CAUTION
BEFORE SERVICING THE CHASSIS, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.
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</tbody>
</table>
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 1MΩ and 5.2MΩ.

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

![Leakage Current Hot Check circuit](image)

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

*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 test high voltage by "drawing an arc".
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

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

General Soldering Guidelines
1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the 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.

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

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

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

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

Fuse and Conventional Resistor
Removal/Replacement
1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

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

At IC Connections
To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

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

1. Application Range
This spec sheet is applied all of the TV used LD02M chassis.

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

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

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

4. Module Specification
4.1. General Features
HM236WU1-300

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
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<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
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<td>Panel Size</td>
<td>599.44 mm(23.6 inches)</td>
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<td>Panel Type</td>
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<td>3</td>
<td>Operating Mode</td>
<td>Normally White</td>
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</tr>
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<td>Backlight Unit</td>
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<td>5</td>
<td>Max Resolution</td>
<td>1920 x 1080</td>
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<td>6</td>
<td>Pixel Pitch</td>
<td>0.2715(H)*0.2715(V)</td>
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4.2. Optical Spec.

<table>
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<th>Item</th>
<th>Specification</th>
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<th>Typ.</th>
<th>Max.</th>
<th>Remark</th>
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<td>80/80</td>
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<td>Up/Down</td>
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<td>Contrst Ratio</td>
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<td>700</td>
<td>1000</td>
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<td>Color Coordinates</td>
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<td></td>
<td>GX</td>
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<td></td>
<td></td>
<td>GY</td>
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<td>WY</td>
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## 5. General specification

### 5.1. TV

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<tr>
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<td>Market</td>
<td>AMERICA, CANADA, MEXICO</td>
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<tr>
<td>2</td>
<td>Broadcasting system</td>
<td>1) Digital : ATSC</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>2) Analog : NTSC</td>
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</tr>
<tr>
<td>3</td>
<td>Receiving system</td>
<td>ATSC/NTSC-M</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Component Input (1EA)</td>
<td>Y/Cb/Cr , Y/Pb/Pr</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CVBS Input (1EA)</td>
<td>NTSC</td>
<td>1 System (Rear) : NTSC CVBS Video input is used by common port with Component.</td>
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<tr>
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<td>RGB Input</td>
<td>RGB-PC</td>
<td>Analog (D-SUB 15Pin)</td>
</tr>
<tr>
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<td>HDMI Input (1EA)</td>
<td>HDMI1</td>
<td>Rear / HDMI version 1.4/ support PC Support HDCP</td>
</tr>
<tr>
<td>8</td>
<td>Audio Input (2EA)</td>
<td>RGB/DVI Audio Component &amp; CVBS</td>
<td>L/R Input CVBS Audio input is used by common port with Component.</td>
</tr>
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<td>9</td>
<td>USB (1EA)</td>
<td>Picture, Music, Movie, SVC</td>
<td>Software Update + Picture + Music + Move</td>
</tr>
<tr>
<td>10</td>
<td>Local Key (Touch)</td>
<td>✈️ ⌂ − + OK SETTINGS INPUT ❌</td>
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## 5.2. RGB/HDMI(PC)

<table>
<thead>
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<th>Remarks</th>
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<td>Supported Sync. Type</td>
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<td>Operating Frequency</td>
<td>Analog Horizontal</td>
<td>30 ~ 83kHz</td>
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<td></td>
<td></td>
<td>Vertical</td>
<td>56 ~ 75 Hz</td>
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<td>Vertical</td>
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<tr>
<td>3</td>
<td>Resolution</td>
<td>Analog Max.</td>
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</tr>
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<td>Digital Max.</td>
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<td>Recommend</td>
<td>1920x1080 @ 60Hz</td>
</tr>
<tr>
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<td>Operating Environment</td>
<td>Temp : 10 °C ~ 35 °C</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Humidity : 20 % ~ 80 %</td>
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</tr>
<tr>
<td>5</td>
<td>Storage Environment</td>
<td>Temp : -10 °C ~ 60 °C non condensing</td>
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<tr>
<td></td>
<td></td>
<td>Humidity : 5 % ~ 90 % non condensing</td>
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## 6. Timing
### 6.1. RGB/ HDMI (PC)

