Website:http://biz.LGservice.com
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COLOR MONITOR
SERVICE MANUAL

CHASSIS NO. : CM54A

MODEL: FLATRON ez T710BH (T710BHQ-K****V*)

CAUTION

BEFORE SERVICING THE UNIT,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

CONTENTS

SPECIFICATIONS

1. PICTURE TUBE
   - Size : 17 inch
   - Deflection Angle : 90¡
   - Neck Diameter : 29.1 mm
   - Stripe Pitch : 0.25 mm
   - Face Treatment : W-ARASC (Anti-Reflection and Anti-Static Coating)
   - Internal : Anti-Glare

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 ~ 0.7 Vp-p
       - a) Color 0, 0 : 0 Vp-p
       - b) Color 7, 0 : 0.467 Vp-p
       - c) Color 15, 0 : 0.7 Vp-p
     - 2) Input Impedance : 75 □
     - 3) Video Color : R, G, B Analog
     - 4) Signal Format : Refer to the Timing Chart
   - 2-3. Signal Connector
     - 3 row 15-pin Connector (Attached)
   - 2-4. Scanning Frequency
     - Horizontal : 30 ~ 71 kHz
     - Vertical : 50 ~ 160 Hz

3. POWER SUPPLY
   - 3-1. Power Range
     - AC 100-240V~ 50/60Hz, 1.0A
   - 3-2. Power Consumption

MODE	POWER CONSUMPTION	LED COLOR
POWER ON	less than 63W	GREEN
SLEEP	less than 3W	FLASH
POWER OFF	less than 3W	OFF

4. DISPLAY AREA
   - 4-1. Active Video Area :
     - • Max Image Size - 325.1 x 243.8 mm (12.80" x 9.60")
     - • Preset Image Size - 310 x 230 mm (12.20" x 9.06")
   - 4-2. Display Color : Full Colors
   - 4-3. Display Resolution : 1280 x 1024 / 60Hz(Max) (Non-Interlace)
   - 4-4. Video Bandwidth : 110 MHz

5. ENVIRONMENT
   - 5-1. Operating Temperature: 0¡C ~ 40¡C (Ambient)
   - 5-2. Relative Humidity : 10%~ 80% (Non-condensing)
   - 5-3. Altitude : 5,000 m

6. DIMENSIONS (with TILT/SWIVEL)
   - Width : 400 mm (15.75 inch)
   - Depth : 411 mm (16.18 inch)
   - Height : 401 mm (15.79 inch)

7. WEIGHT (with TILT/SWIVEL)
   - Net Weight : 13.3 kg
   - Gross Weight : 16.2 kg

SAFETY PRECAUTIONS

SAFETY-RELATED COMPONENT WARNING!

There are special components used in this color monitor which are important for safety. ***These parts are marked on the schematic diagram and the replacement parts list.*** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent X-radiation, shock, fire, or other hazards. Do not modify the original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

CAUTION: No modification of any circuit should be attempted.
Service work should be performed only after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

SAFETY CHECK

Care should be taken while servicing this color monitor because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

FIRE & SHOCK HAZARD

An isolation transformer must be inserted between the color monitor and AC power line before servicing the chassis.

- In servicing, attention must be paid to the original lead dress specially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.
- All the protective devices must be reinstalled per the original design.
- Soldering must be inspected for the cold solder joints, frayed leads, damaged insulation, solder splashes, or the sharp points. Be sure to remove all foreign materials.

IMPLOSION PROTECTION

All used display tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only same type display tubes.

X-RADIATION

The only potential source of X-radiation is the picture tube. However, when the high voltage circuitry is operating properly there is no possibility of an X-radiation problem. The basic precaution which must be exercised is keep the high voltage at the factory recommended level; the normal high voltage is about 25.8kV. The following steps describe how to measure the high voltage and how to prevent X-radiation.

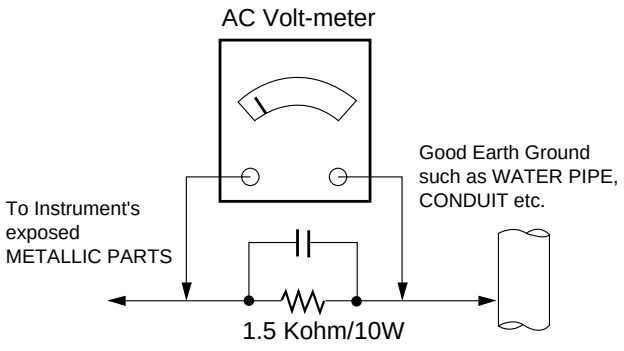
Note : It is important to use an accurate high voltage meter calibrated periodically.

- To measure the high voltage, use a high impedance high voltage meter, connect (–) to chassis and (+) to the CDT anode cap.
- Set the brightness control to maximum point at full white pattern.
- Measure the high voltage. The high voltage meter should be indicated at the factory recommended level.
- If the meter indication exceeds the maximum level, immediate service is required to prevent the possibility of premature component failure.
- To prevent X-radiation possibility, it is essential to use the specified picture tube.

CAUTION:

Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

Leakage Current Hot Check Circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the ***SAFETY PRECAUTIONS*** on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
      CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemicals on or near this receiver or any of its assemblies.
5. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
6. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
9. *Use with this receiver only the test fixtures specified in this service manual.*
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices.* Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature.
      (500°F to 600°F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
      CAUTION: Work quickly to avoid overheating the circuitboard printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

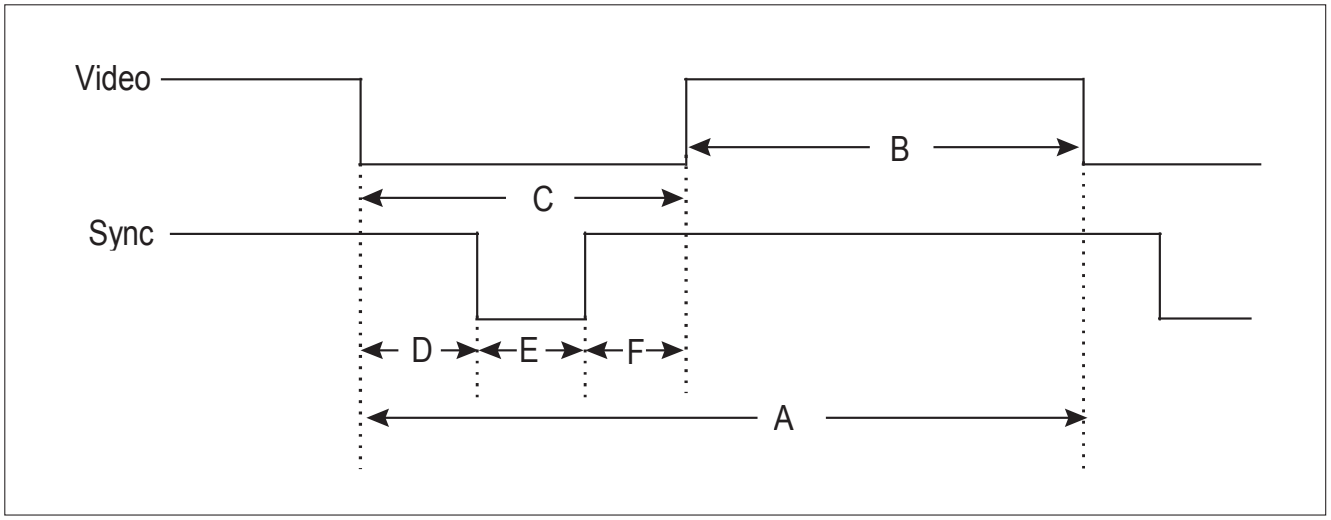
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife.
   Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
   Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

TIMING CHART



<< Dot Clock (MHz), Horizontal Frequency (kHz), Vertical Frequency (Hz), Horizontal etc... (μs), Vertical etc... (ms) >>

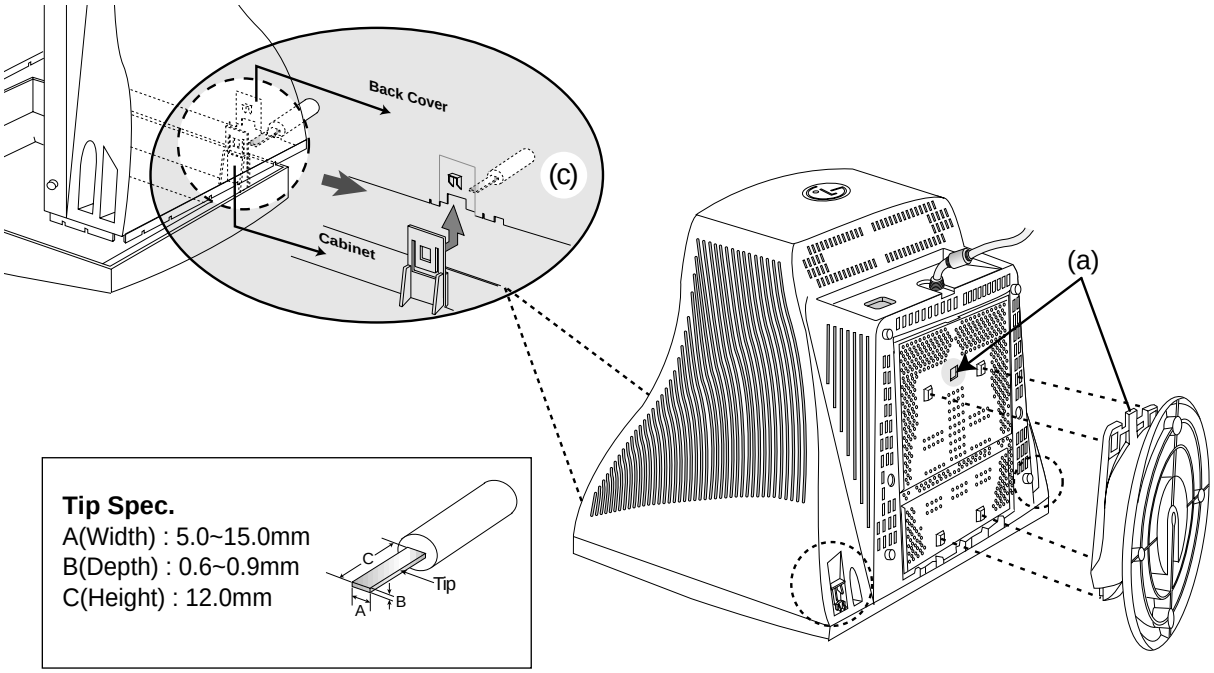
MODE			1	2	3	4
			VESA			
	Polarity		−	+	+	+
H	H-Frequency	KHz	37.500	46.880	53.680	68.677
O	H-Active (A)	uS	26.670	21.330	18.630	14.561
R	H-Video(B)	uS	20.320	16.160	14.220	10.836
I	H-blanking(C)	uS	6.350	5.170	4.410	3.725
Z	H-front porch(D)	uS	0.510	0.320	0.570	0.508
	H-sync time(E)	uS	2.030	1.620	1.140	1.016
	H-back porch(F)	us	3.810	3.223	2.700	2.201
	Polarity		−	+	+	+
	V-Frequency	Hz	74.990	75.010	85.070	85.000
	V-Active (A)	mS	13.335	13.331	11.755	11.764
V	V-Video(B)	mS	12.802	12.798	11.178	11.182
E	V-blanking(C)	mS	0.533	0.533	0.577	0.582
R	V-front porch(D)	mS	0.026	0.021	0.018	0.014
T	V-sync time(E)	mS	0.080	0.064	0.056	0.044
	V-back porch(F)	mS	0.427	0.448	0.503	0.524
Resolution			640* 480	800* 600	800* 600	1024* 768

* No Composite Mode.

DISASSEMBLY

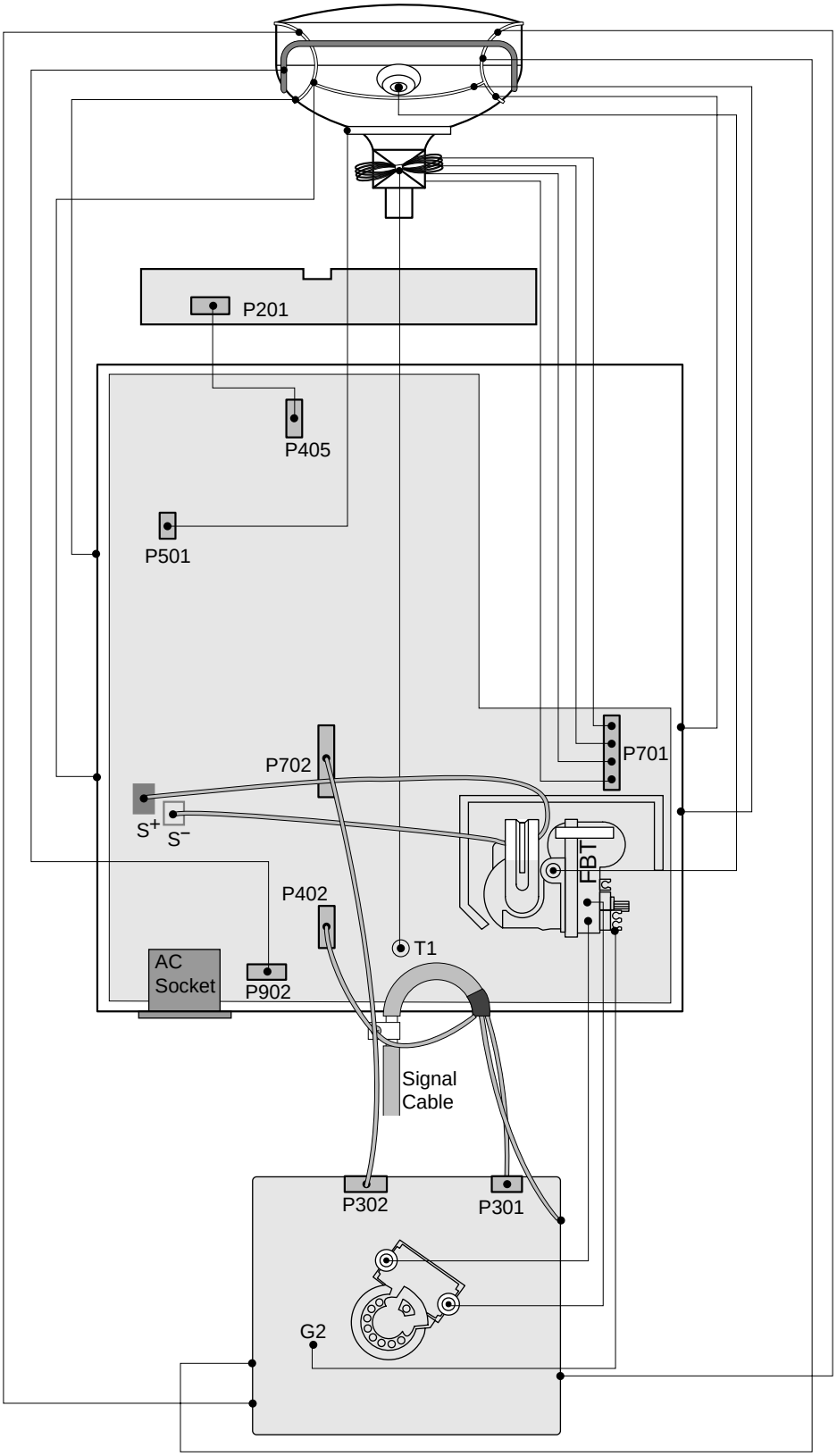
1. TILT/SWIVEL & BACK COVER REMOVAL

1) Set the monitor face downward.
2) Carefully remove the Tilt/Swivel by pulling it upward.
3) Pressing the latch (b), Back cover by pushing it upward.
4) Release the latch (c). (See Tip Spec.)
5) Slide the Back Cover away from the Front Cabinet of the monitor.

