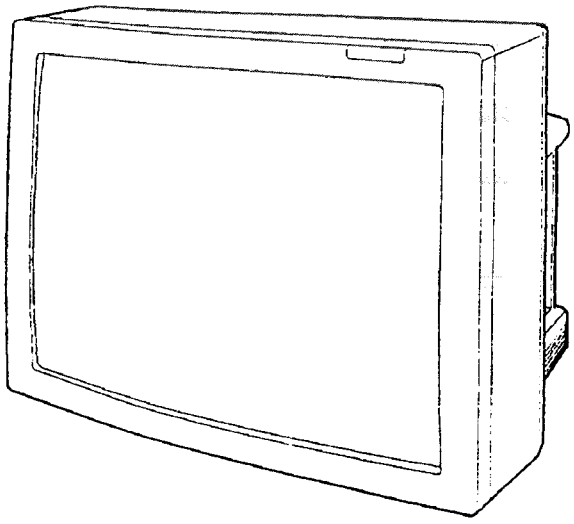
JVC

SERVICE MANUAL

COLOUR VIDEO MONITOR

TM-290ZE-B



CONTENTS

OUTLINE OF THE TM-290ZE-B

1. The TM-290ZE-B uses a different PICTURE TUBE from the TM-290ZE and consequently different MAIN PWB assembly.
   During service, check the PICTURE TUBE Part number and if using the NEW PICTURE TUBE, use this SERVICE MANUAL(No.50936C).
2. For reference during service, the main differences between the TM-290ZE and TM-290ZE-B are indicated in the table below.

DIFFERENCE LIST BETWEEN TM-290ZE AND TM-290ZE-B

⚠	Part No.		Part Name	Description
	PREVIOUS TM-290ZE	NEW TM-290ZE-B		
⚠	M68KPH165X	**M68KTY165X**	**PICTURE TUBE**	**V01 Not Interchangeable**
	FX-1063A	FX-1063B	MAIN PWB ASS'Y	Not Interchangeable

No.50936C
Apr.1996

SPECIFICATIONS

Item	Content
Colour systems	PAL,SECAM,NTSC3.58MHz,NTSC4.43MHz
Picture tube	728mm measured diagonally,data-grade,flat-square,cathode ray tube
Scan size	(W)541 × (H)406mm,676mm measured diagonally
Scanning frequency	H;15.625kHz(PAL,SECAM) / 15.734kHz(NTSC3.58,NTSC4.43MHz) V;50Hz(PAL,SECAM) / 59.94Hz(NTSC3.58,NTSC4.43MHz)
Colour temperature	D-6500K; x = 0.313,y = 0.329 / D-9300K; x = 0.283,y = 0.297 (selectable)
External inputs	
INPUT A:Composite video (1line)	BNC × 2(with 1 bridge - connected output),Termination switch provided,1.0V_{P-P} ,75Ω,negative sync.
Audio (1line;L,R)	RCA × 2,500mVrms,high impedance
INPUT B:Composite video (1line)	BNC × 1,1.0V_{P-P} ,75Ω,negative sync.
Y/C (1line)	DIN(4 pin) × 1,Y:1.0V_{P-P} ,75Ω,negative sync.,C(PAL,burst):0.3V_{P-P} ,75Ω,C(NTSC 3.58/4.43MHz,burst):0.286V_{P-P} ,75Ω
Audio (1line;L,R)	RCA × 2,500mVrms,high impedance
RGB COMPO...:	
Analogue RGB (1line:common with Y,R-Y,B-Y component)	BNC × 3,R,B:0.7V_{P-P} ,75Ω,G:0.7V_{P-P} ,75Ω,G on sync.:1.0V_{P-P} ,75Ω,negative sync.
Component (Y,B-Y,R-Y) (1line:common with analogue RGB)	Y:1.0V_{P-P} ,75Ω,negative sync.,R-Y,B-Y:0.7V_{P-P} (75% colour bar),75Ω
Sync.(1line)	BNC × 1,0.3 - 4.0V_{P-P}composite sync. ,75Ω,negative sync.
Audio (1line;L,R)	RCA × 2,500mVrms,high impedance
RGB Ys: Ys signal (1line)	RCA × 1,low:0 - 0.4V / high:1 - 3V,75Ω
External control terminals	φ3.5mm stereo mini jack × 2
Audio power output (with external speaker)	10W + 10W(at 8Ω),(Be sure to use external speakers of 8 - 16Ω impedance)
Operation temperature	0 -40°C (20 -80% RH)
Power requirement	230V AC,50/60 Hz
Power consumption	153W
Dimension(W × H × D)	638 × 508 × 493 mm
Mass	41.7kg
Accessories	Power cord × 1,Remote control unit (RM-C560) × 1,AA/R6 - size dry cell battery × 2

Design & specification subject to change without notice.

SAFETY PRECAUTIONS

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 (⚠)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 : (⊥) 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 with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time.
   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 B_1 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 10kΩ 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, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) **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.

(2) **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.).

• 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 ohms 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 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

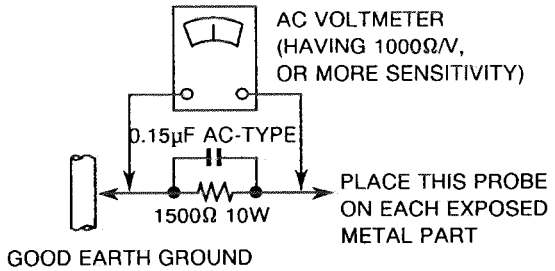
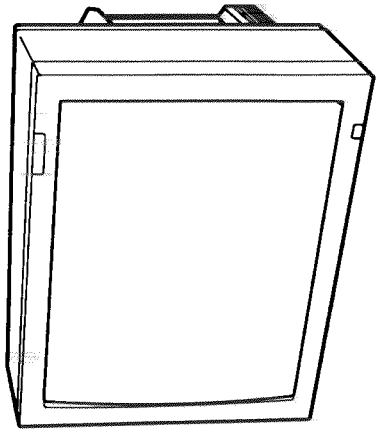


Fig.A

OPERATING INSTRUCTIONS



JVC

TM-290ZE COLOUR VIDEO MONITOR

INSTRUCTIONS:COLOUR VIDEO MONITOR
BEDIENUNGSANLEITUNG : FARB-VIDEO-MONITOR
MANUEL D'INSTRUCTIONS : MONITEUR VIDEO COULEUR
ISTRUZIONI : MONITOR VIDEO A COLORI
MANUAL DE INSTRUCCIONES : MONITOR DE VIDEO A COLOR

TM-290ZE

Printed in Japan
0395-T-UP-VP

JVC
VICTOR COMPANY OF JAPAN, LIMITED

SAFETY PRECAUTIONS

In order to prevent any fatal accidents caused by misoperation or mishandling of the monitor, be fully aware of all the following precautions.

WARNINGS

To prevent fire or the danger of electric shock, do not expose this monitor to rain or moisture.

Dangerous high voltage is present inside the monitor. Do not remove the back cover of the cabinet.

When servicing the monitor, contact qualified service personnel. Never try to service it yourself.

Machine Noise Information Ordinance 3. GSGV, January 18, 1991: The sound pressure level at the operator position is equal to or less than 70 dB(A) according to ISO 7779.

Improper operation, in particular alteration of high voltage or changing the type of tube might result in X-ray emission of considerable dosage. A monitor altered in such a way no longer meets the standards of certification, and must therefore no longer be operated.

PRECAUTIONS

- Use only the power source specified on the monitor.
- When not using this monitor for a long period of time, or when cleaning it, be sure to disconnect the power plug from the AC outlet.
- Do not allow anything to rest on the power cord. And do not place this monitor where people will tread on the power cord. Do not overload AC outlet or power cord as this can result in a fire or electric shock.
- Be sure to consult your dealer regarding where and how to install this monitor to avoid serious accidents (e.g. the monitor falling from the point of installation, etc.) that might occur as a result of faulty installation.
- There are various tapped holes which correspond to the various installation methods. Be sure to consult your dealer, if you are going to use these tapped holes, to prevent any breakdowns or safety hazards from occurring.
- Avoid using this monitor under the following circumstances:
  - in extremely hot, cold or humid places,
  - in dusty places,
  - near appliances generating strong magnetic fields,
  - in places subject to direct sunlight,
  - in badly ventilated places,
  - in vehicles with doors closed.
- Do not cover the ventilation slots while in operation as this could obstruct the required ventilation flow.
- When dust accumulates on the screen surface, clean it with a soft cloth.
- Unplug this monitor from the AC outlet and refer servicing to qualified service personnel under the following circumstances:
  - when the power cord is frayed or the plug is damaged,
  - if liquid has been spilled into the monitor,
  - if the monitor has been dropped or the cabinet has been damaged,
  - when the monitor exhibits a distinct change in performance.
- Do not attempt to service this monitor yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Always refer servicing to qualified service personnel.
- When replacement parts are required, have the service person verify in writing that the replacement parts he/she uses have the same safety characteristics as the original parts. Use of manufacturer's specified replacement parts can prevent fire, electric shock, or other hazards.
- Upon completion of any servicing or repair work to this monitor, please ask the service personnel to perform the safety checks described in the manufacturer's service literature.
- When this monitor reaches the end of its useful life, improper disposal could result in a CRT implosion. Ask qualified service personnel to dispose of this unit.

Thank you for purchasing this JVC colour video monitor. Before using it, read and follow all instructions carefully to take fullest advantage of the monitor's performance.

CONTENTS

FEATURES

- **Digital comb filter for enhanced picture quality (Functions only for NTSC and PAL colour systems.)**
- **Multiformat video input:**
  - **PAL/SECAM/NTSC 3.58 MHz/NTSC 4.43 MHz**
  - **Composite video, Y/C, Component (Y, B-Y, R-Y signal), analogue RGB**
- **Remote control (picture adjustment, white balance adjustment, ID system operation, etc.)**
- **Built-in 10 W +10 W amplifier for use with the external speakers**

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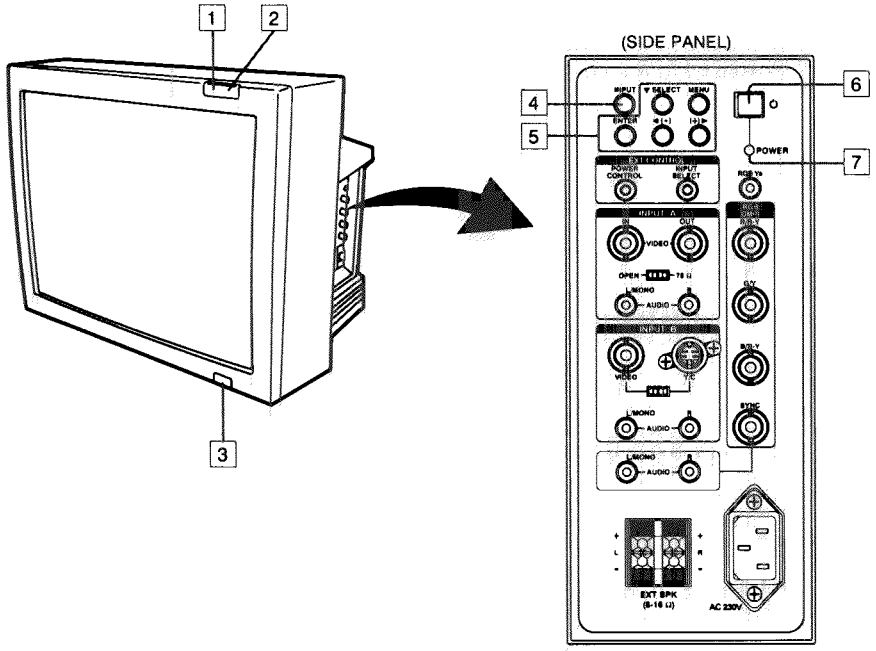
CONTROLS AND FEATURES (MONITOR)



Front Panel

1 MAIN POWER indicator
Glows to indicate that the main power is on.
- Glows dimly when the power is off and glows brightly when the power is on.

2 Remote control sensor
Senses infrared signals emitted from the cordless infrared remote control unit.

3 MAIN POWER switch
Press to turn the main power on or off.

Side Panel

4 INPUT button
Press repeatedly to select an input signal.

5 MENU control buttons
Use to operate on-screen menu functions.

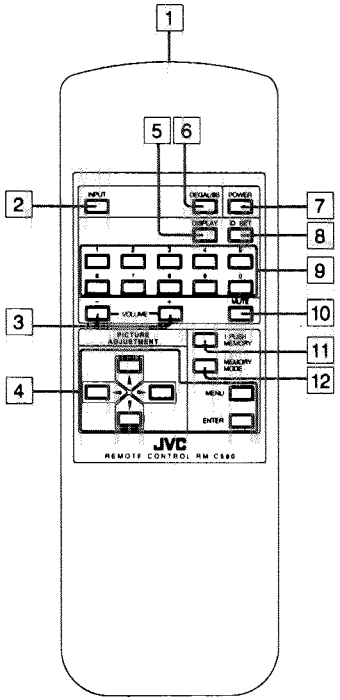
NOTE

- The ◄ (–) and (+) ► buttons are used also to adjust the volume of external speakers connected to the monitor.

6 POWER (standby) button
Press to turn the power on or off when the main power is turned on.

7 POWER indicator
Glows to indicate that the power is on.
- If the POWER indicator blinks it indicates that the monitor has developed a fault. Disconnect the power cord from the AC outlet immediately and consult your dealer.

CONTROLS AND FEATURES (REMOTE CONTROL UNIT)



1 Infrared signal emitting window
Emits infrared signals for remote control.
Point at the sensor on the colour video monitor.

2 INPUT button
Press repeatedly to select an input signal.

3 VOLUME –/+ buttons
Press to adjust the volume of external speakers connected to the monitor.

4 MENU control buttons
Use to operate the on-screen menu functions.

5 DISPLAY button
Press to display the ID number.

6 DEGAUSS button
Press to demagnetize the CRT.

7 POWER button
Press to turn the power on or off when the main power is turned on.

8 ID SET button
Press to set an ID number.

9 Numeric buttons
Press to enter an ID number.

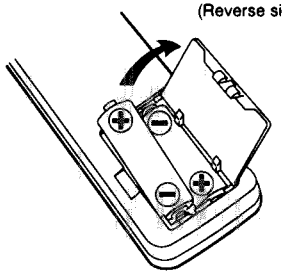
10 MUTE button
Press to mute the sound of external speakers connected to the monitor.

11 1 PUSH MEMORY button
Press to programme the current picture adjustment settings into the memory.

12 MEMORY MODE button
Press to select the memory mode.

BATTERY INSTALLATION

Insert two dry cell batteries into the battery compartment.
Correctly install them from – polarity side observing + and – polarities.



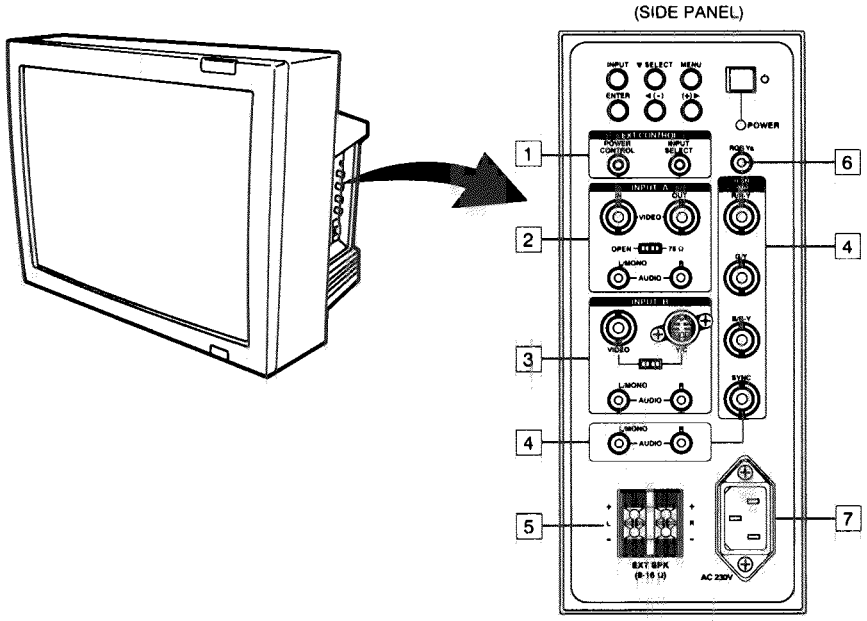
NOTE

- Use AA/R6-size dry cell batteries.
- Battery life is approximately six months to one year. Life varies depending on frequency of use.
- We recommend that you use the supplied batteries to test the remote control unit after purchase, not for regular use. Replace them immediately if operation becomes erratic.
- Do not use new and old batteries together.
- Follow the precautions printed on the batteries.

The instruction below applies only to the use in Holand.
Gebruikte batterijen:

NL Niet weggooien, maar inleveren als KCA.

TERMINALS AND FEATURES



1 EXT CONTROL terminals

If external switches are connected to the EXT CONTROL terminals, the power can be turned on or off, and the input signal can be selected, using the external switches.

2 INPUT A terminals, termination switch

Input terminal for a composite video signal or a bridge-connected output terminal, audio signal input terminals, and termination switch.

- Inputs a monaural audio input signal to the L/MONO terminal of the AUDIO terminals.
- Set the termination switch to OPEN for bridged connection; set it to 75 Ω for input signals only.

3 INPUT B terminals, termination switch

Input terminal for a composite video signal or a Y/C signal, audio signal input terminals, and VIDEO Y/C selection switch.

- Inputs a monaural audio input signal to the L/MONO terminal of the AUDIO terminals.
- Set the VIDEO Y/C selection switch to Y/C when inputting a Y/C signal; set the VIDEO Y/C selection switch to VIDEO when inputting a composite video signal.

4 RGB COMPO. terminals

Input terminal for an analogue RGB signal or a component signal (Y, B-Y, R-Y signal), audio signal input terminals.

- Inputs a monaural audio input signal to the L/MONO terminal of the AUDIO terminals.

5 EXT SPK (external speakers) terminal

External speakers connection terminal.

- Use external speakers that have an impedance of 8-16 Ω.

6 RGB Ys terminal

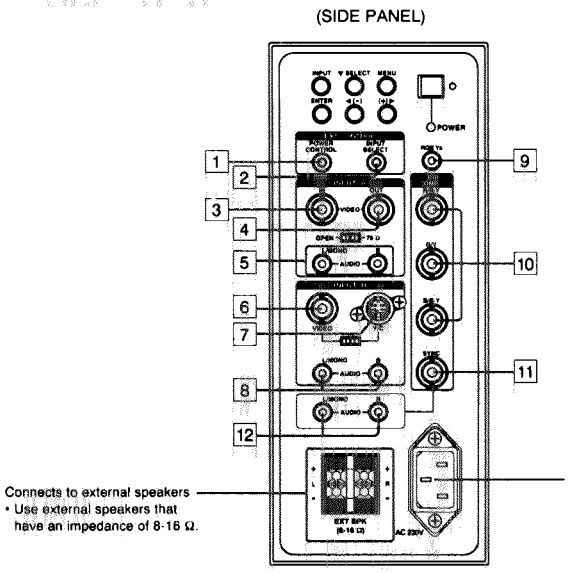
Input terminal for control signal (Ys signal) used to superimpose an analogue RGB signal on a video signal from INPUT A or INPUT B.

7 Power socket

Connect to an AC outlet (230 V AC, 50/60 Hz) using the provided power cord.

CONNECTION AND TERMINAL SETTINGS

CONNECTION



NOTE

- Be sure to turn off each component's power before connection.
- The connection shown below is only an example. Terminals and their functions differ in accordance with the component to be connected. Also read and follow the instructions for the component.
- Only analogue RGB signals of 15.75 kHz horizontal frequency can be input into this monitor.

	Terminal(s)	Signal(s)	FUNCTION	Equipment to be connected
1	POWER CONTROL	Short/Open	Power ON/OFF for monitor	External switch
2	INPUT SELECT	Short/Open	Selection of input mode	External switch
3	INPUT A IN	Composite video signal	Video signal to INPUT A	Component that outputs a composite video signal
4	INPUT A OUT	Composite video signal	Bridge-connected output of video signal input to 3	Component that inputs a composite video signal
5	INPUT A AUDIO	Audio signal(s) (stereo/mono)	Audio signal to INPUT A	Audio signal output terminal(s) of the component connected to 3 or other components that output audio signal(s)
6	INPUT B VIDEO	Composite video signal	Video signal to INPUT B	Component that outputs a composite video signal
7	INPUT B Y/C	Y/C signal	Video signal to INPUT B	Component that outputs a Y/C signal
8	INPUT B AUDIO	Audio signal(s) (stereo/mono)	Audio signal to INPUT B	Audio signal output terminals of the component connected to 6 or 7 or a component that outputs audio signal(s)
9	RGB Ys	Ys signal	Superimposing an analogue RGB signal on a video signal from INPUT A or INPUT B	Component that outputs a Ys signal
10	RGB COMPO. R/R-Y, G/Y, B/B-Y	Analogue RGB signals or component signal (Y, B-Y, R-Y signal)	Video signals to RGB COMPO.	Component that outputs analogue RGB signals or a component signal
11	RGB COMPO. SYNC	Composite sync. signal	Sync. signal of video signal of 10	Sync. signal output terminal of the component connected to 10 or other components that output sync. signals
12	RGB COMPO. AUDIO	Audio signal(s) (stereo/mono)	Audio signal(s) to RGB COMPO.	Audio signal output terminal(s) of the component connected to 10 or other components that output audio signals

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CONNECTION AND TERMINAL SETTINGS (Continued)

Video B terminal settings

Set the VIDEO Y/C selection switch to VIDEO or Y/C, depending on the video signal to be input into the VIDEO B terminal. Set to VIDEO when inputting a composite video signal. Set to Y/C when inputting a Y/C signal.

NOTE

● When the VIDEO Y/C Selection switch is set to Y/C, the input mode display changes from "INPUT B" to "INPUT B. Y/C".

RGB COMPO. terminal settings

Select RGB or COMPO. from the RGB/COMPONENT settings in the FUNCTION SELECT menu, depending on the video signal to be input into the RGB COMPO. terminal.

- To input an analogue RGB signal, select RGB.
- To input a component signal (Y, R-Y, B-Y signal), select COMPO.

For details see "CONTROL USING ON-SCREEN MENU" on page 10 and "RGB/COMPONENT" on page 14.

SYNC terminal settings

When an external sync. signal is input into the SYNC terminal, set RGB COMPO. SYNC in the FUNCTION SELECT menu to EXT (external).

For details see "CONTROL USING ON-SCREEN MENU" on page 10 and "RGB COMPO. SYNC" on page 14.

NOTE

● An external sync. signal that has been into the SYNC terminal cannot be used for signals other than an analogue RGB signal or a component signal (Y, R-Y, B-Y signal).

RGB Ys terminal settings

Set RGB Ys in the FUNCTION SELECT menu according to the video mode on which you wish to superimpose an analogue RGB signal.

For details see "CONTROL USING ON-SCREEN MENU" on page 10 and "RGB Ys" on page 14.

- Ys signal is used to superimpose an analogue RGB signal on a video signal. (Low; 0 - 0.4 V, High; 1 - 3 V)

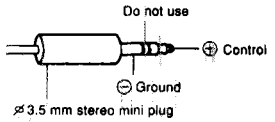
NOTE

● When superimposing, it is necessary to synchronize the video signal with the analogue RGB signal using the TBC (time base corrector unit), etc.

Connection and settings of the EXT CONTROL terminals

If external switches are connected to the EXT CONTROL terminals, monitor power on/off, and input signal switching can be carried out using the external switches.

- Use lock-type external switches.
- Use a plug of the type shown below for the connection.



To set EXT CONTROL FUNCTION:

Set EXT INPUT CNTL or EXT POWER CNTL in the SET-UP MENU according to your requirements.

For details see "SET-UP MENU FUNCTIONS" on page 16, and "EXT INPUT CNTL" and "EXT POWER CNTL" on page 18.

MAIN POWER ON/OFF

To turn the main power ON:
Push the MAIN POWER switch on the front panel.

The MAIN POWER indicator on the front panel glows green.
To turn the main power off, push the MAIN POWER switch again, and the MAIN POWER indicator goes off.

NOTE

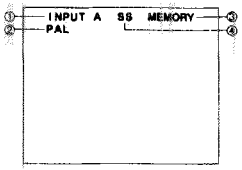
● The MAIN POWER indicator glows dimly when the power is off and glows brightly when the power is on.

BASIC OPERATION

Basic operation of the monitor is carried out using the control buttons on the side panel of the monitor or using the control buttons on the remote control unit.

1. *To turn the power on:* *Press the POWER button.*

The POWER indicator on the side panel of the monitor glows green and the MAIN POWER indicator on the front panel of the monitor glows brightly. Simultaneously, the status display (e.g. [1]) that indicates the current mode of the monitor is displayed for approximately 15 seconds.
To turn off the power, press the POWER button again.
The POWER indicator goes off and the MAIN ROWER indicator turns dim.



[1]

① Input mode indication
② Colour system indication
③ Displayed when in the memory mode
④ Displayed when the SCREEN SAVER is ON

2. *To select the input:* *Press the INPUT button repeatedly.*

The status display (e.g. [1]) is displayed for approximately two seconds.

● Relation between input mode indication and signal input/terminal

Input mode indication	Signal input/terminal
INPUT A	Composite video signal input to INPUT A
INPUT B	Composite video signal input to INPUT B
INPUT B. Y/C	Y/C signal input to INPUT B
RGB	Analogue RGB signal input to RGB COMPO.
COMPONENT	Component signal (Y, B-Y, R-Y signal) input to RGB COMPO.

● Colour system indication

Indication	Colour system
PAL	PAL
SECAM	SECAM
NTSC	NTSC (colour sub-carrier: 3.58 MHz)
NTSC 443	NTSC (colour sub-carrier: 4.43 MHz)

NOTE

● Status display (e.g. [1]) is also displayed for approximately two seconds when the colour system of the input signal has changed.
● The colour system is not displayed in the following cases:
  - When there is no input signal
  - When a black-and-white signal, analogue RGB signal or component signal (Y, B-Y, R-Y signal) is input
  - When the colour system is set to BW manually
● When the colour system is set manually, the colour system of the input signal is not discernable automatically.
For details see "COLOUR SYSTEM" on page 17.

To adjust the sound of external speakers connected to the monitor:

- Press the ◄ (–) / (+) ► button or VOLUME – / + button to decrease or increase the level (within ±20).
- Press the MUTE button on the remote control unit to mute the sound. MUTE appears on the screen for approximately three seconds. Press again to release.

NOTE

● If the power or main power is turned off with sound-muting activated, the function is kept in memory.
● Sound-muting is also released by pressing the ◄ (–) / (+) ► button or VOLUME – / + button.

How to demagnetize the CRT

If you have positioned a non-shielded speaker or other equipment that generates a strong magnetic field near the monitor, or after relocating the monitor, colour patches could appear in the picture caused by magnetization of the CRT. If this occurs, push the DEGAUSS button to demagnetize the CRT.

NOTE

● This function is not effective if activated a second time if only a very short time has elapsed. When degaussing must be repeated, proceed after at least 10 minutes have passed since first degaussing.

CONTROL USING ON-SCREEN MENU

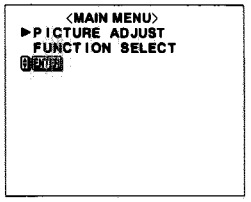
By calling up the menu display on the screen, various functions can be selected and set as required. Use the menu control buttons to operate the on-screen menu functions.

How to call up the menu display and select functions

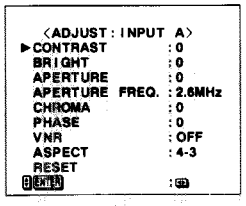
1. Press the MENU button to call up the MAIN MENU display [1] on the screen.
   - To make the MAIN MENU [1] disappear, press the MENU button.
2. Select the menu you want to use by pressing the ▲ / ▼ button on the remote control unit or the ▼ SELECT button on the monitor. (e. g. PICTURE ADJUST)
3. Press the ENTER button to call up the menu display (e.g. [2]) on the screen.
4. Select the function you want to change by pressing the ▲ / ▼ button on the remote control unit or the ▼ SELECT button on the monitor.
5. Change the settings by pressing the ◄ / ► button on the remote control unit or the ◄ (–) / (+) ► button on the monitor.
6. Repeat steps **4** and **5** to change the settings of other functions.
7. When you have finished changing the settings of the functions on the selected menu, press the MENU button to return to the MAIN MENU [1].
8. ● Repeat steps **2** to **6** to change the settings of another menu.
   ● Press the MENU button to complete.
   The MAIN MENU [1] disappears.

NOTE

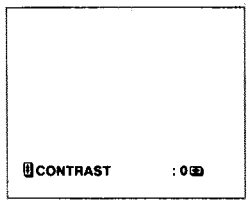
- When menu display (e.g. [2]) is on the screen, press the ENTER button. The display changes to [3]. In this state, you can also select the function or change the setting.
- When the display (e.g. [3]) is on the screen, each time the ▼ button or ▼ SELECT button is pressed, while the ENTER button is held down, the indication moves up or down the screen (display [4]). Press the MENU button when display [3] or [4] is on the screen, and the display returns to [2].
- If no operation occurs for approximately five minutes after calling up the menu display on the screen, the display disappears automatically.
- The settings are all kept in the memory after the power or main power has been turned off.



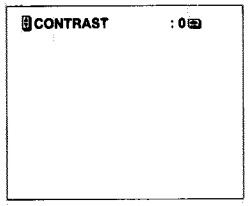
[1]



[2]



[3]



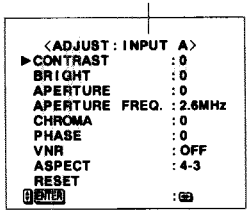
[4]

PICTURE ADJUST MENU FUNCTIONS

By calling up the PICTURE ADJUST menu on the screen, various picture adjustments, VNR (Video Noise Reduction) on/off, and picture aspect ratio switching can be chosen and set as required.

- The settings of the PICTURE ADJUST menu can be changed individually according to input modes. (See [1] on the right.)
  To call up the PICTURE ADJUST menu of the input mode you wish to use, first press the INPUT button to select the desired input mode, then recall the PICTURE ADJUST menu.

Input mode



[1]

CONTRAST (picture contrast)

(Default set level)
(Lower) -20 ⟵ 0 ⟶ +20 (Higher)

BRIGHT (picture brightness)

(Default set level)
(Darker) -20 ⟵ 0 ⟶ +20 (Brighter)

APERTURE (picture sharpness)

(Default set level)
(Softer) -5 ⟵ 0 ⟶ +5 (Sharper)

CHROMA (picture colour density)

(Default set level)
(Lighter) -20 ⟵ 0 ⟶ +20 (Deeper)

PHASE (picture hue)

(Default set level)
(Reddish) -20 ⟵ 0 ⟶ +20 (Greenish)

Relationship between picture adjustments and input video signals

Each picture adjustment is effective for the following video signal input:

Control \ Signal	Composite video, Y/C					RGB	COMPONENT
	PAL	SECAM	NTSC	NTSC 443	Black-and-White		
CONTRAST	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BRIGHT	Yes	Yes	Yes	Yes	Yes	Yes	Yes
APERTURE	Yes	Yes	Yes	Yes	Yes	No	Yes
CHROMA	Yes	Yes	Yes	Yes	No	No	Yes
PHASE	No	No	Yes	Yes	No	No	No

NOTE

- Functions that do not correspond to the signals that are input do not appear on the PICTURE ADJUST menu and therefore cannot be used.

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PICTURE ADJUST MENU FUNCTIONS (Continued)

VNR (Video Noise Reduction settings)

When the VNR is on, noise at the high-frequency end of the video signal is reduced by damping the high-frequency end of the video signal.

