OLED TV
SERVICE MANUAL

CHASSIS : EA34D
MODEL : 55EA8800   55EA8800-UC

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

North/Latin America http://aic.lgservice.com
Europe/Africa http://eic.lgservice.com
Asia/Oceania http://biz.lgservice.com
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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 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

[Diagram of leakage current hot check]

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 the 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 1.25 cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique:
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
    CAUTION: Work quickly to avoid overheating the 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.
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.
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.

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 spec sheet is applied LED TV with (LA34N) chassis

2. Test condition
   Each part is tested as below without special notice.
   1) Temperature: 25 °C ± 5 °C(77 ± 9 °F) , CST : 40 °C±5 °C
   2) Relative Humidity: 65 % ± 10 %
   3) Power Voltage

<table>
<thead>
<tr>
<th>Market</th>
<th>Input voltage</th>
<th>Frequency</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>110~240V</td>
<td>50/60Hz</td>
<td>Standard Voltage of each product is marked by models</td>
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</table>

   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: UL, CSA, CE, IEC specification
      EMC: FCC, ICES, CE, IEC specification
      Wireless: Wireless HD Specification (Option)

4. General Specification

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Specification</th>
<th>Remark</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Market</td>
<td>1) North America</td>
<td></td>
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<tr>
<td>2</td>
<td>Broadcasting System</td>
<td>1) ATSC / NTSC-M</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Receiving System</td>
<td>1) ATSC / NTSC-M</td>
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<tr>
<td>4</td>
<td>Input Voltage</td>
<td>AC 100 - 240V ~ 60Hz</td>
<td></td>
</tr>
</tbody>
</table>
| 5  | Available Channel         | 1) VHF : 02~13
                                   2) UHF : 14~69
                                   3) DTV : 02-69
                                   4) CATV : 01~135
                                   5) CADTV : 01~135              |        |
| 7  | Aspect Ratio              | 16:9                              |        |
| 8  | Tuning System             | FS                                |        |
| 9  | LCD Module                | LC550LUD-MFP2                     | LGD    |
| 10 | Operating Environment     | 1) Temp : 0 ~ 40 deg
                                   2) Humidity : ~ 80 %           |        |
| 11 | Storage Environment       | 1) Temp : -20 ~ 60 deg
                                   2) Humidity : ~ 85 %           |        |
## 5. External input format

### 5.1. 2D mode

#### 5.1.1. Component input (Y, CB/PB, CR/PR)

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
<th>H-freq(kHz)</th>
<th>V-freq.(kHz)</th>
<th>Pixel clock</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>720*480</td>
<td>15.73</td>
<td>60.00</td>
<td>13.5135</td>
<td>SDTV,DVD 480I</td>
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<tr>
<td>2.</td>
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<td>13.50</td>
<td>SDTV,DVD 480I</td>
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<tr>
<td>3.</td>
<td>720*480</td>
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<tr>
<td>4.</td>
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<td>59.94</td>
<td>27.00</td>
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<tr>
<td>5.</td>
<td>1280*720</td>
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<td>60.00</td>
<td>74.25</td>
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</tr>
<tr>
<td>6.</td>
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<td>74.176</td>
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<tr>
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<tr>
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<tr>
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#### 5.1.2. HDMI Input 1 (PC/DTV)

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<th>V-freq.(kHz)</th>
<th>Pixel clock(MHz)</th>
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<tr>
<td>1.</td>
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<td>70.09</td>
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<td>2.</td>
<td>640*350</td>
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### 5.2. 3D Mode

#### 5.2.1. RF Input

<table>
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<tr>
<th>No.</th>
<th>Resolution</th>
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<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1920*1080</td>
<td>45.00</td>
<td>60</td>
<td>74.25</td>
<td>HDTV 1080I</td>
<td>Side by Side, Top &amp; Bottom</td>
</tr>
<tr>
<td>2</td>
<td>1280*720</td>
<td>45.00</td>
<td>60</td>
<td>74.25</td>
<td>HDTV 720P</td>
<td>Side by Side, Top &amp; Bottom</td>
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#### 5.2.2. HDMI Input

##### 5.2.2.1. HDMI 1.3 - DTV (3D supported mode manually)

<table>
<thead>
<tr>
<th>No.</th>
<th>Resolution</th>
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<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
<th>Proposed</th>
<th>Remark</th>
</tr>
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<td>45.00</td>
<td>60.00</td>
<td>74.25</td>
<td>Side by Side  , Top &amp; Bottom,</td>
<td>Single Frame Sequential</td>
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<tr>
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<td>33.75</td>
<td>60.00</td>
<td>74.25</td>
<td>Side by Side  , Top &amp; Bottom</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1920*1080p</td>
<td>67.50</td>
<td>60.00</td>
<td>148.50</td>
<td>Side by Side  , Top &amp; Bottom,</td>
<td>Single Frame Sequential, Column Interleaving</td>
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<td>27.00</td>
<td>24.000</td>
<td>74.25</td>
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##### 5.2.2.2. HDMI 1.3 - DTV (3D supported mode manually)

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<th>Remark</th>
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<td>59.94 / 60.00</td>
<td>74.18 / 74.25</td>
<td>Mandatory</td>
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### 5.2.3. HDMI-PC Input (3D supported mode manually)

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### 5.2.4. USB Input

#### 5.2.4.1. USB Input (3D supported mode automatically)

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<th>Pixel clock(MHz)</th>
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#### 5.2.4.2. USB Input (3D supported mode manually)

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<td>30.000</td>
<td>74.25</td>
<td>HDTV 1080p</td>
<td>Side by Side, Top &amp; Bottom, Checkerboard, Single Frame Sequential, Row Interleaving, Column Interleaving (Photo : Side by Side, Top &amp; Bottom)</td>
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5.2.5. DLNA Input

5.2.5.1. DLNA Input (3D supported mode automatically)

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<th>V-freq.(Hz)</th>
<th>Pixel clock(MHz)</th>
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<td>30.000</td>
<td>74.25</td>
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<td>Side by Side, Top &amp; Bottom, Checkerboard, MPO (Photo)</td>
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5.2.5.2. DLNA Input (3D supported mode manually)

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<td>30.000</td>
<td>74.25</td>
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<td>Side by Side, Top &amp; Bottom, Checkerboard, Single Frame Sequential, Row Interleaving, Column Interleaving (Photo : Side by Side, Top &amp; Bottom)</td>
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5.2.6. Component Input

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<td>HDTV 1080P</td>
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Remark: 3D Input mode

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<th>No</th>
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<th>Top &amp; Bottom</th>
<th>Checkerboard</th>
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<th>Frame Packing</th>
<th>Line Interleaving</th>
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</tbody>
</table>
ADJUSTMENT INSTRUCTION

1. Application
This spec. sheet applies to EA34D Chassis applied LED TV all models manufactured in TV factory.

2. Specification
(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
(2) Adjustment must be done in the correct order.
(3) The adjustment must be performed in the circumstance of 25 ±5℃ of temperature and 65±10% of relative humidity if there is no specific designation.
(4) The input voltage of the receiver must keep 100~240V, 50/60Hz.
(5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15℃.
In case of keeping module is in the circumstance of 0℃, it should be placed in the circumstance of above 15℃ for 2 hours.
In case of keeping module is in the circumstance of below -20℃, it should be placed in the circumstance of above 15℃ for 3 hours.
※ Caution
When still image is displayed for a period of 20 minutes or longer (especially where W/B scale is strong, Digital pattern 13ch and/or Cross hatch pattern 09ch), there can some afterimage in the black level area.

