NEC

PART NO. 599910516

SERVICE MANUAL

COLOR MONITOR **MultiSync® FP1350**

MODEL FP1350-1 (B)

NEC Corporation

200007
08109312

WARNING

The SERVICE PERSONNEL should have the appropriate technical training, knowledge and experience necessary to:

- Be familiar with specialized test equipment, and
- Be careful to follow all safety procedures associated with high voltage CRT circuit designs to minimize danger to themselves and their coworkers.

To avoid electrical shocks, this equipment should be used with an appropriate power code and be connected only to a properly grounded AC outlet.

This equipment utilized a micro-gap power switch. Turn off the set by first pushing the front panel power switch. Next, remove the power cord from the AC outlet.

To prevent fire or shock hazards, do not expose this unit to rain or moisture.

This symbol warns the personnel that un-insulated voltage within the unit may have sufficient magnitude to cause electric shock.

This symbol alerts the personnel that important literature concerning the operation and maintenance of this unit has been included.

Therefore, it should be read carefully in order to avoid any problems.

PRODUCT SAFETY CAUTION

1. When parts replacement is required for servicing, always use the manufacturer's specified replacement.

2. Comply with all caution and safety-related notes on the product display chassis and picture tube.

3. When replacing the component, always be certain that all the components are put back in the place.

4. When servicing display monitor unit, it is required that the provided lead dress is used in the high voltage circuit area.

5. It is also recommended that shatter proof goggles are worn, when removing installing and handling the picture tube. People not equipped with the proper precautionary measures mentioned should keep the picture tube away from body while handling.

6. As for a connector, pick and extract housing with fingers properly since a disconnection and improper contacts may occur, when wires of the connector are led.

7. Use a proper screwdriver. If you use screwdriver that does not fit, you may damage the screws.

8. X-radiation precaution

   This product contains critical electrical and mechanical parts essential for X-ray protection.

   Normal anode voltage is 27.0 kV at zero beam picture tube current under AC 100-120V/220-240V input, and anode voltage must not exceed the voltages shown below under any operation condition.

   To measure anode voltage set brightness for very dim picture, and use a high impedance volt meter between chassis and anode lead and measure high voltage.

   If high voltage exceeds the specifications on the chassis schematic diagram, take the necessary corrective action.

Table MAXIMUM ANODE VOLTAGE

beam current	at 0 mA	at 0.7 mA	at 1.4 mA
A/B/R	34.5 kV	32.5 kV	32.3 kV

9. When you degauss the set with an external degaussing coil, you must keep strictly item " * Notes about degaussing method " of ADJUSTMENT PROCEDURES.

CONTENTS

SPECIFICATION

Monitor Specifications	MultiSync® FP1350™ Monitor	Notes
Picture Tube Diagonal: Viewable Image Size: Radius:	55.3 cm / 22 inch 50.8 cm / 20 inch 57800 mm	90° deflection, 0.25 - 0.27 mm (variable) grille pitch, Medium-Short persistence phosphor, aperture grille CRT, multi-layered, anti-static screen coating, semi-dark-tint screen, and OptiClear® screen surface.
Input Signal Video: Sync:	ANALOG 0.7 Vp-p/75 Ohms Separate sync. TTL Level Horizontal sync. Positive/Negative Vertical sync. Positive/Negative Composite sync. (Positive/Negative) (TTL Level) Sync on Green video (Positive) 0.7 Vp-p and sync. (Negative) 0.3 Vp-p	
Display Colors Analog input:	Unlimited number of Colors	Depends on display card used.
Synchronization Horizontal: Range Vertical:	31 kHz to 115 kHz 55 Hz to 160 Hz	Automatically Automatically
Resolutions Supported Resolution based on horizontal and vertical frequencies only	640 x 480 @ 60 to 160 Hz 800 x 600 @ 55 to 160 Hz 832 x 624 @ 55 to 160 Hz 1024 x 768 @ 55 to 143 Hz 1152 x 870 @ 55 to 125 Hz 1280 x 1024 @ 55 to 107 Hz 1600 x 1200 @ 55 to 92 Hz ..... 1792 x 1344 @ 55 to 81 Hz 1800 x 1440 @ 55 to 76 Hz 1856 x 1392 @ 55 to 78 Hz 1920 x 1440 @ 55 to 76 Hz	Some systems may not support all modes listed. NEC cites recommended resolution a 85 Hz for optimal display performance
Active Display Area Horizontal: (Factory Setting) Vertical:	396 mm 297 mm	Dependent upon signal timing used, and does not include border area.
Active Display Area (Full Scan)	406 mm 305 mm	Dependent upon signal timing used, and does not include border area.
Power Supply	AC 100 - 120 V / 220 - 240 V, 50/60 Hz	
Current Rating	2.3A @ 100 - 120 V / 1.0A@ 220-240 V	
Dimensions	483 mm (W) x 501 mm (H) x 472 mm (D)	
Weight	34.0 kg	
Environmental Considerations Operating Temperature: Humidity: Altitude: Storage Temperature: Humidity: Altitude:	 10°C to + 35°C 30% to 80% 0 to 3000 m -20°C to + 60°C 10% to 90% 0 to 13700 m	

NOTE: Technical specifications are subject to change without notice.

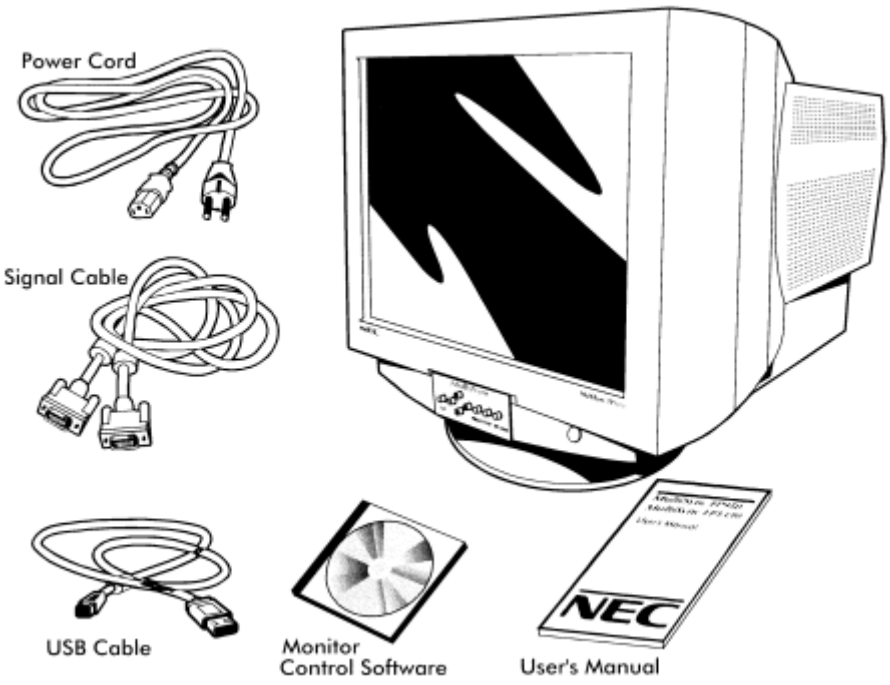
USER'S MANUAL

Only the point is mentioned

Contents

FP Series monitor box* should contain the following:

- MultiSync FP Series Monitor with tilt/swivel base
  MultiSync FP950™ (JC-1946UMW) or
  MultiSync FP1350™ (JC-2241UMW)
- Power Cord
- Signal Cable
- USB Cable
- Monitor Control Software
- User's Manual



*Remember to save your original box and packing material to transport or ship the monitor.

Quick Start

To attach the MultiSync® FP Series monitor to your system,follow these instructions:

1. Turn off the power to your computer and MultiSync monitor.
   If you are using the signal cable, continue to Step 2.
   If you are using a BNC cable, please skip to Step 3.

   NOTE: BNC cables may be purchased at your local electronics store.

2. **For the PC:** Connect one end of the 15-pin mini D-SUB signal cable to the connector of the display card in your system **(Figure A.1)** and the other end to the back of the monitor **(Figure A.2)**. Tighten all screws. Proceed to Step 4.

   For the Mac: Connect the Macintosh cable adapter to the computer (Figure B.1). Attach one end of the 15-pin mini D-SUB signal cable to the Macintosh cable adapter **(Figure B.1)** and the other end to the back of the monitor **(Figure B.2)**. Tighten all screws.
   Proceed to Step 4.

3. Connect the BNC cable to the appropriate connectors on the back of the monitor. Connect the red BNC cable to the BNC connector on the monitor labeled R, the green BNC cable to the BNC connector labeled G (/Sync), the blue BNC cable to the BNC connector labeled B. If you have a fourth BNC connector (Composite Sync), connect it to the BNC connector on the monitor labeled HS/CS. If you have a fifth BNC connector (Vertical Sync), connect it to the BNC connector on the monitor labeled VS **(Figure C.1)**.

NOTE: Incorrect cable connections may result in irregular operation or damage display components.

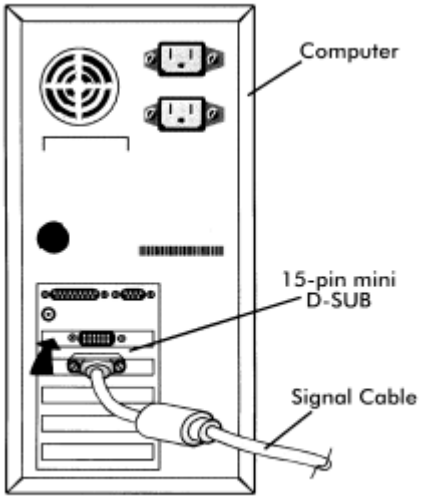


Figure A.1

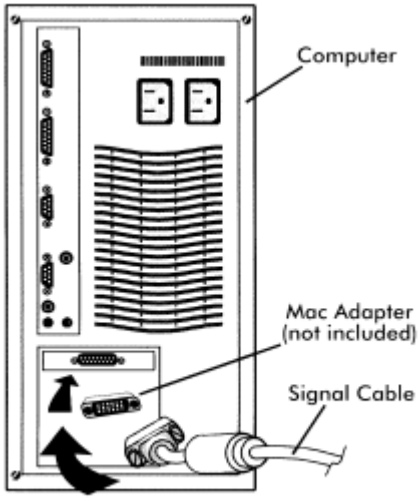


Figure B.1

4. Connect one end of the power cord to the MultiSync® FP Series monitor and the other end to the power outlet **(Figure D.1)**.
5. Turn on the monitor **(Figure E.1)** and the computer.
6. The Factory Setting for your monitor is set for D-SUB installation. If you are using a BNC cable connection, push the BNC/D-SUB button on the front of the monitor **(Figure E.1)** to switch settings.

NOTE: If you have any problems, please refer to the Troubleshooting section of this User's Manual.

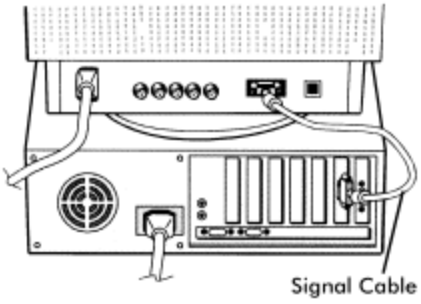


Figure A.2

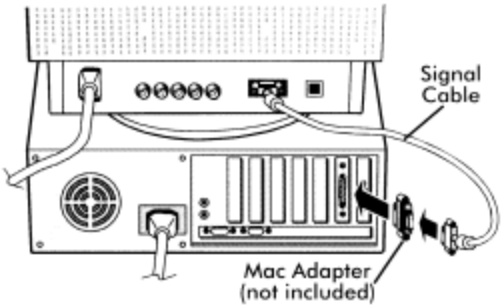


Figure B.2

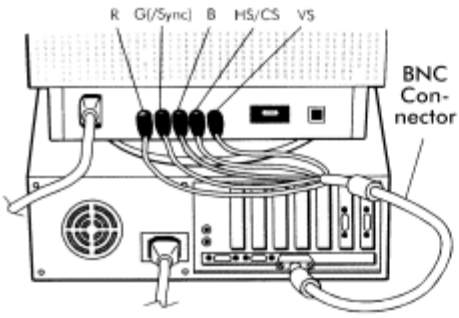


Figure C.1

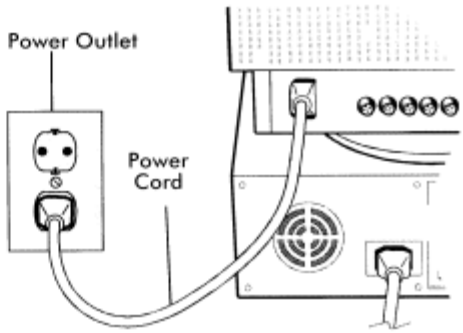


Figure D.1

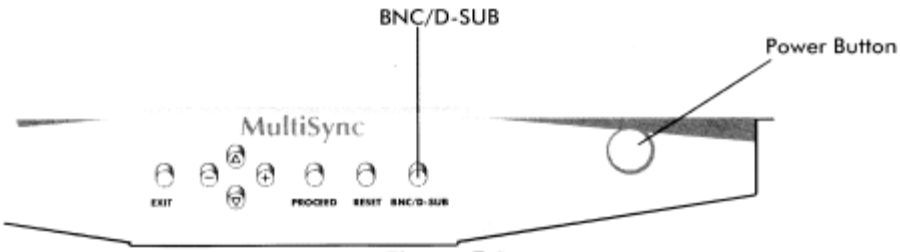


Figure E.1

If your computer is equipped with USB and uses the Windows® 98 operating system and you want to operate the monitor's user controls using your system, you can install USB support by using the following procedure. To attach the USB port on your MultiSync FP Series monitor to a USB port on your system:

1. Using the supplied USB cable, connect the USB Series B connector end to the USB upstream port on the monitor **(Figure 1)**.
2. Connect the other end of the supplied cable to the USB downstream port on the computer (or to a USB Hub attached to the computer) **(Figure 1)**.
3. Install the supplied Monitor Control Software.

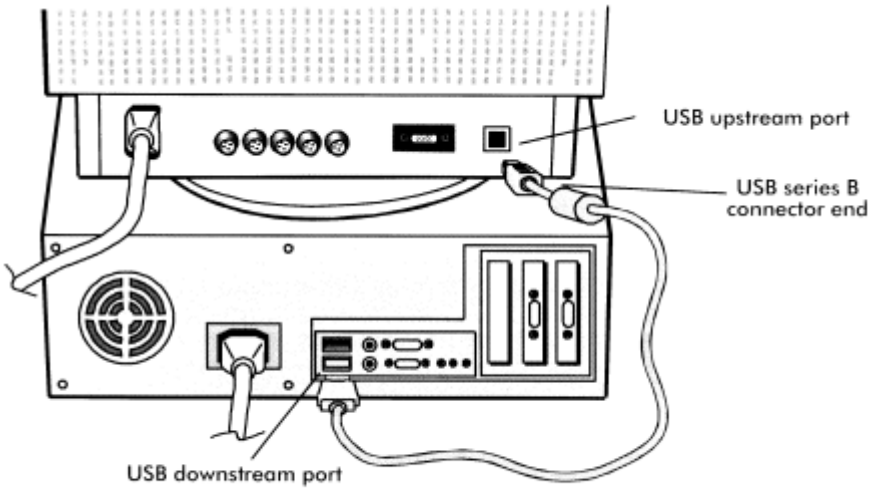


Figure 1

Controls

OSM™ (On-Screen Manager) control buttons on the front of the monitor function as follows:

	Main Menu	**Sub-Menu**
EXIT	Exits the OSM menu.	Exits to the OSM controls main menu.
CONTROL ▲/▼	Moves the highlighted area up/down to select one of the controls.	Moves the highlighted area up/down to select one of the controls.
CONTROL −/+	Moves the highlighted area left/right to select one of the controls.	Moves the bar in the - or + direction to decrease or increase the adjustment.
PROCEED	Has no function.	Only executes control or enters sub, sub-menu.
RESET	Resets all the controls within the highlighted menu to the factory setting.	Resets the highlighted control to the factory setting.

NOTE : When **RESET** is pressed in the main and sub-menu, a warning window will appear allowing you to cancel the reset function.

When OSM controls are activated, icons are displayed at the top of the menu.

If an arrow (→) is displayed in a sub-menu, it indicates further choices are available. To enter a sub, sub-menu, press **PROCEED.**

Brightness/Contrast Controls

Brightness : Adjusts the overall image and background screen brightness.

Contrast : Adjusts the image brightness in relation to the background.

Degauss : Eliminates the buildup of stray magnetic fields which alter the correct scan of the electron beams and affect the purity of the screen colors, focus, and convergence. When activated, your screen image will jump and waver a bit as the screen is demagnetized.

Caution : Please allow a minimum of 20 minutes to elapse between uses of the Degauss Control.

Size and Position Controls

Auto Adjust : Automatically adjusts the horizontal and vertical size and position settings for applicable signal timings.

Left/Right : Moves the image horizontally (left or right).

Down/Up : Moves the image vertically (up or down).

Narrow/Wide : Decreases or increases the horizontal size of the image.

Short/Tall : Decreases or increases the vertical size of the image.

RGB Color Control

Color Presets 1 through 5 selects the desired color setting. The bar is replaced by the color setting choice from 1 to 5. Each color setting is adjusted at the factory to the stated Kelvin. If a setting is adjusted, the name of the setting will change from Kelvin to Custom.

Red, Green, Blue : NEC's AccuColor Control System decreases or increases the monitor's red, green, or blue color guns depending upon which is selected. The change in color will appear on screen and the direction (decrease or increase) will be shown by the bars.

Geometry Controls

The Geometry controls allow you to adjust the curvature or angle of the sides of your display.

IN/OUT (pincushion): Decreases or increases the curvature of the sides either inward or outward.

LEFT/RIGHT (pincushion balance): Decreases or increases the curvature of the sides either to the left or right.

TILT (parallelogram) : Decreases or increases the tilt of the sides either to the left or right.

ALIGN (trapezoidal) : Decreases or increases the bottom of the screen to be the same as the top.

ROTATE (raster rotation) : Rotates the entire display clockwise or counterclockwise.

Tools 1

MOIRÈ CANCELER: Moiré is a wavy pattern which can sometimes appear on the screen. The pattern is repetitive and superimposed as rippled images. When running certain applications, the wavy pattern is more evident than in others. To reduce moiré, adjust the ON/Level by using the –/+ CONTROL buttons.

BASIC CONVERGENCE: Aligns all three colors(R,G,B) to form a single color(white). The purpose of this control is to ensure that a white line drawn on the screen is as crisp and clear as possible.

- Use the Horizontal control to adjust the alignment of the white lines in the up/down direction.
- Use the Vertical control to adjust the alignment of the white lines in the left/right direction.

AREA CONVERGENCE: A small window will appear to indicate the area of adjustment - Top Horizontal, Top Vertical, Bottom Horizontal or Bottom Vertical.

CORNER CORRECTION: Allows you to adjust the geometry of the corners of your display - Top, Top Balance, Bottom or Bottom Balance.

LINEARITY: The Linearity selection allows you to adjust the spacing of the areas on the screen. The purpose of this control is to ensure that a 2cm circle is a true 2cm circle wherever it is drawn on the screen. The best way to determine the vertical linearity is as follows:

- Draw equally spaced horizontal lines using a drawing application that has a ruler.
- Use the Vertical Balance control to adjust the lines near the top and bottom of your screen.
- Use the Vertical control to adjust the spacing between the lines near the center and top of your screen.

GLOBALSYNC CONTROL: Eliminates picture impurities that may result from the earth's magnetic field. While in the sub-menus(GLOBALSYNC, TOP LEFT, TOP RIGHT, BOTTOM LEFT or BOTTOM RIGHT), use the -/+ control buttons to fine tune the GlobalSync corrections.

Note: NEC recommends that you perform GlobalSync correction while running a typical application such as a spreadsheet or text document.

SHARPNESS: Allows you to adjust the clarity of the image, based on the quality of the signal received from the computer.

- Use a full text document to make this adjustment.
- Cycle through the four sharpness settings and select the one that provides the sharpness focus and contrast of the text.

FACTRY PRESET: Selecting Factory Preset allows you a reset most OSM settings back to the factory settings. A warning statement will appear to confirm that you do want to reset ALL settings. Individual settings can be reset by highlighting the control to be reset and pressing the **RESET** button.

Tools 2

LANGUAGE: OSM control menus are available in 7 languages.

OSM POSITION: You can choose where you would like the OSM controls menu to appear on your screen. Selecting OSM Position allows you to manually adjust the OSM controls menu left, right, up or down.

OSM TURN OFF: The OSM menu will stay on as long as it is in use. In the OSM Turn Off sub-menu, you can select how long the monitor waits after the last touch of a button for the OSM menu to disappear. The preset choices are 10, 20, 30, 60 and 120 seconds.

OSM LOCK OUT: This control completely locks out access to all OSM functions except Brightness and Contrast. When attempting to activate OSM while in the lock out mode, a screen will appear indicating that OSM controls are locked out. To activate the OSM Lock Out function, press **PROCEED**, then press ▲ and hold down simultaneously. To deactivate the OSM Lock Out, press **PROCEED**, then press ▲ and hold down simultaneously.

IPM™ System Off Mode:

Enable: The IPM works normally, all stages of energy savings are used.

Disable: The OFF MODE of the IPM is not used.

NOTE: For standard computers and display cards you should keep the factory setting at ENABLE.

EDGELOCK CONTROL: Operating your monitor at a non-standard timing may cause images to appear darker than normal or have color distortion. Use of the EdgeLock control will adjust images to their normal state.

REFRESH NOTIFIER: A message will advise you if the refresh rate of the signal being applied to the monitor by the computer is too low. For further information, please refer to your display card or system manual.
Factory setting is OFF.

❶ Information

Provides you with additional information which included the following:

DISPLAY MODE: Indicates the current mode and frequency setting of the monitor.

FITNESS TIPS: The fitness Tips provide you with helpful reminders to periodically rest your eyes. You may select how frequently the remainders are displayed based upon your individual needs. Select an interval from 15,30,45,60,90 or 120 minutes for the tips to appear. When the tips appear, follow the advice of the tips and press EXIT to clear.

MONTOR INFO: Indicates the model and serial numbers of your monitor.

Recommended Use

Safety Precautions and Maintenance

FOR OPTIMUM PERFORMANCE, PLEASE NOTE THE FOLLOWING WHEN SETTING UP AND USING THE MULTISYNC® FP Series COLOR MONITOR:

- **DO NOT OPEN THE MONITOR.** There are no user serviceable parts inside and opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
- Do not spill any liquids into the cabinet or use your monitor near water.
- Do not insert objects of any kind into the cabinet slots, as they may touch dangerous voltage points, which can be harmful or fatal or may cause electric shock, fire or equipment failure.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- Do not place this product on a sloping or unstable cart, stand or table, as the monitor may fall, causing serious damage to the monitor.
- Keep the monitor away from high capacity transformers, electric motors and other devices such as external speakers or fans, which may create strong magnetic fields.
- If possible, position the monitor so that it is facing the east to minimize the effects of the earth's magnetic field.
- Changing the direction of the monitor while it is powered on may cause image discolora-tion. To correct this, turn the monitor off for 20 minutes before powering it back on.
- When operating the MultiSync FP Series with its AC 220-240V worldwide power supply, use a power supply cord that matches the power supply voltage of the AC power outlet being used. The power supply cord you use must have been approved by and comply with the safety standards of your country (type H05VV-F should be used except in UK).
- In UK, use a BS-approved power cord with molded plug and a black (5A) fuse installed within it with this equipment. If a power cord is not supplied with this equipment please contact your supplier.

Immediately unplug your monitor from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the monitor.
- If the monitor has been exposed to rain or water.

- If the monitor has been dropped or the cabinet damaged.
- If the monitor does not operate normally by following operating instructions.

CAUTION

- Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not block ventilated openings or place the monitor near a radiator or other heat sources. Do not put anything on top of monitor.
- The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet which is easily accessible.
- Handle with care when transporting. Save packaging for transporting.

CORRECT PLACEMENT AND ADJUSTMENT OF THE MONITOR CAN REDUCE EYE, SHOULDER AND NECK FATIGUE. CHECK THEFOLLOWING WHEN YOU POSITION THE MONITOR:

- Adjust the monitor height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.
- Position your monitor no closer than 12 inches and no further away than 28 inches from your eyes. The optimal distance is 24 inches.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.

- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- Clean your monitor regularly. Use a lint-free, non-abrasive cloth and a non-alcohol, neutral, non-abrasive cleaning solution or glass cleaner to minimize dust.
- Adjust the monitor's brightness and contrast controls to enhance readability.

- Use a document holder placed close to the screen.
- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Get regular eye checkups.

Ergonomics

To realize the maximum ergonomics benefits, we recommend the following:

- Adjust the Brightness until the background raster disappears
- Do not position the Contrast control to its maximum setting
- Use the preset Size and Position controls with standard signals
- Use the preset Color Setting and Sides Left/Right controls
- Use non-interlaced signals with a vertical refresh rate between 75-160Hz
- Do not use primary color blue on a dark background, as it is difficult to see and may produce eye fatigue due to insufficient contrast

Features

Flat Aperture Grille CRT: Delivers an unparalleled viewing experience with a virtually flat image, eliminating distortion and reducing glare so that what you see on-screen is what you get on your printed output. The striped phosphor alignment of the CRT delivers superior vertical definition with improved brightness for more uniform image contrast.

OptiClear® Screen Surface: Reduces reflection and glare and increases contrast without sacrificing focus level, clarity or brightness.

Dual Dynamic Beam Focus: Provides precise, continuous focus adjustments of the electron beams resulting in optimum image quality, even to the far edges of the screen.

AccuColor® Control System: Allows you to change between five color settings on your display to match your personal preference.

OSM™ (On-Screen Manager) Controls: Allow you to quickly and easily adjust all elements of your screen image via simple to use on-screen menus.

ErgoDesign® Features: Enhance human ergonomics to improve the working environment, protect the health of the user and save money. Examples include OSM controls for quick and easy image adjustments, tilt/swivel base for pre-ferred angle of vision and compliance with MPRII guidelines for lower emissions.

Plug and Play: The Microsoft® solution with the Windows®95/98 operating system facilitates setup and installation by allowing the monitor to send its capabilities (such as screen size and resolutions supported) directly to your computer, automatically optimizing display performance.

IPM (Intelligent Power Manager) System: Provides innovative power-saving methods that allow the monitor to shift to a lower power consumption level when on but not in use, saving your monitor energy costs, reducing emissions and lowering the air conditioning costs of the workplace and is compliant with NUTEK, VESA DPMS and EPA ENERGY STAR.

Mode	LED Indicator	Power saving
On	Green	None
Stand By	Green	Minimum(Quickest Recovery)
Suspend	Yellow	Moderate(< 15 Watts, Moderate Recovery)
Off(IPM Mode)	Orange	Maximum(< 5 Watts, Slow Recovery)
Off(Power Switch, Off)	No Light	No Power Used(Fully Off)

Reduced Magnetic Field Technology: Reduces magnetic and alternating electric field emissions and static electricity, addressing ergonomic concerns regarding potential risks from extended computer monitor use.

Multiple Frequency Technology: Automatically adjusts monitor to the display card's scanning frequency, thus displaying the resolution required.

FullScan Capability: Allows you to use the entire screen area in most resolu-tions, significantly expanding image size.

GlobalSync®/Corner Purity Control: NEC's unique design automatically elimi-nates picture impurities that may result from stray magnetic fields (including the earth's permanent magnets, etc.) and now allows you to easily adjust impurities in the four corners of your monitor.

Auto Adjust: Allows you to easily and quickly adjust the suitable horizontal and vertical size and position settings.

Convergence Control: Allows you to adjust the horizontal and vertical conver-gence of the top and bottom area to ensure that a white line drawn on the screen is as crisp and clear as possible.

Troubleshooting

No picture

- Display card should be completely seated in its slot.
- Power Button and computer power switch should be in the ON position.
- Signal cable should be completely connected to display card/computer.
- Check connector for bent or pushed-in pins.
- Check that the BNC/D-SUB button is in the correct position.

Image is scrolling or unstable

- Signal cable should be completely attached to the computer.
- Check pin assignments and signal timings of the monitor and your display card with respect to recommended timings and pin assignments.
- If the Macintosh cable adapter is used, check for proper connection or make sure the display card is Macintosh compatible and that the card is properly seated in the computer.

LED on monitor is not lit *(no green, orange, yellow color can be seen)*

- Power Switch should be in the ON position and power cord should be connected.

Picture is fuzzy or color looks blotchy

- If the picture is fuzzy, adjust the Moire Canceler Control. If the color looks blotchy, adjust the Brightness, Contrast or GlobalSync Controls, or use the EdgeLock control to change modes.
- Access the Degauss Control through OSM. Activate the Degauss Control.

  CAUTION: A minimum interval of 20 minutes should exist before the Degauss Function is used a second time.

Picture bounces or a wavy pattern is present in the picture

- Move electrical devices that may be causing electrical interference away from the monitor.

Edges of the display image are not square

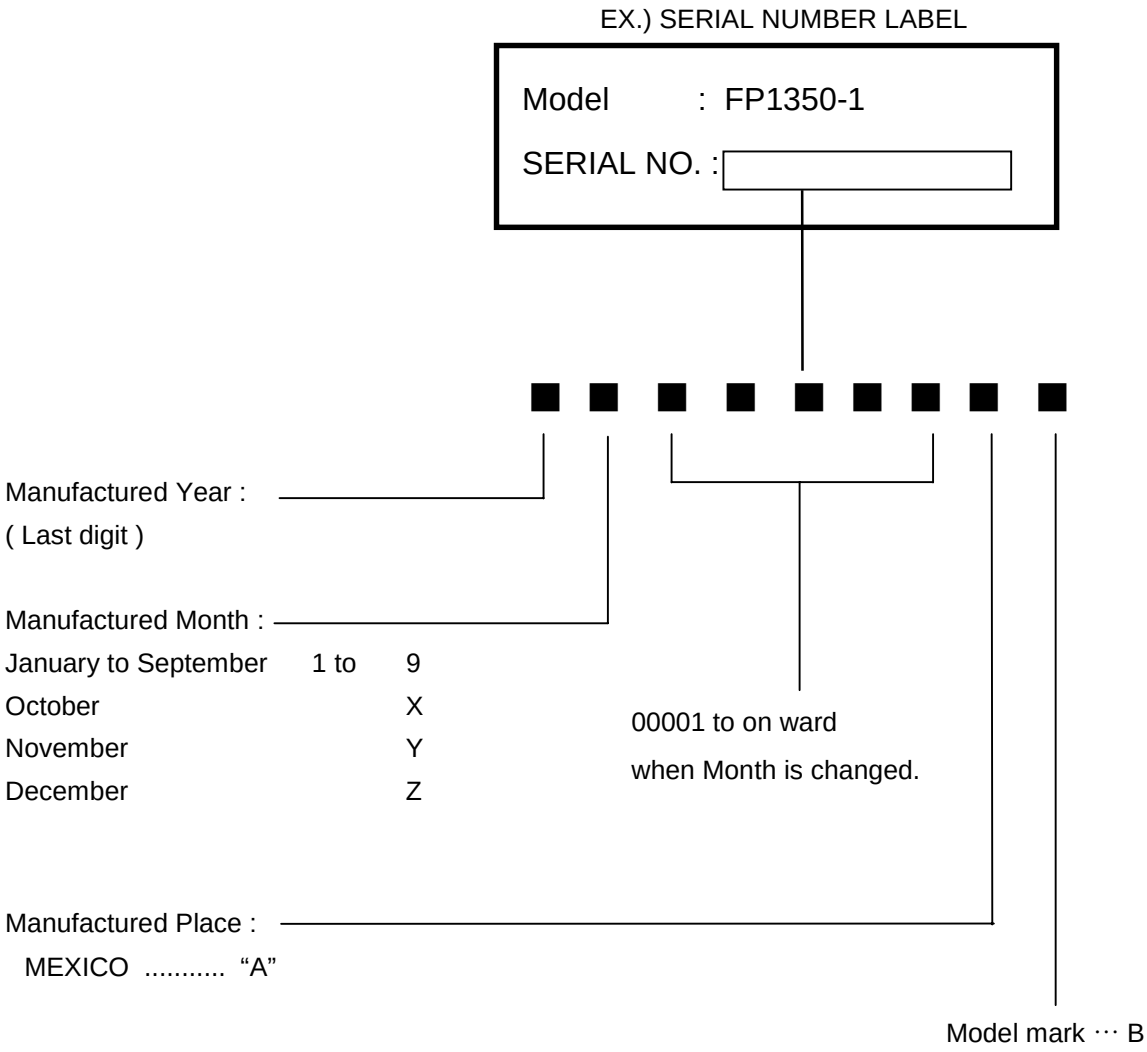
- Use the OSM Geometry and Corner Correction Controls to straighten the edges.
- If possible, position the front of the monitor facing east.

Display image is not centered, too small, or too large

- Use the OSM Size and Position Controls to adjust the image.

SERIAL NUMBER INFORMATION

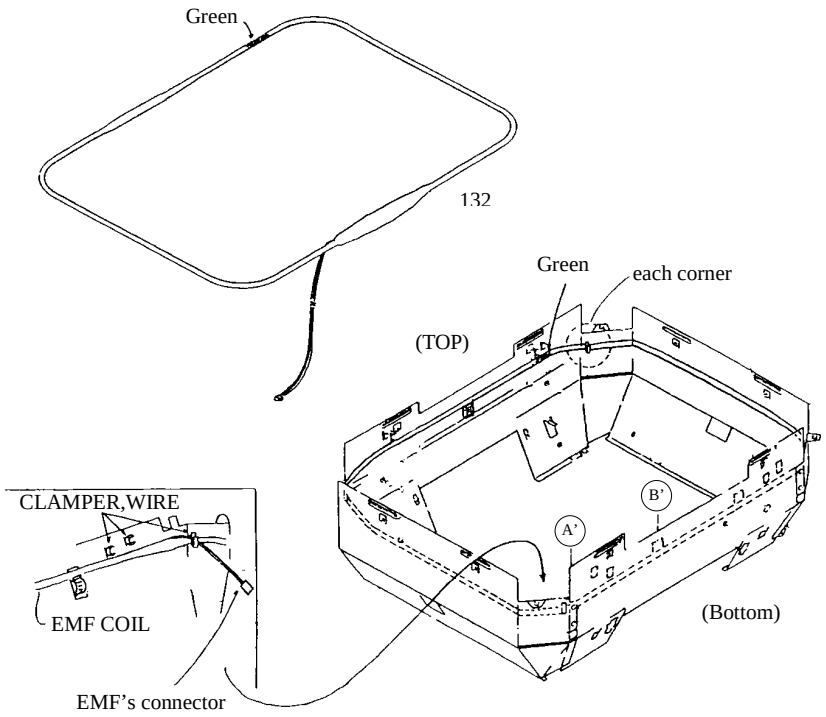
Refer to the serial number information shown below.



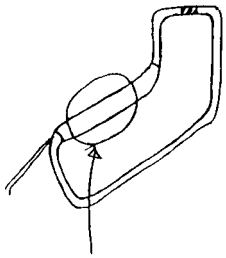
ASSEMBLY

- Before you disassemble the set, turn off power and pull out the power plug.
- Use the appropriate screwdrivers that first the screws. If you use screwdriver that does not fit, you may break the screws.
- Disassembly is the opposite process of assembly.
- Carefully discharge the CRT anode potential by grounding to coating dag before removing Anode Cap.

REMARK	SYMBOL
Clamp the EMF COIL with CLAMPER.(4 points) The thick of the EMF COIL is placed between (A') and (B')	132



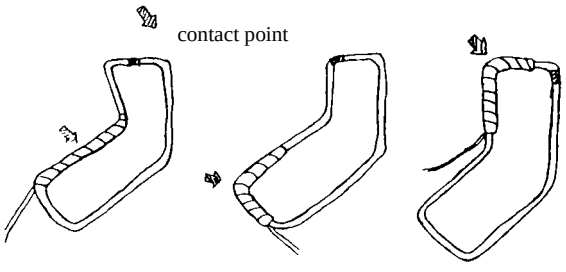
REMARK	SYMBOL
Forming (Corner Coil)	133



These area are wire contact points.

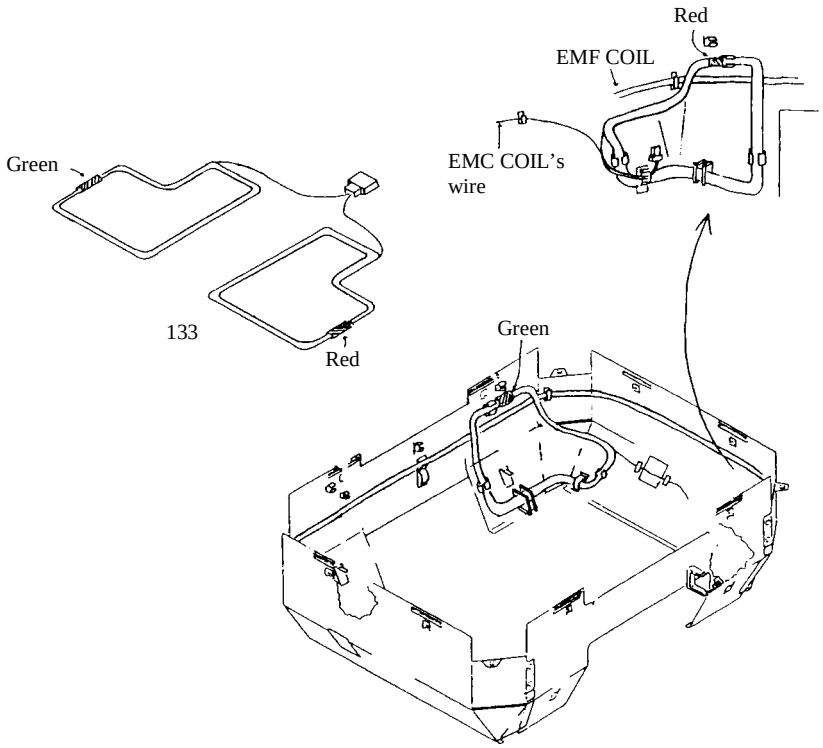
Don't bend these area.

EX.)

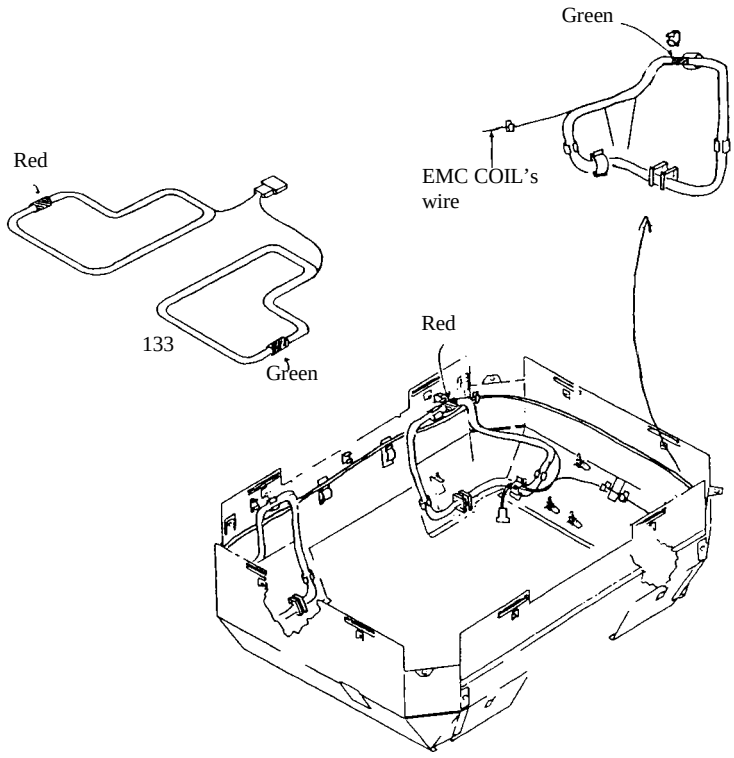


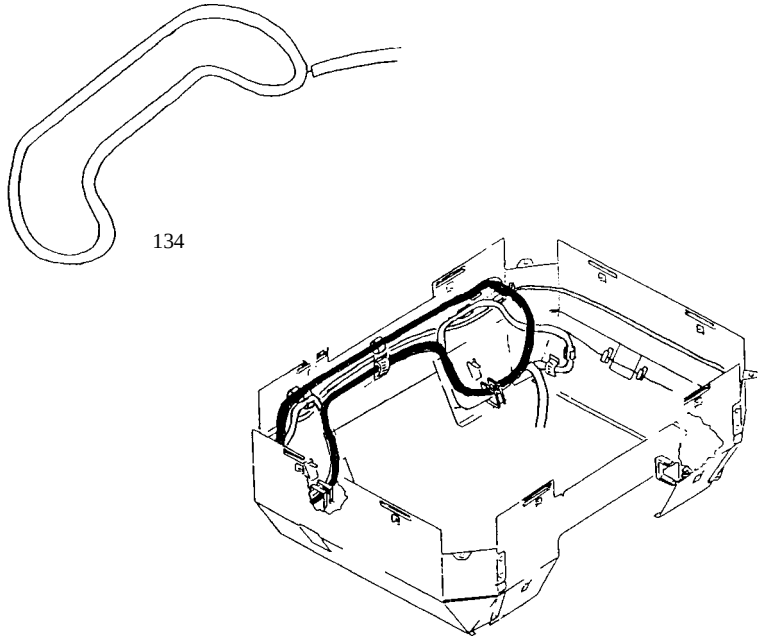
<OK> <NG> <NG>

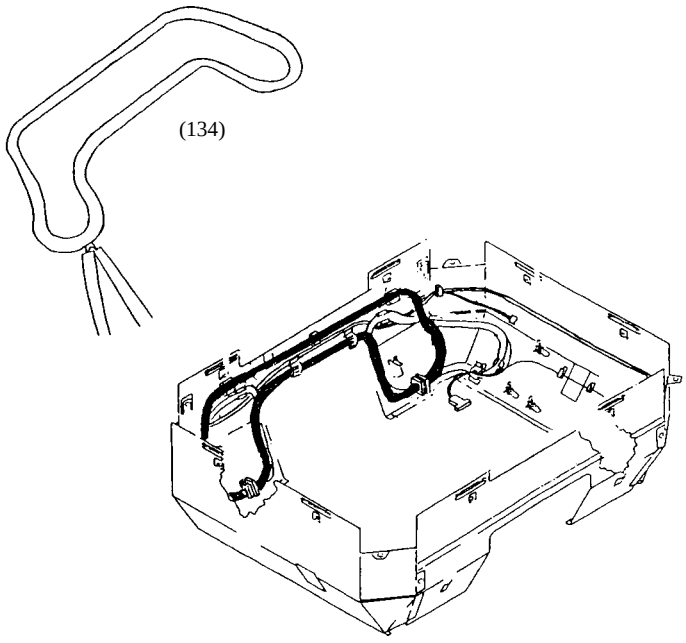
REMARK	SYMBOL
Clamp the EMC COIL with CLAMPER,WIRE.	133

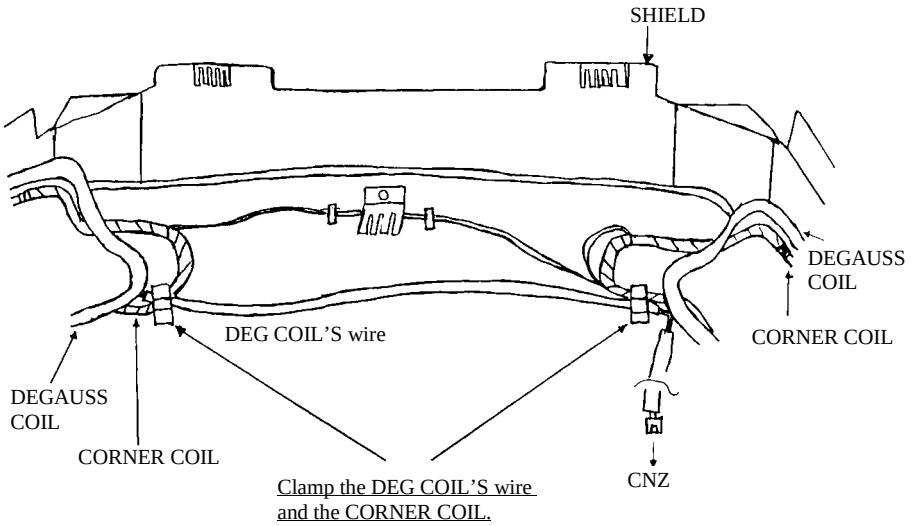


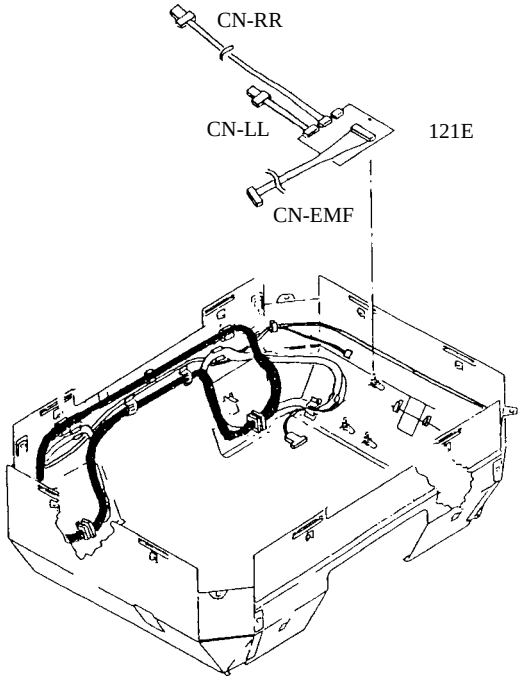
REMARK	SYMBOL
Clamp the EMC COIL with CLAMPER,WIRE.	133

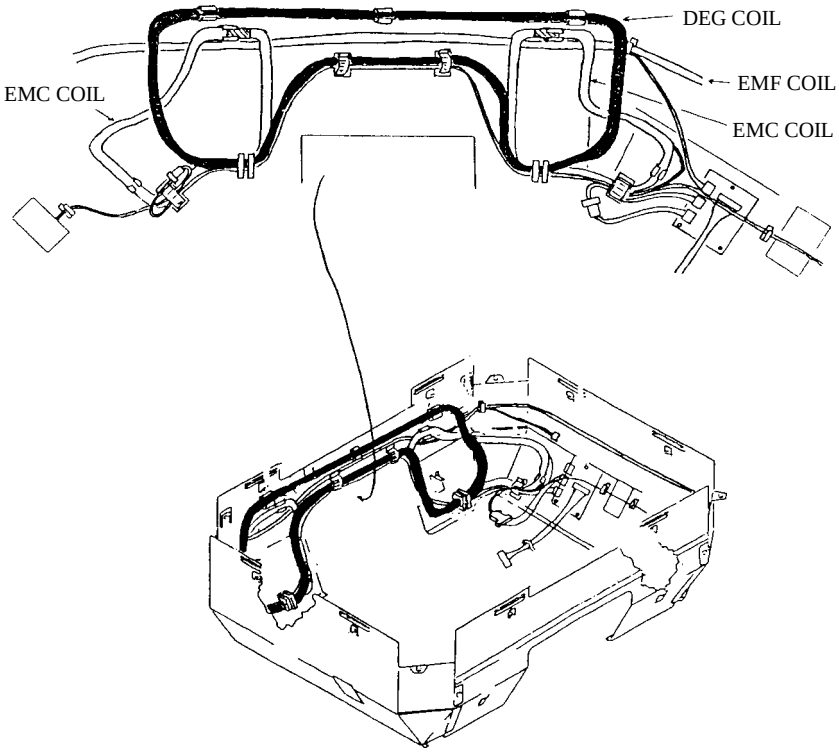


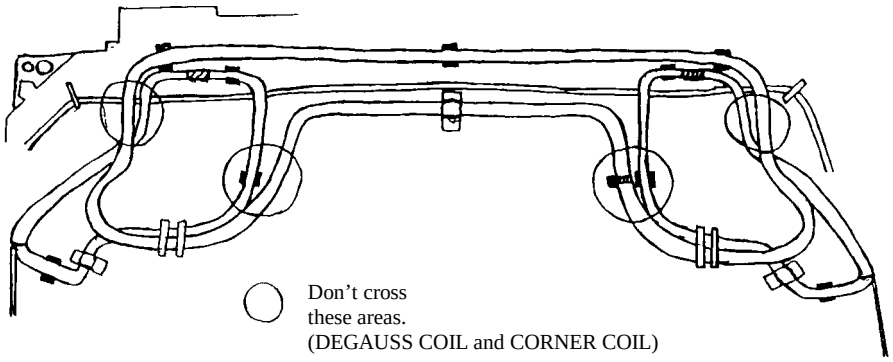
REMARK	SYMBOL	
Clamp the DEG COIL with CLAMPER,WIRE.	134	

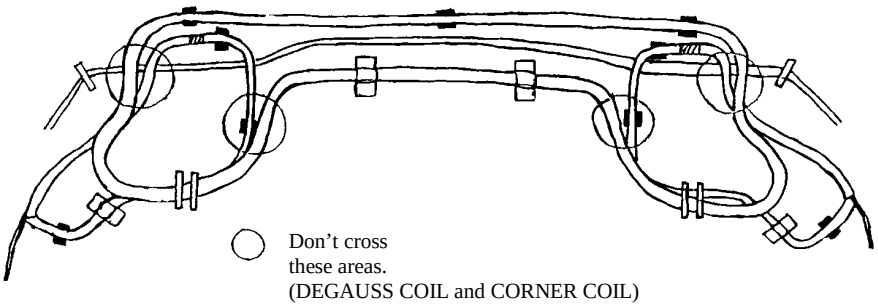
REMARK	SYMBOL	
Clamp the DEG COIL with CLAMPER,WIRE.	(134)	

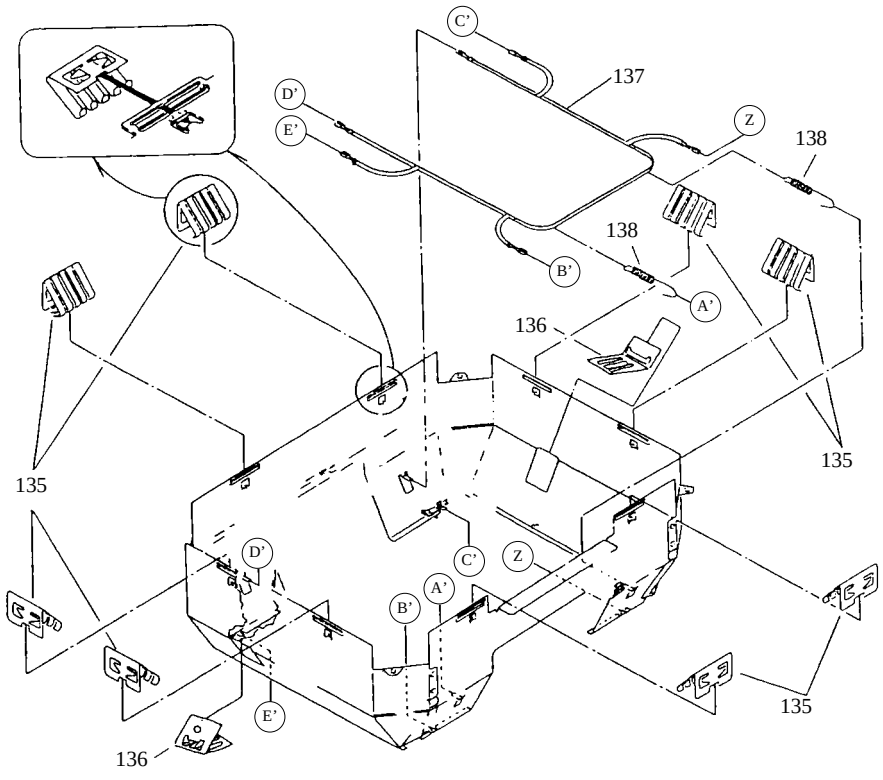
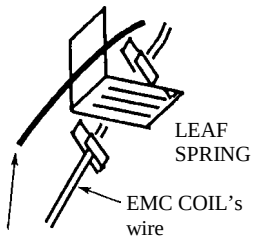
REMARK	SYMBOL	
Clamp the DEG COIL's wire with CLAMPER,WIRE as per sketch.		<SIDE VIEW> 

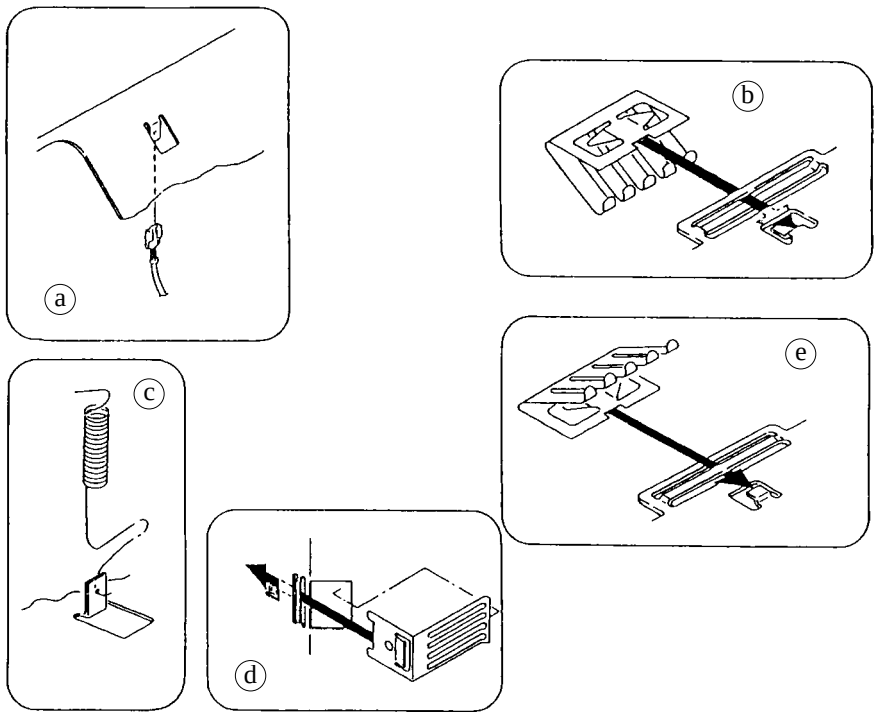
REMARK	SYMBOL	
Mount the EMF PWB.	121E	

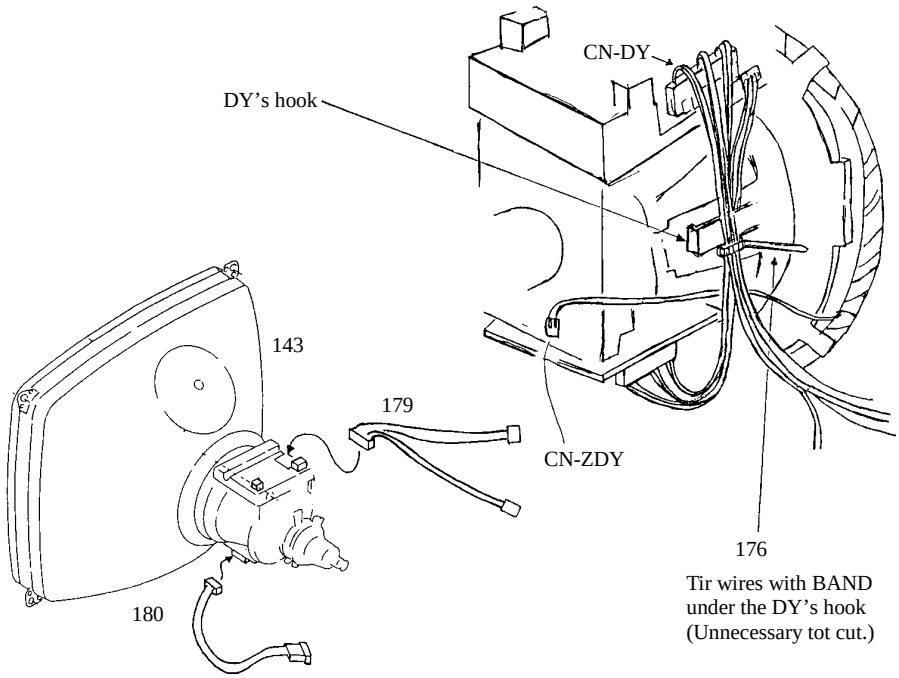
REMARK	SYMBOL	
Clamp the connector.		

REMARK	SYMBOL	
COIL FORMING -UPPER SIDE-		

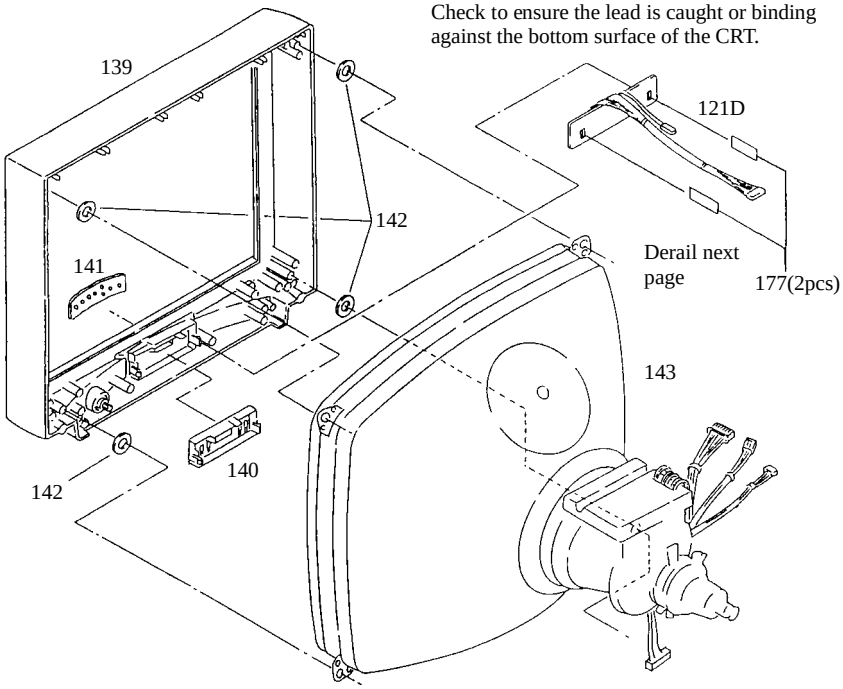
REMARK	SYMBOL	
COIL FORMING -LOWER SIDE-		 Don't cross these areas. (DEGAUSS COIL and CORNER COIL)

REMARK	SYMBOL	
Mount LEAF SPRING (CRT) and LEAF SPRING to the PLATE,SHIELDING.	135 136	
Mount CN-CE and COIL SPRING to the PLATE, SHIELDING.	137 138	
EMC COIL's wire pass through under the LEAF SPRING.(both sides.) 		
Don't change the form the LEAF,SPRING.		
Inspect all wires, coils and clampers to ensure that all leads are dress properly and that all clampers are closed and securely fastened.		

REMARK	SYMBOL	
Dgauss the PLATE SHIELDING (CRT) ASSY.		

REMARK	SYMBOL	
Insert CN-DY and CN-SC1 to CRT's DY. Note: Don't pull out CN-DY if you insert it once. SAFETY	143 179 180	 Tir wires with BAND under the DY's hook (Unnecessary tot cut.)
Tie CN-DY and DY's wirs with BAND (L=100) as persketch. SAFETY	176	
Pass through the CN-ZDY bet ween DY and DY's connectors. SAFETY		

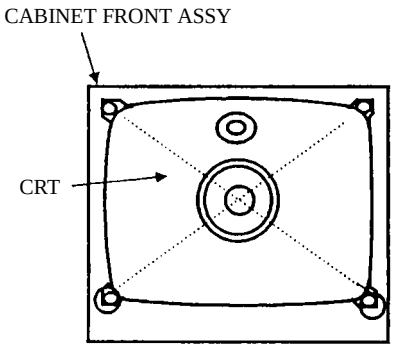
REMARK	SYMBOL
Mount PUSH BUTTON (CONTROL) to CABINET FRONT ASSY.	139 140
Peel off the sheet of CONTROL PANEL and attach PUSH BUTTON (CONTROL) to CABINET FRONT ASSY.	141

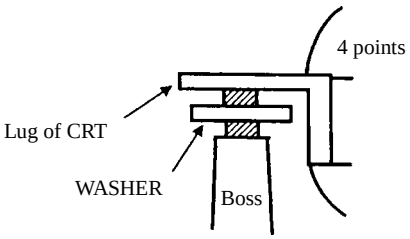


Screw CRT on CABINET,FRONT (4 points).

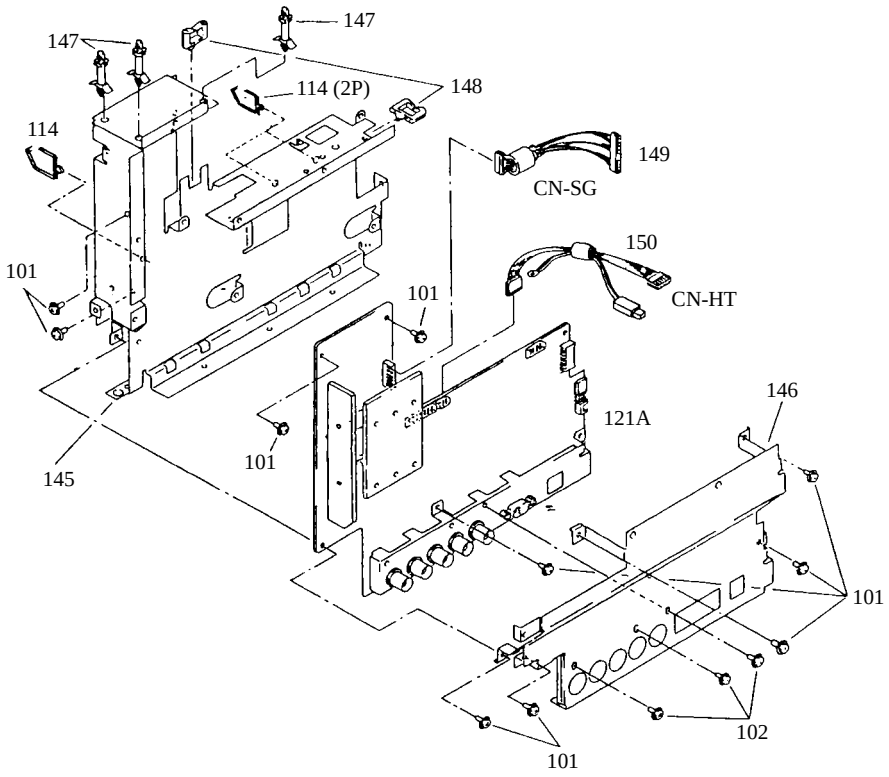
The use of WASHER at setting CRT.
1.Necessary to make sure the screw condition of each Lot. Make sure the CABINET FRONT, it should not be whitish by stress of securing screws. And make sure the gap between CABINET FRONT and CRT. It must keep in tolerance.
2.In case of gap or changing color caused by stress, arrange the thickness of washers.

No.		DESCRIPTION	PART No.	Q'ty
142		WASHER (D20,D6.5,T2)		04
142		WASHER (D20,D6.5,T1)		OR
142		WASHER (D20,D6.5,T1.2)		OR
142		WASHER (D20,D6.5,T1.6)		OR
142		WASHER (T0.5,P20)		OR
142		WASHER,SPECIAL		OR
142				OR

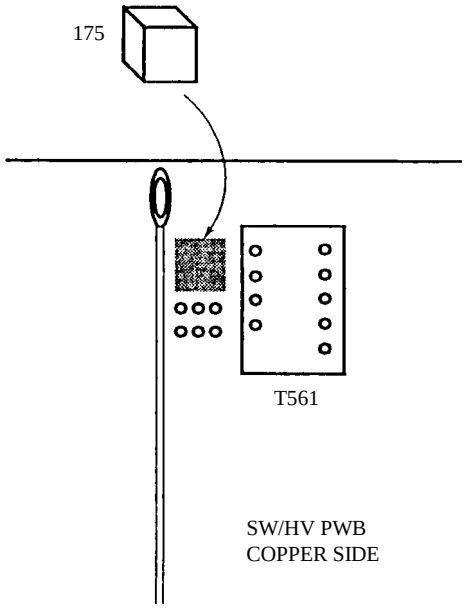


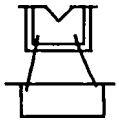


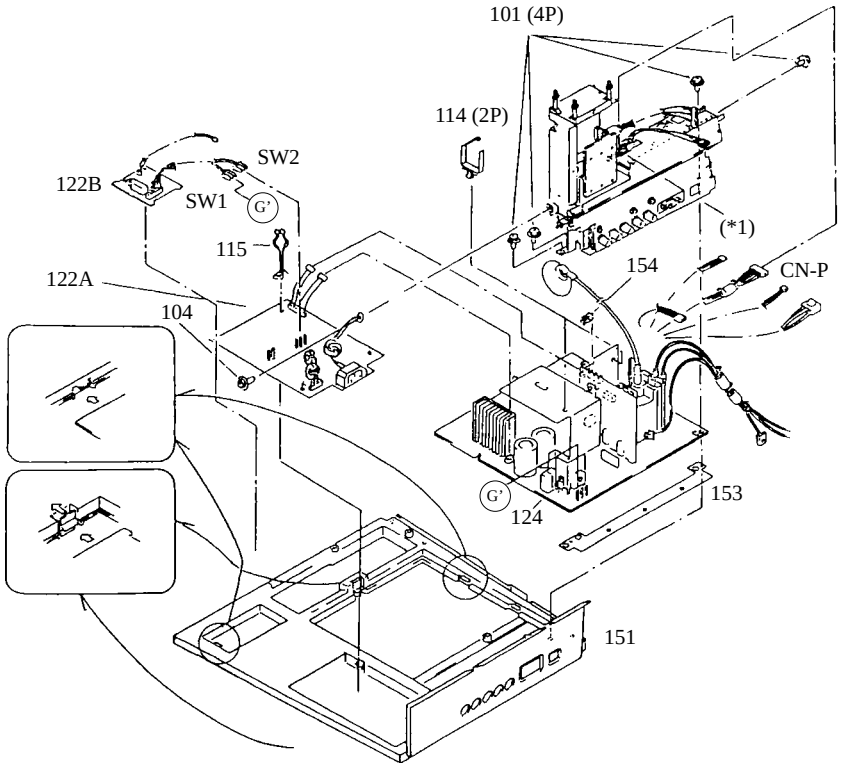
REMARK	SYMBOL
Screw VIDEO PWB ASSY to the PLATE, SHIELDING (BOTTOM).	121A 101 145
Screw PLATE, SHIELDING (VIDEO) to the VIDEO PWB ASSY.	101 102 146
Insert BUSH, INSULATOR, CLAMPER, WIRE and EDGE, SADDLE to the PLATE, SHIELDING (BOTTOM).	114 147 148
Insert CN-SG and CN-HT to the VIDEO PWB ASSY.	149 150



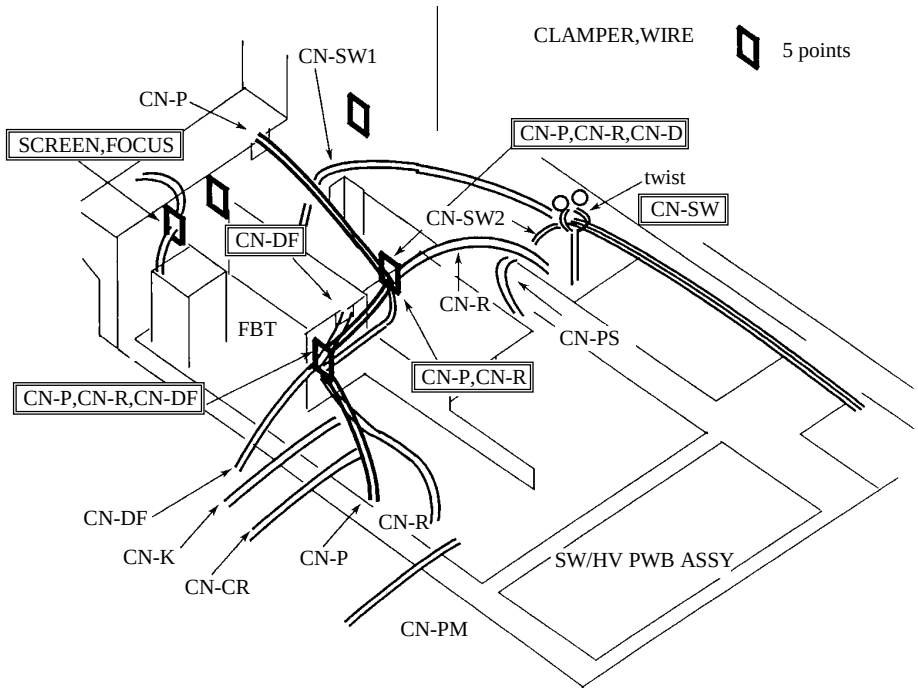
REMARK	SYMBOL
Attach the CUSHION SHEET on SW/HV PWB ASSY.	175

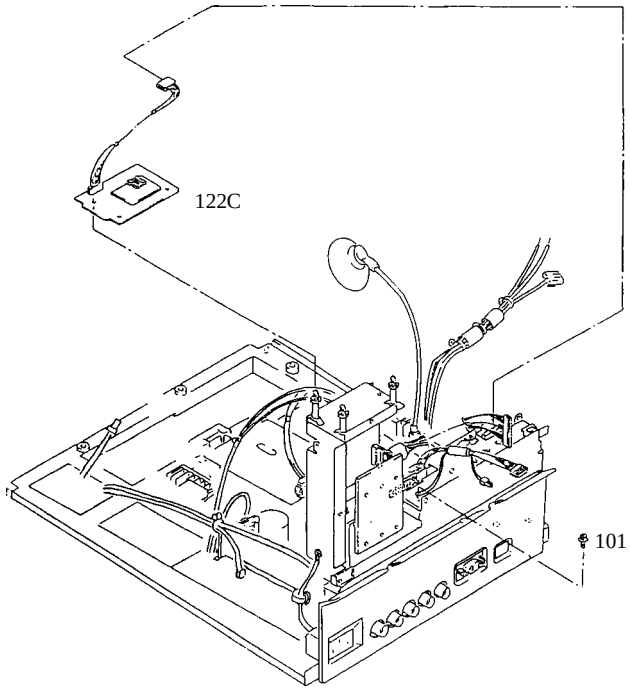


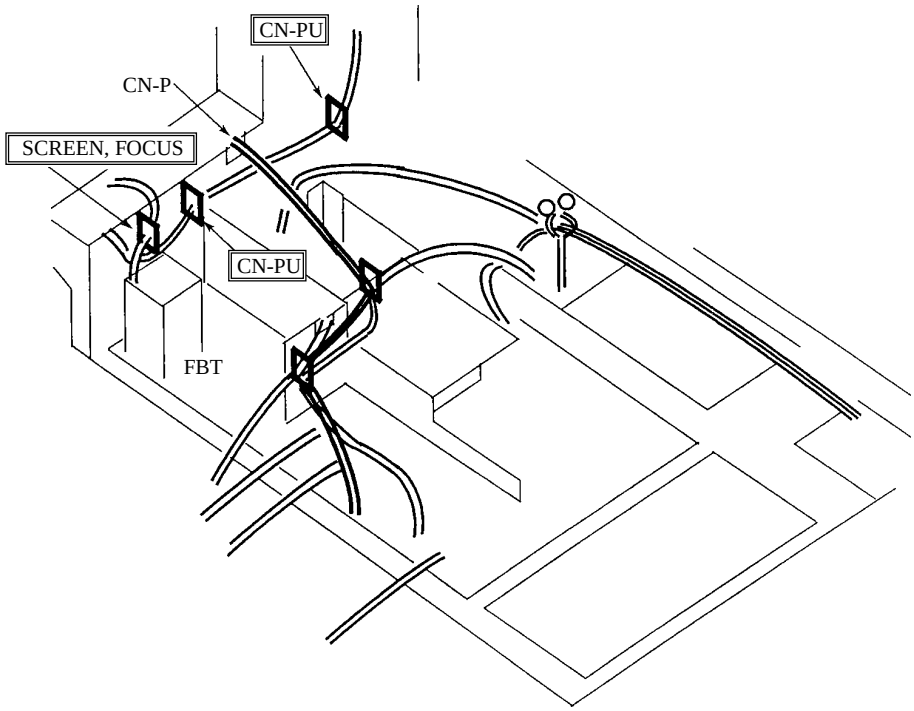
REMARK	SYMBOL
Clamp CN-P with the EDGE SADDLE. EDGE SADDLE  CN-P Back side view	(*1)
Screw the safety earth terminal to the BRACKET (VIDEO, A) SAFETY	104
After the VIDEO PWB ASSY mount the PWB FRAME, connect the CN-SW1.	

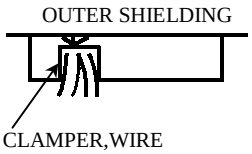


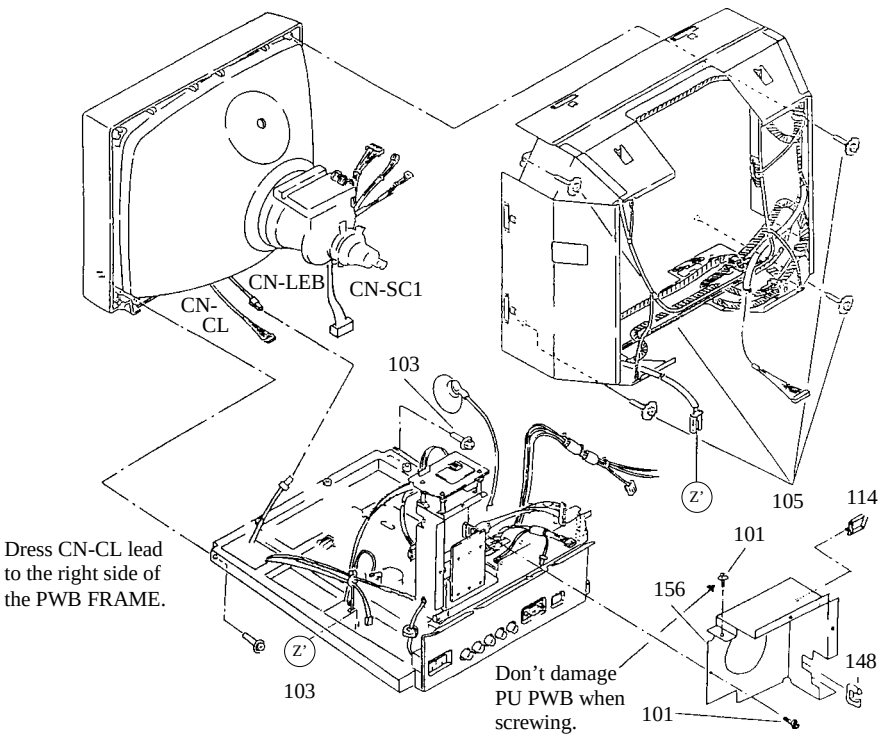
REMARK	SYMBOL
Clamp the wires with the CLAMPER,WIRE as follows.	



REMARK	SYMBOL	
Don't touch copper wire of IC4H1. (Because copper wire is easy to break.)	122C	

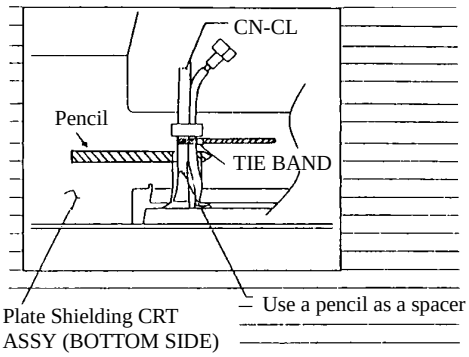
REMARK	SYMBOL	
Clamp CN-CU with the CLAMPER,WIRE as follows.		

REMARK	SYMBOL
Clamp CN-CL and CN-LEB with the CLAMPER,WIRE (bottom side of the OUTER SHIELDING.  	
After mounting the CABINET FRONT ASSY to the FRAME ASSY, SCREW the CASE, SHIELDING (CRT, F). (To avoid broken CRT neck.)	156

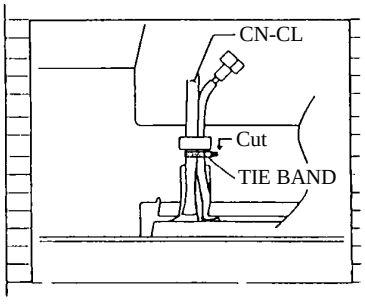


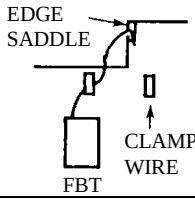
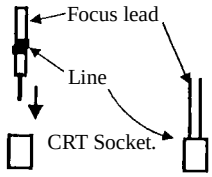
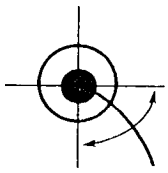
REMARK	SYMBOL
Tie CN-CL and CN-LEB with BAND (L=100). Note: Use a pencil as a spacer.	144

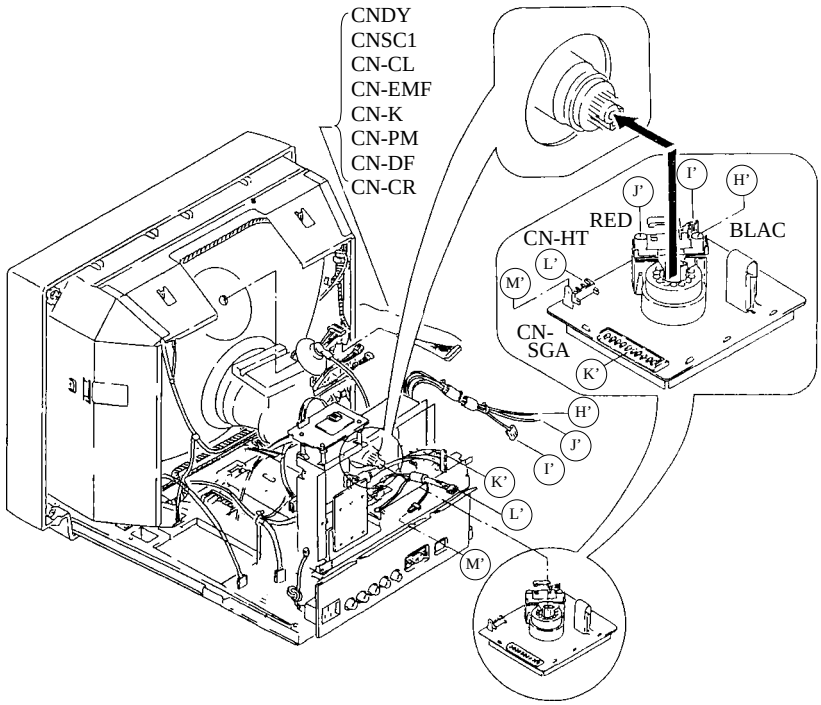
Insert a pencil between PLATE SHIELDING CRT ASSY and CN-CL, CN-LEB as per sketch.



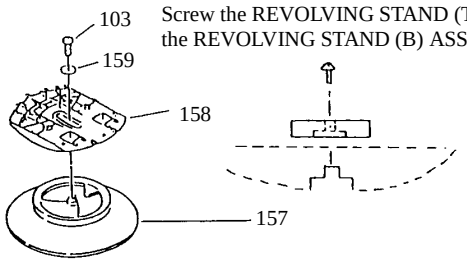
After tie BAND (L=100), pull out a pencil.

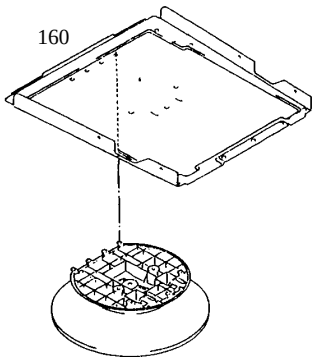


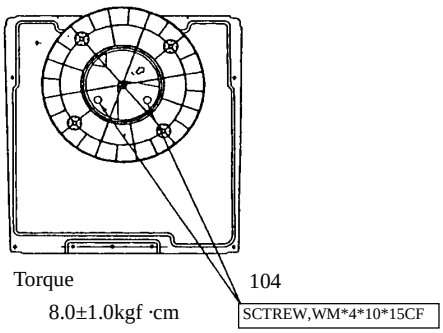
REMARK	SYMBOL
Clamp the leads of FBT with the EDGE SADDLE.  	
Insert the Focus Lead to the CRT Socket. Push in Focus lead so that the Line is all in the CRT Socket.  	
Mount the Anode cap as follows. 	

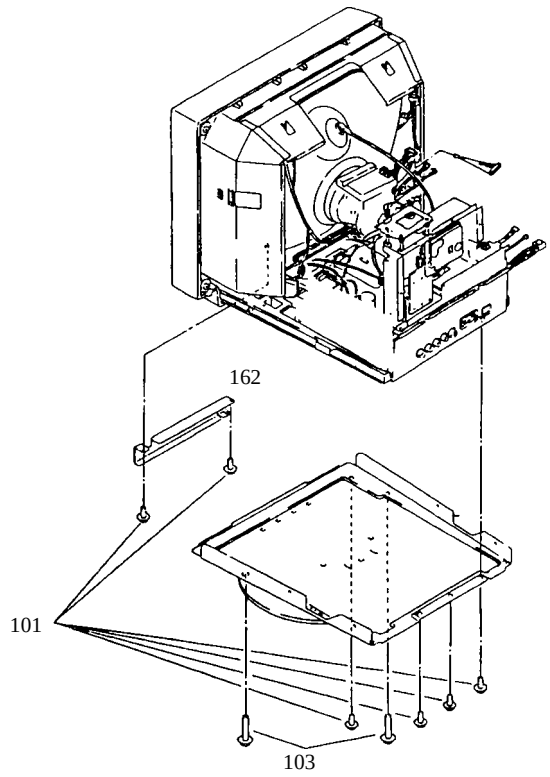


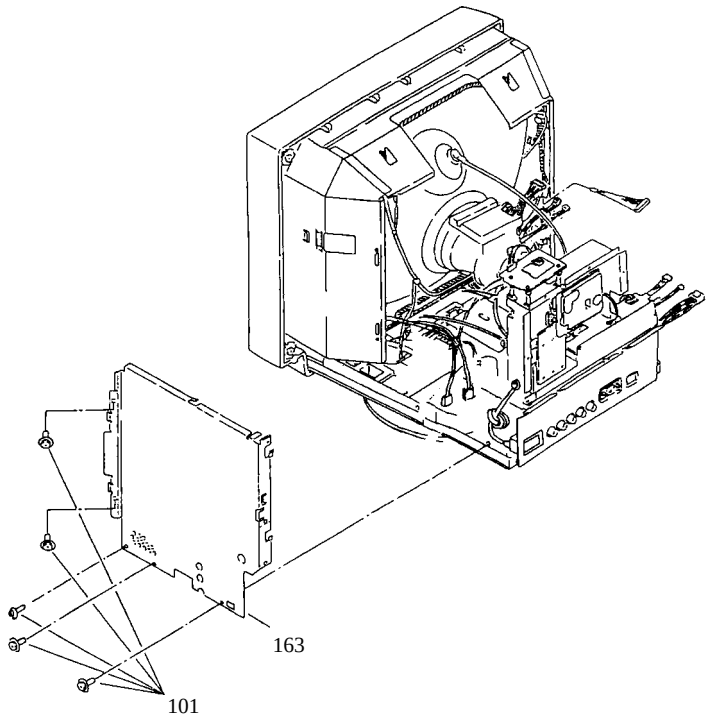
REMARK	SYMBOL
Screw the REVOLVING STAND (T) to the REVOLVING STAND (B) ASSY.	157 158 159 103
Mount the REVOLVING STAND ASSY to the CHASSIS BASE. Degauss both the outside and inside surfaces of the CHASSIS BASE.	160
Screw the REVOLVING STAND ASSY to the CHASSIS BASE.	104



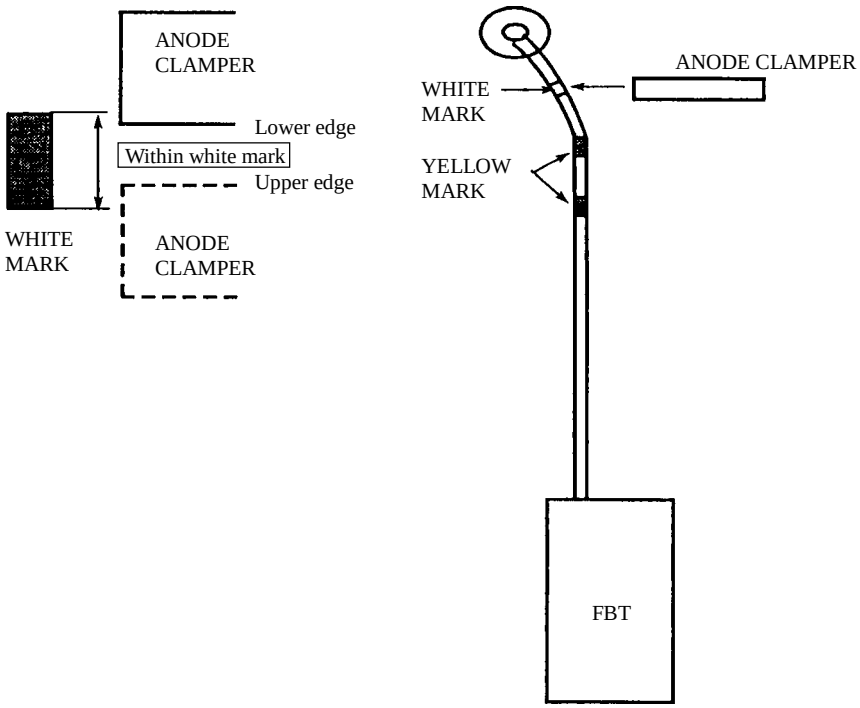




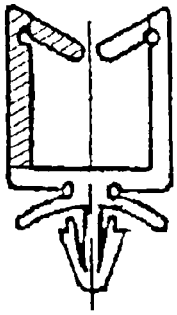
REMARK	SYMBOL	
		

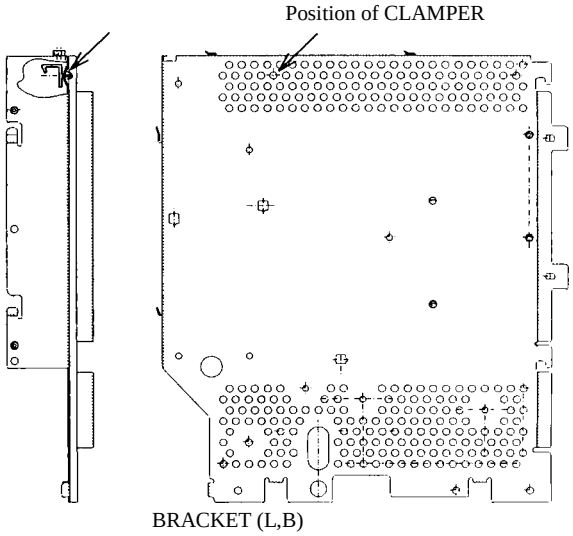
REMARK	SYMBOL	
		

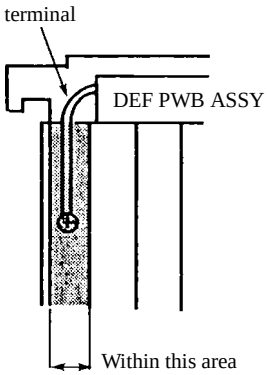
REMARK	SYMBOL
Mount the ANODE CLAMPER to ANODE LEAD. (True up the upper ANODE CLAMPER and adove WHITE MARK.) SAFETY	167

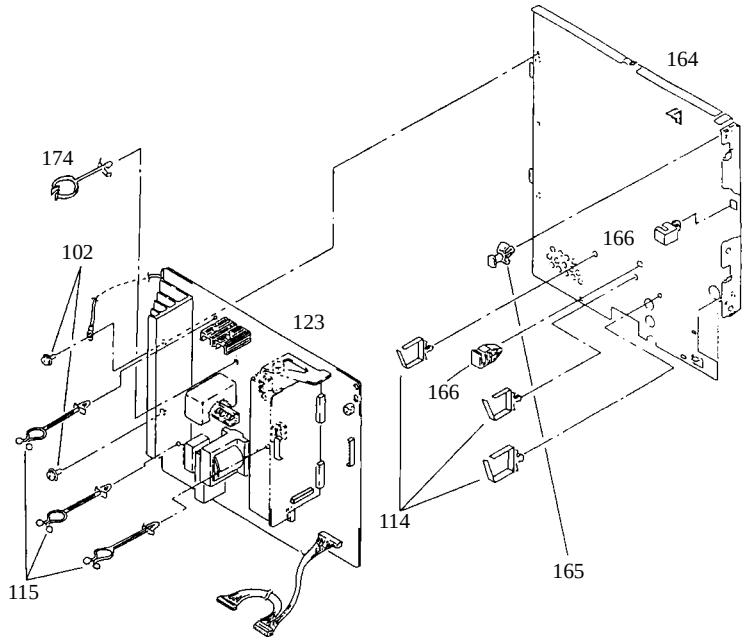


REMARK	SYMBOL
CLAMPER,WIRE should be partially cut away as atching area on figure. Put CLAMPER,WIRE in BRACKET (L,B) as per sketch.	182

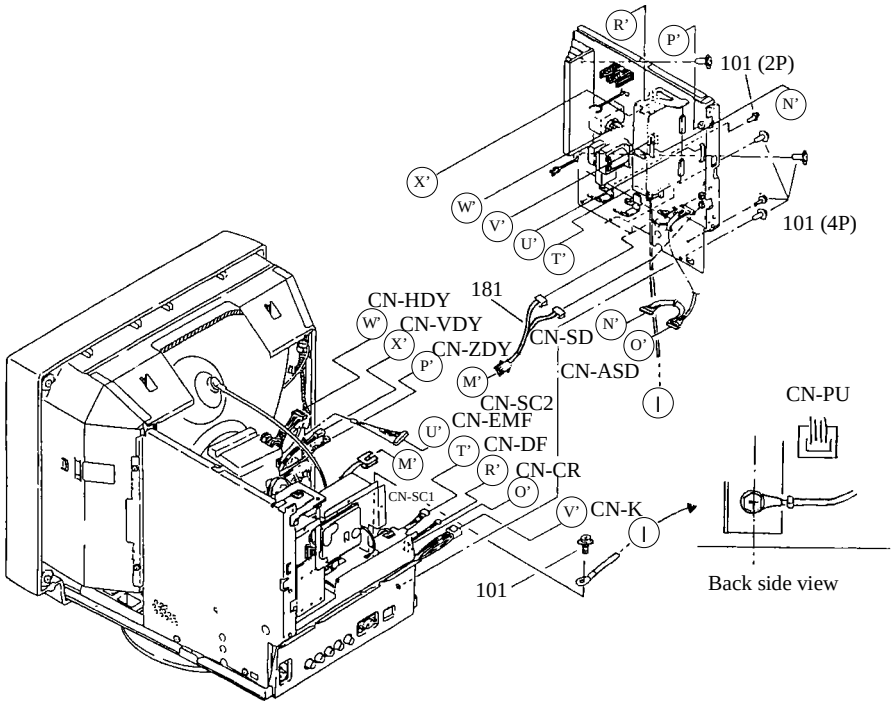


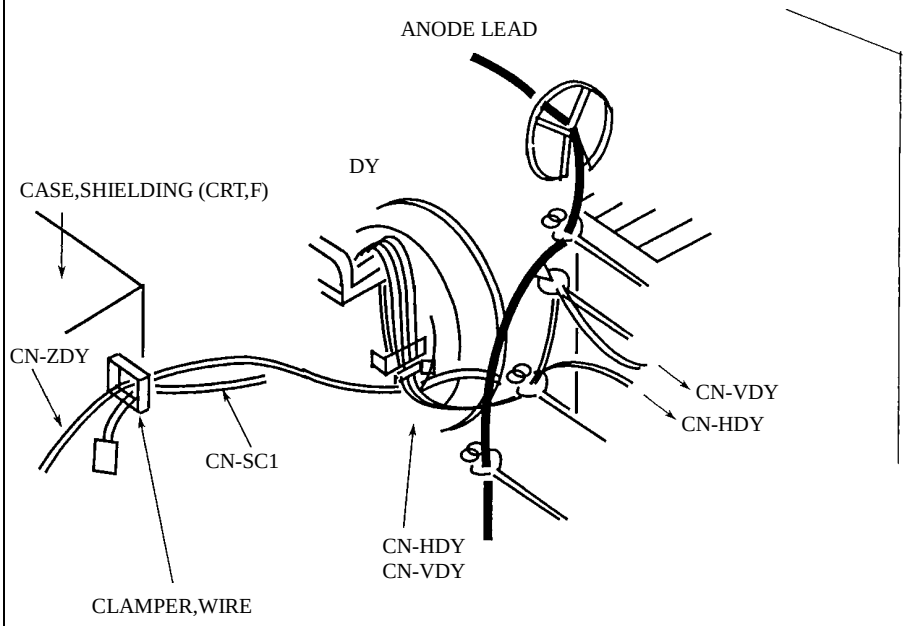


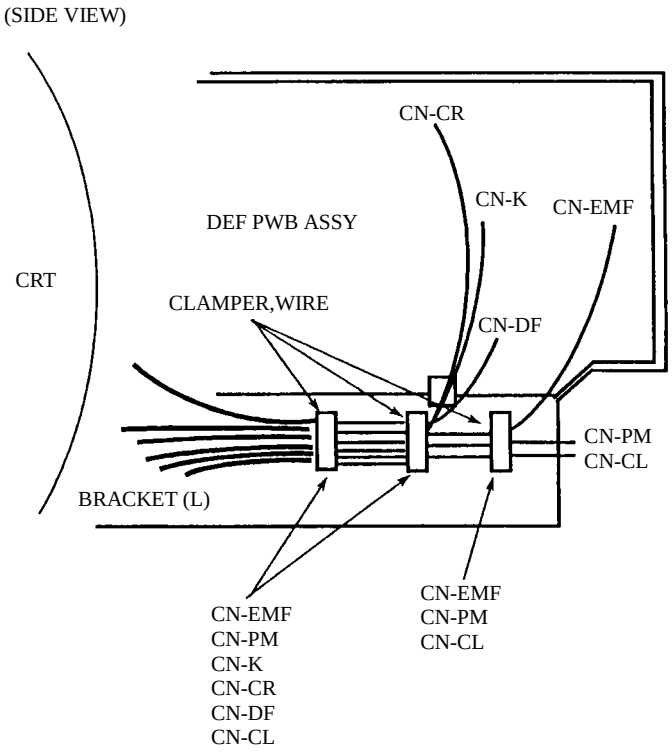
REMARK	SYMBOL
Screw the terminal from HEAT SINK with DEF PWB ASSY.  	

