Цветной монитор

Руководство пользователя

OWNER'S MANUAL

StudioWorks 520Si

CH01

Перед началом эксплуатации Вашего монитора, пожалуйста, внимательно прочитайте данное руководство и сохраните его для использования в будущем.
Ниже впишите номер модели и серийный номер аппарата.
Эта информация находится на этикетке, приклеенной к задней панели монитора.
В случае необходимости ремонта сообщите эту информацю Вашему дилеру.

LG Electronics Inc.

http://www.lge.co.kr

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Информационная служба LG Electronics (095)742-77-77

P/NO:3828TUL057B (S-9909)

Printed in CHINA

Table of Contents

Monitor Registration

The model and serial numbers are found on the rear of this unit. These numbers are unique to this unit and not available to others. You should record requested information here and retain this guide as a permanent record of your purchase. Staple your receipt here.

Date of Purchase : _____
Dealer Purchased From : _____
Dealer Address : _____
Dealer Phone No. : _____
Model No. : _____
Serial No. : _____

Trademark Acknowledgments

LG is a trademark of **LG Electronics Inc.**
IBM is a registered trademark and **VGA** is a trademark of International Business Machines Corporation.

WARNING : To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

AVERTISSEMENT : Ne pas placer cet appareil dans un endroit humide. Cela peut entraîner un incendie ou une décharge électrique.

Important Precautions

This unit has been engineered and manufactured to assure your personal safety, but improper use can result in potential electrical shock or fire hazard. In order not to defeat the safeguards incorporated in this monitor, observe the following basic rules for its installation, use, and servicing. Also follow all warnings and instructions marked directly on your monitor.

On safety

1. Use only the power cord supplied with the unit. In case you use another power cord, make sure that it is certified by the applicable national standards if not being provided by the supplier.

2. If the power cable is faulty in any way, please contact the manufacturer or the nearest authorized repair service provider for a replacement.

3. Operate the monitor only from a power source indicated in the specifications of this manual or listed on the monitor. If you are not sure what type of power supply you have in your home, consult with your dealer.

4. Overloaded AC outlets and extension cords are dangerous. So are frayed power cords and broken plugs. They may result in a shock or fire hazard. Call your service technician for replacement.

5. **DO NOT OPEN THE MONITOR.** There are no user serviceable components inside. There are Dangerous High Voltages inside, even when the power is OFF. Contact your dealer if the monitor is not operating properly.

6. To avoid personal injury :
   - Do not place the monitor on a sloping shelf unless properly secured.
   - Use only a stand recommended by the manufacturer.
   - Do not try to roll a stand with small casters across thresholds or deep pile carpets.

7. To prevent Fire or Hazards:
   - Always turn the monitor OFF if you leave the room for more than a short period of time. Never leave the monitor ON when leaving the house.

- Keep children from dropping or pushing objects into the monitor's cabinet openings. Some internal parts carry hazardous voltages.
- Do not add accessories that have not been designed for this monitor.
- During a lightning storm or when the monitor is to be left unattended for an extended period of time, unplug it from the wall outlet.
- Do not bring magnetic devices such as magnets or motors near the picture tube.

On installation

1. Do not allow anything to rest upon or roll over the power cord, and do not place the monitor where the power cord is subject to damage.
2. Do not use this monitor near water such as near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
3. Monitors are provided with ventilation openings in the cabinet to allow the release of heat generated during operation. If these openings are blocked, built-up heat can cause failures which may result in a fire hazard. Therefore, NEVER:
   - Block the bottom ventilation slots by placing the monitor on a bed, sofa, rug, etc.
   - Place the monitor in a built-in enclosure unless proper ventilation is provided.
   - Cover the openings with cloth or other material.
   - Place the monitor near or over a radiator or heat source.

On cleaning

- Unplug the monitor before cleaning the face of the picture tube.
- Use a slightly damp (not wet) cloth. Do not use an aerosol directly on the picture tube because overspray may cause electrical shock.

On repacking

- Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it in its original material.

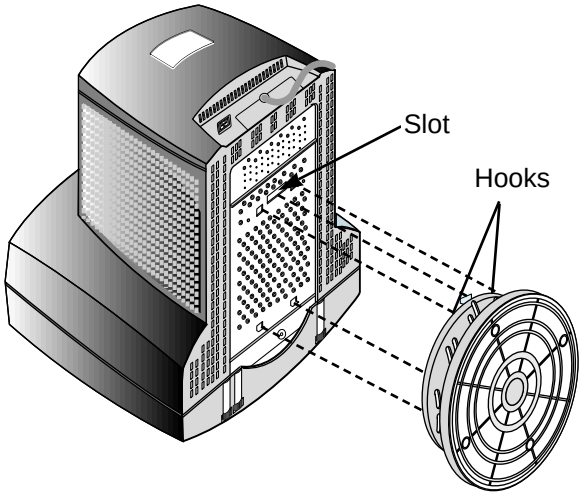
Tilt/Swivel Base

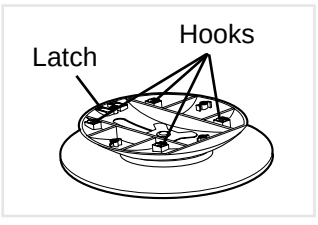
- Turn Off the equipment and all attached options.
- Carefully set the monitor face-down with the underside facing you.

Installation

1. Align the hooks on the tilt/swivel stand with the matching slots in the base of the monitor.
2. Insert the hooks into slots.
3. Slide the tilt/swivel stand toward the front of the monitor until the latches click into the locked position.
4. Carefully upright the monitor, taking care to place the monitor down flatly on an even surface.

NOTE: To remove the stand, gently push in the latch on the bottom of the monitor and then slide the stand toward the back of the monitor. After sliding the stand back, lift off the stand from the monitor.





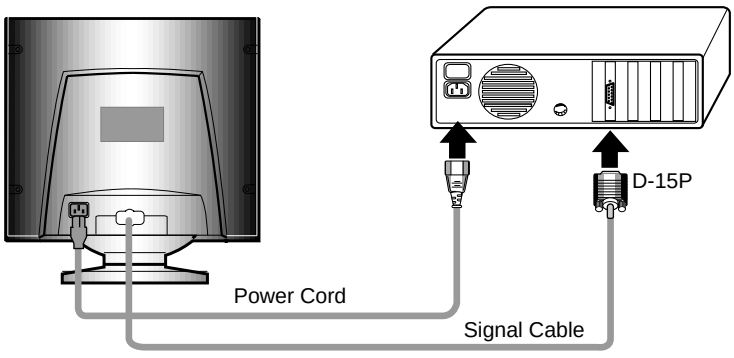
Installation

The supply voltage is marked on the ID label located on the rear panel of the monitor. If your local voltage is different, do not use the monitor and contact your supplier before using the display.

Connections

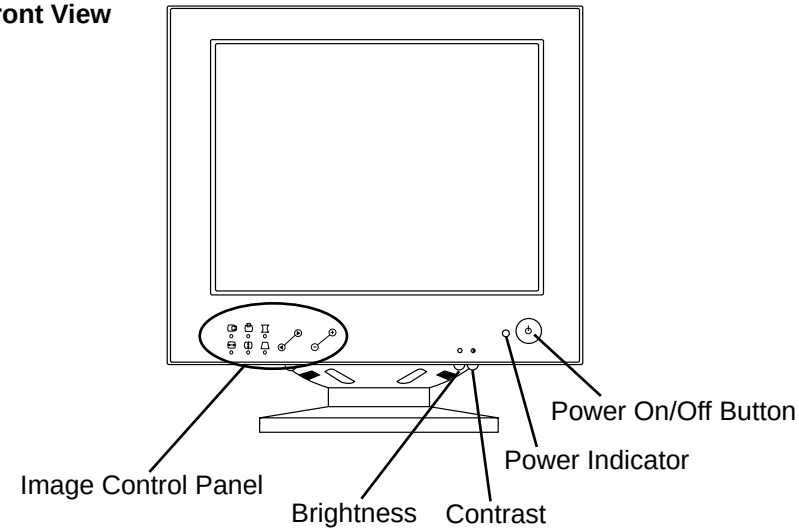
To connect your monitor after the video adapter is properly installed:

1. Turn OFF the power to your computer and all its attached options.
2. Position the monitor and the computer so that you can easily get to the back panel of each.
3. Connect the signal cable with D-sub connector to the graphics board on your PC as described in your PC Owner's Manual.
4. Tighten the screws on the video cable connectors to keep them from coming loose and to prevent radio and TV interference.
5. Connect the power cord to the AC receptacle on the back of the monitor. Plug the other end of the power cord into a properly grounded electrical outlet.
6. The socket-outlet should be installed near the equipment and should be easily accessible.

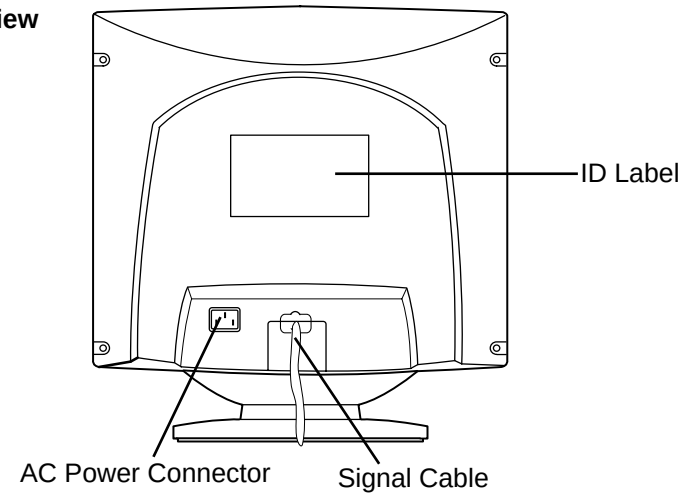


Location and Function of Controls

Front View



Rear View



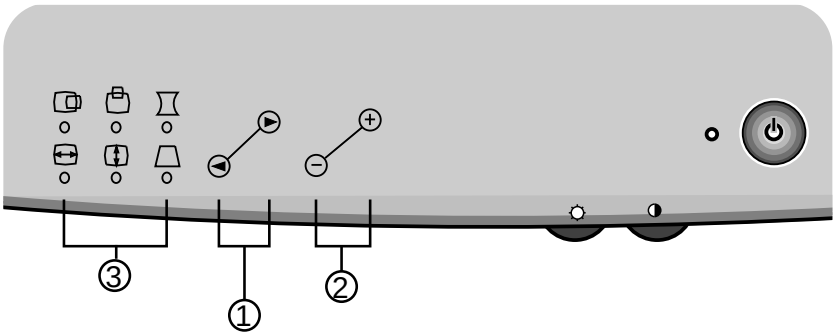
Power On/Off Button
This Button is used to turn the power On or Off.

- **Power Indicator**
  The power indicator lights when the power is On, and indicates the operating status of the display.

Contrast
Adjust the display to the contrast desired. Move the thumbwheel located beneath this indicator to increase or decrease the display contrast.

Brightness
Used to adjust the brightness of the screen. Move the thumbwheel located beneath this indicator to increase or decrease the display brightness.

Image Control Panel



① **Image Selection and Adjustment buttons**
Use either the ◀ or ▶ button to select the icons which you wish to adjust and display.

② **-/+ buttons**
Used to set digital values for each of the select on screen control item by pressing **+** button for increment or **-** button for decrement.

③ **Image Control Icons**

Listed below are the icons, icon names, and icon descriptions of the items.

icon	Description
Horizontal Position	To move picture image left and right. - Moves the screen image left. + Moves the screen image right.
Horizontal Size	To adjust image width. - Decreases the size of the screen image. + Increases the size of the screen image.
Vertical Position	To move image up and down. - Moves the screen image down. + Moves the screen image up.
Vertical Size	To adjust image height. - Decreases the size of the screen image. + Increases the size of the screen image.
Side Pincushion	To correct the bowing in and out of the image. - Curves the image's edges inwards. + Curves the image's edges outwards.
Trapezoid	To correct geometric distortion. - Makes the screen image narrower at the top. + Moves the screen image wider at the top.

* **Recall Function**

When the user wants to recall one of the 6 fatory fixed image modes, push the **-** and **+** buttons simultaneously.

Power Management System

When used in conjunction with a PC having power saving circuitry, or a PC running screen blanking software this monitor automatically reduces its power consumption when the computer is not in use.The monitor has power-saving states, indicated by the light-emitting diode (LED) on the front panel.These power-saving states exceed the Environmental Protection Agency (EPA) Energy Star requirements using the methodology for Display Power Management Signals(DPMS). Developed by the Video Electronics Standards Association(VESA).

Low Radiation Compliance (MPR II)

This monitor meets one of the strictest guidelines available today for low radiation emissions, offering the user extra shielding and an anti-static screen coating. These guidelines, set forth by a government agency in Sweden, limits the amount of emission allowed in the Extremely Low Frequency (ELF) and Very Low Frequency (VLF) electromagnetic range.