Setting	Function
ON	Reduces video signal noise
OFF	VNR does not operate

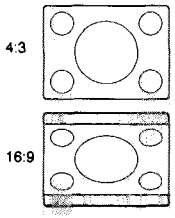
NOTE

- When an analogue RGB signal picture is being monitored, the VNR does not appear and therefore the functions cannot be operated.

ASPECT (picture aspect ratio switching)

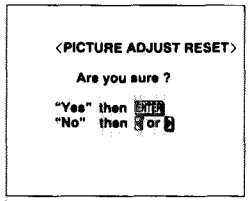
The aspect ratio of the picture can be switched between 4:3 and 16:9. When switching to "16-9" on the screen, the height of the picture is slightly reduced (see right).

Setting	Function
4-3	Standard picture aspect ratio (4:3)
16-9	Displays the picture in 16:9 aspect ratio



How to reset the PICTURE ADJUST menu settings to the factory-preset ones

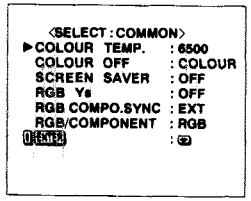
1. Select RESET and press the ENTER button.
   The < PICTURE ADJUST RESET > screen is displayed.
2. ● Press the ENTER button to reset.
   ● Press the ◄ / ► button or ◄ (–) / (+) ► button to cancel.



FUNCTION SELECT MENU FUNCTIONS

Calling up the FUNCTION SELECT menu on the screen allows various settings, switching between analogue RGB signal and component signal (Y, R-Y, B-Y signal), or INT/EXT of sync. signal to be carried out.

- The FUNCTION SELECT menu settings are common to all input modes (See [1] on the right). The settings cannot be changed individually for each input mode.



[1]

COLOUR TEMP. (colour temperature switching)

Use to set the colour temperature of white balance.

Setting	Function
9300	To 9300K
6500	To 6500K

NOTE

- By changing the default setting of the white balance adjustment under the SET-UP MENU display (see page 17 for adjustment), the * indication is added to the right of the setting to indicate that the factory-preset setting was changed.

COLOUR OFF

Turn on COLOUR OFF to display a black-and-white picture by inputting a luminance signal only. Use to check: the noise contained in a luminance signal; and the white balance.

Setting	Function
MONO	COLOUR OFF operates
COLOUR	COLOUR OFF does not operate

NOTE

- When monitoring an analogue RGB signal picture, COLOUR OFF does not appear and therefore the functions cannot be operated.

SCREEN SAVER (prevention of CRT burnout)

The SCREEN SAVER slightly moves the position of the displayed picture, vertically and horizontally, every 30 minutes to prevent the CRT from burnout caused by the long display of a still picture.

Setting	Function
ON	Moves picture position periodically
OFF	SCREEN SAVER does not operate

NOTE

- When the SCREEN SAVER is set to ON, "SS" is displayed in the status display.

FUNCTION SELECT MENU FUNCTIONS (Continued)

RGB Ys (setting the input mode to superimpose an analogue RGB signal)

Use to select the input mode when an analogue RGB signal is superimposed. When the Ys signal input to the RGB Ys terminal is high, an analogue RGB signal is superimposed on the selected input mode.

Setting	Function
A	Superimposes on INPUT A
B	Superimposes on INPUT B
A & B	Superimposes on both INPUT A and INPUT B
OFF	Does not superimpose

NOTE

- When RGB/COMPONENT is set to COMPO., the RGB Ys setting cannot be changed.
  To change the RGB Ys setting, set RGB/COMPONENT to RGB.
- Ys signal level:
  Low; 0 – 0.4 V, High; 1 – 3 V
- Digital comb filter does not function at the input mode set for RGB Ys setting.

RGB COMPO. SYNC (selection of a sync. signal)

Use to select the signal required to synchronize an analogue RGB signal or a component signal (Y, B-Y, R-Y signal) either from the external sync. signal input into the SYNC terminal, or the sync. signal carried in the video signal.

Setting	Function
INT	Synchronizes to the sync. signal carried in the video signal
EXT	Synchronizes to the external sync. signal input into the SYNC terminal

RGB/COMPONENT (input settings to the RGB COMPO. terminal)

Set this according to the video signal to be input into the RGB COMPO. terminal.

Setting	Function
RGB	Use this setting when an analogue RGB signal is input
COMPO.	Use this setting when a component signal (Y, R-Y, B-Y signal) is input

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MEMORY MODE

A set of PICTURE ADJUST menu settings can be programmed into the memory for quick recall as required.

- PICTURE ADJUST menu settings can only be programmed into the memory mode as a set. You cannot programme various setting individually according to each input mode.
- Some of the functions of the PICTURE ADJUST menu recorded in the memory might not operate according to input modes or colour systems. For details see PICTURE ADJUST MENU FUNCTIONS on page 11.

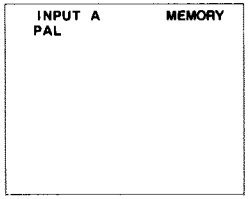
Recall/release of the memory mode

Press the MEMORY MODE button to recall the memory mode.

The status display is displayed for approximately two seconds. "MEMORY" that indicates the memory mode is displayed in this status display. (e.g. [1])

In the memory mode, picture quality is adjusted to the PICTURE ADJUST menu settings that have been programmed into memory, and the VNR and ASPECT settings change.

To cancel the memory mode:
Press the MEMORY MODE button once again.

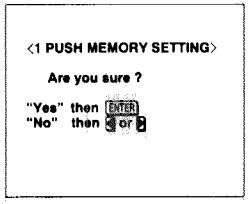


[1]

Programming the current monitor settings into the memory

The settings in the PICTURE ADJUST menu being monitored can be programmed into the memory by pressing the 1 PUSH MEMORY button.

1. Press the 1 PUSH MEMORY button to call up display [2] on the screen.
2. ● Press the ENTER button to programme.
   ● Press the ◄ or ► button to cancel.



[2]

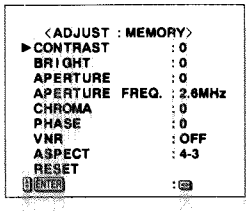
NOTE

- Programmed settings in the PICTURE ADJUST menu are kept in the memory after the power or the main power has been turned off.
- Some functions might not appear on the PICTURE ADJUST menu nor operate according to the input modes or colour systems. The functions that do not appear are programmed into the memory as the factory-preset settings.

Revising the memory mode

The PICTURE ADJUST menu settings programmed into the memory can be changed in the same manner as the normal PICTURE ADJUST menu settings.

1. Press the MEMORY MODE button to recall the memory mode.
2. Change the settings in the same manner used for the normal PICTURE ADJUST menu settings.
   - In memory mode, select PICTURE ADJUST from the MAIN MENU then press the ENTER button to call up display [3] on the screen.
3. Press the MENU button repeatedly. The screen disappears and the changed settings are programmed into the memory.



[3]

NOTE

- Some functions might not appear on display [3] according to the input modes or colour systems. The settings of the functions that are not displayed will not be changed but reprogrammed as is into the memory. To change the settings of the functions that do not appear, cancel the display and switch to the input mode or the colour system that displays the functions. Then recall display [3] on the screen.

TM-290ZE

SET-UP MENU FUNCTIONS

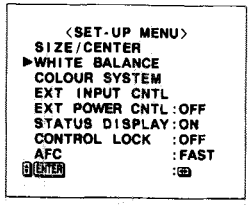
The SET-UP MENU allows various adjustments required to be made when installing the monitor. To operate the SET-UP MENU functions, use the menu control buttons.

How to call up the SET-UP MENU and select a function

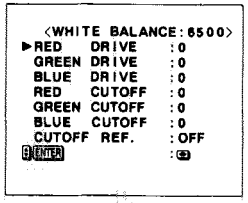
1. To call up the SET-UP MENU [1], with the ENTER button pressed, press the MENU button.
   - To make the SET-UP MENU [1] disappear, press the MENU button.
2. Press the ▲ / ▼ button on the remote control unit or the ▼ SELECT button on the mointor to select a function.
   - To change the EXT POWER CNTL, STATUS DISPLAY, CONTROL LOCK or AFC settings, repeat steps **2** and **5**. Repeating steps **3** and **4** is not necessary.
3. Press the ENTER button to call up the adjustment menu (e.g. [2]) of a selected function (e.g. WHITE BALANCE).
4. Press the ▲ / ▼ button or ▼ SELECT button to select an item to be adjusted.
5. Press the ◄ / ► button on the remote control unit or the ◄ (–) / (+) ► button on the monitor to change the setting.
6. ● To change the settings of another item on the same adjustment menu, repeat steps **4** and **5**.
   - To change the settings of another function, return to the SET-UP MENU [1] and repeat from step **2**. To return to the SET-UP MENU [1] from the adjustment menu (e.g. [2]), press the MENU button.
7. After completing the settings, press the MENU button repeatedly until the display on the screen disappears.

NOTE

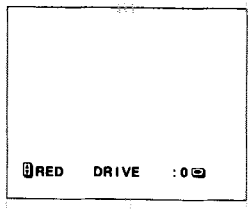
- When an adjustment menu (e.g. [2]) for SIZE/CENTER, WHITE BALANCE, COLOUR SYSTEM or EXT INPUT CNTL is on the screen, press the ENTER button. The display changes to [3]. In this state, you can also select the item or change the settings.
- When display [3] is on the screen, each time the ▼ button or ▼ SELECT button is pressed, while the ENTER button is held down, the indication moves up or down the screen (display [4]). Press the MENU button when display [3] or [4] is on the screen, and the display returns to [2].
- The settings are all kept in the memory after the power or the main power has been turned off.



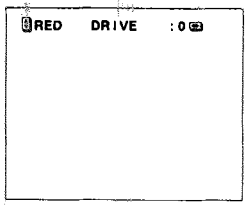
[1]



[2]



[3]



[4]

SET-UP MENU FUNCTIONS (Continued)

SIZE/CENTER (adjusting size/position of the picture)

Horizontal size, vertical size, horizontal positioning and vertical positioning can be finely adjusted individually for each INPUT mode.

Item	Setting	Function
H. POSITION	-10, -9 ... 0 ... +9, +10	+ moves the picture right - moves the picture left
V. POSITION	-10, -9 ... 0 ... +9, +10	+ moves the picture down - moves the picture up
H. SIZE	-10, -9 ... 0 ... +9, +10	+ makes the picture wider - makes the picture narrower
V. SIZE	-10, -9 ... 0 ... +9, +10	+ makes the picture taller - makes the picture shorter

NOTE

- SIZE/CENTER can be set for each input mode of INPUT A, INPUT B, RGB or COMPO.
- To set SIZE/CENTER to other input modes, first make the SET-UP MENU display dissapear, change the input mode, then recall the SET-UP MENU.

WHITE BALANCE (adjusting the white balance)

The white balance can be adjusted individually for each colour temperature of 9300K and 6500K.

Item	Setting	Function
RED DRIVE	-10, -9 ... 0 ... +9, +10	Adjusts the drive level of a red signal component
GREEN DRIVE	-10, -9 ... 0 ... +9, +10	Adjusts the drive level of a green signal component
BLUE DRIVE	-10, -9 ... 0 ... +9, +10	Adjusts the drive level of a blue signal component
RED CUTOFF	-10, -9 ... 0 ... +9, +10	Sets the cut-off voltage of a red signal component
GREEN CUTOFF	-10, -9 ... 0 ... +9, +10	Sets the cut-off voltage of a green signal component
BLUE CUTOFF	-10, -9 ... 0 ... +9, +10	Sets the cut-off voltage of a blue signal component
CUTOFF REF	ON/OFF	ON: Cuts the video signal and switches to a low-light, white balance adjusting screen OFF: Returns to normal screen

NOTE

- By making white balance adjustments on the SET-UP MENU, the ✻ indication is added to the right of the COLOUR TEMP. setting on the FUNCTION SELECT menu.
- When CUTOFF REF is set to ON, RED CUTOFF, GREEN CUTOFF or BLUE CUTOFF can be adjusted precisely.
- The colour temperature setting can be changed using COLOUR TEMP. in the FUNCTION SELECT menu.

COLOUR SYSTEM (selection of a colour system)

When the input mode is INPUT A or INPUT B, the colour system that the monitor corresponds to can be selected manually.

Setting	Function
AUTO	The colour system is automatically selected
PAL, SECAM, NTSC, NTSC 443, BW	Uses the selected colour system regardless of the colour system of the input signal

BW : Treats the input signal as a black-and-white signal.

NOTE

- In normal conditions, AUTO should be selected.

EXT INPUT CNTL (selection of an input mode using the external control unit)

You can select an input mode by toggling between OPEN/SHORT on the external switch connected to the INPUT SELECT terminal of the EXT CONTROL terminals.

The EXT INPUT CNTL menu sets the input mode that can be selected by the OPEN or SHORT setting of the external switch and the validity of the operation using the external switch.

Item	Setting	Function
OPERATE	ON	Selects input mode using the external switch
	OFF	The external switch does not operate
OPEN	INPUT A INPUT B RGB/INT RGB/EXT COMPO./INT COMPO./EXT	Selected input mode is activated when the external switch is set to OPEN
SHORT		Selected input mode is activated when the external switch is set to SHORT

RGB/EXT: Synchronizes an analogue RGB signal to the external sync. signal
COMPO./EXT: Synchronizes a component signal to the external sync. signal

NOTE

- When OPERATE is ON, the INPUT button does not operate to select input control.
- When CONTROL LOCK is ON, EXT INPUT CNTL does not operate.

EXT POWER CNTL (turning the power on/off using the external control unit)

You can turn the monitor power on or off by toggling between OPEN/SHORT on the external switch connected to the POWER CONTROL terminal of the EXT CONTROL terminals.

- The main power of the monitor cannot be turned on or off by this operation.

Setting	Function
ON	The monitor power is turned on when the external switch is set to OPEN and turned off when it is set to SHORT
OFF	The external switch does not operate

NOTE

- When EXT POWER CNTL is ON, the POWER button does not operate to turn the power on or off.
- EXT POWER CNTL does not operate unless the on/off interval of the external switch is approximately 10 seconds or more.

STATUS DISPLAY (setting the status display on/off)

When the power is turned on or the input mode or the colour system is switched, the status display appears on the screen. The display can be set to on or off.

Setting	Function
ON	Status display appears
OFF	Status display does not appear

CONTROL LOCK (locking controls of the monitor)

Activation of the CONTROL LOCK disables most of the controls and changes in the monitor's various functions. The following functions can; however, be controlled under this mode.

Functions that can be operated under the CONTROL LOCK mode.

- Power and main power on/off
- Power on/off using the external control
- CONFIGURATION menu functions
- CONTROL LOCK on/off of the SET-UP MENU
- Volume control, muting of connected external speakers

NOTE

- If you attempt to operate a locked function, "CONTROL LOCK ON!!" appears on screen for approximately two seconds to indicate the function cannot be operated.
- If the power or main power is turned off with the CONTROL LOCK activated, the function is stored in the memory.

To cancel the CONTROL LOCK:

Recall the SET-UP MENU and switch the CONTROL LOCK setting to OFF.

Setting	Function
ON	CONTROL LOCK activates
OFF	CONTROL LOCK does not operate

AFC (switching of the time constant for the AFC)

Use to set the time constant for the AFC (auto fine-frequency control) to correct skew distortion of video signals input via a videotape recorder or other video equipment.

Setting	Function
AUTO	Automatically changes correction speed of AFC
FAST	Faster correction

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PICTURE SETTINGS INITIALIZATION

Settings of each menu can be reset (initialized) to their factory-preset conditions.

How to initialize each menu settings except the SET-UP MENU settings (using the monitor controls)

The settings of each menu (except the SET-UP MENU settings) can be exclusively reset.

- The PICTURE ADJUST menu settings recorded in the memory in the memory mode can be reset the same way as the normal PICTURE ADJUST menu settings.

1. With the ▼ SELECT button pressed, press the MENU button to display [1] on the screen.
2. ● Press the ENTER button to reset.
   ● Press the ◄ (–) or (+) ► button to cancel.

NOTE

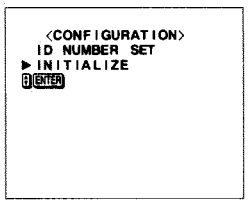
● For factory-presets on the MENU settings, see page 23.

[1]

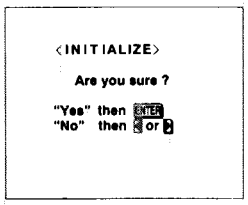
How to initialize all the menu settings (using the monitor controls)

The settings of all menus can be reset at the same time. In this case, the monitor's ID number is also reset to 00.

1. With the monitor power on, do not press the POWER button but push the MAIN POWER switch to turn off the main power.
2. With the ▼ SELECT and MENU buttons pressed, push the MAIN POWER switch to turn the power on. Keep pressing the ▼ SELECT and MENU buttons until [2] appears on the screen.
3. Press the ▼ SELECT button to select INITIALIZE. Then press the ENTER button to display [3] on the screen.
4. ● Press the ENTER button again to reset.
   ● Press the ◄ (–) or (+) ► button to cancel.



[2]



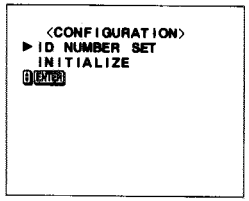
[3]

INDIVIDUAL REMOTE CONTROL OF MULTIPLE MONITORS

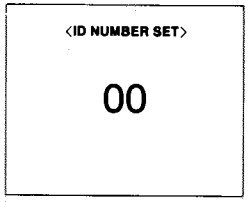
To operate or adjust multiple monitors, by programming and assigning an ID number (00 to 99) to each monitor, a specified monitor can be remote-controlled.

How to programme an ID number (using the monitor controls)

1. With the monitor power on, do not press the POWER button but push the MAIN POWER switch to turn off main power.
2. With the ▼ SELECT and MENU buttons pressed, push the MAIN POWER switch to turn the power on. Keep pressing the ▼ SELECT and MENU buttons to display [1] on the screen.
3. Press the ▼ SELECT button to select ID NUMBER SET. Then press the ENTER button to display [2] on the screen.
4. Select an ID number.
   ● Press the (+) ► button to increase the number.
   ● Press the ◄ (–) button to decrease the number.
5. Press the ENTER button to programme.



[1]



[2]

How to call up an ID number (using the remote control unit)

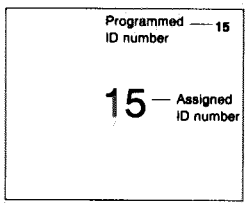
1. Press the DISPLAY button to display the programmed ID number at the top right of the screen.
   ● Red-indicated ID number:
   indicates the monitor can be remote-controlled.
   ● Green-indicated ID number:
   indicates the monitor cannot be remote-controlled.
2. Press the DISPLAY button to make the number disappear.

NOTE

● ID number 00 is always indicated in red.

How to assign a monitor (using the remote control unit)

1. Press the DISPLAY button to display the monitor's programmed ID number.
2. Press the numeric buttons to enter the monitor's ID number.
   The entered ID number appears and blinks on the centre of the screen.
3. Press the ID SET button to complete.
   The programmed ID number in the top right of the screen turns red to indicate the monitor was assigned. Other monitor ID numbers are indicated in green.
4. After adjusting the monitor, repeat steps **2** to **4** to adjust each monitor if necessary.
5. Press the DISPLAY button to clear the on-screen ID numbers.



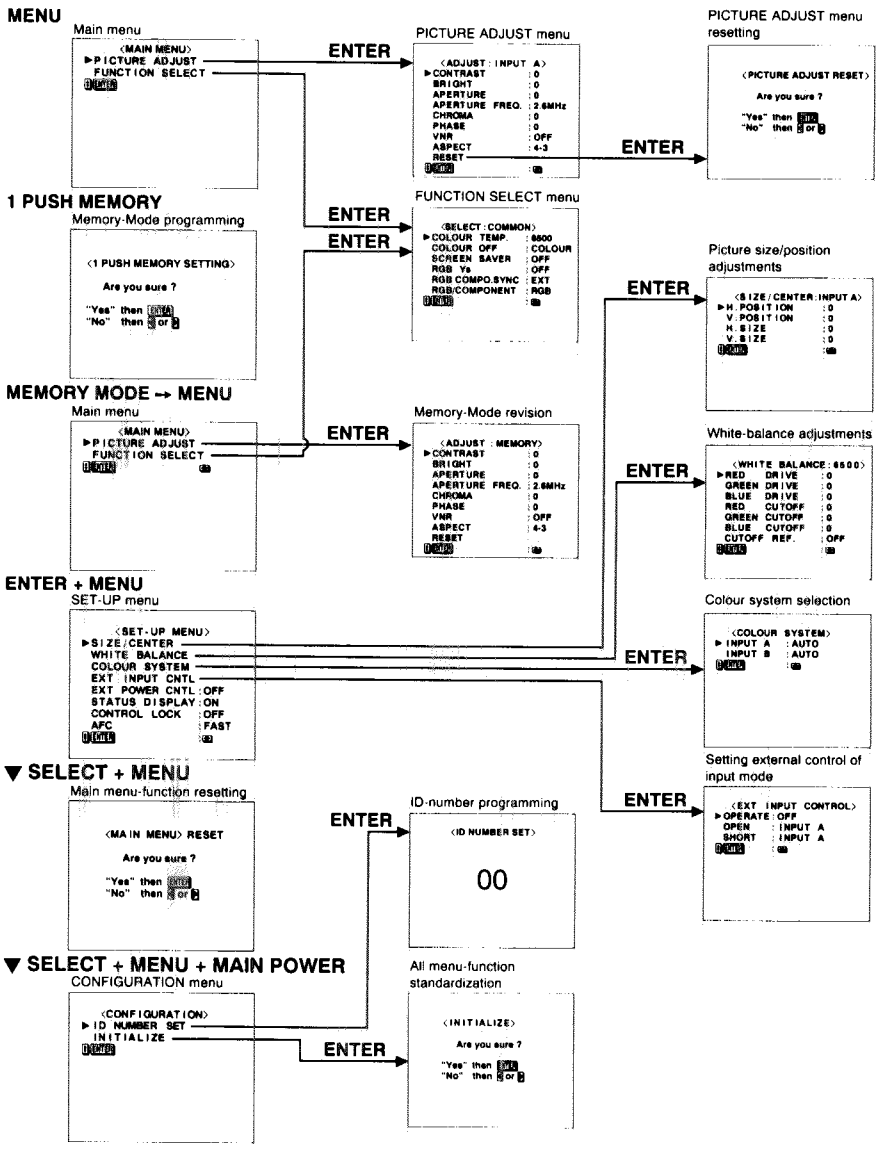
BEFORE CALLING FOR SERVICE

Before concluding that a problem has occurred, check the following points. If the problem persists after carrying out the checks, disconnect the power cord from the AC outlet and consult the dealer from whom you purchased the monitor.

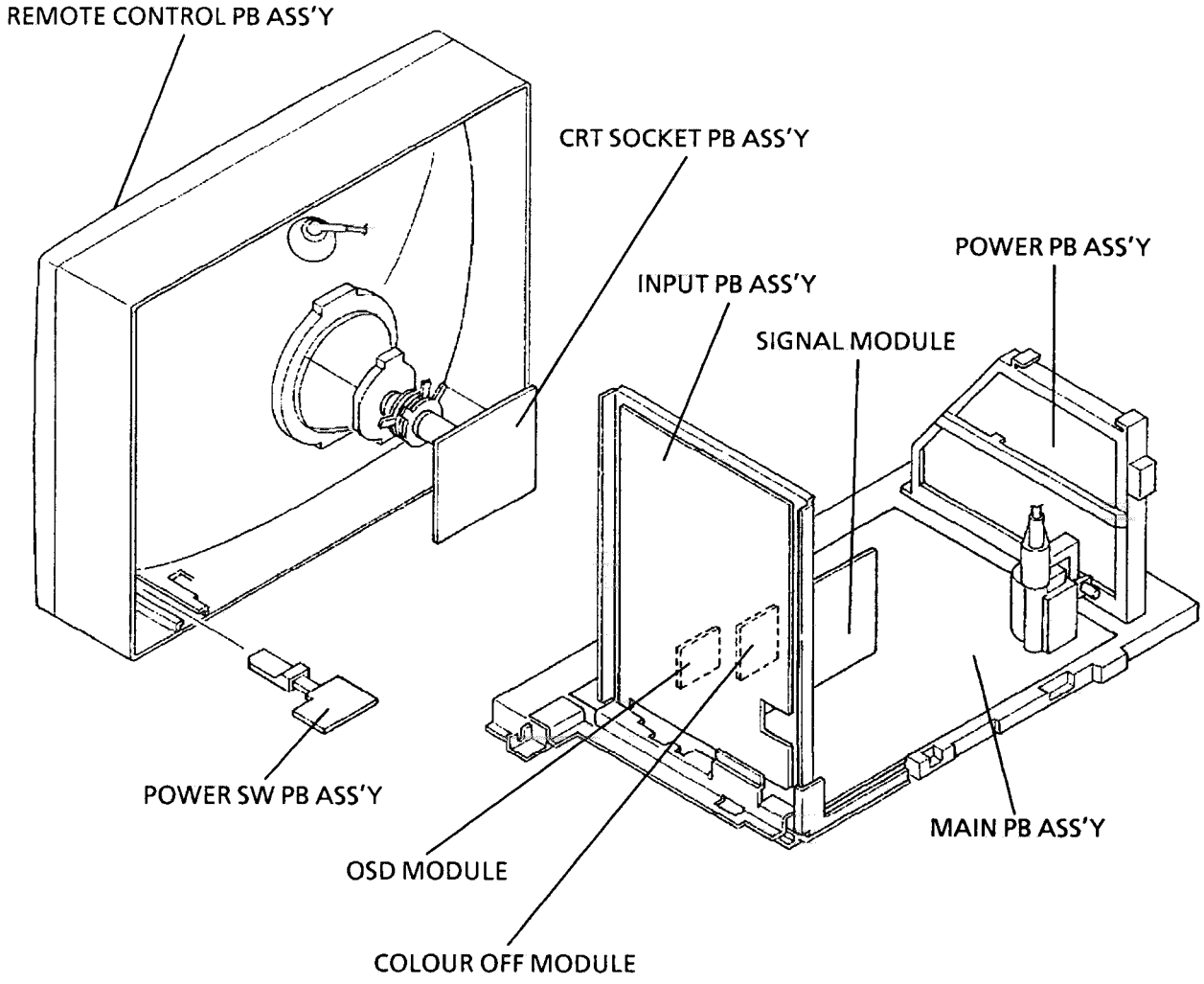
Problems	Points to be checked	Measures
Monitor inoperable	Is CONTROL LOCK set to ON?	Set CONTROL LOCK to OFF
	Is EXT INPUT CNTL set to ON?	When EXT INPUT CNTL is set to ON, INPUT button does not operate
	Is EXT POWER CNTL set to ON?	When EXT POWER CNTL is set to ON, POWER button does not operate
Synchronization with colour system of input signal inoperable	Did you select colour system manually?	Set COLOUR SYSTEM to AUTO
Analogue RGB signal or component signal does not synchronize	Is RGB COMPO. SYNC set correctly?	Set RGB COMPO. SYNC correctly
Position of displayed picture moves suddenly	Is SCREEN SAVER set to ON?	If you do not want to run SCREEN SAVER, set SCREEN SAVER to OFF
Assigned remote control ID number operates another monitor	Is ID number 00 programmed for other monitors?	Programme an ID number other than 00
	Do other monitors indicate a red ID number?	Assign the ID number again
Inoperable remote control	Is the ID number programmed for other monitors assigned?	Assign the monitor's programmed ID number
Power on/off using external switch inoperable	Did you turn external switch on/off at a short interval?	Turn external switch on/off at an interval of approximately 10 seconds or more
No INITIALIZE menu display	Are you pressing the ▼ SELECT and MENU buttons until it appears?	Keep pressing these buttons until it appears
POWER indicator blinks	Monitor has developed a fault. Disconnect power cord from AC outlet immediately and consult your dealer.	

MENU DISPLAY CHART

● **Settings preset at the factory are shown in the menus.**

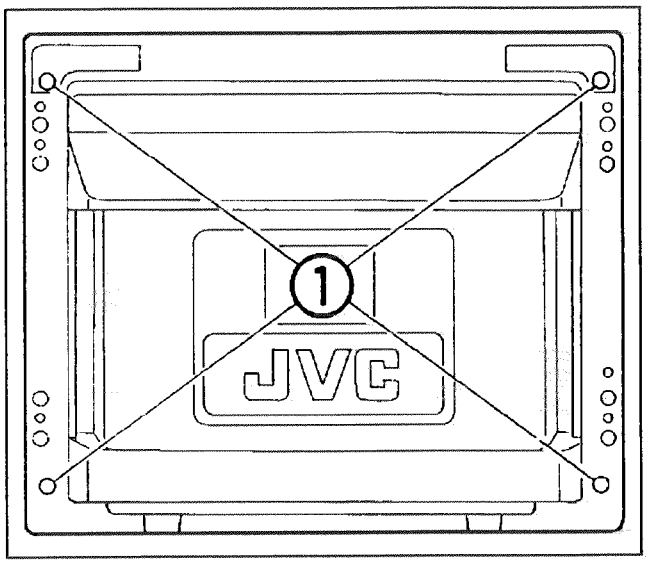


MAIN PARTS LOCATION



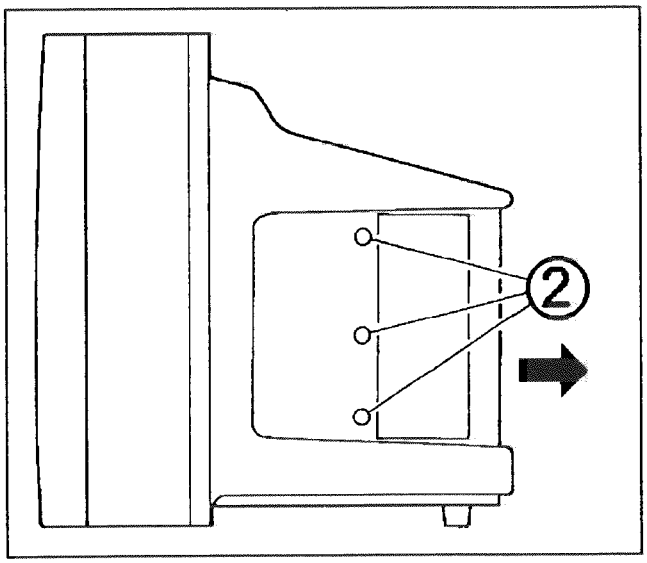
SPECIFIC SERVICE INSTRUCTIONS

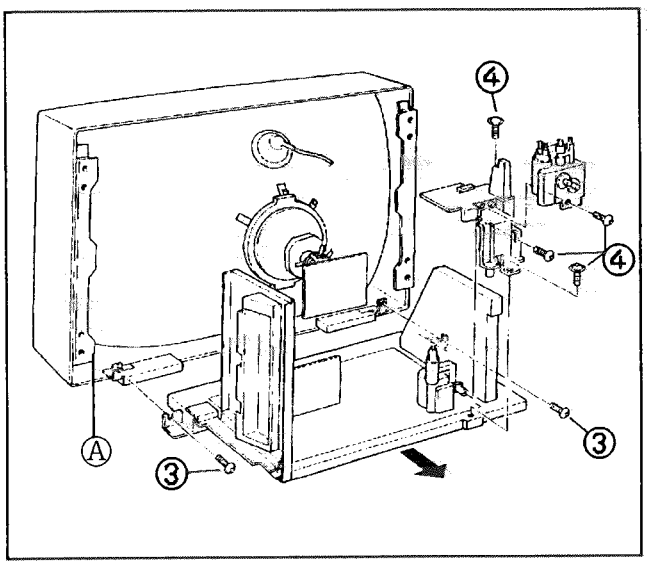
DISASSEMBLY PROCEDURE



Rear cover removal

1. Take out 4 screws (1) from the rear and 3 screws (2) from the side.
2. Pull the rear cover as shown by the arrow to remove it.

