

1080P  
Direct View LCD  
Training



# 55LW5600

LED Backlights

LG Smart TV

LED Plus

LG CINEMA 3D



LG  
Life's Good

LCD-DV Troubleshooting  
55" Class 1080P 120Hz LED  
TV SmartTV (54.6" diagonally)

wireless  
1080p Ready



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See last page for Latest Updates

## *OUTLINE*

### **Preliminary Section:**

Contact Information, Preliminary Matters, LCD Overview,  
General Troubleshooting Steps

### **Product Information Section:** Specifications, Menu Information

### **Cinema 3D Section:** Screen design and theory

### **Disassembly Section:** Removal of Circuit Boards

### **Troubleshooting Section:** Board Operation Troubleshooting of :

- **Switch Mode Power Supply with LED Backlight Driver**
- **Main Board**
  - **T-CON (TFT Panel Driver Board)**
    - **Front IR/Intelligent/Soft Touch Key Board**
  - **Speaker**

# 55LW5600 LCD Direct View Display

## Section 1

**This Section will cover Contact Information and remind the Technician of Important Safety Precautions for the Customers Safety as well as the Technician and the Equipment.**

**Basic Troubleshooting Techniques which can save time and money sometimes can be overlooked. These techniques will also be presented.**

**This Section will get the Technician familiar with the Disassembly, Identification and Layout of the LCD Display Panel.**

**At the end of this Section the Technician should be able to Identify the Circuit Boards and have the ability and knowledge necessary to safely remove and replace any Circuit Board or Assembly.**

## *Preliminary Matters (The Fine Print)*

### ***IMPORTANT SAFETY NOTICE***

The information in this training manual is intended for use by persons possessing an adequate background in electrical equipment, electronic devices, and mechanical systems. In any attempt to repair a major Product, personal injury and property damage can result. The manufacturer or seller maintains no liability for the interpretation of this information, nor can it assume any liability in conjunction with its use. When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Electronics. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury. If wires, screws, clips, straps, nuts, or washers used to complete a ground path are removed for service, they must be returned to their original positions and properly fastened.

### ***CAUTION***

To avoid personal injury, disconnect the power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks. Also be aware that many household products present a weight hazard. At least two people should be involved in the installation or servicing of such devices. Failure to consider the weight of an product could result in physical injury.



## *ESD Notice (Electrostatic Static Discharge)*

Today's sophisticated electronics are electrostatic discharge (ESD) sensitive. ESD can weaken or damage the electronics in a manner that renders them inoperative or reduces the time until their next failure. Connect an ESD wrist strap to a ground connection point or unpainted metal in the product. Alternatively, you can touch your finger repeatedly to a ground connection point or unpainted metal in the product. Before removing a replacement part from its package, touch the anti-static bag to a ground connection point or unpainted metal in the product. Handle the electronic control assembly by its edges only. When repackaging a failed electronic control assembly in an anti-static bag, observe these same precautions.

## *Regulatory Information*

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and the receiver; Connect the equipment to an outlet on a different circuit than that to which the receiver is connected; or consult the dealer or an experienced radio/TV technician for help.

## *LG Contact Information*

**Customer Service (and Part Sales) (800) 243-0000**

**Technical Support (and Part Sales) (800) 847-7597**

**USA Website (GSFS) <http://gsfs-america.lge.com>**

**Customer Service Website <http://www.us.lgservice.com>**

**Knowledgebase Website <http://lgtechassist.com> ← New: 2010/11 Wireless Ready Models Software Downloads**

**LG Web Training <https://lge.webex.com> ← Presentations with Audio/Video and Screen Notations**

**LG CS Learning Academy <http://ln.lge.com/ilearn> ← <http://136.166.4.200>**

Training Manuals, Schematics with Navigational Bookmarks, Start-Up Sequence, Owner's Guides, Interconnect Diagrams, Dimensions, Connector IDs, Product Pictures and Features.

Also available on the Plasma Page:  
PDP Panel Alignment Handbook,  
Plasma Control Board ROM Update (Jig required)

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LG Electronics Alabama, Inc.  
201 James Record Road, Huntsville, AL, 35813.**

## *LCD Direct View Overview*

### Safety and Handling Regulations

1. Approximately 20 minute pre-run time is required before making any picture performance adjustments from the Menu.
2. Refer to the Voltage/Current silk screening on the Switch Mode Power Supply.
3. C-MOS circuits are sensitive to static electricity.  
Use caution when dealing with these IC and circuits.
4. Exercise care when making voltage and waveform checks to prevent costly short circuits from damaging the unit.
5. Be cautious of lost screws and other metal objects to prevent a possible short in the circuitry.

### Checking Points to be Considered

1. Check the appearance of the Replacement Panel and Circuit Boards for both physical damage and part number accuracy.
2. Check the model label. Verify model names and board model matches.
3. Check details of defective condition and history. Example: Oscillator failure dead set, etc...

## Basic Troubleshooting Steps

### Define, Localize, Isolate and Correct

•**Define** Look at the symptom carefully and determine what circuits could be causing the failure. Use your senses Sight, Smell, Touch and Hearing. Look for burned parts and check for possible overheated components. Capacitors will sometimes leak dielectric material and give off a distinct odor. Frequency of power supplies will change with the load, or listen for relay closing etc. Observation of the front Power LED may give some clues.

•**Localize** After carefully checking the symptom and determining the circuits to be checked and after giving a thorough examination using your senses the first check should always be the DC Supply Voltages to those circuits under test. Always confirm the supplies are not only the proper level but be sure they are noise free. If the supplies are missing check the resistance for possible short circuits.

•**Isolate** To further isolate the failure, check for the proper waveforms with the Oscilloscope to make a final determination of the failure. Look for correct Amplitude Phasing and Timing of the signals also check for the proper Duty Cycle of the signals. Sometimes “glitches” or “road bumps” will be an indication of an imminent failure.

•**Correct** The final step is to correct the problem. Be careful of ESD and make sure to check the DC Supplies for proper levels. Make all necessary adjustments and lastly always perform a Safety AC Leakage Test before returning the product back to the Customer.

## 55LW5600 PRODUCT INFORMATION SECTION

This section of the manual will discuss the specifications of the 55LW5600 LCD Direct View Display



### IS IT A TV? OR SOMETHING BETTER?

Welcome to the third dimension! The LW5600 delivers LG Cinema 3D technology and a whole lot more. It lets you tap into the virtually limitless entertainment capabilities of LG Smart TV and enjoy better picture quality with LG's LED Plus display technology.



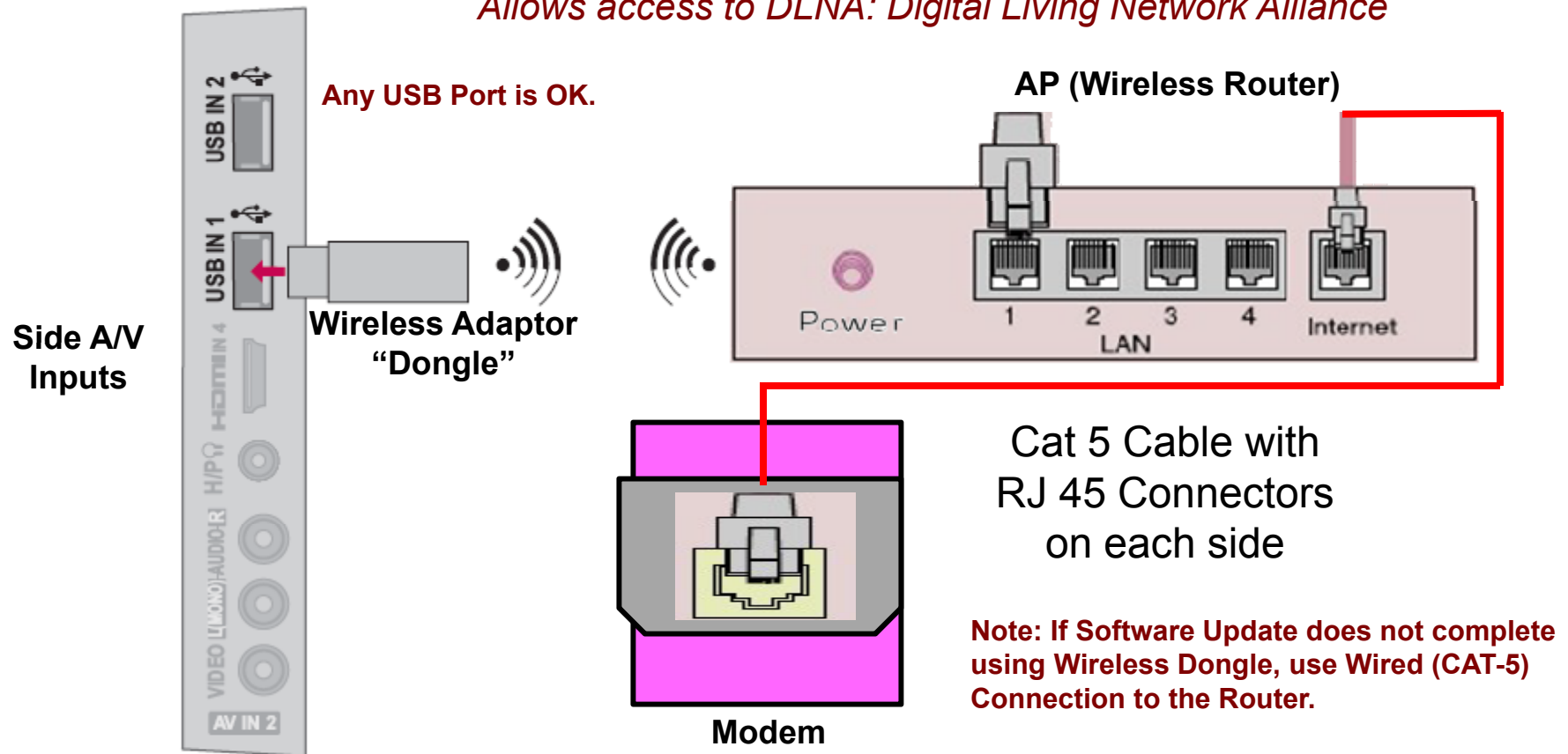
## Wireless Network Adaptor (AN-WF100)

### Wireless Network Adaptor Included



Using the LG Wireless LAN for Broadband Adaptor, which is sold separately, allows the TV to connect to a wireless LAN network. The Wireless Network adaptor attaches to the Television via either of the two USB connections:

*Allows access to DLNA: Digital Living Network Alliance*





## Basic Specifications

## Key TV Features

- LG Smart TV<sup>1</sup>
- LG Cinema 3D<sup>2</sup>
- 2D to 3D Conversion
- LED Plus w/Local Dimming
- TruMotion 120Hz
- Wi-Fi® Ready (Adapter Included)
- Magic Motion Remote (Included)
- Full HD 1080p Resolution
- DLNA Certified®
- ENERGY STAR® Qualified
- Picture Wizard II
- Intelligent Sensor
- Smart Energy Saving
- ISFccc® Ready

<sup>1</sup> Internet connection & subscriptions required and sold separately. The Magic Motion Remote does not come equipped with all LG Smart TV enabled TVs and a separate purchase maybe required. The Hulu Plus service is projected to be available via a firmware update in July 2011. The LG web browser does not support Flash 10 or HTML 5, therefore, access to certain web content may be limited or unavailable.

<sup>2</sup> For a small percentage of the population, the viewing of stereoscopic 3D video technology may cause discomfort such as headaches, dizziness or nausea. If you experience any symptoms, discontinue using the 3D functionality and contact your health care provider. 4 Pairs of 3D glasses are included.

## Logo Familiarization Page 1 of 3



### **LG Cinema 3D**

Want 3D like you get it in the movie theater? Lightweight glasses, wider viewing angles and with clear 3D images? LG's Cinema 3D experience can bring it right to your home. Enjoy amazing depth along with smoother, crisper images, and a clear picture from virtually any angle.



### **LED Plus**

Want deeper blacks and richer colors? LG's LED Plus technology provides even greater control of brightness through local dimming technology to deliver better contrast, amazing clarity and color detail, as well as greater energy efficiency compared to conventional LCD TVs.



### **LG SmartTV**

A revolutionary, easy way to access virtually limitless content, thousands of movies, customizable apps, videos and browse the web all organized in a simple to use interface.



### **Magic Motion Remote (Included)**

Just point and choose selections with LG's unique motion-controlled Magic Remote.

## Logo Familiarization Page 2 of 3



### **DLNA Certified®**

To build a digital network, you need digital devices. That's obvious. But unless those devices are compatible, it won't be much of a network. **DLNA Certified®** devices work together.



### **FULL HD RESOLUTION 1080P HD Resolution Pixels: 1920 (H) × 1080 (V)**

This stunning picture is the reason you wanted HDTV in the first place. With almost double the pixel resolution, Full HD 1080p gives it superior picture quality over standard HDTV. You'll see details and colors like never before.



### **WiFi Ready:**

Getting your LG TV connected to NetCast™ Entertainment Access and other online content is easy when you are WiFi™ Ready. If you have existing wireless broadband, setting it up is simple and you don't need to worry about messy wires.



### **Intelligent Sensor**

The Intelligent sensor will monitor the room lighting environment. When the room lights go out, the TV will automatically adjust the picture for the best viewing enjoyment.



### **Picture Wizard**

Get easy self-calibration with on-screen reference points for key picture quality elements such as black level, color, tint, sharpness and backlight levels. Take the guesswork out of picture adjustments with this simple-to-use feature. It's not actually magic, but it will sure seem that way.

## Logo Familiarization Page 3 of 3



### **Clear Voice Clearer dialogue sound**

Automatically enhances and amplifies the sound of the human voice frequency range to provide high-quality dialogue when background noise swells.



### **Save Energy, Save Money**

Home electronic products use energy when they're off to power features like clock displays and remote controls. Those that have earned the ENERGY STAR use as much as 60% less energy to perform these functions, while providing the same performance at the same price as less-efficient models. Less energy means you pay less on your energy bill. Draws less than 1 Watt in stand by.



### **TruMotion 120Hz**

See sports, video games and high-speed action with virtually no motion blur and in crystal clarity with LG's TruMotion 120Hz technology. Now your TV can keep up with the fastest moving scenes.



### **5M:1 Dynamic Contrast Ratio**

Worrying about dark scenes is a thing of the past. The mega contrast ratio of 5,000,000:1 delivers vivid colors and deep blacks.



### **AV Mode "One click" Cinema, THX Cinema, Sport, Game mode.**

TAKE IT TO THE EDGE is a true multimedia TV with an AV Mode which allows you to choose from 4 different modes of Cinema, Sports and Game by a single click of a remote control.

# 55LW5600 Remote Control

TOP PORTION



p/n AKB72914041

BOTTOM PORTION



Parts List and Owner's Manual list a p/n AKB72914043. It has the same buttons, but some may be in different locations.

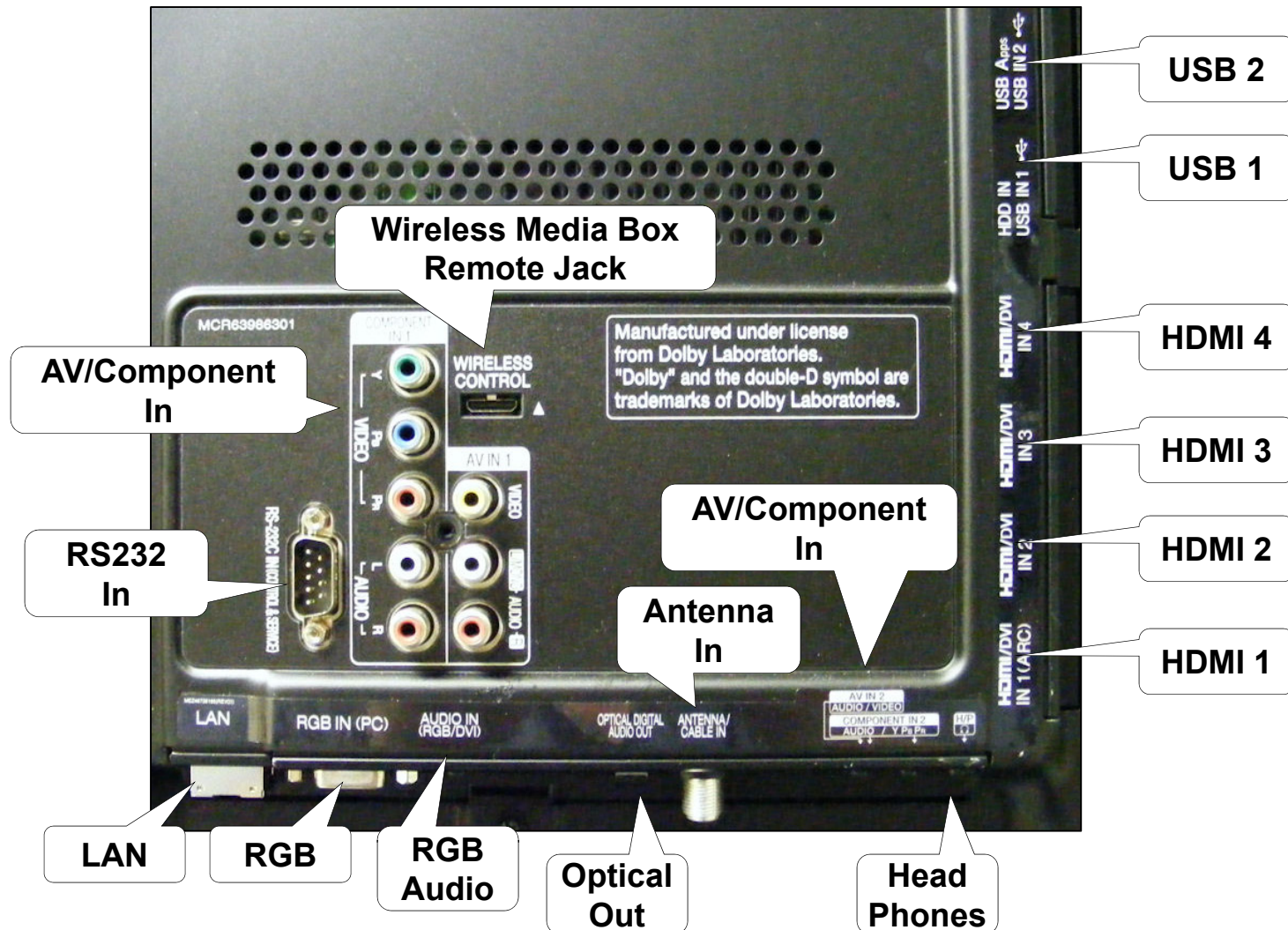


# TV Rear Input / Output Jacks

USB1 or USB2 for Software Upgrades, Music, Videos and Photos. Also for the Wireless Network adaptor.

## Rear In/Out Jacks

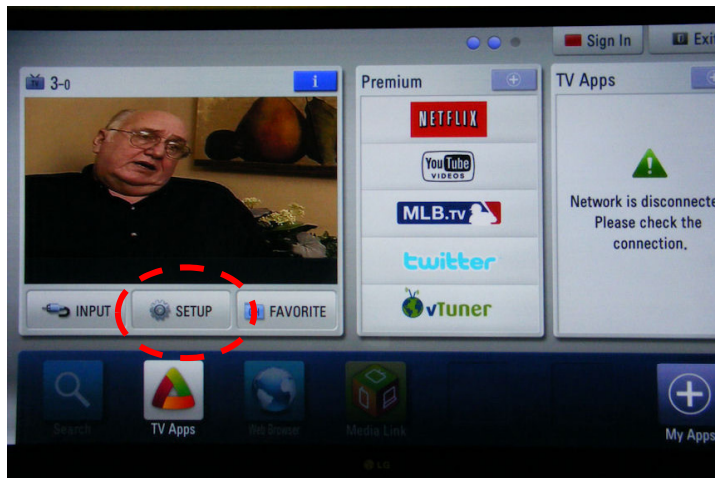
## Side In/Out



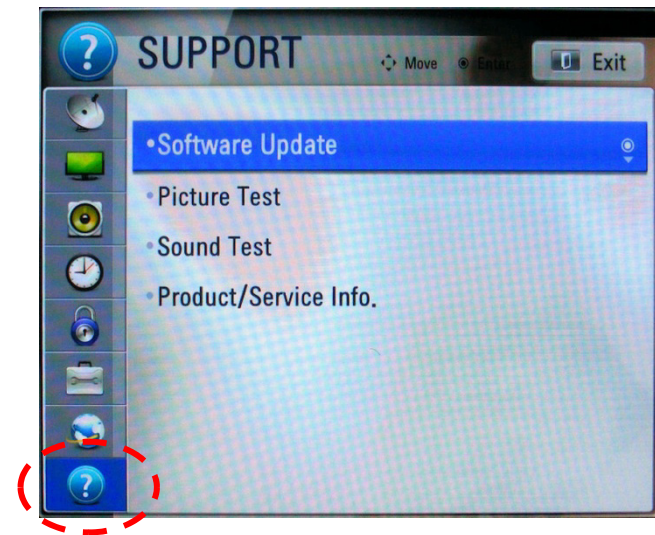
## Software Updates (New and Changed Functions)

A wireless Internet Connection will work for Automatic Software Downloads, however if there are problems completing download, a Wired Internet Connection is preferred

Bring up the Customer's Menu then cursor down 2 times, (Input) will be highlighted. Cursor right to highlight (SETUP). Press "ENTER" on the Remote.



Scroll down to highlight the "?" mark (SUPPORT). Cursor right to highlight "Software Update", Press "ENTER" on Remote



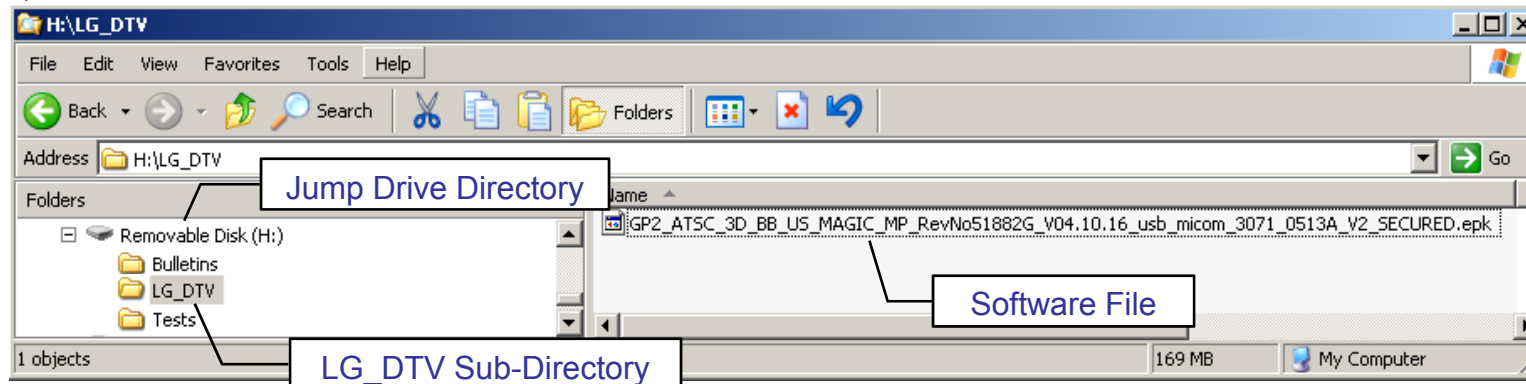
Highlight "Check Update Version" to see if an update is available. Scroll up to highlight "ON" and cursor right to turn off automatic Software Update.




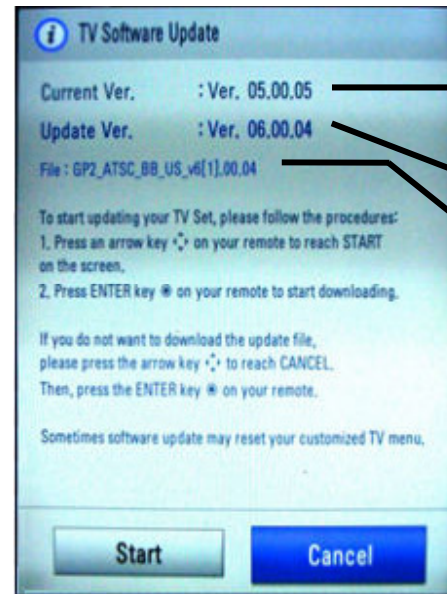


# Generic Plasma USB Automatic Software Download Instructions

1) Download the Software File.



- 2) Copy new software (xxx.epk) to "LG\_DTV" folder. Make sure to have correct software file.
- 3) With TV turned on, insert USB flash drive.
- 4) The "TV Software Upgrade" screen appears. (See figure to right) 
- 5) Cursor left and highlight "START" Button and push "Enter" button using the remote control.
- 6) You can see the download progress Bar.
- 7) Do not unplug until unit has automatically restarted.
- 8) When download is completed, you will see "COMPLETE".
- 9) Your TV will be restarted automatically.



- Currently Installed Version
- Software Version found on the USB Flash Drive
- File found on the USB Flash Drive

**\* CAUTION:**  
Do not remove AC power or the USB Flash Drive. Do not turn off Power, during the upgrade process.

Highlight Start Press Select

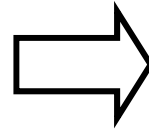
Software Files are now available from  
[LGTechassist.com](http://LGTechassist.com)

## Manual Software Download:

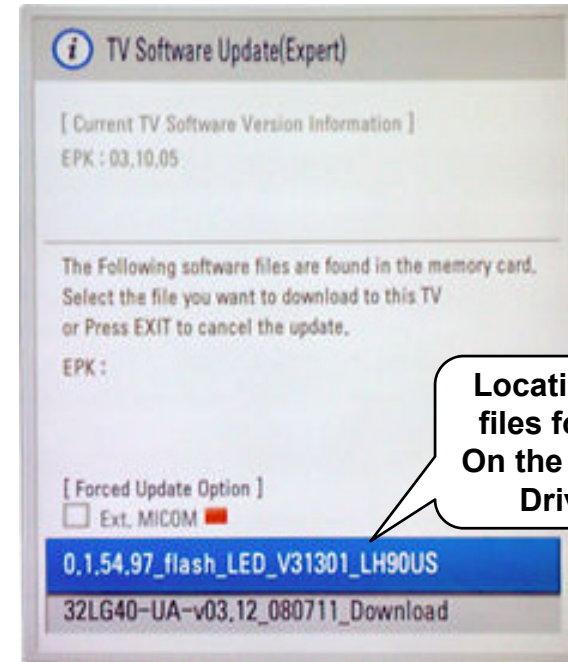
Prepare the Jump Drive as described in the “USB Automatic Download” section and insert it into either of the USB ports. Bring up the Customer’s Menu then cursor down 2 times, (Input) will be highlighted. Cursor right to highlight (SETUP). Press “ENTER” on the Remote. Scroll to “OPTIONS”, (Nothing should be highlighted on the right side). Press the “FAV” key 7 times to bring up the first screen for Manual Download Screen (Expert Mode).



Press the “FAV”  
key 7 times



3



*File shown is not correct for this model.*

4

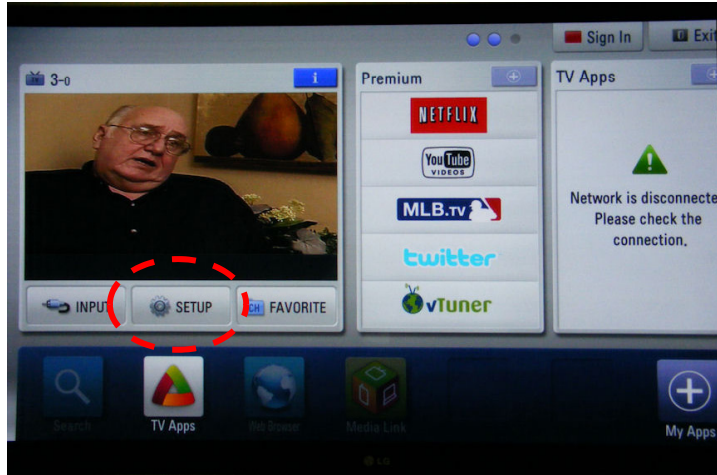
Highlight the Software update file which will appear at the bottom of the screen. (Scroll down if more than one file is on the jump drive). Press “SELECT” to begin the download process.

### **WARNING:**

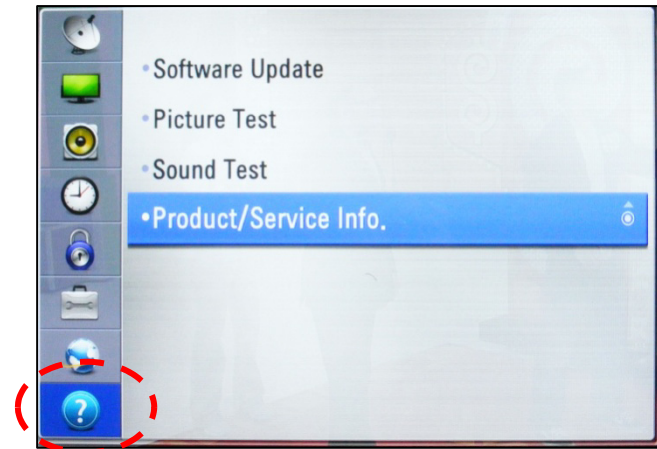
**Use extreme Caution when using the Manual “Forced” Download Menu. Any file can be downloaded when selected and may cause the Main board to become inoperative if the incorrect file was selected.**

## Product and Service Info. Menu

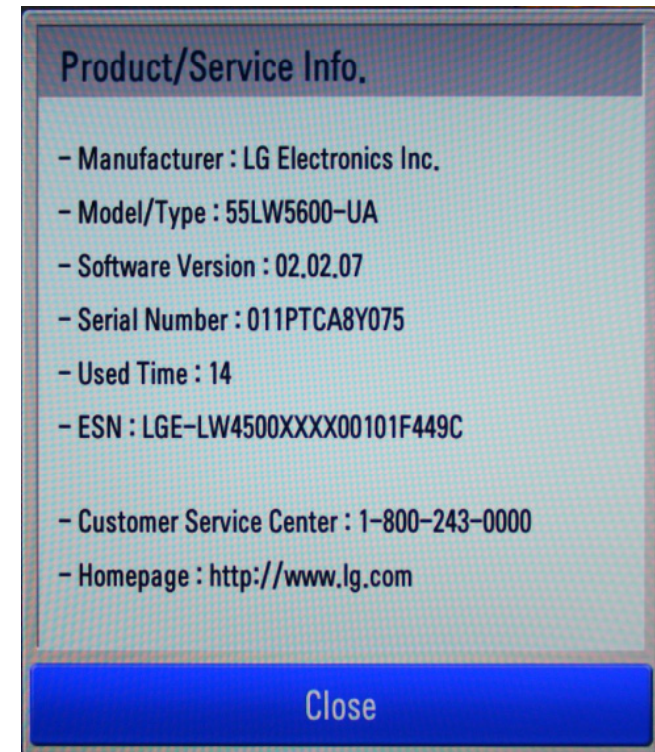
1) Bring up the Customer's Menu then cursor down 2 times, (Input) will be highlighted. Cursor right to highlight (SETUP). Press "ENTER" on the Remote.



2) Scroll down to highlight the "?" mark (SUPPORT). Cursor right and scroll down to highlight "Product/Service Info", Press "ENTER" on Remote



3) Information for Customer Support appears.  
Note: Model Number does not include suffix.

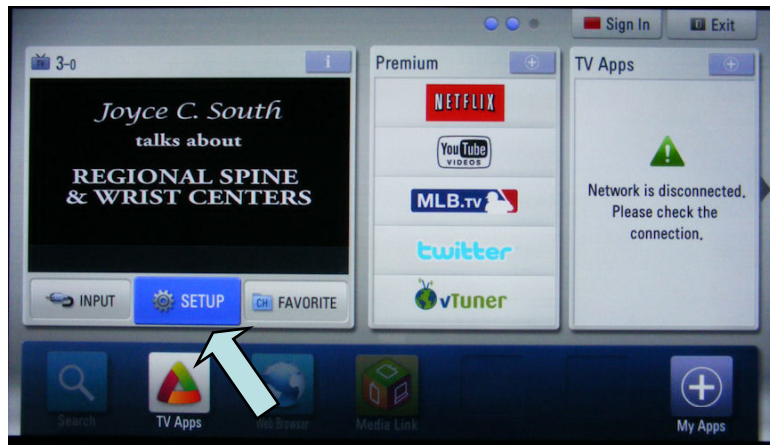




## Accessing the Host Diagnostic Screen (Page 1 of 2)

Use the Host Diagnostic screen to investigate the signal quality of a problem channel.

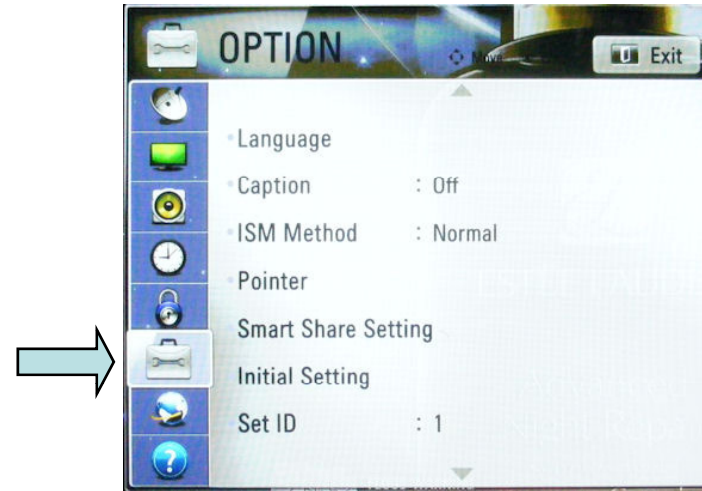
- 1) Place Television on the digital channel that is showing problems.
- 2) Bring up the Customer's Menu. Cursor down two times and right once to highlight "Setup". Press "Enter" on the remote.



- 3) The "Setup" Menu appears.



- 4) Scroll down and highlight "Options".



- 5) Press the (1) Key 5 times.  
The Host Diagnostics screen appears.



See next page for more details.

## 55LW5600 Understanding the Host Diagnostic Screen (Page 2 of 2)

### Host Diagnostics

<p style="text-align: center; color: #e67e22;">Host Information</p> <p>Model Name : 55LW5600-UA (Liquid Crystal Display)</p> <hr/> <p style="text-align: center; color: #e67e22;">Memory</p> <p>FLASH : 524288 KB          DRAM : 524288 KB          NVM : 128 KB</p> <hr/> <p style="text-align: center; color: #e67e22;">Host Release Version</p> <p>Firmware Version(PQ) : 2.02.07.01(25329) <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Software Version</span>          Micom Version : V2.21.2          Compile Date &amp; Time : 20101130 &amp; 08:45:52          Compile User : hellyhorse.kang</p> <hr/> <p style="text-align: center; color: #e67e22;">FAT Status (Main)</p> <p>Center Frequency : 663.00 MHz <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Channel Frequency</span>          PCR lock : Locked <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Program Clock Reference (Locked or No)</span>          Modulation mode : QAM 256 <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Channel Type (8VSB, QAM 64, 256)</span>          Carrier lock status : Locked <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Channel (Locked or Unlocked)</span>          SNR : 37 dB <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Channel Signal to Noise Ratio</span>          Signal level : 100% <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Channel Signal Level (Above 80% good)</span></p>	<p style="text-align: center; color: #e67e22;">Channel Selected</p> <p style="text-align: center; color: #e67e22;">Current Channel (Main)</p> <p>Channel Info : Digital 19-1 <span style="background-color: yellow; border: 1px solid black; padding: 2px;">Blocked or Not Blocked</span>          Parental Control : Channel is not blocked</p> <hr/> <p style="text-align: center; color: #e67e22;">DVI/HDMI Status</p> <p>Can't display this information now</p> <hr/> <p style="text-align: center; color: #e67e22;">Wireless ready Status</p> <p>Wireless Host Ver:0.00.0          Wireless B/B Ver:0.00.0          RF Region Config : Not Configured          Media Box Type : Not Configured          RF Frequency (Value):Auto (N.A.)          Uplink RF Power gain (Value):Auto (Min 0)          Downlink RF Power gain (Value):Auto:Auto (Min 0)          Link Mode : Unicast          RX MAC Address : ff:ff:ff:ff:ff:ff          TX MAC Address : ff:ff:ff:ff:ff:ff          Wireless connection status : Disconnected          Average</p> <div style="background-color: yellow; border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; color: #e67e22;">8VSB (Above 20 is good)          QAM 64 (Above 24 is good)          QAM 256 (Above 30 is good)</p> </div>
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◀▶ Half Page   
 CH    
 Move Page   
 🔄 Exit



# 55LW5600 Service Menu First Page (In-Start Menu)

Bring up the Service Menu using the Service Remote  
And pressing "In-Start" enter password 0413.