DDC (Display Data Channel)

DDC is a communication channel over which the monitor automatically informs the host system(PC) about its capabilities.This monitor has DDC2B function; DDC2B carry out uni-directional communication between PC and monitor. Under these situations, the PC sends display data to the monitor but not commands to control the monitor servings.

NOTE :
- PC must support DDC functions to do this.
- Some older computer systems are not compatible with the DDC standard. If your monitor is displaying a monochrome image or the wrong resolution, need to change with a DDC compatible VGA card.

General Operation

After following the installation instructions and getting familiar with the controls, you are ready to operate the monitor.

1. Turn on the monitor, PC and other peripherals you plan to use.

2. After the PC has booted (powered up and finished self-testing), enter a software application that uses the full screen display.

3. While looking at the image on the screen, adjust the controls for the image size, centering, brightness and contrast levels you prefer.

4. This monitor is an auto scanning monitor, capable of synchronizing with a variety of video standards automatically. The Scanning Mode Table below indicates the resolution, as well as the horizontal and vertical refresh rates, of some of the modes that this monitor can match to the output of your PC's graphics card.
   Other resolutions and standards can also be synchronized and displays on this monitor as long as they are within the horizontal and vertical frequency range of this monitor. See the specifications for this information.

Video Memory Modes

Mode	Display Mode	Horizontal Frequency	Vertical Frequency	Polarity	
				Horiz Sinc	Vert Sinc
1	640 x 480	31.47 kHz	60 Hz	-	-
2	640 x 480	43.27 kHz	85 Hz	-	-
3	720 x 400	31.47 kHz	70 Hz	-	+
4	800 x 600	37.88 kHz	60 Hz	+	+
5	800 x 600	53.67 kHz	85 Hz	+	+
6	1024 x 768	48.36 kHz	60 Hz	-	-

Troubleshooting

The power LED is illuminated amber.

- Display power management mode.
- There is no active signal coming from the PC.
- The signal cable is not fastened securely.
- Check the computer power and graphics adapters configuration.
- The frequency of the signal from the video card is outside the operating range of the monitor.

HORZ: 30kHz-54kHz
VERT: 50Hz-120Hz

The image on the SCREEN is not centered, or too small or not a rectangle shape.

- Image adjustment not been done yet in the current operating mode. Use the SELECT and +/- buttons to set the image to your liking.

The monitor doesn't enter the power saving off mode (Amber led).

- Computer video signal is not VESA DPMS standard. Enter the PC or the video controller card is not using the VESA DPMS power management function.

Service

1. Unplug the monitor from the wall outlet and refer servicing to alified service personnel when :
   - The power cord or plug is damaged or frayed.
   - Liquid has been spilled into the monitor.
   - The monitor has been exposed to rain or water.
   - The monitor does not operate normally following the operating instructions. Adjust only those controls that are covered in the operating instructions. An improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the monitor to normal operation.
   - The monitor has been dropped or the cabinet has been damaged.
   - The monitor exhibits a distinct change in performance.
   - Snapping or popping from the monitor is continuous or frequent while the monitor is operating. It is normal for some monitors to make occasional sounds when being turned on or off, or switching video modes.

2. Do not attempt to service the monitor yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

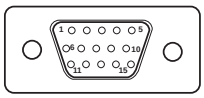
NOTE: The working life of this set is 7 years since the date of delivery to consumer.

Specifications

Sync Signal type

Type	H. Sync	V. Sync
Separate sync	H. Sync	V. Sync

Signal Connector Pin Assignment



Pin	Separate Sync
1	Red
2	Green
3	Blue
4	Ground
5	Self-Test
6	Red Ground
7	Green Ground
8	Blue Ground
9	NC
10	Ground
11	Ground
12	SDA
13	Horiz.Sync
14	Vert.Sync
15	SCL

Specifications

Picture tube : 15 inch (13.8 inches viewable), Tinted,
90 degree deflection
0.28 mm, Non-Glare screen

Horizontal Frequency : 30 ~ 54 kHz

Vertical Frequency : 50 ~ 120 Hz

Video Bandwidth : 65 MHz

Resolution : 1024 x 768 Non Interlace, 60Hz Refresh Rate

Signal connector : 15 pin D-Sub type

Power input : 100-240VAC, 50/60Hz, 1.5A

Power Consumption Table

MODE	H.sync	V.sync	Video	Power Consumption	LED Color
Normal	On	On	On	≤ 85W	Green
Stand-by	Off	On	Off	≤ 15W	Amber
Suspend	On	Off	Off	≤ 15W	Amber
Off	Off	Off	Off	≤ 5W	Amber

Dimensions : 360 x 386 x 388.6 mm (With Tilt/Swivel Stand))
(WXDXH) 14.2 x 15.2 x 14.9 inch

Weight (net) : 12.5 kg (27.6 lbs)

Information in this document is subject to change without notice and does not represent a commitment on the part of LG Electronics Inc.

SPECIFICATIONS

1. PICTURE TUBE

Size	: 15 inch (Flat Square Tube)
Gun	: In-line
Deflection Angle	: 90°
Neck Diameter	: 29.4mm
Phosphor	: P22
Transmission	: 57.0%
Dot Pitch	: 0.28mm
Low Radiation	: MPR-II

2. SIGNAL

2-1. Horizontal & Vertical Sync

1) Input Voltage Level : Low=0~1.2V, High=2.5~5.5V
2) Sync Polarity : Positive or Negative

2-2. Video Input Signal

1) Voltage Level : 0~0.7Vp-p
a) Color 0, 0 : 0Vp-p
b) Color 7, 0 : 0.467Vp-p
c) Color 15, 0 : 0.7Vp-p
2) Input Impedance : 75 Ω
3) Video Color : R, G, B Analog
4) Signal Format : Refer to the Timing Chart

2-3. Signal Connector

15-pin D-Sub Connector

2-4. Scanning Frequency

Horizontal : 30 ~ 54kHz
Vertical : 50 ~ 120Hz

3. POWER SUPPLY

3-1. Power Range

AC 90~264V (Free Voltage), 50/60Hz, 1.5A Max.

3-2. Power Consumption

MODE	H/V SYNC	POWER CONSUMPTION	LED COLOR
NORMAL (ON)	ON/ON	less than 85 W	GREEN
STAND-BY	OFF/ON	less than 15 W	ORANGE
SUSPEND	ON/OFF	less than 15 W	
OFF	OFF/OFF	less than 5 W	ORANGE

4. DISPLAY AREA

4-1. Active Video Area : 270x195mm (10.63"x7.68")
(Available for Full Screen)
4-2. Display Color : Full Colors
4-3. Display Resolution : 1024x768 / 60Hz
(Non-Interlace)
4-4. Video Bandwidth : 65MHz

5. ENVIRONMENT

5-1. Operating Temperature: 0 ~ 35°C (32 ~ 95°F)
(Ambient)
5-2. Relative Humidity : 10 ~ 90 %
(Non-condensing)
5-3. Altitude : 10,000 ft

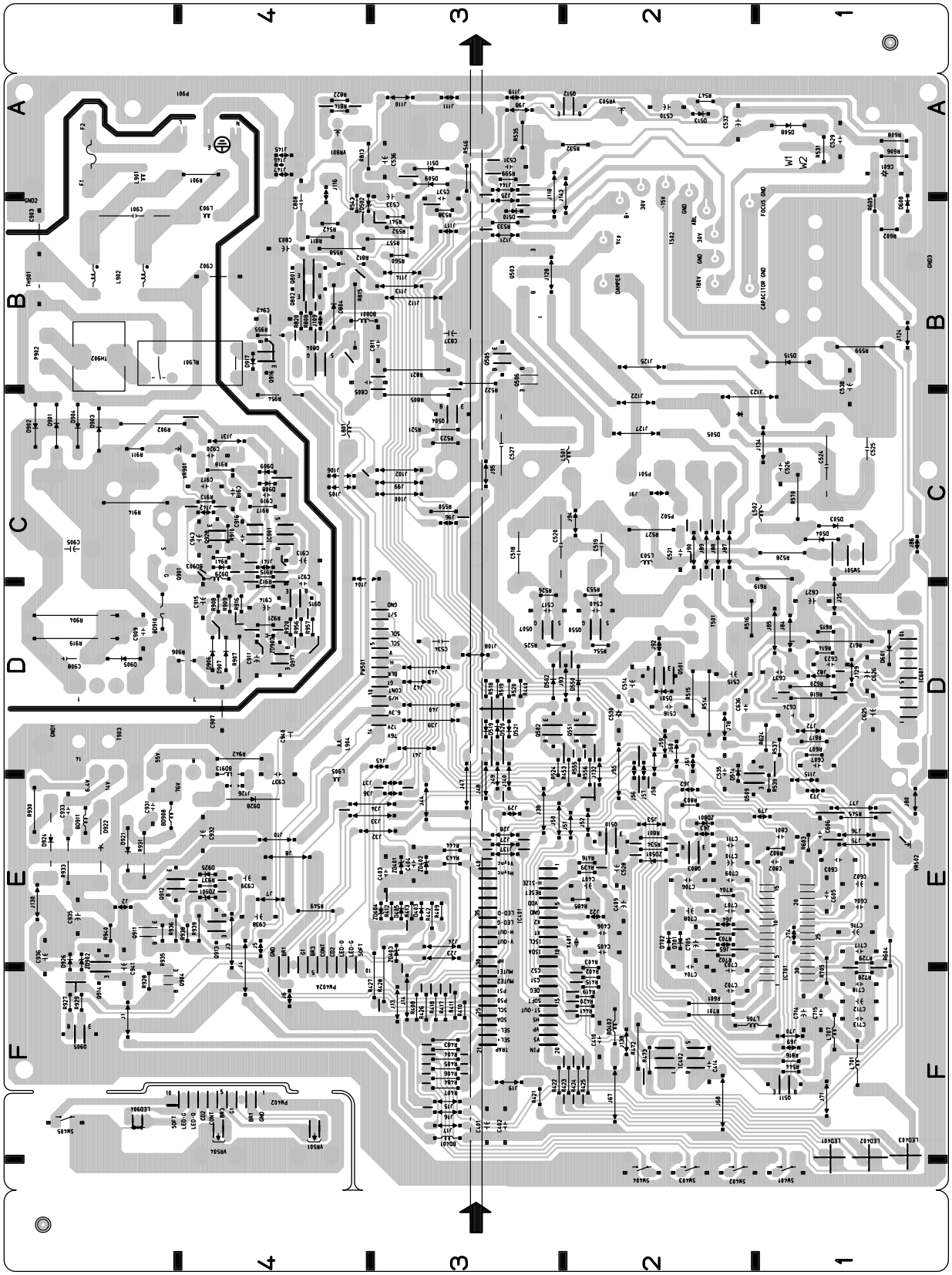
6. DIMENSIONS (with TILT/SWIVEL)

Width	: 360.0mm (14.17 ")
Depth	: 386.0mm (15.20 ")
Height	: 378.0mm (14.88 ")

