LED TV
SERVICE MANUAL

CHASSIS : LB43T
MODEL : 32LB551D-TC 32LB551D-TC

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 \( \Delta \) in the Schematic Diagram and Exploded View. 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 1 W), keep the resistor 10 mm 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 1 MΩ and 5.2 MΩ. 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 1.5 K / 10 watt resistor in parallel with a 0.15 uF 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 is corresponds to 0.5 mA.

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**

When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω

*Base on Adjustment standard*
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 in 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.
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 or cotton-tipped stick or comparable type solder removal device or with solder braid.
5. Do not use freon-propelled spray-on cleaners.
6. 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 circuit board 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.

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.
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 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.

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CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.
1. Application range
This specification is applied to the LED TV used LB43T chassis.

2. Requirement for Test
Each part is tested as below without special appointment.

1) Temperature: 25 °C ± 5 °C (77 °F ± 9 °F), CST: 40 °C ± 5 °C
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage
   - Standard input voltage (AC 100-240 V~, 50/60 Hz)
   - Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method
1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : CE, IEC specification
   - EMC : CE, IEC

4. Model General Specification

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Market</td>
<td>Asia, Oceania, Africa, Middle East (PAL/DVB Market)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Broadcasting system</td>
<td>1) PAL/SECAM-B/G/D/K/I</td>
<td>DTV</td>
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<td></td>
<td></td>
<td>2) NTSC-M</td>
<td>LB43B/LB43M support DVB-T</td>
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<td></td>
<td></td>
<td>3) DVB-T/T2</td>
<td>LB43T support DVB-T/T2</td>
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<td>3.</td>
<td>Channel Storage</td>
<td>ATV - 135EA, DTV - 1000EA</td>
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<td>4.</td>
<td>Receiving system</td>
<td>Analog : Upper Heterodyne</td>
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<td>Digital : COFDM(DVB-T)</td>
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<td>- Guard Interval (Bitrate_Mbit/s)</td>
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<td>Video(Composite Input)</td>
<td>PAL, SECAM, NTSC</td>
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<td>HDMI2-DTV/MHL</td>
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<td>Support HDCP</td>
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<td>SPDIF out</td>
<td>SPDIF out</td>
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<td>USB Input</td>
<td>For My Media(Movie/Photo/Music List) and SVC</td>
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<td>Headphone</td>
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5. Component Video Input (Y, Cb/Pb, Cr/Pr)

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<tr>
<th>No.</th>
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<th>V-freq(Hz)</th>
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<td>480p</td>
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6. HDMI Input : Refer to adjust specification about EDID data.

6.1. DTV mode

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
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<td>59.94 / 60</td>
<td>74.17/74.25</td>
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<td>59.94 / 60</td>
<td>148.35/148.50</td>
<td>HDTV 1080P</td>
</tr>
</tbody>
</table>

6.2. PC mode

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>640*350 @70Hz</td>
<td>31.468</td>
<td>70.09</td>
<td>25.17</td>
<td>EGA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>720*400 @70Hz</td>
<td>31.469</td>
<td>70.08</td>
<td>28.321</td>
<td>DOS</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>640*480 @60Hz</td>
<td>31.469</td>
<td>59.940</td>
<td>25.175</td>
<td>VESA(VGA)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>800*600 @60Hz</td>
<td>37.879</td>
<td>60.31</td>
<td>40.000</td>
<td>VESA(SVGA)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1024*768 @60Hz</td>
<td>48.363</td>
<td>60.00</td>
<td>65.000</td>
<td>VESA(XGA)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1152*864 @60Hz</td>
<td>54.348</td>
<td>60.053</td>
<td>80.002</td>
<td>VESA</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1280*1024 @60Hz</td>
<td>63.981</td>
<td>60.020</td>
<td>108</td>
<td>VESA(SXGA)</td>
<td>FHD only(Support to HDMI-PC)</td>
</tr>
<tr>
<td>8</td>
<td>1360*768 @60Hz</td>
<td>47.712</td>
<td>60.015</td>
<td>85.5</td>
<td>VESA(WXGA)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1920*1080 @60Hz</td>
<td>67.5</td>
<td>60.0</td>
<td>148.5</td>
<td>WUXGA (Reduced blanking)</td>
<td>FHD only(Support to HDMI-PC)</td>
</tr>
</tbody>
</table>
ADJUSTMENT INSTRUCTION

1. Application Range
   This specification sheet is applied to all of the LED TV with LB43T chassis.

2. Designation
   (1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
   (2) Power adjustment : Free Voltage.
   (3) Magnetic Field Condition: Nil.
   (4) Input signal Unit: Product Specification Standard.
   (5) Reserve after operation: Above 5 Minutes (Heat Run)
      Temperature : at 25 °C ± 5 °C
      Relative humidity : 65 ± 10 %
      Input voltage : 100-220 V~, 50/60 Hz
   (6) Adjustment equipments
      : Color Analyzer(CA-210 or CA-110), Service remote control.
   (7) Push the "IN STOP" key - For memory initialization.