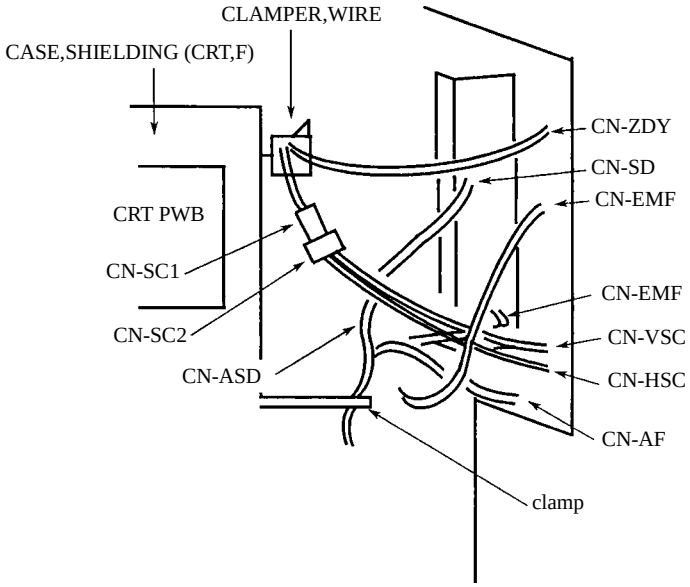


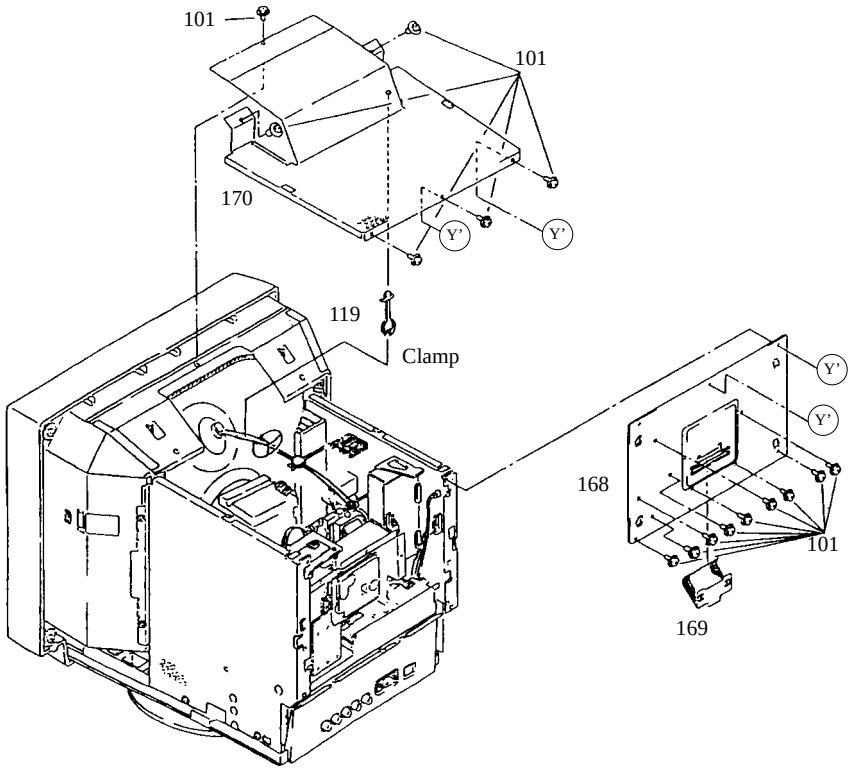
REMARK	SYMBOL
Connect the CN-SC2 to the CNHSC and CNVSC. (CN-SC2) White - CNHSC (White) Yellow - CNVSC (Yellow)	181
Before screw the BRACKET (L), connect the wires. CN-HDY CN-VDY CN-CR CN-K CN-DF CN-SD CN-ASD CN-EMF CN-ZDY CN-CL CN-PM	
Clamp the wires. (Detail next page.)	

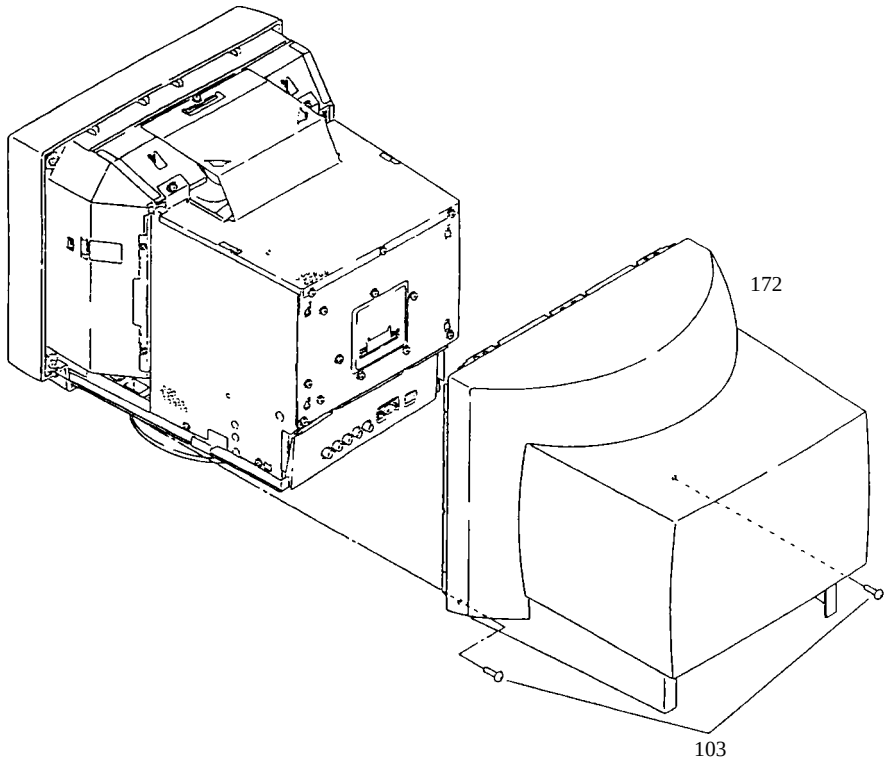


REMARK	SYMBOL	
Clamp the wires. SAFETY		

REMARK	SYMBOL	
Clamp the wires. SAFETY		

REMARK	SYMBOL	
Connect the CN-SC1 to the CN-SC2.		
Clamp the wires. CN-ASD CN-AF		(BACK SIDE) 

REMARK	SYMBOL	
Clamp the ANODE LEAD with the CLAMPER WIRE (H19.5). SAFETY	119	
Don't change the from the LEAF, SPRING.	169	

REMARK	SYMBOL	
		

SYMBOL	CODE	DESCRIPTION	Qty	REMARKS
101	2E853031	CHEXIBS(CUP)*3*8*15CF	52	
102	2E853021	CHEXISS(CUP)*3*8*15BF	05	
103	24851731	SCREW, FT*4*16*15BF(S)	07	
104	24852341	SCREW, WM*4*10*15CF(S)	03	
105	25852641	SCREW, SPECIAL(5*25)	04	
111	25284561	CLAMPER, WIRE	07	
112	25284041	CLAMPER, WIRE	08	
113	25283411	CLAMPER, WIRE	08	
114	25283651	CLAMPER, WIRE	10	
115	25284061	CLAMPER, WIRE	04	
116	25284521	CLAMPER, WIRE(D.G.COIL)	18	
119	25283111	CLAMPER, WIRE(H19.5)	01	
121	840E6C01	VIDEO PWB ASSY	01	
122	843D3B01	SUB PWB ASSY	01	
123	840E6D01	DEF PWB ASSY	01	
124	840E6A02	SW/HV PWB ASSY	01	
125	744E0341	CASE, SHIELDING(CRT,B)	01	
126	744E0761	BRACKET, G(VIDEO, B)	01	
127	744E0391	PLATE. SHIELDING(CRT.A)	02	
129	744E0411	PLATE. SHIELDING(CRT. C)	02	
131	25284581	PWB SUPPORT	03	
132	61322301	COIL(100T, 80H)	01	EMF
133	61322302	CORNER COIL(380T, 105H)	02	EMC
134	61322101	DEGAUSSIING COIL(85T, 10H)	01	DEG
135	741X9741	LEAF SPRING(CRT)	08	
136	741E9881	LEAF SPRING	02	
137	73891347	WIRE CONNECTOR CN-CE	01	CN-CE
138	25534632	COIL SPRING	02	
139	2E322101	CABINET FRONT ASSY	01	
140	2E457751	PUSH BUTTON(CONTROL)	01	
141	25430551	CONTROL PANEL	01	
142	24N00301	WASHER(D20, D6. 5, T2)	04	
143	33022502	CRT M51LRY21X62	01	CRT
145	2E548181	BRACKET(VIDEO.A)	01	
146	744E0351	PLATE, SHIELDING(VIDEO)	01	
147	24282111	BUSHING, INSULATOR	03	
148	25282131	EDGE SADDLE	03	

149	73891360	WIRE CONNECTOR CN-SG	01	CN-SG
150	73891333	WIRE CONNECTOR CN-HT	01	CN-HT
151	2E430491	PWB FRAME	01	
153	2E548231	BRACKET(VIDEO, B)	01	
154	25283461	EDGE SADDLE	01	
156	744E0311	CASE, SHIELDING(CRT, F)	01	
157	2E430821	REVOLVING STAND(B) ASSY	01	
158	25430811	REVOLVING STAND(T)	01	
159	2E426391	SPINDLE	01	
160	2E548061	CHASSIS BASE	01	
162	744E0441	PLATE. SHIELDING(BOTTOM)	01	
163	2E548141	BRACKET(R.B)	01	
164	2E548131	BRAKET(L.B)	01	
165	25280851	BUSHING, INSULATOR	01	
166	25281421	PWB HOLDER	02	
167	25282111	ANODE CLAMPER	01	
168	744E0431	PLATE. SHIELDING(BACK)	01	
169	741X4311	LEAF SPRING(CRT.B)	01	
170	744E0421	PLATE. SHIELDING(TOP)	01	
172	2E322121	CABINET BACK	01	
174	25282992	CLAMPER WIRE(H29.5)	02	
175	25618341	CUSHION SHEET	01	
176	24280701	BAND(L=100)	02	
177	2E618481	PPE SHEET	02	
178	73891295	WIRE CONNECTOR JJ4	01	JJ1
179	73891431	WIRE CONNECTORE CN-DY	01	CN-DY
180	73891432	WIRE CONNECTORE CN-SC1	01	CN-SC1
181	73891433	WIRE CONNECTORE CN-SC2	01	CN-SC2
182	24281691	CLAMPER, WIRE	01	
201	2E781994	LABEL, SERIAL BARCODE(GP)	01	
202	2E785131	LABEL(PTB)	01	
203	2E776021	LABEL, WARNING	01	
204	2E789741	LABEL(CRA)	01	
205	2E789721	NAME PLATE, INSTRUCTION	01	
206	2E788571	LABEL(CE)	01	
207	2E782001	CLEAR LABEL	01	
208	25789021	LABEL(TCO99)	01	

ADJUSTMENT PROCEDURES

Application

These specifications outline the adjustment procedures for Model FP1350-1 22 inch color monitor.

Model : FP1350-1

Destination: Europe Standard Adjustment Conditions

Standard Adjustment Conditions

1. Power Supply Voltage

AC 100V±5% 50/60Hz or AC 120V±5% 60Hz or AC 220V±5% 50Hz

2. Warm Up

Adjust this monitor after a minimum of 90 minutes to allow unit to reach ambient operating temperature. (Use the Self Test screen. Refer item 7-5-3. about Self Test.)

* Adjust the monitor according to item “Rough Adjustment before warm up” before warm up.
* When aging, cover with back cabinet or aging jig.

3. Signals

Unless otherwise specified, inspection should be Mini D-SUB 15 pins.

Video: Analog 0.7±0.01 Vp-p Positive polarity (terminated at 75 ohms ±1%)
or
Analog sync. on green
Video 0.7±0.01 Vp-p positive polarity
Sync 0.3±0.01 Vp-p negative polarity (terminated at 75 ohms ±1%)

Sync.: TTL level (High level: more than 2.4V / Low level: less than 0.8V)
H/V separate, positive / negative polarity
or
H/V composite, positive / negative polarity
or
Sync. on green, 0.3±0.01 Vp-p negative polarity (terminated at 75 ohms ±1%)

4. Magnetic Fields

Vertical Magnetic Fields: 40±1μT Horizontal Magnetic Fields: 30±1μT

* Unless instructed otherwise, the CRT face should be facing to the east.
* Degauss the entire unit with an external degaussing coil for the adjustment.

* Notes about degaussing method

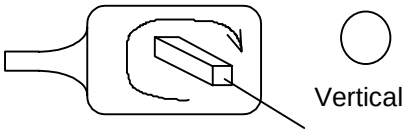
Follow the degaussing procedure below. (To prevent intertwinement of aperture grille)

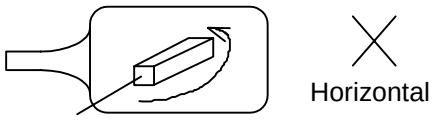
1) Use cylinder-shaped degaussing coil. Do not use ring degaussing coil. But ring degaussing coil can be used at degaussing chassis.

2) In order to remove a magnetization from top sides, base shield and chassis, degauss each side. Do not switch off the degaussing coil abruptly. Move the degaussing coil slowly when degaussing. Note: If the degaussing coil is switched off near the set, the set will be magnetized.

3) To degauss panel surface

Switch on the degaussing coil, keep a distance between panel surface and degaussing coil to more than 50 cm. Move the degaussing coil vertically near the panel surface.
Keep distance of panel surface and degaussing coil to more than 15 mm.





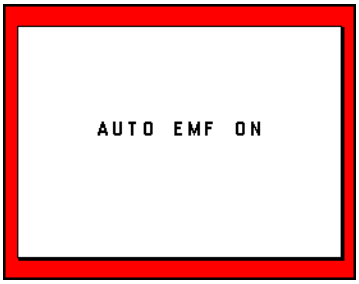
4) Degaussing method of CRT surface

Starting from edge of CRT, move the degaussing coil toward CRT center in circular motion, spending 6 to 7 seconds. (about 4 or 5 round)

When LED is orange in factory mode ("AUTO EMF ON" appear on OSM or TAG 3, TAG 4, TAG 5, TAG B, TAG C is selected), Do not degauss.
In user mode, do not degauss except when "DEGAUSS OK" appear on OSM.

Service Factory MODE: Auto EMF function is off. (LED is yellow)

Auto EMF function off -> on (LED is orange.)



a. TAG 3, TAG 4, TAG5, TAG B, TAG C is selected.

b. When OSM MENU disappear, Push "+" and "▲" switch at once.

Then "AUTO EMF ON" appear on OSM, and AUTO EMF function is on state.
Push any switch and power on/off, AUTO EMF function become off state.
But when receive frequency change, AUTO EMF function stay on state.

User MODE: Auto EMF function is on.(LED is green)

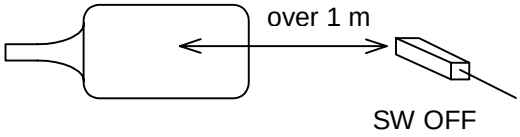
Auto EMF function on -> off

a. Open the MENU (U),TAG7)-"DISPLAY MODE", and Press "+" and "▲" switch at once.

b. Then "DEGAUSS OK" appear on OSM, and AUTO EMF function is on state. When push any switch and power on/off, AUTO EMF function become off state. But when receive frequency change, AUTO EMF function stay on state.

5) After sufficiently degaussing the CRT, move degaussing coil slowly away from the panel surface while rotating from corner to center, taking more than 3 seconds.

Turn off SW more than 1 m away from the CRT. Degauss again if the unit is gaussed.



Magnetized Pattern Example

6) When aperture grille get entangled while degaussing, receive the signal of 1dot alternate pattern and degauss again. If aperture grille remain entangled, vibrate from side.

5. Signal Generator

LVG-1603 is recommended for signal generator.

Use calibrated signal generators. However, use VG-819 in focus regulation.

Note) Adjustment timings are timing tables and are not programmed timing.

6. Color Analyzer, Convergence Meter, Landing Mater

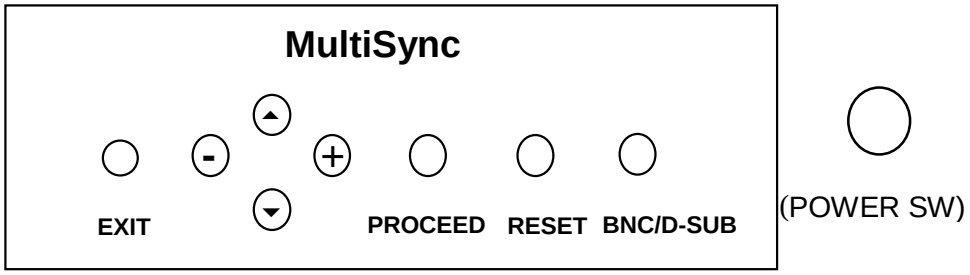
The color analyzer should be CA-100 (made by MINOLTA) or compatible.

The convergence meter should be CC-100 (made by MINOLTA) or compatible.

The Landing meter should be KLD-01 (made by KAMAYA) or compatible.

7. OSM Menu Operation

7-1. Front Panel



7-2. OSM Menu

This unit is adjusted in on screen menu by front panel key operation.

There are 2 types of On Screen menu.
1) Menu (user): This Menu can be operated by a customer.
2) Menu (service): This Menu is hidden from a customer.

Here after, they will be called MENU (U) and MENU (S).

The menu can be displayed when the signal is input to the display unit.

7-3. FACTORY MODE

This model has function that is named "FACTORY MODE"

When the FACTORY MODE is

ON: LED indicator light is yellow usual. But when TAG 3, TAG 4, TAG 5, TAG B or TAG C is selected, LED indicator light is orange.

Power management function does not work.

It is possible to enter MENU (S) by shortcut key.

OFF: LED indicator is GREEN when Horizontal and Vertical Sync Pulse are ON.

Power management function works when the Horizontal or (and) Vertical sync are OFF. It is not possible to enter MENU (S) by shortcut key.

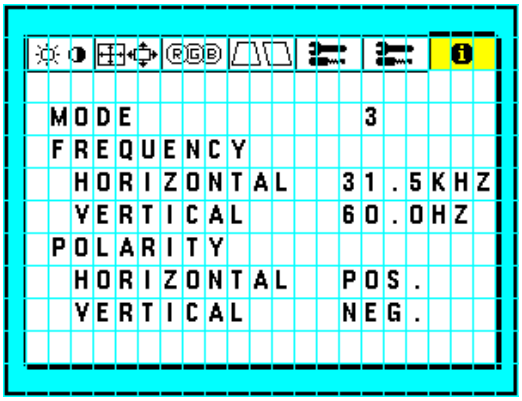
Always turn on “FACTORY MODE”, when adjust the monitor.

If the adjustment finish, should be “FACTORY MODE” OFF.

7-4. FACTORY MODE SETTING

7-4-1 FACTORY MODE: OFF → ON

1) Open the MENU(U),TAG7 - "DISPLAY MODE"(As below)



2) Press "RESET" and "▲","▼" switch at once.

3) A "WARNING" will be displayed, then press "PROCEED" switch once.

4) LED indicator light turn to Yellow from Green.

7-4-2 FACTORY MODE ON → OFF

1) When OSM MENU is displayed, press "EXIT" switch twice. Otherwise, press "EXIT" switch once.

2) A "WARNING" will be displayed, then press "EXIT" switch once.

3) LED indicator light turns to Green from Yellow.

7-5. Displaying the OSM

7-5-1 FACTORY MODE: OFF

MENU(U): Press "EXIT" or "+" , "-" , "▲" , "▼" , "PROCEED" once .

MENU(S): Open MENU, TAG7 "INFORMATION" - "DISPLAY MODE", and press "RESET" and "▲" , "▼" switch at once.

A warning message will be displayed, then press "PROCEED" switch.

7-5-2 FACTORY MODE: ON

MENU(U): Press "+" , "-" or "▲","▼" switch.

MENU(S): Press "PROCEED" switch once.

7-5-3 Self Test

When FACTORY MODE is ON, Self test is on by no signal.

When FACTORY MODE is OFF, Self test in on by power on with pushing “RESET” switch.

7-6. How to turn off OSM MENU

* To close the Menu

Press "EXIT" switch while MENU (U) or MENU (S) is displayed

TAG is highlighted: 1 time.

ITEM is highlighted: 2 times.

entering SUB MENU: 3 times

* To close MENU temporarily.

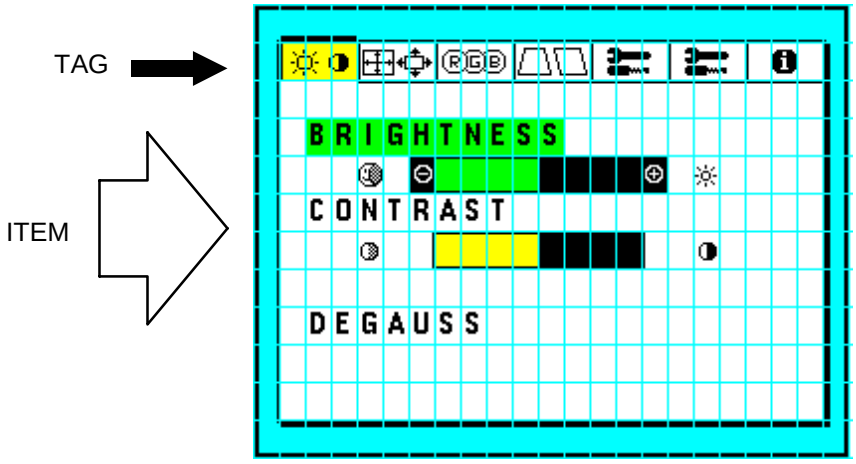
Press "PROCEED" once, while MENU (S) is being displayed.

Press "PROCEED" once more, MENU (S) is displayed again.

7-7. TAG, Item, Sub Menu Change

TAG to TAG	: Push "-" SW or "+" SW.
TAG to item	: Push "▲" SW or "▼" SW
Item to sub Menu	: Push "PROCEED" SW once.
Item to item	: Push "▲" SW or "▼" SW.
Sub Menu to item	: Push "EXIT" SW once.
Item to TAG	: When top item is selected, push "▲" SW.
	When bottom item is selected, push "▼" SW.

Push "EXIT" all items.



7-8. To change Data values

Data values are changed by pressing "-" or "+" switch.

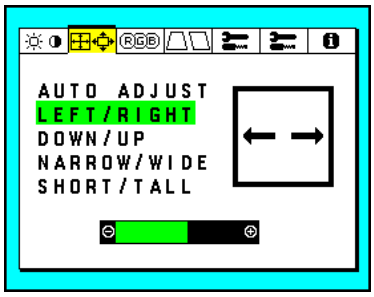
7-9. To save Data Value

Data values are saved for EEPROM, while highlighted ITEM is changed.

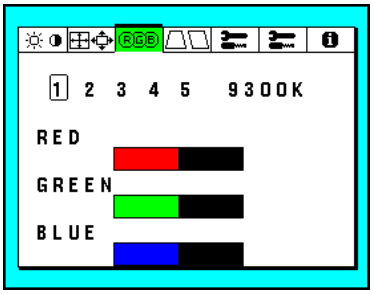
7-10. Structure of OSM Menu (User)

TAG 1) Brightness & Contrast

TAG 2) Size & Position

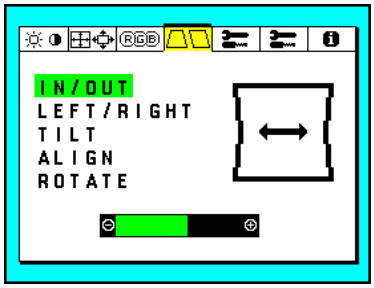


TAG 3) Color Control / AccuColor

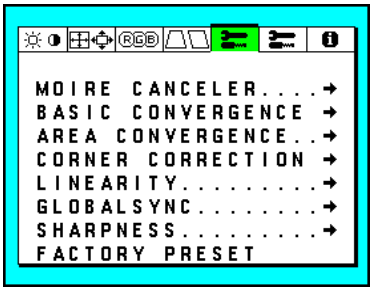


PRESET
No.1 9300K No.2 8200K
No.3 7500K No.4 6500K
No.5 5000K

TAG 4) Geometry

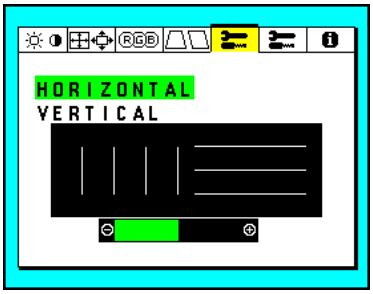


TAG 5) Tools 1

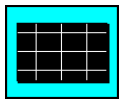


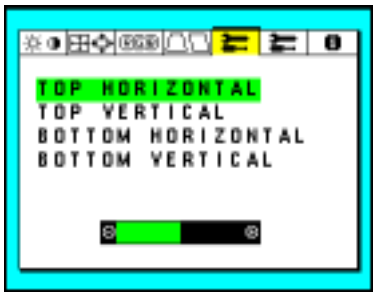
ITEM 5-1) Moire Canceler

ITEM 5-2) Basic Convergence



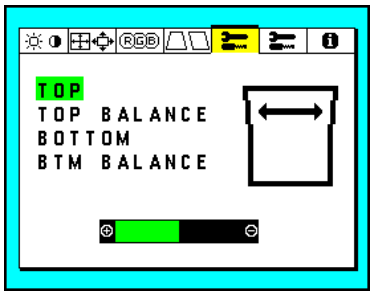
ITEM 5-3) Area Convergence



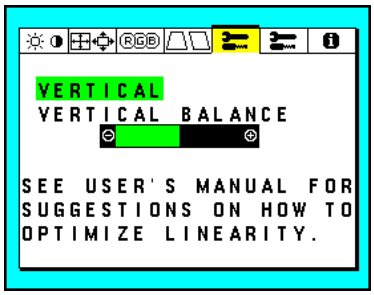


The second OSM appears on the top center area when TOP HORIZONTAL or TOP VERTICAL is selected, and, it appears on the bottom center area when BOTTOM HORIZONTAL or BOTTOM VERTICAL is selected.

ITEM 5-4) Corner Correction

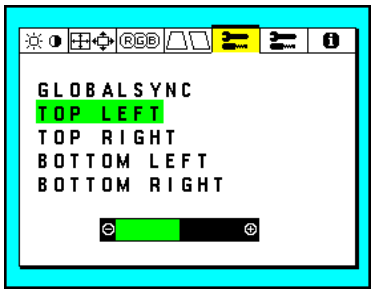


ITEM 5-5) Linearity



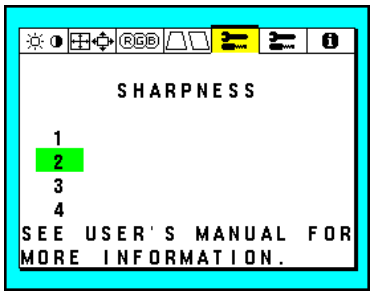
ITEM 5-6-1) GlobalSync 1

ITEM 5-6-2) GlobalSync 2



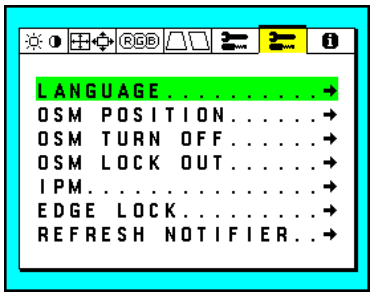
In case of TOP LEFT and BOTTOM LEFT, the left arrow appears on the top left or the bottom left, and, in case of TOP RIGHT and BOTTOM RIGHT, the right arrow appears on the top right or the bottom right.

ITEM 5-7) Sharpness

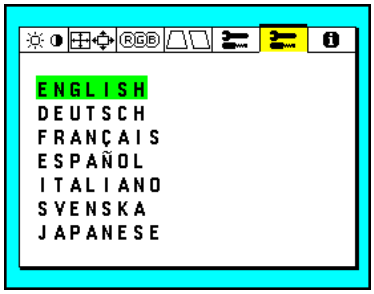


ITEM 5-8) Factory Preset

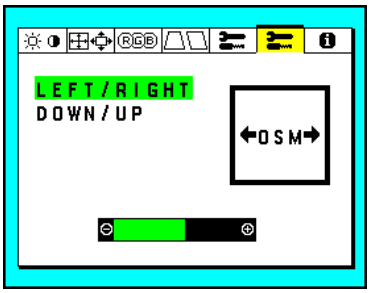
TAG 6) Tools 2



ITEM 6-1) Language

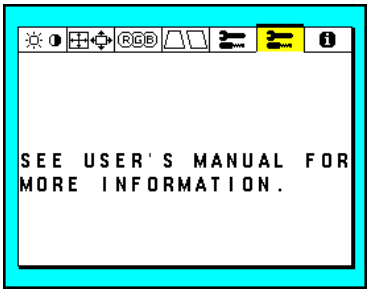


ITEM 6-2) OSM Position

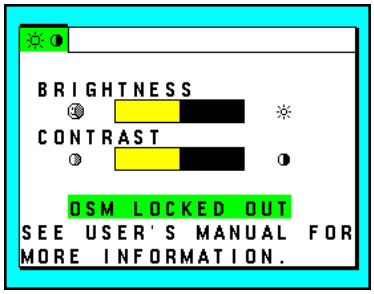


ITEM 6-3) OSM Turn Off

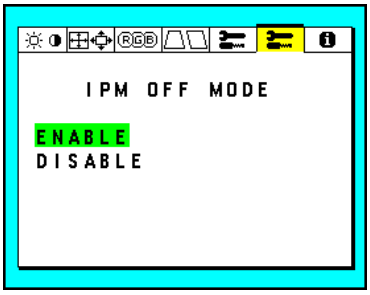
ITEM 6-4-1) OSM Lock Out 1



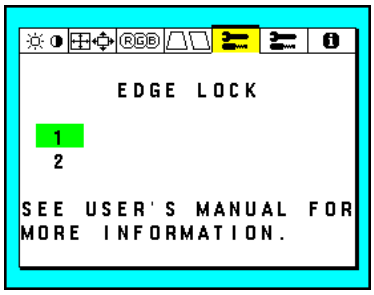
ITEM 6-4-2) OSM Lock Out 2



ITEM 6-5) IPM Off Mode Control Function

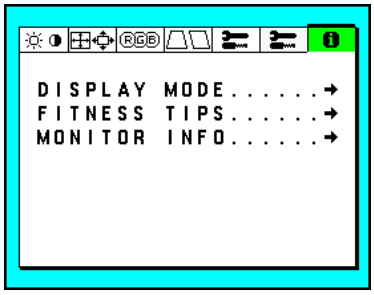


ITEM 6-6) Edge Lock

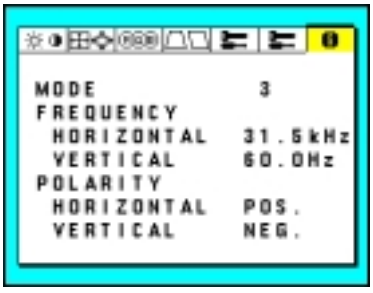


ITEM 6-7) Refresh Notifier

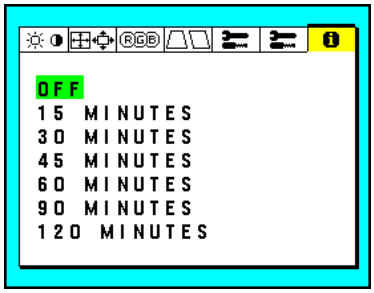
TAG 7) Information



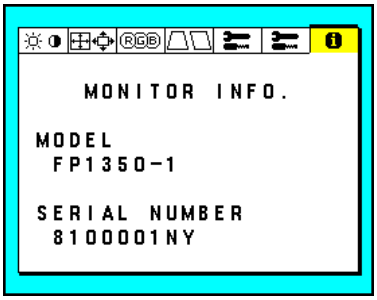
ITEM 7-1) Display Mode



ITEM 7-2) Fitness Tips

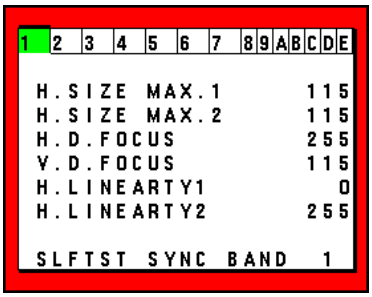


ITEM 7-3) Monitor Info.

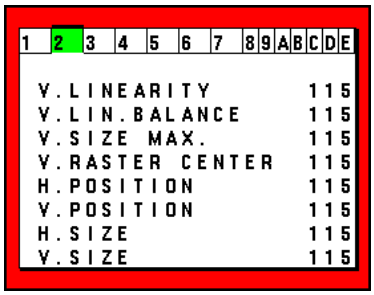


7-11. Structure of OSM Menu (Service)

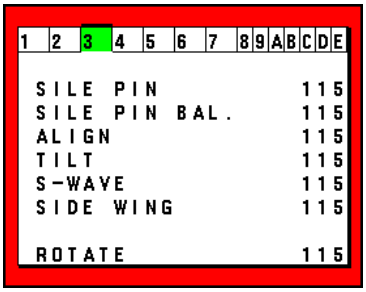
[TAG 1 (S)]



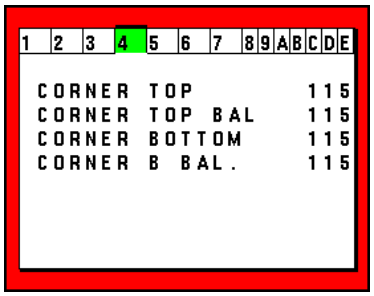
[TAG 2 (S)]



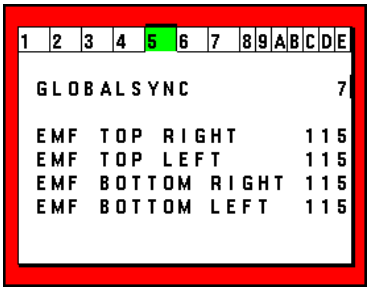
[TAG 3 (S)]



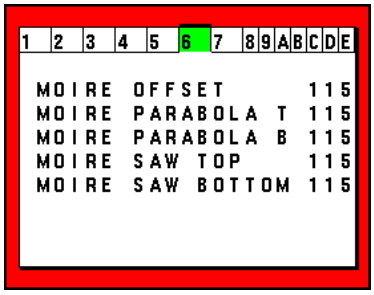
[TAG 4 (S)]



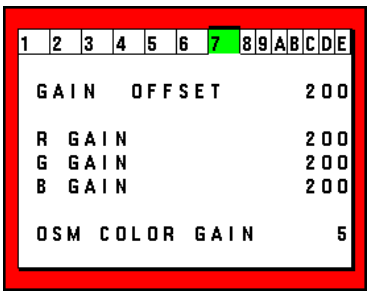
[TAG 5 (S)]



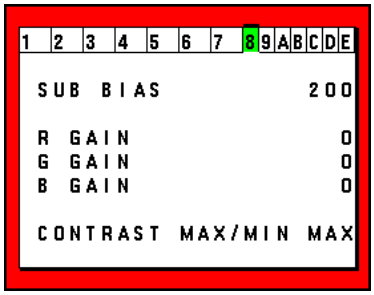
[TAG 6 (S)]



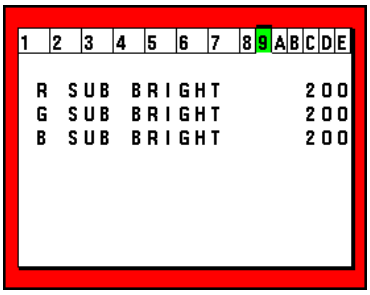
[TAG 7 (S)]



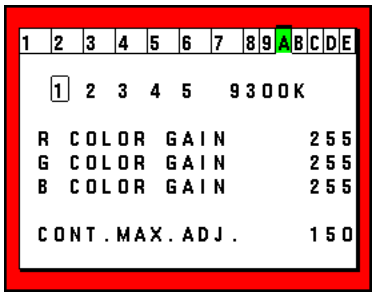
[TAG 8 (S)]



[TAG 9 (S)]

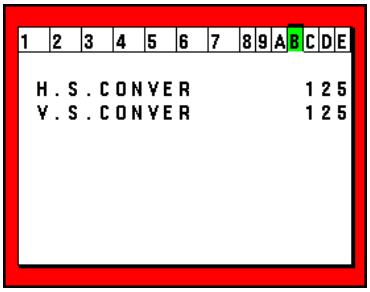


[TAG A (S)]

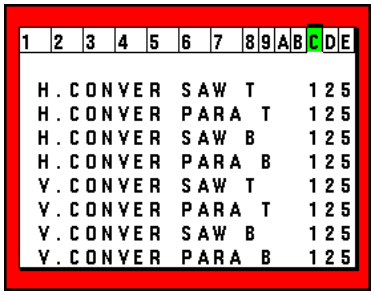


PRESET
No.1 9300K No.2 8200K
No.3 7500K No.4 6500K
No.5 5000K

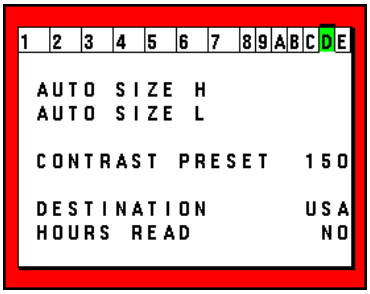
[TAG B (S)]



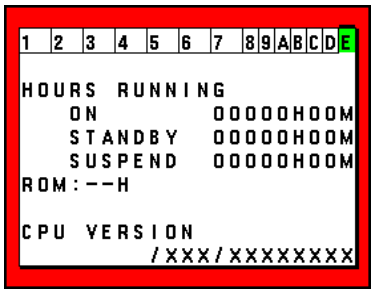
[TAG C (S)]



[TAG D (S)]



[TAG E (S)]



ADJUSTMENT ITEMS

[A] Pre-Adjustment
1. High-Voltage Adjustment ⚠ (When circuit board energizing is examined.)

[B] Initial Settings
1.Control Setting

[C] Main Adjustment
1. Raster Position
   1-1. Horizontal Raster Position
   1-2. Vertical Raster Position
2. Linearity Adjustment
   2-1. Horizontal Linearity Adjustment
   2-2. Vertical Linearity Adjustment
3. Horizontal / Vertical Maximum Size Adjustment
   3-1. Horizontal Maximum Size Adjustment
   3-2. Vertical Maximum Size Adjustment
4. Deflection Distortion Adjustment
   4-1. Horizontal / Vertical Size Rough Adjustment
   4-2. Picture Tilt Adjustment
   4-3. Side Pincushion Balance Adjustment
   4-4. Side Pincushion Adjustment
   4-5. Trapezoid distortion Adjustment
   4-6. Parallelogram Distortion Adjustment
   4-7. Horizontal W-wave Distortion Adjustment
   4-8. Vertical S-wave Distortion Adjustment
   4-9. Corner Distortion Adjustment
   4-10. Overall Distortion Adjustment
5. Preset Picture Size and Position Adjustment
6. Auto Adjustment (Size / Position / Distortion)
   6-1. Outline explanation
   6-2. Equipment for Adjustment
   6-3. Connection
   6-4. Operation
   6-5. Adjustment procedures
7. Video Amplitude Adjustment
   7-1. Settings
   7-2. Video Amplitude
   7-3. OSM Gain Adjustment
   7-4. Cut Off Adjustment ⚠
   7-5. Contrast Tracking Adjustment
   7-6. Brightness Tracking Adjustment
   7-7. Color Preset Adjustment
   7-8. Maximum Brightness Adjustment
8. Focus Adjustment
9. Purity
10. Convergence Adjustment
11. Auto Adjustment
12. Factory settings for shipping

[D] Reference
1. Adjustment Signal
2. Adjustment Signals Timing
3. Position of Connector / Test point of Adjustment

NOTE; ⚠ This MARK is important adjustment item for products safety.

[A] Pre-Adjustment

1. High-Voltage Adjustment  Signal 3 (VGA480) All Black

Initial Setting

SCREEN VR: Fully counterclockwise (MIN)

VR5T1: Fully counterclockwise (MIN)

This adjustment is made when circuit board energizing is examined.

1) Receive signal 3.

2) Adjust VR5T1 slowly so that high voltage is 27kV±0.2kV.

After adjusting, seal VR5T1 with a silicon adhesive and cap (Part No. 74106841).

[B] Initial Settings

1. Control Setting

Before adjusting, set the position of control as follows.

FBT	SCREEN VR	: Fully counterclockwise (MIN)
	FOCUS F1	: Mechanical center
	FOCUS F2	: Mechanical center
VR581		: Fully clockwise (MAX)
SW581		: CRT side

[C] Main Adjustment

Use this manual for aligning the monitor.

1) Push "RESET" SW to reset a highlighted item.

2) Close OSM menu and turn the power off.

3) Turn the monitor back on and confirm that the adjustment values / contrast / white balance / distortion values are the same before the Menu was closed.

When "PROCEED" SW is pushed by the condition which Menu (S) is displayed, OSM Menu will disappear. If "PROCEED" SW is pushed once more, OSM displays)

4) A highlight displays items of TAG 3, TAG 4, TAG 5, TAG B and TAG C, AUTO EMF function becomes

ON, and Landing Rotation Convergence alters.

When it is moved from this items to the tag after the adjusted, AUTO EMF function is turned off, and Landing Rotation Convergence alters.

Previous setting

Signal: No. 3 (VGA480) All White

1) Screen VR setting

Open Menu (U), TAG 1 "BRIGHTNESS & CONTRAST" and push "RESET" SW.

Adjust SCREEN VR so that the back-raster is just disappeared.

2) FOCUS VR setting

Display OSM menu and adjust FOCUS F1 VR and F2 VR to be able to recognize characters.

3) Rough Adjustment before warm up Signal: No. 7 (VESA350@85) All White

Signal: No. 13 (MAC832*624) All White

Signal: No. 27 (H.HOLD 2(115k) fH=110kHz) All Black

Signal: No. 29 (V.RASTER) All White

a. Rough adjustment of horizontal raster position

1) Receive signal 27.
2) Adjust SCREEN VR on the FBT so that the back raster just appears.
3) Make sure to set the position of control as follows :

   VR581 (on the DEF PWB) : Fully clockwise (MAX)

   SW581 (on the DEF PWB) : CRT side
4) Open Menu (S), TAG2 “H.SIZE” and adjust the horizontal size to inside the bezel.
5) If raster has approached on the left of displayed area, switch SW581 position to the CRT side. If raster has approached on the right of displayed area, switch SW581 position to VR581 side.
6) Adjust VR581 so that the raster edge is centered in the bezel.

b. Rough adjustment of vertical horizontal raster position

1) Receive signal 29. All White
2) Menu (S), TAG2 data on ”V.LINEARITY" are 90, and it confirms that data on "V.LIN.BALANCE" are 128.
   * When data are not 90 and 128, Open TAG2 ”V.LINEARITY" and TAG2 "V.LIN.BALANCE", and set up data.
3) Open Menu (S), TAG2 "V.SIZE", adjust "+", "-" SW so that the vertical raster size is 297±3.0 mm.
4) Open Menu (S), TAG 2 "V.RASTER CENTER" and push "RESET" SW.
5) Adjust the vertical raster and the space of the edge as listed below by switch.(Fig 1-2 reference)

   $| Ytop - Ybottom | \leq 1.0mm$
6) Push "EXIT" SW.

c. Rough adjustment of self test screen

1) Receive signal 7.
2) Open Menu(S), TAG1. Make sure that data on "SLFTST SYNC BAND" is "1".
3) Open Menu (S), TAG2 "V.POSITION" and adjust "+", "-" SW so that the picture is centered with in the screen.
4) Open Menu (S), TAG2 "V.SIZE" and adjust it so that top and bottom picture size may be 3-5mm from the bezel. When picture doesn't spread out, open Menu (S), TAG2 "V.SIZE MAX". If not able to set picture size, open Menu (S), TAG2 "V.SIZE MAX", adjust so that screen may become full with the bezel. And open Menu (S), TAG2 "V.SIZE" and adjust it so that top and bottom picture size may be 3-5mm from the bezel.
5) Receive signal 13.
6) Open Menu (S), TAG2 “H.SIZE” and adjust the picture size is just the bezel.
7) Display the self test screen.
   Note) Make sure that the screen is one image.
   If there is not stable, Open Menu(S), TAG1"SLFTST SYNC BAND" and adjust "-"SW so that the data is "0".
8) Make sure that the picture size is just the bezel.

d. Screen VR Adjustment

1) Display the self test screen.

2) Adjusted with the screen VR so that the voltage of the video PWB TP-ABL may become 4.64 (V) <ABL<8.14 (V).

1. Raster Position

1-1. Horizontal Raster Position Signal: No. 27 (H.HOLD 2(115k)) All Black

1) Receive signal 27.

2) Adjust SCREEN-VR on the FBT so that the back raster just appears.

3) Make sure to set the position of control as follows.

VR581: Fully clockwise (MAX).

SW581: Set position to the CRT side.

4) Open Menu (S), TAG2 "H.SIZE", Horizontal Size and adjust "+", "-" SW so that the horizontal size is 396±2.0 mm.

5) If raster has approached on the left of displayed area, change the SW581 position to the CRT side If raster has approached on the right of displayed area, change the SW581 position to the VR581 side.

6) Adjust VR581 so that the distance between the bezel and raster edge is as follows.

$$| XL_{eft} - XR_{ight} | \leq 1.0 \text{ mm}$$

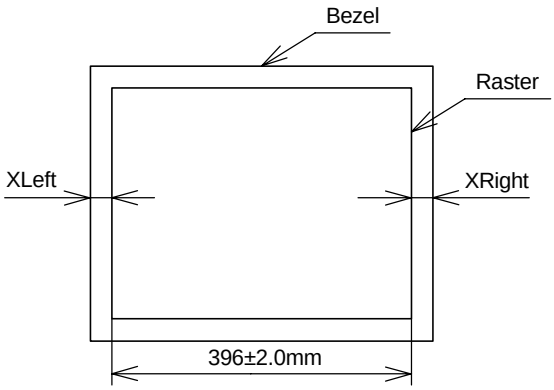


Fig 1-1 Horizontal Raster Centering

1-2. Vertical Raster Position Signal: No. 29 (V.RASTER) All White

1) Receive signal 29.

2) Menu (S), TAG2 data on ”V.LINEARITY" are 90, and it confirms that data on "V.LIN.BALANCE" are 128.
* When data are not 90 and 128, Open TAG2 ”V.LINEARITY" and TAG2 "V.LIN.BALANCE", and set up data.

Open Menu (S), TAG2 "H.SIZE" and adjust "+" SW so that the vertical raster size is 297±3.0 mm.

3) Open Menu (S), TAG 2 "V.RASTER CENTER" and push "RESET" SW.

4) Adjust the vertical raster and the space of the edge as listed below by switch. (Fig 1-2 reference)

$$|\mathbf{Ytop - Ybottom}| \leq 1.0\text{mm}$$

5) Push "RESET" SW.

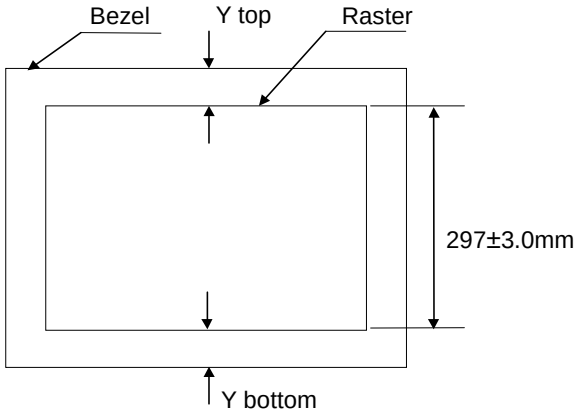


Fig 1-2 Vertical Raster Centering

2. Linearity Adjustment

2-1. Horizontal Linearity Adjustment Signal: No. 17 (1024*768@75Hz) Cross hatch pattern
Signal: No. 23 (1600*1200@85Hz) Cross hatch pattern

* Hereunder integrate is done when value of control former "H.LINEARITY 1:60" and "H.LINEARITY 2:180" come off the value of standardized.

1) Receive signal 23.

2) Open Menu (S), TAG2 "H.POSITION" and adjust "+", "-" SW so that the picture is centered with in the screen.

3) Open Menu (S), TAG2 "H.SIZE" and adjust "+" SW so that the horizontal size is 396±3 mm. If not able to set horizontal size, open Menu (S), TAG1 "H.SIZE MAX 2", adjust the horizontal size is 396 mm. After, Data on "H.SIZE" adjusted to the maximum (255).

4) Open Menu (S), TAG1 "H.LINEARITY 2" and adjusted so that the horizontal direction width of the second square may become the same from both ends of the screen.

Note: When a OSM Menu is hidden temporarily for picture adjustment, push "PROCEED " SW once to display OSM Menu.

5) Receive signal 17.

6) Open Menu (S), TAG2 "H.POSITION" and adjust "+", "-" SW so that the picture is centered with in the screen.

7) Open Menu (S), TAG2 "H.SIZE" and adjust "+" SW so that the horizontal size is 396±3 mm. If not able to set horizontal size, open Menu (S), TAG1 "H.SIZE MAX 1", adjust the vertical size is 396 mm. After, Data on "H.SIZE" adjusted to the maximum (255).

8) Open Menu (S), TAG1 "H.LINEARITY 1" and adjusted so that the horizontal direction width of the second square may become the same from both ends of the screen.

Note: When a OSM Menu is hidden temporarily for picture adjustment, push "PROCEED " SW once to display OSM Menu.

9) Push "EXIT" SW.

2-2. Vertical Linearity Adjustment Signal: No. 22 (1600*1200@75Hz) Cross hatch pattern

1) Receive signal 22.
2) Open Menu (S), TAG2 "V.POSITION" and adjust "+", "-" SW so that the picture is centered with in the screen.
3) Open Menu (S), TAG2 "V.SIZE" and adjust "+" SW so that the vertical size is 297±3 mm. If not able to set vertical size, open Menu (S), TAG2 "V.SIZE MAX", adjust the vertical size is 297±3 mm. After open Menu (S), TAG2 "V.SIZE" so that the data is max (255).

4) Open Menu (S), TAG2 "V.LINEARITY" and adjust "+", "-" SW to make size of top square and bottom square on the screen equal vertically.

Note: When a OSM Menu is hidden temporarily for picture adjustment, push "PROCEED " SW once to display OSM Menu.

5) Open Menu (S) TAG2 "V.LIN.BALANCE" and adjust "+", "-" SW to make size of top square and bottom square on the screen equal vertically.

6) Open Menu (S) TAG2 "V.LINEARITY" again and adjust "+", "-" SW to make size of top square and center square on the screen equal vertically.

7) Make sure that the linearity of top, center, and bottom on the screen are ±3%.

8) Push "EXIT" SW.

3. Horizontal / Vertical Maximum Size Adjustment

3-1. Horizontal Maximum Size Adjustment Signal: No. 13 (MAC832*624) All white

Signal: No. 35 (H.SIZE) All white

1) Receive signal 13.
2) Open Menu (S), TAG2 "V.SIZE" and adjust "+", "-" SW so that the vertical size is 297±5 mm. If not able to set vertical size, open Menu (S), TAG2 "V.SIZE MAX", adjust the vertical size. And open Menu (S), TAG2 "V.SIZE" and adjust vertical size.
3) Open Menu (S), TAG3 "IN / OUT" and adjust "+", "-" SW to correct side pincushion distortion.
4) Open Menu (S), TAG1 "H.SIZE MAX.1", push “RESET”SW and make sure that "H.SIZE MAX.1" is set to 1.
5) Open Menu (S), TAG1 "H.SIZE MAX.1", and adjust "+", "-" SW so that video horizontal size may become full with the bezel.
6) Receive signal 35.
7) Open Menu (S), TAG2 "H.POSITION", rough adjust so that video area may become in the center of the screen.
8) Open Menu (S), TAG1 "H.SIZE MAX. 2", and push "EXIT" SW. It confirms that data on "H.SIZE MAX.1" are 0.
9) Open Menu (S), TAG1 "H.SIZE MAX. 2", and adjust "+", "-" SW so that video horizontal size may become full with the bezel.
10) Push "EXIT" SW.

3-2. Vertical Maximum Size Adjustment Signal: No. 28 (V.MAX) All white

1) Receive signal 28.
2) Open Menu (S), TAG2 "V.POSITION" and adjust "+", "-" SW so that the picture is centered with in the screen.
3) Open Menu (S), TAG3 "V.SIZE MAX", push “RESET”SW and adjust "+", "-" SW so that the vertical size is 297±3 mm.
4) Push "EXIT" SW.

4. Deflection Distortion Adjustment

Environment: Adjustment Magnetic Field by three dimension magnetic field system.Turn the CRT face to east and degauss the monitor using an external degaussing coil.

* When distortion amount is confirmed in the hereunder adjusted, It is made the condition that items of the menu tag 3 or 4 is select, or PROCEED is used in the condition that items is select, and turn off condition the OSM.

* After 4-1 section and 4-2 section are adjusted, Redo adjusts 4-3 sections to 4-8 sections in the case of the manual adjustment. When distortion left at the top-bottom corner, the adjusted of 4-9 section is done by this adjustment. 4-10 section is confirmed at the end.

4-1. Horizontal / Vertical Size Rough Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG2 "H.POSITION", "V.POSITION", "H.SIZE", "V.SIZE" and adjust the screen size to the following values.

Horizontal Size: 396 mm ± 3 mm

Vertical Size: 297 mm ± 3 mm

Horizontal Picture Position: | Xleft - XRight | ≤ 3.0 mm

Vertical Picture Position: | XTop - XBottom | ≤ 2.0 mm

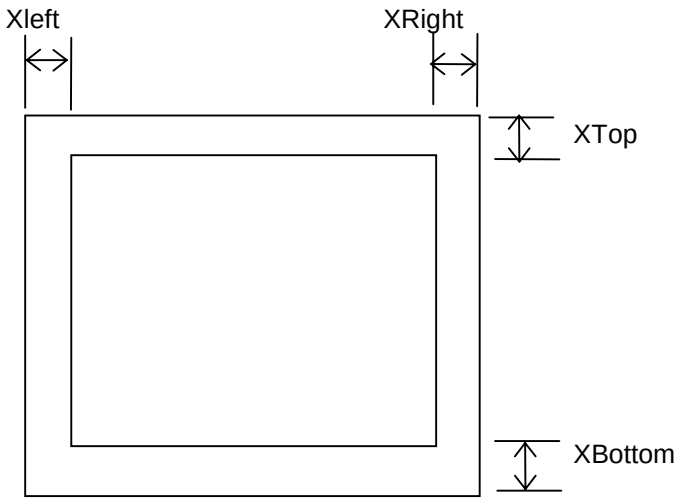


Fig 4-1 Screen Size Rough Adjustment

4-2. Picture Tilt Adjustment Signal: No. 33 (788*1200@75Hz) Cross Hatch Pattern

1) Receive signal 33.

2) Open Menu (S) TAG3 "ROTATE" and make sure that initial value of adjustment data is "128".

3) Turn the CRT face to east and degauss the monitor using an external degaussing coil.

4) Make sure that the picture tilt meets the following specification.
X ≤ ± 2.0 mm

If out of specification, correct CRT assembly.

5) Open Menu (S) TAG3 "ROTATE" and make sure that the picture is tilted as follows by "+", "-" SW.

"-" SW: counterclockwise

"+" SW: clockwise

6) Open Menu (S) TAG3 "ROTATE" and adjust "+", "-" SW so that the picture tilt meets the following standards. The maximum correction is ±1.0mm.

X ≤ ± 1.0 mm

7) Push "EXIT" SW.

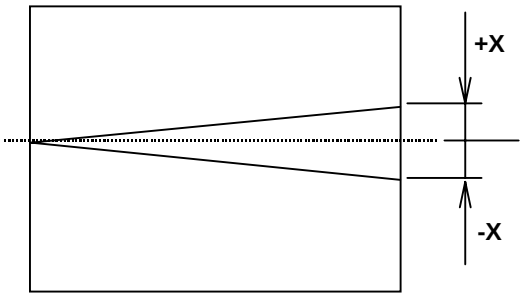


Fig 4-2 Picture Tilt

4-3. Side Pincushion Balance Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 "SIDE PIN BAL".

Adjust "+", "-" SW so that the difference of X_{SL} and X_{SR} is equal (maximum 1.0 mm).

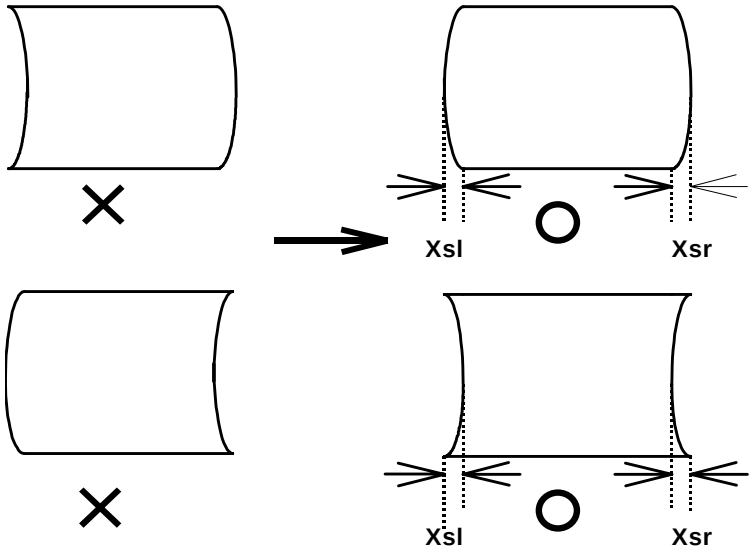


Fig 4-3 Side Pincushion Balance

4-4. Side Pincushion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 "SIDE PIN".

Adjust "+", "-" SW so that the side pincushion distortion is small (maximum ± 0.5 mm).

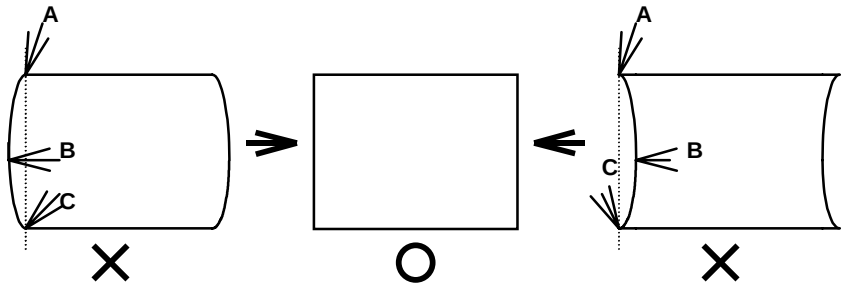


Fig 4-4 Side Pincushion

4-5. Trapezoid Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 "ALIGN".

Adjust "+", "-" SW so that the Trapezoid Distortion is equal to X_{top} and X_{btm}. ($|X_{top} - X_{btm}| \leq 1.0$ mm)

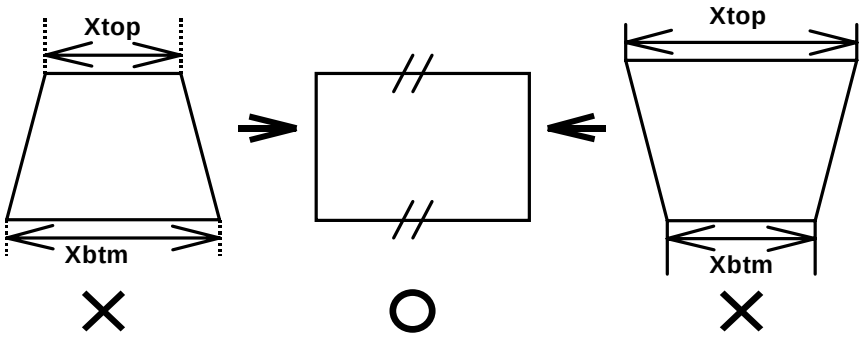


Fig 4-5 Trapezoid Distortion

4-6. Parallelogram Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 "TILT". Adjust "+", "-" SW so that the vertical line and horizontal line at the screen's center fall at right angles. (maximum 90° ± 0.5°)

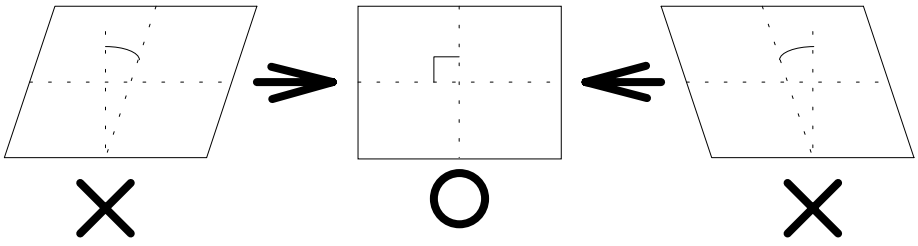


Fig 4-6 Parallelogram Distortion

4-7. Horizontal W-wave Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 " SIDE WING ".

Adjust "+", "-" SW so that the side vertical line is about straight. (maximum ± 0.5 mm)

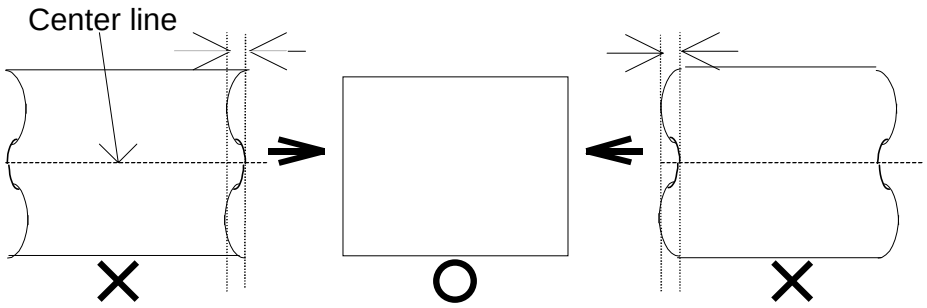


Fig 4-7 Horizontal W-wave Distortion

4-8. Vertical S-wave Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Open Menu (S), TAG3 "S.WAVE".

Adjust "+", "-" SW so that the side vertical line is about straight. (maximum ± 0.5 mm)

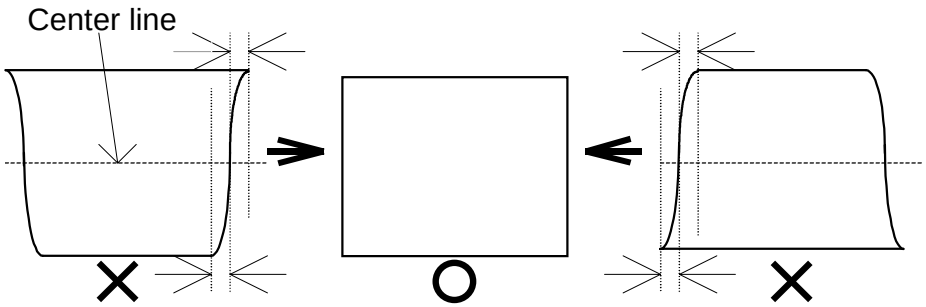


Fig 4-8 Vertical S-wave Distortion

If Trapezoid Distortion is out of specification, repeat adjustment step 4-5.

It implements this adjustment in case of the following Undulation distortion.

Undulation is a directional difference of tilt at AB and DE.

Following figures (I) and (II) are example.

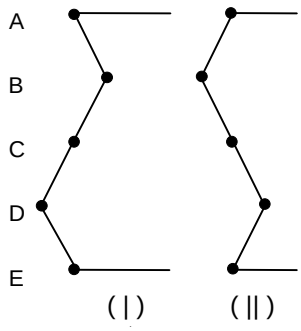


Fig 4-9 Vertical S-wave Distortion Definition

4-9. Corner Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

Do this integrate when distortion is adjust in the top or the bottom after the integrate to 4-8 sections.

4-9-1. Top Corner Distortion Adjustment

1) Open Menu (S), TAG4 "CORNER TOP".

Adjust "+", "-" SW so that the top corner forms a right angle. (maximum ± 1.0 mm)

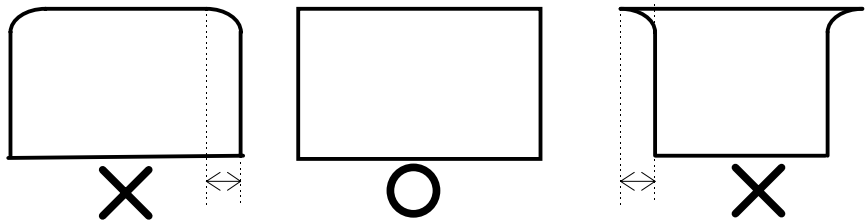


Fig 4-10 Top Corner Distortion

4-9-2. Bottom Corner Distortion Adjustment

1) Open Menu(S), TAG4 "CORNER BOTTOM".

Adjust "+", "-" SW so that the bottom corner forms a right angle. (maximum ± 1.0 mm)

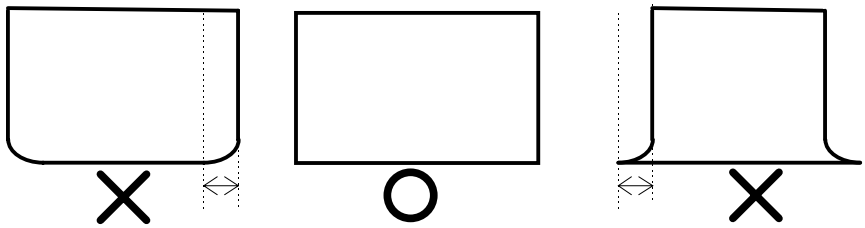


Fig 4-11 Bottom Corner Distortion

4-9-3. Top Corner Balance Adjustment

1) Open Menu(S), TAG4 "CORNER TOP BAL".

Adjust "+", "-" SW so that the top corner forms a right angle. (maximum ± 1.0 mm)

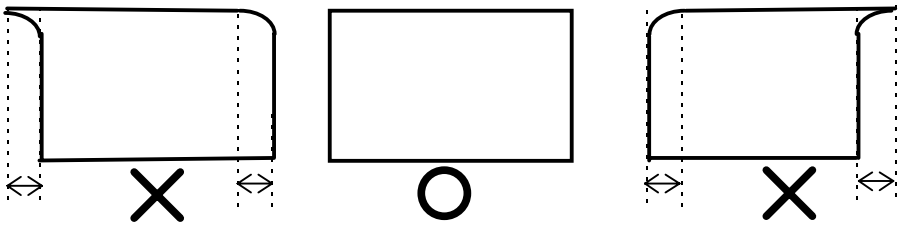


Fig 4-12 Top Corner Balance

4-9-4 Bottom Corner Balance Adjustment

1) Open Menu (S), TAG4 "CORNER BOTTOM BAL".

Adjust "+", "-" SW so that the bottom corner forms a right angle. (maximum ± 1.0 mm)

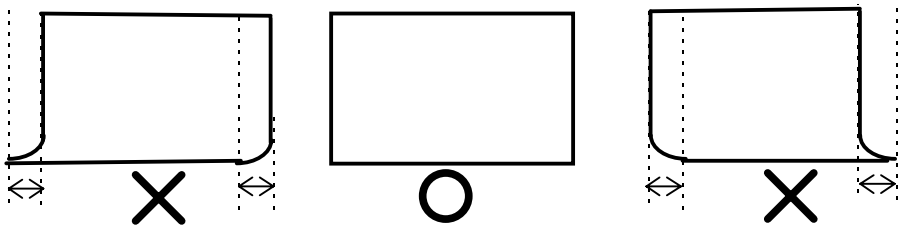


Fig 4-13 Bottom Corner Balance

4-10. Overall Distortion Adjustment Signal: No. 33 (788*1200@75Hz) All white

1) Confirm that adjustment on steps 4-2 to 4-9 meets the specifications.

2) If undulating, re-adjustment each distortion adjustment.

Undulation is a directional difference of tilt at either AC and CE or both.

Following figures (I) and (II) are example. AB and BC, CD and DE are the direction of tilt.

Undulated correction is the same direction of tilt at AB and BC, CD and DE.

Following figures (III) and (IV) are example. In this state, each adjustment standard must be met.

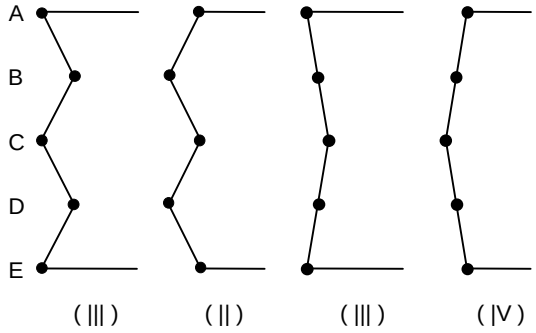


Fig 4-14 Undulated Definition

5. Preset Picture Size and Position Adjustment

Signal:	No. 3 (VGA480)	No.14 (800*600@85Hz)
	No. 6 (MAC 640*480)	No.17 (1024*768@75Hz)
	No.12 (VESA 640*480@85Hz)	No.21 (1280*1024@75Hz)
	No.13 (MAC 832*624)	No.22 (1600*1200@75Hz)
		No.23 (1600*1200@85Hz)

Video: All White

1) Receive signal 3.

2) Open Menu (S), TAG2 "H.POSITION", "V.POSITION", "H.SIZE", "V.SIZE".

3) Adjust the picture size and position as listed below by "+", "-" SW.

Picture size

H: 396 ± 1 mm

V: 297 ± 1 mm

Picture Position

H: $| X_{Left} - X_{Right} | \leq 1.0$ mm

V: $| X_{Top} - X_{Bottom} | \leq 1.0$ mm

4) Push "EXIT" SW.

5) Receive the next signal and repeat steps 2) - 4).

Note: Before receiving the next signal, always push "EXIT" SW to store adjustments.

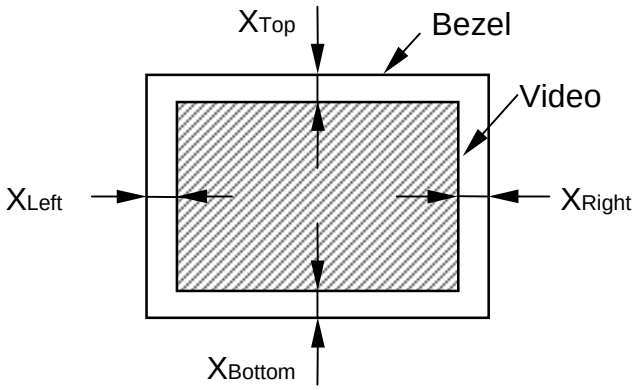


Fig 5-1 Picture Position

6) For the signals below, picture size and position are calculated from above adjustment data and data are written into EEPROM.

Preset Signal:
- No. 1 (VGA350)
- No. 2 (VGA400)
- No. 4 (640*400@70Hz)
- No. 5 (800*600@60Hz)
- No. 7 (VESA350@85Hz)
- No. 8 (VESA400@85Hz)
- No. 9 (VESA640*480@75Hz)
- No.10 (XGA)
- No.11 (VESA800*600@75Hz)
- No.15 (1024*768@70Hz)
- No.16 (1280*1024@60Hz)
- No.18 (Mac1152*870)
- No.19 (1024*768@85Hz)
- No. 20 (1280*1024@70Hz)

USER Signal:
- USER1 (PC98 1120*750(I))
- USER2 (VESA 800*600@56Hz)
- USER3 (VESA 1024*768@60Hz)
- USER4 (VESA 800*60072Hz)
- USER5 (1120*750@60Hz)
- USER6 (640*480@100Hz)
- USER7 (XGA-2 1024*768@72Hz)
- USER8 (1024*768@80Hz)
- USER9 (800*600@100Hz)
- USER10 (640*480@120Hz)
- USER11 (640*480@140Hz)
- USER12 (VESA 1600*1200@60Hz)
- USER26 (VESA 1920*1440@75Hz)
- USER13 (VESA 1600*1200@60Hz)
- USER14 (1024*768@100Hz)
- USER15 (800*600@120Hz)
- USER16 (640*480@160Hz)
- USER17 (VESA 1920*1440@60Hz)
- USER18 (1600*1200@70Hz)
- USER19 (1280*1024@85Hz)
- USER20 (800*600@140Hz)
- USER21 (VESA 1792*1344@75Hz)
- USER22 (VESA 1600*1200@80Hz)
- USER23 (1024*768@120Hz)
- USER24 (800*600@160Hz)

6. Auto Adjustment (Size / Position / Distortion)

6-1. Outline explanation

1) Adjustment for Size, Position and Distortion for all preset signals can be done by selecting only one specified signal.

   Accordingly, following adjustments can be done automatically by using this jig.

   ・Horizontal / Vertical Size Adjustment (include Max Size Adjustment)

   ・Horizontal / Vertical Position Adjustment

   ・Distortion Adjustment

2) The Menu of this adjustment is representative and they differ with every model.
   However operation method is similar.

3) If Horizontal / Vertical Max Size Adjustment are not need, it requires no adjustment.
   If the model requires Horizontal / Vertical Max Size Adjustment, follow the instructions that are displayed.

6-2. Equipment for Adjustment

1) Auto ADJ I/F jig

2) The software for auto ADJ I/F jig

3) Printer cable (Should be prepared at your side.)

4) PC(IBM PC or compatible) (Should be prepared at your side.)

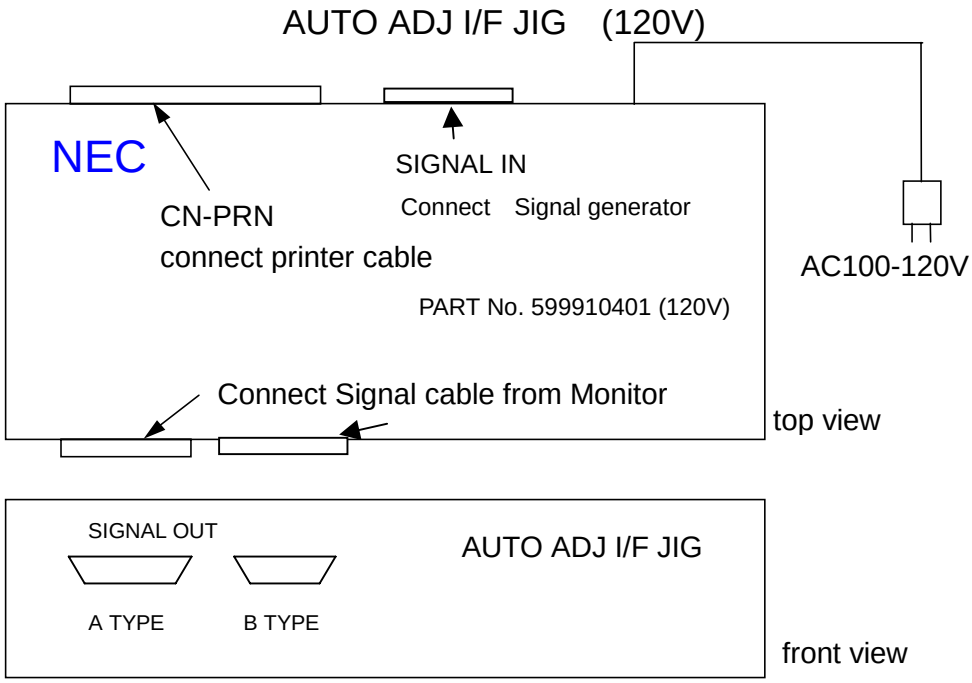


Fig 6-1 Auto ADJ I/F jig

6-3. Connection

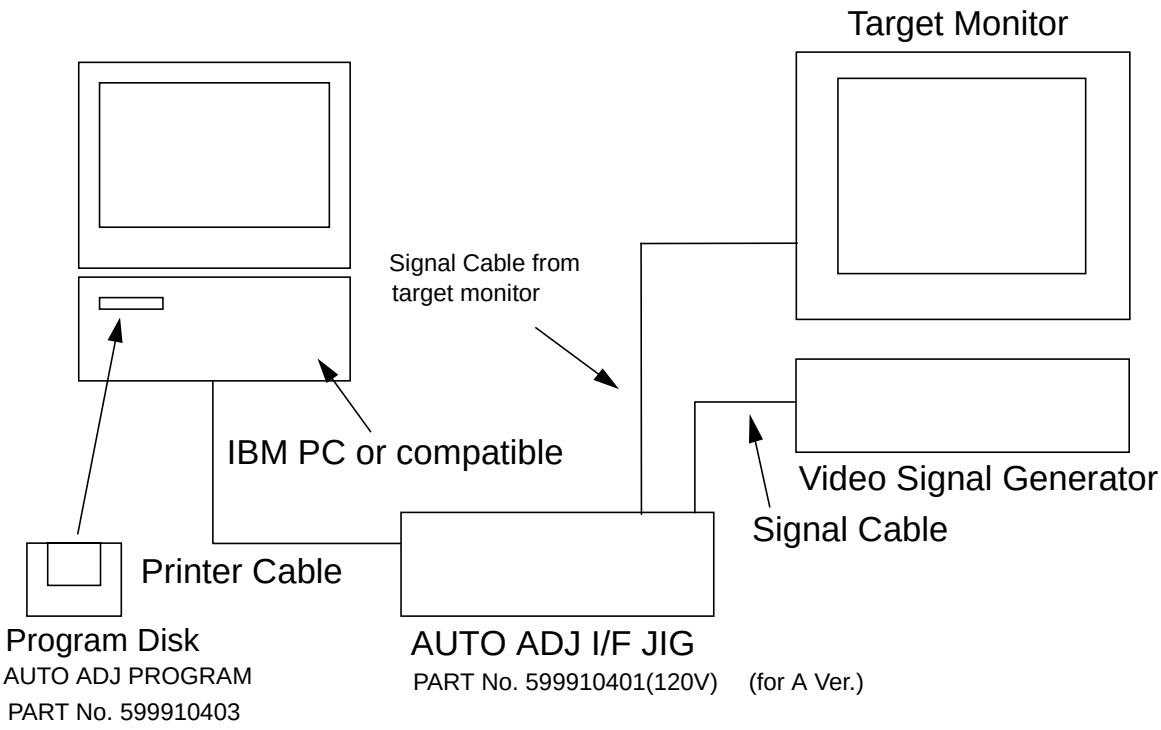


Fig 6-2 Connection

1) Connect signal cable from target monitor to Auto ADJ I/F jig. (From here after, this is abbreviated “JIG”.)

2) Connect Printer cable to JIG AND PC.

3) Power on the monitor, JIG and PC after set up the software for auto ADJ I/F jig in PC.

All adjustment for Size, Position and Distortion can be done from PC by using this jig.

Adjustment for Size, Position and Distortion for all preset signals can be done by selecting only one specified (“80: TOTAL1 (1024*768(75))”) signal.

Note: Distortion adjustment signal may differ from another type monitor in some cases.

In this case, use signal displayed on the screen menu.

6-4. Operation

1) Programming flow chart

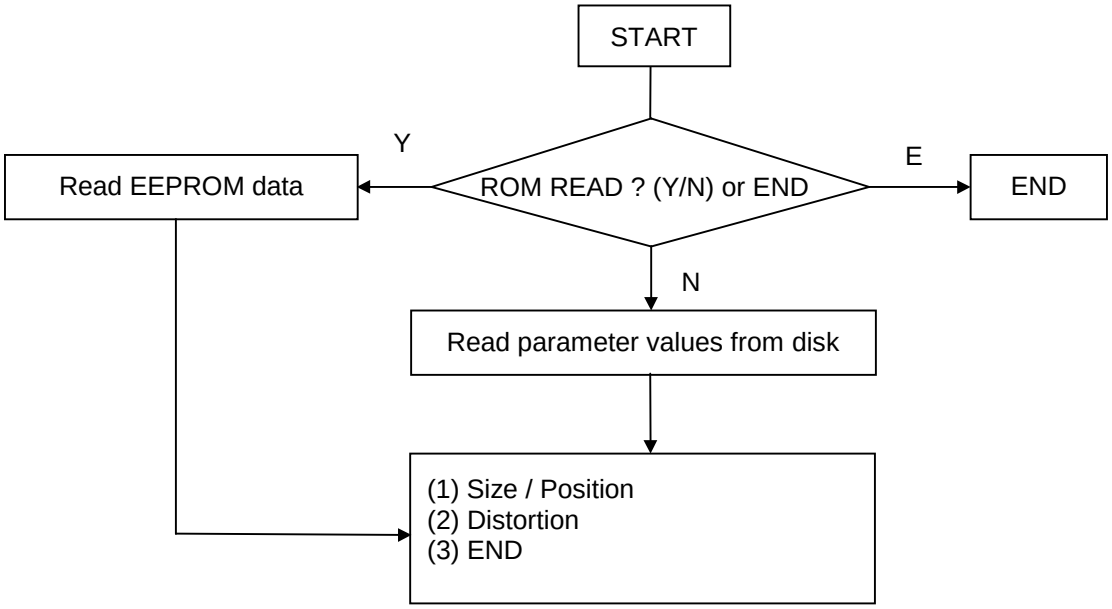


Fig 6-3 Programming flow chart of service adjustment

6-5. Adjustment procedures

1) Start the program

a. Insert FD of software for auto ADJ I/F jig into PC.

b. Then Power on the PC, the AUTO ADJ I/F jig and Monitor.

c. As models list will appear on monitor screen, select the model number and push “RETURN” key.

d. As following message will appear on monitor screen, push “Y” or “N” key.

Size/Position Distortion Manual Adjust Program SPSC2.EXE Version 1.00

ROM READ ? (Y/N) or END (E) **MODEL:**

Y: INITIAL DATA = READING SET **FP1350-1**
N: INITIAL DATA = PARAMETER FILE

(Menu A)

If “Y” key is selected:

PC begins to read the data that is saved in EEPROM of the monitor, and to adjust the monitor using the data as reference.

If “N” key is selected:

PC begins to adjust the monitor using the data saved in program disk as reference.

Note: Push “N” key, when screen size and position are not correct and data are destroyed.

Also push “N” key, if you are not sure which reference to use.

If “E” key is selected:

PC ends adjustment program.

