LED LCD TV
SERVICE MANUAL

CHASSIS : LB91L
MODEL : 42SL90QD 42SL90QD-AA

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 △ 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 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 1MQ and 5.2MQ.
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 is 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

[Diagram of 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".
   **CAUTION:** Before servicing receivers covered by this service manual, always follow the safety precautions.

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.

**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.

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.

7. 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. Carefully remove the transistor from the heat sink of the circuit board.
3. Solder each transistor lead, and clip off excess lead.
4. 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. Application Range
This specification sheet is applied to the LCD TV used LB91L chassis.

2. Specification
Each part is tested as below without special appointment

1) Temperature : 25 ± 5°C (77 ± 9°F), CST : 40 ± 5°C
2) Relative Humidity : 65 ±10%
3) Power Voltage : Standard input voltage(100-240V@ 50/60Hz)
   * 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 20 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 specification

4. Module Specification

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Display Screen Device</td>
<td>42 wide Color Display Module</td>
<td>LCD</td>
</tr>
<tr>
<td>2.</td>
<td>Aspect Ratio</td>
<td>16:9</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>LCD Module</td>
<td>42” TFT LCD FHD, 200Hz</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Operating Environment</td>
<td>Temp.: 0 ~ 50°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humidity : 10 ~ 90%</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Storage Environment</td>
<td>Temp. : -20 ~ 60 deg</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Input Voltage</td>
<td>AC 100-240V~, 50/60Hz</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Power Consumption</td>
<td>Power on (White)</td>
<td>LCD(Module)+Backlight(Lamp)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typ :154, Max :168</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Module Size</td>
<td>973.2 (H)x 566.2 (V)x 11.9(B)/25.5 mm(D)</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Pixel Pitch</td>
<td>0.4845 (H)x 0.4845 (V)</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Back Light</td>
<td>LED</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Color Depth</td>
<td>1.06B Colors (10bit)</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Coating</td>
<td>3H</td>
<td></td>
</tr>
</tbody>
</table>
### 5. 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>Australia/ New Zealand/ Singapore</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Broadcasting system</td>
<td>Digital</td>
<td>DVB-T 06-12, UHF 27-69 Australia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analog</td>
<td>UHF 21-69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) PAL-B/B</td>
<td>VHF/UHF 0-75 , CATV 2-44 Australia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) PAL-BG</td>
<td>VHF/UHF 1-69 , CATV 01-47 New Zealand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) PAL-I</td>
<td>VHF/UHF 1-69 , CATV 01-47 Singapore</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) PAL-DK</td>
<td>VHF/UHF 1-69 , CATV 01-47 Singapore</td>
</tr>
<tr>
<td>3</td>
<td>Receiving system</td>
<td>Analog : Upper Heterodyne</td>
<td>Digital : COFDM, QAM</td>
</tr>
<tr>
<td>4</td>
<td>Video Input RCA(2EA)</td>
<td>PAL, NTSC</td>
<td>2 System : PAL, NTSC</td>
</tr>
<tr>
<td>5</td>
<td>Component Input (2EA)</td>
<td>Y/Cb/Cr, Y/Pb/Pr</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RGB Input</td>
<td>RGB-PC</td>
<td>Analog(D-SUB 15PIN)</td>
</tr>
<tr>
<td>7</td>
<td>HDMI Input (4EA)</td>
<td>HDMI1-DTV/DVI</td>
<td>PC(HDMI version 1.3)/DTV format, Support HDCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDMI2-DTV</td>
<td>DTV format, Support HDCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDMI3-DTV</td>
<td>DTV format, Support HDCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDMI4-DTV</td>
<td>DTV format, Support HDCP</td>
</tr>
<tr>
<td>8</td>
<td>Audio Input (4EA)</td>
<td>RGB/DVI Audio,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Component 1/2, AV</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>SDPIF out (1EA)</td>
<td>Optical Audio out</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>USB (1EA)</td>
<td>USB2.0</td>
<td>JPEG, MP3, DivX and SVC (download)</td>
</tr>
</tbody>
</table>

### 6. Component Video Input (Y, P_B, P_R)

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq(Hz)</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>720x480</td>
<td>15.73</td>
<td>60.00</td>
<td>SDTV, DVD 480i</td>
</tr>
<tr>
<td>2.</td>
<td>720x480</td>
<td>15.63</td>
<td>59.94</td>
<td>SDTV, DVD 480i</td>
</tr>
<tr>
<td>3.</td>
<td>720x480</td>
<td>31.47</td>
<td>59.94</td>
<td>480p</td>
</tr>
<tr>
<td>4.</td>
<td>720x480</td>
<td>31.50</td>
<td>60.00</td>
<td>480p</td>
</tr>
<tr>
<td>5.</td>
<td>720x576</td>
<td>15.625</td>
<td>50.00</td>
<td>SDTV, DVD 625 Line</td>
</tr>
<tr>
<td>6.</td>
<td>720x576</td>
<td>31.25</td>
<td>50.00</td>
<td>HDTV 576p</td>
</tr>
<tr>
<td>7.</td>
<td>1280x720</td>
<td>45.00</td>
<td>50.00</td>
<td>HDTV 720p</td>
</tr>
<tr>
<td>8.</td>
<td>1280x720</td>
<td>44.96</td>
<td>59.94</td>
<td>HDTV 720p</td>
</tr>
<tr>
<td>9.</td>
<td>1280x720</td>
<td>45.00</td>
<td>60.00</td>
<td>HDTV 720p</td>
</tr>
<tr>
<td>10.</td>
<td>1920x1080</td>
<td>31.25</td>
<td>50.00</td>
<td>HDTV 1080i</td>
</tr>
<tr>
<td>11.</td>
<td>1920x1080</td>
<td>33.75</td>
<td>60.00</td>
<td>HDTV 1080i</td>
</tr>
<tr>
<td>12.</td>
<td>1920x1080</td>
<td>33.72</td>
<td>59.94</td>
<td>HDTV 1080i</td>
</tr>
<tr>
<td>13.</td>
<td>1920x1080</td>
<td>56.250</td>
<td>50</td>
<td>HDTV 1080p</td>
</tr>
<tr>
<td>14.</td>
<td>1920x1080</td>
<td>67.43/67.5</td>
<td>59.94/60</td>
<td>HDTV 1080p</td>
</tr>
</tbody>
</table>
### 7. RGB input (PC)