7. WEIGHT (with TILT/SWIVEL)

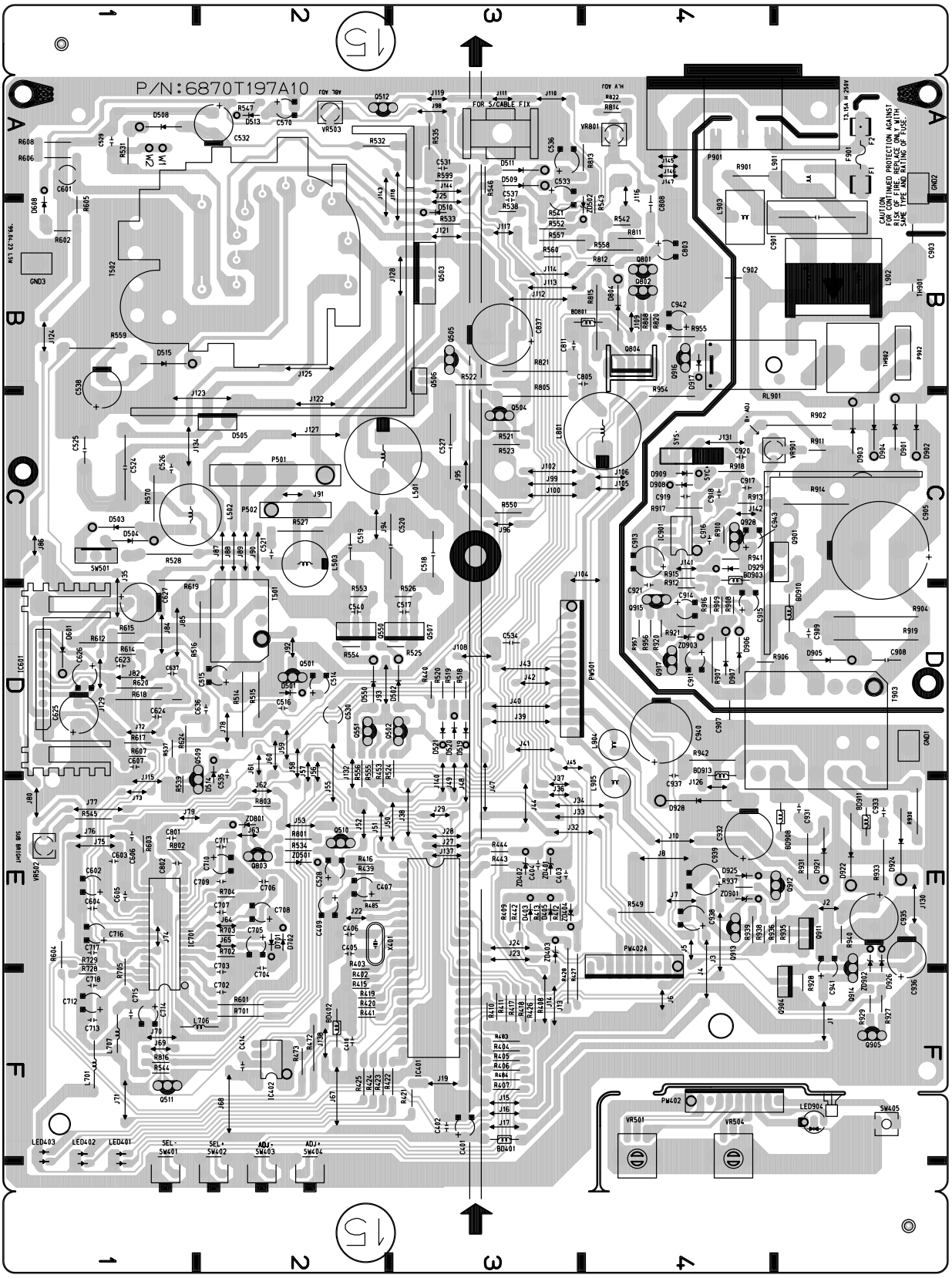
Net Weight	: 12.5kg (27.56 lbs)
Gross Weight	: 14.8kg (32.63 lbs)

2. MAIN BOARD (Solder Side)

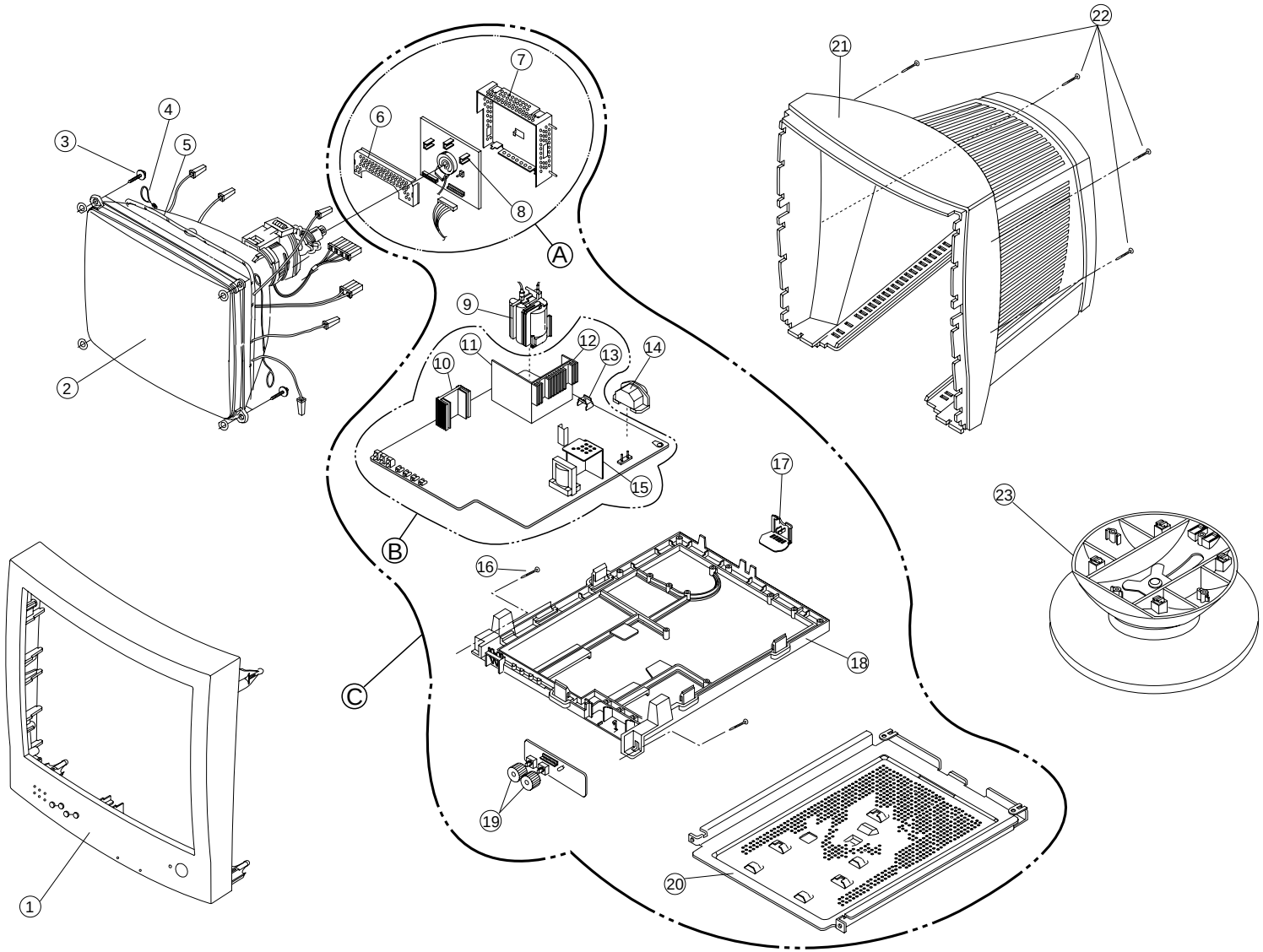


PRINTED CIRCUIT BOARD

1. MAIN BOARD (Component Side)



EXPLODED VIEW

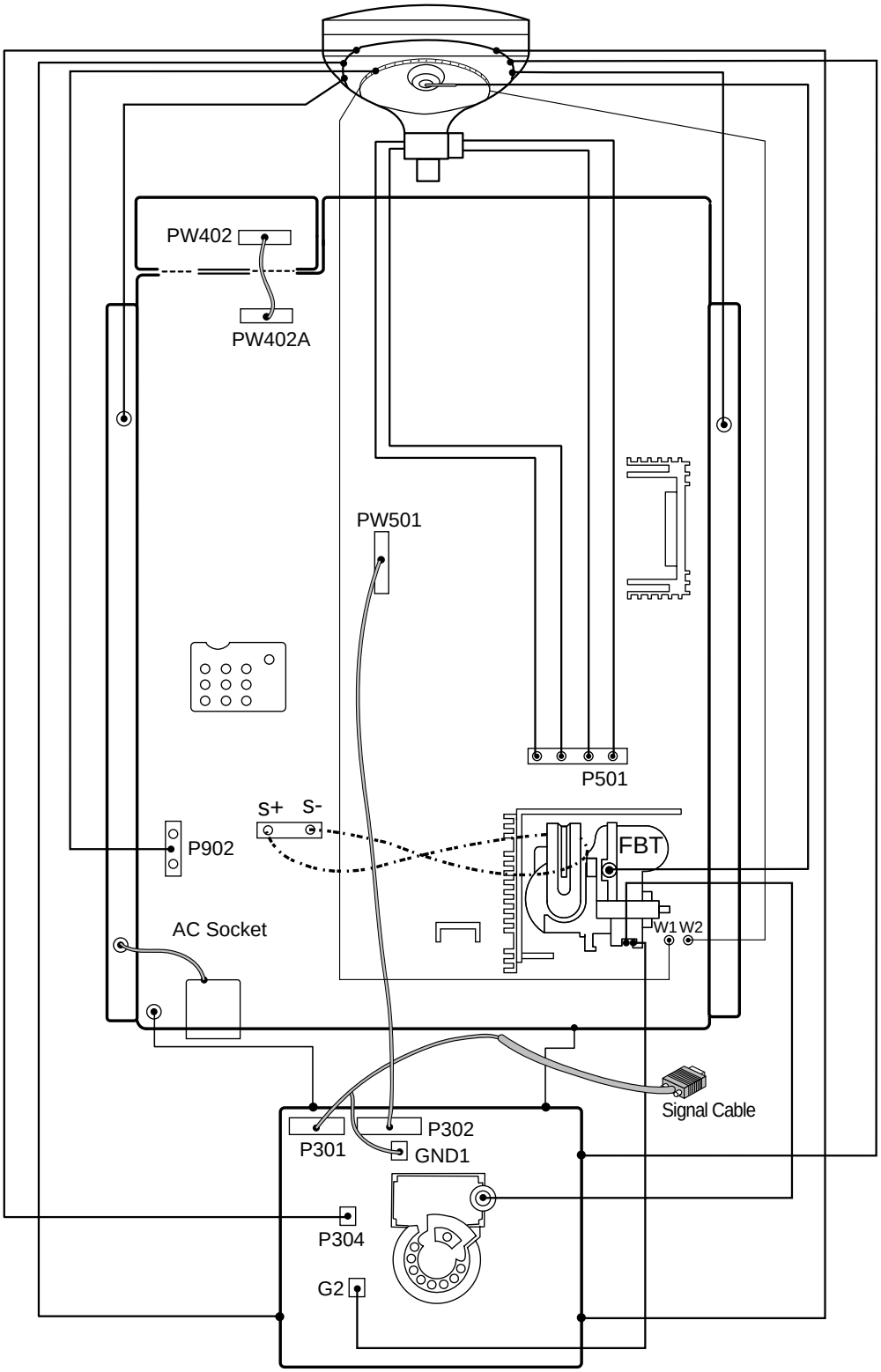


EXPLODED VIEW PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Material	*Remark
1	3091TKB008U	CABINET ASS'Y	1		L
2	6318TP1502A	CDT, M36EDR320X151/6F01, PHILIPS	1		L
3	339-002D	SCREW, PHP+5x30BP(FZMY)+GW18	4		
4	6868T15003A	CDT EARTH	1		L
5	6140TC3002A	DEGAUSSING COIL	1		L
6	407-H54A	VIDEO SHIELD (FRONT)	1	SPTE-C, T0.3	
7	4815TKV008P	VIDEO SHIELD (REAR)	1	SPTE-C, T0.3	L
8	407-S88A	PLATE, HEAT SINK FOR Q341, Q351, Q361	3	TERN SHEET, T1.0	
9	6174Z-1017E	FBT, FMMPC51-M1017E	1		
10	407-S87L	PLATE, HEAT SINK FOR IC601	1	AL	
11	4920TKP042B	PLATE, SUB HEAT SINK FOR D505, Q503, Q506	1	AL	
12	4920TKC007D	PLATE, HEAT SINK FOR D505, Q503, Q506	1	AL, T2.0	
13	4950TKE002A	PLATE, GROUND TERMINAL	1	TERN SHEET, T1.0	
14	6621TAZ003A	AC SOCKET ASS'Y	1		
15	407-Q39D	PLATE, HEAT SINK FOR Q901	1	AL, T1.5	
16	332-102J	SCREW, PTP+4x20BP (FZMY)	2		
17	3550TKK004Y	PIECE, REAR COVER	1		
18	4810TKM013C	MAIN BRACKET	1		L
19	4940TKC006A	KNOB, CONTROL	2		
20	340-732Y	BOTTOM BRACKET	1	SBHG1-A, T1.0	
21	303-K30U	BACK COVER	1		L
22	332-102H	SCREW, PTP+4x40BP (FZMY)	4		
23	231-048U	TILT/SWIVEL	1		L
A	6871TVT109B	PCB ASS'Y, VIDEO TOTAL	1		L
B	6871TMH113B	PCB ASS'Y, MAIN	1		L
C	3313T15047B	CHASSIS ASS'Y, MAIN TOTAL	1		L

* Remark 'L' are local sourcing parts in China factory of the LG Electronics Inc.