2) Adjustment procedure

Adjust monitor in following steps.

a. Distortion adjustment

b. H. SIZE(MAX) adjustment

c. V. SIZE(MAX) adjustment

d. Size / Position adjustment

a. Distortion adjustment

a-1. The following menu B will appear on screen.

```
Size/Position Distortion Manual Adjust Program SPSC2.EXE Version 1.00
                                                    MODEL:
1 : Size / Position                                 FP1350-1
2 : Distortion
3 : END
                    No. ? _
```

(Menu B)

Note: Above menu may differ in some models.

"1 : Size / Position" : Adjustment of size and position

"2 : Distortion" : Adjustment of distortion

"3 : END" : Return to start menu screen

a-2. Select "Distortion" while menu B is displayed, and push "RETURN" key.

a-3. Input the adjustment signal that is specified as "80: TOTAL1 (1024*768(75))" on menu D.

a-4. Then, following menu will appear on monitor screen. For getting good distortion, adjust each items on "Distortion Adjustment" with pushing "1", "4", "7", "3", "6" and "9" keys.

Note: Distortion adjustment signal may differ from another type of monitor in some cases.

In this case, use signal displayed on screen menu.

a-5. If adjustment is ended, push "RETURN" key to end the adjustment.

(Distortion data values of all preset signals are written by this operation.)

```
Distortion Adjust                   MODEL:
                                    FP1350-1
 1 : ROTATION
 2 : PARALLELOGRAM
 3 : TRAPEZOID
 4 : PIN CUSHION
 5 : PINCUSHION BALANCE

 7 : V LINEAR
 8 : V LINEAR BALANCE
 9 : S_WAVE
10 : W_WAVE
11 : UP CORNER
12 : UP CORNER BALANCE
13 : LOW CORNER
14 : LOW CORNER BALLANCE
15 : END          No. ? _
```

(Menu C)

b. H. SIZE(MAX) adjustment

b-1. Select “Size / Position” while menu B is displayed, and push “RETURN” key.

b-2. Input a signal displayed on the screen. (If signal is not displayed on the screen, use a signal indicated horizontal maximum size adjustment section in the service manual.)

b-3. As following menu will appear on monitor screen, select “83: H_MAX” and push “RETURN” key.

```
1:VGA350                                    FP1350-1
2:VGA400                                    SIZE/POSITION ADJUSTMENT
3:VGA480                  23:98_640(70)
4:800*600(60)
5:MAC2(640*480)

                          27:640*480(85)
8:VESA640*480(75)         28:1600*1200(85)
9:XGA                     29:800*600(85)
10:VESA800*600(75)        30:1024*768(85)

12:MAC2(832*624)          32:1600*1200(75)
13:1024*768(70)           33:VESA350(85)    Select No.
                          34:VESA400(85)    No. ?  _
15: 1024*768(75)
16:1280*1024(60)
17:MAC_1152               80:TOTAL1(1024*768(75))
18:1280*1024(70)

20:1280*1024(75)          83:H_MAX
                          84:H_MAX2
                          85:V SIZE(MAX)
                          87:END
```

(Menu D)

Meaning of each item in this menu is as follow:

From “1” to “35” : Adjust monitor on each signal

“85” : Adjust a vertical maximum size

“87” : Size / Position adjustment is ended

b-4. As following menu E appear on monitor screen, select “H. SIZE” and push “RETURN” key.

Size/Position Adjust **MODEL:**
FP1350-1

SIGNAL :H_MAX
1 : H. POSI
2 : V. POSI
3 : H. SIZE
4 : V. SIZE
5 : H. SIZE(MAX)
6 : END

(Menu E)

b-5. As following menu F appear on monitor screen, push “5” key.

Then adjust data value to 255 by pushing one of “3”, “6” and ”9” keys.

Note: If screen is over scanned by smaller value than 255, push “RETURN” key to end “H. SIZE” adjustment.

Then select “5 : H. SIZE(MAX)” and decrease horizontal size, and set up data value to 255 at “H. SIZE” adjustment procedure.

In this case, you must be careful not to decrease horizontal size too small at “5 : H. SIZE(MAX)” adjustment.

Size/Position Adjust **MODEL:**
FP1350-1

SIGNAL :H_MAX
1 : H. POSI
2 : V. POSI
3 : H. SIZE
4 : V. SIZE
5 : H. SIZE(MAX)
6 : END

No. ?
DAC VALUE: 120

Decrease : 1(-1), 4(-5), 7(-10) Increase : 3(+1), 6(+5), 9(+10) Original : 5
END(NO WRITE) : e E END(WRITE) : ENTER

(Menu F)

Function of each key is as follows

"1" : data value decreases by 1 (H. SIZE becomes smaller)

"4" : data value decreases by 5 (H. SIZE becomes smaller)

"7" : data value decreases by 10 (H. SIZE becomes smaller)

"3" : data value increases by 1 (H. SIZE expands)

"6" : data value increases by 5 (H. SIZE expands)

"9" : data value increases by 10 (H. SIZE expands)

"5" : set up data value to reference value

"e or E" : ends without saving data

"ENTER" : Ends after saved data

b-6. Return to Size / Position adjustment menu by pushing "e" key, and select "5 : H. SIZE(MAX)".

Adjust the horizontal size to horizontal maximum size adjustment value on service manual.

b-7. If adjustment is ended, push "RETURN" key to end the adjustment.
(H. SIZE MAX data values of all preset signals are written by this operation.)

b-8. Select "84: H_MAX2" on the menu D, repeat steps b-4 to b-7.

c. V. SIZE(MAX) adjustment

c-1. Open menu D, "85 : V. SIZE(MAX)" and push "RETURN" key.

c-2. Input a signal displayed on the screen. (If signal is not displayed on the screen, use a signal indicated vertical maximum size adjustment section in the service manual.)

c-3. As following message will appear on screen, push "RETURN" key.

"INPUT V. SIZE(MAX) SIGNAL HIT ENTER KEY"

c-4. Following menu G will appear on screen.

INPUT V. SIZE(MAX) SIGNAL HIT ENTER KEY

MODEL:
FP1350-1

DAC VALUE : 0

Decrease : 1(-1), 4(-5), 7(-10) Increase : 3(+1), 6(+5), 9(+10) Original : 5

END(NO WRITE) : e E END(WRITE) : ENTER

(Menu G)

c-5. Adjust a vertical maximum size value as indicated on the service manual.

c-6. If adjustment is ended, push "RETURN" key to end the adjustment.

d. Size / Position adjustment

d-1. Open menu B, “Size / Position” and push “RETURN” key.

d-2. As following menu D appears on monitor screen, select “80: TOTAL1 (1024*768(75))” and push “RETURN” key.

d-3. As following menu E appears on monitor screen, select “H. POSI” and push “RETURN” key.

d-4. Menu F will appear on monitor screen.

d-5. Input a signal indicated by menu screen F. (If signal is not indicated on screen, input the signal that is specified as “80: TOTAL1 (1024*768(75))” on menu D.)

d-6. Adjust the H. POSI to reference value which is specified on service manual by pushing “1”, “4”, “7”, “3”, “6” and “9” keys.

d-7. If adjustment is ended, push “RETURN” key to end the adjustment.

(H. POSI data values of all preset signals are written by this operation.)

d-8. Adjust V. POSI, H. SIZE and V. SIZE in the same way.

Adjust them as specified on the service manual.

e. Confirmation of Size / Position about another signals

e-1. Open menu D, make sure that Size / Position values are in the standard of signals except “80: TOTAL1(1024*768(75))” signal.

Note: Do not forget to change signal of signal generator for each adjustment.

f. Handling when Size / Position are non-standard

f-1. Open menu D, select non-standard signal and push “RETURN” key.

f-2. When menu E is displayed on screen, select a non-standard item and push “RETURN” key.

f-3. Menu F will appear on monitor screen.

f-4. Input a non-standard signal.

f-5. Adjust the screen size / position again by pushing “1”, “4”, “7”, “3”, “6” and “9” keys.

f-6. If adjustment is ended, push “RETURN” key to end the adjustment.

Note: Do not perform the automatic adjustment (“80: TOTAL1(1024*768(75))”), after this adjustment is ended. If you wrongly performed it, you must readjust this procedure.

Note:

This program must be used with IBM compatible computer.

This program is controlled by IBM compatible computer using a parallel port.

The parallel I/O port may be different depending on the computer types.

Open a parameter file to change the value of the parallel port if auto adjustment cannot be performed.

Example:

Parallel port setting (Parameter file)

PRI_DATA_ADR 378

PRI_BUSY_ADR 379

When it is above-mentioned example, 378, an input port amount to 379 as for an output port of a parallel port.

7. Video Amplitude Adjustment Signal: No. 23 (1600*1200@85Hz) Window pattern (H:33% V:33%)

7-1. Settings

NOTE: Degauss the monitor using an external degaussing coil.

1) Confirm that the video signal of generator is as follows.

Video: Analog 0.7Vp-p ± 0.01V p-p (terminated 75 ohms ± 1 %)

2) Receive signal No.23 (All White), confirms that there is screen size of hereunder span. It is adjust in menu TAG 2 (S),"H.SIZE", "V.SIZE", "H.POSITION", "V.POSITION" in the case as the outside of the span.

Horizontal Size : 396±3mm

Vertical Size : 297±3mm

Horizontal picture position: |XLeft - Xright | ≤ 3.0mm

Vertical picture position: |Xtop - Xbottom | ≤ 3.0mm

3) Open Menu (S), TAG 7,TAG 8,TAG 9,TAG A, TAG D and make sure that the following values are preset.

Menu (S), TAG 7

GAIN	: 200
R GAIN	: 200
G GAIN	: 200
B GAIN	: 200
OSM COLOR GAIN	:5

Menu (S), TAG 8

SUB BIAS	: 255
R BIAS	: 0
G BIAS	: 0
B BIAS	: 0

Menu (S), TAG 9

G SUB BRIGHT	: 150
B SUB BRIGHT	: 150
R SUB BRIGHT	: 150

Menu (S), TAG A

COLOR PRESET	: 1(9300K)
R COLOR GAIN	: 255
G COLOR GAIN	: 255
B COLOR GAIN	: 255
CONT.MAX.ADJ.	: 150

Menu(S), TAG D

CONTRAST PRESET: 150

7-2. Video Amplitude Signal: No.23 (1600*1200@85Hz) Window Pattern (H:33% V:33%)

1) Receive signal 23.

2) Open Menu (S), TAG7.

3) Adjust "+", "-" SW so that video amplitude at TP-R (R GAIN) on the CRT PWB is set to 45 Vp-p (+0V/ -1V).

4) When the indicated value of the video amplitude is not 45 Vp-p(+0V/ -1V) with Gain data maximum, increase the R Gain values.

5) Adjust "+", "-" SW so that video amplitude at TP-G (G GAIN) ,TP-B (B GAIN) on the CRT PWB is set to 45 Vp-p(+0V/ -1V)

6) Push "EXIT" SW.

* When adjusting video amplitude, move cursor to desired function and push PROCEED button to hide the OSM menu. Adjustment can be made with OSM menu hidden. OSM menu must be hidden since its amplitude will appear on the wave form.

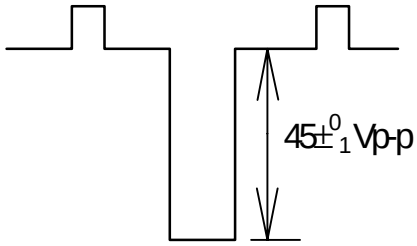


Fig 7-1 Wave form of RK, GK, BK

7-3. OSM Gain Adjustment Signal: No.23 (1600*1200@85Hz) All black

1) Receive signal 23.

2) Open Menu (S), TAG7 “OSM COLOR GAIN”.

3) Adjust “+”, ”-” SW so that OSM video amplitude at TP-G on the CRT PWB is set to 31 (±4) Vp-p.

4) Push "EXIT" SW.

7-4. Cut off Adjustment Signal: No.23 (1600*1200@85Hz) All black

1) Receive signal 23. All Black

2) Open Menu (S), TAG8 "SUB BIAS" and push “RESET” SW.

Note: Do not touch a front panel key and do not come out from “SUB BIAS” since a picture can not be seen.

3) Connect the DVM with a high voltage probe at TP-G2 on the CRT PWB and adjust SCREEN VR to obtain 700 Vdc ± 5 Vdc. (Use a high voltmeter whose maximum voltage is more than 1.5kV and input resistance is more than 1000 MΩ.)

4) Set 00 channel x, y, Y modes of color analyzer CA-100 and make sure that the following values are preset.

x = 0.273

y = 0.300

Y = 0.2 cd/m^2

5) Set analyzer mode at color analyzer.

6) Open Menu (S), TAG8 " SUB BIAS " and adjust until raster appears with “+” and “-“ SW . The color that appears first is the reference color.

Adjust “+”,”-“SW so that its color analyzer indicated value is 20-80.

If color analyzer does not indicate 20-80, adjust “SUB BIAS” 255 and go to 7).

Then reference color is anything OK.

7) Open Menu (S), TAG8 and adjust the reference color bias so that its analyzer indicated value is 90-110.

8) Open Menu (S), TAG8 and adjust the other color biases so that its analyzer indicated value is 90-110.

9) When the indicated value of the reference color is over 110, repeat steps 7) to 8) so that it is 90-110.

10) Close menu.

7-5. Contrast Tracking Adjustment Signal: No.23 (1600*1200@85Hz) Window Pattern (H: 33% V:33%)

1) Receive Signal 23.

2) Open Menu (S), TAG8 “CONT MAX/MIN”. Adjust "+" SW so that the contrast is max.

3) Setting modes x, y, Y at the color analyzer, measures the window color temperature. This measurement determines x=x1, y=y1.

4) Open Menu (S), TAG8 “CONT MAX/MIN”. Adjust "-" SW so that the contrast is min.

5) Measure the window color temperature. This measurement determines x=x2, y=y2.

6) Open Menu(S), TAG8 “G BIAS”, ”R BIAS”, ”B BIAS” and make sure that the window color temperature are the following values :

$x2 = x1 \pm 0.003$ $y2 = y1 \pm 0.003$

7) Open Menu (S), TAG8 “CONT MAX/MIN”. Adjust "+" SW so that the contrast is max.

8) Measure the window color and confirm that the readings are the following values :

$x1 = x2 \pm 0.003$ $y1 = y2 \pm 0.003$.

If not, repeat items 3) to 8).

9) Push "EXIT" SW twice.

7-6. Brightness Tracking Adjustment Signal: No.23 (1600*1200@85Hz) All black

1) Receive Signal 23.

2) Set modes x, y, Y at color analyzer.

3) Open Menu (S), TAG9 “G SUB BRIGHT”, “B SUB BRIGHT”, “R SUB BRIGHT” and push "RESET" SW. (Each figure becomes 0.)

4) Adjust "+", "-" SW so that the “G SUB BRIGHT” is 5 ± 0.5 cd/m^2.

5) Adjust “R SUB BRIGHT", "B SUB BRIGHT" and adjust "+", "-" SW so that the each color temperature measured in step 7-5.

$x = x1 \pm 0.002$

$y = y1 \pm 0.002$

6) Push "EXIT" SW.

7-7. Color Preset Adjustment Signal: No.23 (1600*1200@85Hz) Window Pattern (H:33% V:33%)

1) Receive Signal 23.

2) Open Menu (S), TAG A and push "RESET" SW. (R/G/B COLOR GAIN value is made the early stages.)

3) Open Menu (S), TAG A, "Color Preset No.1 9300k ".

4) Open Menu (S), TAG A, and adjust "R COLOR GAIN", "G COLOR GAIN", "B COLOR GAIN" so that the color temperature is the following value. (RGB either value make become 255 at this time.)

$x = 0.283 \pm 0.003$

$y = 0.297 \pm 0.003$

5) Push "EXIT" SW.

6) Open Menu(S), TAG A, and adjust Color Presets No.2 to 5 (8200K ~ 5000K) to the following values :

COLOR PRESET No.	x	y
2(8200K)	0.290 ± 0.003	0.313 ± 0.003
3(7500K)	0.300 ± 0.003	0.315 ± 0.003
4(6500K)	0.315 ± 0.003	0.325 ± 0.003
5(5000K)	0.345 ± 0.003	0.350 ± 0.003

7-8.Maximun Brightness adjustment Signal: No.23 (1600*1200@85Hz) Window Pattern (H:33% V:33%)

1) Receive Signal 23.

2) Open Menu (S), TAG A "Color Preset No.1 9300K ".

3) Open Menu (S), TAG A “CONT.MAX.ADJ”. Adjust "+", "-" SW so that the “window brightness” is 140(+0, -1) cd/m^2.

4) Open Menu (S), TAG D “CONTRAST PRESET” and push "RESET" SW.

7-9.Contrast preset adjustment **(B version only)**

Signal: No.23 (1600*1200@85Hz) Window Pattern (H:33% V:33%)

1) Receive Signal 23.

2) Open Menu (S), TAG D "CONTRAST PRESET".

3) Adjust "+", "-" SW so that the “window brightness” is 90(+0, -1) cd/m^2.

8. Focus Adjustment

Signal: No.23 (1600*1200@85Hz) Window Pattern (H:33% V:33%)
No.31(1600*1200@60Hz) Cross Hatch Pattern “∃“ Character Pattern
PC Excel Focus Check Pattern (1280*1024@85Hz)

PC Focus Check Pattern
Video Board: Millennium ||
Application: Excel (Microsoft)
Font: Arial
Font Size: 8
Character: ##&&%%$$##

* After maximum horizontal amplitude adjustment, maximum vertical amplitude adjustment, and video adjustment are completed, perform this focus adjustment.

For steps of 9) , 10), 15), 16), adjust it with signal input through BNC using signal generator VG-819 or alternate.

* "CONTRAST" of the user menu and "BRIGHTNESS" are set up.

BNC input	:CONTRAST - PRESET	BRIGHTNESS - PRESET
D-SUB input	:CONTRAST - MAX.	BRIGHTNESS - PRESET

As for 1)-3), it applies to A version only.

1) Receive Signal 23.

2) Open Menu (S), TAG D “CONTRAST PRESET”.

3) Adjust "+", "-" SW so that the “window brightness” is 90(+0, -1) cd/m^2.

4) Receive Signal 31.

5) Open Menu (S), TAG2 "H.SIZE", "V.SIZE","H.POSITION", "V.POSITION".

Adjust the picture size and position as listed below by "+", "-" SW.

Picture size
H: 396±1 mm
V: 297±1 mm

Picture Position
H: $| XL_{eft} – XR_{ight} | \leq 1.0$ mm
V: $| XT_{op} – XB_{ottom} | \leq 1.0$ mm

6) Open Menu (S), TAG1 "V.D.FOCUS".

Adjust the voltage at TP-DF on the SW/HV PWB to obtain the following values.

The waveform of the TP-DF on the SW/HV PWB is observed, and the amplitude of parabolic-wave of the vertical period is adjusted to 185 ± 5Vp-p with "V.D.FOCUS".

Note: When measuring Vp-p, use a 100:1 probe with capacitance of approx. 2pF.

7) Open Menu (S), TAG1 "H.D.FOCUS", and confirms that data are "210".

   * When data are different, a " H.D.FOCUS " will be displayed, adjusted to "210".

8) "EXIT" Switch is pushed, and data is saved in the memory.

9) Receive Signal 31 (1600*1200 (60Hz) cross-hatch pattern (green monochrome)) by BNC input, Menu (U), TAG1 of "CONTRAST" and "BRIGHTNESS" are set up in " PRESET ".

10) The halo level is down with FOCUS VR F2 of FBT, and adjust so that vertical line may become thin in the center of the screen.

11) Receive Excel of PC (Focus check pattern (1280*1024@85Hz) by D-SUB input, Hereunder setting is done in the user menu.

CONRAST	:MAX.	BRIGHTNESS	:PRESET (Menu (U), TAG1)
H.SIZE	:396mm±1mm	V.SIZE	:297mm±1mm (Menu (U), TAG2)

12) It pays attention to the horizontal line of EXCEL.
A Focus is made to get fat with VR, and some double horizontal lines are displayed.
Adjust within the limits of value of VDF(±10STEP) so that the horizontal line double pallet width of 4 square of center and top and bottom may become the same.
Adjust within the limits of value of VDF(between 210±20STEP) so that the horizontal line width of 4 cell of center and top and bottom may become the same.
Note: Double horizontal lines is done as the one for the center is a little opened because both differences become ambiguous when it is displayed too much. And because it becomes over-revision, it is faced a little inside at the edge of the screen.

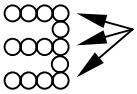
13) Adjust Focus VR F2 so that character vertical wire of EXCEL may get clear thicker.

14) Adjust Focus VR F1 so that horizontal is not double line and characters are fine on all area.

15) Receive signal 31("∃ " character) by BNC input, and "CONTRAST" and "BRIGHTNESS" are adjusted to PRESET in the user menu.

16) Make sure that the horizontal lines of " ∃ " character white and green colors are crisp as possible in the whole screen. (It is confirmed by using a magnifying glass of 10 times.)

a)  The space between horizontal lines is crisp.

b)  The horizontal lines are not bold, and do not form halos.

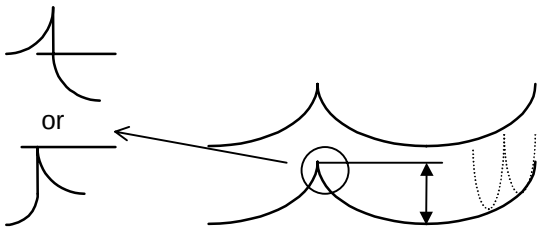
When it isn't missing, it is adjusted again about 13), the 14) clause.

17) Receive signal 3. (Cross-hatch,Red/Green/Blue each color) Make sure halo is within the specification.

Vertical line halo: halo and core are less than 10(Red). halo and core are less than 9(Green and Blue).

Horizontal line halo: judged to be level (core / halo: 1/1)

18) Open Menu (S), TAG D “CONTRAST PRESET” and push “RESET” SW.(it applies to A/R/AS version only)



Vertical Cycle 185 ± 5V

Fig 8-1 Dynamic Focus Wave Form

9. Purity Signal: No. 22 (1600*1200@75Hz) All green

Adjustment Magnetic Field by three dimension magnetic field system.

Setting of the Landing meter (KLD-01 made by KAMAYA)

Volt: 2.0V Time: 50ms GAIN: 7

* Adjust this monitor after a minimum of 90 minutes to allow unit to reach ambient operating temperature. (Use the Self Test screen. Refer item 7-5-3. About Self Test.)

1) Turn the CRT face to east, and the outside degauss is done, and demagnetization is done again in the Degauss power source.

   The degauss of the outside is conducted in the front face, both sides, the base, the top panel.

   But, degauss is unnecessary for the chassis of the part of aluminum.

2) Receive signal 22(all green) and make sure that the following specifications are satisfied.

Picture Size	H: 396mm±1.0mm V: 297mm±1.0mm
Picture Position	H: | XLeft - Xright | ≤ 1.0mm
	V: | Xtop - Xbottom | ≤ 1.0mm

3) Open Menu (S), TAG 5 “EMF TOP RIGHT”.

4) The four corners (Within 3*3cm) of the screen (Fig 9-3) are measured by the Landing meter, and the value of X when the value of Y was made 0 is measured.
   When measured value is more than ±3%, Adjust "+","-" SW so that items of each four corners the following standards.

   $-3\% \leq \times \leq +3\%$

5) Measure that the items of each four corners are $-3\% \leq \times \leq +3\%$

   When it is not in the adjustment standard, 4), 5) clause are repeated.

Top Right	: EMF TOP RIGHT	Top Left	: EMF TOP LEFT
Bottom Right	: EMF BOTTOM RIGHT	Bottom Left	: EMF BOTTOM LEFT

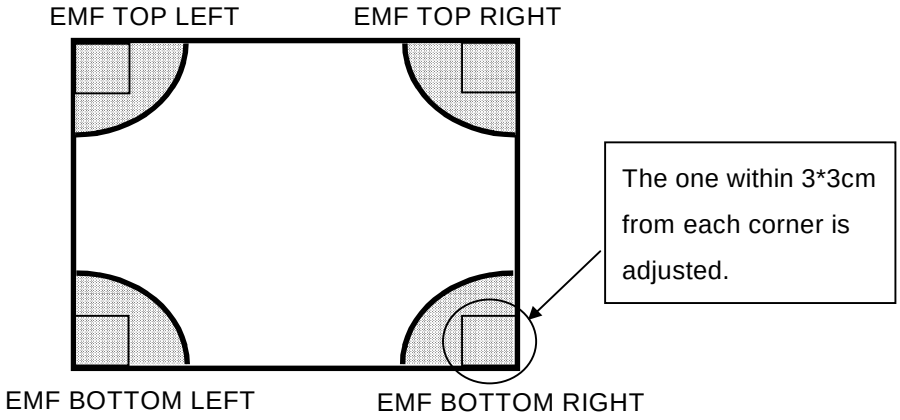


Fig 9-1 Landing measurement point

Don't use "GLOBAL SYNC" when you adjust it.

10. Convergence Adjustment Signal: No.33 (788*1200 @ 75Hz) Cross Hatch Pattern and frame pattern

Environment: Adjustment Magnetic Field by three dimension magnetic field system.
Turn the CRT face to east and degauss the monitor using external differential coil.

1) Receive Signal 33 (Cross Hatch Pattern and frame Pattern).
It confirms that screen amplitude and screen position are following value.

Screen amplitude	H: 396mm±1.0mm
	V: 297mm±1.0mm
Screen position	H: l Xleft -Xright l ≤ 1.0mm
	V: l Xtop -Xbottom l ≤ 1.0mm

Receive Signal 33 (Cross Hatch Pattern)

Adjust the H/V an interval of Cross Hatch Pattern to the following values, and Cross Hatch Pattern consist of the 15 vertical line and the 11 horizontal line is displayed.

H interval : 54dot

V interval : 112line

The adjustment confirmation is open each convergence revision items of Menu(S),TAG B and TAG C and push "PROCEED"SW.

2) Measure misconvergence, by using Fig.10-6 standard mentioned below.

a. Measure misconvergence at screen center.

If it is not satisfactory, adjust the static convergence of the green by using

the 6-pole magnets on the CPM assembly.

X: l "R-G"+"B-G" l < 0.10mm
Y: l "R-G"+"B-G" l < 0.10mm

Measure misconvergence at screen center once again.

If it is not satisfactory, adjust the static convergence of the blue and red by using the4-pole magnets on the CPM assembly.

X: l "R-B" l < 0.20mm
Y: l "R-B" l < 0.20mm

b. Open Menu(S), TAG B "H.S.CONVER" , and adjusted so that misconvergence of the horizontal direction may become the minimum in G of the Fig.10-7 and H and the l point.

Open Menu(S), TAG B "V.S.CONVER", and adjusted so that misconvergence of the vertical direction may become the minimum.

But, the revision span of "H.S.CONVER" and "V.S.CONVER" is made 69-187.

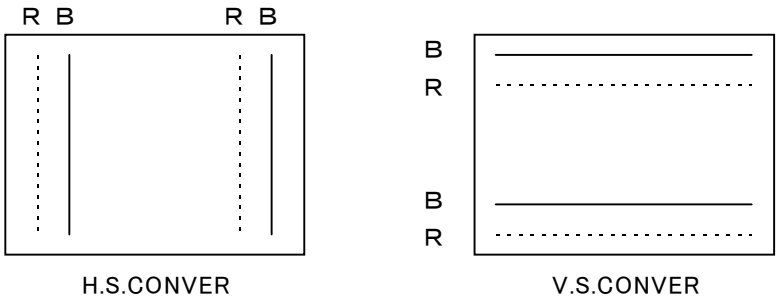
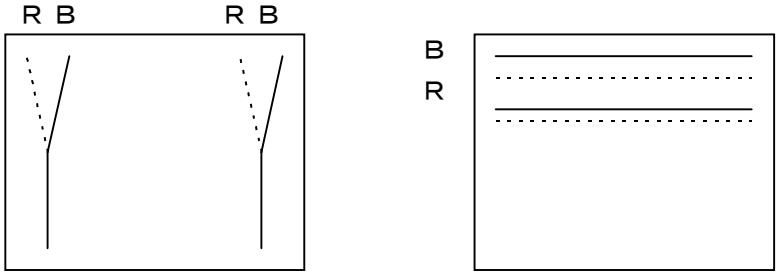


Fig 10-1 The move of the R line and the B line when "H.S./V.S. CONVER" was moved in the + direction.

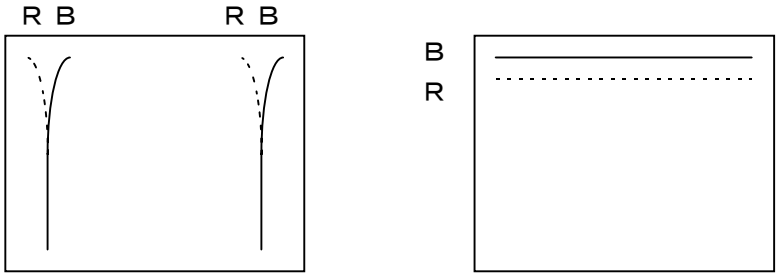
c. Open Menu(S), TAG C "H.CONVER SAW T", and adjusted so that misconvergence of the horizontal direction may become the minimum in D of the Fig 10-7 and E and F point. Open Menu(S), TAG C "V.CONVER SAW T", and adjusted so that misconvergence of the vertical direction may become the minimum.



H.CONVER SAW T V.CONVER SAW T

Fig 10-2 The move of the R line and the B line when "H./V. CONVER SAW T" was moved in the + direction.

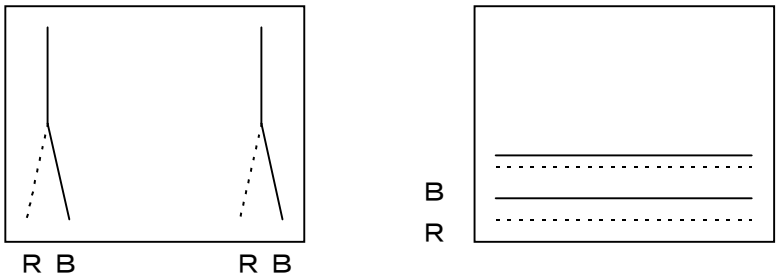
d. Open Menu(S), TAG C "H.CONVER PARA T", and adjusted so that misconvergence of the horizontal direction may become the minimum in A of the Fig 10-7 and B and Cpoint. Open Menu(S), TAG C "V.CONVER PARA T", and adjusted so that misconvergence of the vertical direction may become minimum.



H.CONVER PARA T V.CONVER PARA T

Fig 10-3 The move of the R line and the B line when "./V. CONVER PARA T"was moved in the + direction.

e. Open Menu(S), TAG C "H.CONVER SAW B", and adjusted so that misconvergence of the horizontal direction may become the minimum in J of the Fig 10-7 and K and L point. Open Menu(S), TAG C "V.CONVER SAW B", and adjusted so that misconvergence of the vertical direction may become minimum.



H.CONVER SAW B V.CONVER SAW B

Fig 10-4 The move of the R line and the B line when "H./V. CONVER SAW B" was moved in the + direction.

f. Open Menu(S), TAG C "H.CONVER PARA B", and adjusted so that misconvergence of the horizontal direction may become the minimum in M of the Fig 10-7 and N and O point. Open Menu(S), TAG C "V.CONVER PARA B", and adjusted so that misconvergence of the vertical direction may become minimum.

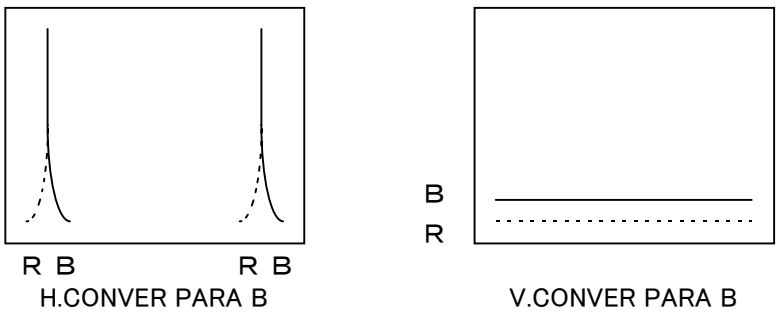


Fig 10-5 The move of the R line and the B line when "H./V. CONVER PARA B" was moved in the + direction.

3) Measure misconvergence, by using following standards mentioned below.
Adjusted to satisfy the standard of the Xv revision Coil on DY, XH slider ,Blue-BOW revision ring, 6-pole magnets on the CPM, spoiler magnet.

* The installation lie of each VR and slider is shown in the Fig. 10-8,and actuation is shown in the Fig.10-9.

* There is a deflecting yoke in a point to install the XH slider from side to side to side.
When it was imported in the left viewed from the screen side, Demonstrated in Fig.10-9-c.
When it was imported in the right viewed from the screen side, Demonstrated in Fig.10-9-d.

The value of standards : x , y ≤ 0.30mm

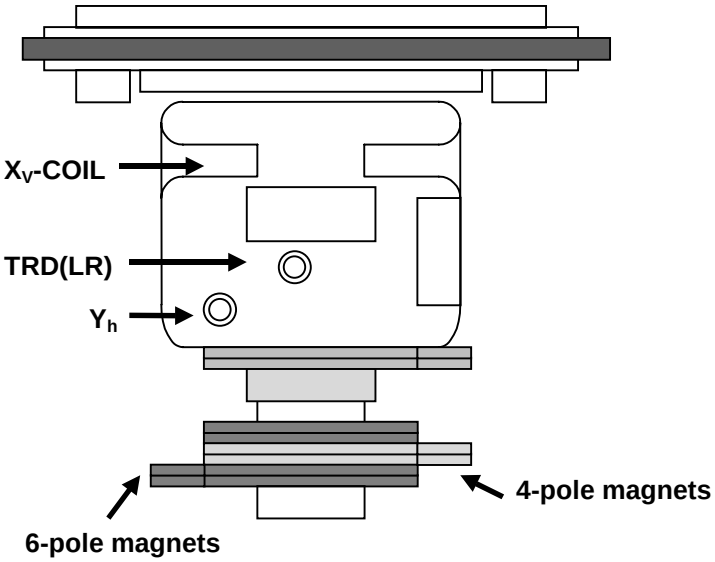


Fig 10-4 The location of the VR. and Coil and magnets

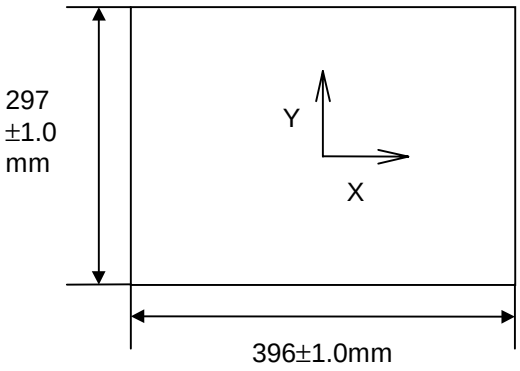


Fig.10-6 The value of Convergence

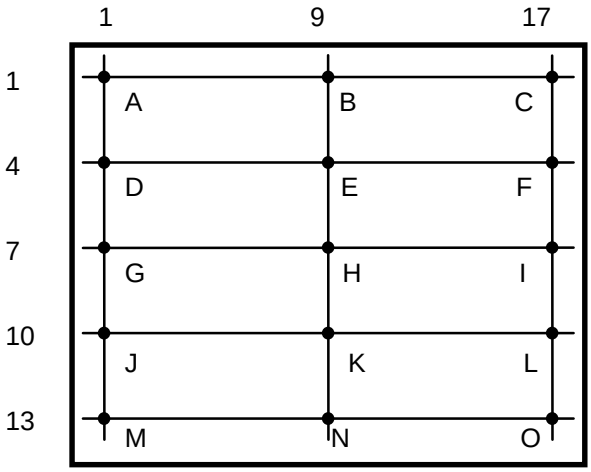
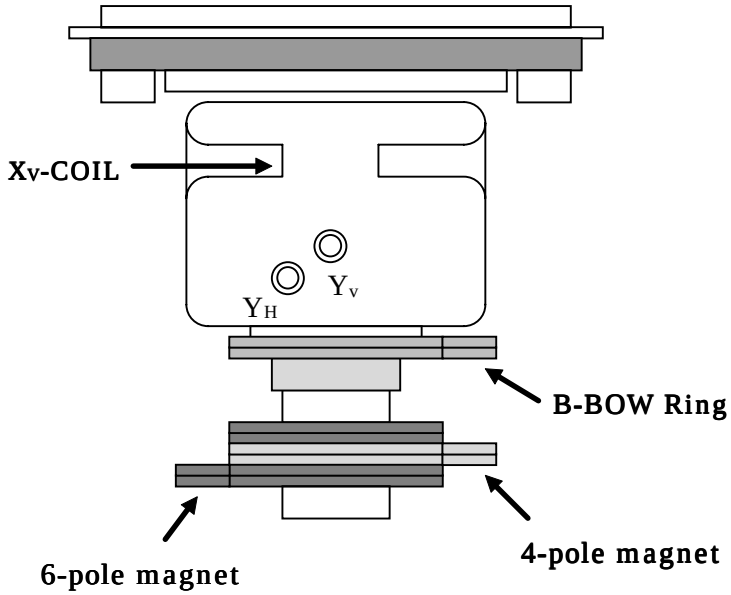


Fig.10-7 Adjustment position of Convergence



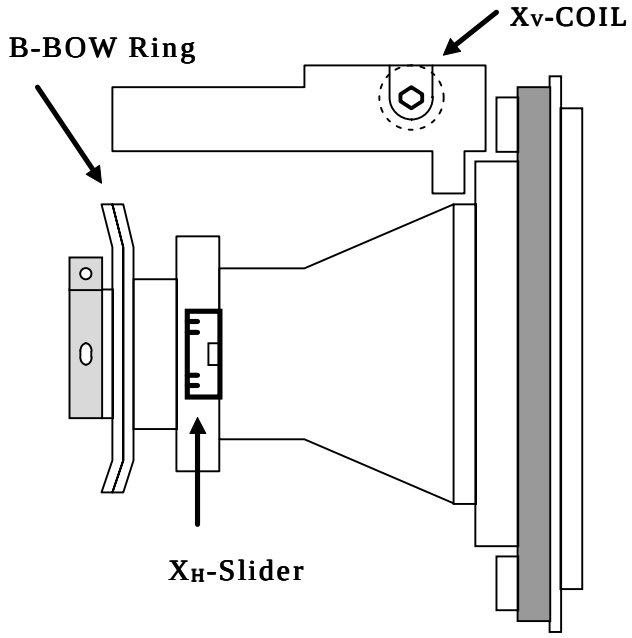


Fig.10-8 The location of the deflecting yoke on the revision VR, Coil, the slider.

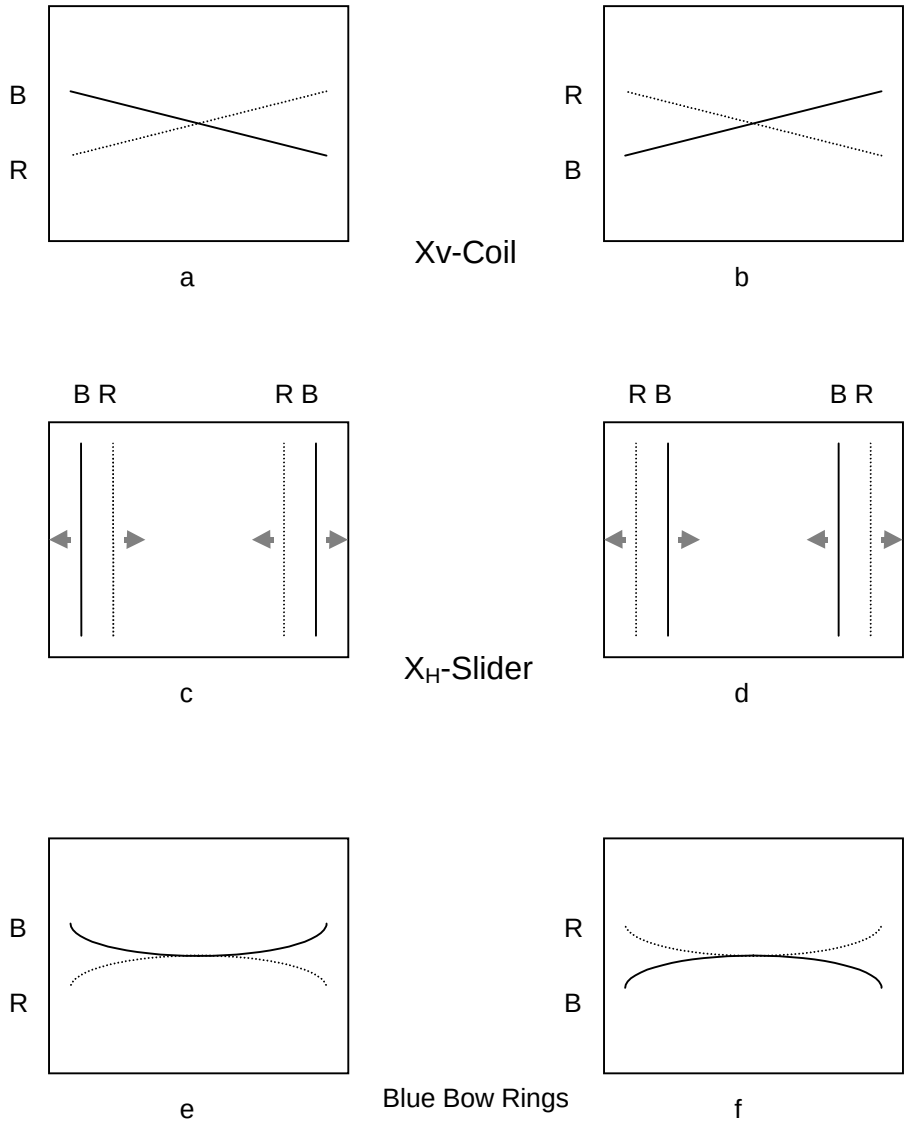


Fig. 10-9 The move of the R line and the B line by the revision VR, Coil, the slider.

11. Auto Adjustment Signal: No. 3 (VGA480) All White

Signal: No. 23 (1600*1200@85Hz) All White

When this adjustment is done, picture size, linearity, picture position, picture deformation, video adjustment are to be finished.

1) Receive signal 3 (VGA480) All White, and confirm that the picture size and picture position is as follows. Open Menu (S), TAG D "AUTO ADJUT L", and push "Proceed" SW (Adjustment data is written in the Monitor at this time).

2) Receive signal 23 (1600*1200@85Hz) All White, and confirm that the picture size and picture position is as follows.
Open Menu (S), TAG D "AUTO ADJUT H", and push "Proceed" SW (Adjustment data is written in the Monitor at this time).

Picture size	H: 396±1mm V: 297±1mm
Picture position	H: | Xleft - Xright | ≤ 1.0mm V: | Xtop - Xbottom | ≤ 1.0mm

12. Factory settings for shipping

1) Open MENU(S) ,TAG D), and “destination” set following

A Ver :USA

B Ver :EUR

2) OPEN MENU(S) ,TAG D), and “HOURS READ” set “NO”.

Press “EXIT” switch two times.

3) Make sure that the LED is Green when the unit receive Signal (Make sure that come out of the MENU(S))

4) Open MENU(U) ,TAG5) "TOOL1”, and move highlighted bar to "FACTORY PRESET" and press the RESET switch. Then press the PROCEED switch.

5) OSM

Open MENU(U) and make sure that the display of the third item is as follows.

TOOL2-LANGUAGE	: ENGLISH
TOOL2-IPM	:“IPM OFF MODE” ENABLE
TOOL2-EDGE LOCK	:”1”

6) BNC/D-SUB switch : D-SUB

7) POWER switch : OFF

[D] Reference

1. Adjustment Signal

NO.	Signal Name	SYNC Form	SYNC Polarity (H/V)
1	VGA 350	Separate	Pos/Neg
2	VGA 400	Separate	Neg/Pos
3	VGA 480	Separate	Neg/Neg
4	640*400@70Hz	Separate	Neg/Neg
5	800*600@60Hz	Separate	Pos/Pos
6	MAC 640*480	Composite + Sync on G	Neg/Neg
7	VESA 350@85Hz	Separate	Pos/Neg
8	VESA 400@85Hz	Separate	Neg/Pos
9	VESA 640*480@75Hz	Separate	Neg/Neg
10	XGA	Separate	Pos/Pos
11	VESA 800*600@75Hz	Separate	Pos/Pos
12	VESA 640*480@85Hz	Separate	Neg/Neg
13	MAC 832*624	Composite + Sync on G	Neg/Neg
14	800*600@85Hz	Separate	Pos/Pos
15	1024*768@70Hz	Separate	Neg/Neg
16	1280*1024@60Hz	Separate	Pos/Pos
17	1024*768@75Hz	Separate	Pos/Pos
18	MAC 1152*870	Composite + Sync on G	Neg/Neg
19	1024*768@85Hz	Separate	Pos/Pos
20	1280*1024@70Hz	Sync on G	
21	1280*1024@75Hz	Separate	Pos/Pos
22	1600*1200@75Hz	Separate	Pos/Pos
23	1600*1200@85Hz	Separate	Pos/Pos
25	H.HOLD1	Composite	Pos/Pos *1
27	H.HOLD2(115K)	Separate	Pos/Pos *1
28	V.MAX	Separate	Neg/Neg
29	V.RASTER	Separate	Pos/Pos
30	EDID	Separate	Neg/Neg
31	1600*1200@60Hz	Separate	Pos/Pos
32	1280*1024@85Hz	Separate	Pos/Pos
33	788*1200@75Hz	Separate	Pos/Pos

NO.	Signal Name	SYNC Form	SYNC Polarity (H/V)
USER1	PC98 1120*750(1)	Separate	Pos/Pos
USER2	VESA 800*600@56Hz	Separate	Pos/Pos
USER3	VESA 1024*768@60Hz	Separate	Neg/Neg
USER4	VESA 800*600@72Hz	Separate	Pos/Pos
USER5	1120*750@60Hz	Separate	Neg/Neg
USER6	640*480@100Hz	Separate	Neg/Neg
USER7	XGA-2 1024*768@72Hz	Separate	Neg/Neg
USER8	1024*768@80Hz	Separate	Pos/Pos
USER9	800*600@100Hz	Separate	Pos/Pos
USER10	640*480@120Hz	Separate	Neg/Neg
USER11	640*480@140Hz	Separate	Neg/Neg
USER12	VESA 1600*1200@60Hz	Separate	Pos/Pos
USER13	VESA 1152*864@85Hz	Separate	Pos/Pos
USER14	1024*768@100Hz	Separate	Pos/Pos
USER15	800*600@120Hz	Separate	Pos/Pos
USER16	640*480@160Hz	Separate	Neg/Neg
USER17	VESA1920*1440@60Hz	Separate	Neg/Pos
USER18	1600*1200@70Hz	Separate	Pos/Pos
USER19	1280*1024@85Hz	Separate	Pos/Pos
USER20	800*600@140Hz	Separate	Pos/Pos
USER21	VESA1792*1344@75Hz	Separate	Neg/Pos
USER22	VESA1600*1200@80Hz	Separate	Pos/Pos
USER23	1024*768@120Hz	Separate	Pos/Pos
USER24	800*600@160Hz	Separate	Pos/Pos
USER26	VESA1920*1440@75Hz	Separate	Neg/Pos

*1 When an approximate value is utilized because it is impossible to output the exact fH from the signal generator
On the 31kHz side, utilize the highest frequency signal that satisfies fH ≤ 31.0kHz.
On the 115kHz side, utilize the lowest frequency signal that satisfies fH ≥ 115kHz. (Tolerance must be within 50Hz.) being used:

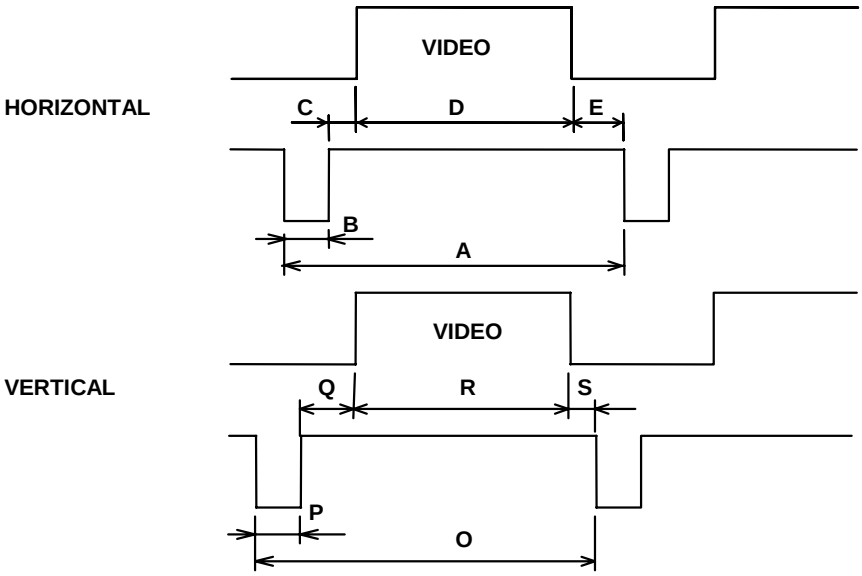
*2 Supply the sync signals output from the signal generator as follows:
H/V Composite : Supply to the set undergoing adjustment
V. SYNC only : Supply to the CA-100 color analyzer.

*3 The crosshatch pattern shall have 17 vertical lines and 13 horizontal lines.

2. Timing of Adjustment Signal

Signal Timing Charts

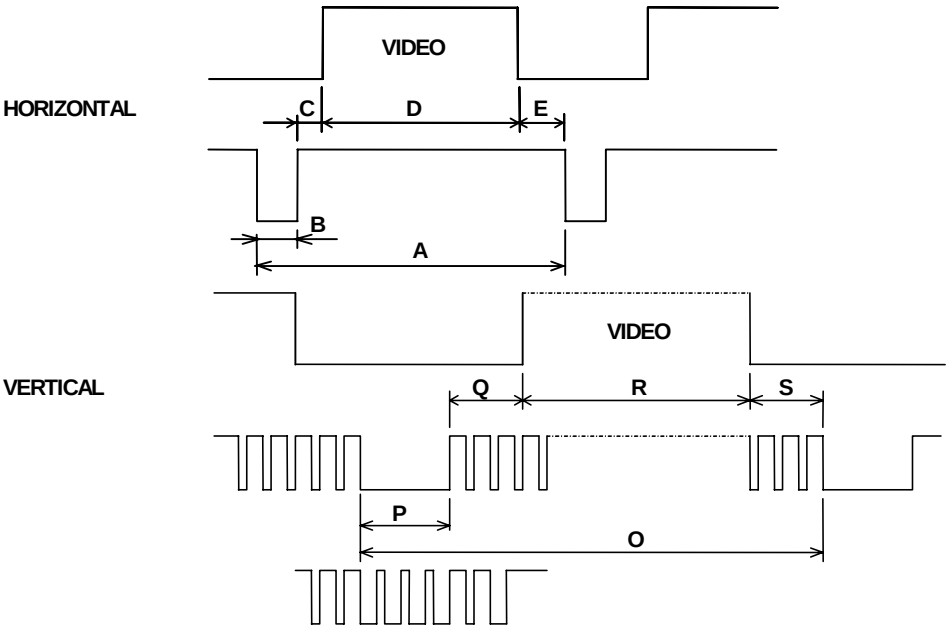
SEPARATE SYNC



A: H.Total Time
B: H.Sync Time
C: H.Back Porch
D: H.Addr Time
E: H.Front Porch

Sync Polarity: Positive/Negative

COMPOSITE SYNC



O: V.Total Time
P: V.Sync Time
Q: V.Back Porch
R: V.Addr Time
S: V.Front Porch

Sync Polarity: Positive/Negative

TIMING NAME	1 VGA350		2 VGA400		3 VGA480		4 640*400@70Hz		5 800*600@60	
Pixel Clock		28.322[MHz]		28.322[MHz]		25.175[MHz]		25.175[MHz]		40.000[MHz]
H.Frequency		31.469[kHz]		31.469[kHz]		31.469[kHz]		31.467[kHz]		37.879[kHz]
V.Frequency		70.086[Hz]		70.087[Hz]		59.940[Hz]		70.086[Hz]		60.317[Hz]
H.Tortal Time	900 [dots]	31.778 [us]	900 [dots]	31.777 [us]	800 [dots]	31.778 [us]	800 [dots]	31.778 [us]	1056 [dots]	26.400 [us]
H.Addr Time	720 [dots]	25.778 [us]	720 [dots]	25.422 [us]	640 [dots]	25.422 [us]	640 [dots]	25.422 [us]	800 [dots]	20.000 [us]
H.Blank Time	180 [dots]	6.356 [us]	180 [dots]	6.355 [us]	160 [dots]	6.356 [us]	160 [dots]	6.356 [us]	256 [dots]	6.400 [us]
H.Front Porch	18 [dots]	0.636 [us]	18 [dots]	0.636 [us]	16 [dots]	0.636 [us]	17 [dots]	0.675 [us]	40 [dots]	1.000 [us]
H.Sync Time	108 [dots]	3.813 [us]	108 [dots]	3.813 [us]	96 [dots]	3.813 [us]	64 [dots]	2.542 [us]	128 [dots]	3.200 [us]
H.Back Porch	54 [dots]	1.907 [us]	54 [dots]	1.907 [us]	48 [dots]	1.907 [us]	79 [dots]	3.138 [us]	88 [dots]	2.200 [us]
V.Tortal Time	449 [lines]	14.268 [ms]	449 [lines]	14.268 [ms]	525 [lines]	16.683 [ms]	449 [lines]	14.268 [ms]	628 [lines]	16.579 [ms]
V.Addr Time	350 [lines]	11.122 [ms]	400 [lines]	12.711 [ms]	480 [lines]	15.253 [ms]	400 [lines]	12.711 [ms]	600 [lines]	15.840 [ms]
V.Blank Time	99 [lines]	3.146 [ms]	49 [lines]	1.557 [ms]	45 [lines]	1.430 [ms]	49 [lines]	1.557 [ms]	28 [lines]	0.739 [ms]
V.Front Porch	37 [lines]	1.176 [ms]	12 [lines]	0.381 [ms]	10 [lines]	0.318 [ms]	13 [lines]	0.413 [ms]	1 [lines]	0.026 [ms]
V.Sync Time	2 [lines]	0.064 [ms]	2 [lines]	0.064 [ms]	2 [lines]	0.064 [ms]	2 [lines]	0.064 [ms]	4 [lines]	0.106 [ms]
V.Back Porch	60 [lines]	1.907 [ms]	35 [lines]	1.112 [ms]	33 [lines]	1.049 [ms]	34 [lines]	1.080 [ms]	23 [lines]	0.607 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarity	Positive		Negative		Negative		Negative		Positive	
V.Sync Polarity	Negative		Positive		Negative		Negative		Positive	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	6 MAC640*480		7 VESA640*350@85Hz		8 VESA640*400@85Hz		9 VESA640*480@75Hz		10 XGA	
Pixel Clock		30.240[MHz]		31.500[MHz]		31.500[MHz]		31.500[MHz]		44.900[MHz]
H.Frequency		35.000[kHz]		37.861[kHz]		37.861[kHz]		37.500[kHz]		35.522[kHz]
V.Frequency		66.667[Hz]		85.080[Hz]		85.080[Hz]		75.000[Hz]		87.064[Hz]
H.Tortal Time	864 [dots]	28.571 [us]	832 [dots]	26.413 [us]	832 [dots]	26.413 [us]	840 [dots]	26.667 [us]	1264 [dots]	29.577 [us]
H.Addr Time	640 [dots]	21.164 [us]	640 [dots]	20.317 [us]	640 [dots]	20.317 [us]	640 [dots]	20.317 [us]	1024 [dots]	22.806 [us]
H.Blank Time	224 [dots]	7.407 [us]	192 [dots]	6.095 [us]	192 [dots]	6.095 [us]	200 [dots]	6.349 [us]	240 [dots]	6.771 [us]
H.Front Porch	64 [dots]	2.116 [us]	32 [dots]	1.016 [us]	32 [dots]	1.016 [us]	16 [dots]	0.508 [us]	8 [dots]	0.535 [us]
H.Sync Time	64 [dots]	2.116 [us]	64 [dots]	2.032 [us]	64 [dots]	2.032 [us]	64 [dots]	2.032 [us]	176 [dots]	3.029 [us]
H.Back Porch	96 [dots]	3.175 [us]	96 [dots]	3.048 [us]	96 [dots]	3.048 [us]	120 [dots]	3.810 [us]	56 [dots]	3.207 [us]
V.Tortal Time	525 [lines]	15.000 [ms]	445 [lines]	11.754 [ms]	445 [lines]	11.754 [ms]	500 [lines]	13.333 [ms]	408 [lines]	23.839 [ms]
V.Addr Time	480 [lines]	13.714 [ms]	350 [lines]	9.244 [ms]	400 [lines]	10.565 [ms]	480 [lines]	12.800 [ms]	384 [lines]	22.715 [ms]
V.Blank Time	45 [lines]	1.286 [ms]	95 [lines]	2.509 [ms]	45 [lines]	1.189 [ms]	20 [lines]	0.533 [ms]	24 [lines]	1.124 [ms]
V.Front Porch	3 [lines]	0.086 [ms]	32 [lines]	0.845 [ms]	1 [lines]	0.026 [ms]	1 [lines]	0.027 [ms]	0 [lines]	0.089 [ms]
V.Sync Time	3 [lines]	0.086 [ms]	3 [lines]	0.079 [ms]	3 [lines]	0.079 [ms]	3 [lines]	0.080 [ms]	4 [lines]	0.177 [ms]
V.Back Porch	39 [lines]	1.114 [ms]	60 [lines]	1.585 [ms]	41 [lines]	1.083 [ms]	16 [lines]	0.427 [ms]	20 [lines]	0.858 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Interlaced	
H.Sync Polarity	Negative		Positive		Negative		Negative		Positive	
V.Sync Polarity	Negative		Negative		Positive		Negative		Positive	
	Composite + Sync On G		Separate		Separate		Separate		Separate	

TIMING NAME	11 VESA800*600@75Hz		12 VESA640*480@85Hz		13 MAC832*624		14 VESA800*600@85Hz		15 VESA1024*768@70Hz	
Pixel Clock		49.500[MHz]		36.000[MHz]		57.283[MHz]		56.250[MHz]		75.000[MHz]
H.Frequency		46.875[kHz]		43.296[kHz]		49.725[kHz]		53.674[kHz]		56.476[kHz]
V.Frequency		75.000[Hz]		85.008[Hz]		74.550[Hz]		85.061[Hz]		70.069[Hz]
H.Tortal Time	1056 [dots]	21.333 [us]	832 [dots]	23.111 [us]	1152 [dots]	20.111 [us]	1048 [dots]	18.631 [us]	1328 [dots]	17.707 [us]
H.Addr Time	800 [dots]	16.162 [us]	640 [dots]	17.778 [us]	832 [dots]	14.524 [us]	800 [dots]	14.222 [us]	1024 [dots]	13.653 [us]
H.Blank Time	256 [dots]	5.172 [us]	192 [dots]	5.333 [us]	320 [dots]	5.586 [us]	248 [dots]	4.409 [us]	304 [dots]	4.053 [us]
H.Front Porch	16 [dots]	0.323 [us]	56 [dots]	1.556 [us]	32 [dots]	0.559 [us]	32 [dots]	0.569 [us]	24 [dots]	0.320 [us]
H.Sync Time	80 [dots]	1.616 [us]	56 [dots]	1.556 [us]	64 [dots]	1.117 [us]	64 [dots]	1.138 [us]	136 [dots]	1.813 [us]
H.Back Porch	160 [dots]	3.232 [us]	80 [dots]	2.222 [us]	224 [dots]	3.910 [us]	152 [dots]	2.702 [us]	144 [dots]	1.920 [us]
V.Tortal Time	625 [lines]	13.333 [ms]	509 [lines]	11.764 [ms]	667 [lines]	13.414 [ms]	631 [lines]	11.756 [ms]	806 [lines]	14.272 [ms]
V.Addr Time	600 [lines]	12.800 [ms]	480 [lines]	11.093 [ms]	624 [lines]	12.549 [ms]	600 [lines]	11.179 [ms]	768 [lines]	13.599 [ms]
V.Blank Time	25 [lines]	0.533 [ms]	29 [lines]	0.670 [ms]	43 [lines]	0.865 [ms]	31 [lines]	0.578 [ms]	38 [lines]	0.673 [ms]
V.Front Porch	1 [lines]	0.021 [ms]	1 [lines]	0.023 [ms]	1 [lines]	0.020 [ms]	1 [lines]	0.019 [ms]	3 [lines]	0.053 [ms]
V.Sync Time	3 [lines]	0.064 [ms]	3 [lines]	0.069 [ms]	3 [lines]	0.060 [ms]	3 [lines]	0.056 [ms]	6 [lines]	0.106 [ms]
V.Back Porch	21 [lines]	0.448 [ms]	25 [lines]	0.578 [ms]	39 [lines]	0.784 [ms]	27 [lines]	0.503 [ms]	29 [lines]	0.513 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Positive		Negative		Negative		Positive		Negative	
V.Sync Polarily	Positive		Negative		Negative		Positive		Negative	
	Separate		Separate		Composite + Sync On G		Separate		Separate	
TIMING NAME	16 VESA1280*1024@60Hz		17 VESA1024*768@75Hz		18 MAC1152*870		19 VESA1024*768@85Hz		20 1280*1024@70Hz	
Pixel Clock		108.00[MHz]		78.750[MHz]		100.00[MHz]		94.500[MHz]		127.000[MHz]
H.Frequency		63.981[kHz]		60.023[kHz]		68.681[kHz]		68.677[kHz]		74.970[kHz]
V.Frequency		60.020[Hz]		75.029[Hz]		75.062[Hz]		84.997[Hz]		69.870[Hz]
H.Tortal Time	1688 [dots]	15.630 [us]	1312 [dots]	16.660 [us]	1456 [dots]	14.560 [us]	1376 [dots]	14.561 [us]	1694 [dots]	29.577 [us]
H.Addr Time	1280 [dots]	11.582 [us]	1024 [dots]	13.003 [us]	1152 [dots]	11.520 [us]	1024 [dots]	10.836 [us]	1280 [dots]	22.806 [us]
H.Blank Time	408 [dots]	3.778 [us]	288 [dots]	3.657 [us]	304 [dots]	3.040 [us]	352 [dots]	3.725 [us]	414 [dots]	6.771 [us]
H.Front Porch	48 [dots]	0.444 [us]	16 [dots]	0.203 [us]	32 [dots]	0.320 [us]	48 [dots]	0.508 [us]	30 [dots]	0.535 [us]
H.Sync Time	112 [dots]	1.037 [us]	96 [dots]	1.219 [us]	128 [dots]	1.280 [us]	96 [dots]	1.016 [us]	160 [dots]	3.029 [us]
H.Back Porch	248 [dots]	2.296 [us]	176 [dots]	2.235 [us]	144 [dots]	1.440 [us]	208 [dots]	2.201 [us]	224 [dots]	3.207 [us]
V.Tortal Time	1066 [lines]	16.661 [ms]	800 [lines]	13.328 [ms]	915 [lines]	13.322 [ms]	808 [lines]	11.765 [ms]	1073 [lines]	14.312 [ms]
V.Addr Time	1024 [lines]	16.005 [ms]	768 [lines]	12.795 [ms]	870 [lines]	12.667 [ms]	768 [lines]	11.183 [ms]	1024 [lines]	13.659 [ms]
V.Blank Time	42 [lines]	0.656 [ms]	32 [lines]	0.533 [ms]	45 [lines]	0.655 [ms]	40 [lines]	0.582 [ms]	48 [lines]	0.654 [ms]
V.Front Porch	1 [lines]	0.016 [ms]	1 [lines]	0.017 [ms]	3 [lines]	0.044 [ms]	1 [lines]	0.015 [ms]	3 [lines]	0.040 [ms]
V.Sync Time	3 [lines]	0.047 [ms]	3 [lines]	0.050 [ms]	3 [lines]	0.044 [ms]	3 [lines]	0.044 [ms]	4 [lines]	0.053 [ms]
V.Back Porch	38 [lines]	0.594 [ms]	28 [lines]	0.466 [ms]	39 [lines]	0.568 [ms]	36 [lines]	0.524 [ms]	42 [lines]	0.560 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Positive		Positive		Negative		Positive		Negative	
V.Sync Polarily	Positive		Positive		Negative		Positive		Negative	
	Separate		Separate		Composite + Sync On G		Separate		Sync On G	

TIMING NAME	21 VESA1280*1024@75Hz		22 VESA1600*1200@75Hz		23 VESA1600*1200@85Hz		24 VESA1920*1440@75Hz		25 H.HOLD1	
Pixel Clock		135.000[MHz]		202.500[MHz]		229.500[MHz]		297.000[MHz]		27.900[MHz]
H.Frequency		79.976[kHz]		93.750[kHz]		106.250[kHz]		112.500[kHz]		31.000[kHz]
V.Frequency		75.025[Hz]		75.000[Hz]		85.000[Hz]		75.000[Hz]		54.963[Hz]
H.Tortal Time	1688 [dots]	12.504 [us]	2160 [dots]	10.667 [us]	2160 [dots]	9.412 [us]	2640 [dots]	8.889 [us]	900 [dots]	32.260 [us]
H.Addr Time	1280 [dots]	9.481 [us]	1600 [dots]	7.901 [us]	1600 [dots]	6.972 [us]	1920 [dots]	6.465 [us]	720 [dots]	25.810 [us]
H.Blank Time	408 [dots]	3.022 [us]	560 [dots]	2.765 [us]	560 [dots]	2.440 [us]	720 [dots]	2.424 [us]	180 [dots]	6.450 [us]
H.Front Porch	16 [dots]	0.119 [us]	64 [dots]	0.316 [us]	64 [dots]	0.279 [us]	144 [dots]	0.485 [us]	18 [dots]	0.640 [us]
H.Sync Time	144 [dots]	1.067 [us]	192 [dots]	0.948 [us]	192 [dots]	0.837 [us]	224 [dots]	0.754 [us]	108 [dots]	3.870 [us]
H.Back Porch	248 [dots]	1.837 [us]	304 [dots]	1.501 [us]	304 [dots]	1.325 [us]	352 [dots]	1.185 [us]	54 [dots]	1.940 [us]
V.Tortal Time	1066 [lines]	13.329 [ms]	1250 [lines]	13.333 [ms]	1250 [lines]	11.765 [ms]	1500 [lines]	13.333 [ms]	564 [lines]	18.194 [ms]
V.Addr Time	1024 [lines]	12.804 [ms]	1200 [lines]	12.800 [ms]	1200 [lines]	11.294 [ms]	1440 [lines]	12.800 [ms]	428 [lines]	13.807 [ms]
V.Blank Time	42 [lines]	0.525 [ms]	50 [lines]	0.533 [ms]	50 [lines]	0.471 [ms]	60 [lines]	0.533 [ms]	136 [lines]	4.387 [ms]
V.Front Porch	1 [lines]	0.013 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.009 [ms]	1 [lines]	0.009 [ms]	52 [lines]	1.677 [ms]
V.Sync Time	3 [lines]	0.038 [ms]	3 [lines]	0.032 [ms]	3 [lines]	0.028 [ms]	3 [lines]	0.027 [ms]	2 [lines]	0.065 [ms]
V.Back Porch	38 [lines]	0.475 [ms]	46 [lines]	0.491 [ms]	46 [lines]	0.433 [ms]	56 [lines]	0.498 [ms]	82 [lines]	2.645 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarity	Positive		Positive		Positive		Negative		Positive	
V.Sync Polarity	Positive		Positive		Positive		Positive		Positive	
	Separate		Separate		Separate		Separate		Composit	

TIMING NAME	26 H.HOLD2(110K)		27 H.HOLD2(115K)		28 V.MAX		29 V.RASTER		30 EDID	
Pixel Clock		237.600[MHz]		142.140[MHz]		84.500[MHz]		78.750[MHz]		28.322[MHz]
H.Frequency		110.000[kHz]		115.000[kHz]		65.000[kHz]		60.023[kHz]		31.463[kHz]
V.Frequency		160.000[Hz]		160.000[Hz]		80.65[Hz]		75.029[Hz]		42.01[Hz]
H.Tortal Time	2160 [dots]	9.091 [us]	1236 [dots]	8.695 [us]	1300 [dots]	15.38 [us]	1328 [dots]	16.66 [us]	900 [dots]	31.777 [us]
H.Addr Time	1600 [dots]	6.734 [us]	900 [dots]	6.332 [us]	1024 [dots]	12.12 [us]	1024 [dots]	13.003 [us]	720 [dots]	25.422 [us]
H.Blank Time	560 [dots]	2.357 [us]	336 [dots]	2.364 [us]	276 [dots]	3.26 [us]	288 [dots]	33.657 [us]	180 [dots]	6.36 [us]
H.Front Porch	64 [dots]	0.269 [us]	68 [dots]	0.478 [us]	24 [dots]	0.28 [us]	16 [dots]	0.203 [us]	18 [dots]	0.636 [us]
H.Sync Time	192 [dots]	0.808 [us]	100 [dots]	0.704 [us]	92 [dots]	1.09 [us]	96 [dots]	1.219 [us]	108 [dots]	3.813 [us]
H.Back Porch	309 [dots]	1.280 [us]	168 [dots]	1.182 [us]	160 [dots]	1.89 [us]	176 [dots]	2.235 [us]	54 [dots]	1.907 [us]
V.Tortal Time	687 [lines]	6.250 [ms]	718 [lines]	6.250 [ms]	806 [lines]	12.4 [ms]	800 [lines]	13.328 [ms]	749 [lines]	23.8 [ms]
V.Addr Time	660 [lines]	6.000 [ms]	690 [lines]	6.000 [ms]	596 [lines]	9.169 [ms]	788 [lines]	13.128 [ms]	685 [lines]	21.767 [ms]
V.Blank Time	27 [lines]	0.250 [ms]	28 [lines]	0.250 [ms]	210 [lines]	3.231 [ms]	13 [lines]	0.217 [ms]	64 [lines]	2.034 [ms]
V.Front Porch	1 [lines]	0.013 [ms]	1 [lines]	0.013 [ms]	89 [lines]	1.343 [ms]	0 [lines]	0 [ms]	14 [lines]	0.445 [ms]
V.Sync Time	4 [lines]	0.038 [ms]	4 [lines]	0.038 [ms]	6 [lines]	0.092 [ms]	3 [lines]	0.05 [ms]	3 [lines]	0.095 [ms]
V.Back Porch	22 [lines]	0.200 [ms]	23 [lines]	0.200 [ms]	115 [lines]	1.796 [ms]	9 [lines]	0.150 [ms]	47 [lines]	1.494 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarity	Positive		Positive		Negative		Positive		Negative	
V.Sync Polarity	Positive		Positive		Negative		Positive		Negative	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	31 VESA1600*1200@60Hz		32 VESA1280*1024@85Hz		33 788*1200@75		34 812*1024@85		35 H.SIZE	
Pixel Clock		162.000 [MHz]		157.500[MHz]		99.900[MHz]		99.900[MHz]		229.500[MHz]
H.Frequency		75.000 [kHz]		91.146[kHz]		93.720[kHz]		91.160[kHz]		106.250[kHz]
V.Frequency		60.000 [Hz]		85.024[Hz]		74.980[Hz]		85.040[Hz]		85.000[Hz]
H.Tortal Time	2160 [dots]	13.333 [us]	1728 [dots]	10.971 [us]	1066 [dots]	10.670 [us]	1096 [dots]	10.970 [us]	2160 [dots]	9.412 [us]
H.Addr Time	1600 [dots]	9.877 [us]	1280 [dots]	8.127 [us]	788 [dots]	7.890 [us]	812 [dots]	8.120 [us]	1520 [dots]	6.623 [us]
H.Blank Time	560 [dots]	3.457 [us]	448 [dots]	2.844 [us]	278 [dots]	2.780 [us]	284 [dots]	2.850 [us]	640 [dots]	2.789 [us]
H.Front Porch	64 [dots]	0.395 [us]	64 [dots]	0.406 [us]	34 [dots]	0.340 [us]	40 [dots]	0.410 [us]	104 [dots]	0.454 [us]
H.Sync Time	192 [dots]	1.185 [us]	160 [dots]	1.016 [us]	94 [dots]	0.940 [us]	102 [dots]	1.020 [us]	192 [dots]	0.837 [us]
H.Back Porch	304 [dots]	1.877 [us]	224 [dots]	1.422 [us]	150 [dots]	1.500 [us]	142 [dots]	1.420 [us]	344 [dots]	1.500 [us]
V.Tortal Time	1250 [lines]	16.667 [ms]	1072 [lines]	11.761 [ms]	1250 [lines]	11.337 [ms]	1072 [lines]	11.760 [ms]	1250 [lines]	11.765 [ms]
V.Addr Time	1200 [lines]	16.000 [ms]	1024 [lines]	11.235 [ms]	1200 [lines]	12.804 [ms]	1024 [lines]	11.233 [ms]	1200 [lines]	11.294 [ms]
V.Blank Time	50 [lines]	0.667 [ms]	48 [lines]	0.527 [ms]	50 [lines]	0.533 [ms]	48 [lines]	0.527 [ms]	50 [lines]	0.471 [ms]
V.Front Porch	1 [lines]	0.013 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.010 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.009 [ms]
V.Sync Time	3 [lines]	0.040 [ms]	3 [lines]	0.033 [ms]	3 [lines]	0.032 [ms]	3 [lines]	0.033 [ms]	3 [lines]	0.028 [ms]
V.Back Porch	46 [lines]	0.613 [ms]	44 [lines]	0.483 [ms]	46 [lines]	0.491 [ms]	44 [lines]	0.483 [ms]	46 [lines]	0.433 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Positive		Positive		Positive		Positive		Positive	
V.Sync Polarily	Positive		Positive		Positive		Positive		Positive	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME										
Pixel Clock		[MHz]		[MHz]		[MHz]		[MHz]		[MHz]
H.Frequency		[kHz		[kHz]		[kHz]		[kHz]		[kHz]
V.Frequency		[Hz]		[Hz]		[Hz]		[Hz]		[Hz]
H.Tortal Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Addr Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Blank Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Front Porch	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Sync Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Back Porch	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
V.Tortal Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Addr Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Blank Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Front Porch	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Sync Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Back Porch	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
Scan Type										
H.Sync Polarily										
V.Sync Polarily										

TIMING NAME	USER1 PC98 1120*750(I)		USER2 VESA800*600@56Hz		USER3 VESA1024*768@60Hz		USER4 VESA800*600@72Hz		USER5 1120*750@60Hz	
Pixel Clock		47.846[MHz]		36.000[MHz]		65.000[MHz]		50.000[MHz]		78.431[MHz]
H.Frequency		32.861[kHz]		35.156[kHz]		48.363[kHz]		48.077[kHz]		50.020[kHz]
V.Frequency		78.993[Hz]		56.250[Hz]		60.004[Hz]		72.188[Hz]		60.048[Hz]
H.Tortal Time	1456 [dots]	30.431 [us]	1024 [dots]	28.444 [us]	1344 [dots]	20.677 [us]	1040 [dots]	20.800 [us]	1568 [dots]	19.992 [us]
H.Addr Time	1120 [dots]	23.408 [us]	800 [dots]	22.222 [us]	1024 [dots]	15.754 [us]	800 [dots]	16.000 [us]	1120 [dots]	14.280 [us]
H.Blank Time	336 [dots]	7.023 [us]	224 [dots]	6.222 [us]	320 [dots]	4.923 [us]	240 [dots]	4.800 [us]	448 [dots]	5.712 [us]
H.Front Porch	112 [dots]	2.341 [us]	24 [dots]	0.667 [us]	24 [dots]	0.369 [us]	56 [dots]	1.120 [us]	168 [dots]	2.142 [us]
H.Sync Time	84 [dots]	1.756 [us]	72 [dots]	2.000 [us]	136 [dots]	2.092 [us]	120 [dots]	2.400 [us]	112 [dots]	1.428 [us]
H.Back Porch	140 [dots]	2.926 [us]	128 [dots]	3.556 [us]	160 [dots]	2.462 [us]	64 [dots]	1.280 [us]	168 [dots]	2.142 [us]
V.Tortal Time	416 [lines]	12.659 [ms]	625 [lines]	17.778 [ms]	806 [lines]	16.666 [ms]	666 [lines]	13.853 [ms]	833 [lines]	16.653 [ms]
V.Addr Time	375.5 [lines]	11.427 [ms]	600 [lines]	17.067 [ms]	768 [lines]	15.88 [ms]	600 [lines]	12.480 [ms]	750 [lines]	14.994 [ms]
V.Blank Time	40.5 [lines]	1.232 [ms]	25 [lines]	0.711 [ms]	38 [lines]	0.786 [ms]	66 [lines]	1.373 [ms]	83 [lines]	1.659 [ms]
V.Front Porch	9 [lines]	0.274 [ms]	1 [lines]	0.028 [ms]	3 [lines]	0.062 [ms]	37 [lines]	0.770 [ms]	27 [lines]	0.540 [ms]
V.Sync Time	5 [lines]	0.152 [ms]	2 [lines]	0.057 [ms]	6 [lines]	0.124 [ms]	6 [lines]	0.125 [ms]	10 [lines]	0.200 [ms]
V.Back Porch	26.5 [lines]	0.806 [ms]	22 [lines]	0.626 [ms]	29 [lines]	0.600 [ms]	23 [lines]	0.478 [ms]	46 [lines]	0.920 [ms]
Scan Type	interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Positive		Positive		Negative		Positive		Negative	
V.Sync Polarily	Positive		Positive		Negative		Positive		Negative	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	USER6 640*480@100Hz		USER7 XGA-2 1024*768@72Hz		USER8 1024*768@80Hz		USER9 800*600@100Hz		USER10 640*480@120Hz	
Pixel Clock		42.000[MHz]		79.000[MHz]		88.504[MHz]		68.179[MHz]		50.400[MHz]
H.Frequency		50.000[kHz]		58.088[kHz]		64.320[kHz]		63.600[kHz]		59.990[kHz]
V.Frequency		100.000[Hz]		71.980[Hz]		80.000[Hz]		100.000[Hz]		119.980[Hz]
H.Tortal Time	840 [dots]	20.000 [us]	1360 [dots]	17.215 [us]	1376 [dots]	15.547 [us]	1072 [dots]	15.723 [us]	840 [dots]	16.669 [us]
H.Addr Time	640 [dots]	15.240 [us]	1024 [dots]	12.962 [us]	1024 [dots]	11.570 [us]	800 [dots]	11.734 [us]	640 [dots]	12.701 [us]
H.Blank Time	200 [dots]	4.760 [us]	336 [dots]	4.253 [us]	352 [dots]	3.977 [us]	272 [dots]	3.989 [us]	200 [dots]	3.969 [us]
H.Front Porch	16 [dots]	0.380 [us]	8 [dots]	0.101 [us]	64 [dots]	0.723 [us]	48 [dots]	0.704 [us]	16 [dots]	0.318 [us]
H.Sync Time	64 [dots]	1.520 [us]	288 [dots]	3.646 [us]	112 [dots]	1.265 [us]	88 [dots]	1.291 [us]	64 [dots]	1.270 [us]
H.Back Porch	120 [dots]	2.860 [us]	40 [dots]	0.506 [us]	176 [dots]	1.989 [us]	136 [dots]	1.995 [us]	120 [dots]	2.381 [us]
V.Tortal Time	500 [lines]	10.000 [ms]	807 [lines]	13.893 [ms]	804 [lines]	12.500 [ms]	636 [lines]	10.000 [ms]	500 [lines]	8.335 [ms]
V.Addr Time	480 [lines]	9.600 [ms]	768 [lines]	13.221 [ms]	768 [lines]	11.940 [ms]	600 [lines]	9.434 [ms]	480 [lines]	8.001 [ms]
V.Blank Time	20 [lines]	0.400 [ms]	39 [lines]	0.671 [ms]	36 [lines]	0.560 [ms]	36 [lines]	0.566 [ms]	20 [lines]	0.334 [ms]
V.Front Porch	1 [lines]	0.020 [ms]	0 [lines]	0.000 [ms]	1 [lines]	0.016 [ms]	1 [lines]	0.016 [ms]	1 [lines]	0.017 [ms]
V.Sync Time	3 [lines]	0.060 [ms]	8 [lines]	0.138 [ms]	3 [lines]	0.047 [ms]	3 [lines]	0.047 [ms]	3 [lines]	0.050 [ms]
V.Back Porch	16 [lines]	0.320 [ms]	31 [lines]	0.534 [ms]	32 [lines]	0.498 [ms]	32 [lines]	0.503 [ms]	16 [lines]	0.267 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Negative		Negative		Positive		Positive		Negative	
V.Sync Polarily	Negative		Negative		Positive		Positive		Negative	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	USER11 640*480@140Hz		USER12 VESA1600*1200@60Hz		USER13 VESA1152*864@85Hz		USER14 1024*768@100Hz		USER15 800*600@120Hz	
Pixel Clock		58.800[MHz]		162.000[MHz]		121.500[MHz]		108.390[MHz]		83.250[MHz]
H.Frequency		70.000[kHz]		75.000[kHz]		77.094[kHz]		80.647[kHz]		78.835[kHz]
V.Frequency		140.000[Hz]		60.000[Hz]		84.999[Hz]		100.059[Hz]		121.659[Hz]
H.Tortal Time	840 [dots]	14.286 [us]	2160 [dots]	13.333 [us]	1576 [dots]	12.971 [us]	1344 [dots]	12.400 [us]	1056 [dots]	12.685 [us]
H.Addr Time	640 [dots]	10.884 [us]	1600 [dots]	9.877 [us]	1152 [dots]	9.481 [us]	1024 [dots]	9.447 [us]	800 [dots]	9.610 [us]
H.Blank Time	200 [dots]	3.401 [us]	560 [dots]	3.457 [us]	424 [dots]	3.490 [us]	320 [dots]	2.952 [us]	256 [dots]	3.075 [us]
H.Front Porch	16 [dots]	0.272 [us]	64 [dots]	0.395 [us]	64 [dots]	0.527 [us]	24 [dots]	0.221 [us]	32 [dots]	0.384 [us]
H.Sync Time	64 [dots]	1.088 [us]	192 [dots]	1.185 [us]	128 [dots]	1.053 [us]	136 [dots]	1.255 [us]	80 [dots]	0.961 [us]
H.Back Porch	120 [dots]	2.041 [us]	304 [dots]	1.877 [us]	232 [dots]	1.909 [us]	160 [dots]	1.476 [us]	144 [dots]	1.730 [us]
V.Tortal Time	500 [lines]	7.143 [ms]	1250 [lines]	16.667 [ms]	907 [lines]	11.765 [ms]	806 [lines]	9.994 [ms]	648 [lines]	8.220 [ms]
V.Addr Time	480 [lines]	6.857 [ms]	1200 [lines]	16.000 [ms]	864 [lines]	11.207 [ms]	768 [lines]	9.523 [ms]	600 [lines]	7.611 [ms]
V.Blank Time	20 [lines]	0.286 [ms]	50 [lines]	0.667 [ms]	43 [lines]	0.558 [ms]	38 [lines]	0.471 [ms]	48 [lines]	0.609 [ms]
V.Front Porch	1 [lines]	0.014 [ms]	1 [lines]	0.013 [ms]	1 [lines]	0.013 [ms]	3 [lines]	0.037 [ms]	2 [lines]	0.025 [ms]
V.Sync Time	3 [lines]	0.043 [ms]	3 [lines]	0.040 [ms]	3 [lines]	0.039 [ms]	6 [lines]	0.074 [ms]	4 [lines]	0.051 [ms]
V.Back Porch	16 [lines]	0.229 [ms]	46 [lines]	0.613 [ms]	39 [lines]	0.506 [ms]	29 [lines]	0.360 [ms]	42 [lines]	0.533 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Negative		Positive		Positive		Positive		Positive	
V.Sync Polarily	Negative		Positive		Positive		Positive		Positive	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	USER16 640*480@160Hz		USER17 VESA1920*1440@60Hz		USER18 VESA1600*1200@70Hz		USER19 VESA1280*1024@85Hz		USER20 800*600@140Hz	
Pixel Clock		67.200[MHz]		234.000[MHz]		189.000[MHz]		157.500[MHz]		92.300[MHz]
H.Frequency		80.000[kHz]		90.000[kHz]		87.500[kHz]		91.146[kHz]		87.488[kHz]
V.Frequency		160.000[Hz]		60.000[Hz]		70.000[Hz]		85.024[Hz]		139.981[Hz]
H.Tortal Time	840 [dots]	12.500 [us]	2600 [dots]	11.111 [us]	2160 [dots]	11.429 [us]	1728 [dots]	10.971 [us]	1055 [dots]	11.430 [us]
H.Addr Time	640 [dots]	9.524 [us]	1920 [dots]	8.205 [us]	1600 [dots]	8.466 [us]	1280 [dots]	8.127 [us]	799 [dots]	8.657 [us]
H.Blank Time	200 [dots]	2.976 [us]	680 [dots]	2.906 [us]	560 [dots]	2.963 [us]	448 [dots]	2.844 [us]	256 [dots]	2.774 [us]
H.Front Porch	16 [dots]	0.238 [us]	128 [dots]	0.547 [us]	64 [dots]	0.339 [us]	64 [dots]	0.406 [us]	16 [dots]	0.173 [us]
H.Sync Time	64 [dots]	0.952 [us]	208 [dots]	0.889 [us]	192 [dots]	1.016 [us]	160 [dots]	1.016 [us]	80 [dots]	0.867 [us]
H.Back Porch	120 [dots]	1.786 [us]	344 [dots]	1.470 [us]	304 [dots]	1.608 [us]	224 [dots]	1.422 [us]	160 [dots]	1.733 [us]
V.Tortal Time	500 [lines]	6.250 [ms]	1500 [lines]	16.667 [ms]	1250 [lines]	14.286 [ms]	1072 [lines]	11.761 [ms]	625 [lines]	7.144 [ms]
V.Addr Time	480 [lines]	6.000 [ms]	1440 [lines]	16.000 [ms]	1200 [lines]	13.714 [ms]	1024 [lines]	11.235 [ms]	600 [lines]	6.858 [ms]
V.Blank Time	20 [lines]	0.250 [ms]	60 [lines]	0.667 [ms]	50 [lines]	0.571 [ms]	48 [lines]	0.527 [ms]	25 [lines]	0.286 [ms]
V.Front Porch	1 [lines]	0.013 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.011 [ms]	1 [lines]	0.011 [ms]
V.Sync Time	3 [lines]	0.038 [ms]	3 [lines]	0.033 [ms]	3 [lines]	0.034 [ms]	3 [lines]	0.033 [ms]	3 [lines]	0.034 [ms]
V.Back Porch	16 [lines]	0.200 [ms]	56 [lines]	0.622 [ms]	46 [lines]	0.526 [ms]	44 [lines]	0.483 [ms]	21 [lines]	0.240 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Negative		Negative		Positive		Positive		Positive	
V.Sync Polarily	Negative		Positive		Positive		Positive		Positive	
	Separate		Separate		Separate		Separate		Separate	

TIMING NAME	USER21 VESA1792*1344@75Hz		USER22 VESA1600*1200@80Hz		USER23 1024*768@120Hz		USER24 800*600@160Hz		USER26 1920*1440@75Hz	
Pixel Clock		261.000[MHz]		216.000[MHz]		139.054[MHz]		116.406[MHz]		297.000 [MHz]
H.Frequency		106.270[kHz]		100.000[kHz]		98.760[kHz]		105.440[kHz]		112.500 [kHz]
V.Frequency		74.997[Hz]		80.000[Hz]		120.000[Hz]		160[Hz]		75.000 [Hz]
H.Tortal Time	2456 [dots]	9.410 [us]	2160 [dots]	10.000 [us]	1408 [dots]	10.126 [us]	1104 [dots]	9.484 [us]	2640 [dots]	8.889 [us]
H.Addr Time	1792 [dots]	6.866 [us]	1600 [dots]	7.407 [us]	1024 [dots]	7.364 [us]	800 [dots]	6.873 [us]	1920 [dots]	6.465 [us]
H.Blank Time	664 [dots]	2.544 [us]	560 [dots]	2.593 [us]	384 [dots]	2.762 [us]	304 [dots]	2.612 [us]	720 [dots]	2.424 [us]
H.Front Porch	96 [dots]	0.368 [us]	64 [dots]	0.296 [us]	80 [dots]	0.575 [us]	64 [dots]	0.550 [us]	144 [dots]	0.485 [us]
H.Sync Time	216 [dots]	0.828 [us]	192 [dots]	0.889 [us]	112 [dots]	0.805 [us]	88 [dots]	0.765 [us]	224 [dots]	0.754 [us]
H.Back Porch	352 [dots]	1.349 [us]	304 [dots]	1.407 [us]	192 [dots]	1.381 [us]	152 [dots]	1.306 [us]	352 [dots]	1.185 [us]
V.Tortal Time	1417 [lines]	13.334 [ms]	1250 [lines]	12.500 [ms]	823 [lines]	8.333 [ms]	659 [lines]	6.250 [ms]	1500 [lines]	13.333 [ms]
V.Addr Time	1344 [lines]	12.647 [ms]	1200 [lines]	12.000 [ms]	768 [lines]	7.776 [ms]	600 [lines]	5.690 [ms]	1440 [lines]	12.800 [ms]
V.Blank Time	73 [lines]	0.687 [ms]	50 [lines]	0.500 [ms]	55 [lines]	0.557 [ms]	59 [lines]	0.560 [ms]	60 [lines]	0.533 [ms]
V.Front Porch	1 [lines]	0.009 [ms]	1 [lines]	0.010 [ms]	1 [lines]	0.010 [ms]	1 [lines]	0.009 [ms]	1 [lines]	0.009 [ms]
V.Sync Time	3 [lines]	0.028 [ms]	3 [lines]	0.030 [ms]	3 [lines]	0.030 [ms]	3 [lines]	0.028 [ms]	3 [lines]	0.027 [ms]
V.Back Porch	69 [lines]	0.649 [ms]	46 [lines]	0.460 [ms]	51 [lines]	0.516 [ms]	55 [lines]	0.522 [ms]	56 [lines]	0.498 [ms]
Scan Type	Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced		Non-interlaced	
H.Sync Polarily	Negative		Positive		Positive		Positive		Negative	
V.Sync Polarily	Positive		Positive		Positive		Positive		Positive	
	Separate		Separate		Separate		Separate		Separate	
TIMING NAME										
Pixel Clock		[MHz]		[MHz]		[MHz]		[MHz]		[MHz]
H.Frequency		[kHz]		[kHz]		[kHz]		[kHz]		[kHz]
V.Frequency		[Hz]		[Hz]		[Hz]		[Hz]		[Hz]
H.Tortal Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Addr Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Blank Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Front Porch	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Sync Time	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
H.Back Porch	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]	[dots]	[us]
V.Tortal Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Addr Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Blank Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Front Porch	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Sync Time	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
V.Back Porch	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]	[lines]	[ms]
Scan Type										
H.Sync Polarily										
V.Sync Polarily										

NOTE) Use special signals when original signals can not be made by equipped signal generator. Don't use these signal timing for Focus Adjustment. (The resolution is different.)