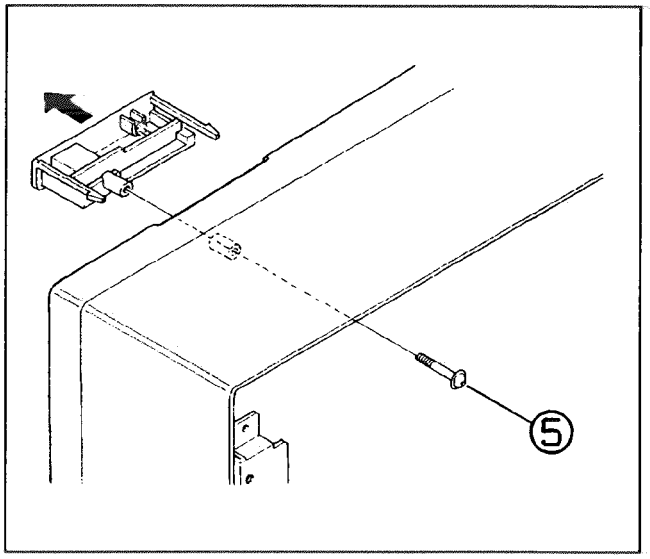




Main chassis and focus pack

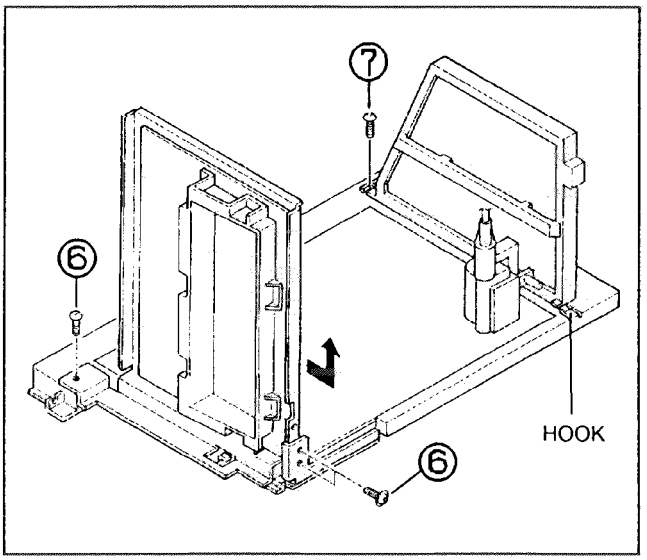
1. Remove the rear cover.
2. Take out 2 screws (3).
3. Remove the screw (A) with the earth wire.
4. Raise the chassis slightly and pull as shown by the arrow to remove it.
5. Take out 4 screws (4).
6. Remove the focus pack and HVT holder.

- Disengage wires and connectors as required.



Remote control receiver

1. Remove the rear cover.
2. Loosen 1 screw (5).
3. Disengage the hooks from the rear and remove the cover from the front.
4. Remove the PWB in the upward direction.

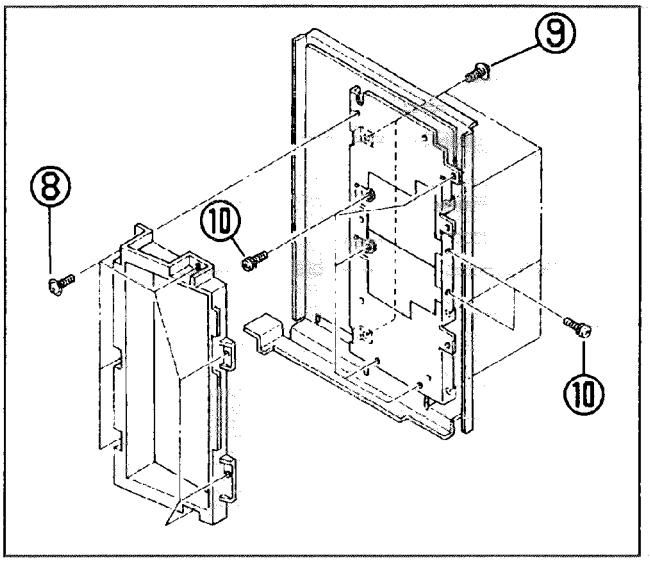


Input and power PB assemblies

1. Remove the rear cover.
2. Pull out the main chassis.
3. Take out 3 screws (6).
4. Pull upward and remove the PWB, then remove the input PB assembly.

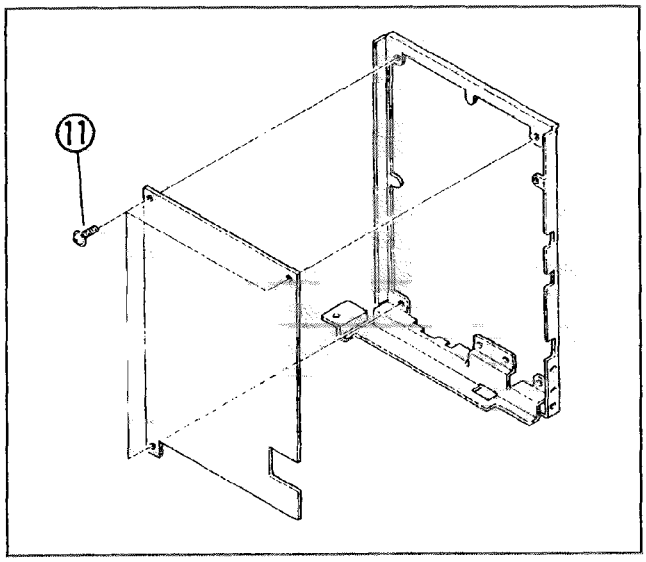
Note: The input PB assembly cannot be completely removed unless the AC inlet connector is removed.

5. Take out 1 screw (7) and while pressing the hook, pull and raise the power PB to remove it.

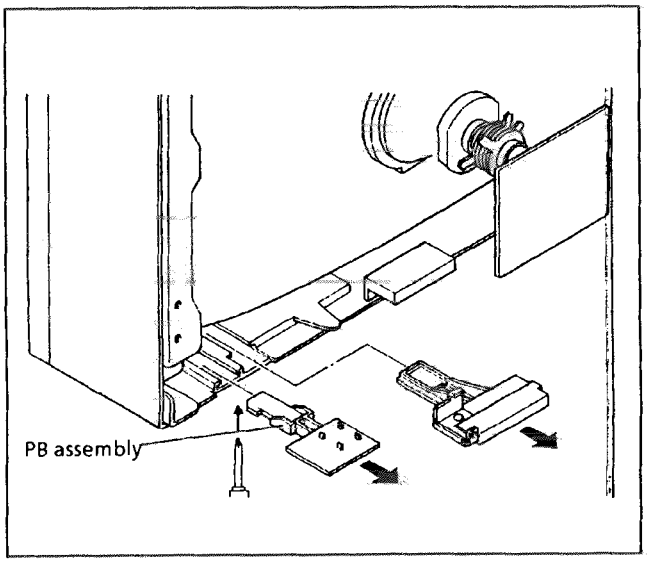


Disassembling the input PB assembly

1. Remove the rear cover.
2. Pull out the main chassis.
3. Remove the input PB assembly.
4. Take out 7 screws (8) and remove the terminal base.
5. Take out 5 screws (9) and 7 screws (10), and remove the terminal bracket .

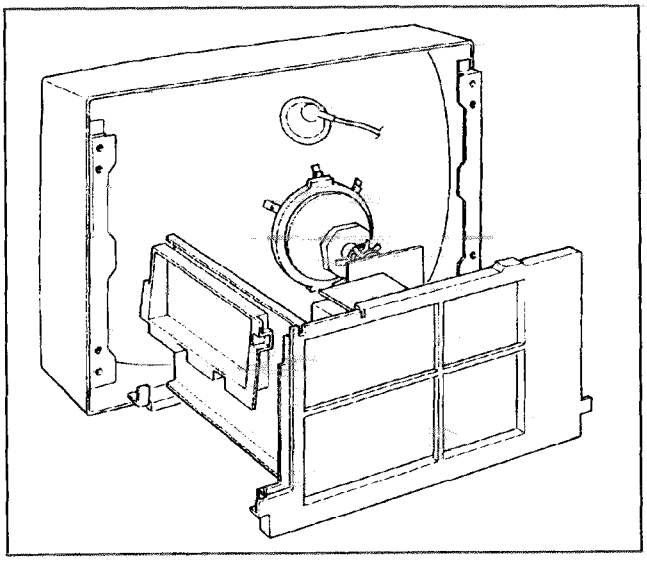


6. Take out 3 screws (11) and remove the input PB assembly and PB bracket.



Power switch PB assembly

1. Remove the rear cover.
2. Pull out the main chassis.
3. While using a screwdriver or similar tool to press the holder tabs upward from the bottom, pull the holder to remove it.
4. Pull the power switch PB assembly as shown by the arrow to remove it.



Main PB checking

1. Remove the rear cover.
2. Pull out the main chassis.
3. Stand with the front downward.
4. Disengage wire clamps as required.

- Be sure to confirm that all connectors are properly engaged before supplying power. Place paper or other insulator between the PBs to prevent contact with other parts (such as CRT socket PB).

Service menu entry

- If the separately sold remote controller (RM-C560) is available, this can be used for adjustments. Normally, perform adjustments using the set front control panel.

1. While holding Enter depressed, press Degauss.
2. The letter S appears at the upper left of the screen.
3. While holding Enter depressed, press Menu.
4. The screen display changes to <SERVICE MENU> PLEASE, DON'T TOUCH!
5. Press the left [←] or right arrow [→] to display the service menu.
   If Step 4 state continues for more than 5 seconds without a further operation, the display extinguishes and the mode is released.

Item selection

- While the service main menu is displayed:

1. Press the up [↑] or down arrow [↓] to select the item.
2. After selecting the item, press Enter.
3. The adjustment mode menu is displayed.

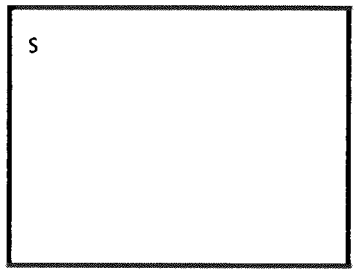
Setting value change

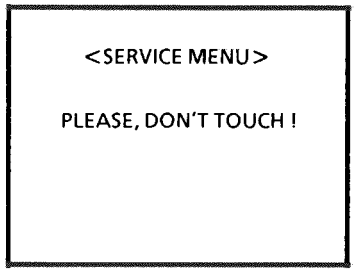
- While the adjustment mode menu is displayed:

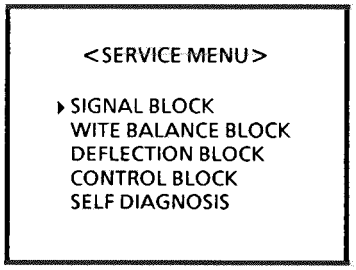
1. Press the right arrow [→] to change the setting value in the + direction.
2. Press the left arrow [←] to change the setting value in the - direction.
3. Press the up [↑] or down arrow [↓] to change the adjustment item number.

Service menu exit

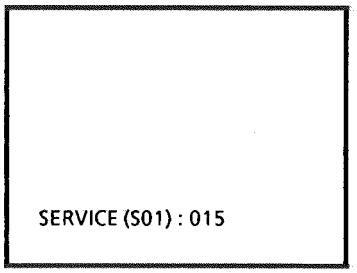
1. When settings are completed, press Menu.
2. The service main menu returns.
3. Again press Menu.
4. The screen display extinguishes and the service mode is exited.



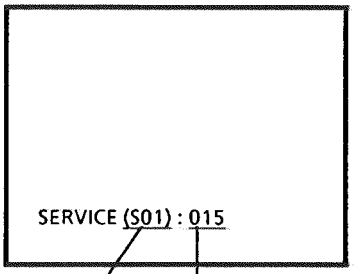




Service main menu



Adjustment mode menu



■ Signal system settings

No.	Signal	Aspect	Item	Data type	Variable range	Initial value
S01	VIDEO,COMPO.	4:3	CONTRAST	Standard value	0~63	39
S02	VIDEO,COMPO.	4:3	BRIGHT	Standard value	0~63	29
S03	VIDEO,COMPO.	4:3	APERTURE	Standard value	0~63	37
S04	RGB	4:3	CONTRAST	Correction value	-30~ +30	00
S05	RGB	4:3	BRIGHT	Correction value	-30~ +30	00
S06	RGB	4:3	APERTURE	Correction value	-30~ +30	-09
S07	ALL	16:9	CONTRAST	Correction value	-30~ +30	00
S08	ALL	16:9	BRIGHT	Correction value	-30~ +30	00
S09	ALL	16:9	APERTURE	Correction value	-30~ +30	00
S10	CUTOFF REF.	ALL	CONTRAST	Fixed value	0~63	00
S11	CUTOFF REF.	ALL	BRIGHT	Fixed value	0~63	39
S12	CUTOFF REF.	ALL	APERTURE	Fixed value	0~63	47
S13	PAL.(BW50)	ALL	CHROMA	Standard value	0~63	34
S14	PAL,(BW50)	ALL	PHASE	Standard value	0~63	32
S15	SECAM	ALL	CHROMA	Standard value	0~63	35
S16	SECAM	ALL	PHASE	Standard value	0~63	32
S17	NTSC,(BW60)	ALL	CHROMA	Standard value	0~63	28
S18	NTSC(BW60)	ALL	PHASE	Standard value	0~63	32
S19	N443	ALL	CHROMA	Standard value	0~63	31
S20	N443	ALL	PHASE	Standard value	0~63	32
S21	COMPONENT	ALL	CHROMA	Standard value	0~63	32
S22	COMPONENT	ALL	PHASE	Standard value	0~63	32
S23	RGB	ALL	CHROMA	Standard value	0~63	32
S24	RGB	ALL	PHASE	Standard value	0~63	32
S25	CUTOFF REF.	ALL	CHROMA	Fixed value	0~63	00
S26	CUTOFF REF.	ALL	PHASE	Fixed value	0~63	32
S27	PAL,BW50	ALL	Y DELAY	Fixed value	0~63	02
S28	SECAM	ALL	Y DELAY	Fixed value	0~63	12
S29	NTSC,BW60	ALL	Y DELAY	Fixed value	0~63	04
S30	N443	ALL	Y DELAY	Fixed value	0~63	02
S31	PAL,BW50(Y/C)	ALL	Y DELAY	Fixed value	0~63	03

No.	Signal	Aspect	Item	Data type	Variable range	Initial value
S32	SECAM(Y/C)	ALL	Y DELAY	Fixed value	0~63	11
S33	NTSC,BW60(Y/C)	ALL	Y DELAY	Fixed value	0~63	03
S34	N443(Y/C)	ALL	Y DELAY	Fixed value	0~63	03
S35	COMPONENT	ALL	Y DELAY	Fixed value	0~63	00
S36	ALL	ALL	PEAK DRIVE LIMIT	Fixed value	0~255	26
S37	ALL	ALL	TDA4680 CTL-REG-1	Fixed value	0~255	129
S38	ALL	ALL	TDA4680 CTL-REG-2	Fixed value	0~255	00
S39	ALL	ALL	TDA9162 SUB-ADD-0	Fixed value	0~255	03
S40	ALL	ALL	TDA9162 SUB-ADD-2	Fixed value	0~255	208
S41	ALL	ALL	TDA4672 Y DELAY/SC	Fixed value	0~255	66
S42	ALL	ALL	TDA4672 PEAKING	Fixed value	0~255	101
S43	ALL	ALL	CXA1545AS DATA1	Fixed value	0~255	164
S44	ALL	ALL	CXA1545AS DATA2	Fixed value	0~255	164
S45	ALL	ALL	CXA1545AS DATA3	Fixed value	0~255	164
S46	ALL(Ys 0N)	ALL	APERTURE	Fixed value	-30~ +30	+03

■ White balance system settings

No.	Signal	Aspect	Item	Data type	Variable range	Initial value
W01	6500	4:3	RED DRIVE	Standard value	0~63	38
W02	6500	4:3	GREEN DRIVE	Standard value	0~63	32
W03	6500	4:3	BLUE DRIVE	Standard value	0~63	23
W04	6500	4:3	RED CUTOFF	Standard value	0~63	54
W05	6500	4:3	GREEN CUTOFF	Standard value	0~63	25
W06	6500	4:3	BLUE CUTOFF	Standard value	0~63	09
W07	9300	4:3	RED DRIVE	Standard value	0~63	37
W08	9300	4:3	GREEN DRIVE	Standard value	0~63	32
W09	9300	4:3	BLUE DRIVE	Standard value	0~63	29
W10	9300	4:3	RED CUTOFF	Standard value	0~63	40
W11	9300	4:3	GREEN CUTOFF	Standard value	0~63	25
W12	9300	4:3	BLUE CUTOFF	Standard value	0~63	30
W13	6500	16:9	RED DRIVE	Correction value	-30~ +30	00
W14	6500	16:9	GREEN DRIVE	Correction value	-30~ +30	00
W15	6500	16:9	BLUE DRIVE	Correction value	-30~ +30	00
W16	6500	16:9	RED CUTOFF	Correction value	-30~ +30	00
W17	6500	16:9	GREEN CUTOFF	Correction value	-30~ +30	00
W18	6500	16:9	BLUE CUTOFF	Correction value	-30~ +30	00
W19	9300	16:9	RED DRIVE	Correction value	-30~ +30	00
W20	9300	16:9	GREEN DRIVE	Correction value	-30~ +30	00
W21	9300	16:9	BLUE DRIVE	Correction value	-30~ +30	00
W22	9300	16:9	RED CUTOFF	Correction value	-30~ +30	00
W23	9300	16:9	GREEN CUTOFF	Correction value	-30~ +30	00
W24	9300	16:9	BLUE CUTOFF	Correction value	-30~ +30	00

■ Deflection system settings

No.	Signal	Aspect	Item	Data type	Variable range	Initial value
D01	50Hz ALL	4:3	H-SHIFT	Standard value	0~63	31
D02	50Hz ALL	4:3	EW-WIDTH	Standard value	0~63	49
D03	50Hz ALL	4:3	EW-PARABOLA	Standard value	0~63	30
D04	50Hz ALL	4:3	EW-CORNER	Standard value	0~63	32
D05	50Hz ALL	4:3	EW-TRAPEZIUM	Standard value	0~63	32
D06	50Hz ALL	4:3	V-SLOPE	Standard value	0~63	33
D07	50Hz ALL	4:3	V-AMP	Standard value	0~63	17
D08	50Hz ALL	4:3	S-CORRECTION	Standard value	0~63	19
D09	50Hz ALL	4:3	V-SHIFT	Standard value	0~63	34
D10	60Hz ALL	4:3	H-SHIFT	Correction value	-30~+30	+09
D11	60Hz ALL	4:3	EW-WIDTH	Correction value	-30~+30	-01
D12	60Hz ALL	4:3	EW-PARABOLA	Correction value	-30~+30	00
D13	60Hz ALL	4:3	EW-CORNER	Correction value	-30~+30	00
D14	60Hz ALL	4:3	EW-TRAPEZIUM	Correction value	-30~+30	-02
D15	60Hz ALL	4:3	V-SLOPE	Correction value	-30~+30	00
D16	60Hz ALL	4:3	V-AMP	Correction value	-30~+30	-01
D17	60Hz ALL	4:3	S-CORRECTION	Correction value	-30~+30	00
D18	60Hz ALL	4:3	V-SHIFT	Correction value	-30~+30	-02
D19	50Hz ALL	16:9	H-SHIFT	Correction value	-30~+30	00
D20	50Hz ALL	16:9	EW-WIDTH	Correction value	-30~+30	00
D21	50Hz ALL	16:9	EW-PARABOLA	Correction value	-30~+30	00
D22	50Hz ALL	16:9	EW-CORNER	Correction value	-30~+30	00
D23	50Hz ALL	16:9	EW-TRAPEZIUM	Correction value	-30~+30	00
D24	50Hz ALL	16:9	V-SLOPE	Correction value	-30~+30	00
D25	50Hz ALL	16:9	V-AMP	Correction value	-30~+30	+07
D26	50Hz ALL	16:9	S-CORRECTION	Correction value	-30~+30	00
D27	50Hz ALL	16:9	V-SHIFT	Correction value	-30~+30	+03
D28	60Hz ALL	16:9	H-SHIFT	Correction value	-30~+30	+09
D29	60Hz ALL	16:9	EW-WIDTH	Correction value	-30~+30	-01
D30	60Hz ALL	16:9	EW-PARABOLA	Correction value	-30~+30	00
D31	60Hz ALL	16:9	EW-CORNER	Correction value	-30~+30	00

No.	Signal	Aspect	Item	Data type	Variable range	Initial value
D32	60Hz ALL	16:9	EW-TRAPEZIUM	Correction value	-30～+30	-03
D33	60Hz ALL	16:9	V-SLOPE	Correction value	-30～+30	00
D34	60Hz ALL	16:9	V-AMP	Correction value	-30～+30	+07
D35	60Hz ALL	16:9	S-CORRECTION	Correction value	-30～+30	00
D36	60Hz ALL	16:9	V-SHIFT	Correction value	-30～+30	+02
D37	ALL	ALL	SCREEN SAVER H-SHIFT	Fixed value	-30～+30	+10
D38	ALL	ALL	SCREEN SAVER V-SHIFT	Fixed value	-30～+30	+10
D39	ALL	ALL	SCREEN SAVER INTERVAL	Fixed value	0:30 1:60 2:2	00
D40	ALL	ALL	TDA9162 SUB-11	Fixed value	0～255	32
D41	ALL	ALL	TDA9162 SUB-12	Fixed value	0～255	00

■ Control system settings

No.	Signal	Aspect	Item	Data type	Variable range	Setting item	Initial value
C01	ALL	ALL	Colour temperature setting at initialize	Fixed value	0～255	0:6500,1:9300	00
C02	ALL	ALL	Ik ON/OFF CONTROL	Fixed value	0～255	0:OFF,1:ON	01
C03	ALL	ALL	SERVICE BRIGHTNESS	Fixed value	0～255		00
C04	ALL	ALL	LOW LIGHT SERVICE	Fixed value	0～255	0:OFF,1:ON	00
C05	ALL	ALL	COMPOSITE NOTCH	Fixed value	0～255	0:OFF,1:ON	00
C06	ALL	ALL	WITHOUT VNR	Fixed value	0～255	0:OFF,1:ON	00
C07	ALL	ALL	MENU TIME SETTING	Fixed value	0～255	0: 5 minutes, 1: continuous	00
C08	ALL	ALL	ON SCREEN COLOUR	Fixed value	0～255	0/1:BLACK, 2/3:GREEN, 4/5:RED, 5/6:ORANGE	07
C09	ALL	ALL	ON SCREEN POSITION(H)	Fixed value	0～255		02
C10	60Hz ALL	ALL	ON SCREEN POSITION(V)	Fixed value	0～255		02

No.	Signal	Aspect	Item	Data type	Variable range	Setting item	Initial value
C11	50Hz ALL	ALL	ON SCREEN POSITION(V)	Fixed value	0~255		04
C12	ALL	ALL	BRIGHT CENTER-MAX	Fixed value	0~255		20
C13	ALL	ALL	BRIGHT CENTER-MIN	Fixed value	0~255		236
C14	ALL	ALL	CONTRAST CENTER-MAX	Fixed value	0~255		20
C15	ALL	ALL	CONTRAST CENTER-MIN	Fixed value	0~255		236
C16	Except RGB	ALL	CHROMA CENTER-MAX	Fixed value	0~255		20
C17	Except RGB	ALL	CHROMA CENTER-MIN	Fixed value	0~255		236
C18	Except RGB	ALL	PHASE CENTER-MAX	Fixed value	0~255		20
C19	Except RGB	ALL	PHASE CENTER-MIN	Fixed value	0~255		236
C20	ALL	ALL	COLOUR SYSTEM RETRY TIMER	Fixed value	0~255		10
C21	ALL	ALL	NO SYNC RETRY TIMER	Fixed value	0~255		00
C22	ALL	ALL	MAIN POWER SW	Fixed value	0~255		00
C23		ALL	RESERVED	Fixed value	0~255		00
C24		ALL	RESERVED	Fixed value	0~255		00
C25	ALL	ALL	SERVICE MODE CHARACTER TYPE	Fixed value	0~255	0: base 10 1: base 16	00

Memory IC replacement notes

This model uses non-volatile memory ICs. When these are replaced, the data must be reset.
Video and deflection system data are stored in IC103. If this is replaced without entering the data, a normal picture will not be obtained. When replacing, be sure to use an IC containing the (initial value) data.

■ Set-up menu record

Press Menu and at the menu display, check if an asterisk (*) appears after Color Temp. If the asterisk appears, the user has set the values according to personal preference. To the extent possible, make a memo of the setting values before replacing the IC.

■ IC replacement steps

1. To the extent possible, make a memo of the set-up menu and adjustment mode menu contents.
2. Switch off the power and disconnect the power cord from the outlet.
3. Replace IC103.
4. Reconnect the power cord to the outlet and switch power on.
5. Refer to the memo and enter the setting values.
6. Perform adjustments according to the adjustment items.

SERVICE ADJUSTMENTS

PRIOR TO STATING ADJUSTMENT

1. Supply power to the set and measuring instruments and allow to warm up for at least 30 minutes.
2. Confirm the proper AC power voltage is being supplied.
3. Use care not to disturb controls and switches not mentioned in the adjustment items.
4. Refer to adjustment settings and set user operated controls (bright, contrast, hue, tint, etc.) to the indicated positions.

TOOLS AND FIXTURES FOR ADJUSTMENT

- DC voltmeter (digital voltmeter)
- Oscilloscope
- Signal generator (PAL/SECAM/NTSC systems)
  - Color bar and split color bar patterns
  - Crosshatch pattern
  - Cross pattern
  - Red raster pattern
  - Green raster pattern
  - Blue raster pattern
  - Philips pattern (including R-Y and B-Y) — Desirable
  - TV resolution pattern — Desirable
- Remote control unit (RM-C560) — Adjustments easier if available
- Color analyzer — Desirable
- High voltage meter — Desirable

ADJUSTMENT SETTINGS

1. PICTURE ADJUST

CONTRAST	0
BRIGHT	0
APERTURE	0
APERTURE FREQ	2.6MHz
CHROMA	0
PHASE	0
VNR	OFF
ASPECT	4-3
RESET	

2. FUNCTION SELECT

COLOUR TEMP.	6500
COLOUR OFF	COLOUR
SCREEN SAVER	OFF
RGB Ys	OFF
RGB/COMPO. SYNC	EXT
RGB/COMPONENT	RGB

3. SET-UP MENU

SIZE/CENTER	
WHITE BALANCE	
COLOUR SYSTEM	
EXT INPUT CNTL	
EXT POWER CNTL	OFF
STATUS DISPLAY	ON
CONTROL LOCK	OFF
AFC	AUTO

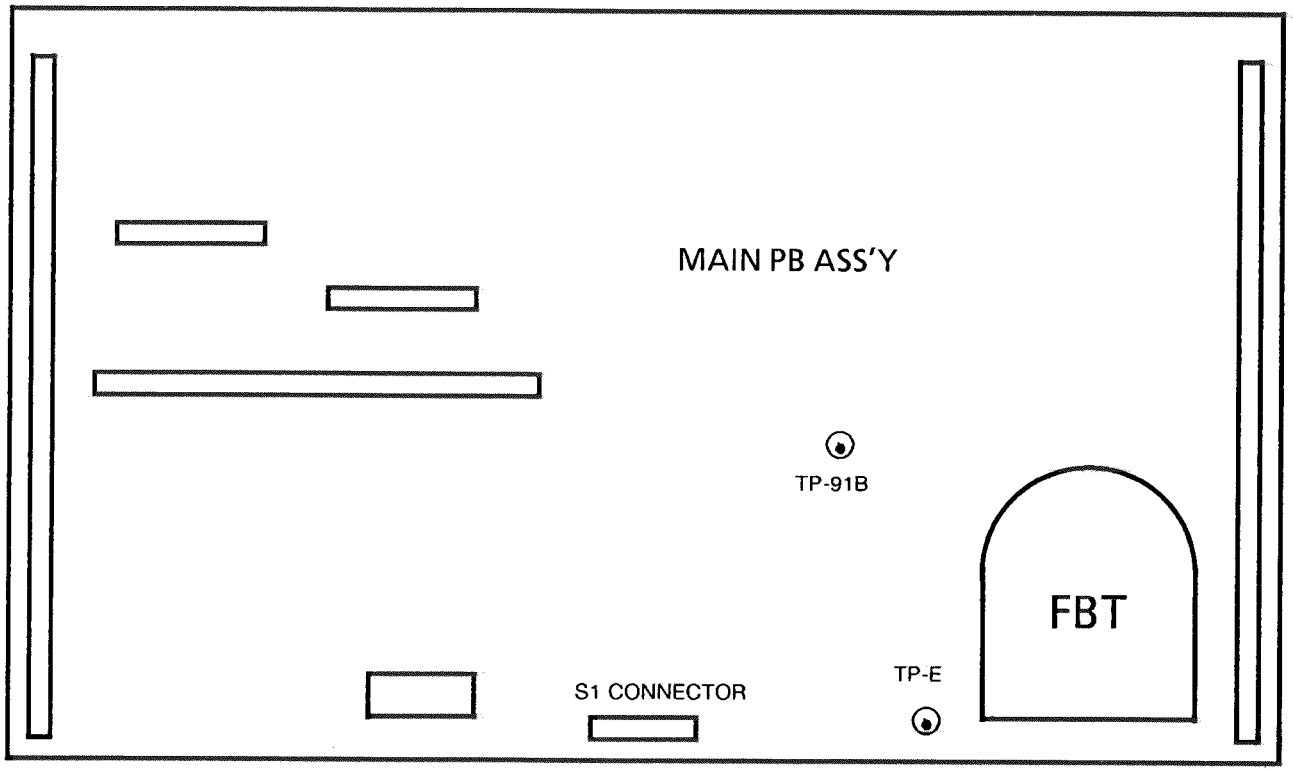
3-1.SIZE/CENTERING

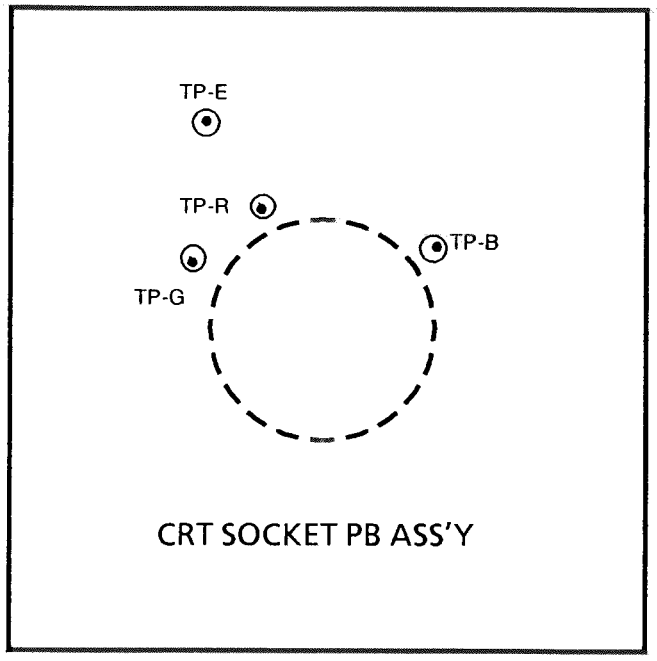
H.POSITION	0
V.POSITION	0
H.SIZE	0
V.SIZE	0

