



website:<http://biz.LGservice.com>

LCD TV

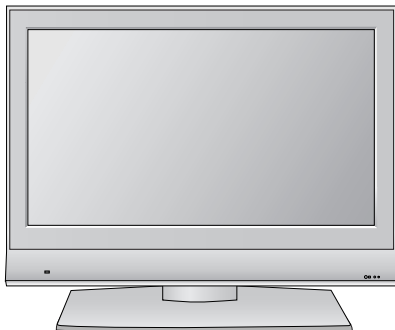
SERVICE MANUAL

CHASSIS : LD73A

MODEL : 32LC4D 32LC4D-ZA
32LC45 32LC45-ZA
32LC46 32LC46-ZC

CAUTION

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



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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by \triangle in the Schematic Diagram and Replacement Parts List.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between $1M\Omega$ and $5.2M\Omega$.

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

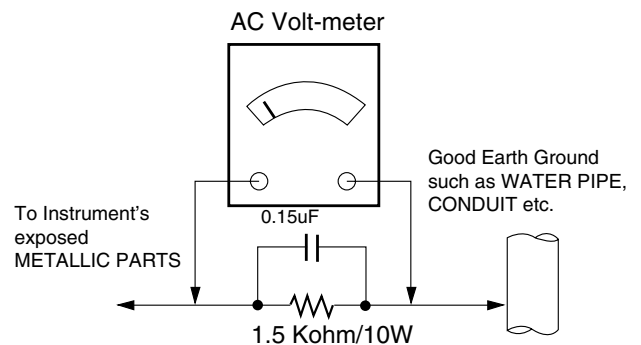
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

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.
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. Do not spray chemicals on or near this receiver or any of its assemblies.
4. 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 is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. 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.
7. 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.
8. *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.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. General Specification(TV)

No	Item	Specification	Remark
1.	Video input applicable system	PAL-D/K, B/G, I, SECAM	
2.	Receivable Broadcasting System	1) PAL/SECAM BG 2) PAL/SECAM DK 3) PAL I/I 4) SECAM L/L' 5) DVB-T	EU(PAL Market)
3.	RF Input Channel	VHF : E2 ~ E12 UHF : E21 ~ E69 CATV : S1 ~ S20 HYPER : S21~ S47	PAL
4.	Input Voltage	100 - 240~ / 50Hz, 60Hz	
5.	Market	EU	
6.	Picture Size	32 inch	
7.	Tuning System	FVS 100 program	PAL, 200 PR.(Option)
8.	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : 10~90 %	
9.	Storage Environment	3) Temp : -20 ~ 50 deg 4) Humidity : 10~90 %	
10.	Display	LCD Module	LPL

2. General Specification

No	Item	Specification	Remark
1	Panel	32" TFT WXGA LCD	
2	Frequency range	H : 45 ~ 50Khz V : 47 ~ 63Hz	PC Input
3	Power consumption	26inch ≤ 4.6 W	
		32inch ≤ 5.54 W	
4	LCD Module- LPL(32inch)	Type Size 32" 760.0 x 450.0 x 42.8(mm)	(H)x(V)x(D)
		Pixel Pitch 32" 170.25 x 510.75 x RGB(μm)	
		Pixel Format 1366 horiz. By 768 vert. Pixels RGB strip arrangement	
		Coating Hard coating (3H), Anti-glare reatment of the front polarizer	
		Back Light 32" 18EEFL	

3. Optical Feature(LCD Module-LPL)

No	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle [CR>10]	R/L, U/D		178, 178			
2	Luminance	Luminance(cd/m ²)		320	400		32"
		Variation				1.3	MAX/MIN
3	Contrast Ratio	CR(32")		600	800		All White/All Black
		CR _D (With)(32")		1200	1600		All White/All Black
4	CIE Color Coordinates	White	Wx	Typ -0.03	0.285	Typ +0.03	LPL(26")
			Wy		0.293		
		Red	Xr		0.640		
			Yr		0.343		
		Green	Xg		0.280		
			Yg		0.605		
		Blue	Xb		0.145		
			Yb		0.065		

4. Component Video Input (Y, Pb, Pr)

No	Specification			Proposed
	Resolution	H-freq(kHz)	V-freq(Hz)	
1.	720x480	15.73	60.00	SDTV, DVD 480i
2.	720x480	15.63	59.94	SDTV, DVD 480i
3.	720x480	31.47	59.94	480p
4.	720x576	15.625	50.00	SDTV, DVD 625 Line
5.	720x576	31.25	50.00	HDTV 576p
6.	1280x720	45.00	50.00	HDTV 720p
7.	1280x720	44.96	59.94	HDTV 720p
8.	1920x1080	31.25	50.00	HDTV 1080i
9.	1920x1080	33.75	60.00	HDTV 1080i
10.	1920x1080	33.72	59.94	HDTV 1080i

6. RGB PC INPUT Mode Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
1.	720X400	31.468	70.08	28.321	
2.	640X480	31.469	59.94	25.17	VESA
		37.684	75.00	31.50	
3.	800X600	37.879	60.31	40.00	VESA
		46.875	75.00	49.50	
4.	832X624	49.725	74.55	57.283	
5.	1024X768	48.363	60.00	65.00	VESA(XGA)
		56.470	70.00	75.00	
		60.123	75.029	78.75	
6.	1280X768	47.776	59.870	79.50	VESA(WXGA)
7.	1360X768	47.720	59.799	84.75	VESA(WXGA)
8.	1366X768	47.720	59.799	84.75	Supported
9.	1920X1080	67.50	60.00	148.50	

7. HDMI DTV Mode Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Remark	Proposed
1.	640X480	31.50	59.94	25.175	SDTV 480p 60Hz	
2.	640X480	31.50	60	25.20	SDTV 480p 60Hz	
3.	720X480	31.47	59.94	27.00	SDTV 480p 60Hz	
4.	720X480	31.47	60	27.027	SDTV 480p 60Hz	
5.	720X576	31.25	50.00	27.000	SDTV 576p 50Hz	
6.	1280X720	45.00	50.00	74.176	HDTV 720p 50Hz	HDCP
7.	1280X720	44.96	59.94	74.176	HDTV 720p 60Hz	HDCP
8.	1280X720	44.96	60	74.250	HDTV 720p 60Hz	HDCP
9.	1920X1080	28.13	50.00	74.250	HDTV 1080i 50Hz	HDCP
10.	1920X1080	33.72	59.94	74.176	HDTV 1080i 60Hz	HDCP
11.	1920X1080	33.75	60	74.250	HDTV 1080i 60Hz	HDCP
12.	1920X1080	27	24	74.250	HDTV 1080P 24Hz	HDCP
13.	1920X1080	56.25	50.00	148.500	HDTV 1080P 50Hz	HDCP
14.	1920X1080	67.43	59.94	148.352	HDTV 1080P 60Hz	HDCP
15.	1920X1080	67.50	60	148.500	HDTV 1080P 60Hz	HDCP

8. HDMI INPUT Mode Table

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
1.	720X400	31.468	70.08	28.321	
2.	640X480	31.469 37.684	59.94 75.00	25.17 31.50	VESA
3.	800X600	37.879 46.875	60.31 75.00	40.00 49.50	VESA
4.	832X624	49.725	74.55	57.283	
5.	1024X768	48.363 56.470 60.123	60.00 70.00 75.029	65.00 75.00 78.75	VESA(XGA)
6.	1280X768	47.776	59.870	79.50	VESA(WXGA)
7.	1360X768	47.720	59.799	84.75	VESA(WXGA)
8.	1366X768	47.720	59.799	84.75	Supported
9.	1920X1080	67.50	60.00	148.50	

ADJUSTMENT INSTRUCTION

1. Application Range

This spec. sheet is applied to all of the LD73A chassis manufactured at LG TV Plant all over the world.

2. Specification.

- 1) Because this is not a hot chassis, it is not necessary to use an isolation transformer.
However, the use of isolation transformer will help to protect test instruments
- 2) Adjustment must be done in the correct sequence.
- 3) The adjustment must be performed at 25±5°C temperature and 65±10% relative humidity if there is no specified designation.
- 4) The input voltage of the receiver must be kept between 100-220V~, 50/60Hz.
- 5) Before adjustment, execute Heat-Run for 30 minutes at RF no signal.

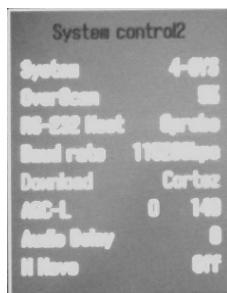
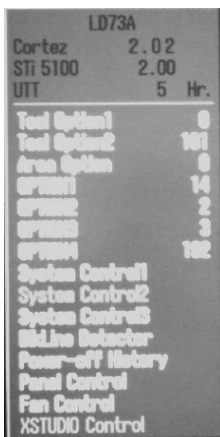
3. Channel Memory

3.1. Setting up the LGIDS

- 1) Install the LGIDS
- 2) After installation, restart your PC.
- 3) Extract [files.zip] to folder [c:\LGIDS\files]
- 4) Start LGIDS.

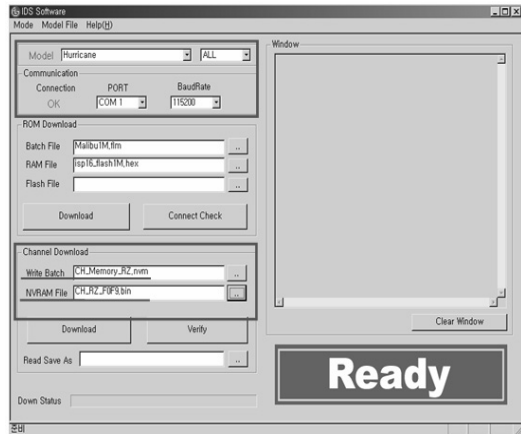
3.2 Channel memory method

- 1) Press TILT key in Adjust remote(Automatic setting).
- 2) Setting up like bottom figure
[Confirmation: Press ADJ Key in the Adjust remote control. Select "**System Control2**" by using ▲/▼ (CH+/-) key, and press ■ (ENTER). RS-232 Host : Gprobe, Baud Rate : 115200bps, Download:Cortez]

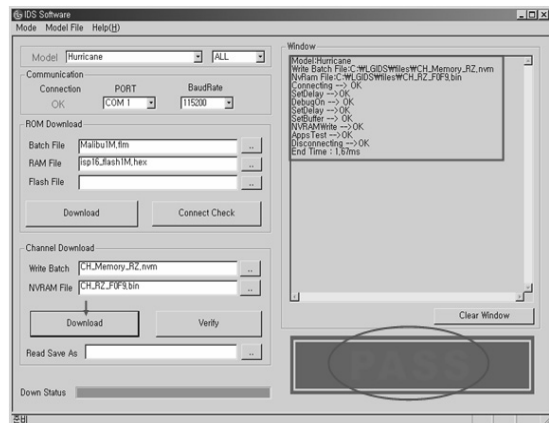


- 3) Connect RS232 cable .(Use the general RS-232C Twisted Serial Cable).
- 4) Operate LGIDS
- 5) Select "Hurricane" and "ALL" on Model dialog and check your connection in Communication dialog.
(If your connection is 'NG', then set your PORT(COM1,2,3,...) correctly. If your connection has completed, you can see "Ready")

- 6) Select proper CH_memory file(*.nvm) for each model at [Channel Download] => [Write Batch].
Next, select proper binary file(*.bin) including the CH information for each model at [Channel Download] => [NVRAM File].






- 7) Click the [Download] button.
It means the completion of the CH memory download if all items show 'OK' and Status is changed by 'PASS' at the lower right corner of the window.