IN START	Model and S/N	Adjust Check	Country Group
Model Name: 55LW5600-UA	1. Adjust Check	1. Country Group (Press OK to Save)	Country Group Code
Serial Number: 011PTCA8Y075	2. ADC Data	Country Group Code	<b>02</b>
S/W Version: : 02.02.07.01	3. ADC Data Over Off Status	Country Group	<b>US</b>
MICOM Version : 2.21.2	4. System 1	Country	<b>US</b>
BOOT Version : 1.02.33	5. System 2	2. Tool Option	Tool Option 1
FRC Version : 20.ba	6. Model Number D/L	Tool Option 2	<b>33179</b>
IR LED Version : a2.0	7. Test Option	Tool Option 3	<b>4161</b>
EDID (RGB/HDMI) : 0.00/0.00	8. External ADC	Tool Option 4	<b>7295</b>
Chip Type : BCM 35230	9. Spread Spectrum	Tool Option 5	<b>21897</b>
Wireless Host Ver. : 0.00.0	10. Sync Level	Tool Option 6	<b>14925</b>
Wireless B/B/ Ver. : 0.00.0	11. Wireless Ready	3. Adjust White Balance:	<b>665</b>
Vi-Fi Version : 1.0	12. Stable Count	480i Component	<b>OK(0)</b>
Vi-Fi Channel : 0	13. ODC Test	1080p Component	<b>OTP</b>
Wi-Fi MAC : 00:00:00:00:00:00	14. Local Dimming	RGB	<b>OK</b>
MAC Address : E8:5B:5B:2E:C3:67	15. SDP Server Selection	5. EDID(PCM):	<b>OK</b>
Widevine : LGTV10L000010332	16. Network Error History	RGB	<b>OK (0x89)</b>
ESN Num. : LGE-LW4500XXXX00101F449C		HDMI1	<b>OK (0x5B,0x72)</b>
Formatter Version : 20.ba		HDMI2	<b>OK (0x5B,0x62)</b>
RF Receiver Version : VB091		HDMI3	<b>OK (0x5B,0x52)</b>
Debug Status : RELEASE		HDMI4	<b>OK (0x5B,0x42)</b>
UTT : 12			
APP History Ver.:25329			
PQL DB:LGD_AF_LGT10_XXXXXX			



## 55LW5600 Power Off Status (In-Start Menu)

IN START		Power Off Status
Model Name: 55LW5600-UA	1. Adjust Check	0. POWER_OFF_BY_LOCAL_KEY
Serial Number: 011PTCA8Y075	2. ADC Data	1. POWER_OFF_BY_ACDET
S/W Version: : 02.02.07.01	3. Power Off Status ▶	2. POWER_OFF_BY_REMOTE_KEY1
MICOM Version : 2.21.2	4. System 1	3. POWER_OFF_BY_LOCAL_KEY
BOOT Version : 1.02.33	5. System 2	4. POWER_OFF_BY_ACDET
FRC Version : 20.ba	6. Model Number D/L	5. POWER_OFF_BY_ACDET
IR LED Version : a2.0	7. Test Option	6. POWER_OFF_BY_OFFTIMER
EDID (RGB/HDMI) : 0.00/0.00	8. External ADC	7. POWER_OFF_BY_SW_DL
Chip Type : BCM 35230	9. Spread Spectrum	8. POWER_OFF_BY_ACDET
Wireless Host Ver. : 0.00.0	10. Sync Level	9. POWER_OFF_BY_LOCAL_KEY
Wireless B/B/ Ver. : 0.00.0	11. Wireless Ready	10. POWER_OFF_BY_LOCAL_KEY
Vi-Fi Version : 1.0	12. Stable Count	11. POWER_OFF_BY_REMOTE_KEY1
Vi-Fi Channel : 0	13. ODC Test	12. POWER_OFF_BY_REMOTE_KEY1
Wi-Fi MAC : 00:00:00:00:00:00	14. Local Dimming	13. POWER_OFF_BY_ACDET
MAC Address : E8:5B:5B:2E:C3:67	15. SDP Server Selection	14. POWER_OFF_BY_ACDET
Widevine : LGTV10L000010332	16. Network Error History	15. POWER_OFF_BY_LOCAL_KEY
ESN Num. : LGE-LW4500XXXX00101F449C		16. POWER_OFF_BY_AUTO_OFF
Formatter Version : 20.ba		17. POWER_OFF_BY_INSTOP
RF Receiver Version : VB091		18. POWER_OFF_BY_LOCAL_KEY
Debug Status : RELEASE		19. POWER_OFF_BY_REMOTE_KEY1
		20. POWER_OFF_BY_REMOTE_KEY1
		21. POWER_OFF_BY_ACDET
		22. POWER_OFF_BY_SW_DL
		23. POWER_OFF_BY_LOCAL_KEY

Select  
Item 3

**LOCAL\_KEY** (Key Board Power)  
**REMOTE\_KEY1** (Remote Power)  
**ACDET** (Loss of AC Power)  
**SW\_DL** (Software Download Restart)

**INSTOP** (Instop Button on Serv. Remote)  
**SW\_DL** (Software Download)  
**AUTO\_OFF** (No Signal Time Out)  
**OFF\_TIMER** (Auto Off after 2 hours)

## In Start Menu "Power Off Status"

Factor	MODE	Contents
Micom	POWER_OFF_BY_CPUCMD	Power off by CPU Command
	POWER_OFF_BY_ABN	Power off by abnormal status
	POWER_OFF_BY_KEYTIMEOUT	Power off when TV is not turned off during a certain time
	POWER_OFF_BY_ACDET	Power off by not detecting AC (abnormal case)
	POWER_OFF_BY_RESET	Power off by Micom Reset
	POWER_OFF_BY_5VMNT	Power off by not detecting 5V monitoring
	POWER_OFF_BY_NO_POLLING	Power off when receiving no ack
CPU	POWER_OFF_BY_REMOTE_KEY	Power off by remote key
	POWER_OFF_BY_OFF_TIMER	Power off by Off timer
	POWER_OFF_BY_SLEEP_TIMER	Power off by sleep timer
	POWER_OFF_BY_FAN_CONTROL	Power off by fan control
	POWER_OFF_BY_INSTOP_KEY	Power off by Instop Key
	POWER_OFF_BY_AUTO_OFF	Power off by auto off function (10 Min off with no Signal)
	POWER_OFF_BY_ON_TIMER	Power off by On timer (2 hours off with no button press after auto on)
	POWER_OFF_BY_RS232C	Power off by RS232C command
	POWER_OFF_BY_SWDOWN	Power off by software download
	POWER_OFF_BY_LOCAL_KEY	Power off by local key
	POWER_OFF_BY_CPU_ABNORMAL	Power off by CPU Abnormal status
	POWER_OFF_BY_INV_ERROR	Power off by LCD module inverter error
	POWER_OFF_BY_OTA	Power off by OTA update
POWER_OFF_BY_UNKNOWN	Power off by the other causes	

# 55LW5600 UTT Reset (In-Start Menu)

IN START		SYSTEM 1	
Model Name: 55LW5600-UA		0. Baudrate	9600
Serial Number: 011PTCA8Y075		1. 2 Hours Off (On Timer)	On
S/W Version: : 02.02.07.01		2. 2 Hours Off (Screen Mute)	Off
MICOM Version : 2.21.2		3. 15Min Force Off	On
BOOT Version : 1.02.33		4. Audio EQ	On
FRC Version : 20.ba	<b>Select Item 4</b>	5. Dynamic EQ	On
IR LED Version : a2.0		6. A2 Threshold	11
EDID (RGB/HDMI) : 0.00/0.00		7. HDMI Sound(Port1)	HDMI Port1
Chip Type : BCM 35230		8. Lip Sync Adjust(DTV)	0
Wireless Host Ver. : 0.00.0		9. Dimming	On
Wireless B/B/ Ver. : 0.00.0		10. Tuner Option	Default
Vi-Fi Version : 1.0		11. Atten RF Signal	Off
Vi-Fi Channel : 0		12. <b>UTT Reset</b>	<b>Reset</b>
Wi-Fi MAC : 00:00:00:00:00:00		13. Channel Mute	On
MAC Address : E8:5B:5B:2E:C3:67		14. Debug Status	RELEASE
Widevine : LGTV10L000010332		15. NVRAM Type	EEPROM
ESN Num. : LGE-LW4500XXXX00101F449C		16. HDEV	Off
Formatter Version : 20.ba		17. Blue back	On
RF Receiver Version : VB091		18. China Cable SO	On
Debug Status : RELEASE		19. Booster On (VHF)	0
		20. Booster Off (VHF)	0
		21. Booster On (UHF)	0
		22. Booster Off (UHF)	0
		23. Auto ADC	On
UTT : 12	<b>Unit's Total Time</b>		
APP History Ver.:25329			
PQL DB:LGD_AF_LGT10_XXXXXX			

Note: After UTT is reset, the UTT time on the left will not reset to "0" until the Service Menu is exited.

Scroll to (System 1) then Right Cursor

Scroll to (UTT Reset) Press (Select) Reset changes to Doing then back to Reset

After Reset (Doing) has completed, Reset returns. After Exit the UTT Timer is "0"

## 55LW5600 Model Number Download Screen (In-Start Menu)

When the Main Board is replaced, the Model Number and Serial Number must be corrected. Follow these instructions

Bring up the Service Menu using the Service Remote. Scroll down to item 6. Model Number D/L to highlight. Press “Cursor Right” a black cursor should appear under the first digit in the Model Number line.

IN SART	
Model Name: 55LW5600-UA	1. Adjust Check
Serial Number: 011PTCA8Y075	2. ADC Data
S/W Version: : 02.02.07.01	3. Power Off Status
MICOM Version : 2.21.2	4. System 1
BOOT Version : 1.02.33	5. System 2
FRC Version : 20. <b>Select Item 6</b>	<b>6. Model Number D/L</b>
IR LED Version : a2.0	7. Test Option
EDID (RGB/HDMI) : 0.00/0.00	8. External ADC
Chip Type : BCM 35230	9. Spread Spectrum
Wireless Host Ver. : 0.00.0	10. Sync Level
Wireless B/B/ Ver. : 0.00.0	11. Wireless Ready
Vi-Fi Version : 1.0	12. Stable Count
Vi-Fi Channel : 0	13. ODC Test
Wi-Fi MAC : 00:00:00:00:00:00	14. Local Dimming
MAC Address : E8:5B:5B:2E:C3:67	15. SDP Server Selection
Widevine : LGTV10L000010332	16. Network Error History
ESN Num. : LGE-LW4500XXXX00101F449C	
Formatter Version : 20.ba	
RF Receiver Version : VB091	
Debug Status : RELEASE	
UTT : 12	
APP History Ver.:25329	
PQL DB:LGD_AF_LGT10_XXXXXX	

Model Number D/L	
0. Model Name	<b>55LW5600-UA</b>
1. Serial Num.	011PTCA8Y075
Press OK to Save	

**To Change the Model Number**

- 1) Use the cursor right or left to select the digit to change.
- 2) Use the cursor up or down to change.
- 3) Press “ENTER” to Save
- 4) Cursor right until there is no cursor under the text.
- 5) Cursor down to highlight “Serial Number” and change per step 2 above.
- 6) Press “ENTER” to Save

Note: If you need to return to the “Model Number” line, Cursor right until there is no cursor under the text and then press the Cursor Up button on the remote. Be sure to press “Save” after all changes are made on any line. After completion, press “In-Start” to update information on the left in the IN START Screen.

# 55LW5600 EDID Download Screens

EZ ADJUST	
0. Tool Option1	
1. Tool Option2	
2. Tool Option3	
3. Tool Option4	
4. Tool Option5	
5. Tool Option6	
6. Country Group	
7. ADC Calibration	
8. White Balance	
9. 10 Point WB	
10. Test Pattern	
11. PCM EDID D/L	
12. AC3 EDID D/L	
13. Sub B/C	
14. Touch Sensitivity Setting	
15. Ext. Input Adjust	

## When Item 11 was selected

PCM EDID D/L	
HDMI1	OK/(PCM)
HDMI2	OK/(PCM)
HDMI3	OK/(PCM)
HDMI4	OK/(PCM)
RGB	OK/(PCM)
<b>Start</b>	<b>Reset</b>

If Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **EDID PCM** this shows **OK(PCM)**

If Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **AC3**, this shows **NG**.

If **NG** was shown, highlight "**Start**" and press Select on the remote. "**Writing**" appears, then **OK/(PCM)** shows here. Now Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **EDID PCM**.

If **Reset** is selected, **Erasing** will appear and then this shows "**NG**".

## When Item 12 was selected

AC3 EDID D/L	
HDMI1	OK/(AC3)
HDMI2	OK/(AC3)
HDMI3	OK/(AC3)
HDMI4	OK/(AC3)
RGB	OK/(AC3)
<b>Start</b>	<b>Reset</b>

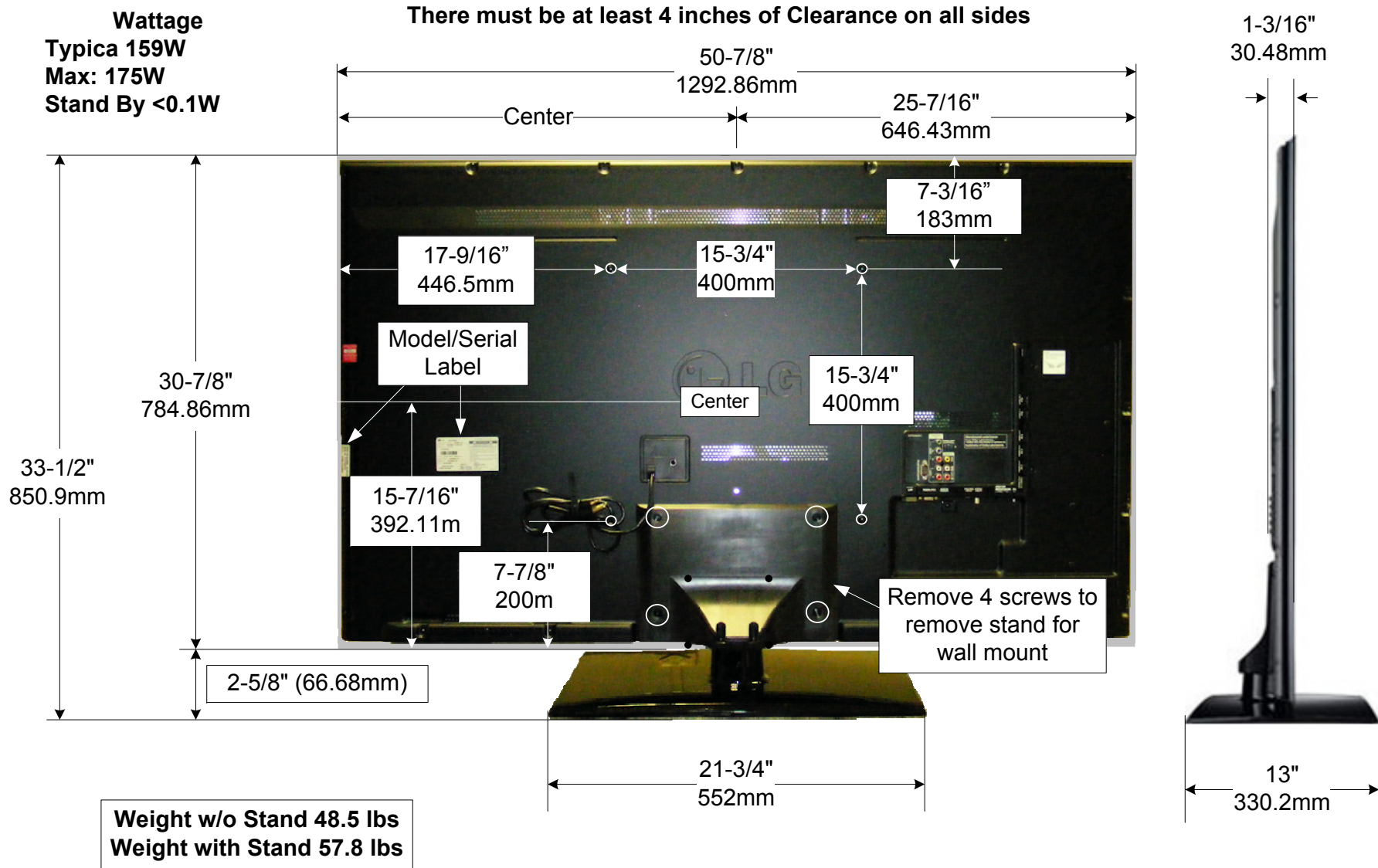
If Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **EDID AC3** this shows **OK(AC3)**

If Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **PCM**, this shows **NG**.

If **NG** was shown, highlight "**Start**" and press Select on the remote. "**Writing**" appears, then **OK/(AC3)** shows here. Now Item 5 on Adjust Check in the 1<sup>st</sup> page of the Service Menu shows **EDID AC3**.

If **Reset** is selected, **Erasing** will appear and then this shows "**NG**".

# 55LW5600 Product Dimensions





## *PASSIVE 3D SECTION*

### **PASSIVE 3D**

This section of the manual will discuss the Passive 3D used in the 55LW5600 LCD Direct View Television.

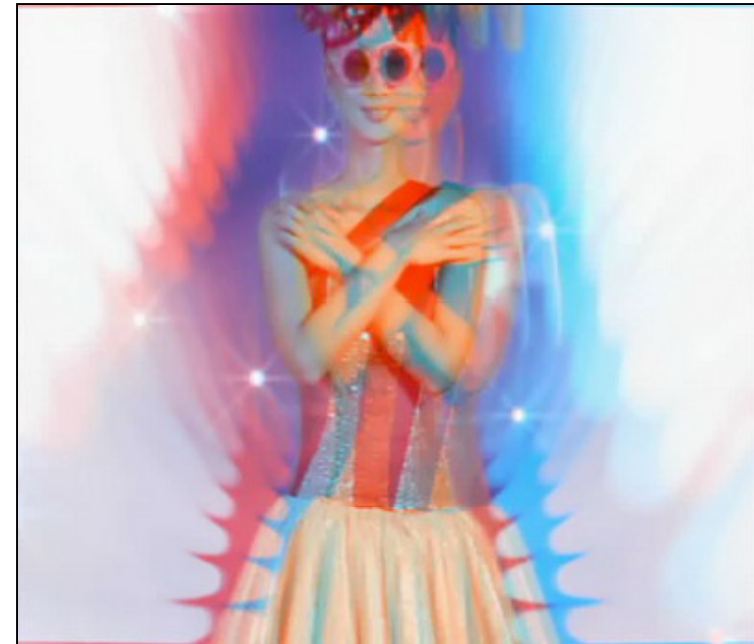
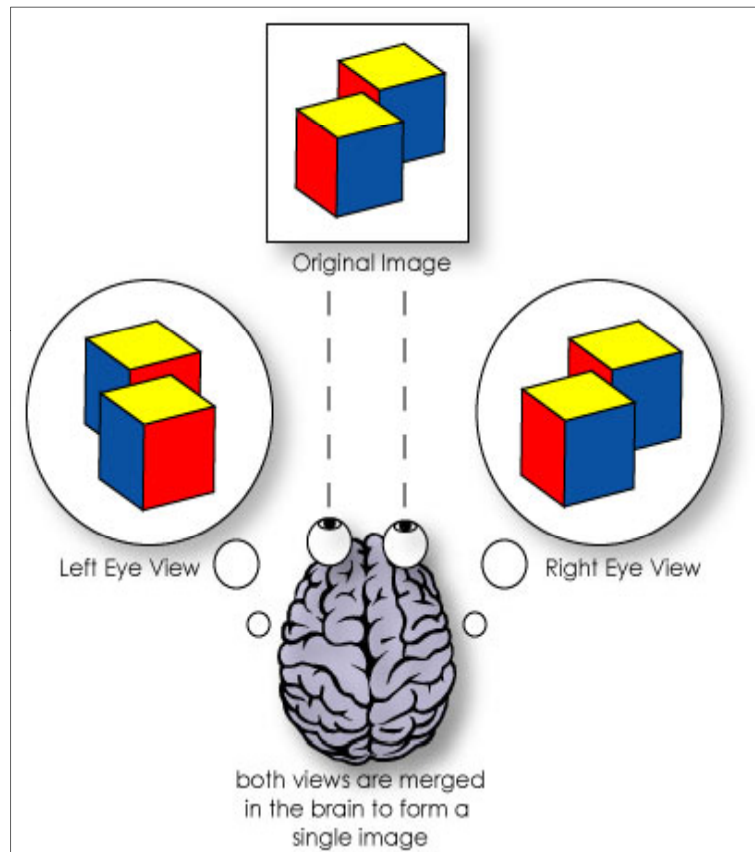
Upon completion of this section the Technician will have a better understanding of Passive 3D.





## What is 3D (From the human viewpoint)

Each eye looks at an image from slightly different angles. Therefore, the brain takes these two different images and translates them into one image giving us depth perception. This is difficult to reproduce on a 2 dimensional screen. We have to come up with a scheme that will allow us to see the same image from two different angles giving us 3D effects.

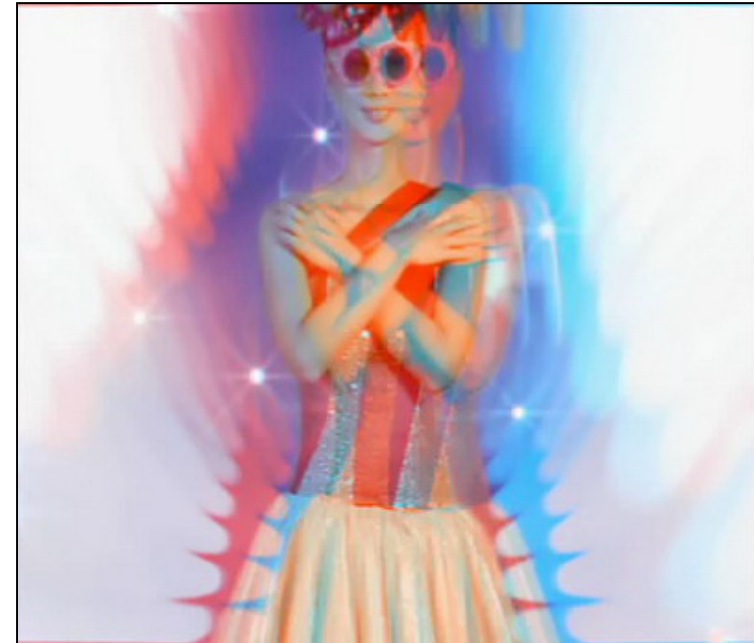
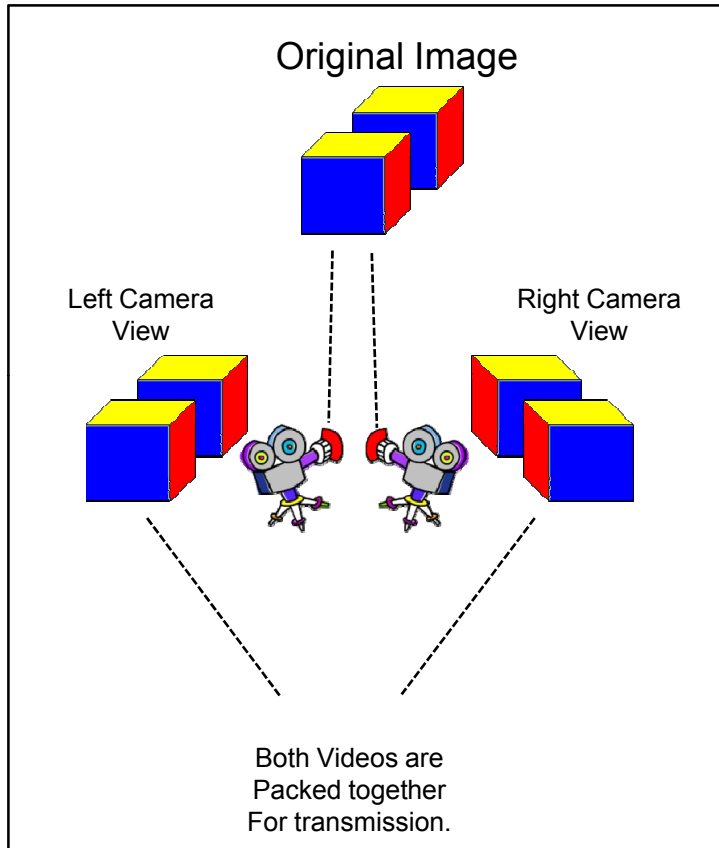


If the two images were added together without the brain doing the calculations to combine them, they would appear out of focus.

Note: The Left and Right eye are actually seeing the same image but from a different angle, but for this explanation one is shown inverted from the other for clarity purposes simply to show there is a difference between the two images seen by each eye.

## What is 3D (From the camera viewpoint)

Each Camera looks at an image from slightly different angles. Each camera generates its own video, we'll call "Left Camera View" and "Right Camera View". The Frame packing adds both of these videos together as described in the "3D Broadcasting" page.



The two videos are separated by the Frame rate converter in the Television and put on the screen. The first horizontal line is the Left Camera view and the 2<sup>nd</sup> line is the Right camera view. 3<sup>rd</sup> line is Left, 4<sup>th</sup> is Right and so on.

Note: The Left and Right Cameras are actually seeing the same image but from a different angle, but for this explanation one is shown inverted from the other for clarity purposes simply to show there is a difference between the two images seen by each camera.

# LCD 3D Formatter

## 3D Formatter

- All Formats of input are available and converted by 3D technology
- Full HD input available
- 3D Enhancement

### HDMI 1.3 / HDMI 1.4

Regular 2D

### 3D Formats (Frame Packed)

1) Side by Side

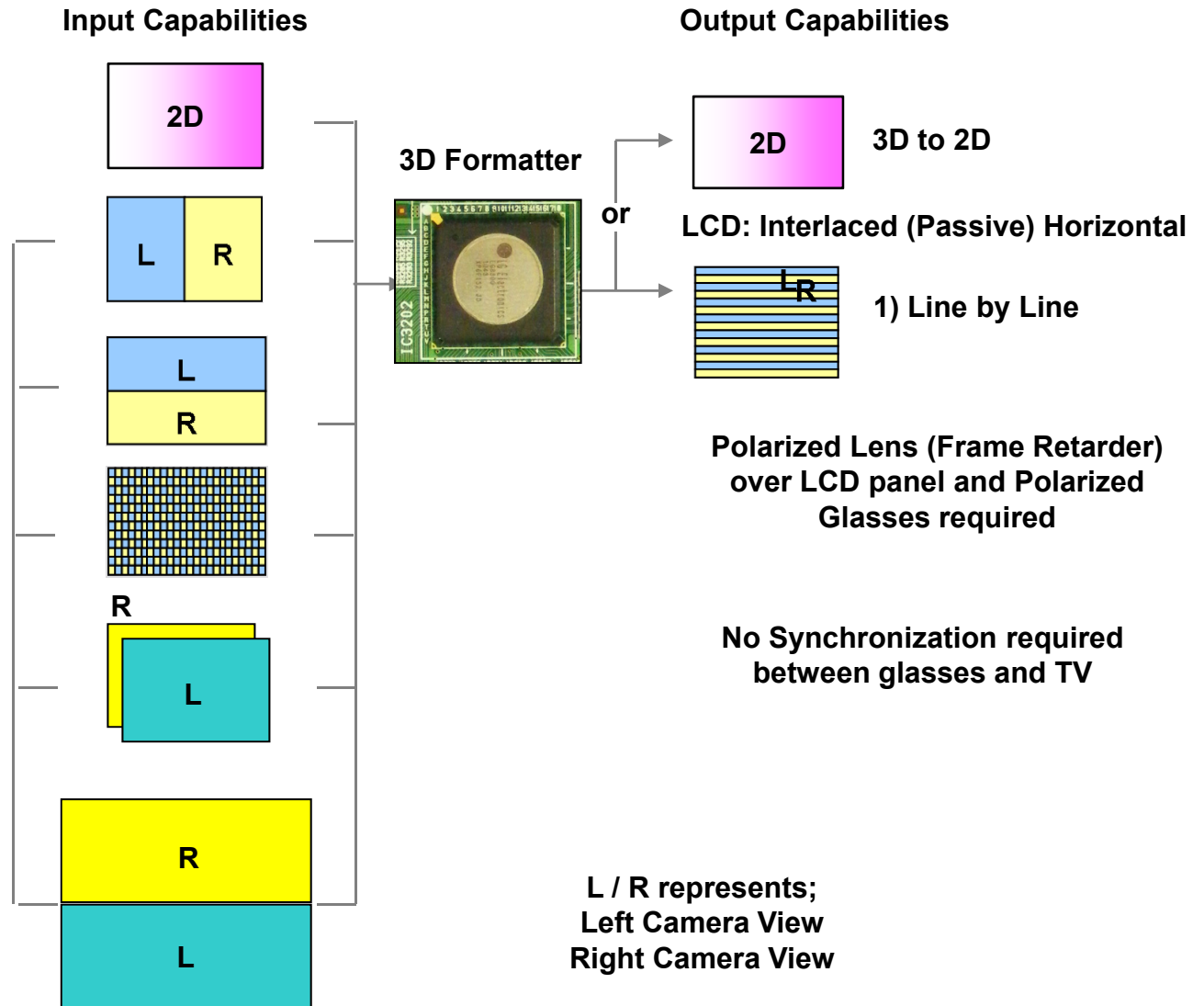
2) Top and Bottom

3) Checkerboard

4) Frame Sequential  
(Full Resolution available)

### HDMI 1.4 (Only)

5) Over/Under

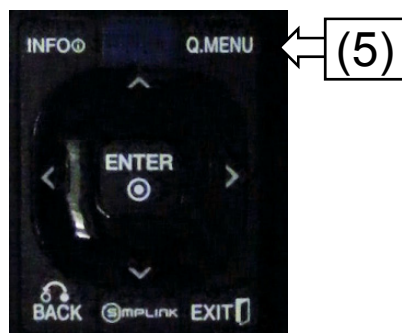
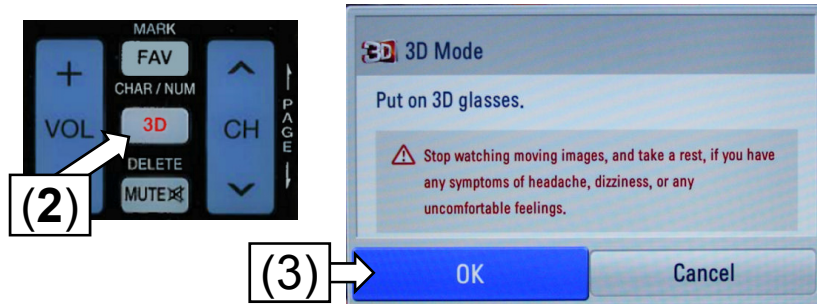
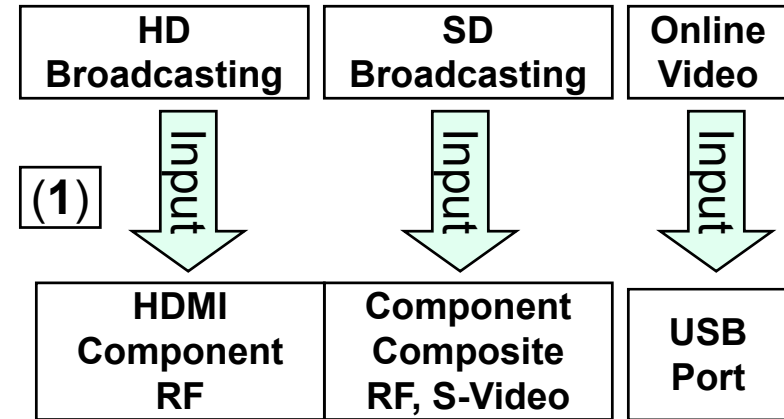


# TV 3D broadcasting

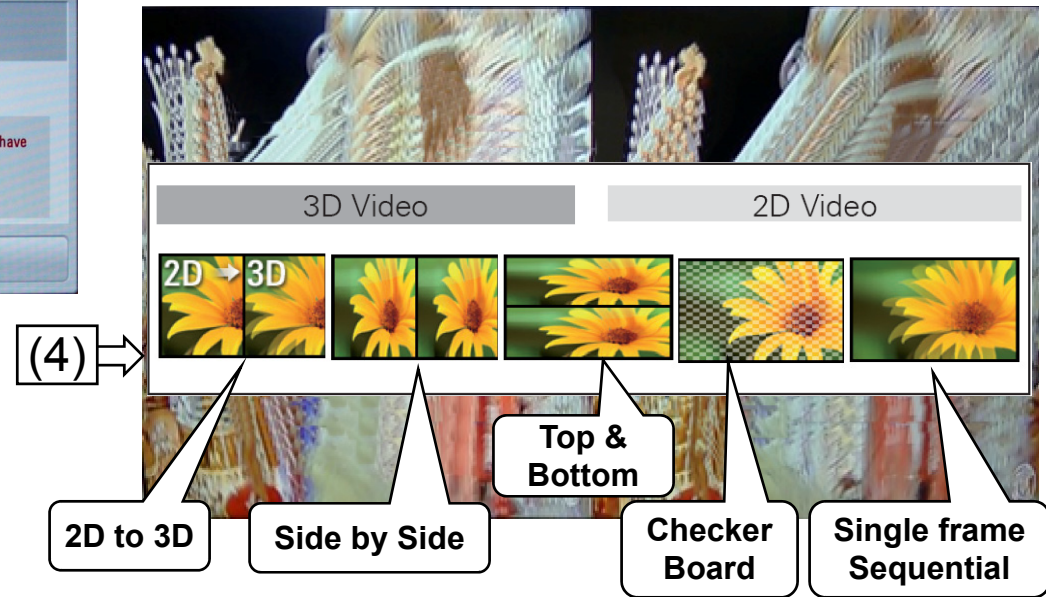
## 3D for All types of broadcasting signals

1. Input of broadcasting signal
2. Press "3D" button. Read the Warning.
3. Press "ENTER".
4. Select type of input source.
5. In case 3D looks \*abnormal, press "Quick MENU" and select "3D Mode Setting".

\*Abnormality may be caused by reversed L/R order of the input signal. If TV already in Left/Right change to Right/Left or vice versa.



See next page for more 3D Mode Setting details.