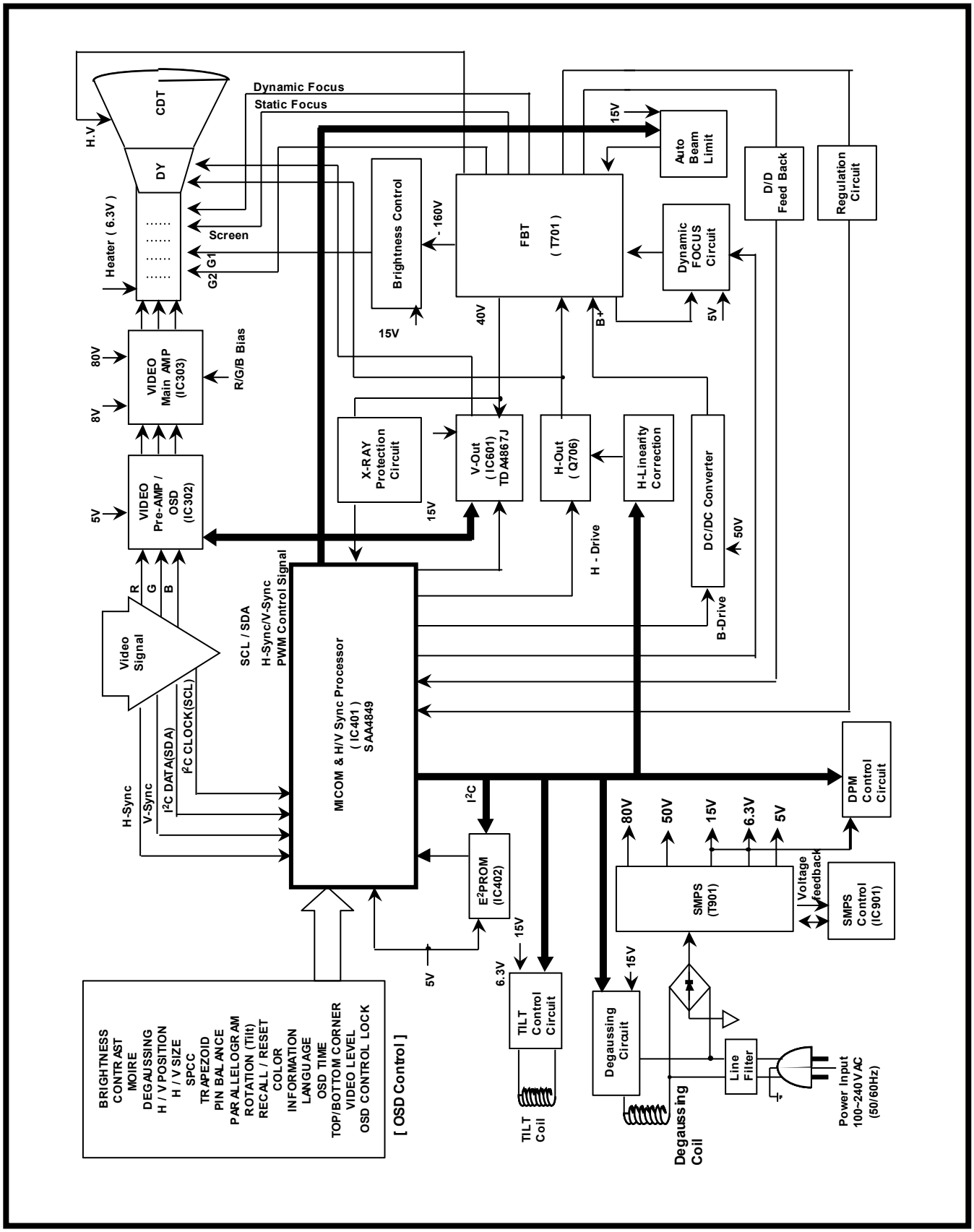


Tip Spec.
A(Width) : 5.0~15.0mm
B(Depth) : 0.6~0.9mm
C(Height) : 12.0mm

WIRING DIAGRAM



BLOCK DIAGRAM



DESCRIPTION OF BLOCK DIAGRAM

1. SMPS(Switching Mode Power Supply)

When you turn on the power switch, the operating fprocedure is as follows:

1) The AC line voltage is rectified by the bridge diode D900.
2) The control IC(IC901) starts switching and generates switch pulse in the primary turn of the SMPS transformer(T901)
3) The switching pulses of the primary turns are induced to the secondary turns of the transformer by the turn ratio. This pulses are rectified by each diode(D971, D961(D962),D951,D942,D941)
4) Each rectified DC voltage(80V, 50V, 15V,6.3V and 5V)

2. Over Voltage Protection Circuit

When the input of IC901 Vin (pin 4) is more than 22V, all the secondary voltages of the SMPS transformer (T901) down to low value

3. Display Power Management Circuit(DPM)

1) DPM OFF
When no input of horizontal or vertical sync Q951, Q941 are turned off .Then input power consumption is below 4 watts.

.

4. Microprocessor Control & Horizontal and Vertical Sync Processor Circuit

The operating procedure is as follows ;

1) There is Horizontal & Vertical process function in Microprocessor.(IC401)
2) Microprocessor (IC401) discriminates the operating mode from the sync polarity and resolution.
3) After microprocessor reads these adjusted mode data stored at EEPROM, it controls operating mode data through IIC
4) Users can control screen condition by the OSD Select,Up, Down, Left, Right, Exit.

5. D/D Converter Circuit.

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

6. X-RAY Protection Circuit

When the high Voltage reaches to 29kV in an abnormal case, the high voltage detector circuit, R818,D721,C739-1 R416, C409 start operation to shut down high voltage circuit.

7. Horizontal S-correction Circuit.

This circuit corrects the horizontal linearity for each horizontal sync frequency.

8. Horizontal drive and Output Circuit.

This circuit is a horizontal deflection amplifier for raster scan.

9. ABL Circuit

This circuit limits the beam-current for the reliability of CDT

10. Vertical Output Circuit

This circuit takes the vertical ramp wave from the TDA4867J (IC601) and perform the vertical deflection by supplying the saw-tooth wave current to the vertical deflection yoke.

11. Blanking and Brightness Control Circuit.

Blanking circuit eliminates the retrace line by supplying a negative pulse wave to the G1 of the CDT.
Brightness control circuit is used for control of the screen brightness by changing the DC level G1.

12. Image Rotation (Tilt) Circuit.

This circuit corrects the tilt of the screen by supplying the image rotation signal to the tilt coil which is attached near the deflection yoke of the CDT.

13. OSD (On Screen Display) Circuit.

This circuit displays information of the monitor`s status on the screen.

14. Video Processor Circuit.

Video processor circuit consists of the video drive output block. The video drive IC(IC302) receives the video signal from PC. The gain of each channel is controlled by MICOM through IIC.
The cut-off circuit compensate different voltage of each channel between the cathode and the G1 of the CDT.

15. Video Pre-Amp Circuit.

This circuit amplifies the analog video signal from 0~0.7 V to 0~4 V. It is operated by taking the clamp, R,G,B drive and contrast signal from the MICOM (IC401)

16. Video Output Amp Circuit.

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

ADJUSTMENT

1. Preparation for Service Adjustment

GENERAL INFORMATION

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

- Alignment appliances and tools.
  - IBM compatible PC.
  - Programmable Signal Generator.
    (eg. VG-819 made by Astrodesign Co.)
  - EPROM or EEPROM with saved each mode data.
  - Alignment Adaptor and Software.
  - Digital Voltmeter.
  - White Balance Meter.
  - Luminance Meter.
  - High-voltage Meter.

AUTOMATIC AND MANUAL DEGAUSSING

The degaussing coil is mounted around the CDT so that automatic degaussing when turn on the monitor. But a monitor is moved or faced in a different direction, become poor color purity cause of CDT magnetized, then press DEGAUSSING on the OSD menu.

ADJUSTMENT PROCEDURE & METHOD

- Install the cable for adjustment such as Figure 1and run the alignment program on the DOS for IBM compatible PC.
- Set external Brightness and Contrast volume to max position.

1. Adjustment for B^+ Voltage.

1) Display cross hatch pattern at Mode 4.
2) Check D961 cathode voltage within 50V ± 1V .

2. Adjustment for High-Voltage.

1) Display cross hatch pattern at Mode 4.
2) Enter the SVC SUB menu as the following instruction.
3) Adjust H/Voltage to 21kV±0.1 kV by adjust 1-P value.

2. Adjustment by Service Hot key

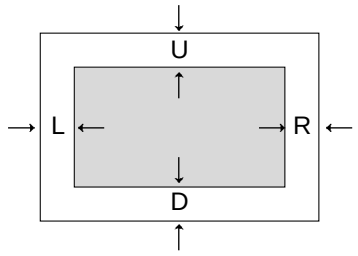
How to enter SVC HOT KEY

1. Press Menu and OSD window will appear.
2. While OSD window is displayed, ★★ is seen on the left bottom of OSD window.
3. Press ◁ + select switch simultaneously and the screen will immediately refresh.
4. Press Menu and make sure that ★★ is changed to 1 2.
5. Follow the menu on the left of OSD window to find 12 and OSD will change as shown in the figure.
6. Select Degauss in the above figure and then press Select and ▷ to enter the screen of the SUB menu. (Back Raster for Pattern)

FOS SPEC

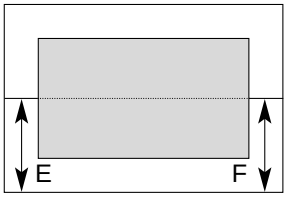
1. Size
   H : 310±4mm
   V : 230±4mm
   Scanning frequency : All Mode (Mode 1~5)
   Display image : Cross hatch pattern

2. Centering
   Scanning frequency : All Mode (Mode 1~5)
   Display image : Crosshatch pattern
   Horizontal : 10 Row
   Vertical : 8 Row



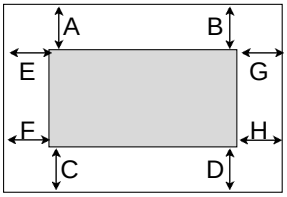
H : | L-R | ≤ 4mm, V : | U-D | ≤ 4mm

3. Tilt
   Scanning frequency : All Mode (Mode 1~5)
   Display image : Crosshatch pattern
   Horizontal : 10 Row
   Vertical : 8 Row



Tilt : | E-F | ≤ 2.0mm

4. Distortion
   Scanning frequency : All Mode (Mode 1~5)
   Display image : Crosshatch pattern
   Horizontal : 10 Row
   Vertical : 8 Row



   | A-B | ≤ 2.0mm, | C-D | ≤ 2.0mm
   | E-F | ≤ 2.0mm, | G-H | ≤ 2.0mm

5. Displa Size drift
   - ±4mm : 25℃ Standard, 10℃, 35℃
   - ±0.5mm : 180V ~ 264V

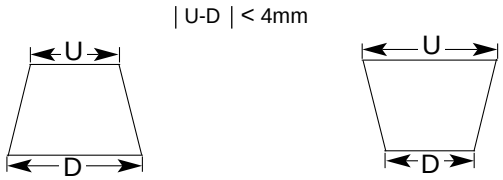
6. Linearity

				Y1
				Y2
				Y3
				Y4
X1	X2	X3	X4	

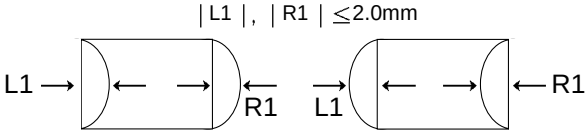
   Formula : {(Max - Min) / Max} x 100(%)
   Criteria : H - 10% Max. (Upper 40kHz)
   14% Max. (Less 40kHz)
   V - 8% Max.

7. Regulation
   Luminance ≤ 2mm
   Dynamic(lode) ≤ 2mm
   Scanning frequency : All Mode (Mode 1~5)

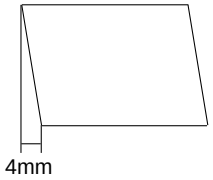
8. Trapezoid



9. Pin Balance



10. Parallelogram



11. Adjustment of white balance (Adjustment of chromaticity diagram)
   *(Adjustment of white balance must be made after entering Hot Key Mode and DEGAUSS.)

   CONDITIONS
   Signal: 69 kHz / 85 Hz
   Display image: Back raster (Color 0,0)
   Contrast: Maximum
   Brightness: Maximum
   Color temperature: 9300K

11-1. Adjustment of cut off (Adjustment of back raster)

11-1(a). Before adjustment, press Menu and Degauss to remove.
=> Enter hot key mode.
   Adjust Brightness and Contrast to Max in OSD window.

(1) Adjust cut off (back raster) first. Enter DEGAUSS in the Menu and modify the following data.
   Modify RCUT to Min ,
   Modify GCUT To Min ,
   Adjust to BCUT Data = 127 (7F (h)) ,
   Adjust to SBRT Data = 205 (CD (h)).
(2) Turn FBT screen volume on "CRT COLOR ANALYZER CA-100" equipment to adjust Brightness to 0.4 ±0.05FL.
(3) Adjust RCUT, GCUT, and SBRT to set chromaticity diagram at :
   x: 0.283±0.005
   y: 0.298±0.005
   Y: 0.40±0.05FL

* If color values would not be matched desirable values, repeat sequence 1 and 2 after readjusting “GREEN CUTOFF” control a little different.

11-2. Adjustment of White Balance

After finishing adjustment of cut off (back raster), approve "Color(15.0) Full white pattern".
Adjust BDRV Data = 95
SCON=127.
Adjust RDRV and GDRV to set chromaticity diagram at :
x: 0.283±0.005
y: 0.298±0.005
Approve "Window pattern (70x70mm)" to adjust S-CON to Y : 50±1FL.
Approve "Color (15.0) Full white pattern" again and adjust ABL Data to Y : 32±1FL

12. Focus Adjustment

CONDITIONS
Scanning frequency : All Mode (Mode 1~4)
Display image: H character pattern
Brightness: Cut off point
Contrast: Maximum

PROCEDURE
1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

13. Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS
Orientation: Monitor facing east
Scanning Frequency: 1024 x 768@85Hz(69kHz/85Hz)
Display image: White flat field
Luminance: Cut off point at the center of the display area

Note: Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE
For trained and experienced service technicians only.
Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields.

2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer.

3. Make sure the spacing between the PCM assembly and the CRT stem is 29 mm ± 1 mm.

4. Display a green pattern over the entire display area.

5. Adjust the purity magnet rings on the PCM assembly to display a pure green pattern.
(Optimum setting: x = 0.295 ± 0.015,
y = 0.594 ± 0.015)

6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 4-6. Color Purity Tolerances

Red:	x=0.620±0.015	y=0.334±0.015
Green:	x=0.620±0.015	y=0.334±0.015
Blue:	x=0.620±0.015	y=0.334±0.015

(For 9300K color adjustment: x = 0.283 ± 0.02,
y = 0.298 ± 0.02)

7. When you have the PCMs properly adjusted, carefully glue them together to prevent their movement during shipping.

3. Adjustment Using Service software Program (Adjustment Program)

1. Adjustment for Factory Mode (Preset Mode).

1) Display cross hatch pattern at Mode All.
2) Run alignment program for T710BHQ on the IBM compatible PC.
3) EEPROM → ALL CLEAR → Y(Yes) command.
<Caution> *Do not run this procedure unless the EEPROM is changed. All data in EEPROM (mode data and color data) will be erased.*
4) COMMAND → PRESET START → Y(Yes) command.
5) DIST. ADJ. → FOS. ADJ command.
6) Adjust H-POSITION as arrow keys to center of the screen.
7) Adjust H-SIZE as arrow keys to 310 ± 2mm.
8) Adjust V-POSITION as arrow keys to center of the screen.
9) Adjust V-SIZE as arrow keys to 230 ± 2mm.
10) Adjust TRAPEZOID as arrow keys to be the best condition.
11) Adjust SIDE PINCUSHON as arrow keys to be the best condition.
12) Adjust TILT as arrow keys to be the best condition.
13) Display cross hatch pattern at Mode 4.
14) DIST. ADJ. → BALANCE DATA command.
15) Adjust balance of Pin-Balance as arrow keys to be the best condition.
16) Adjust parallelogram as arrow keys to be the best condition.
17) Save of the Mode.
18) Save of the System.
19) Display from Mode 4 and repeat above from number 6) to 16).
20) COMMAND → PRESET EXIT → Y (Yes) command.