3. Adjustment items
3.1. Main PCBA Adjustments
(1) ADC adjustment: Component 480i, 1080p
(2) EDID downloads for HDMI
※ Remark
- Above adjustment items can be also performed in Final Assembly if needed. Adjustment items in both PCBA and final assembly tages can be checked by using the INSTART Menu -> 1. ADJUST CHECK.

3.2. Final assembly adjustment
(1) White Balance adjustment
(2) RS-232C functionality check
(3) Factory Option setting per destination
(4) Shipment mode setting (In-Stop)
(5) GND and HI-POT test

3.3. Appendix
(1) Tool option menu, USB Download (S/W Update, Option and Service only)
(2) Manual adjustment for ADC calibration and White balance.
(3) Shipment conditions, Channel pre-set

4. MAIN PCBA Adjustments
4.1. ADC Calibration
- An ADC calibration is not necessary because MAIN SoC (LGExxx) is already calibrated from IC Maker
- If it needs to adjust manually, refer to appendix.

4.2. MAC Address, ESN Key and Widevine Key download
4.2.1. Equipment & Condition
1) Key Write: Com 1,2,3,4 and 115200 (Baudrate)
2) Barcode: Com 1,2,3,4 and 9600 (Baudrate)

4.2.2. Communication Port connection
1) Play file: keydownload.exe

4.2.3. Download process
1) Select the download items.
2) Mode check: Online Only
3) Check the test process
- US, Canada models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
- Korea, Mexico models: DETECT -> MAC_WRITE -> WIDEVINE_WRITE
4) Play: START
5) Check of result: Ready, Test, OK or NG
6) Printer out (MAC Address Label)

4.2.4. Communication Port connection
1) Connect: PCBA Jig -> RS-232C Port == PC -> RS-232C Port

4.2.5. Download
1) US, Canada models (13Y LCD TV + MAC + Widevine + ESN Key + DTCP Key + HDCP1.4 and HDCP2.0)

4.2.6. Inspection
- In INSTART menu, check these keys.
4.3. LAN port Inspection (Ping Test)

4.3.1. Equipment setting
1) Play the LAN Port Test PROGRAM.
2) Input IP set up for an inspection to Test Program.
   - IP number: 12.12.2.2

4.3.2. LAN PORT inspection (PING TEST)
1) Play the LAN Port Test Program.
2) Connect each other LAN Port Jack.
3) Play Test (F9) button and confirm OK Message.
4) Remove LAN CABLE

4.4. EDID Download

4.4.1 Overview
▪ It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of “Plug and Play”.

4.4.2 Equipment
▪ Since embedded EDID data is used, EDID download JIG, HDMI cable and D-sub cable are not need.
▪ Adjust remcon

4.4.3 Download method
1) Press Adj. key on the Adj. R/C,
2) Select EDID D/L menu.
3) By pressing Enter key, EDID download will begin
4) If Download is successful, OK is display, but If Download is failure, NG is displayed.
5) If Download is failure, Re-try downloads.

※ Caution) When EDID Download, must remove RGB/HDMI Cable.

---

4.4.4. EDID DATA(PCM)

(1)DTS
# HDMI 1(C/S : E8 36)
EDID Block 0, Bytes 0-127 [00H-7FH]
0 1 2 3 4 5 6 7 8 9 A B C D E F
0 | 00 FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01
10 | 01 17 01 03 80 A0 5A 78 0A EE 91 A3 54 4C 99 26
20 | 0F 50 54 A1 08 00 31 40 45 40 61 40 71 40 81 80
30 | 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40 | 45 00 40 84 63 00 00 01 6E 66 21 50 B0 51 00 18 30
50 | 40 70 36 00 40 84 63 00 00 01 6E 00 00 00 FD 00 3A
60 | 3E 1E 53 10 00 0A 20 20 20 20 20 00 00 00 FC
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 00 01 E8

EDID Block 1, Bytes 128-255 [80H-FFH]
0 1 2 3 4 5 6 7 8 9 A B C D E F
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
10 | C0 15 07 50 09 57 07 78 03 C0 00 10 00 B8 2D 20
20 | C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
30 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
40 | 40 84 63 00 00 00 00 00 00 00 00 00 00 00 00 00
50 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
60 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 00 01 E8

# HDMI 2(C/S : E8 26)
EDID Block 0, Bytes 0-127 [00H-7FH]
0 1 2 3 4 5 6 7 8 9 A B C D E F
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
10 | C0 15 07 50 09 57 07 78 03 C0 00 10 00 B8 2D 20
20 | C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
30 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
40 | 40 84 63 00 00 00 00 00 00 00 00 00 00 00 00 00
50 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
60 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 00 01 E8

EDID Block 1, Bytes 128-255 [80H-FFH]
0 1 2 3 4 5 6 7 8 9 A B C D E F
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
10 | C0 15 07 50 09 57 07 78 03 C0 00 10 00 B8 2D 20
20 | C0 0E 01 4F 00 FE 08 10 06 10 18 10 28 10 38 10
30 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
40 | 40 84 63 00 00 00 00 00 00 00 00 00 00 00 00 00
50 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3d 06
60 | E3 05 03 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 20 00 01 E8
(2)AC3

# HDMI 1(C/S : E8 3F)
EDID Block 0, Bytes 0-127 [00H-7FH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 00 FF FF FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01 01 10 | 01 17 01 03 80 A0 5A 78 0A EE 91 A3 54 4C 99 26 20 | 0F 50 54 A1 08 00 31 40 45 40 61 40 71 40 81 80 30 | 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 40 | 45 05 00 40 84 63 00 00 1E 66 21 50 B0 51 00 1B 30 50 | 40 70 36 00 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

EDID Block 1, Bytes 128-255 [80H-FFH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3D 66 20 | 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

# HDMI 4(C/S : E8 06)
EDID Block 0, Bytes 0-127 [00H-7FH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 00 FF FF FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01 10 | 01 17 01 03 80 A0 5A 78 0A EE 91 A3 54 4C 99 26 20 | 0F 50 54 A1 08 00 31 40 45 40 61 40 71 40 81 80 30 | 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 40 | 45 05 00 40 84 63 00 00 1E 66 21 50 B0 51 00 1B 30 50 | 40 70 36 00 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

EDID Block 1, Bytes 128-255 [80H-FFH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3D 66 20 | 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

