
R8162	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J
R8163	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J
R8164	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R8181	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J
R8182	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J
R8183	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J
R8184	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R8601	QRK126J-101X	UNF C RESISTOR	100Ω 1/2W J
R8602	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R8603	NRSA63J-102X	MG RESISTOR	1kΩ 1/16W J
R8604	NRSA63J-470X	MG RESISTOR	47Ω 1/16W J
R8605	QRZ9021-220	FUSI RESISTOR	22Ω 1W J
R8606	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R8607	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R8608	NRSA63J-221X	MG RESISTOR	220Ω 1/16W J
R8609	NRSA63J-272X	MG RESISTOR	2.7kΩ 1/16W J
R8610	NRSA63J-154X	MG RESISTOR	150kΩ 1/16W J
R8611	QRE121J-102Y	C RESISTOR	1kΩ 1/2W J
R8612	QRE121J-4R7Y	C RESISTOR	4.7Ω 1/2W J
R8613	NRSA63J-332X	MG RESISTOR	3.3kΩ 1/16W J
R8614	NRSA63J-104X	MG RESISTOR	100kΩ 1/16W J
R8747	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R8749	NRSA63J-472X	MG RESISTOR	4.7kΩ 1/16W J
R8750	NRSA63J-103X	MG RESISTOR	10kΩ 1/16W J
R8751	NRSA63J-122X	MG RESISTOR	1.2kΩ 1/16W J
R8752	NRSA63J-683X	MG RESISTOR	68kΩ 1/16W J
R8753	NRSA63J-333X	MG RESISTOR	33kΩ 1/16W J
CN8003	QGB1505K1-15	CONNECTOR	B-B (1-15)
CN80SP	WJM0340-001A	E-SI C WIRE C-F	
J8005	CEMN036-005	PIN JACK	AUDIO IN
J8006	CEMN079-002	PIN JACK	REMOTE

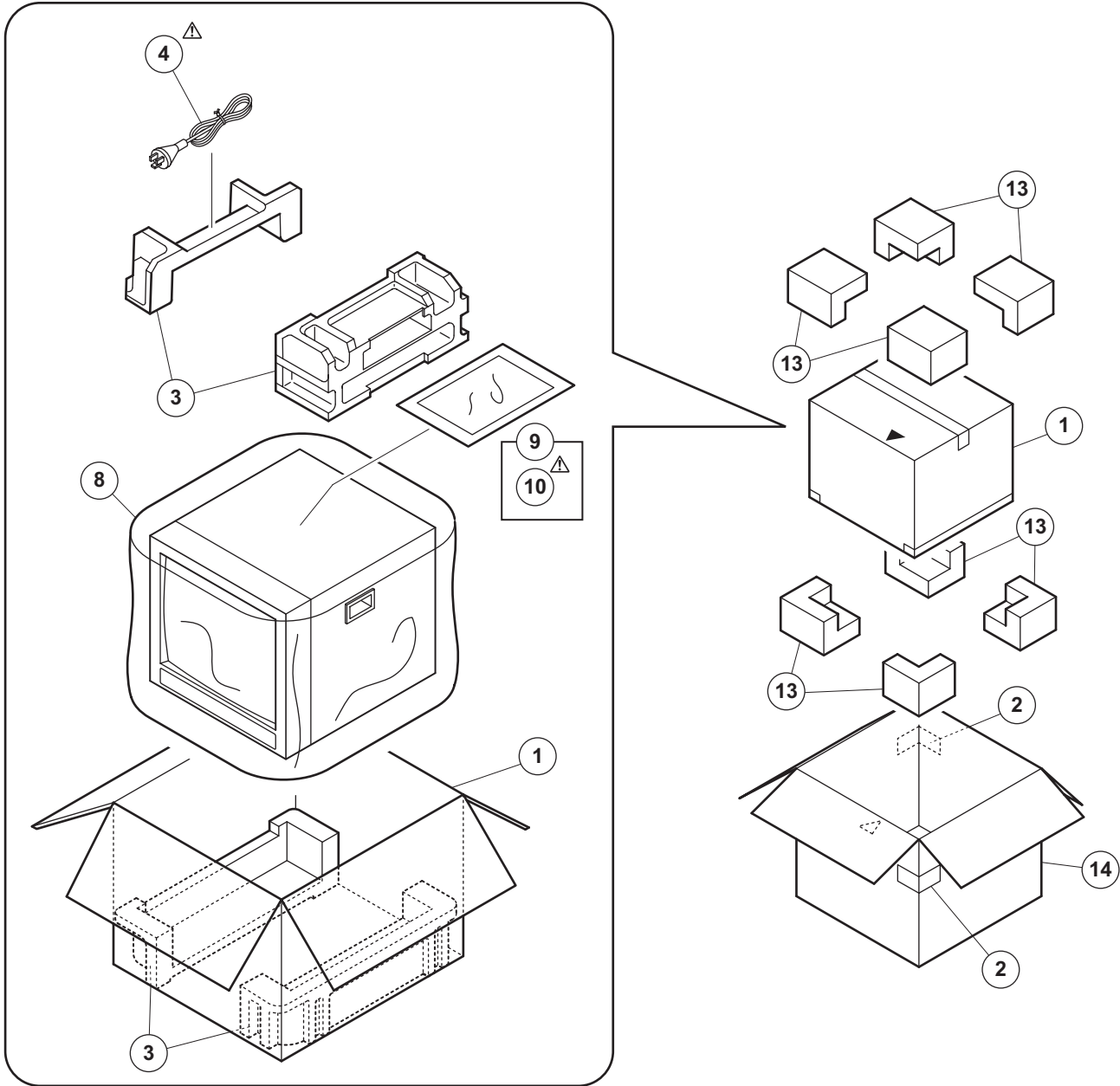
PACKING [TM-A210G/U , TM-A210G/E]