2. Adjustment for White Balance and Luminance.

1) Set the White Balance Meter.
2) Press the DEGAUSSING on the OSD menu for demagnetization of the CDT.
3) Display color 0,0 pattern at Mode 4.
4) COMMAND → PRESET START → Y(Yes) command.
5) Set Bightness and Contrast to max position.
6) COLOR ADJ. → LUMINANCE command of the alignment program.
7) COLOR ADJ. → BIAS ADJ. command of the alignment program.
8) Check whether blue color or not at R-BIAS and G-BIAS to min position, Sub-Brightness to 205 (CD(h))position, B-Bias to 127(7F(h))position. If it's not blue color, the monitor must repair.
9) Adjust Screen control on the FBT to 0.4 ± 0.05FL of the raster luminance.
10) Adjust R-BIAS and G-BIAS command to x=0.283 ± 0.006 and y=0.298 ± 0.006 on the White Balance Meter with PC arrow keys.
11) Display color 15,0 Full White(70x70mm) at mode 4.
12) DRIVE ADJ command.
13) Set B-DRIVE to 95(5F(h)) at DRIVE of the alignment program.
14) Adjust R-DRIVE and G-DRIVE command to white balance x=0.283 ± 0.003 and y=0.298 ± 0.003 on the White Balance Meter with PC arrow keys.
15) Adjust SUB-CONTRAST command to 50±1FL of the raster luminance.
16) Display color 15,0 full white patten at Mode 4.
17) COLOR ADJ. → LUMINANCE → ABL command.
18) Adjust ABL to 32 ± 1FL of the luminance.
19) Exit from the program.

4. EDID Data Edit Using Service software Program

4.1 Read and Modify EDID Data

1) Connector the monitor and adjust device as Figure1
2) Display color 15,0 cross hatch pattern at Mode 4.
3) Use EDIT – MODEL SEL. command to select the right model info file.
4) Use EDIT – EDID INFO command and return to read the EDID Data.
5) Modify the EDID Data if needed and using F10 to save the change and exit.

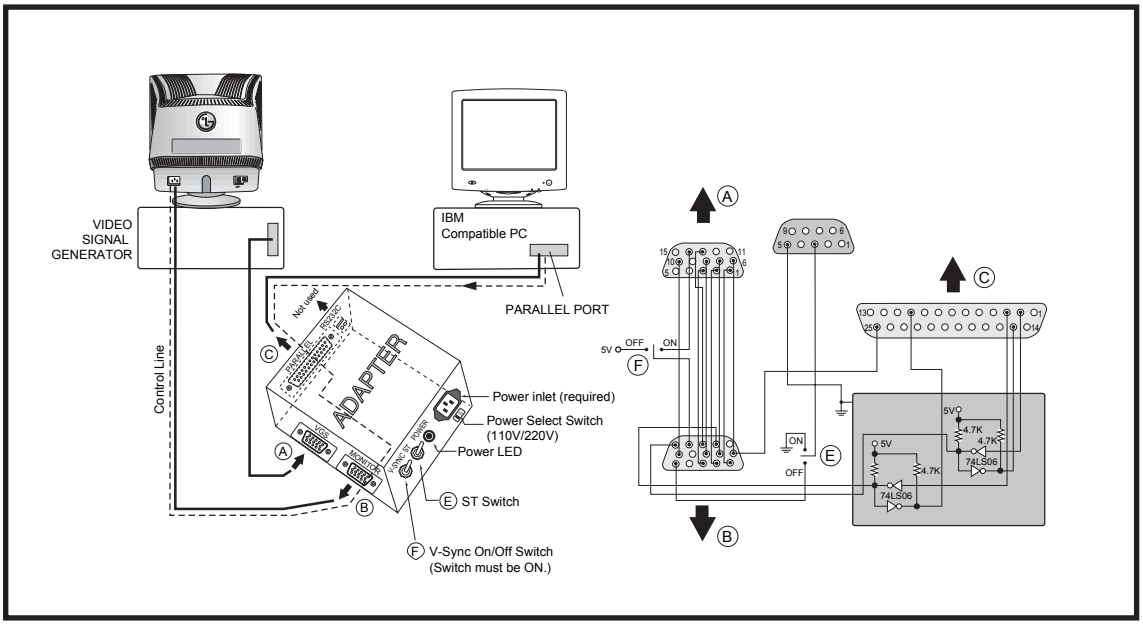
4.2 Write EDID Data.

1) Display color 15,0 cross hatch pattern at Mode 4.
2) Use EEPROM -- Write EDID command and confirm
   "EDID Write OK!!" message of monitor.
3) Exit from the alignment program.
4) Power switch OFF/ON for EDID data save.

EDID DATA EDIT

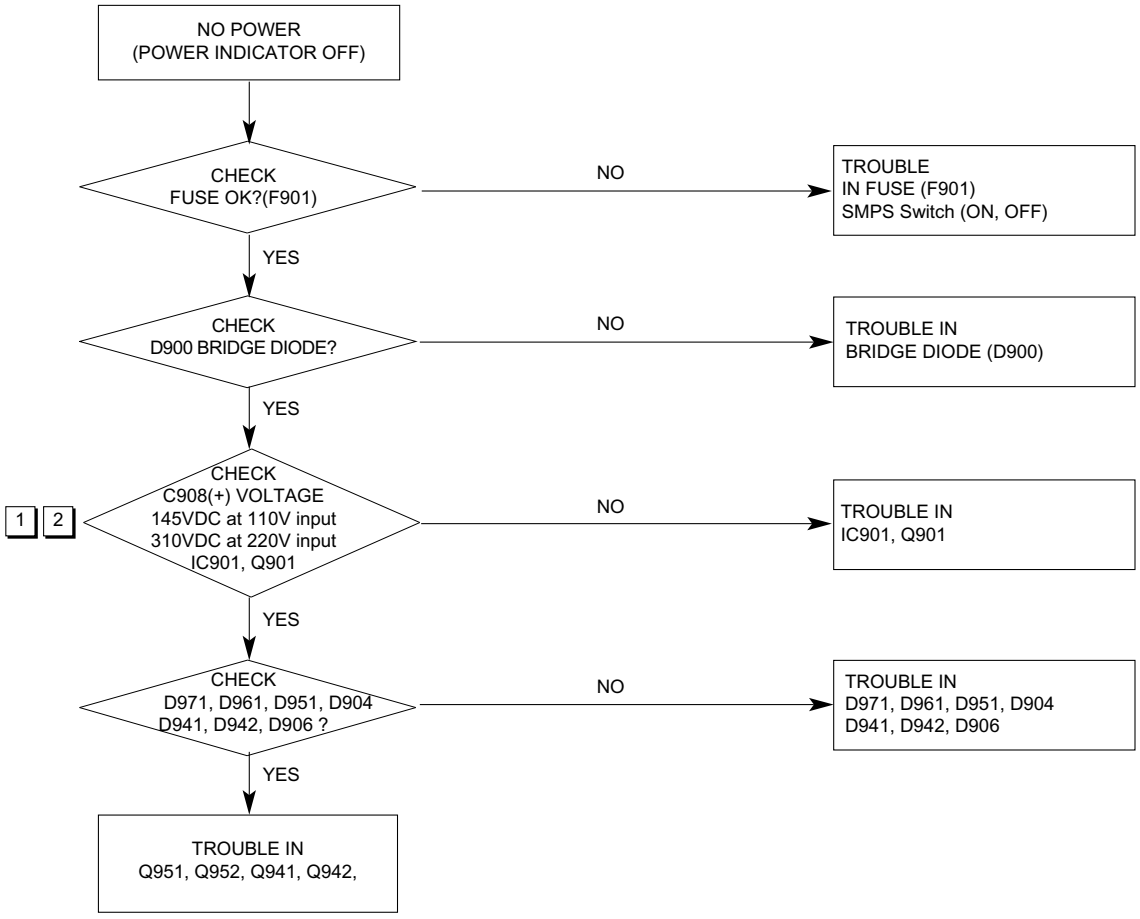
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	# 66	# 43	* 01	* 01	* 01	* 01
1	** 01	*** 10	01	03	18	21	18	B5	EA	F6	29	A2	53	47	99	25
2	10	48	4C	FF	FE	80	31	59	71	4F	45	59	61	59	81	80
3	81	4A	01	01	01	01	EA	24	00	60	41	00	28	30	30	60
4	13	00	36	E6	10	00	00	1E	00	00	00	FD	00	32	A0	1E
5	47	0B	00	0A	20	20	20	20	20	20	00	00	00	FC	00	54
6	37	31	30	42	48	0A	20	20	20	20	20	20	00	00	00	FC
7	00	0A	20	20	20	20	20	20	20	20	20	20	20	20	00	%