# HDMI 2(C/S : E8 2F)
EDID Block 0, Bytes 0-127 [00H-7FH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 00 FF FF FF FF FF FF FF FF 00 1E 6D 01 00 01 01 01 01 10 | 01 17 01 03 80 A0 5A 78 0A EE 91 A3 54 4C 99 26 20 | 0F 50 54 A1 08 00 31 40 45 40 61 40 71 40 81 80 30 | 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 40 | 45 05 00 40 84 63 00 00 1E 66 21 50 B0 51 00 1B 30 50 | 40 70 36 00 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

EDID Block 1, Bytes 128-255 [80H-FFH]

0 1 2 3 4 5 6 7 8 9 A B C D E F
-----------------------------
0 | 02 03 34 F1 48 90 22 20 05 04 03 02 01 29 3D 66 20 | 40 84 63 00 00 1E 00 00 00 FD 00 3A 60 | 3E 1E 53 10 10 00 0A 20 20 20 20 00 00 00 FC 70 | 00 4C 47 20 54 56 0A 20 20 20 20 20 01 E8

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Only for training and service purposes
- 13 -
LGE Internal Use Only
### 5. Final Assembly Adjustment

#### 5.1. White Balance Adjustment

##### 5.1.1. Overview

1. **W/B adj. Objective & How-it-works**
   - **Objective:** To reduce each Panel's W/B deviation
   - **How-it-works:** When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.

2. **Adj. condition:** normal temperature
   - Surrounding Temperature: 25±5 °C
   - Warm-up time: About 5 Min
   - Surrounding Humidity: 20% ~ 80%

3. **Adj. condition and cautionary items**
   - **Lighting condition in surrounding area:** surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
   - **Probe location:** Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~100°)
   - **Aging time:** After Aging Start, Keep the Power ON status during 5 Minutes.
   - In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

4. **Equipment**
   - **Color Analyzer:** CA-210 (NCG: CH 9 / WCG: CH12 / LED: CH14 / OLED: CH: 17)
   - **Adj. Computer (During auto adj., RS-232C protocol is needed)**
   - **Adjust Remocon**
   - **Video Signal Generator MSPG-925F 720p/204-Gray (Model: 217, Pattern: 49)**

   *Color Analyzer Matrix should be calibrated using CS-1000*
5.1.3. Equipment connection

5.1.4. Adjustment Command (Protocol)
(1) RS-232C Command used during auto-adj.

<table>
<thead>
<tr>
<th>RS-232C COMMAND</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wb 00 00</td>
<td>Begin White Balance adj.</td>
</tr>
<tr>
<td>Wb 00 ff</td>
<td>End White Balance adj.</td>
</tr>
</tbody>
</table>

(2) Adjustment Map

<table>
<thead>
<tr>
<th>Adj. Item</th>
<th>Command (lower caseASCII)</th>
<th>Data Range (Hex.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool</td>
<td>R Gain j g</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j h</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j i</td>
<td>00 C0</td>
</tr>
<tr>
<td>Medium</td>
<td>R Gain j a</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j b</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j c</td>
<td>00 C0</td>
</tr>
<tr>
<td>Warm</td>
<td>R Gain j d</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>G Gain j e</td>
<td>00 C0</td>
</tr>
<tr>
<td></td>
<td>B Gain j f</td>
<td>00 C0</td>
</tr>
</tbody>
</table>

5.1.5. Adjustment method

5.1.5.1. Auto WB calibration
(1) Set TV in ADJ mode using P-ONLY key (or POWER ON key)
(2) Place optical probe on the center of the display
   - It need to check probe condition of zero calibration before adjustment.
(3) Connect RS-232C Cable
(4) Select mode in ADJ Program and begin a adjustment.
(5) When WB adjustment is completed with OK message, check adjustment status of pre-set mode (Cool, Medium, Warm)
(6) Remove probe and RS-232C cable.
   • W/B Adj. must begin as start command "wb 00 00", and finish as end command "wb 00 ff", and Adj. offset if need

5.1.5.2. OLED White balance table

(1) Cool Mode
   - Purpose: Especially B-gain fix adjust leads to the luminance enhancement. Adjust the color temperature to reduce the deviation of the module color temperature.
   - Principle: To adjust the white balance without the saturation, Adjust the B gain more than 192 ( If R gain or G gain is more than 255, G gain can adjust less than 192 ) and change the others ( R/G Gain ).
   - Adjustment mode: mode – Cool

(2) Medium / Warm Mode
   - Purpose: Adjust the color temperature to reduce the deviation of the module color temperature.
   - Principle: To adjust the white balance without the saturation, Fix the B gain to 192 (default data) and decrease the others.
   - Adjustment mode: mode – Medium

(3) Warm
   - Purpose: Adjust the color temperature to reduce the deviation of the module color temperature.
   - Principle: To adjust the white balance without the saturation, Fix the W gain to 192 (default data) and decrease the others.
   - Adjustment mode: mode – Warm

(4) THX(Warm)
   - Purpose: Adjust the color temperature to reduce the deviation of the module color temperature.
   - Principle: To adjust the white balance without the saturation, Fix the W gain to 192 (default data) and decrease the others.
   - Adjustment mode: mode – Warm
   - Auto White balance 4 point
   - Adjust 100 IRE White Balance
     - Adjust Gamma 2.2 each IRE (60, 40, 20). Using max luminance
     - Complete 4 point gamma, W/B.
5.1.6. Reference (White Balance Adj. coordinate and color temperature)
(1) Luminance: 204 Gray, 80IRE
(2) Standard color coordinate and temperature using CS-1000 (over 26 inch)

5.1.7. Reference (White Balance Adj. coordinate and color temperature)
- Luminance: 204 Gray
- Standard color coordinate and temperature using CS-1000 (over 26 inch)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Coordinate</th>
<th>Temp</th>
<th>△uv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Cool</td>
<td>0.271</td>
<td>0.270</td>
<td>13,000K</td>
</tr>
<tr>
<td>Medium</td>
<td>0.285</td>
<td>0.293</td>
<td>9,300K</td>
</tr>
<tr>
<td>Warm</td>
<td>0.313</td>
<td>0.329</td>
<td>6,500K</td>
</tr>
</tbody>
</table>

- Standard color coordinate and temperature using CA-210(CH-14)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Coordinate</th>
<th>Temp</th>
<th>△uv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Cool</td>
<td>0.271±0.002</td>
<td>0.270±0.002</td>
<td>13,000K</td>
</tr>
<tr>
<td>Medium</td>
<td>0.285±0.002</td>
<td>0.293±0.002</td>
<td>9,300K</td>
</tr>
<tr>
<td>Warm</td>
<td>0.313±0.002</td>
<td>0.329±0.002</td>
<td>6,500K</td>
</tr>
</tbody>
</table>

5.2. Tool Option setting & Inspection per countries

5.2.1. Overview
(1) Tool option selection is only done for models in Non-USA North America due to rating
(2) Applied model: EA34D Chassis applied to CANADA and MEXICO

5.2.2. Country Group selection
(1) Press ADJ key on the Adj. R/C, and then select Country Group Menu
(2) Depending on destination, select US, then on the lower Country option, select US, CA, MX. Selection is done using +, - KEY

5.2.3. Tool Option inspection
- Press Adj. key on the Adj. R/C, then select Tool option

<table>
<thead>
<tr>
<th>Model</th>
<th>Tool 1</th>
<th>Tool 2</th>
<th>Tool 3</th>
<th>Tool 4</th>
<th>Tool 5</th>
<th>Tool 6</th>
<th>Tool 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>55EA9800-UA</td>
<td>32791</td>
<td>21777</td>
<td>5085</td>
<td>61837</td>
<td>55446</td>
<td>1432</td>
<td>47147</td>
</tr>
</tbody>
</table>

※ Tool option can be reconstructed by Software

5.3. Magic Motion remote controller Check

5.3.1. Test equipment
- RF-remote controller for check, IR-KEY-CODE remote controller.
- Check AA battery before test. A recommendation is that a tester change battery every lots.