PACKING PARTS LIST [TM-A210G/U , TM-A210G/E]

△ Ref.No.	Part No.	Part Name	Description	Local
1	LC11194-005A-H	PACKING CASE		
2	LC20989-001A-H	CORNER LABEL	(x2)	
3	CP11655-00C-H	CUSHION ASSY	4 pcs in 1set	
△ 4	QMP1110-244K	POWER CORD	2m BLACK	TM-A210G/U
5	QPA01203005	POLY BAG	12cm x 30cm	TM-A210G/U
△ 6	QMPL040-200-JC	POWER CORD	2m BLACK	TM-A210G/E
△ 7	QMPP170-200-JC	POWER CORD(EK)	2m BLACK	TM-A210G/E
8	CP30967-003-H	POLY BAG		
9	CP30966-001-H	POLY BAG		
△ 10	LCT1357-001A-H	INST BOOK		
11	BT-51014-2H	WARRANTY CARD		TM-A210G/U
12	BT-51024-1H	SERVICE INF CARD		TM-A210G/U

PACKING [TM-A210G/c]



PACKING PARTS LIST [TM-A210G/c]

△ Ref.No.	Part No.	Part Name	Description	Local
1	LC11570-001A-C	PACKING CASE		
2	LC20989-001A-H	CORNER LABEL	(x2)	
3	CP11655-00C-H	CUSHION ASSY	4 pcs in 1set	
△ 4	QMPS210-200-JC	POWER CORD	2m BLACK	
8	CP30967-003-H	POLY BAG		
9	CP30966-001-H	POLY BAG		
△ 10	LCT1358-001A-H	INST BOOK		
13	LC31100-001A-H	CORNER CUSHION	(x8)	
14	LC11194-018B-H	PACKING CASE		

TM-A210G/C, TM-A210G/E, TM-A210G/U

STANDARD CIRCUIT DIAGRAM

NOTE ON USING CIRCUIT DIAGRAMS

1.SAFETY

The components identified by the Δ symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

2.SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

- (1)Input signal : Colour bar signal
- (2)Setting positions of each knob/button and variable resistor : Original setting position when shipped
- (3)Internal resistance of tester :DC 20k Ω /V
- (4)Oscilloscope sweeping time :H \Rightarrow 20 μ s/div
:V \Rightarrow 5ms/div
:Others \Rightarrow Sweeping time is specified
- (5)Voltage values :All DC voltage values

* Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

3.INDICATION OF PARTS SYMBOL [EXAMPLE]

- In the PW board :R1209 \rightarrow R209

4.INDICATIONS ON THE CIRCUIT DIAGRAM

(1)Resistors

- Resistance value

- No unit :[Ω]
- K :[k Ω]
- M :[M Ω]

- Rated allowable power

- No indication :1/ 16 [W]
- Others :As specified

- Type

- No indication :Carbon resistor
- OMR :Oxide metal film resistor
- MFR :Metal film resistor
- MPR :Metal plate resistor
- UNFR :Uninflammable resistor
- FR :Fusible resistor

* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

(2)Capacitors

- Capacitance value

- 1 or higher :[pF]
- less than 1 :[μ F]

- Withstand voltage

- No indication :DC50[V]
- Others :DC withstand voltage [V]
- AC indicated :AC withstand voltage [V]

* Electrolytic Capacitors

47/50[Example]:Capacitance value [μ F]/withstand voltage[V]

- Type

- No indication :Ceramic capacitor
- MM :Metalized mylar capacitor
- PP :Polypropylene capacitor
- MPP :Metalized polypropylene capacitor
- MF :Metalized film capacitor
- TF :Thin film capacitor
- BP :Bipolar electrolytic capacitor
- TAN :Tantalum capacitor

(3)Coils

- No unit :[μ H]
- Others :As specified

(4)Power Supply

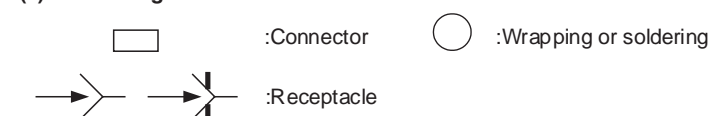


* Respective voltage values are indicated

(5)Test point

- :Test point
- :Only test point display

(6)Connecting method



(7)Ground symbol

- :LIVE side ground
- :ISOLATED(NEUTRAL) side ground
- :EARTH ground
- :DIGITAL ground

5.NOTE FOR REPAIRING SERVICE

This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (\perp) side GND and the ISOLATED(NEUTRAL) : (\downarrow) side GND. Therefore, care must be taken for the following points.

- (1)Do not touch the LIVE side GND or the LIVE side GND and the ISOLATED(NEUTRAL) side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
- (2)Do not short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or never measure with a measuring apparatus measure with a measuring apparatus (oscilloscope, etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND at the same time. If the above precaution is not respected , a fuse or any parts will be broken.

◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

NOTE

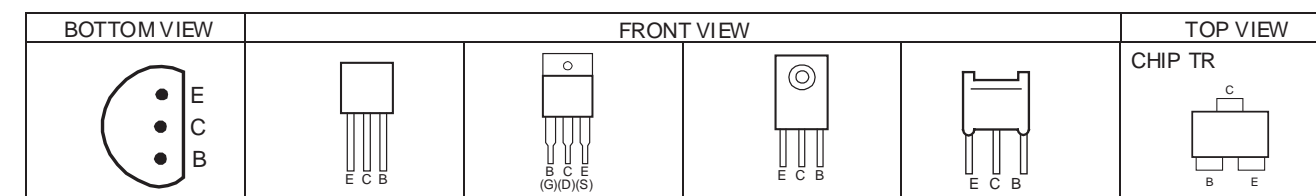
- ◇ Due improvement in performance, some part numbers show in the circuit diagram may not agree with those indicated in the part list. When ordering parts, please use the numbers that appear in the Parts List.