3-2.WHITE BALANCE : D 6500

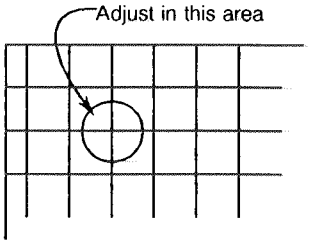
RED DRIVE	0
GREEN DRIVE	0
BLUE DRIVE	0
RED CUTOFF	0
GREEN CUTOFF	0
BLUE CUTOFF	0
CUTOFF REF.	OFF

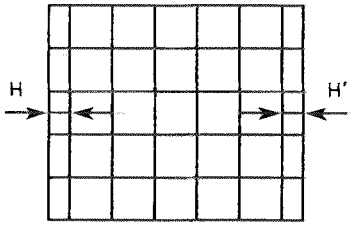
ADJUSTMENT LOCATION

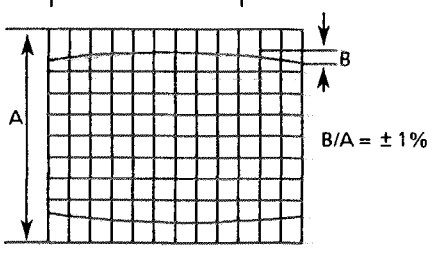


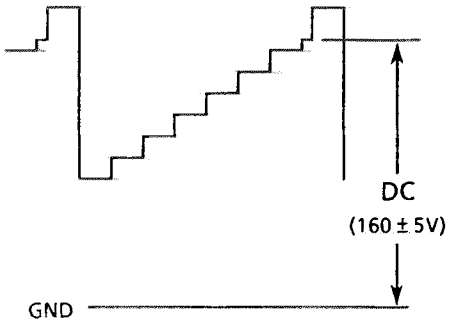


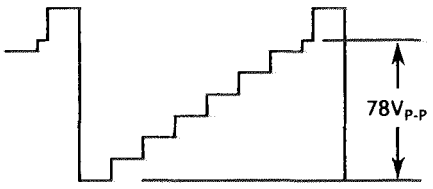
ADJUSTING STEP

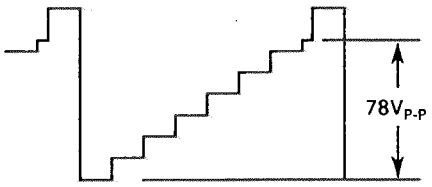
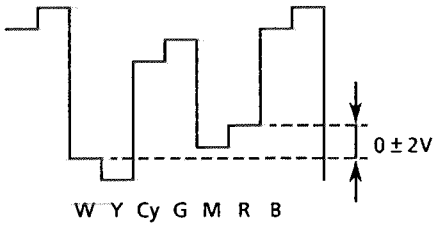
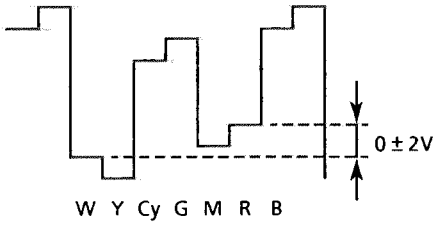
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
B1 voltage and X-ray protector operation checks	Voltmeter Resolution pattern signal	S1 connector pin 1 or main PB assembly TP-91B S1 connector pins 3 and 4		1. Supply a resolution pattern signal input. 2. Connect a voltmeter to the S connector pin 1. Confirm DC 134.0 ± 2.0 V. 3. Connect a 10 kΩ resistor in series between the S connector pins 3 and 4. Confirm the protector operates and the sub-power switch LED on the mainframe side panel flashes. 4. After checking, initialize in the self-check function (service mode).
Focus adjustment	Crosshatch signal 		Focus VR (HVT module)	• Confirm correct purity, convergence, bright and contrast adjustments. 1. Supply a crosshatch signal input. 2. While observing the picture, turn the Focus VR. Stop at the position the focus deteriorates slightly. Turn the VR counter-clockwise, then again slightly clockwise to adjust the focus. 3. After adjusting, check the convergence adjustment.
Vertical center adjustment	Full colour bar signals (PAL and NTSC) REMOTE CONTROL UNIT		<D09> V-SHIFT(4:3 50Hz) <D18> V-SHIFT(4:3 60Hz) <D27> V-SHIFT(16:9 50Hz) <D36> V-SHIFT(16:9 60Hz)	1. Supply a PAL full colour bar signal input. 2. Adjust D09 to align the signal colour and black and white boundary with the CRT center mark. 3. Supply an NTSC full colour bar signal input. 4. Adjust D18 to align the signal colour and black and white boundary with the CRT center mark. 5. Set the aspect to 16 : 9. If the adjustment shifts, perform the following steps. 6. Supply a PAL full colour bar signal input. 7. Adjust D27 to align the signal colour and black and white boundary with the CRT center mark. 8. Supply an NTSC full colour bar signal input. 9. Adjust D36 to align the signal colour and black and white boundary with the CRT center mark. 10. Return the aspect to 4 : 3.
Vertical gain (4 : 3 mode)	Crosshatch signals (PAL and NTSC) REMOTE CONTROL UNIT		<D06> V-SLOPE(4:3 50Hz) <D07> V-AMP(4:3 50Hz) <D15> V-SLOPE(4:3 60Hz) <D16> V-AMP(4:3 60Hz)	1. Supply a PAL crosshatch signal input. 2. Adjust D06 so that the squares at the top and bottom of the screen are the same height. 3. Adjust the vertical gain with D07 for 92 % of the overall crosshatch. 4. Supply an NTSC crosshatch signal input. 5. Adjust D15 so that the squares at the top and bottom of the screen are the same height. 6. Adjust the vertical gain with D16 for 92 % of the overall crosshatch.

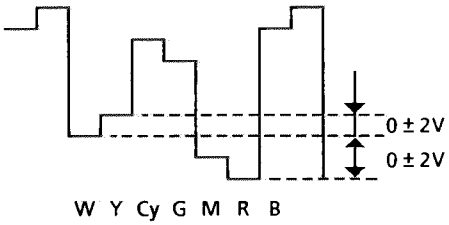
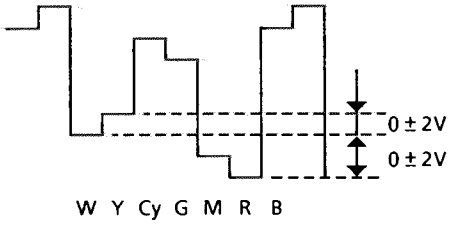
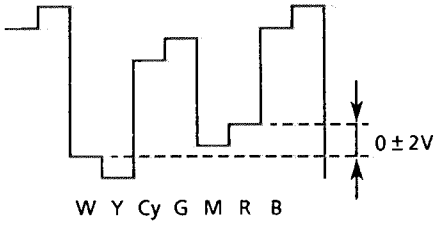
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Vertical gain (16 : 9 mode)	Crosshatch signals (PAL and NTSC) REMOTE CONTROL UNIT		<D24> V-SLOPE(16:9 50Hz) <D25> V-AMP(16:9 50Hz) <D33> V-SLOPE(16:9 60Hz) <D34> V-AMP(16:9 60Hz)	1. Set the aspect to 16 : 9. If adjustment shifts, perform the following steps. 2. Supply a PAL crosshatch signal input. 3. Adjust D24 so that the squares at the top and bottom of the screen are the same height. 4. Adjust the vertical gain with D25 for 92 % of the overall crosshatch. 5. Supply an NTSC crosshatch signal input. 6. Adjust D33 so that the squares at the top and bottom of the screen are the same height. 7. Adjust the vertical gain with D34 for 92 % of the overall crosshatch. 8. Return the aspect to 4 : 3.
Horizontal center	Crosshatch signals (PAL and NTSC) REMOTE CONTROL UNIT		<D01> H-SHIFT(4:3 50Hz) <D10> H-SHIFT(4:3 60Hz) <D19> H-SHIFT(16:9 50Hz) <D28> H-SHIFT(16:9 60Hz)	1. Supply a PAL crosshatch signal input. 2. Adjust D01 to equalize both edges of the crosshatch signal (H = H'). 3. Supply an NTSC crosshatch signal input. 4. Adjust D10 to equalize both edges of the crosshatch signal (H = H').  5. Set the aspect to 16 : 9. If adjustment shifts, perform the following steps. 6. Supply a PAL crosshatch signal input. 7. Adjust D19 to equalize both edges of the crosshatch signal (H = H'). 8. Supply an NTSC crosshatch signal input. 9. Adjust D28 to equalize both edges of the crosshatch signal (H = H'). 10. Return the aspect to 4 : 3.
Horizontal gain (4 : 3 mode)	Crosshatch signals (PAL and NTSC) REMOTE CONTROL UNIT		<D02> EW-WIDTH(4:3 50Hz) <D11> EW-WIDTH(4:3 60Hz)	1. Supply a PAL crosshatch signal input. 2. Adjust the horizontal gain with D02 for 92 % of the overall crosshatch. 3. Supply an NTSC crosshatch signal input. 4. Adjust the horizontal gain with D11 for 92 % of the overall crosshatch.
Horizontal gain (16 : 9 mode)	Crosshatch signals (PAL and NTSC) REMOTE CONTROL UNIT		<D20> EW-WIDTH(16:9 50Hz) <D29> EW-WIDTH(16:9 60Hz)	1. Set the aspect to 16 : 9. If adjustment shifts, perform the following steps. 2. Supply a PAL crosshatch signal input. 3. Adjust the horizontal gain with D20 for 92 % of the overall crosshatch. 4. Supply an NTSC crosshatch signal input. 5. Adjust the horizontal gain with D29 for 92 % of the overall crosshatch. 6. Return the aspect to 4 : 3.

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
V linearity, side pincushion, trapezoid, corner pincushion (4 : 3 mode)	Crosshatch signal (PAL) REMOTE CONTROL UNIT		<D03> EW-PARABOLA <D05> EW-TRAPEZIUM <D08> S-CORRECTION <D04> EW-CORNER	1. Supply a PAL crosshatch signal input. 2. Adjust D03 so that the second vertical line from each edge of the crosshatch is nearly a straight line. 3. Adjust D05 so that the vertical lines at each edge of the crosshatch are nearly parallel. 4. If vertical compression or expansion is visible at the center, adjust with D08. 5. If the corners are distorted, adjust with D04.
V linearity, side pincushion, trapezoid, corner pincushion (16 : 9 mode)	Crosshatch signal (PAL) REMOTE CONTROL UNIT		<D21> EW-PARABOLA <D23> EW-TRAPEZIUM <D26> S-CORRECTION <D22> EW-CORNER	1. Set the aspect to 16 : 9. If adjustment shifts, perform the following steps. 2. Supply a PAL crosshatch signal input. 3. Adjust D21 so that the second vertical line from each edge of the crosshatch is nearly a straight line. 4. Adjust D23 so that the vertical lines at each edge of the crosshatch are nearly parallel. 5. If vertical compression or expansion is visible at the center, adjust with D26. 6. If the corners are distorted, adjust with D22. 7. Return the aspect to 4 : 3.
V linearity, side pincushion, trapezoid, corner pincushion (NTSC mode)	Crosshatch signal (NTSC) REMOTE CONTROL UNIT		<D12> EW-PARABOLA <D14> EW-TRAPEZIUM <D17> S-CORRECTION <D13> EW-CORNER <D30> EW-PARABOLA <D32> EW-TRAPEZIUM <D35> S-CORRECTION <D31> EW-CORNER	1. Supply an NTSC crosshatch signal input. 2. Adjust D12 so that the second vertical line from each edge of the crosshatch is nearly a straight line. 3. Adjust D14 so that the vertical lines at each edge of the crosshatch are nearly parallel. 4. If vertical compression or expansion is visible at the center, adjust with D17. 5. If the corners are distorted, adjust with D13. 6. Set the aspect to 16 : 9. If adjustment shifts, perform the following steps. 7. Adjust D30 so that the second vertical line from each edge of the crosshatch is nearly a straight line. 8. Adjust D32 so that the vertical lines at each edge of the crosshatch are nearly parallel. 9. If vertical compression or expansion is visible at the center, adjust with D35. 10. If the corners are distorted, adjust with D31. 11. Return the aspect to 4 : 3.
Vertical pincushion	Crosshatch signal (PAL) Hex wrench  		L504 (T/B PIN) [MAIN PB ASS'Y]	1. Supply a PAL crosshatch signal input. 2. Adjust L504 so that the ends of the top and bottom horizontal lines of the crosshatch are straight. 3. If the lines cannot be straightened completely, adjust so that curvature is within ± 1 % of the vertical display area (B/A %).

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Screen control	Greyscale signal (PAL) or colour bar with chroma off oscilloscope	TP-R TP-G TP-B [CRT SOCKET PB ASS'Y]	Screen VR	1. Supply a greyscale signal input. 2. In sequence, connect an oscilloscope to TP-R, TP-G and TP-B. Determine the test point with the lowest DC voltage. 3. Adjust the screen voltage to set the DC voltage at this lowest test point to 160 ± 5V. 
Low light adjustment (D6500 K)	Greyscale signal (PAL) or colour bar with chroma off REMOTE CONTROL UNIT		<W04> RED CUT OFF <W06> BLUE CUT OFF	1. Supply a greyscale signal input. 2. Set the colour temperature ton to D6500 with Function Select. 3. Adjust the white balance of the bar near black colour with <W04> and <W06>.
Low light adjustment (D9300 K)	Greyscale signal (PAL) or colour bar with chroma off REMOTE CONTROL UNIT		<W10> RED CUT OFF <W12> BLUE CUT OFF	1. Supply a greyscale signal input. 2. Set the colour temperature to D9300 with Function Select. 3. Adjust the white balance of the bar near black colour with <W10> and <W12>. 4. Return the COLOUR OFF to COLOUR with Function Select.
High light adjustment (D6500 K)	Resolution pattern signal Colour analyzer REMOTE CONTROL UNIT		<W02> GREEN-GAIN <W01> RED-GAIN <W03> BLUE-GAIN	1. Supply a resolution pattern signal input. 2. Set the colour temperature ton to D6500 with Function Select. 3. Set the COLOUR OFF to MONO with Function Select. 4. Set <W02> to 32. 5. Adjust <W01> and <W03> for colour analyzer values of X = 0.313 and Y = 0.329 . 6. If a colour analyzer is not available, supply a colour bar signal input and adjust the white balance of the white band with <W01> and <W03>. 7. Return the COLOUR OFF to COLOUR with Function Select.

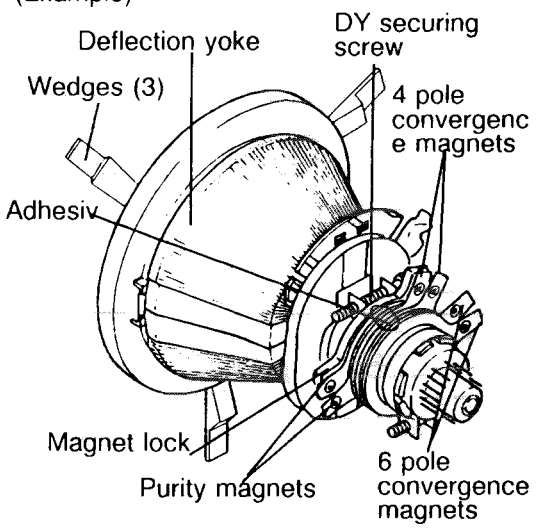
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
High light adjustment (D9300 K)	Resolution pattern signal Colour analyzer REMOTE CONTROL UNIT		<W08> GREEN-GAIN <W07> RED-GAIN <W09> BLUE-GAIN	1. Supply a resolution pattern signal input. 2. Set the colour temperature ton D9300 with Function Select. 3. Set the COLOUR OFF to MONO with Function Select. 4. Set <W08> to 32. 5. Adjust <W07> and <W09> for colour analyzer values of X = 0.283 and Y = 0.297 . 6. If a colour analyzer is not available, supply a colour bar signal input and adjust the white balance of the white band with <W07> and <W09>. 7. Return the COLOUR OFF to COLOUR with Function Select. 8. Return the colour temperature to D6500 with Function Select.
Bright adjustment	Split colour bar signal REMOTE CONTROL UNIT		<S02> 4:3 BRIGHT <S08> 16:9 BRIGHT	1. Supply a split colour bar signal input. 2. Adjust S02 to where the 0 % black portion of the split colour bar is slightly illuminated. 3. Also confirm correct brightness for other signals. 4. Set the aspect to 16 : 9 and adjust <S08> in the same manner. 5. Return the aspect to 4 : 3.
Bright adjustment (RGB)	Split colour bar signal or a signal including 0 % black REMOTE CONTROL UNIT		<S05> RGB BRIGHT	1. Supply a split colour bar signal to the RGB inputs. 2. Adjust S05 to where the 0 % black portion of the split colour bar is slightly illuminated. 3. Also confirm correct brightness for other signals.
Contrast adjustment	Full colour bar signal REMOTE CONTROL UNIT	TP-G [CRT SOCKET PB ASS'Y]	<S01> CONTRAST	1. Supply a full colour bar signal input. 2. Connect an oscilloscope to TP-G. 3. Adjust <S01> for 78 V between black (0 %) and white (75 %) levels. 

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Contrast adjustment (RGB)	Full colour bar signal REMOTE CONTROL UNIT	TP-G [CRT SOCKET PB ASS'Y]	<S04> RGB CONTRAST	1. Supply a full colour bar signal to the RGB inputs. 2. Connect an oscilloscope to TP-G. 3. Adjust <S01> for 78 V between black (0 %) and white (75 %) levels. 
Colour adjustment (PAL)	Full colour bar signal REMOTE CONTROL UNIT	TP-R [CRT SOCKET PB ASS'Y]	<S13> PAL CHROMA	1. Supply a PAL full colour bar signal input. 2. Connect an oscilloscope to TP-R. 3. Adjust S13 so that red (R) is 0 ± 2 V with respect to white (W). 
Colour adjustment (SECAM)	Full colour bar signal REMOTE CONTROL UNIT	TP-R [CRT SOCKET PB ASS'Y]	<S15> SECAM CHROMA	1. Supply a SECAM full colour bar signal input. 2. Connect an oscilloscope to TP-R. 3. Adjust S15 so that red (R) is 0 ± 2 V with respect to white (W). 

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Colour and tint (NTSC 3.58)	Full colour bar signal REMOTE CONTROL UNIT	TP-R [CRT SOCKET PB ASS'Y]	<S17> NTSC CHROMA <S18> NTSC PHASE	1. Supply an NTSC full colour bar signal input. 2. Connect an oscilloscope to TP-R. 3. Adjust S17 so that red (R) is 0 ± 2 V with respect to white (W). 4. Adjust S18 so that yellow (Y) is 0 ± 2 V with respect to white (W). 
Colour and tint (NTSC 4.43)	Full colour bar signal REMOTE CONTROL UNIT	TP-R [CRT SOCKET PB ASS'Y]	<S19> NTSC CHROMA <S20> NTSC PHASE	1. Supply an NTSC full colour bar signal input. 2. Connect an oscilloscope to TP-R. 3. Adjust S19 so that red (R) is 0 ± 2 V with respect to white (W). 4. Adjust S20 so that yellow (Y) is 0 ± 2 V with respect to white (W). 
Colour adjustment (component)	Full colour bar signal $Y = 0.7V_{p-p}$ (YS = $1.0V_{p-p}$) (100%WHITE) $R-Y = 0.7V_{p-p}$ (75%COLOUR) $B-Y = 0.7V_{p-p}$ (75%COLOUR) REMOTE CONTROL UNIT	TP-R [CRT SOCKET PB ASS'Y]	<S21> COMPO.CHROMA	1. Supply a PAL full colour bar signal input. 2. Connect an oscilloscope to TP-R. 3. Adjust S21 so that red (R) is 0 ± 2 V with respect to white (W). 

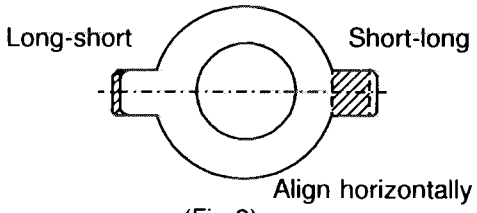
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Purity adjustment	**Degaussing coil** **Signal generator(All green, all red, all blue, cross pattern signals)**		**Purity magnets** **Convergence magnets**	1. Be sure to degauss using the degaussing coil. 2. Carefully remove the wedges. 3. Peel the adhesive from the 6 magnets to allow turning the magnets.(For models using magnet lock, loosen the lock.) 4. Supply an all green signal input. 5. Loosen the deflection yoke securing screw and slide the yoke fully rearward to produce a red circle display. 6. Overlap the long with short tabs of the 2 purity magnets and position these horizontally.

(Example)



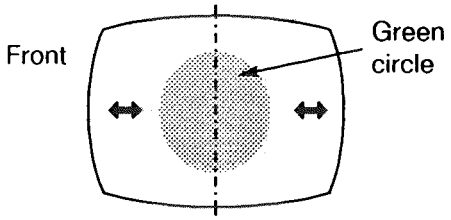
(Fig.1)

*Set the 2 purity magnets horizontally.



(Fig.2)

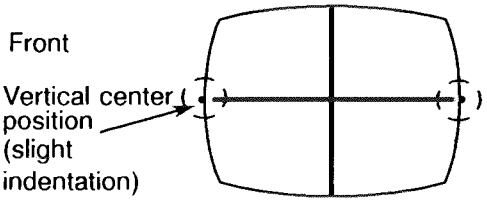
7. Adjust the rotational angle between the tabs to produce a green circle at the center of the screen.



Set the green area at the **center**

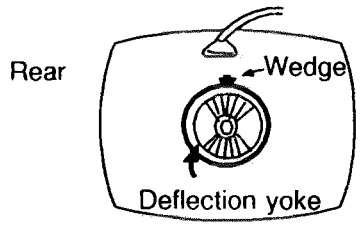
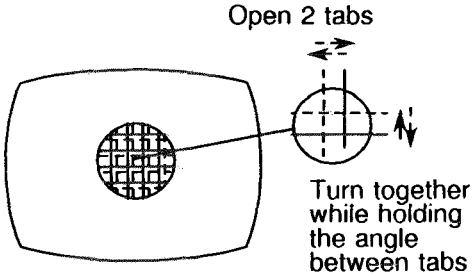
(Fig.3)

8. Supply a cross pattern input and check for deviation of the vertical center position.If deviated, while maintaining the angle between the tabs, rotate the magnets to center the vertical position to the extent possible.

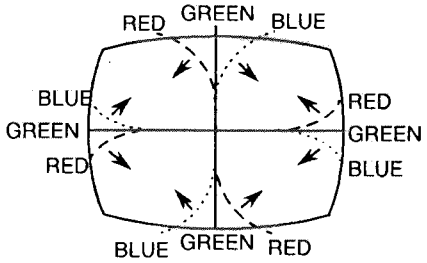


Set the indentations near the horizontal line(tolerance about ± 5 mm)

(Fig.4)

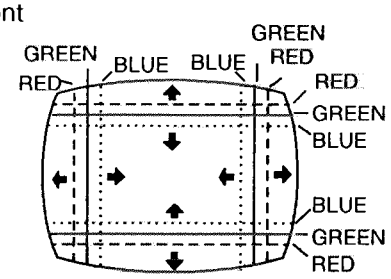
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
				9. Repeat steps 7 and 8. 10. Supply an all green signal input and shift the deflection yoke forward to where he overall screen is a green single color. 11. Also check the red and blue single color rasters. 12. Suitably tighten the deflection yoke securing screw to prevent forward to rearward shifting. (For models with magnet lock, lightly tighten the lock so that the 6 magnets do not move by slight touching.)
Static (center) convergence adjustment	**Signal generator(crosshatch)**		**Deflection yoke** **Wedges** **Convergence magnets**	1. Supply a crosshatch pattern input. 2. Move the deflection yoke up, down, left and right to roughly adjust the perimeter convergence.Temporarily secure with one wedge at the top.  (Fig.5) 3. Use the 4 pole magnets to overlap red and blue at the picture center to produce magenta. 4. Use the 6 pole magnets to overlap the green lines with the magenta. 5. If required, repeat steps 1 and 2.  (Fig.6)

<table>
<tr><th>Item</th><th>Test equipment</th><th>Test points</th><th>Adjustment locations</th><th>Adjustment procedure</th></tr>
<tr><td>Dynamic (perimeter) convergence adjustment</td><td>Signal generator(crosshatch)</td><td></td><td>Wedges
Deflection yoke</td><td>1. Supply a crosshatch pattern input.
2. Remove the wedge temporarily securing the deflection yoke.
3. Wobble the deflection yoke vertically and set the convergence deviation as indicated in Fig.7.Again temporarily secure by inserting a wedge at the top.
4. Wobble the deflection yoke left and right and set the convergence deviation as indicated in Fig.8.
5. Alternately repeat steps 2 and 3 and adjust for minimum convergence deviation.

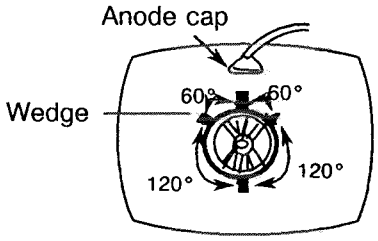
Front
 

Arrow directions when yoke is tilted upward
(opposite directions when tilted downward)

(Fig.7)

Front
 

Arrow directions when yoke is tilted rightward
(opposite directions when tilted leftward)

(Fig.8)</td></tr>
<tr><td>After completing convergence adjustment</td><td>Double sided tape
Adhesive</td><td></td><td>Wedges
Magnet lock</td><td>1. Insert the wedges as shown in Fig.9.
 

Securing with 3 wedges

(Fig.9)

Note: Double sided tape is applied to the wedges.Peel off the covering to secure.Do not reuse old wedges, replace them.

Wedge part number: CE40764-00A

2. Tighten the deflection yoke securing screw.
3. Apply adhesive to secure the 6 magnets as indicated in Fig.1.</td></tr>
</table>

TROUBLESHOOTING

Self diagnosis functions

This model includes self - diagnosis functions for the following items. When a fault occurs, a record is stored in the memory.

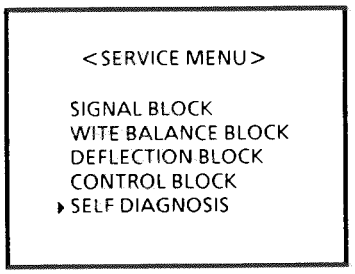
Diagnosed item	On - screen display	Contents	LED lighting time at error
Overcurrent protector	OCP	Overcurrent Protector operating events	2 second
X - ray protector	X-RAY	X - ray protector operating events	0.2 second
Memory	BUS-MEMORY	IC002 EEPROM memory faulty readout operation	1 second
Selector	BUS-1545	IC101 CAX1545AS IC faulty operation	0.5 second
Def. control/decoder	BUS-9162	IC801 TDA9162 IC faulty operation	0.5 second
Video processor	BUS-4680	IC007 TDA4680 IC faulty operation	0.5 second

Self - diagnosis function usage

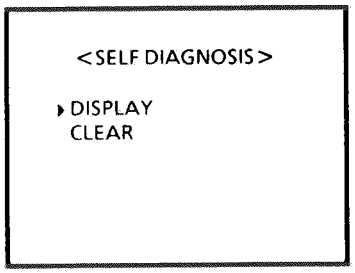
Self - diagnosis display mode entry

1. Set the service mode.
2. Select SELF DIAGNOSIS and press the Enter key.
3. Select DISPLAY and press the Enter key.
4. The present status is displayed.

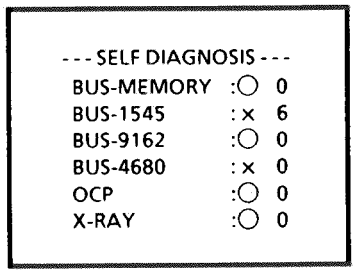
The error occurrence frequency is displayed.
If no occurrence, ○ is indicated;
if 1 or more times, × is indicated.



Service main menu



Self diagnosis main menu



Self diagnosis menu

Releasing self diagnosis display mode

- To erase the fault history:
  At the self diagnosis menu, select Clear and Press the Enter key.
- To preserve the fault history:
  Disconnect the power cord from AC

Notes regarding fault history

- Fault events can be stored up 9 times. Fault events are not counted in excess of 9 times.
- Pulse type or other interference temporarily preventing transmission is counted as a fault (particularly when checking the I2C bus). This remains as part of the fault history unless erased.
  If many faults are counted for multiple items, diagnosis can be impeded. If there is risk of a symptom recurring, erase the fault history to allow recording the diagnosis results.
- There may be an operating voltage difference between the CPU and I2C bus. Note if the power cord is disconnected from AC while power is on, this can be counted as a fault in the I2C bus diagnosis

TM-290ZE-B
STANDARD CIRCUIT DIAGRAM

■NOTE ON USING CIRCUIT DIAGRAMS

1.SAFETY

The components identified by the ⚠ 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 :PAL Color bar signal
(2)Setting positions of each knob/button and variable resistor :Original setting position when shipped
(3)Internal resistance of tester :DC 20kΩ/V
(4)Oscilloscope sweeping time :H ⇒20μS/div
:V ⇒5mS/div
:Others ⇒ 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→R209

4.INDICATIONS ON THE CIRCUIT DIAGRAM

(1)Resistors

•Resistance value
No unit :[Ω]
K :[KΩ]
M :[MΩ]

•Rated allowable power
No indication :1/6[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
1or higher :[pF]
less than 1 :[μF]

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

* Electrolytic Capacitors
47/50[Example]:Capacitance value[μF]/withstand voltage[V]

•Type
No indication :Ceramic capacitor
MY :Mylar 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 :[μH]
Others :As specified

(4)Power Supply

:B1(134V)
:B2(12V)
:9V
:5V

* Respective voltage values are indicated.

(5)Test Point

: Test point
: Only test point display

(6)Connecting method

: Connector
: Wrapping or soldering
: Receptacle

(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 : (⊥) side GND and the ISOLATED(NEUTRAL) : (⏚) 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 (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.