	Program No.	Original	Special	Original	Special	Original	Special	Original	Special	Original	Special	Original	Special
		16	16	18	18	21	21	22	22	23	23	24	24
	Signal Name	VESA1280* 1024@60	-	MAC1152* 870	-	VESA1280 *1024@75	-	VESA1600* 1200@75	-	VESA1600 *1200@85	-	VESA1920 *1440@75	-
	Resolution	1280*1024	-	1152*870	-	1280*1024	-	1600*1200	-	1600*1200	-	1920*1440	-
	Dot Clock (MHz)	108.000	81	100.000	75	135.000	67.5	202.500	50.625	229.500	57.375	297.000	74.250
	fh (kHz)	63.981	63.981	68.681	68.681	79.976	79.976	93.750	93.750	106.250	106.250	112.500	112.500
	fv (Hz)	60.020	60.020	75.062	75.062	75.025	75.025	75.000	75.000	85.000	85.000	75.000	75.000
Horizontal	Cell Size (Dot)	8	8	8	8	8	8	8	8	8	8	8	8
	Total (Dot)	1688	1266	1456	1092	1688	844	2160	540	2160	540	2640	660
	(CHR)	211	158	182	137	211	106	270	68	270	68	330	83
	(uS)	15.630	15.63	14.560	14.560	12.504	12.504	10.667	10..667	9.412	9.412	8.889	8.889
	Disp (Dot)	1280	960	1152	864	1280	640	1600	400	1600	400	1920	480
	(CHR)	160	120	144	108	160	80	200	50	200	50	240	60
	(uS)	11.852	11.852	11.520	11.520	9.481	9.481	7.901	7.901	6.972	6.972	6.465	6.465
	Front (Dot)	48	36	32	24	16	8	64	16	64	16	144	36
	(uS)	0.444	0.444	0.320	0.320	0.119	0.119	0.316	0.316	0.279	0.279	0.485	0485
	Sync Pulse(Dot)	112	84	128	96	144	72	192	48	192	48	224	56
	(uS)	1.037	1.037	1.280	1.280	1.067	1.067	0.948	0.948	0.837	0.837	0.754	0.754
	Back (Dot)	248	186	144	108	248	124	304	76	304	76	352	88
	(uS)	2.296	2.296	1.440	1.440	1.837	1.837	1.501	1.501	1.325	1.325	1.185	1.185
	Program No.	Original	Special	Original	Special	Original	Special	Original	Special	Original	Special	Original	Special
		26	26	27	27	32	32	33	33	34	34	35	35
	Signal Name	H.HOLD2 (110K)	-	H.HOLD2 (115K)	-	VESA1280 *1024@85	-	788*1200 @75	-	812*1024 @85	-	H.SIZE	-
	Resolution					1280*1024	-	788*1200		812*1024			
	Dot Clock (MHz)	237.600	59.400	142.140	71.070	157.500	78.750	99.900	74.925	99.900	74.925	229.500	57.375
	fh (kHz)	110.000	110.000	115.000	115.000	91.146	91.146	93.720	93.720	91.160	91.160	106.250	106.250
	fv (Hz)	160.000	160.000	160.000	160.000	85.024	85.024	74.980	74.980	85.040	85.040	85.000	85.000
Horizontal	Cell Size (Dot)	8	8	8	8	8	8	8	8	8	8	8	8
	Total (Dot)	2160	540	1236	618	1728	864	1066	800	1096	822	2160	540
	(CHR)	270	68	155	77	216	108	133	100	137	103	270	68
	(uS)	9.091	9.091	8.695	8.695	10.971	10.971	10.670	10.670	10.970	10.970	9.412	9.412
	Disp (Dot)	1600	400	900	450	1280	640	788	591	812	609	1520	380
	(CHR)	200	50	113	56	160	80	99	74	102	76	190	48
	(uS)	6.734	6.734	6.332	6.332	8.127	8.127	7.890	7.890	8.120	8.120	6.623	6.623
	Front (Dot)	64	16	68	34	64	32	34	26	40	30	104	26
	(uS)	0.269	0.269	0.478	0.478	0.406	0.406	0.340	0.340	0.410	0.410	0.454	0.454
	Sync Pulse(Dot)	192	48	100	50	160	80	94	71	102	77	192	48
	(uS)	0.808	0.808	0.704	0.704	1.016	1.016	0.940	0.940	1.020	1.020	0.837	0.837
	Back (Dot)	309	77	168	84	224	112	150	113	142	107	344	86
	(uS)	1.280	1.280	1.182	1.182	1.422	1.422	1.500	1.500	1.420	1.420	1.500	1.500

3. Position of Connector / Test point of Adjustment

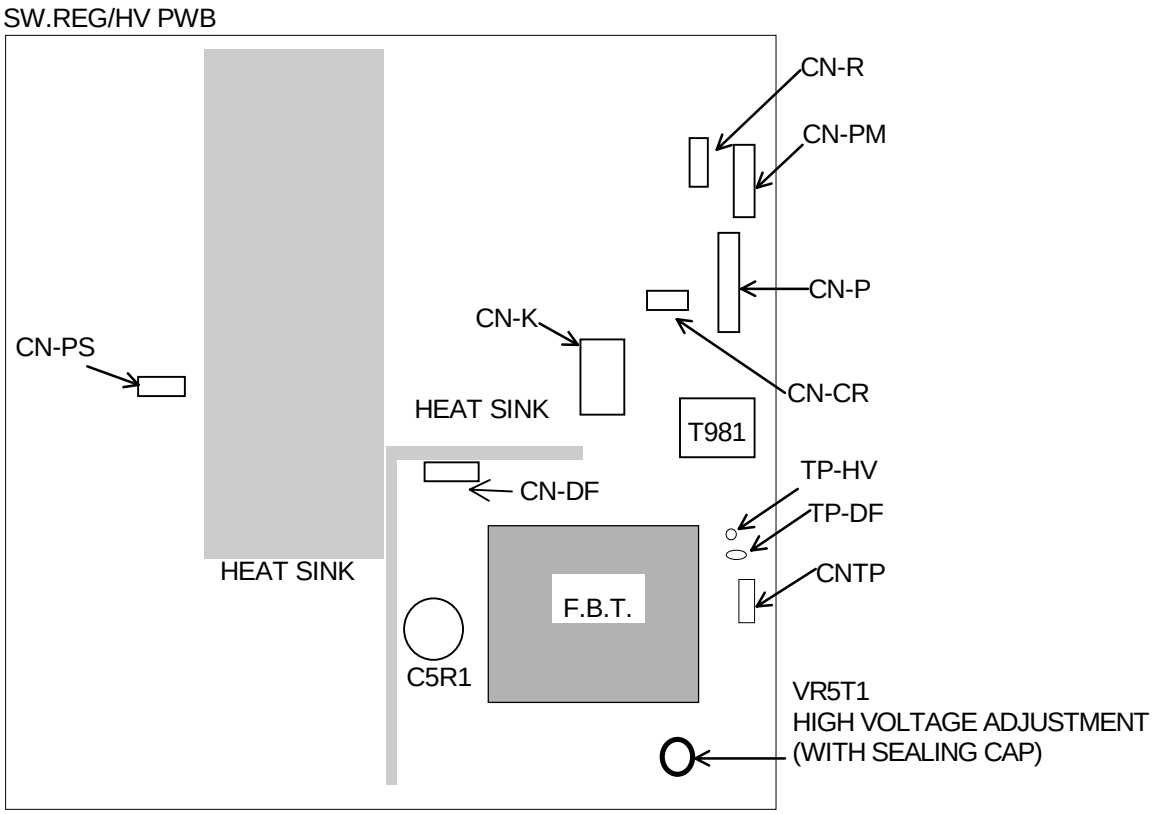


Fig 3-1 SW/HV PWB (PARTS SIDE)

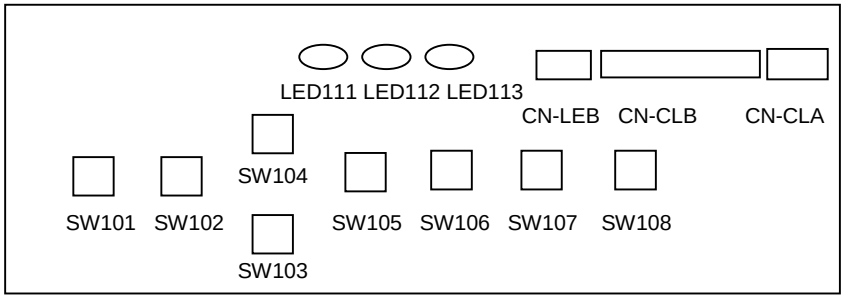


Fig 3-2 CONT PWB (PARTS SIDE)

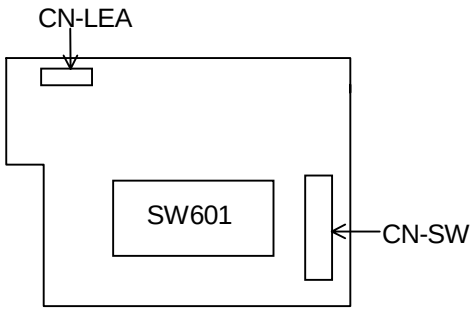


Fig 3-3 SW PWB(PARTS SIDE)

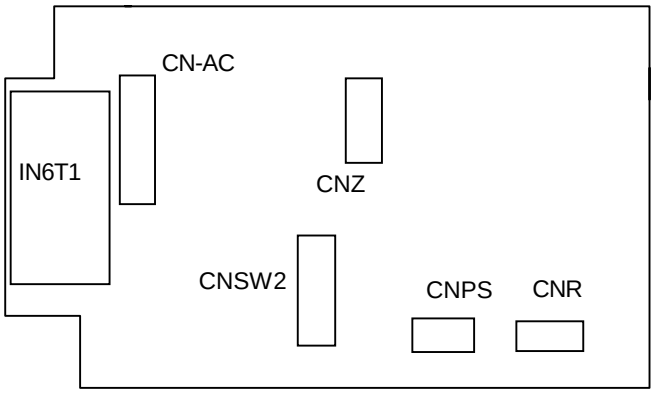


Fig 3-4 INLET PWB (PARTS SIDE)

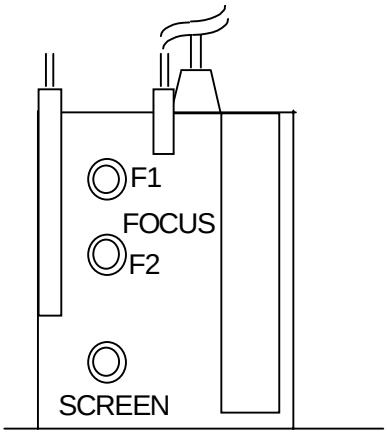


Fig 3-5 F.B.T. VR

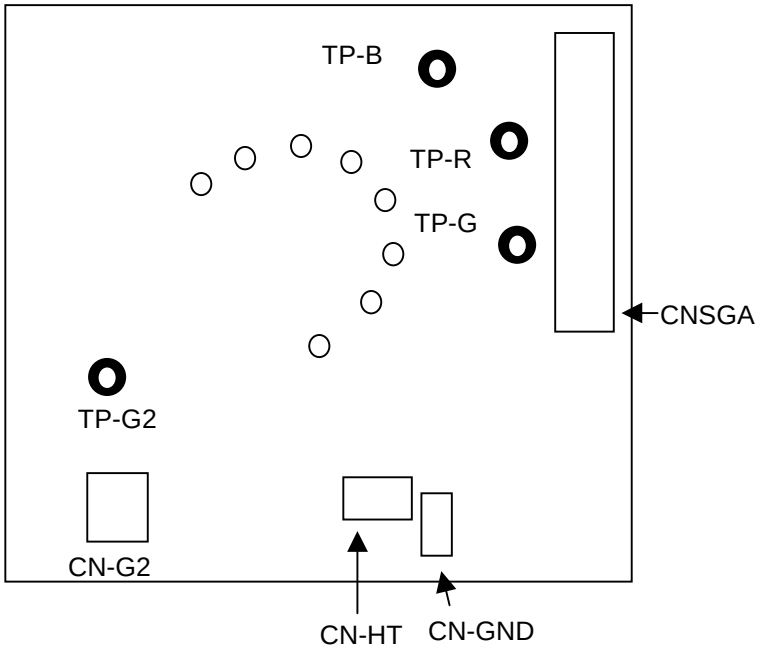


Fig 3-6 CRT PWB (PARTS SIDE)

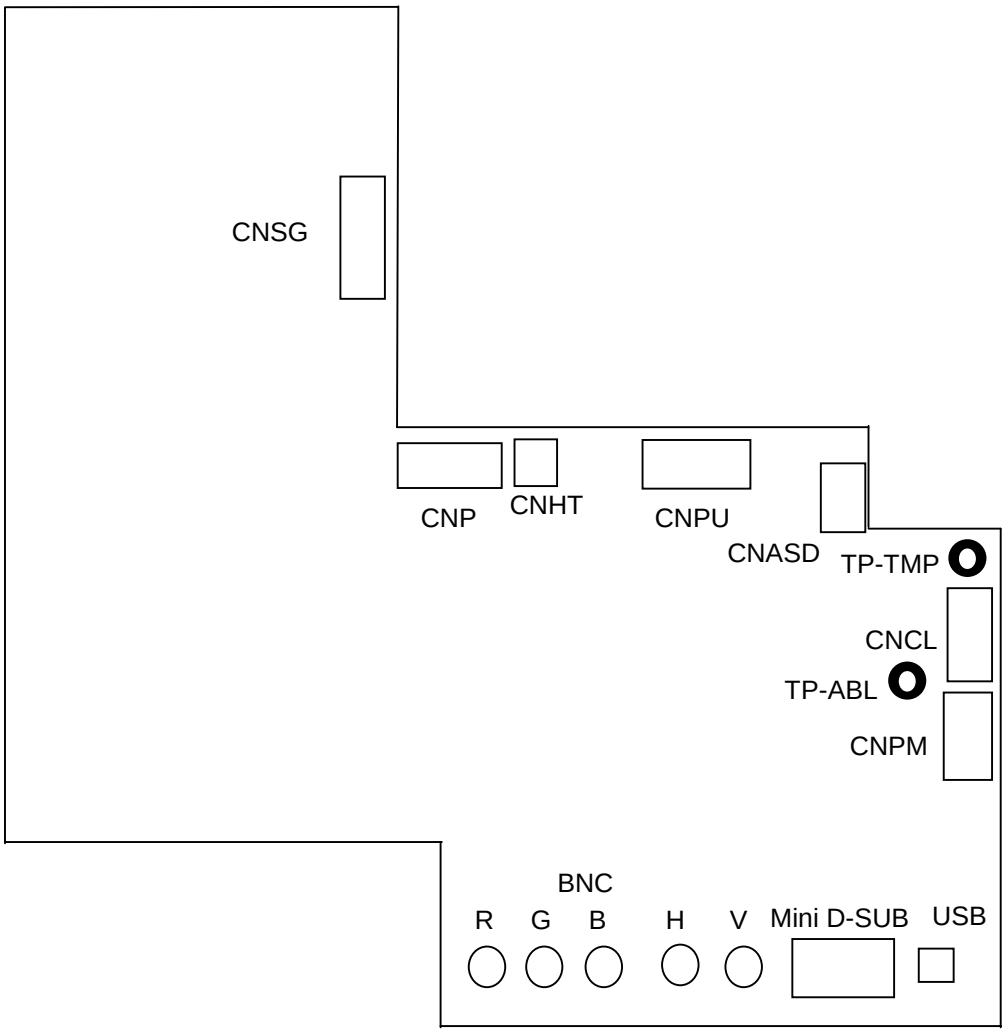


Fig 3-7 VIDEO PWB (PARTS SIDE)

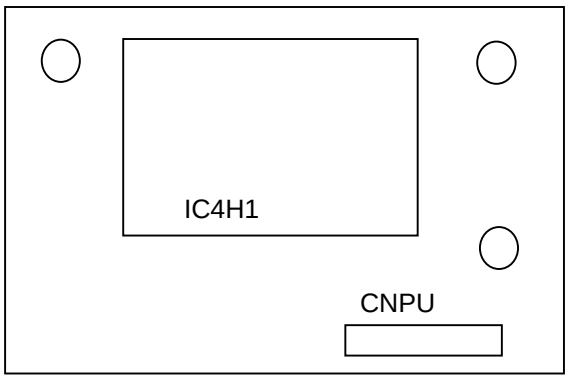


Fig 3-8 PU PWB (PARTS SIDE)

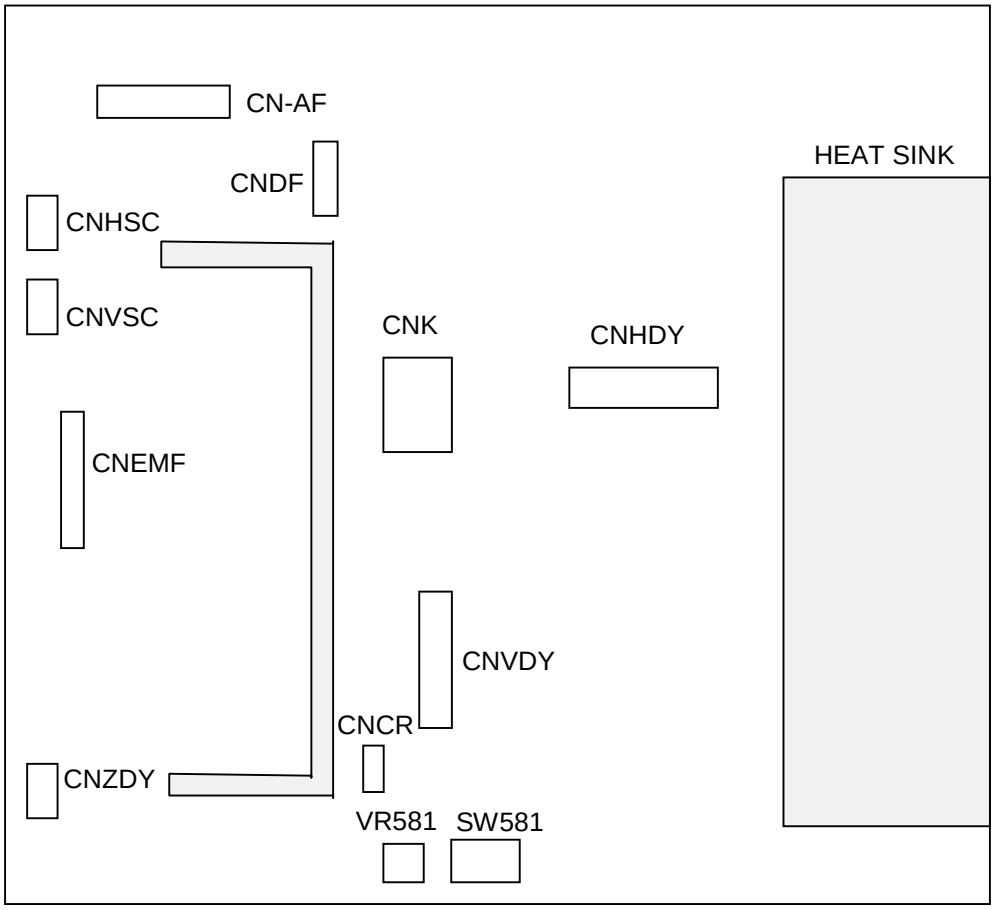


Fig 3-9 DEF PWB (PARTS SIDE)

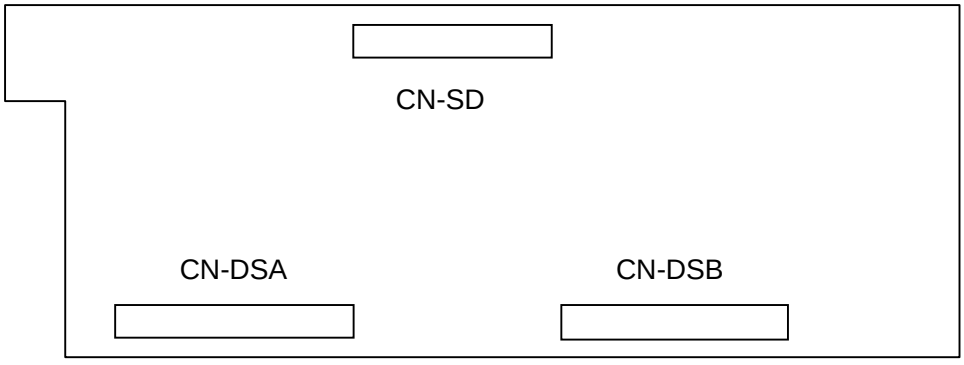


Fig 3-10 OSC PWB (PARTS SIDE)

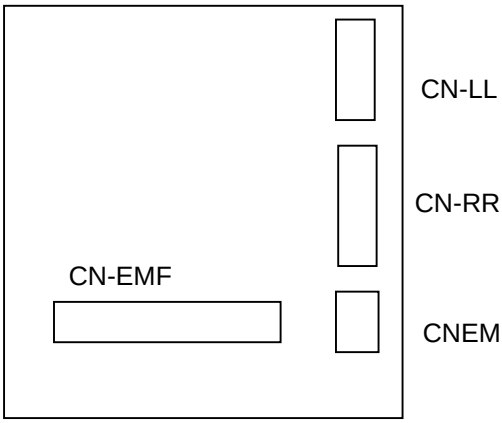


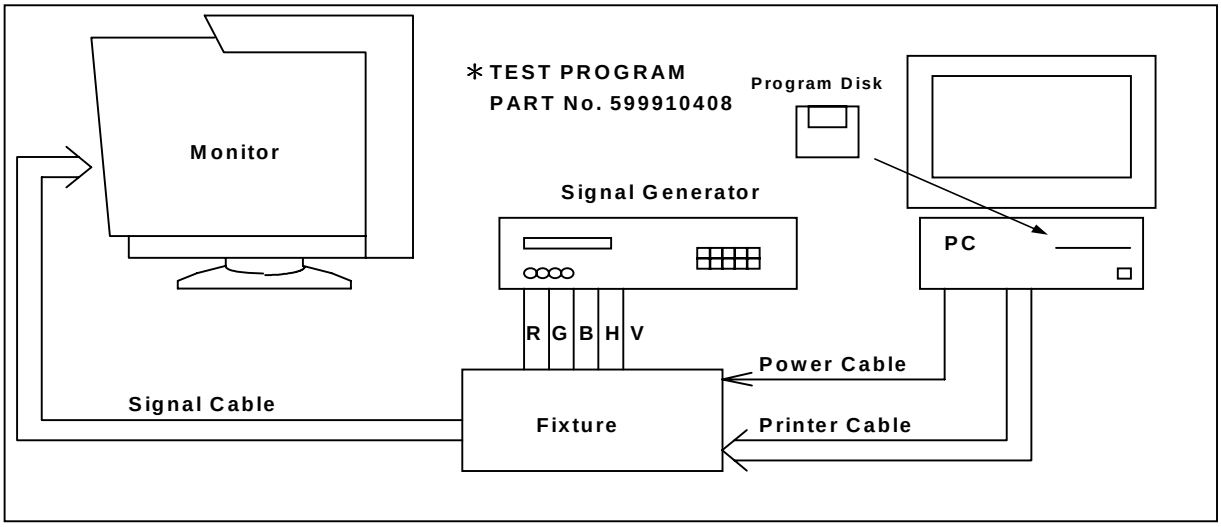
Fig.3-11 EMF PWB

INSPECTION

1. Inspection of PLUG & PLAY communication

1-1. A construction of System

This system should be connected as shown below.



1-2. Starting method

1) Input Signal

Input signal must be separate sync. Two kinds of signals must be prepared.

One is the signal whose vertical synchronization frequency is 42Hz, and another is the signal whose vertical synchronization frequency is between 55Hz and 25kHz.

Horizontal synchronization frequency should be set to reasonable value (example 31.5kHz).

2) Power ON procedure

- First, put the floppy disk for PnP Inspection into PC and turn on PC.
- Turn on Fixture.
- Make sure that fixture's LED turns on and off.
- Turn on signal generator and monitor.

3) Starting PC Software

- Inspection of PnP communication

To check the PnP communication, EDID file name is FP1350, set "P FP1350" to DOS command line and press return key.

- Writing EDID to EEPROM and inspection of PnP communication

To write EDID to EEPROM and check the PnP communication which its EDID file name is FP1350, type "WP FP1350" on DOS prompt line and press return key.

1-3. Operation

- The operation should be performed according to the screen message.
- When the message of “Please set Vsync to 42Hz.” is displayed, set the signal generator to the signal with vertical synchronization frequency of 42Hz. When the message of “Please set Vsync to over 55Hz.” is displayed, set the signal generator to the signal whose vertical synchronization frequency is between 55Hz and 25kHz.
- The message of “Normally Complete” means that writing of EDID data or PnP inspection completed normally.

  The message of “Error” means that writing of EDID data or PnP inspection finished incorrectly.
- When the PnP inspection is completed, read EDID data would be displayed. And if the read EDID data differed from the original EDID data, the different bytes would be displayed in red.
- For the details of error, see the messages displayed at the bottom right of the screen. The meaning of the messages is shown on section 4.
- After writing of EDID data or inspection of DDC2B, monitor can not be communicated by DDC1. In that case, turn off and on the monitor again, which will make the DDC1 communication test possible.
- Make sure that fixture’s LED flashes on and off before writing EDID data, inspecting DDC1 and DDC2B.

  If the fixture’s LED does not flash on and off, turn off and turn on the monitor and the fixture.

1-4. Error Messages

- Start Bit Error

  This message is displayed when the start bit is not “H” while sending data from PC to MPU on the fixture. This error will be caused by noise etc. on the line.
- Command Error

  This message is displayed when the different command is sent from PC to MPU on the fixture.
- Hardware Error

  This message means that the PC does not recognize ACK command sent from the MPU on the fixture.
- File Open Error

  This message means that the input EDID file name was wrong.
- Command line Switch Error

  This message means that the input communication command is incorrect.
- Parity Error

  This message is displayed when the MPU on the fixture recognized the parity bit is incorrect. This error can be caused by noise etc. on the line.
- EDID Data Error

  This message is displayed when the null bit is not detected in EDID data read by DDC1 communication.
- EDID Data Sort Error

  This message is displayed when the header code is not detected in EDID data read by DDC1 communication.
- Time Out Error

  This message is displayed when the PC does not recognize ACK commands sent from MPU within 10m sec after the PC had sent communication command or EDID data. If this error occurs, check the connection on PC, fixture and monitor.

1-5. EDID data file

The EDID data file text is shown below. When you write or inspect EDID for this monitor, the following table can be used.

File name : FP1350

EDID-119

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	8A	57	01	01	01	01
10	27	08	01	01	0E	29	1E	78	E8	A0	B8	A2	54	4C	9B	26
20	10	48	4C	FF	FF	80	31	59	45	59	61	59	71	4F	81	59
30	81	99	A9	59	D1	4F	04	74	80	D0	72	A0	3C	50	90	E0
40	13	00	96	30	11	00	00	1C	00	00	00	FD	00	37	A0	1F
50	73	19	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4E
60	45	43	20	46	50	31	33	35	30	0A	20	20	00	00	00	FF
70	00	38	34	30	30	30	30	31	4B	41	0A	20	20	20	00	19

Table 1-5. Data list (Management number : EDID-119)

※1 : address 10h　　Manufactured month x 4
※2 : address 11h　　Manufactured year - 1990
※3 : address 71h ～ 7Dh　　Input serial number (ASCII code)
Add 20th remaining address.
※4 : address 7Fh　　Checksum. The sum of entire 128byte shall be equal to 00h.

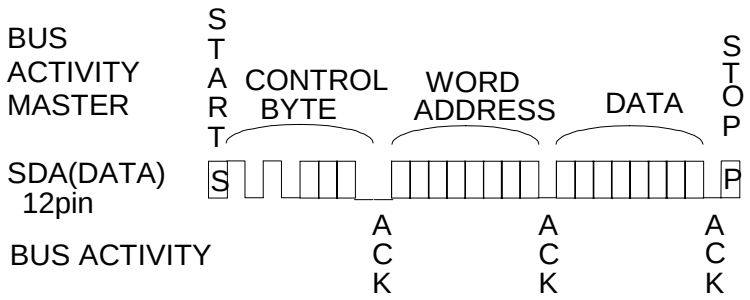


Diagram 1-5 Timing chart of DDC2B

2. CRT

[A] Screen and Faceplate Blemishes

1. Measuring conditions

1-1. Defect, when tube is in operation, shall be observe under the following conditions:

9,300 K +27 M.P.C.D.(or 6,550 K + 7 M.P.C.D.) and white raster of 34 cd/m^2 (10 ft-L) at the center of the screen or component monochromatic raster used to generate raster above.

Ambient light shall be approx. 10 Lx.

1-2. Observe the defect, when tube is not in operation, under the light of approx. 200 Lx, measured at the faceplate surface.

1-3. Observe at a distance of 45cm from the screen.

1-4. Observe white and individual field, and appearance respectively.

2. Zone division

Screen can be divided into 2 zones as follows.

Zone A: Internal rectangle of 395mm by horizontal and 295mm by vertical of which the screen center is located in the center.

Zone B: Area outside the rectangle.

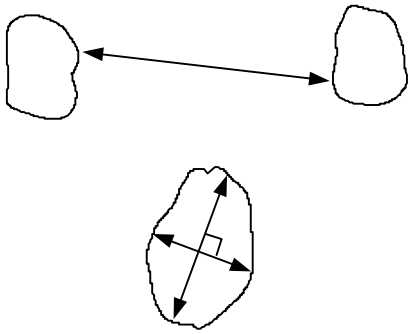
3. Defect criteria

3-1. Defective phosphor screen

1) Distance between defects (Minimum distance)

2) Mean defect diameter

Mean diameter = (shorter diameter + longer diameter) / 2



3) Defect criteria (acceptable defect amount)

a) Dark spot, Blocked aparture

Mean diameter (mm)	A	B	A + B	Shortest distance
0.51 ~	0	0	0	-
0.31 ~ 0.50	0	0	0	-
0.15 ~ 0.30	6 (note 1)	6 (note 1)	10 (note 1)	10mm

b) Discoloration, Stain, Missing phospher, etc.

Mean diameter(mm)	A	B	A + B	Shortest distance
0.51 ~ 0.75	0	1	-	20mm
0.15 ~ 0.50	2	3	-	20mm

Note 1: This criteria is applied to each color respectively.

Note 2: Ignore all defect regarding 1 trio of phosphor stripe corresponding to the last slit.

3-2. Defective faceplate

1) Bubble, Stone, and Blister, etc.

Mean diameter (*1) (mm)	Acceptable number of defect			Minimum interval (mm)
	Zone A	Zone B	A + B	
0.76	0	0	0	30
0.51 ~ 0.75	0	1	1	
0.26 ~ 0.50	2	3	5	
0.11 ~ 0.25	-	-	-	(*2)

Note (*1) Mean diameter shall be either one of the following values, which is smaller.

(a + b) / 2 or a / 20 + 2b (a: length, b: width)

Note (*2) Maximum 5 pcs. In area of Φ 10mm.

2) Scratch

Width more than 0.16mm	Not acceptable.
Width 0.11mm ~ 0.15mm	Length shall be less than 3mm
Width 0.06mm ~ 0.10mm	Length shall be less than 26mm
Width less than 0.05mm	No length limitation

3) Other glass defect

Flaw, crack and chip must not be visually noticeable.

See the limitation sample regarding iron rust and striae, etc.

[B] Defective AR-film standards

1. Test conditions

1) Place the bulb on the test table and light it with the white fluorescent lamp from the above.

2) Illuminance on the surface of the bulb tube shall be more than 1000 Lx, less than 1500 Lx.

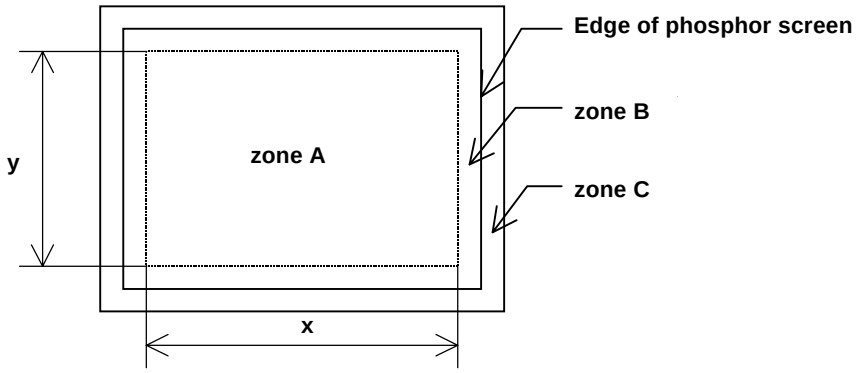
3) Observe at a 40cm distance from tube surface, ignore the defects that can not be seen at this distance.

2. Zone classification

Zone A: Internal rectangular area with the horizontal and vertical dimensions shown in the following fig. In which the screen center is located in the middle.

Zone B: Area between the edge of Zone A and phosphor screen.

Zone C: Area outside the edge of phosphor screen.



Dimension table Unit = mm

Size	X	Y
41cm	300	225
46cm	360	270
51cm	395	295

3. Defect standards

3-1. Scratch (Glass and coating)

Width	Zone A + B
More than 0.16mm	Not acceptable
0.11 ~ 0.15mm	Length within 13mm
0.06 ~ 0.10mm	Length within 26mm
Less than 0.05mm	No limitation of length

(Note 1) In the case that it has very law contrast, regard it as a stain, not as a scratch and apply the ratings in the 3-2. even if the scratch7s width is in excess of 0.16mm.

(Note 2) There is no specified standards regarding Z one C. However, no defect is acceptable that damages the quality of the product. Discuss regarding the limitation, if necessary.

3-2. Opacity such as stain, etc. and peeling of coating

Defect contrast shall be classified. And judge defects in each contrast classification, according to size.

Definition of contrast

- High contrast: foreign object that blocks off the light from the phosphor screen, such as graphite and dust, etc.
- Middle contrast: Translucent foreign object and stain (Ex. Solidified coating materials and white stains, etc.)

- Low contrast: Visually noticeable stain and flaw, etc. that rarely block off the Light from the phosphor screen.

  → visible interference color through the reflection (not visible through the permeability)

(Note) Ignore the light spot with no interference color.

(However, Non of them with its size in excess of 3.75mm is acceptable, that damages the product quality.)

Standards

Mean diameter for each contrast (Note 1) (mm)			Acceptable number in each zone		Acceptable interval (mm)
High contrast	Middle contrast	Low contrast	Zone A	Zone B	
Smaller than 0.10	Smaller than 0.20	Smaller than 0.50	Ignore	Ignore	-
0.11 ~ 0.25	0.21 ~ 0.50	0.51 ~ 1.25	2 [4]	4 [5]	20
0.26 ~ 0.50	0.51 ~ 1.00	1.26 ~ 2.50	1 [4]	2 [4]	40
0.51 ~ 0.75	1.01 ~ 1.50	2.51 ~ 3.75	0 [4]	1 [4]	80

Values inside [ ] represent acceptable number in low contrast.

See the table in the next page for total defect number, which is acceptable in low contrast.

Total standards for low contrast defect	A	B
Standards for each zone	6	8
Total of A + B	10	

(Note 1) Mean diameter = Either value of (a + b) / 2, 20+2b, which is smaller. (a: length b: width)

(Note 2) Acceptable interval shall be the larger one in the case that defects have different intervals.

(Note 3) There is no standard regarding zone C. Therefore, no defect is accepted that may deteriorate the value of products. Defect level by consultation. Discuss if necessary.

3-3. Reflectance : ≤ 0.7% (at the screen center)

3-4. Reflective color irregularity

No reflective color irregularity is accepted, which is easy to find visually.

3-5. Strength

Wear and abrasion resistance: Coating should withstand 30-minute scrubbing with a #50 eraser. (load; 500g)

Pencil resistance: Coating should withstand 3H pencil. (according to conformed item of Coating Strength JIS-5400)

[Supplementary explanation] Definition of striped coating (tear) and flaw (rubbed coating) (according to JIS)

Striped coating (tear): Tear that reaches to the glass surface

Flaw (rubbed coating): Scratches that slightly dig into the surface of the coating

3-6. Dirt, cloudiness, color irregularity, streaks and other defects

No defects should not be detected when white or green raster are on the screen.

Set the new boundary sample if necessary.

4. Cautions for cleaning AR-firm CRT

4-1. Do not rub or hit CRT surface with hard object.

4-2. Wipe off the dust softly with a dry soft cloth if necessary.

Do not use the acid and alkaline cleaner, solution such as detergent or thinner, etc.

If dust can not be wiped off with a dry soft cloth, use the water, ethyl alcohol, neutral glass cleaner or detergent.

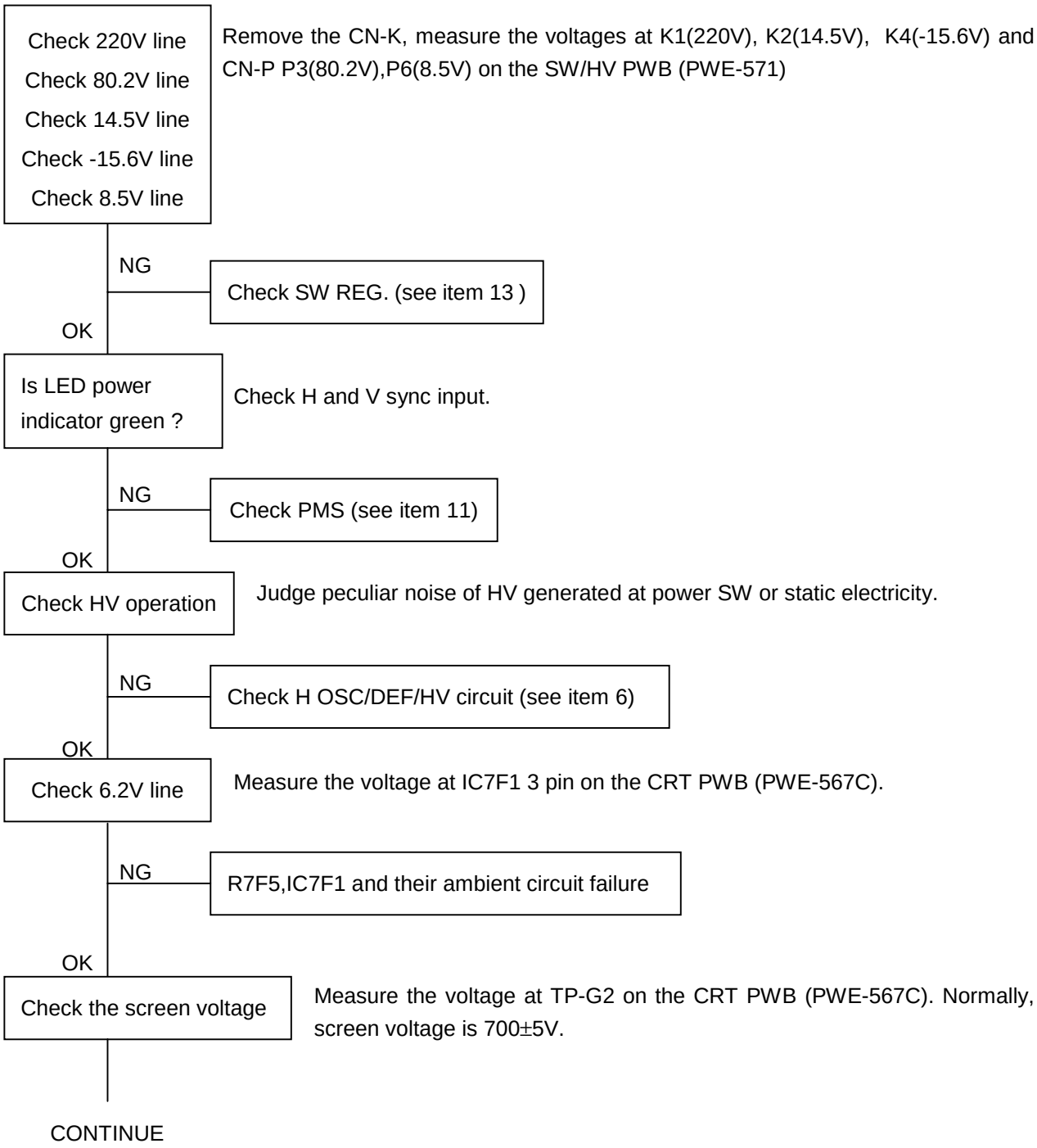
4-3. If and when necessary to touch CRT surface with tool, perform it with care.

4-4. Be careful not to damage or scratch CRT surface with a hard foreign object, etc. while cleaning.

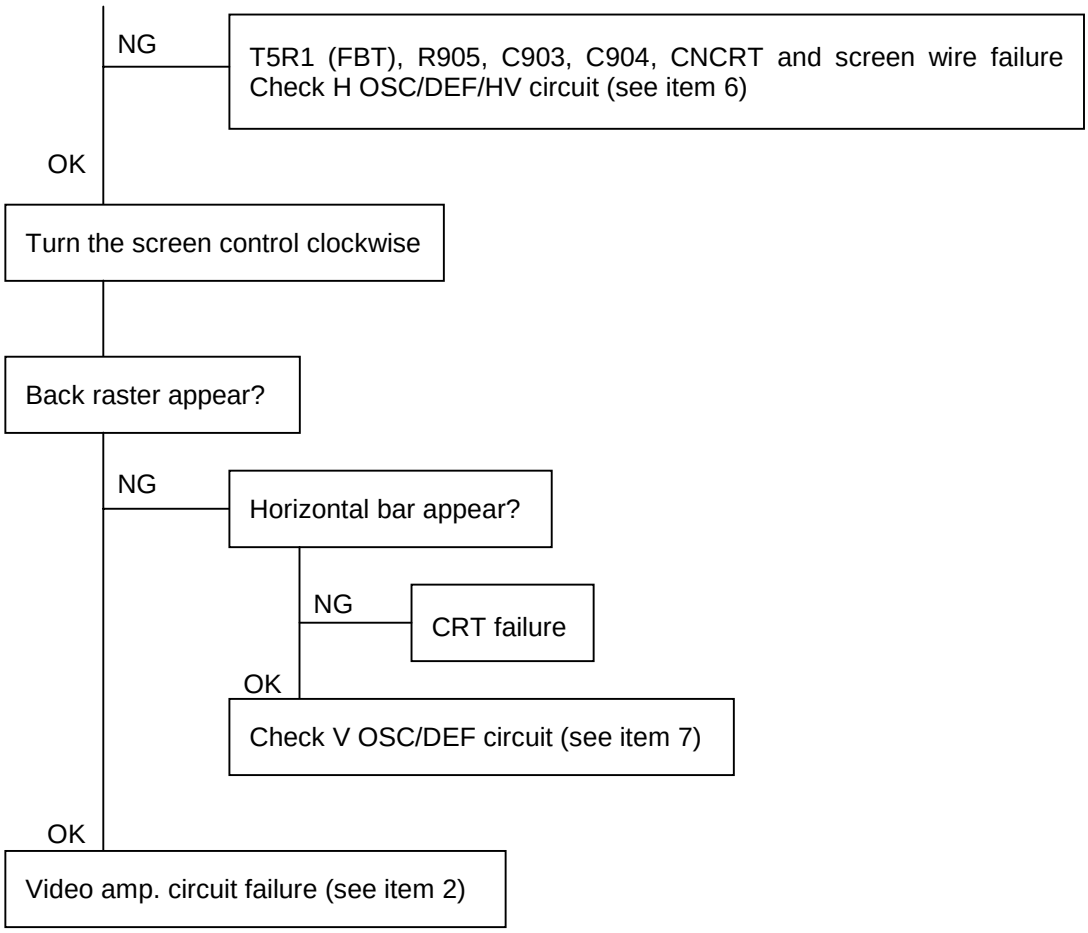
TROUBLE SHOOTING

TABLE OF CONTENTS

1. NO RASTER


Check 220V line
Check 80.2V line
Check 14.5V line
Check -15.6V line
Check 8.5V line
Remove the CN-K, measure the voltages at K1(220V), K2(14.5V), K4(-15.6V) and CN-P P3(80.2V),P6(8.5V) on the SW/HV PWB (PWE-571)
NG
Check SW REG. (see item 13)
OK
Is LED power indicator green ?
Check H and V sync input.
NG
Check PMS (see item 11)
OK
Check HV operation
Judge peculiar noise of HV generated at power SW or static electricity.
NG
Check H OSC/DEF/HV circuit (see item 6)
OK
Check 6.2V line
Measure the voltage at IC7F1 3 pin on the CRT PWB (PWE-567C).
NG
R7F5,IC7F1 and their ambient circuit failure
OK
Check the screen voltage
Measure the voltage at TP-G2 on the CRT PWB (PWE-567C). Normally, screen voltage is 700±5V.
CONTINUE

CONTINUE


NG
T5R1 (FBT), R905, C903, C904, CNCRT and screen wire failure
Check H OSC/DEF/HV circuit (see item 6)
OK
Turn the screen control clockwise
Back raster appear?
NG
Horizontal bar appear?
NG
CRT failure
OK
Check V OSC/DEF circuit (see item 7)
OK
Video amp. circuit failure (see item 2)

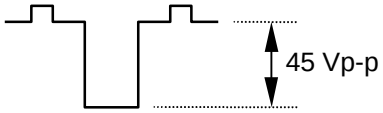
2. ABNORMAL VIDEO ON CRT SCREEN (too dark or too bright)

* Input 1/4 window pattern.

Set up BRIGHTNESS: preset, CONTRAST:max. and R/G/B control:all max. at OSM menu.

Check R/G/B video output

Measure R/G/B video outputs at TP-R, TP-G and TP-B on the CRT PWB (PWE-567C). Normally, R/G/B video output voltages are approx. 45Vp-p with 1/4 window pattern input when the contrast control of the OSM menu is MAX.



NG

Check IC721 output (VIDEO)

Measure the video output at IC721 pins 6(R), 14(G) and 4(B) on VIDEO PWB (PWE-567A).
Normally, the wave form is same as upon figure.

OK

C729R/G/B failure, or CN-SG Failure.

NG

Check 80V line

Measure the voltage at CNP 3 on the VIDEO PWB(PWE-567A).

NG

CN-P failure, or check SW-REG (see item 13)

OK

Check Vbb line and 12V line

1) Check the voltage at C726 on the VIDEO PWB(PWE-567A). The voltage is approx. 9.1V_{DC}.
2) Check the voltage at R728 (reverse of ZD721) on the VIDEO PWB (PWE-567A). The voltage is approx. 12V_{DC}.

NG

1) ZD721, C726, R728 failure.
2) CN-AF failure.

OK

Check IC721 input (VIDEO)

Measure the video input at IC721 pins 8(R), 12(G) and 2(B) on VIDEO PWB (PWE-567A). The voltage is approx. 5Vp-p.

OK

IC721 failure.

NG

Check IC711 output (VIDEO)

Measure the video output at IC711 pins 32(R), 29(G) and 35(B) on VIDEO PWB (PWE-567A). The voltage is approx. 3Vp-p.

CONTINUE 1 CONTINUE 2

CONTINUE 1 CONTINUE 2

OK → Q711 R/G/B failure.

NG → Check IC711 input

1) Measure the video input at IC711 pins 6(R), 11(G) and 2(B) on VIDEO PWB (PWE-567A). The voltage is approx. 0.78Vp-p.
2) Measure the clamp pulse input at IC711 pin 19 on VIDEO PWB (PWE-567A). The voltage is approx. 4.2Vp-p.
3) Measure the voltage at IC711 pin 15 on VIDEO PWB (PWE-567A). The voltage is approx. $3.9V_{DC}$.
4) Measure the voltage at IC711 pin 30 on VIDEO PWB (PWE-567A). The voltage is approx. $2.3V_{DC}$.
5) Measure the voltage at IC711 pin 17 on VIDEO PWB (PWE-567A). The voltage is approx. $5.0V_{DC}$.

1)-5) OK → IC711 failure.

2) NG → IC7A1 failure.

3) NG → C773 or Q772 failure.

4) NG → D713 failure.

5) NG → LC768 failure.

1) NG → Check IC731 output (VIDEO)

Measure the video output at IC731 pins 35(R), 30(G) and 27(B) on VIDEO PWB (PWE-567A). The voltage is approx. 0.78Vp-p.

OK → C711 R/G/B or C712R/G/B failure.

NG → Check IC731 input (VIDEO)

Measure the video input at IC731 pins 2(R), 5(G) and 7(B) [BNC] or pins 11(R), 13(G) and 16(B) [D-SUB] on VIDEO PWB (PWE-567A). The voltage is approx. 0.7Vp-p.

CONTINUE 1 CONTINUE 2

CONTINUE 1 CONTINUE 2

OK

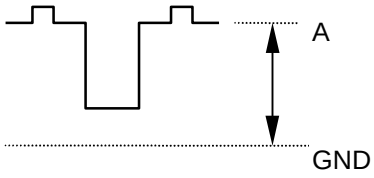
IC731 failure.

NG

BNC: LC761R/G/B, C701R/G/B, C702R/G/B or MD701R/G/B failure.
D-SUB: LC762R/G/B, C703R/G/B, C704R/G/B or MD702R/G/B failure.

Check R/G/B cathode voltage video output

Measure R/G/B cathode voltages at TP-R, TP-G and TP-B on the CRT PWB (PWE-567C). Normally, the DC voltage is between approx. $80V_{DC}$ and $150V_{DC}$ at point A when BRIGHTNESS is preset. The DC voltage moves 15V or 20V when BRIGHTNESS changes from min. to max..



NG

Check the power supply voltage of clamp circuit

Measure the voltage at C747 on the VIDEO PWB (PWB-567A). The voltage is approx. 220V.

NG

LC76A, LC76N or CNP failure.

OK

D741 R/G/B, Q741R/G/B, IC742 or IC751 failure.

OK

Check the screen voltage

Measure the voltage at TP-G2 on the CRT PWB (PWB-567C). Normally, the screen voltage is $700\pm15V_{DC}$. Adjust $700\pm5V_{DC}$ if it is different.

NG

- R905, C903, C904 or CNCRT on the CRT PWB (PWB-567C), T5R1 (FBT) on the SW/HV PWB (PWB-571) or screen wire failure.
- Check H OSC/DEF/HV circuit (see item 6)

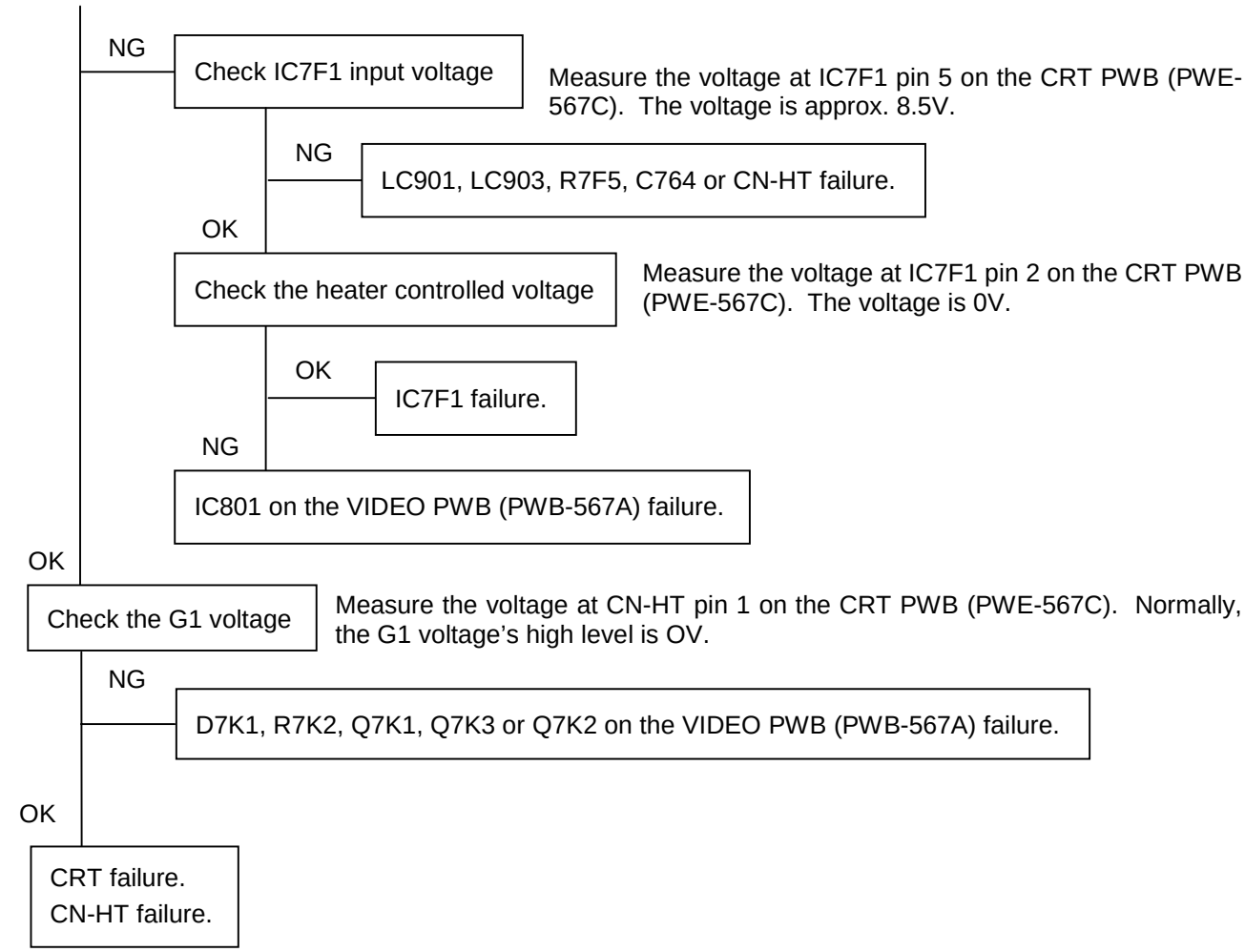
OK

Check the heater voltage

Measure the voltage at IC7F1 pin 3 on the CRT PWB (PWE-567C). The voltage is approx. 6.2V.

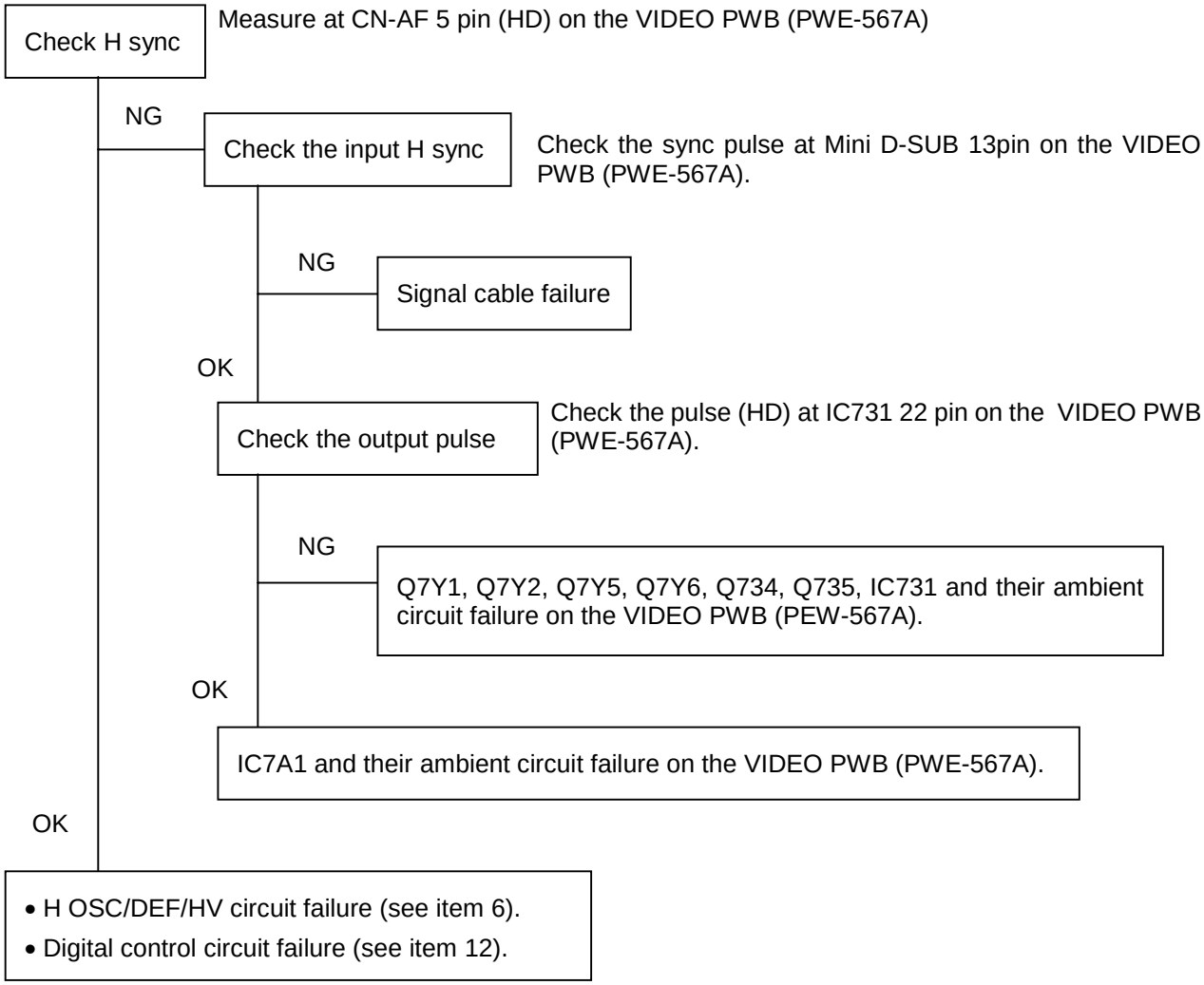
CONTINUE

CONTINUE

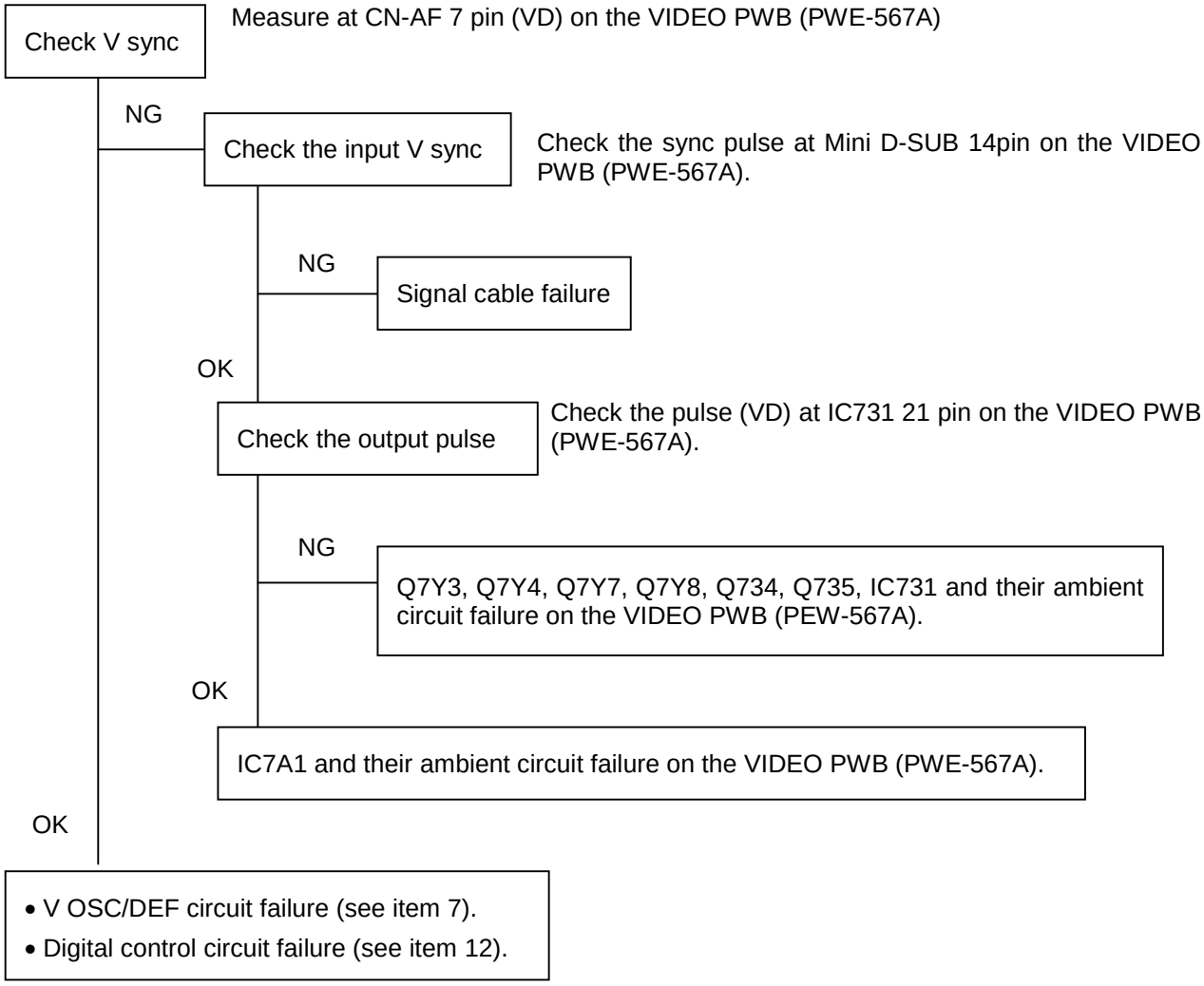

NG
Check IC7F1 input voltage
Measure the voltage at IC7F1 pin 5 on the CRT PWB (PWE-567C). The voltage is approx. 8.5V.
NG
LC901, LC903, R7F5, C764 or CN-HT failure.
OK
Check the heater controlled voltage
Measure the voltage at IC7F1 pin 2 on the CRT PWB (PWE-567C). The voltage is 0V.
OK
IC7F1 failure.
NG
IC801 on the VIDEO PWB (PWB-567A) failure.
OK
Check the G1 voltage
Measure the voltage at CN-HT pin 1 on the CRT PWB (PWE-567C). Normally, the G1 voltage's high level is OV.
NG
D7K1, R7K2, Q7K1, Q7K3 or Q7K2 on the VIDEO PWB (PWB-567A) failure.
OK
CRT failure.
CN-HT failure.

3. UNSTABLE PICTURE

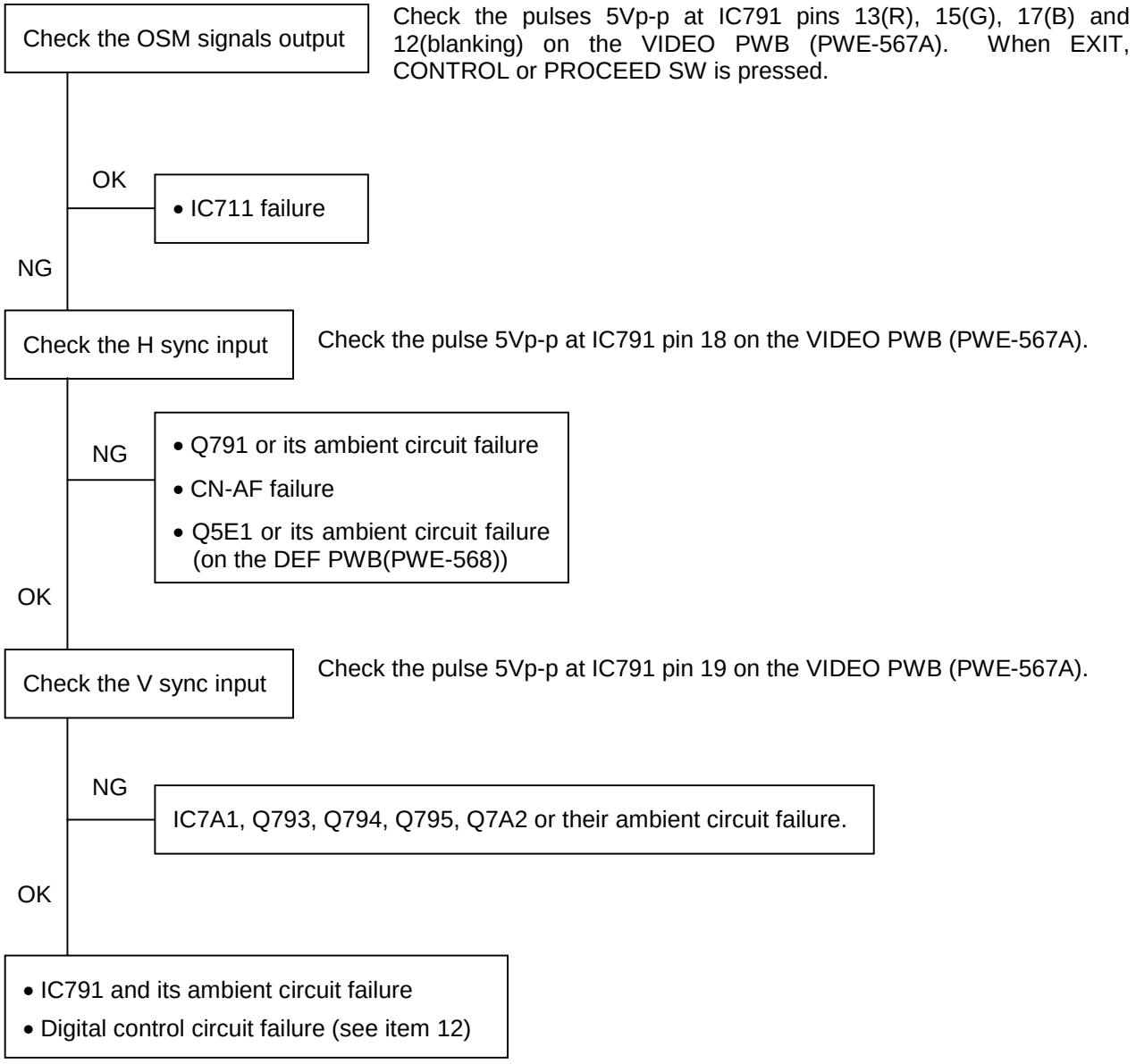
3-1. Horizontal



3-2. Vertical


Check V sync
Measure at CN-AF 7 pin (VD) on the VIDEO PWB (PWE-567A)
NG
Check the input V sync
Check the sync pulse at Mini D-SUB 14pin on the VIDEO PWB (PWE-567A).
NG
Signal cable failure
OK
Check the output pulse
Check the pulse (VD) at IC731 21 pin on the VIDEO PWB (PWE-567A).
NG
Q7Y3, Q7Y4, Q7Y7, Q7Y8, Q734, Q735, IC731 and their ambient circuit failure on the VIDEO PWB (PEW-567A).
OK
IC7A1 and their ambient circuit failure on the VIDEO PWB (PWE-567A).
OK
• V OSC/DEF circuit failure (see item 7).
• Digital control circuit failure (see item 12).

4. ON SCREEN MANAGER (OSM) FAILURE



5. ABNORMAL PICTURE

5-1. Horizontal Size

Check HV voltage — Measure the voltage at CRT anode. Normally, the voltage is approx. 27KV.

NG → HV circuit failure (see item 6)

OK

Check 8.5V line — Check the voltage at CNP pin 6 on the VIDEO PWB (PWE-567A).

NG → SW REG. failure (see item 13)

OK

Check the voltage which is supplied to CPU

NG → IC801, IC802, IC8G1, IC7A1or their ambient circuit failure

OK

Check the horizontal frequency mode output (IC571 pins 5~7、10~12) See Fig. 5.1.1

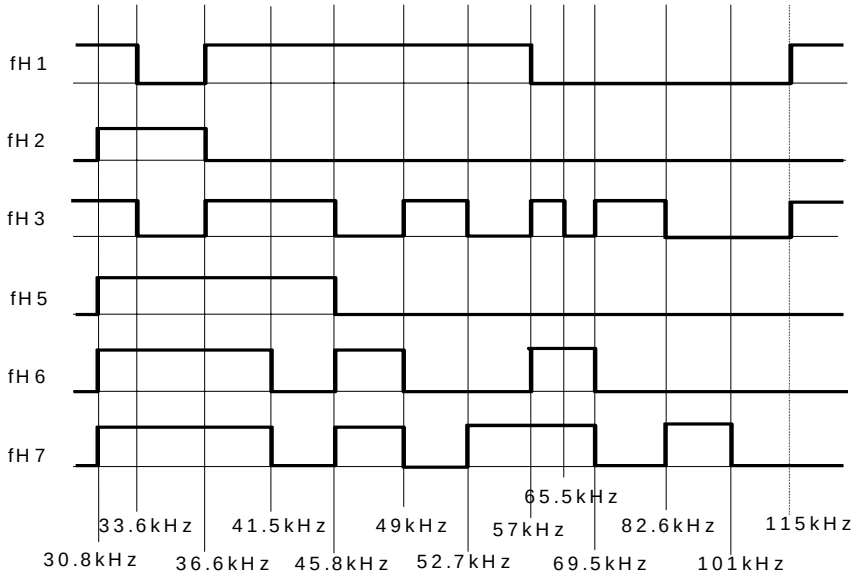


Fig 5.1.1

CONTINUE

CONTINUE

NG — IC571 failure

OK

Check S-correction capacitor Switching circuit

Check the operation of MQ571, Q572, Q573.

NG — MQ571, Q572, Q573 failure.

OK

Check whether IC592 pin 1 on DEF PWB and IC531 pin 5 vary by horizontal size control in OSD menu or not

Measure the voltage at IC592 pin 1 and IC531 pin 12.

Normally, pin 1 voltage varies from approx. 3.5V to 5V and pin 5 voltage varies from approx. 0.9V to 5V.

NG — Digital control circuit or IC592 failure

OK

Check Q561 FBP See Fig 5.1.2

Measure the voltage at Q561 Collector.
Normally, this voltage varies from 850 to 1200V by H-SIZE control for user.

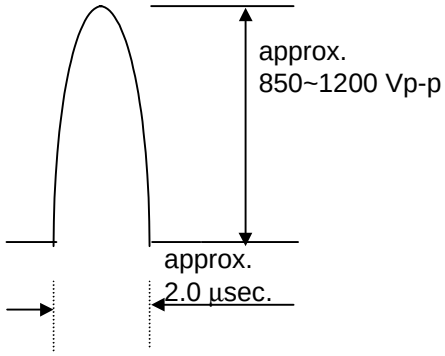


Fig 5.1.2

NG — Q561, D561, D562, C561, H-DY or their ambient circuit failure

OK

Check the distortion correction circuit (see item 5-6)

OK

H OSC/DEF/HV circuit failure (see item 6)

5-2. Vertical Size

Check whether the amplitude (approx. 6Vp-p~10Vp-p) at CN-DSB pin 12 on the DEF PWB (PWE-568) varies by OSD vertical size control or not ?

NG

- IC501 or IC511 failure.
- Digital control circuit failure. (see item 12)

OK

Check whether the amplitude (approx. 6Vp-p~10Vp-p) at IC421 8 pin on the DEF PWB (PWE-568) varies by OSD vertical size control or not ?

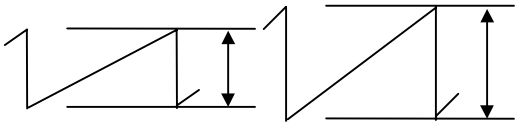
NG

IC421 or its ambient circuit failure.

OK

V OSC/DEF circuit failure. (see item 7)

v. saw wave



v. size min.
Approx. 6Vp-p

v. size max.
Approx.10Vp-p

5-3. Horizontal Position

Check the raster position.

NG

Raster centering circuit failure.

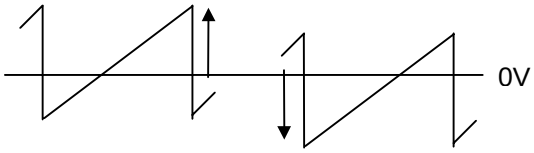
OK

- IC501 failure.
- Q504, Q505 or their ambient circuit failure.
- Digital control circuit failure. (see item 12)

5-4. Vertical Position

Check whether the DC voltages level at CN-DSB pin 12 on the DEF PWB (PWE-568) varies by OSD vertical position control or not?

V. saw wave



NG
- IC501 failure.
- Digital control circuit failure. (see item 12)

OK

Check whether the DC voltages level at IC421 pin 8 on the DEF PWB (PWE-568) varies by OSD vertical position control or not?

Position down Position up

NG
- IC421 or its ambient circuit failure.

OK
- IC401, VDY or their ambient circuit failure.

5-5. Poor Linearity

5-5-1. Horizontal

Check an item 5-1.

OK

T571, Q571, IC591、IC532(pin 17) or their ambient circuit failure.

5-5-2. Vertical

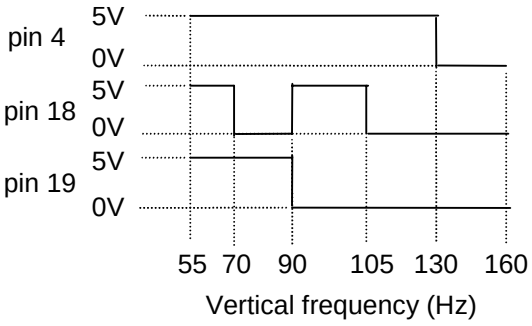
Check if the vertical linearity on the screen varies by OSD "VERTICAL LINEARITY" and "VERTICAL LINEARITY BALANCE".

NG
- IC501 failure.
- Digital control circuit failure. (see item 12)

OK

Check the D/A converter output. (IC532 pin 4,18,19)

Check the voltage at IC532 pin 4,18 and 19.
The output voltages of each pin are as follows.

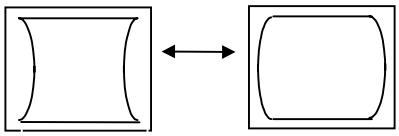


NG
- IC532 or its ambient circuit failure.
- Digital control circuit failure. (see item 12)

OK
- Q421, Q422, Q423 or their ambient circuit failure.
- IC421 or its ambient circuit failure.

5-6. Distortion Correction Circuit

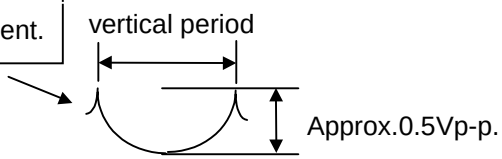
Check whether the distortion on the screen varies by OSD distortion correction control (SIDEPIN) or not ?



Sidepin - Sidepin +

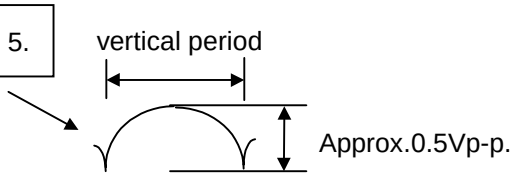
NG

Check the waveform at CN-DSB pin 11 is present.



NG

Check the waveform at IC511 pin 5.



NG

- IC501, R544 or C524 failure.
- Digital control circuit failure (see item 12)

OK

IC511 or its ambient circuit failure.

OK

Check the waveform at IC5GA pin 3.

NG

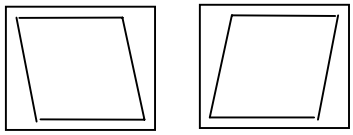
IC5GA or its ambient circuit failure.

OK

IC5A1, Q5A1 or their ambient circuit failure.

OK

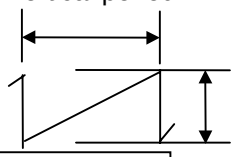
Check whether the distortion on the screen varies by OSD distortion correction control (TILT) or not ?



TILT min. TILT max.

NG

Check the waveform at C519.



Approx. 0.5Vp-p when TILT control is min. condition.

NG

IC501, R526 or C519 failure.

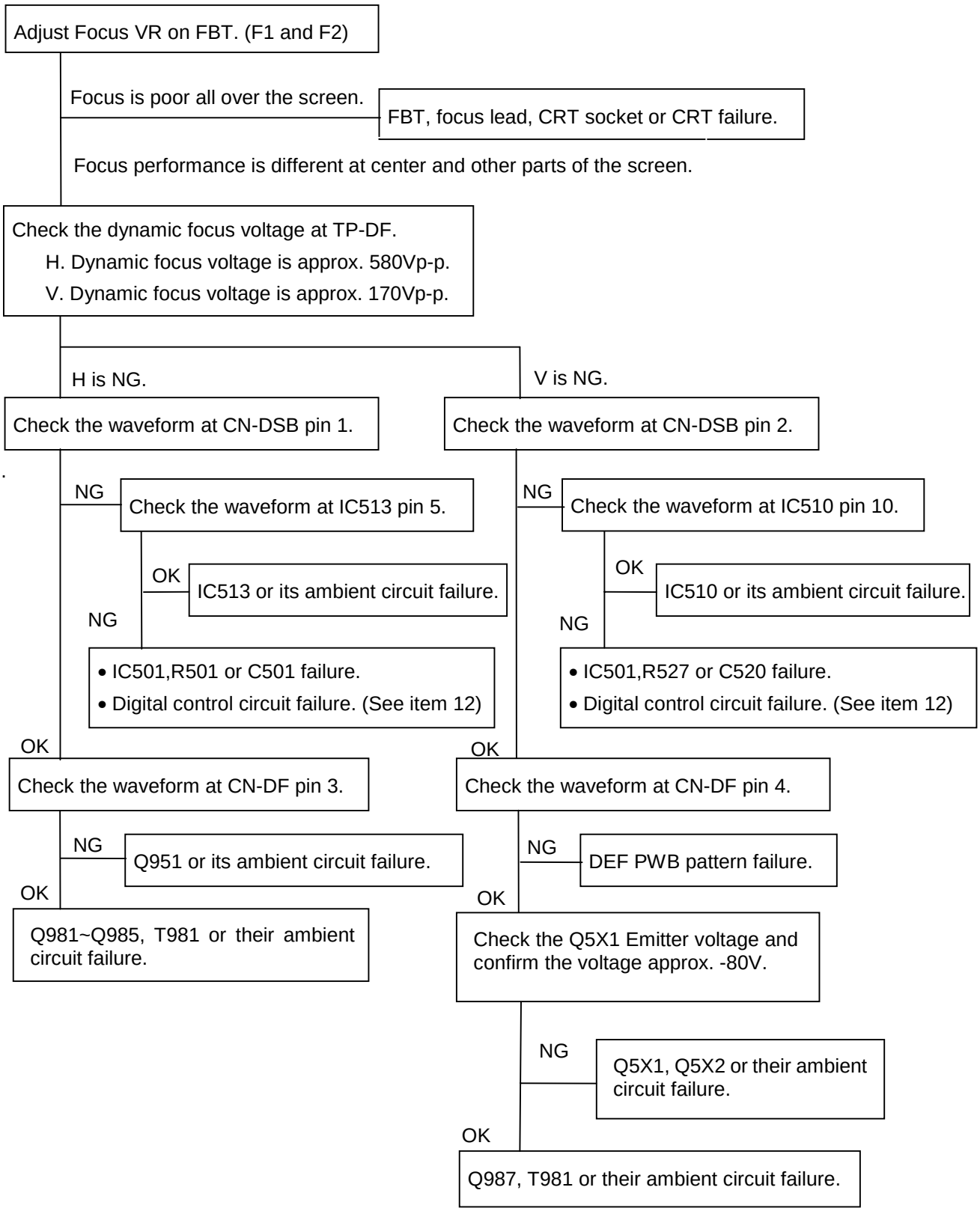
OK

IC511 or its ambient circuit failure.

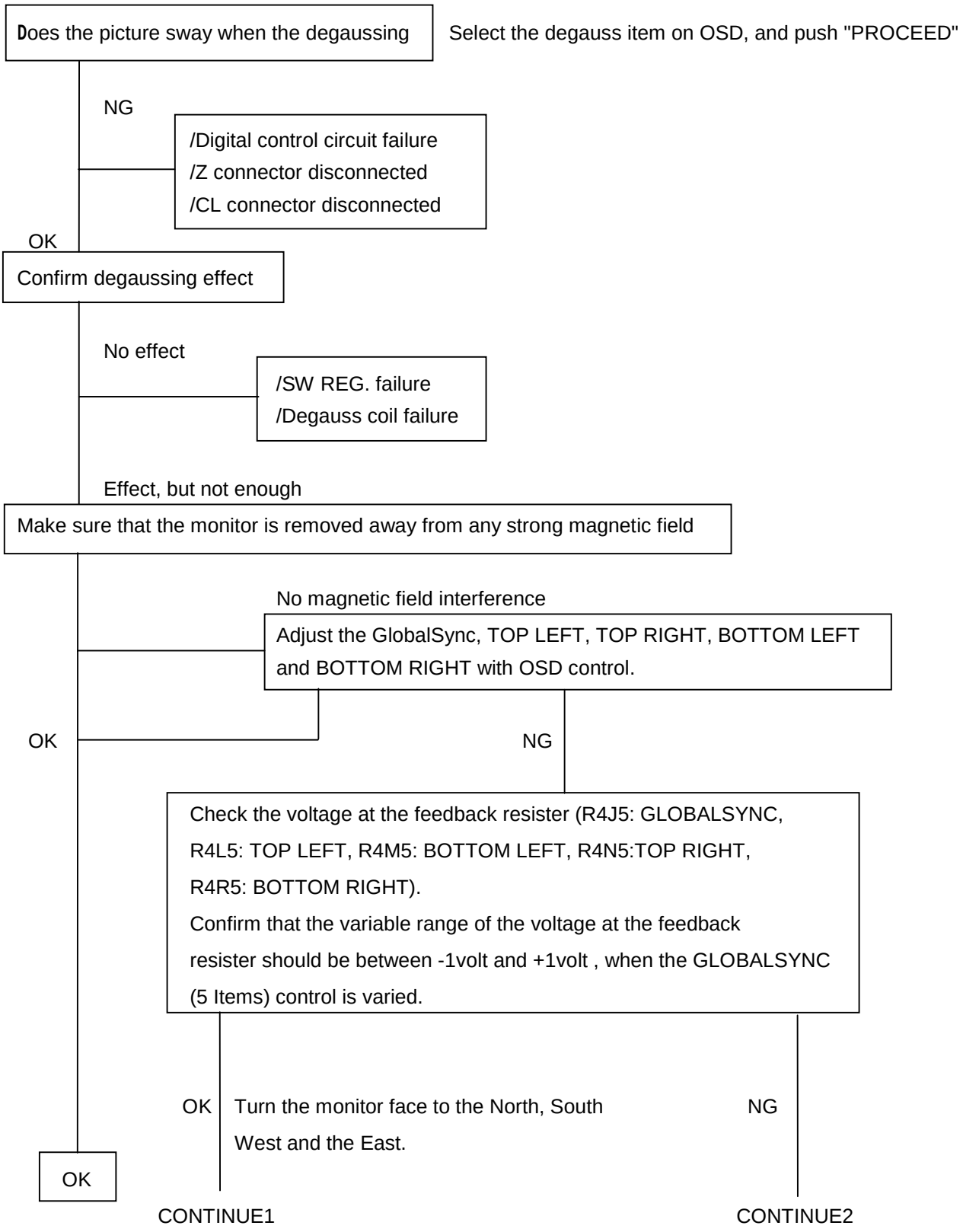
OK

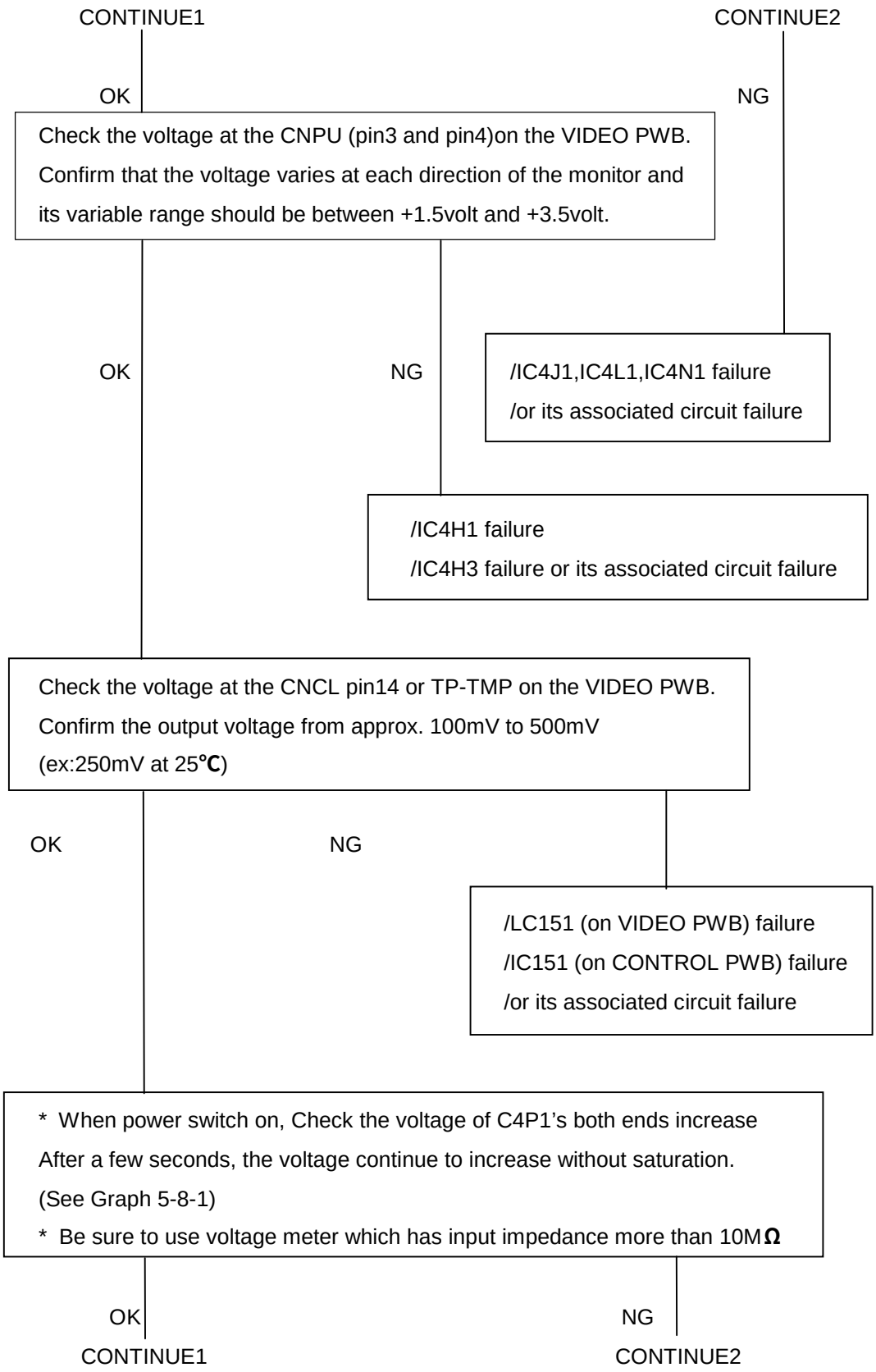
H OSC/DEF/HV circuit failure. (see item 6)

5-7. Poor Focus



5-8. Impurity on CRT Screen




CONTINUE1
CONTINUE2
OK
NG
Check the voltage at the CNPU (pin3 and pin4)on the VIDEO PWB.
Confirm that the voltage varies at each direction of the monitor and
its variable range should be between +1.5volt and +3.5volt.
OK
NG
/IC4J1,IC4L1,IC4N1 failure
/or its associated circuit failure
/IC4H1 failure
/IC4H3 failure or its associated circuit failure
Check the voltage at the CNCL pin14 or TP-TMP on the VIDEO PWB.
Confirm the output voltage from approx. 100mV to 500mV
(ex:250mV at 25℃)
OK
NG
/LC151 (on VIDEO PWB) failure
/IC151 (on CONTROL PWB) failure
/or its associated circuit failure
* When power switch on, Check the voltage of C4P1's both ends increase
After a few seconds, the voltage continue to increase without saturation.
(See Graph 5-8-1)
* Be sure to use voltage meter which has input impedance more than 10MΩ
OK
NG
CONTINUE1
CONTINUE2

CONTINUE1

OK

CONTINUE2

NG

/Q4P1, Q4P3, MD4P1
/or its associated circuit failure

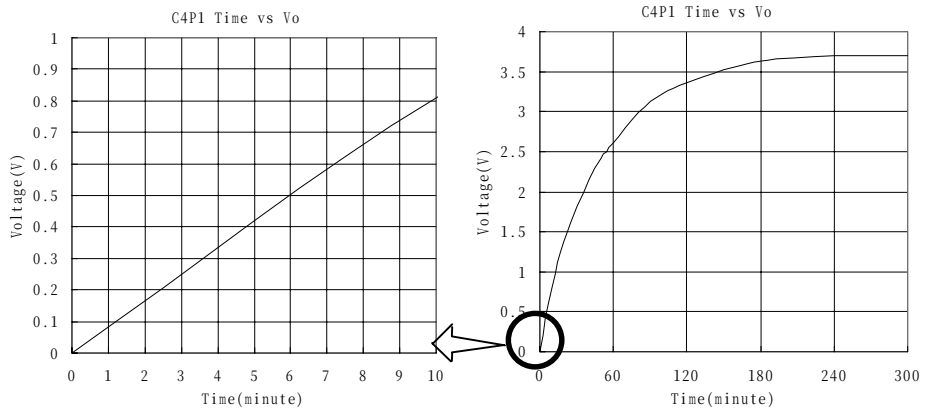
* When power switch on too, Check the voltage of IC801 pin 51 increase at approx. C4P1 voltage (See Graph 5-8-1) + 0.5V
* Be sure to use voltage meter which has input impedance more than 10MΩ

OK

NG

CRT, DY failure

/Q4P4, D4P1, MD4P2, R4P7
/or its associated circuit failure



Graph 5-8-1: C4P1 Voltage

6. H OSC / DEF / HV CIRCUIT FAILURE

Check the horizontal drive pulse.