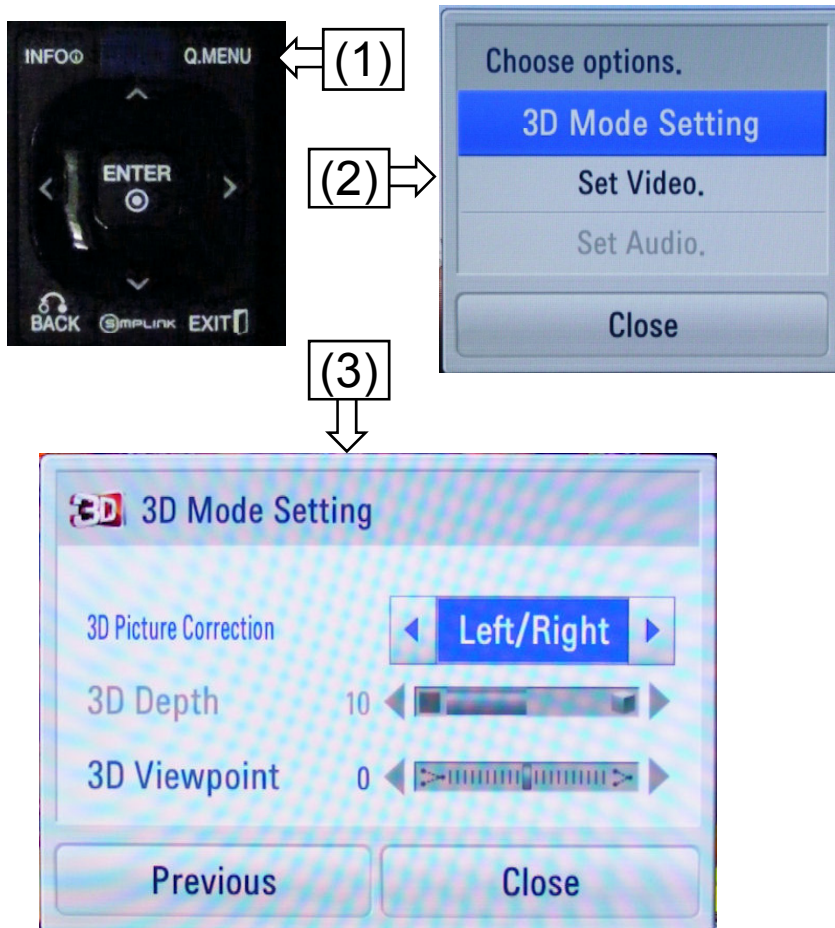
Note: Picture behind the menu is showing a side by side format.  
 Note: HDMI 1.4 will automatically select 3D type for you.



## 3D Settings Menu

**3D settings may help with 3D view pleasure.**

(1) In case 3D looks \*abnormal, press “Quick MENU” (2) Select “3D Mode Setting”.



**3D Picture Correction:** Changes the order of images in the right and left sides of the picture in 3D mode.

**3D Depth:** Adjusts the distance between the object and the background in the picture to enhance the 3D effect in 2D to 3D mode.


**3D View Point:** Brings the picture (including both the object and background images) to the front or back to enhance the 3D effect in 3D mode.

### Other 3D Mode Settings on different Model Menus

**3D Picture Balance:** Adjusts the color and brightness difference between the right and left sides of the picture in 3D mode.

**3D Picture Size:** Cuts off the outer edges of the picture and stretch it to fit the full screen in 3D mode.

## Advantages of Passive 3D

GLASSES	ADVANTAGES	
<p data-bbox="268 618 470 662">AG-P110</p>  <p data-bbox="178 881 583 1003">4 Pair Come with the TV Additional Glasses Reasonably priced</p>	Easy Wear	Light Weight : 15g
	<ul data-bbox="625 735 911 979" style="list-style-type: none"> <li>• Comfortable</li> <li>• Flicker Free</li> <li>• Light</li> <li>• No Batteries</li> <li>• No Charging</li> </ul>	<ul data-bbox="1077 735 1927 979" style="list-style-type: none"> <li>• Possible to watch 3D while laying down</li> <li>• Horizontal (Left/Right) Viewing Angle Free</li> <li>• Large group of people can watch simultaneously</li> <li>• No synchronization pulse to interfere with.</li> </ul>
	<ul data-bbox="625 1032 1829 1125" style="list-style-type: none"> <li>• Compatibility with all types of 3D Passive TV Maker</li> <li>• Glasses can be made by polarized coating on normal glasses</li> </ul>	

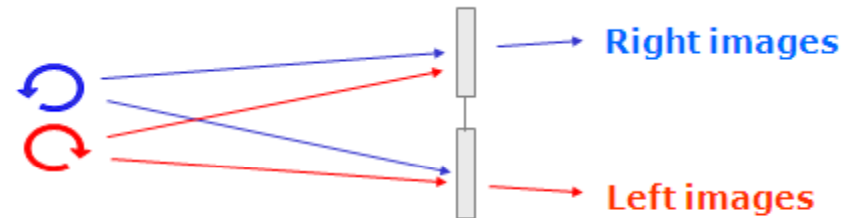
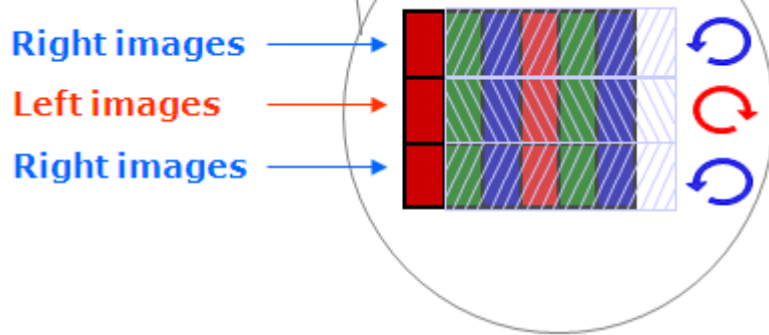
## PR Type of 3D Display

**Pattern Retarder** makes separation of polarization status.  
Each eye can see left and right images respectively when wearing polarized glasses.



Separated by patterned retarder

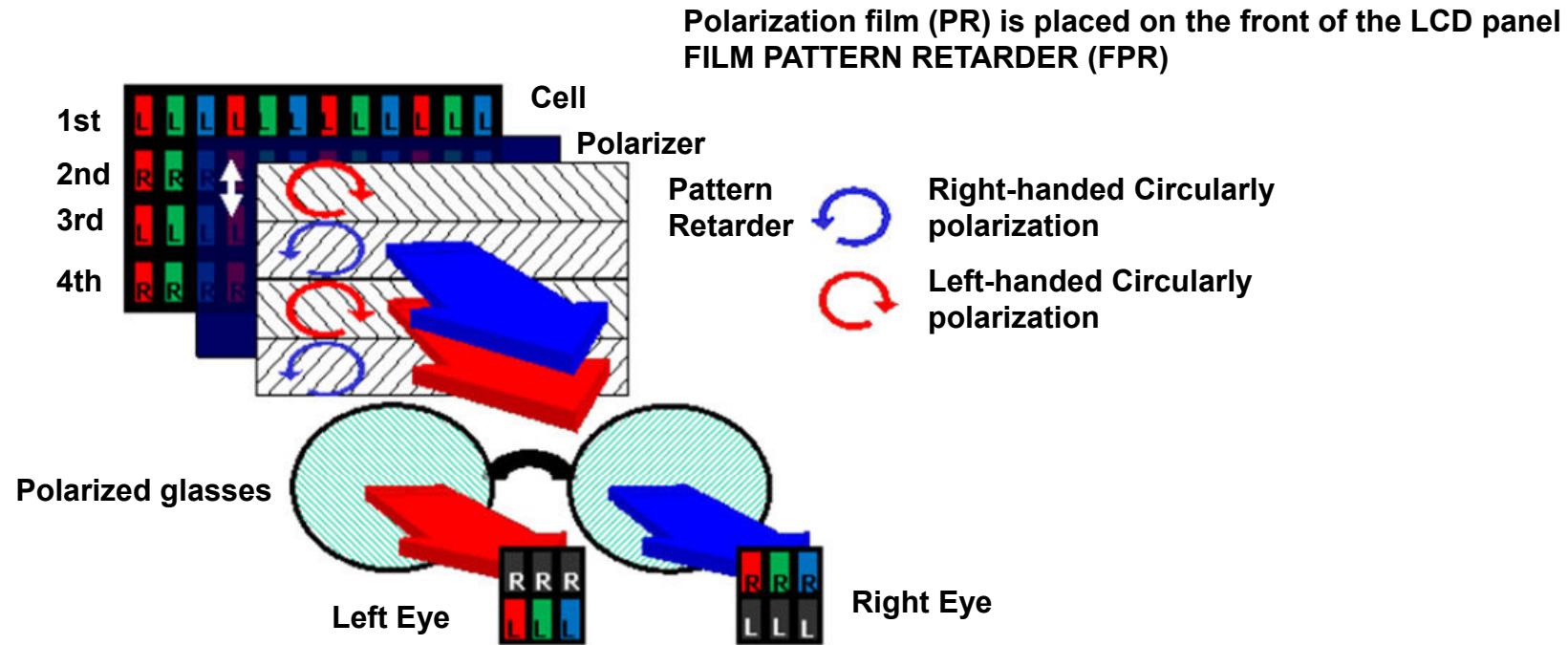
Distinguished by Polarized Glasses



Right images input to odd lines  
Left images input to even lines



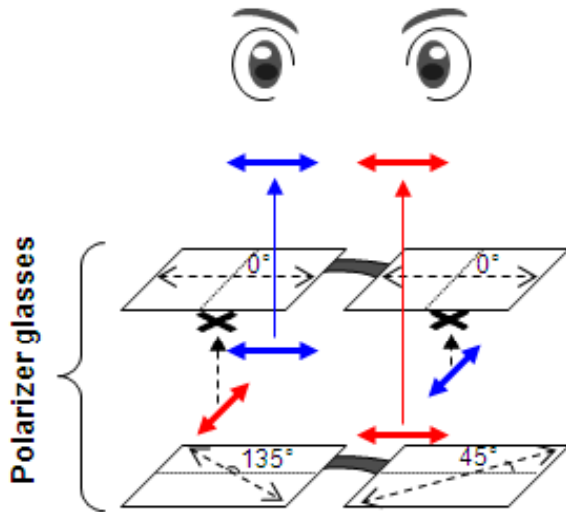
## FPR 3D Display Design



1. Patterned Retarder plate is attached on the LCD module
2. Patterned Retarder plate rotates odd line to CW 45 degree and even line CCW 45 degree
3. Odd number pixels see through the Left lens and even number pixels see through the Right lens of the Polarized glasses
4. The brain combines separated images into 3D image

## Polarizer State

Pattern retarder makes 2 kinds of polarization states; LHC, RHC  
 Polarizer glasses is possible to distinguish polarization state.



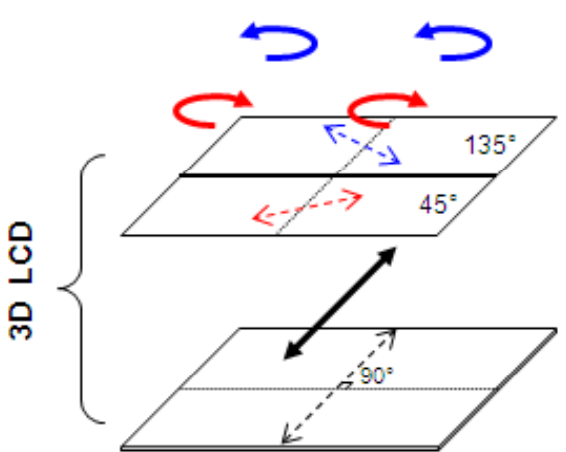
**Polarization State #4  
 (Linear)**

Polarizer

**Polarization State #3  
 (Circular)**

Quarter Wave Plate

**Distinguish polarization state**  
 - LHC : Left Handed Circularly Polarization  
 - RHC : Right Handed Circularly Polarization



**Polarization State #2  
 (Circular)**

Pattern Retarder

**Polarization State #1  
 (Linear)**

Polarizer of LCD

**Divides light output into 2 kinds of polarization states**  
 - LHC : Left Handed Circularly Polarization  
 - RHC : Right Handed Circularly Polarization

## 3D Supported Formats

Input	Signal	Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Playable 3D video format	
HDMI	720p	1280x720	45.00	60	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» HDMI 3D Top &amp; Bottom</li> </ul>	
			90.00	60	<ul style="list-style-type: none"> <li>» HDMI 3D Frame Packing</li> </ul>	
	1080i	1920x1080	33.75	60	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» HDMI 3D Side by Side (Half)</li> </ul>	
					<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> <li>» Single Frame Sequential</li> </ul>	
	1080p	1920x1080			60	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> <li>» Single Frame Sequential</li> </ul>
						<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> <li>» HDMI 3D Top &amp; Bottom</li> </ul>
						<ul style="list-style-type: none"> <li>» HDMI 3D Frame Packing</li> </ul>
						<ul style="list-style-type: none"> <li>» HDMI 3D Frame Packing</li> </ul>
						<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> </ul>
	Component (  )	720p	1280x720	44.96	59.94	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> </ul>
45.00				60.00		
1080i		1920x1080	33.72	59.94	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> </ul>	
			33.75	60.00		
RGB-PC	1080p	1920x1080	66.587	59.934	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> </ul>	
USB	1080p	1920x1080	33.75	30	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> <li>» MPO (Photo)</li> </ul>	
DLNA	1080p	1920x1080	33.75	30	<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> <li>» Checker Board</li> </ul>	
Signal					Playable 3D video format	
DTV	720p, 1080i				<ul style="list-style-type: none"> <li>» Side by Side</li> <li>» Top &amp; Bottom</li> </ul>	

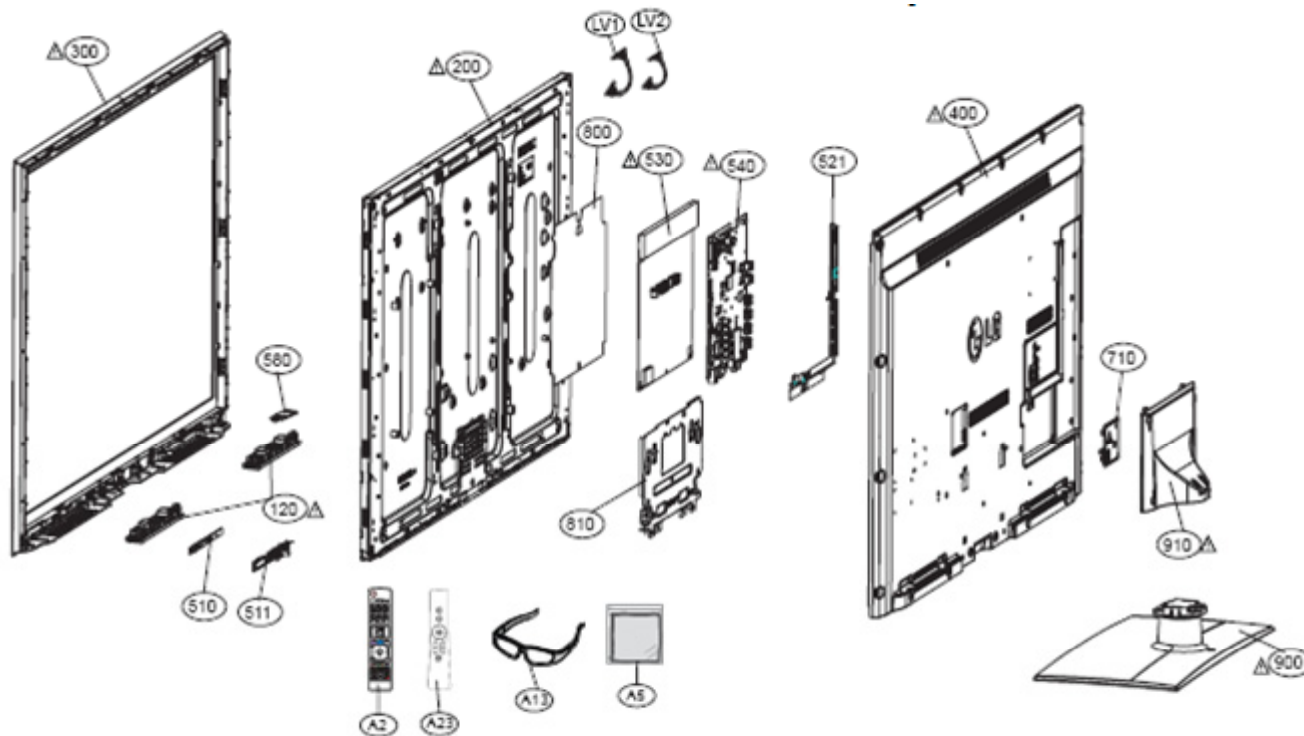
- Media contents and a player need to support HDMI 3D Frame Packing, HDMI 3D Side by Side, HDMI 3D Top & Bottom to play in 3D.
- Video, which is input as HDMI 3D Frame Packing, HDMI 3D Side by Side, HDMI 3D Top & Bottom format, is switched into the 3D screen automatically.

## DISASSEMBLY SECTION

### Disassembly:

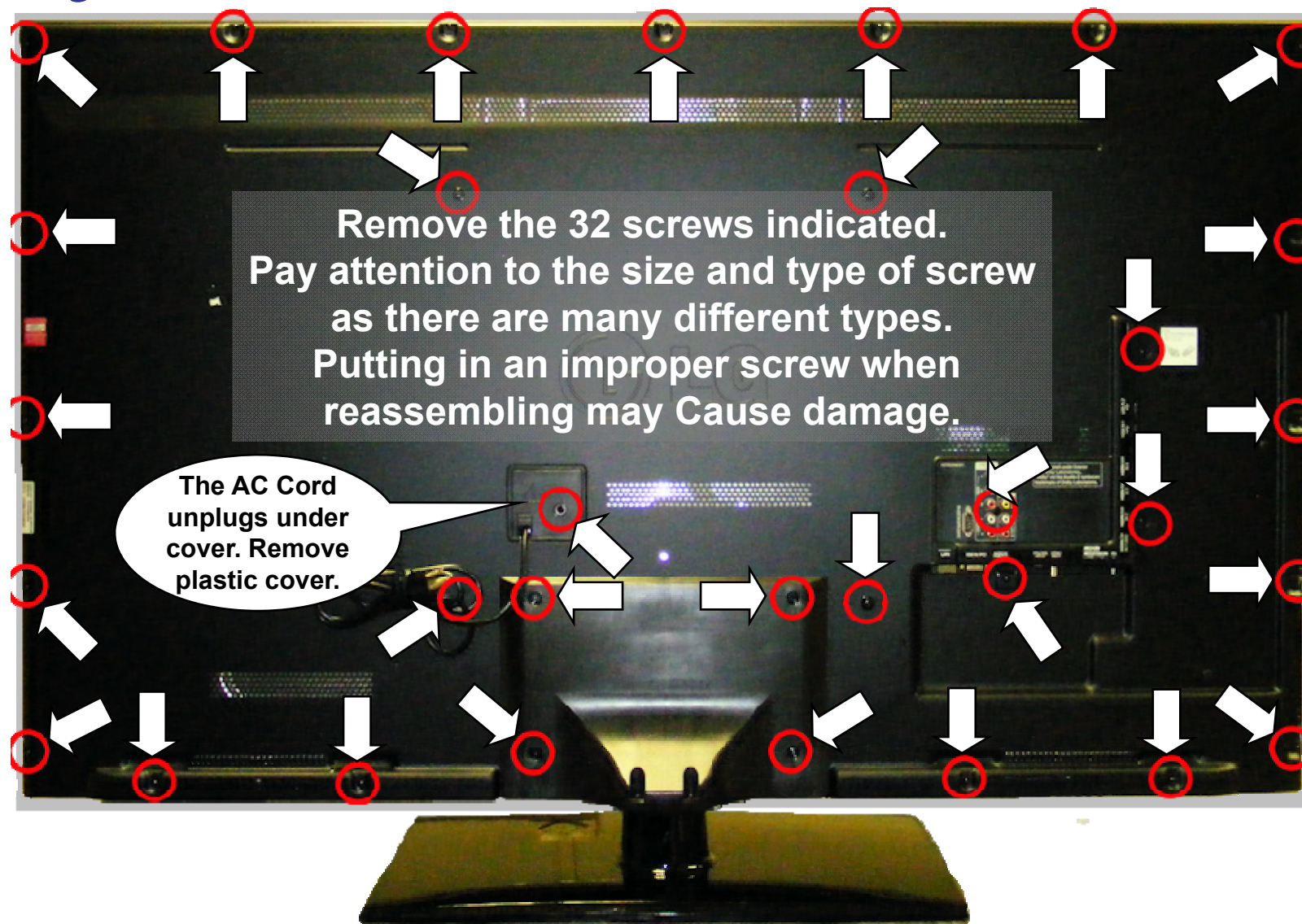
This section of the manual will discuss Disassembly, Layout (Circuit Board Identification) of the 55LW5600 LCD Direct View Television.

Upon completion of this section the Technician will have a better understanding of the disassembly procedures, the layout of the printed circuit boards and be able to identify each board.



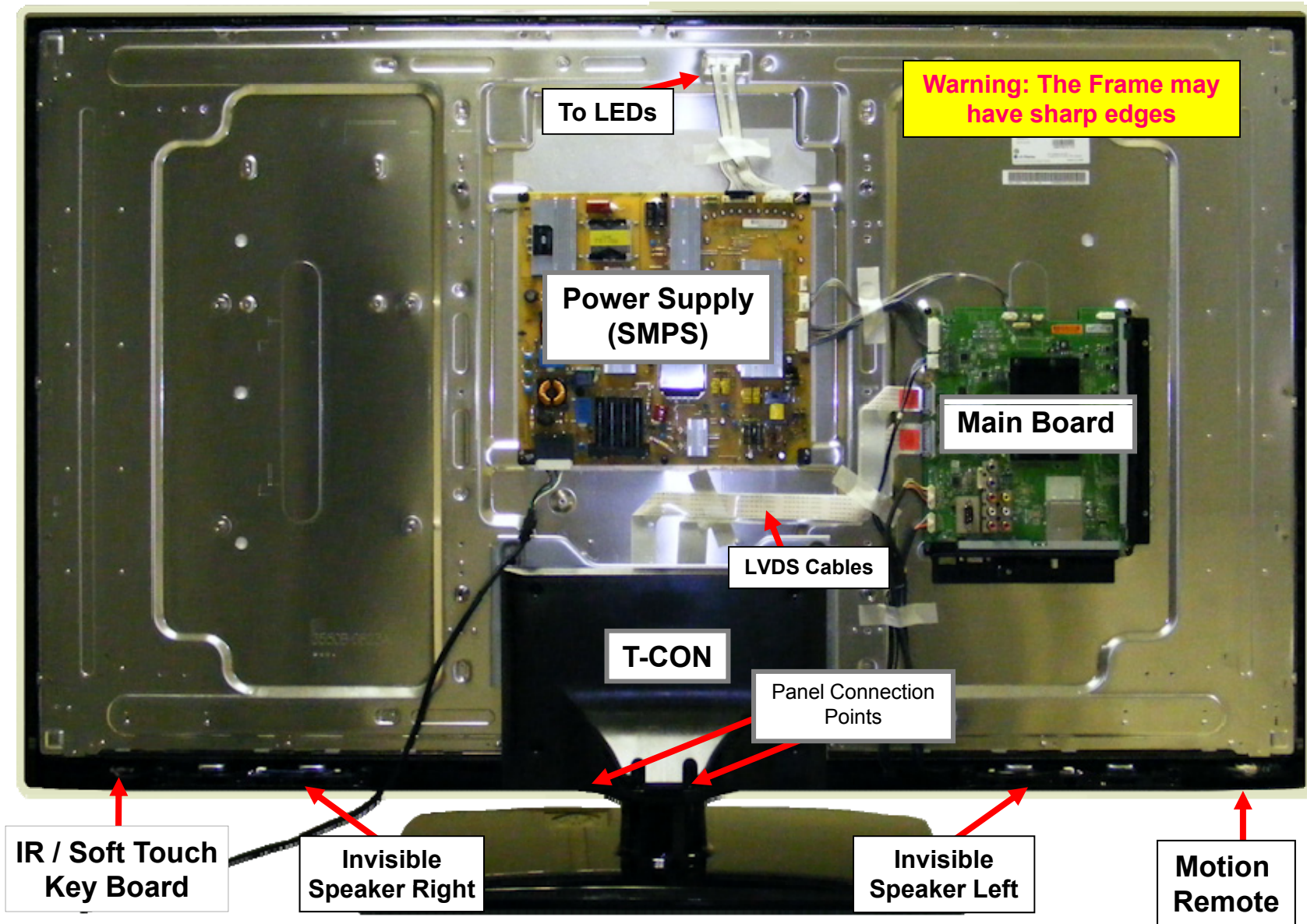


## Removing the Back Cover



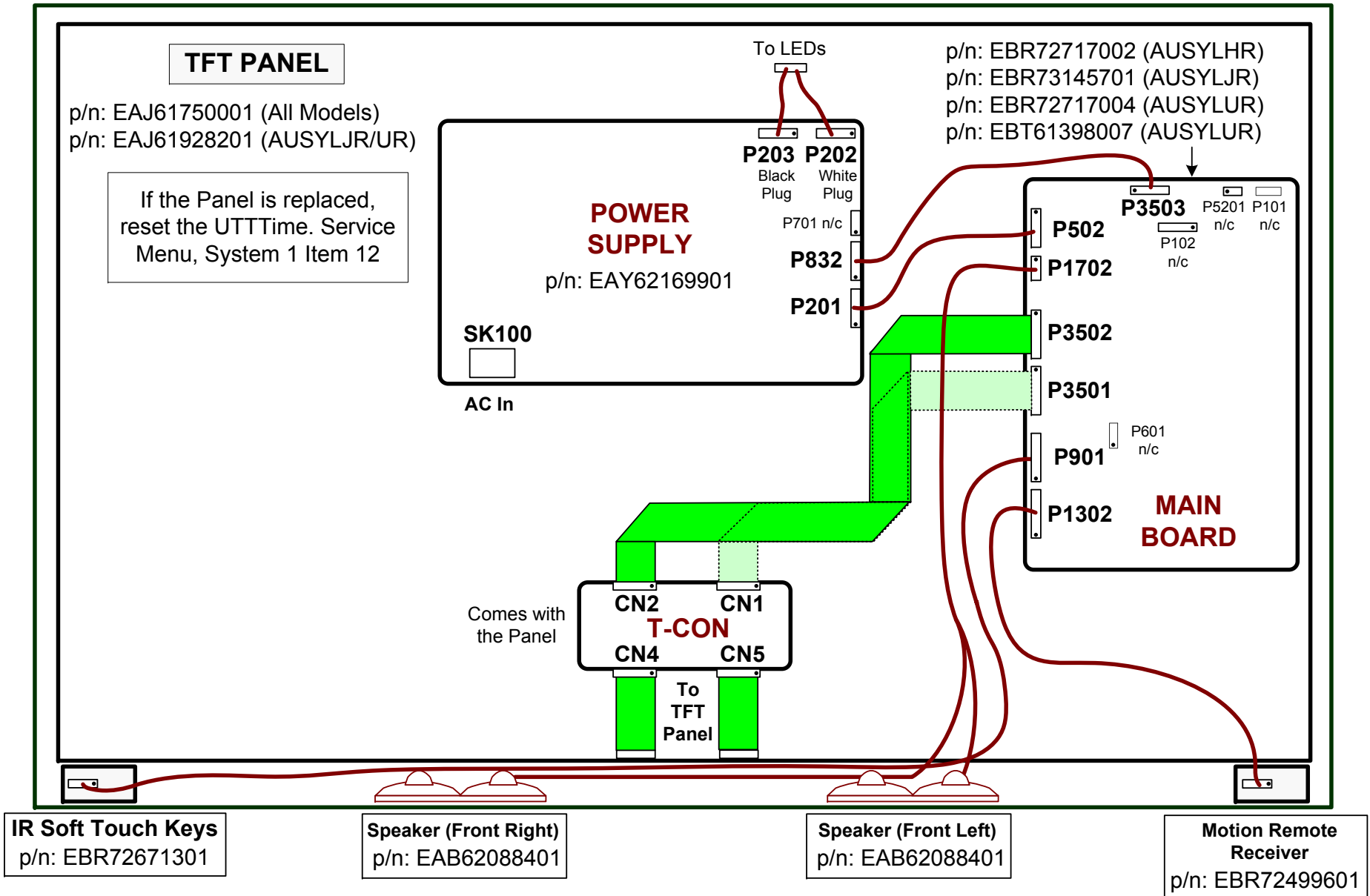
The Stand has to be removed before removing the back.

## Circuit Board Layout





# 55LW5600 Connector Identification Diagram



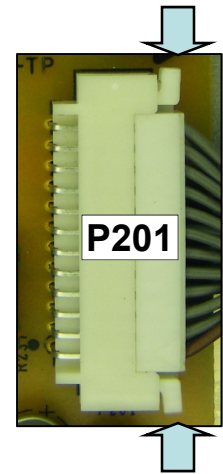
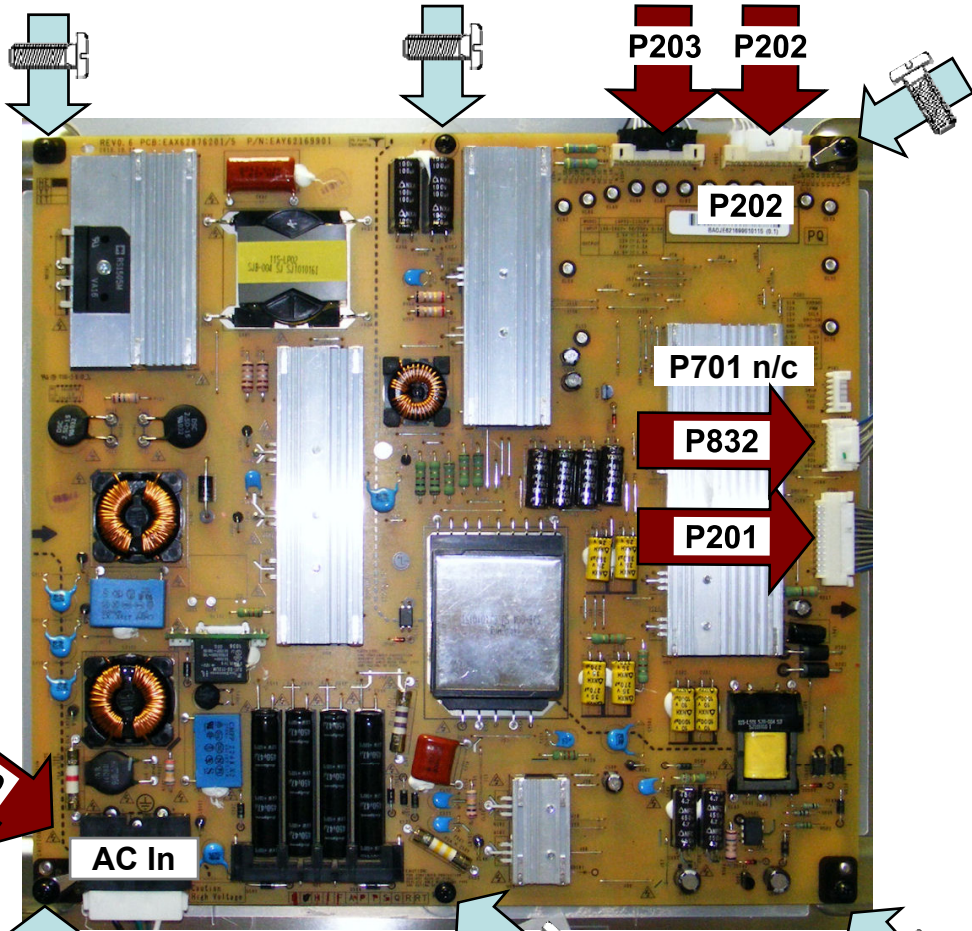


# Power Supply Board Removal

p/n EAY62169901

①

Disconnect P201, P202, P203, P832 and AC In SK100.

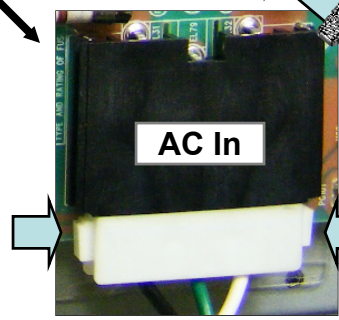


Press in gently on the two tabs to release lock

②

Remove the 6 screws indicated by the arrows.

**Note: This screw is a different size with washer.**



SK100

SK100 fits very snug into it's connector. Press in on the two tabs to release lock

# Removing the Main Board

The Decorative Metal Plate is one Piece

1

Disconnect P3503, P502, P1702, P1502, P1501, P901 and P1302.

2

Remove any tape holding down any cables. Remove the 5 (Maybe 6) screws indicated by the arrows.

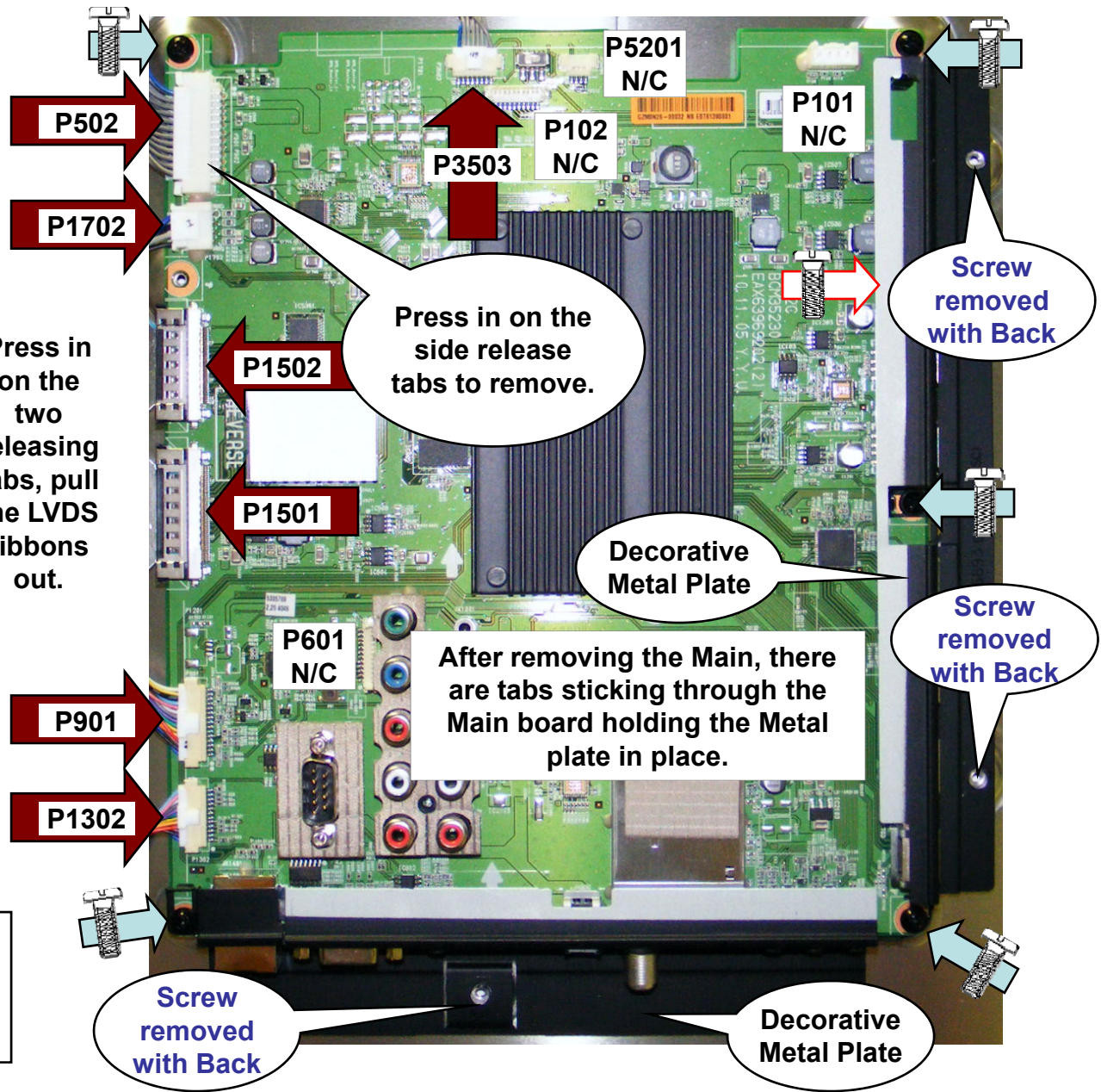
3

Remove the board.

