LG TRAINING CENTER

1080P
Direct View LCD
Training

47LX9500

LED Backlights

NetCast ENTERTAINMENT ACCESS

wireless 1080p Ready

LG

Life's Good

LCD-DV Troubleshooting
47" Class Full HD 1080P
LCD TV (47" diagonally)

FULL LED Slim

Published September 10th, 2010

OUTLINE

Preliminary Section:

Contact Information, Preliminary Matters, Specifications,
LCD Overview, General Troubleshooting Steps,
Signal Distribution, Disassembly Instructions and Voltages

Disassembly Section: Removal of Circuit Boards

Troubleshooting Section: Board Operation Troubleshooting of :

- **Switch Mode Power Supply**
  - **Inverter Boards Main and Secondary (LED Backlight Drivers)**
    - **Main Board**
      - **T-CON/3D Board**
        - **Ft Control Board**
          - **Soft Touch Keys**
            - **Speakers**

47LX9500 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.

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.

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	**us.lgservice.com**
Knowledgebase Website	**lgtechassist.com** ← New: Software Downloads Technical Assistance
LG Web Training	**lge.webex.com** ← Presentations with Audio/Video and Screen Marks
LG CS Academy	**lgcsacademy.com** ← **http://136.166.4.200**

LCD-DV:	**32LG40, 32LH30, 37LH55, 42LG60, 42LG70, 42LH20, 42LH40, 42LH50, 42LH90, 42SL80, 47LG90, 47LH85, 47LX9500, 47LX9500**
PLASMA:	**42PG20, 42PQ20, 42PQ30, 50PG20, 50PJ350, 50PK750, 50PS80, 50PS60, 60PK750, 60PS11, 60PS60, 60PS80**

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

New Training Materials on the Learning Academy site

Published September 2010 by LG Technical Support and Training
LG Electronics Alabama, Inc.
201 James Record Road, Huntsville, AL, 35813.

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…

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.

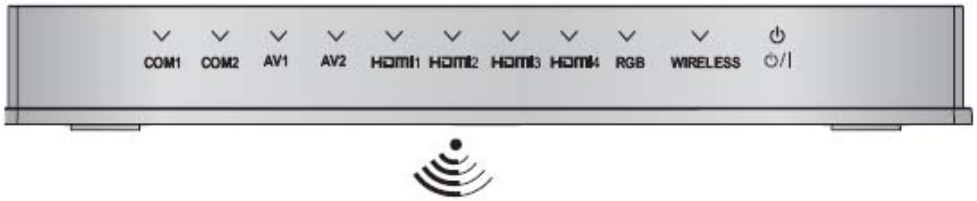
47LX9500 PRODUCT INFORMATION SECTION

This section of the manual will discuss the specifications of the 47LX9500
LCD Direct View Display

Wireless Media Box (Sold Separately)

The Wireless Media box communicates to the television via a wireless receiver called a "Dongle". The Dongle attaches to the Television via two connections:

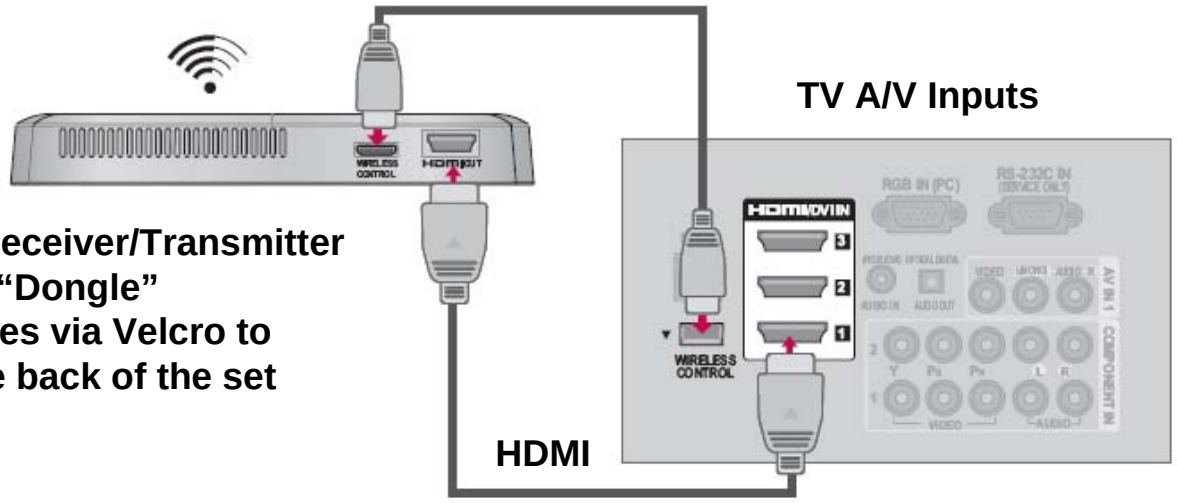
1. HDMI Cable from the Dongle to the TV to transfer Audio and Video Signals.
2. Wired Remote cable between the TV and Dongle for Control Functions.