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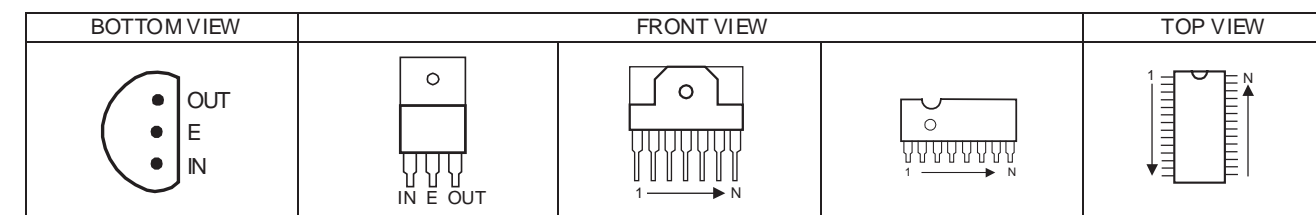
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SEMICONDUCTOR SHAPES

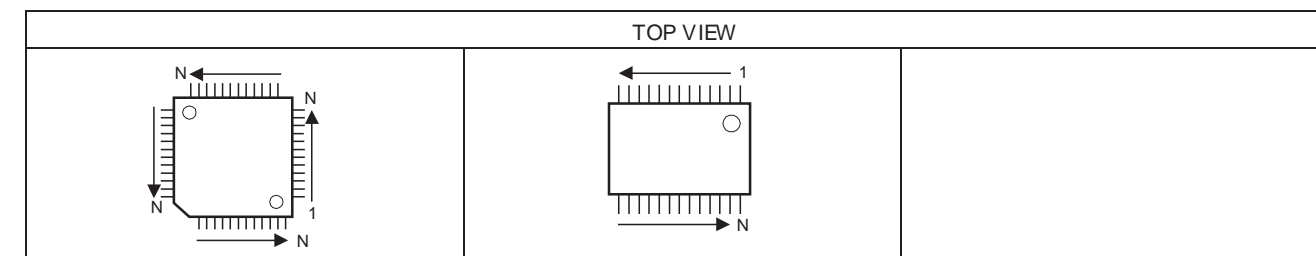
TRANSISTOR



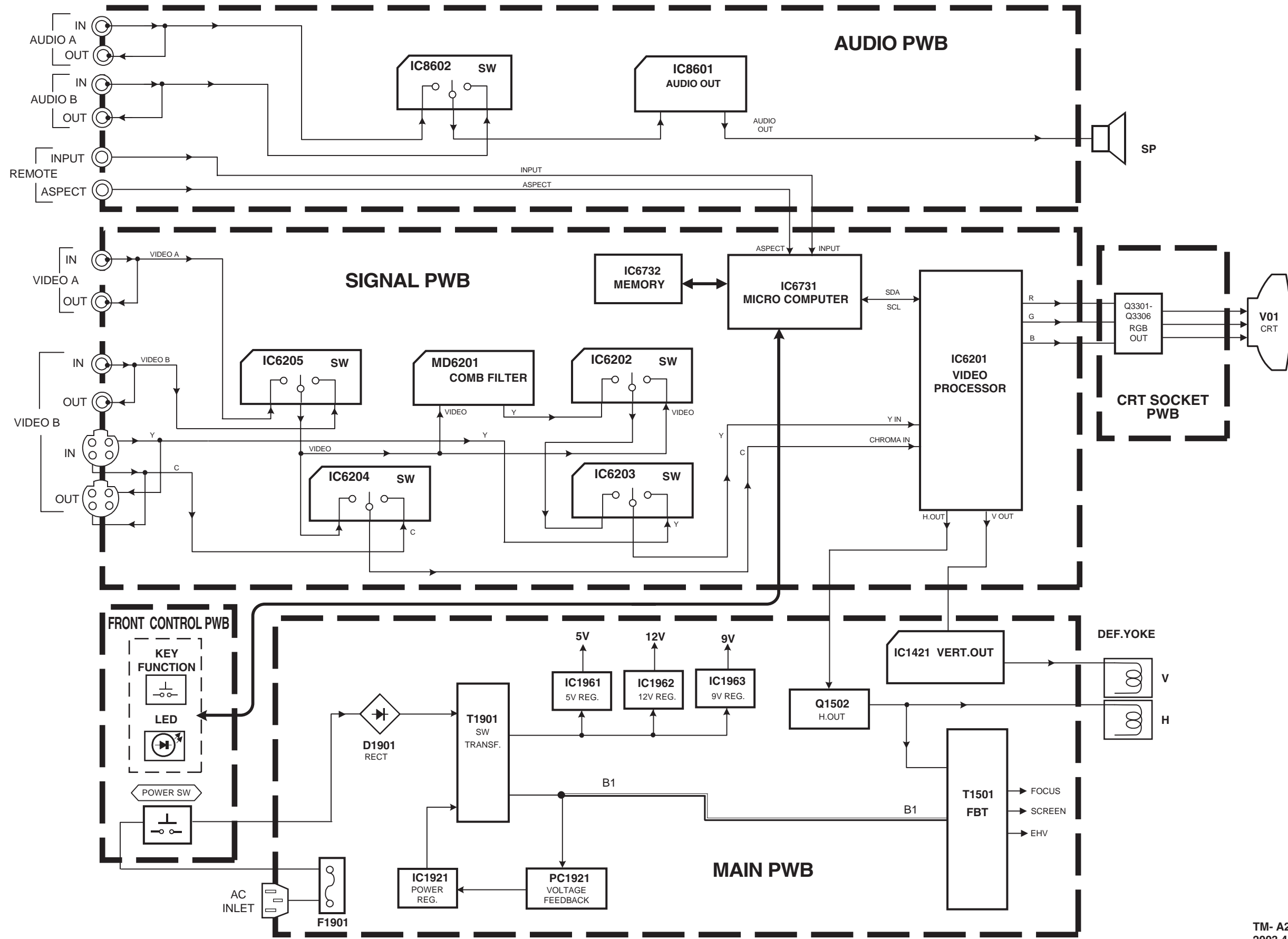
IC



CHIP IC

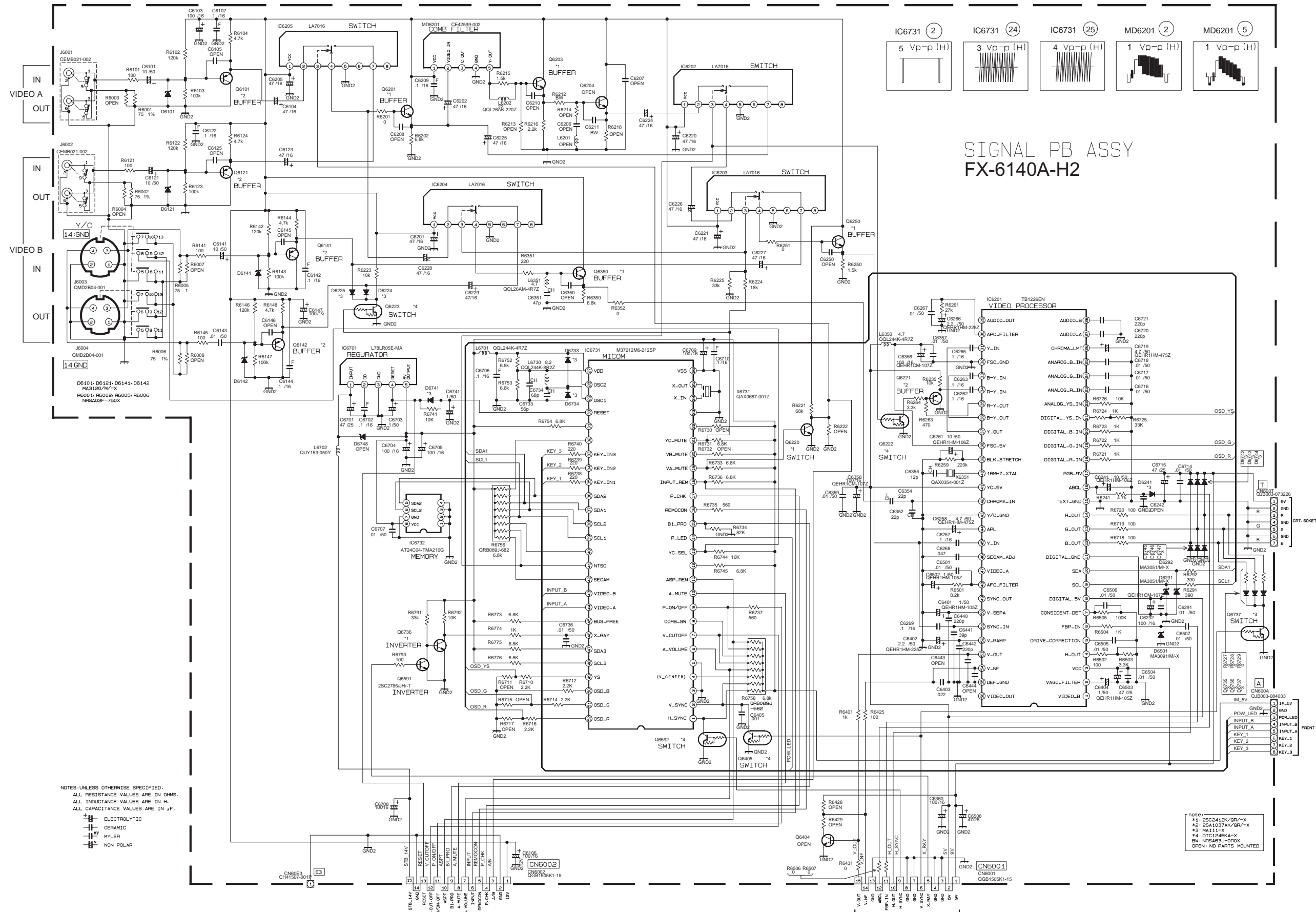
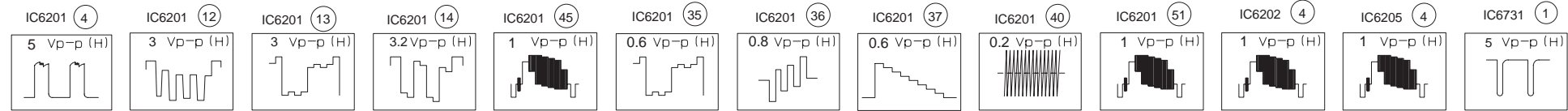