4

Remove the board. Then Remove the wrap around decorative Metal piece. Note: It is one piece.

p/n: EBR72717002 (AUSYLHR)  
 p/n: EBR73145701 (AUSYLJR)  
 p/n: EBR72717004 (AUSYLUR)  
 p/n: EBT61398007 (AUSYLUR)



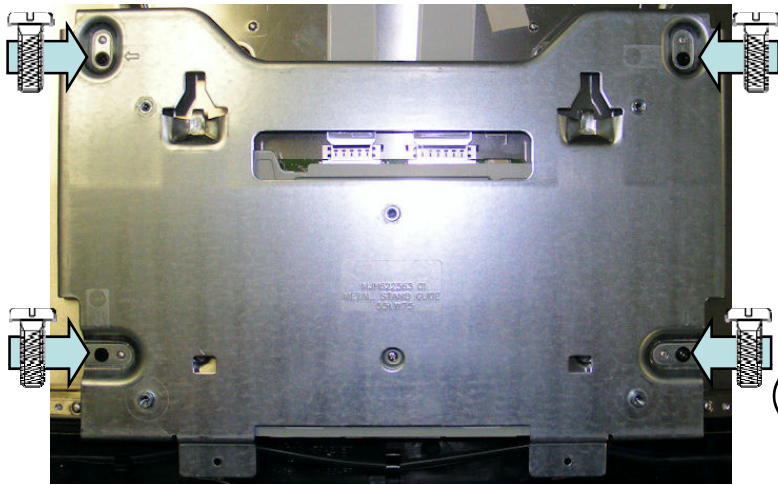


# Removing the T-CON (1 of 2)

Comes with the Panel

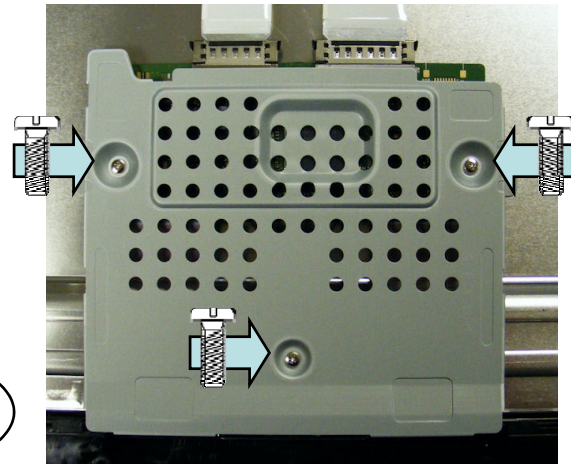
1

T-CON is under the Stand Bracket.  
Remove the Stand Bracket (4 Screws).



2

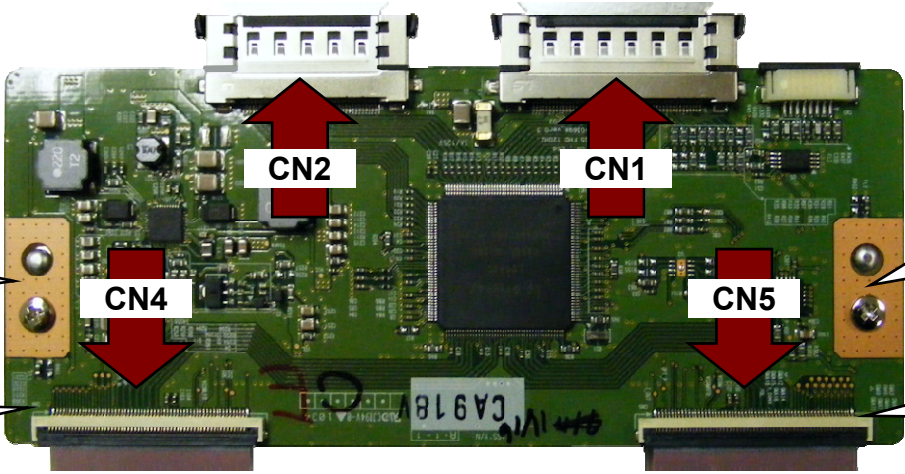
T-CON is under a Shield.  
Remove the T-CON Shield (3 Screws).



Press in on the two side unlocking tabs.

3

Disconnect CN1, CN2, CN4 and CN5.



See next page for removing Connectors.

Return Screws if testing board.

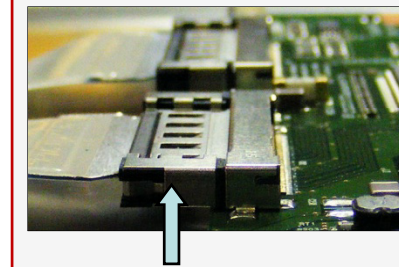
Return Screws if testing board.

Flip up the unlocking tabs.

Flip up the unlocking tabs.

## T-CON Board Removal Continued (2 of 2)

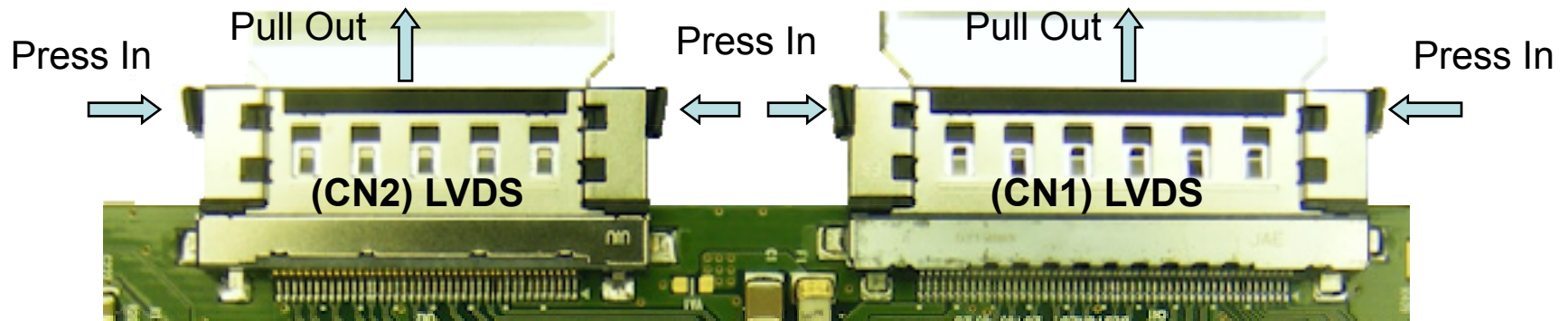
- ④ To remove the LVDS cables CN1 and CN2;  
Press in on the two tabs and slowly rock the  
cable out of the connector.  
(Shown by the arrows in Figures below)



**BROKEN TAB:**  
If a tab is broken,  
Use a thin object  
And push in at the  
Location shown by  
The arrow on the left.

### Removing LVDS

### From the Main (Top of the board)

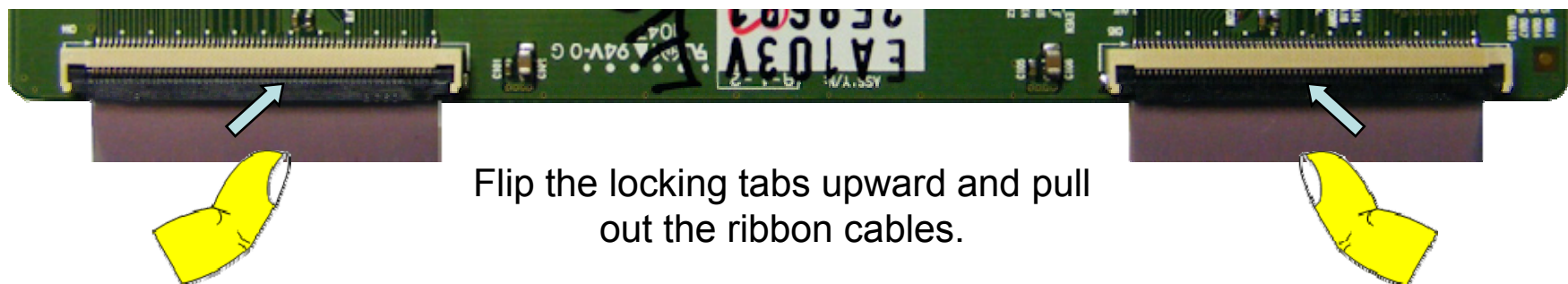


### Removing Ribbons

CN4

### To the Panel (Bottom of the board)

CN5



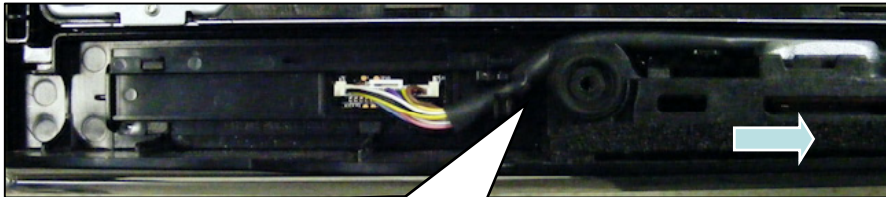


## Removing the Front IR Page 1 of 2

IR/Key board p/n: EBR72671301

1

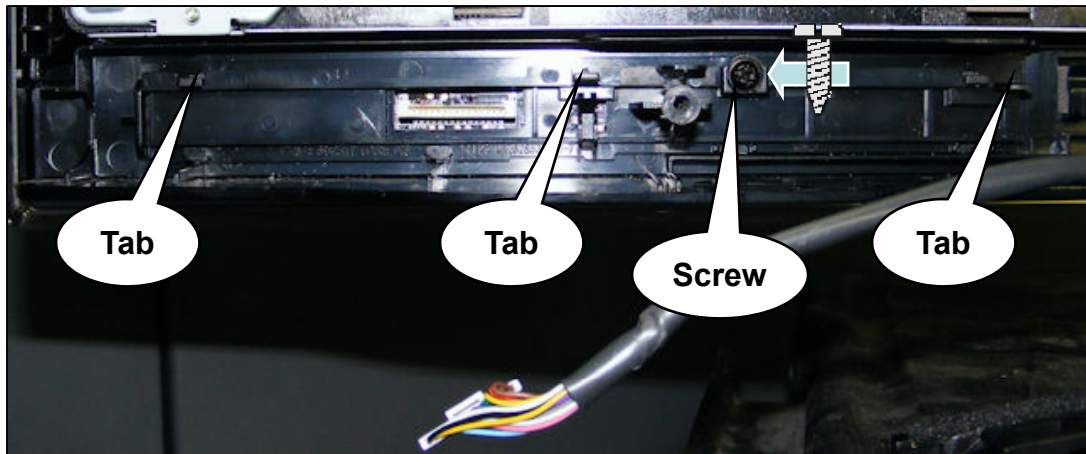
The Front IR Item 510 on the parts breakdown is under a wire routing bracket Item 511. Disconnect the cable coming from the Main board and remove it from the wire holders in Item 511.



Wire routing bracket, Slide Right

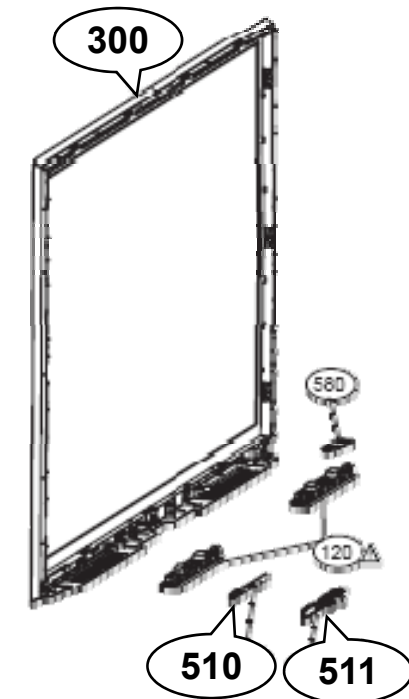
2

Remove the Speaker by sliding it forward.



3

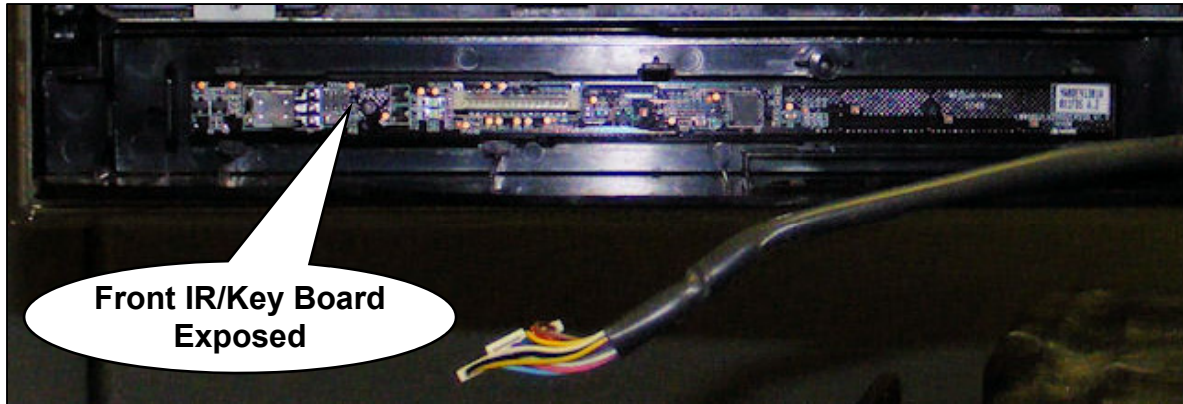
Remove the one screw. Lift up on the three tabs at the top of Item 511 and pull the Item 511 slightly forward. Lift Item 511 up and out.



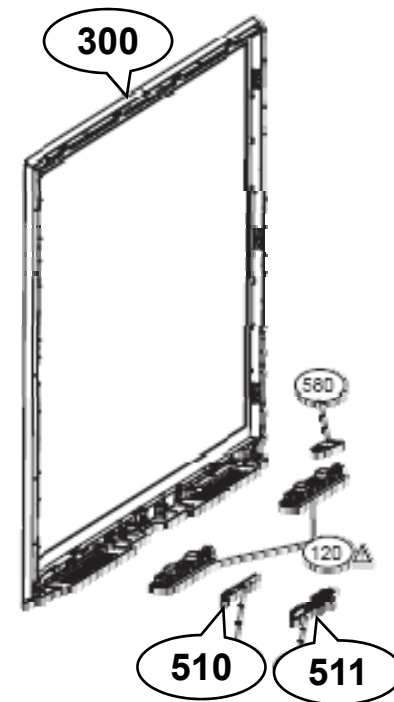


## Removing the Front IR Continued

p/n: EBR72671301



After gaining access to the Front IR/Intelligent Sensor Board, lay the TV down on its face and remove the LCD Panel by releasing the tabs around the perimeter of the panel. Lift the Panel up and out.  
The Front IR / Key Board is attached to the Front Frame  
Item 300 p/n: ABJ73289206.  
It must be separated to replace independently. Part number: EBR72671301.



## *TROUBLESHOOTING SECTION*

### **Troubleshooting:**

This section of the manual will discuss troubleshooting.

Upon completion of this section the Technician will have a better understanding of how to diagnosis and resolve problems.

## POWER SUPPLY SECTION

**This switch mode power supply develops Stand By 3.5V at all times when AC is applied. At power on, it develops 12V and 24V for the Main board. It develops 63V for the LED Backlights.**

This power supply draws less than 1 watt during stand by mode. The fuse F101 reads approximately 57V and F501 reads 154V during this time (from hot ground) . The transformer T501 delivers an AC signal which is rectified and filtered by D201, D202, C201 and C202 which develops a Stand-By voltage of 3.55V which is used by the SMPS Controller circuit and is also sent to the Main Board. It is output P201 pins 9~12 and sent to the P502 on the Main Board.

When the controller chip on the back side of the SMPS receives the PWR-ON command 3.4V via P201 Pin 1, it turns on the Relay RL101 which supplies AC to the bridge rectifier BD101. The primary section (Power Factor Controller circuit) increases its current supplying ability. Both Primary fuses F101 and F501 now reads between 395V~397V (from hot ground). D253 receiving switching pulses from L601 and filtered by C256 and C257, develops the 63V for the LED backlights.

When the SMPS receives the DRV\_ON command from the Main board via P201 Pin 18 (3.24V) it turns on the on-board Inverter to start driving the LED backlights. The backlight brightness is controlled by the Main board via PWM Pin 22 and Local Dimming signals via P832.

### **P201 Connector: (To Main Board)**

3.5V\_ST (3.55V) output P201 pins 9~12  
12V output P201 pins 17, 19 and 21  
24V output P201 pins 2, 3 and 4.  
Turn on commands.

### **P202 Connector: (To Panel LEDs)**

63V output P202 pins 1 and 12.

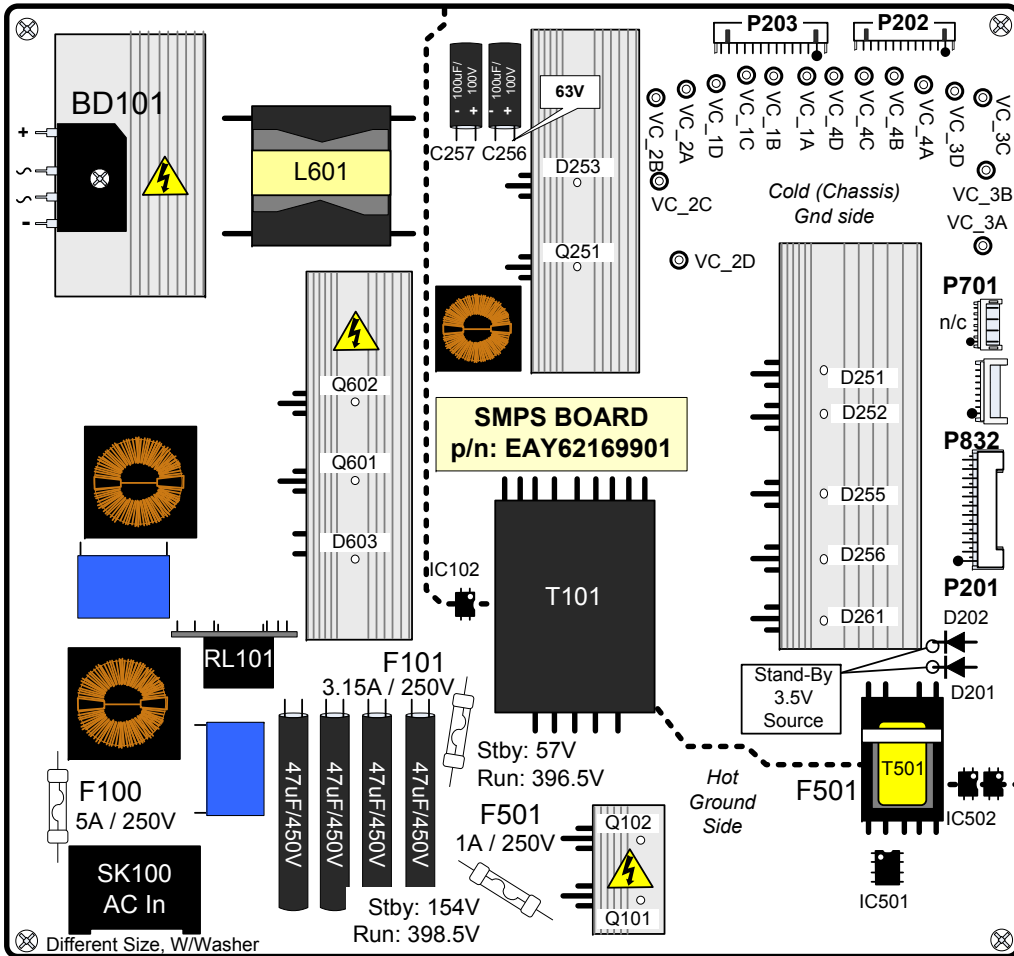
### **P203 Connector: (To Panel LEDs)**

63V output P203 pins 1 and 13.

### **P832 Connector: (To the Main Board)**

This connector receives the Local Dimming signals.

# 55LW5600 Power Supply Drawing



P201 Connector "SMPS Board" To P502 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
24	ERROR	n/c	n/c	2.2V
23	n/c	n/c	n/c	n/c
22	PWM	0V	0.2V~3.3V	OL
21	12V	0V	12.07V	0.48V
20	n/c	n/c	n/c	n/c
19	12V	0V	12.07V	0.48V
18	DRV-ON	0V	3.24V	OL
17	12V	0V	12.07V	0.48V
16	V-SYNC	n/c	n/c	n/c
13~15	Gnd	Gnd	Gnd	Gnd
9~12	3.5V	3.56V	3.51V	OL
5~8	Gnd	Gnd	Gnd	Gnd
2~4	24V	0V	25V	1.1V
1	PWR-ON	0V	3.4V	1.16V

(1) P-DIM1 (Digital Dimming) Global Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and room light condition. 0.2V 0% to 3.3V 100% and the Intelligent Sensor. Output from the Video Processor IC900.

Indicates Hot Ground

## 63V Line:

PWR-ON turns on the 63V supply but it will only be 56V. Note: A block of LEDs can be turned on with this voltage. It will increase to 63V when the DRV-ON line goes high.

MODEL	LGP55-11SLPB	
INPUT	100-240V~50/60Hz	2.5A
OUTPUT	3.5V	= 1.8A
	12V	= 2.8A
	24V	= 1.2A
	81.4V	= 1.6A

## SMPS TEST 1: To Force Power Supply On.

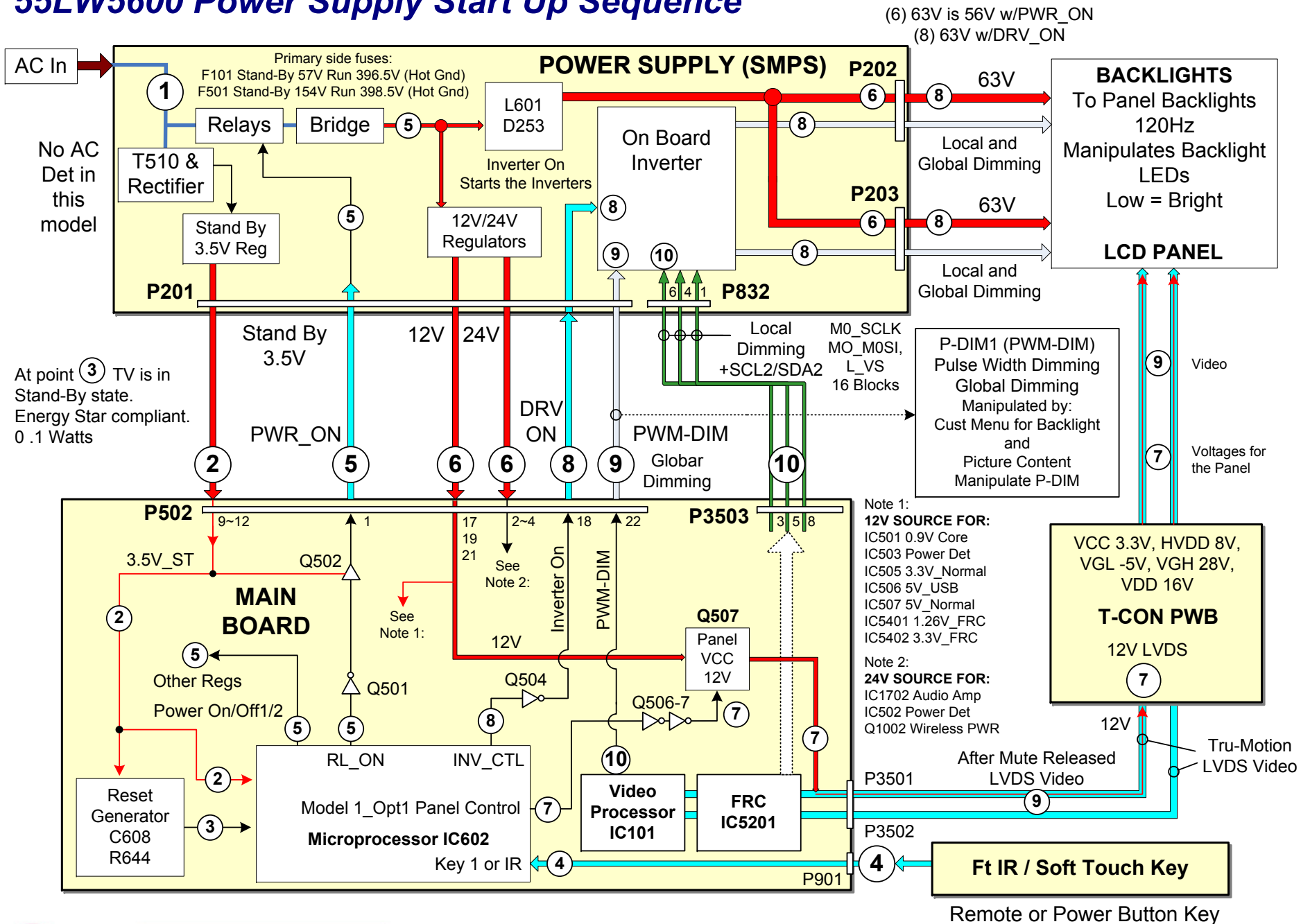
Disconnect P502 on Main board.  
 (A) Jump pins 9, 10, 11 or 12 (STBY\_3.5V) to pin 1. Test Voltage Outputs 12V, 24V to Main and 56V to the Panel LEDs. Remove AC power. Leave the jumper in place. No Backlights at this time.

## SMPS TEST 2:

(B) Jump pins 9, 10, 11 or 12 (3.5V) to pin 18 (DRV-ON). Apply AC power, the Backlights should turn on. Note, the LED B+ will now jump to 63V then back down to 63V.

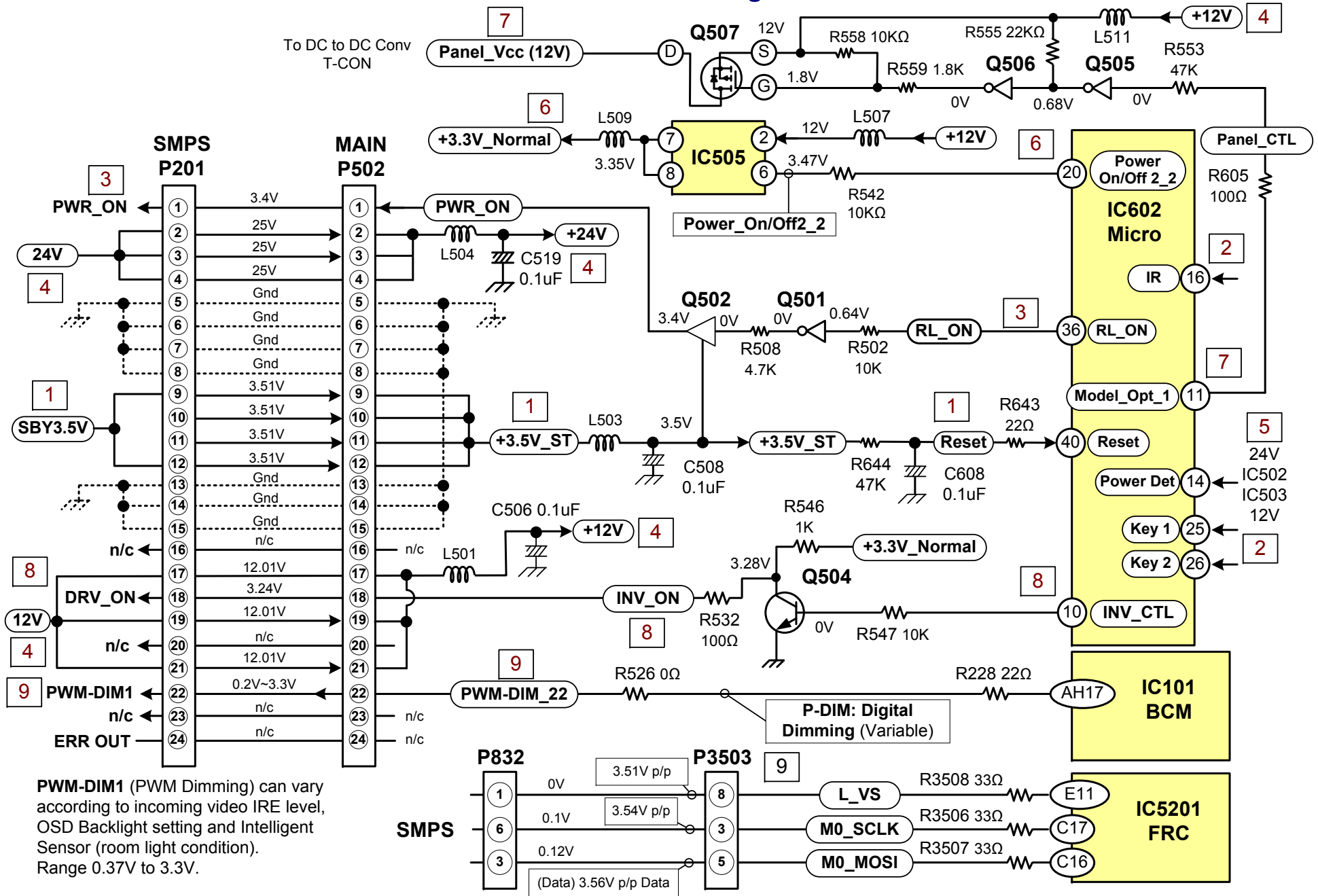
Note: If there is a problem with a load from the panel backlights, you can remove AC and Disconnect P202 or P203. When AC is reapplied, the Backlight LEDs should turn on for about 4 seconds and then shut off.

# 55LW5600 Power Supply Start Up Sequence





# 55LW5600 Television Turn On Commands Circuit Drawing



## Power Supply Board Low Voltage Test 1

**AC Should not be applied at any time while adding jumpers or While unplugging connectors as damage to the circuit Board may occur.**

- a) When AC is applied, the SMPS “MUST” be producing STBY 3.5V on pins 9, 10, 11 or 12 of P201.

If 3.5V Standby is not being generated, the SMPS is defective and must be replaced. There is no need to continue with the next test.

But, make sure AC is arriving at the connector SK101.

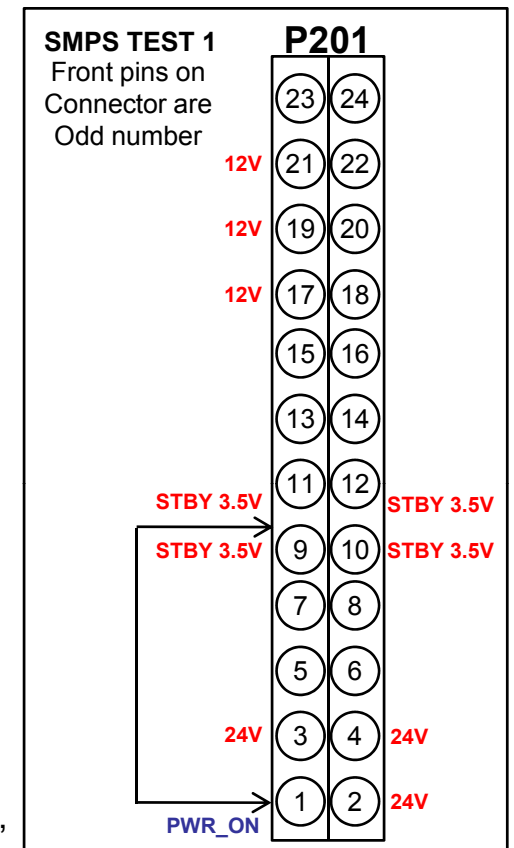
- b) Unplug P502 on the Main Board to make insertion of the Jumpers easier.  
Use P502 Side to insert resistors

### TEST 1:

- (1) Add a jumper between (3.5V STBY) pin 7, 8, 9 or 10 and Pin 1 (PWR\_ON).  
Apply AC. This will turn on the power supply, relay will click.
- a) Check that the 24V (25.02V) and 12V (12.08V) power supplies are turned on,
- P201 (12V pins 17, 19 and 21)
  - P201 (24V pins 2, 3 and 4)
  - P202 (56V pins 1 and 12) AND P203 (pins 1 and 13)

### (2) Remove AC power

**No Backlights during this test**



**Pin 1 is the Brown Wire**

## Power Supply Board Backlights Test 2

**Continue if the 1<sup>st</sup> test was OK.  
Leave original jumper in place.**

- (3) Add another jumper between (STBY\_3.5V) pin 9, 10, 11 or 12 and Pin 18 (DRV\_ON).
- (4) Apply AC Power. Simulating a Power and Backlight On command.

### **Backlights Normal:**

- a) If normal, the backlights should turn on.  
SMPS OK, Inverter OK.

### **Backlights Abnormal:**

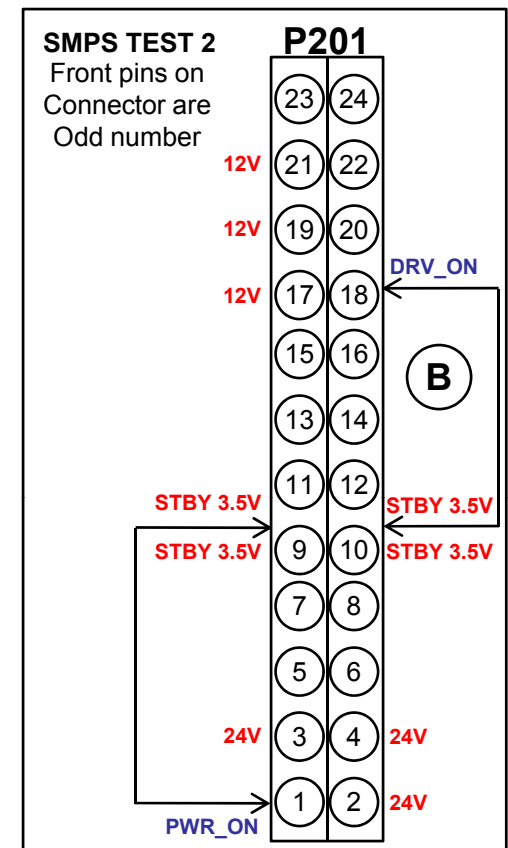
- a) Recheck all connections.
- b) Confirm the **DRV\_ON** line pulling up to at least 3V.
- c) Check the connections to the Panel.

If the DRV\_On command is pulling up to at least 3V and the 63V is being generated from C256 + leg, see the Inverter Section of the Power Supply for additional checks.

Note: If either P202 or P203 is disconnected, the backlights will come on,

The Error line will go high, then the backlights shut off in 4~6 seconds.