WIRING DIAGRAM



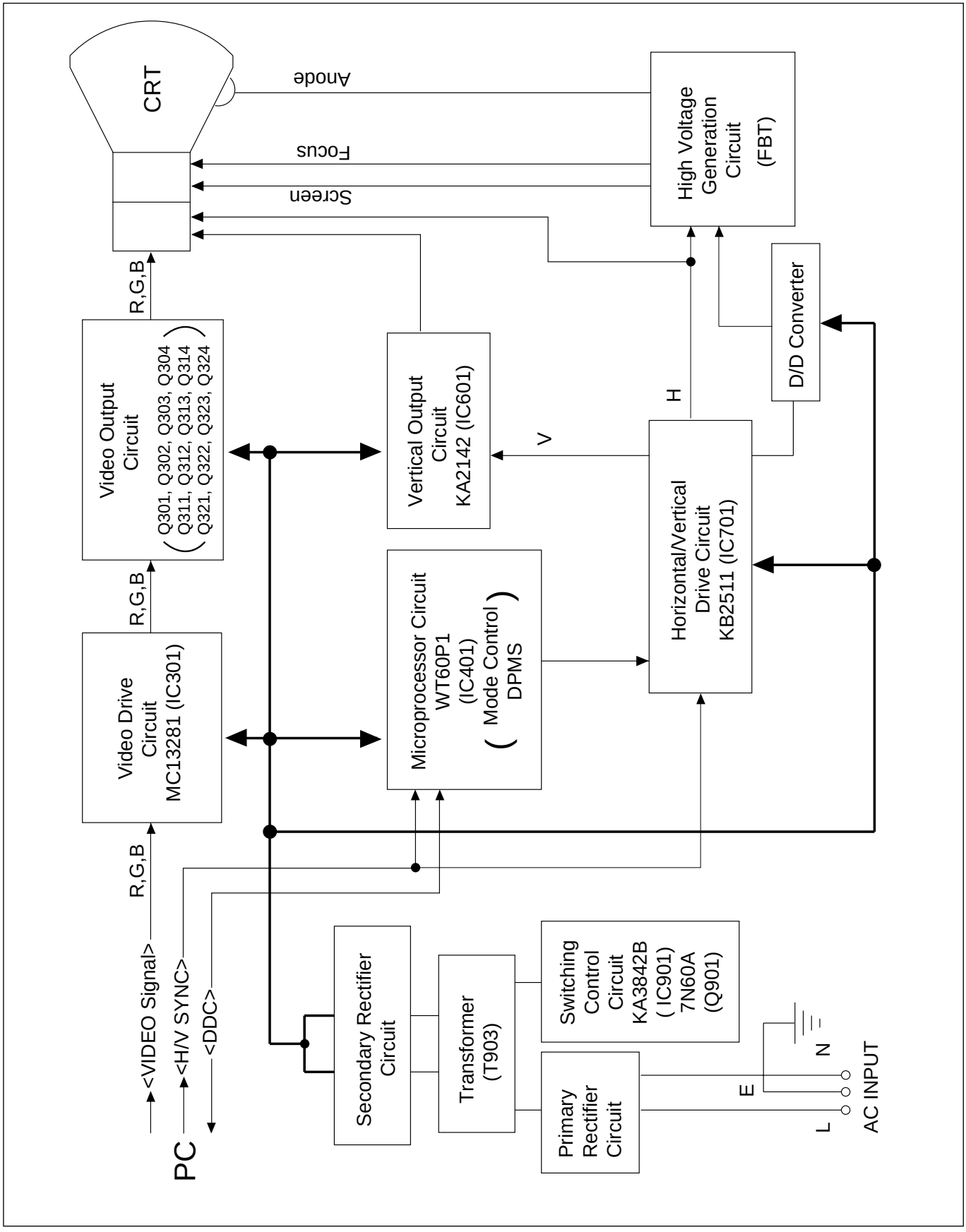
CB550B SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

DATE: 1999.04.23 P/N:3854T15040A

BLOCK DIAGRAM



DESCRIPTION OF BLOCK DIAGRAM

1. Primary Rectifier Circuit

This circuit transform AC line voltage to DC voltage as the supplied source for secondary circuit.
It is operated by C905 (electrolytic capacitor) and D901, D902, D903, D904 (bridge diode).

2. Switching Control Circuit

This circuit operate to be kept output of the secondary rectified circuit in constant level any conditions; no load, full load, and line voltage variation, ... etc.
The main function is operated by the IC901 (KA3842B) syncronizing to horizontal frequency via a connector that tie around the core of the T502 (FBT).

3. Secondary Rectifier Circuit

This circuit rectifying the pulse waveform of the transformer generated by switching control circuit.
It is consists of capacitors and diodes.
The output voltages are 76V, 55V, 14V, and 6.4V that are necessary to the secondary circuit.

4. Video Pre-Amp Circuit

This circuit pre-amplify the video signal (Red, Green and Blue) to make sufficient signal for the video output circuit.
The function is operated by the IC301 (MC13281).

5. Video Output Circuit

This circuit amplifies the video signal which comes from the video pre-amp circuit and amplified video signal is applied to the CDT cathode.

6. Microprocessor Circuit

This circuit generate control signal that need to operating of horizontal and vertical drive circuit, DDC2B (Plug & Play), and DPM (energy saviing) funtion. DDC2B (Plug & Play) function is operated by combination of H/V Sync and SDA/SCL signal.

7. Horizontal and Vertical Drive Circuit

This circuit take function, that are H/V-position, H/V-size, side-pincushion, and trapezoid, with the output of microprocessor circuit.
The generated vertical signal is applied to the vertical output circuit. The generated horizontal signal is applied to the horizontal output and high voltage generation circuit.
These are controlled by the IC701 (KB2511) circuit.

8. Vertical Output Circuit

This circuit take the vertical ramp wave from the IC701 (KB2511) and perform vertical deflection by supplying saw-tooth current from the IC601 (KA2142) to the vertical deflection yoke.

9. High Voltage Generation Circuit

This circuit used for generating pulse the primary coil of T502 (FBT).
A boosted voltage–about 25kV–appears at the secondary of T502 (FBT) and it is supplied to the anode of the CDT (Cathode Display Tube).

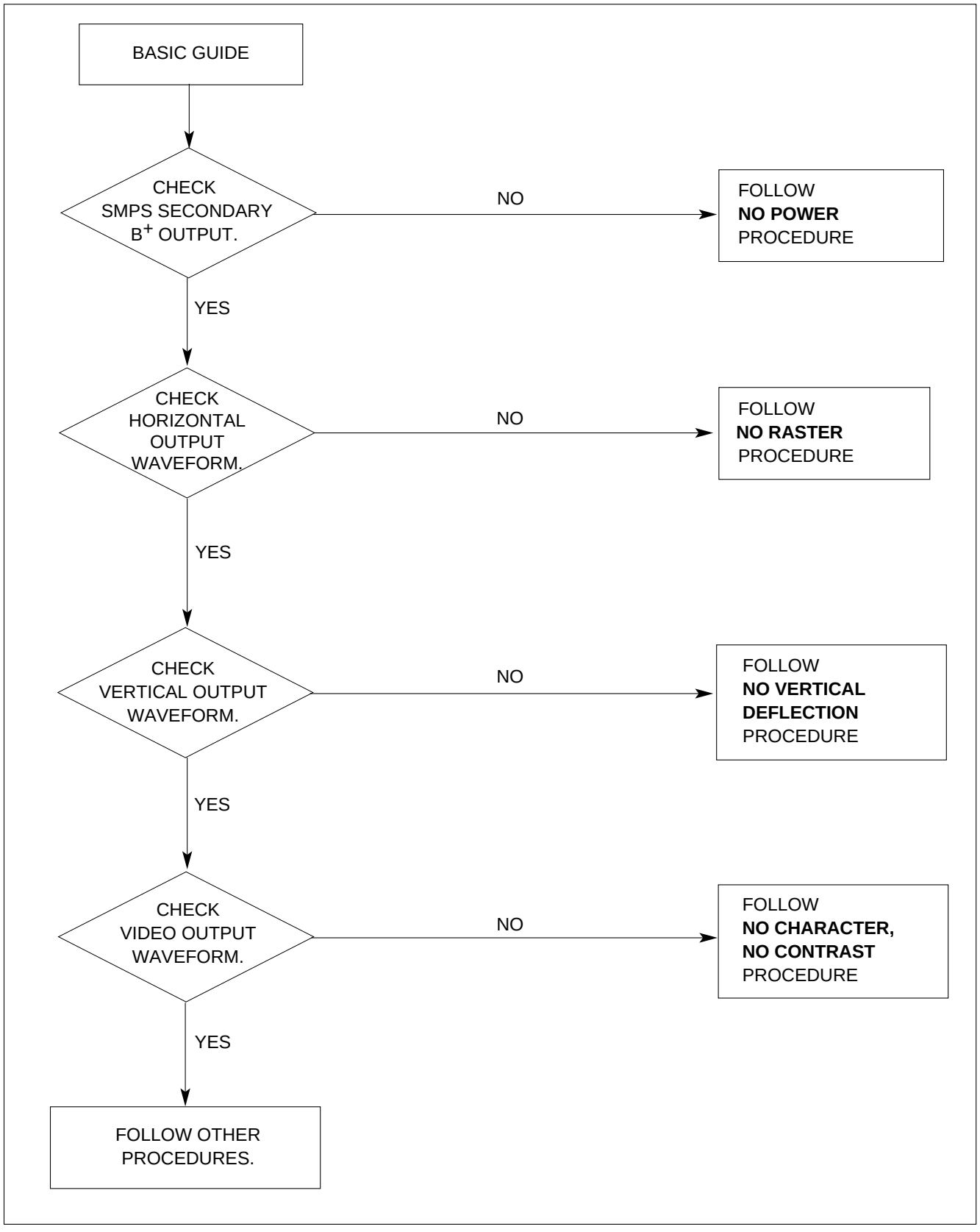
10. Blanking and Brightness Control Circuit.

Blanking circuit eliminate retrace line by supplying negative pulse to the G1 of the CDT (Cathode Display Tube).
Brightness circuit is used to control screen brightness by changing the DC level of the G1.

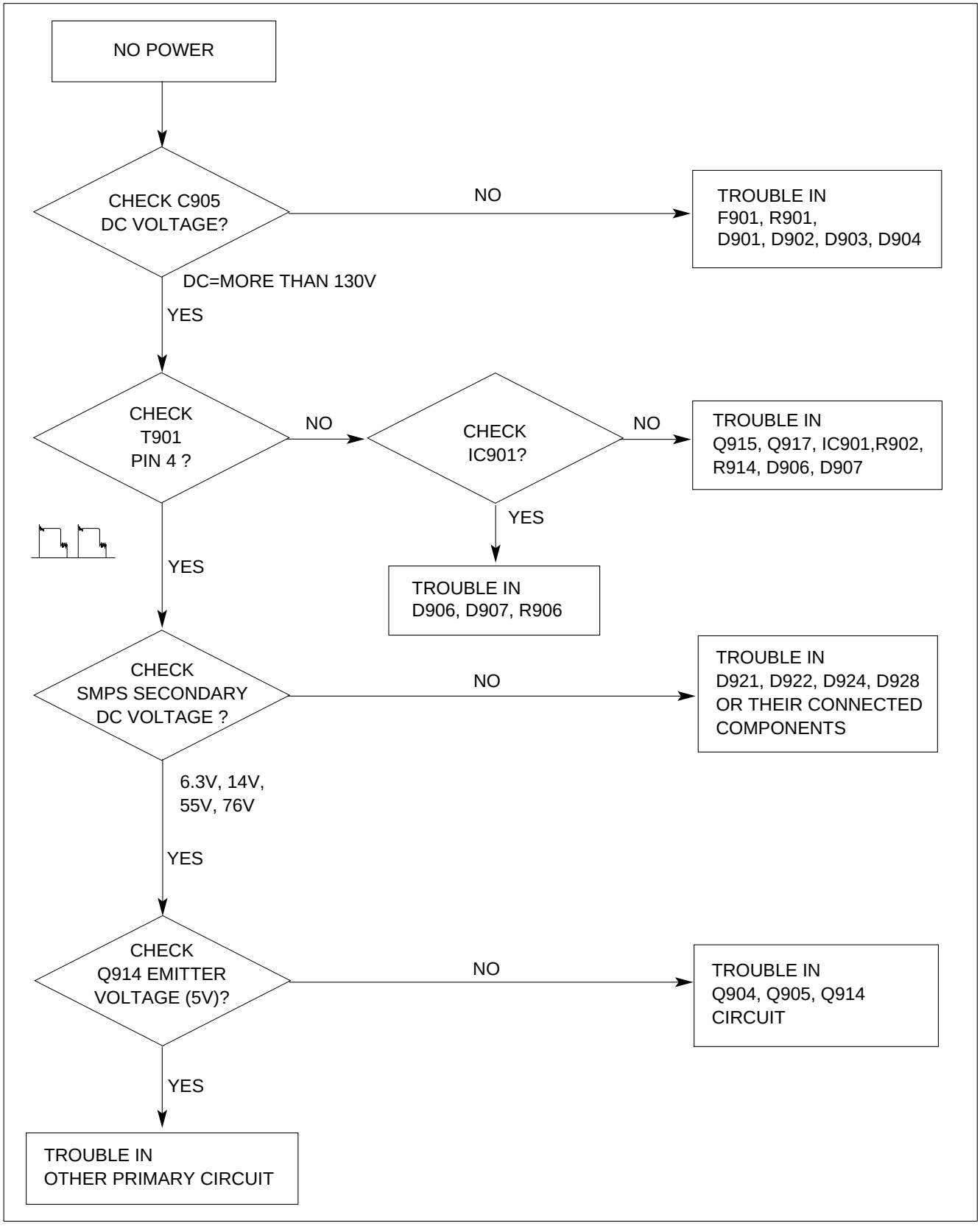
11. D/D Converter.