BLOCK DIAGRAM



CIRCUIT DIAGRAMS

SIGNAL PWB CIRCUIT DIAGRAM



SIGNAL PWB ASSY
FX-6140A-H2

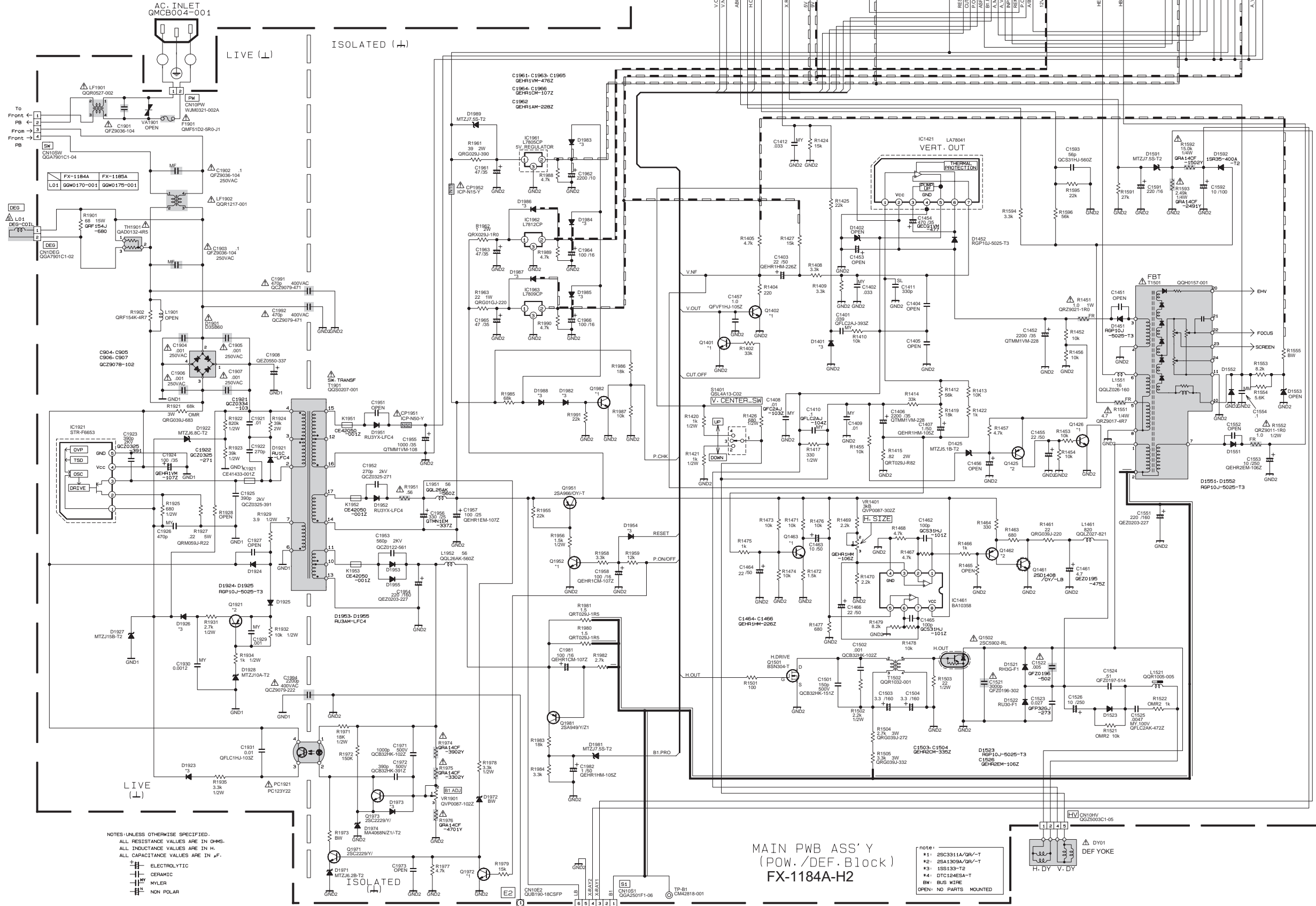
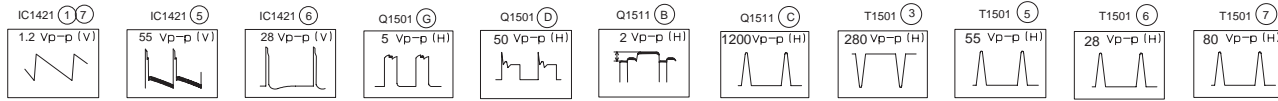
PIN NO.	VOLTAGE (V)	PIN NO.	VOLTAGE (V)
1	2.6	19	0
2	2.5	20	4.9
3	8.8	21	4.9
4	2	22	4.9
5	4.4	23	0
6	1	24	2.1
7	4.7	25	2
8	4.8	26	0
9	4.2	27	4.9
10	4.1	28	0
11	0	29	0
12	2.3	30	4.9
13	2.5	31	4.9
14	2.6	32	4.9
15	0	33	4.9
16	6.2	34	4.9
17	8.8	35	4.9
18	0	36	4.9
19	0	37	4.4
20	0	38	4.9
21	0	39	4.5
22	0	40	4.9
23	4.2	41	0
24	4.2	42	0
25	4.4	43	4.9
26	2.3	44	0
27	2.7	45	4.9
28	2.7	46	0
29	4.4	47	4.9
30	2.9	48	4.9
31	2.1	49	0
32	0	50	0
33	2.3	51	0
34	2.3	52	0
35	1.7	IC6732	1
36	1.7		0
37	2.2		0
38	4.9		0
39	4.4		0
40	3.6		4.9
41	4.8		7
42	3.3		8
43	0		8
44	2.2	MD6201	1
45	2.1		11.8
46	2.8		2
47	2.7		4.4
48	5.1		5
49	0		4
50	5.1	IC6101	E
51	2.3		6.3
52	4.3		C
53	0.5	IC6121	B
54	4.3		5.7
55	0		E
56	3.5		6.3
IC6202	11.8	IC6141	E
2	7.7		0.6
3	0		C
4	7		B
5	0		5.3
6	NC		C
7	7.6		B
8	NC	IC6201	E
9	11.8		6.3
10	7.6		C
11	0		11.8
12	7.6		B
13	0		3.8
14	7		C
15	0		11.8
16	NC		B
17	7.7		4.4
18	NC		C
19	NC		1.7
20	NC		C
21	7.7		E
22	7.7		2.3
23	3		C
24	7.6		B
25	0		3.2
26	NC		E
27	7.7		0
28	7.6		2.3
29	7.6		C
30	7.6		0.1
31	7.6		C
32	7.6		B
33	7.6		4.8
34	7		C
35	0		6.3
36	NC		C
37	7.7		11.8
38	NC		B
39	NC		6.9
40	NC		6.3
41	14.8	IC6701	E
42	5.8		C
43	0		11.8
44	4.9		B
45	4.9		0
46	0		4.6
47	4.1		C
48	4.6		0
49	0		E
50	0		0
51	4.9		C
52	0		0.5
53	0		B
54	0		0.1
55	0.2		E
56	0		0
57	0		0
58	4.9		C
59	2.9		B
60	0		-0.1
61	0		0
62	0		0
63	0		0
64	0		0
65	0		0
66	0.2		E
67	0		0
68	0.2		C
69	0		4
70	0		B
71	2.4		0
72	4.9		0
73	0		0
74	0		0
75	0		0
76	0		0
77	0		0
78	0		0
79	0		0
80	0		0

NOTES-UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN P.F.