4. EDID

* Caution

- 1) Use the proper signal cable for EDID Download
 - Analog EDID : Pin3 exists
 - Digital EDID : Pin3 exists
- 2) Never connect HDMI & D-sub Cable at the same time.
- 3) Use the proper cables below for EDID Writing.
- 4) Download HDMI1, HDMI2 separately because HDMI1 is different from HDMI2.

For Analog EDID	For HDMI EDID	
D-sub to D-sub	DVI-D to HDMI or HDMI ro HDMI	
		

4.1. EDID Data

Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

4.2. Data

(1) ANALOG (128 bytes)

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	0	FF	FF	FF	FF	FF	FF	0	1E	6D	(a)		(b)			
0x01	(c)	1	3	1	46	27	78	EA	D9	B0	A3	57	49	9C	25	
0x02	11	49	4B	A5	6E	0	31	40	45	40	61	40	D1	C0	1	1
0x03	1	1	1	1	1	1	1B	21	50	A0	51	0	1E	30	48	88
0x04	35	0	BC	86	21	0	0	1C	26	36	80	A0	70	38	1F	40
0x05	50	20	85	4	BC	86	21	0	0	18			(d)			
0x06				(e)									0	0	0	FD
0x07	0	3C	4B	1D	43	0E	0	0A	20	20	20	20	20	20	0	(e-1)

(2) HDMI 1 (256 bytes)=>

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	0	FF	FF	FF	FF	FF	FF	0	1E	6D	(a)		(b)			
0x01	(c)	1	3	80	46	27	78	EA	D9	B0	A3	57	49	9C	25	
0x02	11	49	4B	A5	6E	0	31	40	45	40	61	40	D1	C0	1	1
0x03	1	1	1	1	1	1	2	3A	80	18	71	38	2D	40	58	2C
0x04	45	0	C4	8E	21	0	0	1E	1B	21	50	A0	51	0	1E	30
0x05	48	88	35	0	BC	86	21	0	0	1C			(d)			
0x06				(e)									0	0	0	FD
0x07	0	32	4B	1C	43	0F	0	0A	20	20	20	20	20	20	1	(e-2)
0x08	2	3	21	F1	4E	2	11	1	3	12	13	4	14	5	21	1F
0x09	20	22	10	23	9	7	7	83	1	0	0	65	3	0C	0	10
0x0A	0	1	1D	0	BC	52	D0	1E	20	B8	28	55	40	C4	8E	21
0x0B	0	0	1E	1	1D	0	72	51	D0	1E	20	6E	28	55	0	C4
0x0C	8E	21	0	0	1E	1	1D	80	D0	72	1C	16	20	10	2C	25
0x0D	80	C4	8E	21	0	0	9E	8C	0A	D0	90	20	40	31	20	0C
0x0E	40	55	0	C4	8E	21	0	0	18	4E	1F	0	80	51	0	1E
0x0F	30	40	80	37	0	BC	88	21	0	0	18	0	0	0	0	(f-1)

=> Detail EDID Options are below (a, b, c, d, e-1, e-2, f-1, f-2)

(3) HDMI 2 (256 bytes)

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	0	FF	FF	FF	FF	FF	FF	0	1E	6D	(a)		(b)			
0x01	(c)	1	3	80	46	27	78	EA	D9	B0	A3	57	49	9C	25	
0x02	11	49	4B	A5	6E	0	31	40	45	40	61	40	D1	C0	1	1
0x03	1	1	1	1	1	1	2	3A	80	18	71	38	2D	40	58	2C
0x04	45	0	C4	8E	21	0	0	1E	1B	21	50	A0	51	0	1E	30
0x05	48	88	35	0	BC	86	21	0	0	1C			(d)			
0x06				(e)									0	0	0	FD
0x07	0	32	4B	1C	43	0F	0	0A	20	20	20	20	20	20	1	(e-2)
0x08	2	3	21	F1	4E	2	11	1	3	12	13	4	14	5	21	1F
0x09	20	22	10	23	9	7	7	83	1	0	0	65	3	0C	0	10
0x0A	0	1	1D	0	BC	52	D0	1E	20	B8	28	55	40	C4	8E	21
0x0B	0	0	1E	1	1D	0	72	51	D0	1E	20	6E	28	55	0	C4
0x0C	8E	21	0	0	1E	1	1D	80	D0	72	1C	16	20	10	2C	25
0x0D	80	C4	8E	21	0	0	9E	8C	0A	D0	90	20	40	31	20	0C
0x0E	40	55	0	C4	8E	21	0	0	18	4E	1F	0	80	51	0	1E
0x0F	30	40	80	37	0	BC	88	21	0	0	18	0	0	0	0	(f-2)

=> Detail EDID Options are below (a, b, c, d, e-1, e-2, f-1, f-2)

(a) Product ID

(b) Serial No: Controlled on production line.

(c) Month, Year: Controlled on production line:

ex) Monthly : '09' -> '09'

Year : '2006' -> '10'

(d) Model Name(Hex):

Nome di modello	Dait(Hex)
26LC4D-ZA	000000FC0032364C4334442D5A410A202020
26LC7D-ZA	000000FC0032364C4337442D5A410A202020
32LC4D-ZA	000000FC0033374C4334442D5A410A202020
32LC7D-ZA	000000FC0033324C4337442D5A410A202020
37LC4D-ZA	000000FC0033374C4334442D5A410A202020
37LC7D-ZA	000000FC0033374C4337442D5A410A202020
42LC4D-ZA	000000FC0034324C4334442D5A410A202020
42LC7D-ZA	000000FC0034324C4337442D5A410A202020

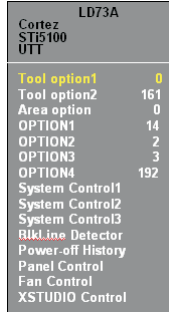
(e-1, e-2, f-1, f-2) Checksum: Changeable by total EDID data.

Nome di modello	(e)-1(Hex)	(e)-2(Hex)	(f)-1(Hex)	(f)-2(Hex)
26LC4D	90	CF	CC	BC
26LC7D	8D	CC	CC	BC
32LC4D	93	D2	CC	BC
32LC7D	90	CF	CC	BC
37LC4D	8E	CD	CC	BC
37LC7D	8B	CA	CC	BC
42LC4D	92	D1	CC	BC
42LC7D	8F	CE	CC	BC

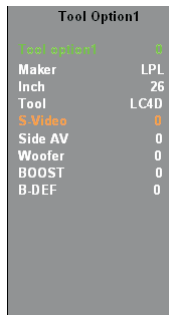
* Before AV ADC Calibration, should be executed the "Tool option 1"

5. Select method of Tool option 1

- 1) Press ADJ Key in the Adjust remote control.
- 2) Select "Tool option 1" by using ▲/▼ (CH+/-) key, and press ■(ENTER).



- 3) Select "Maker" by using ▲/▼ (CH+/-) key, and change the module maker and. applied module classification by using ◀/▶ (VOL+/-).
- 4) Select "Inch" by using ▲/▼ (CH+/-) key, and change the module according to the inch of model.
- 5) Select "Tool" by using ▲/▼ (CH+/-) key, and change the tool name according to the model.



(Inch of model : 26", 32", 37", 42", Applied module under the classification)

	Creatore	Pollice	Attrezzo
0	LPL	26	LD4D
64			LD7D
2	CMO		LD4D
66			LD7D
4	LPL	32	LD4D
68			LD7D
8	LPL	37	LD4D
72			LD7D
12	LPL	42	LD4D
76			LD7D

6. ADC Calibration

ADC	RF/AV/S-VIDEO	Component	RGB-PC
MSPG925F	PALJ	Model:215 (720P)	Model: 3
	INPUT SELECT	Pattern:65	(1024*768 60Hz)
	AV3	Model: 202 (PAL-BGDHI)	Pattern: 65
		720P/50Hz	
	Pattern: 65	7 Color Bar	
	PAL 7 Color Bar		

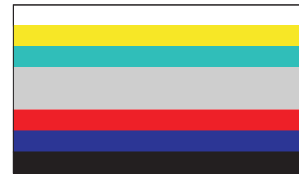
<Caution>

- System control RS-232 Host should be "PC" for adjustment.
- Before AV ADC Calibration, execute the "Module selection".

6.1. Adjustment of RF/AV/S-VIDEO

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925FS Pattern Generator (Which has Video Signal: 7 Color Bar Pattern shown in Fig. 1)
=> Model: 202 / Pattern: 65



<Fig. 1>

(2) Method of Auto RF/AV/S-VIDEO Color Balance.

- 1) Input the Video Signal: 7 Color Bar signal into AV3.
- 2) Set the PSM to Dynamic mode in the Picture menu.
- 3) Press **IN-START** key on R/C for adjustment.
- 4) Press the ▶(Vol.+) key to operate the set, then it becomes automatically.
- 5) Auto-RGB OK means the adjustment is completed.

6.2 Adjustment of Component.

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925FS Pattern Generator (Which has 720p/60Hz YPbPr output Pattern shown in Fig. 1)
=> Model:215/Pattern: 65

(2) Method of Auto Component Color Balance

- 1) Input the Component 720p/50Hz 7 Color Bar(MSPG-925FS model:215, pattern:65) signal into Component.
- 2) Set the PSM to Dynamic mode in the Picture menu
- 3) Press the IN-START key on R/C for adjustment.
- 4) Press the ▶(Vol.+) key to operate the set , then it becomes automatically.
- 5) Auto-RGB OK means the adjustment is completed.

6.3 Adjustment of RGB

(1) Required Equipments

- Remote controller for adjustment
- MSPG-925F Pattern Generator (Which has XGA [1024*768] 60Hz 8 Color Bar pattern shown in Fig. 1)

(2) Method of Auto RGB Color Balance

- 1) Input the PC 1024x768@60Hz 100% Color Bar pattern (MSPG-925F model:37, pattern:33) into RGB. (Using D-sub to D-sub cable)
- 2) Set the PSM to Dynamic mode in Picture menu.
- 3) Press the IN-START key on R/C for adjustment
- 4) Press the ►(Vol.+) key operate To set , then it becomes automatically.
- 5) Auto-RGB OK means adjustment is completed.

* Before White-balance, the AV ADC should be done.

7. White Balance

* Test Equipment

Color Analyzer (CA-210/CH.9)

-> When you adjust LCD color temperature, on Color analyzer (CA-210), you should use Channel 9 which is Matrix compensated (White, Red, Green, Blue revised) by CS-1000 and adjust in accordance with White balance adjustment coordinate which is specified on the next.

* Color temperature standards according to CSM and Module

Cool : 11,000k
 Medium : 9,300k
 Warm : 6,500k

* White balance adjustment coordinate and color temperature

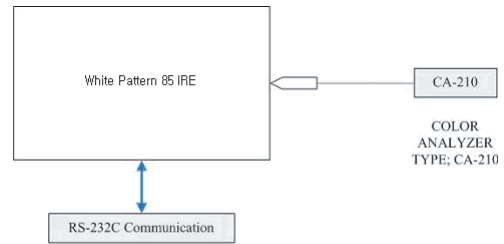
Cool	CS-1000	CA-210(CH 9)
x	0.276	0.276±0.002
y	0.283	0.283±0.002
Δuv	0.000	0.000
Medium	CS-1000	CA-210(CH 9)
x	0.285	0.285±0.002
y	0.293	0.293±0.002
Δuv	0.000	0.000
Warm	CS-1000	CA-210(CH 9)
x	0.313	0.313±0.002
y	0.329	0.329±0.002
Δuv	0.004	0.004

- PC (for communication through RS-232C)

- > UART Baud rate : 115200 bps
- Luminance Y AV : upper 150 cd/β≥ (Typ : 350 cd/β≥)
- > Applying to Cool, Medium, Warm mode

* Connecting picture of the measuring instrument (On Automatic control)

Inside PATTERN is used when W/B is controlled. Connect to auto controller or push control R/C IN-START
 -> Enter the mode of White-Balance, the pattern will come out.