### **REMOVE AC POWER:**



**Pin 1 is the Brown Wire**

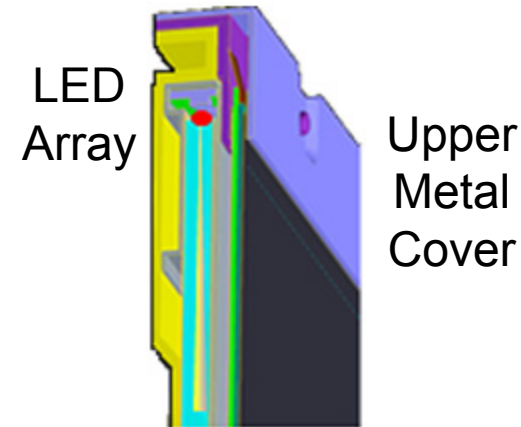
## 2 SIDED EDGE LIT SECTION

### 2 Sided Edge Lit Panel Structure

LED Array is on the side of Module



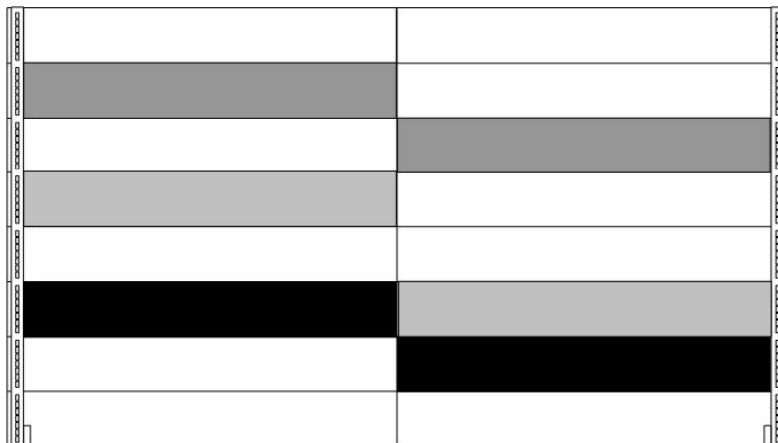
Backlight Structure



### Local Dimming

8 Blocks

8 Blocks

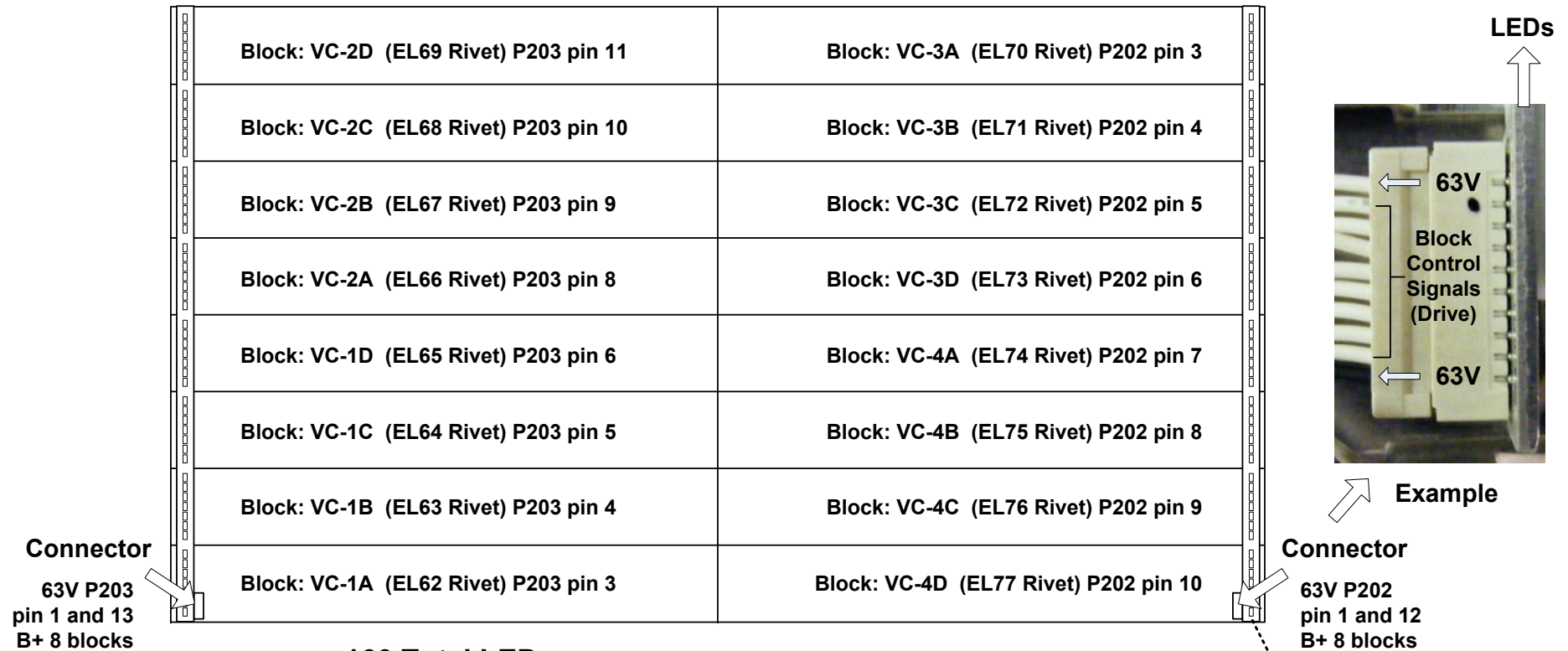


Each of the 16 blocks can be controlled independently (Local Dimming) or all of them as a group (Global Dimming) P-DIM.

This allows the panel to be darkened out in areas that are black or low brightness areas of the video. This allows for more deeper blacks and a thin design.

# 55LW5600 2 Sided Edge Lit Panel (V6) 2011

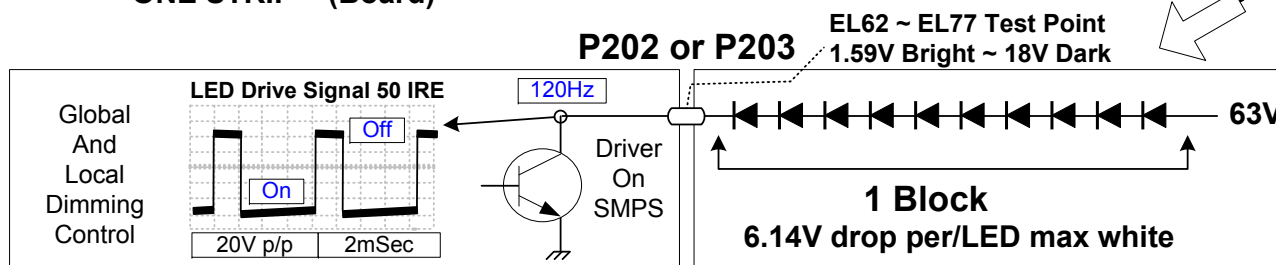
## 55" TWO SIDED EDGE 2011 (Rear View)



**160 Total LEDs**  
**2 Boards (Strips)**  
**80 LEDs per/board**

**16 Total Blocks**  
**8 Blocks per/board (8 on Left, 8 on Right)**  
**10 LEDs per/block**

**ONE STRIP = (Board)**



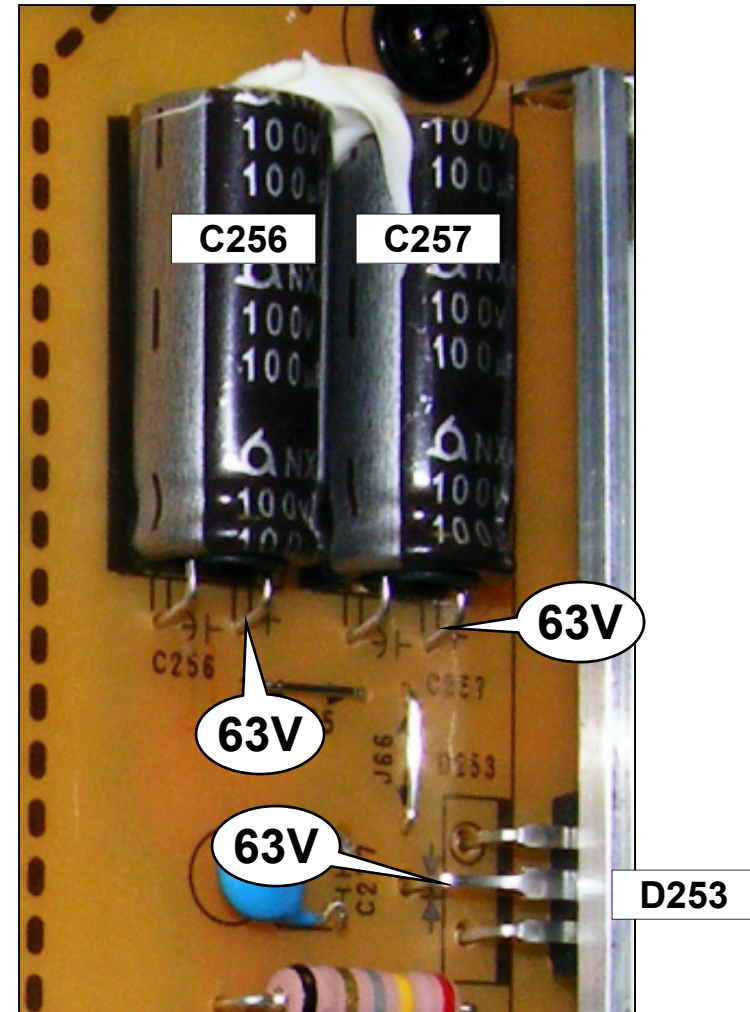
One LED can be tested with a Diode Check using a DVM. Forward biased, the LED should light.



## 63V Power Supply for the Backlights Section of the SMPS

The Power Supply for the Backlights can be checked at the (+) side of C256 or C257 or the Cathode of D253.

Note: When the PWR\_ON command Arrives, this voltage will read 56V.  
When the DRV\_ON command arrives This voltage will rise to 63V.



Location: Top Center of the SMPS

## P202 and P203 Backlight Driver Section of the SMPS Association with TPs

Tip: You can use the right side of R287 or R288 to check for the 63V.

Tip: Remember to use a 220Ω to ground on any of the “EL” Test Points to force an LED Block to turn on.

**P203**

Pin	Label	TP
1	LED+	C256+
2	n/c	n/a
3	VC-1A	EL62
4	VC-1B	EL63
5	VC-1C	EL64
6	VC-1D	EL65
7	n/c	n/a
8	VC-2A	EL66
9	VC-2B	EL67
10	VC-2C	EL68
11	VC-2D	EL69
12	n/c	n/a
13	LED+	C256+

**P203**    **1**    **P202**    **1**

**P202**

Pin	Label	TP
1	LED+	C256+
2	n/c	n/c
3	VC-3A	EL70
4	VC-3B	EL71
5	VC-3C	EL72
6	VC-3D	EL73
7	VC-4A	EL74
8	VC-4B	EL75
9	VC-4C	EL76
10	VC-4D	EL77
11	n/c	n/c
12	LED+	C256+

**WARNING: Do not simply “Ground” any of the EL Test Points (EL62~EL77) to turn on an LED Block. The LED Block will be destroyed.**

## P202 / P203 Power Supply Connector Voltage and Diode Check

**P202 White Plug "SMPS Board" To "Panel LEDs"**

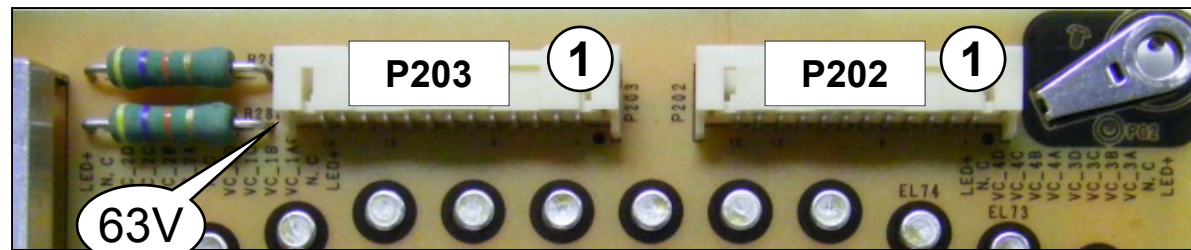
Pin	Label	TP	Run	Diode Check
1	LED+	C256+	63V	OL
2	n/c	n/c	n/c	OL
3	VC-3A	EL70	*1.59V~18V	OL
4	VC-3B	EL71	*1.59V~18V	OL
5	VC-3C	EL72	*1.59V~18V	OL
6	VC-3D	EL73	*1.59V~18V	OL
7	VC-4A	EL74	*1.59V~18V	OL
8	VC-4B	EL75	*1.59V~18V	OL
9	VC-4C	EL76	*1.59V~18V	OL
10	VC-4D	EL77	*1.59V~18V	OL
11	n/c	n/c	n/c	OL
12	LED+	C256+	63V	OL

**P203 Black Plug "SMPS Board" To "Panel LEDs"**

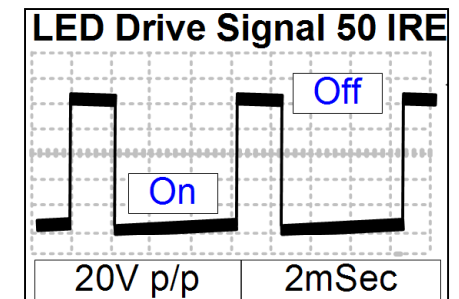
Pin	Label	TP	Run	Diode Check
1	LED+	C256+	63V	OL
2	n/c	n/a	n/c	OL
3	VC-1A	EL62	*1.59V~18V	OL
4	VC-1B	EL63	*1.59V~18V	OL
5	VC-1C	EL64	*1.59V~18V	OL
6	VC-1D	EL65	*1.59V~18V	OL
7	n/c	n/a	n/c	OL
8	VC-2A	EL66	*1.59V~18V	OL
9	VC-2B	EL67	*1.59V~18V	OL
10	VC-2C	EL68	*1.59V~18V	OL
11	VC-2D	EL69	*1.59V~18V	OL
12	n/c	n/a	n/c	OL
13	LED+	C256+	63V	OL

\*White to Black screen

\*White to Black screen



\*The drive signal changes due to the brightness level of the backlights. Low indicates "Bright". High indicates "Dim".



Diode Mode values taken with all Connectors Removed

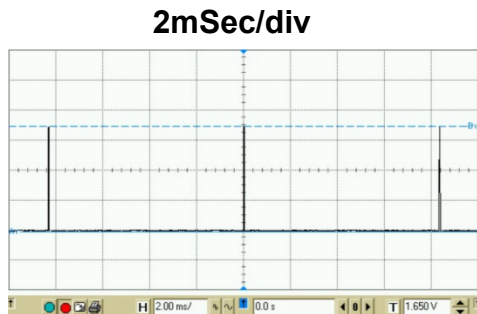
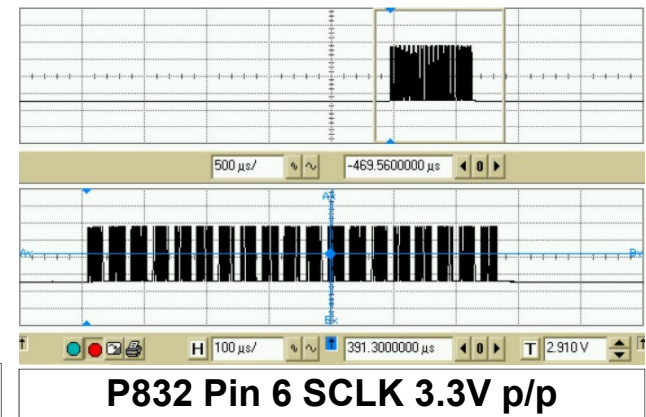
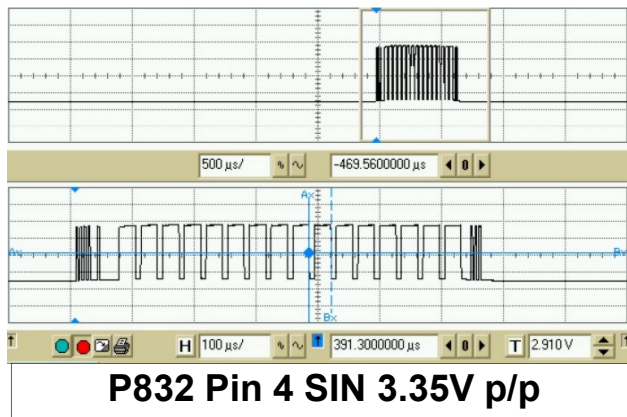
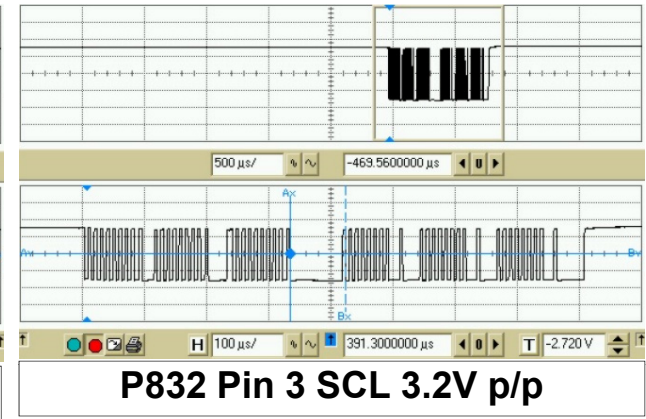
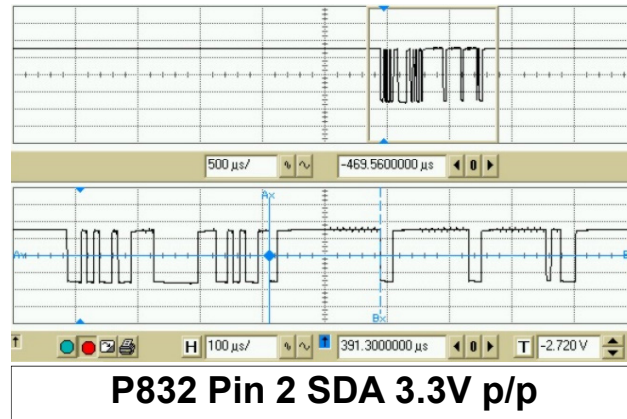


# P832 Local Dimming Drive Waveforms

P832 "SMPS" to P3503 "MAIN"

Pin	Label
1	VSYNC
2	SDA
3	SCL
4	SIN
5	Gnd
6	L/DIM0_SCLK
7	n/c
8	Reverse

Top Waveforms are 500uSec/div  
Bottom Waveforms are 100uSec/div

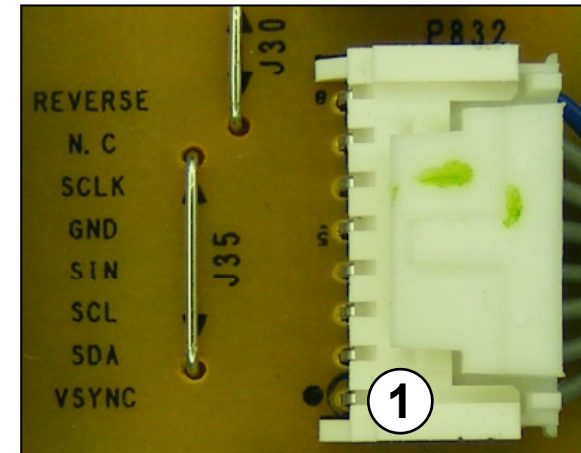


# P832 Voltages and Diode Checks

## P832 "SMPS" to P3503 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
8	Reverse	0V	0V	1.91V
7	n/c	n/c	n/c	OL
6	L/DIM0_SCLK	0V	0.1V	OL
5	Gnd	Gnd	Gnd	Gnd
4	SIN	0V	0.12V	OL
3	SCL	0V	3.2V	OL
2	SDA	0V	3.2V	OL
1	VSYNC	0V	0V	2V

P832 Connector

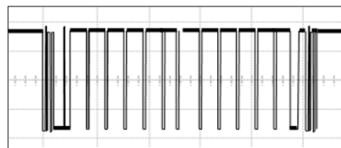


Note: On the Main Board the pins are Reversed and the Labels may be different.

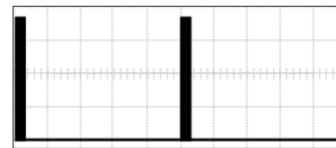
Diode Mode values taken with all Connectors Removed

### P832 Local Dimming Waveform Information

SIN  
Pin 4 P832  
3.57V p/p  
Local Dimming On



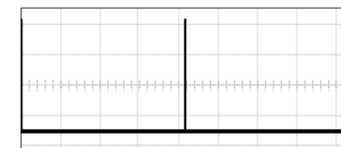
SCLK  
Pin 6 P832  
3.54V p/p



SIN  
Pin 4 P832  
3.57V p/p  
Local Dimming Off



V-SYNC  
Pin 1 P832  
3.5V p/p



SMPS P832		MAIN P3503	
Pin	Label	Pin	Label
8	Reverse	1	Reverse
7	n/c	2	n/c
6	SCLK	3	M0_SCLK
5	Gnd	4	Gnd
4	SIN	5	M0_MOSI
3	SCL	6	SCL2_3.3V
2	SDA	7	SDA2_3.3V
1	VSYNC	8	L_VS



# P201 Power Supply Connector Voltage and Diode Check

P201 Connector "SMPS Board" To P502 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
24	ERROR	n/c	n/c	2.2V
23	n/c	n/c	n/c	n/c
22	PWM	0V	0.2V~3.3V	OL
21	12V	0V	12.07V	0.48V
20	n/c	n/c	n/c	n/c
19	12V	0V	12.07V	0.48V
18	DRV-ON	0V	3.24V	OL
17	12V	0V	12.07V	0.48V
16	V-SYNC	n/c	n/c	n/c
13~15	Gnd	Gnd	Gnd	Gnd
9~12	3.5V	3.56V	3.51V	OL
5~8	Gnd	Gnd	Gnd	Gnd
2~4	24V	0V	25V	1.1V
1	PWR-ON	0V	3.4V	1.16V

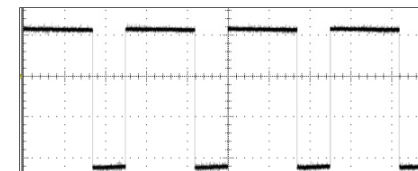
(1) PWR\_ON Pin 1 turns on the SMPS which send 12V and 24V to the Main. The 63V Power Supply turns on too, but only generates 56V at this time.

P201 Connector



Odd pins are on top row

(3) PDIM1 Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition) Output from the Video Processor IC900. Range 0.37V to 3.3V.



P-DIM1  
3.66V p/p 50IRE

Diode Mode values taken with all Connectors Removed

# SK100 and AC Fuse Power Supply Voltage and Diode Check

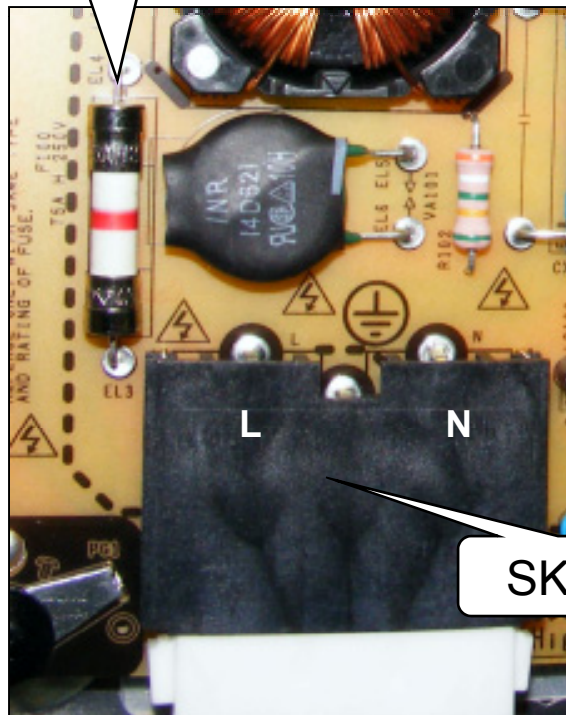
## SK100 "SMPS" to AC IN

Pin	Label	STBY	Run	Diode Check
EL1	L	120Vac		OL
EL3	N			OL

AC Voltage Readings (From Hot Ground)  
Pins 1 and 2 for STBY and RUN.

F100  
5A/250V  
AC IN

F100



Diode Mode values taken with all Connectors Removed

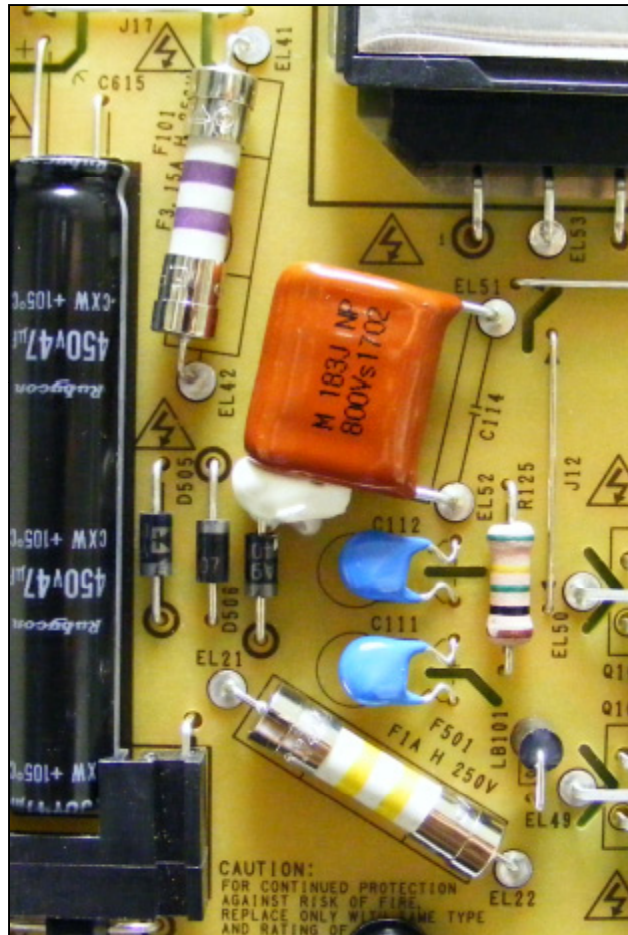
**F100 (Diode Check)**  
**Red or Black Lead on Fuse (Open)**  
Other Lead on Hot Ground

**Bottom Left of SMPS**

SK100

## F101 and F501 Power Supply Voltage Checks

F101  
3.15A/250V  
From Hot Gnd  
STBY 57V  
Run 396.5V



F501  
1A/250V  
From Hot Gnd  
STBY 154V  
Run 398.5V

If the set was on and then turned off, the voltage takes a while to bleed down.

## MAIN BOARD SECTION

The Main board receives its operational B+ from the Power Supply via P502.

There are two LVDS cable feeds that are output to the T-CON (TFT Driver). These carry the dual 24 bit LVDS Video and TruMotion Video equaling a 120Hz video signal. These signals have already been prepared for the T-CON board. The Main board also includes the Frame Rate Converter for 3D, Tuner, Audio and Audio/Video inputs and selection circuits.

Input Voltages from SMPS.

### STAND-BY

- STBY 3.5V (P502 pins 9~12)

### RUN

- 12V (P502 pins 17, 19 and 21).
- 24V (P502 pins 2~4).

The Main board also develops several B+ sources on the board.

### STAND-BY VOLTAGES

- 3.3V\_ST (Direct from SMPS through L503).

### LVDS

- Panel\_VCC (12V Not generated, but switched by Q507 from the 12V arriving from the SMPS).

### TUNER TU2101 and VSB CIRCUIT

- 5V\_TU (Made from 5V\_Normal through L2101 / 4)
- 3.3V\_TU (Made from 3.3V\_Normal L2103).
- 1.26V\_TU IC2103 (Made from 3.3V\_TU).

### AUDIO IC1702

- 3.3V\_AU\_AVDD (Made from 3.3V\_Normal).
- 3.3V\_DVDD (Made from 3.3V\_Normal).
- 1.8V (Made from 3.3V\_Normal).
- 24V (Direct from SMPS through L504).

### GENERAL

- 5V\_Normal IC507 (Made from 12V In).
- 3.3V\_Normal IC505 (Made from 12V In).
- 5V\_USB IC506 (Made from 12V In).

### BCM IC101 Video Processor

- 3.3V\_ST (Direct from SMPS through L503).
- 2.5V\_BCM52230 (IC504)
- D1.5V\_DDR (IC508 )
- 0.9V\_CORE (IC501)

### Frame Rate Converter (IC5201) FRC

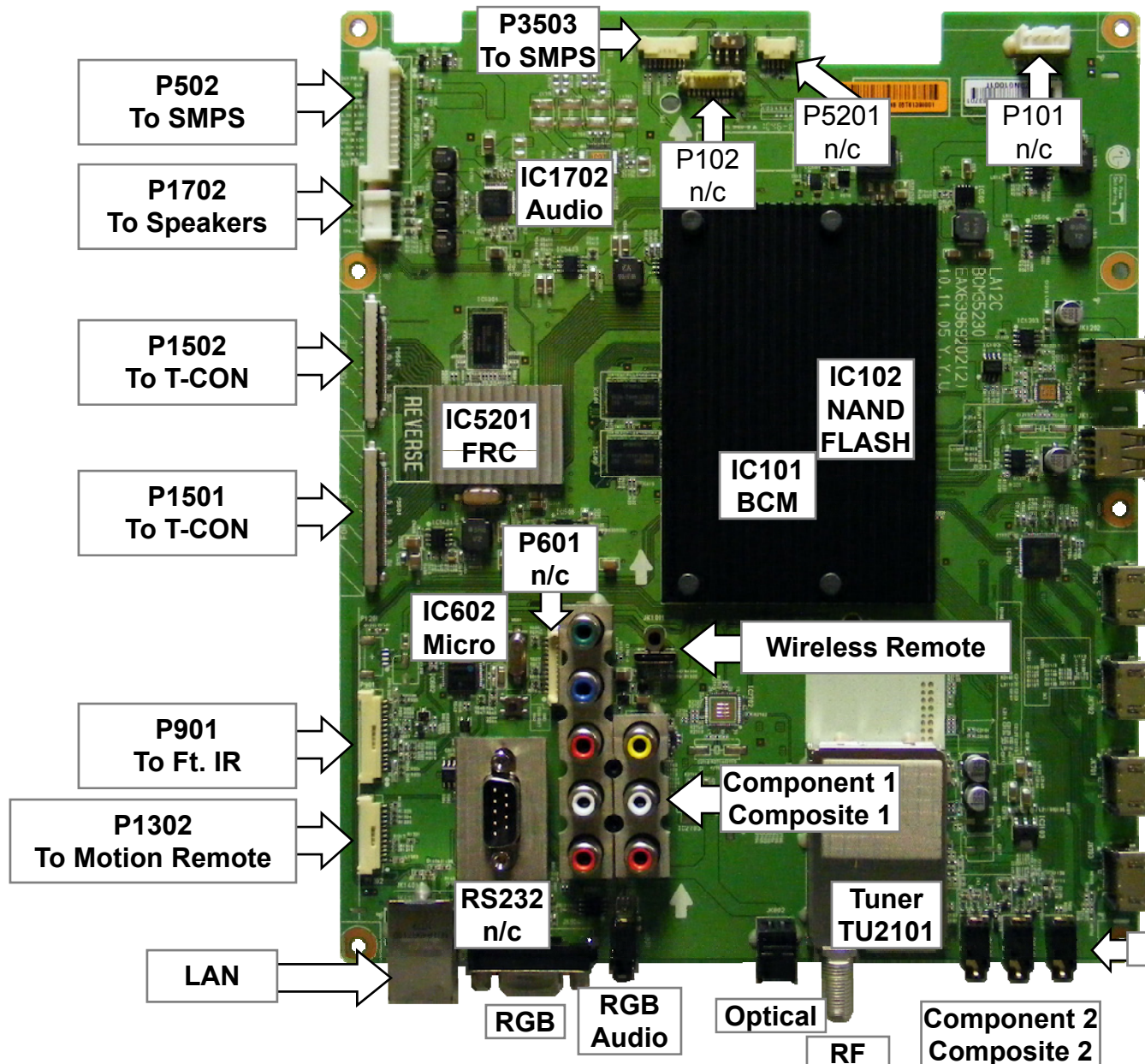
- 1.26V\_FRC (IC5401) 3.3V\_FRC (IC5402),  
1.5V\_FRC (IC5403)

### HDMI SELECTOR VOLTAGES (IC701)

- 3.3V\_HDMI  
(From 3.3V\_Normal through L701)



# Main Board Layout



p/n: EBR72717002 AUSYLHR  
 p/n: EBR73145701 AUSYLJR  
 p/n: EBR72717004 AUSYLUR  
 p/n: EBT61398007 AUSYLUR

**VIDEO PROCESSOR**  
 IC101 is under a Heat Sink.  
 It runs Hot.  
 This is normal.

USB 1  
 USB 2  
 See next page for component identification

HDMI 4  
 HDMI 3  
 HDMI 2  
 HDMI 1

Headphones  
 Component In  
 These connectors are Mini plug type





## 55LW5600 Main (Front Side) Component Voltages

**IC103** NVRAM for USB



Pin	Voltage
[1]	n/c
[2]	0V
[3]	3.34V
[4]	0V
[5]	3.22V
[6]	3.22V
[7]	0V (Gnd)
[8]	3.34V

**IC501** +0.9V\_CORE DC to DC



Pin	Voltage
[1]	3.17V
[2]	0.59V
[3]	0.44V
[4]	11.95V
[5]	0V
[6]	5.33V
[7]	4.6V
[8]	5.81V
[9]	0.95V
[10]	1.36V

**IC504** +2.5V BCM Regulator



Pin	Voltage
[1]	n/c
[2]	4.92V (En)
[3]	3.47V (In)
[4]	3.49V (Ctl)
[5]	n/c
[6]	2.57V (Out)
[7]	0.6V
[8]	0V (Gnd)

**IC505** (+3.3V\_NORMAL) Regulator



Pin	Voltage
[1]	0V (Gnd)
[2]	11.96V (In)
[3]	0V (Gnd)
[4]	0.8V
[5]	0.79V
[6]	3.47V (PWR On/Off2_2)
[7]	3.35V (Out)
[8]	3.35V (Out)

**IC506** Switched 5V for USB 2



Pin	Voltage
[1]	0V (Gnd)
[2]	11.98V (In)
[3]	0V (Gnd)
[4]	0.79V
[5]	3.48V
[6]	3.48V (PWR On/Off2_1)
[7]	4.96V (Out)
[8]	4.96V (Out)

**IC507** (+5V\_NORMAL) Regulator



Pin	Voltage
[1]	0V (Gnd)
[2]	11.98V (In)
[3]	0V (Gnd)
[4]	0.79V
[5]	3.48V
[6]	3.48V (PWR On/Off2_1)
[7]	4.96V (Out)
[8]	4.96V (Out)

**IC508** (+1.5V\_DDR) Regulator



Pin	Voltage
[1]	3.46V
[2]	n/c
[3]	3.46V (In)
[4]	3.49V (PWR On/Off1)
[5]	0V (Gnd)
[6]	3.31V
[7]	0.79V
[8]	1.5V (Out)

**Q901** IR Buffer 2nd



Pin	Voltage
B	0.02V
C	3.48V
E	Gnd

**Q902** IR Buffer 1st



Pin	Voltage
B	0.57V
C	0.02V
E	Gnd

**IC801** RGB Data Buffer



Pin	Voltage
[1]	1.81V
[2]	1.81V
[3]	3.72V
[4]	1.8V
[5]	1.8V
[6]	n/c (4.44V)
[7]	0V (Gnd)
[8]	n/c (4.43V)
[9]	n/c (1.79V)
[10]	n/c (1.79V)
[11]	3.72V
[12]	1.81V
[13]	1.81V
[14]	5V (Vcc In)

**IC802** EDID Data PC



Pin	Voltage
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	4.73V
[6]	4.73V
[7]	4.73V
[8]	4.73V (Vcc In)

**Q1001** Wireless Vcc Driver



Pin	Voltage
B	0.02V
C	24.5V
E	Gnd

On when wireless dongle connected

**Q1002** Wireless Vcc Switch



Pin	Voltage
S	24.5V
G	24.5V
D	0V

On when wireless dongle connected

**IC803** RS232 Routing



Pin	Voltage
[1]	3.5V
[2]	5.64V
[3]	0V
[4]	0V
[5]	(-5.56V)
[6]	(-5.59V)
[7]	n/c (5.64V)
[8]	n/c (0V)
[9]	n/c (3.49V)
[10]	n/c (0V)
[11]	n/c (3.34V)
[12]	3.48V
[13]	0V
[14]	(-5.59V)
[15]	0V (Gnd)
[16]	3.5V (Vcc In)

**IC1203** EDID Data PC



Pin	Voltage
[1]	0V (Gnd)
[2]	4.96V (Vcc In)
[3]	4.96V (Vcc In)
[4]	3.34V (USB Ctl2)
[5]	3.17V
[6]	4.96V (Out)
[7]	4.96V (Out)
[8]	n/c (0V)

**IC1204** EDID Data PC



Pin	Voltage
[1]	0V (Gnd)
[2]	4.96V (Vcc In)
[3]	4.96V (Vcc In)
[4]	3.34V (USB Ctl1)
[5]	3.17V
[6]	4.96V (Out)
[7]	4.96V (Out)
[8]	n/c (0V)

**IC2103** (+1.26V\_TU) Regulator



Pin	Voltage
[1]	0V (Gnd)
[2]	1.27V (Out)
[3]	3.33V (In)

**IC5401** (+1.26V\_FRC) Regulator



Pin	Voltage
[1]	0V (Gnd)
[2]	11.85V (Vcc In)
[3]	0V (Gnd)
[4]	0.8V (FB)
[5]	0.7V
[6]	3.29V (Enable)
[7]	1.29V (Out)
[8]	1.29V (Out)