ELECTROLYTIC
 CERAMIC
 MYLAR
 NON POLAR

*1: 2SC2412K/GR/-X
 *2: 2SA1037AK/GR/-X
 *3: MA111-X
 *4: DTC144EKA-X
 BW: NRS463J-DROX
 OPEN: NO PARTS MOUNTED

MAIN PWB CIRCUIT DIAGRAM



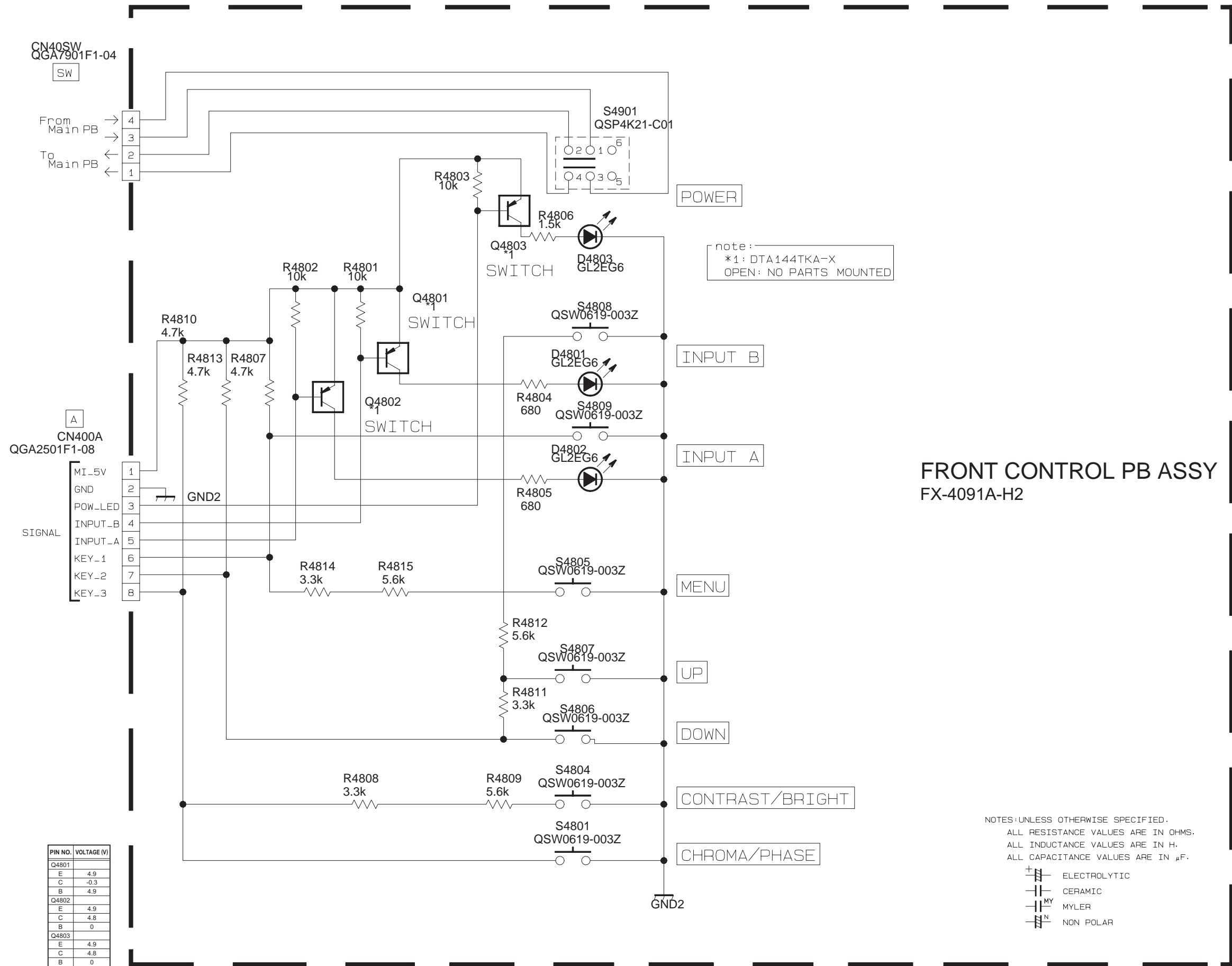
NOTES: UNLESS OTHERWISE SPECIFIED:
 ALL RESISTANCE VALUES ARE IN OHMS.
 ALL INDUCTANCE VALUES ARE IN H.
 ALL CAPACITANCE VALUES ARE IN μF.
 — ELECTROLYTIC
 — CERAMIC
 — MYLAR
 — NON POLAR

MAIN PWB ASS'Y
 (POW./DEF. BLOCK)
 FX-1184A-H2

- note:
- #1: 2SC3311A/GR-T
 - #2: 2SA1308A/GR-T
 - #3: 1SS133-T2
 - #4: DTC1424SA-T
- BN: BUS WIRE
 OPEN: NO PARTS MOUNTED