<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>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>720*400</td>
<td>31.468</td>
<td>70.08</td>
<td></td>
<td>For only DOS mode</td>
</tr>
<tr>
<td>2.</td>
<td>640*480</td>
<td>31.469</td>
<td>59.94</td>
<td></td>
<td>Input 848<em>480 60Hz, 852</em>480 60Hz -&gt; 640*480 60Hz Display</td>
</tr>
<tr>
<td>3.</td>
<td>800*600</td>
<td>37.879</td>
<td>60.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1024*768</td>
<td>48.363</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1280*768</td>
<td>47.78</td>
<td>59.87</td>
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</tr>
<tr>
<td>6.</td>
<td>1360*768</td>
<td>47.72</td>
<td>59.8</td>
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<tr>
<td>7.</td>
<td>1280*1024</td>
<td>63.595</td>
<td>60.0</td>
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<tr>
<td>8.</td>
<td>1920*1080</td>
<td>66.587</td>
<td>59.93</td>
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</tr>
<tr>
<td>9.</td>
<td>1366*768</td>
<td>47.13</td>
<td>59.65</td>
<td></td>
<td></td>
</tr>
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</table>

### 8. HDMI input (PC/DTV)

<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>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>720*480</td>
<td>31.469</td>
<td>59.94</td>
<td>27.00/27.03</td>
<td>SDTV 480P</td>
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<tr>
<td>2.</td>
<td>720*576</td>
<td>31.25</td>
<td>50</td>
<td>54</td>
<td>SDTV 576P</td>
</tr>
<tr>
<td>3.</td>
<td>1280*720</td>
<td>37.500</td>
<td>50</td>
<td>74.25</td>
<td>HDTV 720P</td>
</tr>
<tr>
<td>4.</td>
<td>1280*720</td>
<td>44.96 /45.5</td>
<td>9.94 /60</td>
<td>74.17/74.25</td>
<td>HDTV 720P</td>
</tr>
<tr>
<td>5.</td>
<td>1920*1080</td>
<td>33.72 /33.75</td>
<td>59.94 /60</td>
<td>74.17/74.25</td>
<td>HDTV 1080I</td>
</tr>
<tr>
<td>6.</td>
<td>1920*1080</td>
<td>28.125</td>
<td>50.00</td>
<td>74.25</td>
<td>HDTV 1080I</td>
</tr>
<tr>
<td>7.</td>
<td>1920*1080</td>
<td>26.97 /27</td>
<td>23.97 /24</td>
<td>74.17/74.25</td>
<td>HDTV 1080P</td>
</tr>
<tr>
<td>8.</td>
<td>1920*1080</td>
<td>33.716 /33.75</td>
<td>29.976 /30.00</td>
<td>74.25</td>
<td>HDTV 1080P</td>
</tr>
<tr>
<td>9.</td>
<td>1920*1080</td>
<td>56.250</td>
<td>50</td>
<td>148.5</td>
<td>HDTV 1080P</td>
</tr>
<tr>
<td>10.</td>
<td>1920*1080</td>
<td>67.43 /67.5</td>
<td>59.94 /60</td>
<td>148.35/148.50</td>
<td>HDTV 1080P</td>
</tr>
<tr>
<td>PC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>720*400</td>
<td>31.468</td>
<td>70.08</td>
<td></td>
<td>For only DOS mode</td>
</tr>
<tr>
<td>2.</td>
<td>640*480</td>
<td>31.469</td>
<td>59.94</td>
<td>Input 848<em>640 60Hz, 852</em>480 60Hz -&gt; 640*480 Display</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>800*600</td>
<td>37.879</td>
<td>60.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1024*768</td>
<td>48.363</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1280*768</td>
<td>47.78</td>
<td>59.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>1360*768</td>
<td>47.72</td>
<td>59.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>1280*1024</td>
<td>63.595</td>
<td>60.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>1920*1080</td>
<td>66.587</td>
<td>59.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>1366*768</td>
<td>47.13</td>
<td>59.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ADJUSTMENT INSTRUCTION

1. Application
This spec. sheet is applied all of the LCD TV with LB91L 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: 220V, 60Hz
(6) Adjustment equipments: Color Analyzer (CA-210 or CA-110), Pattern Generator (MSPG-925L or Equivalent), DDC Adjustment Jig equipment, SVC remote controller.
(7) Push The “IN STOP KEY” - For memory initialization.