3. Main PCB check process
   • APC - After Manual-Insert, executing APC

   * Boot file Download
     (1) Execute ISP program "Mstar ISP Utility" and then click "Config" tab.
     (2) Set as below, and then click "Auto Detect" and check "OK" message.
        If "Error" is displayed, check connection between computer, jig, and set.
     (3) Click "Read" tab, and then load download file(XXXX.bin) by clicking "Read"

   * USB DOWNLOAD (*.epk file download)
     (1) Put the USB Stick to the USB socket.
     (2) Automatically detecting update file in USB Stick.
        - If version of update file in USB Stick is lower, it will not work. But version of update file is higher, USB data will be detected automatically.

   Please Check the Speed :
   To use speed between from 200KHz to 400KHz

   Please Check the Speed :
   To use speed between from 200KHz to 400KHz
(3) Show the message "Copying files from memory".

(4) Updating is starting.

(5) Updating Completed, the TV will restart automatically.

(6) If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)
   * If updated version is higher than what TV has, the TV can lost all channel data. In this case, you have to channel recover. If all channel data is cleared, you didn't have a DTV/ATV test on production line.

* After downloading, have to adjust Tool Option again.
   (1) Push "IN-START" key in service remote control.
   (2) Select "Tool Option 1" and push "OK" key.
   (3) Punch in the number. (Each model has their number)
   (4) Completed selecting Tool option.

* RS-232C Connection Method.
  Connection : PCBA (USB Port) → USB to Serial Adapter (UC-232A) → RS-232C cable → PC(RS-232C port)
  ● Product name of USB to Serial Adapter is UC-232A.

4. ADC Process

4.1. ADC
   - Enter Service Mode by pushing "ADJ" key.
   - Enter Internal ADC mode by pushing "►" key at "8. ADC Calibration".

<table>
<thead>
<tr>
<th>EZ ADJUST</th>
<th>ADC Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Tool Option1</td>
<td>1. DTV Comp480i</td>
</tr>
<tr>
<td>6. Tool Option2</td>
<td>2. ATV Comp1080p</td>
</tr>
<tr>
<td>7. Tool Option3</td>
<td>3. DTV Type</td>
</tr>
<tr>
<td>8. Tool Option4</td>
<td>4. Country Group</td>
</tr>
<tr>
<td>9. Tool Option5</td>
<td>5. Area Option</td>
</tr>
<tr>
<td>11. Tool Option Commercial</td>
<td>7. Test Pattern</td>
</tr>
<tr>
<td>12. RS232 D CL</td>
<td>8. ADC Calibration</td>
</tr>
<tr>
<td>13. Sel B/C</td>
<td>9. ADC Test Pattern</td>
</tr>
<tr>
<td>14. Ext. Input Adjust</td>
<td>10. Mode In</td>
</tr>
</tbody>
</table>

<Caution> Using "P-ONLY" key of the Adjustment remote control, power on TV.

* ADC Calibration Protocol (RS232)

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>CMD 1</th>
<th>CMD 2</th>
<th>Data 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter</td>
<td>Adjust MODE</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td>ADC adjust</td>
<td>ADC Adjust</td>
<td>A</td>
<td>D</td>
<td>1</td>
</tr>
</tbody>
</table>

When transfer the "Mode In", Carry the command.

Automatically adjustment (The use of a internal pattern)

Adjust Sequence
- aa 00 00 [Enter Adjust Mode]
- xb 00 40 [Component1 Input (480i)]
- ad 00 10 [Adjust 480i Comp1]
- aa 00 90 End Adjust mode

* Required equipment : Adjustment remote control.

4.2. Function Check

4.2.1. Check display and sound
   - Check Input and Signal items.
   (1) TV
   (2) AV (CVBS)
   (3) COMPONENT (480i)
   (4) HDMI

   * Display and Sound check is executed by Remote control.

<Caution> Not to push the "INSTOP" key after completion if the function inspection.
5. Total Assembly line process

5.1. Adjustment Preparation

- W/B Equipment condition
  CA210: CH14, Test signal: Inner pattern(80IRE)-LED Module

- Above 5 minutes H/run in the inner pattern. ("power on" key of Adjustment remote control)

* The spec of color temperature and coordinate.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Color Temp</th>
<th>Color coordinate</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool (C50)</td>
<td>13,000 K</td>
<td>X=0.271 (±0.002) Y=0.270 (±0.002)</td>
<td>&lt;Test Signal&gt; - Inner pattern for W/B adjust - External white pattern (80IRE, 204gray)</td>
</tr>
<tr>
<td>Medium(0)</td>
<td>9,300 K</td>
<td>X=0.286 (±0.002) Y=0.289 (±0.002)</td>
<td></td>
</tr>
<tr>
<td>Warm(W50)</td>
<td>6,500 K</td>
<td>X=0.313 (±0.002) Y=0.329 (±0.002)</td>
<td></td>
</tr>
</tbody>
</table>

- Connecting picture of the measuring instrument (On Automatic control)
  Inside Pattern is used when W/B is controlled. Connect to auto controller or push Adjustment Remote control POWER ON → Enter the mode of White-Balance, the pattern will come out.