Media Box

Wired Remote to control the Media Box

TV A/V Inputs



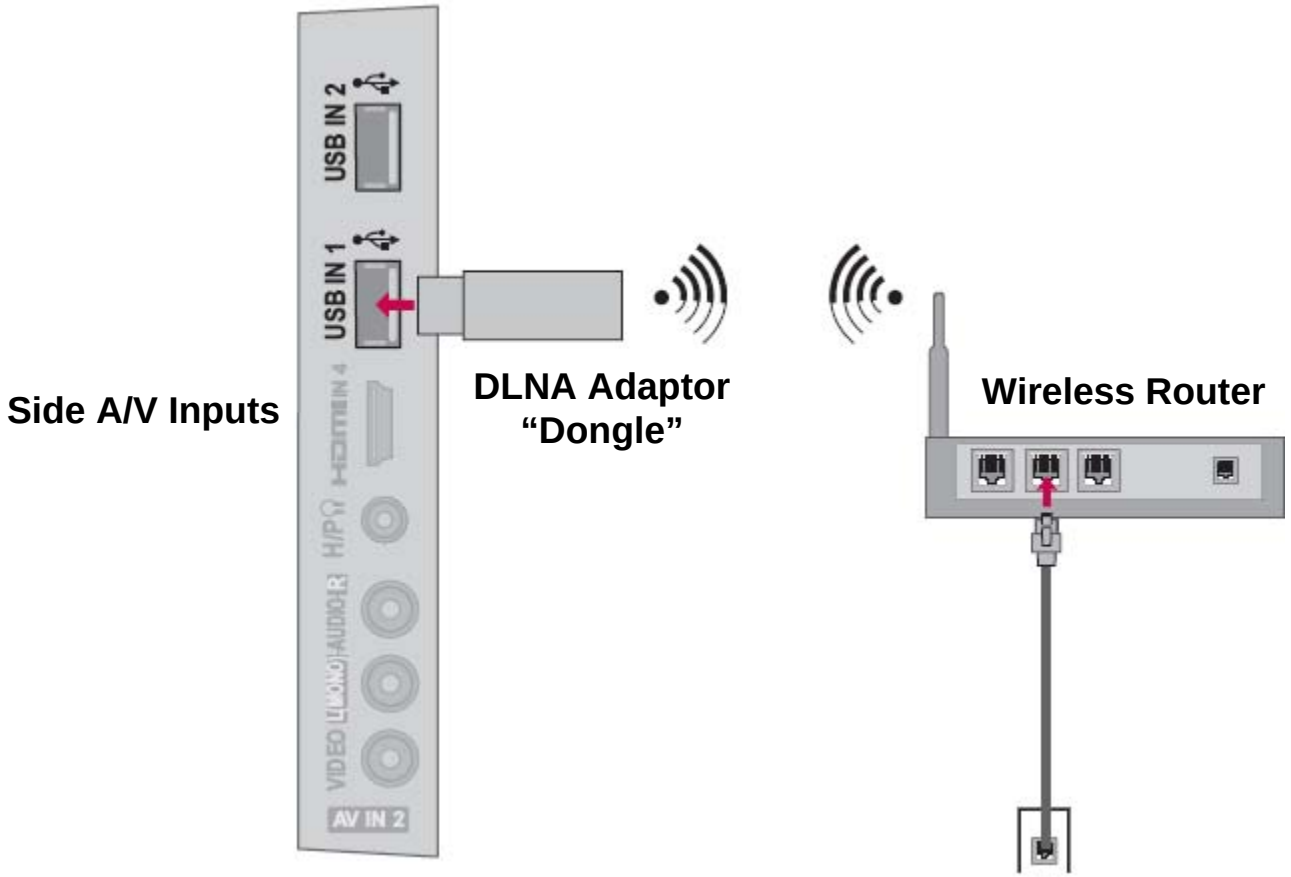
Wireless Receiver/Transmitter "Dongle" Attaches via Velcro to the back of the set

HDMI

Wireless LAN (Sold Separately)

Using the LG Wireless LAN for Broadband/1DLNA Adaptor, which is sold separately, allows the TV to connect to a wireless LAN network. The DLNA adaptor attaches to the Television via either of the two USB connections:

1(DLNA: Digital Living Network Alliance)