Case1: Software version up
1. After downloading S/W by USB, TV set will reboot automatically
2. Push “In-stop” key
3. Push “Power on” key
4. Function inspection
5. After function inspection, Push “In-stop” key.

Case2: Function check at the assembly line
1. When TV set is entering on the assembly line, Push “In-stop” key at first.
2. Push “Power on” key for turning it on.
   -> If you push “Power on” key, TV set will recover channel information by itself.
3. After function inspection, Push “In-stop” key.

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

3-1. 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”.
4) Click “Connect” tab. If “Can’t ” is displayed, Check connection between computer, jig, and set.

5) Click “Auto” tab and set as below
6) Click “Run”.
7) After downloading, check “OK” message.

Please Check the Speed:
To use speed between 200KHz to 400KHz
3-2. USB DOWNLOAD(*.epk file download)

1) Put the USB Stick to the USB socket
2) Automatically detecting update file in USB Stick
   - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting
3) Show the message “Copying files from memory”
4) Updating is staring.
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 downloading version is more high than your TV have, 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 controller.
2) Select “Tool Option 1” and Push “OK” button.
3) Punch in the number. (Each model has their number.)
4) Completed selecting Tool option.

3-3. ADC Process

• Input signal : Component
• Signal equipment displays.

• Component 480i
  MODEL: 209 in Pattern Generator(480i Mode)
  PATTERN : 65 in Pattern Generator(MSPG-925 Series)
• Input Signal : RGB(You don’t need to connect RGB cable Because We use TV internal pattern)
• After enter Service Mode by pushing “ADJ” key,
  • Enter Internal ADC mode by pushing “G” key at “5. ADC Calibration”

* Caution : Using ‘power on’ button of the Adjustment R/C, power on TV.

* ADC Calibration Protocol (RS232)

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>CMD1</th>
<th>CMD2</th>
<th>Data0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enter Adjust Mode</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>ADC adjust</td>
<td>A</td>
<td>D</td>
<td>1</td>
</tr>
</tbody>
</table>

- Adjust Sequence
  • aa 00 00 [Enter Adjust Mode]
  • xb 00 40 [Component Input (480i)]
  • ad 00 10 [Adjust 480i Comp1]
  • xb 00 60 [RGB Input (1024*768)]
  • ad 00 10 [Adjust 1024*768 RGB]
  • aa 00 00 End Adjust mode

* Required equipment : Adjustment R/C.

3-4. Function Check

• Check Input and Signal items. (cf. work instructions)
  1) TV
  2) AV (CVBS)
  3) COMPONENT (480i)
  4) RGB (PC : 1024 x 768 @ 60hz)
  5) HDMI
  6) PC Audio In

* Display and Sound check is executed by Remote control.
* Caution : Not to push the INSTOP key after completion if the function inspection.
4. Total Assembly line process

4-1. Adjustment Preparation

- W/B Equipment condition
  - CA210 : CH 9, Test signal : Inner pattern (85IRE)
  - Above 5 minutes H/run in the inner pattern. (Power on* key of adjust remote control)

- 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 R/C 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 10ux).
  2) Adhere closely the Color Analyzer (CA210) 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.

* Auto adjustment Map(RS-232C)
  - RS-232C COMMAND
    [ CMD ID DATA ]
    - Wb 00 00 White Balance Start
    - Wb 00 ff White Balance End

<table>
<thead>
<tr>
<th>Minute</th>
<th>Cool</th>
<th>Medium</th>
<th>Warm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>276/289</td>
<td>293/308</td>
<td>318/338</td>
</tr>
<tr>
<td>5-9</td>
<td>276/289</td>
<td>293/307</td>
<td>319/337</td>
</tr>
<tr>
<td>10-14</td>
<td>275/286</td>
<td>292/305</td>
<td>318/335</td>
</tr>
<tr>
<td>15-24</td>
<td>274/284</td>
<td>291/303</td>
<td>317/333</td>
</tr>
<tr>
<td>25-39</td>
<td>273/282</td>
<td>290/301</td>
<td>316/331</td>
</tr>
<tr>
<td>40-49</td>
<td>272/280</td>
<td>269/298</td>
<td>315/329</td>
</tr>
<tr>
<td>50-79</td>
<td>270/277</td>
<td>267/295</td>
<td>314/326</td>
</tr>
<tr>
<td>80-</td>
<td>269/273</td>
<td>265/293</td>
<td>312/324</td>
</tr>
</tbody>
</table>

  - After enter Service Mode by pushing “ADJ” key,
  - Enter White Balance by pushing “►” key at “3. White Balance”.

* After done 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.

4-2. DDC EDID Write (RGB 128Byte )

- Connect D-sub Signal Cable to D-Sub Jack.
- Write EDID DATA to EEPROM (24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.

* For SVC main Ass’y, EDID have to be downloaded to Insert Process in advance.

4-3. 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 Ass’y, EDID have to be downloaded to Insert Process in advance.

4-4. 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.