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<th>V-freq(Hz)</th>
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### 6.2. HDMI (DTV)

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<th>V-freq(Hz)</th>
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<td>10</td>
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### 6.3. Component

<table>
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<td>59.940</td>
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<td>60.000</td>
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<td>37.500</td>
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<tr>
<td>11</td>
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<td>33.750</td>
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<td>74.250</td>
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<tr>
<td>12</td>
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<td>50.000</td>
<td>74.250</td>
<td>HDTV 1080I 50Hz</td>
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<tr>
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<td>1920*1080</td>
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<td>67.500</td>
<td>60.000</td>
<td>148.500</td>
<td>HDTV 1080P</td>
</tr>
</tbody>
</table>
ADJUSTMENT INSTRUCTION

1. Application Range
This document is applied to LD02M chassis TV which is manufactured in TV (or Monitor) Factory or is produced on the basis of this data.

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), DDC Adjustment Jig equipment, SVC remote controller.
7) Push The "IN STOP KEY" – For memory initialization

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

* Boot file Download
1) Execute ISP program “Mstar ISP Utility” and then click "Config" tab.
2) Set as below, and then click “Auto Detect” and check “OK” message. If display “Error”, Check connect computer, jig, and set.
3) Click “Connect” tab. If display “Can’t “, Check connect computer, jig, and set.
4) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”.
5) Click “Auto” tab and set as below
6) Click “Run”.
7) After downloading, check “OK” message.

* USB DOWNLOAD(*.epk file download)
1) Make New folder named “LG_DTV” and put ISP file(*.epk) in the folder.
2) Put the USB Stick to the USB socket.
3) 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
4) Show the message “Copying files from memory”
5) Updating is staring.
6) Updating Completed, The TV will restart automatically.
7) 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.
3.1. ADC Process

3.1.1. ADC

1) Press the "ADJ" KEY on R/C and enter EZ ADJUST.
2) Enter ADC Calibration mode by pushing "►" key at "7. ADC Calibration".
3) Push the "Start" button.
4) ADC Calibration is executed automatically.
5) Press "EXIT" key on R/C.

* ADC Calibration Protocol (RS232)

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>CMD 1</th>
<th>CMD 2</th>
<th>Data 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enter ADJUST MODE</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Adjust 'Mode In'</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>When transfer the 'Mode In', Carry the command.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ADC adjust</td>
<td>A</td>
<td>D</td>
<td>1</td>
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<tr>
<td></td>
<td>ADC adjust</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Automatically adjustment (The use of a internal pattern)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Adjust Sequence
  • aa 00 00 [Enter Adjust Mode]
  • xb 00 40 [Component1 Input (480i)]
  • ad 00 10 [Adjust 480i Comp1]
  • xb 00 60 [RGB Input (1024*768)]
  • ad 00 10 [Adjust 1024*768 RGB]
  • aa 00 90 End Adjust mode

3.2. EDID Process

3.2.1. EDID download

1) Press "Power only" key of service remote control.
2) Press the ADJ KEY on R/C and enter EZ ADJUST.
3) Enter EDID D/L mode by pushing "►" key at "EDID D/L".
4) EDID download is executed automatically.
5) Press EXIT key on R/C.

3.2.2. RGB EDID Data

- 24MA32D (Product ID: 22889)

<table>
<thead>
<tr>
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<th>Data 2</th>
<th>Data 3</th>
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<td></td>
<td></td>
</tr>
<tr>
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*(week), **(year), *** (Check sum) : Adjustable Data

3.2.3. HDMI EDID Data

- 24MA32D(Product ID: 22890)

<table>
<thead>
<tr>
<th>Item</th>
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<th>Data 1</th>
<th>Data 2</th>
<th>Data 3</th>
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</tr>
<tr>
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</table>

*(week), **(year), *** (Check sum) : Adjustable Data

**** (physical address) : (HDMI1 : 10, HDMI2 : 20),
***** (Check sum) : (HDMI1 : F6, HDMI2 : E6)

3.3. Function Check

3.3.1. Check display and sound

*Check Input and Signal items. (cf. work instructions)
1) TV
2) AV (SCART/CVBS)
3) COMPONENT (480i)
4) RGB(PC : 1920 x 1080 @ 60Hz)
5) HDMI1/2
6) PC Audio In

* Display and Sound check is executed by Remote controller

→ Caution : Not to push the INSTOP KEY after completion if the function inspection.