* Auto-control interface and directions

  (1) Adjust in the place where the influx of light like floodlight around is blocked. (Illumination is less than 10 lux).
  (2) Adhere closely the Color analyzer(CA210) to the module less than 10 cm 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 5 minutes.
    - Using 'no signal' or 'full white pattern' or the others, check the back light on.

* Auto adjustment Map(RS-232C)

RS-232C COMMAND

[CMD ID DATA]

MIN CENTER MAX

Cool Mid Warm
R Gain 00 00 172 192 192
G Gain 00 00 172 192 192
B Gain 00 00 172 192 192
R Cut 64 64 128
G Cut 64 64 128
B Cut 64 64 128

<Caution>

Color Temperature : COOL, Medium, Warm.
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0,(When R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)
- Color analyzer (CA100+, CA210) should be used in the calibrated ch by CS-1000.
- Operate the zero-calibration of the CA100+ or CA-210, then stick sensor to the module when adjusting.
- After enter Service Mode by pushing “ADJ” key,
- Enter White Balance by pushing “►” key at “9. White Balance”.

For manual adjustment, it is also possible by the following sequence.
1. Set TV in Adj. mode using “P-ONLY” key on remote controller and then operate heat run longer than 15 minutes. (If not executed this step, the condition for W/B may be different.)
2. Push “Exit” key.
3. Enter White Balance mode by pushing the ADJ key and select “9. White Balance”. When KEY (►) is pressed, 206 Gray internal pattern will be displayed.
4. Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10 cm of the surface
5. Select each items (Red/Green/Blue Gain) using ▲/▼ (CH +/-) key on Remote control.
6. Adjust R/ G/ B Gain using ◄/► (VOL +/-) key on R/C.
7. Adjust three modes all (Cool / Medium / Warm)
   - For All model w/o LS345
     Fix the one of R/G/B gain and change the others
   - For G-FIX model
     Cool Mode
     1) Fix the one of R/G/B gain to 192 (default data) and decrease the others. (If G gain is adjusted over 172 and R and B gain less than 192, Adjust is O.K.)
     2) If G gain is less than 172, Increase G gain by up to 172, and then increase R gain and G gain same amount of increasing G gain
     3) If R gain or B gain is over 255, readjust G gain less than 172. Conform To R gain is 255 or B gain is 255 Medium / Warm Mode - Fix the one of R/G/B gain to 192 (default data) and decrease the others.
8. When adjustment is completed, exit adjustment mode using EXIT key on Remote control.

* CASE Cool
First adjust the coordinate far away from the target value(x, y).
1) x, y > target
   i) Decrease the R, G.
2) x, y < target
   i) First decrease the B gain.
   ii) Decrease the one of the others.
3) x > target, y < target
   i) First decrease B, so make y a little more than the target.
   ii) Adjust x value by decreasing the R.
4) x < target, y > target
   i) First decrease B, so make x a little more than the target.
   ii) Adjust x value by decreasing the G.

* After You finish all adjustments, Press “in-start” button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable.
If it is not same, then correct it same with BOM and unplug AC cable.
For correct it to the model’s module from factory JIG model.
* Push the “IN STOP” key after completing the function inspection.

5.2. DDC EDID Write (HDMI 256Byte)
- Connect HDMI Signal Cable to HDMI Jack.
- Write EDID DATA to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.
  * For SVC main Assembly, EDID have to be downloaded to Insert Process in advance.

5.3. EDID DATA
1) All Data : HEXA Value
2) Changeable Data :
   *: Serial No : Controlled / Data:01
   **: Month : Controlled / Data:00
   ***: Year : Controlled
   ****: Check sum

-Auto Download
- After enter Service Mode by pushing “ADJ” key,
- Enter EDID D/L mode
- Enter “START” by pushing “OK” key,
5.4. Outgoing condition Configuration

- When pressing IN-STOP key by Service remote control, Red LED are blinked alternatively. And then automatically turn off. (Must not AC power OFF during blinking)

5.5. GND and HI-POT Test

- 5.5.1. GND & HI-POT auto-check preparation
  1. Check the POWER CABLE and SIGNAL CABE insertion condition.
  2. You can’t use Tuner Ground & Tuner signal line at all models (applied Isolator inner tuner)

- 5.5.2. GND & HI-POT auto-check
  1. Pallet moves in the station. (POWER CORD / AV CORD is tightly inserted)
  2. Connect the AV JACK Tester.
  3. Controller (GWS103-4) on.
  4. GND Test (Auto)
    1. If Test is failed, Buzzzer operates.
    2. If Test is passed, execute next process (Hi-pot test).
       (Remove AV CORD from A/V JACK BOX)
  5. Hi-POT test (Auto)
    1. If Test is failed, Buzzzer operates.
    2. If Test is passed, GOOD Lamp on and move to next process automatically.