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

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>CMD1</th>
<th>CMD2</th>
<th>Data0</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Enter Download</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td>02</td>
<td>Mode In</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>EDID data</td>
<td>A</td>
<td>E</td>
<td>00 0</td>
</tr>
<tr>
<td>04</td>
<td>Model option</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Edid data and Model option download (RS232)

- Detail EDID Options are below

<table>
<thead>
<tr>
<th>Product ID</th>
<th>MODEL NAME</th>
<th>HEX</th>
<th>EDID Table</th>
<th>DDC Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD Model</td>
<td>0001</td>
<td>01 00</td>
<td>Analog/Digital</td>
<td></td>
</tr>
</tbody>
</table>

- Month, Year: SW Released day : ex Monthly : ‘09’ -> ‘09’ Year : ‘2006’ -> ‘10’
- Model Name(Hex):

<table>
<thead>
<tr>
<th>MODEL</th>
<th>MODEL NAME(HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>00 00 00 FC 00 4C 47 20 54 56 0A 01 20 20 20 20 20 (LG TV)</td>
</tr>
</tbody>
</table>

- Checksum: Changeable by total EDID data.
- Vendor Specific

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
<th>Data(Hex)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer ID</td>
<td>GSM</td>
<td>1E6D</td>
</tr>
<tr>
<td>Version</td>
<td>Digital : 1</td>
<td>01</td>
</tr>
<tr>
<td>Revision</td>
<td>Digital : 3</td>
<td>03</td>
</tr>
</tbody>
</table>

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EXPLODED VIEW

IMPORTANT SAFETY NOTICE

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.
CONTROL & BREATHING LED

IR & EYE-O

SMD GASKET
42"/47"
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>Error symptom</th>
<th>A. Video error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>No video/ Normal audio</td>
<td>2008. 3 .26</td>
<td></td>
<td>1/13</td>
</tr>
</tbody>
</table>

1. No video
   - Normal audio
     - Y: Check Back Light On with naked eye
     - N: Move to No video/No audio

2. Check Power Board 20V or 24V output
   - Y: Replace Inverter or module
   - N: Repair Power Board or parts

3. Check Power Board 12V, 5V etc.
   - Y: Normal voltage
     - Y: Replace Main Board
     - N: OR Replace T-con Board or module
   - N: Repair Power Board or parts

※ Precaution A7 & A4
Always check & record S/W Version and White Balance value before replacing the Main Board

Replace Main Board → Re-enter White Balance value
A. Video error

<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></td>
<td>2008. 3 .26</td>
<td>2/13</td>
</tr>
</tbody>
</table>

No Video/ No audio

- Check various voltages of Power Board (5V, 12V, 20V or 24V...)

- Normal voltage?

  - Y: Check and replace MAIN B/D
  - N: Replace Power Board and repair parts

End
**A. Picture Problem**

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Picture Problem</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Picture broken/ Freezing</td>
<td></td>
<td>2008. 3. 26</td>
<td>3/13</td>
</tr>
</tbody>
</table>

### A6 Check RF Signal level

- By using Digital signal level meter
- By using Diagnostics menu on OSD
  - (Menu→Setup→Diagnostic)
  - Signal strength (Normal: over 50%)
  - Signal Quality (Normal: over 50%)

**Y** Check Normal Signal?

**N** Check RF Cable Connection

#### 1. Reconnection

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

#### A7

- Menu→Setup→Booster

#### SVC Bulletin?

- Y
  - Close
- N
  - S/W Upgrade

#### S/W Upgrade?

- Y
  - Close
- N
  - Normal Picture?

#### Normal Picture?

- Y
  - Close
- N
  - Contact with signal distributor or broadcaster (Cable or Air)

### Replace Main B/D

- Close
A. Video error

<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>Color error</td>
<td></td>
<td>2008. 3. 26</td>
<td>4/13</td>
</tr>
</tbody>
</table>

**A8**

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

**A10/ A11**

- Check and replace Link Cable (LVDS) and contact condition
  - Color error?
    - Y
    - N
      - Check color input mode

**A27**

- Replace module
  - Color error?
    - Y
    - N

**A12**

- Check Test pattern
  - External Input/Component error
    - Y
    - N
      - Check external device and cable

- RGB/HDMI/DVI error
  - Check external device and cable
    - Y
    - N

- External device/Cable normal
  - Y
    - Replace Main B/D
  - N
    - Request repair for external device/cable
      - Y
        - Replace Main B/D
      - N
        - Replace Main B/D

End
### Standard Repair Process

<table>
<thead>
<tr>
<th>Error symptom</th>
<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>2008. 3. 26</td>
<td>5/13</td>
<td></td>
</tr>
</tbody>
</table>

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

1. **A13**
   - Check color condition by input
     - External Input
     - Component
     - RGB
     - HDMI/DVI

2. **Screen normal?**
   - **Y**
     - Check and replace Link Cable
   - **N**
     - Request repair for external device

3. **A14/A15**
   - Normal?
     - **Y**
       - Replace T-Con Board
     - **N**
       - Check and replace Link Cable

4. **A27**
   - Screen normal?
     - **Y**
       - Replace Main B/D
     - **N**
       - Replace module

5. **Other Module**
   - Replace module in abnormal displaying after exchanging T-Con B'd

#### External device screen error - Color error

1. **Check S/W Version**
   - **N**
     - Check version
       - **Y**
         - S/W Upgrade
       - **N**
         - Normal screen?
           - **Y**
             - End
           - **N**
             - Connect other external device and cable
               (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
               - Component error
               - RGB error
               - HDMI/DVI error