PIN NO.	VOLTAGE (V)
IC1421	
1	1.3
2	26.7
3	2
4	0
5	11.9
6	2.7
7	1.3
IC1461	
1	11.5
2	5.7
3	5.7
4	0
5	0.8
6	0.8
7	2
8	14.7
IC1921	
1	1.1
2	0.1
3	129
4	15.7
5	0
IC1961	
1	9.6
2	4.9
3	0
IC1962	
1	14.6
2	11.8
3	0
IC1963	
1	13.1
2	8.8
3	0
PC1921	
1	103.7
2	102.8
3	2.8
4	15.7
Q1401	
E	0
C	0.5
B	0
Q1402	
E	0
C	4.1
B	0.5
Q1425	
E	13.2
C	0
B	13.3
Q1426	
E	0
C	4.2
B	0
Q1461	
E	0
C	7.5
B	0.5
Q1462	
E	12.2
C	0.5
B	11.6
Q1463	
E	0.6
C	10.5
B	1.1
Q1501	
D	20.3
S	0
G	1.9
Q1502	
E	0
C	130
B	0
Q1921	
E	6.4
C	6.4
B	5.9
Q1951	
E	14.8
C	14.7
B	14
Q1952	
E	0
C	0.1
B	0.6
Q1971	
E	0.2
C	102.7
B	0
Q1972	
E	0
C	0
B	0.6
Q1973	
E	7
C	102.7
B	7.6
Q1981	
E	115.3
C	0
B	114.8
Q1982	
E	0
C	0
B	0.6

FRONT PWB CIRCUIT DIAGRAM



note:
*1: DTA144TKA-X
OPEN: NO PARTS MOUNTED

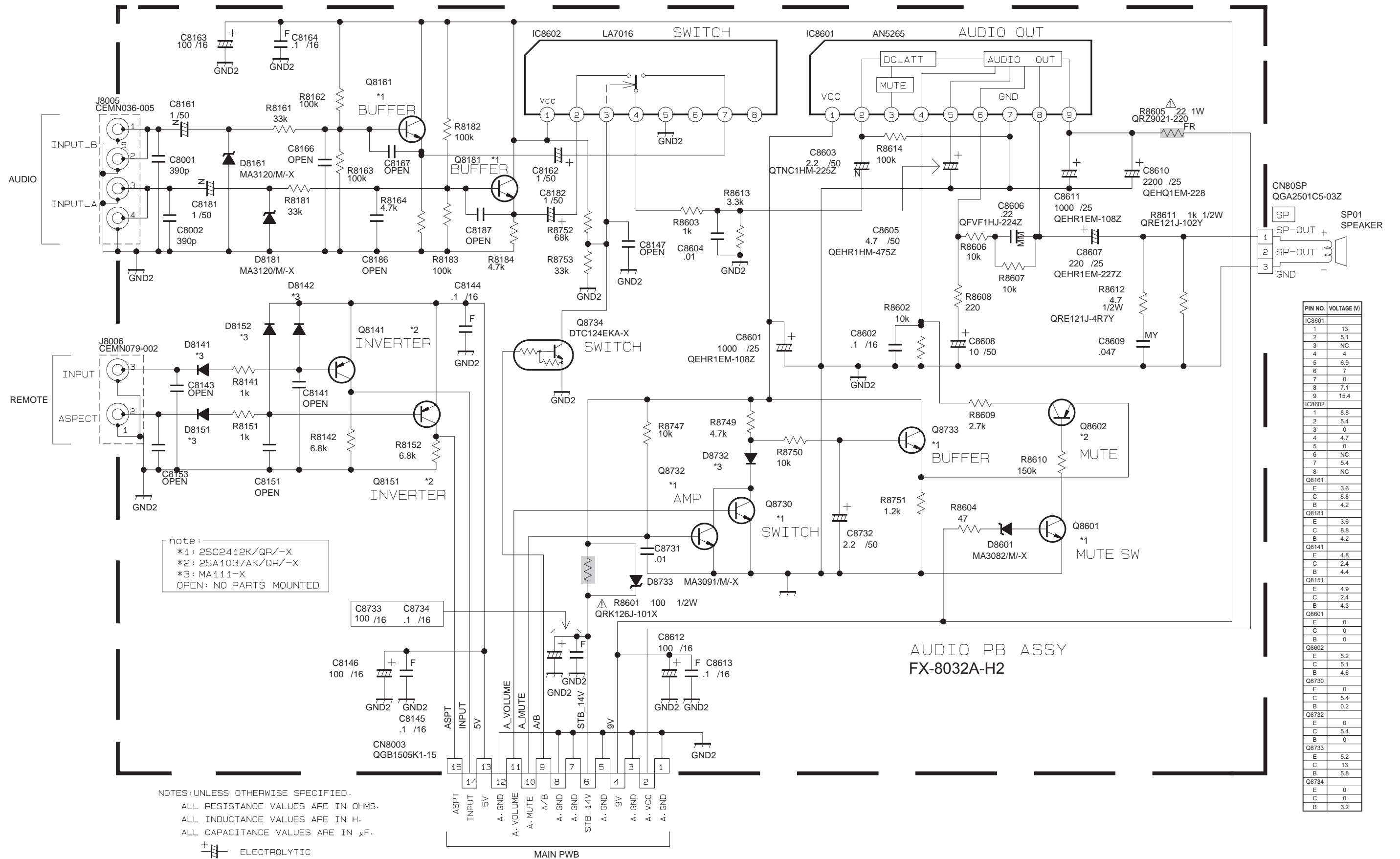
FRONT CONTROL PB ASSY
FX-4091A-H2

PIN NO.	VOLTAGE (V)
Q4801	
E	4.9
C	-0.3
B	4.9
Q4802	
E	4.9
C	4.8
B	0
Q4803	
E	4.9
C	4.8
B	0

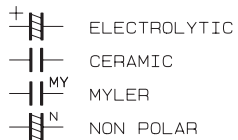
NOTES: UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