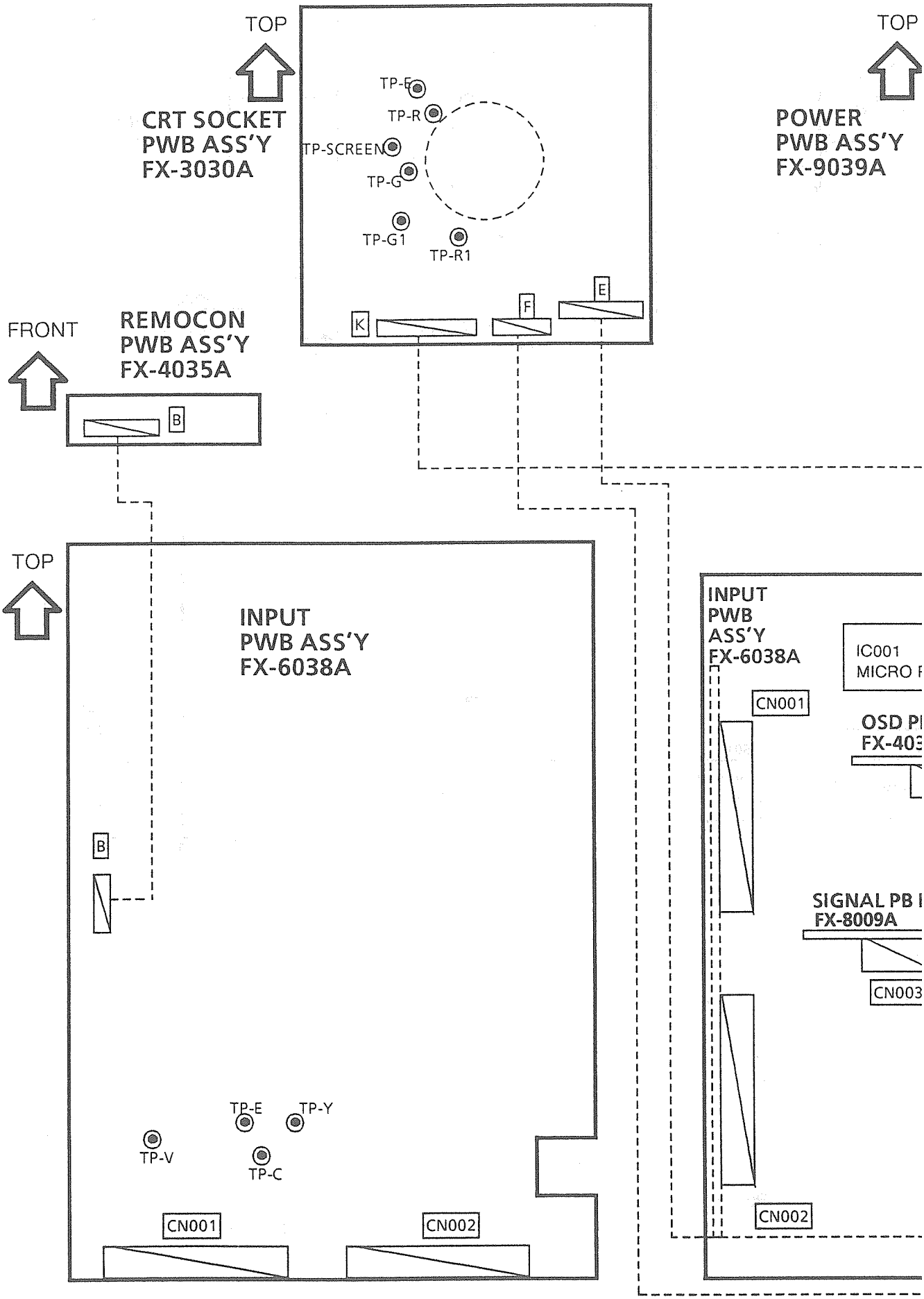
◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

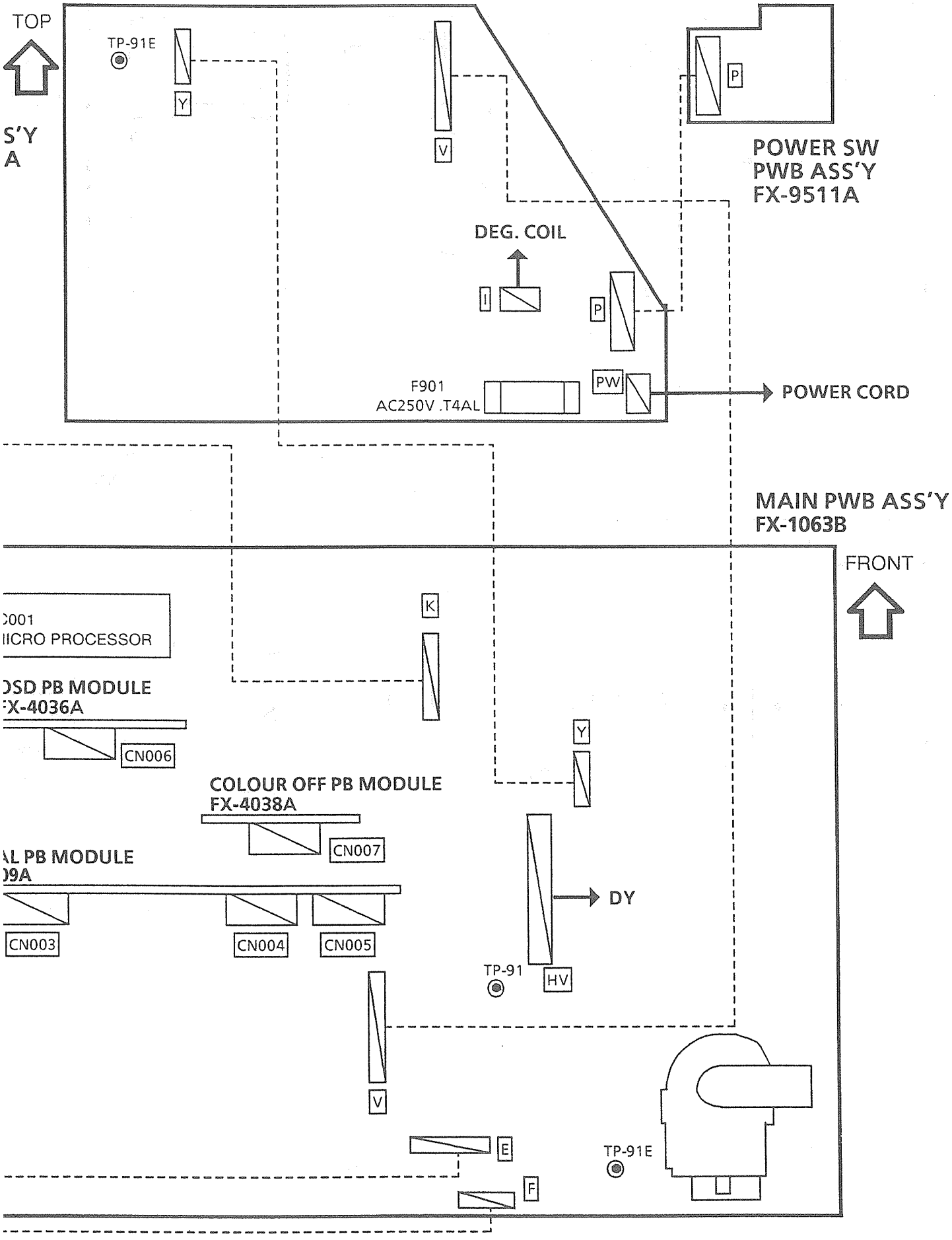
Apr 1996 No.50936C

CONTENTS

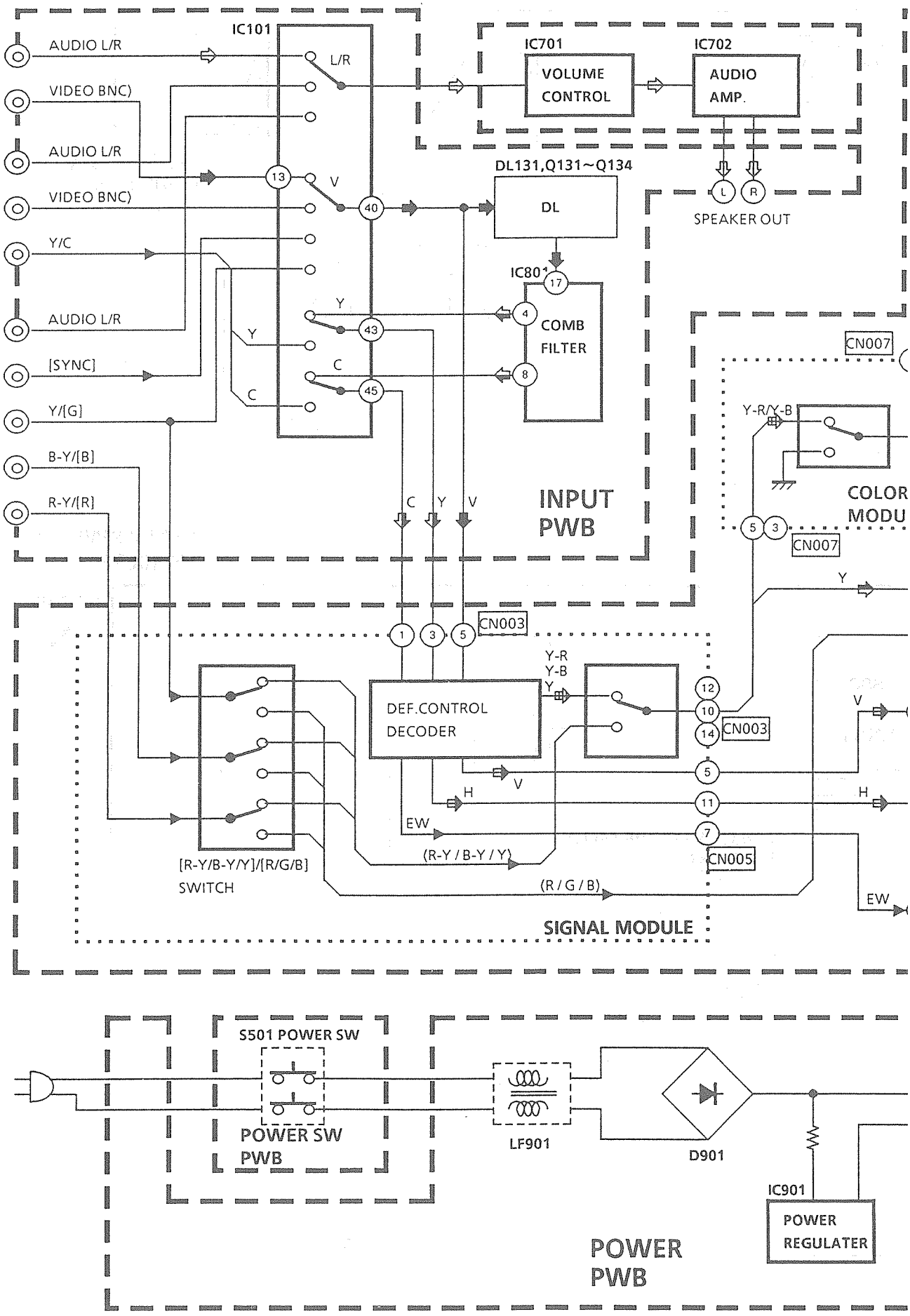
	TM-290ZE-B
INPUT PWB	FX-6038A
REMOCON PWB	FX-4035A
MAIN PWB	FX-1063B
CRT SOCKET PWB	FX-3030A
POWER PWB	FX-9039A
POWER SW PWB	FX-9511A
OSD PB MODULE	FX-4036A
COLOUR OFF PB MODULE	FX-4038A
SIGNAL PB MODLE	FX-8009A

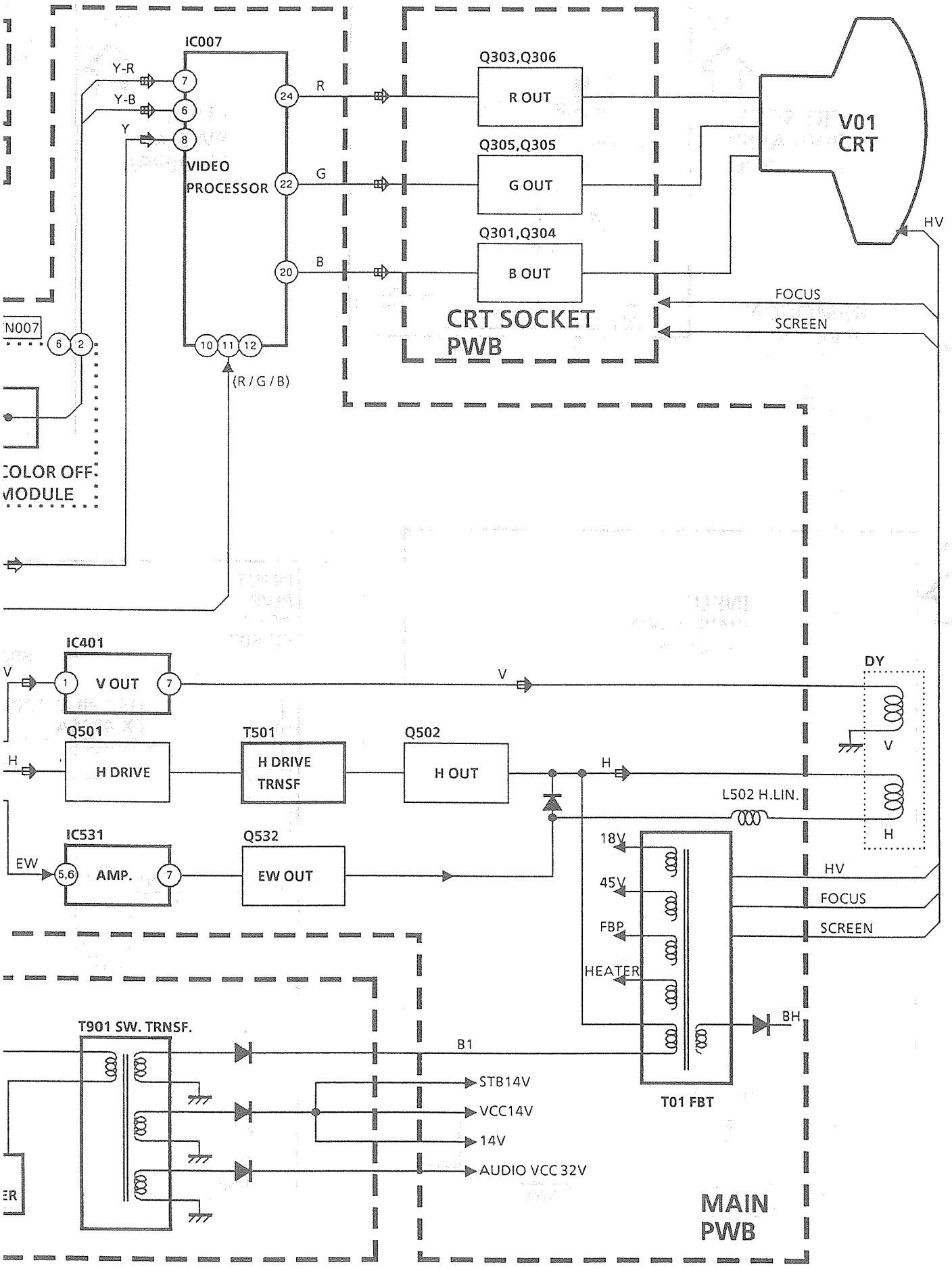
MAIN PARTS AND ALIGNMENTS LOCATION




TOP
S'Y
A
TP-91E
Y
V
P
POWER SW
PWB ASS'Y
FX-9511A
DEG. COIL
I
P
F901
AC250V .T4AL
PW
POWER CORD
MAIN PWB ASS'Y
FX-1063B
FRONT
001
ICRO PROCESSOR
K
SD PB MODULE
X-4036A
CN006
Y
COLOUR OFF PB MODULE
FX-4038A
CN007
L PB MODULE
09A
CN003
CN004
CN005
DY
TP-91
HV
V
E
F
TP-91E

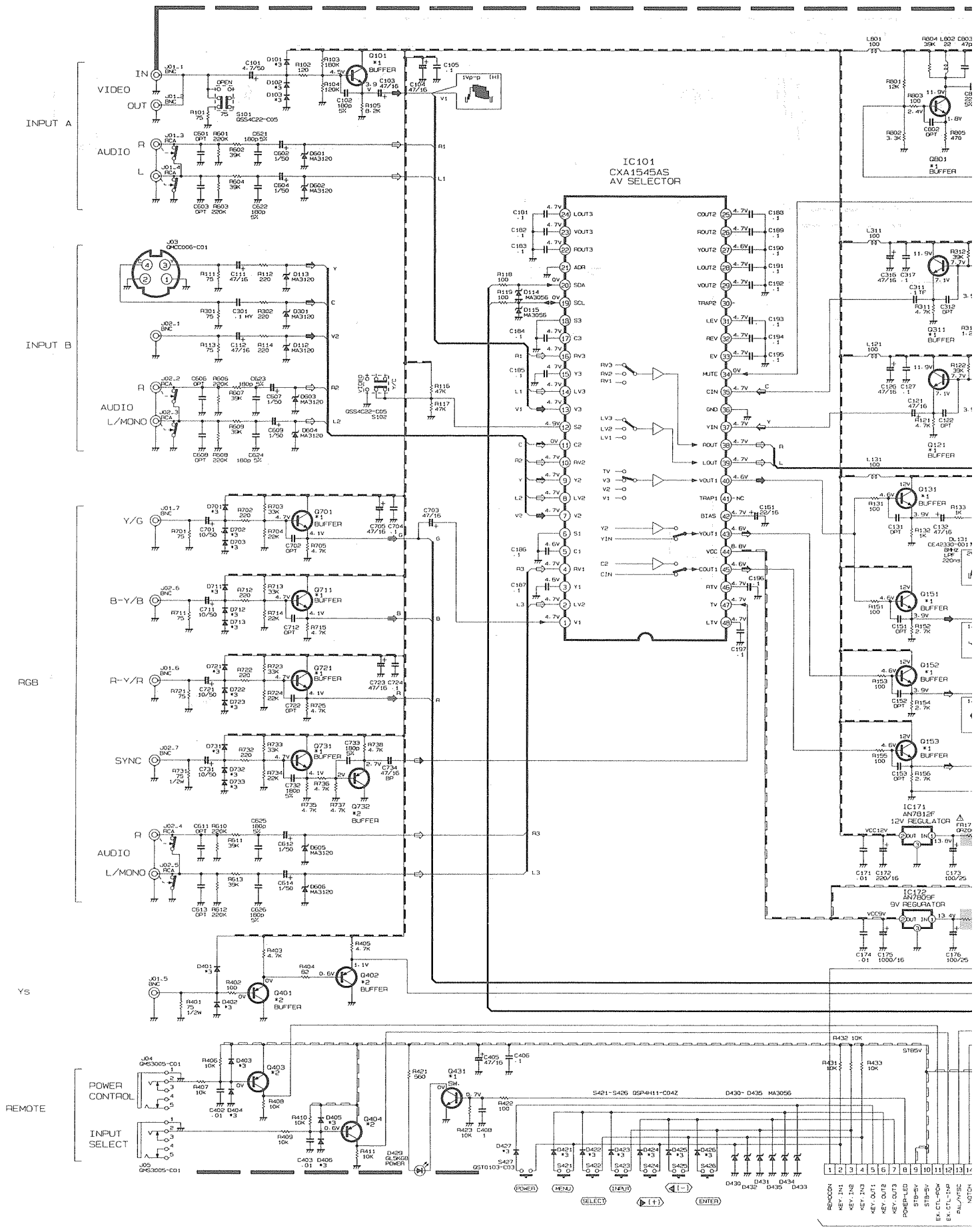
BLOCK DIAGRAM



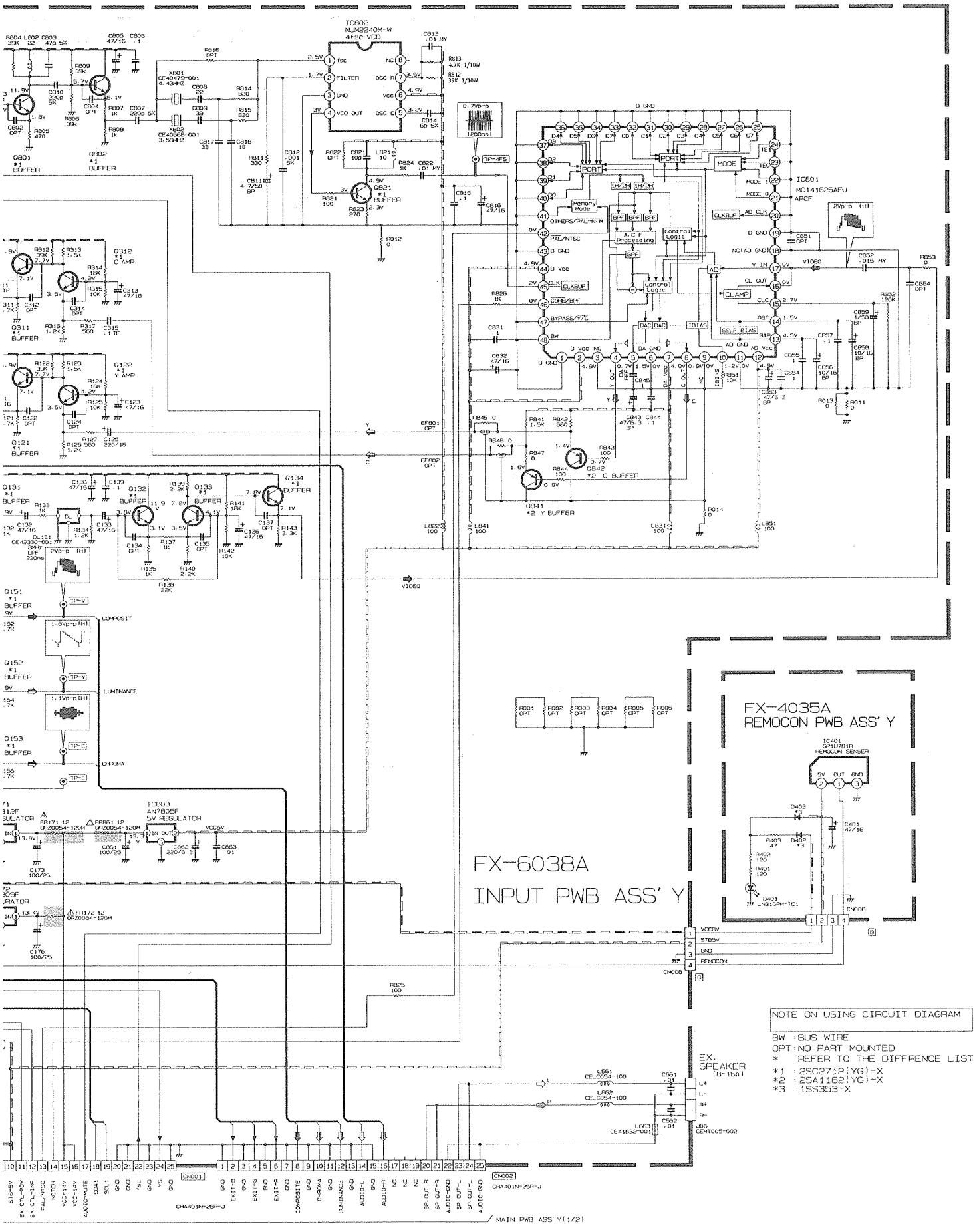

IC007
Y-R
Y-B
Y
VIDEO PROCESSOR
R
G
B
Q303,Q306
R OUT
Q305,Q305
G OUT
Q301,Q304
B OUT
V01 CRT
HV
FOCUS
SCREEN
CRT SOCKET PWB
(R / G / B)
COLOR OFF MODULE
IC401
V OUT
V
DY
Q501
H DRIVE
T501
H DRIVE TRNSF
Q502
H OUT
H
L502 H.LIN.
IC531
EW
AMP.
Q532
EW OUT
18V
45V
FBP
HEATER
BH
T01 FBT
T901 SW. TRNSF.
B1
STB14V
VCC14V
14V
AUDIO VCC 32V
MAIN PWB

CIRCUIT DIAGRAMS AND PWB PATTERNS

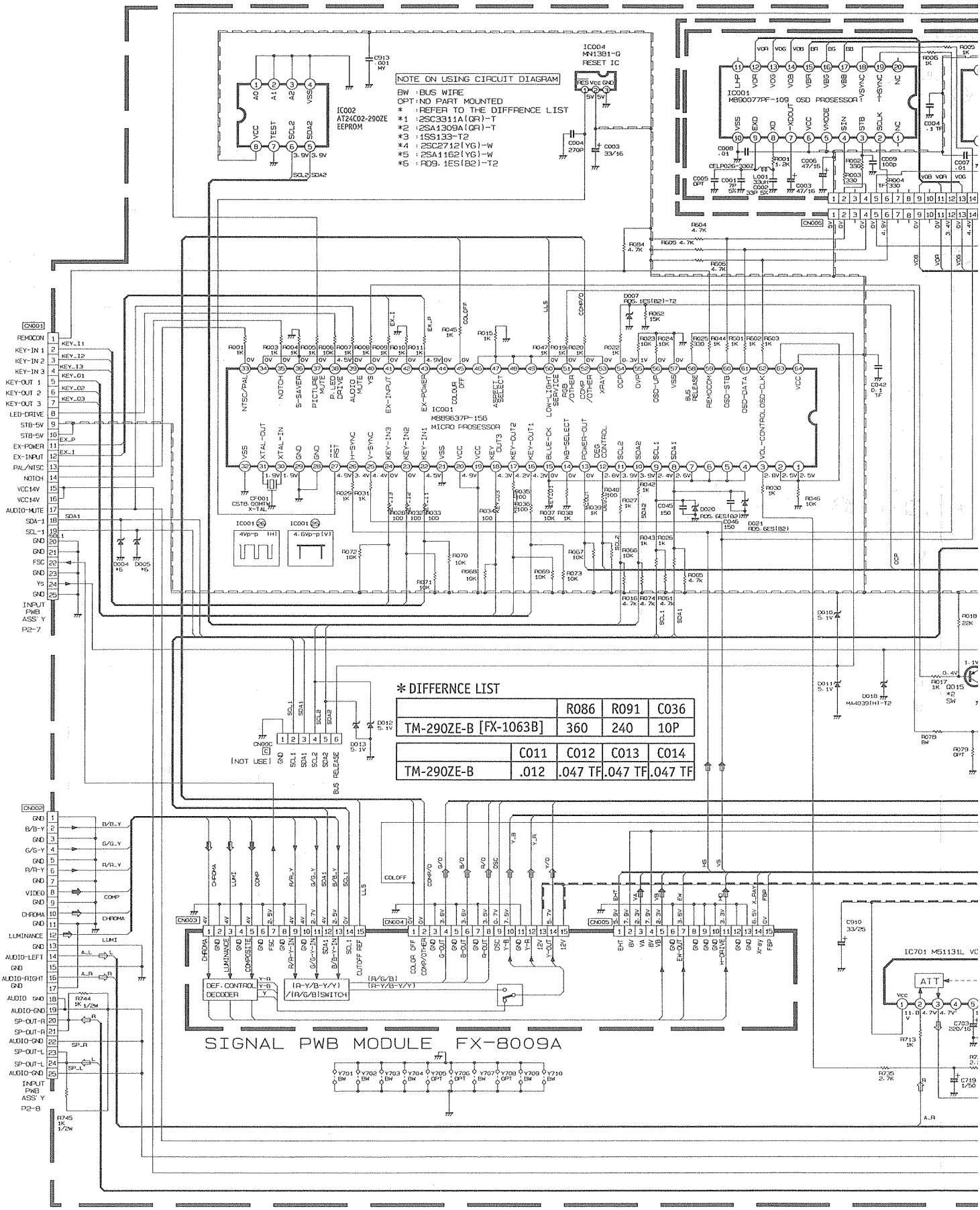
INPUT PWB, REMOCON PWB CIRCUIT DIAGRAMS



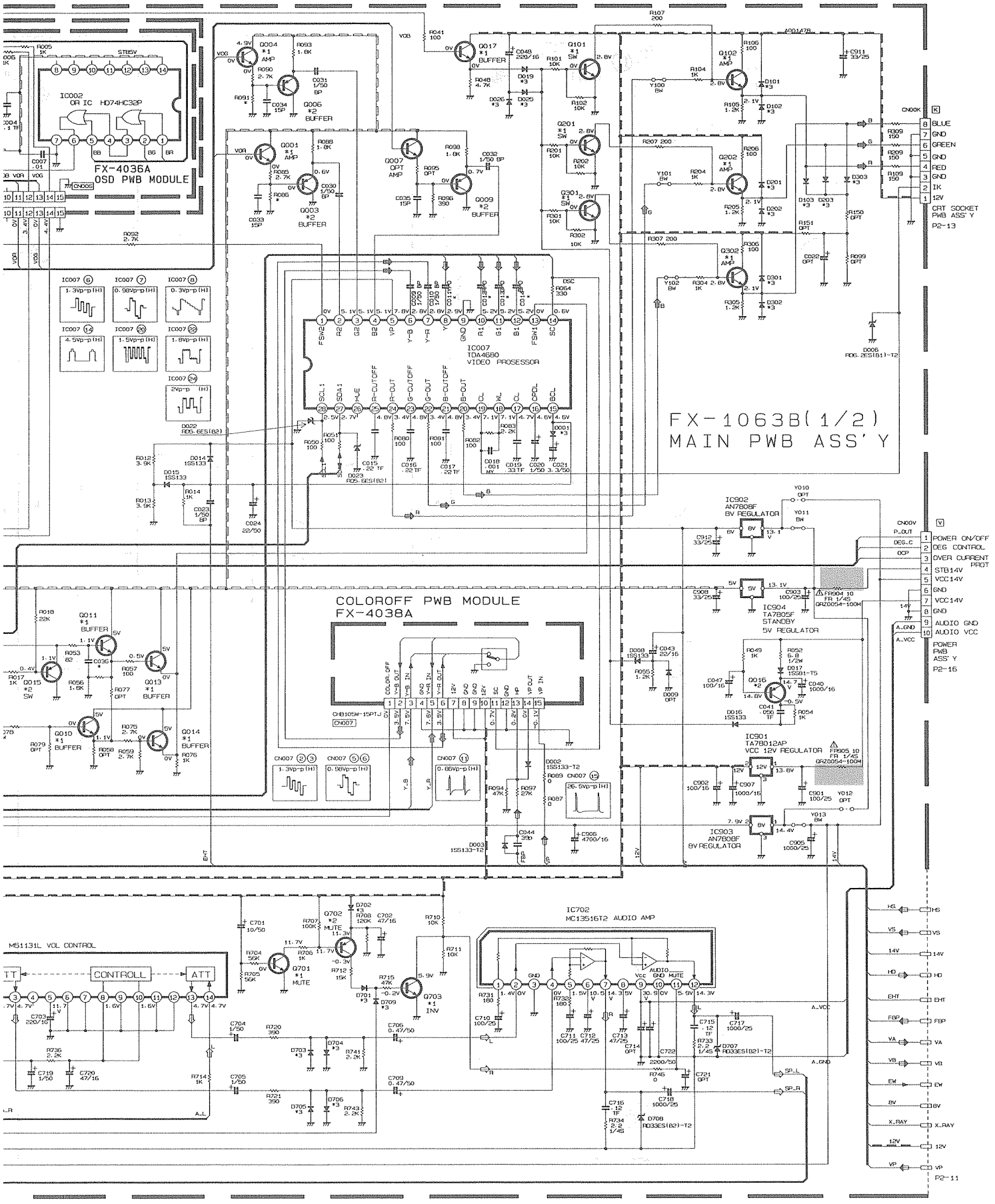
Refer to the following PWB pattern. : INPUT PWB PATTERN 2-17,2-18page, REMOCON PWB PATTERN 2-23page.