To obtain constant high voltage, this circuit supplies controlled DC voltage to the FBT and the horizontal deflection circuit according to the horizontal sync frequency.

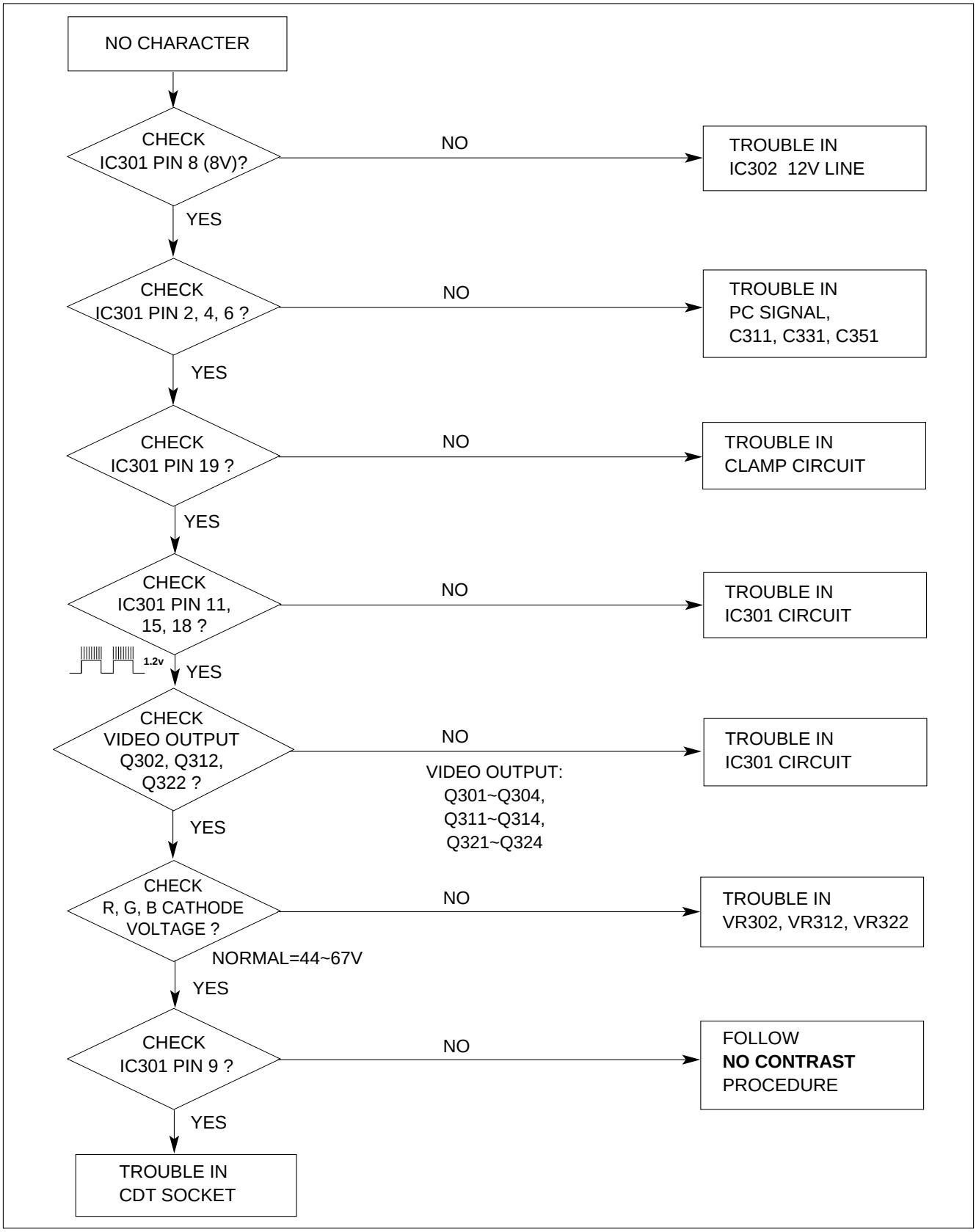
TROUBLESHOOTING GUIDE



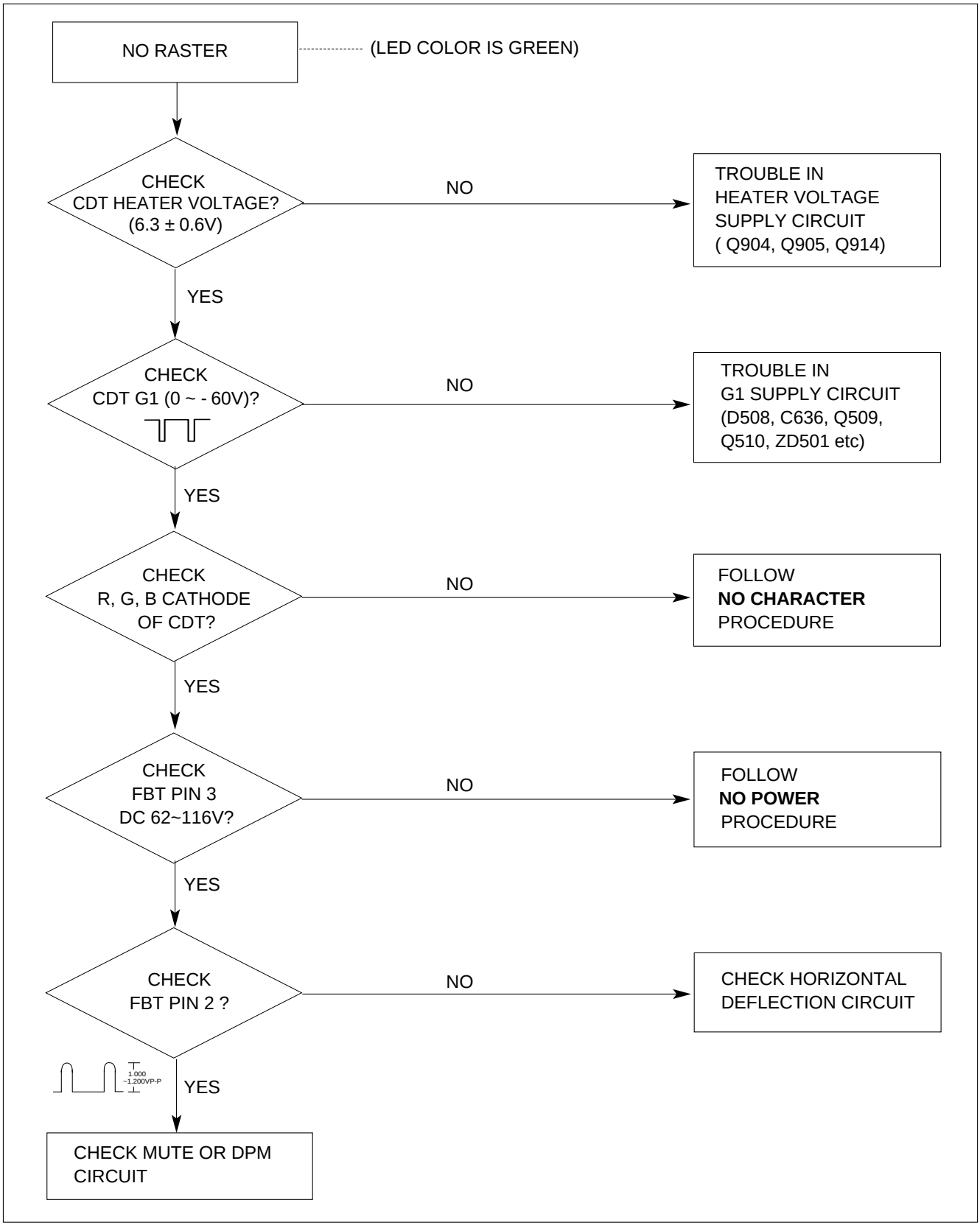
1. NO POWER


NO POWER
CHECK C905 DC VOLTAGE?
NO
TROUBLE IN F901, R901, D901, D902, D903, D904
DC=MORE THAN 130V
YES
CHECK T901 PIN 4 ?
NO
CHECK IC901?
NO
TROUBLE IN Q915, Q917, IC901,R902, R914, D906, D907
YES
TROUBLE IN D906, D907, R906
YES
CHECK SMPS SECONDARY DC VOLTAGE ?
NO
TROUBLE IN D921, D922, D924, D928 OR THEIR CONNECTED COMPONENTS
6.3V, 14V, 55V, 76V
YES
CHECK Q914 EMITTER VOLTAGE (5V)?
NO
TROUBLE IN Q904, Q905, Q914 CIRCUIT
YES
TROUBLE IN OTHER PRIMARY CIRCUIT