Check the drive pulse at CN-DSB pin 10 on the DEF PWB (PWE-568) outputs a rectangle waveform which amplitude is 4.3Vp-p.

OK

Check the waveform of IC592 pin 3.

Normally, it is sawtooth wave which amplitude is approx. 5Vp-p.

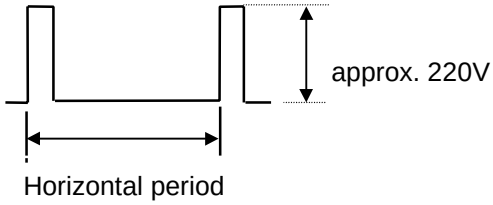
NG

IC592 or its ambient circuit failure.

OK

Check the waveform of gate at Q5G1.

Be sure to get the L5G2 off the DEF PWB, and output as following.



NG

Q5G1, ZD5G1, D5G2 or their ambient circuit failure.

Note: Q561, Q5G1 and Q5A1 will short out at the same time.

OK

Check the voltage for horizontal drive circuit.

Measure the voltage at Q553 collector.
Normally, it is approx. 15V.

NG

R557 failure

OK

Check the AFC pulse at R5E1.

Normally, its amplitude is approx. 50Vp-p~60Vp-p.

NG

Q555, Q561, T551, T561 or their ambient circuit failure.

OK

Check high voltage.

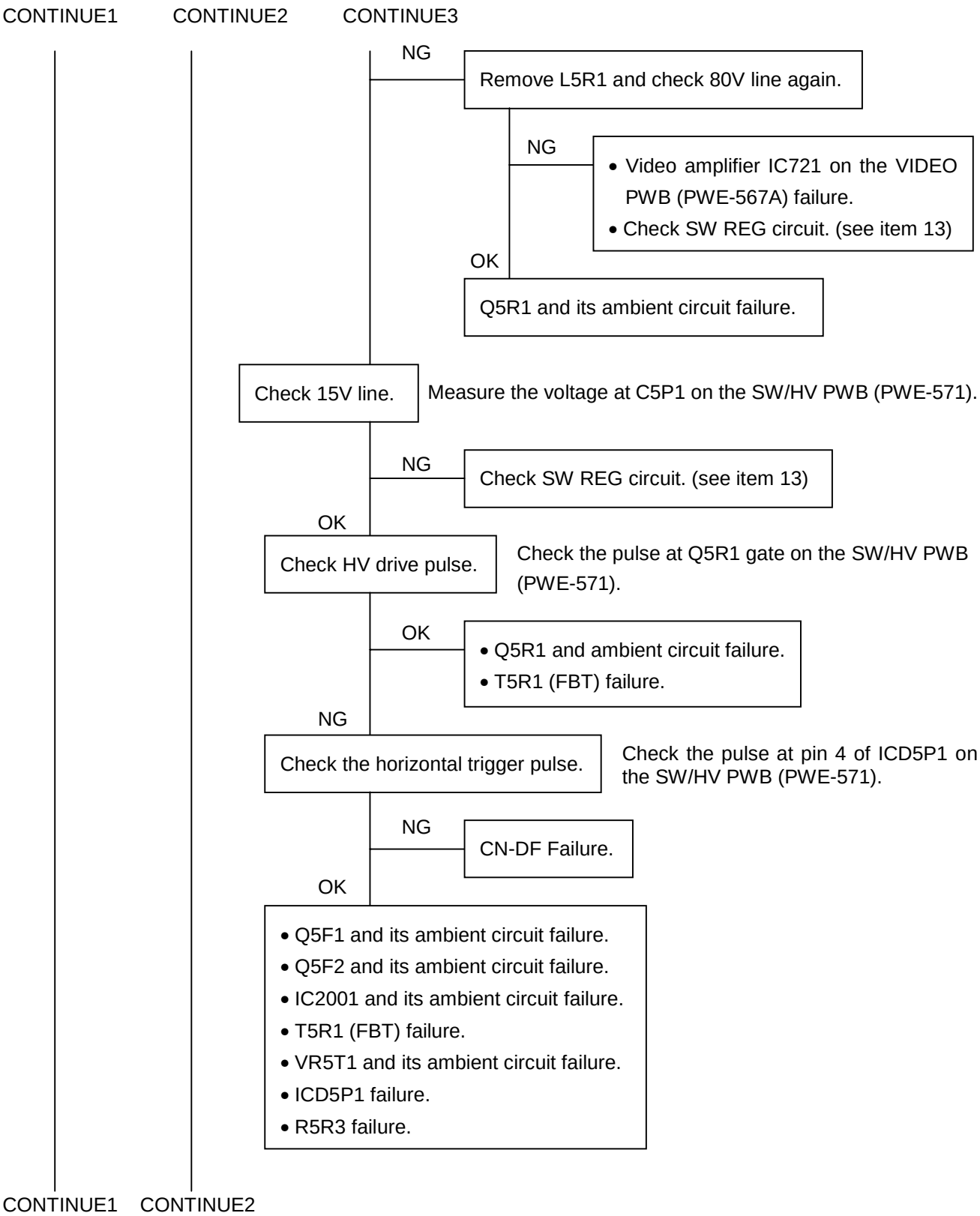
Measure the CRT anode voltage.
Normally, high voltage is approx. 27kV.

NG

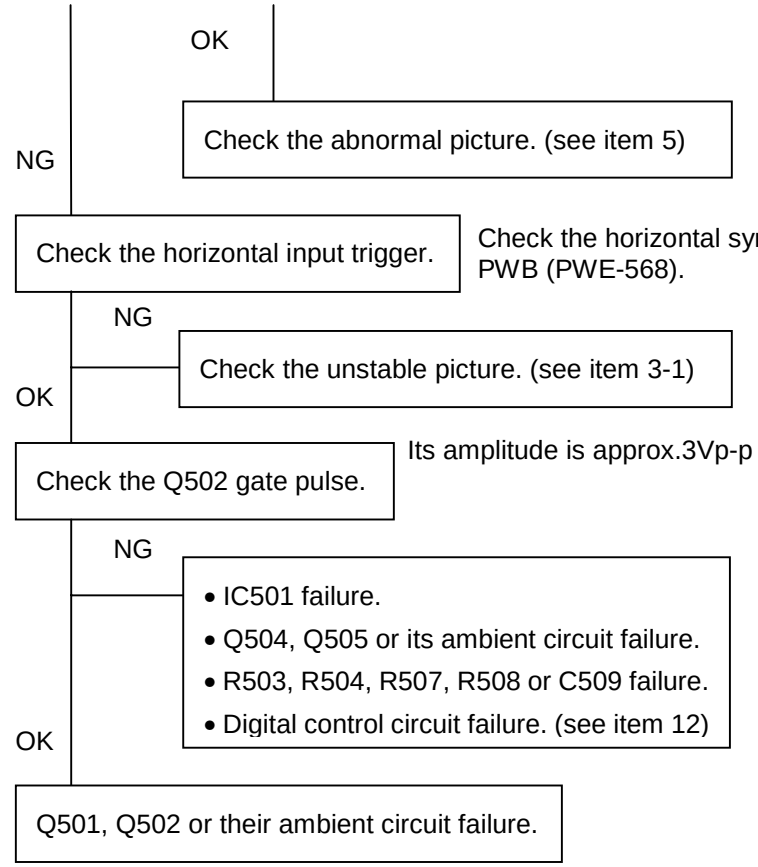
Check 80V line.

Measure the voltage at CN-P pin 3 on the SW/HV PWB (PWE-571).

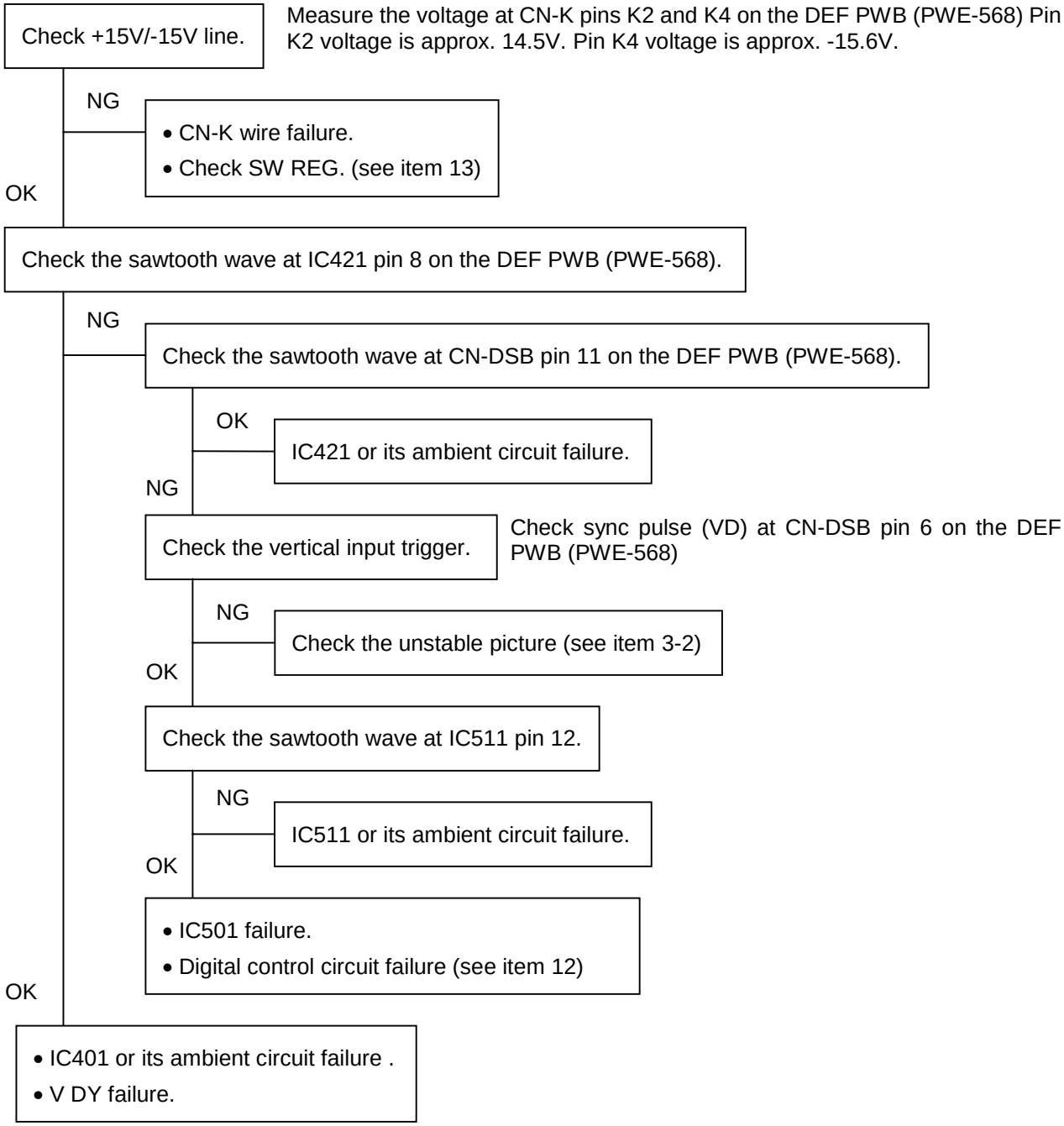
CONTINUE1 CONTINUE2 CONTINUE3


CONTINUE1
CONTINUE2
CONTINUE3
NG
Remove L5R1 and check 80V line again.
NG
• Video amplifier IC721 on the VIDEO PWB (PWE-567A) failure.
• Check SW REG circuit. (see item 13)
OK
Q5R1 and its ambient circuit failure.
Check 15V line.
Measure the voltage at C5P1 on the SW/HV PWB (PWE-571).
NG
Check SW REG circuit. (see item 13)
OK
Check HV drive pulse.
Check the pulse at Q5R1 gate on the SW/HV PWB (PWE-571).
OK
• Q5R1 and ambient circuit failure.
• T5R1 (FBT) failure.
NG
Check the horizontal trigger pulse.
Check the pulse at pin 4 of ICD5P1 on the SW/HV PWB (PWE-571).
NG
CN-DF Failure.
OK
• Q5F1 and its ambient circuit failure.
• Q5F2 and its ambient circuit failure.
• IC2001 and its ambient circuit failure.
• T5R1 (FBT) failure.
• VR5T1 and its ambient circuit failure.
• ICD5P1 failure.
• R5R3 failure.
CONTINUE1
CONTINUE2

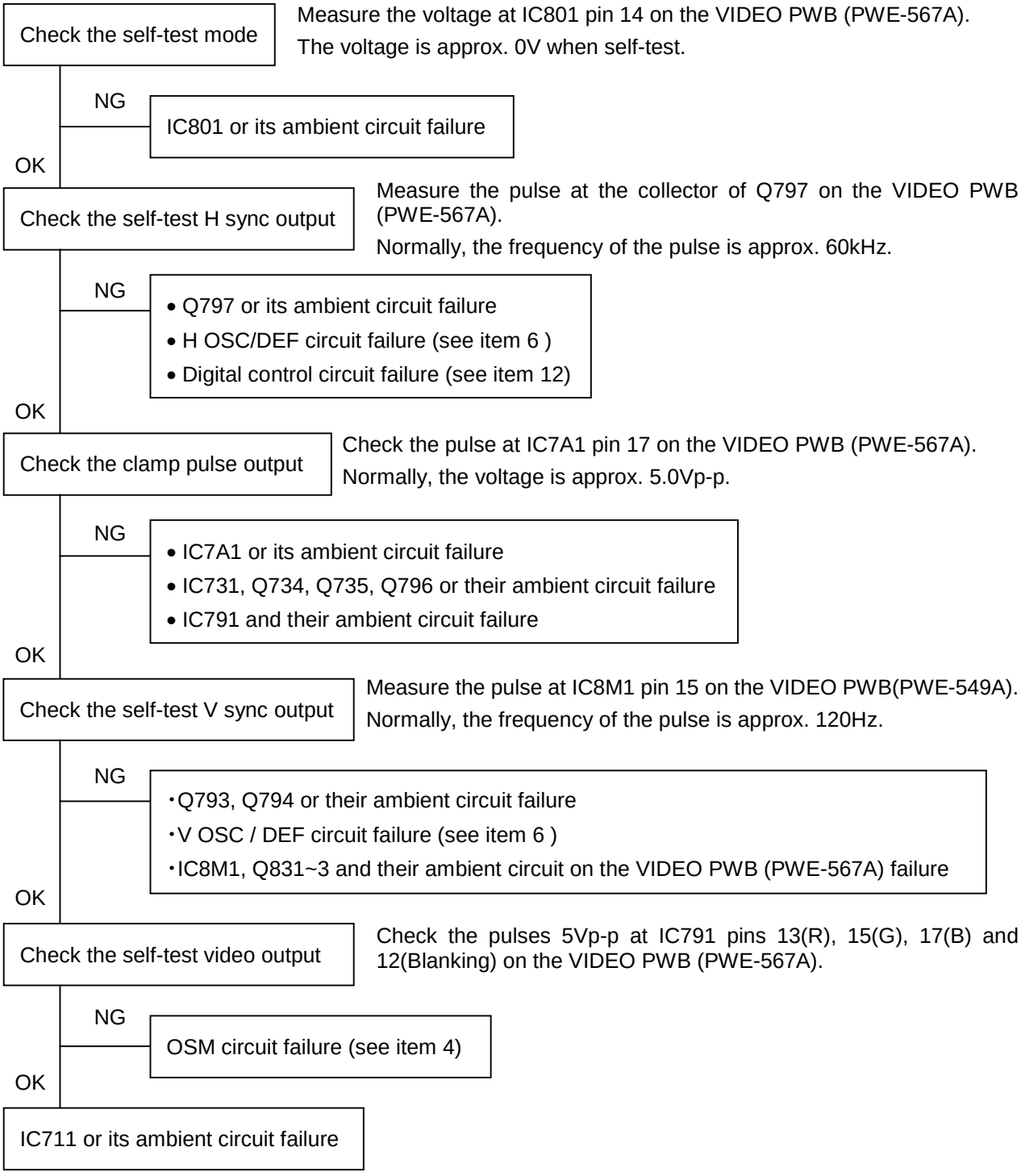
CONTINUE1 CONTINUE2



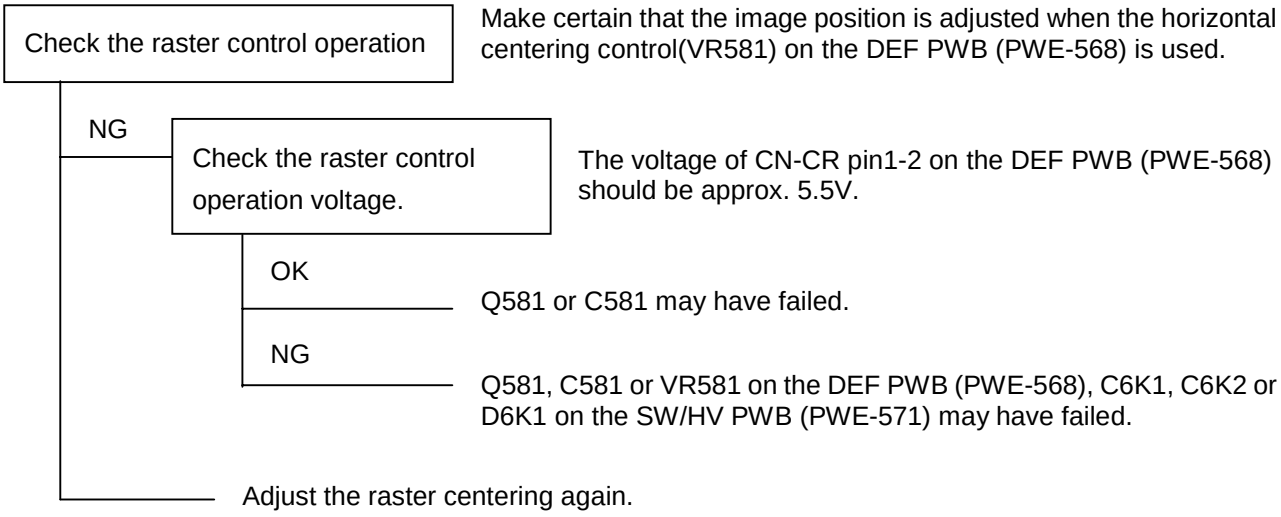
7. V OSC / DEF CIRCUIT FAILURE



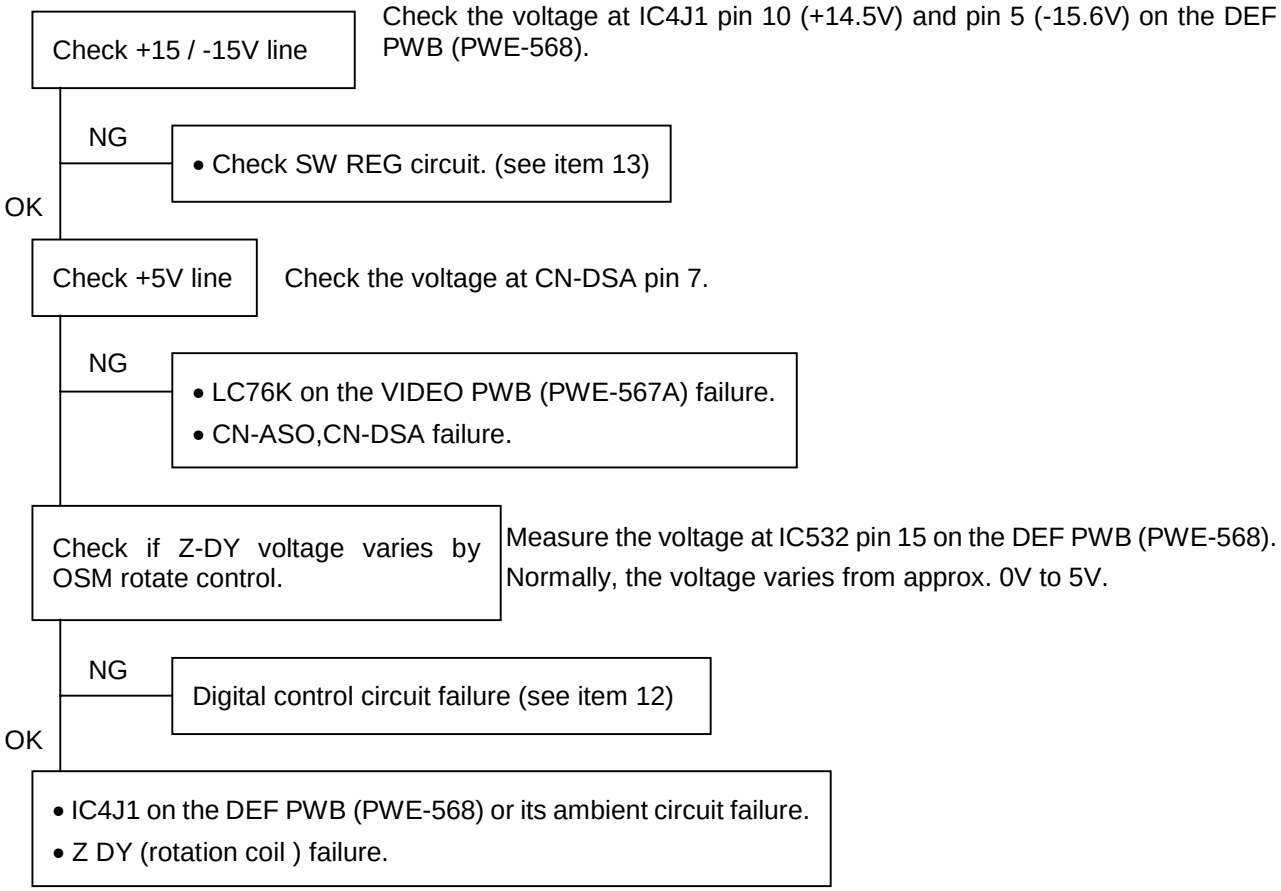
8. SELF TEST ERROR



9. RASTER CENTERING CIRCUIT FAILURE



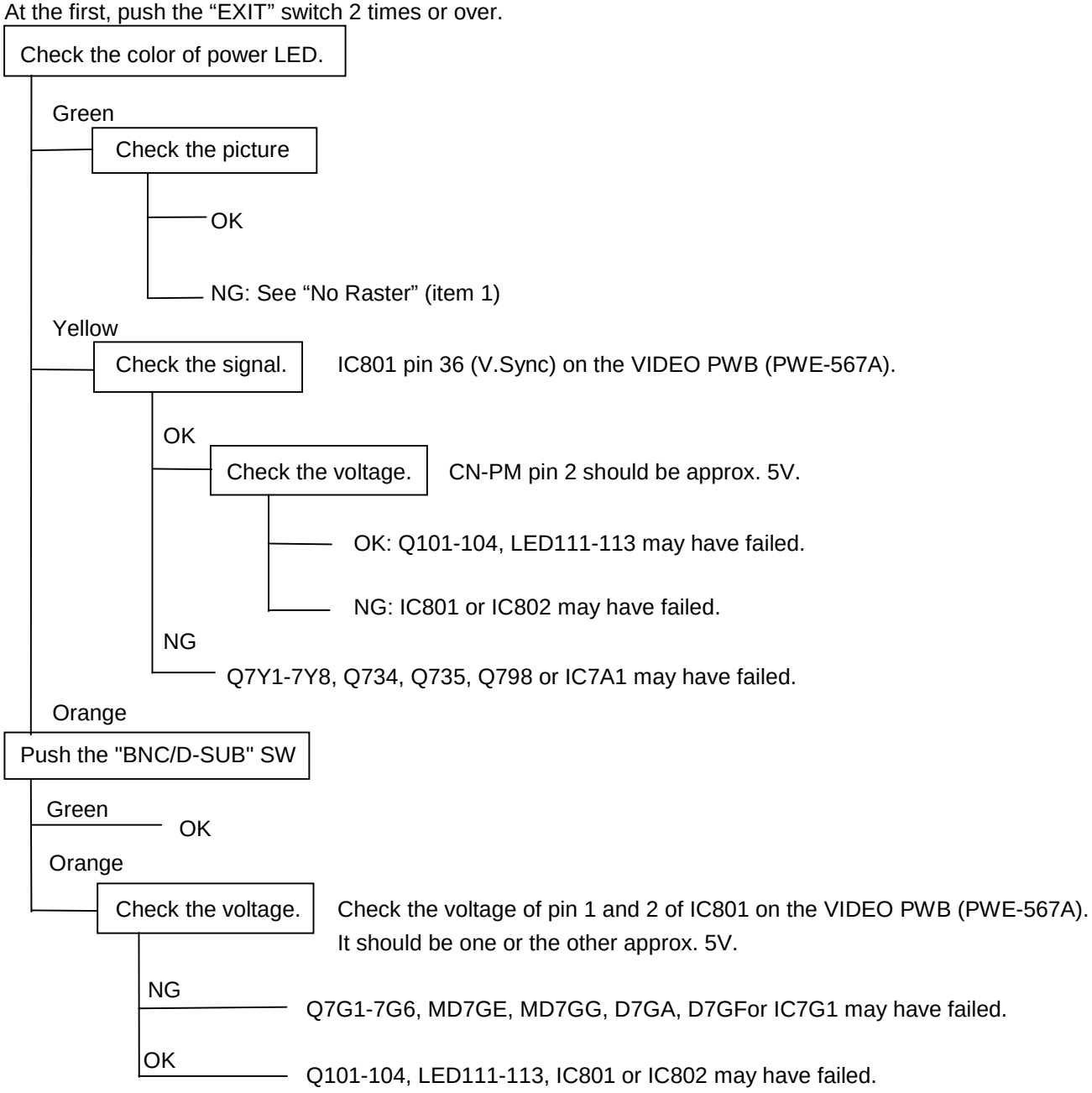
10. RASTER ROTATION ERROR



11. POWER MANAGEMENT SYSTEM (PMS) FAILURE

11-1. PMS FAILURE 1(When a monitor receives Horizontal and Vertical Sync.)

At the first, push the “EXIT” switch 2 times or over.



11-2. PMS FAILURE 2(When a monitor receives no Horizontal Sync)

Check the PMS control voltage.

Check the voltage of pin 22 of IC801.
The voltage should be approx. 5V.

NG

IC801 or IC7A1 may have failed.

OK

SW/HV may have failed. (see item 13)

11-3. PMS FAILURE 3(When a monitor receives no Vertical Sync)

Check the PMS control voltage.

Check the voltage of pin 22 of IC801.
The voltage should be approx. 0V.

NG

IC801 or IC7A1 may have failed

OK

SW/HV may have failed. (see item 13)

11-4. PMS FAILURE 4(When monitor receives neither Horizontal nor Vertical Sync)

Check the PMS control voltage.

Check the voltage of pin 8 and 22 of IC801.
The both voltages should be approx. 0V.

NG

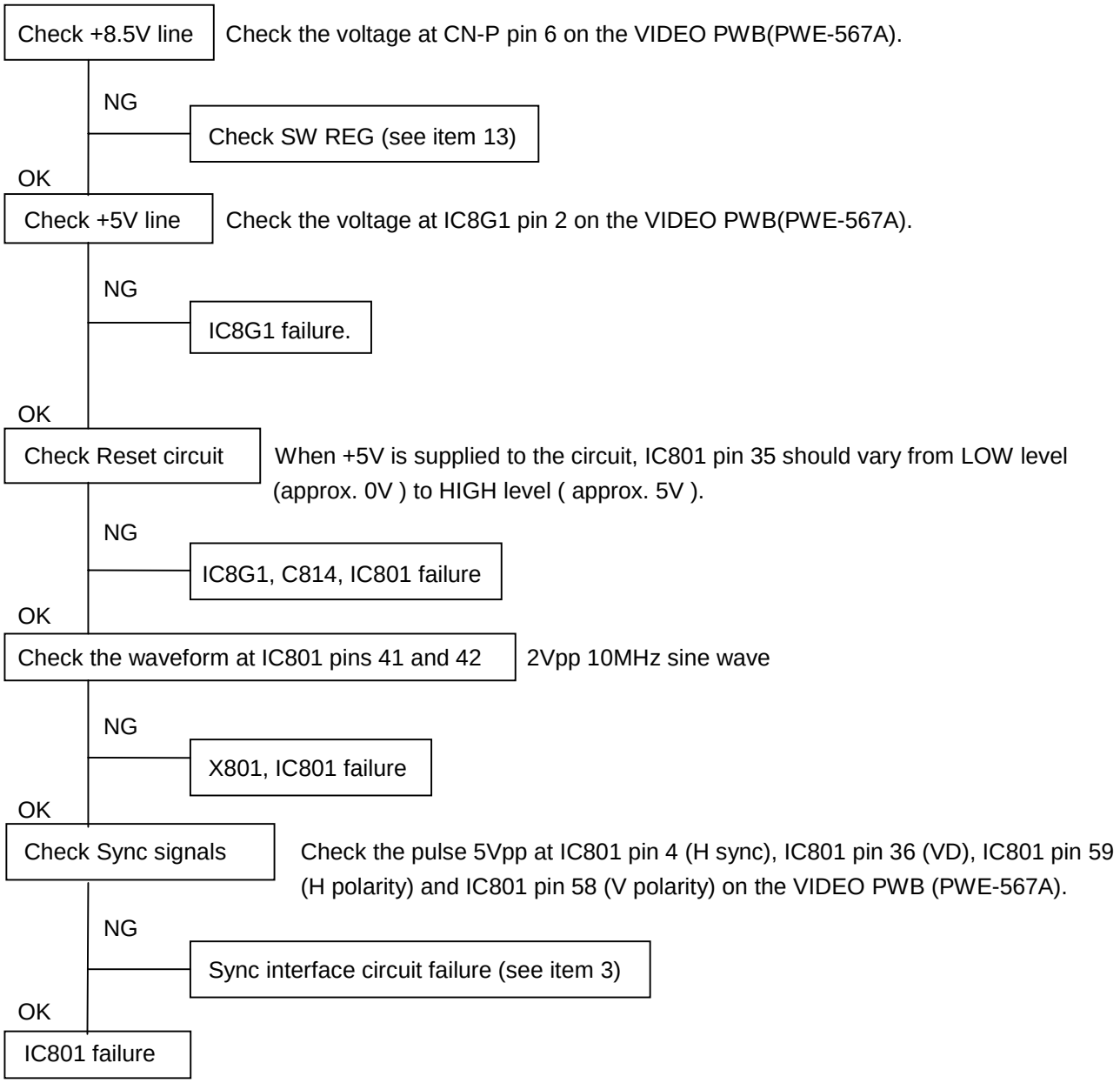
IC801 or IC7A1 may have failed.

OK

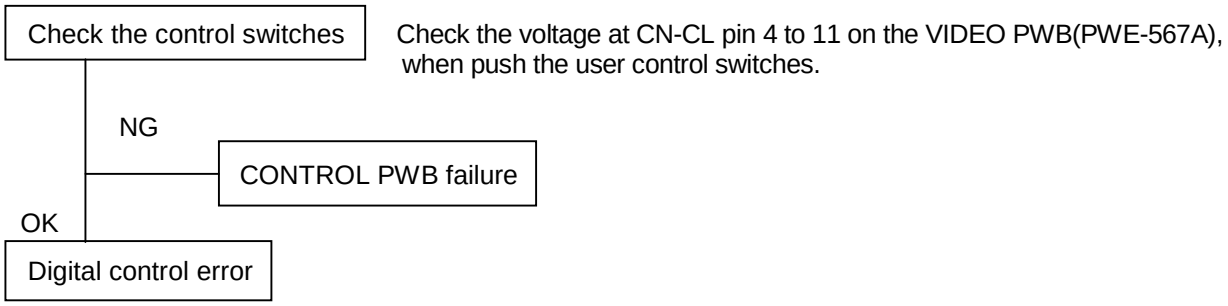
IC8G1, IC8G2 may have failed.

12. DIGITAL CONTROL CIRCUIT FAILURE

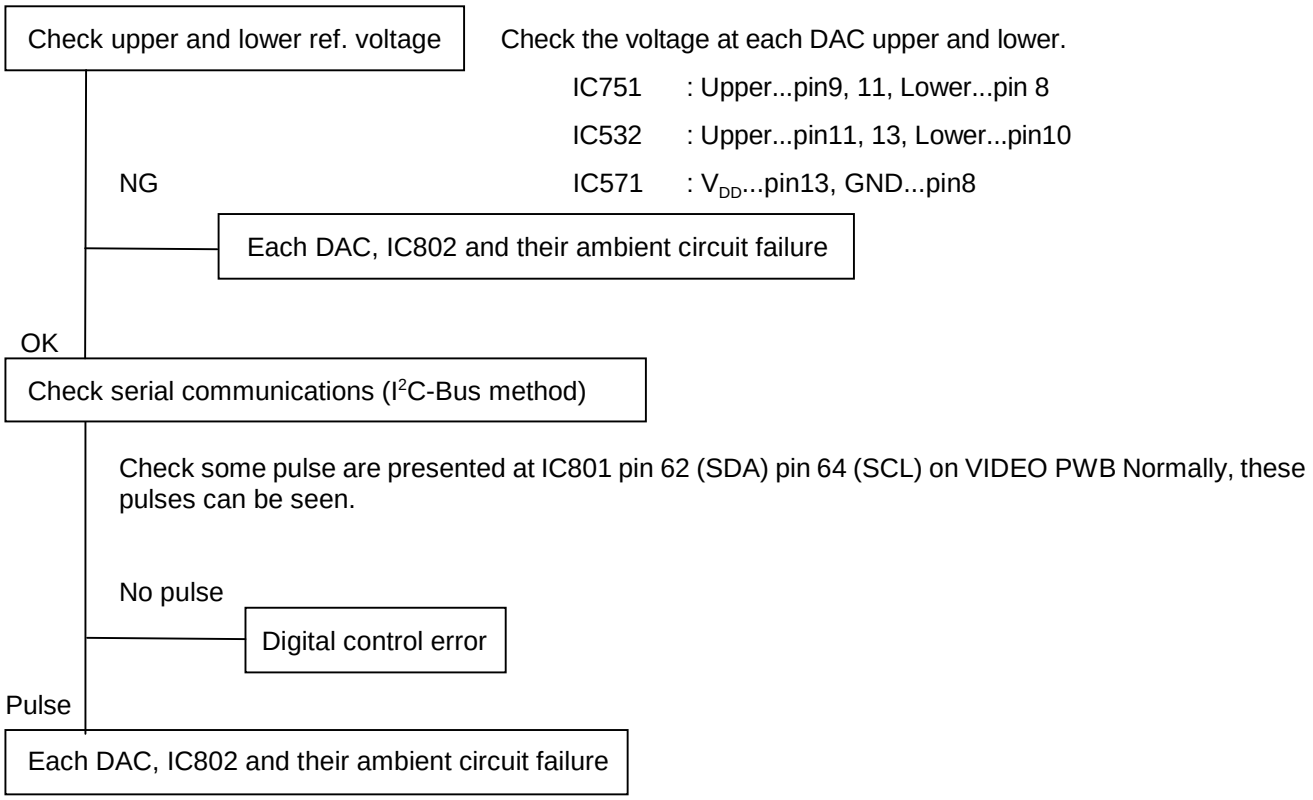
12-1. Digital control error



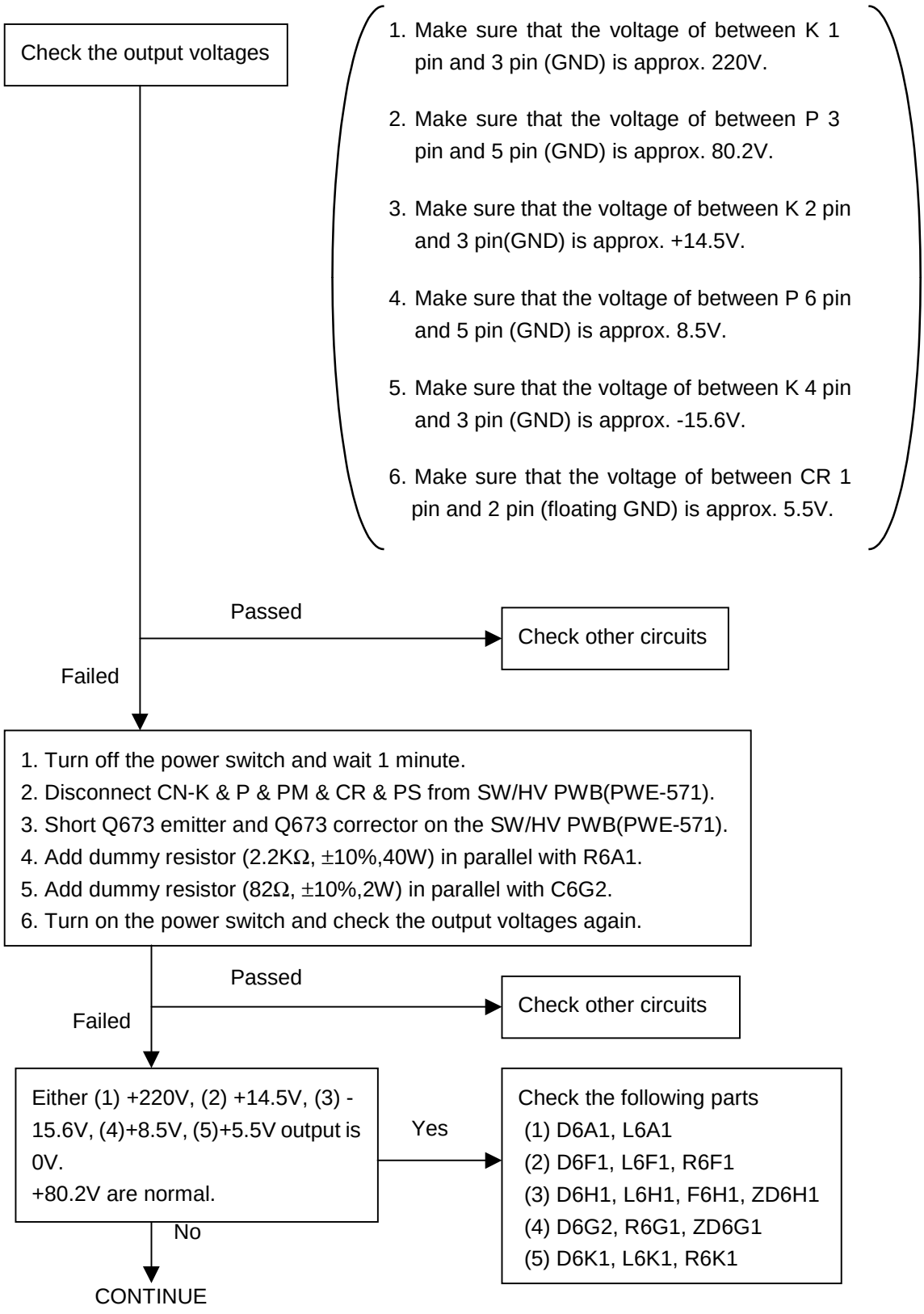
12-2. User control error

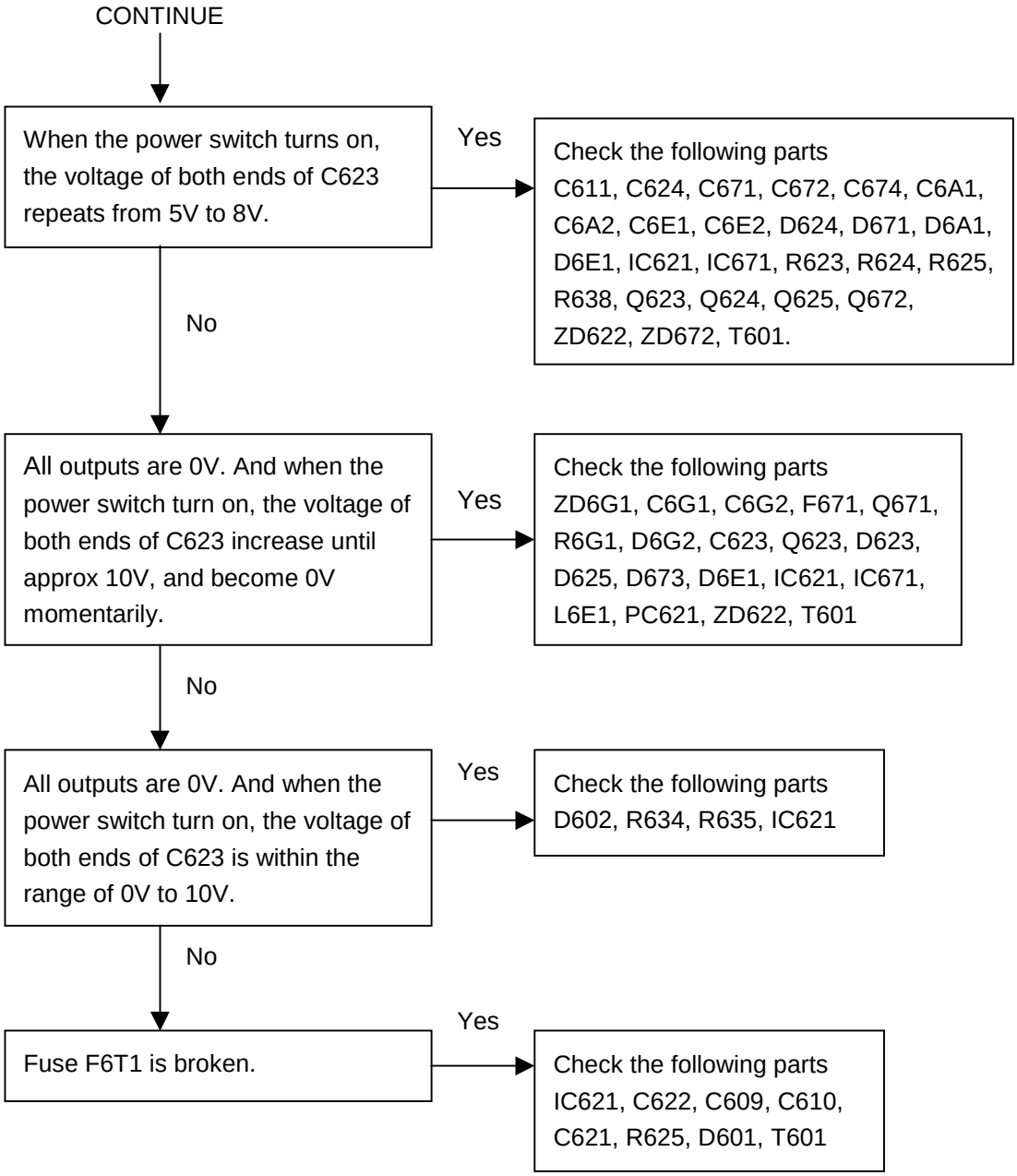


12-3. DAC output error



13. SWITCHING REGULATOR CIRCUIT FAILURE

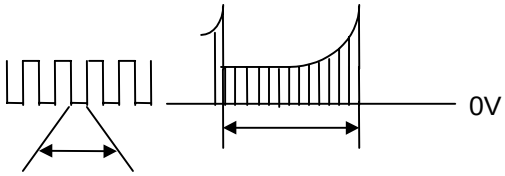



CONTINUE
When the power switch turns on, the voltage of both ends of C623 repeats from 5V to 8V.
Yes
Check the following parts
C611, C624, C671, C672, C674, C6A1, C6A2, C6E1, C6E2, D624, D671, D6A1, D6E1, IC621, IC671, R623, R624, R625, R638, Q623, Q624, Q625, Q672, ZD622, ZD672, T601.
No
All outputs are 0V. And when the power switch turn on, the voltage of both ends of C623 increase until approx 10V, and become 0V momentarily.
Yes
Check the following parts
ZD6G1, C6G1, C6G2, F671, Q671, R6G1, D6G2, C623, Q623, D623, D625, D673, D6E1, IC621, IC671, L6E1, PC621, ZD622, T601
No
All outputs are 0V. And when the power switch turn on, the voltage of both ends of C623 is within the range of 0V to 10V.
Yes
Check the following parts
D602, R634, R635, IC621
No
Fuse F6T1 is broken.
Yes
Check the following parts
IC621, C622, C609, C610, C621, R625, D601, T601

14. MOIRE CANCEL FAILURE

Operate the moire cancel control, and check the moire cancel control signal.

When the moire cancel control is max. condition, IC501 pin 22 waveform is as follows.



horizontal period vertical period

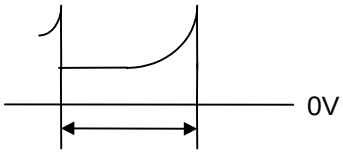
Only horizontal signal is NG.

- IC501 failure.
- Digital control circuit failure. (see item 12)

NG

Check the vertical moire cancel control signal.

When the moire cancel control is max. condition, C513 waveform is as follows.



vertical period

NG

- R512 or C513 failure.
- IC501 failure.
- Digital control circuit failure. (see item 12)

OK

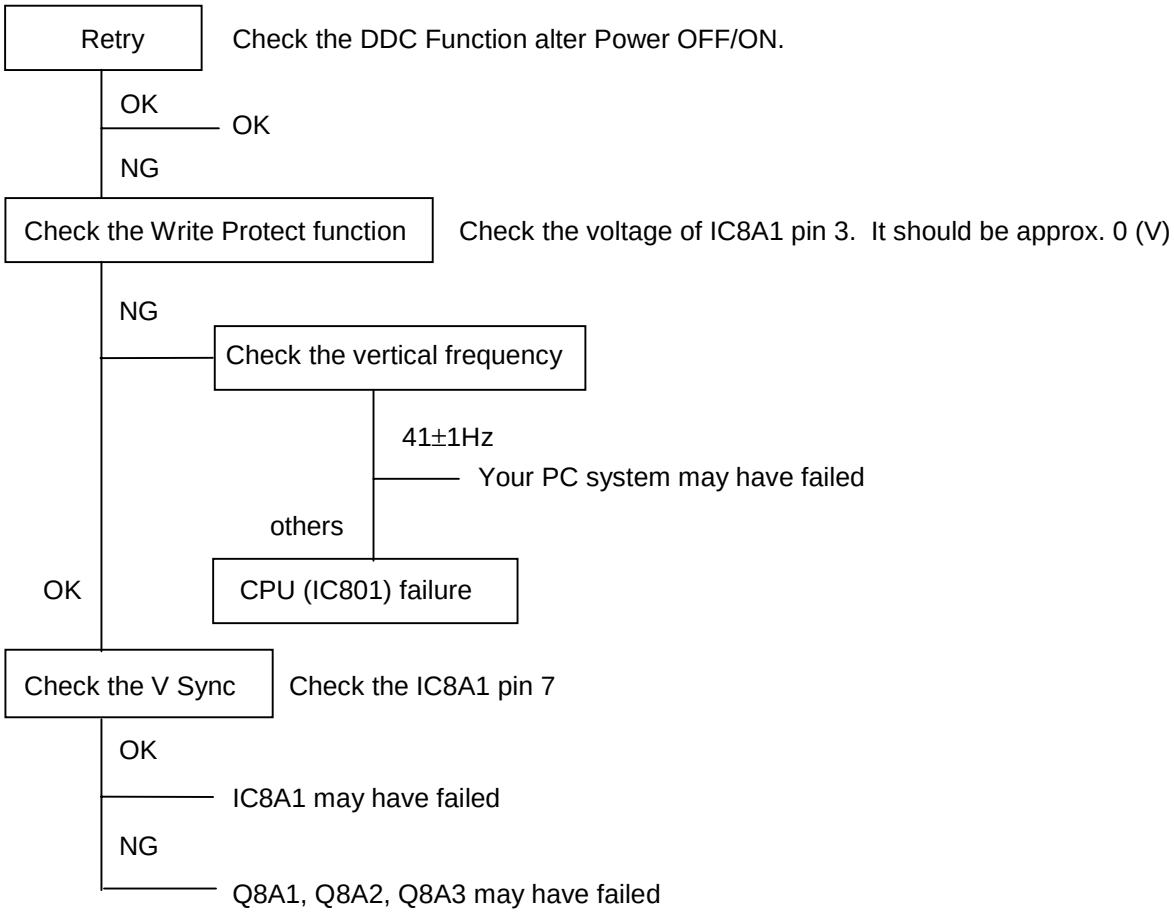
- R513 failure.
- IC501 failure.
- Digital control circuit failure. (see item 12)

OK

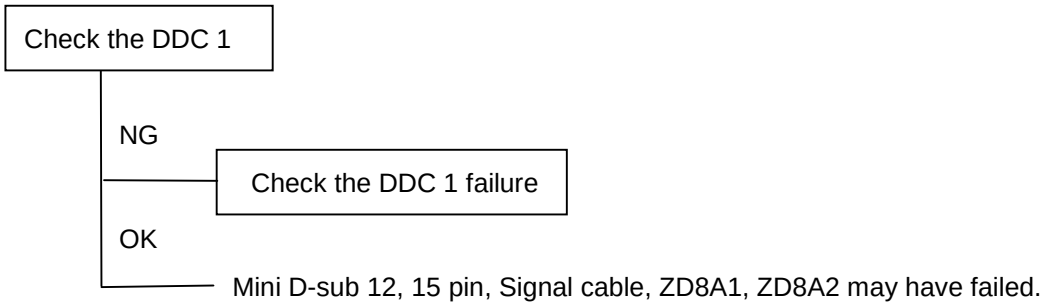
- C512, R511 or R508 failure.
- IC501 failure.

15. PLUG & PLAY FAILURE

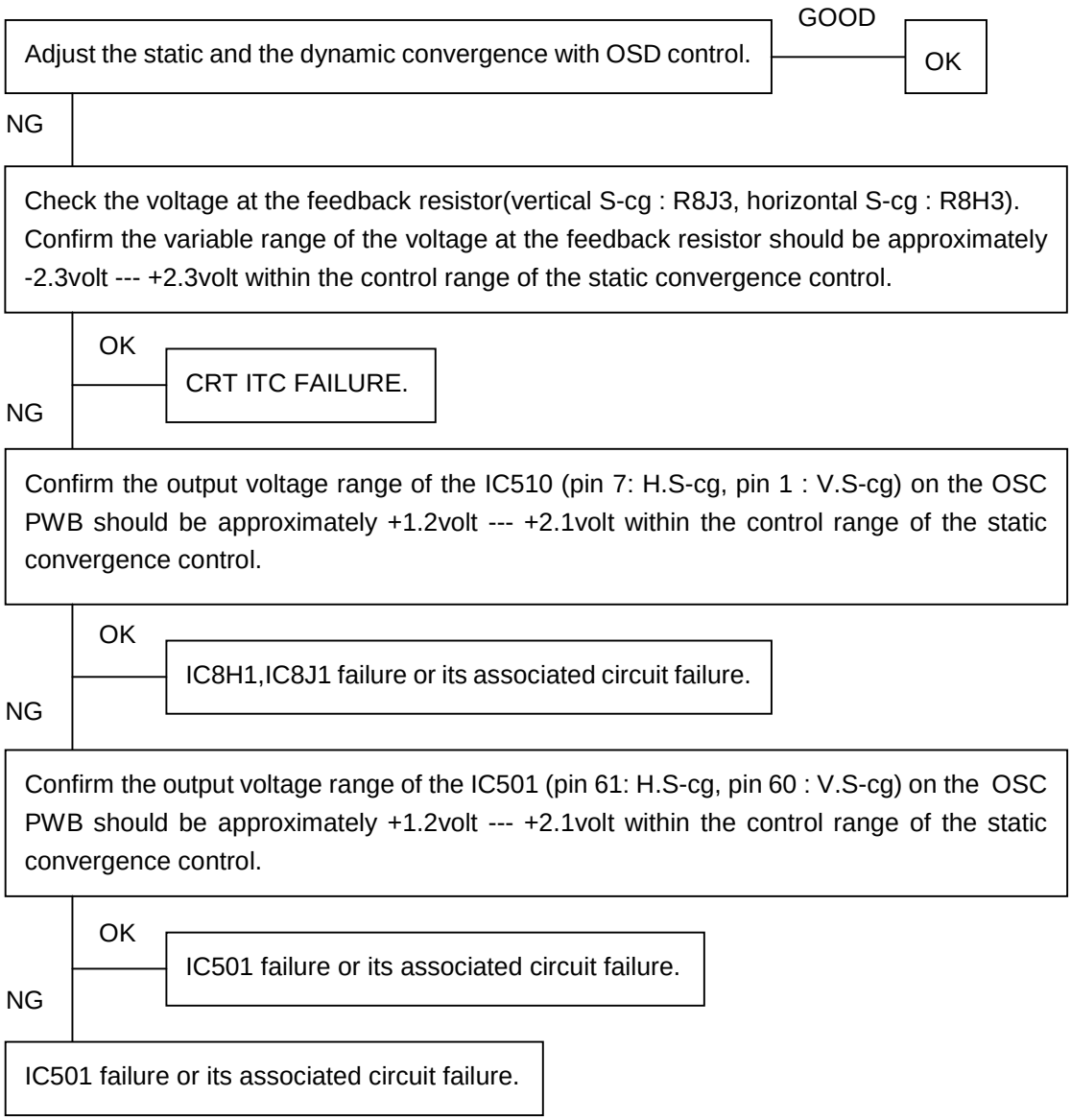
15-1. DDC 1 failure



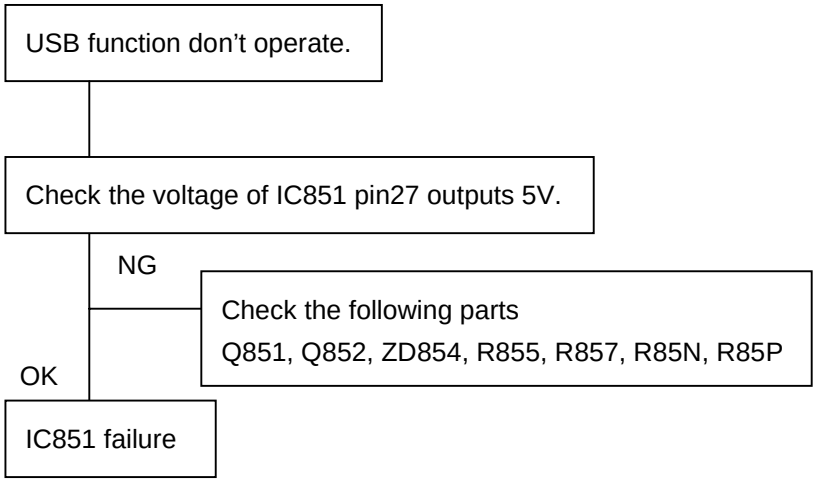
15-2. DDC 2B failure



16. Out of Cg-specification



17. USB CIRCUIT FAILURE



18. AUTO ADJUST CIRCUIT FAILURE

Set signal all white characters, and perform AUTO ADJUST on OSD control.

When check the following contents, perform AUTO ADJUST at the each time.

Check +5.0V and +3.3V

Make sure that the voltage of C8M7 is approx. +5.0V and C8MF is approx.+3.3V.

NG

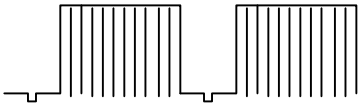
+5.0V line, IC8M2 or IC8G2 failure on the VIDEO PWB.

OK

Check R.G.B video input signals

Check the waveform at IC8M1 pin 27,pin 28 and pin 29.

(Approx. +3.2Vp-p)



V. frequency

NG

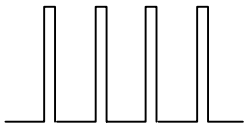
Q8M1R, Q8M1G and Q8M1B failure separately or VIDEO CIRCUIT FAILURE. (See item 2)

OK

Check AFC_TTL input signal

Check the waveform at IC8M1 pin 14.

(Approx.+5.0Vp-p)



H. frequency

NG

CNASD pin 4 or AFC_TTL line failure.

OK

Check V.PUMP input signal

Check the waveform at IC8M1 pin 13.

(Approx. +5.0Vp-p)

V. frequency

NG

CNASD pin8 or V_PUMP line or its ambient circuit failure.

OK

Re-adjust Auto Adjust adjustment (Set again AUTO ADJUST L and AUTO ADJUST H)

NG

Failure IC8M1or it's ambient circuit failure.

OK

The video signal was not possible for working correctly of Auto Adjust function.

CIRCUIT DESCRIPTION

TABLE OF CONTENTS

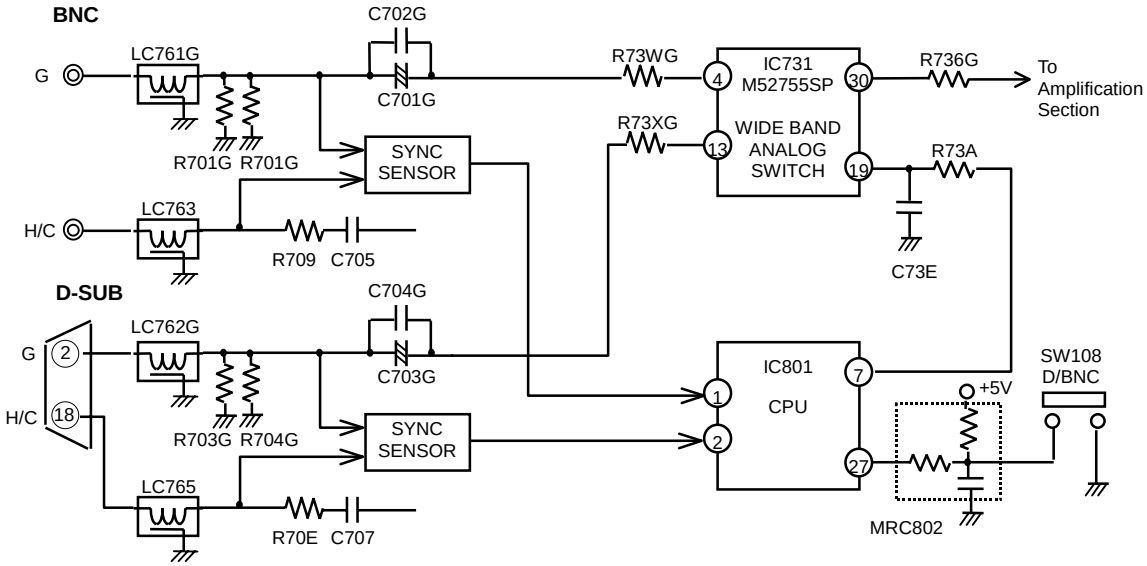
1. VIDEO CIRCUIT

1) Selection of BNC/D-SUB Input

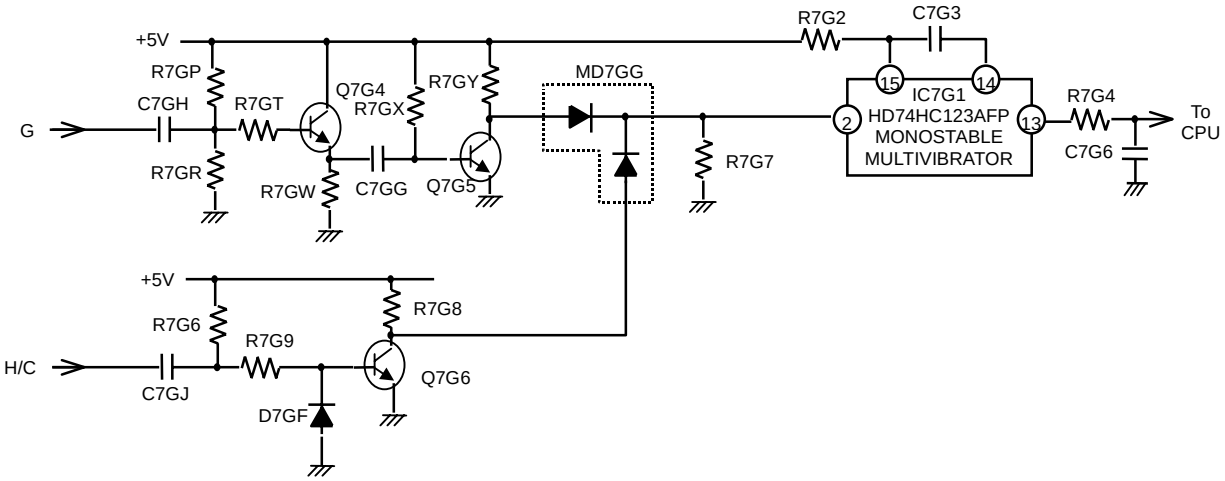
The input selection circuit selects the BNC input or D-SUB input according to the voltage of IC731 pin19 (0V or 5V). IC731 pin19 voltage changes whenever SW108(momentary switch) is pressed.

CPU detects BNC input or D-SUB input by input signal of Sync On Green and H/C sync. JC-1946UMW's user can know by OSM information whether input is BNC or D-SUB. Sync sensor outputs high level when fH is 1kHz or more, and low level when fH is less than 1kHz.

CPU detects BNC/D-SUB inputs and memories CONTRAST, SHARPNESS and EDGELOCK condition at each input.



(Fig 1.1.1) Input Selection Circuit (Green channel)



(Fig 1.1.2) Sync Sensor (D-SUB part)

2) Video Signal Amplification Section

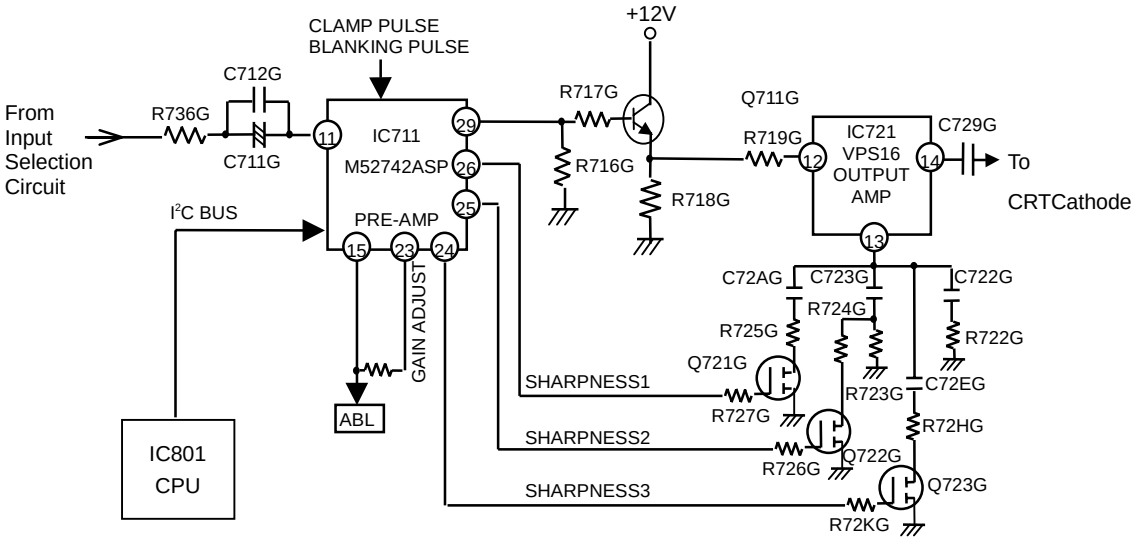
The video signal amplification section basically consists of the input section circuit and the amplification circuit. Each Red(R), Green(G) and Blue(B) video signal circuit is identical to each other, the G circuit being described below.

The video signal through the input selection circuit is input the amplification circuit. The amplification circuit is constructed with IC711(Pre-amp), Q711G(buffer), IC721(Output amp).

IC711 controls CONTRAST and R/G/B GAIN with I^2C BUS by CPU. Only ABL function is controlled by external DC voltage. IC711 is possible to change gain, it is approx.4.3Vpp after the video adjustment.

The output of IC711 is buffered by Q711G and fed to IC721(Output amp).IC721's gain is fixed approx.15 times.

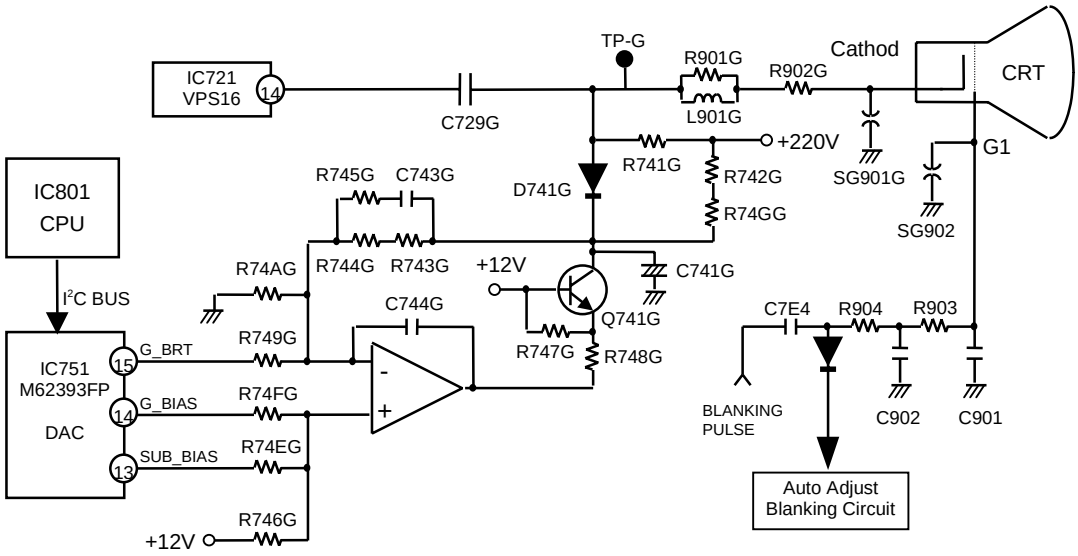
Rs and Cs connected IC721 pin 13 form emitter peaking. Emitter peaking effect changes 4 levels by Q721G, Q722G and Q723G.



(Fig 1.2) Video Amplification Circuit

3) Video Bias Circuit

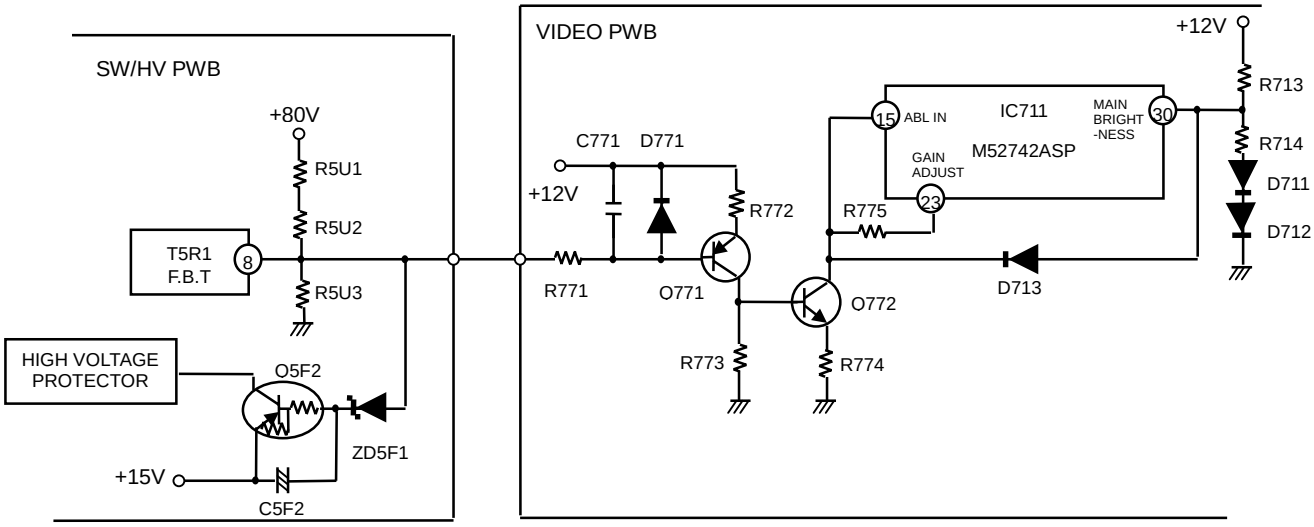
The video signal is amplified maximum 45Vpp in IC721 output, then the signal is done DC bias by video bias circuit through C729G. This DC voltage varies when cut off adjustment and brightness adjustment.
The video bias circuit consists of fixed voltage circuit construction with op-amp. Q741G is used high-voltage transistor due to get approx.80V to 170V at cathode black level voltage.
SUB BIAS, G BIAS and G BRT which are output from DAC IC751 are mixed at the op-amp IC742.



(Fig 1.3) Brightness and Cut-off Control

4) ABL Circuit

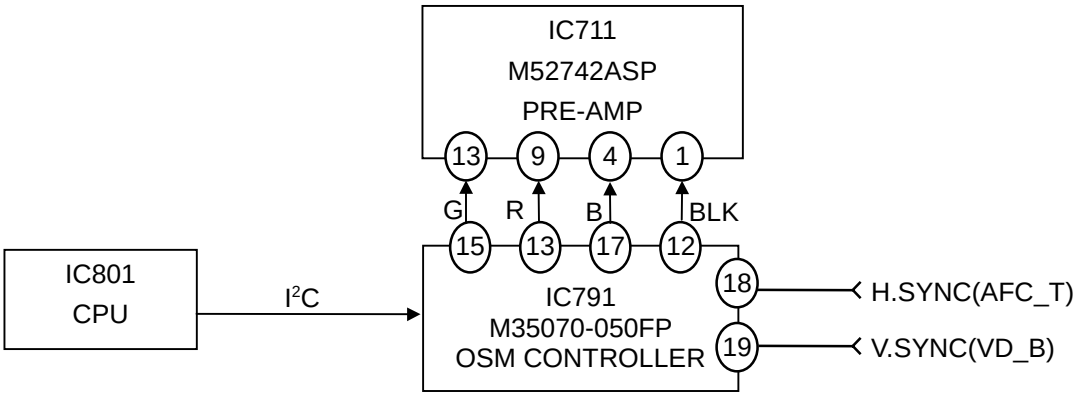
The ABL circuit consists of the part (Q771,Q772 and peripherals) which detects and amplifies the current flowing to the CRT anode, and the other parts (IC711) which control the gain of the video signal (R,G and B). The ABL circuit limits the amplitude of the video signal and serves to keep the maximum average current flowing to the CRT up to 750 μA. When the anode current is less than 750 μA, Q772 does not operate. And the anode current attempts to exceed 750 μA, Q772 operates and the voltage of IC711 pin 15 drops, the gain of IC711 drops. After saturation of IC711 pin 15, D713 becomes ON, then IC711 pin 30 drops. This is the voltage that decides the black level of IC711 video output. Therefore back raster becomes dark.



(Fig 1.4) ABL Circuit

5) On Screen Manager (OSM)

The OSM circuit consists of IC791(OSM controller) and IC711(Pre-amp) which matrix the video signal and the OSM signal. IC791 receives the display data from IC801(CPU), and the signal outputs R, G, B and Blanking are fed out of pins 13, 15, 17 and 12 respectively. The OSM signals are mixed with video signals in IC711(Pre-amp). The OSM screen brightness is controlled by I²C BUS from CPU.



(Fig 1.5) On Screen Manager

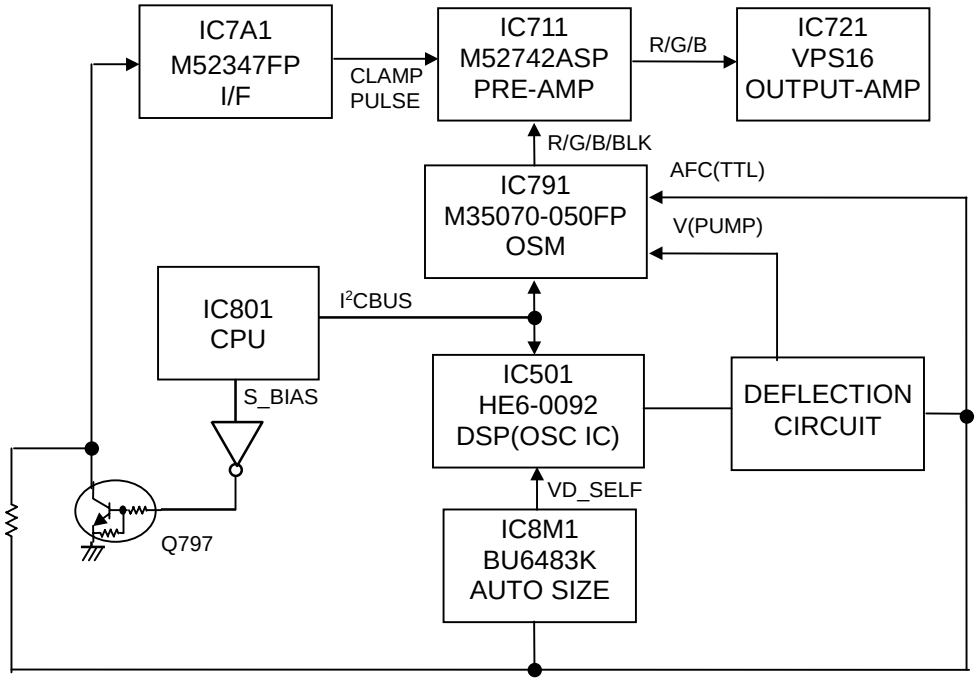
6) Self Test

There are two ways to activate the self test function.

User mode: power on the monitor while holding down the RESET switch

Factory mode: no H/C sync and SOG of selected input mode

When the self test mode is on, IC801(CPU) make IC501 output H_DRIVE at approx.61.6KHz. Thus the horizontal deflection circuit and the high voltage circuit are operated at this frequency. And Q797 turn open by S_BIAS at IC801(CPU) 12pin changed high. Then AFC pulse are fed to IC7A1 to make clamp pulse for IC711. IC8M1 divide H sync frequency (61.6KHz) by 512,then output V sync(approx.120Hz) to IC501. The video signal which is all white is generated by IC791, and fed to IC721(Output amp) via IC711(PRE-AMP).



(Fig1.6) Self Test

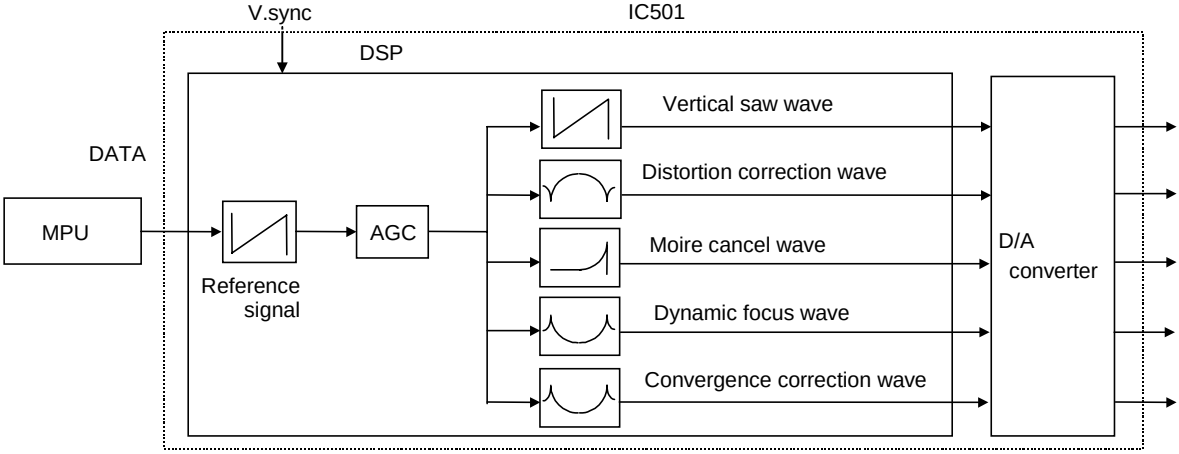
2. DEFLECTION CIRCUIT

2-1. The oscillation and deflection control integrated circuit

The oscillation and the deflection circuit is generated by IC501. IC501 has digital signal processor (DSP) and generates variety of correction signals by calculations. The feature of IC501 are low tolerance and low drift of temperature compared with current analog circuit. The functions of IC501 are Horizontal oscillation, Vertical oscillation, Horizontal position control, Distortion correction, Dynamic focus control, Moire canceler, and Convergence correction. These correction signals generated by DSP are converted to analog signal by the D/A converter, and these signals are output from IC output terminal.

1) Digital Signal Processor (DSP)

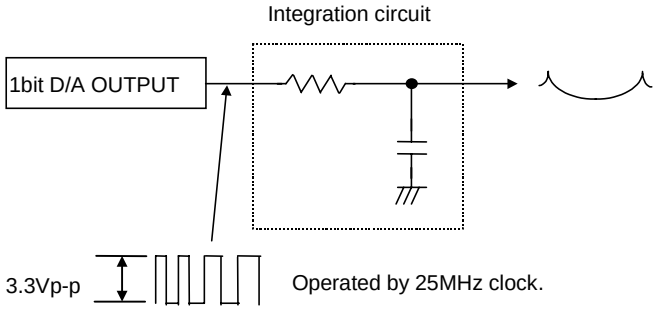
The digital signal processor generates variety of correction signals by calculations based on MPU (IC801) data. The DSP generate saw wave by MPU data. The signal, after the AGC in this saw wave, is moved to the reference signal. This reference signal generates various correction signals. All the signal wave shape formation inside DSP are done by the operation. The output signals from DSP are converted to analog signal by the D/A converter, and then these signals are output from IC output terminal.



(Fig. 2.1) Digital Signal Processor (DSP)

2) 1bit D/A converter (1bit DAC)

Most of the signals which are generated by DSP are output from 1 bit D/A converter. The 1bit D/A converter is pulse width modulation (PWM) circuit which is operated with 25MHz internal clock signal. The 3.3Vp-p signal which is modulated by pulse width is output from the 1bit D/A converter output terminal. This signal is integrated by integration circuit which is composed of resistor and capacitor and creates vertical periodic wave. The vertical dynamic focus control, distortion correction, convergence correction and moire canceler signals are output from the 1bit D/A converter.



(Fig. 2.2) 1bit D/A converter

2-2.HORIZONTAL DEFLECTION CIRCUIT

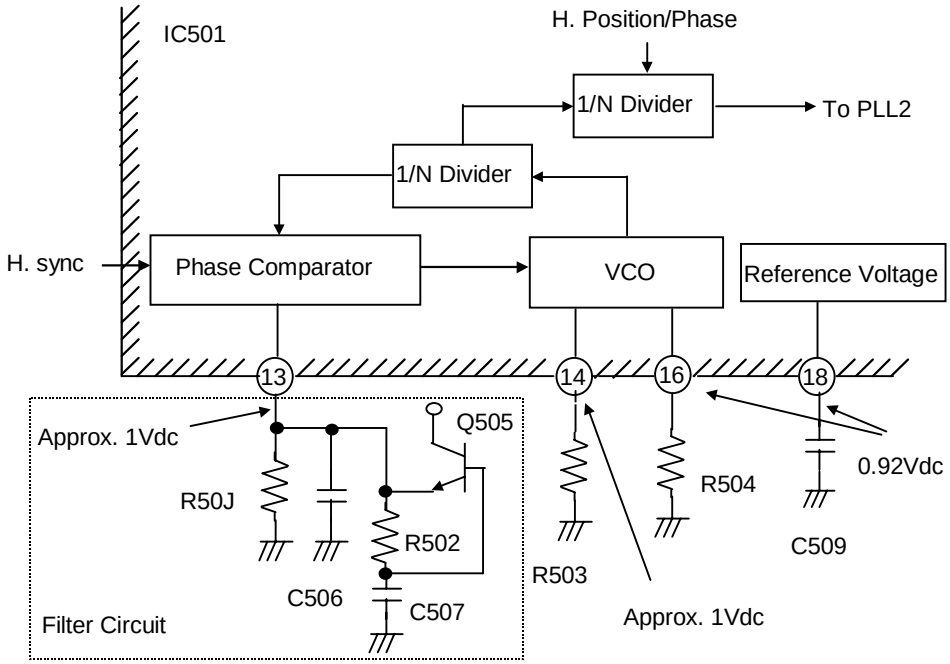
1) Horizontal oscillation circuit and Horizontal position control circuit

The horizontal oscillation circuit and the horizontal position control circuit are constructed by IC501. The horizontal oscillation circuit in IC501 is composed of two PLL (Phase Locked Loop) circuit (PLL1 circuit and PLL2 circuit).

a. PLL1 circuit

MPU (IC801) measures the horizontal frequency of input signal and set the data to the frequency divider of PLL circuit (PLL1 and PLL2) in IC501. Then IC501 oscillates and controls horizontal position by PLL1 circuit based on MPU data.

The peripheral circuit of pin 13 is filter circuit and decides response characteristic of horizontal frequency. The voltage at pin 13 is approximately 1 volt DC. The resistors connected to pin 14 and pin 16 (R503 and R504) decide pull-in range of horizontal frequency. Pin 18 is reference voltage terminal of PLL (PLL1 and PLL) circuit and outputs 0.92 volt.

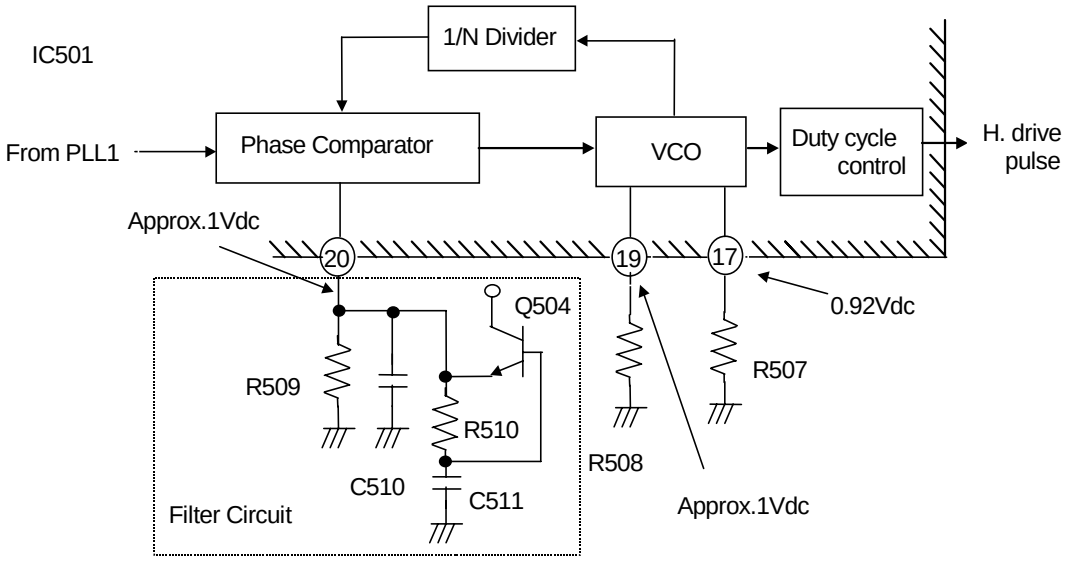


(Fig. 2.3) PLL1 circuit

b. PLL2 circuit

The PLL2 circuit operates phase locking of fly-back pulse at IC501 pin 27 and duty cycle control of horizontal drive pulse at IC501 pin 25. The composition of PLL2 circuit is similar to PLL1 circuit. The peripheral circuit of pin 20 is filter circuit and decides response characteristic of horizontal frequency. The voltage at pin 20 is approximately 1 volt DC. The resistors connected to pin 17 and pin 19 (R507 and R508) of horizontal frequency.

IC501 operates phase locking by comparing internal PLL1 circuit output signal with fly-back pulse. The duty ratio of horizontal drive pulse at IC501 pin 25 is set to approximately 50% by MPU data and this duty ratio does not depend on horizontal frequency.