5.5.3. Checkpoint

- 1. Test voltage
  1) 3 Poles
    - GND: 1.5 kV/min at 100 mA
    - SIGNAL: 3 kV/min at 100 mA
  2) 2 Poles
    - SIGNAL: 3 kV/min at 100 mA
  2. TEST time: 1 second
  3. TEST POINT
    1) 3 Poles
      - GND Test = POWER CORD GND and SIGNAL CABLE GND
      - Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.
    2) 2 Poles
      - Hi-pot Test = Accessible Metal and LIVE & NEUTRAL.
  4. LEAKAGE CURRENT: At 0.5 mArms
6. 3D function test
(Pattern Generator MSHG-600, MSPG-6100[Support HDMI1.4])
* HDMI mode No. 872, pattern No. 83
(1) Please input 3D test pattern like below.

(2) When 3D OSD appear automatically, then select OK button.

(3) Don't wear a 3D Glasses, check the picture like below.
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

TP for NON-EU models (except EU and China)

TP for CI slot

TP for SCART

TP for Headphone

TP for S2

TP for FE_TS_DATA

Copyright © 2014 LG Electronics. Inc. All rights reserved.
Only for training and service purposes

LGE Internal Use Only
USB (SIDE)
Option : Ripple Check !!!
Serial Flash for SPI boot
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
Headphone
*Option: HEADPHONE_EU
RS-232C 4PIN & MSTAR DEBUG 4PIN

THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
L14 Repair Process
## Contents of LCD TV Standard Repair Process

<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom (High category)</th>
<th>Error symptom (Mid category)</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Video error</td>
<td>No video/Normal audio</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>No video/No audio</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Tuning fail, Picture broken/ Freezing</td>
<td>3, 4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Color error</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Vertical/Horizontal bar, residual image, light spot, external device color error</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B. Power error</td>
<td>No power</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Off when on, off while viewing, power auto on/off</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>C. Audio error</td>
<td>No audio/Normal video</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Wrecked audio/discontinuation/noise</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D. Function error</td>
<td>Remote control &amp; Local switch checking</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>External device recognition error</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>E. Noise</td>
<td>Circuit noise, mechanical noise</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F. Exterior error</td>
<td>Exterior defect</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

* First of all, Check whether there is SVC Bulletin in GCSC System for these models.
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Video error_ No video/Normal audio</td>
<td>Check LCD back light with naked eye</td>
<td>A1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>LED driver B+ 24V measuring method</td>
<td>A2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Check White Balance value</td>
<td>A3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Power Board voltage measuring method</td>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A. Video error_ No video/Video lag/stop</td>
<td>TUNER input signal strength checking method</td>
<td>A5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>LCD TV Version checking method</td>
<td>A6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>LCD TV connection diagram</td>
<td>A7</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>A. Video error_Color error</td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Adjustment Test pattern – ADJ Key</td>
<td>A9</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>A. Video error_Vertical/Horizontal bar, residual image, light spot</td>
<td>Check Link Cable (LVDS) reconnection condition</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Adjustment Test pattern – ADJ Key</td>
<td>A9</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>LCD TV connection diagram</td>
<td>A8</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Exchange T–Con Board (1)</td>
<td>A1-1/5</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Exchange T–Con Board (2)</td>
<td>A1-2/5</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Defected Type caused by T–Con/Inverter/Module</td>
<td>Exchange LED driver Board (PSU)</td>
<td>A1-3/5</td>
<td>55” : driver board</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Other : PSU</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>Exchange Module itself (1)</td>
<td>A1-4/5</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Exchange Module itself (2)</td>
<td>A1-5/5</td>
<td></td>
</tr>
</tbody>
</table>
First of all, Check whether all of cables between board is inserted properly or not. (Main B/D ↔ Power B/D, LVDS Cable, Speaker Cable, IR B/D Cable, ..)