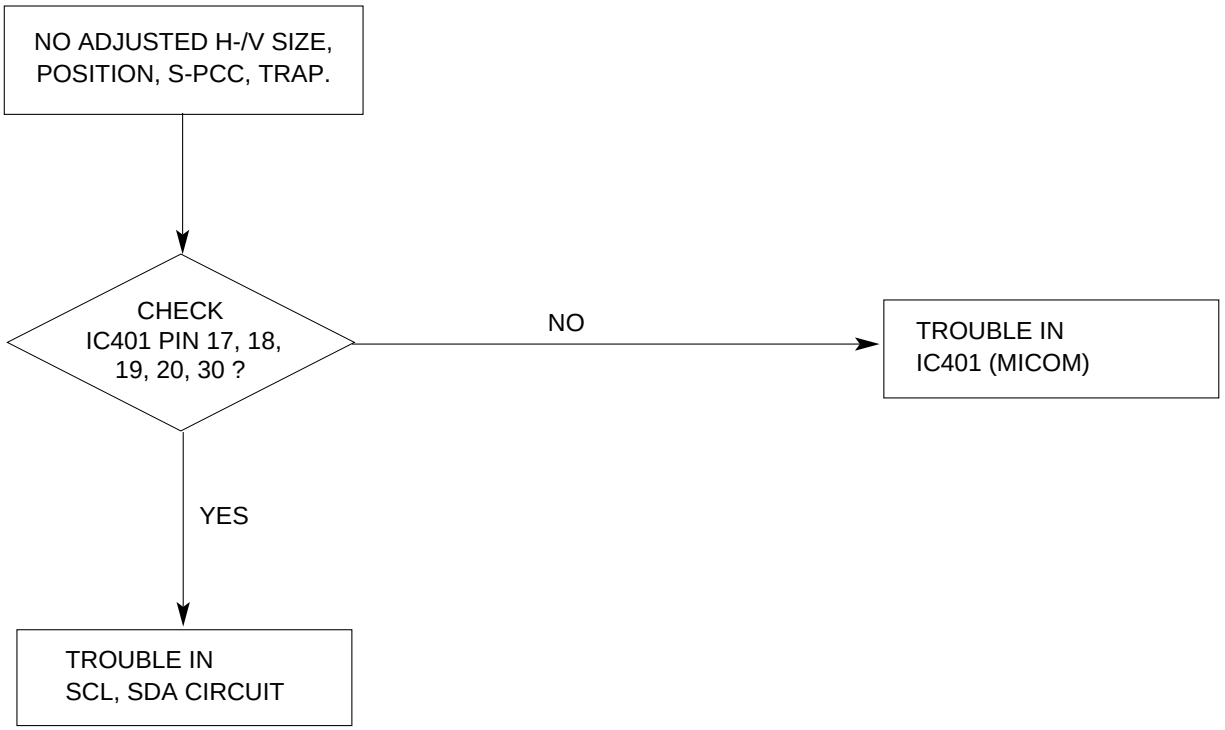
2. NO CHARACTER



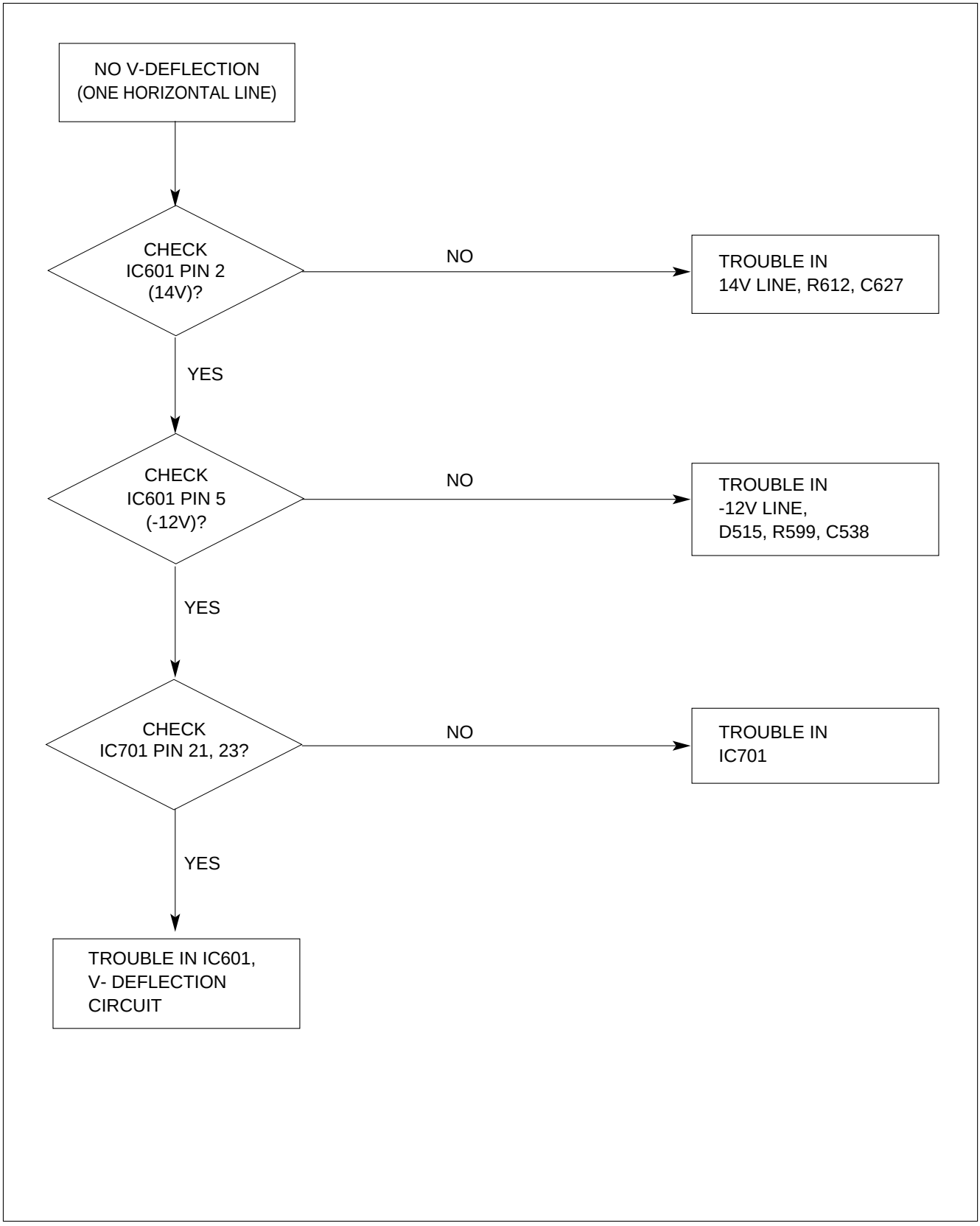
3. NO RASTER


NO RASTER
(LED COLOR IS GREEN)
CHECK
CDT HEATER VOLTAGE?
(6.3 ± 0.6V)
NO
TROUBLE IN
HEATER VOLTAGE
SUPPLY CIRCUIT
(Q904, Q905, Q914)
YES
CHECK
CDT G1 (0 ~ - 60V)?
NO
TROUBLE IN
G1 SUPPLY CIRCUIT
(D508, C636, Q509,
Q510, ZD501 etc)
YES
CHECK
R, G, B CATHODE
OF CDT?
NO
FOLLOW
NO CHARACTER
PROCEDURE
YES
CHECK
FBT PIN 3
DC 62~116V?
NO
FOLLOW
NO POWER
PROCEDURE
YES
CHECK
FBT PIN 2 ?
NO
CHECK HORIZONTAL
DEFLECTION CIRCUIT
1.000
~1.200VP-P
YES
CHECK MUTE OR DPM
CIRCUIT

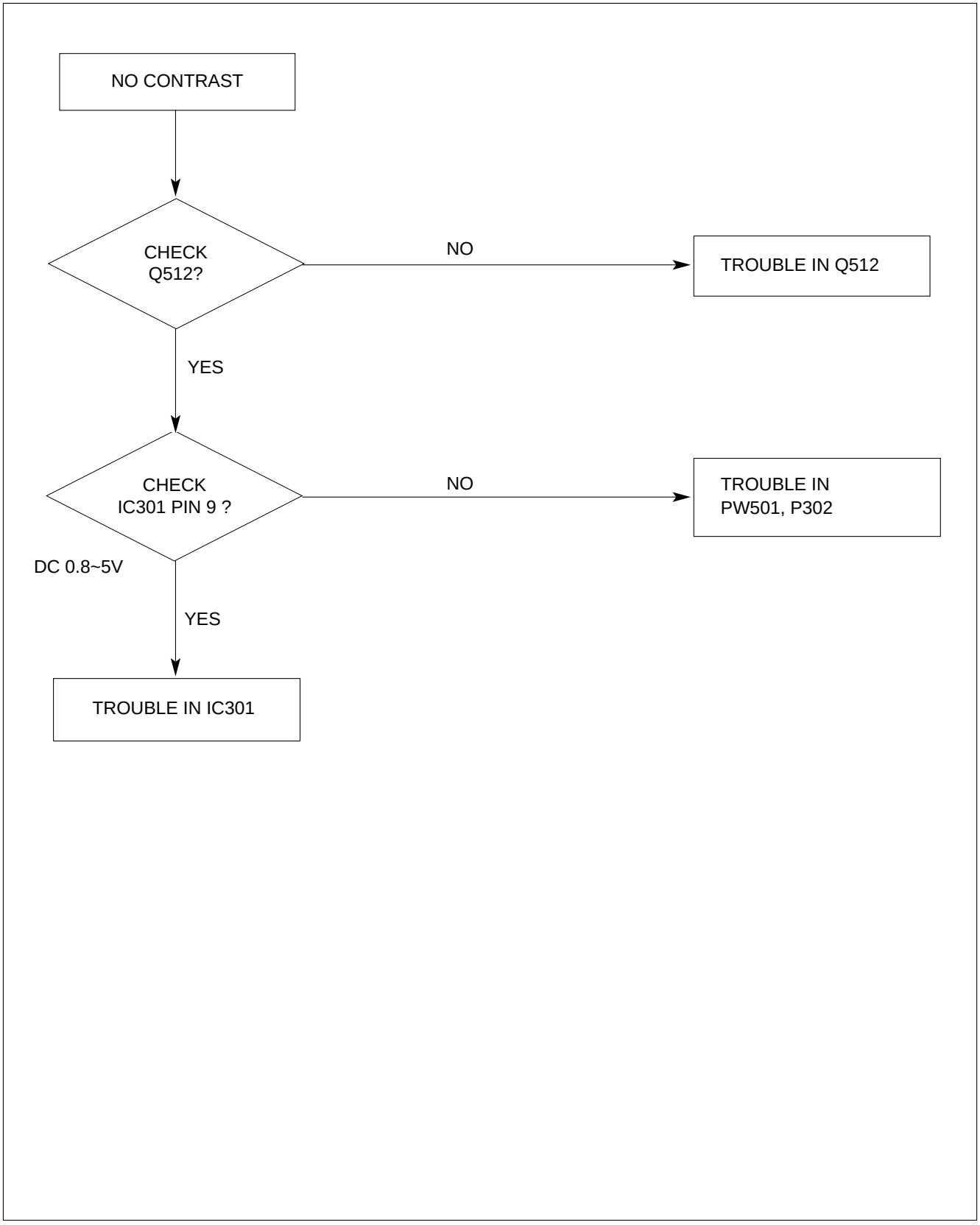
4. TROUBLE IN H/V SIZE, H/V POSITION, S-PCC, TRAPEZOID