→ Caution: - Never connect HDMI & D-sub Cable when download EDID.
- Download HDMI1, HDMI2 separately because HDMI1 is different from HDMI2.

* Edid data and Model option download (RS232)

<table>
<thead>
<tr>
<th>NO</th>
<th>Item</th>
<th>CMD 1</th>
<th>CMD 2</th>
<th>Data 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enter download MODE</td>
<td>A</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Download 'Mode In'</td>
<td>A</td>
<td>A</td>
<td>0</td>
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<tr>
<td></td>
<td>When transfer the 'Mode In', Carry the command.</td>
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<td></td>
<td></td>
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<tr>
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<td>EDID data and Model option download</td>
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<td>E</td>
<td>00</td>
</tr>
<tr>
<td></td>
<td>Automatically download (The use of a internal Data)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Total Assembly line process

4.1. Tool option & ADC Check
1) Press "Power on" key of service remote control.
2) Connect RS232 to USB Signal Cable to USB Jack.
3) Check the 'Tool Option' (Refer to the BOM Comments or Adjustment spec)
4) Check the ‘ADC’ is ok.

4.2. Model name & Serial number Download

4.2.1. Model name & Serial number D/L
1) Press "Power on" key of service remote control.
2) Connect RS232 Signal Cable to RS-232 Jack.
3) Write Serial number by use RS-232.
4) Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).

4.2.2. method & notice
1) Serial number D/L is using of scan equipment.
2) Setting of scan equipment operated by Manufacturing Technology Group.
3) Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

*Manual Download (Model Name and Serial Number)
If the TV set is downloaded by OTA or Service man, Sometimes model name or serial number is initialized. (Not always) There is impossible to download by bar code scan, so It need Manual download.
1) Press the 'Instart' key of ADJ remote controller.
2) Go to the menu 'Model Number D/L' like below photo.
3) Input the Factory model name(ex M2352D-PZN) or Serial number like photo.

4) Check the model name Instart menu ---- Factory name displayed (ex M2352D-PZN)
5) Check the Diagnostics (DTV country only) ---- Buyer model displayed (ex M2352D-PZ)

4.3. Function Check

4.3.1. Check display and sound
*Check Input and Signal items. (cf. work instructions)
1) TV
2) AV (SCART/CVBS)
3) COMPONENT (480i)
4) RGB(PC : 1920 x 1080 @ 60Hz)
5) HDMI1/2
6) PC Audio In
* Display and Sound check is executed by Remote controller

* Caution : Not to push the INSTOP KEY after completion if the function inspection.

4.3.2. PIP Check
1) Press “Power on” key of service remote control.
2) Input RGB & TV(ATV or DTV) signal.
3) Set Input mode to RGB.
4) Press "PIP" key of ADJ remote controller
5) Check TV Video & Audio signal of Sub picture.
4.4. White balance adjustment
RGB_Gains are fixed data for each model. Insert RS-232C Jack which is connected with PC for White Balance or equivalent device.
* Total Assembly line should be check whether the color coordinate(x,y) data refer to below table were meet or not.

<table>
<thead>
<tr>
<th>Color Temperature</th>
<th>Cool</th>
<th>9,300k</th>
<th>°K</th>
<th>Inner pattern (204gray,80IRE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>X=0.285 ±0.03</td>
<td>Y=0.293 ±0.03</td>
</tr>
<tr>
<td>Medium</td>
<td>8,000k</td>
<td>°K</td>
<td>X=0.295 ±0.03</td>
<td>Y=0.305 ±0.03</td>
</tr>
<tr>
<td>Warm</td>
<td>6,500k</td>
<td>°K</td>
<td>X=0.313 ±0.03</td>
<td>Y=0.329 ±0.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Luminance (cd/m²)</th>
<th>Cool</th>
<th>Min : 80</th>
<th>Typ : 110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Min : 80</td>
<td>Typ : 110</td>
<td></td>
</tr>
<tr>
<td>Warm</td>
<td>Min : 80</td>
<td>Typ : 110</td>
<td></td>
</tr>
</tbody>
</table>

*Note : x,y coordinates are drifted about 0.007 after 30 mins heat-run. So checking color coordinate within 5-min at total assembly line, consider x,y coordinates might be up to 0.007 than x,y target of each color temperature.