**IC5402** (+3.3V\_FRC) Regulator



Pin	Voltage
[1]	Under Shield
[2]	Under Shield
[3]	Under Shield
[4]	Under Shield
[5]	0.8V
[6]	3.45 (PWR On/Off2_2)
[7]	3.3V
[8]	3.3V

**Q501** RL\_ON (PWR\_On) 1st Driver



Pin	Voltage
B	0.64V
C	0V
E	Gnd

**Q502** PWR\_ON Switch



Pin	Voltage
[1]	3.5V (In)
[2]	0.67V
[3]	2.62V (Out)

**Q503** 0.9V FET Switch



Pin	Voltage
[1]	0.95V
[2]	0.95V
[3]	0.95V
[4]	1.36V
[5]	11.96V
[6]	11.96V
[7]	11.96V
[8]	11.96V

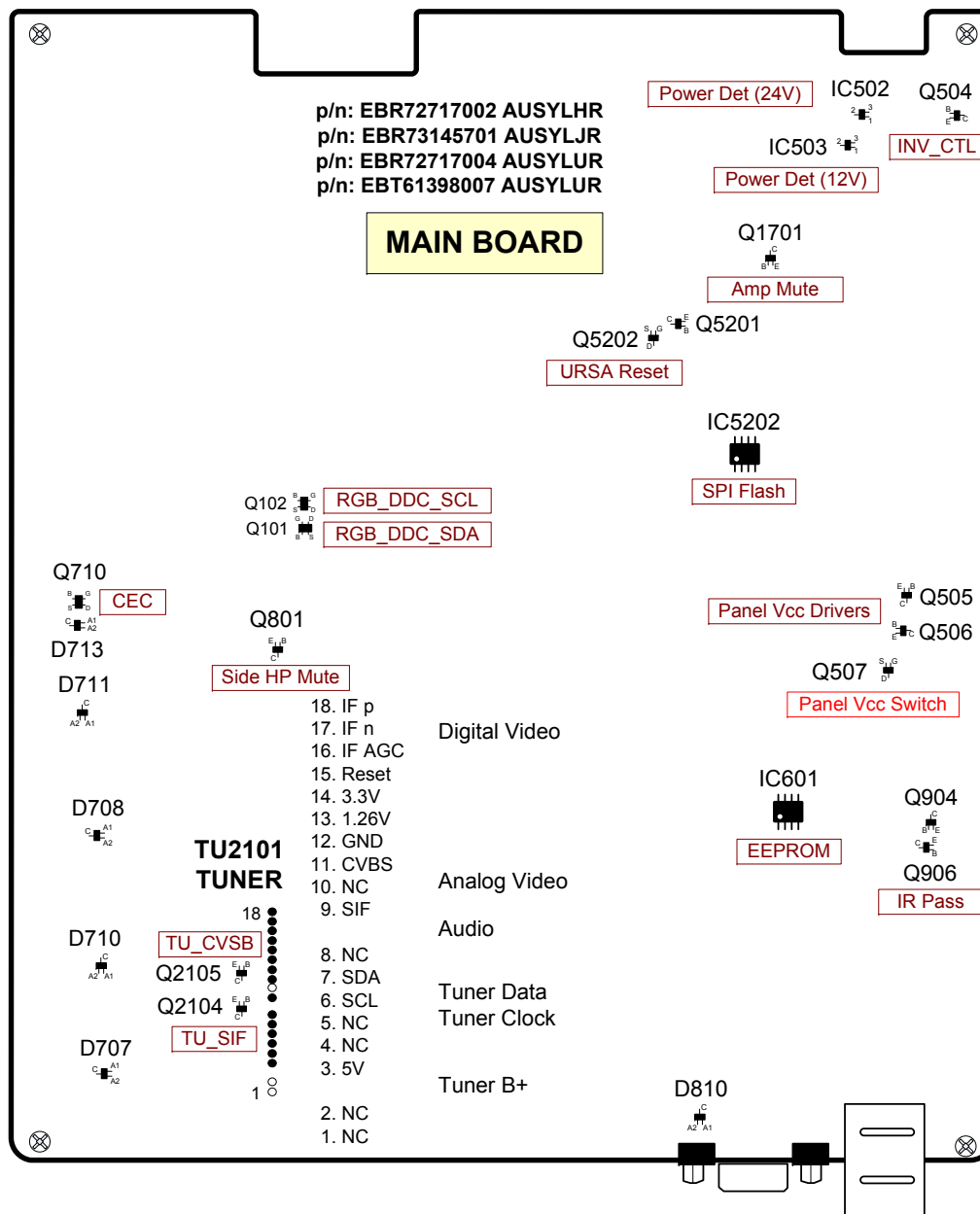
**Q508** 0.9V FET Switch




























Pin	Voltage
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	4.6V
[5]	0.95V
[6]	0.95V
[7]	0.95V
[8]	0.95V



# 47LW5600 Main Board (Back Side) Component Layout



# 55LW5600 Main (Back Side) Component Voltages

<b>IC502</b>  Pin [1] 0V (Gnd) [2] 3.8V (In) [3] 3.73V (Out) <b>Power Det Gen (For +12V)</b>	<b>Q101</b>  [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V <b>RGB_DDC_SDA FET Buffer</b>	<b>Q710</b>  [B] 3.47V [G] 3.51V [S] 3.47V [D] 3.49V <b>CEC Remote HDMI CEC</b>	<b>Q2106</b>  B 3.67V C 0V (Gnd) E 4.35V <b>Tuner Video (Analog) Buffer</b>	<b>D711</b>  A1 4.96V C 5V A2 0V <b>5V Pull-Up to DDC_SCL/SDA_4</b>
<b>IC503</b>  [1] 0V (Gnd) [2] 3.7V (In) [3] 3.73V (Out) <b>Power Det Gen (For +24V)</b>	<b>Q102</b>  [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V <b>RGB_DDC_SCL FET Buffer</b>	<b>Q801</b>  B 0V C 3.35V E Gnd <b>Earphone Mute</b>	<b>Q5201</b>  B 0.11V C 3.33V E 0V (Gnd) <b>URSA Reset Driver</b>	<b>D713</b>  A1 0V C 3.45V A2 3.5V <b>Bias for Q710 HDMI CEC</b>
<b>IC601</b>  [1] 0V (Gnd) [2] 0V (Gnd) [3] 3.49V [4] 0V (Gnd) [5] 3.49V [6] 3.49V [7] 0V (Gnd) [8] 3.50V (Vcc In) <b>EEPROM Micro</b>	<b>Q504</b>  B 0V (INV ON) En C 3.28V (Out) E Gnd <b>INV_CTL (Drv_On) Driver</b>	<b>Q904</b>  B 0.02V C 3.48V E Gnd <b>IR Wireless Pass 2nd Driver</b>	<b>Q5202</b>  G 3.33V S 3.33V D 0V (Out) <b>URSA Reset</b>	<b>D810</b>  A1 4.73V C 5.01V A2 0.07V <b>5V Routing to IC802 RGB EDID</b>
<b>IC5202</b>  [1] 0.43V [2] 3.29V [3] 3.29V [4] 0V (Gnd) [5] ?? [6] ?? [7] 3.29V [8] 3.29V (3.3V_FRC in) <b>SPI FLASH</b>	<b>Q505</b>  B 0V C 0.68V E Gnd <b>PANEL_VCC Control 1st Driver</b>	<b>Q906</b>  B 0.57V C 0V E Gnd <b>IR Wireless Pass 1st Driver</b>	<b>D707</b>  A1 4.96V C 5V A2 0V <b>5V Pull-Up to DDC_SCL/SDA_1</b>	
	<b>Q506</b>  B 0.67V C 0V E Gnd <b>PANEL_VCC Control 2nd Driver</b>	<b>Q1701</b>  B 0V C 3.36V E Gnd <b>AMP_MUTE Pin 19 IC1702</b>	<b>D708</b>  A1 4.96V C 5V A2 0V <b>5V Pull-Up to DDC_SCL/SDA_3</b>	
	<b>Q507</b>  S 11.97V (In) G 1.8V (Enable) D 11.94V (Out) <b>PANEL_VCC Switch</b>	<b>Q2104</b>  B 0.23V C 0V (Gnd) E 0.93V <b>Tuner SIF (Sound) Buffer</b>	<b>D710</b>  A1 4.96V C 5V A2 0V <b>5V Pull-Up to DDC_SCL/SDA_2</b>	

# Main Board X601, X602 and X5201 Crystal Checks

**X5201**

1.71V

1.71V

3V p/p

2.28V p/p

24Mhz

Runs when set is on

Either leg

**X602**

32.768KHz

No Signal

1.18V

Runs all The time

3.51V p/p

2.09V

**IC601 Micro Crystal**

Either leg

2.31V p/p

3.3V p/p

**X601**

1.57V

2V

10Mhz

Runs all the time

**MAIN Board**

Bottom leg

Runs when set is on

# P1702 and IC1702 Audio Amplification for the Speakers Information

## IC1702 VOLTAGES

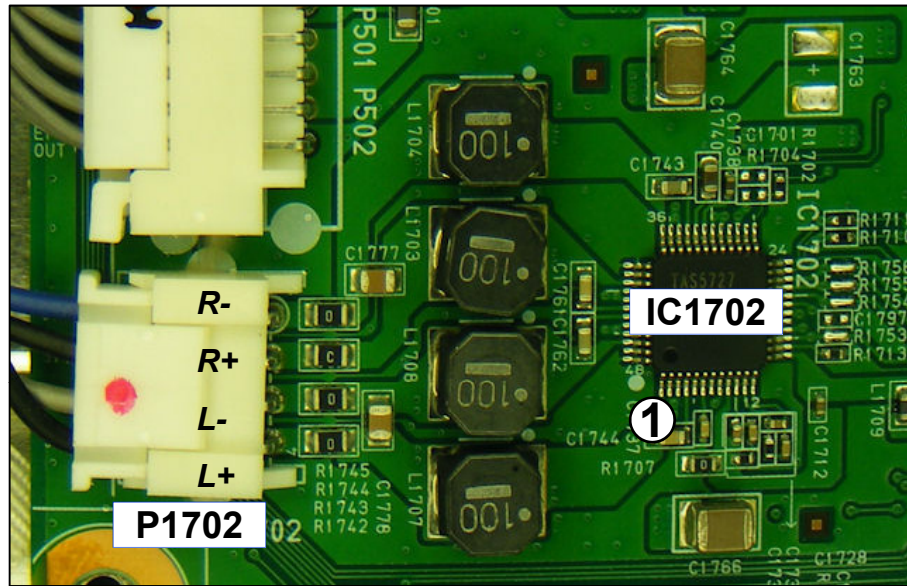
3.3V\_AU\_AVDD pin 13  
 3.3V\_DVDD pin 27  
 All made from  
 3.3V\_Normal

**Right Channel:**  
 24V pin 34, 35 (R-)  
 24V pin 40, 41 (R+)

**Left Channel:**  
 24V pin 44, 45 (L-)  
 24V pin 2, 3 (L+)

Use speaker out to test for defective Audio Amp IC1702

Note: (Normal, 1/2 Audio B+) 12.09V on each pin.



**Amp\_Reset pin 25**  
 Amp\_Reset is generated from Model\_Opt\_0 pin 8 of the Micro. Through R604 it becomes Amp\_Reset and goes to R170-2 and C1701 then to pin 25 of IC1702.

**AMP\_MUTE\_PDN**  
 Q1701 is on the Back side of the board. Mute (it's collector) is Active Low when it's base is high from pin 6 of the Microprocessor. 3.3V\_ST goes to it's Collector which is tied to AMP\_MUTE\_PDN Pin 19

P1702 Connector "Main" To "Speakers"

Pin	Label	SBY	Run	Diode Check
1	SPK-R(-)	0V	12.43V	OL
2	SPK-R(+)	0V	12.43V	OL
3	SPK-L(-)	0V	12.43V	OL
4	SPK-L(+)	0V	12.43V	OL

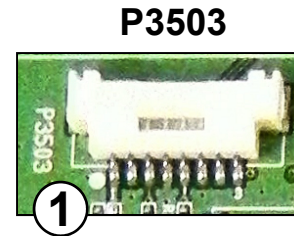
Diode Mode values taken with all Connectors Removed

# P3503 Main Board Connectors Voltage and Diode Check

## Local Dimming Connector P3503 Information

### P3503 Connector "MAIN Board" To P832 "SMPS"

Pin	Label	STBY	Run	Diode Check
1	Reverse	0V	0V	OL
2	n/c	n/c	n/c	OL
3	M0_SCLK	0V	0.1V	OL
4	Gnd	Gnd	Gnd	Gnd
5	M0_MOSI	0V	0.12V	OL
6	SCL2_3.3V	0V	3.2V	1.73V
7	SDA2_3.3V	0V	3.2V	1.71V
8	L_VS	0V	0V	OL



SMPS P832		MAIN P3503	
Pin	Label	Pin	Label
8	Reverse	1	Reverse
7	n/c	2	n/c
6	SCLK	3	M0_SCLK
5	Gnd	4	Gnd
4	SIN	5	M0_MOSI
3	SCL	6	SCL2_3.3V
2	SDA	7	SDA2_3.3V
1	VSYNC	8	L_VS

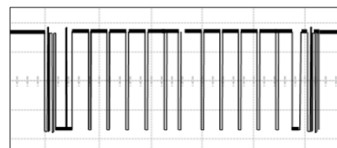
Note: P832 "SMPS" (Pin 1 is reversed).

Note: On the Main Board the pins are reversed and the Labels may be different.

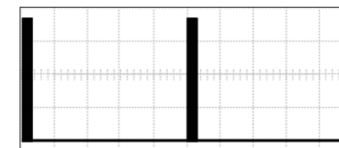
Diode Mode values taken with all Connectors Removed

## P3503 Local Dimming Waveform Information

MOSI Pin 5 P3503  
3.57V p/p  
Local Dimming On



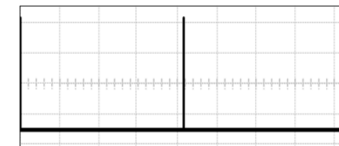
SCLK Pin 3 P3503  
3.54V p/p



MOSI Pin 5 P3503  
3.57V p/p  
Local Dimming Off



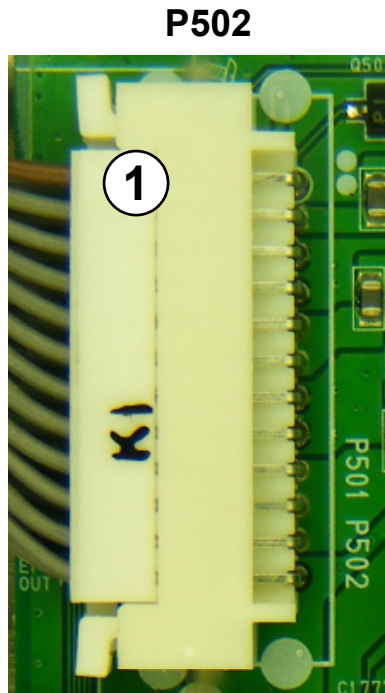
V-SYNC Pin 8 P3503  
3.5V p/p





## P502 Main Board Connector to Power Supply Voltage and Diode Check

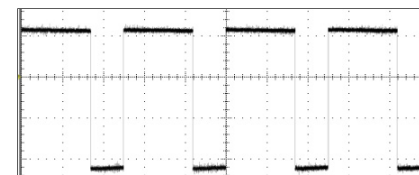
P502 "MAIN Board" Connector To P201 "SMPS Board"



Odd Pins Top Row

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.4V	2.79V
2-4	24V	0V	25V	OL
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V_ST	3.56V	3.51V	1.15V
13-15	Gnd	Gnd	Gnd	Gnd
16	GND/VSYNC	n/c	n/c	OL
17	12V	0V	12.01V	2.09V
18	DRV-ON	0V	3.24V	1.54V
19	12V	0V	12.01V	2.09V
20	A-DIM	n/c	n/c	OL
21	12V	0V	12.01V	2.09V
22	PDIM-1	0V	0.2V~3.3V	2.4V
23	n/c	n/c	n/c	OL
24	Err OUT	n/c	n/c	OL

(1) PDIM Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and Intelligent Sensor (room light condition). Range 0.2V to 3.3V.



P-DIM1  
3.66V p/p 50IRE

Diode Mode values taken with all Connectors Removed

# P3501 "Main" to "T-CON" Voltage and Diode Check

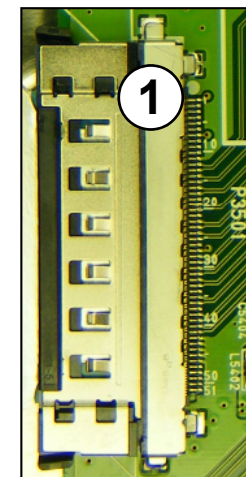
## P3501 "MAIN Board" To "T-CON" CN1

Pin	Label	Run	Diode Check
1	2D/3D_CTL	0V	1.17V
2	n/c	n/c	n/c
3	n/c	n/c	n/c
4	n/c	n/c	n/c
5	n/c	n/c	n/c
6	AU0_65_Mirror	0V	OL
7	LVDS_SEL	0V	OL
8	n/c	n/c	n/c
9	n/c	n/c	n/c
10	n/c	n/c	n/c
11	Gnd	Gnd	Gnd
12	<b>TXA0N</b>	<b>1.24V</b>	<b>1.13V</b>
13	<b>TXA0P</b>	<b>1.18V</b>	<b>1.13V</b>
14	<b>TXA1N</b>	<b>1.23V</b>	<b>1.13V</b>
15	<b>TXA1P</b>	<b>1.16V</b>	<b>1.13V</b>
16	<b>TXA2N</b>	<b>1.25V</b>	<b>1.10V</b>
17	<b>TXA2P</b>	<b>1.16V</b>	<b>1.10V</b>
18	Gnd	Gnd	Gnd
19	TXACLKN	1.19V	0.84V
20	TXACLKP	1.23V	1.12V

Pin	Label	Run	Diode Check
21	Gnd	Gnd	Gnd
22	<b>TXA3N</b>	<b>1.24V</b>	<b>1.12V</b>
23	<b>TXA3P</b>	<b>1.18V</b>	<b>1.12V</b>
24	<b>TXA4N</b>	<b>1.23V</b>	<b>1.12V</b>
25	<b>TXA4P</b>	<b>1.16V</b>	<b>1.12V</b>
26	Gnd	Gnd	Gnd
27	BIT_SEL	2.4V	OL
28	<b>TXB0N</b>	<b>1.24V</b>	<b>1.13V</b>
29	<b>TXB0P</b>	<b>1.18V</b>	<b>1.13V</b>
30	<b>TXB1N</b>	<b>1.23V</b>	<b>0.85V</b>
31	<b>TXB1P</b>	<b>1.16V</b>	<b>1.15V</b>
32	<b>TXB2N</b>	<b>1.25V</b>	<b>1.13V</b>
33	<b>TXB2P</b>	<b>1.16V</b>	<b>1.13V</b>
34	Gnd	Gnd	Gnd
35	TXBCLKN	1.19V	1.11V
36	TXBCLKP	1.23V	1.11V
37	Gnd	Gnd	Gnd
38	<b>TXB3N</b>	<b>1.24V</b>	<b>1.13V</b>
39	<b>TXB3P</b>	<b>1.18V</b>	<b>1.13V</b>
40	<b>TXB4N</b>	<b>1.23V</b>	<b>1.13V</b>

Pin	Label	Run	Diode Check
41	<b>TXB4P</b>	<b>1.16V</b>	<b>1.13V</b>
42	Gnd	Gnd	Gnd
43	Gnd	Gnd	Gnd
44	Gnd	Gnd	Gnd
45	Gnd	Gnd	Gnd
46	Gnd	Gnd	Gnd
47	n/c	n/c	n/c
48	Panel_VCC	12.13V	0.89V
49	Panel_VCC	12.13V	0.89V
50	Panel_VCC	12.13V	0.89V
51	Panel_VCC	12.13V	0.89V

**P3501**



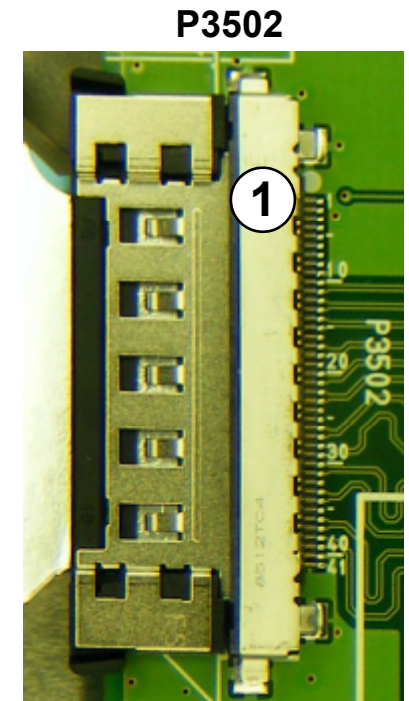
There are no Stand-By Voltages for the Connector  
Diode Mode values taken with all Connectors Removed

Pins in **Bold**  
are Video.

## P3502 "Main" to "T-CON" Voltage and Diode Check

P3502 "MAIN" To "T-CON" CN2

Pin	Label	Run	Diode Check	Pin	Label	Run	Diode Check
1	n/c	n/c	n/c	21	<b>TXC3P</b>	<b>1.18V</b>	<b>1.12V</b>
2	n/c	n/c	n/c	22	<b>TXC4N</b>	<b>1.23V</b>	<b>1.12V</b>
3	n/c	n/c	n/c	23	<b>TXC4P</b>	<b>1.16V</b>	<b>1.12V</b>
4	n/c	n/c	n/c	24	Gnd	Gnd	Gnd
5	n/c	n/c	n/c	25	Gnd	Gnd	Gnd
6	n/c	n/c	n/c	26	<b>TXD0N</b>	<b>1.24V</b>	<b>1.11V</b>
7	n/c	n/c	n/c	27	<b>TXD0P</b>	<b>1.18V</b>	<b>1.12V</b>
8	n/c	n/c	n/c	28	<b>TXD1N</b>	<b>1.23V</b>	<b>1.12V</b>
9	Gnd	Gnd	Gnd	29	<b>TXD1P</b>	<b>1.16V</b>	<b>1.13V</b>
10	<b>TXC0N</b>	<b>1.24V</b>	<b>1.13V</b>	30	<b>TXD2N</b>	<b>1.25V</b>	<b>1.12V</b>
11	<b>TXC0P</b>	<b>1.18V</b>	<b>1.13V</b>	31	<b>TXD2P</b>	<b>1.16V</b>	<b>1.12V</b>
12	<b>TXC1N</b>	<b>1.23V</b>	<b>1.12V</b>	32	Gnd	Gnd	Gnd
13	<b>TXC1P</b>	<b>1.16V</b>	<b>1.12V</b>	33	TXDCLKN	1.19V	1.14V
14	<b>TXC2N</b>	<b>1.25V</b>	<b>1.10V</b>	34	TXDCLKP	1.23V	1.10V
15	<b>TXC2P</b>	<b>1.16V</b>	<b>1.10V</b>	35	Gnd	Gnd	Gnd
16	Gnd	Gnd	Gnd	36	<b>TXD3N</b>	<b>1.24V</b>	<b>1.10V</b>
17	TXCCLKN	1.19V	1.10V	37	<b>TXD3P</b>	<b>1.18V</b>	<b>1.10V</b>
18	TXCCLKP	1.23V	1.10V	38	<b>TXD4N</b>	<b>1.23V</b>	<b>1.10V</b>
19	Gnd	Gnd	Gnd	39	<b>TXD4P</b>	<b>1.16V</b>	<b>1.10V</b>
20	<b>TXC3N</b>	<b>1.24V</b>	<b>1.12V</b>	40	Gnd	Gnd	Gnd
				41	Gnd	Gnd	Gnd



Pins in **Bold** are Video Signals.

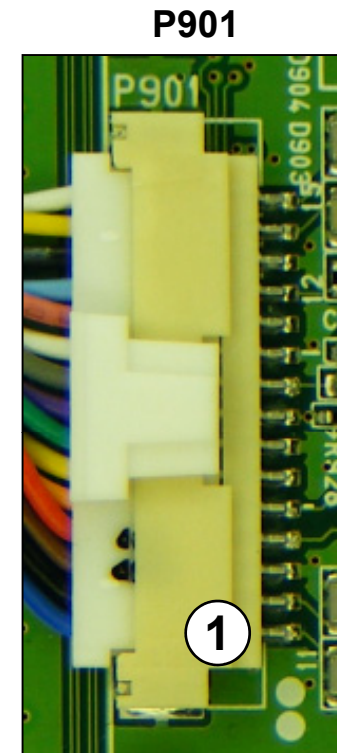
There are no Stand-By Voltages for the Connector.

Diode Mode values taken with all Connectors Removed.

## P901 Main Board to (Ft. IR/Intelligent Sensor) Voltage and Diode Check

P901 Connector "MAIN Board" To "IR Board" J1

Pin	Label	STBY	Run	Diode Check
1	<sup>(1)</sup> SCL	3.55V	3.48V	3.29V
2	<sup>(1)</sup> SDA	3.55V	3.48V	3.29V
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.31V	3.31V	1.84V
5	KEY 2	3.31V	3.31V	1.84V
6	3.5V_ST	3.55V	3.48V	1.15V
7	Gnd	Gnd	Gnd	Gnd
8	LED_B/BUZZ	0V	0V	OL
9	<sup>(2)</sup> IR	1.5V	1.41V	OL
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0V	3.33V	0.55V
12	LED_R/BUZZ	0V	0V	2.68V
13	Gnd	Gnd	Gnd	Gnd
14	<sup>(3)</sup> S/T_SCL	3.55V	3.48V	1.91V
15	<sup>(3)</sup> S/T_SCL	3.55V	3.48V	1.92V



(1) Clock & Data pulses only present when Intelligent Sensor is turned on. (3.6V p/p)

(2) IR pulses (2V p/p)

(3) Clock & Data pulses only present when Set is turned on or Off. (3.9V p/p)

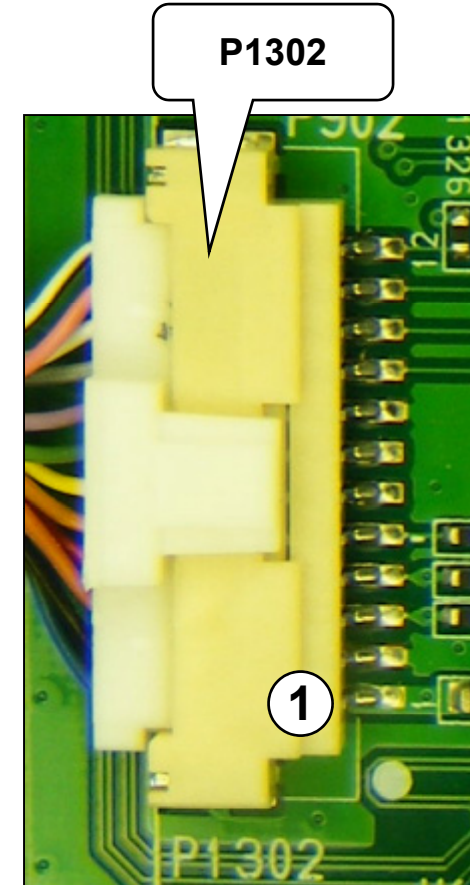
Diode Mode values taken with all Connectors Removed

## P1302 "Main" to "Motion Remote" (Voltage and Diode Check)

P1302 "MAIN Board" To "Motion Remote"

Pin	Label	Run	Diode Check
1	3.5V_Normal	3.41V	0.56V
2	Gnd	Gnd	Gnd
3	M_Remote_RX	3.30V	OL
4	M_Remote_TX	3.31V	OL
5	Reset	3.32V	2.41V
6	DC_MRemote	3.31V	2.42V
7	DD_MRemote	3.31V	2.40V
8	Gnd	Gnd	Gnd
9	GPI0-O	0V	OL
10	GPI0-1	0V	OL
11	GPI0-2	0V	OL
12	GPI0-3	0V	OL

Not Used



Diode Mode values taken with all Connectors Removed

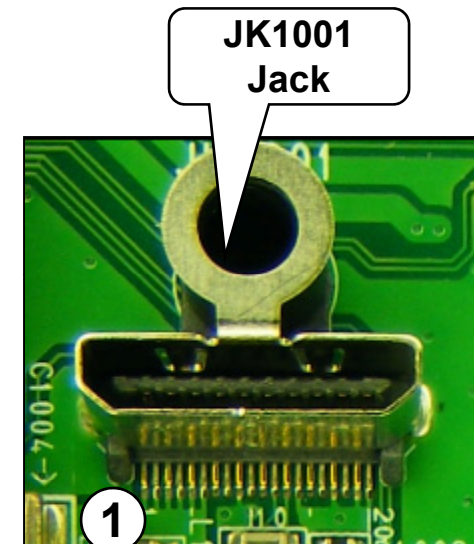


## JK1001 Main Wireless Media Box Dongle Jack (Voltage and Diode Check)

### JK1001 "MAIN Board" To "Wireless Media Box Dongle"

Pin	Label	STBY	Run	Diode Check
1-6	*25V	0V	25V	OL
7	Detect	0V	0.3V	2.39V
8	Interrupt	0V	3.3V	OL
9	Gnd	0V	Gnd	Gnd
10	n/c	0V	3.3V	OL
11	Gnd	0V	Gnd	Gnd
12	I2C_SCL	0V	3.3V	1.77V
13	I2C_SDA	0V	3.3V	1.77V
14	Gnd	0V	Gnd	Gnd
15	Wireless_RX	0V	3.3V	OL
16	Wireless_TX	0V	3.3V	OL
17	Gnd	0V	Gnd	Gnd
18	IR	0.67V	3.3V	OL
19-20	Gnd	0V	Gnd	Gnd

**Wireless Media Box Dongle must be plugged in for these voltages.**



Diode Mode values taken with all Connectors Removed

Voltages with Wireless Media Box Dongle plugged in. Use Media Box Dongle side to read voltages.

Remove cover, (see Wireless Media Box training manual for details).

\*25V Switched from Q1002 Drain front side of the board.

Q1002 turned on by Q1001 front side of the board.

Q1001 turned on by Microprocessor pin 38.

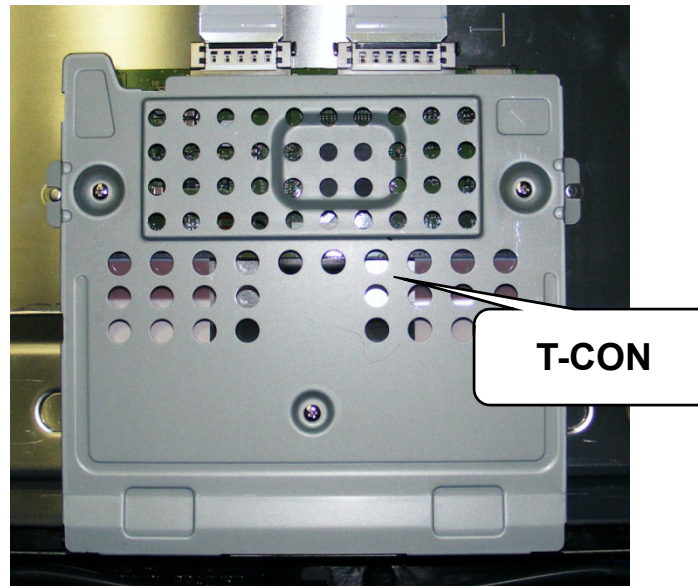
## *T-CON (TFT DRIVE) SECTION*

### TFT-LCD Controller Board

The T-CON is located at the bottom of the panel under the Stand Bracket.

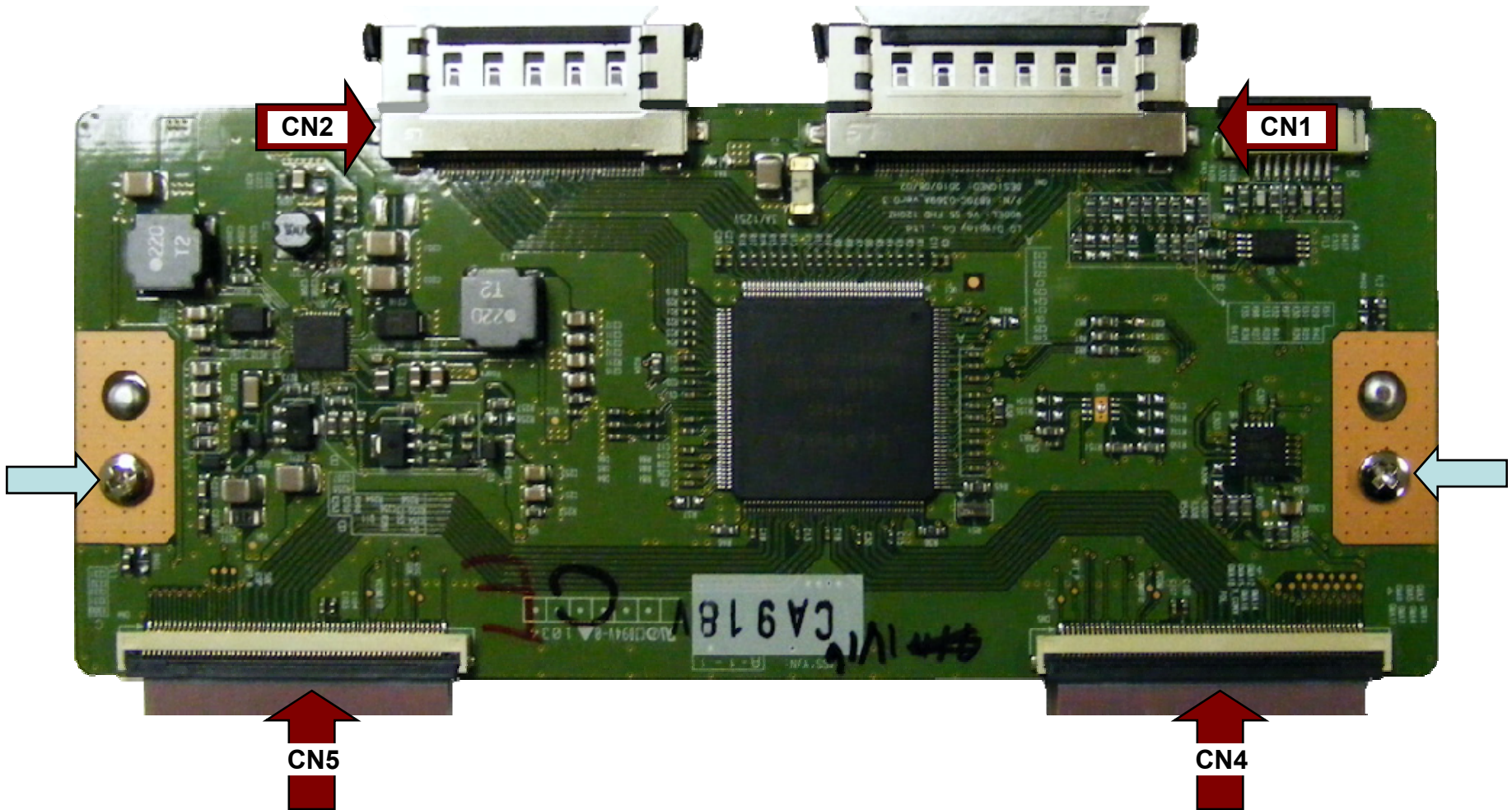
12V is supplied to the T-CON Board from the Main Board via connector CN1 (easily measured at fuse F1). IC UC1 receives 24 bit LVDS video signals from the Main Board at CN1 and CN2 which it processes into TFT Drive Signals. It delivers its output signals through connectors CN4 and CN5 to control the LCD Panel.

US1 and U6 are DC to DC converters which develop the Panels driver voltages. These voltages can be read at the ribbon connector or at test locations on the board which are identified on the following pages.