Figure 1. Cable Connection



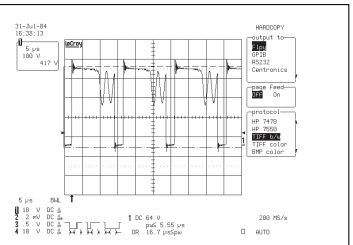
TROUBLESHOOTING GUIDE

1. NO POWER



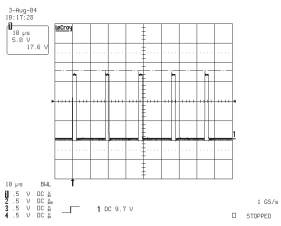
Waveforms

1



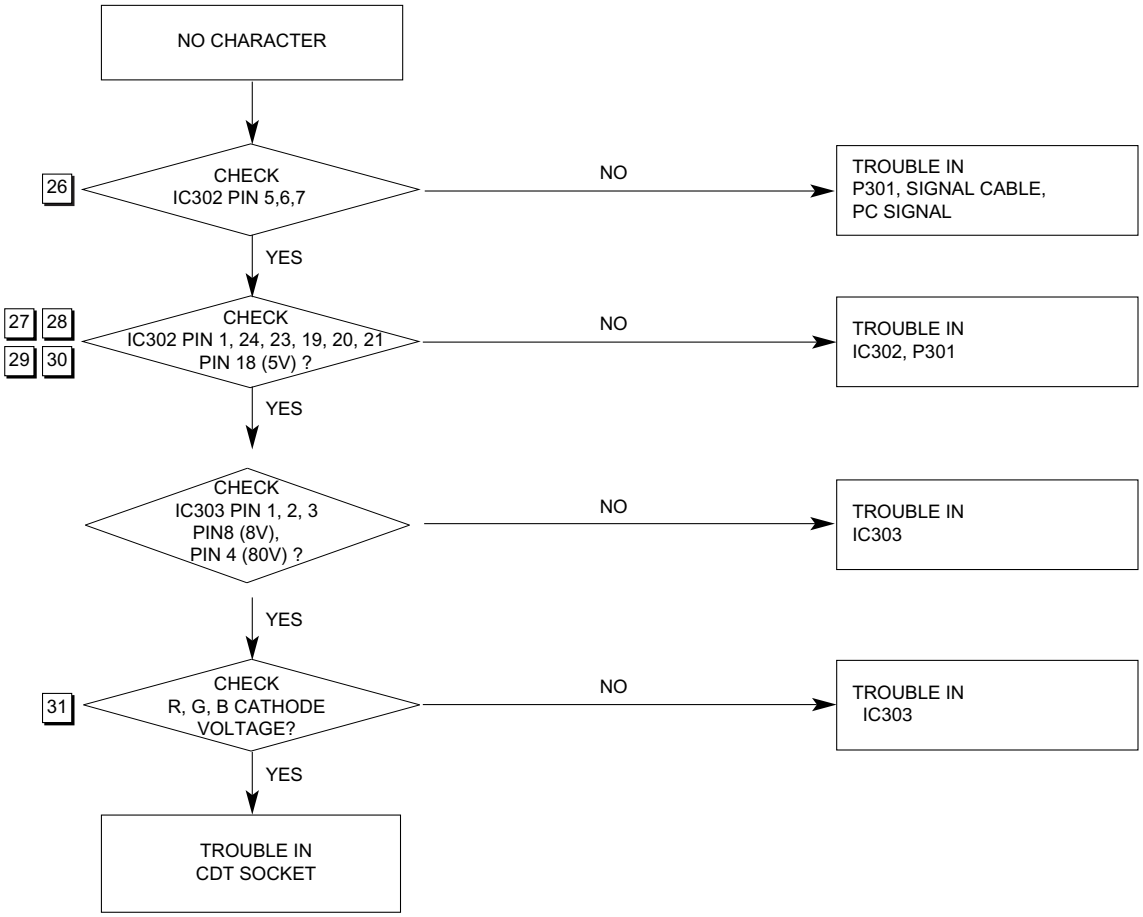
Q901, Drain

2



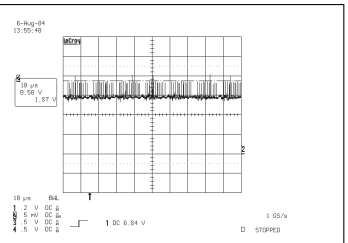
IC901, #6

2. NO CHARACTER



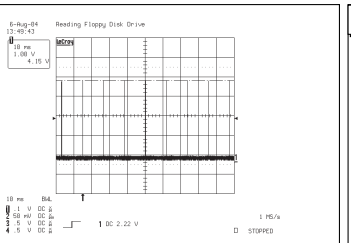
Waveforms

26



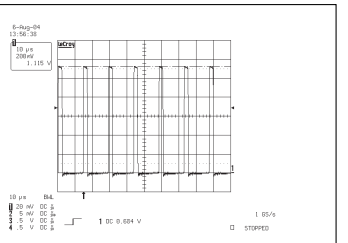
IC302, #5, 6, 7

27



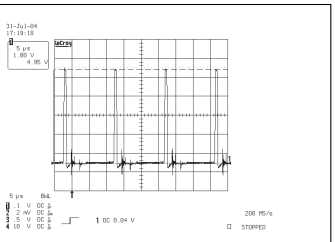
IC302, #1

28



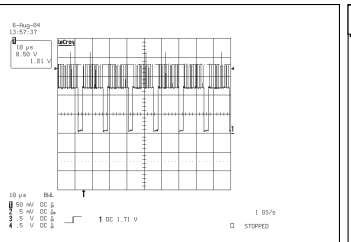
IC302, #24

29



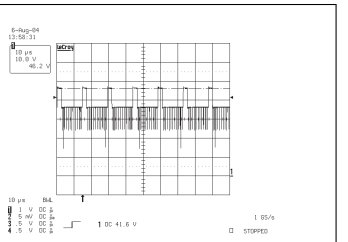
IC302, #23

30



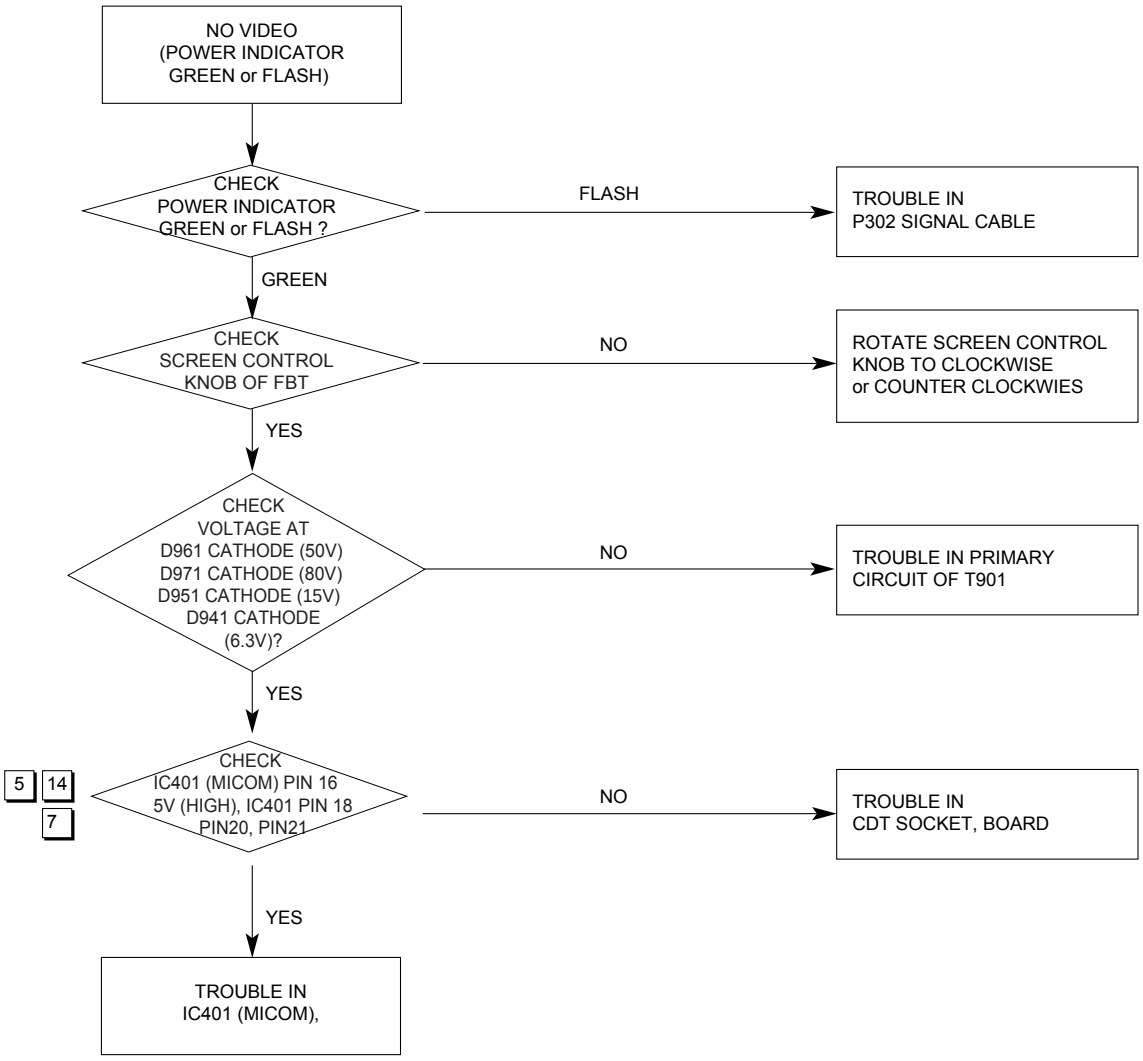
IC302, #19, 20, 21

31



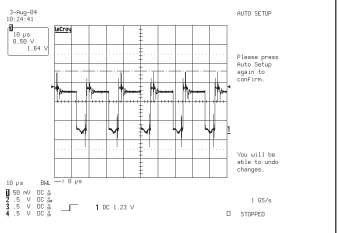
CDT, RK, GK, BK

3. NO RASTER



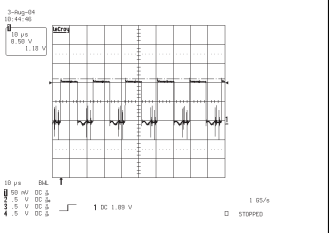
Waveforms

5



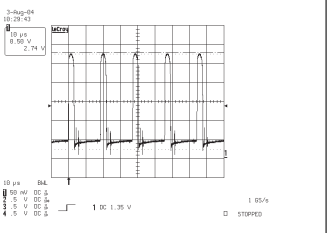
IC401, #18

14



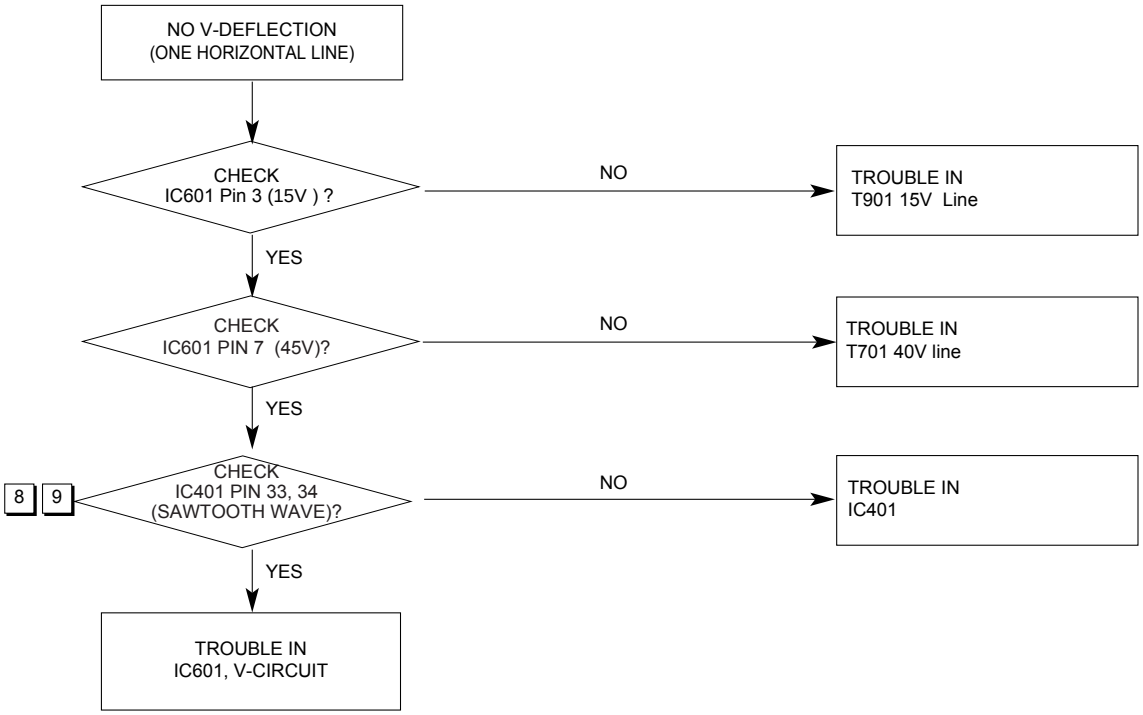
IC401, #20

7



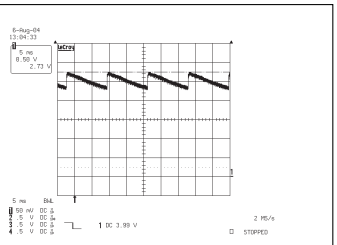
IC401, #21

4. NO VERTICAL DEFLECTION



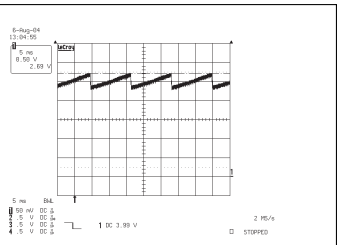
Waveforms

8



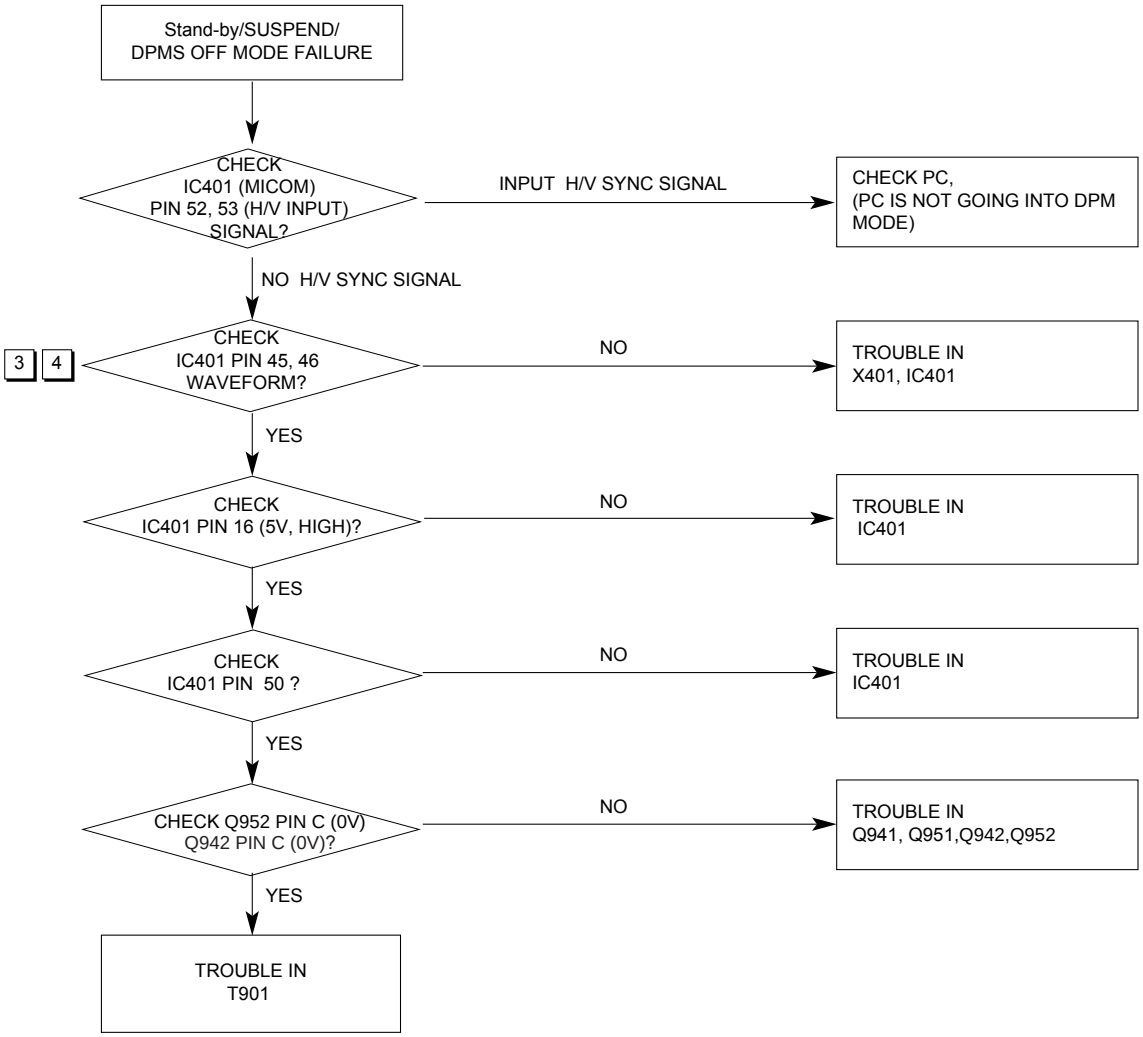
IC401, #33

9



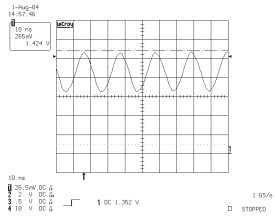
IC401, #34

5. TROUBLE IN DPM



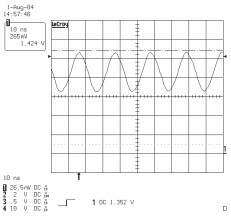
Waveforms

3



C401, #45

4

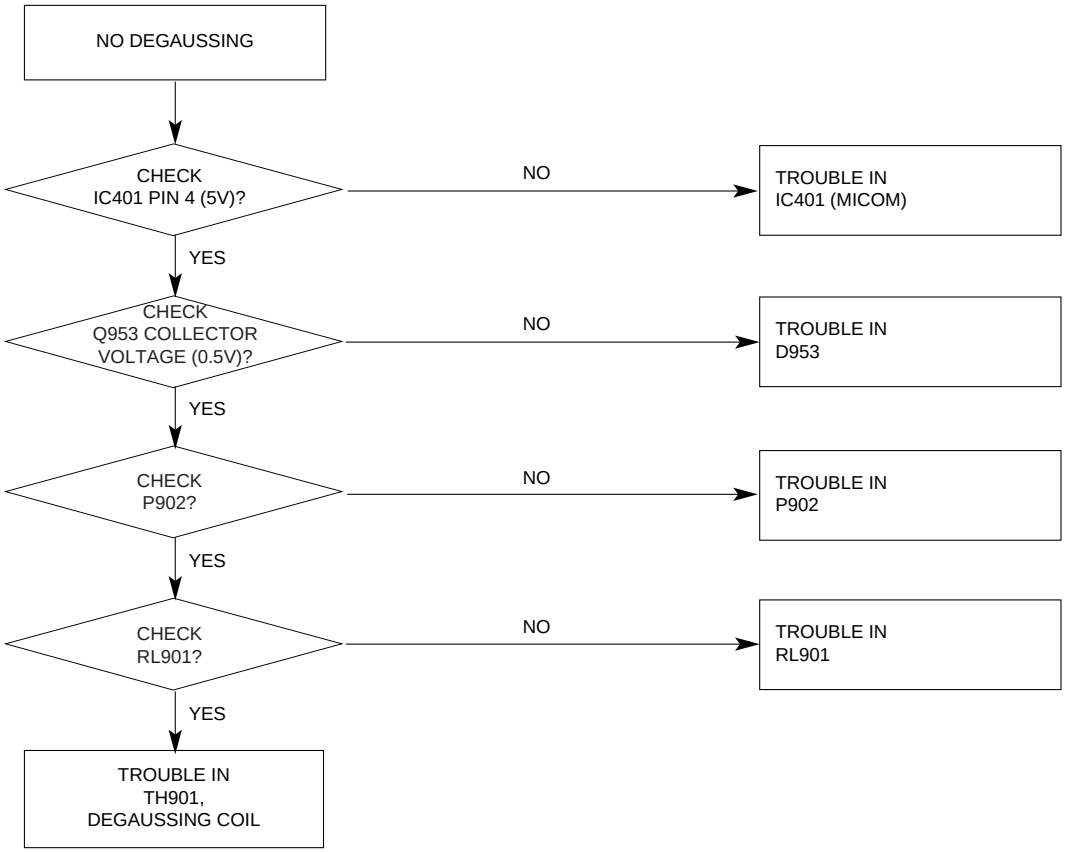


IC401, #46

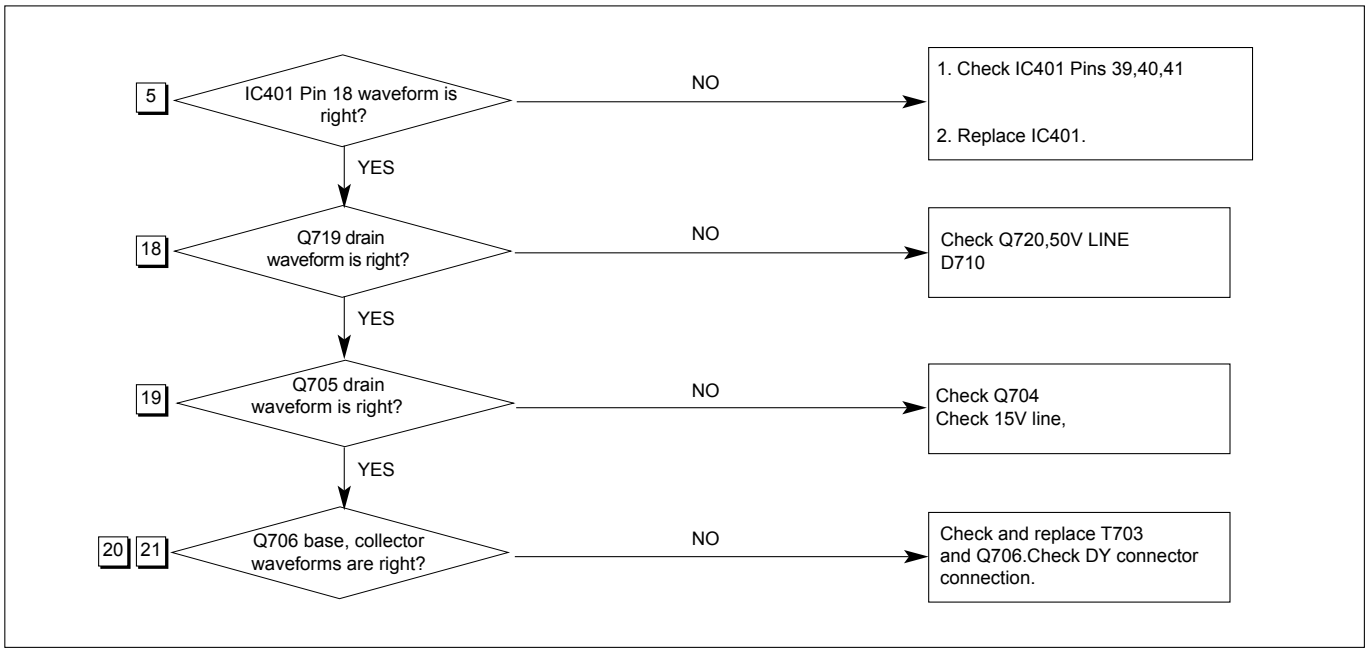
DPMS TABLE

ITEM / MODE	H/V SYNC	VIDEO	LED
NORMAL	ON/ON	NORMAL	GREEN
STAND-BY	OFF/ON	OFF(0V)	FLASH
SUSPEND	ON/OFF	OFF(0V)	FLASH
OFF	OFF/OFF	OFF(0V)	OFF