<Fig. 2> Connecting picture (On Automatic Control)

* Auto-control interface and directions

- 1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10ux).
- 2) Adhere closely the Color Analyzer (CA-210) to the module less than 10cm distance, keep it with the surface of the Module and Color Analyzer's Prove vertically.(80~100°).
- 3) Aging time
 - After aging start, keep the power on (no suspension of power supply) and heat-run over 15 minutes.
 - Using 'no signal' or 'full white pattern' or the others, check the back light on.

7.1 Manual white Balance

- One of R Gain / G Gain / B Gain should be kept on 80, and others are controlled lowering from 80

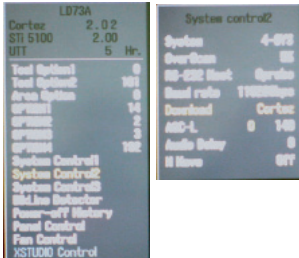
- 1) Press 'power on' of the control R/C, set heat run to white by pressing ►, and heat run over 15 minutes. (Set : RS-233 Host : PC, Baud Rate : 115200bps, Download : Cortez)
- 2) Zero Calibrate CA-210, and when controlling, stick the sensor to the center of LCD module surface.
- 3) Double click In-start key on Controlling R/C and get in 'white balance'.
- 4) Set test-pattern on and display inside pattern. Control is carried out on three color temperature, COOL, MEDIUM, WARM. (Control is carried out three times,)
- 5) When the R/G/B GAIN is 80 on OSD, it is the FULL DYNAMIC Range of the Module. In order to control white balance without the saturation of FULL DYNAMIC Range and DATA, one of R Gain / G Gain / B Gain should be kept on 80, and other two is controlled lowering from 80.

* Color Temperature: Cool, Medium, Warm

- 1) When R GAIN is set to 80
 - Control G GAIN and B GAIN by lowering from 80.
 - 2) When B GAIN is set to 80
 - Control R GAIN and G GAIN by lowering from 80.
 - 3) When G GAIN is set to 80
 - Control R GAIN and B GAIN by lowering from 80.
- One of R Gain / G Gain / B Gain should be kept on 80, and adjust other two lower than 80.
 (When R/G/B GAIN are all 80, it is the FULL DYNAMIC Range of Module)

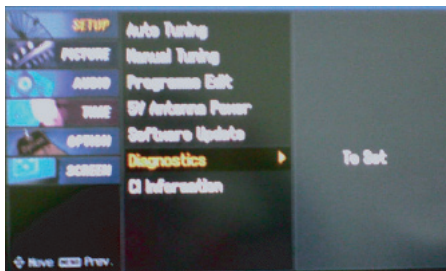
8. Set information(Serial No & Model name)

- (1) Setting up like bottom figure (After setting white balance, this is set)
- 1) Press ADJ Key in the Adjust remoon.
 - 2) Select "System Control 2" by using ▲/▼(CH+/-) key, and press ■(ENTER).
 - 3) Using Adjust remoon, RS-232 Host & Baud Rate & Download value change (RS-232 Host:Gprobe, Baud Rate:115200bps, Download:Cortez)

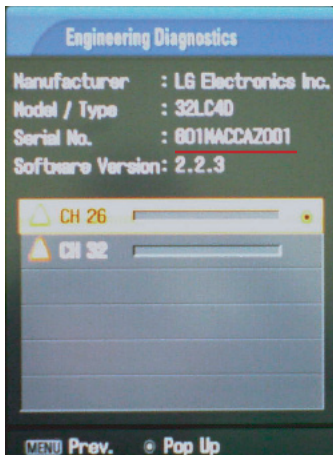


- (2) Bar-code scanning

- 1) Push the menu button in DTV mode.
Select the STATION -> Diagnostics -> To set



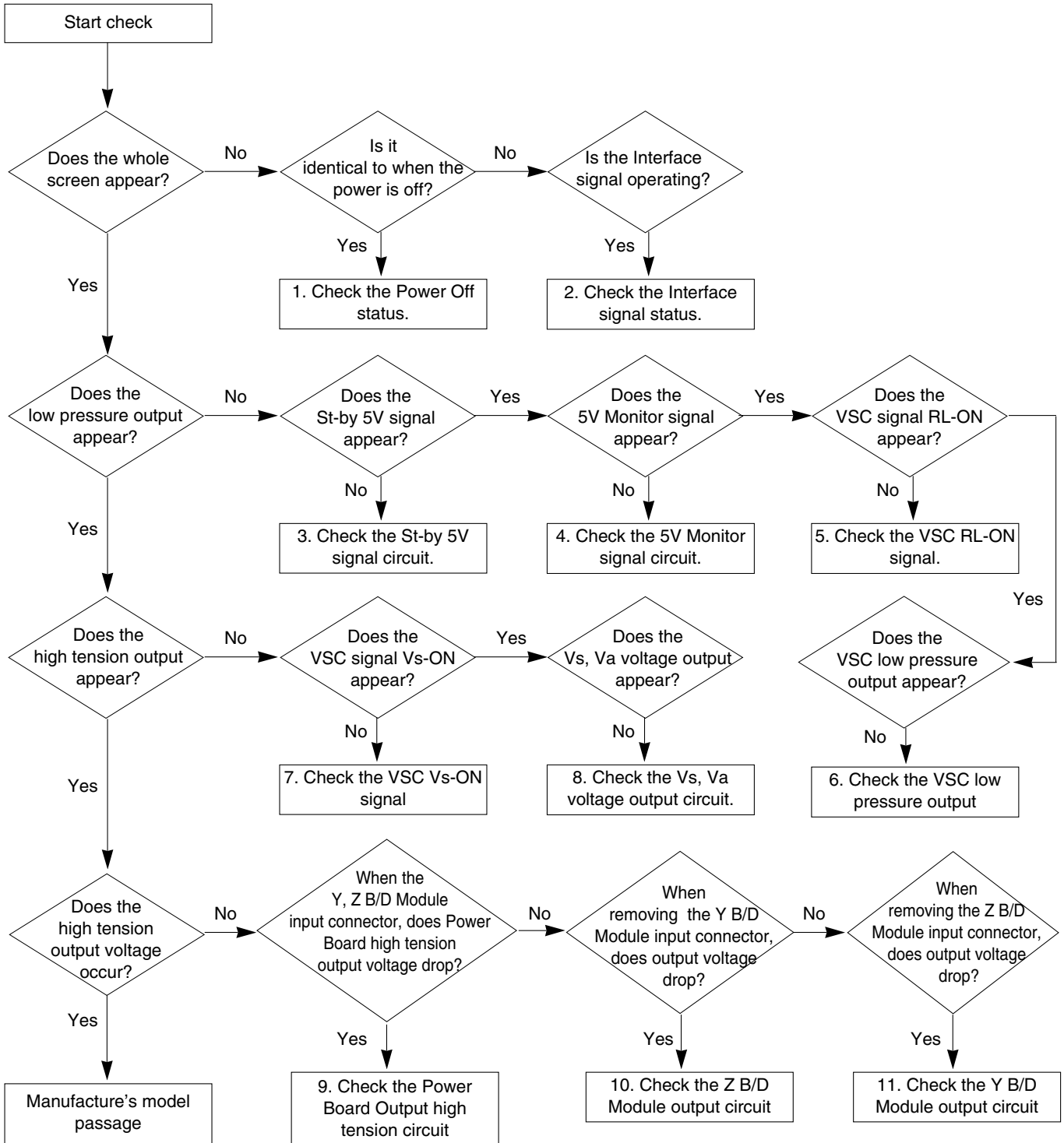
- 2) Check the Serial Number.



TROUBLESHOOTING

1. Power Board

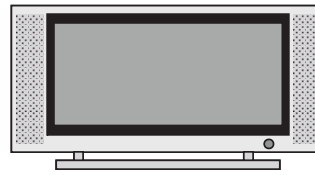
1-1. The full flowchart for the voltage output



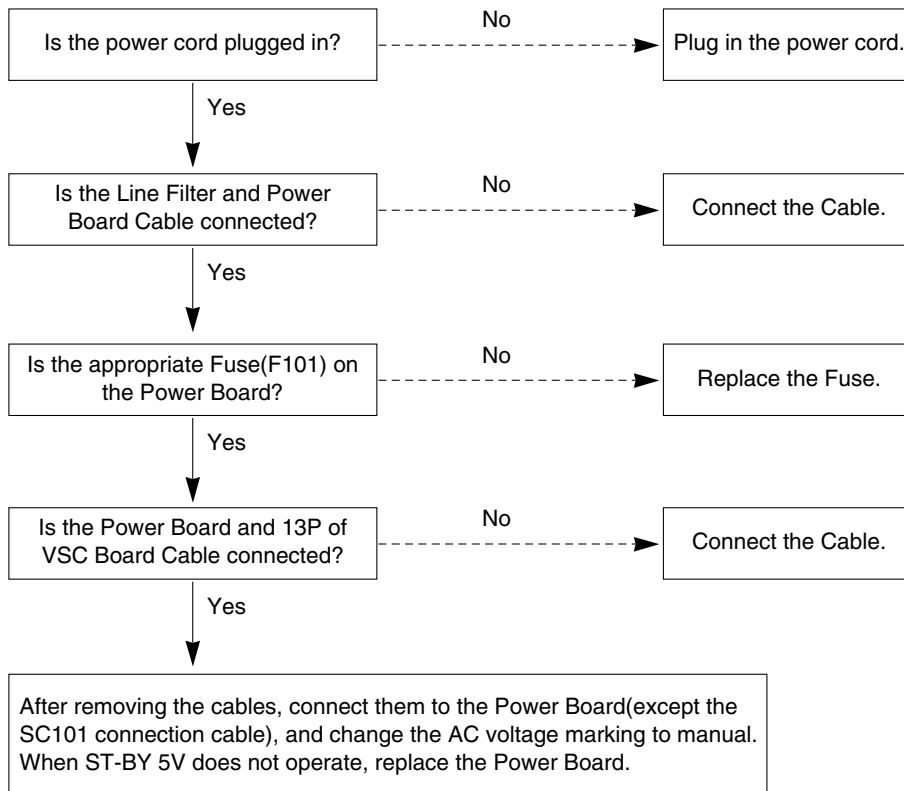
2. No Power

(1) Symptom

- 1) Does not minute discharge at module.
- 2) Non does not come into the front LED.