   - **Y**
     - Connect other external device and cable
       (Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)
       - Screen normal?
         - **Y**
           - Replace Main B/D
         - **N**
           - Request repair for external device

   - End
## B. Power error

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No power</td>
<td>2008.3.26</td>
<td>6/13</td>
</tr>
</tbody>
</table>

### Standard Repair Process

**A17**

- **Check Power LED**
  - Power LED On?
    - Y: DC Power on by pressing Power Key On Remote control
    - N: Check Power cord was inserted properly

**A18**

- Normal voltage?
  - Y: Check ST-BY 5V
    - Y: Close
    - N: Replace Power B/D
  - N: Replace Power B/D

**A19**

- Normal operation?
  - Y: Check Power On “High”
    - Y: OK?
      - Y: Replace Power B/D
      - N: Replace Main B/D
    - N: N

**A20**

- Measure voltage of each output of Power B/D
  - Y: Replace Main B/D
  - N: Replace Power B/D

**A21**

- Check & Repair Mechanical Power switch on Local control of TV

---

**Note:**

- '09 years new model apply mechanical power switch to reduce power consumption in stand-by status.
- If mechanical power switch off
  - Doesn’t turn on by remote control
  - Doesn’t appear LED light
- Please refer to the A21 Page

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Standard Repair Process

LCD TV | Error symptom | B. Power error | Established date | Revised date
--- | --- | --- | --- | ---
 | Off when on, off while viewing, power auto on/off | 2008. 3.26 | 7/13

**A22**

Error?

- **N**
  - Check A/C code
  - Check outlet
  - Check for 3 wave length
  - Fix A/C code & Outlet and describe 3 wave length

- **Y**
  - Check Power Off Mode
    - CPU Abnormal
      - Replace Main B/D
    - Normal
      - End

**A23**

- **N**
  - Replace Power B/D
- **Y**
  - Normal voltage?
    - **Y**
      - Replace Main B/D
    - **N**
      - Replace Power B/D

* 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_OFFTIMER&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_AUTOOFF&quot;</td>
<td>Power off by AUTO OFF</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_ONTIMER&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_RESREC&quot;</td>
<td>Power off by Reserved Record</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_RECEND&quot;</td>
<td>Power off by End of Recording</td>
</tr>
<tr>
<td></td>
<td>&quot;POWEROFF_SWDOWN&quot;</td>
<td>Power off by S/W Download</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_CPUABNORMAL&quot;</td>
<td>Power off by CPU Abnormal</td>
</tr>
</tbody>
</table>
Standard Repair Process

### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>C. Audio error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>No audio/ Normal video</td>
<td>2008. 3.26</td>
<td>8/13</td>
<td></td>
</tr>
</tbody>
</table>

#### No audio

**Screen normal**

- **A24**
  - Check user menu > Speaker off
  - Off
  - Normal voltage
    - Cancel OFF and describe
    - Replace Power Board and repair parts

- **A25**
  - Check audio B+ 20V or 24V of Power Board
  - Replace MAIN Board
  - End

- Check Speaker disconnection
  - Replace Speaker
Wrecked audio/discontinuation/noise is same after “Check input signal” compared to No audio

Check input signal
- RF
- External Input signal

Signal normal?

Y

N

(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

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

Wrecked audio/Discontinuation/Noise only for Analog

Replace Power B/D

Wrecked audio/Discontinuation/Noise only for External input

Connect and check other external device

Normal audio?

Y

N

Check and fix external device

Check audio B+ Voltage (20V or 24V)

Normal voltage?

Y

N

Replace Power B/D

Replace Main B/D

End
D. General Function Problem

Remote control & Local switch checking

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>D. General Function Problem</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2008. 3.26</td>
<td>10/13</td>
</tr>
</tbody>
</table>

1. Remote control(R/C) operating error

- Check R/C itself Operation
  - Normal operating?
    - Y: Check & Repair Cable connection Connector solder
    - N: Check R/C Operating When turn off light in room
      - Normal operating?
        - Y: Normal operating?
          - Y: Check B+ 5V On Main B/D
          - N: Check IR Output signal
        - N: Move
          - Power problem Section
      - N: Replace R/C

- Check B+ 5V On Main B/D
  - Normal Voltage?
    - Y: Check IR Output signal
    - N: Close

- Check 5v on Power B/D Replace Power B/D or Replace Main B/D (Power B/D don't have problem)

2. Local(Mechanical) switch operating error

- Check R/C Operation
  - Normal operating?
    - Y: Check & Repair Cable connection Connector solder
    - N: Move
      - Power problem Section

- Check Assembly status (Key PCB + tool)
  - Normal Operating?
    - Y: Check Key Output signal
    - N: Close

- Check Key Output signal
  - Normal Signal?
    - Y: Replace Main B/D
    - N: Repair/Replace Local switch 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></td>
<td>External device recognition error</td>
<td>2008. 3 .26</td>
<td>11/13</td>
</tr>
</tbody>
</table>

### Check technical information - Fix information
- **S/W Version**
- **N**
  - Technical information?
    - **Y**
      - Check and fix external device/cable
    - **N**
      - Check signal input?
        - **Y**
          - Check and fix external device/cable
        - **N**
          - External Input and Component Recognition error
            - **Y**
              - Replace Main B/D
            - **N**
              - RGB, HDMI, DVI, Optical Recognition error
                - **Y**
                  - Replace Main B/D
                - **N**
                  - Fix in accordance with technical information
## Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>E. Noise</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circuit noise, mechanical noise</td>
<td>2008. 3.26</td>
<td>12/13</td>
</tr>
</tbody>
</table>