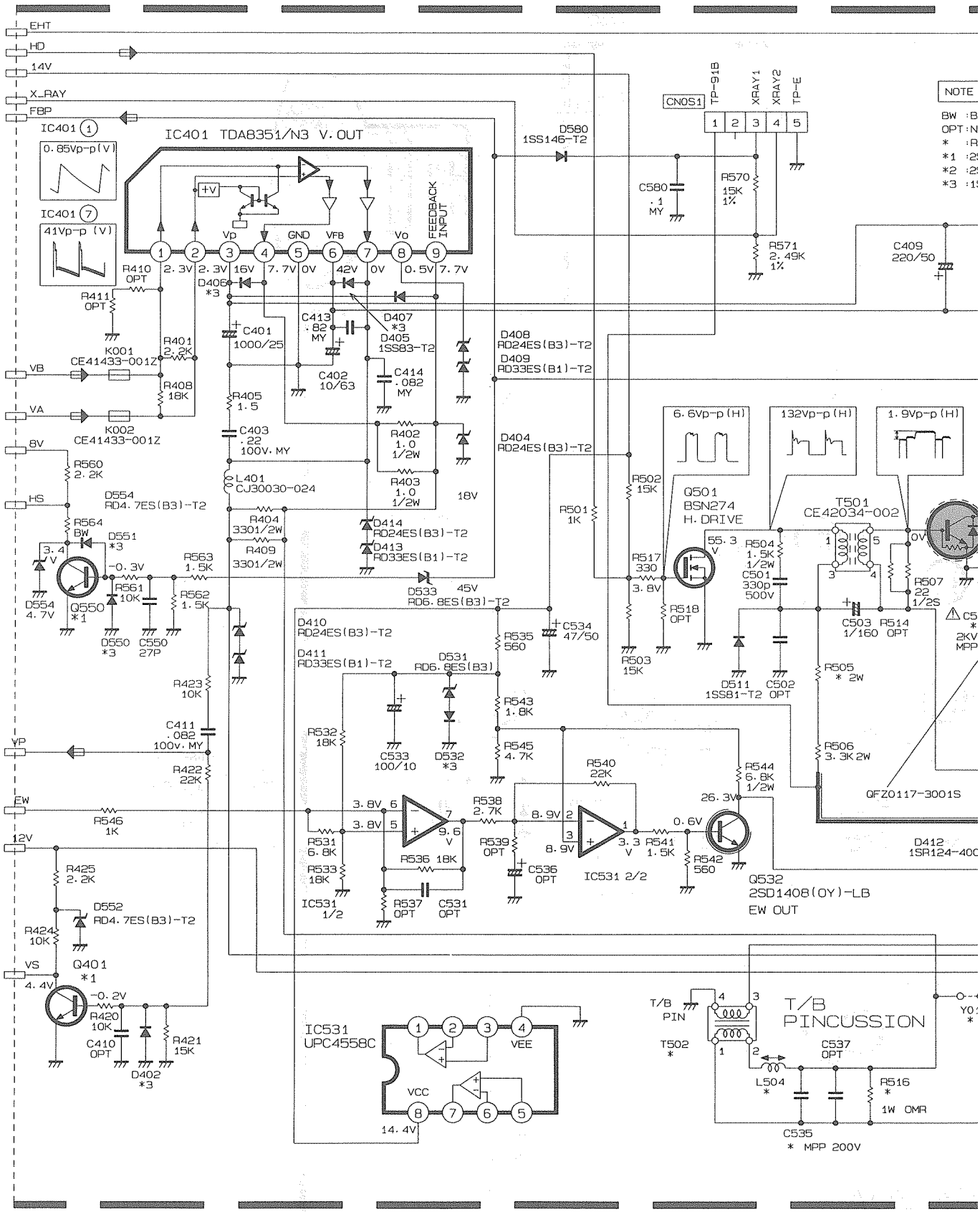
MAIN PWB CIRCUIT DIAGRAMS



Refer to the following PWB pattern. : MAIN PWB PATTERN 2-19,2-20page.



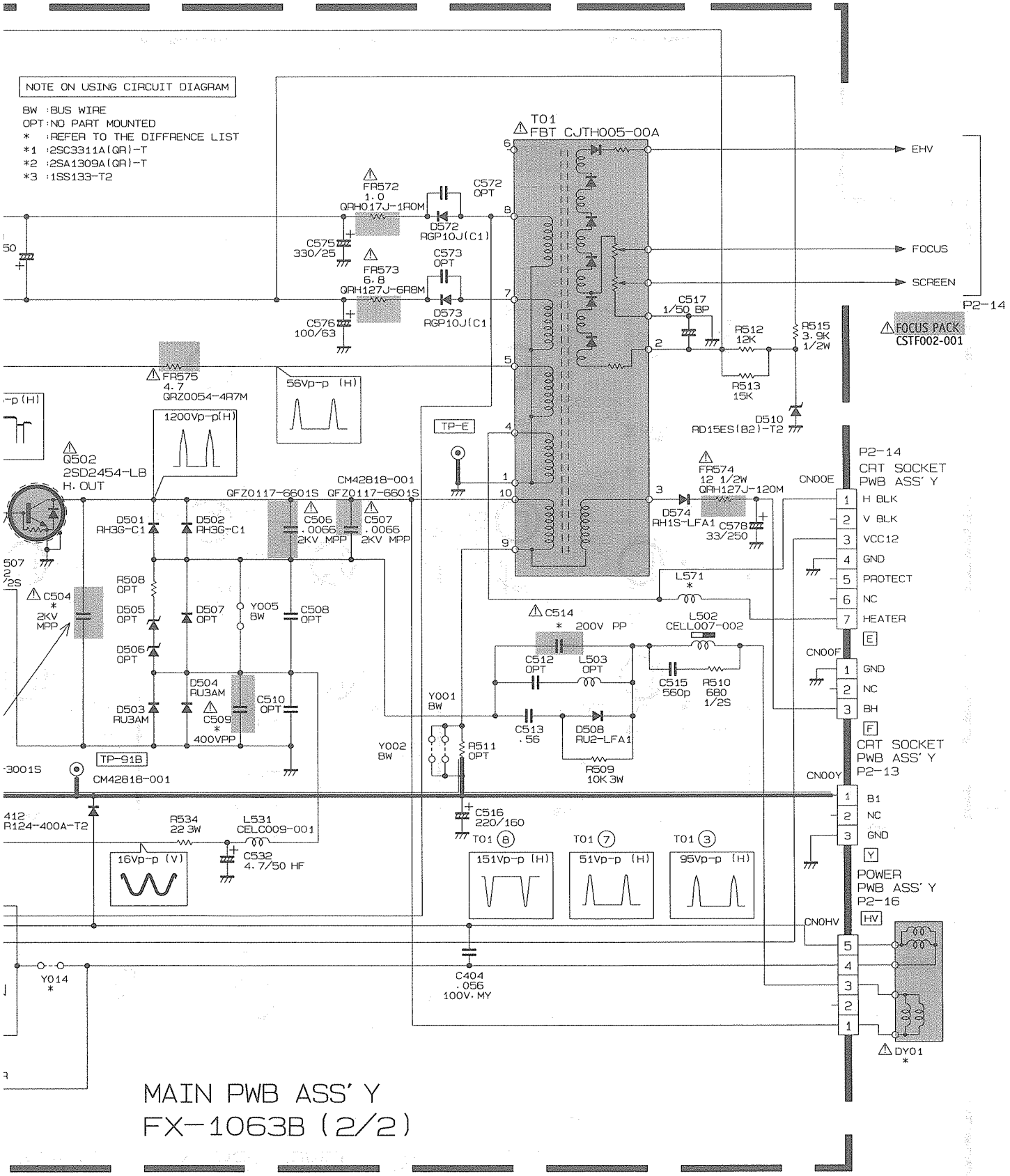
MAIN PWB CIRCUIT DIAGRAMS



*DIFFERENCE LIST

	⚠ C514	⚠ C509	⚠ C504	R505	Y014	R516	
TM-290ZE-B (FX-1063B)	QFZ0119-534S	QFP32GJ-223M	QFZ0117-3001S	QRG029J-332A	OPT	QRG019J-102	QFZ

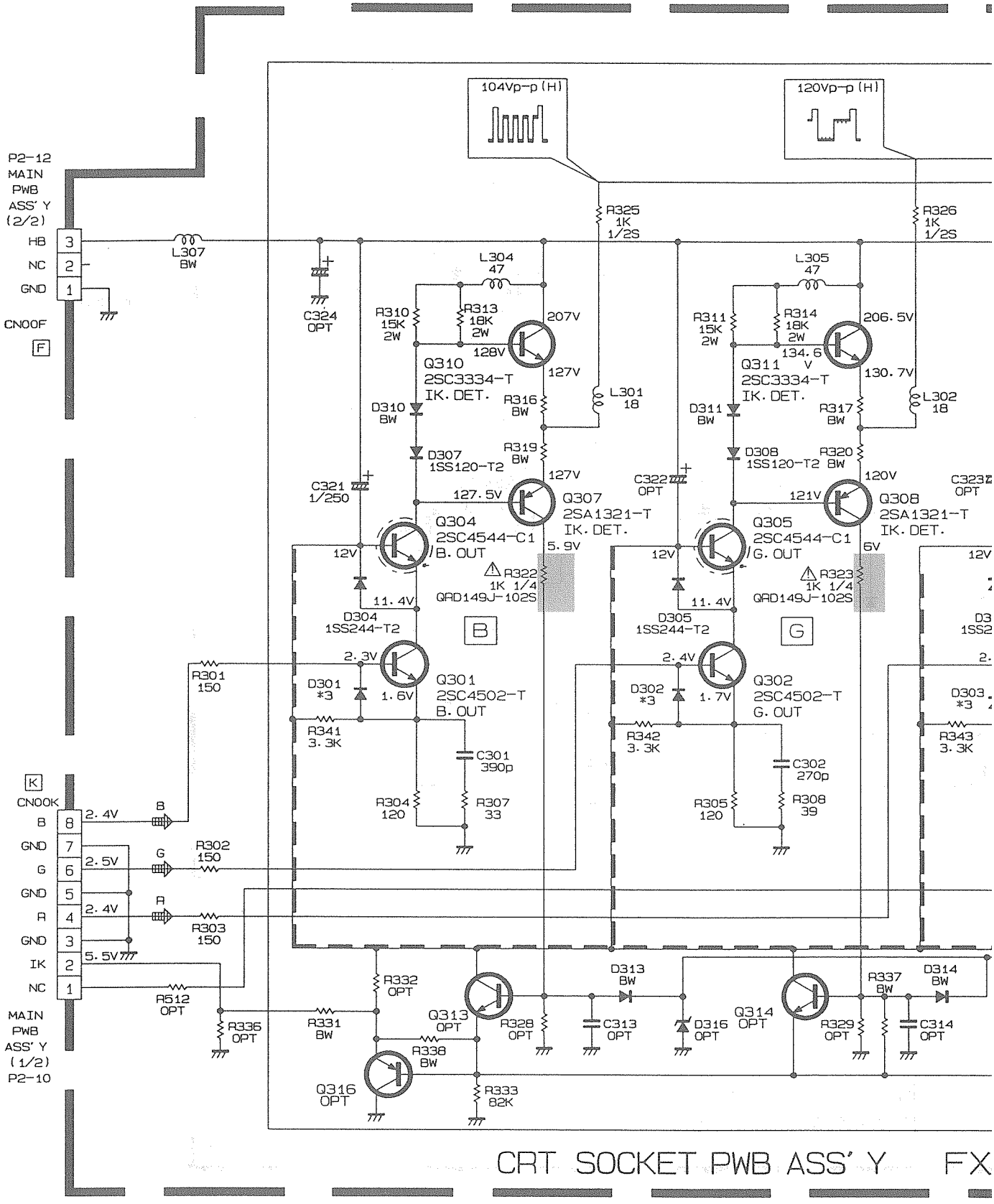
Refer to the following PWB pattern. : MAIN PWB PATTERN 2-19,2-20page.



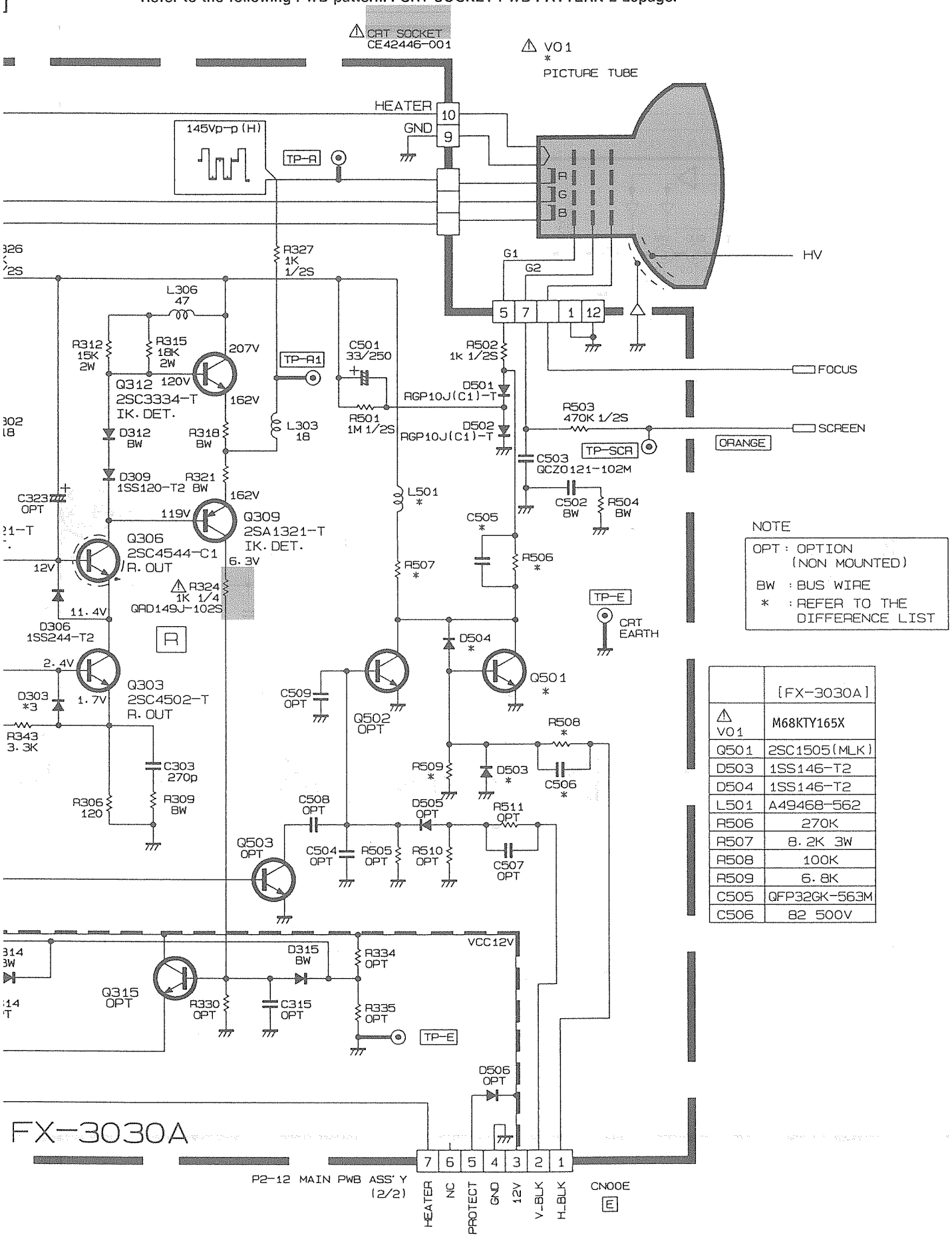
MAIN PWB ASS' Y
FX-1063B (2/2)

	C535	L504	T502	L571	⚠ DY01
2	QFZ0119-254S	CE40140-00F	CE42090-001	CJ30030-051	CE20216-00C

CRT SOCKET PWB CIRCUIT DIAGRAMS



Refer to the following PWB pattern. : CRT SOCKET PWB PATTERN 2-23page.

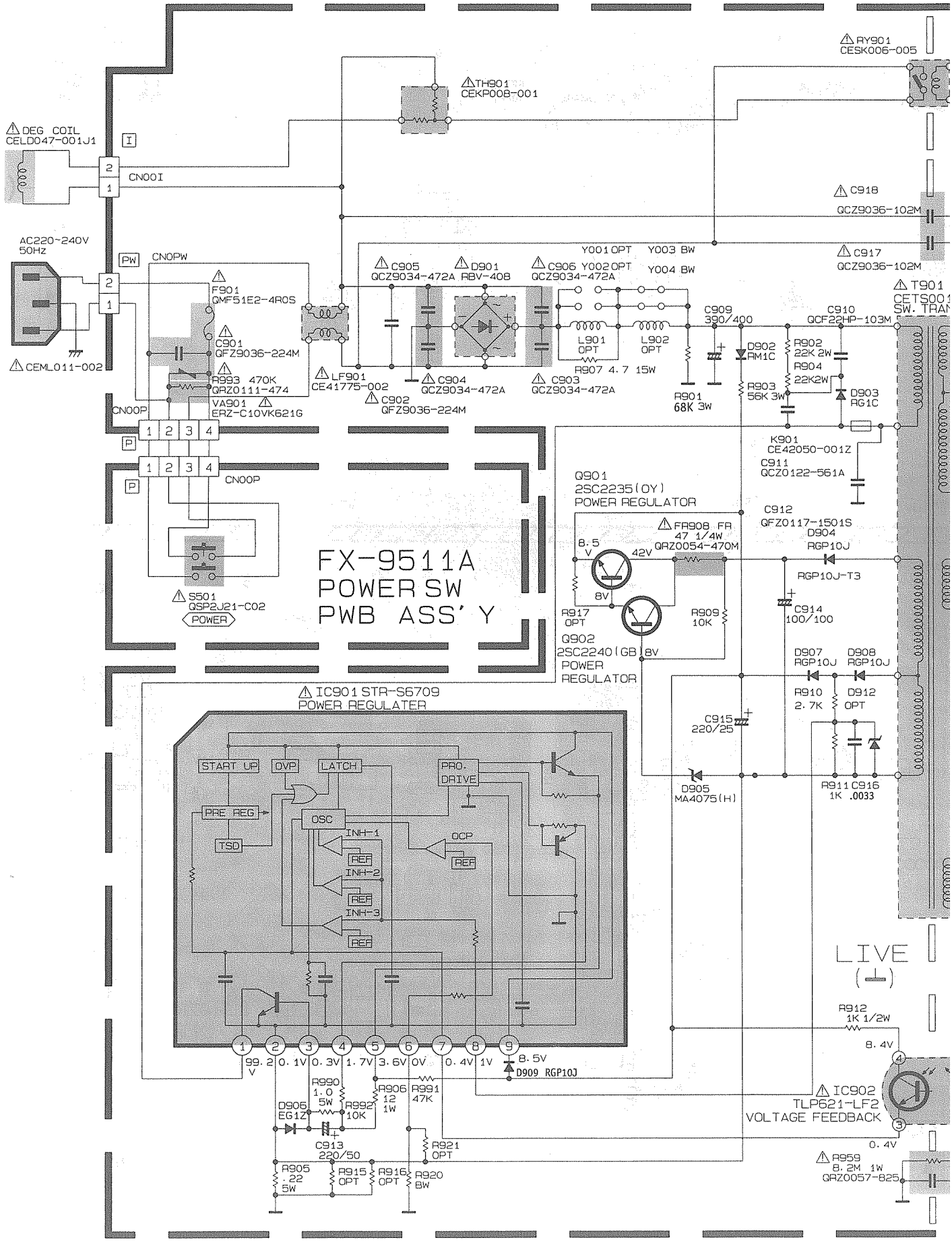


NOTE

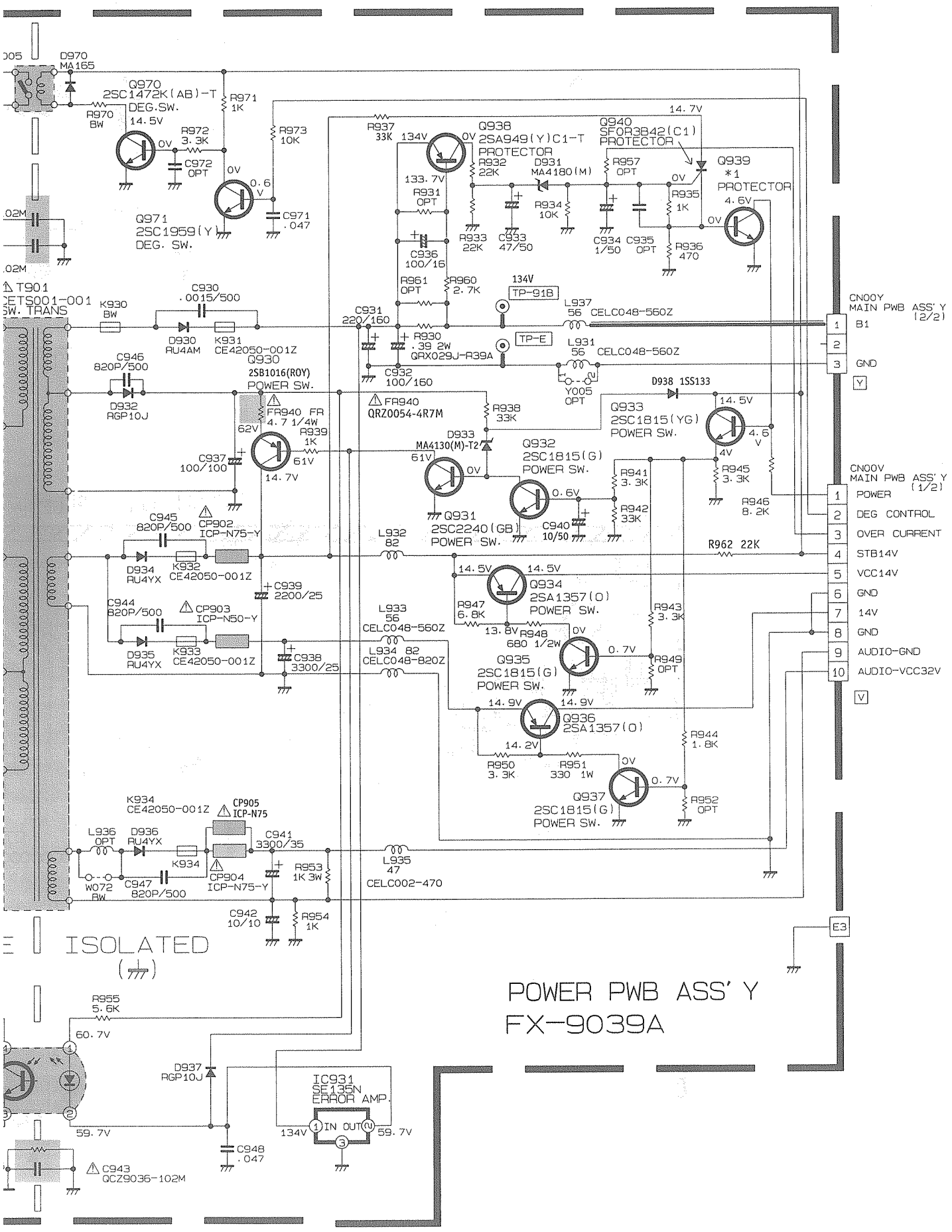
OPT : OPTION (NON MOUNTED)
BW : BUS WIRE
* : REFER TO THE DIFFERENCE LIST

	[FX-3030A]
⚠ V01	M68KTY165X
Q501	2SC1505(MLK)
D503	1SS146-T2
D504	1SS146-T2
L501	A49468-562
R506	270K
R507	8.2K 3W
R508	100K
R509	6.8K
C505	QFP32GK-563M
C506	82 500V

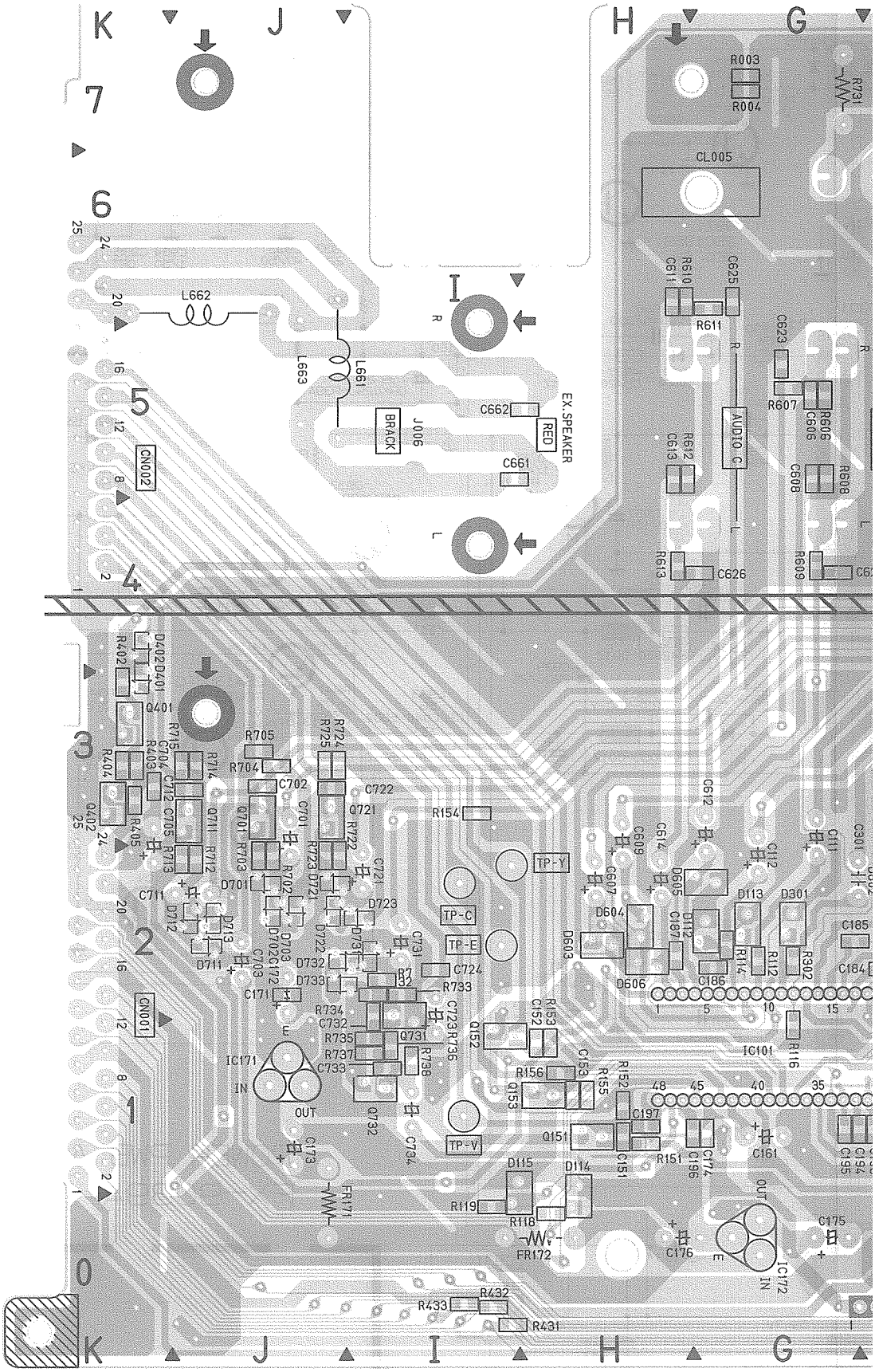
POWER PWB CIRCUIT DIAGRAMS

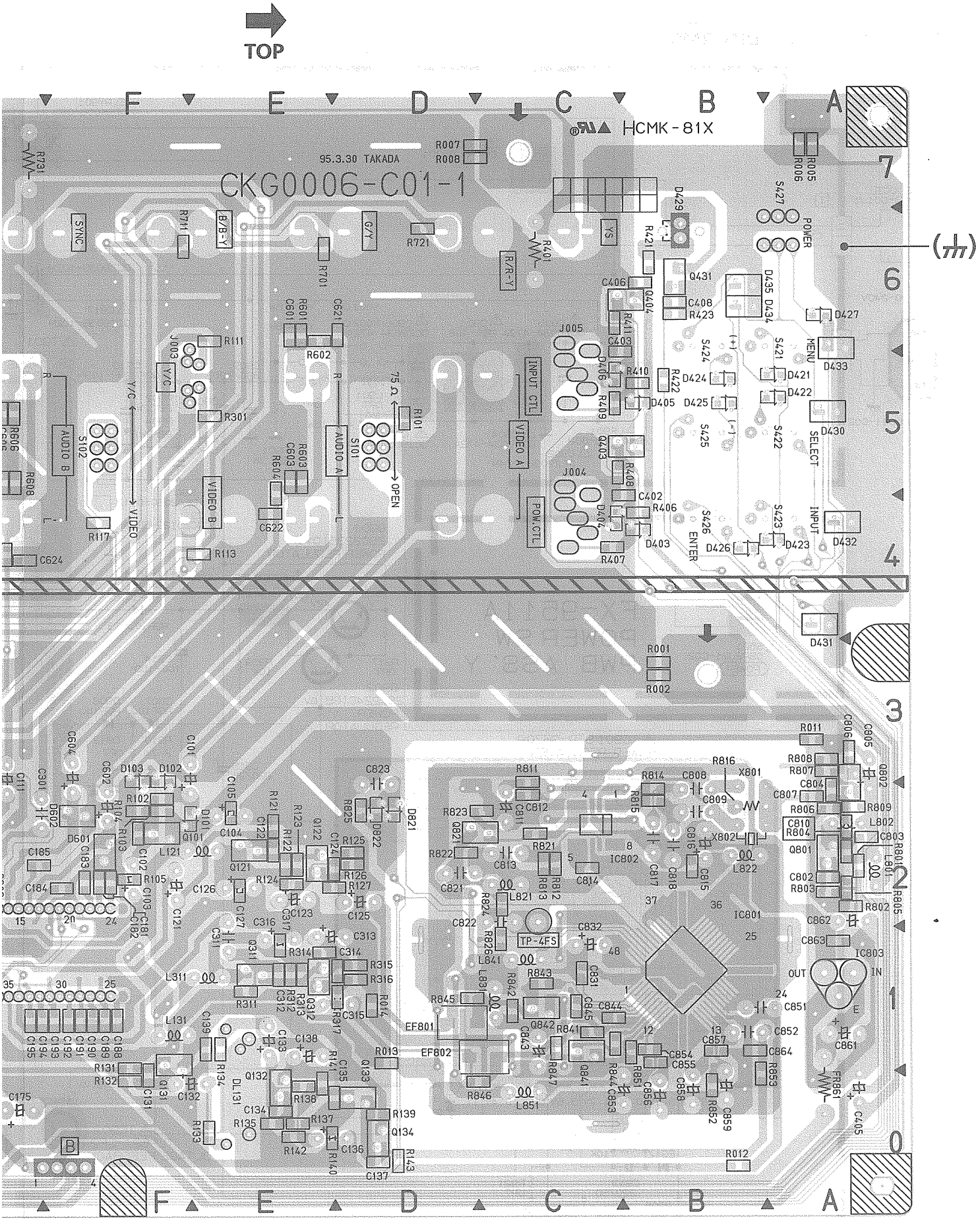


Refer to the following PWB pattern. : POWER PWB PATTERN 2-21,2-22page, POWER SW PWB PATTERN 2-21page.