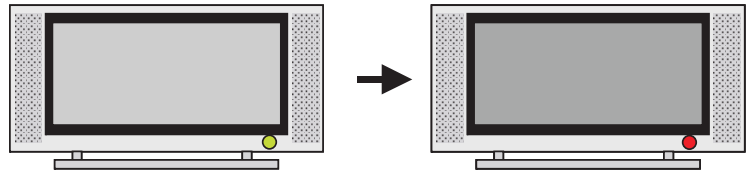
(2) Procedure check



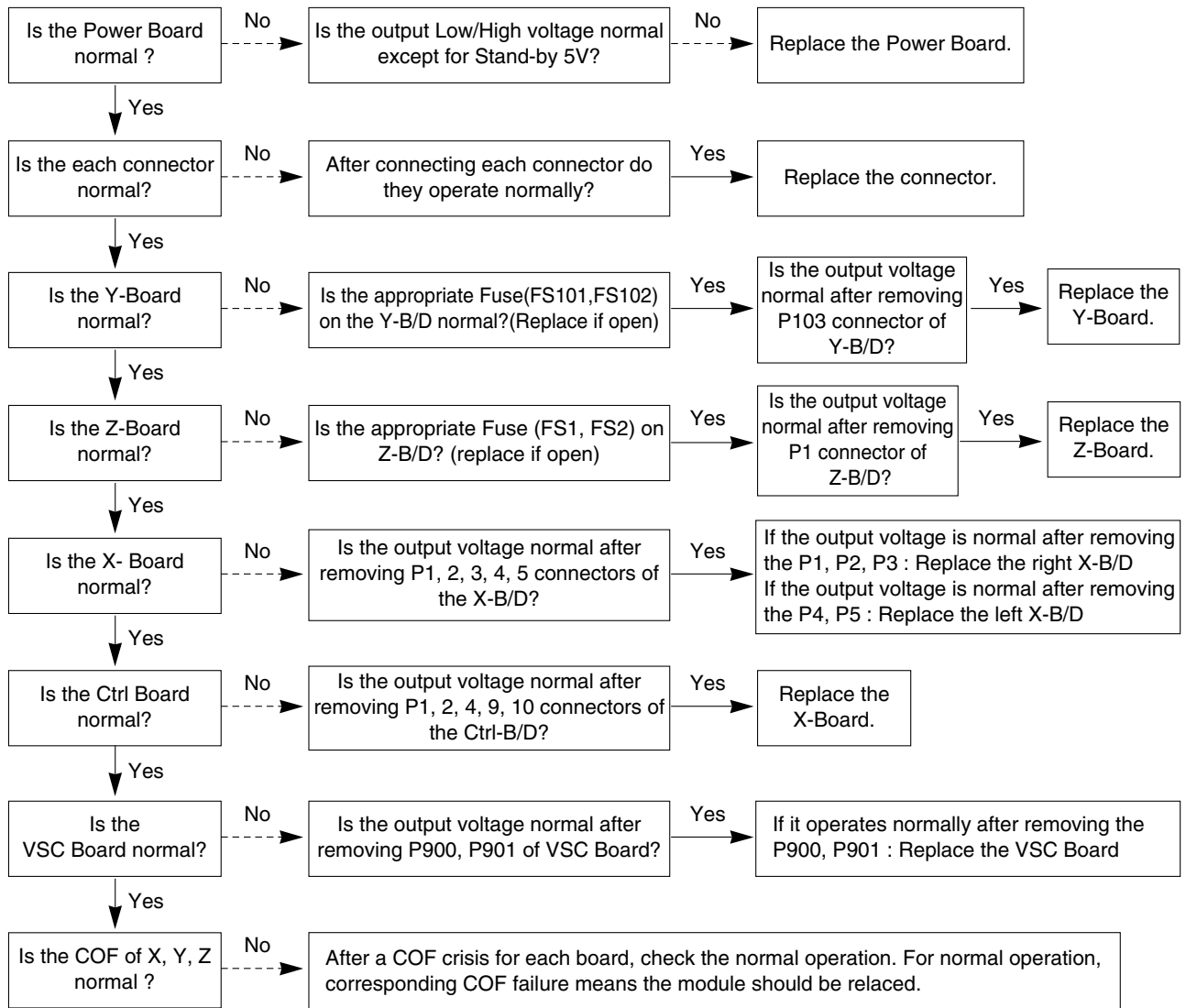
3. Protect Mode

(1) Symptom

- 1) After lighting up once, it does not discharge minutely from module.
- 2) The relay falls.(there is an audible "click")
- 3) The color of the front LED turns from green to red.



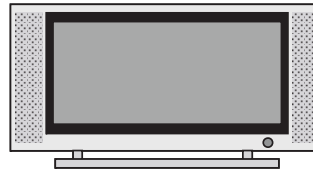
(2) Procedure check



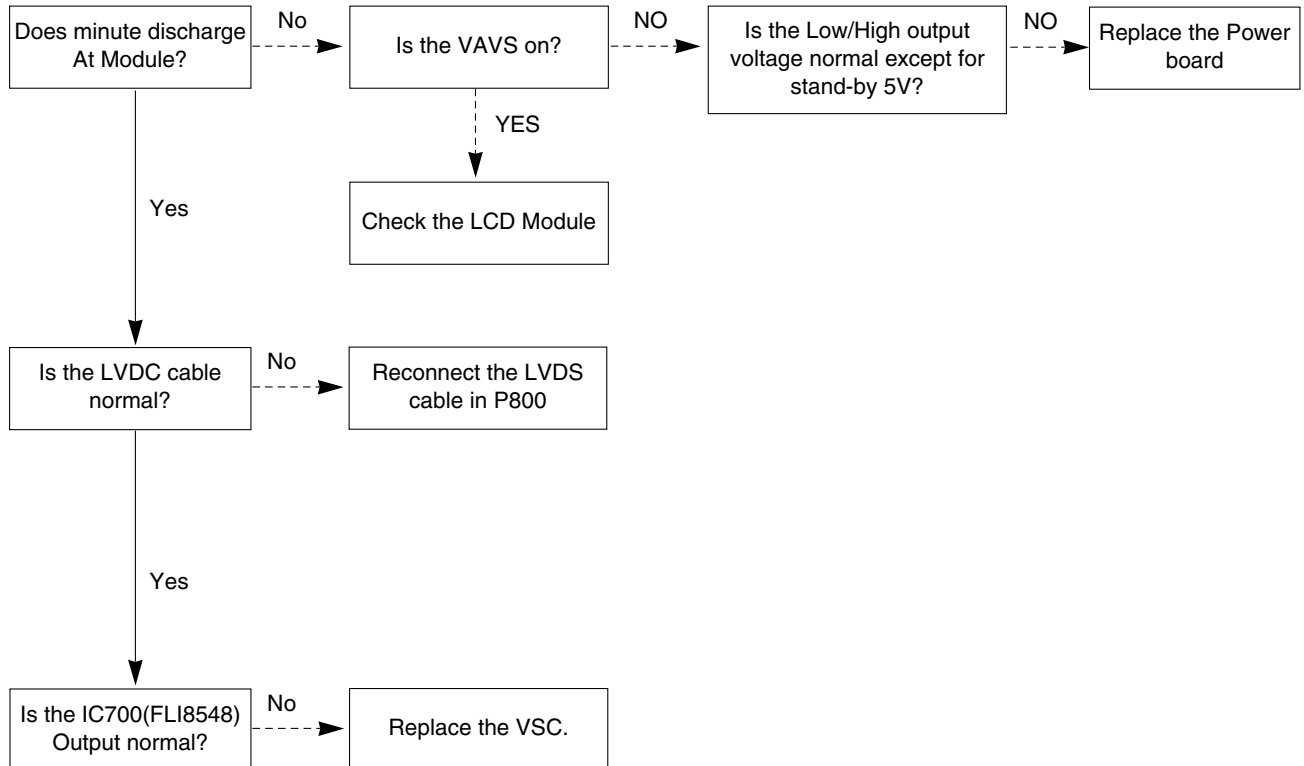
4. No Raster

(1) Symptom

- 1) No OSD and image occur at screen.
- 2) It maintains the condition where the front LED is green.



(2) Procedure check

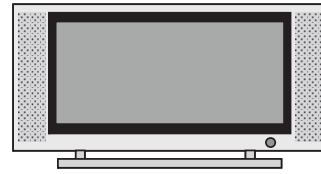


5. In case of strange screen display in specific modes

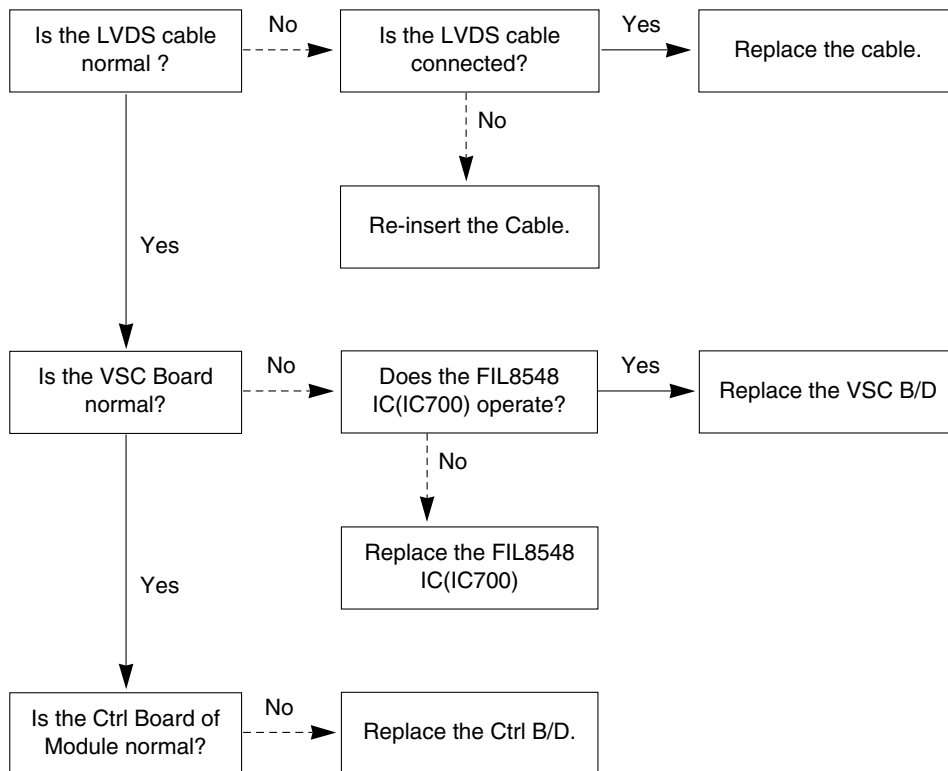
5-1. In case of no OSD display

(1) Symptom

- 1) LED is green.
- 2) The minute discharge is continuously accomplished from the module.



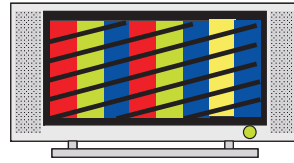
(2) Procedure check



5-2. In case there is no display on the screen in specific modes

(1) Symptom

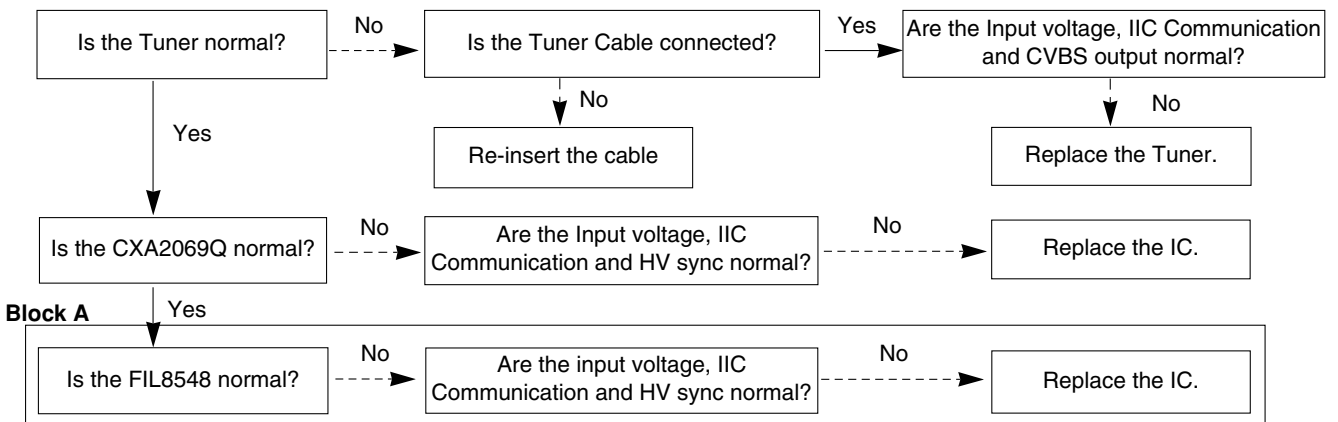
- 1) There is no screen display from a specific input mode (RF, AV, Component, RGB, DVI).