- **A. Video error**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error</th>
<th>Established date</th>
<th>2012. 01.14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No video/ Normal audio</td>
<td></td>
<td>Revised date</td>
<td>1/14</td>
</tr>
</tbody>
</table>

**Standard Repair Process**

1. **No video**
   - **Normal audio**
     - Check Back Light
       - On with naked eye
       - **A1**
         - **A4**
           - Check Power Board
             - 3.5V, 12V, 24V etc.
             - **If Normal Voltage**
               - **Y**
                 - Replace T-con Board or module
               - **N**
                 - Repair Power Board or parts
             - **N**
               - Replace Inverter or module
               - **Y**
                 - Repair Power Board or parts
               - **N**
                 - End

2. **Move to No video/No audio**
   - **Normal Audio**
     - **A2**
       - **A6 & A3**

**Precaution**

- Always check & record S/W Version and White Balance value before replacing the Main Board
  - Replace Main Board
  - Re-enter White Balance value
Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No video/ No audio</td>
<td>Check and replace MAIN B/D</td>
<td>2012.01.14</td>
<td>2/14</td>
</tr>
</tbody>
</table>

- No Video/ No audio
- Check various voltages of Power Board (3.5V, 12V, 24V)
- Normal Voltage
  - Y: Check and replace MAIN B/D
  - N: Replace Power Board and repair parts

End
A. Video error

Picture broken/ Freezing

1. Reconnection
2. Install Booster

Check RF Signal level
- By using Digital signal level meter
- By using Diagnostics menu on OSD (Menu→Set up→Support→Signal Test)
- Signal strength (Normal: over 50%)
- Signal Quality (Normal: over 50%)

Check whether other equipments have problem or not.
(By connecting RF Cable at other equipment)
→ DVD Player, Set-Top-Box, Different maker TV etc

Check S/W Version
N

Y

Check Tuner soldering

Y

N

SVC Bulletin

S/W Upgrade

Normal Picture

End

Replace Main B/D

End

Contact with signal distributor or broadcaster (Cable or Air)

Normal Signal

Y

N

Check RF Cable Connection
1. Reconnection
2. Install Booster

Normal Picture

N

Y

End

End

SVC Bulletin

N

Y

Normal Picture

S/W Upgrade

Y

N

End

LGE Internal Use Only
A. Video error

**A5**

Check RF Signal level

Check RF signal cable (DVB satellite signal or not)
Check whether other equipments have problem or not.
(By connecting RF Cable at other equipment)
→ Set-Top-Box, Different maker TV etc

- Check satellite setting.
- Check LNB frequency.
- Check satellite
- Check Satellite connection (DiSEqC, motor, etc…)

Normal Signal

Y → Normal Setting
N → Check satellite setting.

Y → Change satellite setting
N → SVC Bulletin

N → Check Tuner soldering
Y → Replace Main B/D

End

Contact with signal distributor or broadcaster (Cable or Air)

End

**A6**

Check S/W Version

N → S/W Upgrade
Y → SVC Bulletin

N → Check Tuner soldering
Y → Replace Main B/D

Normal Setting

Y → Normal Setting
N → Check satellite setting.

Y → Change satellite setting
N → SVC Bulletin

N → Check Tuner soldering
Y → Replace Main B/D

Normal Picture

Y → End
N → End

Normal Setting

Y → Normal Setting
N → Check satellite setting.

Y → Change satellite setting
N → SVC Bulletin

N → Check Tuner soldering
Y → Replace Main B/D

Normal Picture

Y → End
N → End

Established date: 2012.01.14
Revised date: 4/14

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tuning fail, Picture broken/ Freezing</td>
<td></td>
<td>2012.01.14</td>
<td>4/14</td>
</tr>
</tbody>
</table>
A. Video error

**Y** Check and replace Link Cable (LVDS) and contact condition

**N** Replace Main B/D

**Y** Replace module

**N** End

- **A7**
  - Check color by input
  - External Input
  - COMPONENT
  - RGB
  - HDMI/DVI

- **A8/A9**
  - Color error

- **A10**
  - Check Test pattern

- **Y** Check error color input mode

- **Y** Replace Main B/D

- **N** Replace module

- **Y** Replace Main B/D

- **N** End

- **Y** Check and replace Link Cable (LVDS) and contact condition

- **Y** Check color by input

- **Y** Check external device and cable

- **N** Request repair for external device/cable

- **Y** Replace Main B/D

- **N** Replace Main B/D
# Standard Repair Process

## LCD TV - Error symptom

<table>
<thead>
<tr>
<th>A. Video error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical / Horizontal bar, residual image, light spot, external device color error</td>
<td>2012.01.14</td>
<td>6/14</td>
</tr>
</tbody>
</table>

### Vertical/Horizontal bar, residual image, light spot

**A7**

1. Check color condition by input
   - External Input
   - Component/AV
   - HDMI
   - Screen normal
   - Replace module

2. Screen normal
   - Y
   - Check external device connection condition
   - N
   - Replace Main B/D
   - Screen normal
   - N
   - Replace Module

**A8/A9**

1. Check test pattern

**A10**

1. Check S/W Version
   - Check Version
   - Y
   - S/W Upgrade
   - N
   - Normal Screen
   - Y
   - End
   - N

### External device screen error - Color error

1. Connect other external device and cable
   (Check normal operation of External Input, Component, HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

2. Screen normal
   - Y
   - Replace Main B/D
   - N
   - Request repair for external device

3. HDMI error

4. Component error

5. External Input error

6. Connect other external device and cable
   (Check normal operation of External Input, Component, HDMI by connecting Jig, pattern Generator, Set-top Box etc.)