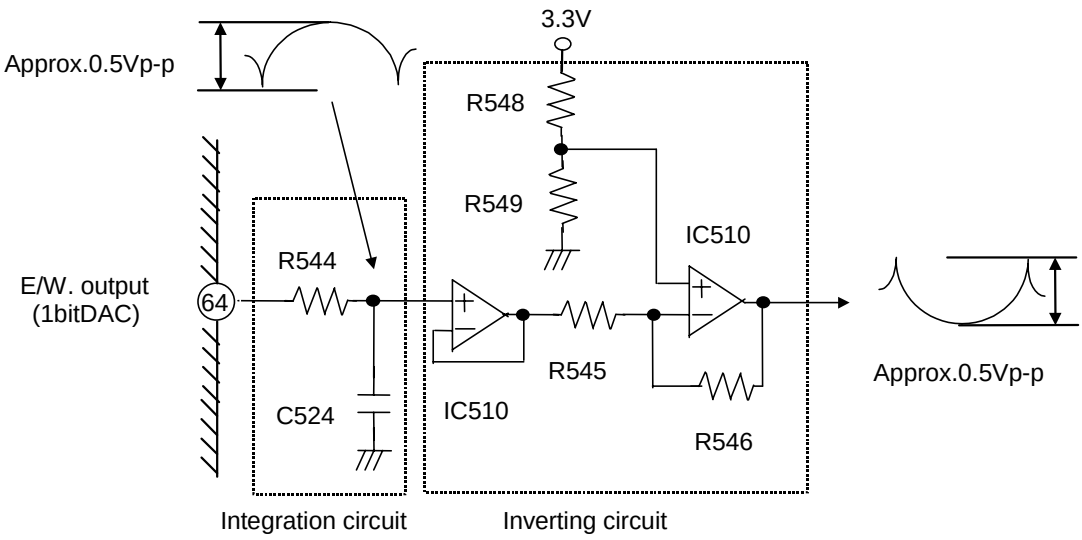
(Fig. 2.4) PLL2 circuit

2) Distortion correction circuit

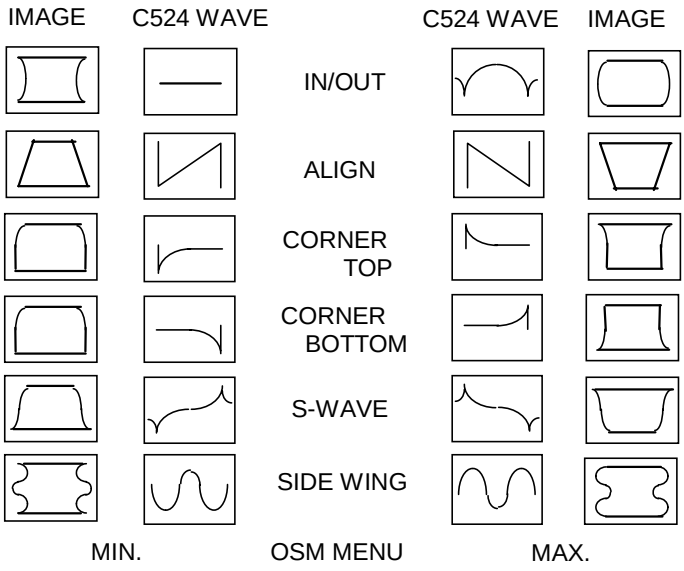
a. Size distortion correction circuit

This model has 6 size distortion correction items. (SIDE PIN, ALIGN, CORNER TOP, CORNER BOTTOM, S-WAVE, SIDE WING). MPU controls these distortion correction data of IC501. DSP in IC501 generates these correction signals and outputs distortion correction signal which is combined each of the correction signals. The distortion correction signal is output from 1bit D/A converter at pin 64, and is integrated by integration circuit which is composed of R544 and C524. This integrated signal is inverted by IC510, and IC510 output signal is input into the distortion correction output circuit.

The figure 2.6. shows the screen image and voltage waveform at C524, when the size distortion correction are operated by OSM.



(Fig. 2.5) size distortion correction signal output

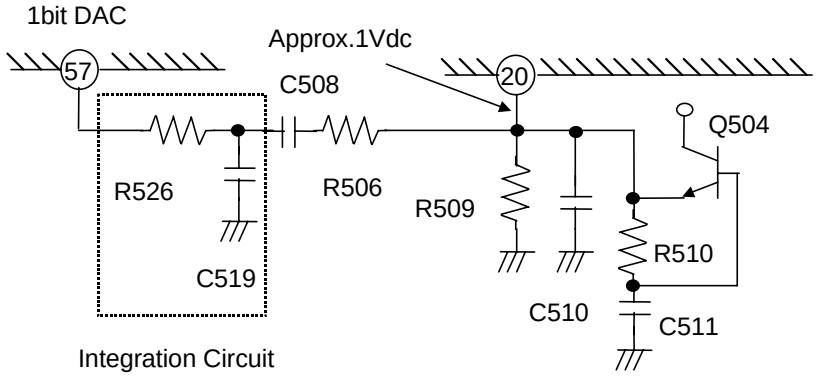


(Fig. 2.6) Voltage at C524 and screen image

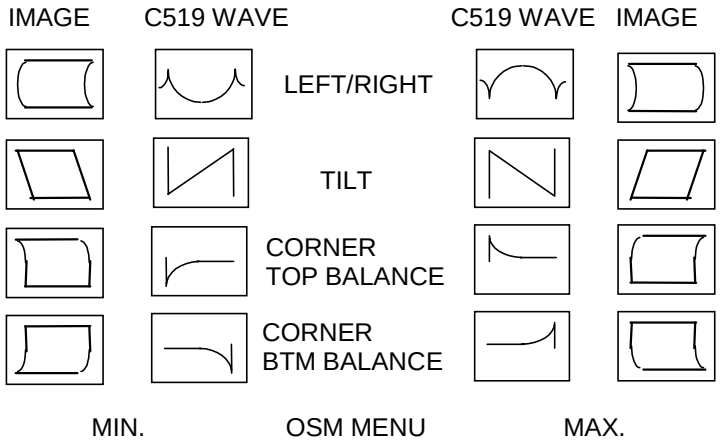
b. Phase distortion correction circuit

This model has 4 phase distortion correction items. (SIDE PIN BALANCE, TILT, CORNER TOP BALANCE, CORNER BOTTOM BALANCE). The distortion correction signal is output from 1bit D/A converter at pin 57, and is integrated by integration circuit which is composed of R525 and C519. This integrated signal is added to filter terminal at pin 20 (PLL2 filter circuit) via C508 and R505.

The figure 2.8. shows the screen image and voltage waveform at C519, when the phase distortion correction are operated by OSM.



(Fig. 2.7) phase distortion correction circuit



(Fig.2.8) voltage at C519 and screen image

3) Horizontal Drive Circuit

The horizontal drive system uses what is generally referred to as a flyback system.

The horizontal drive pulse output from IC501 pin 25 switches Q555 on and off.

It is amplified by T551 and switches Q561 (the horizontal output transistor) on and off.

The voltage of C552 for horizontal drive is fixed at 15V.

4) Horizontal Deflection Output Circuit

It corrects the optimum horizontal linearity by using Linear-coil and S correction capacitor to change the horizontal frequency mode. Horizontal frequency mode is shown in CPU CIRCUIT description section. The Inductance of Linear-coil (T571) varies with horizontal frequency.

5) Horizontal Size Control Circuit

Horizontal size is controlled by power-supply voltage for a horizontal deflection made using PWM method. The horizontal size is controlled by two methods. One is H-SIZE which can be adjusted with a user menu, and the other is H-SIZE MAX which can be adjusted only with a service menu. The horizontal size control circuit consists of the circuit shown in the following.

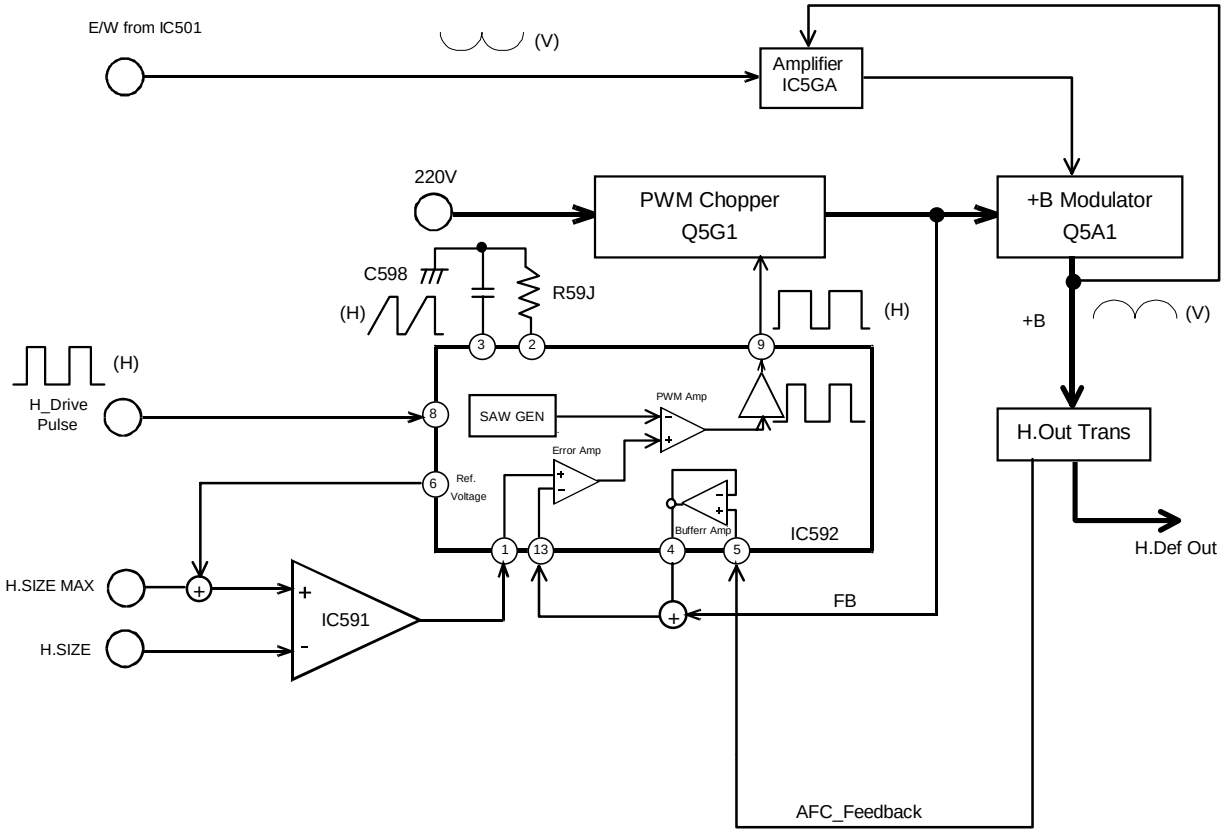
- Saw-tooth-wave form generator
- Switching pulse generator
- PWM Chopper
- +B modulation circuit

A saw-tooth wave form is generated inside IC592 . Its frequency is depend on horizontal drive pulse signal input at pin 8 and its slope is decided by the time constant of R59J and C598. The waveform can be monitored at pin 3.

Horizontal size control voltage is compared with reference voltage from pin 6 of IC592, output is fed into pin1 of IC592. On the other hand, horizontal maximum size control voltage is compared with AFC feedback voltage and then output is fed to a buffer circuit inside IC592 at pin5 and output at pin4 of IC592.

These 2 comparing voltages that are inputted at pin 1 and 13 shall be compared within IC592 as well as feedback from output voltage of PWM chopper circuit. Output of comparison is the voltage that controls the duty cycle of square wave that generated from saw-tooth waveform. Square wave is buffered and output at pin 9 of IC592 to the gate of Q5G1,PWM modulation.

Source voltage (220V) of Q5G1 is converted into horizontal deflection voltage by the duty cycle of the square wave. This voltage is supplied to a horizontal size modulation circuit consists of Q5A1, R5AC, R5AE, C5A5, C5A8, and ZD5A1. Transistor Q5A1 modulates chopper DC output voltage from L5G2, C5G3. Self bias voltage by R5AC and R5AE , and a modulation wave form(E/W parabolic wave form) is applied to a base through C5A6. A modulation wave form is made in the distortion correction circuit described in below section



(Fig. 2.9) HORIZONTAL SIZE CONTROL CIRCUIT

a. Horizontal size modulation circuit

The transistor Q5A1modulates the Chopper output voltage that location is C5G3. This transistor is biased by R5AC and R5AE and the modulation wave is added to the base through C5A6. The modulation wave is made by Horizontal size correction circuit which is described section 2).

b. User H SIZE control

OSM control for users vary from 0 to 255. At this time, the voltage of IC532 pin 5 (HS control line) vary from 5V to 0.9V.

The horizontal video size reduces as much as approximately 78% irrespective of the horizontal frequency when the maximum size is taken to 100%.

c. H SIZE MAX control

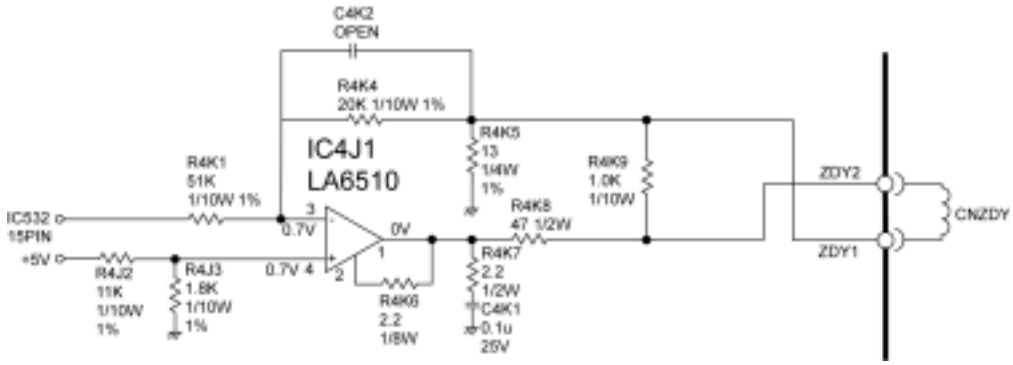
The H SIZE MAX control is accessible in service mode only, and this control sets the maximum horizontal size. The H SIZE for user control vary from the horizontal maximum size which is adjusted at this stage to less than the H SIZE MAX. H SIZE MAX control vary from 0 to 255 on OSM menu, and the voltage of IC532 pin 6 output voltage vary from approximately 0.9V to 5V. The horizontal maximum size control voltage (HSM)is output to IC591 pin 10 and is compared to the HS voltage (IC591 pin 9) . The HSM output voltage is converted to slice voltage at the comparator for PWM control which is input to error amplifier IC592 pin 1.

The H SIZE MAX has two area of memory (H SIZE MAX 1 and 2) which is selected by the below table.

H Frequency Range[KHz]	Selected Memory
101.0 - 115.0	H SIZE MAX 2
82.6 - 101.0	H SIZE MAX 2
69.5 - 82.6	H SIZE MAX 2
52.7 - 69.5	H SIZE MAX 2
49.0 - 52.7	H SIZE MAX 1
41.5 - 49.0	H SIZE MAX 1
36.6 - 41.5	H SIZE MAX 1
33.6 - 36.6	H SIZE MAX 1
30.8 - 33.6	H SIZE MAX 2

6) Rotation Correction Circuit

Raster rotation is corrected by moving the electron beam in the magnetic field produced by current applied to the Z-coil. The amount of correction is proportional to the current applied to the Z-coil and the correction can be adjusted with the control voltage (DC) of the D/A converter. The DC voltage output from IC532(D/A converter) pin 15 generates current to flow in the Z coil, and amount of rotation is determined. User can adjust the level of rotation by operating OSM menu (Rotate).



(Fig. 2.10) Rotation Correction Circuit

7) H Centering Circuit

Switching regulator generates the floating 5.5 volts which is compared to the deflection circuit power supply voltage (high B+ voltage). This voltage is divided by VR581 (H centering) and is supplied to the base of Q581. The voltage differences of Q581's base and emitters is supplied to L562.

Horizontal centering is manipulated by the current supplied by L562 to the horizontal deflection circuit.

2-3. VERTICAL DEFRECTION CIRCUIT

The vertical deflection circuit is constructed by following three blocks.

1) Sawtooth wave generating, vertical size and position control and linearity control circuits

2) Vertical filter circuit

3) Vertical output amplifier circuit

a. Sawtooth wave generating, vertical size and position control and linearity control circuits

The vertical sync signal from IC7A1 on VIDEO PWB is fed to IC501 pin 42 on OSC PWB. DSP in IC501 generates saw wave by calculations. The signal, after the AGC in this saw wave, is moved to vertical deflection control signal. This vertical deflection control signal is output from IC501 pin 1. After IC501 receives vertical size data, vertical position data, vertical max. size data, vertical raster position data, vertical linearity data and vertical linearity balance data from MPU, IC501 pin 1 outputs vertical saw wave which is controlled by these correction items.

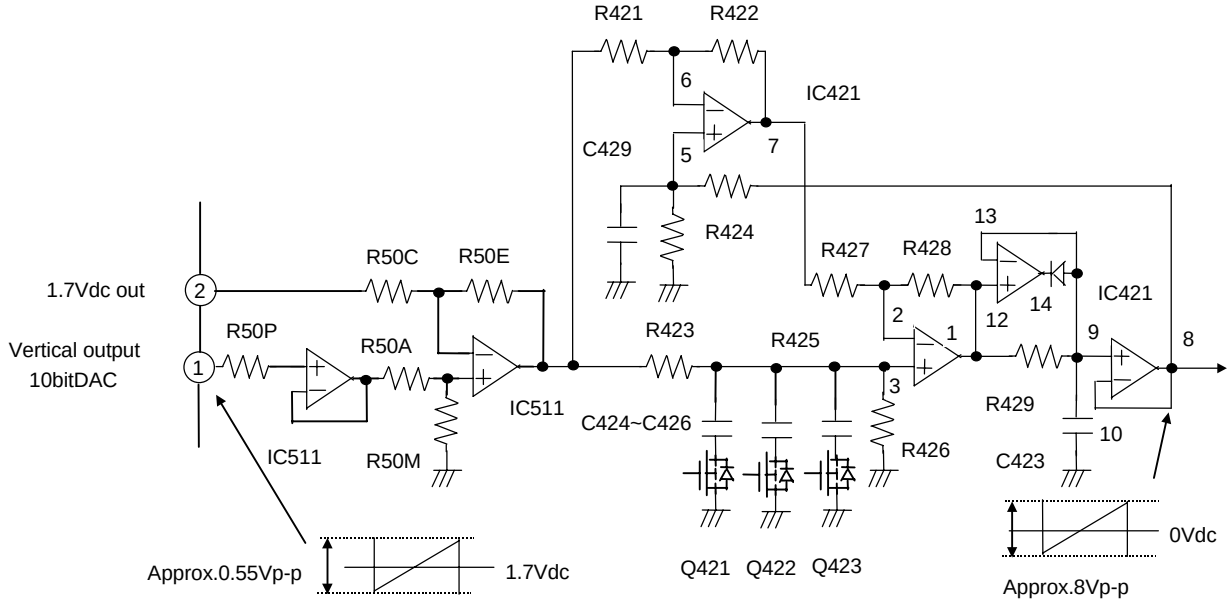
The vertical max. size control is standard adjustment item for vertical size. The vertical raster position control is standard adjustment item for vertical position. These control items do not have the function of tracking operation for distortion correction.

b. Vertical filter circuit

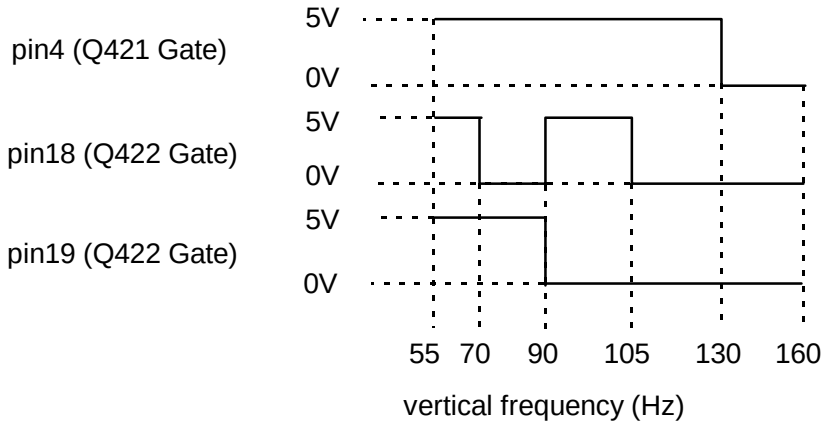
IC501 pin 1 output of vertical saw wave is converted 1.7V DC to 0V DC and amplified 14.5 times by IC511.

The output signal of IC501 includes digital noise because it is generated by digital circuit. After this digital noise is eliminated by filter circuit which are composed of IC421 and its peripheral circuit, the vertical saw wave is sent to the vertical output amplifier circuit.

The vertical saw wave is input to IC421 pin 3. After this vertical saw wave is combined with output signal at IC421 pin 7, this combined signal passes the low pass filter composed of R529 and C423. The low pass filter eliminates the digital noise and the vertical saw wave output from IC421 pin 8. Q421, Q422 and Q423 are correction circuit for vertical linearity. These FET are controlled by IC532 based on vertical frequency. Figure 2.12 shows IC532 output voltage.



(Fig. 2.11) vertical saw wave output and filter circuits

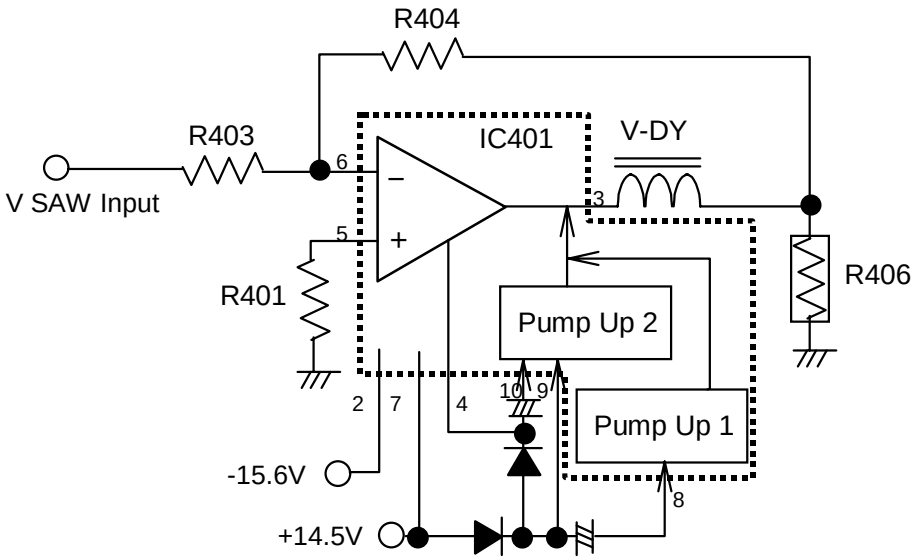


(Fig. 2.12) IC532 output voltage

c. Vertical output amplifier circuit

The current proportional to the input voltage to IC401 is supplied to the vertical deflection coil (V-DY).

The vertical deflection current is taken as voltage wave form on R406 and fed back to IC401.



(Fig. 2.13) Vertical output amplifier circuit

3. HIGH VOLTAGE CIRCUIT

The high voltage circuit consists of the high voltage control circuit, and Q5R1 and its peripheral circuits made up for the high voltage output circuit and the high voltage protection circuit for instance of high voltages circuit irregular operation.

1) High Voltage Control Circuit

ICD5P1 is high voltage control integrated circuit.

The high voltage detection voltage is output to TP-HV from the FBT's internal bleeder resistor.

The AFC pulse output from the horizontal output transformer (T561) is input to 4pin of ICD5P1, and the sawtooth wave is generated in ICD5P1. This sawtooth wave is compared with the high voltage detection voltage and the drive pulse applied to the gate of Q5R1 is generated. This pulse width becomes narrower when the high voltage rises, and becomes wider when high voltage drops.

2) High Voltage Output Circuit

The output circuit operates depending on the drive pulse applied to the gate of Q5R1, and the fly-back pulse is produced at pin 1 of T5R1 (FBT). The drive pulse width changes with respect to the high voltage fluctuation resulting from changes in the CRT beam current and operation frequency, the peak value of the corrector pulse changes, and high voltage stabilization is performed.

3) High Voltage Protector Circuit

This circuit consists of the X-ray protector which stops the operation of the control circuit when the high voltage rises abnormally, and the overcurrent protector which operates when the current flowing into FBT (T5R1) has increased. Once the X-ray protector and the over current protector have started operation, their operation is not canceled unless the power supply is switched off, and then on again.

* X-ray protector

When the high voltage rises, the voltage of T5R1 (FBT) pin 10 rises. This voltage is compared with the reference voltage in IC2001, and when the reference voltage is exceeded, the comparator operates and output voltage of IC2001 (5pin) is high level, then the operation of the high voltage control circuit is stopped.

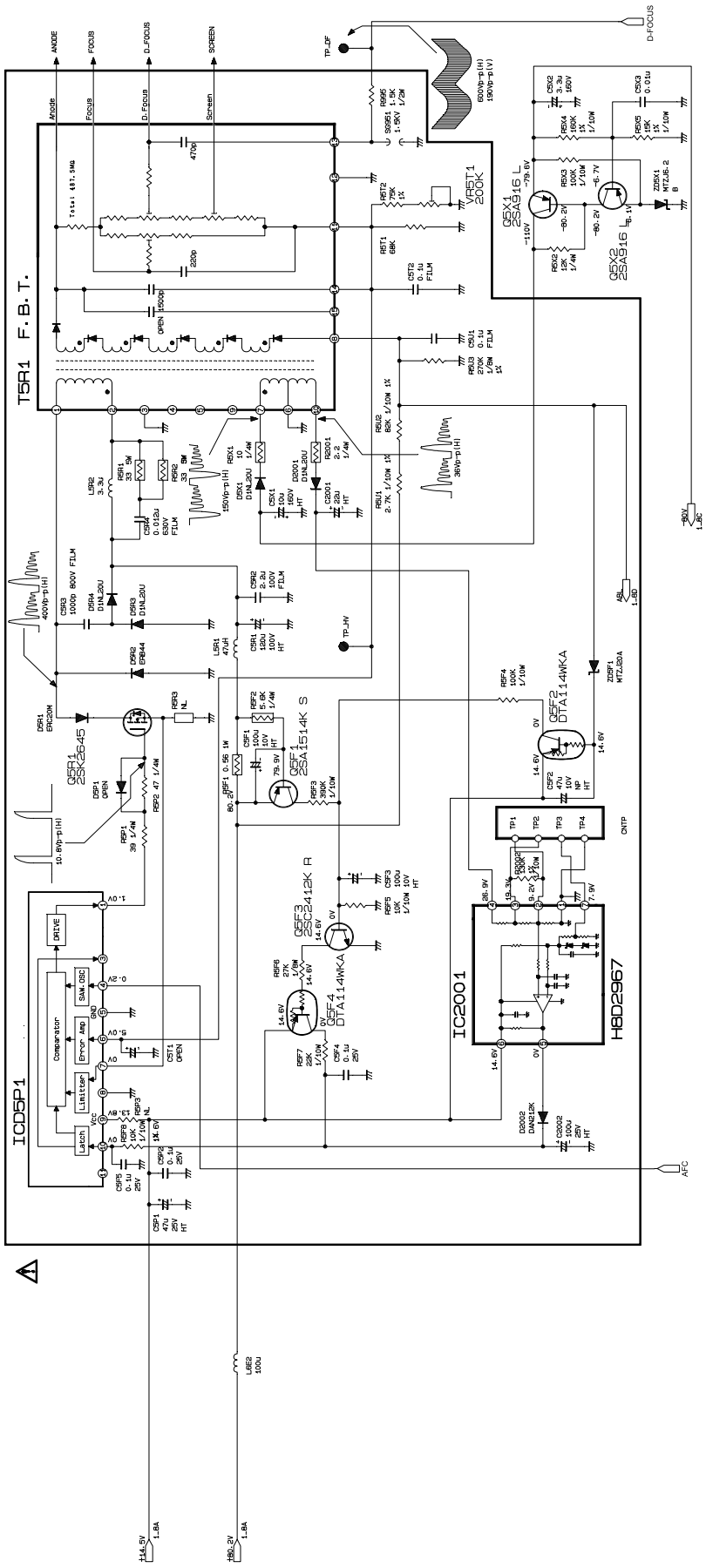
* Overcurrent Protector

When the current flowing into T5R1 (FBT) pin 2 increases, Q5F1 operates and Q5F3 is switched on.

Also when the current flowing into T5R1 (FBT) pin 8 increases, Q5F2 operates and Q5F3 is switched on.

When Q5F3 is switched on, Q5F4 is switched on and the voltage of ICD5P1 10pin rises.

Then latch circuit inside ICD5P1 operates and the high voltage control circuit is stopped.



(Fig.3.1) HIGH VOLTAGE CIRCUIT AND PROTECTOR CIRCUIT

4. BLANKING CIRCUIT

The blanking circuit consists of Q7E1 through Q7E3 which amplify the blanking pulse, the spot killer circuit and the auto adjust blanking circuit.

1) Blanking Circuit

The IC501(DSP) on OSC PWB generates the blanking pulse which are mixed the horizontal blanking pulse and the vertical blanking pulse and outputs the blanking pulse(VH_BLK) from pin40. The blanking pulse is amplified by Q7E1 through Q7E3 and are applied to G1. Therefore during the horizontal and vertical retrace periods, the voltage of G1 becomes low and then the raster is disappeared.

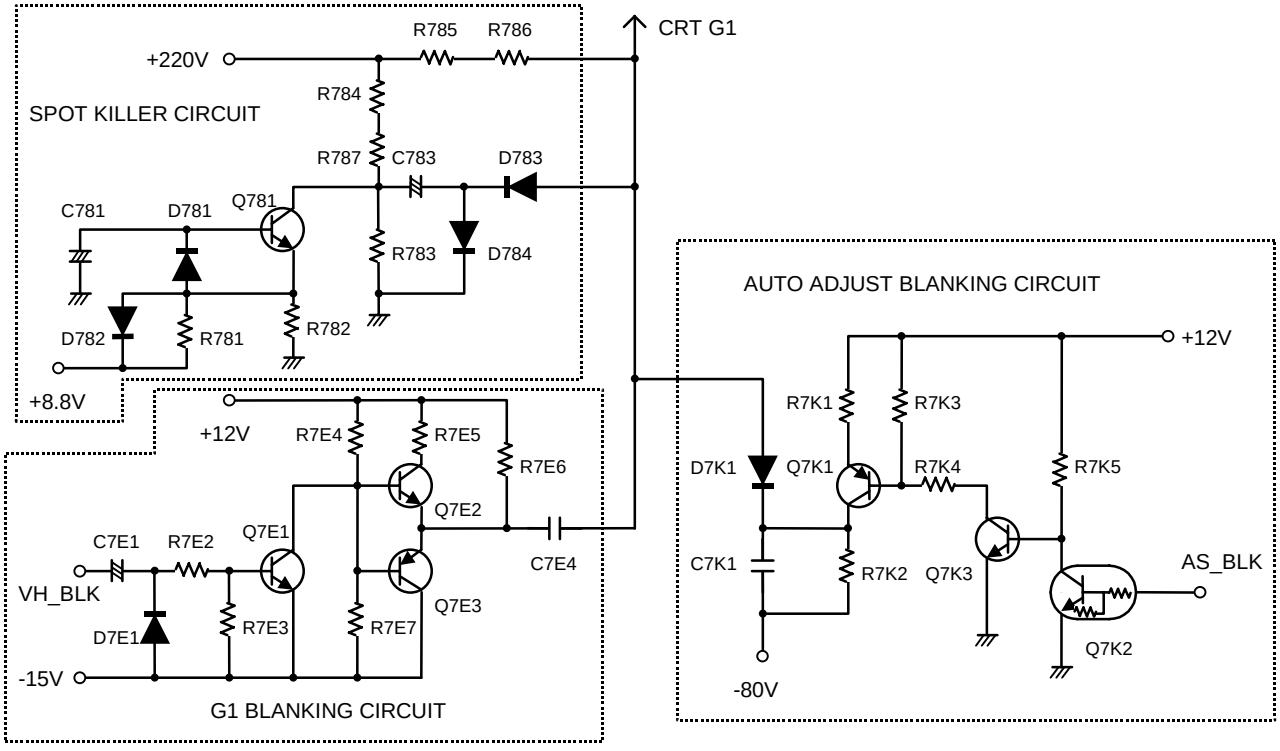
2) Spot Killer Circuit

The spot killer circuit operates when the display is turned off ,the suspend and the off modes. When the power is on, Q781 is turned off by 8.8V of C781 and the collector voltage of Q781 becomes 137V. When the display is turn off, the Q781 is activated by the voltage of 8.8V power supply drop. Then the collector voltage of Q781 becomes 0V from 137V. Therefore G1 voltage is changed to -137V by the change of C783 charge. It is the same with the suspend and the off modes. Then the raster is cut off.

3) Auto Adjust Blanking Circuit

The auto adjust blanking circuit operates one second when the user proceeds the auto adjust on OSM.

Then Q7K2 is activated by the change of the AS_BLK voltage. Then Q7K3 and Q7K1 are turned off. Therefore G1 voltage is change to -80V and the raster is cut off.



(Fig.4.1) Blanking Circuit

5. DYNAMIC FOCUS CIRCUIT

The dynamic focus circuit section is made up of following three blocks:

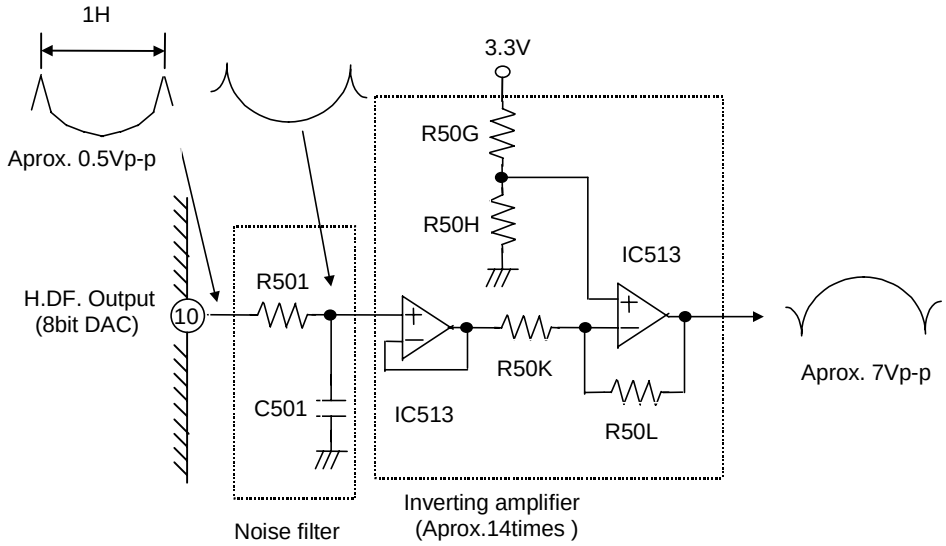
1) The horizontal parabolic wave generation and gain control circuit

2) The vertical parabolic wave generation and gain control circuit

3) The output amplifier circuit and the coupling circuit

1) The horizontal parabolic wave generation and gain control circuit

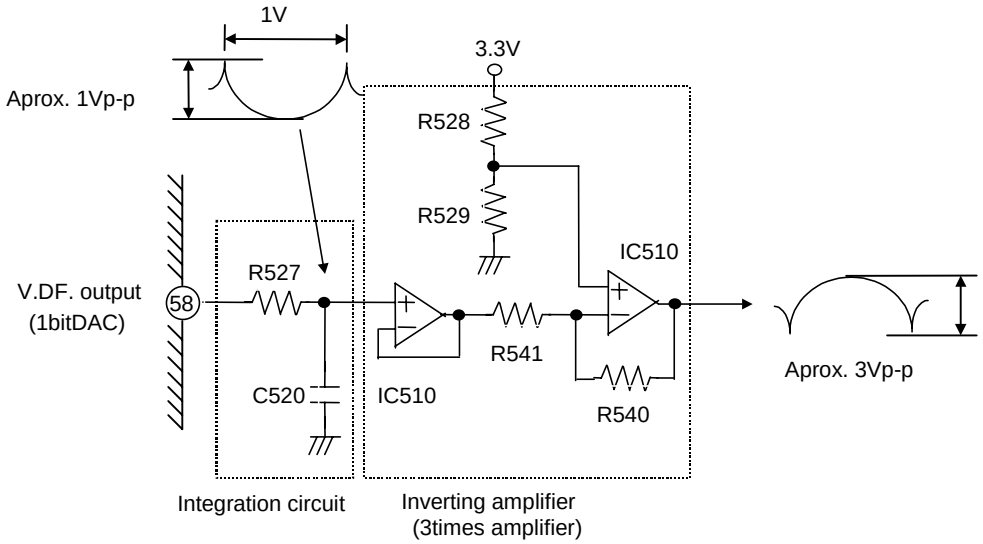
IC501 generates horizontal dynamic focus signal controlled by MPU data based on horizontal frequency and horizontal screen size. The horizontal dynamic focus signal which is generated by internal logic circuit is multiplied with vertical period signal which is created by DSP. The multiplier inside IC501 outputs the horizontal dynamic focus signal modulated with the vertical signal. This signal is output from 8bit D/A converter at pin 10 after it is converted to analog signal. The output signal at pin 10 is smoothed by noise filter composed of R501 and C501. After this signal is inverted and amplified approximately 14 times by IC513, it is sent to the horizontal dynamic focus output circuit.



(Fig. 5.1) The horizontal parabolic wave generation and gain control circuit

2) The vertical parabolic wave generation and gain control circuit

The vertical parabolic wave is generated by DSP. IC501 generates vertical parabolic wave by calculation based on MPU data and outputs vertical dynamic focus correction signal at IC501 pin 58. This signal is integrated by integration circuit composed of R527 and C520. After this signal is inverted and amplified approximately 3 times by IC510, it is sent to the vertical dynamic focus output circuit.

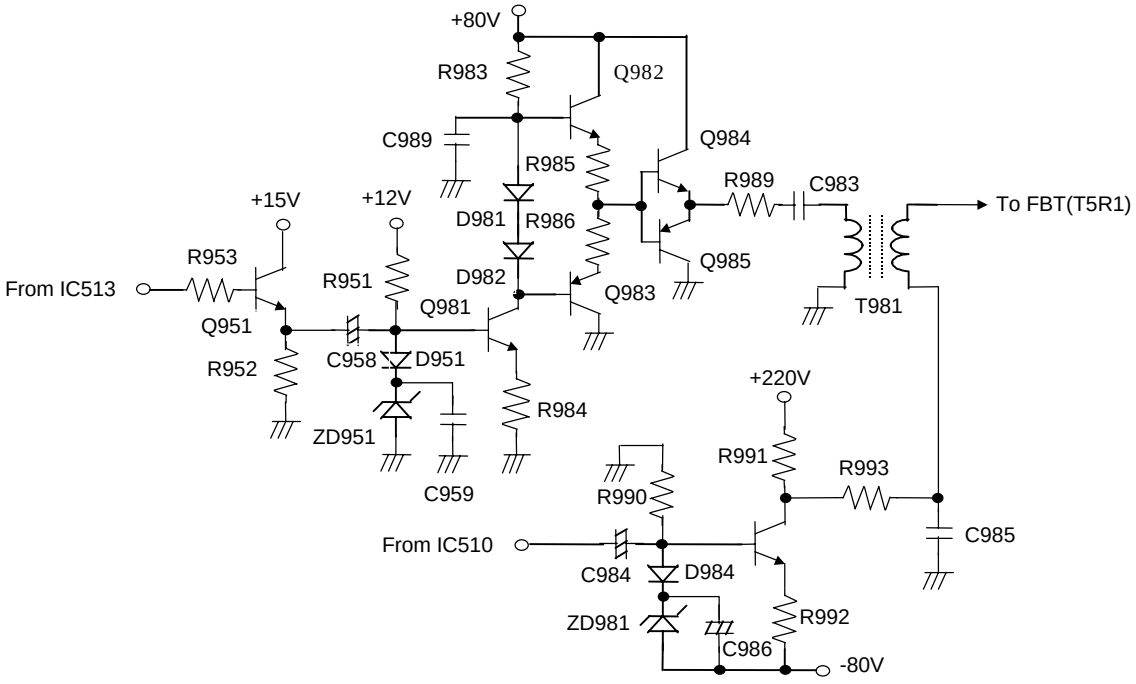


(Fig. 5.2) The vertical parabolic wave generation and gain control circuit

3) The output amplifier circuit and the coupling circuit

The horizontal and vertical parabola waveforms output from IC501 are clamped before each output circuit for wide dynamic range of the output circuit. The clamp voltage is determined by the voltages of ZD951 (for the horizontal parabolic wave) and ZD981 (for the vertical parabolic wave).

After the clamp circuit, the horizontal parabola waveform is amplified approximately 12 times by Q981. The output signal at Q981 collector is input to T981 via the buffer circuit which is composed of Q982, Q983, Q984 and Q985. The gain of T981 is approximately 9. The vertical parabola waveform is amplified approximately 80 times by Q987. The output signal at Q987 collector modulates the secondary winding of T981 as the vertical parabola waveform. Therefore, T981 outputs the horizontal parabola waveform which is modulated by the vertical waveform. This modulated waveform is input to the CRT focus grid via the built-in capacitor of T5R1 (FBT).



(Fig. 5.3) The dynamic focus output circuit

6. CPU CIRCUIT

1) CPU

IC801: 8 bit CPU / CMOS IC

IC802: EEPROM / CMOS IC

IC571: I/O Expander

This system has the following functions.

Frequency Counter

I^2C BUS control

fH band

Degaussing Control

DAC control (see 2. DC Control Circuit)

PMS control (see 3. Power Management system (PMS) Circuit)

OSD control (see 5. User Control Operation)

a. Frequency Counter

IC801 counts Horizontal frequency by event counter, Vertical frequency by interval timer. Horizontal sync is negative input to IC801 pin 4. Vertical sync is positive input to IC801 pin 36.

Sync range

Horizontal	31.0 - 115.0 kHz
Vertical	55.0 - 160 Hz

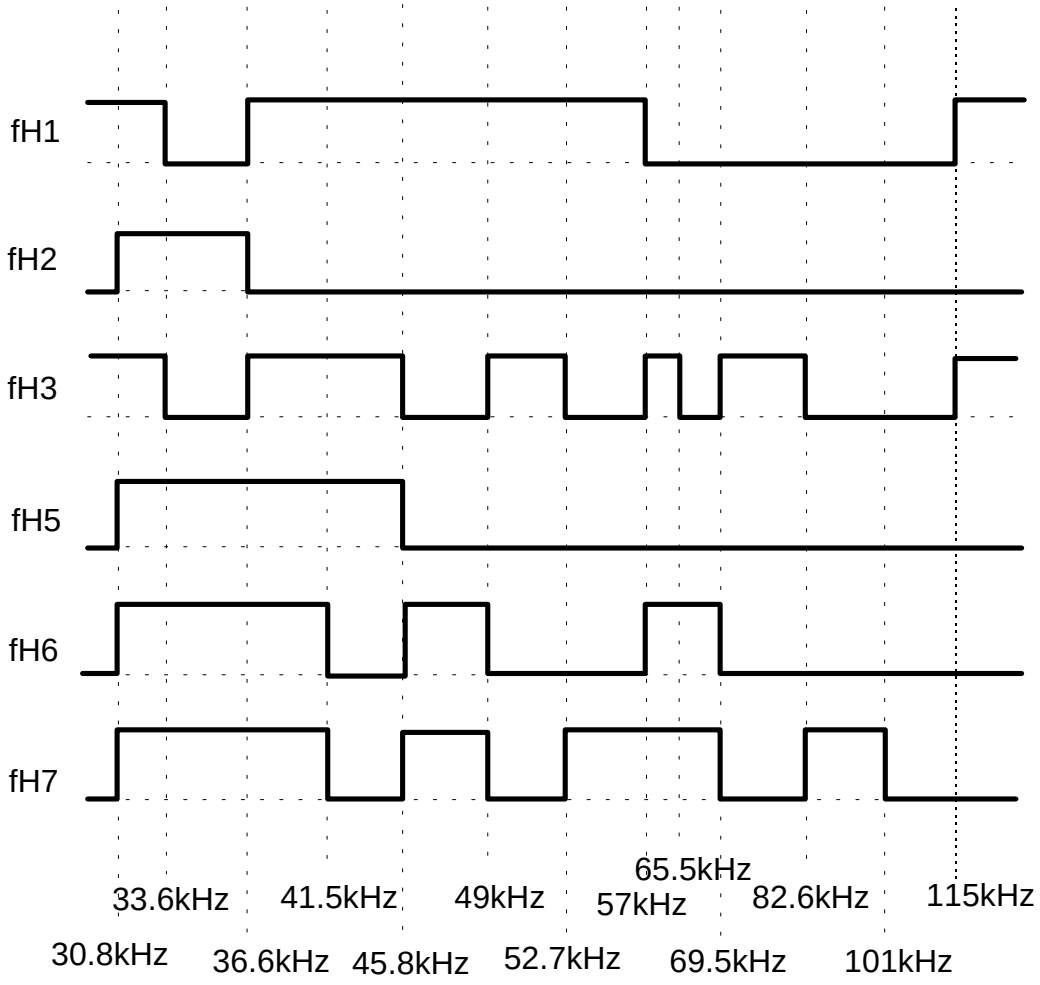
If Horizontal frequency is less than 1 kHz or Vertical frequency is less than 10 Hz, IC801 judges “NO PULSE”. And IC801 enters to “PMS MODE”.

b. I^2C BUS control

CPU (IC801) controls the following ICs through I^2C BUS.

DAC	IC751(M62393FP)、IC532(M62392FP)
PREAMP	IC711(M52742ASP)
E^2PROM	IC802(24LC08,M24C08) 、IC8A1(24LCS21A)
I/O EXPANDER	IC571(M62320FP)
OSC IC(DSP)	IC501(HE6-0092)
OSD IC	IC791(M35070-050FP)
SUB CPU	IC851(MC68HC705BD32FU)
AUTO SIZE IC	IC8M1(BU6483K)

c. Fh Band



(Fig. 6.1) Output fh Band status (IC571)

Attention: fH1 to 7 Band signals are output for horizontal output circuit control to keep the horizontal linearity constant.

d. Degaussing Control

Manual degaussing signal. IC801 pin 53 becomes High for 3 seconds when user presses the “PROCEED” switch while “DEGAUSS” (MENU(u) - “BRIGHTNESS & CONTRAST”) or “GLOBALSYNC” (MENU(u) - “TOOL2”) is highlighted, the monitor is powered on.

DAC - ”ROTATE”,”GLOBALSYNC”, and “CONVERGENCE” data value is set to center, while degaussing. This pin will be LOW in normal condition.

2) DC Control Circuit

CPU (IC801) controls three DAC ICs (IC532, IC751, IC711) through I^2C BUS. Its analog outputs control DAC output so that the analog voltage corresponds to the DC control data from CPU. IC802 is an EEPROM which stores the DC control data for preset graphics standard timings.

Table 1 Summary of DAC control (IC532 on DEF PWB: CS0=CS1=CS2=0)

PORT	NAME	Summary
A01	COR_LT	Corner Landing Adjustment (LEFT TOP)
A02	ROT	Raster Rotation Adjustment
A03	EMF	Earth Magnetic Field Correction
A04	H_LIN	Horizontal Linearity Adjustment
A05	FV_L2	Vertical Filter Switch 2
A06	FV_L3	Vertical Filter Switch 3
A07	FV_L1	Vertical Filter Switch 1
A08	HS	Horizontal Size Adjustment
A09	HSM	Horizontal Maximum Size Adjustment
A10	COR_RB	Corner Landing Adjustment (RIGHT BOTTOM)
A11	COR_RT	Corner Landing Adjustment (RIGHT TOP)
A12	COR_LB	Corner Landing Adjustment (LEFT BOTTOM)

Table 2 Summary of DAC control (IC751 on VIDEO PWB: CS0=1 CS1=CS2=0)

PORT	NAME	Summary
A01	-	Not in use
A02	SUB_BIAS	CRT Cut off adjustment
A03	G_BIAS	CRT Cut off adjustment (Green)
A04	G_BRT	Brightness tracking adjustment (Green)
A05	B_BRT	Brightness tracking adjustment (Blue)
A06	B_BIAS	CRT Cut off adjustment (Blue)
A07	R_BIAS	CRT Cut off adjustment (Red)
A08	R_BRT	Brightness tracking adjustment (Red)

Table 3 Summary of DAC control (IC711 on VIDEO PWB)

PORT	NAME	Summary
D/A OUT1	SHARP1	Picture sharpness control 1
D/A OUT2	SHARP2	Picture sharpness control 2
D/A OUT3	SHARP3	Picture sharpness control 3
D/A OUT4	GAIN_ADJ	Video gain adjustment

3) Power Management System (PMS) Circuit

PMS circuits reduce power consumption. They have 3 modes of stand-by, suspend and off.

Table 4 PMS Mode (IC801)

Mode	Pin 22 PMS_SUS#	Pin 8 PMS_OFF#	Pin 54 POWER LED
On	High	High	Low
Stand-by	High	High	Low
Suspend	Low	High	Pulse(1KHz)
Off	Low	Low	High

a. Stand-by Mode

When the horizontal sync is not input, this monitor enters stand-by mode in a few seconds. The video signal of IC711 pin 29, 32, 35 are stopped by the video blank signal from IC801 pin 10. Then CPU (IC801) controls the DAC outputs of the I/O Expander(IC571) to high. (fH1~fH3 and fH5~fH7 becomes high.)

When the horizontal sync is input, this monitor returns to normal operation mode with the shortest recovery time.

b. Suspend Mode

When the vertical sync is not input, this monitor enters suspend mode in a few seconds. IC801 outputs pulse(1kHz) from pin 54. Because Q101 and Q102 toggle on-off alternately, LED111,LED112 and LED113 turn yellow. IC801 pin 22 outputs low to operate each power saving circuit. When the vertical sync is input to this monitor, it becomes normal operation mode with longer recovery time than stand-by Mode.

c. OFF mode

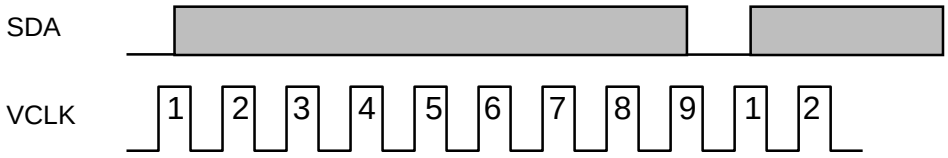
When the horizontal sync and vertical sync are not input, this monitor enters off mode in a few seconds. IC801 pin 8 becomes low, then IC8G2 (5V regulator) turns off.

4) Plug and Play (DDC 1 / 2)

VESA Display Data Channels (DDC)

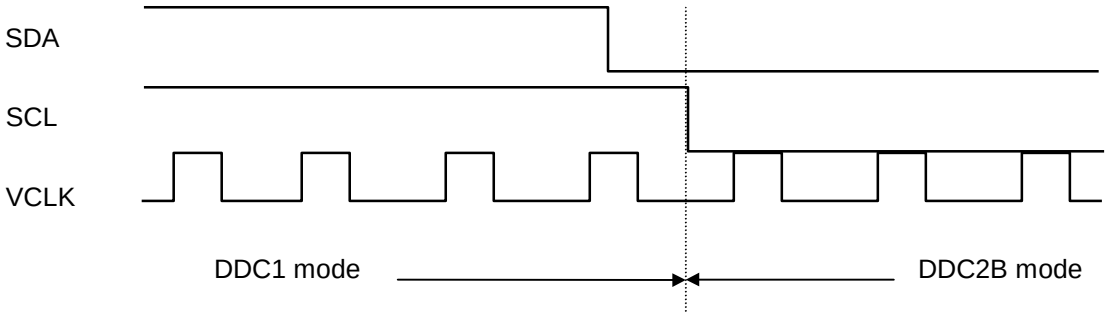
a. DDC1

When the monitor is turned on, the operation mode starts in DDC1 mode. When the VCLK (SYNC) is provided to IC8A1 pin 7, serial data stream is generated from the IC8A1 pin 5 by synchronizing with the rising edge of the VCLK. The contents of the serial data (SDA) is called EDID, and it contains the information of monitor's specification and supported signals. The EDID is composed of 8 bits, 128 bytes, but the individual data is composed of 9 bits. The 9th bit is always low and is ignored. If 128 bytes are finished to generate, then the 24LCS21A starts to generate the first byte. This operation lasts continuously until the operation mode changes to DDC2B.



b. DDC2B

When the SCL (IC8A1 pin 6) input is changed from high to low, the operation mode changes from DDC1 to DDC2B. The output data is the same as DDC1 (EDID), but the communication protocol is different. In DDC2B mode, the serial data is communicated by I^2C-bus protocol. The operation mode never go back from DDC2B to DDC1 except by turning off the monitor.



5) User Control Operation

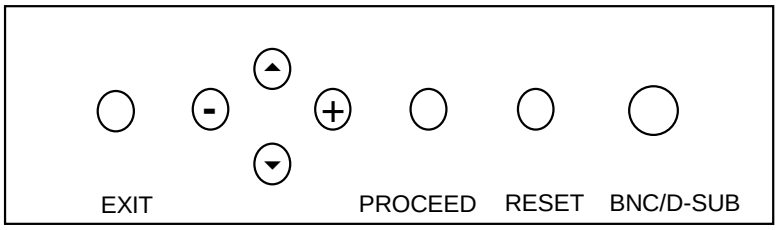
User Control Interface (IC801)

Table 5 Input (IC801)

Pushed SW	pin 33	pin 32	pin 34	pin 31	pin 30	pin 29	pin 28	pin27
EXIT	Low	High	High	High	High	High	High	High
-	High	Low	High	High	High	High	High	High
▼	High	High	Low	High	High	High	High	High
▲	High	High	High	Low	High	High	High	High
+	High	High	High	High	Low	High	High	High
PROCEED	High	High	High	High	High	Low	High	High
RESET	High	High	High	High	High	High	Low	High
BNC/D-SUB	High	High	High	High	High	High	High	Low

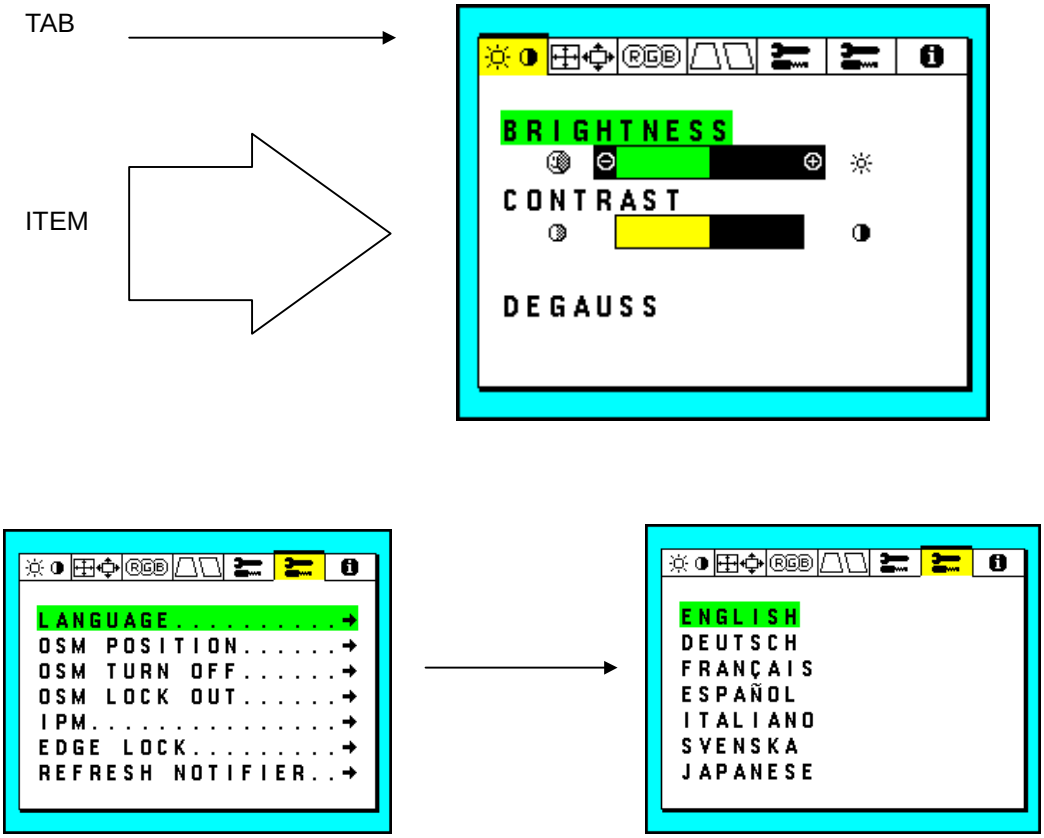
a. OSD

This model is adjusted through OSD (On Screen Display ; it is called OSM™ in the USA), by operating Control Panel. It is located on the lower center of front panel.

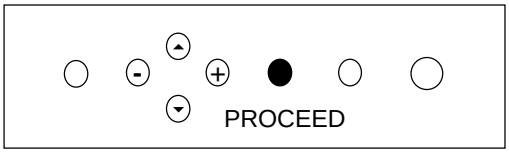


(Fig. 6.2) Control Panel

b. OSM MENU structure is as below. (It is structured “TAB”, “SUB MENU”)



press “PROCEED”



(Fig. 6.3) SUB MENU

Table 6 USER CONTROL SWITCH FUNCTION

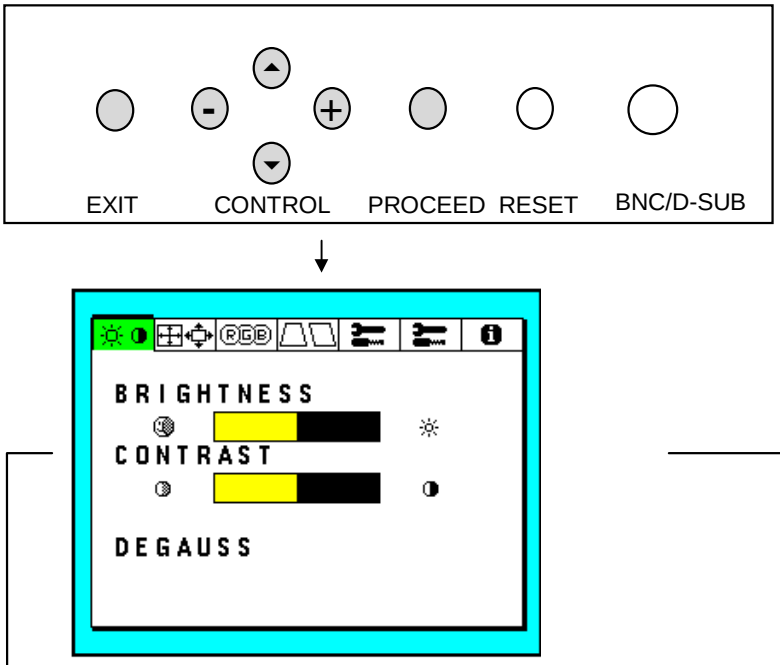
MENU	KEY	“EXIT”	“-”	“+”	“▲”	“▼”	“PROCEED”
TAB	TAB		●	●			
TAB	ITEM					●	
ITEM	SUBMENU						●
ITEM	ITEM				●	●	
SUBMENU	ITEM	●					
ITEM	TAB	●			●*	●**	
ALLITEM	TAB	●					

* : Valid only if highlighted bar is on top ITEM

** : Valid only if highlighted bar is on bottom ITEM

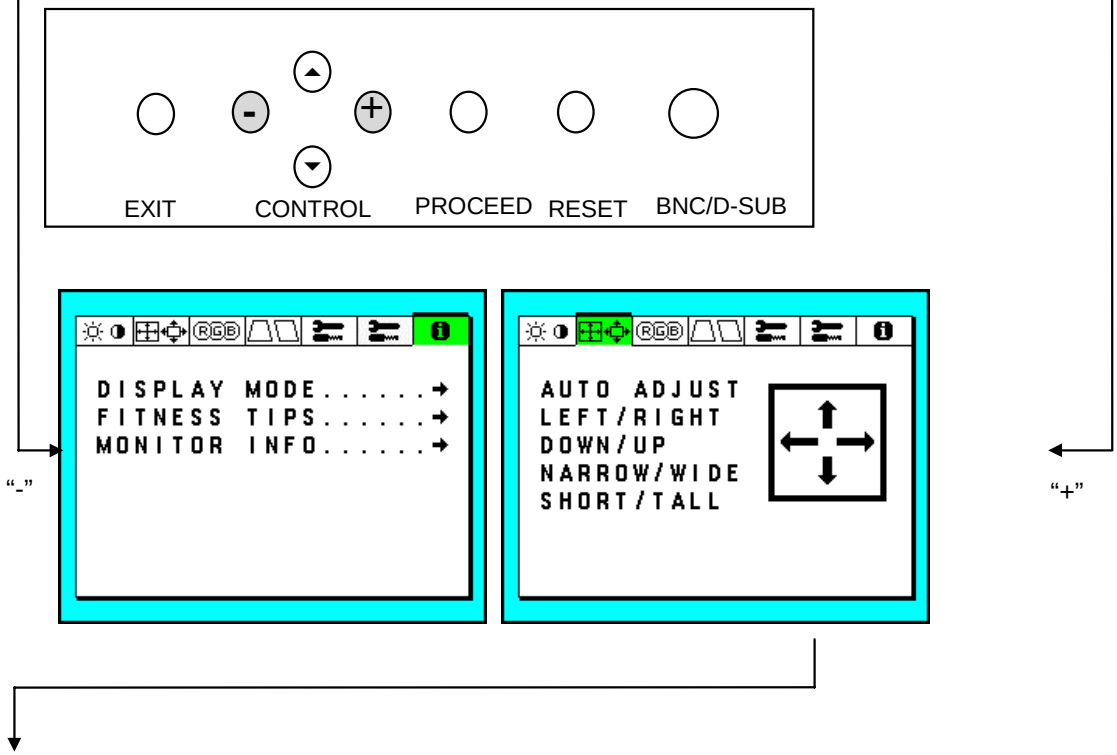
c. How to display OSM MENU

MENU(u) : Press “EXIT” or “-”, “+”, “▲”, “▼”, “PROCEED” once when OSM MENU is not displayed.

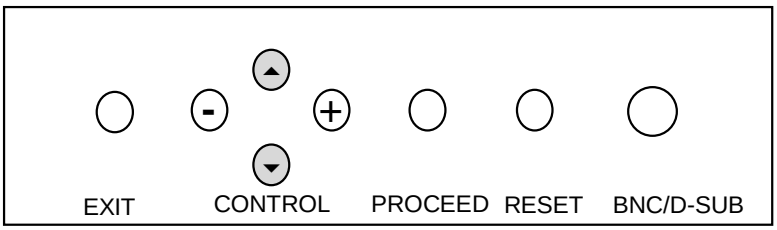


d. How to change TAB

press “-” OR “+” switch while highlighted bar is on TAB

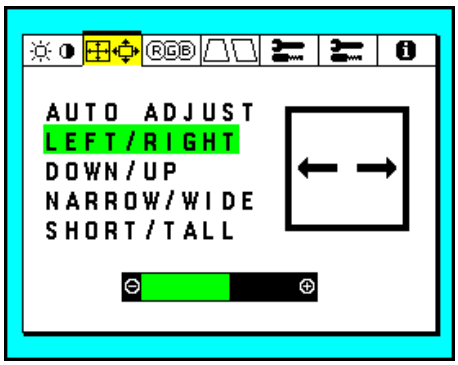


e. Select ITEM



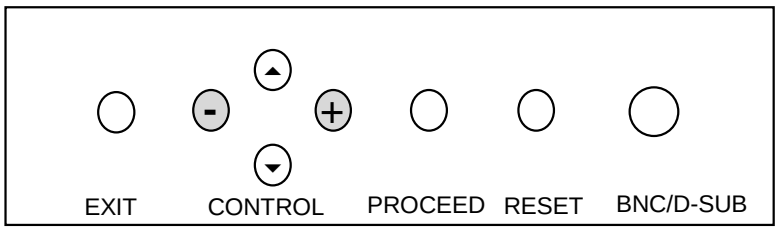
Press "▲" or "▼" switch

"▼"

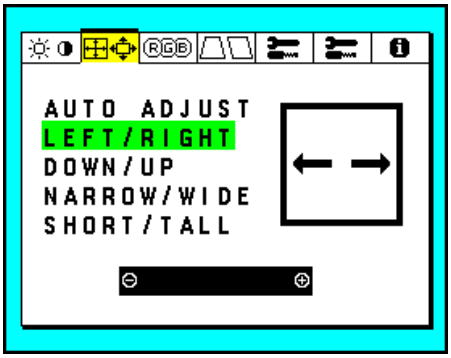


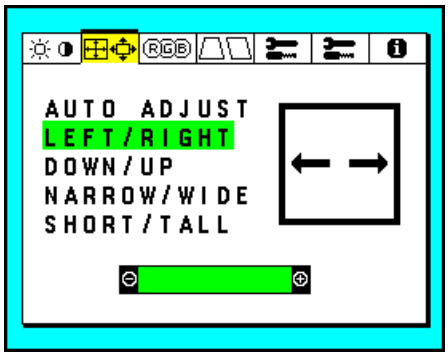
6) Change DATA Value

Press "-" or "+" switch while highlighted BAR is on ITEM



"-"

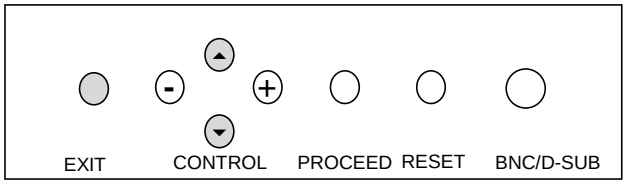




"+"

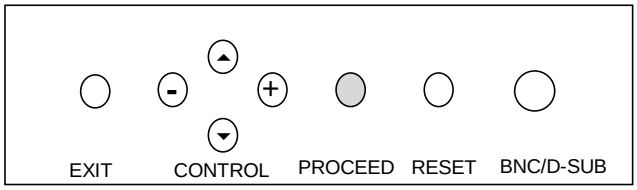
7) Save DATA Value To Memory

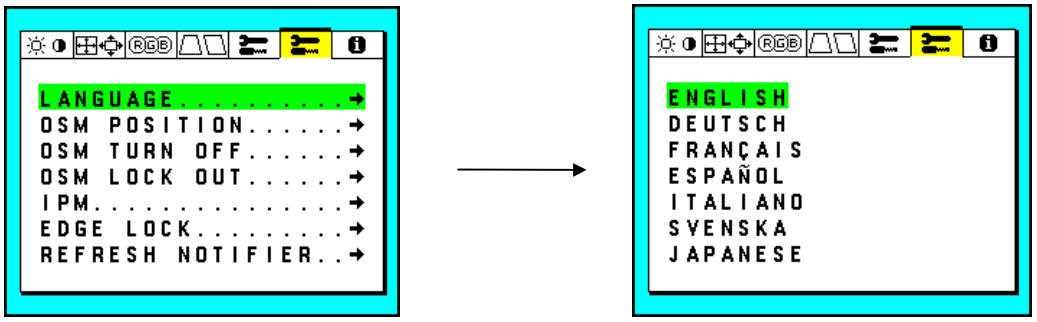
Move highlighted BAR to other “ITEM” or “TAB” (press “EXIT” or “▼”, “▲”)



8) Open SUB MENU

Press “PROCEED” switch when the highlighted “ITEM” contains “..→”



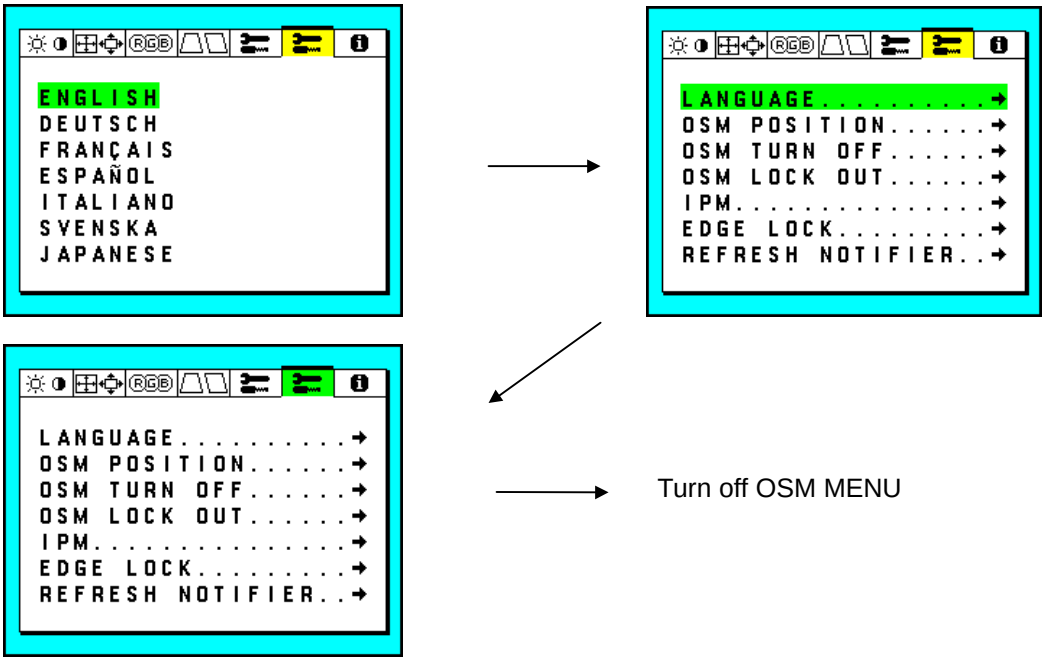


9) Turn off OSM MENU

Press “EXIT” switch once : when highlighted BAR is on “TAB”

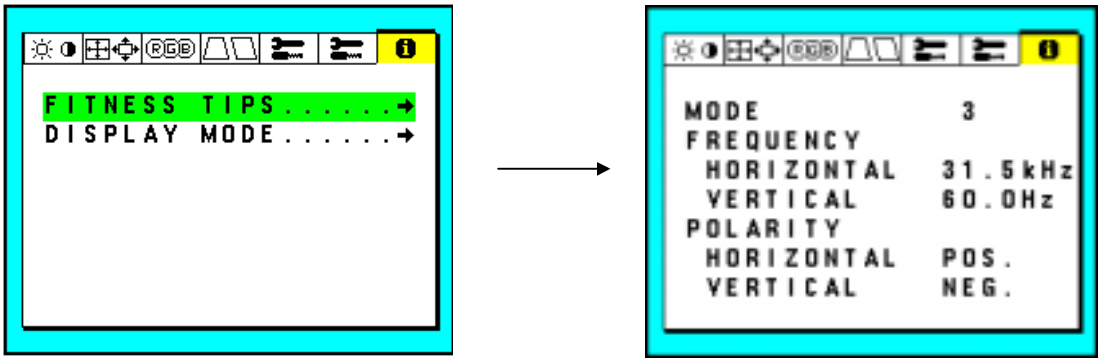
twice : when highlighted BAR is on “TAB”

three times : when entering “SUB MENU”

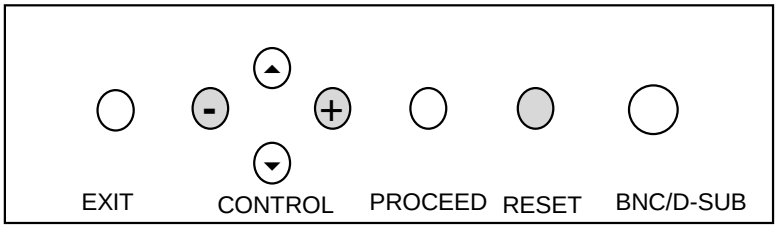


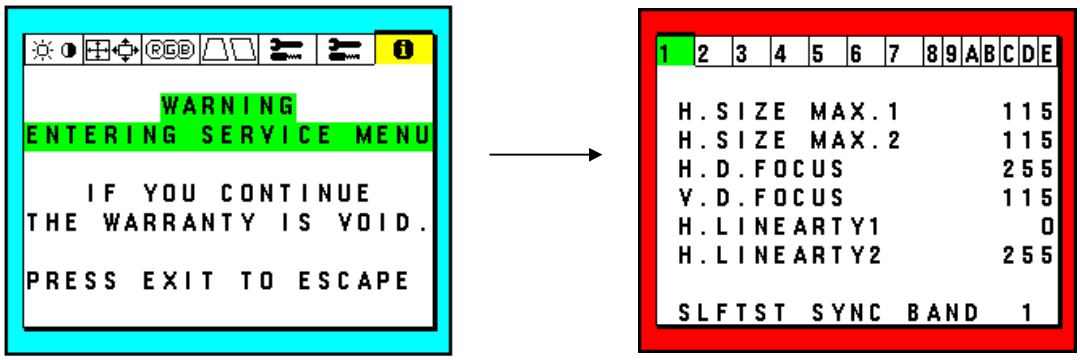
10) Open MENU(S)

Open menu “INFORMATION” - “DISPLAY MODE”



then press “RESET” and “+”, “-” switch at same time

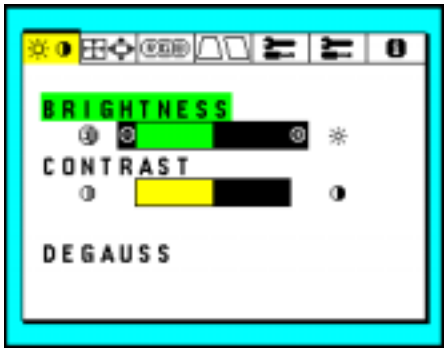




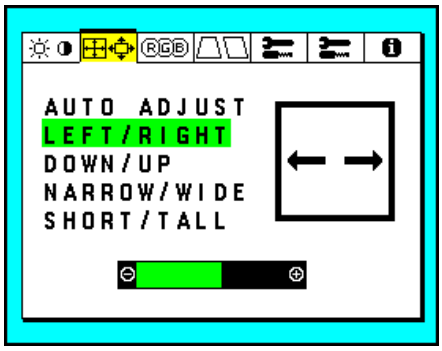
A warning message will be displayed, then press “PROCEED”

• OSM MENU Structure

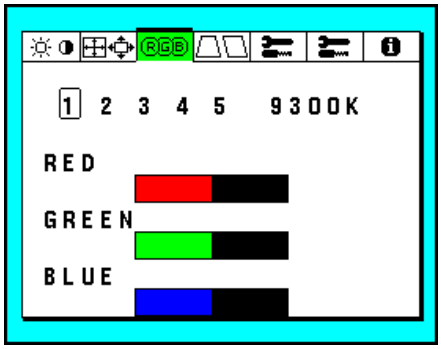
1. MENU (u)



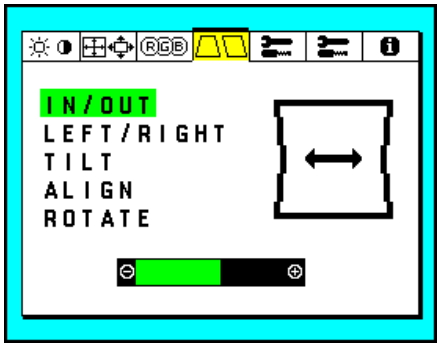
(Fig. 6.4) MENU(u) - “BRIGHTNESS&CONTRAST”



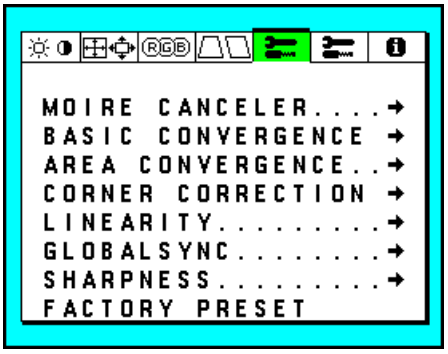
(Fig. 6.5) MENU(u) - “SIZE & POSITION”



(Fig. 6.6) MENU (u) - “RGB”

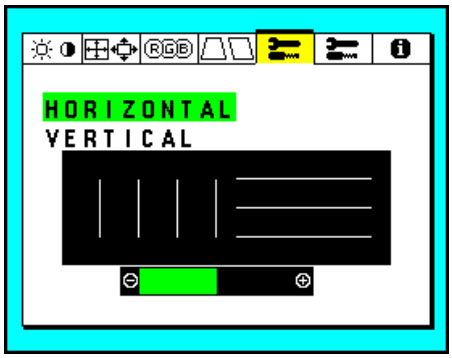


(Fig. 6.7) MENU(u) “GEOMETRY”

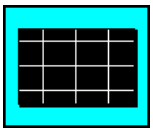


(Fig. 6.8) MENU(u) - “TOOL1”

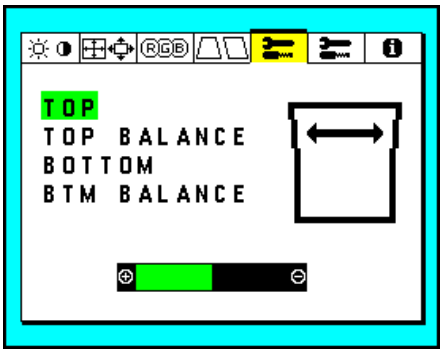
(Fig. 6.9) SUB MENU(u) - “MOIRE CANCELER”



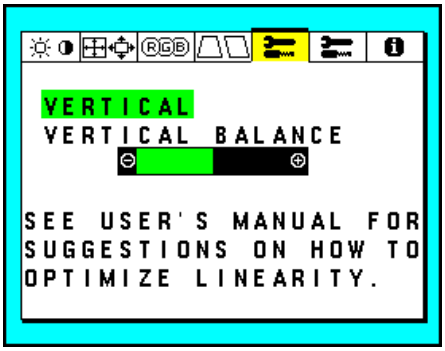
(Fig. 6.10) SUB MENU(u) - “BASIC CONVERGENCE”



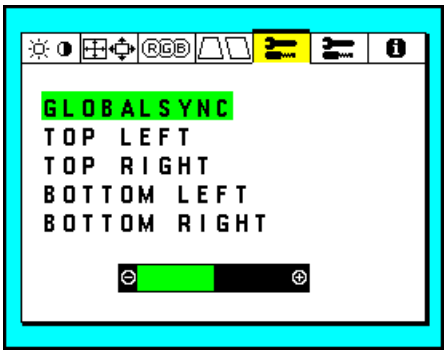
(Fig. 6.11) SUB MENU(u) - “AREA CONVERGENCE”



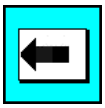
(Fig. 6.12) SUB MENU(u) - “CORNER CORRECTION”

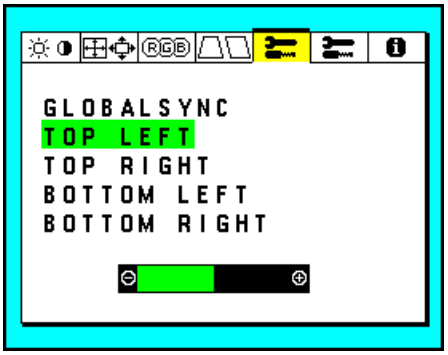


(Fig. 6.13) SUB MENU(u) - “LINEARITY”

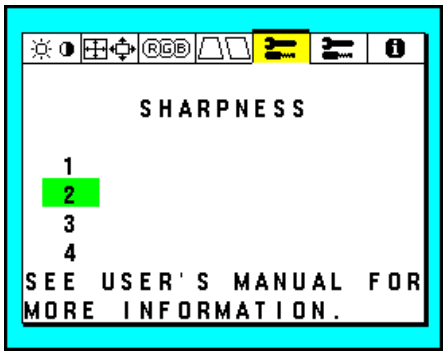


(Fig. 6.14) SUB MENU(u) - “GLOBALSYNC 1”



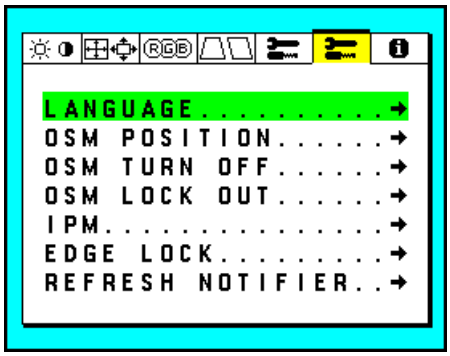


(Fig. 6.15) SUB MENU(u) - “GLOBALSYNC 2”



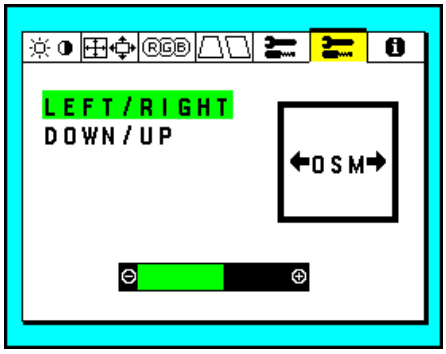
(Fig. 6.16) SUB MENU(u) -“SHARPNESS”

(Fig. 6.17) MENU(u) - “FACTORY PRESET”



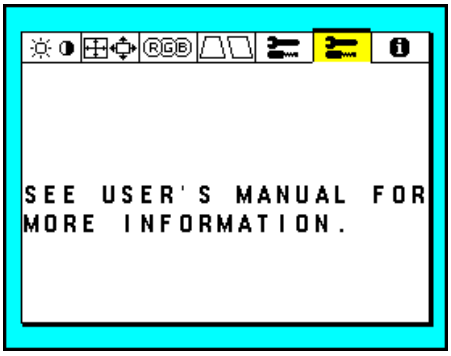
(Fig. 6.18) SUB MENU(u) - “TOOL2”

(Fig. 6.19) MENU(u) - “LANGUAGE”

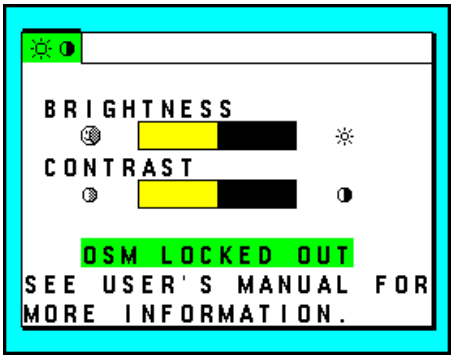


(Fig. 6.20) SUB MENU(u) - “OSM POSITION”

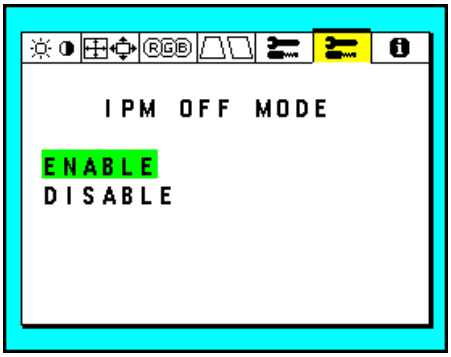
(Fig. 6.21) SUB MENU(u) - “OSM TURN OFF”



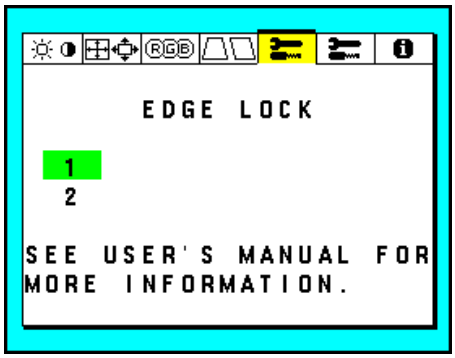
(Fig. 6.22) SUB MENU(u) - “OSM LOCK OUT1”



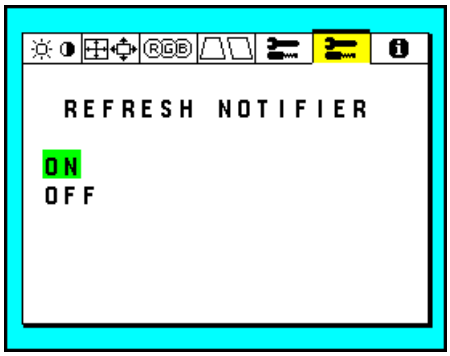
(Fig. 6.23) SUB MENU(u) - “OSM LOCK OUT2”



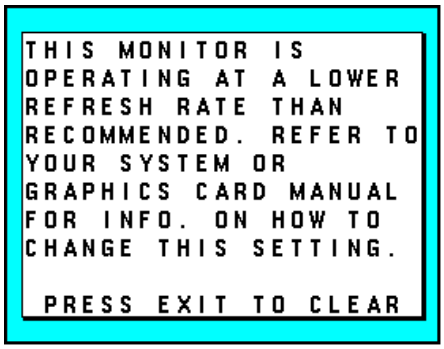
(Fig. 6.24) SUB MENU(u) - “IPM OFF MODE”



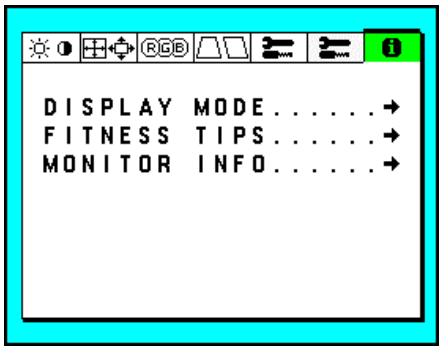
(Fig. 6.25) SUB MENU (u) - “EDGE LOCK”



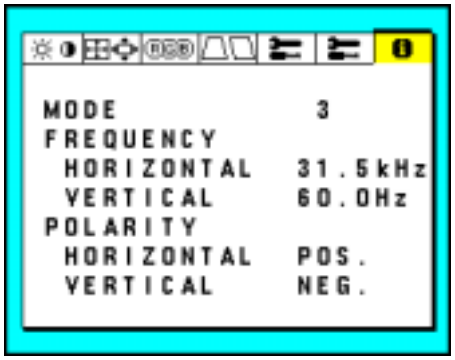
(Fig. 6.26) SUB MENU(u)- “REFRESH NOTIFIER”



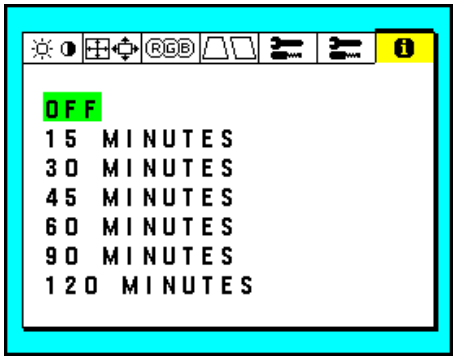
(Fig. 6.27) “REFRESH NOTIFIRE” MESSAGE“



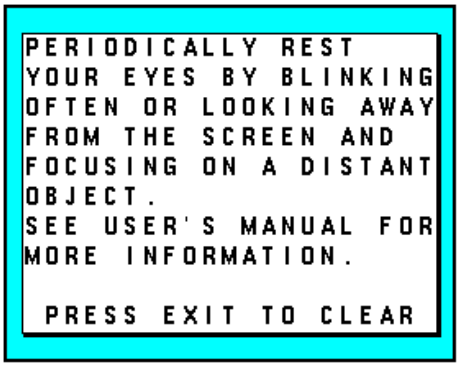
(Fig. 6.28) MENU(u) - “INFORMATION”



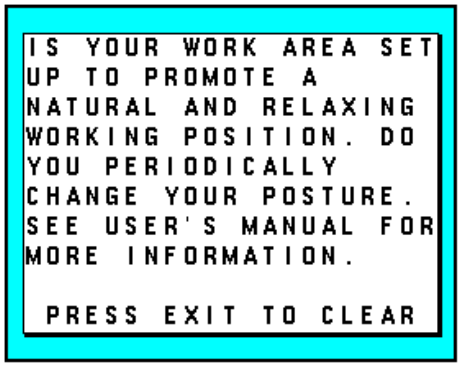
(Fig. 6.29) SUB MENU(u) - “DISPLAY MODE”



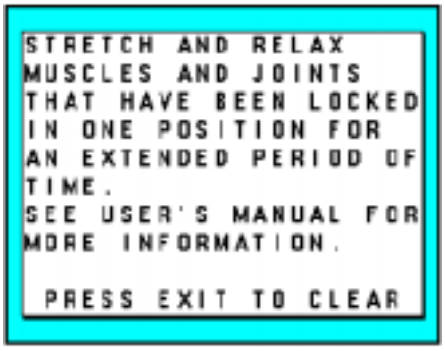
(Fig. 6.30) SUB MENU(u) - “FITNESS TIPS”



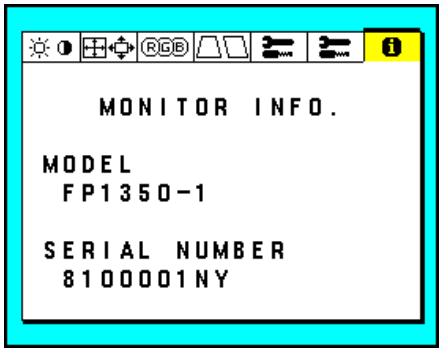
(Fig. 6.31) “FITNESS TIPS” MESSAGE-1



(Fig. 6.32) “FITNESS TIPS” MESSAGE-2

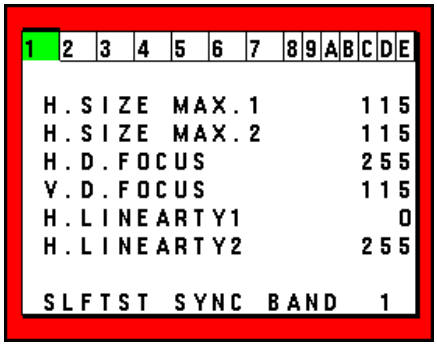


(Fig. 6.33) "FITNESS TIPS" MESSAGE-3

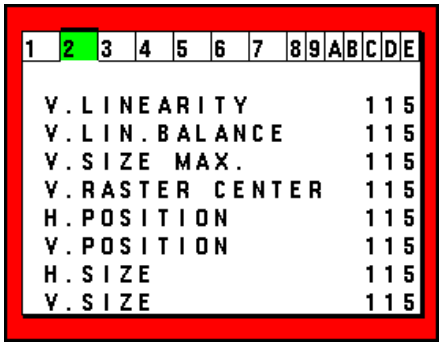


(Fig. 6.34) SUB MENU(u) - "MONITOR INFO."