### Circuit noise
- Identify noise type
- Check location of noise
- Replace inverter
- OR
- Replace LIPS B/D

### 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.

- ※ 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)

- ※ When the noise is severe, replace the module (For models with fix information, upgrade the S/W or provide the description)

- <With Inverter Module>
- <Without Inverter Module>
<table>
<thead>
<tr>
<th><strong>F. Exterior defect</strong></th>
<th><strong>Established date</strong></th>
<th><strong>Revised date</strong></th>
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</thead>
<tbody>
<tr>
<td>Exterior defect</td>
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<td>13/13</td>
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### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom part with exterior damage</td>
<td>Replace module</td>
</tr>
<tr>
<td>Cabinet damage</td>
<td>Replace cabinet</td>
</tr>
<tr>
<td>Remote controller damage</td>
<td>Replace remote controller</td>
</tr>
<tr>
<td>Stand dent</td>
<td>Replace stand</td>
</tr>
</tbody>
</table>
## LCD TV Repair Process Index

**- Trouble shooting by input block (Component level check)**

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<th>Input Block</th>
<th>Page</th>
<th>Remark</th>
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<tbody>
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<td>Power Problem</td>
<td>Power-up Boot fail</td>
<td>1~2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>No OSD</td>
<td>3~4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Digital TV</td>
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<td></td>
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<tr>
<td>4</td>
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<td>Analog TV</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Video Problem</td>
<td>AV (Scart / CVBS/ S-Video)</td>
<td>7~12</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Component</td>
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<td>7</td>
<td></td>
<td>RGB(D-SUB)</td>
<td>14~15</td>
<td></td>
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<td>8</td>
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<td>HDMI</td>
<td>16~17</td>
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<td>Audio Problem</td>
<td>All Input</td>
<td>18</td>
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<td>10</td>
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<td>Digital TV</td>
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<td>Analog TV</td>
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<td>AV / Component / RGB, HDMI-PC/ HDMI-DTV</td>
<td>21~26</td>
<td></td>
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<td>AV Audio out / No Audio (Headphone &amp; SPDIF)</td>
<td>27~30</td>
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<td>USB / Remocon Problem</td>
<td>USB no connect / Remocon</td>
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<td>Intelligent Sensor</td>
<td>Intelligent Sensor</td>
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<td></td>
</tr>
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</table>
**LCD TV** | **Symptom** | **Power-Up Boot Fail**
---|---|---

**Making:** 2009.2.1  
**Revision:** 1/25

- **P800 Pin #7–#10**  
  Voltage Level = 5V ?  
  - NO
  - YES

- **P800 Pin #2**  
  Voltage Level = 5V ?  
  - NO
  - YES

- **P800 Pin #13, 14 = 12V**  
  P800 Pin #17, 18 = 24V ?  
  - NO  
  - YES

- **MAIN B’D L815 = 3.3V ?**  
  - NO
  - YES

- **MAIN B’D L816 = 1.26V ?**  
  - NO
  - YES

- **MAIN B’D L809 = 1.8V ?**  
  - NO
  - YES

- **Check MAIN B’D X100 Clock 12MHz**  
  - NO
  - YES

- **Replace MAIN B’D IC102 NAND FLASH**  
  - NO
  - YES

- **Replace MAIN B’D IC103 Serial Flash**  
  - NO
  - YES

- **Replace MAIN B’D IC300, IC301 DDR2 Memory**  
  - NO
  - YES

- **Replace MAIN B’D IC100**

---

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**No OSD**

1. Check Power connector OK?
   - Yes: Replace Power Board
   - No: Replace MAIN B'D Q802

2. P800 Pin #13, 14 = 12V
   - Yes: Check LVDS Cable OK?
     - Yes: Replace Main Board
     - No: Replace LVDS Cable
   - No: Replace MAIN B'D Q805

3. P800 Pin #17, 18 = 24V?
   - Yes: MAIN B'D L810 = 12V?
     - Yes: Replace LVDS Cable
     - No: Replace MAIN B'D Q802
   - No: Replace MAIN B'D Q805

4. MAIN B'D L810 = 12V?
   - Yes: Replace LVDS Cable
   - No: Replace MAIN B'D Q805
Check RF Cable

YES

MAIN B’D L1111 = 5V ?

NO

Replace MAIN B’D IC808

YES

MAIN B’D L1112 = 3.3V ?

NO

Replace MAIN B’D IC1103

YES

MAIN B’D L1113 = 1.8V ?

NO

Replace MAIN B’D IC1105

YES

MAIN B’D X1101 Clock ?