5.3.2. Test
(1) Make pairing with TV set by pressing “Start key(Wheel key)” on RCU.
(2) Check a cursor on screen by pressing “Wheel key” of RCU
(3) Stop paring with TV set by pressing “Back+ Home” key of RCU

5.3.3. Applied models

<table>
<thead>
<tr>
<th>Chassis</th>
<th>Model Name</th>
<th>Magic RF receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA34D</td>
<td>55EA8800-UA</td>
<td>Built-in</td>
</tr>
<tr>
<td></td>
<td>55EA9800-UA</td>
<td></td>
</tr>
</tbody>
</table>

5.4. Wi-Fi MAC Address Check

5.4.1. Using RS232 Command

<table>
<thead>
<tr>
<th>Command</th>
<th>Set ACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>[A][I][ ][Set ID][ ][20][Cr]</td>
<td>[O][K][x] or [N][G]</td>
</tr>
</tbody>
</table>

5.4.2. Check the menu on in-start
5.5. 3D pattern test (Only for 3D models)

5.5.1. Test equipment
(1) Pattern Generator MSHG-600 or MSPG-6100 (HDMI 1.4 support)
(2) Pattern: HDMI mode (model No. 872, pattern No. 83)

5.5.2. Test method
(1) Input 3D test signal as Fig.1.

(2) Press ‘OK’ key as a 3D input OSD is shown.
(3) Check pattern as Fig2 without 3D glasses. (3D mode without 3D glasses)

5.6. HDMI ARC Function Inspection

5.6.1. Test equipment
- Optic Receiver Speaker
- MSHG-600 (SW: 1220 ↑)
- HDMI Cable (for 1.4 version)

5.6.2. Test method
(1) Insert the HDMI Cable to the HDMI ARC port from the master equipment (HDMI1)

(2) Check the sound from the TV Set
(3) Check the Sound from the Speaker or using AV & Optic TEST program (It’s connected to MSHG-600)

* Remark: Inspect in Power Only Mode and check SW version in a master equipment
5.7. PIP/ W&R Function Inspection

(1) Objective : To check the connection between sub tuner and PCBA, and their Function
(2) Test Method : This Inspection is available only Power-Only Status.
2) Check that the SUB TUNER pop up window on the TV Set.
3) Check that the normal operation (picture, sound) of DTV on the TV Set.

5.8. Ship-out mode check (In-stop)
• After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode

6. AUDIO output check
6.1. Audio input condition
(1) RF input: Mono, 1KHz sine wave signal, 100% Modulation
(2) CVBS, Component: 1KHz sine wave signal (0.4Vrms)
(3) RGB PC: 1KHz sine wave signal (0.7Vrms)

6.2. Specification

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Audio practical max Output, L/R (Distortion=10% max Output)</td>
<td>9.0</td>
<td>10.0</td>
<td>12.0</td>
<td>W Vrms</td>
<td>(1) Measurement condition - EQ/AVL/Clear Voice: Off (2) Speaker (8Ω Impedance)</td>
</tr>
</tbody>
</table>

6.3. Audio Output Inspection
(1) INPUT CHECK –S KEY OF ADJUST REMOTE CONTROLLER TO INSPECT SPEAKER
(2) When you click the first, the output volume of left & right main speakers must be 50

(3) When you click the second, the output volume of left & right main speakers must be 80.

(4) When you click the third, the output volume of left & right main speakers must be 100.

(5) When you click the fourth, the output volume of left main speaker must be 50.

(6) When you click the fifth, the output volume of right main speaker must be 50.

(7) When you click the sixth, the output volume of left sub speaker must be 100.

(8) When you click the seventh, the output volume of right sub speaker must be 100.

(9) When you click the eighth, the output volume of all speakers (left & right main speaker and left & right sub speaker) must be 30.
7. Soft Touch Key Check
- Before you start a test, you must run a 'Power Only Mode'.
AFTER Touch SOFT TOUCH KEY OF SET, LOCAL KEY CHECK DISPLAY WILL START

(1) Tab Test : Touch SOFT TOUCH KEY OF SET quickly

(2) Left Test : Touch SOFT TOUCH KEY OF SET to the left side.

(3) Right Test : Touch SOFT TOUCH KEY OF SET to the right side

(4) Long Tab Test : Touch SOFT TOUCH KEY OF SET long.

- Don't need to run a test with this sequence. For example, the sequence such as 'Right → Tab → Long Tab → Left' is allowed.

8. EYE Q Green Inspection
(1) Turn on TV
(2) Press EYE key of Adj. R/C

(3) Cover the Eye Q sensor on the front of the using your hand and wait for 6 seconds

(4) Confirm that value is lower than 100 of the "Raw Data (Sensor data, Back light )" If after 6 seconds, value is not lower than 100, replace Eye Q sensor

(5) Remove your hand from the Eye Q sensor and wait for 6 seconds

(6) Confirm that "ok" pop up. If change is not seen, replace Eye Q sensor
9. GND and HI-POT Test

9.1. GND & HI-POT auto-check preparation
(1) Check the POWER CABLE and SIGNAL CABE insertion condition

9.2. 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)
   - If Test is failed, Buzzer operates.
   - If Test is passed, execute next process (Hi-pot test).
   (Remove A/V CORD from A/V JACK BOX)
(5) HI-POT test (Auto)
   - If Test is failed, Buzzer operates.
   - If Test is passed, GOOD Lamp on and move to next process automatically.