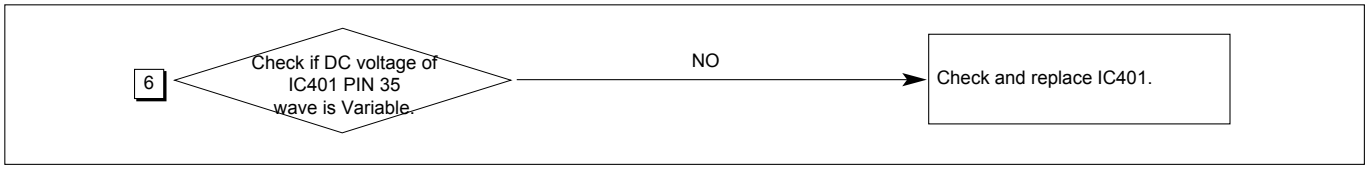
6. NO DEGAUSSING



7. H_Deflection Failure

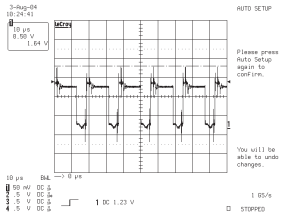


8. Invariable H_Size



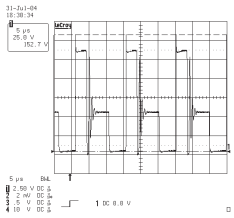
Waveforms

5



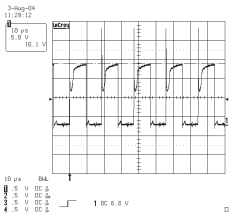
IC401, #18

18



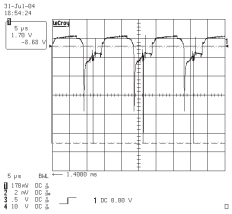
Q719, Drain

19



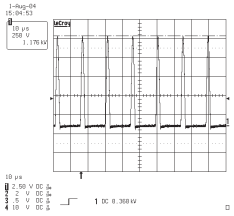
Q705, Drain

20



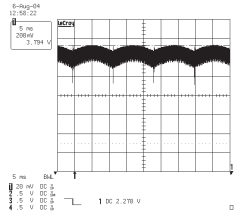
Q706, Base

21



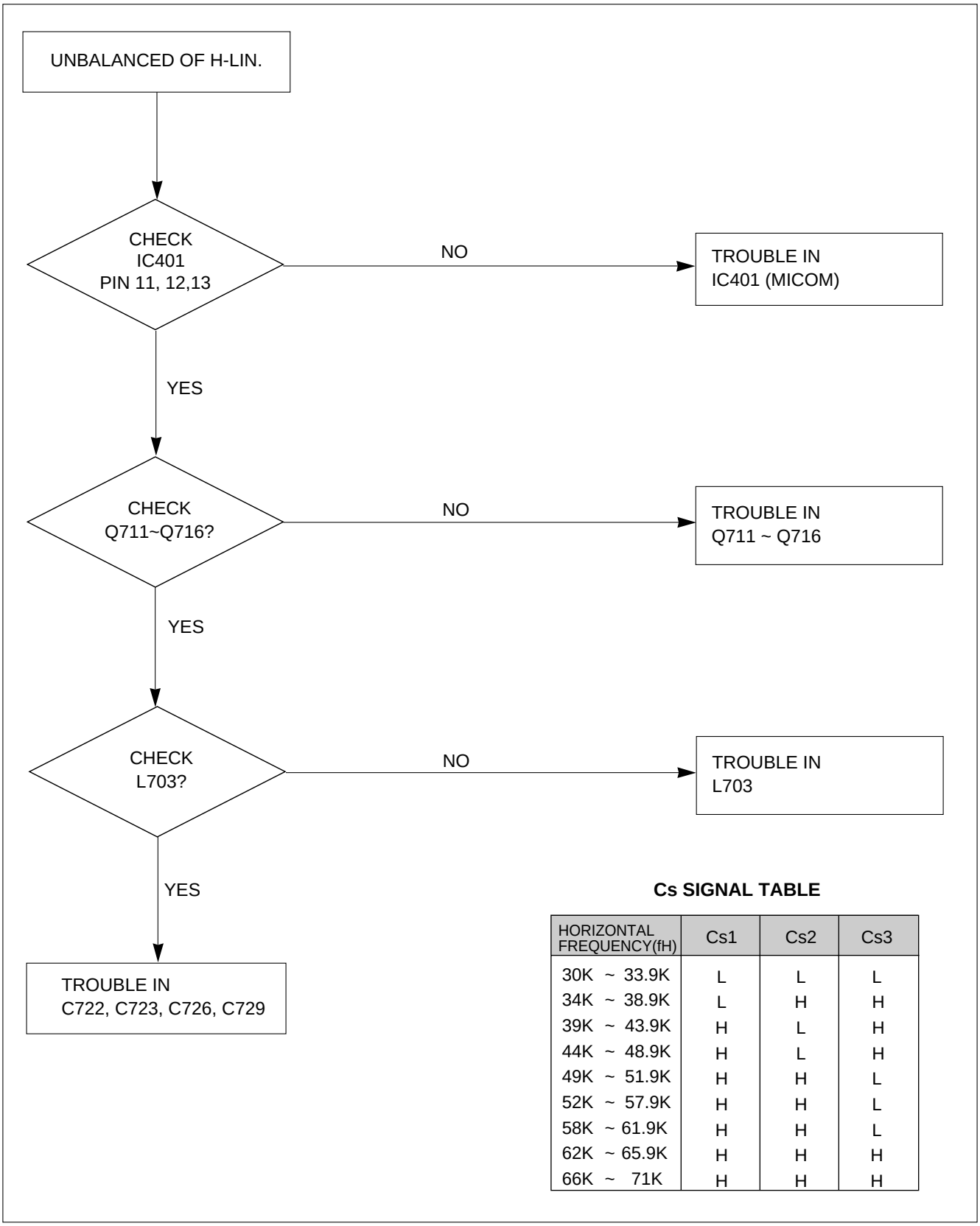
Q706, Collector

6



IC401, #35

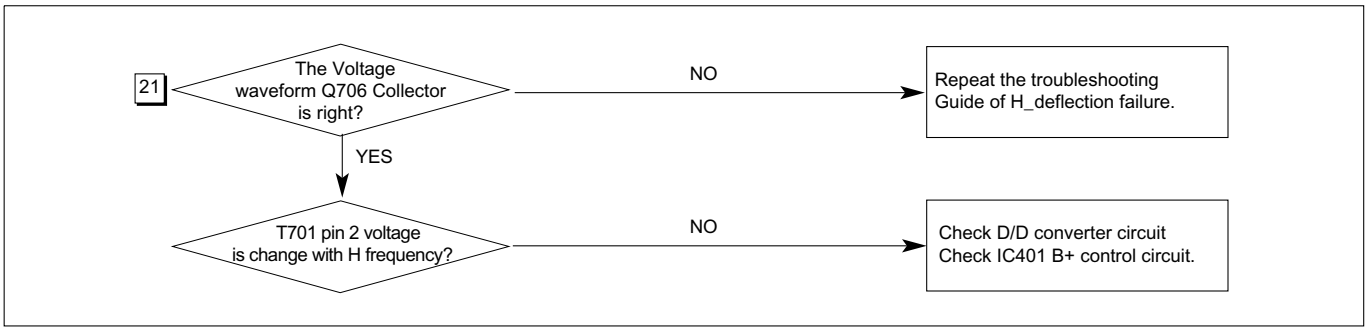
9. TROUBLE IN H-LINEARITY



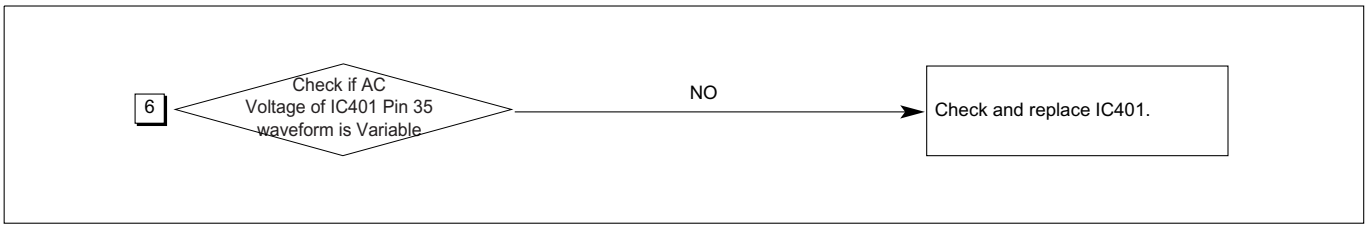
Cs SIGNAL TABLE

HORIZONTAL FREQUENCY(fH)	Cs1	Cs2	Cs3
30K ~ 33.9K	L	L	L
34K ~ 38.9K	L	H	H
39K ~ 43.9K	H	L	H
44K ~ 48.9K	H	L	H
49K ~ 51.9K	H	H	L
52K ~ 57.9K	H	H	L
58K ~ 61.9K	H	H	L
62K ~ 65.9K	H	H	H
66K ~ 71K	H	H	H