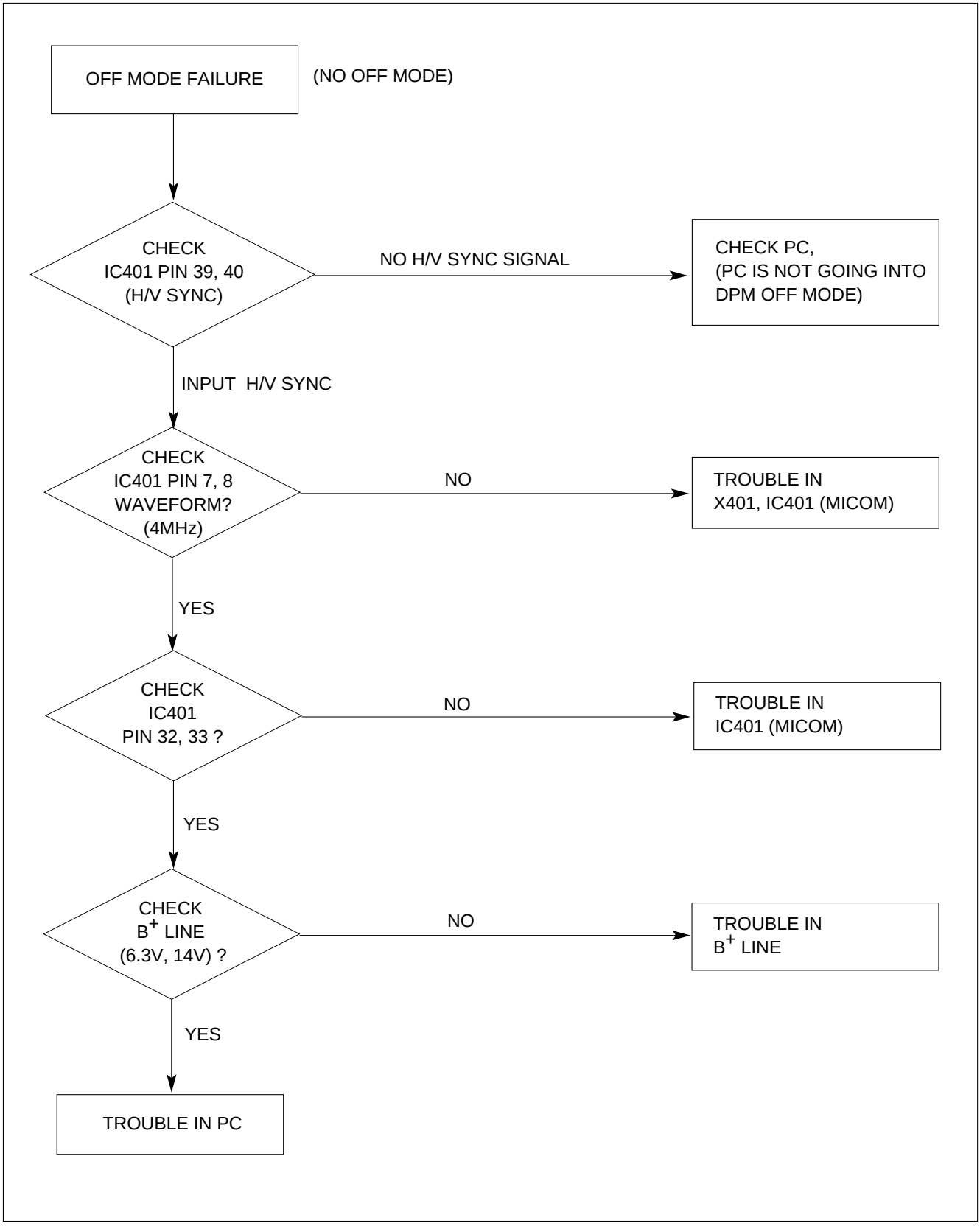
5. NO VERTICAL DEFLECTION



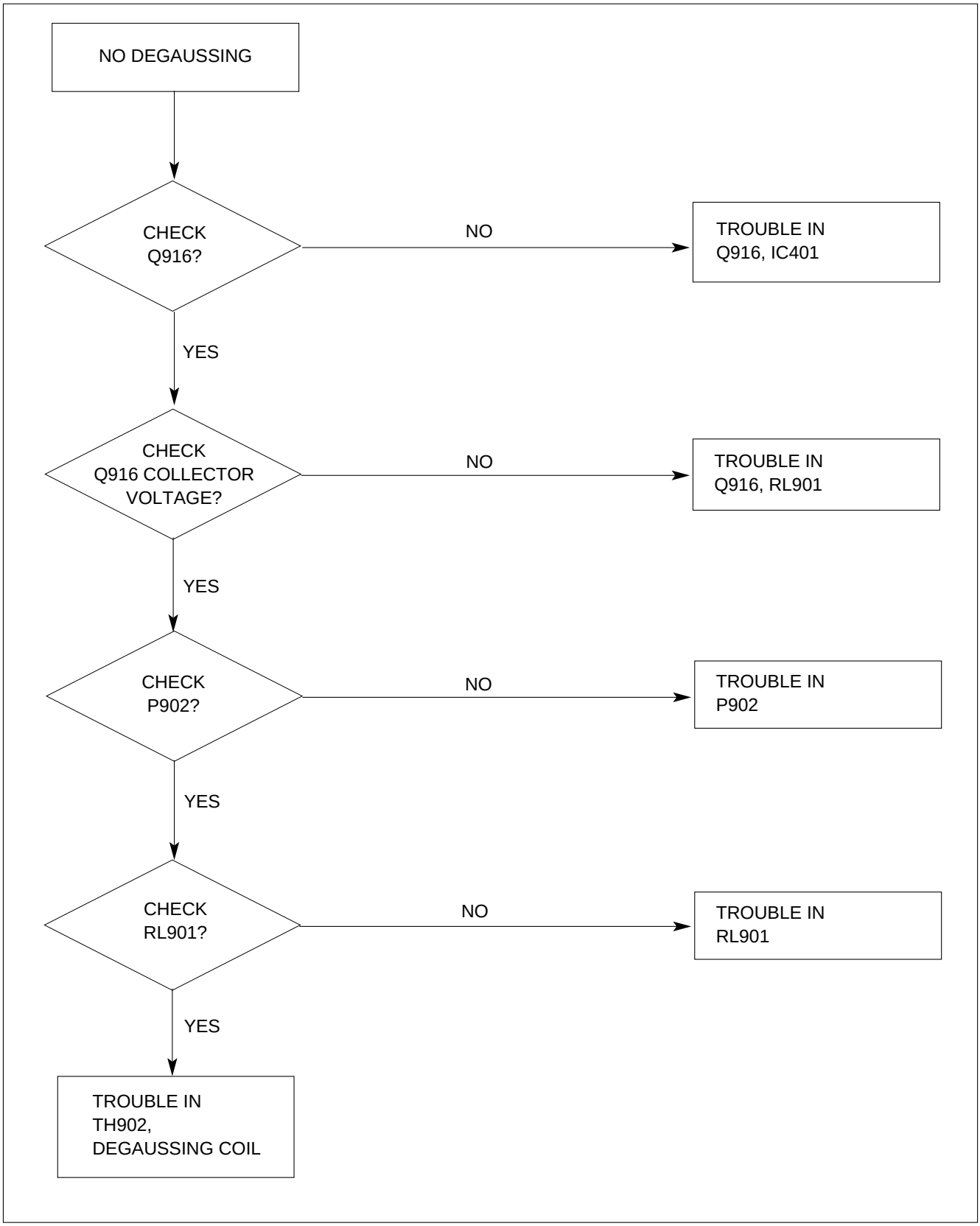
6. NO CONTRAST



7. TROUBLE IN DPM



8. NO DEGAUSSING



ADJUSTMENT

GENERAL INFORMATION

All adjustment are thoroughly checked and corrected when the monitor leaves factory, but sometimes several minor adjustment may be required.
Adjustment should be following procedure and after warming up for a minimum of 30 minutes.

- Alignment appliances and tools.
  - Programmable Signal Generator.
    (eg. VG-819 made by Astrodesign Co.)
  - E(E)PROM with each mode data saved.
  - Digital Voltmeter.
  - White Balance Meter.
  - Luminance Meter.

ADJUSTMENT PROCEDURE & METHOD

Set Contrast (◑) and Brightness (☼) volume to max position.

1. Adjustment for B^+ Voltage

1) Display cross hatch pattern at Mode 1.
2) Adjust VR901 to 14±0.2Vdc at D922 cathode voltage.

2. Adjustment for High Voltage

1) Display cross hatch pattern at Mode 1.
2) Adjust D804 cathode voltage to 63±0.2Vdc with **VR801**.

3. Adjustment for Screen Image (Factory Mode)

Install adaptor and cable for adjustment such as figure 1 and run alignment program on DOS for IBM compatible PC.

1) Set Ⓔ ST Switch to OFF of the adaptor.
   (Refer to see Figure 1.)
2) Display cross hatch pattern at Mode 1.
3) Adjust horizontal size (⇔) with H-SIZE in the alignment program or +, – buttons on the monitor to 270±1mm.
4) Adjust horizontal position (▣) with H-POSI in the alignment program or +, – buttons on the monitor to center of the screen.
5) Adjust vertical size (⇕) with V-SIZE in the alignment program or +, – buttons on the monitor to 195±1mm.
6) Adjust vertical position (▭) with V-POSI in the alignment program or +, – buttons on the monitor to center of the screen.
7) Adjust side-pincushion (⧖) with S-PCC in the alignment program or +, – buttons on the monitor to be the best condition.
8) Adjust trapezoid (⏢) with TRAPEZOID in the alignment program or +, – buttons on the monitor to be the best condition.
9) Display from Mode 2 to Mode 5 and repeat above adjustment.

4. Adjustment for White Balance and Luminance.

1) Set the White Balance Meter.
2) Demagnetize CDT with the demagnetizer. (external degaussing coil).
3) Adjust H x V size to 270±2mm x 195±2mm.
4) Display color 0,0 pattern at Mode 1.
5) Set Brightness (☼), Contrast (◑) volume to max position.
6) Set VR302 (G-BIAS) and VR312 (R-BIAS) to min and VR322 (B-BIAS) to center position.
7) Adjust Screen control on the FBT to 0.9~1FL of the raster luminance.
8) Adjust VR302 (G-BIAS) and VR312(R-BIAS) to x=0.283±0.01 and y=0.298±0.01.
9) Adjust Screen control on the FBT to 0.3~0.4FL of the raster luminance.
10) Display color 15,0 box pattern (70 x 70mm) at Mode 1.
11) Set Brightness (☼), Contrast (◑) volume to max position.
12) Adjust VR311 (G-DRIVE) to 55±1FL of the box pattern luminance.
13) Adjust VR301 (R-DRIVE) and VR321 (B-DRIVE) to x=0.283±0.003 and y=0.298±0.003.
14) Set Brightness (☼), Contrast (◑) volume to max position.
15) Display color 15,0 full white patten at Mode 1.
16) Adjust VR503 (ABL) to 33±1FL of the luminance.

5. Adjustment for Focus.

1) Display H character in the full screen at Mode 4.
2) Adjust two Focus control on the FBT that should be the best condition.

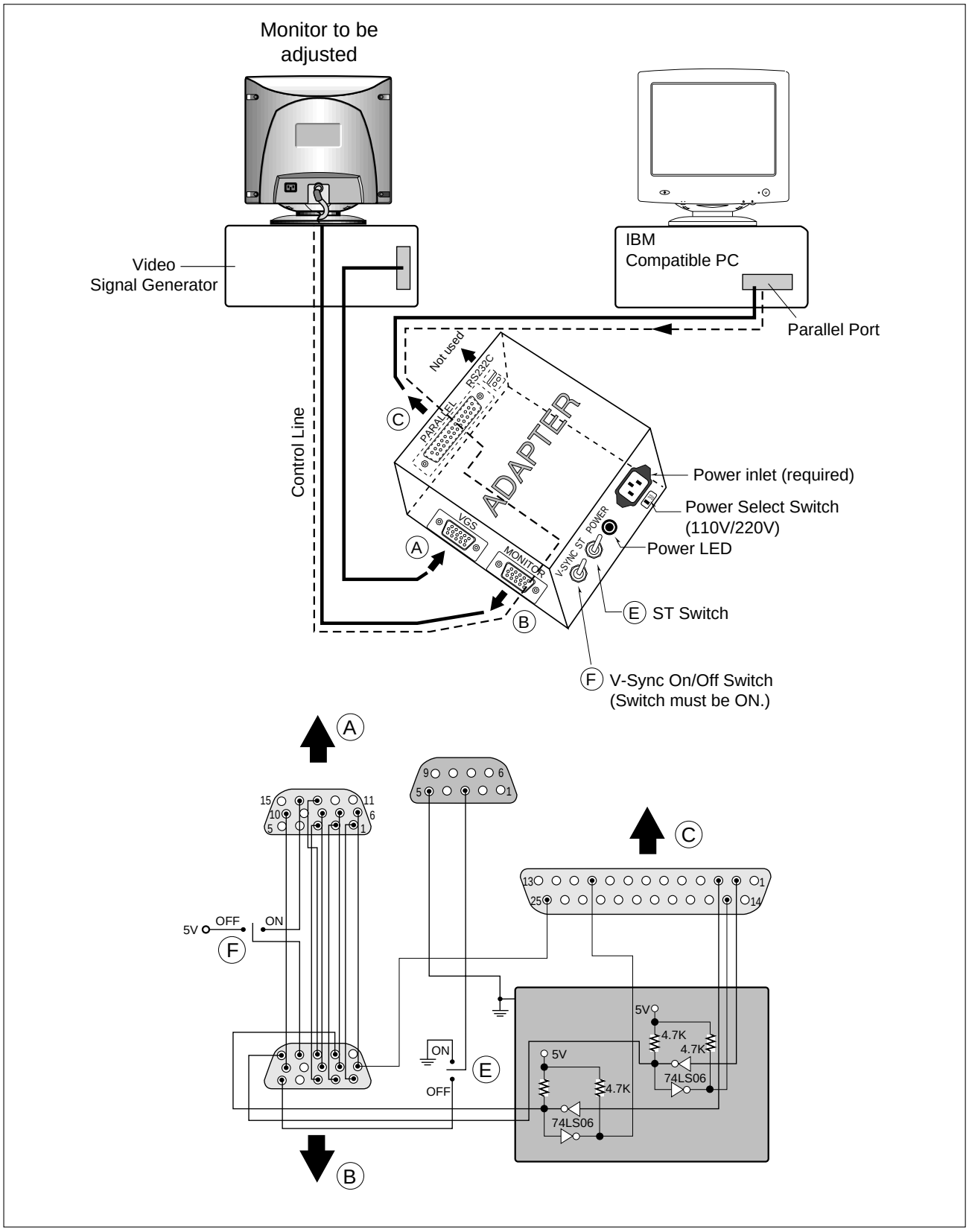
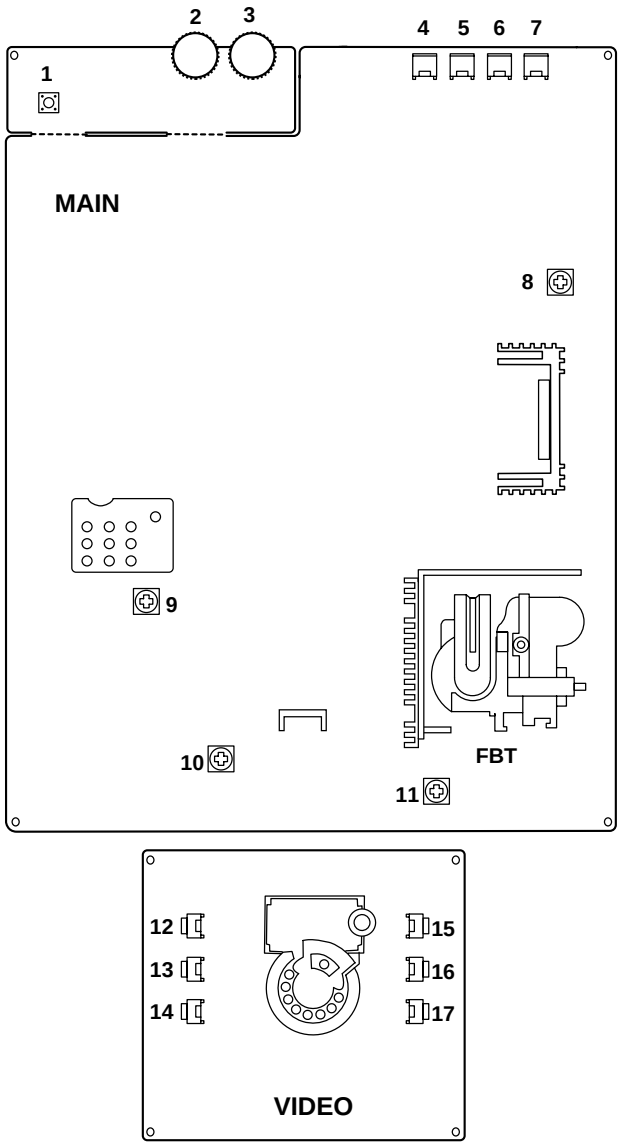