9.3. Checkpoint
(1) Test voltage
   - GND: 1.5KV/min at 100mA
   - SIGNAL: 3KV/min at 100mA
(2) TEST time: 1 second
(3) TEST POINT
   - GND Test = POWER CORD GND and SIGNAL CABLE GND.
   - Hi-pot Test = POWER CORD GND and LIVE & NEUTRAL.
(4) LEAKAGE CURRENT: At 0.5mArms

10. USB S/W Download
    (optional, Service only)
(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 lower than that of TV set, it didn't work. Otherwise USB data is automatically detected.
(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.
   * 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, TOOL OPTION setting is needed 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.)
11. Optional adjustments

11.1. Manual ADC Calibration

11.1.1. Equipment & Condition

(1) Adjustment Remocon
(2) 801GF (802B, 802F, 802R) or MSPG925FA Pattern Generator
   - Resolution: 480i Comp1 (MSPG-925FA: model-209, pattern-65)
   - Resolution: 1080p Comp1 (MSPG-925FA: model-225, pattern-65)
   - Resolution: 1080p RGB (MSPG-925FA: model-225, pattern-65)
   - Pattern: Horizontal 100% Color Bar Pattern
   - Pattern level: 0.7±0.1 Vp-p

11.1.2. Equipment & Condition

11.1.2.1. ADC 480i/1080p Comp

(1) Check connected condition of Comp cable to the equipment
(2) Give a 480i Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA → Model: 209, Pattern: 65)
(3) Change input mode as Component1 and picture mode as "Standard"
(4) Press the In-start Key on the ADJ remote after at least 1 min of signal reception. Then, select 7.External ADC. And Press OK or Right Button for going to sub menu.
(5) Press OK in Comp 480i menu
(6) Give a 1080p Mode, Horizontal 100% Color Bar Pattern to Comp1. (MSPG-925FA → Model: 225, Pattern: 65)
(7) Press OK in Comp 1080p menu
(8) If ADC Comp is successful, “ADC Component Success” is displayed. If ADC calibration is failure, “ADC Component Fail” is displayed.
(10) If ADC calibration is failure, after rechecking ADC pattern or condition, retry calibration
(11) If ADC calibration is failure, after recheck ADC pattern or condition, retry calibration

11.1.2.2. Equipment

(2) Adj. Computer (During auto adj., RS-232C protocol is needed)
(3) Adjust Remocon
(4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 217, Pattern: 78)

11.2. Manual White balance Adjustment

11.2.1. Adj. condition and cautionary items

(1) Lighting condition in surrounding area surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
(2) Probe location: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~ 100°)
(3) Aging time
   - After Aging Start, Keep the Power ON status during 5 Minutes.
   - In case of LCD, Back-light on should be checked using no signal or Full-white pattern

11.2.2. Equipment

(2) Adj. Computer (During auto adj., RS-232C protocol is needed)
(3) Adjust Remocon
(4) Video Signal Generator MSPG-925F 720p/216-Gray (Model: 217, Pattern: 78)

11.2.3. Adjustment

(1) Set TV in Adj. mode using POWER ON
(2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface.
(3) Press ADJ key → EZ adjust using adj. R/C → 6. White-Balance then press the cursor to the right (KEY►). When KEY► is pressed 216 Gray internal pattern will be displayed.
(4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
(5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

   • If internal pattern is not available, use RF input. In EZ Adj. menu 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.
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.
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 MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
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VA4808
5.5V
OPT

C4801
1000pF
50V
EU

VA4804
5.5V
EU

SC_G

VA4800
20V
EU

VA4803
5.5V
EU

VA4805
5.5V
EU

DTV/MNT_V_OUT

SC_CVBS_IN

+3.3V_NORMAL

JK4800
DA1R018H91E
EU
1
AUDIO_R_OUT
2
AUDIO_R_IN
3
AUDIO_L_OUT
4
AUDIO_GND
5
B_GND
6
AUDIO_L_IN
7
B_OUT
8
ID
9
G_GND
10
G_OUT
11
R_GND
12
R_OUT
13
RGB_IO
14
SYNC_GND
15
SYNC_OUT
16
SYNC_IN
17
COM_GND
18
AV_DET
19
SHIELD

C4803
4700pF
EU

VA4802
5.6V
EU

VA4806
5.5V
EU

VA4809
5.6V
EU

C4802
4700pF
EU

R4801
10K
EU

R4800
75
EU

R4802
100
1/16W
5%
EU

L4801
BLM18PG121SN1D
EU

L4800
BLM18PG121SN1D
EU

Full Scart(18 Pin Gender)

Close to Junction

Full Scart (18 Pin Gender)
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILTER 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.
Ethernet Block
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 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. WHEN SERVICING, IT IS ESSENTIAL THAT ONLY MANUFACTURER SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.
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DVB-S2 LNB Part Allegro

(OPTION: LNB)

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 manufacturer specified parts be used for the critical components in the symbol mark of the schematic.

Input trace widths should be sized to conduct at least 3A.
Output trace widths should be sized to conduct at least 2A.

3A

2A

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LVDS

[10Pin LVDS OUTPUT Connector]  [51Pin LVDS OUTPUT Connector]

OLED : FRC_RESET = LVDS_VAL
INV_CTL = ELVDD_ON

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OLED vs. LED

OLED is next generation display which is simple, thin and light. OLED can achieve natural and vivid colors due to self-emitting characteristics.

Indirect light source display, which is complex and consists of many components. Light is supplied from BLU and goes through many layers.

Simple structure with not many components (without BLU) → Paper slim & light
Self-emitting display → Better response time / contrast ratio compared to LCD
Main PCB for Broadband

55EA9800

Clear Speaker

CAM USB

Local Dim.
To PSU
H13 Block diagram

H13 LG1154A

H13 LG1154D

Motion-R

OPTIC

IR_Blaster

HP

SPK/Clear Speaker

M-Remote_Rx/Tx

SPDIF

IRB_SPI

HiP Audio L/R

HiP AMP

GS

Audio AMP

CI

CI

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H13 Block diagram
H13 Block diagram

+3.3V D Demod
+1.23V D Demod
+1.8V TUNER
+3.3V TUNER
+3.3V NORMAL

LNB_TX
LNB_OUT

T/C_DIF[N]
T/C_DIF[P]

I2C_SCL4
I2C_SDA4

S2_SCL
S2_SDA

S2_RESET

RESET

/LTU_RESET1

APN [SCL3] ARB [SDA3]
AG6 [GPIO15]
AH13 [SCL5]
AH13 [SDA5]

ADC_I_INP
ADC_I_INN

IF_P
TUNER_SIF
IF_AGC

U17 [ADC_I_INP]
V17 [ADC_I_INN]

FILTER

IF_P
IF_N
TU_CVBS

TU6503 TDSQ-H651F
LG1154D
LG1154A

H13
LG1154D

IC6900 A8303SETR-TB

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**H13 Block diagram**

```
Jack Side                      SOC Side
AV1                           AV1_CVBS_IN_SOC
      Phone JACK              AUAD_L/R_CH2_IN
AV1_CVBS_IN  SC_CVBS_IN       SC_CVBS_IN_SOC
      SC_R/G/B/CVBS_IN_SOY    COMP1_PR_IN_SOC
COMP1_PB_IN_SOC               COMP1_Y_IN_SOC
COMP1_PB_IN_SOC               COMP1_PB_IN_SOC
COMP1_PB_IN_SOC               COMP1_PB_IN_SOC
                  COMP1_Y/Pb/Pr
                  COMP2_PB_IN_SOC
                  COMP2_Y_IN_SOC_SOY
                  PR1/2PB1S0Y1_IN
                  TUNER_SIF
                  ADC_I_INP/INN
                  [CVBS_IN3]
                  [AUAD_L/R_CH2_IN]
                  [CVBS_IN2]
                  [PB2/Y2/SOY2/PR2_IN]
                  [PR1/2PB1S0Y1_IN]
                  [CVBS_IN1]
```
H13 Block diagram
H13 Block diagram