10. Abnormal H_Size



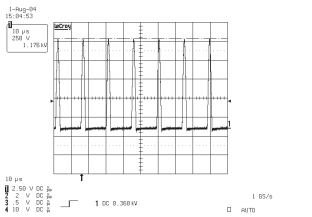
11. Side Pin or Trap Failure



12. Para. or Pin Balance Failure

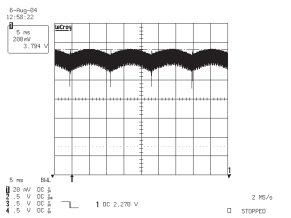
Waveforms

21



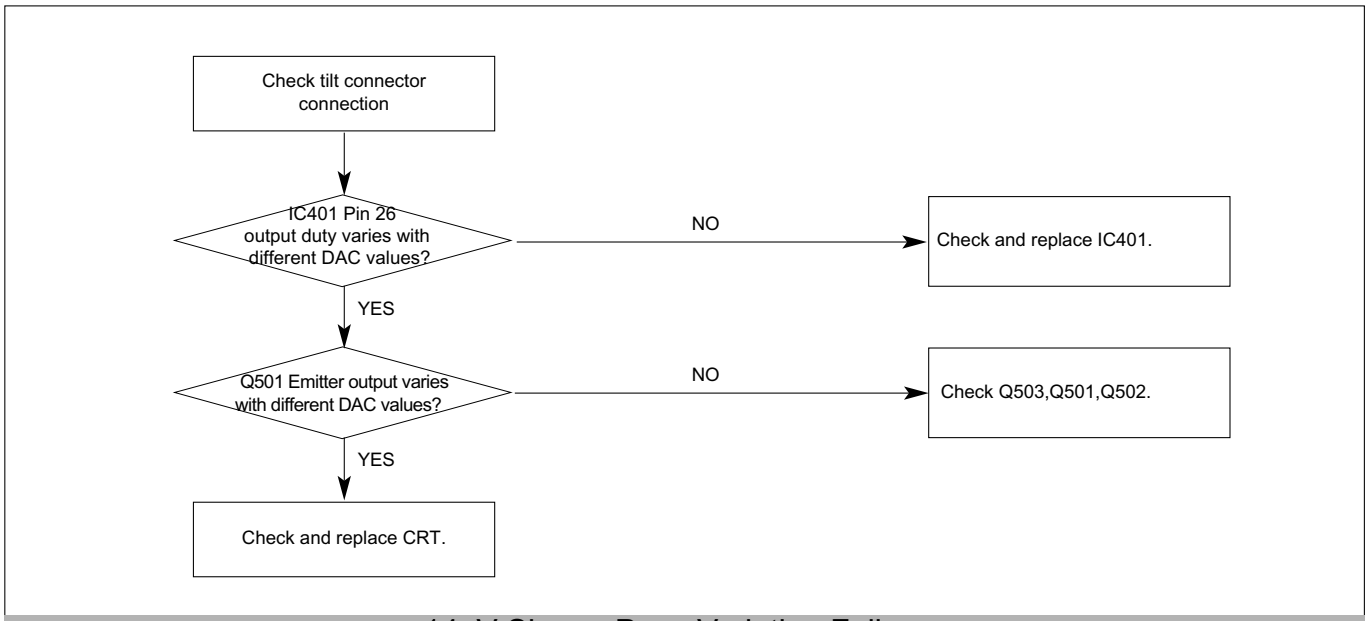
Q706, Collector

6

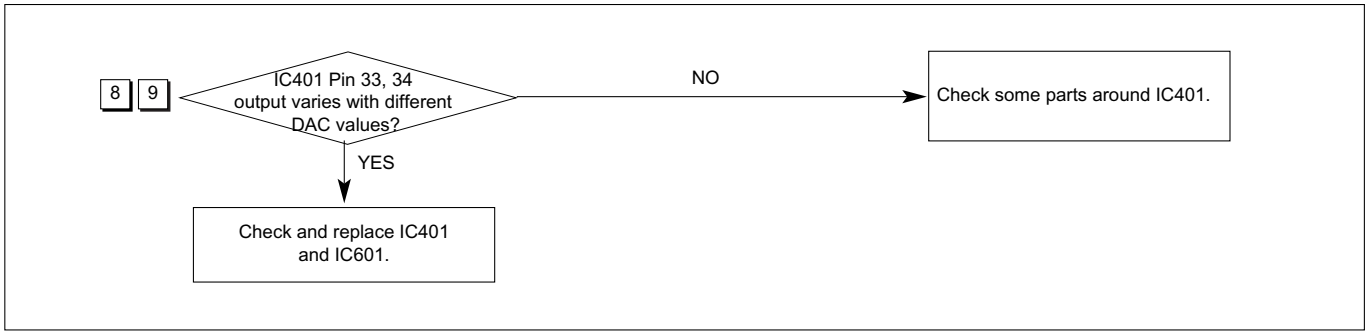


IC401, #35

13. Tilt Failure

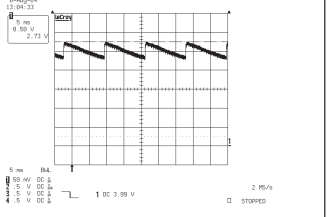


14. V Size or Pos. Variation Failure



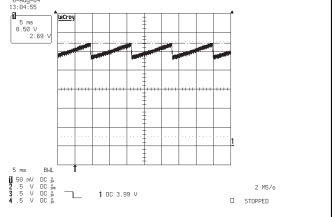
Waveforms

8



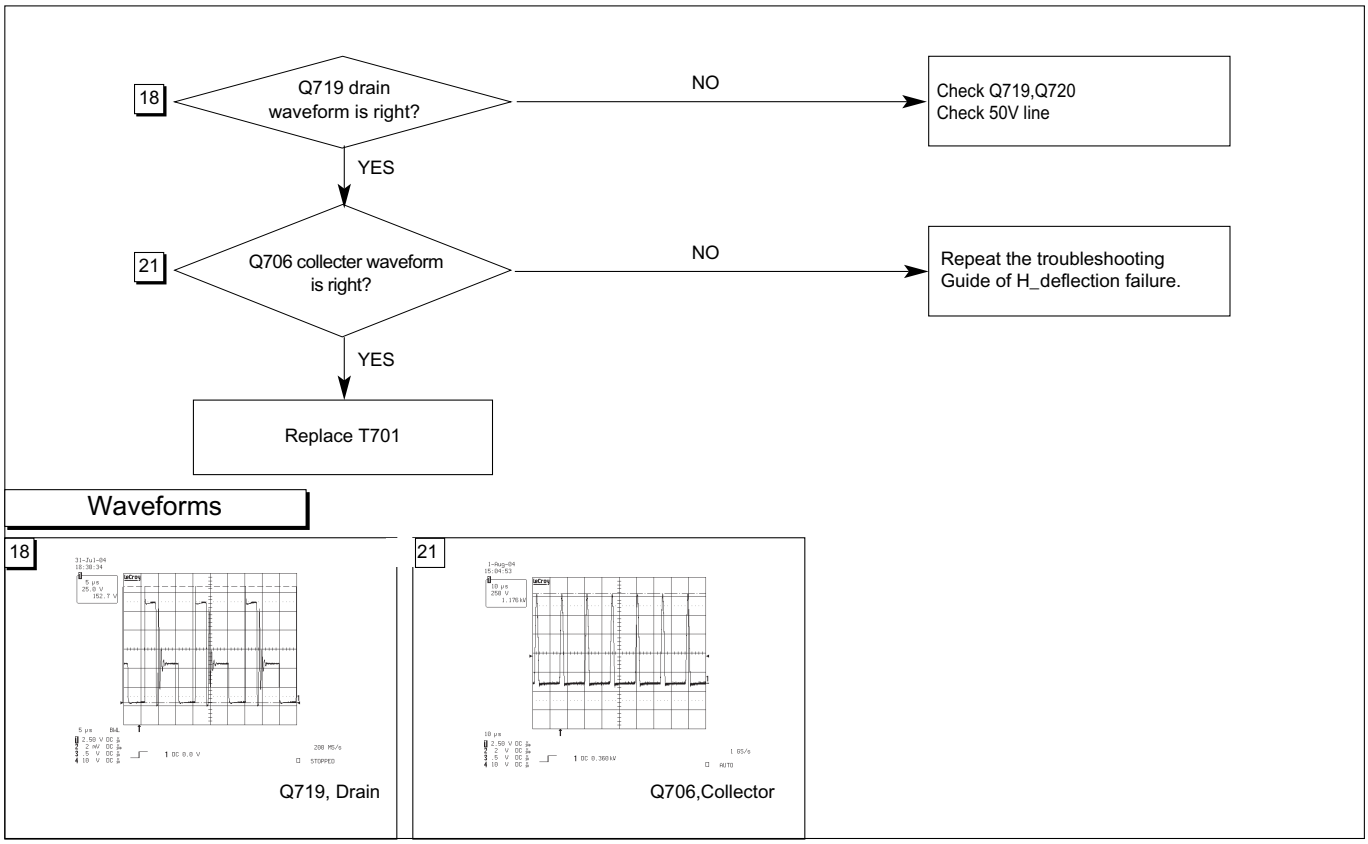
IC401, #33

9

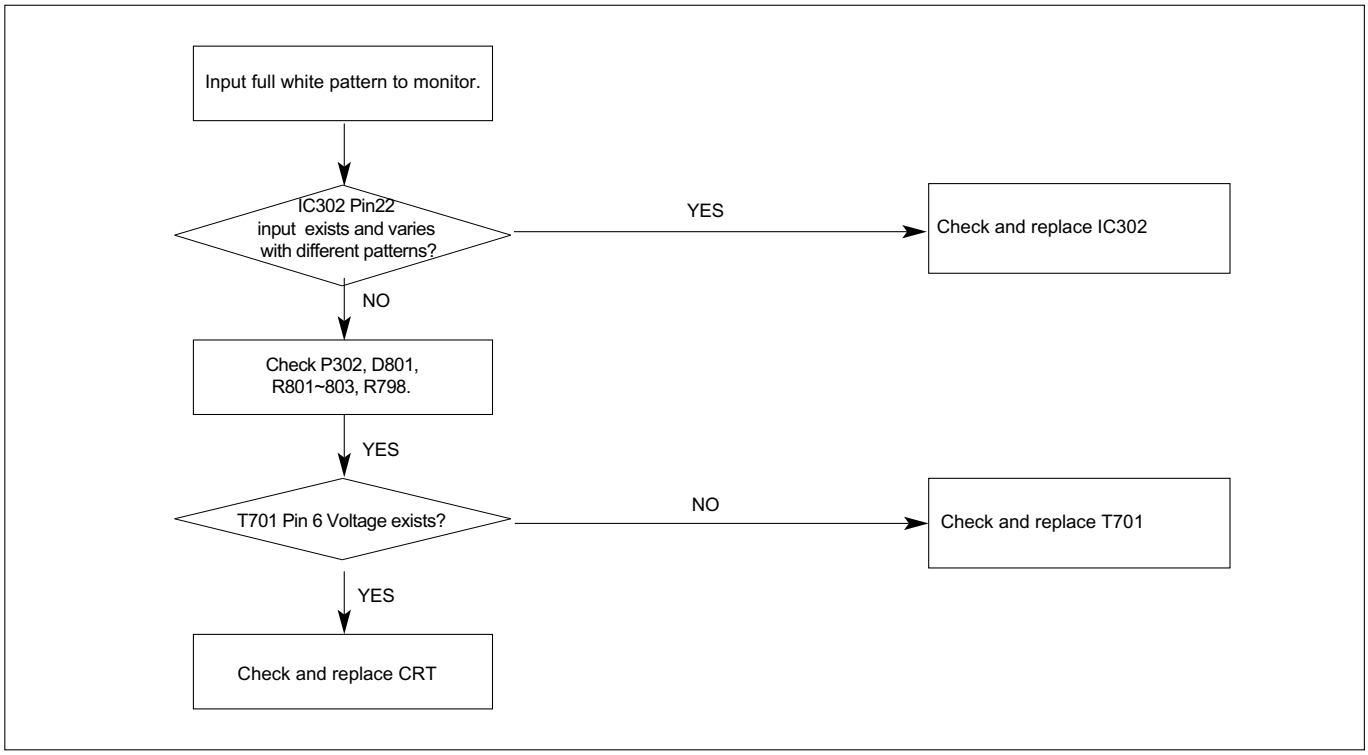


IC401, #34

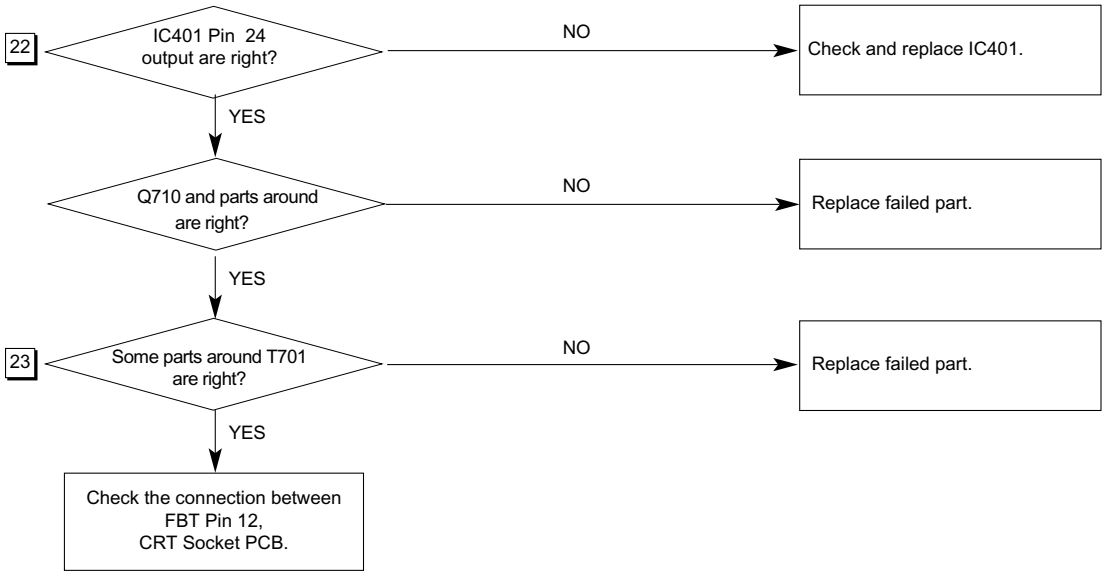
15. High Voltage Failure



16. ABL Failure

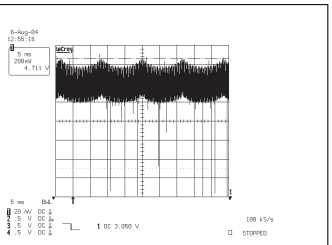


17. Focus Failure



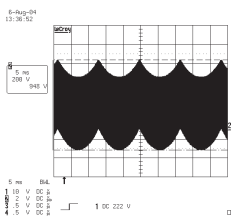
Waveforms

22



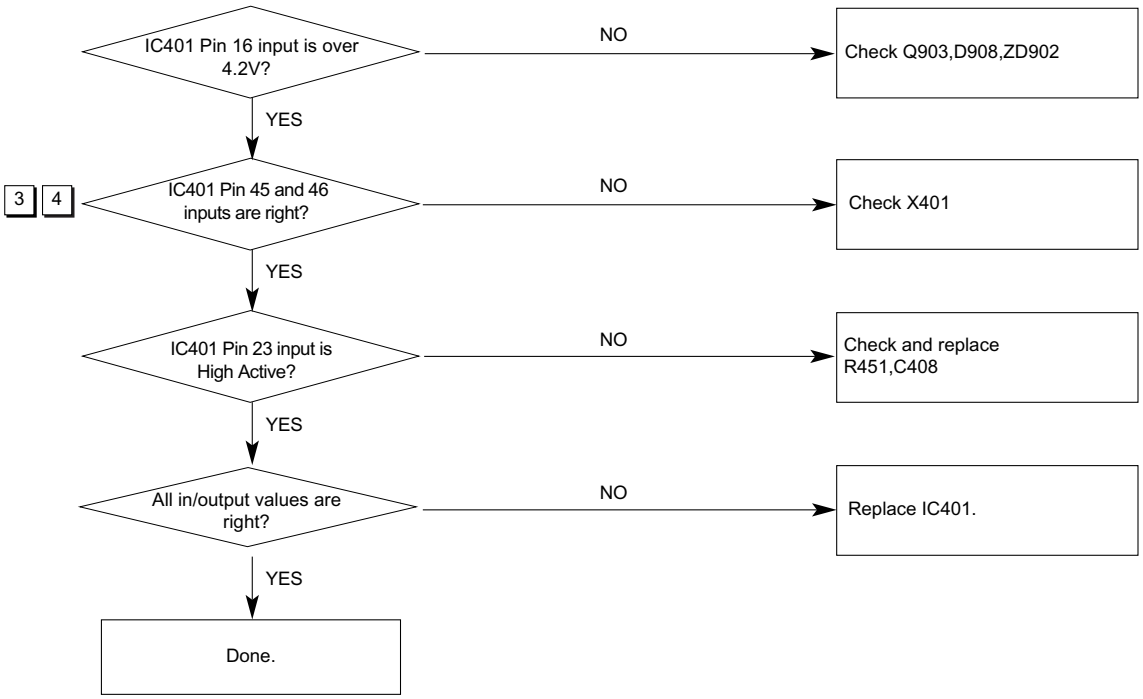
IC401, #24

23