- ELECTROLYTIC
- CERAMIC
- MYLER
- NON POLAR

AUDIO PWB CIRCUIT DIAGRAM



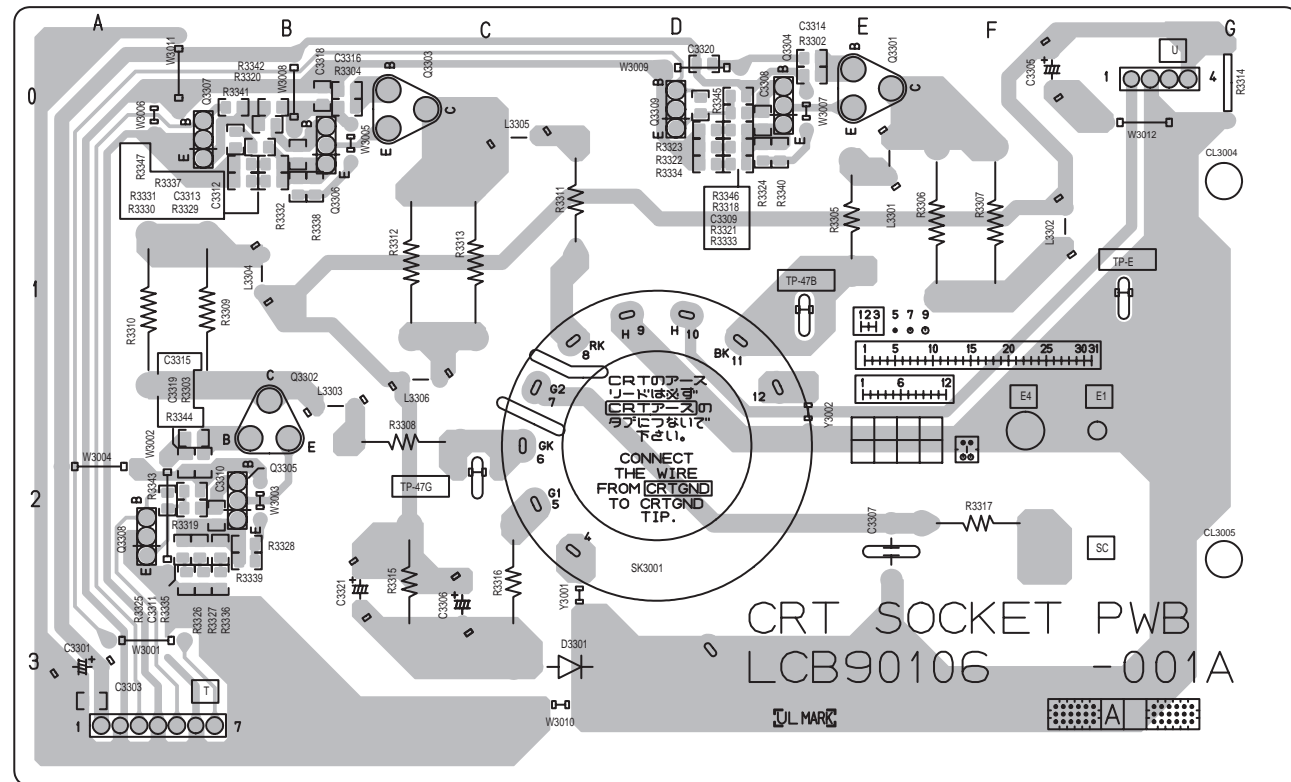
NOTES: UNLESS OTHERWISE SPECIFIED.
 ALL RESISTANCE VALUES ARE IN OHMS.
 ALL INDUCTANCE VALUES ARE IN H.
 ALL CAPACITANCE VALUES ARE IN μF.



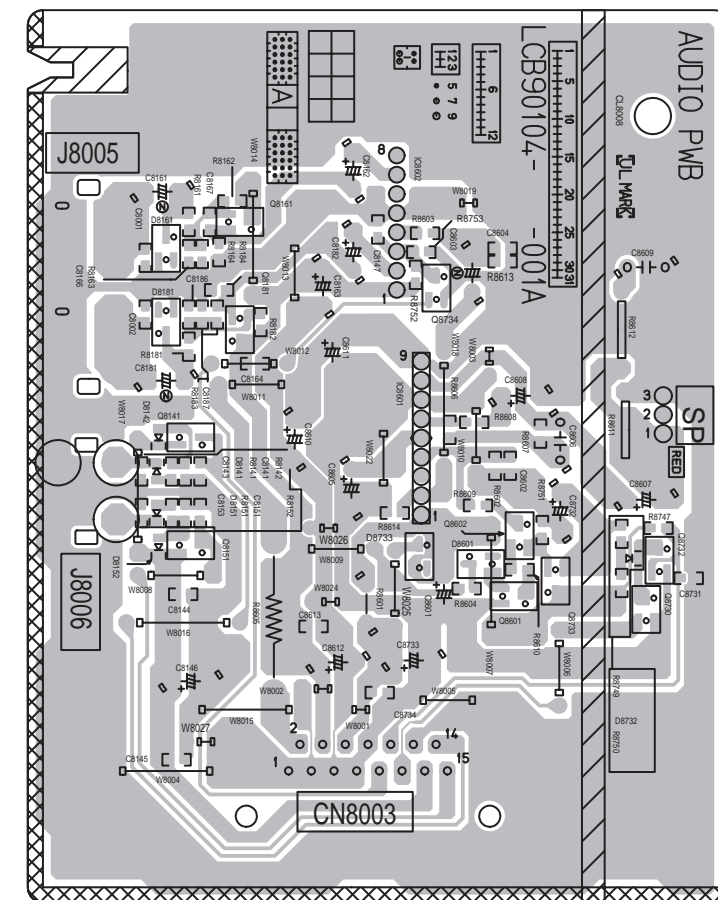
CRT SOCKET PWB PATTERN

AUDIO PWB PATTERN

TOP



TOP



FRONT