USB_CAMERA_DP / DM
CAM DET
MICOM

USB3
USB_DP3 / DM

USB2
USB2_DP / DM
USB2_CTL2

USB3
USB3_DP / DM
USB3_RXP / RXM
USB3_TXP / TXM
USB_CTL2

USB1
USB1_DP / DM
USB1_RXP / RXM
USB1_TXP / TXM
USB1_CTL1

OCP_USB1
TPS2554

OCP_USB2/3
TPS2062C

USB_CTL3

USB3

USB_DP3 / DM3

USB_Camera
(+5V_USB2 - Ready)

USB_C TL3

EB_CS2/GPIO2

USB2_HUB IC_IN_DP / DM

USB2_2_DP / DM

USB2_1_DP / DM

USB2_CTL2

[USB2_2_DP / DM]

[EB_CS2/GPIO2]

[USB2_1_DP / DM]

[USB2_CTL2]

[USB2_2_DP / DM]

[USB2_1_DP / DM]

Motion Remote Receiver

GPIO13

M_REMOTE_RESET

M_REMOTE_CTS / RTS

M_REMOTE_TX / RX

[MREMOTE_CTS / RTS]

[MREMOTE_TX / RX]

[UART1_RXD / TXD]

[GPIO15 / GPIO18]

UART0_RXD

UART0_TXD

[UART0_RXD]

[UART0_TXD]

SOC_RX

SOC_TX

SOC_RX

SOC_TX

4Pin debugging

Wafer P3800

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Interconnection - 1

55EA9800

[PCBs]
1 Main PCB
2 PSU
3 WIFI ASSY
4 BT MOTION ASSY
5 IR PCB
6 Touch Key / Logo
<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>No video/Normal audio</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No video/No audio</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>A. Video error</td>
<td>Picture broken/ Freezing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Color error</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Vertical/Horizontal bar, residual image, light spot, external device color error</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B. Power error</td>
<td>No power</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Off when on, off while viewing, power auto on/off</td>
<td>7</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, EPI Cable, Speaker Cable, IR B/D Cable, ..)

<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></td>
<td>2013.01.31</td>
<td>1/16</td>
</tr>
</tbody>
</table>

- **A1**
  - Check OLED Light On with naked eye
  - **Y** Normal audio
  - **N** Move to No video/No audio

- **A18**
  - Check Power Board 24V output
  - **Y** Normal voltage
  - **N** Replace Inverter or module

- **A18**
  - Repair Power Board or parts
  - Replace T-con Board or module
  - And Adjust VCOM
### 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>No video/ No audio</td>
<td>2013.01.31</td>
<td>2/16</td>
</tr>
</tbody>
</table>

- **A18**
  - Check various voltages of Power Board (3.5V, 12V, 20V or 24V...)
  - Normal voltage?
    - Y: Check and replace MAIN B/D
    - N: Replace Power Board and repair

End
## 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>Picture broken/ Freezing</td>
<td></td>
<td>2013.01.31</td>
<td>3/16</td>
</tr>
</tbody>
</table>

### A3

- **Check RF Signal level**
  - By using Digital signal level meter
  - By using Diagnostics menu on OSD
    - Setting → Set up → Manual Tuning → Check the Signal
  - Signal strength (Normal: over 50%)
  - Signal Quality (Normal: over 50%)

### Y

- Normal Signal?

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

## A. Video error

### Color 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></td>
<td>Color error</td>
<td>2013.01.31</td>
<td>4/16</td>
</tr>
</tbody>
</table>

**A6**
- Check color by input
  - External Input
  - COMPONENT
  - AV
  - HDMI

**A7**
- Check and replace Link Cable (EPI) and contact condition

- Color error?
  - Y: Replace Main B/D
  - N: Replace module

- Check error color input mode

- End
**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>Vertical / Horizontal bar, residual image, light spot, external device color error</td>
<td></td>
<td>2013.01.31</td>
<td>5/16</td>
</tr>
</tbody>
</table>

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

#### A6
- Check color condition by input
  - External Input
  - Component
  - HDMI
- Screen normal?
  - Y
    - Check external device connection condition
  - N
    - Replace module
- Y
  - Normal?
    - Y
      - Replace Module
    - N
      - Request repair for external device
- N
  - Screen normal?
    - Y
      - Replace Main B/D (adjust VCOM)
    - N
      - Replace Main B/D
- End

#### A7
- Check and replace Link Cable
- Screen normal?
  - Y
    - Replace Main B/D (adjust VCOM)
  - N
    - Replace Main B/D
- End

For LGD panel

For other panel
**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>No power</td>
<td></td>
<td>2013.01.31</td>
<td>6/16</td>
</tr>
</tbody>
</table>

**Check**
- **Logo LED**

**Power LED**
- **On?**
  - Y: Normal
  - N: Replace Power B/D

**Check Power cord was inserted properly**

**DC Power on by pressing Power Key On Remote control**
- **Normal operation?**
  - Y: Replace Main B/D
  - N: **Measure voltage of each output of Power B/D**

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

- Stand-By: Red or Turn Off
- Operating: Turn Off

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### B. Power error

#### Error symptom
Off when on, off while viewing, power auto on/off

<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>Off when on, off while viewing, power auto on/off</td>
<td>2013.01.31</td>
<td>7/16</td>
</tr>
</tbody>
</table>

#### Standard Repair Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check outlet</td>
</tr>
<tr>
<td>2</td>
<td>Check A/C cord</td>
</tr>
<tr>
<td>3</td>
<td>Check for all 3-phase power out</td>
</tr>
<tr>
<td>4</td>
<td>Error?</td>
</tr>
<tr>
<td></td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>CPU Abnormal</td>
</tr>
<tr>
<td></td>
<td>Normal?</td>
</tr>
<tr>
<td></td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>Abnormal 1</td>
</tr>
<tr>
<td>7</td>
<td><strong>A18</strong> (If Power Off mode is not displayed) Check Power B/D</td>
</tr>
<tr>
<td>8</td>
<td>Normal voltage?</td>
</tr>
<tr>
<td></td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

#### Status Power off List Explanation

- **POWEROFF REMOTEKEY**
  - Power off by REMOTE CONTROL
- **POWEROFF_OFFTIMER**
  - Power off by OFF TIMER
- **POWEROFF_SLEEPTIMER**
  - Power off by SLEEP TIMER
- **POWEROFF_INSTOP**
  - Power off by INSTOP KEY
- **POWEROFF_AUTOOFF**
  - Power off by AUTO OFF
- **POWEROFF_ONTIMER**
  - Power off by ON TIMER
- **POWEROFF_20V_DET**
  - Power off by AC OFF
- **POWEROFF_RESREC**
  - Power off by Reservated Record
- **POWEROFF_RECEND**
  - Power off by End of Recording
- **POWEROFF_SWDOWN**
  - Power off by S/W Download
- **POWEROFF UNKNOWN**
  - Power off by unknown status except CPU trouble
- **POWEROFF_CPUABNORMAL**
  - Power off by CPU Abnormal
- **POWEROFF_ABNORMAL1**
  - Power off by abnormal status except CPU trouble
- **POWEROFF_ONTIMER**
  - Power off by ON TIMER
Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>C. Audio error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No audio/Normal video</td>
<td></td>
<td>2013.01.31</td>
<td>8/16</td>
</tr>
</tbody>
</table>