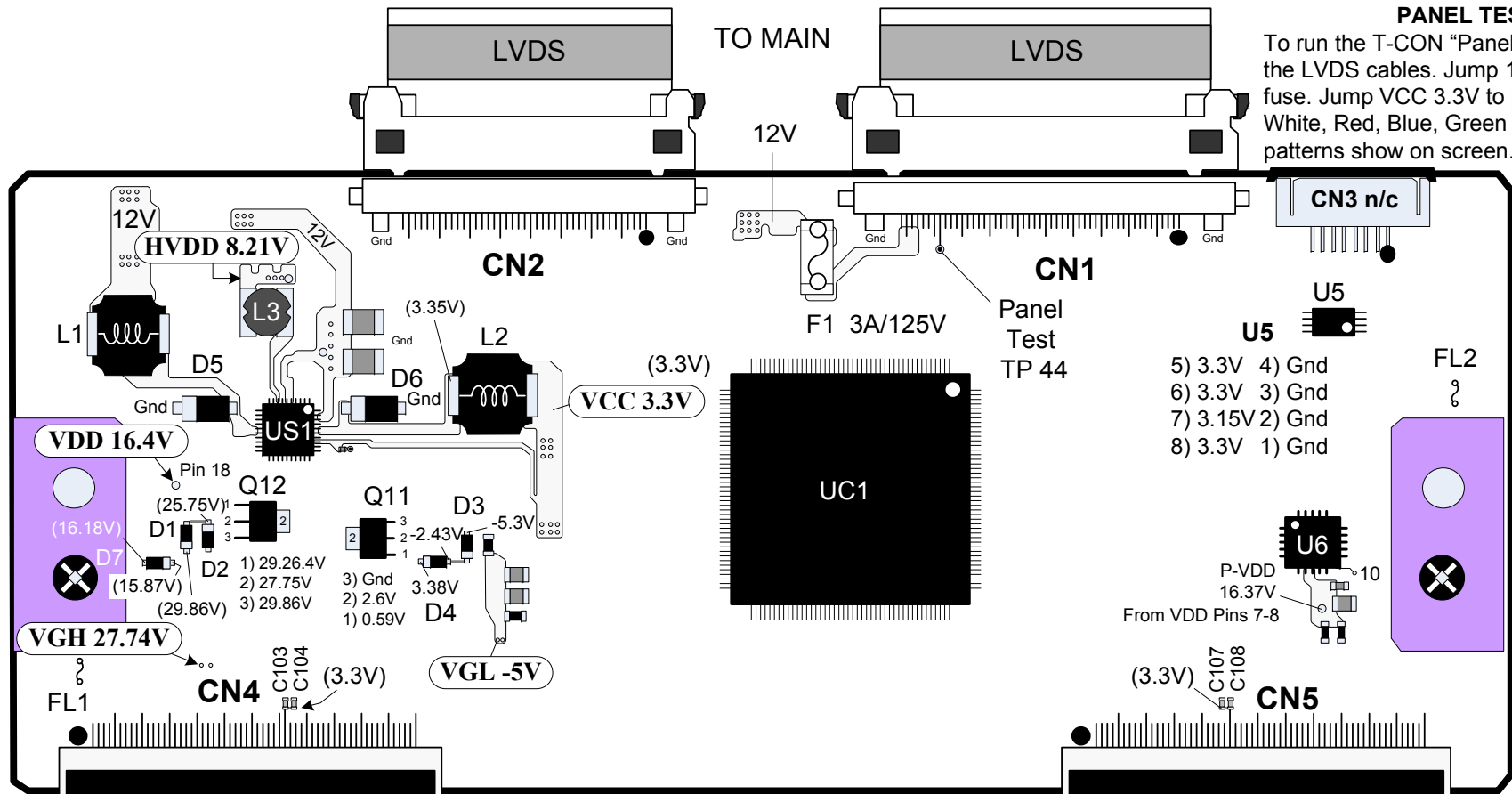
## T-CON (TFT Drive) Board Layout

**TIP:** The two screws shown in the picture are for the Service Position. They would have been removed when removing the shield. Be sure to reinstall them if servicing the T-CON board.



# 55LW5600 T-CON (TFT Drive) with (Shield Removed) Components Identified

**Warning:** T-Con Board under shield. Be sure to reinsert screws before operating set with shield removed.



**PANEL TEST**  
To run the T-CON "Panel Test", remove the LVDS cables. Jump 12V to the 12V fuse. Jump VCC 3.3V to pin 44 on CN1. White, Red, Blue, Green and Black patterns show on screen.

- U5**
- 5) 3.3V 4) Gnd
  - 6) 3.3V 3) Gnd
  - 7) 3.15V 2) Gnd
  - 8) 3.3V 1) Gnd

- Pin 51, 52 VGH **27.74V**
- Pin 35, 36 VCC **3.3V**
- Pin 47, 48 VGL **-5.3V**
- Pin 40, 41 VDD **16.4V**
- Pin 38, 39 HVDD **8.21V**

TO TFT MODULE

- Pin 9, 10 VGH **27.74V**
- Pin 13, 14 VGL **-5V**
- Pin 22, 23 HVDD **8.21V**
- Pin 25, 26 VCC **3.3V**
- Pin 20, 21 VDD **16.4V**

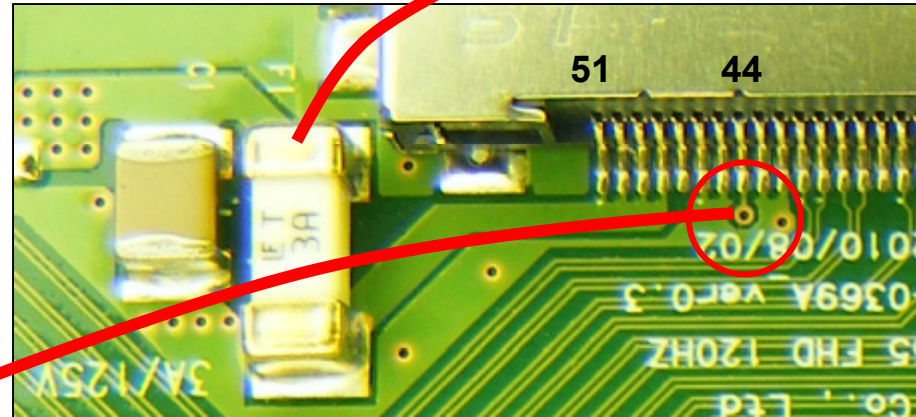
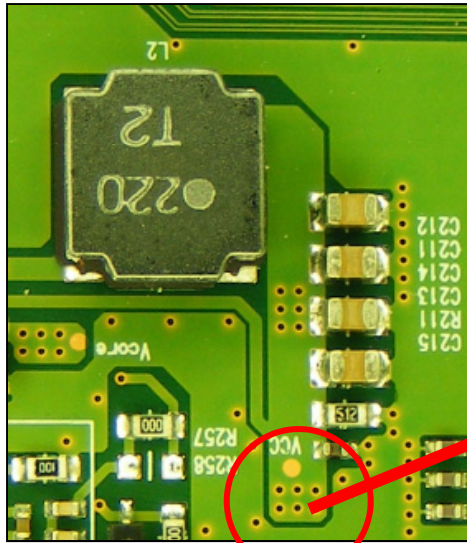
Other Voltages from U6 to the Panel with no silk screen labels:

- U6 pin 10: (16.12V) to CN4 pin 2, CN5 pin 59
- U6 pin 11: (13.3V) to CN4 pin 3, CN5 pin 58
- U6 pin 12: (12.2V) to CN4 pin 4, CN5 pin 57
- U6 pin 13: (10.26V) to CN4 pin 5, CN5 pin 56
- U6 pin 14: (5.9V) to CN4 pin 8, CN5 pin 53
- U6 pin 15: (4.05V) to CN4 pin 9, CN5 pin 52
- U6 pin 18: (3.01V) to CN4 pin 10, CN5 pin 51
- U6 pin 19: (2.36V) to CN4 pin 11, CN5 pin 50

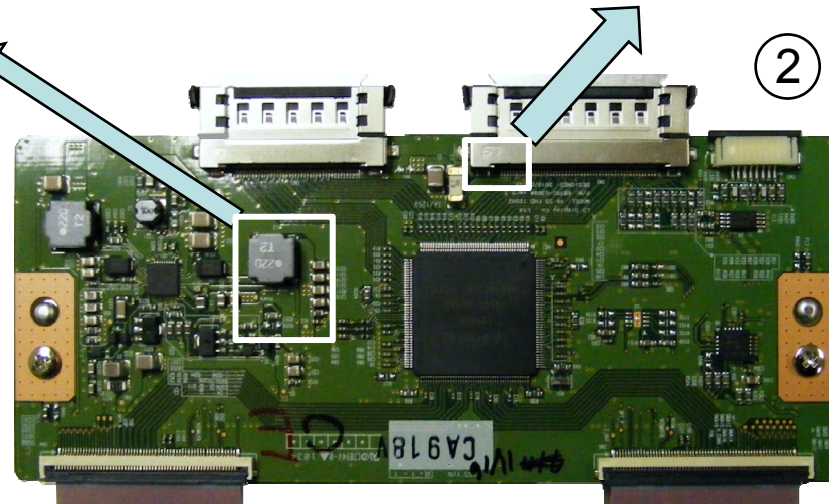


## T-CON (TFT Drive) Board Panel Test

- ① Set up the Power Supply Test as in Test 2 (Shown on page 46). Do not apply AC at this time.
- ③ Jump 12V from the SMPS to the T-CON Fuse F1 (P201 pin 17 or 19 or 21)



- ④ Jump 3.3V from the VCC TP to pin 44 of CN1



- ② Disconnect both LVDS Cables

Note: The connector has hash marks to indicate steps of 5. The marks are off one pin to the left. 5 is actually 6.

- ⑤ Apply AC to the Power Supply and Toggling patterns of White, Red, Blue, Green should appear on the screen



## CN1 T-CON Connector CN1 to the Main PWB (Voltage and Diode Check)

CN1 "T-CON" to "MAIN Board" P3501

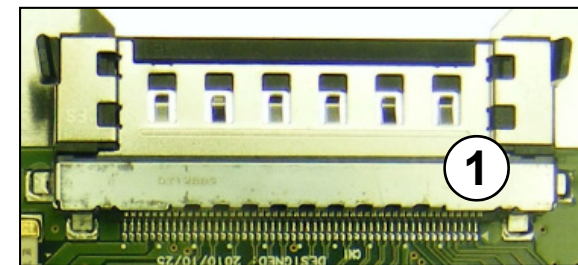
Pin	Label	Run	Diode Check
1	n/c	n/c	n/c
2	*3D_SYNC	0V	OL
3	n/c	n/c	n/c
4	SDA2_3.3V	3.3V	OL
5	SCL2_3.3V	3.3V	OL
6	FRC_RESET	3.14V	OL
7	LVDS_SEL	0V	OL
8	n/c	n/c	n/c
9	n/c	n/c	n/c
10	PANEL_CTL	0V	OL
11	Gnd	Gnd	Gnd
12	<b>TXA0N</b>	1.23V	1.94V
13	<b>TXA0P</b>	1.16V	1.94V
14	<b>TXA1N</b>	1.25V	1.94V
15	<b>TXA1P</b>	1.15V	1.94V
16	<b>TXA2N</b>	1.27V	1.94V
17	<b>TXA2P</b>	1.15V	1.94V
18	Gnd	Gnd	Gnd
19	TXACLKN	1.19V	1.94V
20	TXACLKP	1.23V	1.94V

Pin	Label	Run	Diode Check
21	Gnd	Gnd	Gnd
22	<b>TXA3N</b>	1.29V	1.94V
23	<b>TXA3P</b>	1.12V	1.94V
24	<b>TXA4N</b>	1.33V	1.94V
25	<b>TXA4P</b>	1.08V	1.94V
26	Gnd	Gnd	Gnd
27	BIT_SEL	2.40V	OL
28	<b>TXB0N</b>	1.23V	1.94V
29	<b>TXB0P</b>	1.18V	1.94V
30	<b>TXB1N</b>	1.24V	1.94V
31	<b>TXB1P</b>	1.17V	1.94V
32	<b>TXB2N</b>	1.29V	1.94V
33	<b>TXB2P</b>	1.15V	1.94V
34	Gnd	Gnd	Gnd
35	TXBCLKN	1.19V	1.94V
36	TXBCLKP	1.23V	1.94V
37	Gnd	Gnd	Gnd
38	<b>TXB3N</b>	1.27V	1.94V
39	<b>TXB3P</b>	1.31V	1.94V
40	<b>TXB4N</b>	1.31V	1.94V

Pin	Label	Run	Diode Check
41	<b>TXB4P</b>	1.08V	1.94V
42	Gnd	Gnd	Gnd
43	Gnd	Gnd	Gnd
44	Gnd	Gnd	OL
45	Gnd	Gnd	Gnd
46	Gnd	Gnd	Gnd
47	n/c	n/c	n/c
48	Panel_VCC	11.98V	OL
49	Panel_VCC	11.98V	OL
50	Panel_VCC	11.98V	OL
51	Panel_VCC	11.98V	OL

**Bold labels are video signals.**  
Pins 48~51 are 12V

**CN1**



Hash marks in steps of 5.  
First hash mark is off by 1 pin.  
Starts on pin 6.

Pin 2 (3D\_Sync) will go high when 3D is played.  
But is not used by the Main Board.

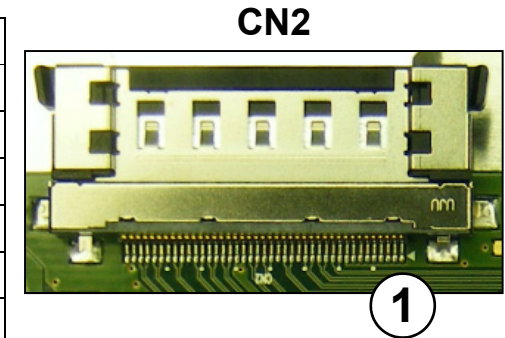
Diode Mode values taken with all Connectors Removed

## CN2 T-CON to the Main PWB (Voltage and Diode Check)

### CN2 "T-CON" to "MAIN" P1503

Pin	Label	Run	Diode Check
1	n/c	n/c	n/c
2	n/c	n/c	n/c
3	n/c	n/c	n/c
4	n/c	n/c	n/c
5	n/c	n/c	n/c
6	n/c	n/c	n/c
7	n/c	n/c	n/c
8	n/c	n/c	n/c
9	Gnd	Gnd	Gnd
10	TXC0N	1.23V	1.94V
11	TXC0P	1.18V	1.94V
12	TXC1N	1.24V	1.94V
13	TXC1P	1.19V	1.94V
14	TXC2N	1.26V	1.94V
15	TXC2P	1.15V	1.94V
16	Gnd	Gnd	Gnd
17	TXCCLKN	1.18V	1.94V
18	TXCCLKP	1.22V	1.94V
19	Gnd	Gnd	Gnd
20	TXC3N	1.24V	1.94V
21	TXC3P	1.16V	1.94V

Pin	Label	Run	Diode Check
22	TXC4N	1.28V	1.94V
23	TXC4P	1.11V	1.94V
24	Gnd	Gnd	Gnd
25	Gnd	Gnd	Gnd
26	TXD0N	1.23V	1.94V
27	TXD0P	1.18V	1.94V
28	TXD1N	1.23V	1.94V
29	TXD1P	1.18V	1.94V
30	TXD2N	1.25V	1.94V
31	TXD2P	1.15V	1.94V
32	Gnd	Gnd	Gnd
33	TXDCLKN	1.19V	1.94V
34	TXDCLKP	1.23V	1.94V
35	Gnd	Gnd	Gnd
36	TXD3N	1.25V	1.94V
37	TXD3P	1.17V	1.94V
38	TXD4N	1.31V	1.94V
39	TXD4P	1.20V	1.94V
40	Gnd	Gnd	Gnd
41	Gnd	Gnd	Gnd



Bold labels are video signals.

Diode Mode values taken with all Connectors Removed

## *FRONT (IR, INTELLIGENT SENSOR and POWER LED) SECTION*

The Intelligent Sensor and IR board (located on the bottom left as viewed from the rear) contains the IR (Infrared Remote Sensor) and the Intelligent Sensor. This board also has the Soft Touch Key Board.

The IR board receives its operating B+ pin 6 from the Main P901 (STBY 3.5V).

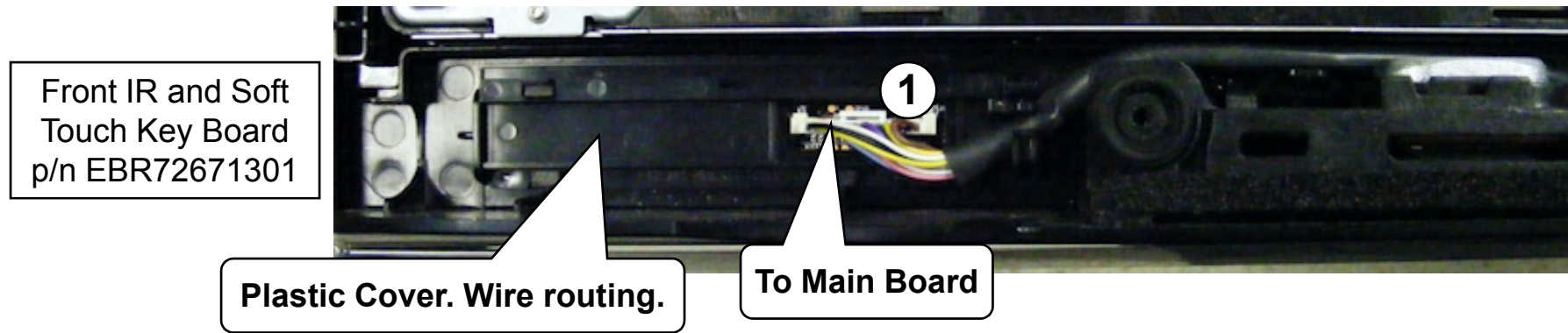
The IR (Infrared) remote receiver can be measured (1.48V) at pin 9 of connector P901 on the Main board in Stand-By. During run pin 9 reads (1.47V).

The IR pulses (2V p/p) are sent to the Main board and on to the Microprocessor (IC602) via pin 16.

The Front Power LEDs are controlled by different Clock and Data lines which communicate with the LED Driver IC U1. These clock and data lines are from the Main board P901 pins 14 and 15 which are only active when the Power is turned on or off.

The Soft Touch Keys are part of the IR board. Key 1 (pin 4) and Key 2 (pin 5) are output from Pat P901 on the Main Board, then to the Microprocessor 25 and 26 lines.

The Intelligent Sensor communicates with the Micro Processor IC602 pins 3 & 4 via clock and data lines EEPROM\_SCL and EEPROM\_SDA arriving on connector P901 pins 1 and 2 on the Main board. The Intelligent Sensor circuit receives its operational voltage when the set turns on via pin 11 (3.3V\_Normal).

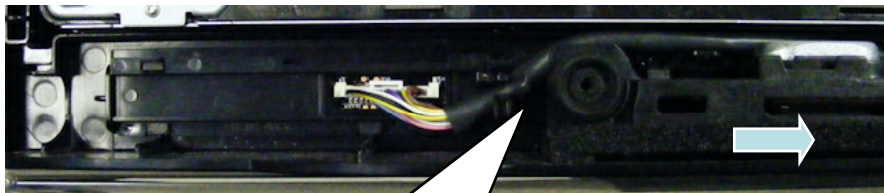


## Gaining access to the Front IR/Key Board

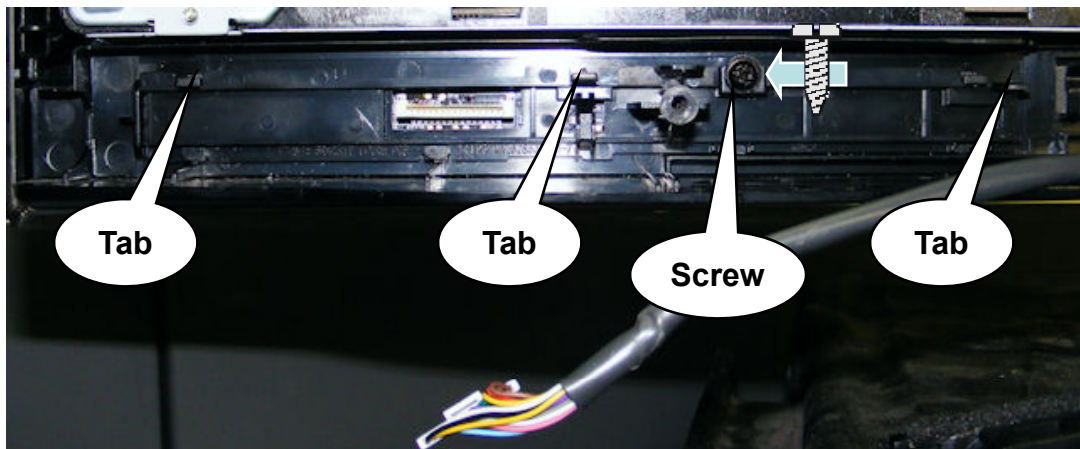
IR/Key board p/n: EBR72671301

The Front IR Item 510 on the parts breakdown is under a wire routing bracket Item 511. Disconnect the cable coming from the Main board and remove it from the wire holders in Item 511.

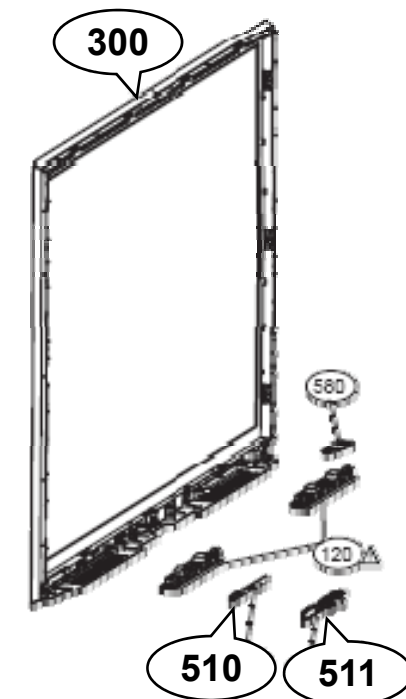
Remove the Speaker by sliding it forward.



Wire routing bracket, Slide Right



**3** Remove the one screw.  
Lift up on the three tabs at the top of Item 511 and pull the Item 511 slightly forward.  
Lift Item 511 up and out.



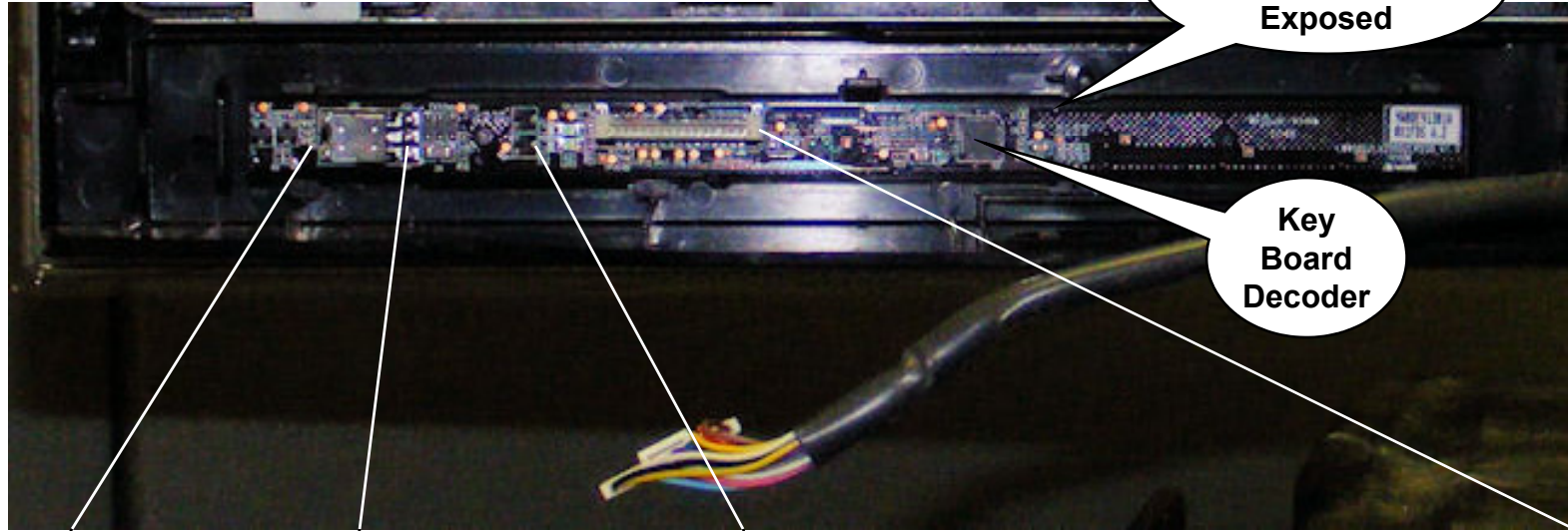


# Front IR Component Identification

See Disassembly section for gaining access to the IR/Key Board

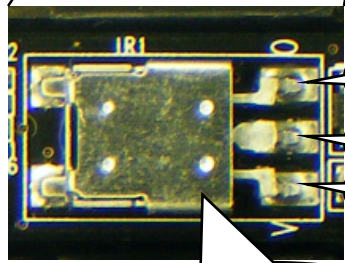
Attached to the Front Frame

IR/Key Board p/n: EBR72671301



Front IR/Key Board Exposed

Key Board Decoder

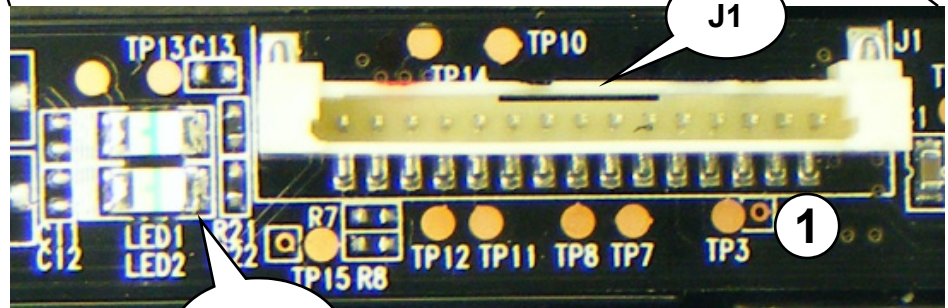


Infrared Receiver IC2

Output: 1.48V

Ground

Input Voltage 3.55V



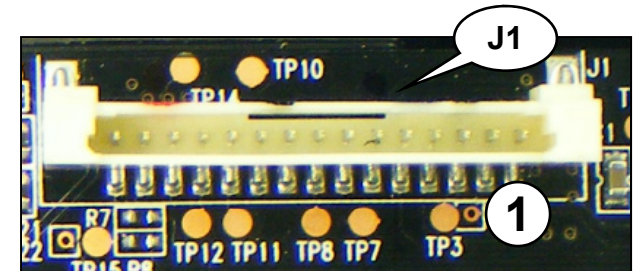
Power LEDs



## J1 Front IR/Soft Touch Key Board Voltage and Diode Check

J1 "IR Board" To P901 "Main Board"

Pin	Label	STBY	Run	Diode Check
1	SCL	3.55V	3.49V	OL
2	SDA	3.55V	3.49V	OL
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.33V	3.33V	OL
5	KEY 2	3.33V	3.33V	OL
6	3.5V_ST	3.55V	3.49V	OL
7	Gnd	Gnd	Gnd	Gnd
8	LED_B/BUZZ	0V	0V	OL
9	IR	1.48V	1.47V	OL
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0V	3.33V	OL
12	LED_R/BUZZ	0V	0V	OL
13	Gnd	Gnd	Gnd	Gnd
14	S/T_SCL	3.55V	3.49V	OL
15	S/T_SDA	3.55V	3.49V	OL



(1) Clock & Data pulses only present when Intelligent Sensor is turned on. (3.6V p/p)

(2) IR pulses (2V p/p)

(3) Clock & Data pulses only present when Set is turned on or Off. (3.9V p/p)

Diode Mode values taken with all Connectors Removed

## Soft Touch Key Resistance and Voltages

### Key 1 Line

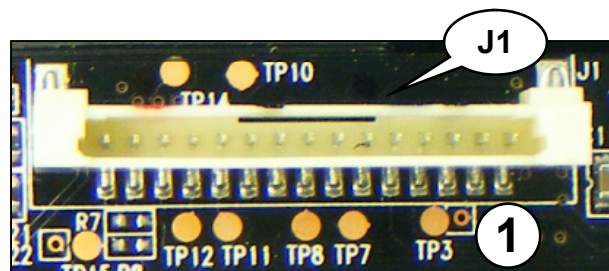
KEY 1	Pin 4 measured from Gnd
Volume (+)	16.8M Ohms
Volume (-)	10.7M Ohms
Home	5.4M Ohms
Enter	1.19M Ohms

KEY 1	Pin 4 measured from Gnd
Volume (+)	1.67V
Volume (-)	1.07V
Home	0.54V
Enter	0.12V

### Key 2 Line

KEY 2	Pin 5 measured from Gnd
CH (Up)	15.9M Ohms
CH (Dn)	9.8M Ohms
Power	5.7M Ohms
Input	1.19M Ohms

KEY 2	Pin 5 measured from Gnd
CH (Up)	1.56V
CH (Dn)	0.98V
Power	0.53V
Input	0.12V



Diode Mode values taken with all Connectors Removed

## MOTION REMOTE BOARD SECTION

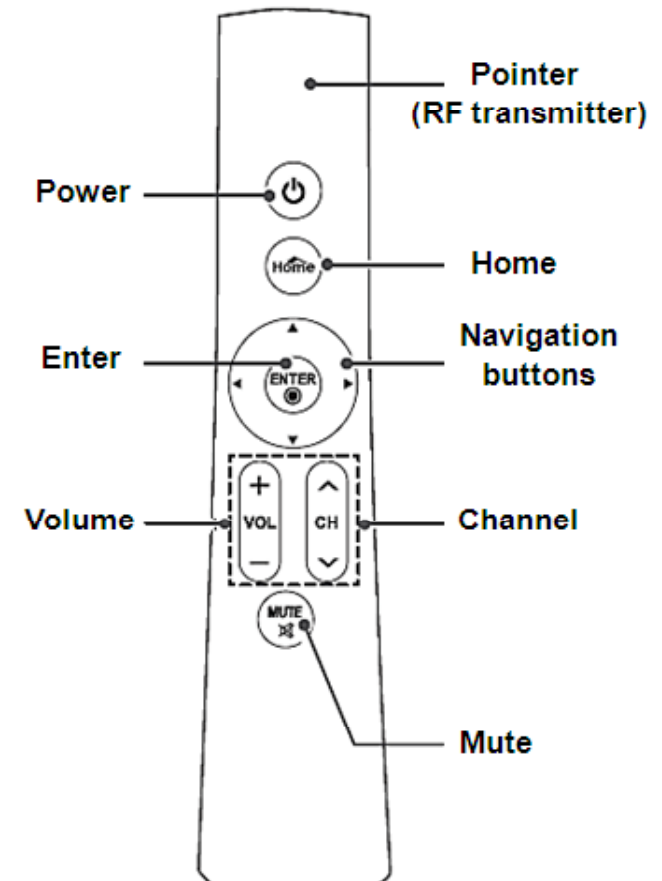


The first time the Motion Remote has its batteries installed and pointed at the Television, the Motion Remote is synchronized with the TV. After that, when pointing the remote at the TV and pressing the Enter key, a pointer appears on screen, then by moving the Motion Remote around, the pointer moves with the movement of the remote. When the pointer is placed over a selectable button, you can press the center “Enter” button and active the object. This makes navigation much easier.

You can also adjust the volume, change channels and mute the audio with the Motion Remote and it has a convenient “Home” button for the TV Menu.

A wrist band can be attached to the remote to avoid dropping and damaging the remote.

The Motion Remote utilizes a specialized receiver on the Television to receive the RF signal and this information is then routed to P1302 and on to the IC101 the BCM IC for pointer positioning and interpretation of the other functions.



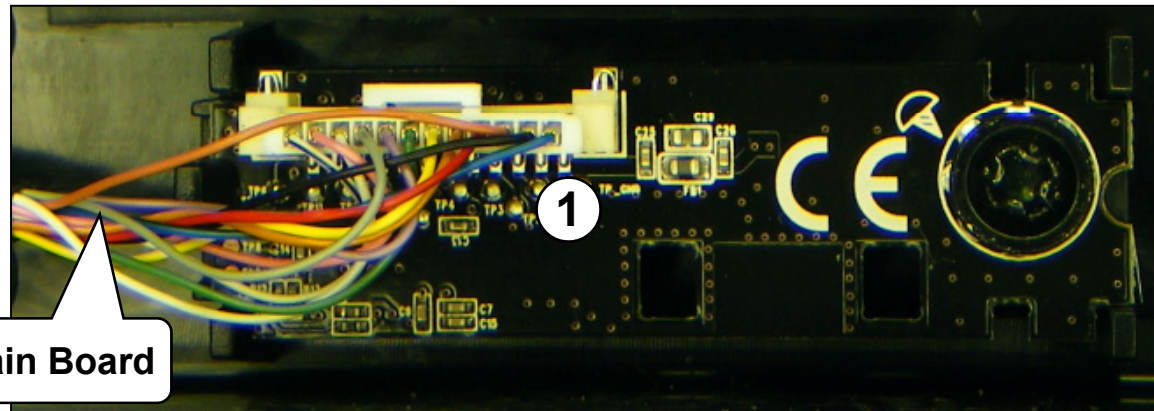
How to **Re-register the Magic Motion Remote** Control after Registration Failure. Reset the remote control by pressing and holding both the **ENTER** and **MUTE** buttons for **5 seconds**.

An LED will blink 3 times indicating the remote is ready for registering.

**Motion Remote “Magic Remote” AKB72914043**

## Motion Remote Receiver Board Voltage and Diode Check

Motion Remote Board  
p/n EBR72499601



"Motion Remote Receiver Board" To P1302 "Main"

Pin	Label	STBY	Run	Diode Check
1	3.5V_Normal	0.35V	3.33V	0.53V
2	Gnd	Gnd	Gnd	Gnd
3	M_Remote_RX	0.35V	3.33V	OL
4	M_Remote_TX	0.35V	3.33V	OL
5	Reset	0.35V	3.33V	OL
6	DC_MRemote	0.35V	3.33V	2.41V
7	DD_MRemote	0.35V	3.33V	2.38V
8	Gnd	Gnd	Gnd	Gnd
9	GPI0-O	0V	0V	OL
10	GPI0-1	0V	0V	OL
11	GPI0-2	0V	0V	OL
12	GPI0-3	0V	0V	OL

Diode Mode values taken with all Connectors Removed



## INVISIBLE SPEAKER SECTION

The 55LW56000 contains the Invisible Speaker system.

The Full Range Speakers point downward, so there is no front viewable speaker grill or air ports.

Back View



Front View



Speaker  
p/n EAB62088401

## *INTERCONNECT DIAGRAM (11 X 17 FOLDOUT SECTION)*

*This section shows the 11X17 foldout that's available in the Paper and Adobe version of the Training Manual.*

*The Adobe version of this Training Manual allows the viewer to zoom in and out making reading of the small text easier.*

*This Power Point shows a graphical representation of the 11 X 17 foldout page so clarity is limited.*

# 55LW560 INTERCONNECT DIAGRAM

Note: If a particular area is exhibiting a dimmer backlight level than other areas or the overall brightness seems dim, be sure to first check the customer's Menu setting for Backlights. Raise the percentage and see if the overall brightness returns to normal. If not,

- 1<sup>st</sup>: Check the P-DIM level, it should rise with the percentage shown on screen. 100%, 3.3V. Follow the P-DIM signal all the way to the Inverter.
- 2<sup>nd</sup>: Turn off Local Dimming in the Customers Menu or unplug P832. If the brightness returns to normal, examine the signals required for Local Dimming. (SIN, V-SYNC and SCLK). Suspect the Main Board.

You can also test each of the 12 blocks functionality by grounding the return path signal (V1-V4) through a 220Ω, providing the 63V LED Power is present. See "LED Single Block Test" instructions below.