*Note : Manual W/B process using adjusts Remote control.
1) After enter Service Mode by pushing "ADJ" key,
2) Enter "White Balance" by pushing "1" key at "White Balance".

4.5. DPM Operation check
- Measurement Condition: 100~240V@ 50/60Hz
1) Set Input to RGB-PC and connect D-sub cable to set – RGB Mode. Set Input to HDMI1/2(with Input Label set to PC) and connect HDMI1/2 cable to set – HDMI Mode
2) Cut off H sync or V sync of signal.
3) Check DPM operation refer to the below table.

<table>
<thead>
<tr>
<th>Operating Condition</th>
<th>Sync (HV/I)</th>
<th>Video</th>
<th>LED</th>
<th>Wattage (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power S/W On</td>
<td>Sleep mode - RGB,HDMI</td>
<td>Off/Off</td>
<td>Off</td>
<td>Amber</td>
</tr>
</tbody>
</table>

* Press the ‘Instant’ key of ADJ remote controller

4.6.1. Model Name & SW Version Check
1) Check ‘Model Name’.
2) Check ‘S/W Version’ (Refer to the IC Ver. in the BOM)

4.6.2. Adjust Check
1) Check ‘Country Group’
2) Check ‘Area Option’
3) Check ‘Tool Option’ (Refer to the BOM Comments)
4) Check ‘Adjust ADC[Comp&RGB] is OK.
5) Check ‘EDID[RGB&HDMI1/2] is OK.
* After check all, Press the ‘EXIT’ key of ADJ remote controller to go out SVC menu.

4.7. Outgoing condition Configuration
* After all function test., press IN-STOP Key by SVC Remote controller. And make Outgoing Condition.
1. No Power

Check L800 All Voltage Level (19V)
- N
  - Check IC2602 Output Voltage Level (3.3V_ST)
    - N
      - Replace IC2602
    - Y
      - Replace IC2602 & Recheck
  - Y
    - Replace IC2602 & Recheck
  - Replace IC2602 & Recheck

Check IC802 Output Voltage Level (5V)
- N
  - Replace IC802 & Recheck
  - Y
  - Replace IC802 & Recheck
  - Replace IC802 & Recheck

Check IC806 Output Voltage Level (1.24V)
- N
  - Replace IC806 & Recheck
  - Y
  - Replace IC806 & Recheck
  - Replace IC806 & Recheck

Check IC810 Output Voltage Level (2.5V)
- N
  - Replace IC810 & Recheck
  - Y
  - Replace IC810 & Recheck
  - Replace IC810 & Recheck

Check IC807 Output Voltage Level (1.5V)
- N
  - Replace IC807 & Recheck
  - Y
  - Replace IC807 & Recheck
  - Replace IC807 & Recheck

Check X201 Clock 24MHz
- N
  - Replace X201
  - Y
  - Replace X201

Replace IC100 Flash Memory
2. No Picture

Module
Back Light On?

Check WLED_ENABLE high
R1127

Check LED Driver output
(P1101/P1103 #1,2,5,6)

Check IC101
Replace Main Scaler IC

Replace Main Scaler IC

Check Panel power
P1002(#1,2,3) 5V
IC802 Output 5V

Replace IC802

Check Panel clock
P1002(#10,11,22,23)

Check IC101
Repair Main B/D

Replace Cable

Check FFC Cable for damage
or open conductors.