- **C. Audio error**

  - **A20**
    - Check user menu > Speaker off
    - Off
    - Y: Cancel OFF
    - N: A21+A18

  - **A21+A18**
    - Check audio B+ 24 of Power Board
    - Normal
    - Y: Replace Power Board and repair parts
    - N: Disconnection

---

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Standard Repair Process

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>C. Audio error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wrecked audio/ discontinuation/noise</td>
<td>Established date 2013.01.31</td>
</tr>
<tr>
<td></td>
<td>Revised date 9/16</td>
<td></td>
</tr>
</tbody>
</table>

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

- Check input signal
  - RF
  - External Input signal

- Signal normal?
  - Y
  - N

- Check and replace speaker and connector

- Wrecked audio/ Discontinuation/ Noise for all audio
  - A21+A18
  - Check audio B+ Voltage (24V)
  - N
  - Y

- Normal voltage?
  - Y
  - N

- Replace Main B/D

- Replace Power B/D

- Wrecked audio/ Discontinuation/ Noise only for D-TV

- Wrecked audio/ Discontinuation/ Noise only for External Input
  - Y
  - N

- Connect and check other external device

Request repair to external cable/ANT provider

Replace Power B/D

Replace Main B/D

Replace Main B/D

(When RF signal is not received)
1. Remote control (R/C) operating error

- Check R/C itself Operation
  - Normal operating?
    - Y: Check & Repair Cable connection Connector solder
    - N: Replace Main B/D

- Check R/C Operating When turn off light in room
  - Replace Battery of R/C

- If R/C operate, Explain the customer

- Check & Repair Cable connection Connector solder
  - Normal operating?
    - Y: Check B+ 3.5V On Main B/D
    - N: Check IR Output signal

- Check B+ 3.5V On Main B/D
  - Normal Voltage?
    - Y: Check IR Output signal
    - N: Repair/Replace IR B/D

- Check IR Output signal
  - Normal Signal?
    - Y: Replace Main B/D
    - N: Replace Power B/D or Replace Main B/D (Power B/D don’t have problem)
2. MR13/P (Magic Remocon) operating error

- Check the INSTART menu
  - RF Receiver ver is "00.00"?
    - Y: Check MR13/P itself Operation
    - N: Check & Repair RF assy connection
  - N: Check MR13/P itself Operation
    - Y: Normal operating?
      - Y: Press the wheel
        - N: Is show ok message?
          - Y: Close
          - N: Turn off/on the set and press the wheel
        - N: Check & Replace Battery of MR13/P
          - Y: Close
          - N: Normal
3. Wifi operating error

<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Standard Repair Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D. Function error</td>
<td>Established date</td>
</tr>
<tr>
<td></td>
<td>Wifi operating checking</td>
<td>2013.01.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Revised date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12/16</td>
</tr>
</tbody>
</table>

- Check the INSTART menu
- Vi-Fi Mac value is "NG"?
- Check the Wifi wafer 1pin
- Normal Voltage?
- Replace Main B/D
- Close

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4. Camera operating error

<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>Camera operating checking</td>
<td>2013.01.31</td>
<td>13/16</td>
</tr>
</tbody>
</table>

4. Camera operating error

- **A4**: Check the INSTART menu
- **A25**: Check the Camera wafer P4200 2pin
- **A25 Y**: Check & Repair Camera cable connection
- **N**: Camera Ver. is "NG"?
- **Y**: Normal Voltage?
- **N**: Replace Camera B/D
- **Y**: Close
## Standard Repair Process

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>D. Function error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD TV</td>
<td>External device recognition error</td>
<td>2013.01.31</td>
<td>14/16</td>
</tr>
</tbody>
</table>

**Check input signal**

**Y**

Check technical information
- Fix information
- S/W Version

**N**

Technical information?

**Y**

External input and component recognition error?

**N**

Replace Main B/D
### Standard Repair Process

<table>
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<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>2013.01.31</td>
<td>15/16</td>
</tr>
</tbody>
</table>

#### Circuit noise
- **Identify noise type**
- **Check location of noise**
- **Replace PSU**

#### Mechanical noise
- **Identify noise type**
- **Check location of noise**

*When the noise 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 an S/W fix information)*

*Describe the basis of the description in the Owner’s Manual.*
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<tr>
<th>Standard Repair Process</th>
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</thead>
<tbody>
<tr>
<td>LCD TV</td>
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<td></td>
</tr>
</tbody>
</table>

- **Error symptom**: Exterior defect

**Module damage**
- Replace module

**Cabinet damage**
- Replace cabinet

- **Zoom part with exterior damage**
<table>
<thead>
<tr>
<th>No.</th>
<th>Error symptom</th>
<th>Content</th>
<th>Page</th>
<th>Remarks</th>
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</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>
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<tr>
<td>2</td>
<td></td>
<td>Check White Balance value</td>
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<tr>
<td>4</td>
<td>A. Video error _ video error /Video lag/stop</td>
<td>TUNER input signal strength checking method</td>
<td>A3</td>
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<td>5</td>
<td></td>
<td>LCD-TV Version checking method</td>
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<tr>
<td>6</td>
<td></td>
<td>Tuner Checking Part</td>
<td>A5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A. Video error _ Vertical/Horizontal bar,</td>
<td>LCD TV connection diagram</td>
<td>A6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>residual image, light spot</td>
<td>Check Link Cable (EPI) connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Error symptom</td>
<td>Content</td>
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<td>--------------------------------------------</td>
<td>---------------------------------------------------</td>
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</tr>
<tr>
<td>16</td>
<td>B. Power error_ No power</td>
<td>Check front display LED</td>
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<td>17</td>
<td></td>
<td>Check power input Voltage &amp; ST-BY 3.5V</td>
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</tr>
<tr>
<td>18</td>
<td>B. Power error_Off when on, off while viewing</td>
<td>POWER OFF MODE checking method</td>
<td>A19</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>C. Audio error_ No audio/Normal video</td>
<td>Checking method in menu when there is no audio</td>
<td>A20</td>
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<tr>
<td>20</td>
<td></td>
<td>Voltage and speaker checking method when there is no audio</td>
<td>A21</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>
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</tr>
<tr>
<td></td>
<td>Check LCD back light with naked eye</td>
<td>2013.01.31</td>
<td>A1</td>
<td></td>
</tr>
</tbody>
</table>

After Remove the Rear Cover, turning on the power and disassembling the case, check with the naked eye.
<table>
<thead>
<tr>
<th>Error symptom</th>
<th>A. Video error  No video/Normal audio</th>
<th>Established date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Check White Balance value</td>
<td>Revised date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A2</td>
</tr>
</tbody>
</table>