7. Screen normal
   - Y
   - Replace Main B/D
   - N

---

**Established date**: 2012.01.14  
**Revised date**: 6/14  
**End**: Screen normal

---

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Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>B. Power error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Off when on, off while viewing, power auto on/off</td>
<td></td>
<td>2012.01.14</td>
<td>8/14</td>
</tr>
</tbody>
</table>

**Check outlet**

- Check A/C cord
- Check for all 3-phase power out

**Check Power Off Mode**

- Error
  - Y: Fix A/C cord & Outlet and check each 3-phase out
  - N: (If Power Off mode is not displayed) Check Power B/D

**Check Power B/D**

- Normal Voltage
  - Y: Replace Main B/D
  - N: Replace Power B/D

- CPU Abnormal
  - Abnormal
  - Abnormal1
  - Normal

**Replace Main B/D**

**Replace Power B/D**

* Caution
  - Check and fix exterior of Power B/D Part

* Please refer to the all cases which can be displayed on power off mode.

<table>
<thead>
<tr>
<th>Status</th>
<th>Power off List</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&quot;POWEROFF_REMOTEKEY&quot;</td>
<td>Power off by REMOTE CONTROL</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_OFF TIMER&quot;</td>
<td>Power off by OFF TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_SLEEPTIMER&quot;</td>
<td>Power off by SLEEP TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_INSTOP&quot;</td>
<td>Power off by INSTOP KEY</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_AUTO OFF&quot;</td>
<td>Power off by AUTO OFF</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_ON TIMER&quot;</td>
<td>Power off by ON TIMER</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RS232C&quot;</td>
<td>Power off by RS232C</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RES REC&quot;</td>
<td>Power off by Reservated Record</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_REC END&quot;</td>
<td>Power off by End of Recording</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_S W DOWNLOAD&quot;</td>
<td>Power off by S/W Download</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_UNKNOWN&quot;</td>
<td>Power off by unknown status except listed case</td>
</tr>
<tr>
<td>Abnormal</td>
<td>&quot;POWEROFF_ABNORMAL1&quot;</td>
<td>Power off by abnormal status except CPU trouble</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_CPU_ABNORMAL&quot;</td>
<td>Power off by CPU Abnormal</td>
</tr>
</tbody>
</table>
C. Audio error

No audio/ Normal video

**Standard Repair Process**

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>No audio/ Normal video</td>
<td>2012.01.14</td>
<td>9/14</td>
</tr>
</tbody>
</table>

**A15**
No audio
Check user menu → Speaker off

**A16**
Check audio B+ 24V of Power Board

- **Y**
  - Normal Voltage
  - Replace Power Board and repair parts

- **N**
  - Off
  - Cancel OFF

- **Check Speaker disconnection**
  - **N**
    - Replace MAIN Board → End
  - **Y**
    - Replace Speaker

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→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio

Check input signal
- RF
- External Input signal

Signal Normal

Y

Wrecked Audio/Discontinuation/Noise for all audio
Check and replace speaker and connector

Wrecked Audio/Discontinuation/Noise only for D-TV

Replace Main B/D

Normal Voltage

Y

Replace Power B/D

N

Wrecked Audio/Discontinuation/Noise only for Analog

Connect and check other external device

Replace Main B/D

End

(When RF signal is not received)
Request repair to external cable/ANT provider

(In case of External Input signal error)
Check and fix external device

Check and fix external device

(Wrecked Audio/Discontinuation/Noise only for External Input)

Normal Audio

Y

Check audio B+ Voltage (24V)

N
1. Remote control (R/C) operating error

- **Check R/C itself Operation**
  - Normal Operating: Y
  - Normal Operating: N

- **Check R/C Operating When turn off light in room**
  - Normal Operating: Y
  - Normal Operating: N

- **Check & Repair**
  - Cable connection
  - Connector solder

- **Check & Replace Battery of R/C**
  - Normal Operating: Y
  - Normal Operating: N

- **Check B+ 3.5V On Main B/D**
  - Normal Voltage: Y
  - Normal Voltage: N

- **Check IR Output signal**
  - Normal Signal: Y
  - Normal Signal: N

- **Check 3.5v on Power B/D**
  - Replace Power B/D or Replace Main B/D (Power B/D don't have problem)