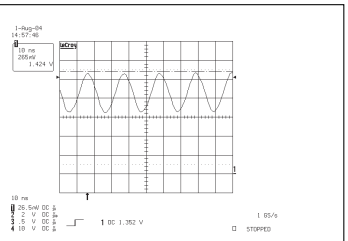
FBT, #12

18. Micom Failure



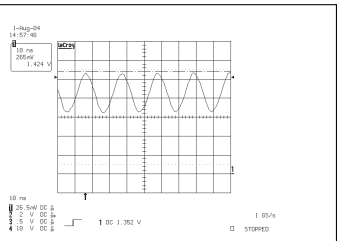
Waveforms

3



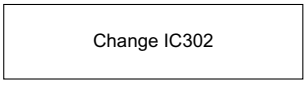
IC401, #45

4

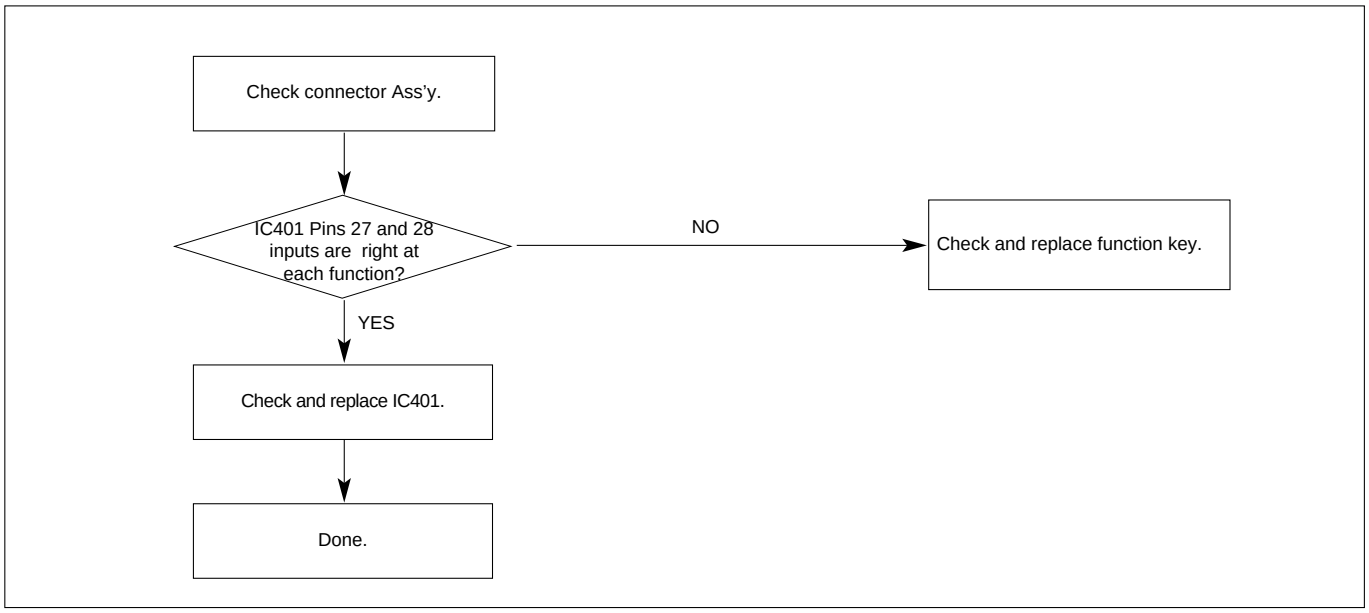


IC401, #46

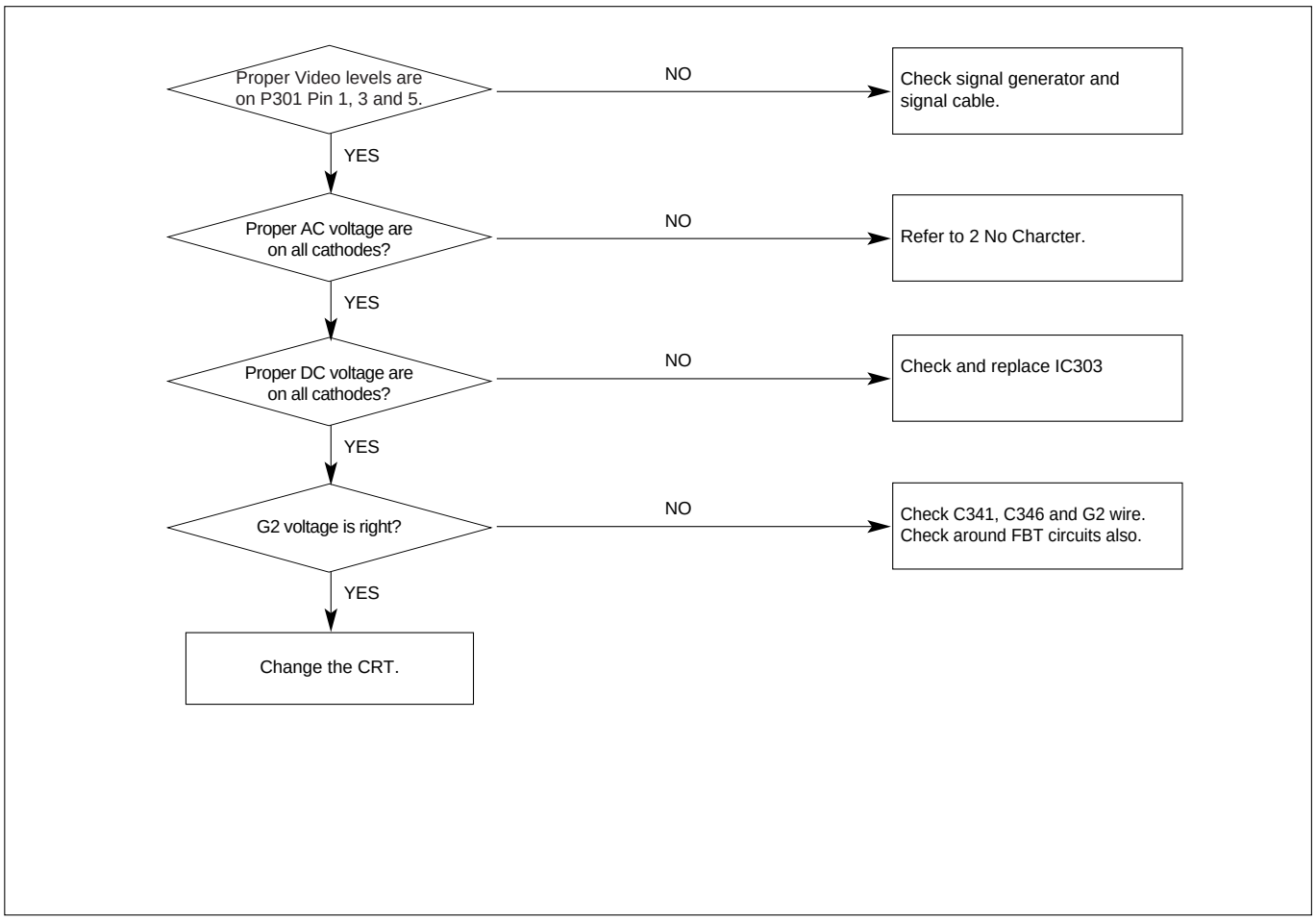
19. OSD Failure



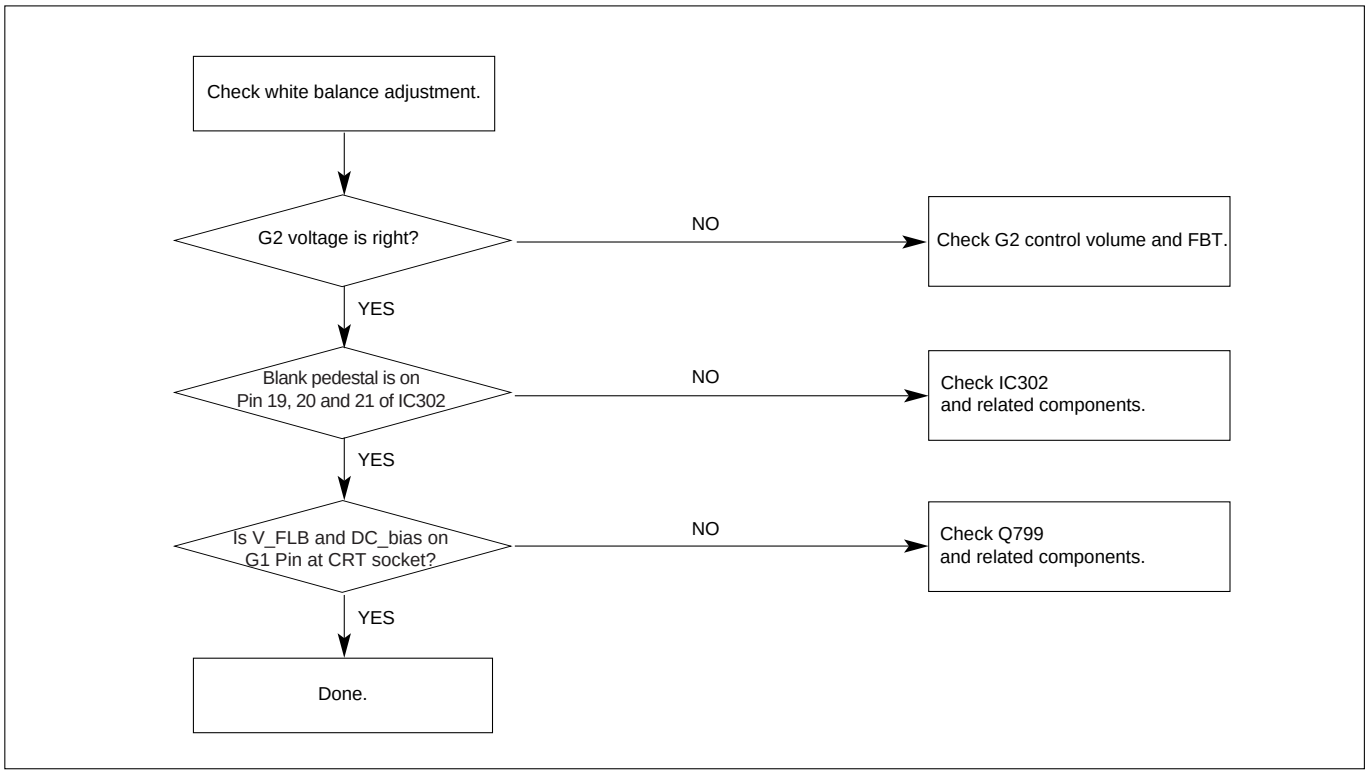
20. User Control Failure



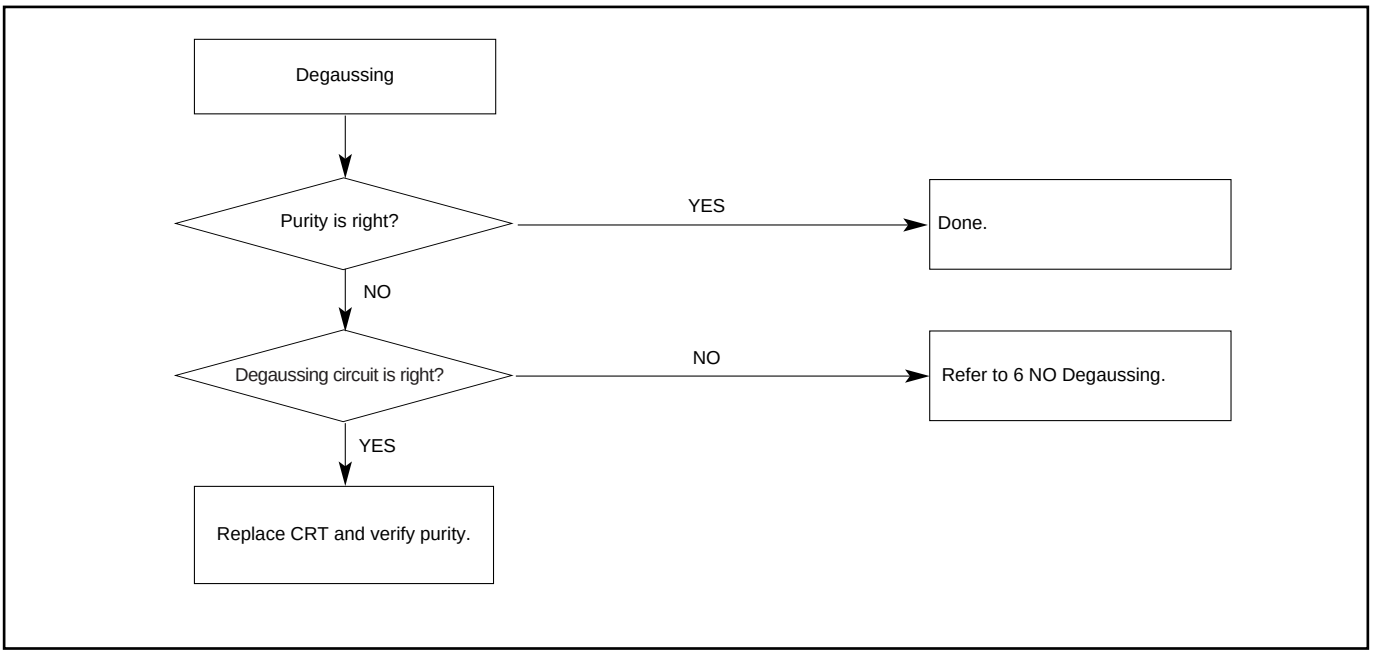
21. Missing Color



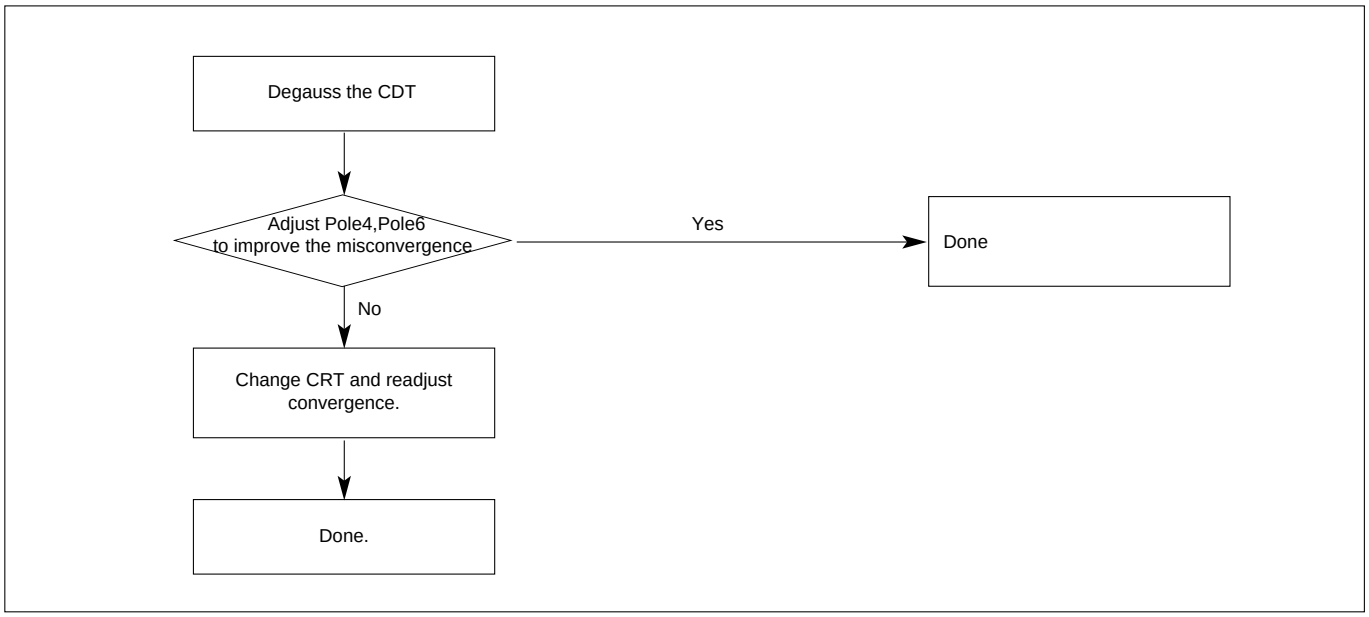
22. Visible Retrace



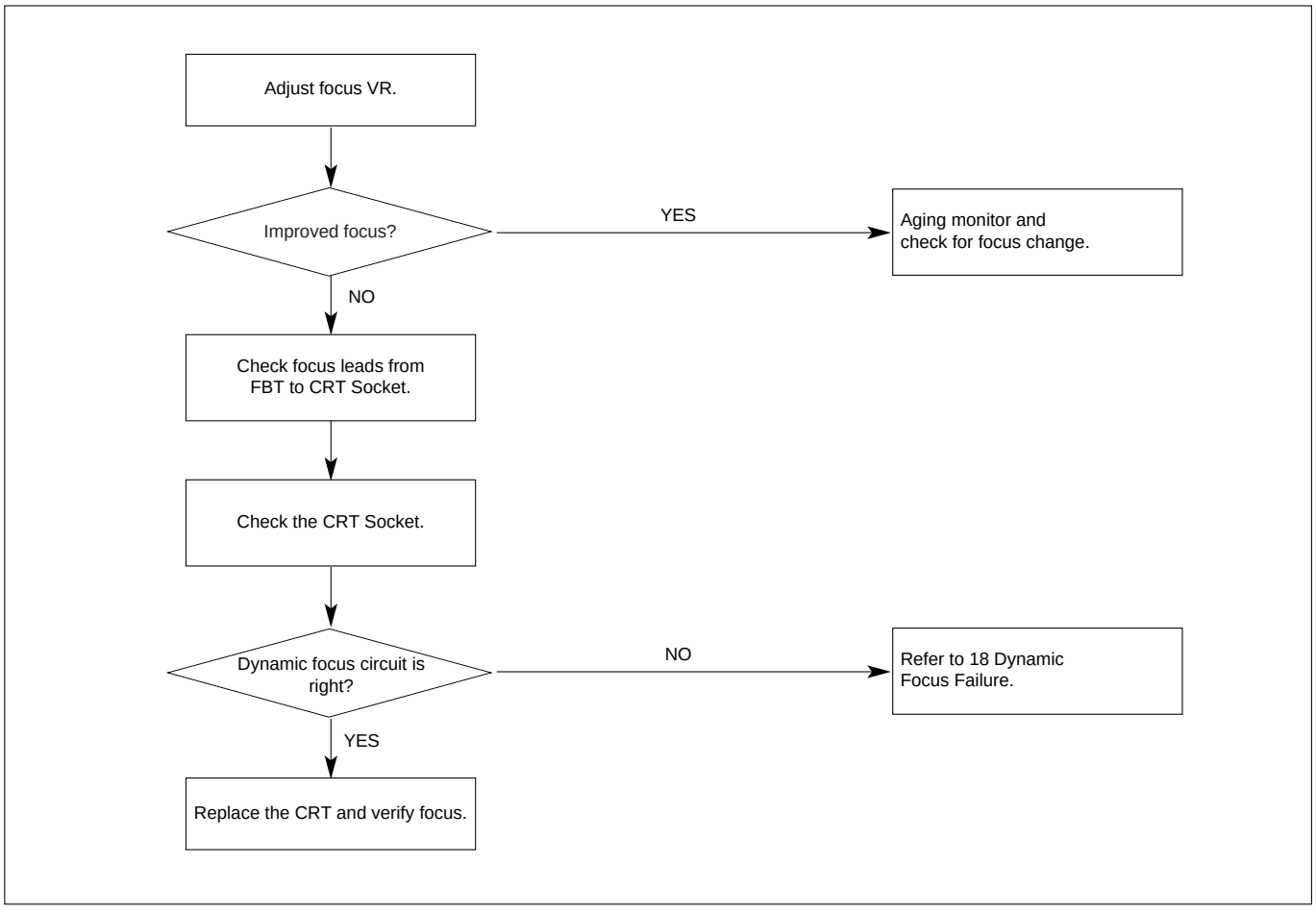
23. Purity Failure



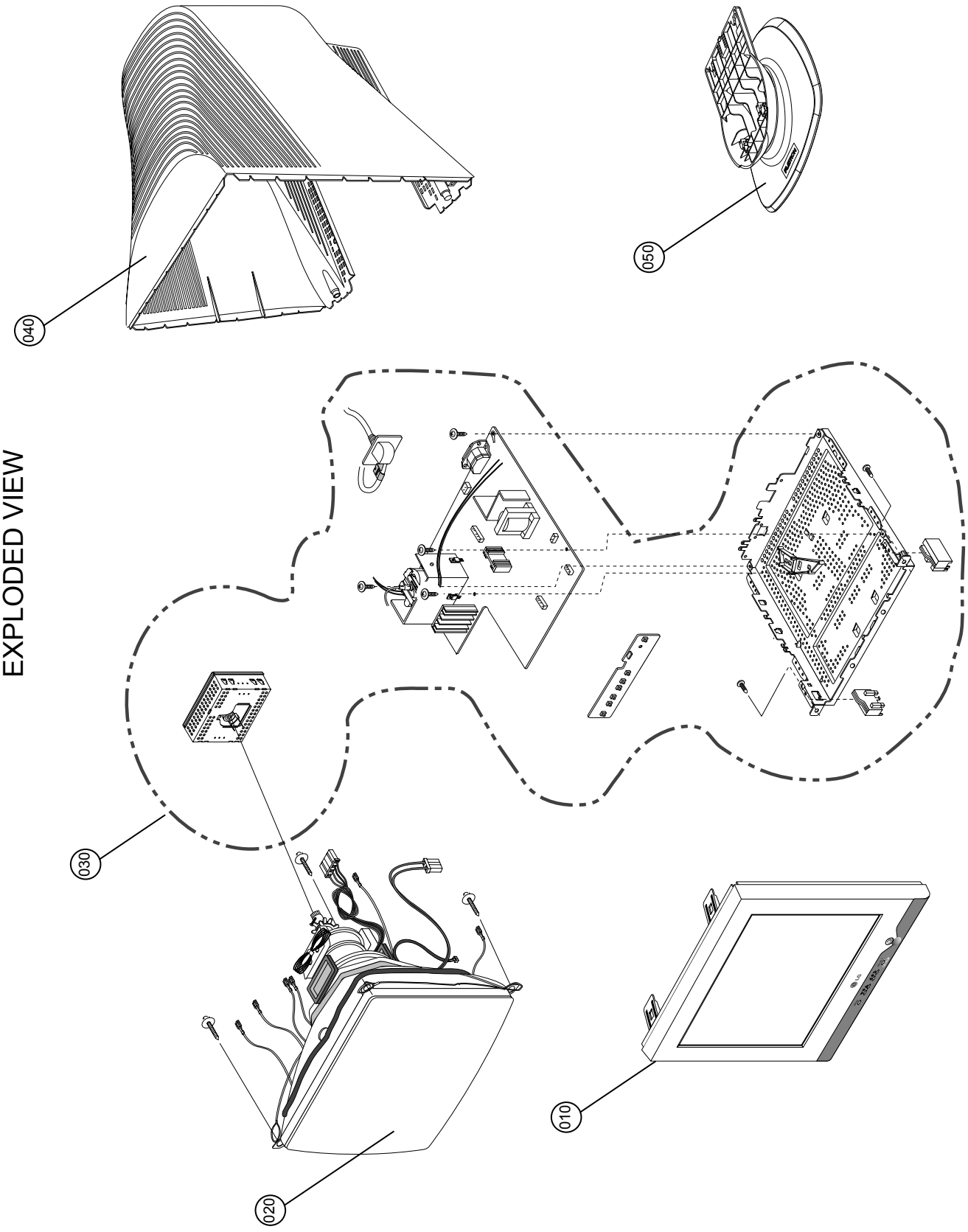
24. Misconvergence



25. Poor Focus



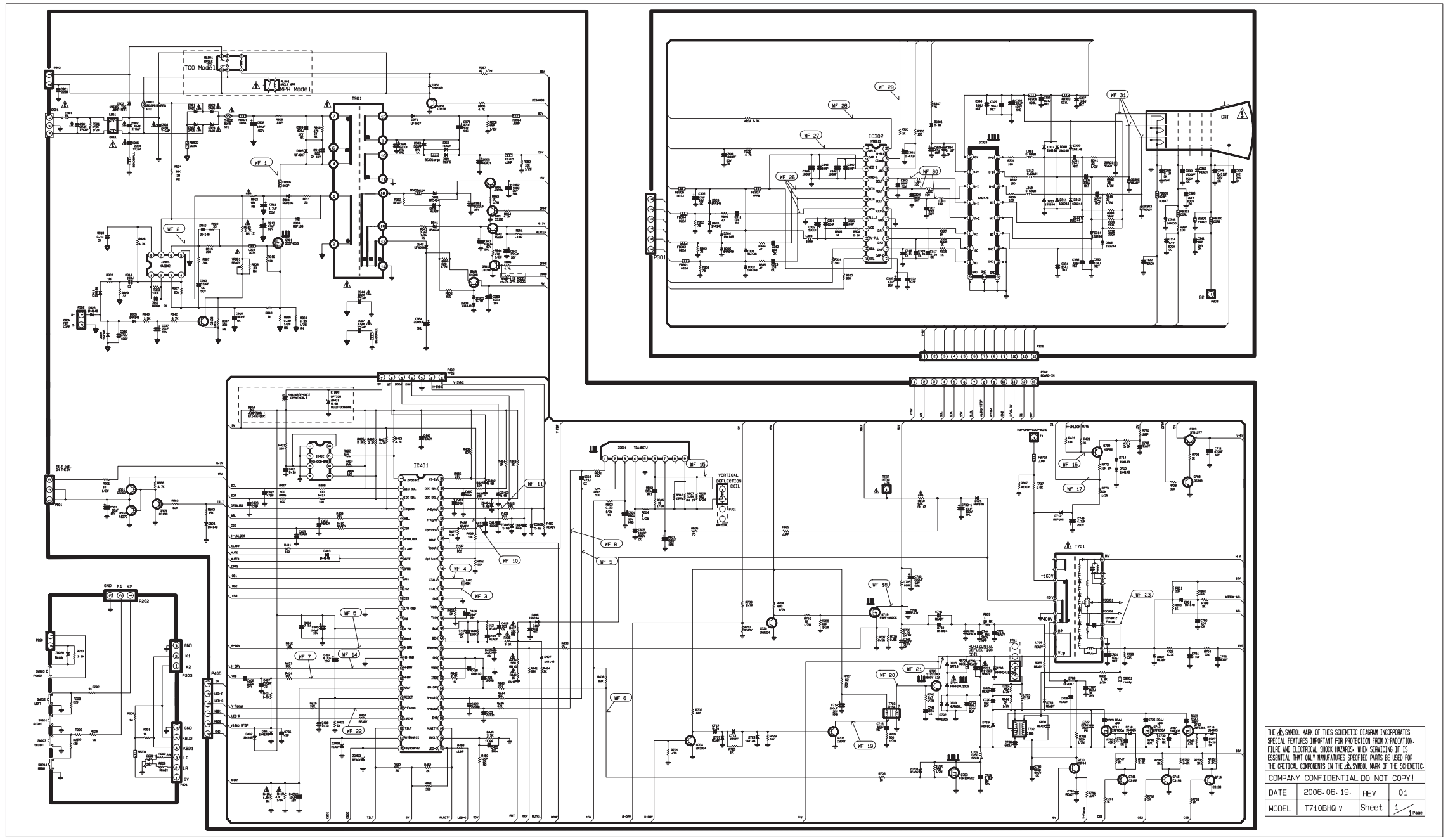
EXPLODED VIEW

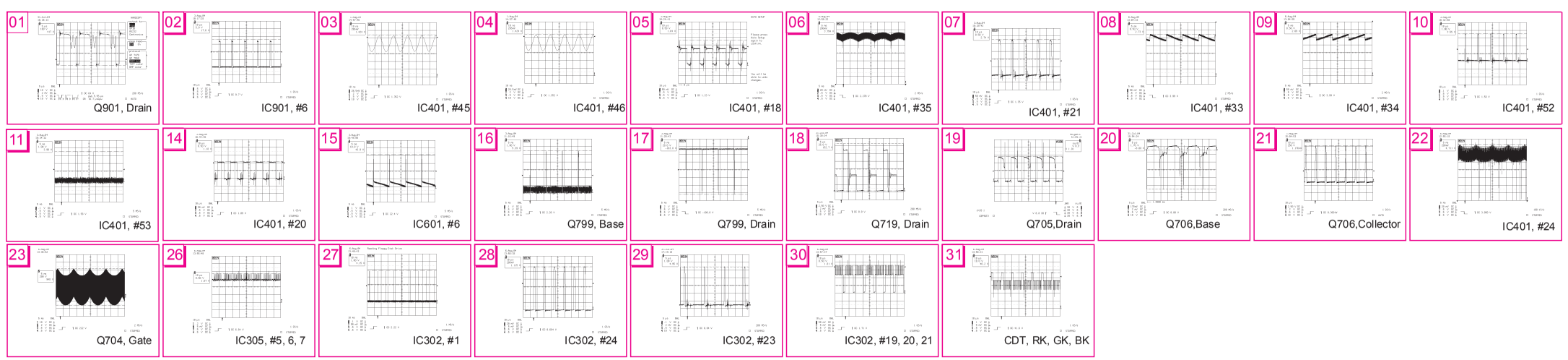


EXPLODED VIEW PARTS LIST

Ref. No.	Part No.	Description
010	3091TKC089U	Cover Assembly,T710BH BRAND C079 5200HF,TCO99,B/VIEW,ER04,DI