1. Press the ADJ button on the remote controller for adjustment.
2. Enter into White Balance of item 6.
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.
<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>Content</th>
<th>Established date</th>
<th>Revised date</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Video error_Video error, video lag/stop</td>
<td>TUNER input signal strength checking method</td>
<td>2013.01.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

```
Model Name: 55EA9800-NA
Serial Number: 90110G100049
J/V Version: 01.30.01.01
F/W Version: 3.00.3
BOOT Version: 2.01.07
FRC Version: 10.a7
PWM (min/max/StartDuty): 3 / 95 / 99
EDID (RGB/HDMI): NULL / 0.00
Chip Type: L9.U10
Wi-Fi Channel: 11
Wi-Fi MAC: B4:83:4A:62:07:30
MAC Address: E3:58:98:24:58:70
IP Address: 0.0.0.0
WWW.BG/1234/5678
```

Version
<table>
<thead>
<tr>
<th>Error symptom</th>
<th>Content</th>
<th>Established date</th>
<th>Revised date</th>
<th>A5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Video error_Video error, video lag/stop</td>
<td>TUNER checking part</td>
<td>2013.01.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error symptom</td>
<td>A. Video error _Vertical/Horizontal bar, residual image, light spot</td>
<td>Established date</td>
<td>Revised date</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------</td>
<td>------------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>LCD TV</td>
<td>LCD TV connection diagram (1)</td>
<td>2013.01.31</td>
<td>A6</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Check Link Cable (EPI) reconnection condition</td>
<td>2013.01.31</td>
<td>A7</td>
</tr>
</tbody>
</table>

Check the contact condition of the Link Cable, especially dust or mis insertion.
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<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>A. Video error_Color error</th>
<th>Established date</th>
<th>Revised date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Adjustment Test pattern - ADJ Key</td>
<td>2013.01.31</td>
<td>A8</td>
</tr>
</tbody>
</table>

- 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!)

---

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Appendix : Exchange the Module (1)

수직 비내림  
Brightness difference  
Line Dim

Press damage  
Un-repairable Cases

In this case please exchange the module.
Appendix : Exchange the Module (2)

- Angle view
- Color difference
- Brightness dot noise
- Half dead

In this case, please exchange the module.
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<table>
<thead>
<tr>
<th>Error symptom</th>
<th>B. Power error _No power</th>
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<tbody>
<tr>
<td>LCD TV</td>
<td>Check front display Logo</td>
<td>2013.01.31</td>
<td>A17</td>
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</tbody>
</table>

ST-BY condition: On or Off
Power ON condition: Turn Off

Front LED control : Menu

Æ Option

Standby Light

Æ ON/ Off

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<table>
<thead>
<tr>
<th>LCD TV</th>
<th>Error symptom</th>
<th>B. Power error _No power</th>
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<th>Revised date</th>
<th>A18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Check power input voltage and ST-BY 3.5V</td>
<td>2013.01.31</td>
<td>A18</td>
<td></td>
</tr>
</tbody>
</table>

#### Check the DC 24V, 12V, 3.5V.

<table>
<thead>
<tr>
<th>18 Pin (Power Board ↔ Main Board)</th>
</tr>
</thead>
<tbody>
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<td>1</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>LCD TV</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Error symptom:**

- Off when on, off whileing viewing

**Established date:** 2013.01.31

**Revised date:** A19

**Content:**

1. Press the IN-START button of the remote controller for adjustment
2. Check the entry into adjustment item 3
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<thead>
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<th>Error symptom</th>
<th>C. Audio error_No audio/Normal video</th>
<th>Established date</th>
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<th>A20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Content</td>
<td>2013.01.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Checking method in menu when there is no audio</td>
<td></td>
<td></td>
<td>A20</td>
<td></td>
</tr>
</tbody>
</table>
C. Audio error_No audio/Normal video

Established date: 2013.01.31

Error symptom

Voltage and speaker checking method when there is no audio

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<th>Content</th>
<th>Revised date</th>
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</thead>
<tbody>
<tr>
<td>Voltage and speaker checking method when there is no audio</td>
<td>A21</td>
</tr>
</tbody>
</table>

### Checking order when there is no audio

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.
## Standard Repair Process Detail Technical Manual

### LCD TV

<table>
<thead>
<tr>
<th>Error symptom</th>
<th>D. Function error</th>
<th>Established date</th>
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<tbody>
<tr>
<td>Content</td>
<td>Remote controller operation checking method</td>
<td>2013.01.31</td>
<td>A22</td>
</tr>
</tbody>
</table>

① ②

#### Checking order

1. Check Touch cable condition between Touch & Main board.
2. Check the st-by 3.5V on the terminal 4,7.
3. 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.

### Diagram

- P4002
- 1 KEY2
- 2 +3.5V_ST
- 3 GND
- 4 LOGO Light Wafer
- 5 IR
- 6 GND
- 7 EYE SCL
- 8 EYE SDA
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<table>
<thead>
<tr>
<th>Error symptom</th>
<th>D. Function error</th>
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<th>Content</th>
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</thead>
<tbody>
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<td>LCD TV</td>
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<td>Remote operation checking method</td>
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</table>

#### Board Pins

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<thead>
<tr>
<th>Pin</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>+3.5V_WOL</td>
</tr>
<tr>
<td>2</td>
<td>+3.3V</td>
</tr>
<tr>
<td>3</td>
<td>USB_DM</td>
</tr>
<tr>
<td>4</td>
<td>RTS</td>
</tr>
<tr>
<td>5</td>
<td>USB_OP</td>
</tr>
<tr>
<td>6</td>
<td>RX</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>8</td>
<td>TX</td>
</tr>
<tr>
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<td>Wifi operation checking method</td>
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</tbody>
</table>

### Checking order

1. Check Wifi cable condition between Wifi assy & Main board.
2. Check the 3.3V on the terminal 2.

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<th></th>
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<tr>
<td>Error symptom</td>
<td>D. Function error</td>
<td>Established date</td>
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<tr>
<td>LCD TV D. Function error</td>
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<tr>
<td>Content</td>
<td>Camera operation checking method</td>
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</tbody>
</table>

**Checking order**

1. Check Camera cable condition between Camera assy & Main board.
2. Check the 3.5V on the terminal 2.
3. Check the 3.5V on the terminal 2.
4. Check the 3.5V on the terminal 2.
5. Check the 3.5V on the terminal 2.
6. Check the 3.5V on the terminal 2.
7. Check the 3.5V on the terminal 2.
8. Check the 3.5V on the terminal 2.
9. Check the 3.5V on the terminal 2.
10. Check the 3.5V on the terminal 2.
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<th>E. Etc</th>
<th>Established date</th>
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<tr>
<td>LCD TV</td>
<td>Tool option changing method</td>
<td>2013.01.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Contact the USB memory. (USB 1, 2, 3 jack)
2. Enter the password. (ex. 000000)* Access USB Memory has each password.