Key TV Features

- INFINIA Series*
- 3D Ready
- Full LED Slim w/Local Dimming
- THX Certified Display
- NetCast™ Entertainment Access*
- (Wi-Fi® Ready)
- Wireless 1080p Ready*
- DLNA Certified®
- TruMotion 480Hz
- Full HD 1080p Resolution
- 10M:1 Dynamic Contrast Ratio
- Seamless Design
- Picture Wizard II
(Easy Picture Calibration)
- Smart Energy Saving
- Magic Motion Remote Control
- Easy Picture Calibration
- ENERGY STAR® Qualified
- XD Engine
- Intelligent Sensor
- AV Mode II (Cinema, Sports, Game)
- Clear Voice II
- ISFccc® Ready
- 24P Real Cinema
- USB 2.0 (JPEG, MP3, DivX HD)
- DivX® HD
- 4 HDMI™ V.1.4 Inputs
- SIMPLINK™ Connectivity
- Dolby® Digital 5.1 Decoder
- Infinite Sound

Logo Familiarization Page 1 of 4

INFINIA

New definition television. LG's INFINIA TVs are redefining home entertainment. Even beyond their jaw-dropping design, they offer access to virtually unlimited entertainment through broadband connectivity and freedom with wireless HD capability.

THX CERTIFIED
THX
DISPLAY
EXCEPTIONAL IMAGE QUALITY

You don't have to take our word for it that this is an amazing TV. To earn THX certification, our TV's passed more than 30 rigorous tests, ensuring you're bringing an uncompromised HD experience home - as the director wanted it.

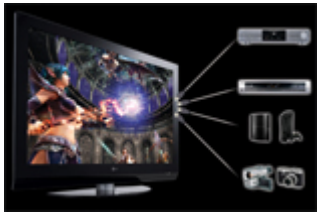
NetCast™
ENTERTAINMENT ACCESS

Entertainment on tap. NetCast Entertainment Access brings the best Internet services direct to your TV—no computer required. Instantly access movies and TV shows, news and weather and the world's largest library of HD movies in 1080p.

Logo Familiarization Page 2 of 4

FULL HD RESOLUTION 1080P HD Resolution Pixels: 1920 (H) × 1080 (V)
Enjoy twice the picture quality of standard HDTV with almost double the pixel resolution. See sharper details like never before. Just imagine a Blu-ray disc or video game seen on your new LG Full HD 1080p TV.

HDMI (1.3 Deep Color) Digital multi-connectivity
HDMI (1.3 Deep color) provides a wider bandwidth (340MHz, 10.2Gbps) than that of HDMI 1.2, delivering a broader range of colors, and also drastically improves the data-transmission speed.



Invisible Speaker
Personally tuned by Mr. Mark Levinson for LG
TAKE IT TO THE EDGE newly introduces 'Invisible Speaker' system, guaranteeing first class audio quality personally tuned by Mr. Mark Levinson, world renowned as an audio authority. It provides Full Sweet Spot and realistic sound equal to that of theaters with its Invisible Speaker.

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.

Logo Familiarization Page 3 of 4

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
It reduces the plasma display's power consumption.
The default factory setting complies with the Energy Star requirements and is adjusted to the comfortable level to be viewed at home.
(Turns on Intelligent Sensor).

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 480Hz
the world's first "TruMotion 480Hz" panel, a combination of LG's existing 240Hz technology with a new "scanning backlight" capable of being rapidly switched on and off. When combined with the 240Hz system it results in 480 images being displayed per second. A higher refresh rate generally makes for smoother video and less blur, especially in fast moving footage such as sports. Also bringing the response times down to 4ms, and the controllable backlight leads to both improved contrast and, when dimmed, energy savings.

Logo Familiarization Page 4 of 4

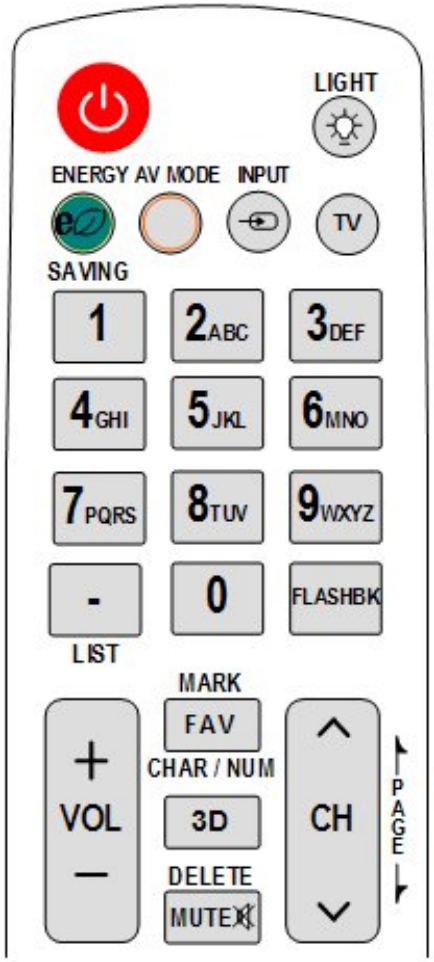
Wireless Ready
Wireless 1080p Connectivity lets you cut loose from messy wires and still get a stunning Full HD picture. Disclaimer: Wireless media kit required and sold separately.