NO

Replace MAIN B’D X1101
Analog TV Video Problem

Check RF Cable

- YES
- MAIN B'D L1111 = 5V?
  - NO → Replace MAIN B'D IC808
  - YES
- MAIN B'D L1112 = 3.3V?
  - NO → Replace MAIN B'D IC1103
  - YES
- MAIN B'D L1113 = 1.8V?
  - NO → Replace MAIN B'D IC1105
  - YES
- MAIN B'D X1101 Clock?
  - NO → Replace MAIN B'D X1101
AV1 (CVBS) No Video Problem

<table>
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<tr>
<th>LCD TV</th>
<th>Symptom</th>
<th>AV1 (CVBS) No Video Problem</th>
</tr>
</thead>
<tbody>
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<td>Making</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Revision</td>
</tr>
</tbody>
</table>

- **Check Signal format**
  - Is it supported? **YES**
  - **Check the RCA Cable**
    - **YES**
    - Check MAIN B'D R420 Video Signal?
      - **NO**
      - MAIN B'D JK402 Check
        - **NO**
        - **Replace MAIN B'D JK402**
      - **YES**
      - **Replace MAIN B'D IC 100**
    - **NO**
    - **Replace MAIN B'D C217**
  - **NO**
  - **Replace MAIN B'D C217**

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# AV2 (CVBS) No Video Problem

<table>
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<th>Symptom</th>
<th>AV2 (CVBS) No Video Problem</th>
<th>Making</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Revision</td>
<td>6/25</td>
</tr>
</tbody>
</table>

## Check Signal format
- Is it supported?
  - Yes
  - No

## Check the RCA Cable
- Yes
  - Check MAIN B’D R465 Video Signal
    - No
      - MAIN B’D JK402 Check
        - NO
          - Replace MAIN B’D JK404
      - YES
        - Replace MAIN B’D IC 100
    - YES
      - Replace MAIN B’D C211
  - NO
    - Replace MAIN B’D C211
LCD TV

Component1 No Video/
No Color Problem

<table>
<thead>
<tr>
<th>Symptom</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No Video/No Color Problem</td>
<td></td>
</tr>
</tbody>
</table>

- **Check Signal format**: Is it supported?
  - **YES**: Check the Component Cable
  - **NO**: Replace MAIN B'D JK402

- **Check the Component Cable**
  - **YES**: MAIN B'D JK402 Check
  - **NO**: Replace MAIN B'D JK402

- **Check MAIN B'D R421 Video Signal?**
  - **NO**: Replace MAIN B'D IC 100
  - **YES**: MAIN B'D R421 Check

- **Check MAIN B'D C200, C203 (Y) C201 (Pb) C202 (Pr) Video Signal?**
  - **NO**: Replace MAIN B'D C200 or C203 or C201 or C202
  - **YES**: Replace MAIN B'D IC 100
## Component2 No Video/No Color Problem

<table>
<thead>
<tr>
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<th>Symptom</th>
<th>Component2 No Video/No Color Problem</th>
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</thead>
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</tr>
<tr>
<td></td>
<td>Revision</td>
<td>8/25</td>
</tr>
</tbody>
</table>

### Diagram

1. **Check Signal format**
   - Is it supported?
   - **YES**
   - **Check the Component Cable**
     - **YES**
     - **Check MAIN B'D R422 Video Signal?**
       - **NO**
       - **MAIN B'D JK402 Check**
         - **NO**
         - **Replace MAIN B'D JK402**
       - **YES**
       - **Replace MAIN B'D IC 100**
     - **NO**
     - **Replace MAIN B'D C214 or C209 or C215 or C216**
   - **NO**
   - **Check MAIN B'D C214, C209 (Y) C215 (Pb) C216 (Pr) Video Signal?**
     - **NO**
     - **Replace MAIN B'D C214 or C209 or C215 or C216**
   - **YES**

---

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**LCD TV**  |  **Symptom**  |  **RGB No Video Problem**  
---|---|---

**Making**: 2009.2.1  
**Revision**: 9/25  

- Check Signal format Is it supported?  
  - YES  
  - Check the RGB Cable  
    - YES  
    - MAIN B’D JK405 Pin #2 Video signal? R446 has Vsync? R447 has Hsync?  
      - NO  
      - MAIN B’D JK405 Check  
        - NO  
        - Replace MAIN B’D JK405  
      - YES  
      - MAIN B’D JK405 Check  
      - NO  
      - Replace MAIN B’D JK405  
      - YES  
      - Replace MAIN B’D IC 100  

**Check MAIN B’D C207 (Video)**  
R2030 (HSYNC)  
R2031 (VSYNC)  

**Replace MAIN B’D C207 or R2030 or R2031**
**LCD TV** | **Symptom** | **RGB No Color Problem**
--- | --- | ---
| | | 

**Revision**

10/25

**Check Signal format**
Is it supported?

- YES

**Check the RGB Cable**

- YES

**MAIN B’D JK405**
Pin #3 (BLUE)
Pin #2 (GREEN)
Pin #1 (RED)
Video signal?

- NO

**MAIN B’D JK405 Check**

- NO

**Replace MAIN B’D JK405**

- YES

**Check MAIN B’D C2016 (RED)**
C2017 (GREEN)
C2018 (BLUE)
Video signal?

- NO

**Replace MAIN B’D C2016 or C2017 or C2018**

- YES

**Replace MAIN B’D IC 100**
**HDMI 1~4 All No Video Problem**

- **Check Signal format**
  - Is it supported? YES

- **Check the HDMI Cable**
  - YES

- **Check the ADJUST MENU**
  - EDID OK? NO (Refer to Adjustment Spec)
    - Download EDID

- **Replace**
  - MAIN B'D IC601 (HDCP KEY) NO
    - Replace MAIN B'D IC 100
**HDMI1 or 2 or 3 or 4 No Video Problem**