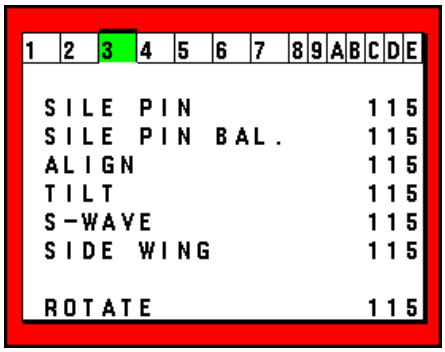
2. MENU(s)



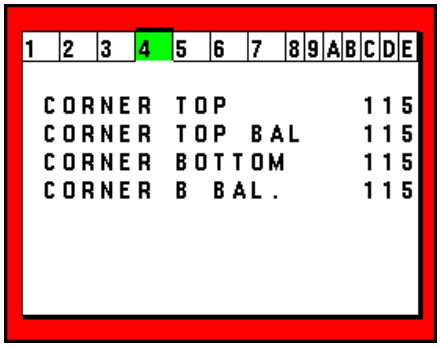
(Fig. 6.35) MENU(s) - TAG1



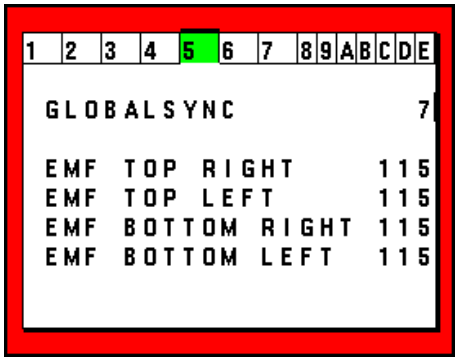
(Fig. 6.36) MENU(s) - TAG2



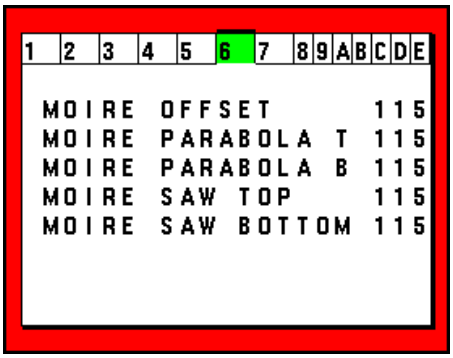
(Fig. 6.37) MENU(s) - TAG3



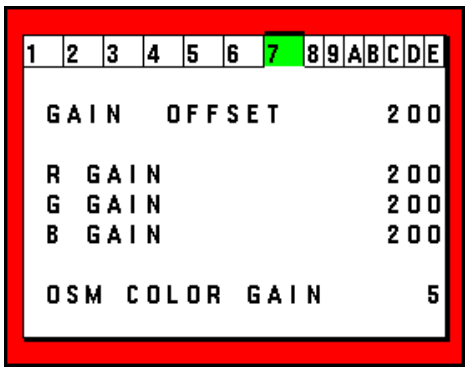
(Fig. 6.38) MENU(s) - TAG4



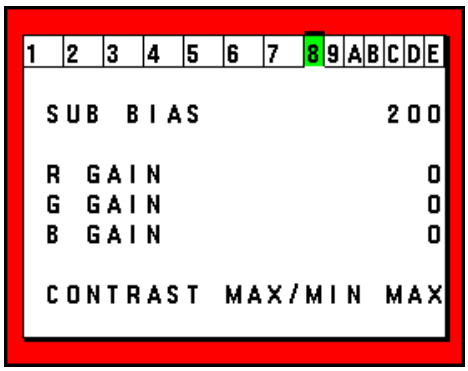
(Fig. 6.39) MENU(s) - TAG5



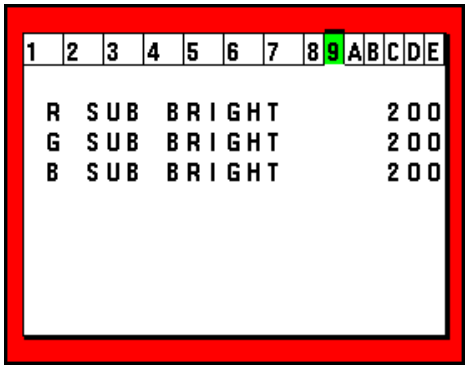
(Fig. 6.40) MENU(s) - TAG6



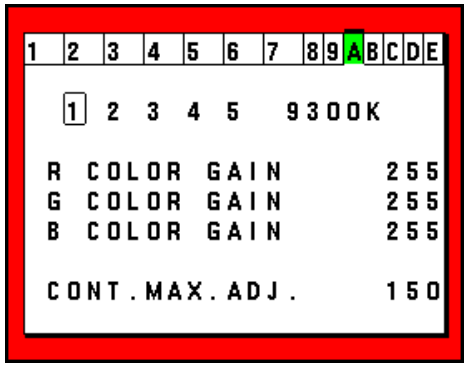
(Fig. 6.41) MENU(s) - TAG7



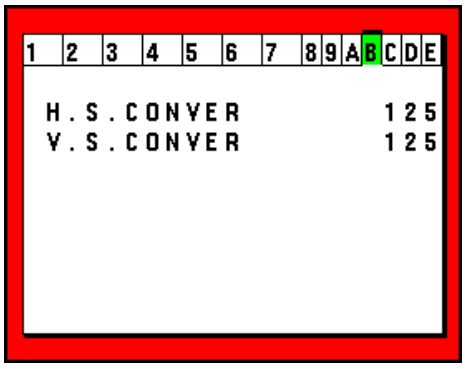
(Fig. 6.42) MENU(s) - TAG8



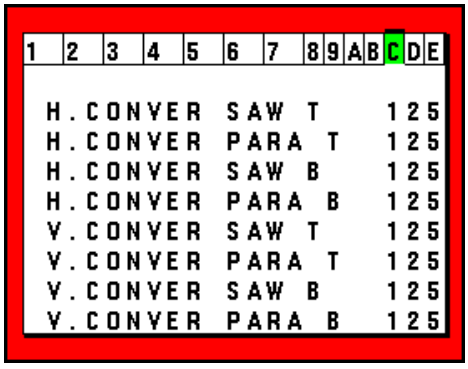
(Fig. 6.43) MENU(s) - TAG9



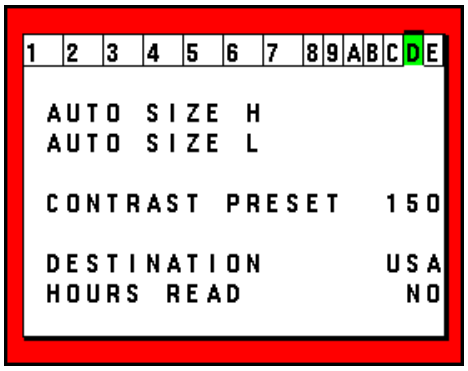
(Fig. 6.44) MENU(s) - TAG A



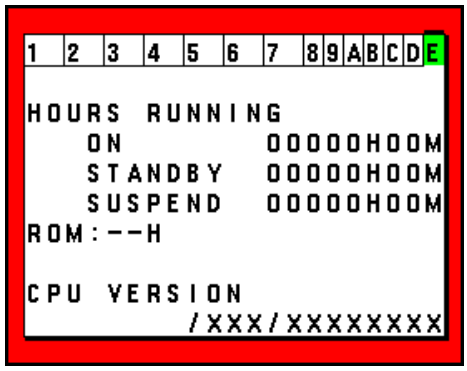
(Fig. 6.45) MENU(s) - TAG B



(Fig. 6.46) MENU(s) - TAG C



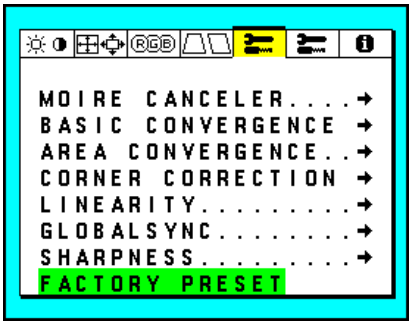
(Fig. 6.47) MENU(s) - TAG D



(Fig. 6.48) MENU(s) - TAG D

Factory Preset

Open Menu (u) - “TOOL1”, then move highlighted BAR to “FACTORY PRESET”



“Warning message” will be displayed, when “RESET” switch is pressed.

All user setting are set to “FACTORY PRESET” value when “PROCEED” switch is pressed.

Table 11 FACTORY PRESET

TAB	ITEM	preset value
BRIGHTNESS & CONTRAST	BRIGHTNESS	SET TO FACTORY PRESET
	CONTRAST	A/R/AS ver.:MAXIMUM B ver.:90cd
	DEGAUSS	---
SIZE & POSITION	ALL ITEMS	SET TO FACTORY PRESET
RGB	12345	NO. 1 (9300K)
	RED, GREEN, BLUE	SET TO FACTORY PRESET
GEOMETRY	ALL ITEMS	SET TO FACTORY PRESET
TOOL1	MOIRE CANCELER	MODE : OFF LEVEL : MINIMUM
	BASIC CONVERGENCE	SET TO FACTORY PRESET
	AREA CONVERGENCE	SET TO FACTORY PRESET
	CORNER CORRECTION	SET TO FACTORY PRESET
	LINEARITY	SET TO FACTORY PRESET
	GLOBALSYNC	SET TO FACTORY PRESET
	SHARPNESS	MODE 2
TOOL2	LANGUAGE	NO CHANGE
	OSM POSITION	SET TO FACTORY PRESET
	OSM TURN OFF	30 SECONDS
	OSM LOCK OUT	---
	IPM	NO CHANGE
	EDGE LOCK	NO CHANGE
	REFRESH NOTIFIER	MODE:OFF
INFORMATION	FITNESS TIPS	OFF

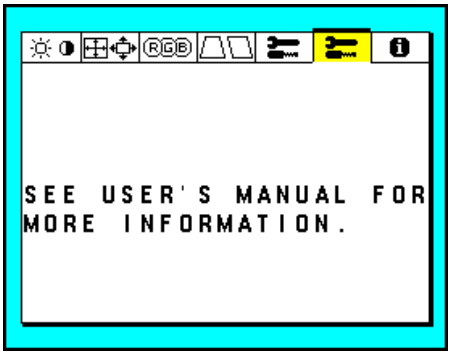
FITNESS TIPS

How to confirm “FITNESS TIPS” message.

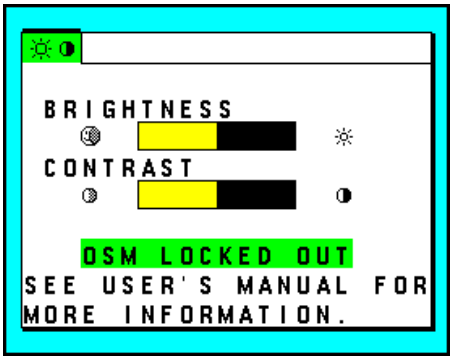
1) Open SUB MENU (u) - “INFORMATION” - “FITNESS TIPS”
2) Press “+” and “—” switch together, then message will be displayed.
3) Press “+” switch, then message will change.
4) Press “+” switch, then message will change.
5) Press “+” switch, the SUB MENU(u) - “INFORMATION” - “FITNESS TIPS” will be displayed.

OSM LOCK OUT

1) Open MENU (u) - “TOOL2”
2) Move highlighted BAR to “OSM LOCK OUT”
3) Press “PROCEED” switch while “OSM LOCK OUT” is highlighted, then message will be displayed as below.



4) Press “▲” and “PROCEED” switch together, then message will be displayed as below, and OSM is locked out.



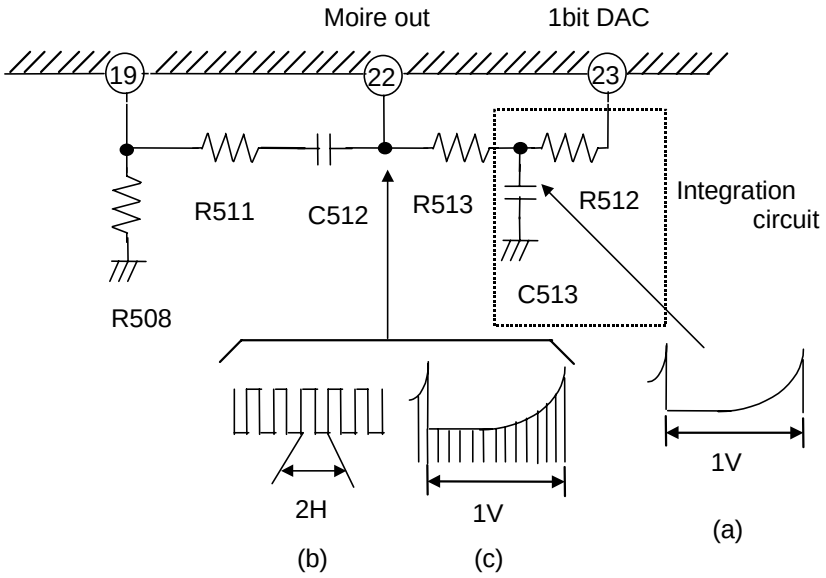
5) Any control switch does not work while OSM is locked out.
6) To unlock “OSM LOCK OUT”, press “▲” and “PROCEED” switch together when the above message is displayed.

7. MOIRE CANCELLER

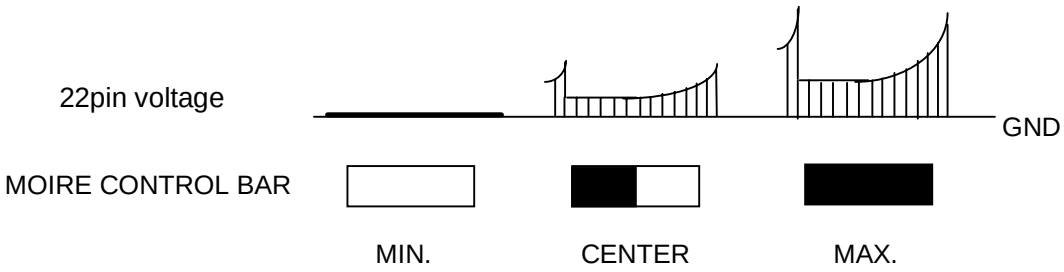
MOIRE canceler circuit is constructed by IC501 and its peripheral circuits. IC501 generates moire canceling signal which the period is double the horizontal and vertical wave signals controlled by MPU data. The moire canceling signal which is modulated by vertical period is output from 1bit D/A converter at pin 23. The output signal at pin 23 is integrated by integrated circuit which is composed of R512 and C513.

The waveform at C513 is vertical periodic signal shown on the diagram (a). The function of this signal is to cancel moire in all screen area with changing vertical modulation value. When the moire cancel function is activated, pin 22 outputs the square wave signal shown on the diagram (b). This square wave signal is combined with C513 signal by R513, and the combined signal is added to pin 19 via C512 and R511. Pin 22 output signal is shown on this diagram (c). When moire canceler control is operated, the signal at pin 22 is shown on the Fig. 7.2.

Moire cancel vertical modulation items in OSM menu such as “MOIRE SAW TOP” and “MOIRE PARABOLA T” are set to fixed value. These control items do not have to be adjusted.



(Fig. 7.1) MOIRE canceler circuit



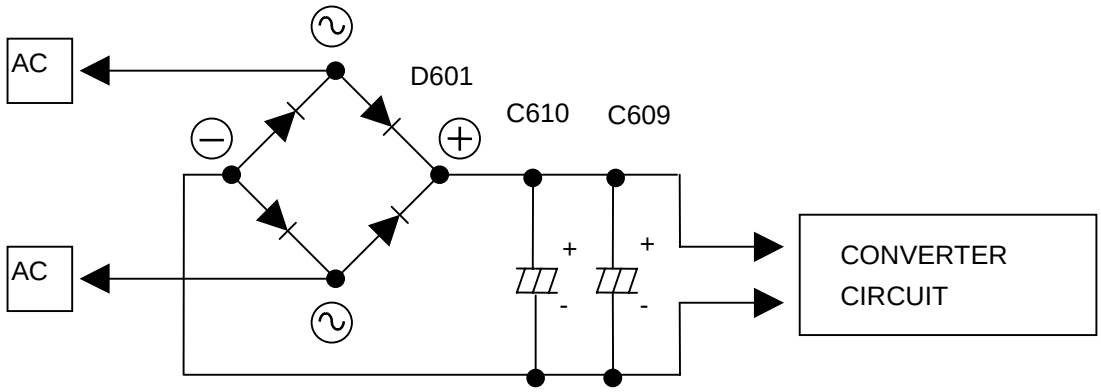
(Fig.7.2) 22 pin voltage when moire canceler is operated.

8. SWITCHING REGULATOR CIRCUIT

8-1. Rectifying and Smoothing Circuit

AC input is rectified by D601. Then, it is smoothed by C610 and C609.

The resulting DC voltage is supplied to the converter circuit.



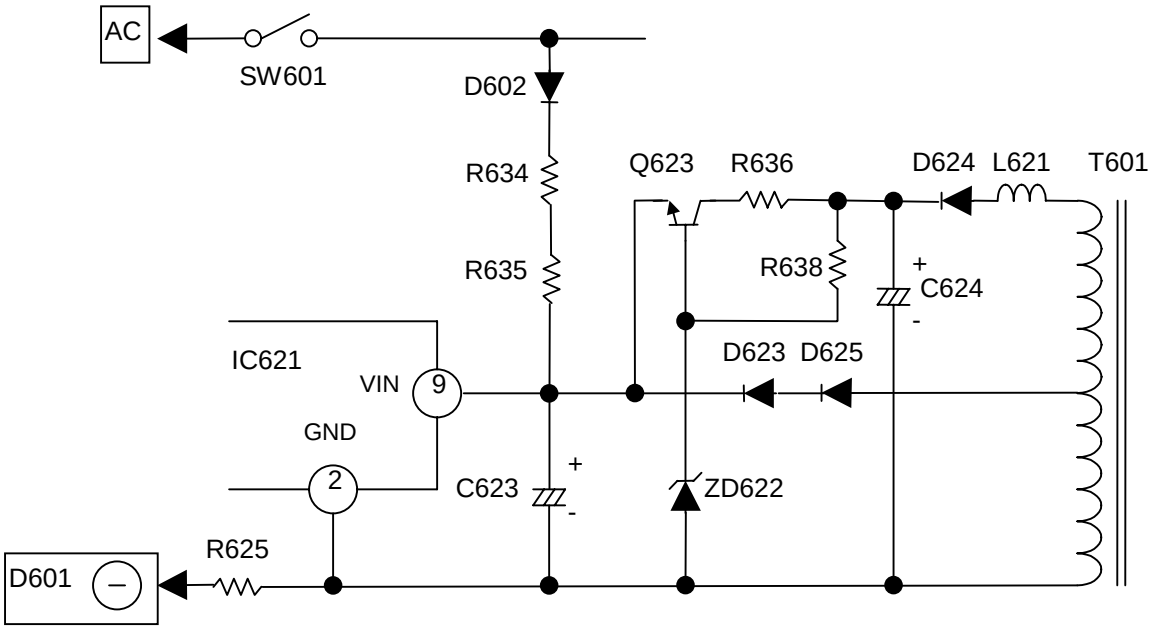
(Fig. 8-1) Rectifying and Smoothing Circuit

8-2. Auxiliary Power Supply Circuit

The auxiliary power supply circuit need to activate IC621. When the power switch is turn on, the current flows into the capacitor C623 through R634, R635 and D602. Oscillation starts when the voltage of IC621 pin 9 reaches 8V by this action.

After the start of oscillation, the fly-back voltage of the auxiliary winding of T601 is rectified and smoothed by D625,D623 and C623.

The resulting DC voltage is supplied to IC621 pin 9.

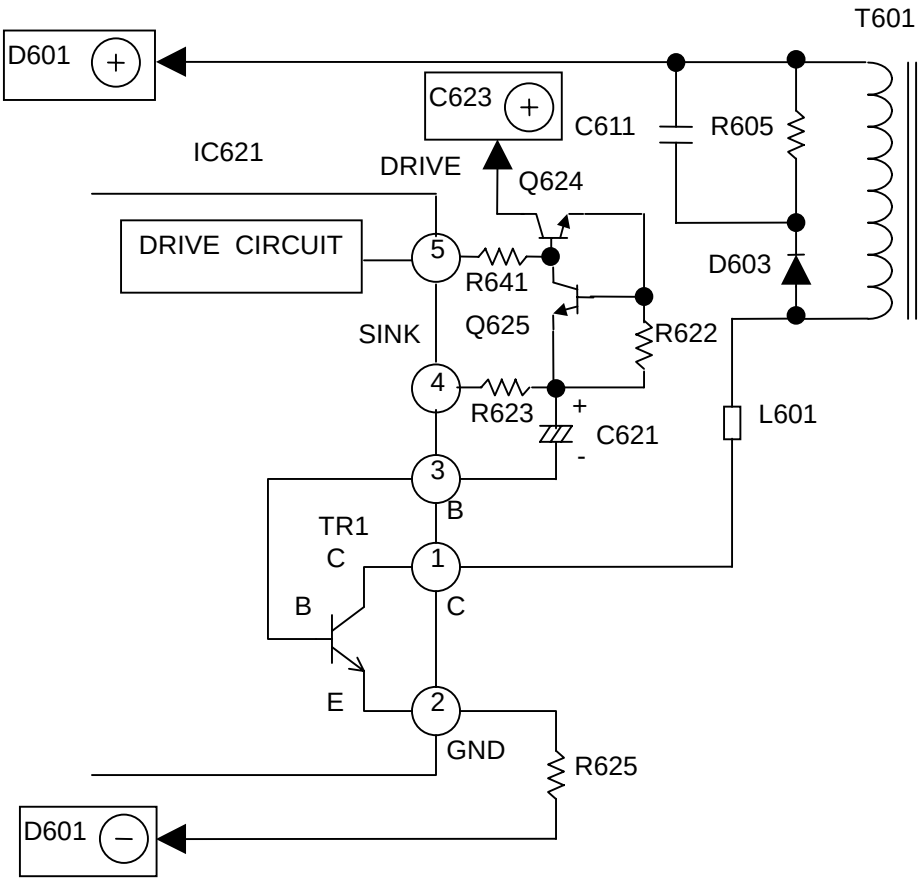


(Fig.8-2) Auxiliary Power Supply Circuit

8-3. Converter Circuit

The converter circuit consists of the primary winding of T601, a switching device TR1(internal IC621) and surge absorbers (C611, R605 and D603) which are connected to the primary winding of T601.

The oscillating signal through IC621 pin 5,Q624,R622 and C621 applied to IC621 pin 3(the base of TR1) so that the collector-emitter is turned ON and OFF. In result, the oscillating voltage is applied to the primary winding of T601.

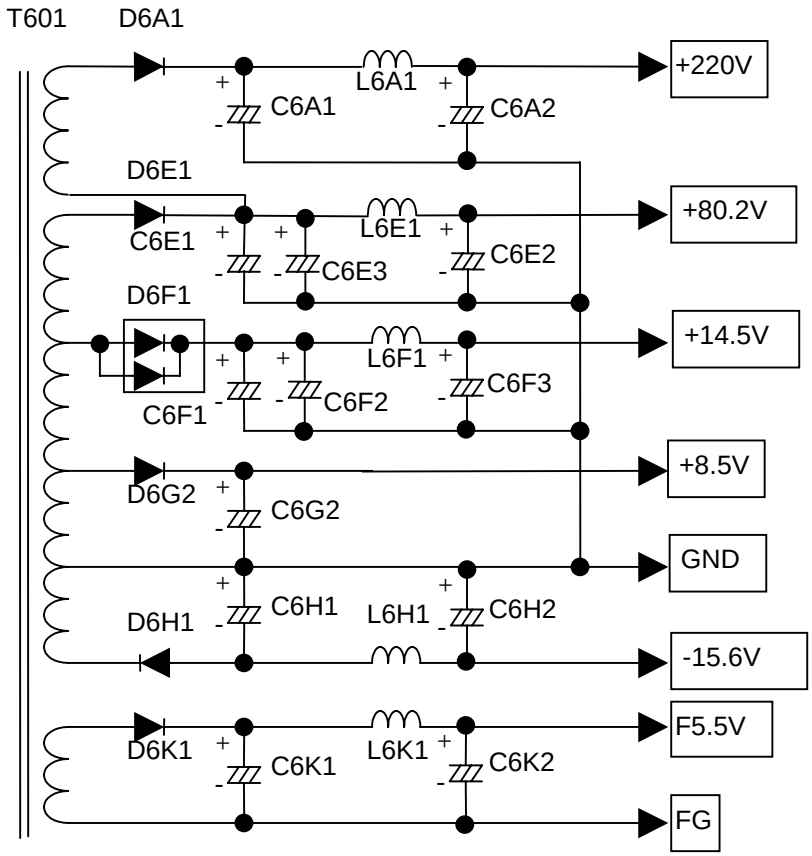


(Fig.8-3) Converter Circuit

8-4. Output Rectifying and Smoothing Circuit

The fly-back voltages which are generated at the secondary windings of T601 are rectified by D6A1, D6E1, D6F1, D6G2, D6H1 and D6K1. Then, these voltages are smoothed by C6A1, C6A2, C6E1, C6E2, C6F1, C6F2, C6F3, C6G2, C6H1, C6H2, C6K1 and C6K2 so that DC voltages are obtained.

The DC voltages are maintained constantly by controlling the ON period duty cycle of TR1 (internal IC621) in the converter circuit.

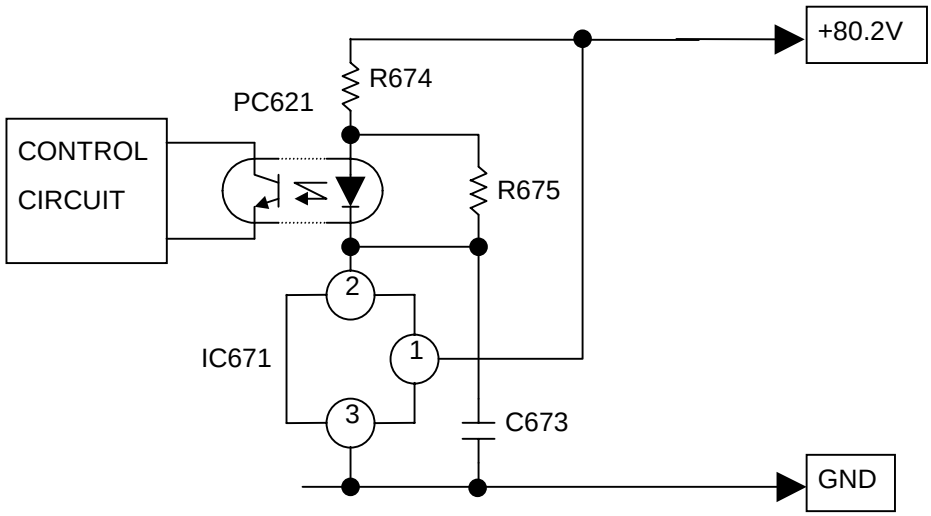


(Fig.8-4) Output Rectifying and smoothing Circuit

8-5. Error Detection Amplifier Circuit

The output voltage +80.2V is compared with the reference voltage at the error amplifier IC671.

An error signal is applied to the control circuit via the photocupler PC621.

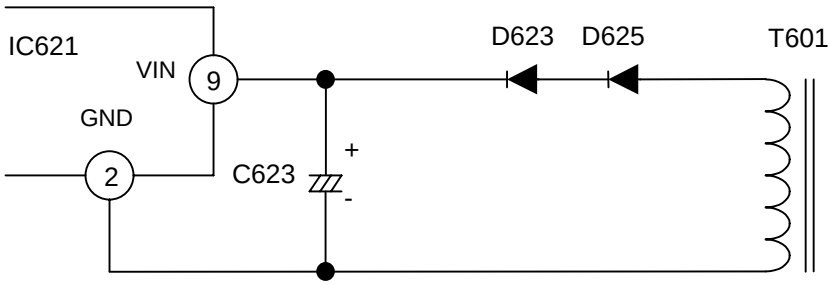


(Fig.8-5) Error Detection Amplifier Circuit

8-6. Over Voltage Protection

If some failure occurs and the output voltage of the secondary windings of T601 increase, the voltage of the auxiliary winding of T601 also increase proportionally. When the voltage of C623 and IC621 pin 9 increase.

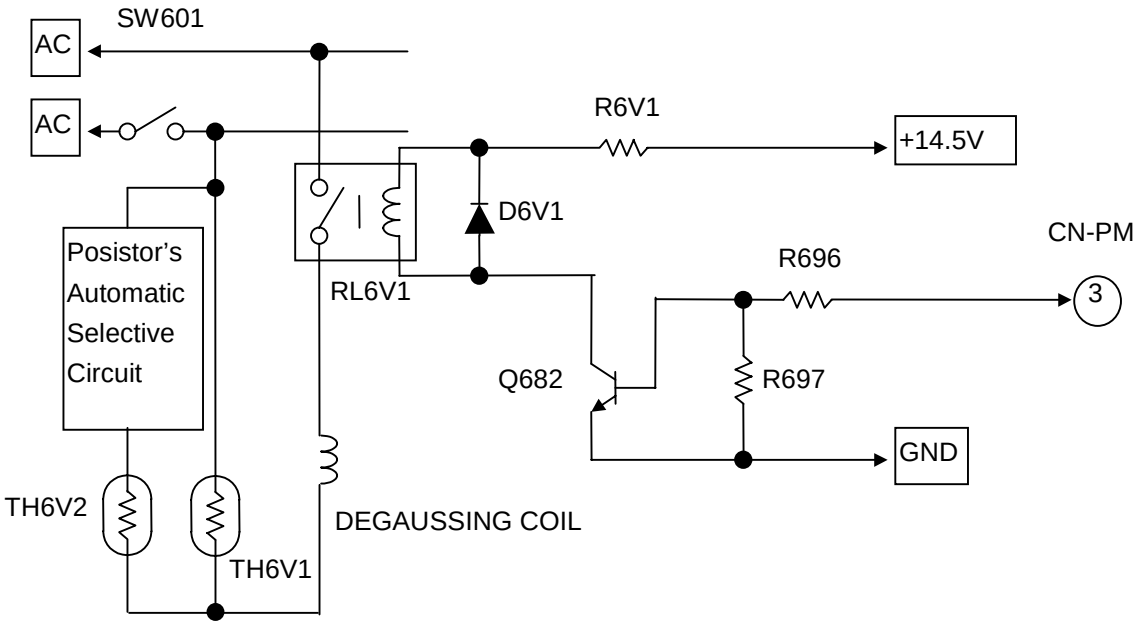
This action will stop the oscillator with in IC.



(Fig.8-6) Over Voltage Protection

8-7. Degaussing Circuit

When the power switch turns on, or when user accesses the OSM degauss control, the current flows from CN-PM pin 3 to the base of Q682. Then Q682 and RL6V1 turn on for 3 seconds.



(Fig.8-7) Degaussing Circuit

8-8. Posistor's Automatic Selective Circuit

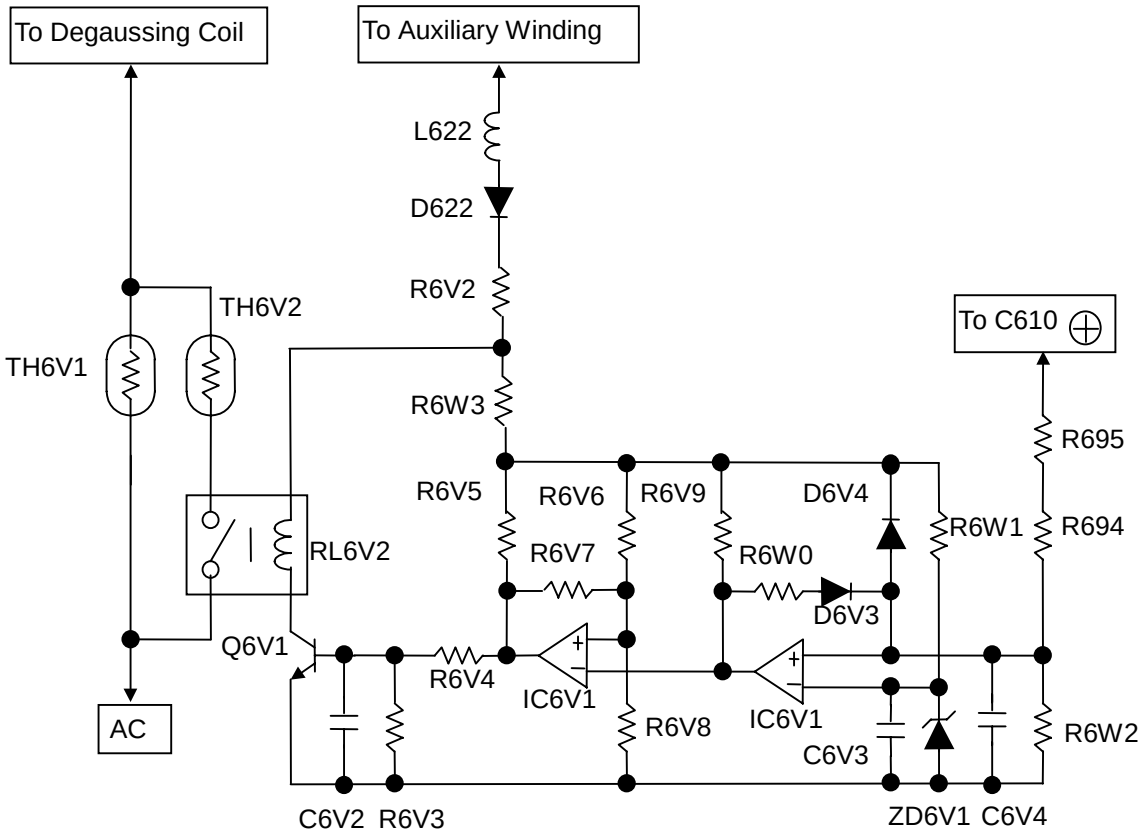
When the power switch is turn on, the voltage of C610 is detected by IC6V1.

If AC input voltage is less than AC 150V, IC6V1 output is high.

This will cause Q6V1 and RL6V2 to turn on.

Then the posistor TH6V2 is connected in parallel with TH6V1.

If AC input voltage is more than AC 150V, IC6V1 output is low. This will cause Q6V1 to turn off, and the posistor TH6V2 is not connected.



(Fig.8-8) Posistor's Automatic Selective Circuit

8-9. Over Current Protection

If some failure occurs and the total power of secondary outputs increase, the peak voltage of IC621 pin6 increases proportionally.

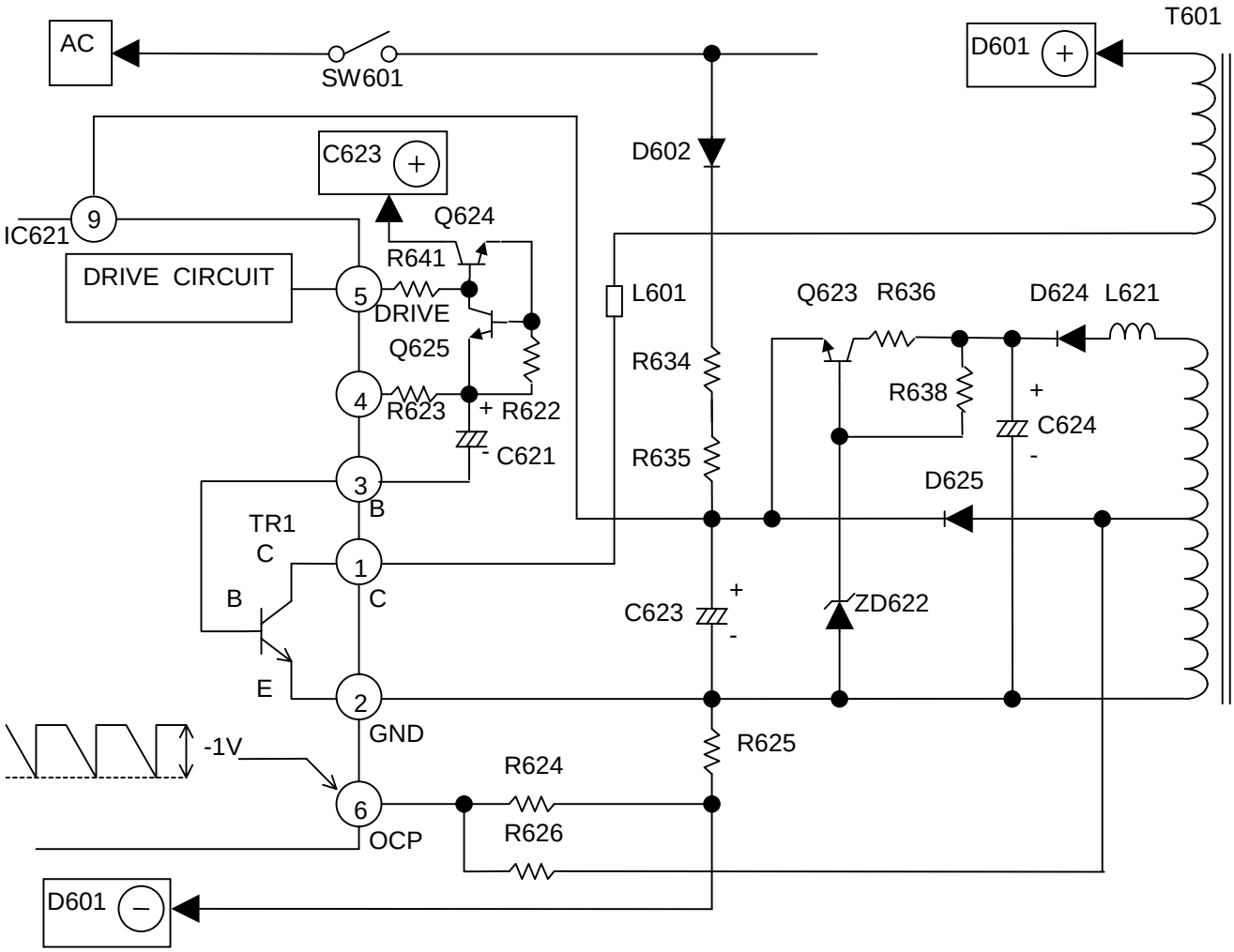
And when the peak voltage of IC621 pin 6 reaches -1V, IC621 decreases ON period duty cycle of TR1 (internal IC621).

And also the voltage of secondary outputs and the voltage of auxiliary winding of T601 decrease.

When the auxiliary winding T601 decreases below 5V, IC621 operation stop.

But the charging current flows into the capacitor C623 through R634, R635 and IC621 operation start when the voltage of IC621 pin 9 reaches 8V by this action.

So IC621 repeats the intermittent oscillation.



(Fig.8-9) Over Current Protection

8-10. Power Management System Circuit

When the horizontal and vertical Sync. are missing, the voltage of CN-PM pin 2 becomes low level and Q673 turn off and Q672 turn on.

As current flows via R673, R675 and D673 into a PC621 when Q672 turns on, each output voltage starts lowering and becomes stable. When the voltage of C671 “+” terminal (about +80V at normal output voltage), reduced to about +11V in this event.

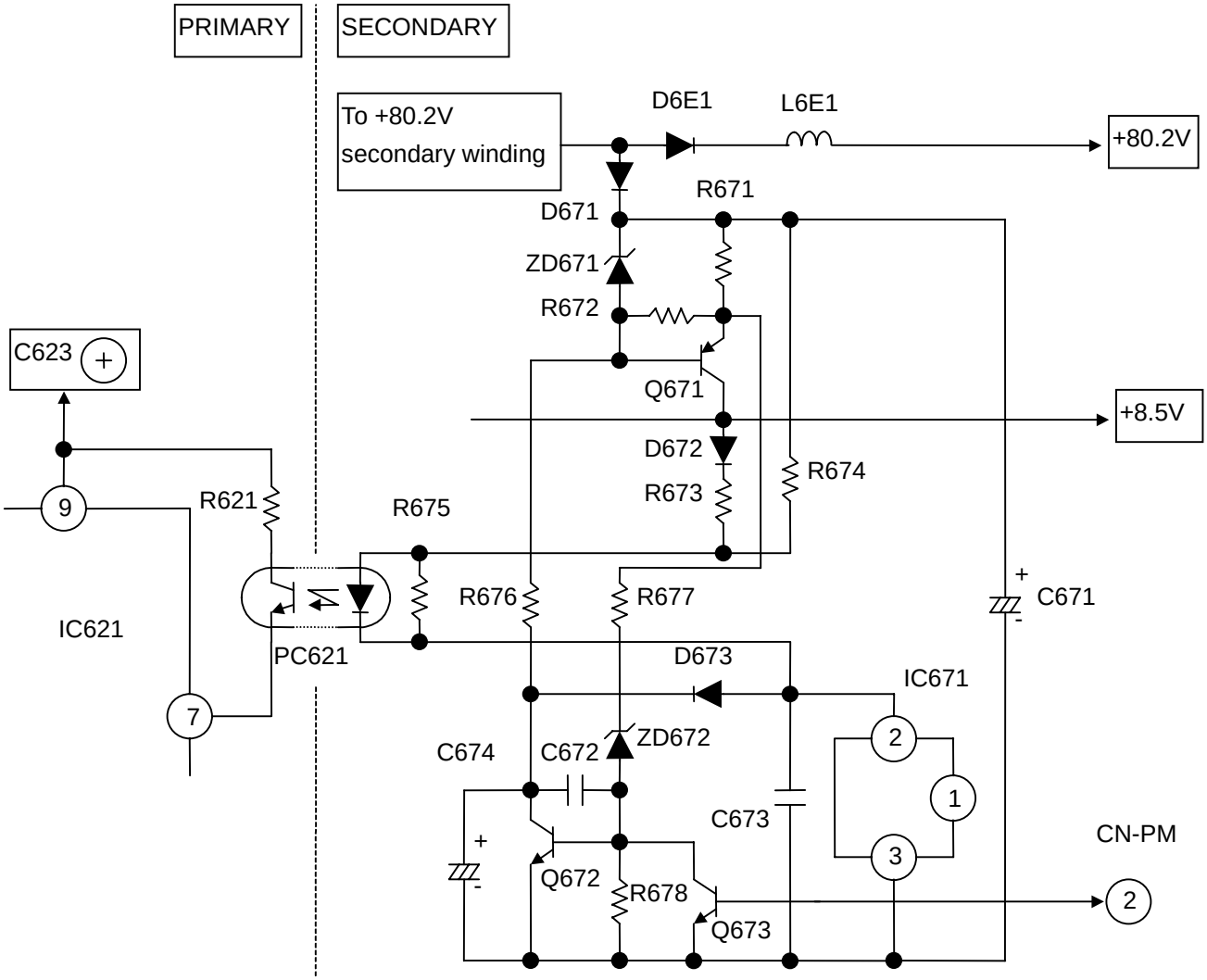
The stable power source for IC801 can be established by supplying C671 “+” terminal through R671 and Q671 while Q672 in on.

This is “SUSPEND STATE” and “OFF STATE” condition.

When the horizontal and vertical Sync applies again, the voltage of CN-PM pin 2 becomes high and Q673 turns on and Q672 turns off.

At this time, each output voltage rise and becomes stable at the normal output voltage.

And “ON STATE” is achieved.



(Fig.8-10) Power Management System Circuit

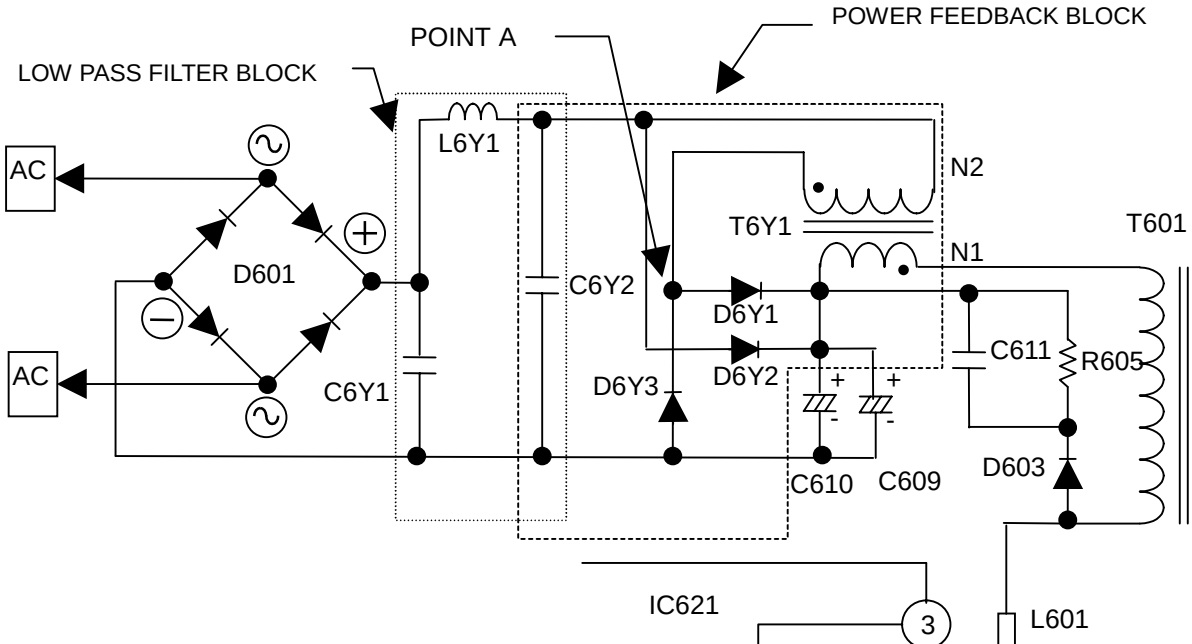
8-11. Power Factor Controller Circuit

This circuit is composed of Low pass filter block and Power feedback block. AC input is rectified by D601, then it charge C6Y2, C610 and C609.

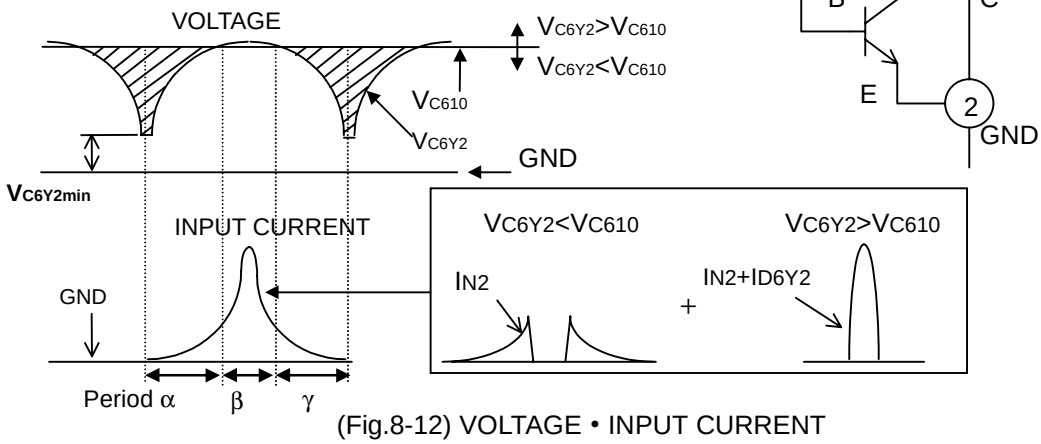
C610 is not charged during period α and period γ from input voltage directly, because the voltage of C6Y2 is smaller than the voltage of C610. Then, C610 is charged during period α and period γ by Power feedback block. When TR1 (internal IC621) turn on, the N1 winding of T6Y1 is charged with energy. When TR1(internal IC621) turn off, the N2 winding of T6Y1 discharge energy. So, the voltage of point A is the part of slant line(Fig.8-12 : VC610-VC6Y2).And C610 is charged with feedback energy during period α and period γ , because the voltage of point A is bigger than the voltage of C610.

C610 is charged during period β (Fig.8-12) from input voltage directly.(Power supply which doesn't have “Power Factor Controller Circuit” is only charged during this period.)

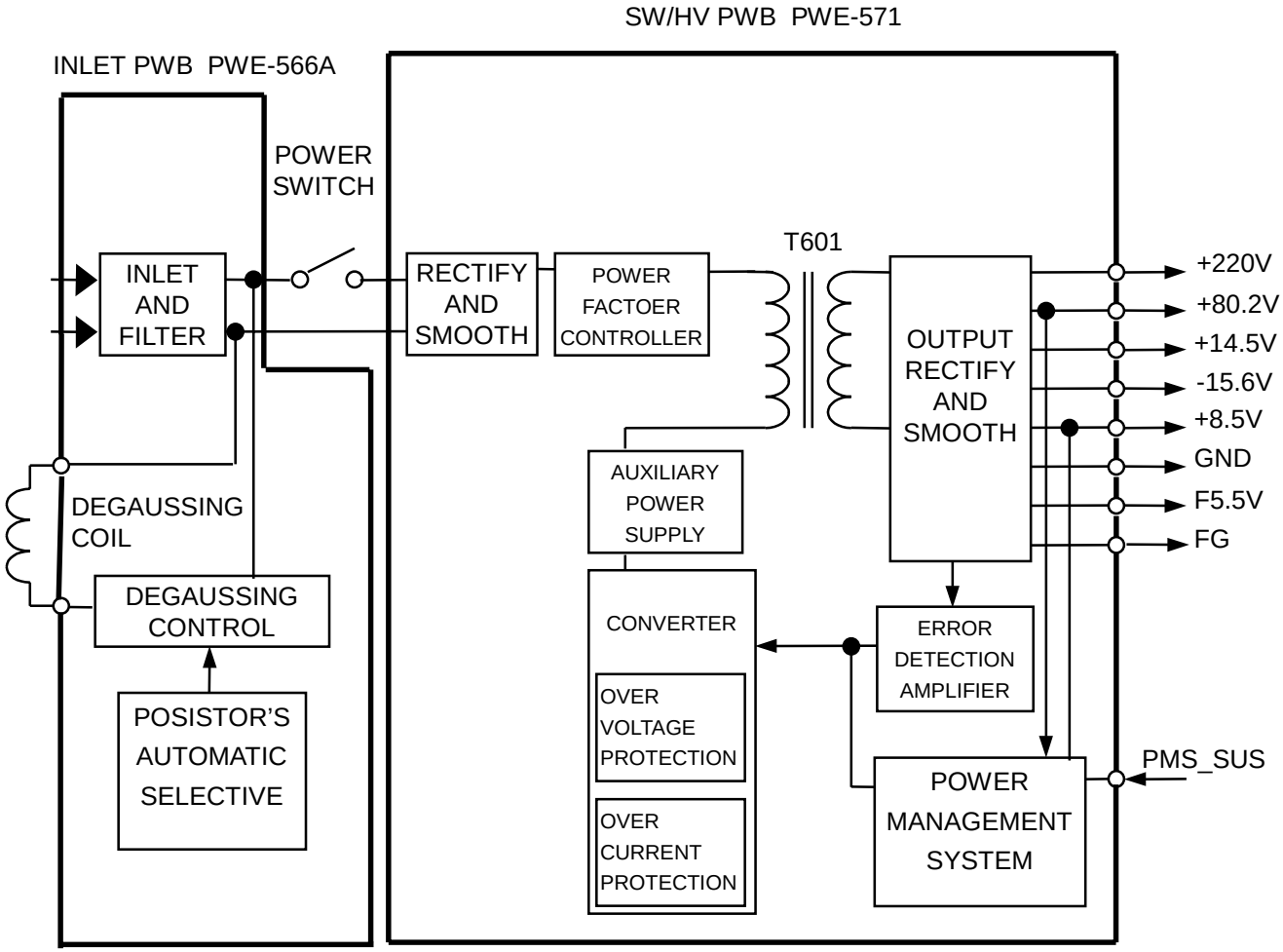
Finally, the voltage of C610 and input current become Wave of Fig.8-12.The harmonic current is decrease, and Power Factor is improved. Because C610 is charged not only period β but also many parts of 1 cycle.



(Fig.8-11) POWER FOCTER CONTROLLER CIRCUIT



(Fig.8-12) VOLTAGE • INPUT CURRENT


SW/HV PWB PWE-571
INLET PWB PWE-566A
POWER SWITCH
INLET AND FILTER
RECTIFY AND SMOOTH
POWER FACTOER CONTROLLER
T601
OUTPUT RECTIFY AND SMOOTH
+220V
+80.2V
+14.5V
-15.6V
+8.5V
GND
F5.5V
FG
DEGAUSSING COIL
DEGAUSSING CONTROL
POSISTOR'S AUTOMATIC SELECTIVE
AUXILIARY POWER SUPPLY
CONVERTER
OVER VOLTAGE PROTECTION
OVER CURRENT PROTECTION
ERROR DETECTION AMPLIFIER
POWER MANAGEMENT SYSTEM
PMS_SUS

9. DYNAMIC CONVERGENCE CORRECTION CIRCUIT

The dynamic convergence is corrected by adjusting the DC,saw wave and parabolic wave current flowing at both (the horizontal and vertical convergence correction) coils which are constructed on the deflection yoke.(refer to Fig.9.1.)

The horizontal convergence correction circuit is same as the vertical convergence correction, the horizontal correction circuit being described below.

The convergence correction wave is generated by DSP(IC501).IC501 generates the DC, vertical saw wave and parabolic wave accordiong to calculation based on MPU data and outputs dynamic convergence correction signal at IC501 pin 61. This signal is integrated at integration circuit composed of R543 and C523. The output voltage of IC510 (0V-3.3V) generates the convergence correction current which turn the direction at the center voltage (1.65V). This current flows to the feedback resistors (R8H3), and is detected as voltage at the feedback resistors. This voltage is fed back to IC8H1.

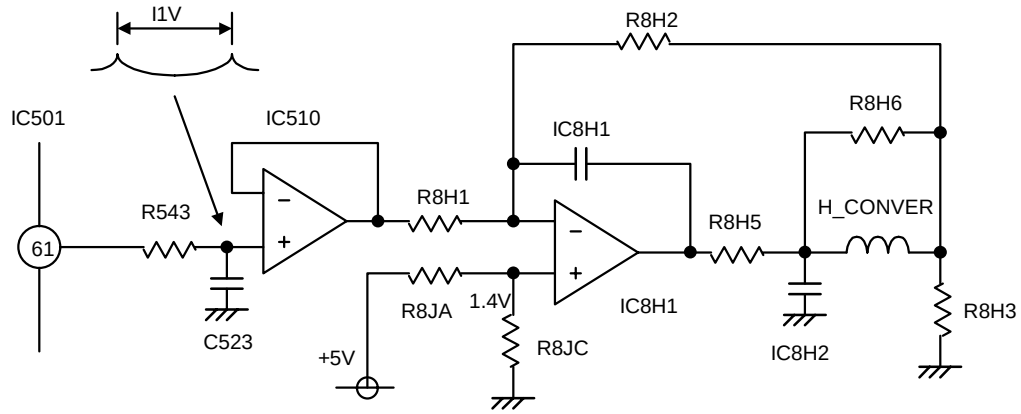
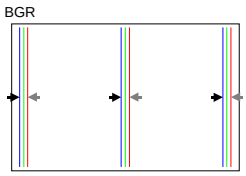
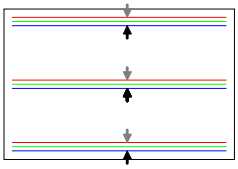
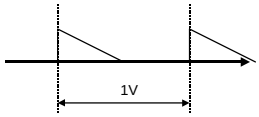
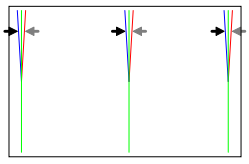
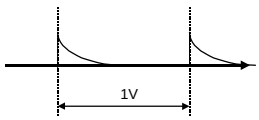
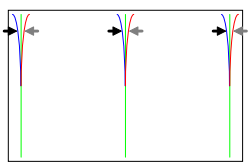


Fig.9.1. Convergence circuit

	SERVICE MENU	USER MENU	WAVE FORM	PICTURE IMAGE
1	H.S.CONVER	HORIZONTAL	DC	
2	V.S.CONVER	VERICAL	DC	
3	H.CONVER SAW T	TOP HORIZONTAL		
4	H.CONVER PARA T	-		

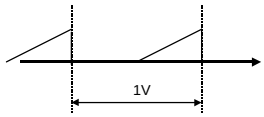
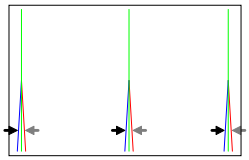
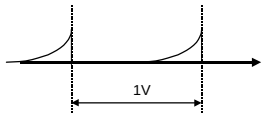
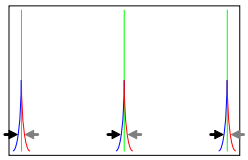
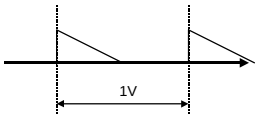
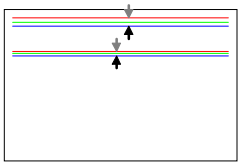
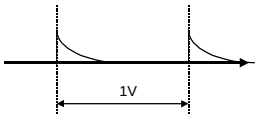
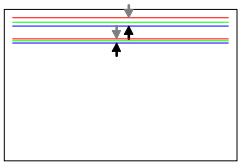
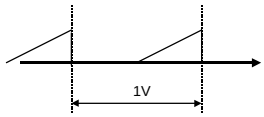
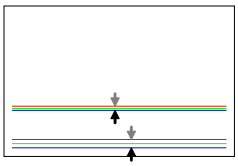
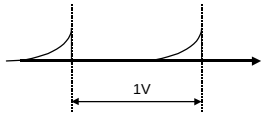
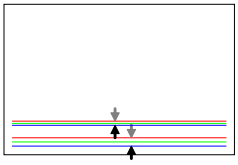
5	H.CONVER SAW B	BOTTOM HORIZONTAL		
6	H.CONVER PARA B	-		
7	V.CONVER SAW T	TOP VERTICAL		
8	V.CONVER PARA T	-		
9	V.CONVER SAW B	BOTTOM VERTICAL		
10	V.CONVER PARA B	-		

Fig. 9.2. Convergence correction function on OSM

10. AUTO and MANUAL PURITY CORRECTION (GLOBALSYNC) CIRCUIT

1) SENSOR PART

JC-2241UMW has three sensors to correct poor purity.

A) SENSOR OF EARTH MAGNETIC FIELD CIRCUIT

B) SENSOR OF TEMPERATURE CIRCUIT

C) SENSOR OF CRT BEAM CURRENT CIRCUIT

1-A) SENSOR OF EARTH MAGNETIC FIELD CIRCUIT

EARTH MAGNETIC FIELD CORRECTION CIRCUIT compensates automatically for purity problem of the EAST,WEST,NORTH and SOUTH magnetic field.

Magnetic sensor (IC4H1) is used in this circuit.

When the magnetic field change, the voltage of IC4H1 pin5 (CNPU pin3), IC4H1 pin6(CNPU pin2) varies.

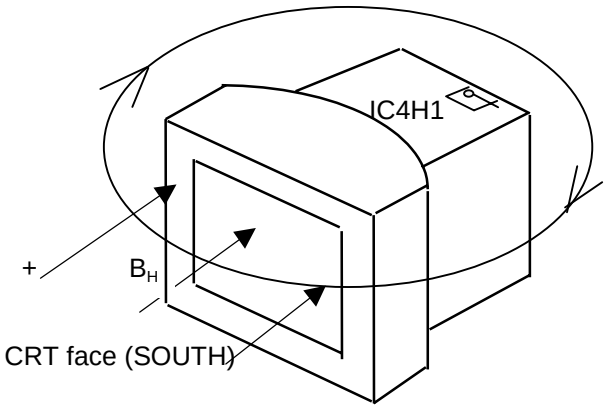
CNPU pin3 voltage is fed to the A/D converter in IC801 (pin48).

CNPU pin2 voltage is fed to the A/D converter in IC801 (pin47).

And the reference voltage (2.5V) of Magnetic sensor (IC4H1 pin7) is fed IC801 (pin49) too.

CRT face Direction (Horizontal magnetic field B_H:30uT)	IC4H1 pin5 Voltage-IC4H1 pin7 Voltage	IC4H1 pin6 Voltage-IC4H1 pin7 Voltage
EAST	0V	-0.5V
WEST	0V	0.5V
SOUTH	-0.5V	0
NORTH	0.5V	0

(Fig.10.1) The example of Magnetic sensor (IC4H1) voltage

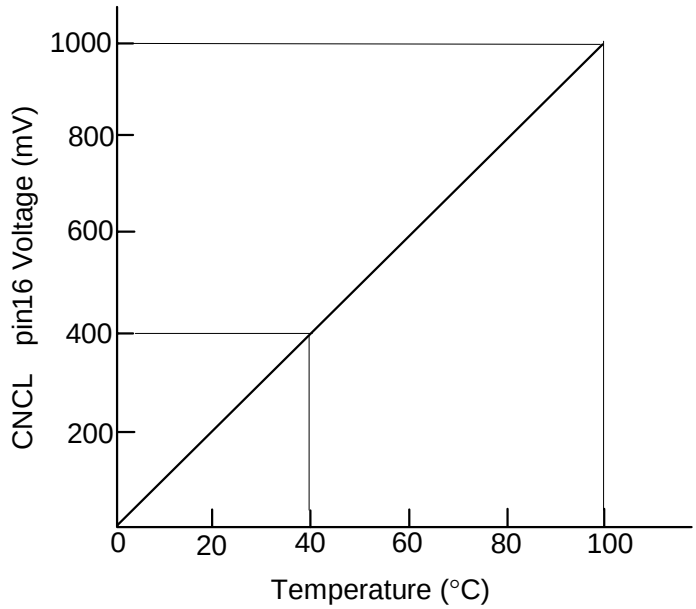


1-B) SENSOR OF TEMPERATURE CIRCUIT

Temperature Sensor (IC151) is used in this circuit.(on CONTROL PWB)

When the surrounding temperature of the unit change, the voltage of IC151 out put pin (CNCL 16pin on VIDEO PWB) varies.

This voltage is fed to the A/D converter in IC801 (pin50)

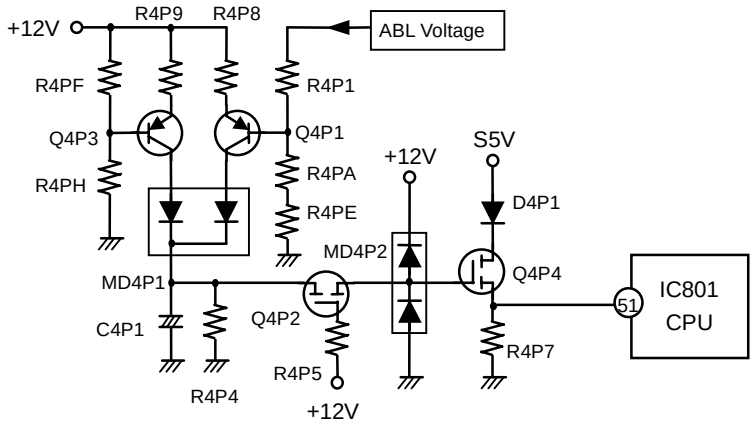


(Fig.10.2) The example of Temperature sensor (IC4H1) voltage

1-C) SENSOR OF CRT BEAM CURRENT CIRCUIT

Change of purity is caused by warm up after power on and changing of CRT beam current.

Correction voltage is generated by charging C4P1. This voltage can detect both warm up and changing of CRT beam current. Warm up is detected by C4P1 charging time, changing of CRT beam current is detected by changing of ABL voltage. Correction voltage is input to IC801 pin 51. IC801 calculates four corner purity correction. Q4P2 is switch in PMS and power off. Q4P4 is buffer of correction voltage.



(Fig.10.3) Sensor of CRT beam current circuit

2) PURITY CORRECTION PART

2-A) NORTH/SOUTH purity correction

MPU controls output voltage by comparing the sensor voltage (IC801 pin48) with the reference voltage (IC801 pin49) and GLOBALSYNC OSD.

The D/A converter (IC532 pin16) output center voltage is 2.5V and variable range is between 0V and +5V.

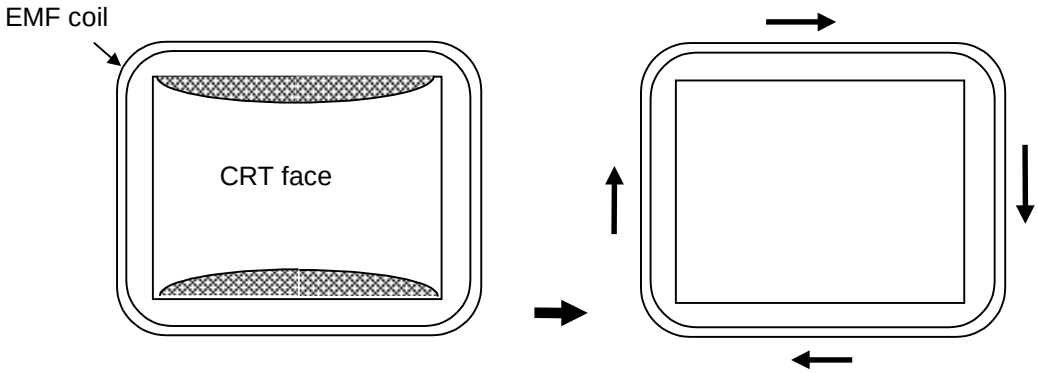
The DC output current flows in the EMF (Earth Magnetic Field) coil.

This current flows to the feedback resistor (R4J5) of IC4J1.

This current is detected as voltage at the feedback resistor.

NOTE) : During DEGAUSS, becomes Low level(D/A converter output voltage is 2.5V), therefore the current doesn't flow in the EMF coil.

And it prevents magnetization in the CRT.



(The example of image: Correction of NORTH/SOUTH purity)

2-B) Four corner purity correction.

MPU controls output voltage by comparing 4 input voltages(IC801 pin47,pin49,pin50,pin51) and GLOBALSYNC (TOP LEFT, TOP RIGHT, BOTTOM LEFT, BOTTOM RIGHT) OSD.

The D/A converter IC532 (pin14:TOP LEFT, pin8:TOP RIGHT, pin9:BOTTOM LEFT, pin7:BOTTOM RIGHT) output center voltage is 2.5V and variable range is between 0V and +5V.

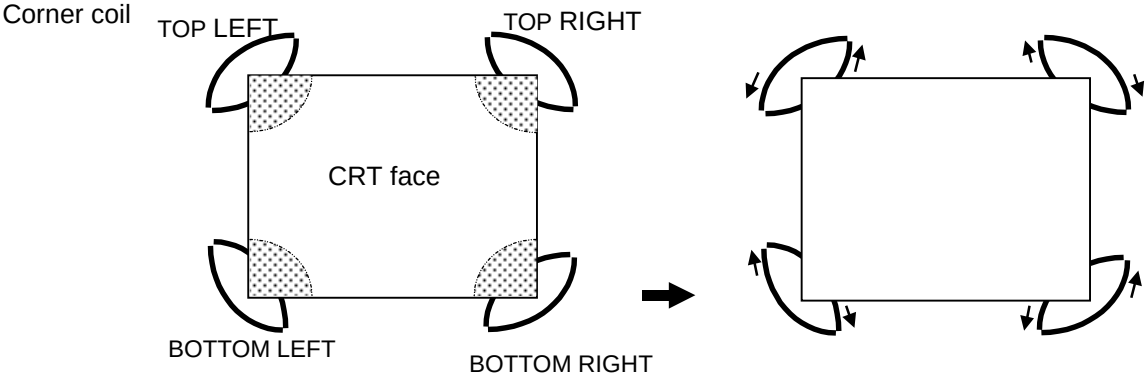
The DC output current flows in the corner coil(four corner).

This current flows to the feedback resistor(R4L5,R4N5,R4M5,R4R5)of IC4L1 and IC4N1.

This current is detected as voltage at the feedback resistor.

NOTE) :During DEGAUSS, becomes Low level(D/A converter output voltage is 2.5V), therefore the current doesn't flow in the corner coil.

And it prevents magnetization in the CRT.



(The example of image: Correction of four corner purity)

11. USB CIRCUIT

IC801 (MAIN MPU) uses as the I2 C-Bus master, and IC851 (USB MPU) uses as the I2 C-Bus slave.

At the time of power on of the monitor, IC801 forwards the present value and the necessary early period data to IC851 through I^2C-Bus (SCL, SDA).

In the case that CN-USB and PC (USB HOST) are connecting with USB cable, the 5V from PC is input to IC851 pin27 through Q851, Q852.

Then according to IC851 forwards these data to PC through D+/D-, the monitor is recognized as the human interface device.

And, in the case that CN-USB and PC are connected with USB cable in the condition of power off of the monitor, the monitor is not recognized as a/the human interface device, because IC851 pin27 becomes low by Q851, Q852.

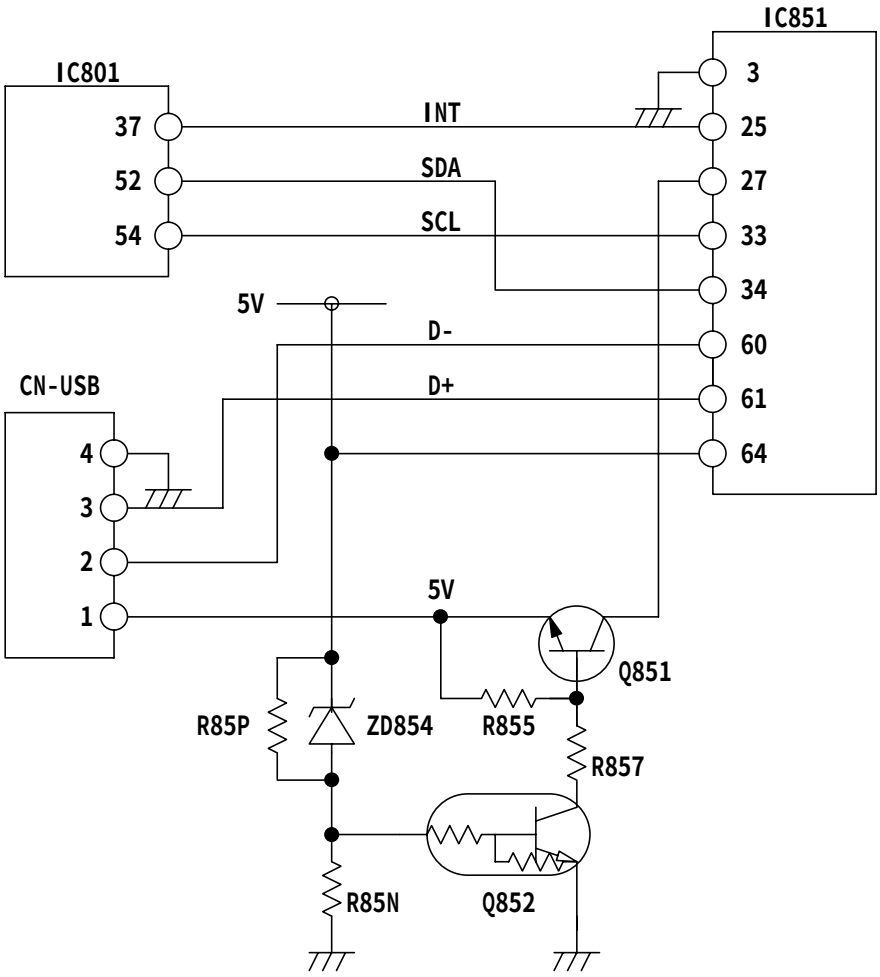
In the case that the monitor is adjusted with USB ,the WINDOWS application called APPLET is used.

For example, when we do the adjustment of H.SIZE by using APPLET, the command that makes H. SIZE a certain value is forwarded from PC to IC851 through D+/D-.

At this time, IC851 forwards 1 pulse to the INT line, because it needs to forward the command to IC801.

By this IC801 reads out the command from IC851 through I2 C-Bus, because it recognizes that the command from PC is forwarded to IC851.

IC801 controls DAC by the command as OSM control.



(Fig.11.1) USB Circuit

12. AUTO ADJUST CIRCUIT

By detecting video signal, AutoAdjust function adjusts size and position. MPU has several standards of frequency, active ratio and so on. MPU compares measurement data and with their standards, and calculates adaptive size and position data and sets them.

IC8M1 is video detecting IC. It measures following data.

H.trace.time, H.disp.time, H.front.porch, H.back.porch

V.total.time, V.disp.time, V.front.porch, V, back.porch

That means AutoAdjust function can't work correctly in the cases as follows.

a. No signal (ex. All black)

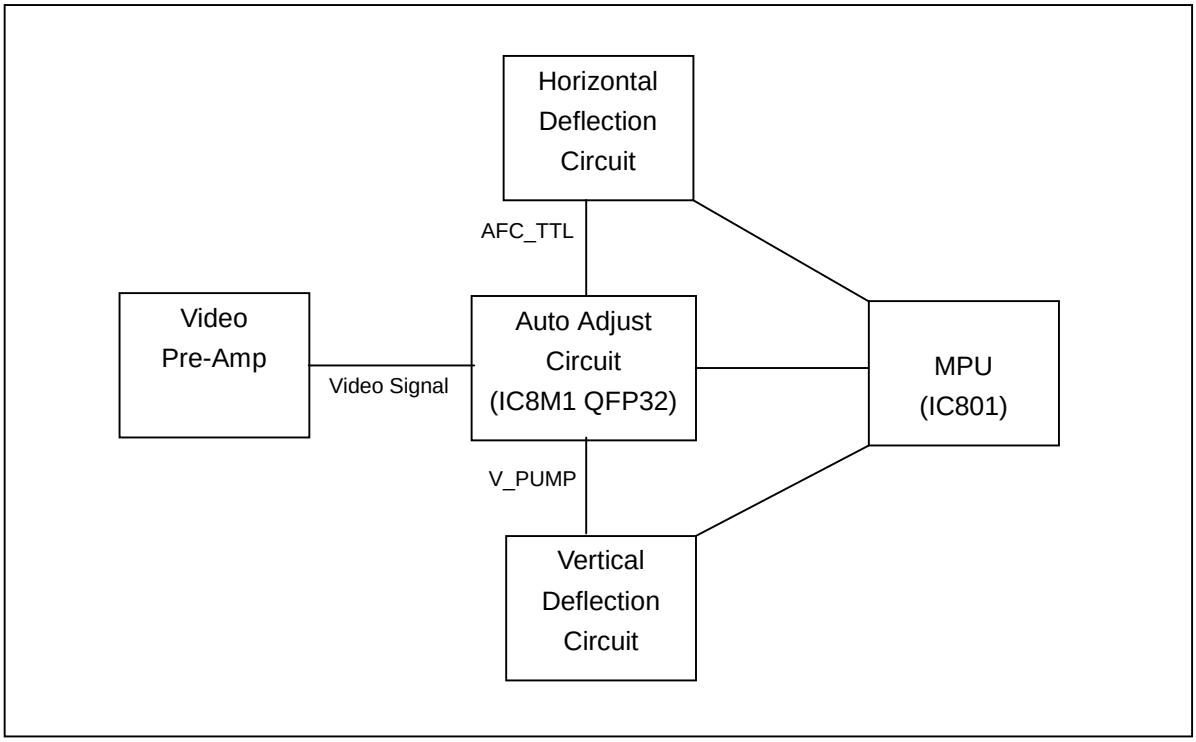
b. Too narrow active ratio (ex. 1/3 window)

c. Animation (ex. movie, game)

d. Too dark

If Animation, sometimes AutoAdjust function can detect video signal and sometimes can't. As a result AutoAdjust function can't work stably.

A blinking picture is worst case.



(Fig.12.1) Auto Adjust Circuit Block Diagram

REPLACEMENT PARTS LIST

The components specified for Model FP1350-1(B)

SYMBOL	PART NO	DESCRIPTION
*** CRT & TUNER ***		
CRT	3A302201	CRT M51LRY21X62
*** ICS ***		
IC151	370EF040	IC LM45CIM3X
IC401	37006027	IC LA7876N
IC421	370E6178	IC BA14741F-E2
IC471	37005256	IC UPC7812AHF (REG)
IC481	370KE062	IC BA033FP-E2
IC4H3	37056616	IC BA10358
IC4J1	37011003	IC LA6510
IC4L1	37011003	IC LA6510
IC4N1	37011003	IC LA6510
IC501	37R56288	MOS HE6-0092(JANGLE61882)
IC510	370E6178	IC BA14741F-E2
IC511	370E6178	IC BA14741F-E2
IC513	370EB067	IC UPC814G2-E2(OP-AMP)
IC532	370EF032	MOS M62392FP-D
IC571	37REH024	MOS M62320FP-D-T2
IC591	370AA067	IC BA10324AF-E2 (OP-AMP)
IC592	37076409	IC BA9757
IC5A1	370AA092	IC BA4558F-E2(OP-AMP)
IC5GA	370EF021	IC CA0007AM-T
IC621	37076406	IC STR-S6729A(LF953)
IC671	37076357	IC SE080N(LF12)
IC6V1	37011351	IC KIA393P (COMP)
IC711	37011401	IC M52742ASP
IC721	37011380	IC VPS16
IC731	37RAA021	IC M52755FP-D
IC742	370AA067	IC BA10324AF-E2 (OP-AMP)
IC751	370EF031	MOS M62393FP-D
IC791	37R56305	MOS M35070-050FP
IC7A1	370EF025	IC M52347FP
IC7F1	37076408	IC SI-3062FA
IC7G1	370EC058	MOS HD74HC123AFP-EL
IC801	37R56332	MOS UPD78018FYGC-R19-AB8
IC802	370EE002	MOS M24C08-MN6 T
IC851	37R56326	MOS LSC528223FU
IC854	370A1009	IC UPC1093J-T (REG)
IC8A1	370ED003	MOS 24LCS21AT/SN
IC8G1	37005277	IC PQ05RR13 (REG)
IC8G2	37005349	IC PQ05RD08(REG)

SYMBOL	PART NO	DESCRIPTION
IC8H1	37011320	IC LA6500
IC8J1	37011320	IC LA6500
IC8M1	37076420	MOS BU6483K(V_DETECT)
IC8M2	370KE062	IC BA033FP-E2

*** TRANSISTORS ***

CR601	35595026	TRIAC AC10FSM
MQ571	35135001	TR SLA5041 (FET-ARRAY)
Q101	35AB0313	TR 2SA1037AK-T146 R
Q102	35AB0313	TR 2SA1037AK-T146 R
Q103	35EB0238	TR DTC114YKA-T146
Q104	35EB0238	TR DTC114YKA-T146
Q411	35KB2498	TR 2SK3018-T106
Q421	35KB2498	TR 2SK3018-T106
Q423	35KB2498	TR 2SK3018-T106
Q4P1	35AB0313	TR 2SA1037AK-T146 R
Q4P2	35KB2498	TR 2SK3018-T106
Q4P3	35AB0313	TR 2SA1037AK-T146 R
Q4P4	35KB2505	TR 2SK1103-Q(TX)
Q501	35CB1113	TR 2SC2412K-T146 R
Q502	35KB2498	TR 2SK3018-T106
Q503	35AB0313	TR 2SA1037AK-T146 R
Q504	35CB1113	TR 2SC2412K-T146 R
Q505	35CB1113	TR 2SC2412K-T146 R
Q553	35CB1113	TR 2SC2412K-T146 R
Q554	35AB0313	TR 2SA1037AK-T146 R
Q555	35128023	TR IRLS530A
Q561	35095411	TR 2SC5453
Q571	35072612	TR 2SD2396 J
Q572	35128003	TR 2SK2098-01MR(F119)
Q573	35128003	TR 2SK2098-01MR(F119)
Q581	35072612	TR 2SD2396 J
Q5A1	35072720	TR 2SD1889
Q5E1	35CB1113	TR 2SC2412K-T146 R
Q5F1	35AB1596	TR 2SA1514K S-T
Q5F2	35EB0212	TR DTA114WKA-T146
Q5F3	35CB1113	TR 2SC2412K-T146 R
Q5F4	35EB0212	TR DTA114WKA-T146
Q5G1	35127790	TR 2SJ449
Q5R1	35128009	TR 2SK2645-01MR(F111)
Q5X1	350K4112	TR 2SA916-T L
Q5X2	350K4112	TR 2SA916-T L
Q621	350E3218	TR 2SC1740S-T R
Q622	350J4817	TR 2SC1473A-TA Q
Q623	35095270	TR 2SC2317
Q624	35092400	TR 2SC3852A
Q625	35092400	TR 2SC3852A
Q671	35030000	TR 2SB1626

SYMBOL	PART NO	DESCRIPTION
Q672	350J5382	TR 2SC3478A-T K
Q673	35EB0230	TR DTC114EKA-T146
Q682	35CB0012	TR 2SC1623-T1B L6
Q6P1	350E3218	TR 2SC1740S-T R
Q6V1	350E3218	TR 2SC1740S-T R
Q711B	350H0200	TR 2SC2407A-T
Q711G	350H0200	TR 2SC2407A-T
Q711R	350H0200	TR 2SC2407A-T
Q721B	35KB2498	TR 2SK3018-T106
Q721G	35KB2498	TR 2SK3018-T106
Q721R	35KB2498	TR 2SK3018-T106
Q722B	35KB2498	TR 2SK3018-T106
Q722G	35KB2498	TR 2SK3018-T106
Q722R	35KB2498	TR 2SK3018-T106
Q723B	35KB2498	TR 2SK3018-T106
Q723G	35KB2498	TR 2SK3018-T106
Q723R	35KB2498	TR 2SK3018-T106
Q732	35AB0313	TR 2SA1037AK-T146 R
Q734	35EB0230	TR DTC114EKA-T146
Q735	35EB0230	TR DTC114EKA-T146
Q741B	350J5205	TR 2SC3415S-TP
Q741G	350J5205	TR 2SC3415S-TP
Q741R	350J5205	TR 2SC3415S-TP
Q771	35AB0313	TR 2SA1037AK-T146 R
Q772	35CB1113	TR 2SC2412K-T146 R
Q781	350J5205	TR 2SC3415S-TP
Q791	3AEC0001	TR 2SC3437-Y(TE85L)
Q792	3AEC0001	TR 2SC3437-Y(TE85L)
Q793	35CB1113	TR 2SC2412K-T146 R
Q794	35EB0232	TR DTC144EKA-T146(0°)
Q795	35CB1113	TR 2SC2412K-T146 R
Q796	3AEC0001	TR 2SC3437-Y(TE85L)
Q797	35EB0230	TR DTC114EKA-T146
Q798	35EB0230	TR DTC114EKA-T146
Q7A1	35EB0232	TR DTC144EKA-T146(0°)
Q7A2	35CB1113	TR 2SC2412K-T146 R
Q7E1	35CB2393	TR 2SC3757 R-TX
Q7E2	35CB1113	TR 2SC2412K-T146 R
Q7E3	35AB0313	TR 2SA1037AK-T146 R
Q7G1	35CB1113	TR 2SC2412K-T146 R
Q7G2	35CB1113	TR 2SC2412K-T146 R
Q7G3	35CB1113	TR 2SC2412K-T146 R
Q7G4	35CB1113	TR 2SC2412K-T146 R
Q7G5	35CB1113	TR 2SC2412K-T146 R
Q7G6	35CB1113	TR 2SC2412K-T146 R
Q7K1	350K4112	TR 2SA916-T L
Q7K2	35EB0232	TR DTC144EKA-T146(0°)
Q7K3	35CB1113	TR 2SC2412K-T146 R

SYMBOL	PART NO	DESCRIPTION
Q7Y1	35AB1592	TR 2SA1434-TB
Q7Y2	35CB2468	TR 2SC3624-T1B-L18
Q7Y3	35AB1592	TR 2SA1434-TB
Q7Y4	35CB2468	TR 2SC3624-T1B-L18
Q7Y5	35AB1592	TR 2SA1434-TB
Q7Y6	35CB2468	TR 2SC3624-T1B-L18
Q7Y7	35AB1592	TR 2SA1434-TB
Q7Y8	35CB2468	TR 2SC3624-T1B-L18
Q831	35EB0230	TR DTC114EKA-T146
Q832	35EB0230	TR DTC114EKA-T146
Q833	35EB0230	TR DTC114EKA-T146
Q834	35EB0230	TR DTC114EKA-T146
Q851	35AB0313	TR 2SA1037AK-T146 R
Q852	35EB0232	TR DTC144EKA-T146(0°)
Q8A1	35CB1113	TR 2SC2412K-T146 R
Q8A2	35EB0232	TR DTC144EKA-T146(0°)
Q8A3	35CB1113	TR 2SC2412K-T146 R
Q8A4	35AB0313	TR 2SA1037AK-T146 R
Q8A5	35KB2498	TR 2SK3018-T106
Q8A6	35KB2498	TR 2SK3018-T106
Q8M1B	35CB2453	TR 2SC3772-3-TB
Q8M1G	35CB2453	TR 2SC3772-3-TB
Q8M1R	35CB2453	TR 2SC3772-3-TB
Q951	35CB1113	TR 2SC2412K-T146 R
Q981	35CB2491	TR 2SC3906K-E2
Q982	350J5241	TR 2SC2389S-TP R
Q983	350A2001	TR 2SA1038S-TP R
Q984	35072752	TR 2SD1763A E
Q985	35030012	TR 2SB1186A E
Q987	350J5262	TR 2SC4620 P-TV2

*** DIODES ***

D2001	361K7822	DIODE D1NL20,AT52
D2002	36CB0213	DIODE DAN212K-T146
D401	361K7778	DIODE PR1004G,AT52
D402	361K7778	DIODE PR1004G,AT52
D421	360K1025	DIODE 1SS133
D4H1	360K1025	DIODE 1SS133
D4H2	360K1025	DIODE 1SS133
D4P1	36CB0213	DIODE DAN212K-T146
D541	360K1025	DIODE 1SS133
D542	360K1025	DIODE 1SS133
D551	36107771	DIODE FE5DL-6596
D553	36107775	DIODE RX3Z(LF014-102)
D561	36107846	DIODE FMC-28UA
D562	36108250	DIODE FMQ-G5FS
D591	361K7778	DIODE PR1004G,AT52
D592	361K7778	DIODE PR1004G,AT52

SYMBOL	PART NO	DESCRIPTION
D593	360K1025	DIODE 1SS133
D5A1	361K8252	DI RB721Q-40T72
D5A2	361K8252	DI RB721Q-40T72
D5E1	361K7777	DIODE 1SS244-T72
D5E2	361K7777	DIODE 1SS244-T72
D5E3	360K1025	DIODE 1SS133
D5G1	360K1025	DIODE 1SS133
D5G2	36107792	DIODE YG911S3R
D5G3	361K8252	DI RB721Q-40T72
D5G4	361K8252	DI RB721Q-40T72
D5P1	36CB0213	DIODE DAN212K-T146
D5R1	36107308	DIODE ERC20M-08
D5R2	361K7606	DIODE ERB44-08 V1
D5R3	361K7822	DIODE D1NL20,AT52
D5R4	361K7822	DIODE D1NL20,AT52
D5X1	361K7822	DIODE D1NL20,AT52
D601	36108116	DIODE KBU605G-FA1
D602	361K7523	DIODE ERA15-04V1
D603	361K7174	DIODE RU1P V1
D604	361K7823	DI ERA18-02-V1
D622	361K7823	DI ERA18-02-V1
D623	361K7823	DI ERA18-02-V1
D624	361K7505	DIODE ERB44-06V1
D625	361K7823	DI ERA18-02-V1
D626	361K7823	DI ERA18-02-V1
D627	36107858	DI RG2A2(LF-B4)
D628	361K7842	DIODE ERB38-06(V1)
D629	361K7823	DI ERA18-02-V1
D671	36107844	DIODE RU3A(LF-C4)
D672	361K7823	DI ERA18-02-V1
D673	361K7823	DI ERA18-02-V1
D6A1	36107835	DI RU3C(LF-C4)
D6E1	36107841	DIODE FMU-G16S
D6F1	36107729	DIODE YG901C2
D6G2	36107832	DI ERC30-01(L3)
D6H1	36107832	DI ERC30-01(L3)
D6K1	361K7823	DI ERA18-02-V1
D6P1	361K7523	DIODE ERA15-04V1
D6P2	361K7523	DIODE ERA15-04V1
D6V1	360K1025	DIODE 1SS133
D6V2	360K1025	DIODE 1SS133
D6V3	360K1025	DIODE 1SS133
D6V4	360K1025	DIODE 1SS133
D6Y1	36107320	DIODE FMG-G26S
D6Y2	36107701	DIODE RU4AM(LF-K2)
D6Y3	361K7842	DIODE ERB38-06(V1)
D711	360K1025	DIODE 1SS133
D712	360K1025	DIODE 1SS133

SYMBOL	PART NO	DESCRIPTION
D713	360K1025	DIODE 1SS133
D721B	36CB0072	DIODE HSM83-TL
D721G	36CB0072	DIODE HSM83-TL
D721R	36CB0072	DIODE HSM83-TL
D722B	36CB0072	DIODE HSM83-TL
D722G	36CB0072	DIODE HSM83-TL
D722R	36CB0072	DIODE HSM83-TL
D741B	361K7777	DIODE 1SS244-T72
D741G	361K7777	DIODE 1SS244-T72
D741R	361K7777	DIODE 1SS244-T72
D771	360K1025	DIODE 1SS133
D781	360K1025	DIODE 1SS133
D782	360K1025	DIODE 1SS133
D783	36CB0072	DIODE HSM83-TL
D784	36CB0072	DIODE HSM83-TL
D7E1	360K1025	DIODE 1SS133
D7GA	360K1025	DIODE 1SS133
D7GF	360K1025	DIODE 1SS133
D7K1	361K7562	DIODE EGP10G G23
D8A1	36CB0233	DIODE RB411D-T146
D8M2B	360K1025	DIODE 1SS133
D8M2G	360K1025	DIODE 1SS133
D8M2R	360K1025	DIODE 1SS133
D951	360K1025	DIODE 1SS133
D981	36CB0213	DIODE DAN212K-T146
D982	36CB0213	DIODE DAN212K-T146
D984	36CB0213	DIODE DAN212K-T146
LED111	36801424	LED SMLS79723C
LED112	36801424	LED SMLS79723C
LED113	36801424	LED SMLS79723C
MD4P1	36CB0079	DIODE DAN202K-T146(0°)
MD4P2	36CB0054	DIODE DA204K-T
MD701B	36CB0054	DIODE DA204K-T
MD701G	36CB0054	DIODE DA204K-T
MD701R	36CB0054	DIODE DA204K-T
MD702B	36CB0054	DIODE DA204K-T
MD702G	36CB0054	DIODE DA204K-T
MD702R	36CB0054	DIODE DA204K-T
MD711	36CB0079	DIODE DAN202K-T146(0°)
MD7GE	36CB0079	DIODE DAN202K-T146(0°)
MD7GG	36CB0079	DIODE DAN202K-T146(0°)
ZD592	360A0055	DIODE MTZJ8.2B T-72
ZD5A1	360A0119	DIODE MTZJ33D-T72
ZD5E1	360A0039	DIODE MTZJ5.6B T-72
ZD5F1	360A0091	DIODE MTZJ20A
ZD5G1	360A0059	DIODE MTZJ9.1B T-72
ZD5GA	360A0035	DIODE MTZJ5.1B T-72
ZD5GC	360A0035	DIODE MTZJ5.1B T-72

SYMBOL	PART NO	DESCRIPTION
ZD5X1	360A0043	DIODE MTZJ6.2B T-72
ZD621	360A0072	DIODE MTZJ12B
ZD622	360A0051	DIODE MTZJ7.5B T-72
ZD623	360K3116	DIODE RD4.7EB(3)-T4
ZD671	360A0021	DIODE MTZJ3.6B T-72
ZD672	360K3486	DI RD6.8JS AB(2)-T4
ZD6G1	360K3120	DIODE RD24EB(3)-T4
ZD6H1	360K3120	DIODE RD24EB(3)-T4
ZD6P1	360A0072	DIODE MTZJ12B
ZD6V1	360A0038	DIODE MTZJ5.6A T-72
ZD6V2	360A0064	DIODE MTZJ10C
ZD701	360A0039	DIODE MTZJ5.6B T-72
ZD702	360A0039	DIODE MTZJ5.6B T-72
ZD703	360A0039	DIODE MTZJ5.6B T-72
ZD704	360A0039	DIODE MTZJ5.6B T-72
ZD721	360A0060	DIODE MTZJ9.1C T-72
ZD852	360A0039	DIODE MTZJ5.6B T-72
ZD853	360A0039	DIODE MTZJ5.6B T-72
ZD854	360A0018	DIODE MTZJ3.3B T-72
ZD8A1	360A0039	DIODE MTZJ5.6B T-72
ZD8A2	360A0039	DIODE MTZJ5.6B T-72
ZD951	360A0039	DIODE MTZJ5.6B T-72
ZD981	360A0026	DIODE MTZJ4.3A T-72

*** TRANSFORMERS ***

T551	45804033	TRANS,H.DRAIVE
T561	47710025	TRANS,H.OUTPUT
T5R1	47105733	FBT(PCS)
T601	46311122	SWITCHING TRANS
T6Y1	46316102	SWITCHING TRANS
T981	45950005	D.F.TRANS(W515K)

*** VARIABLE RESISTORS ***

VR581	410G1157	R,VARIABLE B1.0K
VR5T1	415K5163	R,VARIABLE B200K

*** RELAYS & SWITCHES ***

RL6V1	65660047	RELAY RPEF-12
RL6V2	65660047	RELAY RPEF-12
SW101	65360051	TACT SWITCH SKHHQV
SW102	65360051	TACT SWITCH SKHHQV
SW103	65360051	TACT SWITCH SKHHQV
SW104	65360051	TACT SWITCH SKHHQV
SW105	65360051	TACT SWITCH SKHHQV
SW106	65360051	TACT SWITCH SKHHQV
SW107	65360051	TACT SWITCH SKHHQV
SW108	65360051	TACT SWITCH SKHHQV
SW581	65161075	SWITCH SLIDE SSSF022-S09N

SYMBOL	PART NO	DESCRIPTION
SW601	65360071	PUSH SWITCH ESB92S21B

*** PWB ASSYS ***

	840E6A03	SW/HV PWB ASSY
	840E6C01	VIDEO PWB ASSY
	840E6D01	DEF PWB ASSY
	843D3B01	SUB PWB ASSY

*** COILS & FILTERS ***

DEG	61322101	DEGAUSSIING COIL(85T,10H)
EMC	61322302	CORNER COIL(380T,105H)
EMF	61322301	COIL(100T,80H)
FL6T1	61062235	COIL,FILTER (LFZ2805V10)
FL6T2	61062234	COIL,FILTER (LFZ2404V11)
L561	610G0342	CHOKECOIL TSL1112RA-331KR
L562	46204008	COIL,CHOKE 4MH
L5G1	610F3025	COIL,FILTER 47UH
L5G2	46206023	COIL,CHOKE 4MH
L5R1	610G0233	FILTER CHOKE PJ8T-470K
L5R2	610F3014	COIL,FILTER 3.3UH
L601	616K5076	COIL,BEADS
L602	616K5076	COIL,BEADS
L621	610E4001	COIL,FILTER 10UH
L622	610E4001	COIL,FILTER 10UH
L6A1	610G0335	CHOKECOIL TSL1112RA-680K1
L6E1	610F3023	COIL,FILTER 33UH
L6E2	610G0322	CHOKECOIL TSL0709-101KR66
L6F1	610G0333	CHOKECOIL TSL1112RA-330K2
L6F2	610G0333	CHOKECOIL TSL1112RA-330K2
L6H1	610F3023	COIL,FILTER 33UH
L6H2	610G0335	CHOKECOIL TSL1112RA-680K1
L6K1	610F3023	COIL,FILTER 33UH
L6Y1	61099166	COIL,CHOKE 400UH
L711	610E1729	COIL,FILTER 100UH
L731	610G0111	INDUCTOR,BEADS(FBR07HA121
L732	610G0111	INDUCTOR,BEADS(FBR07HA121
L763	610F3025	COIL,FILTER 47UH
L791	610E1725	COIL,FILTER 47UH
L901B	610F6505	COIL,FILTER 0.22UH
L901G	610F6505	COIL,FILTER 0.22UH
L901R	610F6505	COIL,FILTER 0.22UH
LC151	616K6971	NOISE FILTER TY2E103MCT
LC4H1	616K6971	NOISE FILTER TY2E103MCT
LC761B	616J9020	NOISE FILTER TX04200NB
LC761G	616J9020	NOISE FILTER TX04200NB
LC761R	616J9020	NOISE FILTER TX04200NB
LC762B	616K6964	NOISE FILTER TX07250NBT
LC762G	616K6964	NOISE FILTER TX07250NBT

SYMBOL	PART NO	DESCRIPTION
LC762R	616K6964	NOISE FILTER TX07250NBT
LC763	616K6942	NOISE FILTER FILMAC TU20M
LC764	616K6942	NOISE FILTER FILMAC TU20M
LC765	616K6942	NOISE FILTER FILMAC TU20M
LC766	616K6942	NOISE FILTER FILMAC TU20M
LC767	390J9028	FILTER ZJSC-R47-391TA
LC768	390J9028	FILTER ZJSC-R47-391TA
LC769	616K6970	NOISE FILTER TY2E101MCT
LC76A	616K6970	NOISE FILTER TY2E101MCT
LC76E	616K6971	NOISE FILTER TY2E103MCT
LC76F	616K6971	NOISE FILTER TY2E103MCT
LC76G	616K6971	NOISE FILTER TY2E103MCT
LC76H	616K6971	NOISE FILTER TY2E103MCT
LC76K	616K6971	NOISE FILTER TY2E103MCT
LC76M	616K6971	NOISE FILTER TY2E103MCT
LC76N	616K6971	NOISE FILTER TY2E103MCT
LC76R	390J9028	FILTER ZJSC-R47-391TA
LC851	616K6970	NOISE FILTER TY2E101MCT
LC852	616K6970	NOISE FILTER TY2E101MCT
LC853	616K6970	NOISE FILTER TY2E101MCT
LC854	616K6971	NOISE FILTER TY2E103MCT
LC901	616K6971	NOISE FILTER TY2E103MCT
LC902	616K6971	NOISE FILTER TY2E103MCT
LC903	616K6970	NOISE FILTER TY2E101MCT
MRC801	39040002	RC,NETWORK 10K 1K 0.01UF
MRC802	39040002	RC,NETWORK 10K 1K 0.01UF
T571	60918114	COIL,VARIABLE LIN.