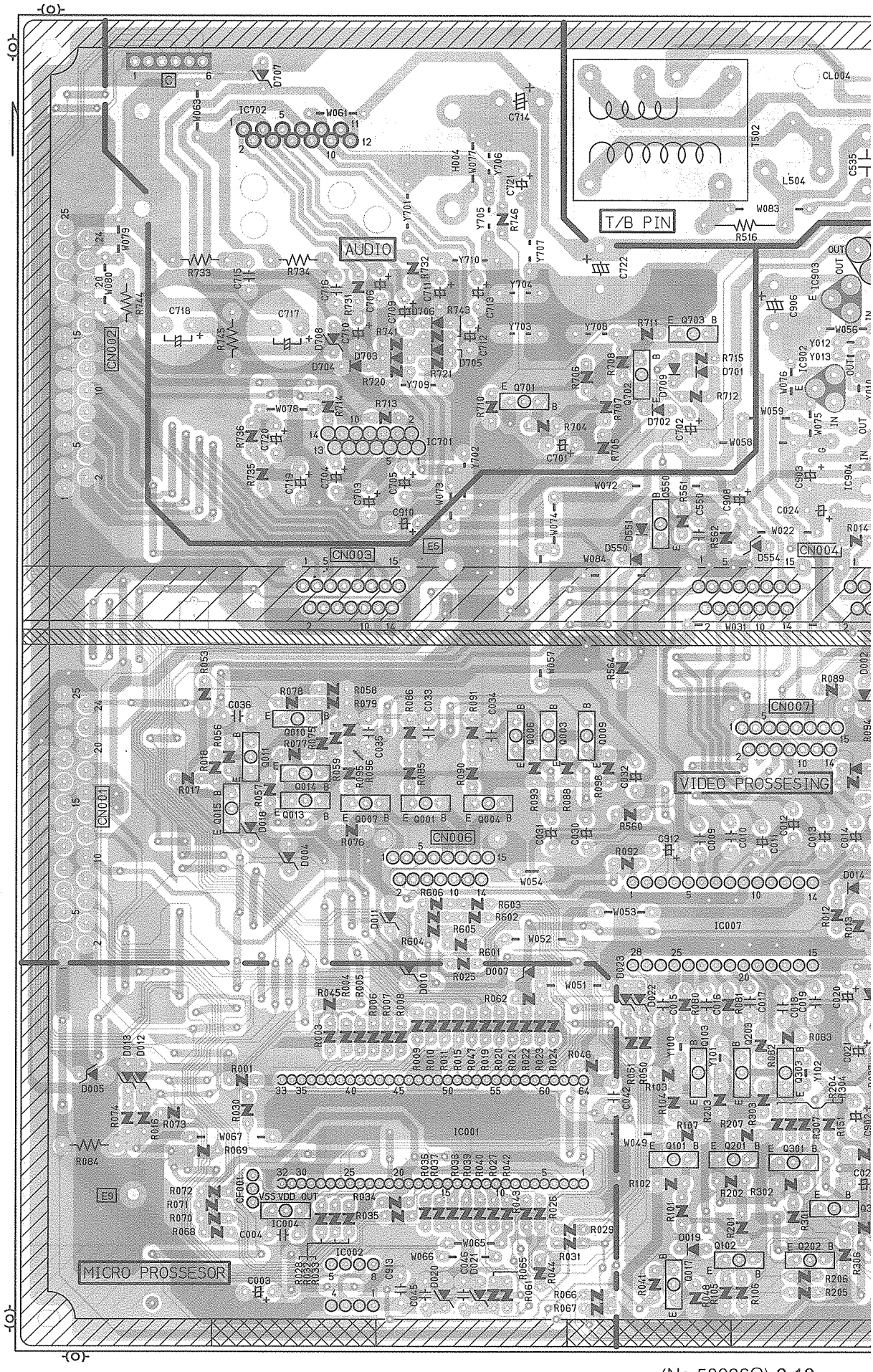


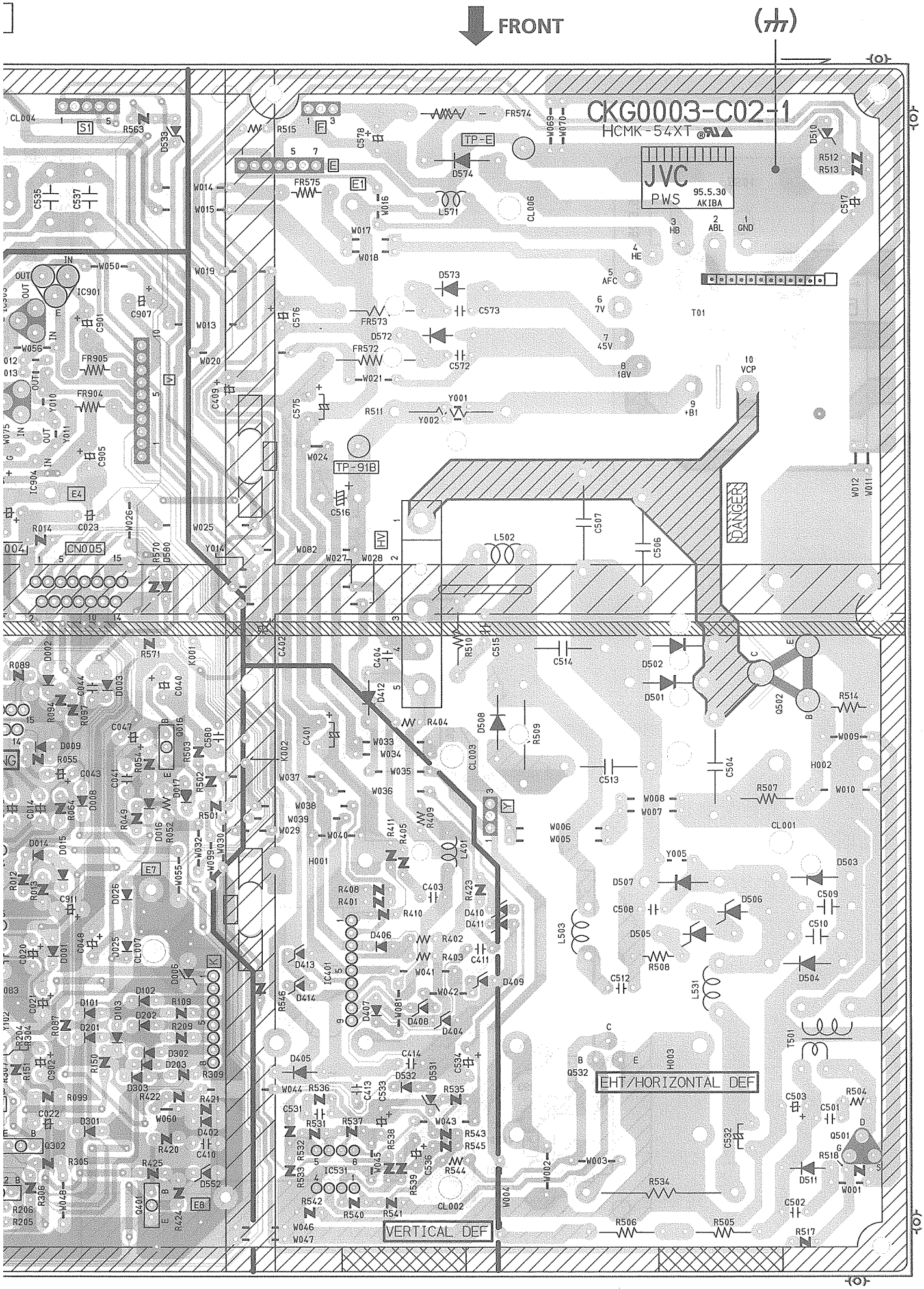
INPUT PWB PATTERN (FX-6038A)



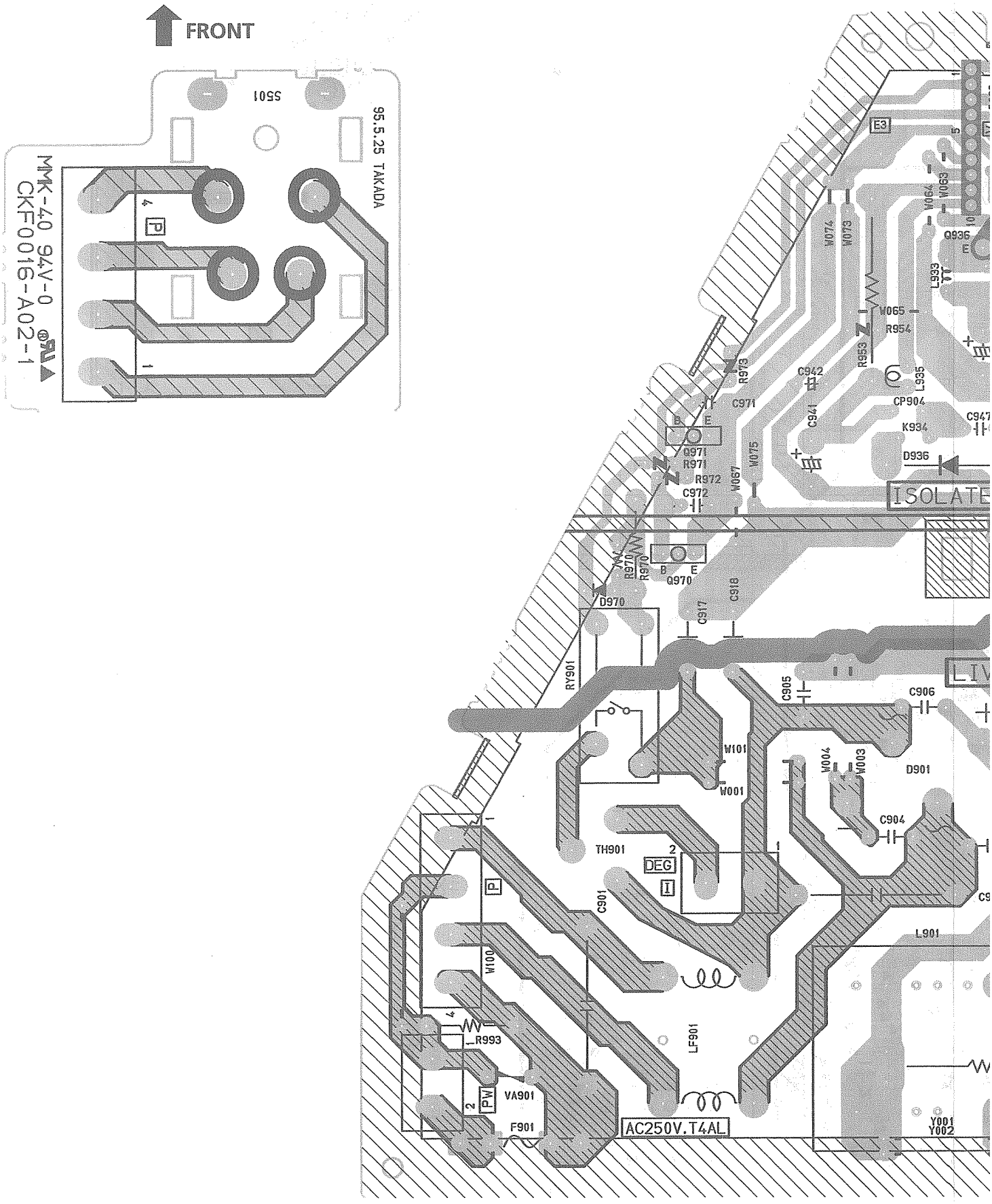

TOP
HCMK-81X
95.3.30 TAKADA
CKG0006-C01-1
SYNC
B/B-Y
G/Y
R/R-Y
Y/C
VIDEO
AUDIO B
AUDIO A
VIDEO B
VIDEO A
INPUT CTL
POW.CTL
75 Ω
OPEN
POWER
MENU
SELECT
ENTER
INPUT
TP-4FS
IC801
IC802
IC803
X801
X802
EF801
EF802
F
E
D
C
B
A
7
6
5
4
3
2
1
0

MAIN PWB PATTERN (FX-1063B)[TM-290ZE-B]

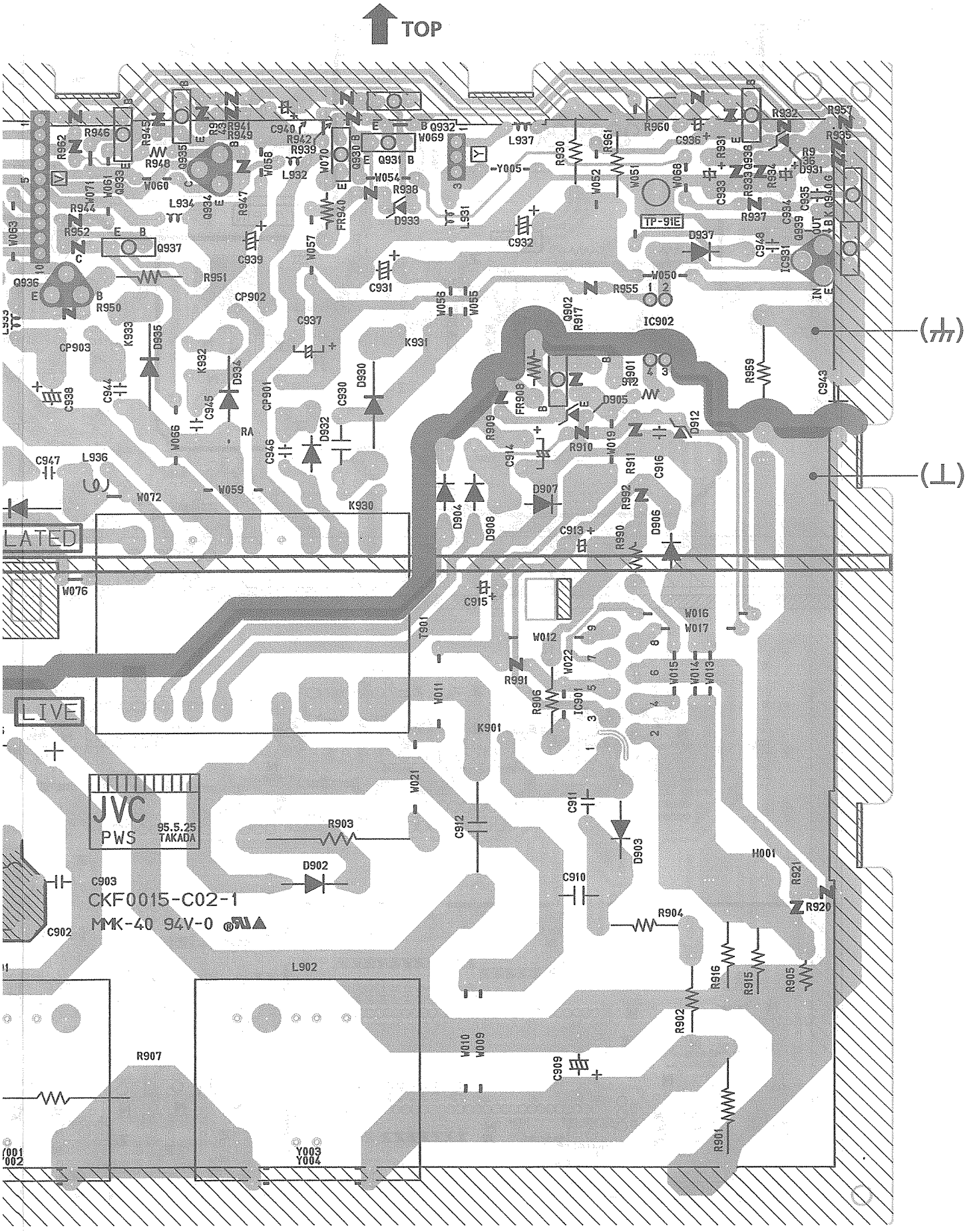



FRONT
CKG0003-C02-1
HCMK-54XT
JVC
P.W.S 95.5.30 AKIBA
TP-E
TP-91B
DANGER
EHT/HORIZONTAL DEF
VERTICAL DEF
CN005
S1
IC901
IC904
Q401
Q501
Q502
Q532
T01
T501
L502
L503
L531
L571
IC531
CL001
CL002
CL003
CL004
CL006
H001
H002
H003
TP-E
TP-91B

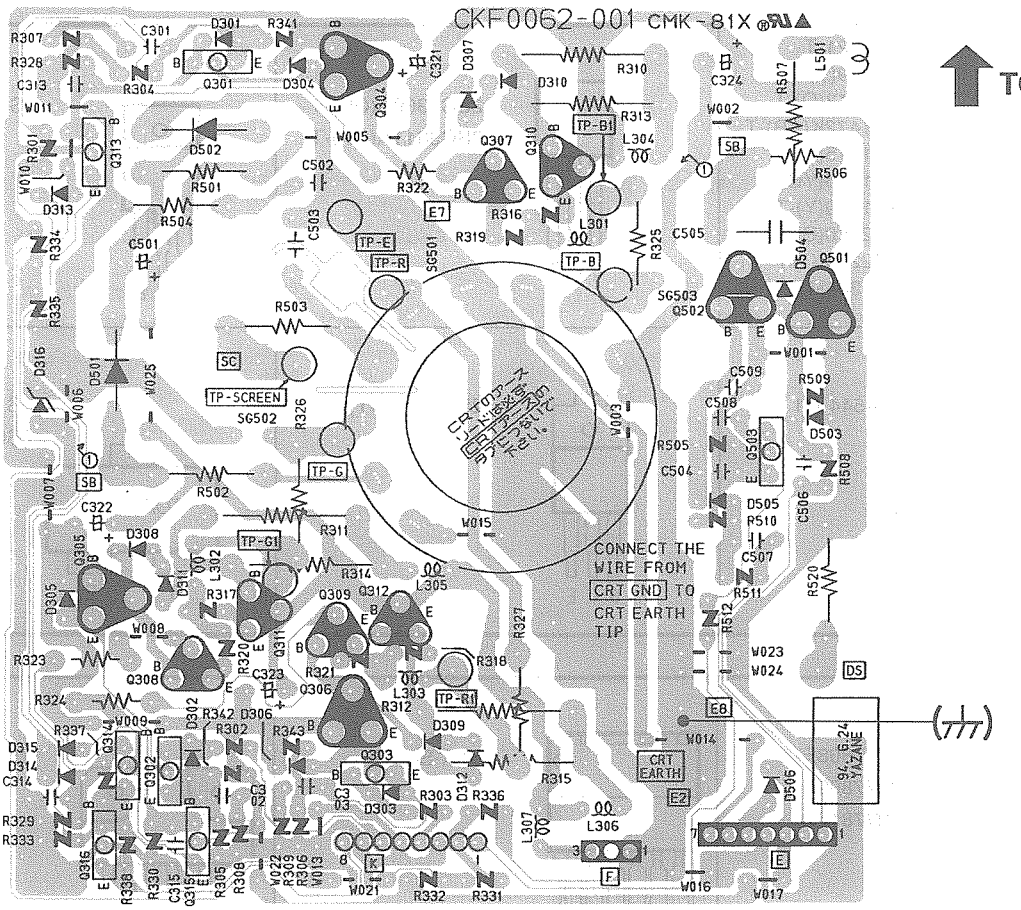
POWER PWB SW PATTERN (FX-9511A)



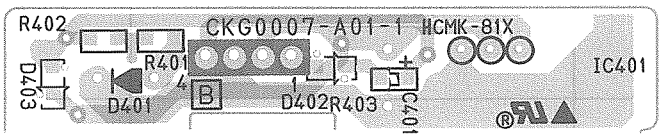
POWER PWB PATTERN (FX-9039A)



CRT SOCKET PWB PATTERN (FX-3030A)

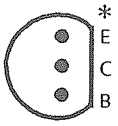


REMOCON PWB PATTERN (FX-4035A)

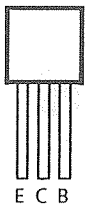


SEMICONDUCTOR SHAPES (* = Bottom view)

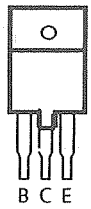
● TRANSISTOR



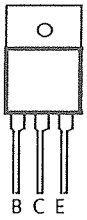
2SA1321-T
2SA949(Y)C1-T
2SA1013(O)-T
2SC1472K(AB)-T
2SC1815(G)-T
2SC1815(YG)-T
2SC1959(Y)-T
2SC2240(GB)-T
2SC2235(OY)
2SC3334-T



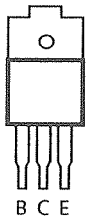
2SC1309A(QR)-T
2SC3311A(QR)-T



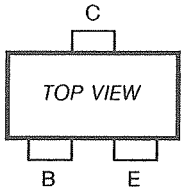
2SD2454-LB



2SC4544-C1

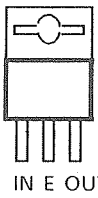


2SD1408(OY)-LB

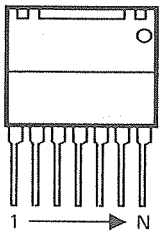


2SA1162(YG)-X
2SC2712(YG)-X

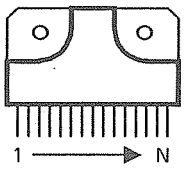
● IC



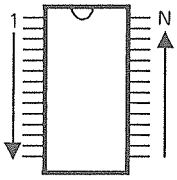
AN7805F
AN7808F
AN7809F
AN7812G



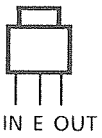
STR-S6709



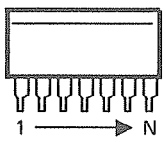
MC13516T2



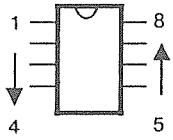
CXA1545AS
MB89P637
TDA4680/V6



TA7805F



M51131L



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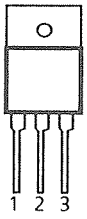
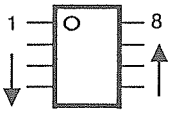
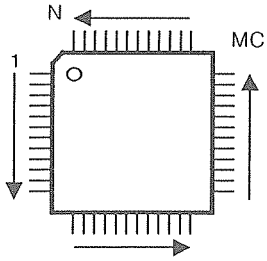


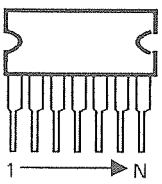
SE135N



NJM2240M-W



MC141625AFU



TDA8351

PARTS LIST

CAUTION

- The parts identified by the ⚠ 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 .
- As a rule, the resistors and capacitors which are indicated as shown in "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" are not shown in the list of the parts on the board .
  When ordering the service parts, confirm the resistance/rated power, capacitance/rated voltage, and type of the parts, then order by the part No. indicated according to "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" .

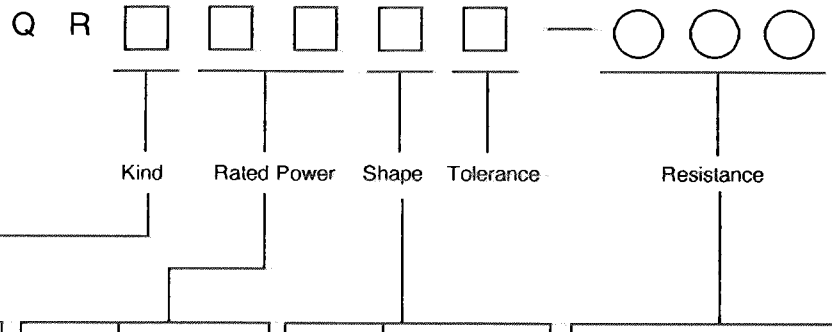
ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

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

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

HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS

■ RESISTOR



Symbol	Part Name
C	COMP.R
D	C R
S	CH MG R

Symbol	Rated Power
0 1	1 w
1 2	1/2 w
1 4	1/4 w
1 6	1/6 w
1 8	1/8 w

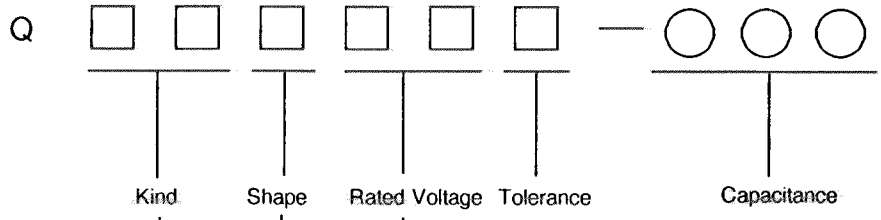
Symbol	Shape
1	Straight lead
8	Chip

Indicate with first two-figure expressed by Ω and following 0.
please note that,in case of resistance less than 10 Ω, a letter "R"will be effective as point.

EX.

2.2 Ω = 2R2
470 Ω = 47×10^1 → 471
150kΩ = 15×10^4 → 154

■ CAPACITOR



Symbol	Part Name
CS	C CAP.
CS	CH C CAP.
ET	E CAP.
FM	M CAP.

5Figure / 6Figure	0	1	2
A		10V	100V
C		16V	160V
D			200V
E		25V	250V
H		50V	500V
J	6.3V	63V	
V		35V	

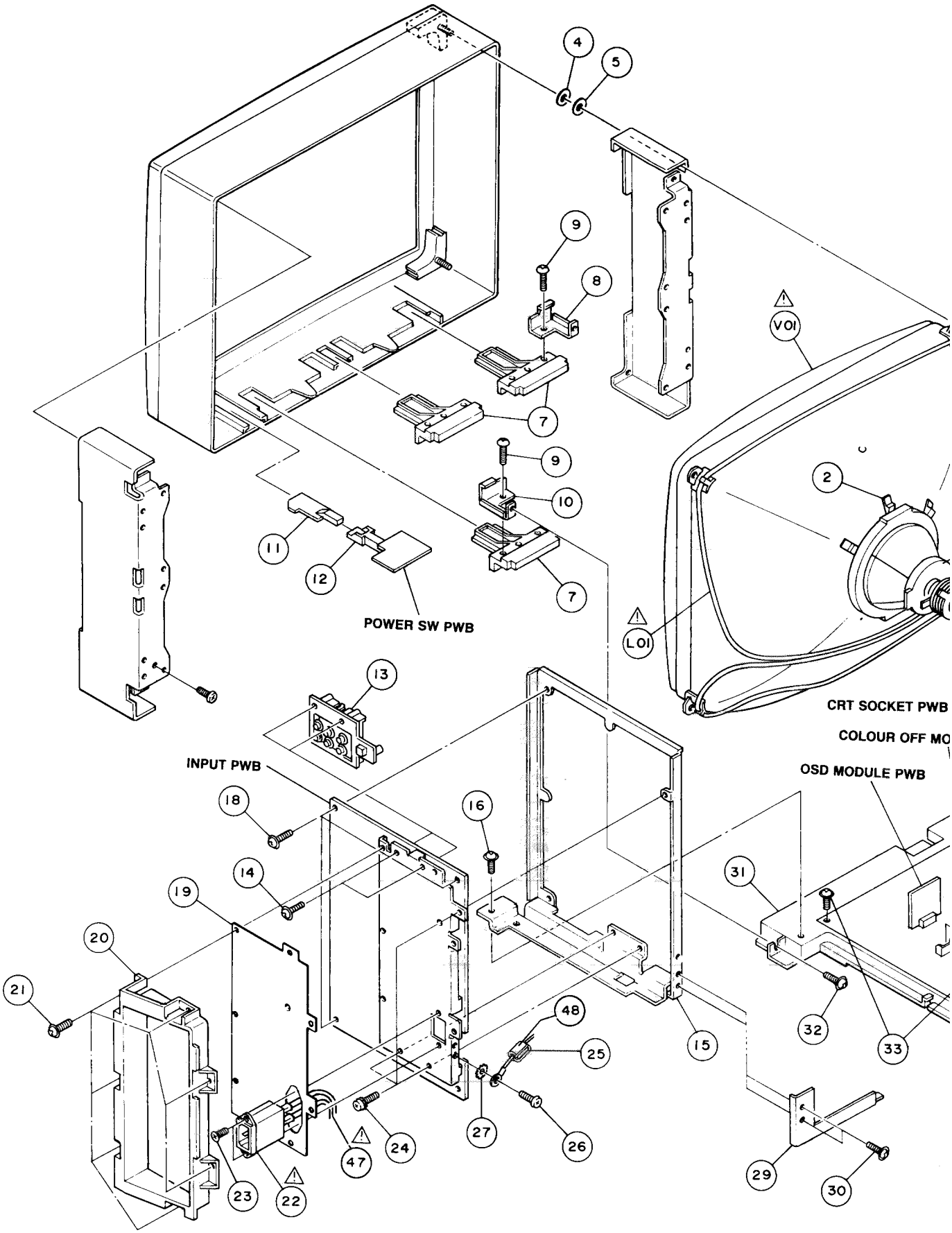
Indicate with first two-figure expressed by pF and following 0.
Please note that,in case of capacitance less than 10 pF a letter "R" will be effective as point.

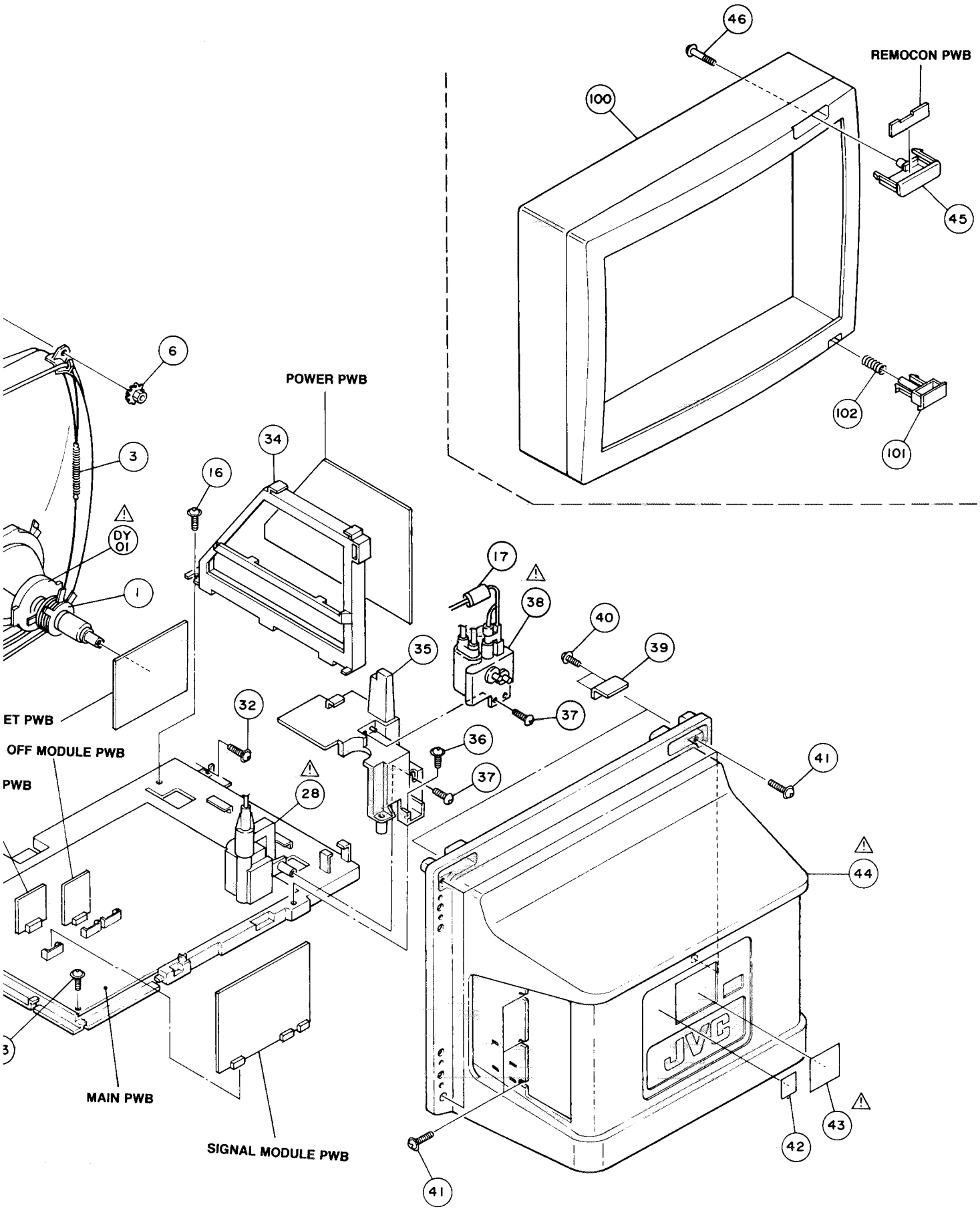
EX

5pF = 5R0
1000pF = 10×10^2 → 102
47μF = 47×10^6 → 476

Symbol	Shape
1	Straight lead
1	Leads in the same direction
8	Chip
A	Leads in the same direction (compact part)

EXPLODED VIEW




46
REMOCON PWB
100
45
6
POWER PWB
102
101
34
3
16
DY
01
17
38
40
39
1
35
37
ET PWB
32
36
OFF MODULE PWB
37
41
PWB
28
44
MAIN PWB
43
42
SIGNAL MODULE PWB
41