- **Replace Main B/D**

---

**Standard Repair Process**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>D. Function error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remote control &amp; Local switch checking</td>
<td></td>
<td>2012.01.14</td>
<td>11/14</td>
</tr>
</tbody>
</table>
## Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>D. Function error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External device recognition error</td>
<td>2012.01.14</td>
<td>12/14</td>
</tr>
</tbody>
</table>

### Check technical information
- Fix information
- S/W Version

### Check signal input
- **Y**: Check technical information
- **N**: Check input signal

### Check and fix external device/cable

### Technical information
- **Y**: Fix in accordance with technical information
- **N**: External Input and Component Recognition error

### Establish date
- 2012.01.14

### Revised date
- 12/14

### Error symptom

- **D. Function error**
- **External device recognition error**

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### Diagram

- Check input signal
  - Signal Input: **Y**
  - **N**: Check input signal

- Check technical information
  - Fix information
  - S/W Version

- Technical Information
  - **Y**: Fix in accordance with technical information
  - **N**: External Input and Component Recognition error

- HDMI, Optical Recognition error
  - Replace Main B/D

- Replace Main B/D

---

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---
E. Noise

- Circuit noise, mechanical noise

**Standard Repair Process**

- **Identify nose type**
  - Circuit noise
    - Check location of noise
      - OR
        - Replace PSU (with LED driver)
        - Replace LED driver
  - Mechanical noise
    - Check location of noise

※ Mechanical noise is a natural phenomenon, and apply the 1st level description. When the customer does not agree, apply the process by stage.
※ Describe the basis of the description in “Part related to nose” in the Owner’s Manual.

※ When the nose is severe, replace the module (For models with fix information, upgrade the S/W or provide the description)
※ If there is a “Tak Tak” noise from the cabinet, refer to the KMS fix information and then proceed as shown in the solution manual (For models without any fix information, provide the description)
standard repair process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>F. Exterior defect</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exterior defect</td>
<td></td>
<td>2012.01.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Revised date</td>
<td>14/14</td>
</tr>
</tbody>
</table>

- Zoom part with exterior damage
  - Module damage
    - Replace module
  - Cabinet damage
    - Replace cabinet
  - Remote controller damage
    - Replace remote controller
  - Stand damage
    - Replace stand
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>B. Power error_No power</td>
<td>Check front display LED</td>
<td>A11</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Check power input Voltage &amp; ST–BY 3.5V</td>
<td>A12</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>Checking method when power is ON</td>
<td>A13</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>POWER BOARD voltage measuring method</td>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>B. Power error_Off when on, off while viewing</td>
<td>POWER OFF MODE checking method</td>
<td>A14</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>C. Audio error_No audio/Normal video</td>
<td>Checking method in menu when there is no audio</td>
<td>A15</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>Voltage and speaker checking method when there is no audio</td>
<td>A16</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>C. Audio error_Wrecked audio/discontinuation</td>
<td>Voltage and speaker checking method in case of audio error</td>
<td>A16</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>D. Function error_ No response in remote controller, key error</td>
<td>Remote controller operation checking method</td>
<td>A17</td>
<td></td>
</tr>
<tr>
<td>LCD TV</td>
<td>Error symptom</td>
<td>A. Video error_No video/Normal audio</td>
<td>Established date</td>
<td>Revised date</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>---------------------------------</td>
<td>------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check Back Light On with naked eye</td>
<td>2012.01.14</td>
<td>A1</td>
</tr>
</tbody>
</table>

**<ALL MODELS>**

Power On -> disjoint back case -> check lighting at 2 points.
<table>
<thead>
<tr>
<th>Error symptom</th>
<th>A. Video error_No video/Normal audio</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Inverter B+ 24V measuring method</td>
<td>2012.01.14</td>
<td>A2</td>
</tr>
</tbody>
</table>

1. Measure DC 24V applying to inverter PCB from Power Board.

2. Output 24V from Power Board -> supply to inverter PCB.

Check Pin contacting statement and connection statement.
Entry method

1. Press the ADJ button on the remote controller for adjustment.

2. Enter into White Balance of item 7.

3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.
## Check DC 3.5V, 12V, 24V