## P202 White Plug "SMPS Board" To "Panel LEDs"

Pin	Label	TP	Run	Diode
1	LED+	C256+	63V	OL
2	n/c	n/c	n/c	OL
3	VC-3A	EL70	*1.59V~18V	OL
4	VC-3B	EL71	*1.59V~18V	OL
5	VC-3C	EL72	*1.59V~18V	OL
6	VC-3D	EL73	*1.59V~18V	OL
7	VC-4A	EL74	*1.59V~18V	OL
8	VC-4B	EL75	*1.59V~18V	OL
9	VC-4C	EL76	*1.59V~18V	OL
10	VC-4D	EL77	*1.59V~18V	OL
11	n/c	n/c	n/c	OL
12	LED+	C256+	63V	OL

\*White to Black screen

## P203 Black Plug "SMPS Board" To "Panel LEDs"

Pin	Label	TP	Run	Diode
1	LED+	C256+	63V	OL
2	n/c	n/a	n/c	OL
3	VC-1A	EL62	*1.59V~18V	OL
4	VC-1B	EL63	*1.59V~18V	OL
5	VC-1C	EL64	*1.59V~18V	OL
6	VC-1D	EL65	*1.59V~18V	OL
7	n/c	n/a	n/c	OL
8	VC-2A	EL66	*1.59V~18V	OL
9	VC-2B	EL67	*1.59V~18V	OL
10	VC-2C	EL68	*1.59V~18V	OL
11	VC-2D	EL69	*1.59V~18V	OL
12	n/c	n/a	n/c	OL
13	LED+	C256+	63V	OL

\*White to Black screen

## P832 "SMPS" to P3503 "MAIN Board"

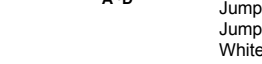
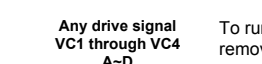
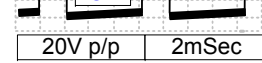
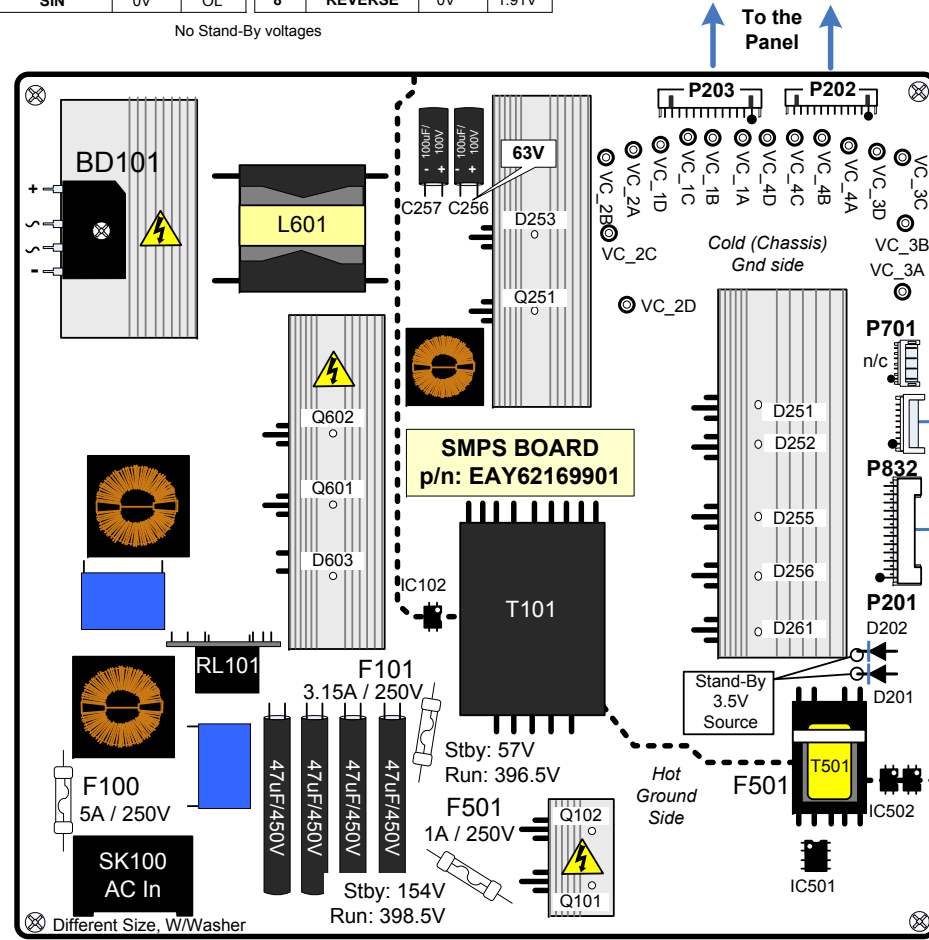
Pin	Label	Run	Diode	Pin	Label	Run	Diode
1	VSYNC	0V	2V	5	GND	Gnd	Gnd
2	SDA	3.2V	OL	6	SCLK	0V	OL
3	SCL	3.2V	OL	7	N.C.	n/c	n/c
4	SIN	0V	OL	8	REVERSE	0V	1.91V

No Stand-By voltages

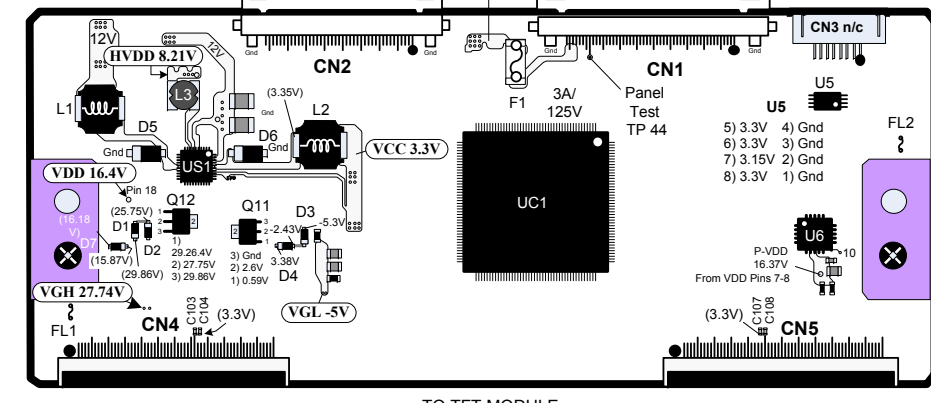
**PWR-ON:** Starts 12V, 24V and 63V LED Power. (56V at this time). No Backlights.

**DRV-ON:** Starts Backlights. LED Power goes to 63V.

(1) PWM Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition). Output from the Video Processor. Range 0.2V to 3.3V.



**PANEL TEST**  
To run the T-CON "Panel Test", remove the LVDS cables. Jump 12V to the 12V fuse. Jump VCC 3.3V to pin 44 on CN1. White, Red, Blue, Green and Black patterns show on screen.



Pin	Label	Run	Diode	Pin	Label	Run	Diode
Pin 51, 52 VGH	27.74V	Pin 35, 36 VCC	3.3V	Pin 9, 10 VGH	27.74V	Pin 25, 26 VCC	3.3V
Pin 47, 48 VGL	5.3V	Pin 40, 41 VDD	16.4V	Pin 13, 14 VGL	-5V	Pin 20, 21 VDD	16.4V
Pin 38, 39 HVDD	8.21V			Pin 22, 23 HVDD	8.21V		

Other Voltages from U6 to the Panel with no silk screen labels:  
 U6 pin 10: (16.12V) to CN4 pin 2, CN5 pin 59  
 U6 pin 11: (13.3V) to CN4 pin 3, CN5 pin 58  
 U6 pin 12: (12.2V) to CN4 pin 4, CN5 pin 57  
 U6 pin 13: (10.26V) to CN4 pin 5, CN5 pin 56  
 U6 pin 14: (5.9V) to CN4 pin 8, CN5 pin 53  
 U6 pin 15: (4.05V) to CN4 pin 9, CN5 pin 52  
 U6 pin 16: (3.01V) to CN4 pin 10, CN5 pin 51  
 U6 pin 19: (2.36V) to CN4 pin 11, CN5 pin 50

## P201 "SMPS Board" To P502 "MAIN Board"

Pin	Label	STBY	Run	Diode Check
24	ERROR	n/c	n/c	2.2V
23	n/c	n/c	n/c	n/c
22	(1) PWM	0V	0.2V~3.3V	OL
21	12V	0V	12.07V	0.48V
20	n/c	n/c	n/c	OL
19	12V	0V	12.07V	0.48V
18	DRV-ON	0V	3.24V	OL
17	12V	0V	12.07V	0.48V
16	V_Sync	0V	0V	OL
13-15	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.56V	3.51V	OL
5-8	Gnd	Gnd	Gnd	Gnd
2-4	24V	0V	25V	1.1V
1	PWR-ON	0V	3.4V	1.16V

## P1302 "MAIN Board" To "Motion Remote"

Pin	Label	STBY	Run	Diode Check
1	3.5V_Normal	0V	3.41V	0.56V
2	Gnd	Gnd	Gnd	Gnd
3	M_Remote_RX	0V	3.30V	OL
4	M_Remote_TX	0V	3.31V	OL
5	Reset	0V	3.32V	2.41V
6	DC_MRemote	0V	3.31V	2.42V
7	DD_MRemote	0V	3.31V	2.40V
8	Gnd	Gnd	Gnd	Gnd
9	GPI0-O	0V	0V	OL
10	GPI0-1	0V	0V	OL
11	GPI0-2	0V	0V	OL
12	GPI0-3	0V	0V	OL

## P502 "MAIN Board" To P201 "SMPS Board"

Pin	Diode
1	2.79V
2-4	OL
5-8	Gnd
9-12	1.15V
13-15	Gnd
16	OL
17	2.09V
18	1.54V
19	2.09V
20	OL
21	2.09V
22	2.4V
23	OL
24	OL

For voltages, see SMPS Tables.

## P3503 "Main" to P832 "SMPS"

Pin	Diode
1	OL
2	OL
3	OL
4	Gnd
5	OL
6	1.73V
7	1.71V
8	OL

For voltages, see SMPS Tables.

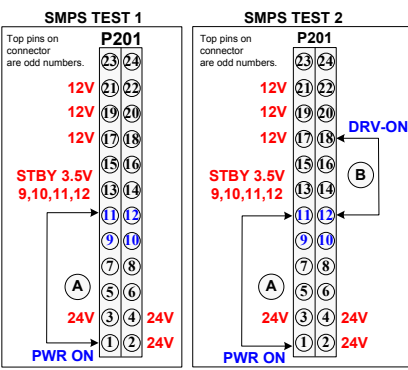
**Warning:**  
T-CON Board under shield. Be sure to reinsert screws before operating set with shield removed.

## P901 Connector "MAIN Board" To "IR Board"

Pin	Label	STBY	Run	Diode	Pin	Label	STBY	Run	Diode
1	SCL	3.55V	3.48V	3.29V	7	Gnd	Gnd	Gnd	Gnd
2	SDA	3.55V	3.48V	3.29V	8	LED_B	0V	0V	OL
3	Gnd	Gnd	Gnd	Gnd	9	IR	1.5V	1.41V	OL
4	KEY 1	3.31V	3.31V	1.84V	10	Gnd	Gnd	Gnd	Gnd
5	KEY 2	3.31V	3.31V	1.84V	11	+3.3V_Normal	0V	3.33V	0.55V
6	3.5V_ST	3.55V	3.48V	1.15V	12	LED_R	0V	0V	2.68V

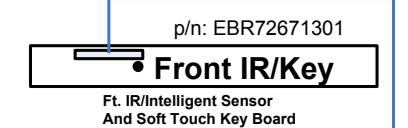
## Motion Remote

p/n: EBR72499601



Note: If there is a problem with a load from the panel backlights, you can remove AC and Disconnect P202 or P203. When AC is reappplied, the Backlight LEDs should turn on for about 4 seconds and then shut off.

**LED SINGLE BLOCK TEST DIM OR DARK PICTURE:**  
Confirm the 63V to the LED Backlights is present. Turn the Brightness, Contrast and Backlights all the way up. Confirm P-DIM is 3.3V. Using a 220Ω resistor, jump any of the blocks grounding lug (VC\_1-4\_A-D) while observing the picture and each block should turn on maximum.



PANEL PART NUMBERS p/n: EAJ61750001 (All Models)  
p/n: EAJ61928201 (AUSYLJR/UR)

55LW5600 MAIN (FRONT SIDE) SIMICONDUCTORS

<b>IC103</b> NVRAM for USB Pin [1] n/c [2] 0V [3] 3.34V [4] 0V [5] 3.22V [6] 3.22V [7] 0V (Gnd) [8] 3.34V	<b>IC505</b> (+3.3V_NORMAL) Regulator Pin [1] 0V (Gnd) [2] 11.96V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.79V [6] 3.47V (PWR On/Off2_2) [7] 3.35V (Out) [8] 3.35V (Out)	<b>IC508</b> (+1.5V_DDR) Regulator Pin [1] 3.46V [2] n/c [3] 3.46V (In) [4] 3.49V (PWR On/Off1) [5] 0V (Gnd) [6] 3.31V [7] 0.79V [8] 1.5V (Out)	<b>IC802</b> EDID Data PC Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.73V [6] 4.73V [7] 4.73V [8] 4.73V (Vcc In)	<b>IC1203</b> EDID Data PC Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl2) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)	<b>IC5401</b> (+1.26V_FRC) Regulator Pin [1] 0V (Gnd) [2] 11.85V (Vcc In) [3] 0V (Gnd) [4] 0.8V (FB) [5] 0.7V [6] 3.29V (Enable) [7] 1.29V (Out) [8] 1.29V (Out)	<b>Q503</b> 0.9V FET Switch Pin [1] 0.95V [2] 0.95V [3] 0.95V [4] 1.36V [5] 11.96V [6] 11.96V [7] 11.96V [8] 11.96V	<b>Q1001</b> Wireless Vcc Driver Pin B 0.02V C 24.5V E Gnd On when wireless dongle connected
<b>IC501</b> +0.9V_CORE DC to DC Pin [1] 3.17V [2] 0.59V [3] 0.44V [4] 11.95V [5] 0V [6] 5.33V [7] 4.6V [8] 5.81V [9] 0.95V [10] 1.36V	<b>IC506</b> Switched 5V for USB 2 Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)	<b>IC801</b> RGB Data Buffer Pin [1] 1.81V [2] 1.81V [3] 3.72V [4] 1.8V [5] 1.8V [6] n/c (4.44V) [7] 0V (Gnd) [8] n/c (4.43V) [9] n/c (1.79V) [10] n/c (1.79V) [11] 3.72V [12] 1.81V [13] 1.81V [14] 5V (Vcc In)	<b>IC803</b> RS232 Routing Pin [1] 3.5V [2] 5.64V [3] 0V [4] 0V [5] (-5.56V) [6] (-5.59V) [7] n/c (5.64V) [8] n/c (0V) [9] n/c (3.49V) [10] n/c (0V) [11] n/c (3.34V) [12] 3.48V [13] 0V [14] (-5.59V) [15] 0V (Gnd) [16] 3.5V (Vcc In)	<b>IC1204</b> EDID Data PC Pin [1] 0V (Gnd) [2] 4.96V (Vcc In) [3] 4.96V (Vcc In) [4] 3.34V (USB Ctl1) [5] 3.17V [6] 4.96V (Out) [7] 4.96V (Out) [8] n/c (0V)	<b>IC5402</b> (+3.3V_FRC) Regulator Pin [1] Under Shield [2] Under Shield [3] Under Shield [4] Under Shield [5] 0.8V [6] 3.45 (PWR On/Off2_2) [7] 3.3V [8] 3.3V	<b>Q508</b> 0.9V FET Switch Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 4.6V [5] 0.95V [6] 0.95V [7] 0.95V [8] 0.95V	<b>Q1002</b> Wireless Vcc Switch Pin S 24.5V G 24.5V D 0V On when wireless dongle connected
<b>IC504</b> +2.5V BCM Regulator Pin [1] n/c [2] 4.92V (En) [3] 3.47V (In) [4] 3.49V (Ctl) [5] n/c [6] 2.57V (Out) [7] 0.6V [8] 0V (Gnd)	<b>IC507</b> (+5V_NORMAL) Regulator Pin [1] 0V (Gnd) [2] 11.98V (In) [3] 0V (Gnd) [4] 0.79V [5] 3.48V [6] 3.48V (PWR On/Off2_1) [7] 4.96V (Out) [8] 4.96V (Out)	<b>Q501</b> RL_ON (PWR_On) 1st Driver Pin B 0.64V C 0V E Gnd	<b>Q502</b> PWR_ON Switch Pin [1] 3.5V (In) [2] 0.67V [3] 2.62V (Out)	<b>Q901</b> IR Buffer 2nd Pin B 0.02V C 3.48V E Gnd	<b>Q902</b> IR Buffer 1st Pin B 0.57V C 0.02V E Gnd		

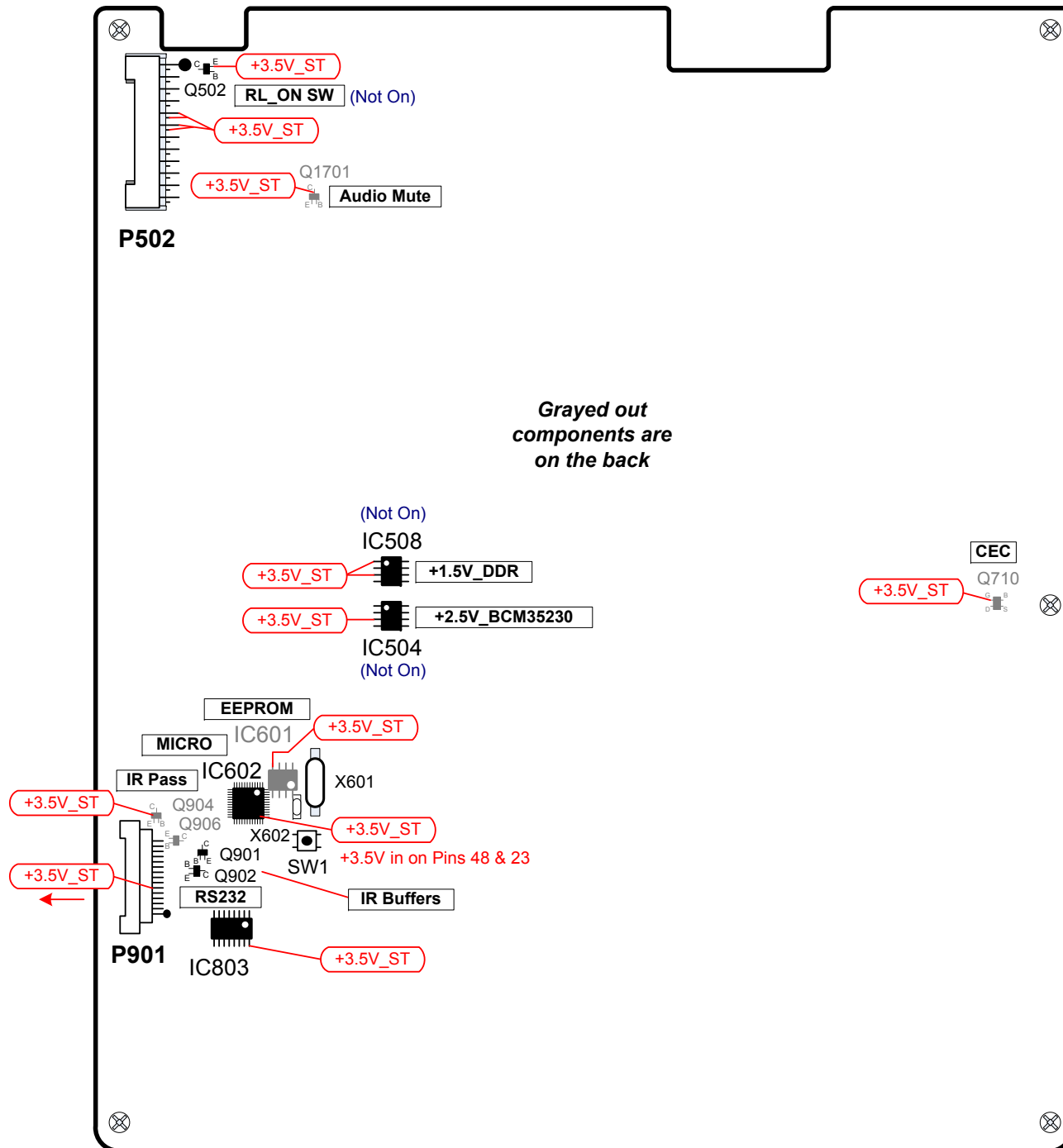
55LW5600 MAIN (BACK SIDE) SIMICONDUCTORS

<b>IC502</b> Power Det Gen (For +12V) Pin [1] 0V (Gnd) [2] 3.8V (In) [3] 3.73V (Out)	<b>IC5202</b> SPI FLASH Pin [1] 0.43V [2] 3.29V [3] 3.29V [4] 0V (Gnd) [5] ?? [6] ?? [7] 3.29V [8] 3.29V (3.3V_FRC in)	<b>Q101</b> RGB_DDC_SDA FET Buffer Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V	<b>Q710</b> CEC Remote HDMI CEC Pin [B] 3.47V [G] 3.51V [S] 3.47V [D] 3.49V	<b>Q2104</b> Tuner SIF (Sound) Buffer Pin B 0.23V C 0V (Gnd) E 0.93V	<b>D707</b> 5V Pull-Up to DDC_SCL/SDA_1 Pin A1 4.96V C 5V A2 0V	<b>D713</b> Bias for Q710 HDMI CEC Pin A1 0V C 3.45V A2 3.5V
<b>IC503</b> Power Det Gen (For +24V) Pin [1] 0V (Gnd) [2] 3.7V (In) [3] 3.73V (Out)	<b>Q506</b> PANEL_VCC Control 2nd Driver Pin B 0.67V C 0V E Gnd	<b>Q102</b> RGB_DDC_SCL FET Buffer Pin [B] 0V (Gnd) [G] 3.3V [S] 4.74V [D] 3.34V	<b>Q801</b> Earphone Mute Pin B 0V C 3.35V E Gnd	<b>Q2106</b> Tuner Video (Analog) Buffer Pin B 3.67V C 0V (Gnd) E 4.35V	<b>D708</b> 5V Pull-Up to DDC_SCL/SDA_3 Pin A1 4.96V C 5V A2 0V	<b>D810</b> 5V Routing to IC802 RGB EDID Pin A1 4.73V C 5.01V A2 0.07V
<b>IC601</b> EEPROM Micro Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 3.49V [4] 0V (Gnd) [5] 3.49V [6] 3.49V [7] 0V (Gnd) [8] 3.50V (Vcc In)	<b>Q507</b> PANEL_VCC Switch Pin S 11.97V (In) G 1.8V (Enable) D 11.94V (Out)	<b>Q504</b> INV_CTL (Drv_On) Driver Pin B 0V (INV ON) En C 3.28V (Out) E Gnd	<b>Q904</b> IR Wireless Pass 2nd Driver Pin B 0.02V C 3.48V E Gnd	<b>Q5201</b> URSA Reset Driver Pin B 0.11V C 3.33V E 0V (Gnd)	<b>D710</b> 5V Pull-Up to DDC_SCL/SDA_2 Pin A1 4.96V C 5V A2 0V	<b>D711</b> 5V Pull-Up to DDC_SCL/SDA_4 Pin A1 4.96V C 5V A2 0V
<b>Q505</b> PANEL_VCC Control 1st Driver Pin B 0V C 0.68V E Gnd	<b>Q906</b> IR Wireless Pass 1st Driver Pin B 0.57V C 0V E Gnd	<b>Q5202</b> URSA Reset Pin G 3.33V S 3.33V D 0V (Out)	<b>D711</b> 5V Pull-Up to DDC_SCL/SDA_4 Pin A1 4.96V C 5V A2 0V			

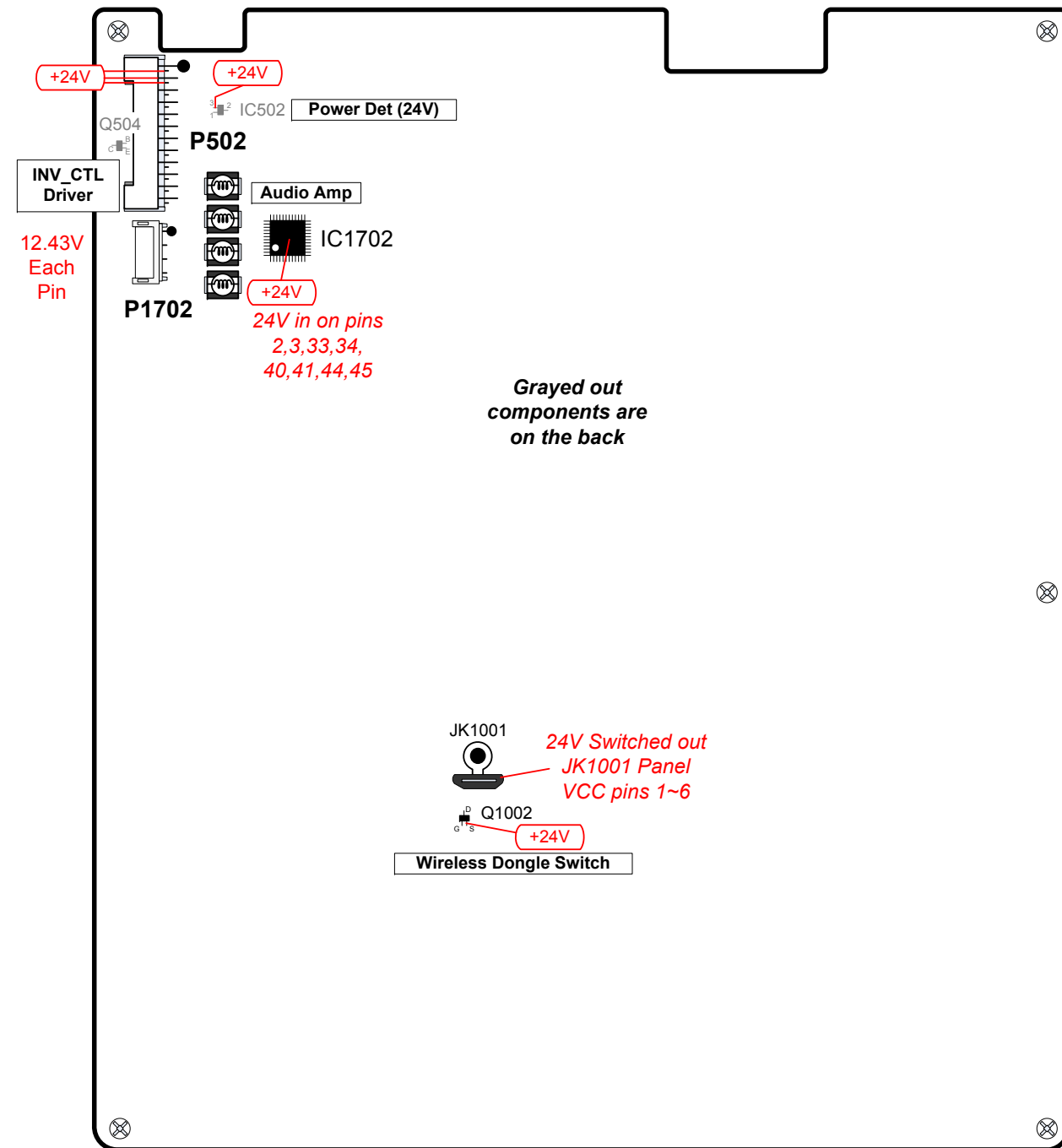


# 55LW5600 Main Board Components on in (Stand\_By 3.5V) and with (24V)

## Components on by Stand\_By 3.5V

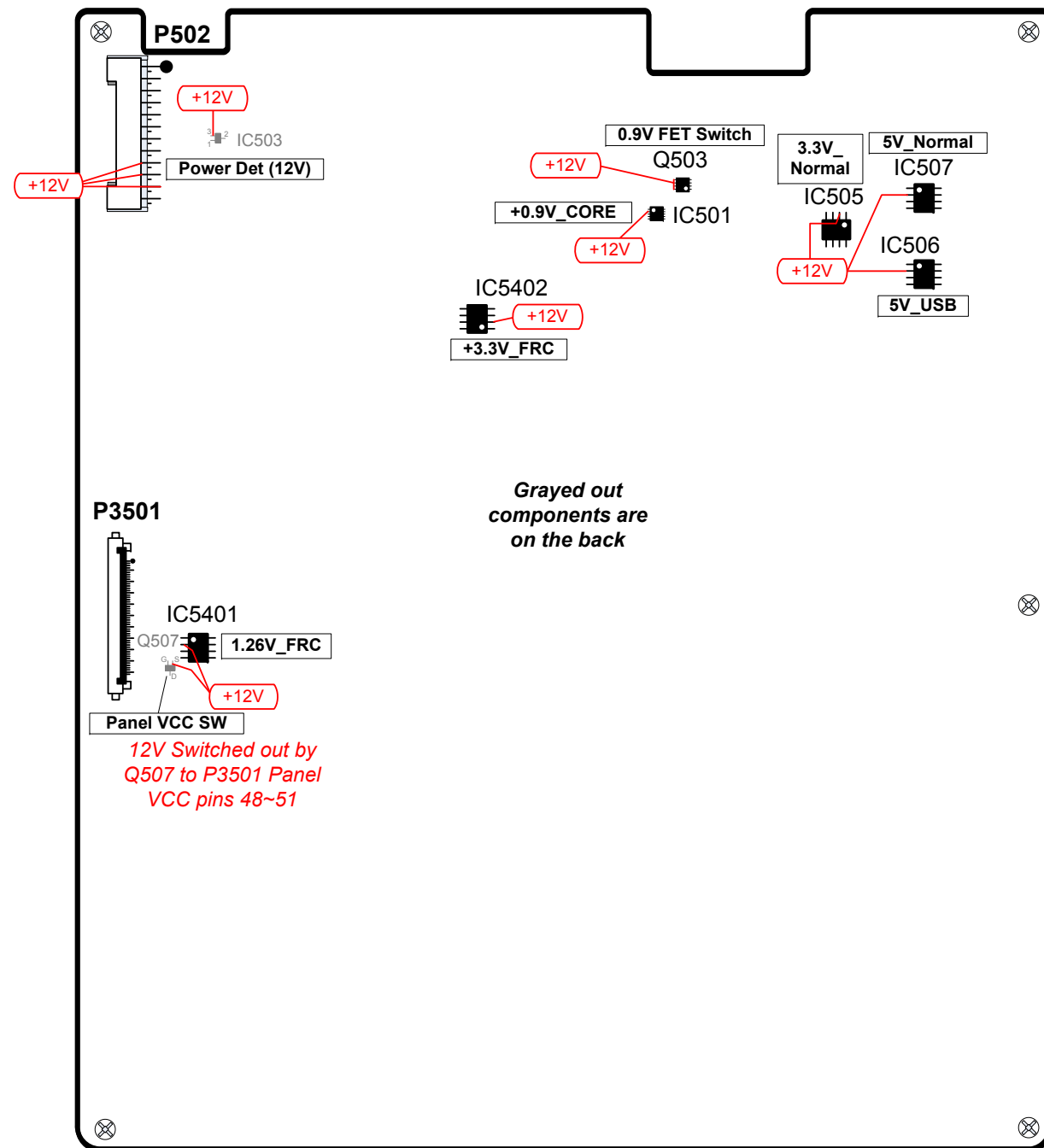


## Components on by 24V

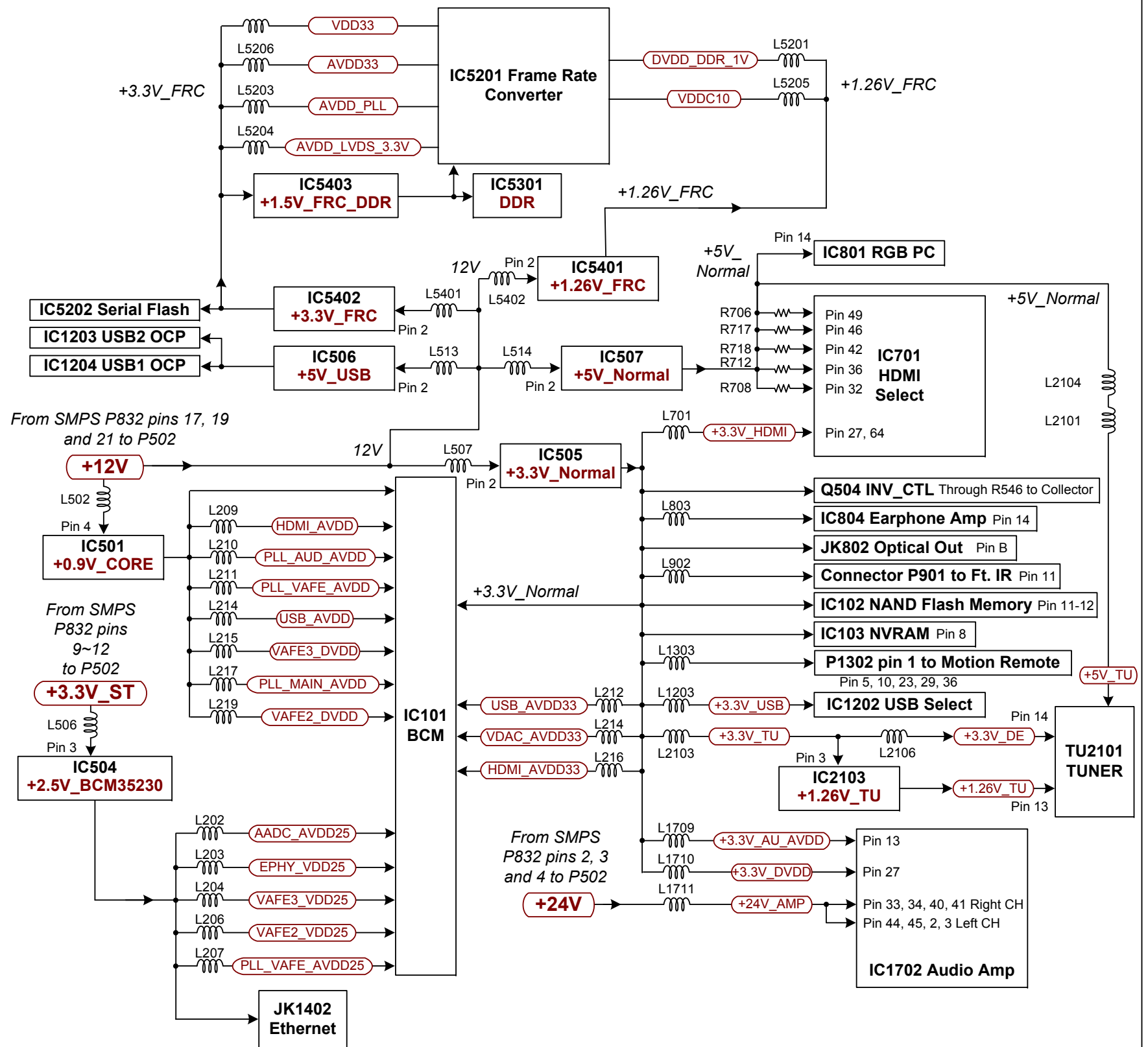


# 55LW5600 Main Board Components on with (12V) and Other Voltage Distributions

## Components on by 12V



## Other Voltage Distributions



# 55LW5600 Conclusion Page Direct View LCD



## 3D

*This concludes the 55LW56000  
training session.*



### 07/13/2011 Updates

Added Voltage Distribution pages to the end of the training manual.

### Updates 07/27/2011

1. Page 55: The bottom IC is the FRC IC.
2. Updated page 55 and 77 with information about the Main board pins P3503 are reversed on P832 on the SMPS. Added Local Dimming Waveforms to pages 64 and 77.
3. Moved the Speaker Connector P1702 to page 76 (from page 77) to free up room for the waveforms on page 77.
4. Page 94 cleaned up the Table related to Resistance and Voltages for the Soft Touch Key Board.

### 08/03/2011 Updates

Added pages 26 and 27 referencing Power Off Status

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