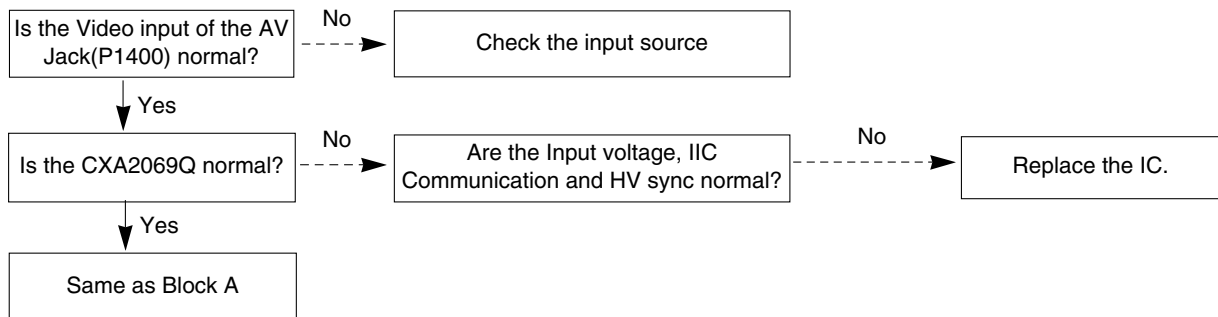
(2) Procedure check

- 1) Check the all input modes have normal display.
- 2) Check the video(main)/ data(sub), video(main)/ video(sub) have normal displays from the PIP mode or DW mode(re-check it/ swap).

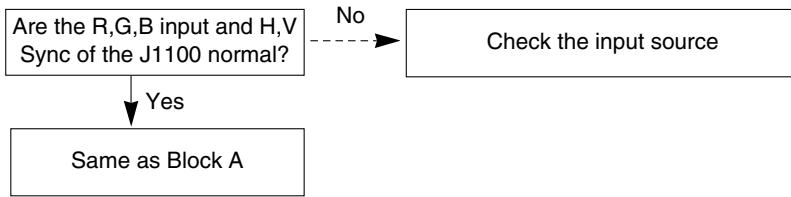
(3) In case of an unusual display in RF mode



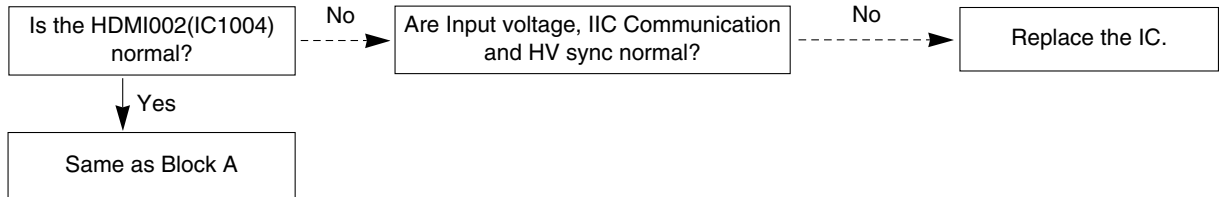
(4) In case of an unusual display in side S-video/ AV mode



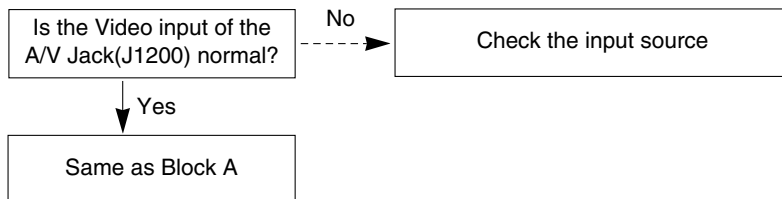
(5) In case of an unusual display in Component, RGB mode



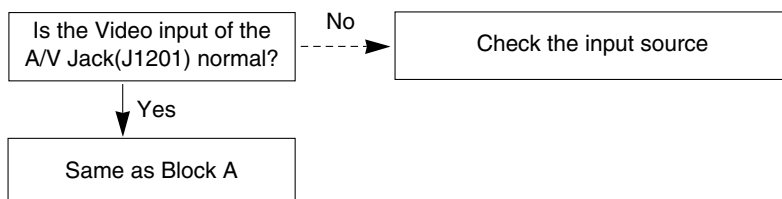
(6) In case of an unusual display in HDMI mode



(7) In case of an unusual display in SCART1 mode



(8) In case of an unusual display in SCART2 mode



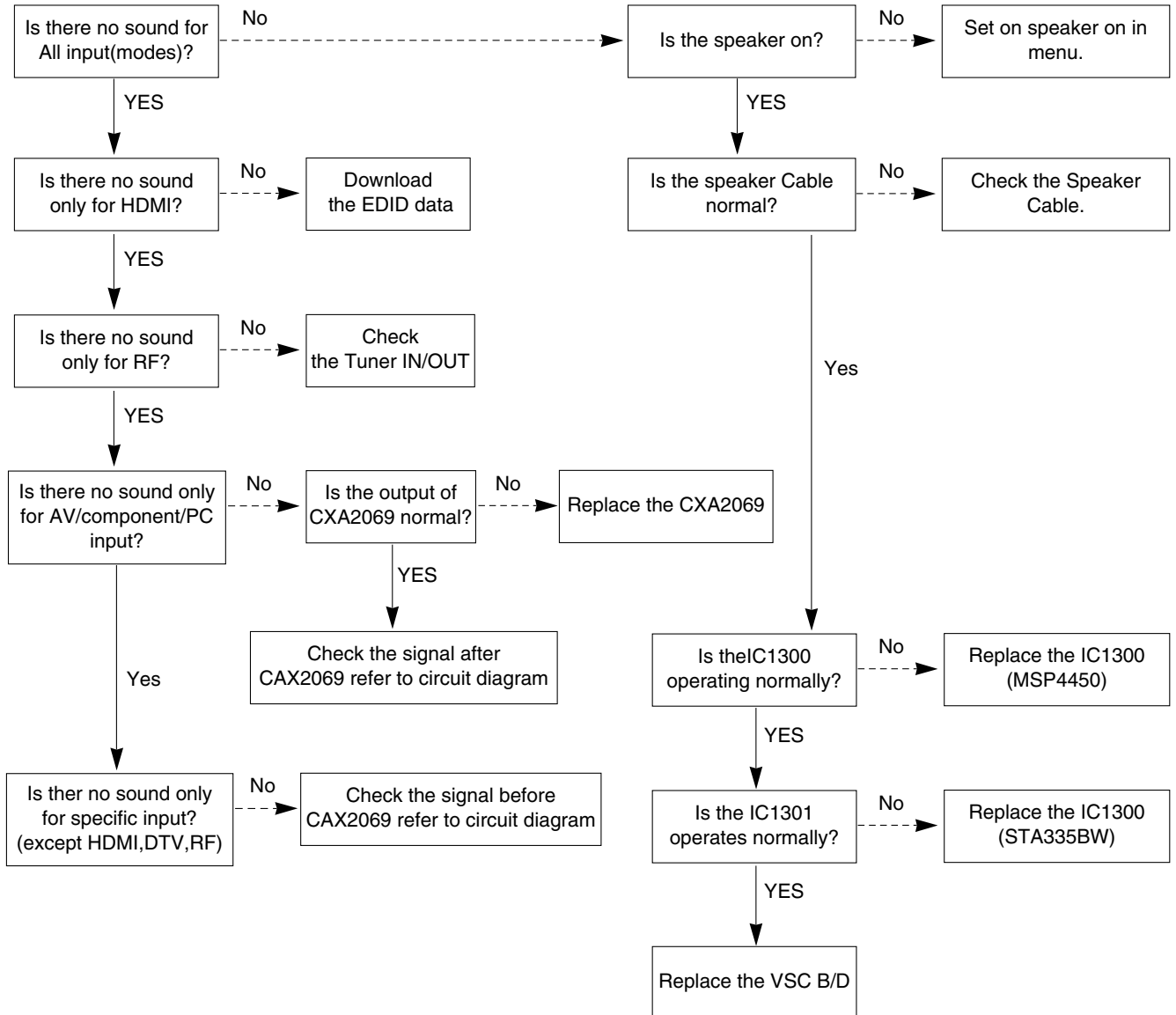
6. In case of no sound

(1) Symptom

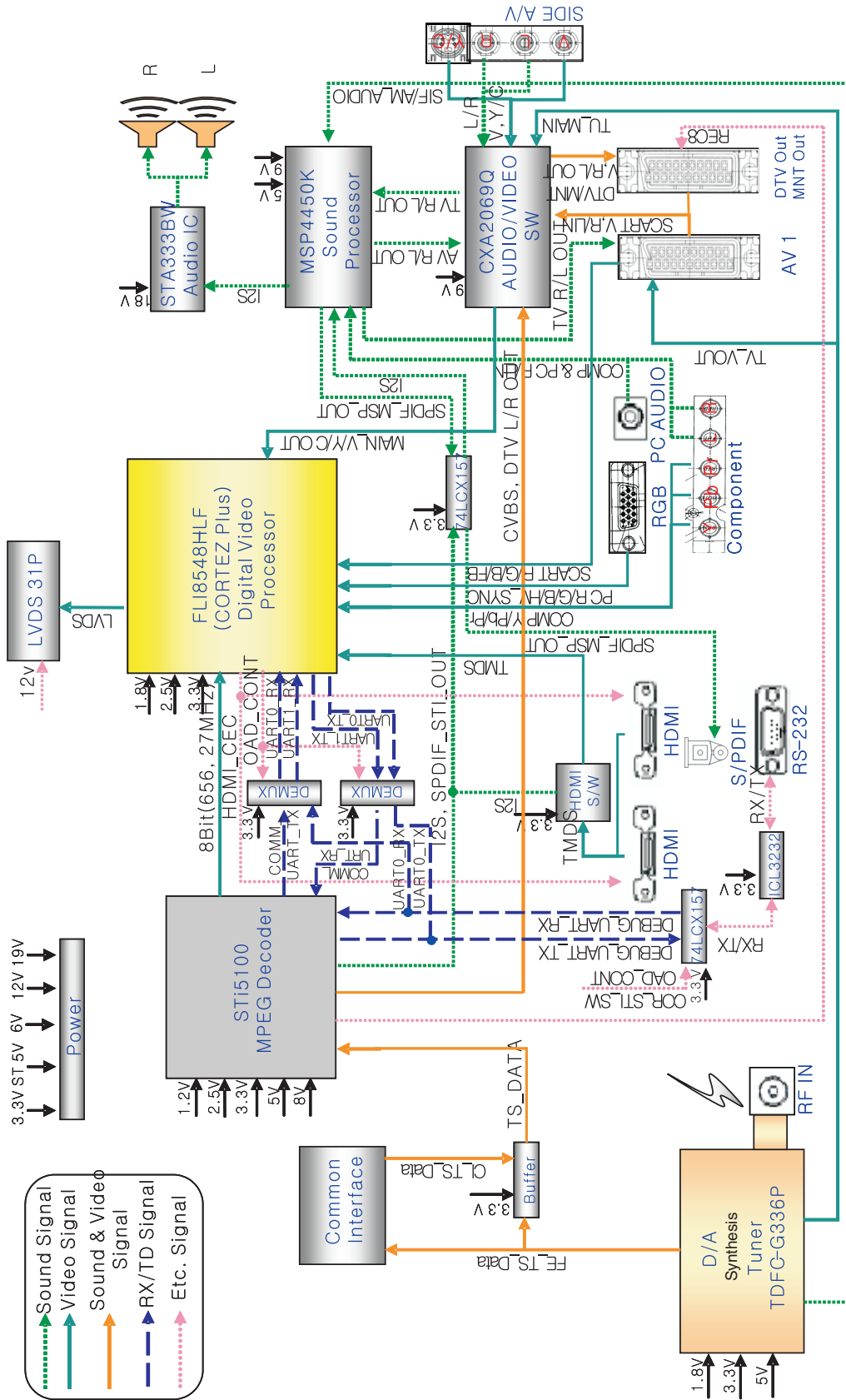
- 1) LED is Green.
- 2) Screen display appears but there is no sound.