*** ELECTRICAL PARTS & MISCELLANEOUS PARTS ***

CABLE	73893255	SIGNAL CABLE MD15P-MD15P
CDROM	68830763	FP950/1350 CD-ROM VER1.1
CNBNC	32990281	PANEL,MD-SUB/BNC
CNCRT	70032275	CRT SOCKET HPS0720-015005
CORD	70800087	POWER CORD E-2 L1.8 GRY
F671	666J9242	FUSE 25101.6,AT52
F6H1	666J9141	FUSE 25102.5,AT52
F6T1	66671040	FUSE 250V 5A(215)
IC2001	79645922	HV PROTECTOR UNIT
ICD5P1	79646261	HV CONTROL UNIT
IN6T1	70521069	INLET SK-1019(DELTA)
PC621	38200354	PHOTOCOUPLER PC123FY2
PC6P1	38200354	PHOTOCOUPLER PC123FY2
SG901B	329J0047	ARRESTER (300V),AT52
SG901G	329J0047	ARRESTER (300V),AT52
SG901R	329J0047	ARRESTER (300V),AT52
SG902	329J0047	ARRESTER (300V),AT52
SG903	667K6007	SPARK GAP 1.5KV
SG951	667K6007	SPARK GAP 1.5KV

SYMBOL	PART NO	DESCRIPTION
TH6V1	38112071	POSISTOR (PTH451A180M270A
TH6V2	38112072	POSISTOR (PTH451ABG3R0Q14
USBCAB	73893263	USB CABLE
X801	64098039	X'TAL(10.000MHZ)
X851	64098070	X'TAL HC-49U/S(6MHZ)CIT
X8M1	64098075	X'TAL 20MHZ(CSA-309)

*** KNOBS & PUSH BUTTONS ***

A4501	2E457751	PUSH BUTTON(CONTROL)

*** APPEARANCE PARTS ***

A3002	2E324471	CABINET BACK
A3003	2E324451	CABINET FRONT ASSY
A4001	25430552	CONTROL PANEL
A4003	2E430783	REVOLVING STAND ASSY
A5004	2E548061	CHASSIS BASE
A6001	25618341	CUSHION SHEET

*** PRINTED & PACKING MATERIALS ***

A7001	2E789731	NAME PLATE,INSTRUCTION
A7503	2E785131	LABEL(PTB)
A7506	2E789751	LABEL(ESCUTCHEON)
A8001	2E837051	CARTON BOX(JC-2241UMW(B))
A8002	2E835061	BAG,POLYETHYLENE
A8003	2E835892	FILLER(T).CARTON
A8004	2E835902	FILLER(B).CARTON
A8005	2E836001	PLATE,PULL
A8007	2E833831	SHEET PROTECTION
MANUAL	78134181	MANUAL CN756/CN725 B USA
	2E835061	BAG,POLYETHYLENE

*** RESISTORS ***

J413	40AA1000	R,CHIP 0H 5% 1/8W
J414	40AA1000	R,CHIP 0H 5% 1/8W
J415	40AA1000	R,CHIP 0H 5% 1/8W
J416	40AA1000	R,CHIP 0H 5% 1/8W
J419	40AA1000	R,CHIP 0H 5% 1/8W
J420	40AA1000	R,CHIP 0H 5% 1/8W
J421	40AA1000	R,CHIP 0H 5% 1/8W
J422	40AA1000	R,CHIP 0H 5% 1/8W
J423	40AA1000	R,CHIP 0H 5% 1/8W
J430	40AA3000	R,CHIP 0.0H 5% 1/10W
J431	40AA3000	R,CHIP 0.0H 5% 1/10W
J432	40AA3000	R,CHIP 0.0H 5% 1/10W
J433	40AA3000	R,CHIP 0.0H 5% 1/10W
J733	40AA3000	R,CHIP 0.0H 5% 1/10W
J952	40AA1000	R,CHIP 0H 5% 1/8W
R101	40AAD129	R,CHIP 15H 5% 1/2W

SYMBOL	PART NO	DESCRIPTION
R102	40AB3161	R,CHIP 330H 1% 1/10W
R103	40AB3173	R,CHIP 1.0K 1% 1/10W
R104	40AB3169	R,CHIP 680H 1% 1/10W
R105	40AB3170	R,CHIP 750H 1% 1/10W
R106	40AB3155	R,CHIP 180H 1% 1/10W
R111	40AA3125	R,CHIP 10H 5% 1/10W
R112	40AA3125	R,CHIP 10H 5% 1/10W
R113	40AA3125	R,CHIP 10H 5% 1/10W
R151	40AA3146	R,CHIP 75H 5% 1/10W
R2001	404K5109	R,METAL 2.2H 5% 1/4W
R2002	40AB3223	R,CHIP 120K 1% 1/10W
R401	40AA3181	R,CHIP 2.2K 5% 1/10W
R402	40AC7301	R,CHIP 1.0H 5% 1/2W
R403	40AB3199	R,CHIP 12K 1% 1/10W
R404	40AB3183	R,CHIP 2.7K 1% 1/10W
R405	40AAD189	R,CHIP 4.7K 5% 1/2W
R406	40499440	R,METAL 1.0H 1% 1W
R411	40AB3211	R,CHIP 39K 1% 1/10W
R412	40AA3159	R,CHIP 270H 5% 1/10W
R413	40AB3208	R,CHIP 30K 1% 1/10W
R414	40AA2165	R,CHIP 470H 5% 1/4W
R421	40AA3197	R,CHIP 10K 5% 1/10W
R422	40AA3197	R,CHIP 10K 5% 1/10W
R423	40AA3197	R,CHIP 10K 5% 1/10W
R424	40AA3197	R,CHIP 10K 5% 1/10W
R425	40AB3197	R,CHIP 10K 1% 1/10W
R426	40AB3197	R,CHIP 10K 1% 1/10W
R427	40AB3197	R,CHIP 10K 1% 1/10W
R428	40AB3197	R,CHIP 10K 1% 1/10W
R429	40AA3215	R,CHIP 56K 5% 1/10W
R42A	40AA3149	R,CHIP 100H 5% 1/10W
R42E	40AA3149	R,CHIP 100H 5% 1/10W
R4H1	401K5721	R,CARBON 100K 5% 1/6W
R4H2	401K5697	R,CARBON 10K 5% 1/6W
R4H5	401K5721	R,CARBON 100K 5% 1/6W
R4H6	401K5697	R,CARBON 10K 5% 1/6W
R4H7	404C1680	R,METAL 2.0K 1% 1/6W
R4H8	404C1673	R,METAL 1.0K 1% 1/6W
R4H9	404K5125	R,METAL 10H 5% 1/4W
R4J1	40AB3214	R,CHIP 51K 1% 1/10W
R4J2	40AB3198	R,CHIP 11K 1% 1/10W
R4J3	40AB3179	R,CHIP 1.8K 1% 1/10W
R4J4	40AB3204	R,CHIP 20K 1% 1/10W
R4J5	40AB2125	R,CHIP 10H 1% 1/4W
R4J6	40AC5309	R,CHIP 2.2H 5% 1/8W
R4J7	40AC7309	R,CHIP 2.2H 5% 1/2W
R4J8	40AAD125	R,CHIP 10H 5% 1/2W
R4K1	40AB3214	R,CHIP 51K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R4K4	40AB3204	R,CHIP 20K 1% 1/10W
R4K5	40AB2128	R,CHIP 13H 1% 1/4W
R4K6	40AC5309	R,CHIP 2.2H 5% 1/8W
R4K7	40AC7309	R,CHIP 2.2H 5% 1/2W
R4K8	40AAD141	R,CHIP 47H 5% 1/2W
R4K9	40AA3173	R,CHIP 1.0K 5% 1/10W
R4L1	40AB3214	R,CHIP 51K 1% 1/10W
R4L4	40AB3204	R,CHIP 20K 1% 1/10W
R4L5	40AB2127	R,CHIP 12H 1% 1/4W
R4L6	40AC7309	R,CHIP 2.2H 5% 1/2W
R4L9	40AC5309	R,CHIP 2.2H 5% 1/8W
R4M1	40AB3214	R,CHIP 51K 1% 1/10W
R4M4	40AB3204	R,CHIP 20K 1% 1/10W
R4M5	40AB2127	R,CHIP 12H 1% 1/4W
R4M6	40AC7309	R,CHIP 2.2H 5% 1/2W
R4M9	40AC5309	R,CHIP 2.2H 5% 1/8W
R4N1	40AB3214	R,CHIP 51K 1% 1/10W
R4N4	40AB3204	R,CHIP 20K 1% 1/10W
R4N5	40AB2127	R,CHIP 12H 1% 1/4W
R4N6	40AC7309	R,CHIP 2.2H 5% 1/2W
R4N9	40AC5309	R,CHIP 2.2H 5% 1/8W
R4P1	40AB3219	R,CHIP 82K 1% 1/10W
R4P4	404C1740	R,METAL 620K 1% 1/6W
R4P5	40AA3149	R,CHIP 100H 5% 1/10W
R4P6	40AA3000	R,CHIP 0.0H 5% 1/10W
R4P7	40AA3197	R,CHIP 10K 5% 1/10W
R4P8	404J9476	R,METAL 2.2M 1% 1/4W
R4P9	404C1745	R,METAL 1.0M 1% 1/6W
R4PA	40AB3225	R,CHIP 150K 1% 1/10W
R4PE	40AB3203	R,CHIP 18K 1% 1/10W
R4PF	40AB3212	R,CHIP 43K 1% 1/10W
R4PH	40AB3219	R,CHIP 82K 1% 1/10W
R4R1	40AB3214	R,CHIP 51K 1% 1/10W
R4R4	40AB3204	R,CHIP 20K 1% 1/10W
R4R5	40AB2127	R,CHIP 12H 1% 1/4W
R4R6	40AC7309	R,CHIP 2.2H 5% 1/2W
R4R9	40AC5309	R,CHIP 2.2H 5% 1/8W
R501	40AA3173	R,CHIP 1.0K 5% 1/10W
R502	40AA1155	R,CHIP 180H 5% 1/8W
R503	40AB3177	R,CHIP 1.5K 1% 1/10W
R504	40AB3168	R,CHIP 620H 1% 1/10W
R506	40AA3169	R,CHIP 680H 5% 1/10W
R507	40AA3169	R,CHIP 680H 5% 1/10W
R508	40AA3175	R,CHIP 1.2K 5% 1/10W
R509	40AA3199	R,CHIP 12K 5% 1/10W
R50A	40AB3183	R,CHIP 2.7K 1% 1/10W
R50C	40AB3182	R,CHIP 2.4K 1% 1/10W
R50E	40AB3210	R,CHIP 36K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R50G	40AB3197	R,CHIP 10K 1% 1/10W
R50H	40AB3199	R,CHIP 12K 1% 1/10W
R50J	40AA3221	R,CHIP 100K 5% 1/10W
R50K	40AB3187	R,CHIP 3.9K 1% 1/10W
R50L	40AB3215	R,CHIP 56K 1% 1/10W
R50M	40AB3215	R,CHIP 56K 1% 1/10W
R50P	40AA3197	R,CHIP 10K 5% 1/10W
R510	40AA1151	R,CHIP 120H 5% 1/8W
R511	40AA3245	R,CHIP 1.0M 5% 1/10W
R512	40AA3173	R,CHIP 1.0K 5% 1/10W
R513	40AA3189	R,CHIP 4.7K 5% 1/10W
R514	40AA3221	R,CHIP 100K 5% 1/10W
R515	40AA2165	R,CHIP 470H 5% 1/4W
R516	40AA3173	R,CHIP 1.0K 5% 1/10W
R517	40AA3173	R,CHIP 1.0K 5% 1/10W
R518	40AA3190	R,CHIP 5.1K 5% 1/10W
R519	40AA3193	R,CHIP 6.8K 5% 1/10W
R51A	40AA3149	R,CHIP 100H 5% 1/10W
R51F	40AA3190	R,CHIP 5.1K 5% 1/10W
R51G	40AA3169	R,CHIP 680H 5% 1/10W
R51P	404K5125	R,METAL 10H 5% 1/4W
R51R	404K5133	R,METAL 22H 5% 1/4W
R51W	40AA3189	R,CHIP 4.7K 5% 1/10W
R520	40AA3190	R,CHIP 5.1K 5% 1/10W
R521	40AA3197	R,CHIP 10K 5% 1/10W
R522	40AA3149	R,CHIP 100H 5% 1/10W
R523	40AA3149	R,CHIP 100H 5% 1/10W
R524	40AA3149	R,CHIP 100H 5% 1/10W
R525	40AA3197	R,CHIP 10K 5% 1/10W
R526	40AA3173	R,CHIP 1.0K 5% 1/10W
R527	40AA3173	R,CHIP 1.0K 5% 1/10W
R528	40AA3197	R,CHIP 10K 5% 1/10W
R529	40AA3208	R,CHIP 30K 5% 1/10W
R52A	40AA3000	R,CHIP 0.0H 5% 1/10W
R52C	40AA3161	R,CHIP 330H 5% 1/10W
R52E	40AA3173	R,CHIP 1.0K 5% 1/10W
R52F	40AA3173	R,CHIP 1.0K 5% 1/10W
R52H	40AA3173	R,CHIP 1.0K 5% 1/10W
R531	40AA3173	R,CHIP 1.0K 5% 1/10W
R532	40AA1149	R,CHIP 100H 5% 1/8W
R533	40AA3149	R,CHIP 100H 5% 1/10W
R53E	40AA3149	R,CHIP 100H 5% 1/10W
R53F	40AA3149	R,CHIP 100H 5% 1/10W
R540	40AA3209	R,CHIP 33K 5% 1/10W
R541	40AA3197	R,CHIP 10K 5% 1/10W
R542	40AA3173	R,CHIP 1.0K 5% 1/10W
R543	40AA3173	R,CHIP 1.0K 5% 1/10W
R544	40AA3173	R,CHIP 1.0K 5% 1/10W

SYMBOL	PART NO	DESCRIPTION
R545	40AB3197	R,CHIP 10K 1% 1/10W
R546	40AB3197	R,CHIP 10K 1% 1/10W
R548	40AA3197	R,CHIP 10K 5% 1/10W
R549	40AA3208	R,CHIP 30K 5% 1/10W
R54A	40AA3173	R,CHIP 1.0K 5% 1/10W
R556	40AA3149	R,CHIP 100H 5% 1/10W
R557	404J9510	R,METAL 2.2H 5% 1/4W
R558	40AA3125	R,CHIP 10H 5% 1/10W
R559	40371133	R,METAL 22H 5% 1W
R55A	40399092	R,METAL 1.2H 5% 5W
R55E	40AA3197	R,CHIP 10K 5% 1/10W
R55K	401J9820	R,CARBON 0.0H
R561	40371125	R,METAL 10H 5% 1W
R562	40373127	R,METAL 12H 5% 3W
R56A	40AB3211	R,CHIP 39K 1% 1/10W
R56C	40AB3199	R,CHIP 12K 1% 1/10W
R56E	40AA3197	R,CHIP 10K 5% 1/10W
R56F	40AA3205	R,CHIP 22K 5% 1/10W
R571	40383028	R,METAL 180H 5% 3W
R573	40AA1239	R,CHIP 560K 5% 1/8W
R574	40AA1239	R,CHIP 560K 5% 1/8W
R575	40AA1239	R,CHIP 560K 5% 1/8W
R576	40AA1239	R,CHIP 560K 5% 1/8W
R577	40AA1239	R,CHIP 560K 5% 1/8W
R578	40AA1239	R,CHIP 560K 5% 1/8W
R579	40AA3149	R,CHIP 100H 5% 1/10W
R57A	40AA3149	R,CHIP 100H 5% 1/10W
R57C	40AA3149	R,CHIP 100H 5% 1/10W
R57E	40AA3149	R,CHIP 100H 5% 1/10W
R57F	40AA3149	R,CHIP 100H 5% 1/10W
R57J	40AA3149	R,CHIP 100H 5% 1/10W
R57K	40373141	R,METAL 47H 5% 3W
R57L	40AA3189	R,CHIP 4.7K 5% 1/10W
R57M	40AA3173	R,CHIP 1.0K 5% 1/10W
R57N	40AA3197	R,CHIP 10K 5% 1/10W
R57P	40AA3213	R,CHIP 47K 5% 1/10W
R57T	40AA5145	R,CHIP 68H 5% 1/4W
R581	40AA1165	R,CHIP 470H 5% 1/8W
R582	40AA3125	R,CHIP 10H 5% 1/10W
R583	40371129	R,METAL 15H 5% 1W
R584	40371131	R,METAL 18H 5% 1W
R592	40AB3223	R,CHIP 120K 1% 1/10W
R593	40AB3197	R,CHIP 10K 1% 1/10W
R595	40AA1205	R,CHIP 22K 5% 1/8W
R596	40AA1213	R,CHIP 47K 5% 1/8W
R597	40AA1197	R,CHIP 10K 5% 1/8W
R598	40AA3209	R,CHIP 33K 5% 1/10W
R599	40AB3233	R,CHIP 330K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R59A	40AB3224	R,CHIP 130K 1% 1/10W
R59C	40AB3206	R,CHIP 24K 1% 1/10W
R59E	40AB3205	R,CHIP 22K 1% 1/10W
R59F	40AA3199	R,CHIP 12K 5% 1/10W
R59G	40AB3185	R,CHIP 3.3K 1% 1/10W
R59J	40AA3218	R,CHIP 75K 5% 1/10W
R59K	40AA3191	R,CHIP 5.6K 5% 1/10W
R59L	40AA3197	R,CHIP 10K 5% 1/10W
R59M	40AB3199	R,CHIP 12K 1% 1/10W
R59N	404K5133	R,METAL 22H 5% 1/4W
R59P	40AB3201	R,CHIP 15K 1% 1/10W
R59R	40AB5223	R,CHIP 120K 1% 1/2W
R59T	40AB3175	R,CHIP 1.2K 1% 1/10W
R59W	40AA3197	R,CHIP 10K 5% 1/10W
R5A1	404K5125	R,METAL 10H 5% 1/4W
R5A3	40AA3201	R,CHIP 15K 5% 1/10W
R5A4	40AB3229	R,CHIP 220K 1% 1/10W
R5A5	40AA3197	R,CHIP 10K 5% 1/10W
R5A6	40AA3197	R,CHIP 10K 5% 1/10W
R5A7	40AA3191	R,CHIP 5.6K 5% 1/10W
R5A8	40AA3239	R,CHIP 560K 5% 1/10W
R5A9	404J9509	R,METAL 470H 1% 1/4W
R5AC	40AA3191	R,CHIP 5.6K 5% 1/10W
R5AE	40371221	R,METAL 100K 5% 1W
R5E1	404J9510	R,METAL 2.2H 5% 1/4W
R5E2	40AA3179	R,CHIP 1.8K 5% 1/10W
R5E3	40371187	R,METAL 3.9K 5% 1W
R5E4	40AA3173	R,CHIP 1.0K 5% 1/10W
R5E5	40AA3173	R,CHIP 1.0K 5% 1/10W
R5F1	40371339	R,METAL 0.56H 5% 1W
R5F2	401G6191	R,CARBON 5.6K 5% 1/4W
R5F3	40AA3235	R,CHIP 390K 5% 1/10W
R5F4	40AA3221	R,CHIP 100K 5% 1/10W
R5F5	40AA3197	R,CHIP 10K 5% 1/10W
R5F6	40AA1207	R,CHIP 27K 5% 1/8W
R5F7	40AA3205	R,CHIP 22K 5% 1/10W
R5F8	40AA3197	R,CHIP 10K 5% 1/10W
R5G1	40AA5141	R,CHIP 47H 5% 1/4W
R5G2	40AA3195	R,CHIP 8.2K 5% 1/10W
R5G3	40AC5309	R,CHIP 2.2H 5% 1/8W
R5GA	40AAD163	R,CHIP 390H 5% 1/2W
R5GC	40AAD163	R,CHIP 390H 5% 1/2W
R5GE	40AB3201	R,CHIP 15K 1% 1/10W
R5GF	40AB3197	R,CHIP 10K 1% 1/10W
R5P1	40AA2133	R,CHIP 22H 5% 1/4E
R5P2	40AA2133	R,CHIP 22H 5% 1/4E
R5P3	404K5149	R,METAL 100H 5% 1/4W
R5R1	40224137	R,WIRE 33H 5% 5W

SYMBOL	PART NO	DESCRIPTION
R5R2	40224137	R,WIRE 33H 5% 5W
R5R3	40409907	R,NETAL 0.18H 5% 1W
R5T1	404C1731	R,METAL 270K 1% 1/6W
R5T2	404C1718	R,METAL 75K 1% 1/6W
R5U1	40AB3183	R,CHIP 2.7K 1% 1/10W
R5U2	40AB3219	R,CHIP 82K 1% 1/10W
R5U3	40AB1231	R,CHIP 270K 1% 1/8W
R5X1	404K5125	R,METAL 10H 5% 1/4W
R5X2	40AA2199	R,CHIP 12K 5% 1/4W
R5X3	40AA3221	R,CHIP 100K 5% 1/10W
R5X4	40AB3226	R,CHIP 160K 1% 1/10W
R5X5	40AB3201	R,CHIP 15K 1% 1/10W
R602	40299104	R,WIRE 10H 5% 5W
R603	40AA3197	R,CHIP 10K 5% 1/10W
R604	40372143	R,METAL 56H 5% 2W
R605	40299181	R,WIRE 56K 5% 5W
R606	40299104	R,WIRE 10H 5% 5W
R621	40AA3169	R,CHIP 680H 5% 1/10W
R622	40371103	R,METAL 1.2H 5% 1W
R623	40371337	R,METAL 0.47H 5% 1W
R624	40AB3149	R,CHIP 100H 1% 1/10W
R625	40499462	R,METAL 0.12H 5% 3W
R626	404C1689	R、METAL 4.7K 1% 1/6W
R627	404C1745	R,METAL 1.0M 1% 1/6W
R628	404C1745	R,METAL 1.0M 1% 1/6W
R629	40AB3217	R,CHIP 68K 1% 1/10W
R630	40AB3217	R,CHIP 68K 1% 1/10W
R631	401K5739	R,CARBON 560K 5% 1/6W
R632	401K5739	R,CARBON 560K 5% 1/6W
R633	40AA3205	R,CHIP 22K 5% 1/10W
R634	40372217	R,METAL 68K 5% 2W
R635	40372221	R,METAL 100K 5% 2W
R636	401G6109	R,CARBON 2.2H 5% 1/4W
R638	40372197	R,METAL 10K 5% 2W
R639	40AA3179	R,CHIP 1.8K 5% 1/10W
R640	40AA3169	R,CHIP 680H 5% 1/10W
R641	40AA3171	R,CHIP 820H 5% 1/10W
R642	40AA3221	R,CHIP 100K 5% 1/10W
R671	40373109	R,METAL 2.2H 5% 3W
R672	40AA3189	R,CHIP 4.7K 5% 1/10W
R673	40AA3169	R,CHIP 680H 5% 1/10W
R674	40373187	R,METAL 3.9K 5% 3W
R675	40AA3177	R,CHIP 1.5K 5% 1/10W
R676	401K5671	R,CARBON 820H 5% 1/6W
R677	40371199	R,METAL 12K 5% 1W
R678	40AA3219	R,CHIP 82K 5% 1/10W
R694	404C1745	R,METAL 1.0M 1% 1/6W
R695	404C1745	R,METAL 1.0M 1% 1/6W

SYMBOL	PART NO	DESCRIPTION
R696	40AA3187	R,CHIP 3.9K 5% 1/10W
R697	40AA3219	R,CHIP 82K 5% 1/10W
R6A1	40371221	R,METAL 100K 5% 1W
R6E1	40372199	R,METAL 12K 5% 2W
R6F1	40499508	R,METAL 0.1H 5% 1/2W
R6G1	40499507	R,METAL 0.22H 5% 1/2W
R6K1	404E1329	R,METAL 0.22H 5% 1/4W
R6K2	401K5669	R,CARBON 680H 5% 1/6W
R6P1	40372217	R,METAL 68K 5% 2W
R6P2	401K5701	R,CARBON 15K 5% 1/6W
R6T1	401H6757	R,CARBON 3.3M 5% 1/2W
R6V1	401C6631	R,CARBON 18H 5% 1/4W
R6V2	401G6109	R,CARBON 2.2H 5% 1/4W
R6V3	401K5697	R,CARBON 10K 5% 1/6W
R6V4	401K5669	R,CARBON 680H 5% 1/6W
R6V5	401K5691	R,CARBON 5.6K 5% 1/6W
R6V6	401K5721	R,CARBON 100K 5% 1/6W
R6V7	401K5745	R,CARBON 1.0M 5% 1/6W
R6V8	401K5721	R,CARBON 100K 5% 1/6W
R6V9	401K5689	R,CARBON 4.7K 5% 1/6W
R6W0	401K5673	R,CARBON 1.0K 5% 1/6W
R6W1	401K5689	R,CARBON 4.7K 5% 1/6W
R6W2	404C1715	R,METAL 56K 1% 1/6W
R6W3	401K5663	R,CARBON 390H 5% 1/6W
R701B	40AB3153	R,CHIP 150H 1% 1/10W
R701G	40AB3153	R,CHIP 150H 1% 1/10W
R701R	40AB3153	R,CHIP 150H 1% 1/10W
R702B	40AB3153	R,CHIP 150H 1% 1/10W
R702G	40AB3153	R,CHIP 150H 1% 1/10W
R702R	40AB3153	R,CHIP 150H 1% 1/10W
R703B	40AB3153	R,CHIP 150H 1% 1/10W
R703G	40AB3153	R,CHIP 150H 1% 1/10W
R703R	40AB3153	R,CHIP 150H 1% 1/10W
R704B	40AB3153	R,CHIP 150H 1% 1/10W
R704G	40AB3153	R,CHIP 150H 1% 1/10W
R704R	40AB3153	R,CHIP 150H 1% 1/10W
R709	40AA3175	R,CHIP 1.2K 5% 1/10W
R70A	40AA3143	R,CHIP 56H 5% 1/10W
R70E	40AA3175	R,CHIP 1.2K 5% 1/10W
R70F	40AA3143	R,CHIP 56H 5% 1/10W
R712	40AA3149	R,CHIP 100H 5% 1/10W
R713	40AB3199	R,CHIP 12K 1% 1/10W
R714	40AB3177	R,CHIP 1.5K 1% 1/10W
R716B	40AAD165	R,CHIP 470H 5% 1/2W
R716G	40AAD165	R,CHIP 470H 5% 1/2W
R716R	40AAD165	R,CHIP 470H 5% 1/2W
R717B	40AA3151	R,CHIP 120H 5% 1/10W
R717G	40AA3151	R,CHIP 120H 5% 1/10W

SYMBOL	PART NO	DESCRIPTION
R717R	40AA3151	R,CHIP 120H 5% 1/10W
R718B	40AAD159	R,CHIP 270H 5% 1/2W
R718G	40AAD159	R,CHIP 270H 5% 1/2W
R718R	40AAD159	R,CHIP 270H 5% 1/2W
R719B	40AA3151	R,CHIP 120H 5% 1/10W
R719G	40AA3151	R,CHIP 120H 5% 1/10W
R719R	40AA3151	R,CHIP 120H 5% 1/10W
R71A	40AA3177	R,CHIP 1.5K 5% 1/10W
R71E	40AA3173	R,CHIP 1.0K 5% 1/10W
R71F	40AA3149	R,CHIP 100H 5% 1/10W
R71G	40AA3149	R,CHIP 100H 5% 1/10W
R71H	40AA3155	R,CHIP 180H 5% 1/10W
R71K	40AA3000	R,CHIP 0.0H 5% 1/10W
R721B	40AA3149	R,CHIP 100H 5% 1/10W
R721G	40AA3149	R,CHIP 100H 5% 1/10W
R721R	40AA3149	R,CHIP 100H 5% 1/10W
R722B	40AB3185	R,CHIP 3.3K 1% 1/10W
R722G	40AB3185	R,CHIP 3.3K 1% 1/10W
R722R	40AB3185	R,CHIP 3.3K 1% 1/10W
R723B	40AB3171	R,CHIP 820H 1% 1/10W
R723G	40AB3171	R,CHIP 820H 1% 1/10W
R723R	40AB3171	R,CHIP 820H 1% 1/10W
R724B	40AB3151	R,CHIP 120H 1% 1/10W
R724G	40AB3151	R,CHIP 120H 1% 1/10W
R724R	40AB3151	R,CHIP 120H 1% 1/10W
R725B	40AB3159	R,CHIP 270H 1% 1/10W
R725G	40AB3159	R,CHIP 270H 1% 1/10W
R725R	40AB3159	R,CHIP 270H 1% 1/10W
R726B	40AA3149	R,CHIP 100H 5% 1/10W
R726G	40AA3149	R,CHIP 100H 5% 1/10W
R726R	40AA3149	R,CHIP 100H 5% 1/10W
R727B	40AA3149	R,CHIP 100H 5% 1/10W
R727G	40AA3149	R,CHIP 100H 5% 1/10W
R727R	40AA3149	R,CHIP 100H 5% 1/10W
R728	40AAD163	R,CHIP 390H 5% 1/2W
R72E	40AA3173	R,CHIP 1.0K 5% 1/10W
R72F	40AA3173	R,CHIP 1.0K 5% 1/10W
R72G	40AA3173	R,CHIP 1.0K 5% 1/10W
R72HB	40AB3159	R,CHIP 270H 1% 1/10W
R72HG	40AB3159	R,CHIP 270H 1% 1/10W
R72HR	40AB3159	R,CHIP 270H 1% 1/10W
R72KB	40AA3149	R,CHIP 100H 5% 1/10W
R72KG	40AA3149	R,CHIP 100H 5% 1/10W
R72KR	40AA3149	R,CHIP 100H 5% 1/10W
R731	40AA3149	R,CHIP 100H 5% 1/10W
R732	40AA3149	R,CHIP 100H 5% 1/10W
R733	40AA3149	R,CHIP 100H 5% 1/10W
R734	40AA3149	R,CHIP 100H 5% 1/10W

SYMBOL	PART NO	DESCRIPTION
R736B	40AA3143	R,CHIP 56H 5% 1/10W
R736G	40AA3141	R,CHIP 47H 5% 1/10W
R736R	40AA3143	R,CHIP 56H 5% 1/10W
R738	40AA3169	R,CHIP 680H 5% 1/10W
R739	40AA3181	R,CHIP 2.2K 5% 1/10W
R73A	40AA3173	R,CHIP 1.0K 5% 1/10W
R73E	40AB3191	R,CHIP 5.6K 1% 1/10W
R73F	40AB3183	R,CHIP 2.7K 1% 1/10W
R73G	40AB3205	R,CHIP 22K 1% 1/10W
R73H	40AA3173	R,CHIP 1.0K 5% 1/10W
R73J	40AB3191	R,CHIP 5.6K 1% 1/10W
R73K	40AB3183	R,CHIP 2.7K 1% 1/10W
R73WB	40AA3137	R,CHIP 33H 5% 1/10W
R73WG	40AA3137	R,CHIP 33H 5% 1/10W
R73WR	40AA3137	R,CHIP 33H 5% 1/10W
R73XB	40AA3137	R,CHIP 33H 5% 1/10W
R73XG	40AA3137	R,CHIP 33H 5% 1/10W
R73XR	40AA3137	R,CHIP 33H 5% 1/10W
R741B	401K5737	R,CARBON 470K 5% 1/6W
R741G	401K5737	R,CARBON 470K 5% 1/6W
R741R	401K5737	R,CARBON 470K 5% 1/6W
R742B	40AAD213	R,CHIP 47K 5% 1/2W
R742G	40AAD213	R,CHIP 47K 5% 1/2W
R742R	40AAD213	R,CHIP 47K 5% 1/2W
R743B	40AB3233	R,CHIP 330K 1% 1/10W
R743G	40AB3233	R,CHIP 330K 1% 1/10W
R743R	40AB3233	R,CHIP 330K 1% 1/10W
R744B	40AB3227	R,CHIP 180K 1% 1/10W
R744G	40AB3227	R,CHIP 180K 1% 1/10W
R744R	40AB3227	R,CHIP 180K 1% 1/10W
R745B	40AA3157	R,CHIP 220H 5% 1/10W
R745G	40AA3157	R,CHIP 220H 5% 1/10W
R745R	40AA3157	R,CHIP 220H 5% 1/10W
R746B	40AB3221	R,CHIP 100K 1% 1/10W
R746G	40AB3221	R,CHIP 100K 1% 1/10W
R746R	40AB3221	R,CHIP 100K 1% 1/10W
R747B	40AA3197	R,CHIP 10K 5% 1/10W
R747G	40AA3197	R,CHIP 10K 5% 1/10W
R747R	40AA3197	R,CHIP 10K 5% 1/10W
R748B	40AA3185	R,CHIP 3.3K 5% 1/10W
R748G	40AA3185	R,CHIP 3.3K 5% 1/10W
R748R	40AA3185	R,CHIP 3.3K 5% 1/10W
R749B	40AB3219	R,CHIP 82K 1% 1/10W
R749G	40AB3219	R,CHIP 82K 1% 1/10W
R749R	40AB3219	R,CHIP 82K 1% 1/10W
R74AB	40AB3205	R,CHIP 22K 1% 1/10W
R74AG	40AB3205	R,CHIP 22K 1% 1/10W
R74AR	40AB3205	R,CHIP 22K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R74EB	40AB3211	R,CHIP 39K 1% 1/10W
R74EG	40AB3211	R,CHIP 39K 1% 1/10W
R74ER	40AB3211	R,CHIP 39K 1% 1/10W
R74FB	40AB3222	R,CHIP 110K 1% 1/10W
R74FG	40AB3222	R,CHIP 110K 1% 1/10W
R74FR	40AB3222	R,CHIP 110K 1% 1/10W
R74GB	40AAD213	R,CHIP 47K 5% 1/2W
R74GG	40AAD213	R,CHIP 47K 5% 1/2W
R74GR	40AAD213	R,CHIP 47K 5% 1/2W
R751	40AA3173	R,CHIP 1.0K 5% 1/10W
R752	40AA3149	R,CHIP 100H 5% 1/10W
R753	40AA3149	R,CHIP 100H 5% 1/10W
R771	40AA3197	R,CHIP 10K 5% 1/10W
R772	40AA3193	R,CHIP 6.8K 5% 1/10W
R773	40AA3173	R,CHIP 1.0K 5% 1/10W
R774	40AA3169	R,CHIP 680H 5% 1/10W
R775	40AA3195	R,CHIP 8.2K 5% 1/10W
R781	40AA3167	R,CHIP 560H 5% 1/10W
R782	40AA3209	R,CHIP 33K 5% 1/10W
R783	40AA1245	R,CHIP 1.0M 5% 1/8W
R784	40AA3231	R,CHIP 270K 5% 1/10W
R785	40AA3242	R,CHIP 750K 5% 1/10W
R786	40AA3242	R,CHIP 750K 5% 1/10W
R787	40AA3233	R,CHIP 330K 5% 1/10W
R791	40AB3173	R,CHIP 1.0K 1% 1/10W
R792	40AA3149	R,CHIP 100H 5% 1/10W
R793	40AA3149	R,CHIP 100H 5% 1/10W
R794	40AA3157	R,CHIP 220H 5% 1/10W
R795B	40AA3157	R,CHIP 220H 5% 1/10W
R795G	40AA3157	R,CHIP 220H 5% 1/10W
R795R	40AA3157	R,CHIP 220H 5% 1/10W
R79A	40AA3181	R,CHIP 2.2K 5% 1/10W
R79E	40AA3197	R,CHIP 10K 5% 1/10W
R79F	40AA3187	R,CHIP 3.9K 5% 1/10W
R79G	40AA3173	R,CHIP 1.0K 5% 1/10W
R79H	40AA3197	R,CHIP 10K 5% 1/10W
R79K	40AA3213	R,CHIP 47K 5% 1/10W
R79L	40AA3189	R,CHIP 4.7K 5% 1/10W
R79M	40AA3197	R,CHIP 10K 5% 1/10W
R79N	40AA3205	R,CHIP 22K 5% 1/10W
R79P	40AA3213	R,CHIP 47K 5% 1/10W
R79R	40AA3213	R,CHIP 47K 5% 1/10W
R79T	40AA3197	R,CHIP 10K 5% 1/10W
R79U	40AA3197	R,CHIP 10K 5% 1/10W
R79W	40AA3181	R,CHIP 2.2K 5% 1/10W
R7A1	40AA3173	R,CHIP 1.0K 5% 1/10W
R7A2	40AB3187	R,CHIP 3.9K 1% 1/10W
R7A3	40AB3181	R,CHIP 2.2K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R7A7	40AA3173	R,CHIP 1.0K 5% 1/10W
R7A8	40AA3169	R,CHIP 680H 5% 1/10W
R7A9	40AA3212	R,CHIP 43K 5% 1/10W
R7AG	40AB3214	R,CHIP 51K 1% 1/10W
R7AH	40AA3169	R,CHIP 680H 5% 1/10W
R7AK	40AA3169	R,CHIP 680H 5% 1/10W
R7AL	40AA3159	R,CHIP 270H 5% 1/10W
R7AM	40AA3159	R,CHIP 270H 5% 1/10W
R7E2	40AA2167	R,CHIP 560H 5% 1/4W
R7E3	40AA3181	R,CHIP 2.2K 5% 1/10W
R7E4	40372169	R,METAL 680H 5% 2W
R7E5	404K5125	R,METAL 10H 5% 1/4W
R7E6	40AA2189	R,CHIP 4.7K 5% 1/4W
R7E7	40AA2195	R,CHIP 8.2K 5% 1/4W
R7F1	40AA3000	R,CHIP 0.0H 5% 1/10W
R7F2	40AA3177	R,CHIP 1.5K 5% 1/10W
R7F5	40371103	R,METAL 1.2H 5% 1W
R7G1	40AA3185	R,CHIP 3.3K 5% 1/10W
R7G2	40AA3185	R,CHIP 3.3K 5% 1/10W
R7G3	40AA3209	R,CHIP 33K 5% 1/10W
R7G4	40AA3209	R,CHIP 33K 5% 1/10W
R7G6	40AB3229	R,CHIP 220K 1% 1/10W
R7G7	40AA3221	R,CHIP 100K 5% 1/10W
R7G8	40AA3199	R,CHIP 12K 5% 1/10W
R7G9	40AB3185	R,CHIP 3.3K 1% 1/10W
R7GA	40AA3209	R,CHIP 33K 5% 1/10W
R7GE	40AA3209	R,CHIP 33K 5% 1/10W
R7GF	40AA3185	R,CHIP 3.3K 5% 1/10W
R7GG	40AA3181	R,CHIP 2.2K 5% 1/10W
R7GH	40AA3227	R,CHIP 180K 5% 1/10W
R7GJ	40AA3199	R,CHIP 12K 5% 1/10W
R7GK	40AB3229	R,CHIP 220K 1% 1/10W
R7GL	40AB3185	R,CHIP 3.3K 1% 1/10W
R7GM	40AA3199	R,CHIP 12K 5% 1/10W
R7GN	40AA3221	R,CHIP 100K 5% 1/10W
R7GP	40AA3209	R,CHIP 33K 5% 1/10W
R7GR	40AA3209	R,CHIP 33K 5% 1/10W
R7GT	40AA3185	R,CHIP 3.3K 5% 1/10W
R7GW	40AA3181	R,CHIP 2.2K 5% 1/10W
R7GX	40AA3227	R,CHIP 180K 5% 1/10W
R7GY	40AA3199	R,CHIP 12K 5% 1/10W
R7K1	40AA3192	R,CHIP 6.2K 5% 1/10W
R7K2	40AAD211	R,CHIP 39K 5% 1/2W
R7K3	40AA3197	R,CHIP 10K 5% 1/10W
R7K4	40AA3000	R,CHIP 0.0H 5% 1/10W
R7K5	40AA3197	R,CHIP 10K 5% 1/10W
R7Y1	40AA3233	R,CHIP 330K 5% 1/10W
R7Y2	40AA3161	R,CHIP 330H 5% 1/10W

SYMBOL	PART NO	DESCRIPTION
R7Y3	40AA3185	R,CHIP 3.3K 5% 1/10W
R7Y4	40AA3233	R,CHIP 330K 5% 1/10W
R7Y5	40AA3161	R,CHIP 330H 5% 1/10W
R7Y6	40AA3185	R,CHIP 3.3K 5% 1/10W
R7Y7	40AA3233	R,CHIP 330K 5% 1/10W
R7Y8	40AA3161	R,CHIP 330H 5% 1/10W
R7Y9	40AA3185	R,CHIP 3.3K 5% 1/10W
R7YA	40AA3233	R,CHIP 330K 5% 1/10W
R7YE	40AA3161	R,CHIP 330H 5% 1/10W
R7YF	40AA3185	R,CHIP 3.3K 5% 1/10W
R801	40AA3179	R,CHIP 1.8K 5% 1/10W
R802	40AA3179	R,CHIP 1.8K 5% 1/10W
R803	40AA3000	R,CHIP 0.0H 5% 1/10W
R804	40AA3000	R,CHIP 0.0H 5% 1/10W
R805	40AA3000	R,CHIP 0.0H 5% 1/10W
R806	40AA3000	R,CHIP 0.0H 5% 1/10W
R807	40AA3000	R,CHIP 0.0H 5% 1/10W
R808	40AA3000	R,CHIP 0.0H 5% 1/10W
R809	40AA3000	R,CHIP 0.0H 5% 1/10W
R80A	40AA3173	R,CHIP 1.0K 5% 1/10W
R80E	40AA3000	R,CHIP 0.0H 5% 1/10W
R80F	40AA3000	R,CHIP 0.0H 5% 1/10W
R80H	40AA3000	R,CHIP 0.0H 5% 1/10W
R80J	40AA3173	R,CHIP 1.0K 5% 1/10W
R80K	40AA3173	R,CHIP 1.0K 5% 1/10W
R810	40AA3173	R,CHIP 1.0K 5% 1/10W
R811	40AA3173	R,CHIP 1.0K 5% 1/10W
R812	40AA3000	R,CHIP 0.0H 5% 1/10W
R813	40AA3125	R,CHIP 10H 5% 1/10W
R814	40AA3125	R,CHIP 10H 5% 1/10W
R815	40AA3125	R,CHIP 10H 5% 1/10W
R818	40AA3173	R,CHIP 1.0K 5% 1/10W
R819	40AA3173	R,CHIP 1.0K 5% 1/10W
R821	40AA3000	R,CHIP 0.0H 5% 1/10W
R822	40AA3173	R,CHIP 1.0K 5% 1/10W
R823	40AA3207	R,CHIP 27K 5% 1/10W
R826	40AA3205	R,CHIP 22K 5% 1/10W
R827	40AA3000	R,CHIP 0.0H 5% 1/10W
R82A	40AA3000	R,CHIP 0.0H 5% 1/10W
R831	40AA3173	R,CHIP 1.0K 5% 1/10W
R832	40AA3189	R,CHIP 4.7K 5% 1/10W
R852	40AA3177	R,CHIP 1.5K 5% 1/10W
R855	40AA3209	R,CHIP 33K 5% 1/10W
R857	40AA3209	R,CHIP 33K 5% 1/10W
R859	40AA3221	R,CHIP 100K 5% 1/10W
R85A	40AA3167	R,CHIP 560H 5% 1/10W
R85E	40AA3000	R,CHIP 0.0H 5% 1/10W
R85F	40AA3000	R,CHIP 0.0H 5% 1/10W

SYMBOL	PART NO	DESCRIPTION
R85H	40AAD149	R,CHIP 100H 5% 1/2W
R85K	40AB3203	R,CHIP 18K 1% 1/10W
R85L	40AB3215	R,CHIP 56K 1% 1/10W
R85M	40AA3000	R,CHIP 0.0H 5% 1/10W
R85N	40AA3173	R,CHIP 1.0K 5% 1/10W
R8A1	40AA3207	R,CHIP 27K 5% 1/10W
R8A2	40AAD146	R,CHIP 75H 5% 1/2W
R8A3	40AA3213	R,CHIP 47K 5% 1/10W
R8A4	40AAD146	R,CHIP 75H 5% 1/2W
R8A5	40AA3197	R,CHIP 10K 5% 1/10W
R8A6	40AA3197	R,CHIP 10K 5% 1/10W
R8A7	40AA3197	R,CHIP 10K 5% 1/10W
R8A8	40AA3213	R,CHIP 47K 5% 1/10W
R8A9	40AAD151	R,CHIP 120H 5% 1/2W
R8AA	40AA3209	R,CHIP 33K 5% 1/10W
R8AE	40AA3173	R,CHIP 1.0K 5% 1/10W
R8AF	40AA3173	R,CHIP 1.0K 5% 1/10W
R8AH	40AA3209	R,CHIP 33K 5% 1/10W
R8AJ	40AA3179	R,CHIP 1.8K 5% 1/10W
R8GE	40372113	R,METAL 3.3H 5% 2W
R8H1	40AB3187	R,CHIP 3.9K 1% 1/10W
R8H2	40AB3205	R,CHIP 22K 1% 1/10W
R8H3	40372143	R,METAL 56H 5% 2W
R8H5	40AC5309	R,CHIP 2.2H 5% 1/8W
R8H6	40AA3149	R,CHIP 100H 5% 1/10W
R8J1	40AB3187	R,CHIP 3.9K 1% 1/10W
R8J2	40AB3205	R,CHIP 22K 1% 1/10W
R8J3	40373139	R,METAL 39H 5% 3W
R8J5	40AC5309	R,CHIP 2.2H 5% 1/8W
R8J6	40AA3159	R,CHIP 270H 5% 1/10W
R8JA	40AB3197	R,CHIP 10K 1% 1/10W
R8JC	40AB3187	R,CHIP 3.9K 1% 1/10W
R8M1B	40AA3161	R,CHIP 330H 5% 1/10W
R8M1G	40AA3161	R,CHIP 330H 5% 1/10W
R8M1R	40AA3161	R,CHIP 330H 5% 1/10W
R8M2B	40AA2177	R,CHIP 1.5K 5% 1/4W
R8M2G	40AA2177	R,CHIP 1.5K 5% 1/4W
R8M2R	40AA2177	R,CHIP 1.5K 5% 1/4W
R8M4B	40AA3153	R,CHIP 150H 5% 1/10W
R8M4G	40AA3153	R,CHIP 150H 5% 1/10W
R8M4R	40AA3153	R,CHIP 150H 5% 1/10W
R8M5	40AA3149	R,CHIP 100H 5% 1/10W
R8M6	40AA3149	R,CHIP 100H 5% 1/10W
R8M7	40AA3149	R,CHIP 100H 5% 1/10W
R8M8	40AA3149	R,CHIP 100H 5% 1/10W
R8M9	40AA3149	R,CHIP 100H 5% 1/10W
R8MA	40AA3245	R,CHIP 1.0M 5% 1/10W
R8MC	40AB3179	R,CHIP 1.8K 1% 1/10W

SYMBOL	PART NO	DESCRIPTION
R8ME	40AB3200	R,CHIP 13K 1% 1/10W
R8MFB	40AA2161	R,CHIP 330H 5% 1/4W
R8MFG	40AA2161	R,CHIP 330H 5% 1/4W
R8MFR	40AA2161	R,CHIP 330H 5% 1/4W
R8MH	40AA3173	R,CHIP 1.0K 5% 1/10W
R901B	40AA3139	R,CHIP 39H 5% 1/10W
R901G	40AA3139	R,CHIP 39H 5% 1/10W
R901R	40AA3139	R,CHIP 39H 5% 1/10W
R902B	401C6629	R,CARBON 15H 5% 1/4W
R902G	401C6629	R,CARBON 15H 5% 1/4W
R902R	401C6629	R,CARBON 15H 5% 1/4W
R903	401C6649	R,CARBON 100H 5% 1/4W
R904	40AAD133	R,CHIP 22H 5% 1/2W
R905	401C6689	R,CARBON 4.7K 5% 1/4W
R951	40AA3197	R,CHIP 10K 5% 1/10W
R952	40AA3173	R,CHIP 1.0K 5% 1/10W
R953	40AA3173	R,CHIP 1.0K 5% 1/10W
R983	40499449	R,METAL 10K 2% 1W
R984	40AB1171	R,CHIP 820H 1% 1/8W
R985	401G6141	R,CARBON 47H 5% 1/4W
R986	401G6141	R,CARBON 47H 5% 1/4W
R989	404J9477	R,METAL 68H 5% 2W
R990	40AA3233	R,CHIP 330K 5% 1/10W
R991	40372215	R,METAL 56K 5% 2W
R992	40AB3169	R,CHIP 680H 1% 1/10W
R993	40AA5193	R,CHIP 6.8K 5% 1/4W
R994	404K5125	R,METAL 10H 5% 1/4W
R995	401H5677	R,CARBON 1.5K 5% 1/2W

*** CAPACITORS ***

C151	42AA2744	C,CERAMIC 25V 0.1UF
C153	42AA2744	C,CERAMIC 25V 0.1UF
C2001	430B9066	C,ELEC 50V 22UF
C2002	430B9042	C,ELEC 25V 100UF
C401	430B9071	C,ELEC 50V 330UF
C402	42AA2744	C,CERAMIC 25V 0.1UF
C403	430B9070	C,ELEC 50V 220UF
C404	430B9070	C,ELEC 50V 220UF
C405	430B9071	C,ELEC 50V 330UF
C406	42AA2744	C,CERAMIC 25V 0.1UF
C407	428D4417	C,METAL FILM 250V 0.22UF
C421	42AA2744	C,CERAMIC 25V 0.1UF
C422	42AA2744	C,CERAMIC 25V 0.1UF
C423	427A7066	C,FILM 100V 0.018UF 5%
C424	42CA1458	C,CERAMIC 50V 560PF
C426	42CA1450	C,CERAMIC 50V 270PF
C427	430B9044	C,ELEC 25V 330UF
C428	430B9044	C,ELEC 25V 330UF

SYMBOL	PART NO	DESCRIPTION
C429	42CA1424	C,CERAMIC 50V 22PF
C471	42AA2726	C,CERAMIC 50V 0.01UF
C472	430B9064	C,ELEC 50V 4.7UF
C473	430B9064	C,ELEC 50V 4.7UF
C481	430B9041	C,ELEC 25V 47UF
C482	42AA2744	C,CERAMIC 25V 0.1UF
C483	430B9032	C,ELEC 16V 470UF
C4H1	430B9041	C,ELEC 25V 47UF
C4H2	421D6009	C,CERAMIC 25V 0.1UF
C4H3	430B9064	C,ELEC 50V 4.7UF
C4H7	430B9064	C,ELEC 50V 4.7UF
C4J1	430B9041	C,ELEC 25V 47UF
C4J2	42AA2744	C,CERAMIC 25V 0.1UF
C4J3	430B9041	C,ELEC 25V 47UF
C4J4	42AA2744	C,CERAMIC 25V 0.1UF
C4J6	42AA2744	C,CERAMIC 25V 0.1UF
C4K1	42AA2744	C,CERAMIC 25V 0.1UF
C4L1	42AA2744	C,CERAMIC 25V 0.1UF
C4L3	430B9041	C,ELEC 25V 47UF
C4L4	42AA2744	C,CERAMIC 25V 0.1UF
C4L5	430B9041	C,ELEC 25V 47UF
C4L6	42AA2744	C,CERAMIC 25V 0.1UF
C4M1	42AA2744	C,CERAMIC 25V 0.1UF
C4N1	42AA2744	C,CERAMIC 25V 0.1UF
C4N3	430B9041	C,ELEC 25V 47UF
C4N4	42AA2744	C,CERAMIC 25V 0.1UF
C4N5	430B9041	C,ELEC 25V 47UF
C4N6	42AA2744	C,CERAMIC 25V 0.1UF
C4P1	4309J248	C,ELEC 10V 3300UF
C4R1	42AA2744	C,CERAMIC 25V 0.1UF
C502	430B9039	C,ELEC 25V 22UF
C503	42AA2744	C,CERAMIC 25V 0.1UF
C504	430B9039	C,ELEC 25V 22UF
C505	42AA2744	C,CERAMIC 25V 0.1UF
C506	42CA1472	C,CERAMIC 50V 2200PF
C507	430B9032	C,ELEC 16V 470UF
C508	433A7014	C,ELEC 16V 100UF
C509	430B9041	C,ELEC 25V 47UF
C510	427F4669	C,FILM 50V 0.033UF
C511	430B9032	C,ELEC 16V 470UF
C512	42AA2744	C,CERAMIC 25V 0.1UF
C513	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C514	42AA2744	C,CERAMIC 25V 0.1UF
C515	430B9029	C,ELEC 16V 100UF
C516	42AA2744	C,CERAMIC 25V 0.1UF
C517	430B9029	C,ELEC 16V 100UF
C518	42AA2744	C,CERAMIC 25V 0.1UF
C519	42AA2744	C,CERAMIC 25V 0.1UF

SYMBOL	PART NO	DESCRIPTION
C520	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C522	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C523	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C524	42AA1533	C,CERAMIC 25V 0.033UF
C52A	42AA2744	C,CERAMIC 25V 0.1UF
C52C	430B9041	C,ELEC 25V 47UF
C52E	42AA2744	C,CERAMIC 25V 0.1UF
C52G	42AA2744	C,CERAMIC 25V 0.1UF
C52J	430B9041	C,ELEC 25V 47UF
C52K	42AA2744	C,CERAMIC 25V 0.1UF
C52L	42AA2744	C,CERAMIC 25V 0.1UF
C52M	430B9041	C,ELEC 25V 47UF
C52N	42AA2744	C,CERAMIC 25V 0.1UF
C52P	430B9041	C,ELEC 25V 47UF
C52T	42AA2744	C,CERAMIC 25V 0.1UF
C532	42AA2744	C,CERAMIC 25V 0.1UF
C533	430B9028	C,ELEC 16V 47UF
C54A	42AA1535	C,CERAMIC 25V 0.047UF
C552	4303H527	C,ELEC 25V 2200UF
C554	420C9571	C,CERAMIC 500V 4700PF
C561	42899190	C,METAL 2.0KV 4800PF 3%
C562	433A7014	C,ELEC 16V 100UF
C56A	430B6065	C,ELEC 50V 10UF
C56C	430B6065	C,ELEC 50V 10UF
C56E	42AA2744	C,CERAMIC 25V 0.1UF
C571	42AA2744	C,CERAMIC 25V 0.1UF
C573	42837229	C,METAL 250V 0.62UF
C574	42837223	C,METAL 250V 0.36UF
C575	42837210	C,METAL 250V 0.1UF
C576	42837220	C,METAL 250V 0.27UF
C577	42837238	C,METAL 250V 1.5UF
C578	42837232	C,METAL 250V 0.82UF
C579	42837214	C,METAL 250V 0.15UF
C57A	42837213	C,METAL 250V 0.13UF
C57C	420C9066	C,CERAMIC 500V 1800PF
C57E	42AA1538	C,CERAMIC 25V 0.1UF
C57F	42AA1538	C,CERAMIC 25V 0.1UF
C57H	42AA1538	C,CERAMIC 25V 0.1UF
C57J	42AA1538	C,CERAMIC 25V 0.1UF
C57K	42AA1538	C,CERAMIC 25V 0.1UF
C57M	42AA1538	C,CERAMIC 25V 0.1UF
C57N	430B6031	C,ELEC 16V 330UF
C57P	430B6065	C,ELEC 50V 10UF
C57T	430B6041	C,ELEC 25V 47UF
C57W	430F1113	C,ELEC 16V 100UF
C581	430B6017	C,ELEC 10V 220UF
C582	433A4026	C,ELEC 16V 100UF
C591	42AA2744	C,CERAMIC 25V 0.1UF

SYMBOL	PART NO	DESCRIPTION
C592	430B9553	C,ELEC 250V 2.2UF
C593	420C9567	C,CERAMIC 500V 2200PF
C595	427F4617	C,FILM 50V 0.022UF
C596	430B6065	C,ELEC 50V 10UF
C597	430B6041	C,ELEC 25V 47UF
C598	42CA1454	C,CERAMIC 50V 390PF
C59C	42AA2744	C,CERAMIC 25V 0.1UF
C59E	42AA2744	C,CERAMIC 25V 0.1UF
C59F	430B6041	C,ELEC 25V 47UF
C59H	430B6042	C,ELEC 25V 100UF
C59L	430B6065	C,ELEC 50V 10UF
C5A1	42AA2744	C,CERAMIC 25V 0.1UF
C5A2	42AA2744	C,CERAMIC 25V 0.1UF
C5A3	433A7046	C,ELEC 50V 10UF
C5A4	427F4687	CQ93M1H151J,BT
C5A5	427F4621	C,FILM 50V 0.047UF
C5A6	4302J556	C,ELEC 250V 10UF
C5A7	428D0097	C,FILM 250V 0.22UF
C5A8	427F4625	C,FILM 50V 0.1UF
C5A9	430B6043	C,ELEC 25V 220UF
C5AC	430B6043	C,ELEC 25V 220UF
C5E1	430B9096	C,ELEC 100V 3.3UF
C5E2	428D0053	C,METAL 100V 0.1UF
C5E3	42CA1440	C,CERAMIC 50V 100PF
C5F1	430B9016	C,ELEC 10V 100UF
C5F2	433A7002	C,ELEC 10V 47UF
C5F3	430B9016	C,ELEC 10V 100UF
C5F4	42AA2744	C,CERAMIC 25V 0.1UF
C5F5	42AA2744	C,CERAMIC 25V 0.1UF
C5G1	4309J236	C,ELEC 350V 33UF
C5G2	428D5093	C,METAL 250V 0.1UF
C5G3	4302J558	C,ELEC 250V 33UF
C5G5	428D5093	C,METAL 250V 0.1UF
C5GA	430B6067	C,ELEC 50V 33UF
C5GE	42AA2726	C,CERAMIC 50V 0.01UF
C5GF	430B6028	C,ELEC 16V 47UF
C5GH	430B6064	C,ELEC 50V 4.7UF
C5GK	42AA2744	C,CERAMIC 25V 0.1UF
C5P1	430B9041	C,ELEC 25V 47UF
C5P2	42AA2744	C,CERAMIC 25V 0.1UF
C5R1	4309J196	C,ELEC 100V 120UF
C5R2	42898011	C,FILM 100V 2.2UF
C5R3	42826301	C,FILM 800V 1000PF
C5R4	42703464	C,FILM 630V 0.012UF
C5T1	430B9062	C,ELEC 50V 2.2UF
C5T2	427F4625	C,FILM 50V 0.1UF
C5U1	427F4625	C,FILM 50V 0.1UF
C5X1	430B9516	C,ELEC 160V 10UF

SYMBOL	PART NO	DESCRIPTION
C5X2	430B6514	C,ELEC 160V 3.3UF
C607	42AA2721	C,CERAMIC 50V 0.1UF
C608	42060330	C,CERAMIC 400V 2200PF
C609	43109896	C,ELEC 400V 330UF
C610	43109896	C,ELEC 400V 330UF
C611	428D0225	C,METAL 630V 0.022UF
C621	430C9502	C,ELEC 35V 220UF
C622	42899196	C,METAL 1.25KV 1000PF 3%
C623	430C9502	C,ELEC 35V 220UF
C624	430B9516	C,ELEC 160V 10UF
C625	42CA1456	C,CERAMIC 50V 470PF
C671	430C9503	C,ELEC 100V 47UF
C672	428D6011	C,METAL 100V 0.15UF
C673	428D6009	C,METAL 100V 0.1UF
C674	430B6094	C,ELEC 100V 1.0UF
C6A1	4303J149	C,ELEC 250V 220UF
C6A2	4302F557	C,ELEC 250V 22UF
C6E1	4302J104	C,ELEC 100V 330UF
C6E2	4302F102	C,ELEC 100V 100UF
C6E3	4302J104	C,ELEC 100V 330UF
C6F1	4302J047	C,ELEC 25V 2200UF
C6F2	4302J047	C,ELEC 25V 2200UF
C6F3	430B6045	C,ELEC 25V 470UF
C6G2	4302J047	C,ELEC 25V 2200UF
C6H1	4302J047	C,ELEC 25V 2200UF
C6H2	430B6045	C,ELEC 25V 470UF
C6K1	430B9020	C,ELEC 10V 1000UF
C6K2	430B6029	C,ELEC 16V 100UF
C6P1	430B6082	C,ELEC 63V 10UF
C6P2	421C3479	C,CERAMIC 50V 0.1UF
C6T1	42826201	C,FILM 250V 0.1UF
C6T2	420EJ013	C,CERAMIC 400V 1000PF
C6T3	420EJ013	C,CERAMIC 400V 1000PF
C6T4	42826201	C,FILM 250V 0.1UF
C6V1	430B9045	C,ELEC 25V 470UF
C6V2	421C3479	C,CERAMIC 50V 0.1UF
C6V3	421C3479	C,CERAMIC 50V 0.1UF
C6V4	421C3479	C,CERAMIC 50V 0.1UF
C6Y1	42845181	C,FILM 400V 0.47UF
C6Y2	42839865	C,METAL FILM 400V 0.47UF
C701B	433A6148	C,ELEC 16V 100UF
C701G	433A6148	C,ELEC 16V 100UF
C701R	433A6148	C,ELEC 16V 100UF
C702B	42AA2726	C,CERAMIC 50V 0.01UF
C702G	42AA2726	C,CERAMIC 50V 0.01UF
C702R	42AA2726	C,CERAMIC 50V 0.01UF
C703B	433A6148	C,ELEC 16V 100UF
C703G	433A6148	C,ELEC 16V 100UF

SYMBOL	PART NO	DESCRIPTION
C703R	433A6148	C,ELEC 16V 100UF
C704B	42AA2726	C,CERAMIC 50V 0.01UF
C704G	42AA2726	C,CERAMIC 50V 0.01UF
C704R	42AA2726	C,CERAMIC 50V 0.01UF
C705	428B3513	C,METAL FILM 50V 0.1UF
C706	433A6143	C,ELEC 16V 10UF
C707	428B3513	C,METAL FILM 50V 0.1UF
C708	433A6143	C,ELEC 16V 10UF
C709	430B8144	C,ELEC 16V 47UF
C711B	433A6180	C,ELEC 50V 3.3UF
C711G	433A6180	C,ELEC 50V 3.3UF
C711R	433A6180	C,ELEC 50V 3.3UF
C712B	42AA2726	C,CERAMIC 50V 0.01UF
C712G	42AA2726	C,CERAMIC 50V 0.01UF
C712R	42AA2726	C,CERAMIC 50V 0.01UF
C713B	430J9184	C,ELEC 16V 100UF
C713G	430J9184	C,ELEC 16V 100UF
C713R	430J9184	C,ELEC 16V 100UF
C714B	42AA2744	C,CERAMIC 25V 0.1UF
C714G	42AA2744	C,CERAMIC 25V 0.1UF
C714R	42AA2744	C,CERAMIC 25V 0.1UF
C715	430B6031	C,ELEC 16V 330UF
C716	42AA2744	C,CERAMIC 25V 0.1UF
C717	430C0244	C,ELEC 16V 47UF
C718	42AA2744	C,CERAMIC 25V 0.1UF
C71AB	42AA2744	C,CERAMIC 25V 0.1UF
C71AG	42AA2744	C,CERAMIC 25V 0.1UF
C71AR	42AA2744	C,CERAMIC 25V 0.1UF
C71E	42AA2744	C,CERAMIC 25V 0.1UF
C71FB	430B9028	C,ELEC 16V 47UF
C71FG	430B9028	C,ELEC 16V 47UF
C71FR	430B9028	C,ELEC 16V 47UF
C721B	42AA1538	C,CERAMIC 25V 0.1UF
C721G	42AA1538	C,CERAMIC 25V 0.1UF
C721R	42AA1538	C,CERAMIC 25V 0.1UF
C722B	42CA1448	C,CERAMIC 50V 220PF
C722G	42CA1448	C,CERAMIC 50V 220PF
C722R	42CA1448	C,CERAMIC 50V 220PF
C723B	42CA1426	C,CERAMIC 50V 27PF
C723G	42CA1426	C,CERAMIC 50V 27PF
C723R	42CA1426	C,CERAMIC 50V 27PF
C724	42AA2744	C,CERAMIC 25V 0.1UF
C725	42AA2744	C,CERAMIC 25V 0.1UF
C726	430B9030	C,ELEC 16V 220UF
C727	428C9002	C,METAL FILM 100V 0.1UF
C728	430B6101	C,ELEC 100V 47UF
C729B	428D0097	C,FILM 250V 0.22UF
C729G	428D0097	C,FILM 250V 0.22UF

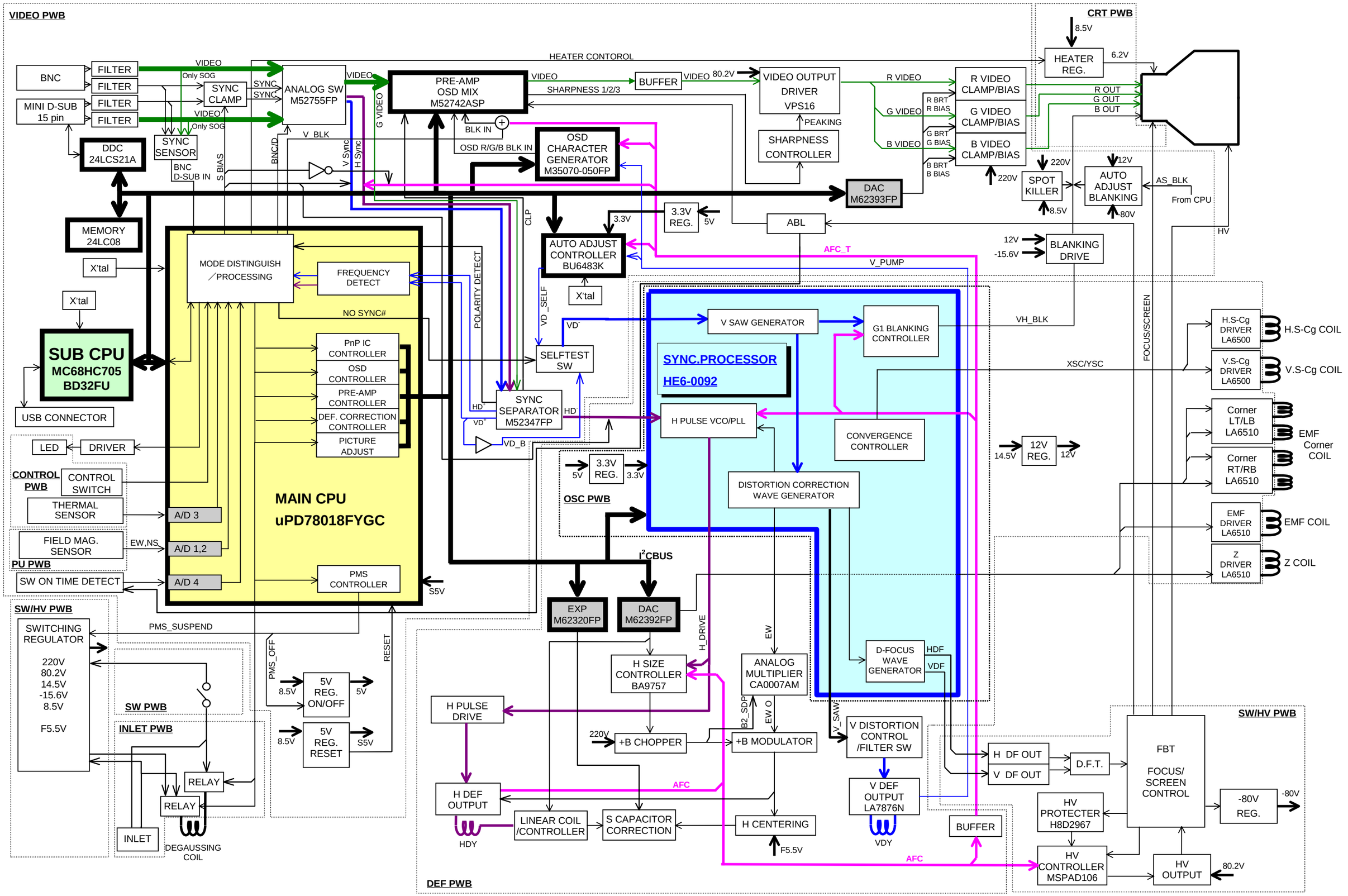
SYMBOL	PART NO	DESCRIPTION
C729R	428D0097	C,FILM 250V 0.22UF
C72AB	42CA1430	C,CERAMIC 50V 39PF
C72AG	42CA1430	C,CERAMIC 50V 39PF
C72AR	42CA1430	C,CERAMIC 50V 39PF
C72EB	42CA1438	C,CERAMIC 50V 82PF
C72EG	42CA1438	C,CERAMIC 50V 82PF
C72ER	42CA1438	C,CERAMIC 50V 82PF
C72F	42AA2744	C,CERAMIC 25V 0.1UF
C731	430C0244	C,ELEC 16V 47UF
C731A	42AA2744	C,CERAMIC 25V 0.1UF
C732B	42AA2744	C,CERAMIC 25V 0.1UF
C732G	42AA2744	C,CERAMIC 25V 0.1UF
C732R	42AA2744	C,CERAMIC 25V 0.1UF
C733B	42AA2744	C,CERAMIC 25V 0.1UF
C733G	42AA2744	C,CERAMIC 25V 0.1UF
C733R	42AA2744	C,CERAMIC 25V 0.1UF
C735	430J9184	C,ELEC 16V 100UF
C735A	42AA2744	C,CERAMIC 25V 0.1UF
C735E	42AA2744	C,CERAMIC 25V 0.1UF
C738	42AA2744	C,CERAMIC 25V 0.1UF
C739	42AA2744	C,CERAMIC 25V 0.1UF
C73A	430C0244	C,ELEC 16V 47UF
C73E	42AA2744	C,CERAMIC 25V 0.1UF
C73F	430B8179	C,ELEC 50V 10UF
C73H	430B8179	C,ELEC 50V 10UF
C741B	430B9552	C,ELEC 250V 1.0UF
C741G	430B9552	C,ELEC 250V 1.0UF
C741R	430B9552	C,ELEC 250V 1.0UF
C742B	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C742G	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C742R	42AA1521	C,CHIP CERAMIC 50V 0.01UF
C743B	428D0093	C,METALFILM 250V 0.1UF
C743G	428D0093	C,METALFILM 250V 0.1UF
C743R	428D0093	C,METALFILM 250V 0.1UF
C744B	427F4673	C,FILM 50V 0.068UF
C744G	427F4673	C,FILM 50V 0.068UF
C744R	427F4673	C,FILM 50V 0.068UF
C747	430C8355	C,ELEC 250V 10UF
C748	42AA2744	C,CERAMIC 25V 0.1UF
C751	42AA2744	C,CERAMIC 25V 0.1UF
C752	42AA2744	C,CERAMIC 25V 0.1UF
C764	430C8419	C,ELEC 16V 100UF
C765	430B6030	C,ELEC 16V 220UF
C766	430B6029	C,ELEC 16V 100UF
C771	427F4675	C,FILM 50V 0.1UF
C772	430B6028	C,ELEC 16V 47UF
C773	430B9028	C,ELEC 16V 47UF
C781	430B6028	C,ELEC 16V 47UF

SYMBOL	PART NO	DESCRIPTION
C783	430B9552	C,ELEC 250V 1.0UF
C791	42AA1505	C,CHIP CERAMIC 50V 470PF
C792	42AA1538	C,CERAMIC 25V 0.1UF
C793	430C0275	C,ELEC 50V 1.0UF
C794	42AA2744	C,CERAMIC 25V 0.1UF
C795	430J9184	C,ELEC 16V 100UF
C796	430B6029	C,ELEC 16V 100UF
C797	42AA2744	C,CERAMIC 25V 0.1UF
C79A	42CA1444	C,CERAMIC 50V 150PF
C79E	42CA1438	C,CERAMIC 50V 82PF
C79G	42AA1515	C,CHIP CERAMIC 50V 3300PF
C79H	42AA1509	C,CHIP CERAMIC 50V 1000PF
C7A1	42AA2744	C,CERAMIC 25V 0.1UF
C7A2	430C0278	C,ELEC 50V 4.7UF
C7A3	428B3511	C,METAL 50V 0.068UF
C7A4	430C0278	C,ELEC 50V 4.7UF
C7A5	430C0275	C,ELEC 50V 1.0UF
C7A8	42CA1448	C,CERAMIC 50V 220PF
C7A9	42AA2744	C,CERAMIC 25V 0.1UF
C7AA	430J9184	C,ELEC 16V 100UF
C7AE	42CA1440	C,CERAMIC 50V 100PF
C7AG	433A6520	C,ELEC 50V 1.0UF
C7E1	430B6069	C,ELEC 50V 100UF
C7E3	430B9028	C,ELEC 16V 47UF
C7E4	428D0097	C,FILM 250V 0.22UF
C7E7	430B6042	C,ELEC 25V 100UF
C7F1	430C8417	C,ELEC 16V 47UF
C7F2	42AA2744	C,CERAMIC 25V 0.1UF
C7F3	42AA2744	C,CERAMIC 25V 0.1UF
C7G1	42AA2744	C,CERAMIC 25V 0.1UF
C7G2	42AA1538	C,CERAMIC 25V 0.1UF
C7G3	42AA1538	C,CERAMIC 25V 0.1UF
C7G5	42AA2744	C,CERAMIC 25V 0.1UF
C7G6	42AA2744	C,CERAMIC 25V 0.1UF
C7GA	42CA1464	C,CERAMIC 50V 1000PF
C7GE	42AA2726	C,CERAMIC 50V 0.01UF
C7GF	42CA1436	C,CERAMIC 50V 68PF
C7GG	42CA1464	C,CERAMIC 50V 1000PF
C7GH	42AA2726	C,CERAMIC 50V 0.01UF
C7GJ	42CA1436	C,CERAMIC 50V 68PF
C7GK	42AA2744	C,CERAMIC 25V 0.1UF
C7K1	428D0081	C,METAL 250V 0.01UF
C801	42AA2744	C,CERAMIC 25V 0.1UF
C802	430B6029	C,ELEC 16V 100UF
C808	42CA1416	C,CERAMIC 50V 10PF
C809	42CA1416	C,CERAMIC 50V 10PF
C811	42AA2744	C,CERAMIC 25V 0.1UF
C814	42AA2744	C,CERAMIC 25V 0.1UF

SYMBOL	PART NO	DESCRIPTION
C816	42AA1509	C,CHIP CERAMIC 50V 1000PF
C817	42AA1509	C,CHIP CERAMIC 50V 1000PF
C818	42AA1509	C,CHIP CERAMIC 50V 1000PF
C852	42CA1428	C,CERAMIC 50V 33PF
C853	42CA1428	C,CERAMIC 50V 33PF
C854	42AA2744	C,CERAMIC 25V 0.1UF
C855	430B8145	C,ELEC 16V 100UF
C857	42AA2744	C,CERAMIC 25V 0.1UF
C85A	430B8179	C,ELEC 50V 10UF
C85E	42AA2744	C,CERAMIC 25V 0.1UF
C8A1	42AA2744	C,CERAMIC 25V 0.1UF
C8A2	430B8144	C,ELEC 16V 47UF
C8G3	42AA2744	C,CERAMIC 25V 0.1UF
C8G4	430B9028	C,ELEC 16V 47UF
C8G6	430B6028	C,ELEC 16V 47UF
C8G7	42AA2744	C,CERAMIC 25V 0.1UF
C8G8	42AA2744	C,CERAMIC 25V 0.1UF
C8G9	42AA2744	C,CERAMIC 25V 0.1UF
C8H1	42CA1456	C,CERAMIC 50V 470PF
C8H2	428B3013	C,METAL FILM 50V 0.1UF
C8HA	430B9041	C,ELEC 25V 47UF
C8HC	42AA2744	C,CERAMIC 25V 0.1UF
C8HE	430B9041	C,ELEC 25V 47UF
C8HF	42AA2744	C,CERAMIC 25V 0.1UF
C8J1	42CA1456	C,CERAMIC 50V 470PF
C8J2	428B3013	C,METAL FILM 50V 0.1UF
C8JC	42AA2744	C,CERAMIC 25V 0.1UF
C8JF	42AA2744	C,CERAMIC 25V 0.1UF
C8M1B	42AA2744	C,CERAMIC 25V 0.1UF
C8M1G	42AA2744	C,CERAMIC 25V 0.1UF
C8M1R	42AA2744	C,CERAMIC 25V 0.1UF
C8M2	42AA2744	C,CERAMIC 25V 0.1UF
C8M3	42AA2744	C,CERAMIC 25V 0.1UF
C8M4	42AA2744	C,CERAMIC 25V 0.1UF
C8M5	42CA1424	C,CERAMIC 50V 22PF
C8M6	42CA1424	C,CERAMIC 50V 22PF
C8M7	430B6028	C,ELEC 16V 47UF
C8M9	42AA2744	C,CERAMIC 25V 0.1UF
C8MA	430B9028	C,ELEC 16V 47UF
C8MF	430B6028	C,ELEC 16V 47UF
C901	420C9557	C,CERAMIC 500V 330PF
C902	420C9551	C,CERAMIC 500V 100PF
C903	4204K108	C,CERAMIC 2KV 0.01UF
C904	420D0019	C,CERAMIC 2KV 1000PF
C905	42AA2744	C,CERAMIC 25V 0.1UF
C958	433A4033	C,ELEC 25V 10UF
C959	42AA2726	C,CERAMIC 50V 0.01UF
C983	428D4317	C,METAL FILM 100V 0.22UF

SYMBOL	PART NO	DESCRIPTION
C984	430B6101	C,ELEC 100V 47UF
C985	420C9563	C,CERAMIC 500V 1000PF
C986	430B6065	C,ELEC 50V 10UF
C987	430B9098	C,ELEC 100V 10 UF
C989	423E2111	C,CERAMIC 500V 10PF

FP1350-1 (B)　BLOCK DIAGRAM



C&C for Human Potential