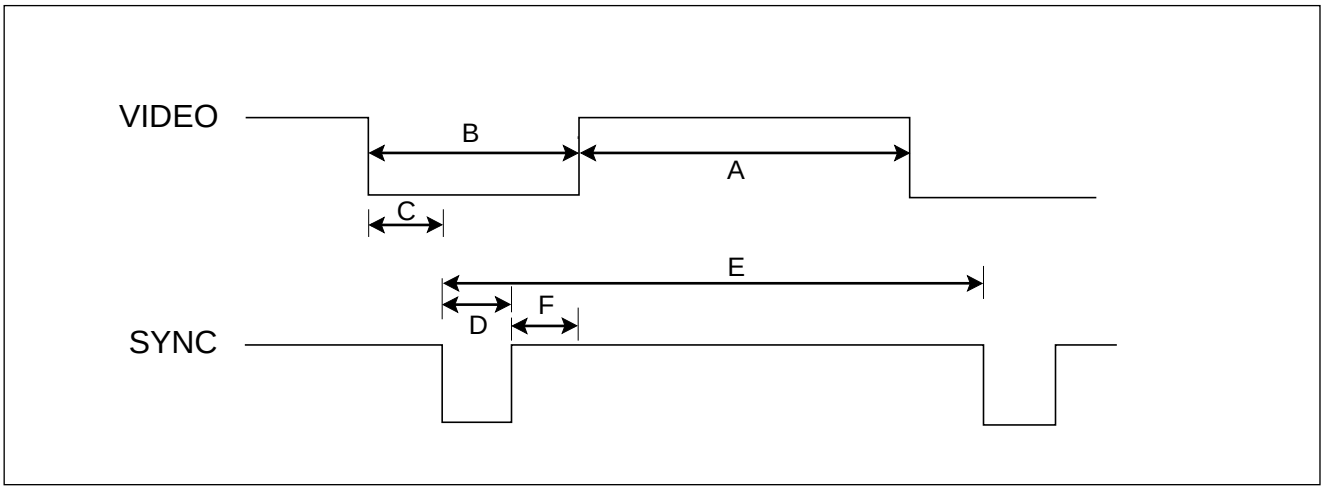
Figure 1. CABLE CONNECTION

CONTROL LOCATIONS



No.	Ref. No.	Control Function	No.	Ref. No.	Control Function
1	SW401	POWER ON/OFF BUTTON	**10**	VR801	HIGH VOLTAGE ADJUSTMENT
2	VR701	CONTRAST	**11**	VR503	ABL ADJUSTMENT
3	VR501	BRIGHTNESS	**12**	VR301	R-DRIVE
4	SW404	ADJUSTMENT (+)	**13**	VR311	G-DRIVE
5	SW403	ADJUSTMENT (–)	**14**	VR321	B-DRIVE
6	SW402	SELECT (+)	**15**	VR322	B-BIAS
7	SW401	SELECT (–)	**16**	VR312	R-BIAS
8	VR502	SUB-BRIGHT	**17**	VR302	G-BIAS
9	VR901	B^+ ADJUSTMENT			

TIMING CHART

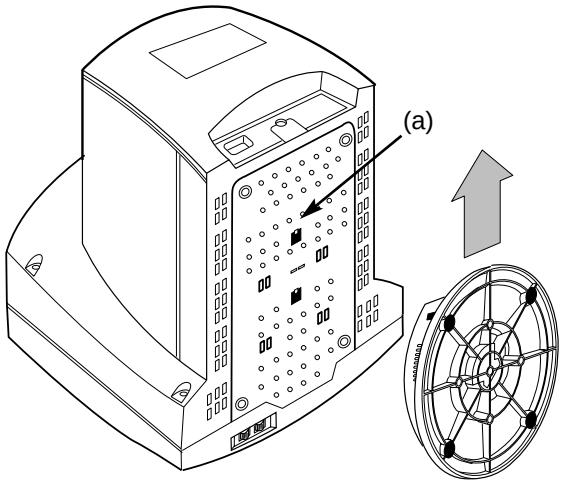


MODE			FACTORY PRESET MODE						
			MARK	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6
HORIZONTAL	Sync Polarity			—	—	—	+	+	—
	Frequency	kHz		31.469	43.269	31.470	37.880	53.674	48.360
	Video Active Time	µs	A	25.422	17.778	25.420	20.000	14.222	15.750
	Blanking Time	µs	B	6.356	5.333	6.360	6.400	4.409	4.920
	Front Porch	µs	C	0.636	1.556	0.640	1.000	0.569	0.370
	Sync Duration	µs	D	3.813	1.556	3.810	3.200	1.138	2.090
	Total Period	µs	E	31.778	23.111	31.780	26.400	18.631	20.680
	Back Porch	µs	F	1.907	2.222	1.910	2.200	2.702	2.460
VERTICAL	Sync Polarity			—	—	+	+	+	—
	Frequency	Hz		59.940	85.008	70.080	60.320	85.061	60.000
	Video Active Time	ms	A	15.253	11.093	12.710	15.840	11.179	15.880
	Blanking Time	ms	B	1.430	0.670	1.557	0.739	0.578	0.786
	Front Porch	ms	C	0.318	0.023	0.413	0.026	0.019	0.062
	Sync Duration	ms	D	0.064	0.069	0.064	0.106	0.056	0.124
	Total Period	ms	E	16.683	11.764	14.270	16.579	11.756	16.670
	Back Porch	ms	F	1.048	0.578	1.080	0.607	0.503	0.60
Resolution				**640 x 480 60Hz**	**640 x 480 85Hz**	**720 x 400 70Hz**	**800 x 600 60Hz**	**800 x 600 85Hz**	**1024 x 768 60Hz**

DISASSEMBLY

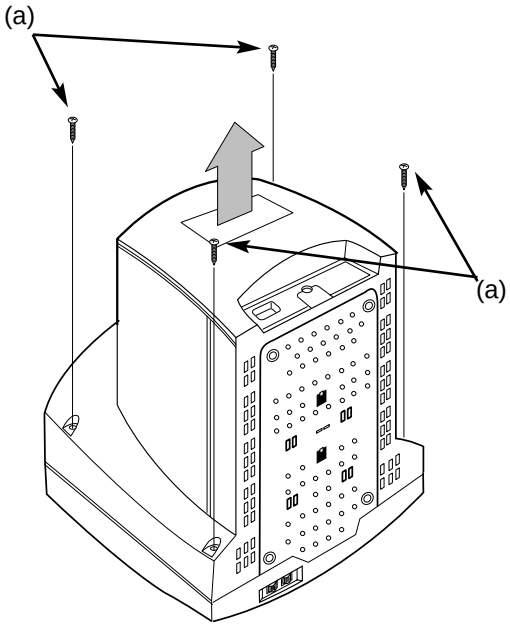
1. TILT/SWIVEL REMOVAL

1) Set the monitor faces downward.
2) Pressing the latch (a), carefully remove the Tilt/Swivel by pulling it upward.



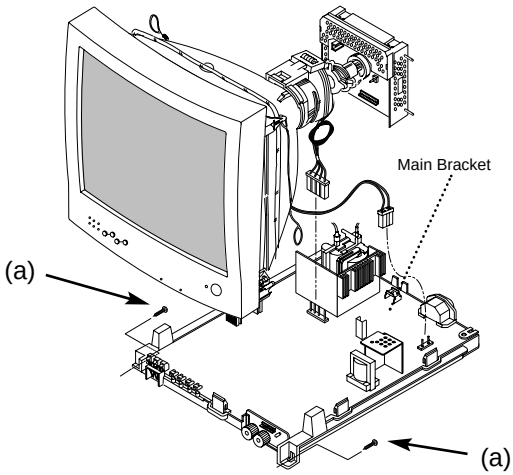
2. BACK COVER REMOVAL

1) Remove four screws (a) from the Back Cover.
2) Slide the Back Cover away from the Front Cabinet of the monitor.



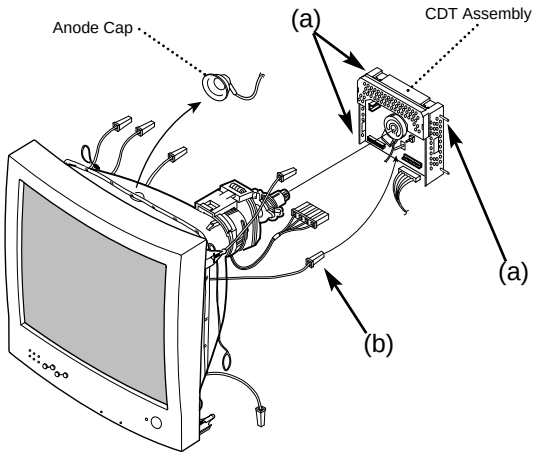
3. TOTAL CHASSIS ASSEMBLY REMOVAL

1) Disconnect P902 (Degaussing pin) and P501 (DY pin).
2) Remove two screws (a) from the Total Chassis Assembly.
3) Remove the Total Chassis Assembly.



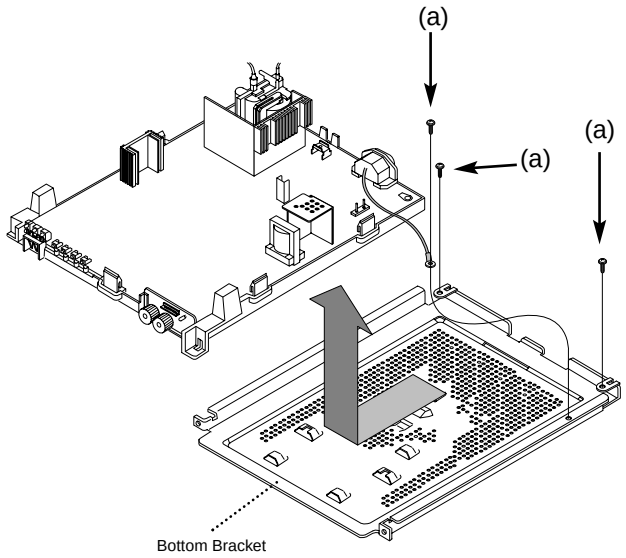
4. VIDEO BOARD ASSEMBLY REMOVAL

1) Remove three pins (a).
2) Remove CDT earth connector (b).
3) Carefully separate the Video Board Assembly from the CDT neck.
4) Discharge the remaining static electricity by shorting between the Anode Cap and the CDT ground.
5) Disconnect the Anode Cap from the CDT.



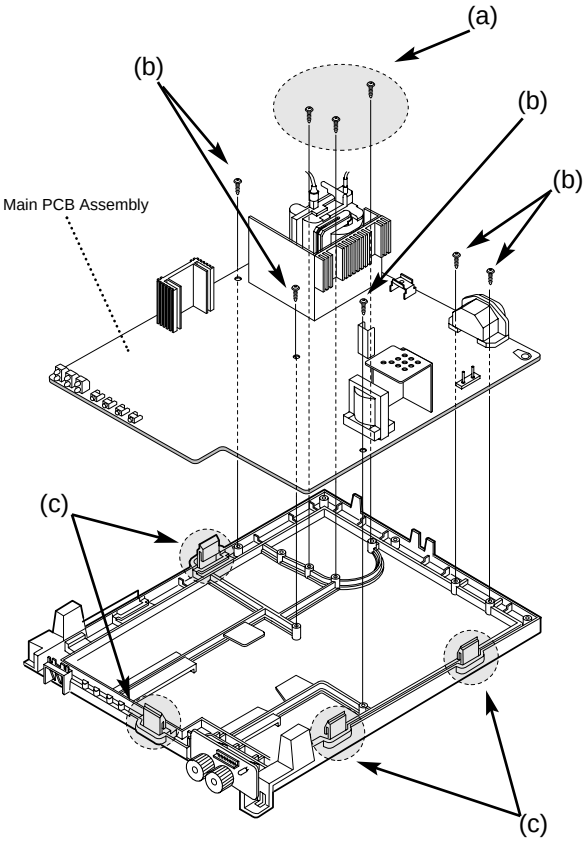
5. BOTTOM BRACKET REMOVAL

1) Remove three screws (a).
2) Remove the Bottom Bracket.

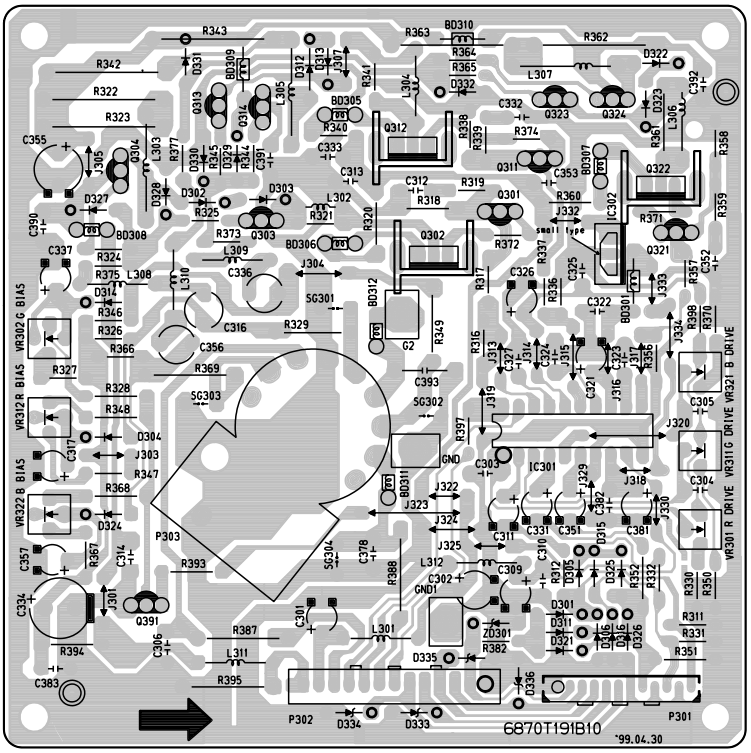


6. MAIN BOARD ASSEMBLY REMOVAL

1) Remove three screws (a).
2) Remove five screws (b).
3) Release four latches (c) from the Main Board Assembly.



3. VIDEO BOARD (Component Side)



4. VIDEO BOARD (Solder Side)