(2) Procedure check

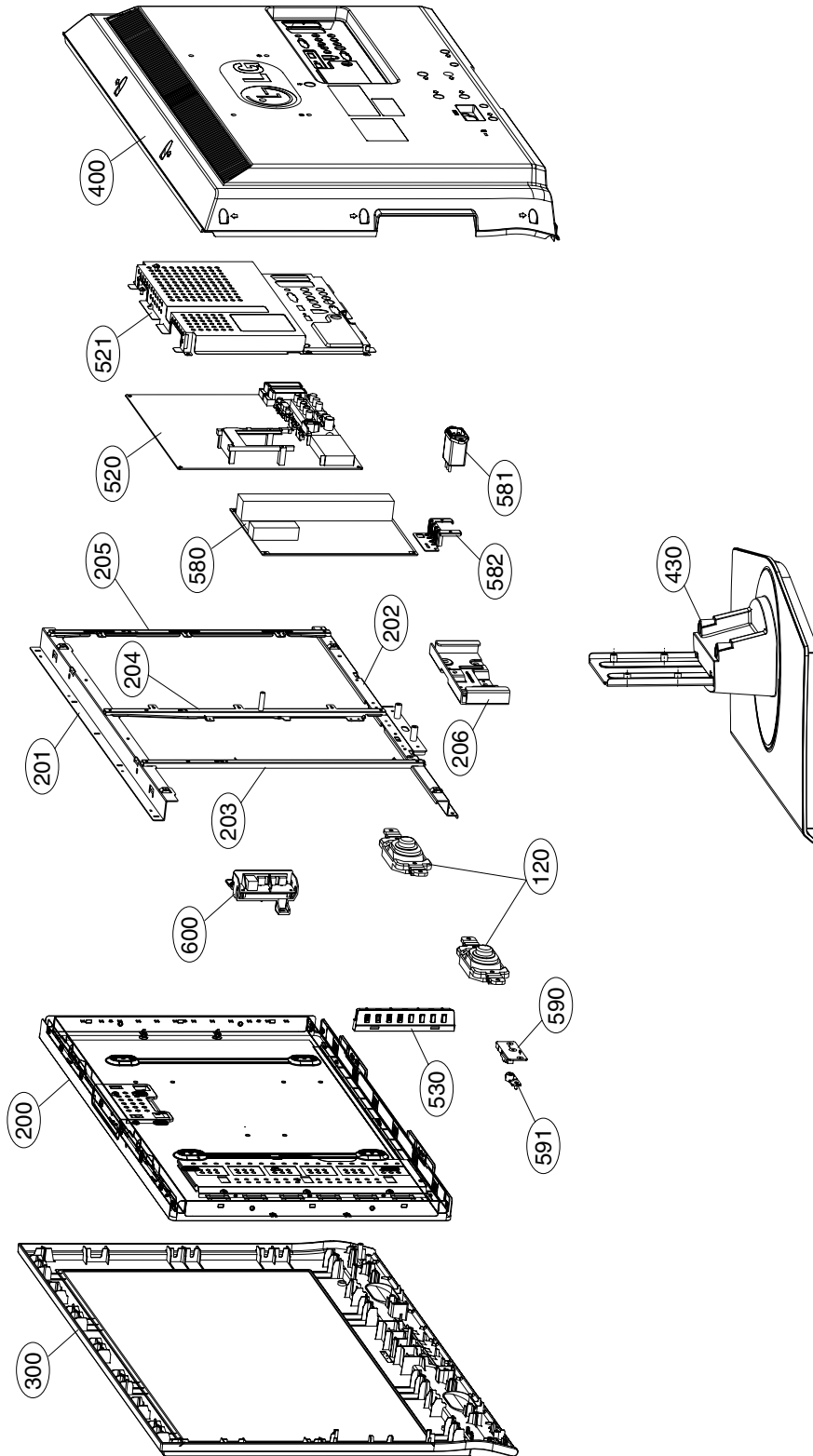


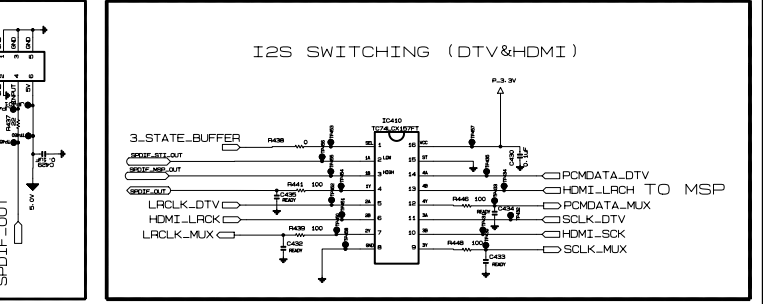
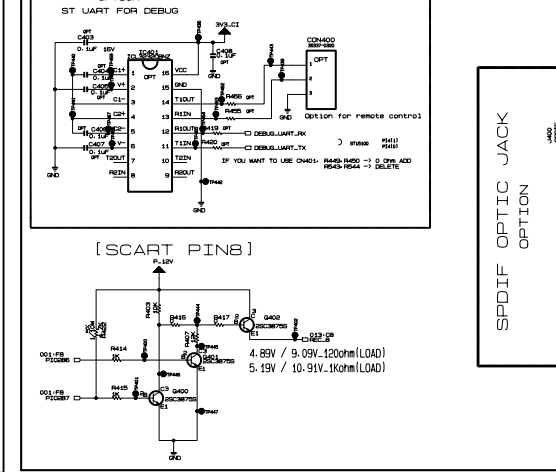
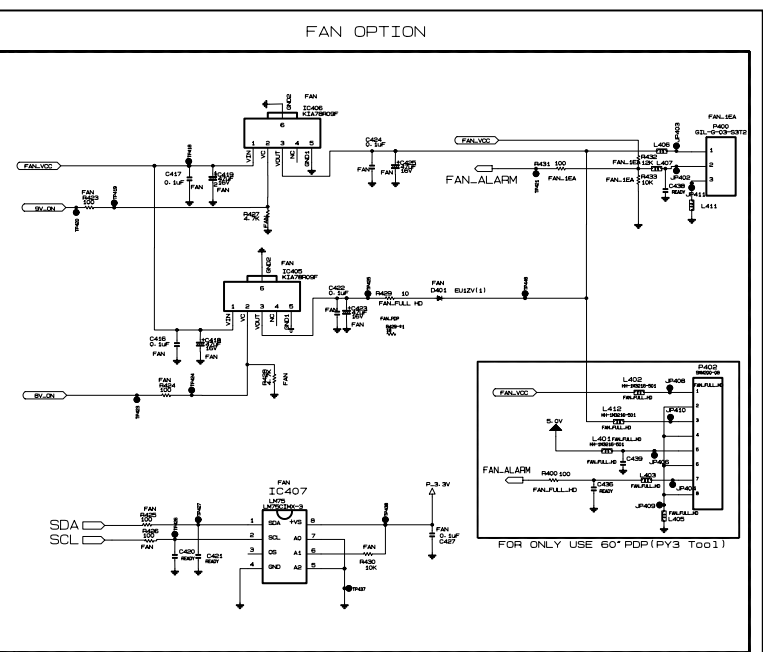