Replace T-con
Board or module
3. No Video - Digital TV

Check RF Cable

Y \rightarrow

1. Check Tuner(TU2601 or 02 or 03 #5) Power (3.3V)
2. Check IC803 Output voltage(3.3V)

N \rightarrow Replace IC803

Y \rightarrow

1. Check Tuner(TU2601 or 02 or 03 #7) Power (1.8V)
2. Check IC805 Output voltage(1.8V)
   For TU2601, check #13 Power (1.23V) and IC806 also

Y \rightarrow

Check Tuner(TU2601 or 02 or 03) I2C Signal
   SCL(R2609), SDA(R2610)

N \rightarrow Check IC101

Y \rightarrow

Check Tuner(TU2601 or 02 or 03) I2C Signal
   SCL(R2609), SDA(R2610)

N \rightarrow Check IC101

Y \rightarrow

Check Tuner(TU2601 or 02 or 03)
   SIF #6 CVBS #8

N \rightarrow Replace Tuner(TU2601 or 02 or 03)
   Recheck

Y \rightarrow

Replace IC805
Replace IC806

N \rightarrow
4. No Video - Analog

Check RF Cable

Y ↓

1. Check Tuner(TU3701 #3) Power (5V)
2. Check IC802 Output voltage (5V)

N → Replace IC802

Y ↓

Check Tuner(TU3701) I2C Signal
SCL(R3702), SDA(R3701)

N → Check IC100

Y ↓

Check Tuner(TU3701)
SIF #9, VIF #11

N → Replace Tuner(TU3701)
Recheck
5. No Video - Component

Check input signal format
Is it supported?

Y

Check Component Cable

Y

Check JK400

N
Replace JK400 or Check Device

Y

Check signal
R239,R237,R241
C220,C218,C222

N
Replace R239,R237,R241
C220,C218,C222

Y
IC101 has problem

Wave form of C220
Wave form of C218
Wave form of C222
6. No Video - RGB

Check input signal format
Is it supported?

Y

Check RGB Cable

Y

Check P400

N
Replace P400 or
Check Device

Y

Check Hsync, Vsync
R4024, R4025

N
Replace R4024, R4025

Y

Check signal RGB
R228, R230, R232
C204, C206, C208

N
Replace R228, R230, R232
C204, C206, C208

Y

IC101 has problem

Wave form of R4025(Vsync)
Wave form of R4024(Hsync)
Wave form of R228/C204
Wave form of R230/C206
Wave form of R232/C208

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7. No Video - HDMI

Check input signal format
Is it supported?

Y

Check HDMI Cable for damage or open connector

Y

Check JK600/JK601 for proper connection or damage

Y

Check I2C Signal (JK601) (#15, #16)

N

Re download EDID data

N

Replace HDPC Key (IC101)

N

Replace connector

Y

Check JK600/JK601 for proper connection or damage

N

Replace Scaler (IC101)
8. No Audio

Make sure you can’t hear any audio and Device support the audio signal normally.

Y

Check Speaker and its wire connection (P700) and the resistance

N

Replace connector or Speaker

Y

1. Check C820 Voltage Level (19V)  
2. Check Audio Amp (IC700) Power (3.3V)

N

Replace IC700(19V), IC2602(3.3V) Or Adapter

Y

Check Signal from IC700 L702, L703, L704, L705

N

Replace IC700

Y

Check Signal from IC101 SDA/SCL  
(R703/R214, R707/R213)

N

Replace IC101
BLOCK DIAGRAM
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. Failure and electrical shock hazards, when servicing if is essential that only manufacturers specified parts be used for the critical components in the symbol mark of the schematic.
The symbol mark of this schematic diagram incorporates special features important for protection from X-radiation. Fire and electrical shock hazards, when servicing it is essential that only manufacturers specified parts be used for the critical components in the symbol mark of the schematic.
<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
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<td>AVDD_DDR0</td>
<td>1K 1%</td>
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<tr>
<td>C1235</td>
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<tr>
<td>C1244</td>
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</tr>
<tr>
<td>C1246</td>
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</table>

**Notes:**
- Close to DDR Power Pin
- EAN61829001
- H5TQ1G63DFR-PBC

**Special Features:**
- Important for protection from X-Radiation, Fire, and Electrical Shock Hazards.