1. **Check Signal format**
   - Is it supported?
   - YES

2. **Check the HDMI Cable**
   - YES

3. **Check MAIN B’D IC600**
   - YES

4. **MAIN B’D JACK Check**
   - JK600 -> HDMI1
   - JK601 -> HDMI2
   - JK602 -> HDMI3
   - JK603 -> HDMI4
   - YES

5. **Replace MAIN B’D IC 100**
**LCD TV**  | **Symptom**  | **All Source no Audio Problem**
--- | --- | ---

- **Check The Speaker**
  - **YES**
  - replace speaker
  - **NO**
  - **Check Speaker Cable**
    - **YES**
    - MAIN B'D L824 = 1.8V
      - **NO**
      - replace MAIN B'D IC807
      - **YES**
      - MAIN B'D Check R701, R702, R705 Signal
        - **YES**
        - replace MAIN B'D IC100
        - **NO**
        - MAIN B'D L705 Pin #1 L704 Pin #2 PWM Signal ?
          - **YES**
          - replace MAIN B'D IC701
          - **NO**
          - replace MAIN B'D IC 701
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<td>Digital TV Video OK ?</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>Replace MAIN B'D IC 100</td>
<td></td>
</tr>
</tbody>
</table>
Analog TV Video OK?

- **YES**
  - Check MAIN B'D R2046 Signal (SIF)
  - **YES**
    - Replace MAIN B'D IC100
  - **NO**
    - MAIN B'D L1101 Signal (SIF)
    - **NO**
      - Replace MAIN B'D IC1102
# LCD TV Symptom

## AV2 No Audio Problem

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</table>

### Flowchart

1. **AV2 Video OK?**
   - **YES**
     - Check the RCA Cable
     - **YES**
       - Check MAIN B’D JK402
       - **NO**
         - Replace MAIN B’D JK402
     - **YES**
       - MAIN B’D C2008 (Right Sound) C2009 (Left Sound) signal ?
         - **YES**
           - Replace MAIN B’D IC 100
         - **NO**
           - Check MAIN B’D C2008, C2009

---

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Component1 No Audio Problem

Component Video OK ?
- YES
  - Check the Component Cable
    - YES
      - Check MAIN B'D JK402
        - NO
          - Replace MAIN B'D JK402
        - YES
          - MAIN B'D C229 (Right Sound) C230 (Left Sound) signal ?
            - YES
              - Replace MAIN B'D IC 100
            - NO
              - Check MAIN B'D C229, C230
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<td>Check the Component Cable</td>
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<tr>
<td></td>
<td>YES</td>
<td>Check MAIN B'D JK402</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>Replace MAIN B'D JK402</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Check MAIN B'D C2013 (Right Sound) C2014 (Left Sound) signal ?</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Replace MAIN B'D IC 100</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>Check MAIN B'D C2013, C2014</td>
</tr>
</tbody>
</table>
RGB Video OK?
- YES
  - Check the PC Audio Cable
    - YES
      - Check MAIN B’D JK401
        - NO
          - Replace MAIN B’D JK401
        - YES
          - MAIN B’D C2015 (Right Sound) C2016 (Left Sound) signal?
            - YES
              - Replace MAIN B’D IC 100
            - NO
              - Check MAIN B’D C2015, C2016
HDMI-DTV No Audio Problem

<table>
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<th>HDMI Video OK?</th>
<th>Check the ADJUST MENU</th>
<th>EDID OK?</th>
<th>Download EDID (Refer to Adjustment Spec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td></td>
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</table>

Check the HDMI Cable

Replace MAIN B'D IC100
### LCD TV Symptom: SPDIF No Audio Problem

1. Speaker Audio OK
   - YES
   - NO → Check the Trouble Shooting Guide Related to Audio Problem

2. Check the SPDIF Cable
   - YES
   - NO → Replace MAIN B'D JK403

3. Check MAIN B'D JK403
   - YES
   - NO → Replace MAIN B'D R2305

4. Check MAIN B'D R2305
   - PWM Signal?
     - YES
     - NO → Replace MAIN B'D IC 100

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Check that the USB Memory & HDD are supported by Spec
(Refer to User Manual’s USB cautions)

YES

Check MAIN B’D JK406 OK ?

NO

Replace MAIN B’D JK406

YES

Check MAIN B’D JK406 Pin #1 5V ?

YES

Replace MAIN B’D IC 100

NO

Check MAIN B’D R826 5V ?

YES

Replace MAIN B’D IC808

NO

Check MAIN B’D R848 12V ?

YES

Replace POWER B’D

NO
<table>
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<th>LCD TV</th>
<th>Symptom</th>
<th>Remote Control Problem</th>
<th>Making</th>
<th>2009. 2 . 1</th>
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</tbody>
</table>

**Remote Control Problem**

1. **Check MAIN B'D P5001 Wafer & Connector**
   - **YES**: Replace it
   - **NO**: Check IR B'D P1 Wafer & Connector

2. **Check IR B'D P1 Wafer & Connector**
   - **YES**: Replace IR B'D
   - **NO**:

---

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<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Symptom</th>
<th>Intelligent Sensor Problem</th>
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<td>Check MAIN B'D P5001 Wafer &amp; Connector</td>
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<td>Replace it</td>
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<td>Check IR B'D P1 Wafer &amp; Connector</td>
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