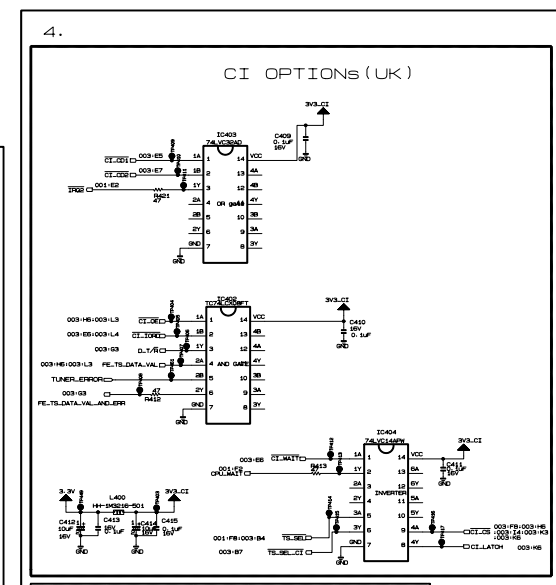
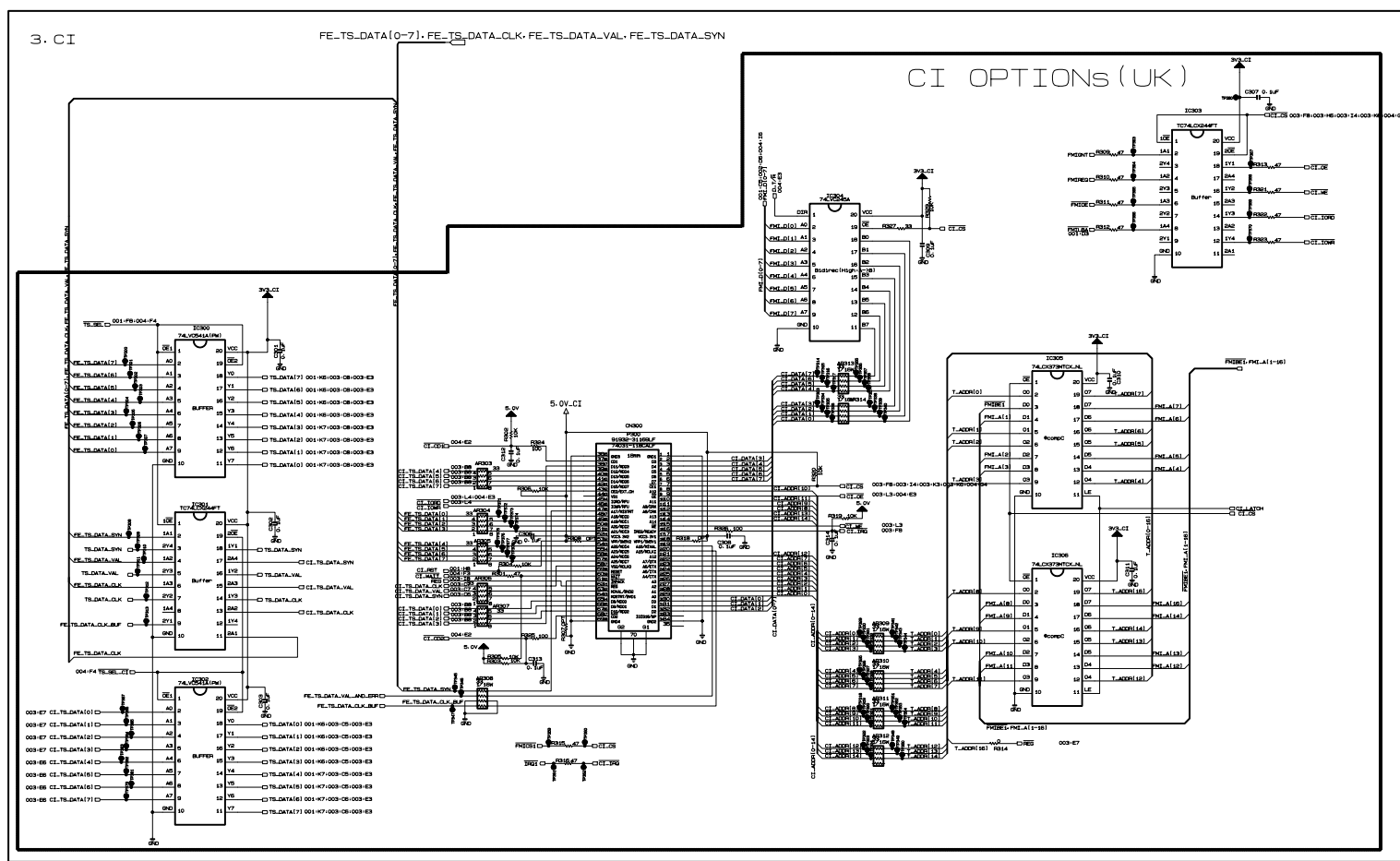
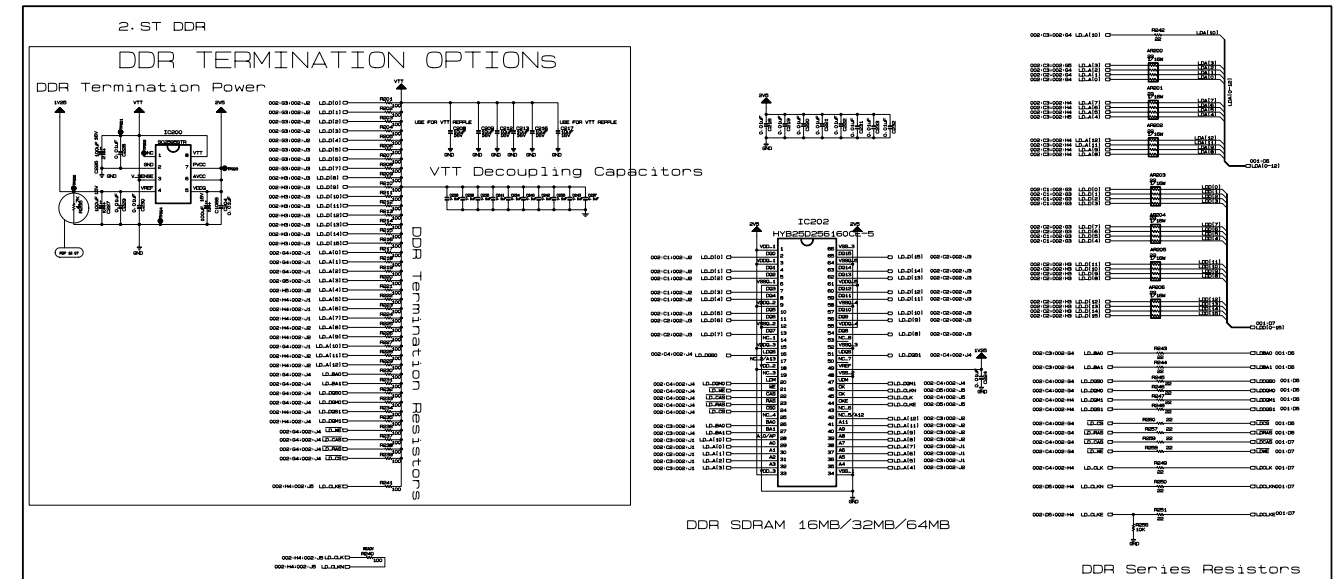
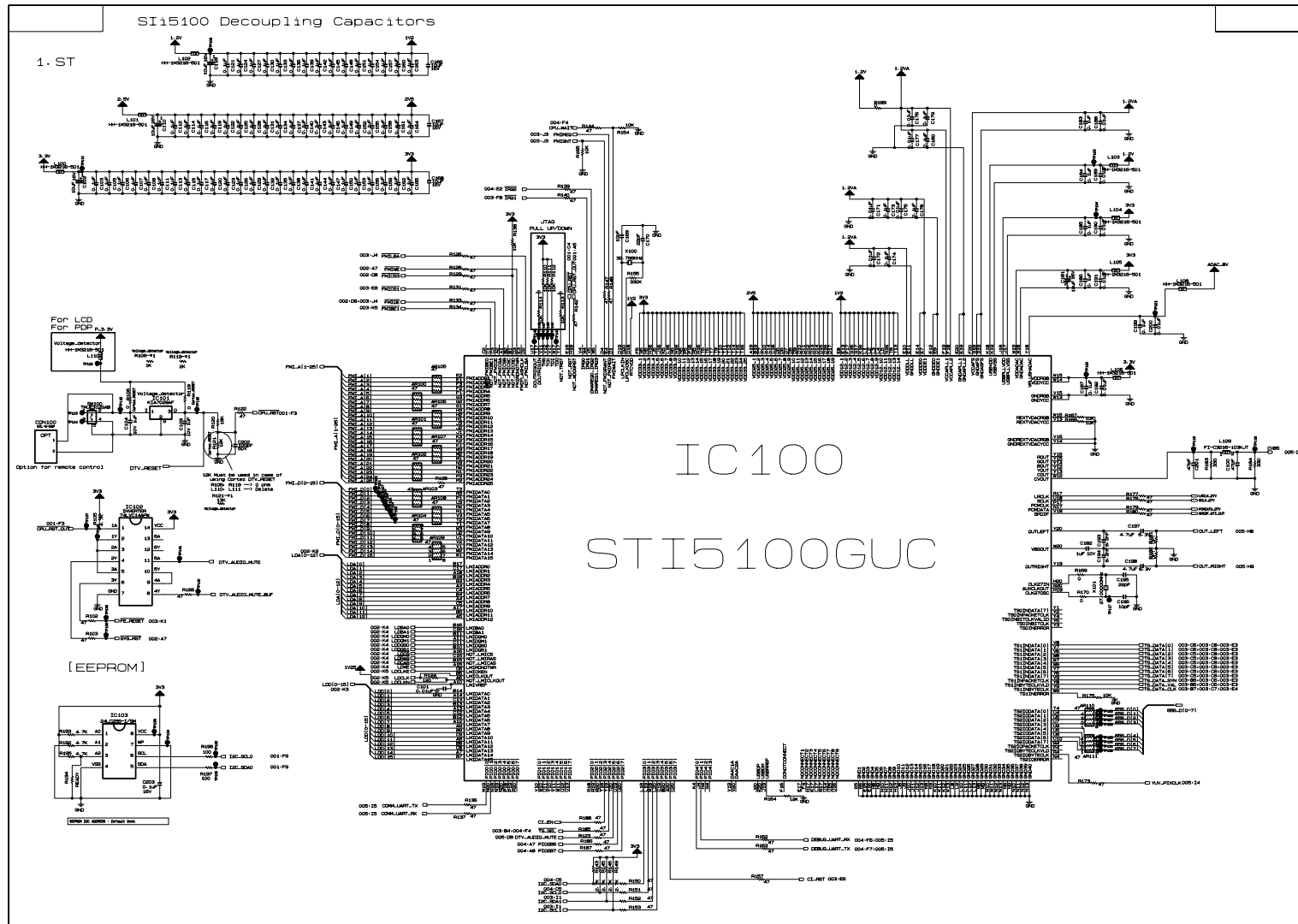
BLOCK DIAGRAM