<table>
<thead>
<tr>
<th>18 Pin (Power Board ↔ Main Board)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SMAW200–H18S5</td>
<td></td>
</tr>
<tr>
<td>1 2</td>
<td></td>
</tr>
<tr>
<td>Power on</td>
<td>DRV ON</td>
</tr>
<tr>
<td>3 4</td>
<td></td>
</tr>
<tr>
<td>3.5V</td>
<td>PDIM#1</td>
</tr>
<tr>
<td>5 6</td>
<td></td>
</tr>
<tr>
<td>3.5V</td>
<td>3.5V</td>
</tr>
<tr>
<td>7 8</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>PDIM#2</td>
</tr>
<tr>
<td>9 10</td>
<td></td>
</tr>
<tr>
<td>24V</td>
<td>24V</td>
</tr>
<tr>
<td>11 12</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>13 14</td>
<td></td>
</tr>
<tr>
<td>12V</td>
<td>12V</td>
</tr>
<tr>
<td>15 16</td>
<td></td>
</tr>
<tr>
<td>12V</td>
<td>NC</td>
</tr>
<tr>
<td>17 18</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
</tbody>
</table>
MENU => Press red key
Remote controller=>signal test
=> Select channel

When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)
1. Checking method for remote controller for adjustment

Press the IN-START with the remote controller for adjustment
<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Content</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Video error _Vertical/Horizontal bar, residual image, light spot</td>
<td>LCD TV connection diagram (1)</td>
<td>2012.01.14</td>
<td>A7</td>
</tr>
</tbody>
</table>

<ALL MODELS> The picture depends on model.

As the part connecting to the external input, check the screen condition by signal
1. Check and replace LVDS Cable
2. Check LVDS connection condition
### Adjustment Test pattern - ADJ Key

#### You can view 6 types of patterns using the ADJ Key

Checking item: 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR, SCAN BAR..) 4. Video error (Classification of MODULE or Main-B/D!)
Appendix : Exchange T-Con Board (1)

- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Solder defect, CNT Broken
- Abnormal Power Section
- Abnormal Power Section
- Solder defect, Short/Crack
- Solder defect, Short/Crack
Appendix : Exchange T-Con Board (2)

- Abnormal Power Section
- Abnormal Power Section
- Solder defect, Short/Crack

- Solder defect, Short/Crack
- Fuse Open, Abnormal power section
- Abnormal Display

- GRADATION
- Noise
- GRADATION
Appendix: Exchange PSU (LED driver)

- No Light
- Dim Light
- Dim Light
- No picture/Sound Ok
Appendix : Exchange the Module (1)

Panel Mura, Light leakage

Panel Mura, Light leakage

Press damage

Crosstalk

Press damage

Crosstalk

Un-repairable Cases
In this case please exchange the module.
Appendix : Exchange the Module (2)

Un-repairable Cases
In this case please exchange the module.
B. Power error _No power

ST-BY condition: Red

Front LED control:
Menu → Option → Standby Light → On/Off
Standard Repair Process Detail Technical Manual

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>B. Power error _No power</th>
<th>Established date</th>
<th>Revised date</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Check power input voltage and ST-BY 5V</td>
<td>2012.01.14</td>
<td>A12</td>
<td></td>
</tr>
</tbody>
</table>

Check DC 3.5V, 12V, 24V

<table>
<thead>
<tr>
<th>18 Pin (Power Board ↔ Main Board)</th>
<th>SMAW200–H18S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power on</td>
</tr>
<tr>
<td>3</td>
<td>3.5V</td>
</tr>
<tr>
<td>5</td>
<td>3.5V</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>9</td>
<td>24V</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
</tr>
<tr>
<td>13</td>
<td>12V</td>
</tr>
<tr>
<td>15</td>
<td>12V</td>
</tr>
<tr>
<td>17</td>
<td>GND</td>
</tr>
</tbody>
</table>
## B. Power error _No power_

### Checking method when power is ON

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD TV</td>
<td>Checking method when power is ON</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012.01.14</td>
<td>A13</td>
</tr>
</tbody>
</table>

Check “power on(Pin 1)” pin is high (about 3.3V)

<table>
<thead>
<tr>
<th>18 Pin (Power Board ↔ Main Board)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMAW200–H18S5</td>
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<td>17</td>
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</tbody>
</table>
Checking order

1. Press the IN-START button of the remote controller for adjustment

2. Check the entry into adjustment item 3.
Checking order

1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker Check
### LCD TV Error symptom

<table>
<thead>
<tr>
<th>C. Audio error_No audio/Normal video</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage and speaker checking method when there is no audio</td>
<td>2012.01.14</td>
<td>A16</td>
</tr>
</tbody>
</table>

### Checking order

1. Check the contact condition of or 24V connector of Main Board
2. Measure the 24V input voltage supplied from Power Board (If there is no input voltage, remove and check the connector)
3. Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

### Voltage and speaker checking method

**18 Pin (Power Board ↔ Main Board)**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| Power on | DRV ON | 3.5V | PDIM#1 | 3.5V | 3.5V | GND | PDIM#2 | 24V | 24V | GND | GND | 12V | 12V | 12V | NC | GND | GND |

<ALL MODELS>
<ALL MODELS>

Checking order

1, 2. Check IR cable condition between IR & Main board.

3. Check the standby 3.3V on the terminal 4.

4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.