020	6318L17046E	CDT,ITC,M41QEE903X00(GB) Low Power Bare CDT 17INCH TINT VERSION 4/3 85KHZ Without (6150Z-7725A)
030	3313T17404E	Main Total Assembly,T710BHQ.KEULEVD BRAND CM51A
040	3809TKC050B	Cover Assembly,T710BH/PH C046 GN5008HF,8C358(EQ54)
050	3043TKK136A	Base Assembly,T710BJ T069/B058 60HR 8C358 BRAND

SCHEMATIC DIAGRAM

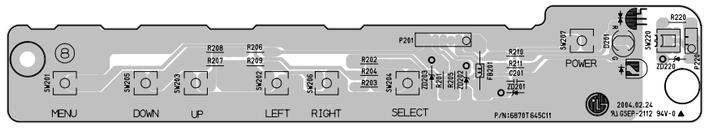




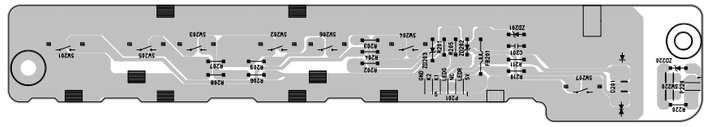
NOTICE
Since this is a basic schematic diagram.
The value of components and some partial connection are sucject to be changed for improvement without notice.

PRINTED CIRCUIT BOARD

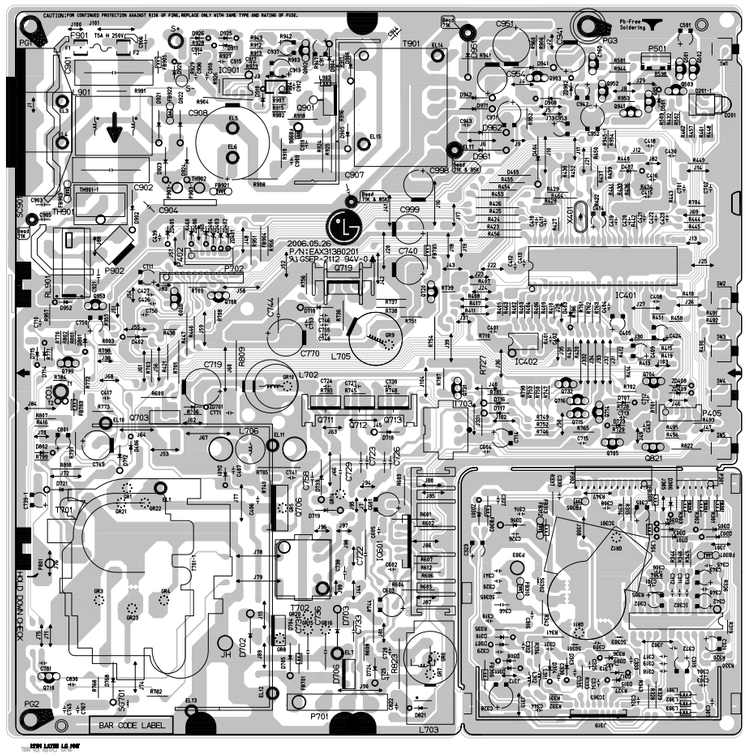
1. CONTROL BOARD (Component Side)



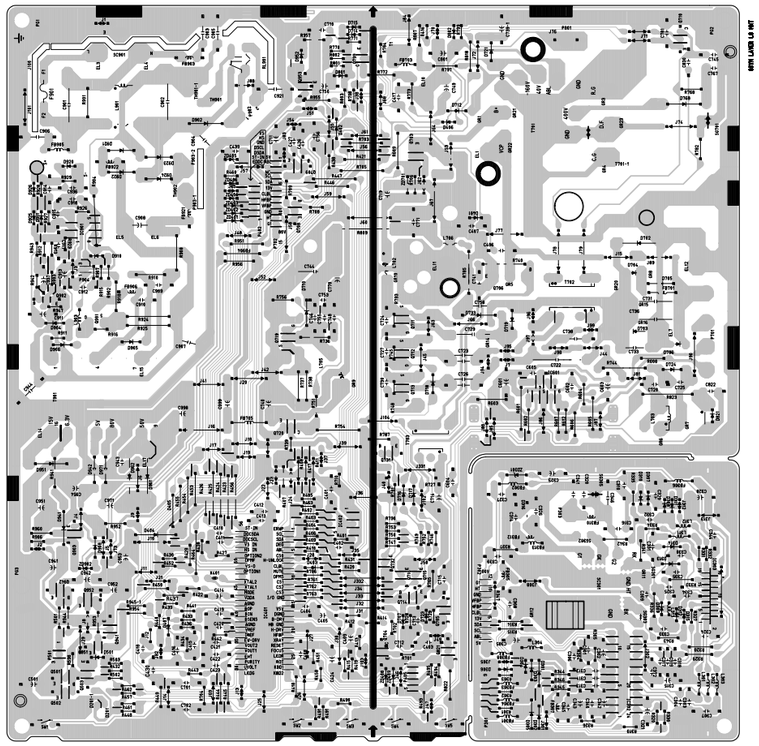
2. CONTROL BOARD (Solder Side)



3. MAIN BOARD (Component Side)



4. MAIN BOARD (Solder Side)



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