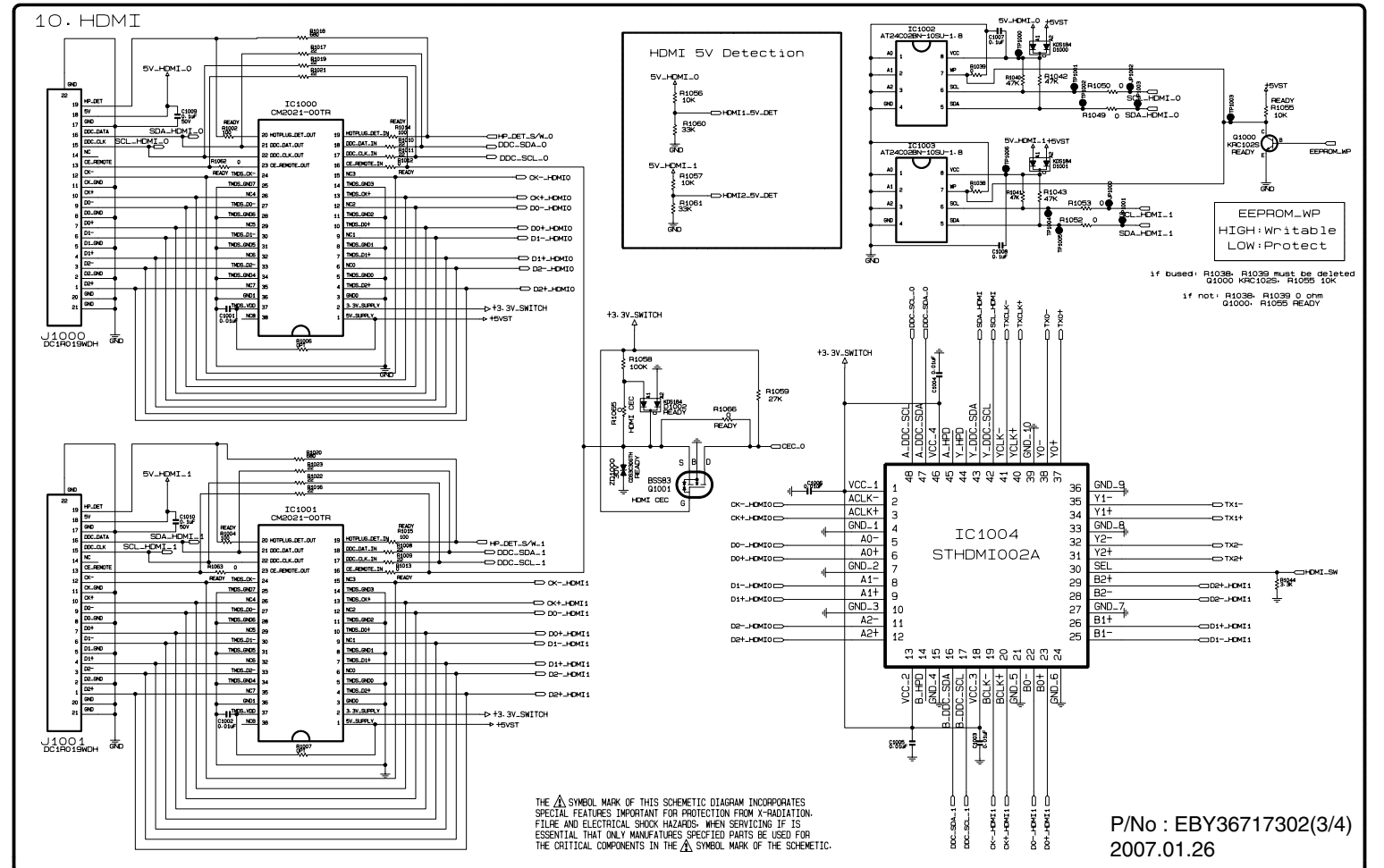
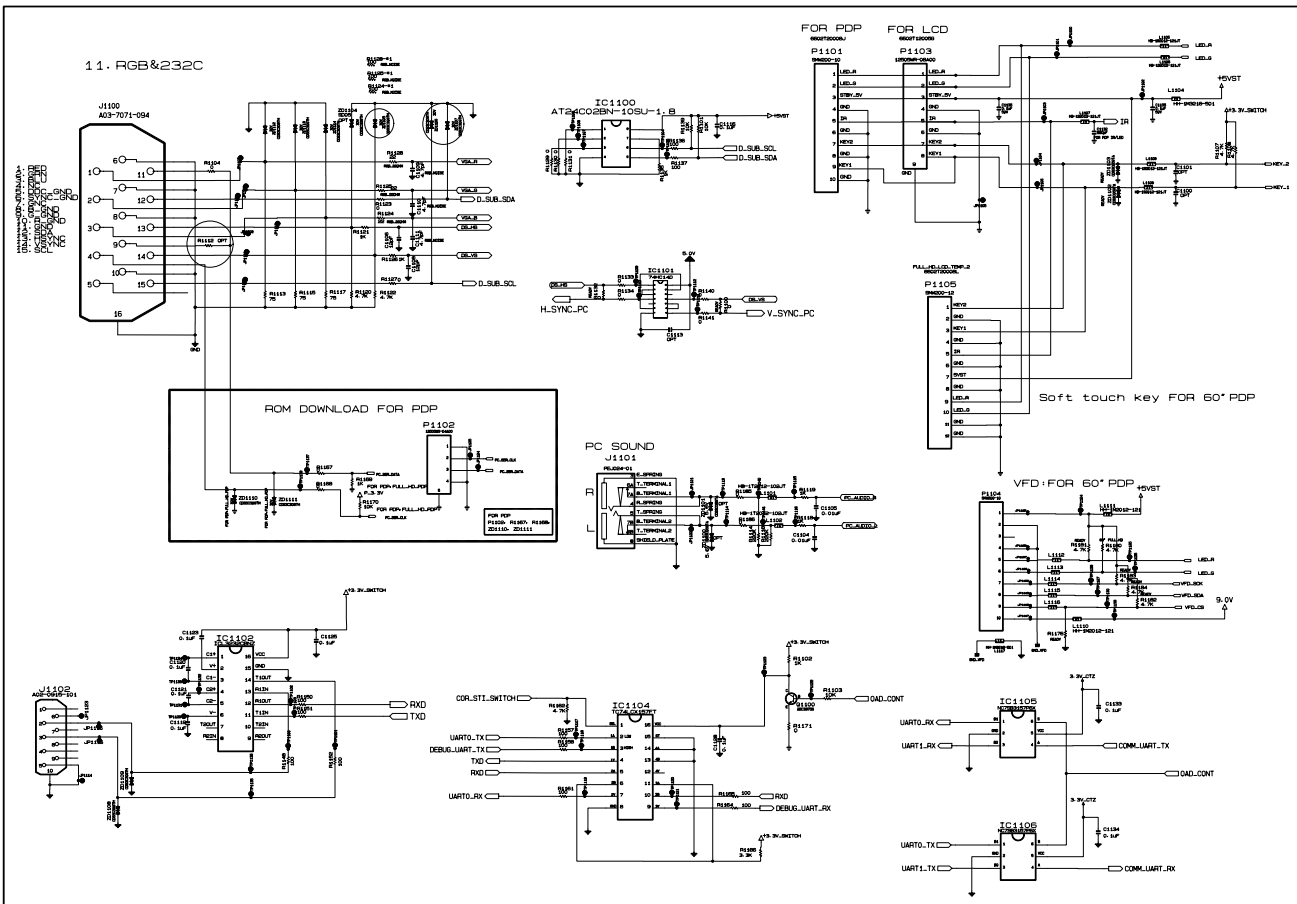
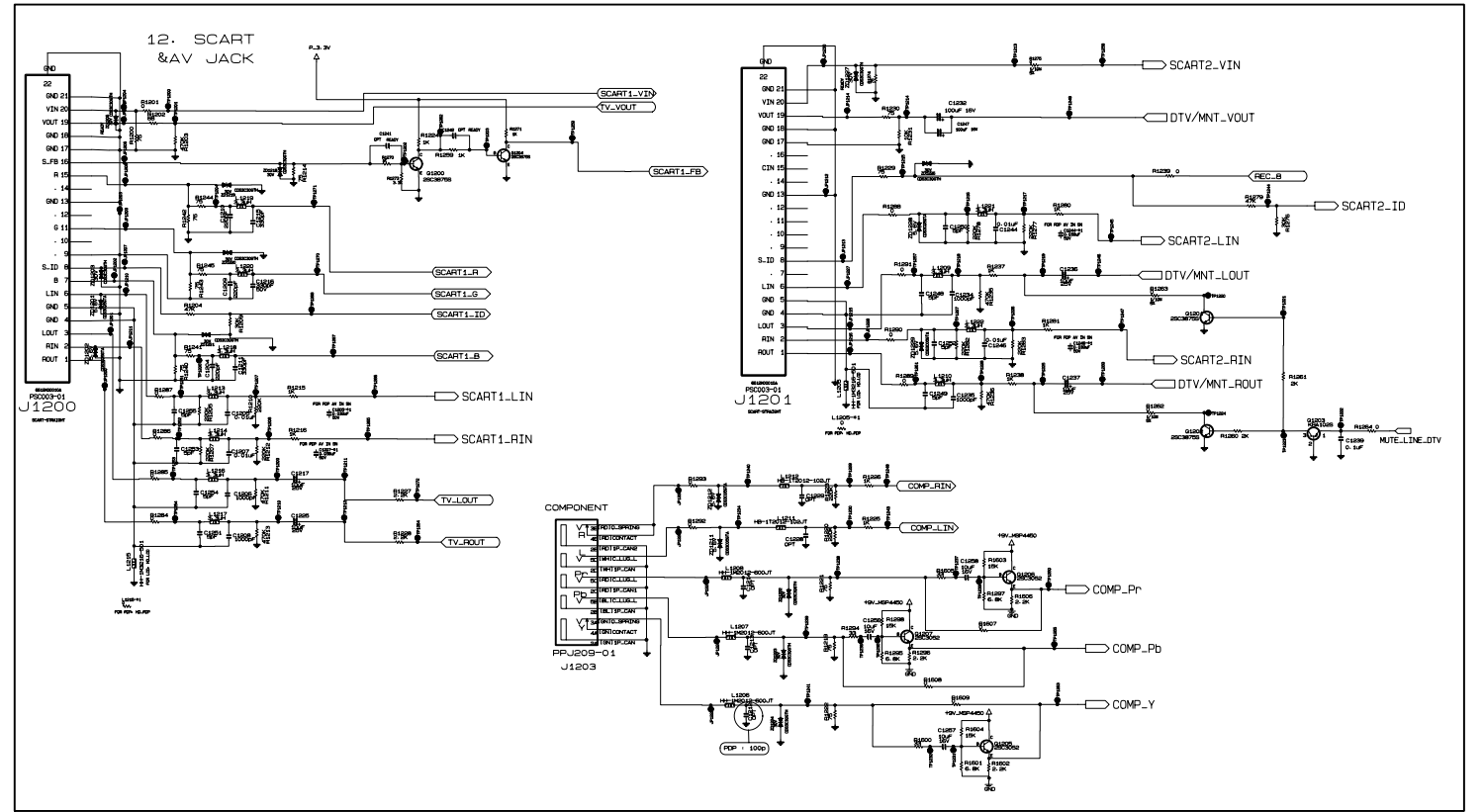
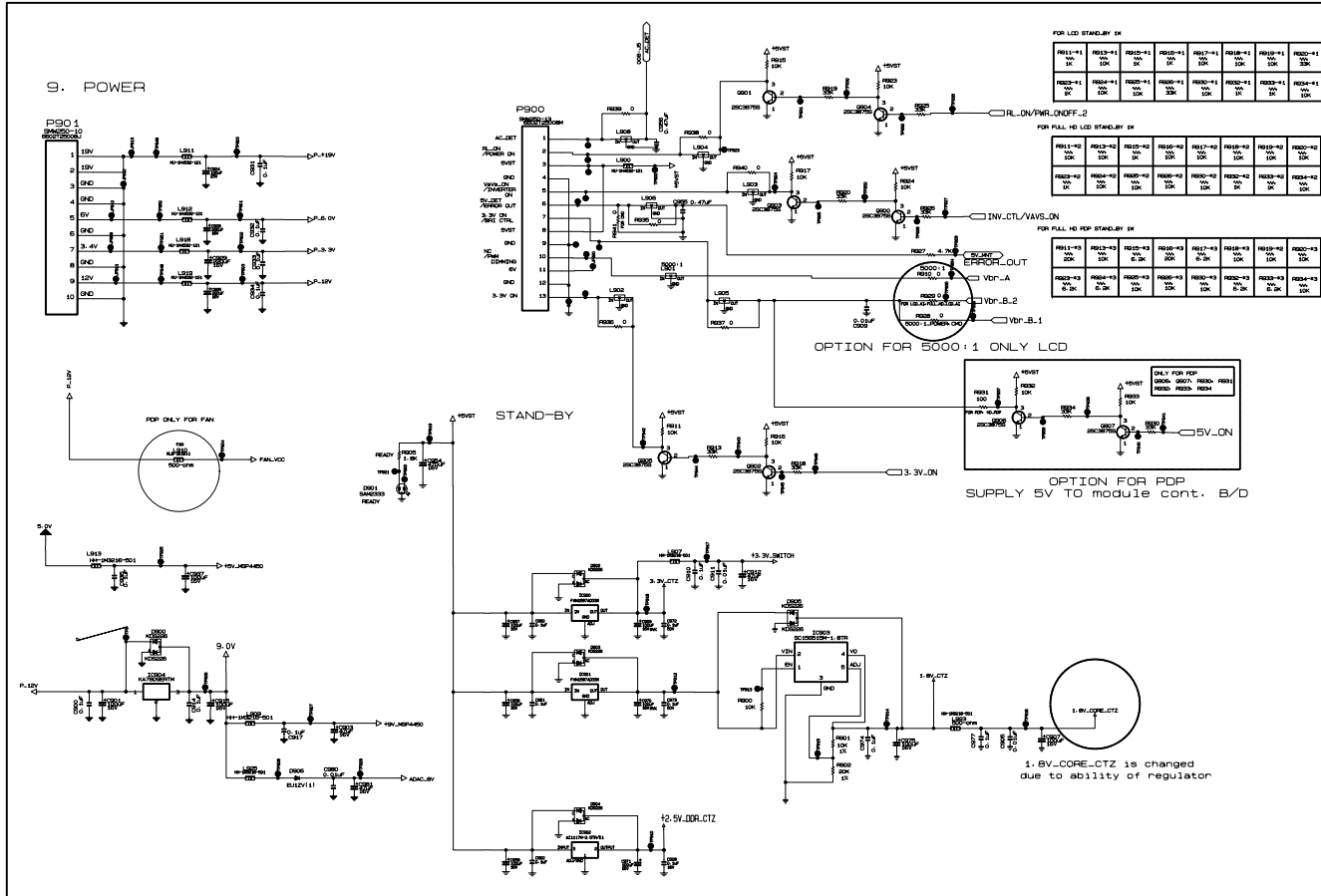


MEMO

EXPLODED VIEW









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