EXPLODED VIEW PARTS LIST

⚠	Ref.No.	Part No.	Part Name	Description	Local
⚠	V01	M68KTY165X	PICTURE TUBE		
⚠	L01	CELD047-001J1	DEG COIL		
⚠	DY01	CE20216-00C	DEFLECTION YOKE		
	1	A75034-B	P.C.MAGNET		
	2	CE40764-00A	WEDGE ASSY	(×4)	
	3	CHGB0015-0B-N	BRAIDED ASSY		
	4	Q03091-132	WASHER	(×4)	
	5	Q03091-118	WASHER	(×4)	
	6	CM45561-00A	NUT ASSY	(×4)	
	7	CM22619-A01	HOLDER	(×3)	
	8	CM47781-B02	HOLDER BRACKET		
	9	SSSB4016Z	TAPPING SCREW	(×2)	
	10	CM47781-B01	HOLDER BRACKET		
	11	CM35658-A01	SW ROD		
	12	CM35657-A01	SW HOLDER		
	13	CM47706-B01	KNOB	Inc.INPUT PWB	
	14	GBSB3012Z	TAPPING SCREW	Inc.INPUT PWB	
	15	CM12387-C02	PB BRACKET		
	16	SBSB4012Z	TAPPING SCREW	(×2)	
	17	CE41355-00F	CORE ASSY		
	18	GBSG3008Z	TAPPING SCREW	(×3)	
	19	CM35659-C03	TERMINAL SHEET		
	20	CM22616-002-V0	TERMINAL BASE		
	21	GBSG3008Z	TAPPING SCREW	(×7)	
⚠	22	CEML011-002	AC INLET(NOISE)		
	23	SSSB3010M	TAPPING SCREW	(×2)	
	24	CM44286-00A	ASSY SCREW	(×3)	
	25	CM47630-001	CORE CLAMP		
	26	CM44287-00B	ASSY SCREW		
	27	CM46603-001	T.LOCK WASHER		
⚠	28	CJTH005-00A	HVT	T01	
	29	CM35783-001	SUPPORT BRACKET		
	30	GBSB3008Z	TAPPING SCREW	(×2)	
	31	CM12008-B02-V0	CHASSIS BASE		
	32	SBSB4012Z	TAPPING SCREW	(×2)	
	33	GBSB3012Z	TAPPING SCREW	(×2)	
	34	CM12085-E01-V0	POWER PB BASE	Inc.POWER PWB	
	35	CM12504-A01-V0	HVT HOLDER		
	36	GBSB3012Z	TAPPING SCREW		
	37	SBSB4012Z	TAPPING SCREW	(×2)	
⚠	38	CJTF002-001	FOCUS PACK		
	39	CM47830-001	HANDLE COVER	(×2)	
	40	GBSF4016M	TAPPING SCREW	(×4)	
	41	GBSF4016M	TAPPING SCREW	(×7)	
	42	CM47832-002	INFO LABEL		
⚠	43	CM22867-025(R)	ROLL R LABEL		
⚠	44	CM12386-002-M0	REAR COVER		
	45	CM22618-005	INDICATOR WINDOW		
	46	CM41262-001	ASSY SCREW		
⚠	47	CHGW0003-0A-N	CONNECTOR ASSY		
	48	CE42236-001	SLEEVE CORE		
	100	CM12384-A0G-M0	FRONT CABI ASSY	Inc.No.101,102	
	101	CM35655-001	POWER KNOB		
	102	CM30861-079	SPRING		

PRINTED WIRING BOARD PARTS LIST

MAIN PW BOARD ASS'Y (FX-1063B)

⚠ Symbol No.	Part No.	Part Name	Description	Local
RESISTOR				
R1052	QRD123J-6R8SX	C R	6.8 Ω 1/2W	J
R1402-03	QRD123J-1R0SX	C R	1.0 Ω 1/2W	J
R1404	QRD123J-331SX	C R	330 Ω 1/2W	J
R1409	QRD123J-331SX	C R	330 Ω 1/2W	J
R1504	QRD123J-152SX	C R	1.5kΩ 1/2W	J
R1505-06	QRG029J-332A	OM R	3.3kΩ 2W	J
R1509	QRG039J-103A	OM R	10kΩ 3W	J
R1515	QRD123J-392SX	C R	3.9kΩ 1/2W	J
R1516	QRG019J-102S	OM R	1kΩ 1W	J
R1534	QRG039J-220	OM R	22 Ω 3W	J
R1544	QRD123J-682SX	C R	6.8kΩ 1/2W	J
R1570	QRV141F-1502AY	MF R	15kΩ 1/4W	F
R1571	QRV141F-2491AY	MF R	2.49kΩ 1/4W	F
CAPACITOR				
C1009-10	QFV71HJ-104MZ	TF CAP.	0.1μF 50V	J
C1011	QFLC1HJ-123MZ	M CAP.	0.012μF 50V	J
C1012-14	QFV71HJ-473MZ	TF CAP.	0.047μF 50V	J
C1015-17	QFV71HJ-224MZ	TF CAP.	0.22μF 50V	J
C1018	QFLC1HJ-102MZ	M CAP.	1000pF 50V	J
C1019	QFV71HJ-334MZ	TF CAP.	0.33μF 50V	J
C1023	QEN61HM-105Z	BP E CAP.	1μF 50V	M
C1030-32	QEN61HM-105Z	BP E CAP.	1μF 50V	M
C1041	QFV71HJ-563MZ	TF CAP.	0.056μF 50V	J
C1042	QFV71HJ-104MZ	TF CAP.	0.1μF 50V	J
C1402	QETC1JM-106Z	E CAP.	10μF 63V	M
C1403	QFLB2AK-224M	M CAP.	0.22μF 100V	K
C1409	QEHC1HM-227MZ	E CAP.	220μF 50V	M
C1411	QFLC2AK-823MZ	M CAP.	0.082μF 100V	K
C1413	QFV71HJ-824MZ	TF CAP.	0.82μF 50V	J
C1414	QFLC2AK-823MZ	M CAP.	0.82μF 100V	K
C1503	QETC2CM-105Z	E CAP.	1μF 160V	M
⚠ C1504	QFZ0117-3001S	MPP CAP.	3000pF 2kV	±2.5%
⚠ C1506	QFZ0117-6601S	MPP CAP.	6600pF 2kV	±2.5%
⚠ C1507	QFZ0117-6601S	MPP CAP.	6600pF 2kV	±2.5%
⚠ C1509	QFP32GJ-223M	PP CAP.	0.022μF 400V	J
C1513	QFZ0119-564S	MPP CAP.	0.56μF 200V	±3%
⚠ C1514	QFZ0119-534S	MPP CAP.	0.53μF 200V	±3%
C1516	QETB2CM-227	E CAP.	220μF 160V	M
C1517	QEN61HM-105Z	BP E CAP.	1μF 50V	M
C1532	QEZ0195-475MZ	E CAP.	47μF 50V	M
C1535	QFZ0119-254S	MPP CAP.	0.25μF 200V	±3%
C1578	QETB2EM-336	E CAP.	33μF 250V	M
C1580	QFLC2AK-104MZ	M CAP.	0.1μF 100V	K
C1715-16	QFV71HJ-124MZ	TF CAP.	0.12μF 50V	J
C1913	QFLC1HJ-102MZ	M CAP.	1000pF 50V	J
TRANSFORMER				
⚠ T01	CJTH005-00A	HVT		
T1501	CE42034-002	H.DRIVE TRANSF.		
T1502	CE42090-001	T/B PIN TRANSF.		
COIL				
L1401	CJ30030-024	HEATER CHOKE		
L1502	CELL007-002	LINEARITY COIL		
L1504	CE40140-00F	WIDTH COIL		
L1531	CELC009-001	WIDTH COIL		
L1571	CJ30030-051	CHOKE COIL		
DIODE				
D1001-03	1SS133-T2	SI.DIODE		
D1004-05	RD9.1ES(B2)-T2	ZENER DIODE		
D1006	RD6.2ES(B1)-T2	ZENER DIODE		
D1007	RD5.1ES(B2)-T2	ZENER DIODE		
D1008	1SS133-T2	SI.DIODE		
D1010-13	RD5.1ES(B2)-T2	ZENER DIODE		
D1014-16	1SS133-T2	SI.DIODE		

⚠	Symbol No.	Part No.	Part Name	Description	Local
	D I O D E				
	D1017	1SS81-T5	SI.DIODE		
	D1018	MA4039(H)-T2	ZENER DIODE		
	D1019	1SS133-T2	SI.DIODE		
	D1020-23	RD5.6ES(B2)-T2	ZENER DIODE		
	D1025-26	1SS133-T2	SI.DIODE		
	D1101-03	1SS133-T2	SI.DIODE		
	D1201-03	1SS133-T2	SI.DIODE		
	D1301-03	1SS133-T2	SI.DIODE		
	D1402	MA165-T2	SI.DIODE		
	D1404	RD24ES(B3)-T2	ZENER DIODE		
	D1405	1SS83-T2	SI.DIODE		
	D1406-07	1SS133-T2	SI.DIODE		
	D1408	RD24ES(B3)-T2	ZENER DIODE		
	D1409	RD33ES(B1)-T2	ZENER DIODE		
	D1410	RD24ES(B3)-T2	ZENER DIODE		
	D1411	RD33ES(B1)-T2	ZENER DIODE		
	D1412	1SR124-400A-T2	SI.DIODE		
	D1413	RD33ES(B1)-T2	ZENER DIODE		
	D1414	RD24ES(B3)-T2	ZENER DIODE		
	D1501-02	RH3G-C1	SI.DIODE		
	D1503-04	RU3AM-LFC4	SI.DIODE		
	D1508	RU2-LFA1	SI.DIODE		
	D1510	RD15ES(B2)-T2	ZENER DIODE		
	D1511	1SS81-T2	SI.DIODE		
	D1531	RD6.8ES(B3)-T2	ZENER DIODE		
	D1532	MA165-T2	SI.DIODE		
	D1533	RD6.8ES(B3)-T2	ZENER DIODE		
	D1550-51	MA165-T2	SI.DIODE		
	D1552	RD4.7ES(B3)-T2	ZENER DIODE		
	D1554	RD4.7ES(B3)-T2	ZENER DIODE		
	D1572-73	RGP10J(C1)-T3	SI.DIODE		
	D1574	RH1S-LFA1	SI.DIODE		
	D1580	1SS146-T2	SI.DIODE		
	D1701-06	1SS133-T2	SI.DIODE		
	D1707-08	RD33ES(B2)-T2	ZENER DIODE		
	D1709	1SS133-T2	SI.DIODE		
	T R A N S I S T O R				
	Q1001	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1003	2SA1309A(QR)-T	SI.TRANSISTOR		
	Q1004	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1006	2SA1309A(QR)-T	SI.TRANSISTOR		
	Q1009	2SA1309A(QR)-T	SI.TRANSISTOR		
	Q1010-11	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1013-14	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1015-16	2SA1309A(QR)-T	SI.TRANSISTOR		
	Q1017	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1101-02	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1201-02	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1301-02	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1401	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1501	BSN274	F.E.T.		
⚠	Q1502	2SD2454-LB	SI.TRANSISTOR		
	Q1532	2SD1408(OY)-LB	POWER TRANSISTOR		
	Q1550	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1701	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q1702	2SA1309A(QR)-T	SI.TRANSISTOR		
	Q1703	2SC3311A(QR)-T	SI.TRANSISTOR		
	I C				
	IC1001	MB89637P-156	I.C(MICRO-COMP)		
	IC1002	AT24C02-290ZE	I.C(EP-ROM)		
	IC1004	MN1381-Q-Y	I.C(MONO-ANA)		
	IC1007	TDA4680/V6	I.C(DIGI-OTHER)		
	IC1401	TDA8351/N3	I.C(MONO-ANA)		
	IC1531	UPC4558C	I.C(MONO-ANA)		

⚠	Symbol No.	Part No.	Part Name	Description	Local
	I C				
	IC1701	M51131L	I.C(MONO-ANA)		
	IC1702	MC13516T2	I.C(MONO-ANA)		
	IC1901	TA78012AP	I.C(MONO-ANA)		
	IC1902-03	AN7808F	I.C(MONO-ANA)		
	IC1904	TA7805F	I C		
	O T H E R S				
	CF1001	CST8.00MTW	CER.RESONATOR		
⚠	FR1572	QRH017J-1R0M	F R	1.0 Ω 1W	J
⚠	FR1573	QRH127J-6R8M	F R	6.8 Ω 1/2W	J
⚠	FR1574	QRH127J-120M	F R	12 Ω 1/2W	J
⚠	FR1575	QRZ0054-4R7M	F R	4.7 Ω 1/4W	J
⚠	FR1904	QRZ0054-100M	F R	10 Ω 1/4W	J
⚠	FR1905	QRZ0054-100M	F R	10 Ω 1/4W	J
	K1001-02	CE41433-001Z	BEADS CORE		

CRT SOCKET PW BOARD ASS'Y (FX-3030A)

⚠	Symbol No.	Part No.	Part Name	Description	Local
	R E S I S T O R				
	R3310-12	QRG029J-153	OM R	15k Ω 2W	J
	R3313-15	QRG029J-183	OM R	18k Ω 2W	J
⚠	R3322	QRD149J-102S	C R	1k Ω 1/4W	J
⚠	R3323	QRD149J-102S	C R	1k Ω 1/4W	J
⚠	R3324	QRD149J-102S	C R	1k Ω 1/4W	J
	R3507	QRG039J-822A	OM R	8.2k Ω 3W	J
	C A P A C I T O R				
	C3321	QETC2EM-105Z	E CAP.	1 μ F 250V	M
	C3501	QETB2EM-336	E CAP.	33 μ F 250V	M
	C3503	QCZ0121-102M	C CAP.	1000 p F 3kV	P
	C3505	QFP32GK-563M	PP CAP.	0.056 μ F 400V	K
	C O I L				
	L3301-03	CELP026-180Z	PEAKING COIL	18 μ H	
	L3304-06	CELP026-470Z	PEAKING COIL	47 μ H	
	L3501	A49468-562	PEAKING COIL	5600 μ H	
	D I O D E				
	D3301-03	1SS133-T2	SI.DIODE		
	D3304-06	1SS244-T2	SI.DIODE		
	D3307-09	1SS120-T2	SI DIODE		
	D3501	RGP10J(C1)-T3	SI.DIODE		
	D3502	RGP10J(C1)-T3	SI.DIODE		
	D3503-04	1SS146-T2	SI.DIODE		
	T R A N S I S T O R				
	Q3301-03	2SC4502-T	SI.TRANSISTOR		
	Q3304-06	2SC4544-C1	SI.TRANSISTOR		
	Q3307-09	2SA1321-T	SI TRANSISTOR		
	Q3310-12	2SC3334-T	SI TRANSISTOR		
	Q3501	2SC1505(MLK)	SI.TRANSISTOR		
	O T H E R S				
⚠	SK3001	CE42446-001	CRT SOCKET		

REMOCON PW BOARD ASS'Y (FX-4035A)

⚠ Symbol No.	Part No.	Part Name	Description	Local
D I O D E				
D4401	LN31GPH-TC1	L.E.D.(GRN)	POWER	
D4402-03	1SS353-X	CHIP DIODE		
I C				
IC4401	GP1U781R	IFR DETECT UNIT		

OSD MODULE PW BOARD ASS'Y (FX-4036A)

⚠ Symbol No.	Part No.	Part Name	Description	Local
O T H E R S				
	FX-4036A	OSD MODULE PW BOARD ASS'Y		

COLOUR OFF MODULE PW BOARD ASS'Y (FX-4038A)

⚠ Symbol No.	Part No.	Part Name	Description	Local
O T H E R S				
	FX-4038A	COLOUR OFF MODULE PW BOARD ASS'Y		

SIGNAL MODULE PW BOARD ASS'Y (FX-8009A)

⚠ Symbol No.	Part No.	Part Name	Description	Local
O T H E R S				
	FX-8009A	COLOUR OFF MODULE PW BOARD ASS'Y		

INPUT PW BOARD ASS'Y (FX-6038A)

⚠ Symbol No.	Part No.	Part Name	Description	Local
RESISTOR				
R6812	NRVA02D-4701NY	CHIP MF R	4.7kΩ 1/10W±0.5%	
R6813	NRVA02D-3902NY	CHIP MF R	39kΩ 1/10W±0.5%	
CAPACITOR				
C6102	NCT03CH-181AY	CHIP CAP.	180pF 1600V H	
C6105	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6127	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6139	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6171	NCF21HZ-103AY	CHIP C CAP.	0.1μF 50V Z	
C6174	NCF21HZ-103AY	CHIP C CAP.	0.1μF 50V Z	
C6181-97	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6301	QFLC1HJ-104MZ	M CAP.	0.1μF 50V J	
C6311	QFV71HJ-104MZ	TF CAP.	0.1μF 50V J	
C6315	QFV71HJ-104MZ	TF CAP.	0.1μF 50V J	
C6317	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6402-03	NCF21HZ-103AY	CHIP C CAP.	0.01μF 50V Z	
C6406	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6408	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6621-26	NCT03CH-181AY	CHIP CAP.	180pF 1600V H	
C6661-62	NCF21HZ-103AY	CHIP C CAP.	0.01μF 50V Z	
C6704	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6724	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6732-33	NCT03CH-181AY	CHIP CAP.	180pF 1600V H	
C6734	QEN61CM-476Z	BP E CAP.	47μF 16V M	
C6803	NCT03CH-470AY	CHIP CAP.	47pF 1600V H	
C6806	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6809	QCT25CH-390Z	C CAP.	39pF 50V J	
C6810	NCT03CH-221AY	CHIP CAP.	220pF 1600V H	
C6811	QEN61HM-475Z	BP E CAP.	4.7μF 50V M	
C6812	NCT03CH-102AY	CHIP CAP.	1000pF 1600V H	
C6813	QFLC1HJ-103MZ	M CAP.	0.01μF 50V J	
C6814	NCT03CH-6R0AY	CHIP CAP.	6pF 1600V H	
C6815	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6822	QFLC1HJ-103MZ	M CAP.	0.01μF 50V J	
C6831	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6843	QEN60JM-476Z	BP E CAP.	47μF 6.3V M	
C6844-45	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6852	QFLC1HJ-153MZ	M CAP.	0.015μF 50V J	
C6853	QEN60JM-476Z	BP E CAP.	47μF 6.3V M	
C6854-55	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6856	QEN61CM-106Z	BP E CAP.	10μF 16V M	
C6857	NCF21HZ-104AY	CHIP C CAP.	0.1μF 50V Z	
C6858	QEN61CM-106Z	BP E CAP.	10μF 16V M	
C6859	QEN61HM-105Z	BP E CAP.	1μF 50V M	
C6862	QETC0JM-227Z	E CAP.	220μF 6.3V M	
C6863	NCF21HZ-103AY	CHIP C CAP.	0.01μF 50V Z	
COIL				
L6121	CELP026-101Z	PEAKING COIL	100μH	
L6131	CELP026-101Z	PEAKING COIL	100μH	
L6311	CELP026-101Z	PEAKING COIL	100μH	
L6661-62	CELC054-100	COIL		
L6663	CE41832-001	LEAD CORE		
L6801	CELP026-101Z	PEAKING COIL	100μH	
L6802	CELP027-220Z	PEAKING COIL	22μH	
L6821	CELP027-100Z	PEAKING COIL	10μH	
L6822	CELP026-101Z	PEAKING COIL	100μH	
L6831	CELP026-101Z	PEAKING COIL	100μH	
L6841	CELP026-101Z	PEAKING COIL	100μH	
L6851	CELP026-101Z	PEAKING COIL	100μH	
DIODE				
D6101-03	1SS353-X	CHIP DIODE		
D6112-13	MA3120-X	ZENER DIODE		
D6114-15	MA3056-X	ZENER DIODE		

⚠	Symbol No.	Part No.	Part Name	Description	Local
	D I O D E				
	D6301	MA3120-X	ZENER DIODE		
	D6401-06	1SS353-X	CHIP DIODE		
	D6421-27	1SS353-X	CHIP DIODE		
	D6429	GL5KG8	L.E.D.		
	D6430-35	MA3056-X	ZENER DIODE		
	D6601-06	MA3120-X	ZENER DIODE		
	D6701-03	1SS353-X	CHIP DIODE		
	D6711-13	1SS353-X	CHIP DIODE		
	D6721-23	1SS353-X	CHIP DIODE		
	D6731-33	1SS353-X	CHIP DIODE		
	T R A N S I S T O R				
	Q6101	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6121-22	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6131-34	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6151-53	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6311-12	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6401-04	2SA1162(YG)-X	CHIP TRANSISTOR		
	Q6431	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6701	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6711	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6721	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6731	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6732	2SA1162(YG)-X	CHIP TRANSISTOR		
	Q6801-02	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6821	2SC2712(YG)-X	CHIP TRANSISTOR		
	Q6841-42	2SA1162(YG)-X	CHIP TRANSISTOR		
	I C				
	IC6101	CXA1545AS	I.C.		
	IC6171	AN7812F	I.C(MONO-ANA)		
	IC6172	AN7809F	I.C.		
	IC6801	MC141625AFU	I.C(DIGI-OTHER)		
	IC6802	NJM2240M-W	I.C(MONO-ANA)		
	IC6803	AN7805F	I.C(MONO-ANA)		
	O T H E R S				
		CM47706-B01	KNOB		
		GBSB3012Z	TAPPING SCREW		
		CM48038-001	LED HOLDER		
	CN6001-02	CHA401N-25R-J	HQF CONNECTOR		
	DL6131	CE42330-001	LOWPASS FILTER		
⚠	FR6171	QRZ0054-120M	F R	12 Ω 1/4W J	
⚠	FR6172	QRZ0054-120M	F R	12 Ω 1/4W J	
⚠	FR6861	QRZ0054-120M	F R	12 Ω 1/4W J	
	J6001	CM35766-A0A	TERMINAL ASSY		
	J6002	CM35767-00B	TERMINAL ASSY		
	J6003	QMCC006-C01	DIN CONNECTOR		
	J6004-05	QMS3005-C01	3.5 JACK		
	J6006	CEMT005-002	EXT SP TERMINAL		
	S6101	QSS4C22-C05	SLIDE SWITCH	OPEN ↔ 75Ω	
	S6102	QSS4C22-C05	SLIDE SWITCH	VIDEO ↔ Y/C	
	S6421	QSP4H11-C04Z	PUSH SWITCH	MENU	
	S6422	QSP4H11-C04Z	PUSH SWITCH	SELECT	
	S6423	QSP4H11-C04Z	PUSH SWITCH	INPUT	
	S6424	QSP4H11-C04Z	PUSH SWITCH	▲(+)	
	S6425	QSP4H11-C04Z	PUSH SWITCH	▼(-)	
	S6426	QSP4H11-C04Z	PUSH SWITCH	ENTER	
	S6427	QST0103-C03	PUSH SWITCH	POWER	
	X6801	CE40479-001	CRYSTAL		
	X6802	CE40668-001	CRYSTAL		

POWER PW BOARD ASS'Y (FX-9039A)

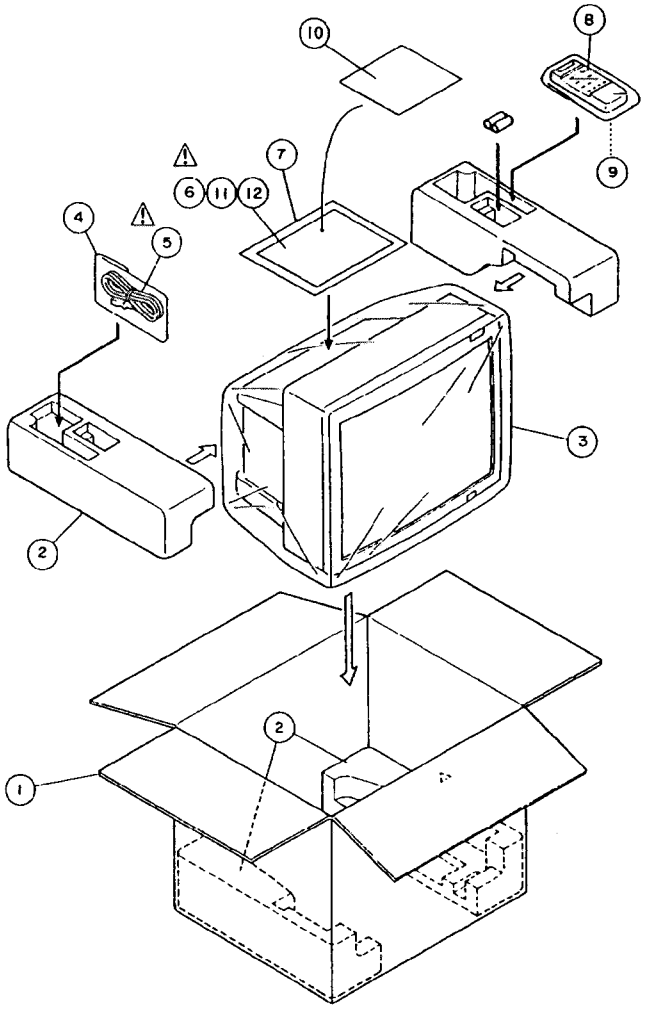
⚠	Symbol No.	Part No.	Part Name	Description	Local
		RESISTOR			
	R9901	QRG039J-683A	OM R	68kΩ 3W	J
	R9902	QRG029J-223A	OM R	22kΩ 2W	J
	R9903	QRG039J-563	OM R	56kΩ 3W	J
	R9904	QRG029J-223A	OM R	22kΩ 2W	J
	R9905	QRM059K-R22	MP R	0.22 Ω 5W	K
	R9906	QRG019J-120S	OM R	12 Ω 1W	J
	R9907	QRF154K-4R7	UNF R	4.7 Ω 15W	K
	R9912	QRD123J-102SX	C R	1kΩ 1/2W	J
	R9930	QRX029J-R39A	MF R	0.39 Ω 2W	J
	R9948	QRD123J-681SX	C R	680 Ω 1/2W	J
	R9951	QRG019J-331S	OM R	330 Ω 1W	J
	R9953	QRG039J-102	OM R	1kΩ 3W	J
⚠	R9959	QRZ0057-825	C R	8.2MΩ 1W	J
	R9990	QRM059K-1R0	MP R	1.0 Ω 5W	K
⚠	R9993	QRZ0111-474	C R	470kΩ 1/2W	K
		CAPACITOR			
⚠	C9901	QFZ9036-224M	M F CAP.	0.22μ FAC250V	M
⚠	C9902	QFZ9036-224M	M F CAP.	0.22μ FAV250V	M
⚠	C9903	QCZ9034-472A	C CAP.	4700p FAC400V	M
⚠	C9904	QCZ9034-472A	C CAP.	4700p FAC400V	M
⚠	C9905	QCZ9034-472A	C CAP.	4700p FAC400V	M
⚠	C9906	QCZ9034-472A	C CAP.	4700p FAC400V	M
	C9909	QEZ0111-397R	E CAP.	390μF 400V	M
	C9910	QCF22HP-103M	CH C CAP.	0.01μF 500V	P
	C9911	QCZ0122-561A	C CAP.	560pF 2kV	K
	C9912	QFZ0117-1501S	MPP CAP.	1500pF 2kV	±2.5%
	C9914	QETC2AM-107Z	E CAP.	100μF 100V	M
⚠	C9917	QCZ9036-102M	C CAP.	1000pF 400V	K
⚠	C9918	QCZ9036-102M	C CAP.	1000pF 400V	K
	C9930	QCZ0122-152A	C CAP.	1500pF 2kV	K
	C9931	QETB2CM-227	E CAP.	220μF 160V	M
	C9932	QETB2CM-107	E CAP.	100μF 160V	M
	C9937	QETC2AM-107Z	E CAP.	100μF 100V	M
	C9940	QEHC1HM-106MZ	E CAP.	10μF 50V	M
	C9941	QETB1VM-338	E CAP.	3300μF 35V	M
⚠	C9943	QCZ9036-102M	C CAP.	1000pF 400V	K
	C9948	QFLC2AK-473MZ	M CAP.	0.047μF 100V	K
	C9971	QFLC2AK-473MZ	M CAP.	0.047μF 100V	K
		TRANSFORMER			
⚠	T9901	CETS001-001	SWITCH.TRANSF.		
		COIL			
	L9931	CELC048-560Z	CHOKE COIL	56μH	
	L9932	CELC048-820Z	CHOKE COIL	82μH	
	L9933	CELC048-560Z	CHOKE COIL	56μH	
	L9935	CELC002-470	CHOKE COIL	47μH	
	L9937	CELC048-560Z	CHOKE COIL	56μH	
		DIODE			
⚠	D9901	RBV-408	BRIDGE DIODE		
	D9902	RM1C-T3	SI DIODE		
	D9903	RG1C-LFA1	SI.DIODE		
	D9904	RGP10J-T3	SI.DIODE		
	D9905	MA4075(H)-T2	ZENER DIODE		
	D9906	EG1Z-T3	SI.DIODE		
	D9907-08	RGP10J-T3	SI.DIODE		
	D9909	RGP10J(C1)	SI.DIODE		
	D9930	RU4AM-C1	SI.DIODE		
	D9931	MA4180(M)-T2	ZENER DIODE		
	D9932	RGP10J-T3	SI.DIODE		
	D9933	MA4130(M)-T2	ZENER DIODE		
	D9934-36	RU4YX-C1	SI.DIODE		
	D9937	RGP10J-T3	SI.DIODE		
	D9938	1SS133	SI.DIODE		
	D9970	MA165-T2	SI.DIODE		

⚠	Symbol No.	Part No.	Part Name	Description	Local
	T R A N S I S T O R				
	Q9901	2SC2235(OY)	SI.TRANSISTOR		
	Q9902	2SC2240(GB)-T	SI.TRANSISTOR		
	Q9930	2SB1016(ROY)	SI.TRANSISTOR		
	Q9931	2SC2240(GB)-T	SI.TRANSISTOR		
	Q9932	2SC1815(G)-T	SI.TRANSISTOR		
	Q9933	2SC1815(YG)-T	SI.TRANSISTOR		
	Q9934	2SA1357(O)	SI.TRANSISTOR		
	Q9935	2SC1815(G)-T	SI.TRANSISTOR		
	Q9936	2SA1357(O)	SI.TRANSISTOR		
	Q9937	2SC1815(G)-T	SI.TRANSISTOR		
	Q9938	2SA949(Y)C1-T	SI.TRANSISTOR		
	Q9939	2SC3311A(QR)-T	SI.TRANSISTOR		
	Q9940	SF0R3B42(C1)-T	S C R		
	Q9970	2SC1472K(AB)-T	SI TRANSISTOR		
	Q9971	2SC1959(Y)-T	SI.TRANSISTOR		
	I C				
⚠	IC9901	STR-S6709	I.C(HYBRID)		
⚠	IC9902	TLP621-LF2	I.C(PH.COUPLER)		
	IC9931	SE135N	I.C(HYBRID)		
	O T H E R S				
		CEMG002-001Z	FUSE CLIP		
		CM12085-E01-V0	POWER PB BASE		
⚠	CP9902	ICP-N75-Y	I.C.PROTECT		
⚠	CP9903	ICP-N50-Y	I.C.PROTECT		
⚠	CP9904	ICP-N75-Y	I.C.PROTECT		
⚠	CP9905	ICP-N75	I.C.PROTECT		
⚠	F9901	QMF51E2-4R0S	FUSE	4A	
⚠	FR9908	QRZ0054-470M	F R	47 Ω 1/4W J	
⚠	FR9940	QRZ0054-4R7M	F R	4.7 Ω 1/4W J	
	K9901	CE42050-001Z	CORE		
	K9931-34	CE42050-001Z	CORE		
⚠	LF9901	CE41775-002	LINE FILTER		
⚠	RY9901	CESK006-005	RELAY		
⚠	TH9901	CEKP008-001	P.THERMISTOR		
⚠	VA9901	ERZ-C10VK621G	VARISTOR		

POWER SW PW BOARD ASS'Y (FX-9511A)

⚠	Symbol No.	Part No.	Part Name	Description	Local
	O T H E R S				
⚠	S9501	QSP2J21-C02	PUSH SWITCH	POWER	

PACKING



PACKING PARTS LIST

⚠	Ref.No.	Part No.	Part Name	Description	Local
	1	CP11245-011	PACKING CASE		
	2	CP11220-B0A	PACKING CUSHION		
	3	AP3756-44	POLY BAG		
	4	QPGA012-03005	POLY BAG		
⚠	5	QMP4908-200K	POWER CORD		
⚠	6	CQ40027-003	INST BOOK		
	7	QPGA025-03505	POLY BAG		
	8	RM-C560-1	RC HAND PIECE		
	9	BAS110201A	BATTERY COVER	(FOR RC HAND PIECE)	
	10	CP30812-002	CAUTION SHEET		
	11	CM23030-001	X-RAY CARD		
	12	CM23079-001	X-RAY CARD		

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