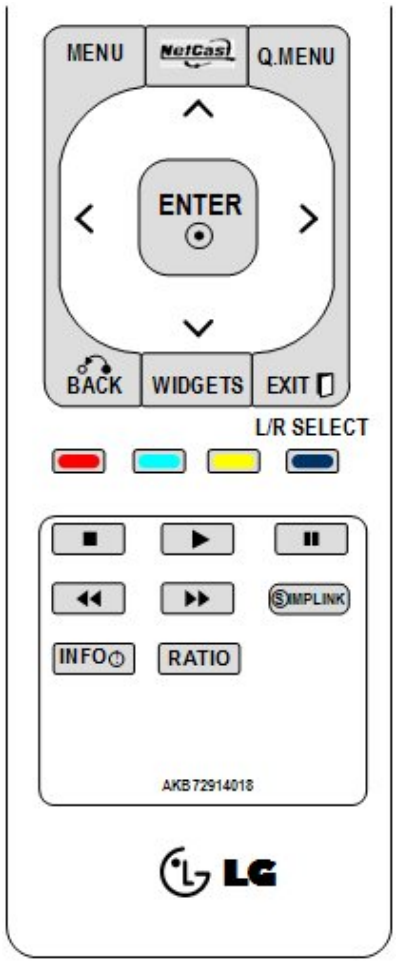
Picture Wizard
Get easy self-calibration with on-screen reference points for key picture quality elements such as black level, color, tint, sharpness and backlight levels. Take the guesswork out of picture adjustments with this simple-to-use feature. It's not actually magic, but it will sure seem that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

Seamless Design
You'll love the stunning picture while it's on and marvel at its appearance while it's off. The display is a seamless, edge-to-edge panel of glass over an ultra-slim, almost unnoticeable bezel. It's a sleek, elegant, virtually border-free design that will appeal to even the most refined sense of style.

Magic Motion Remote Control
With the wave of your hand, operate the onscreen menus using the Magic Motion Remote.

47LX9500 Remote Controls

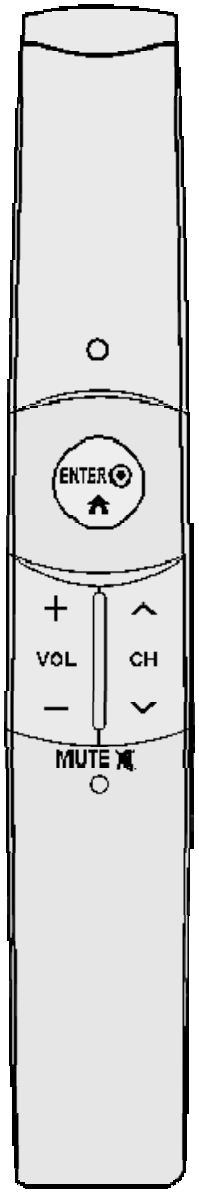




Top Half

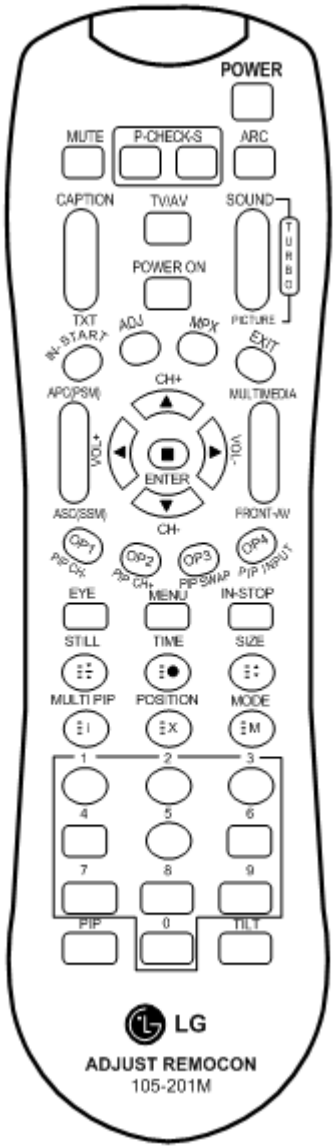
Bottom Half

Remote AKB72914018



Magic Motion Remote AKB73035402

Accessing the Service Menu



105-201M

To access the Service Menu.

1) **You must have either Service Remote. p/n 105-201M or p/n MKJ39170828**
2) **Press "In-Start"**
3) **A Password screen appears.**
4) **Enter the Password.**

Note: A Password is required to enter the Service Menu. Enter; **0000**

Note: If **0000** does not work use **0413.**

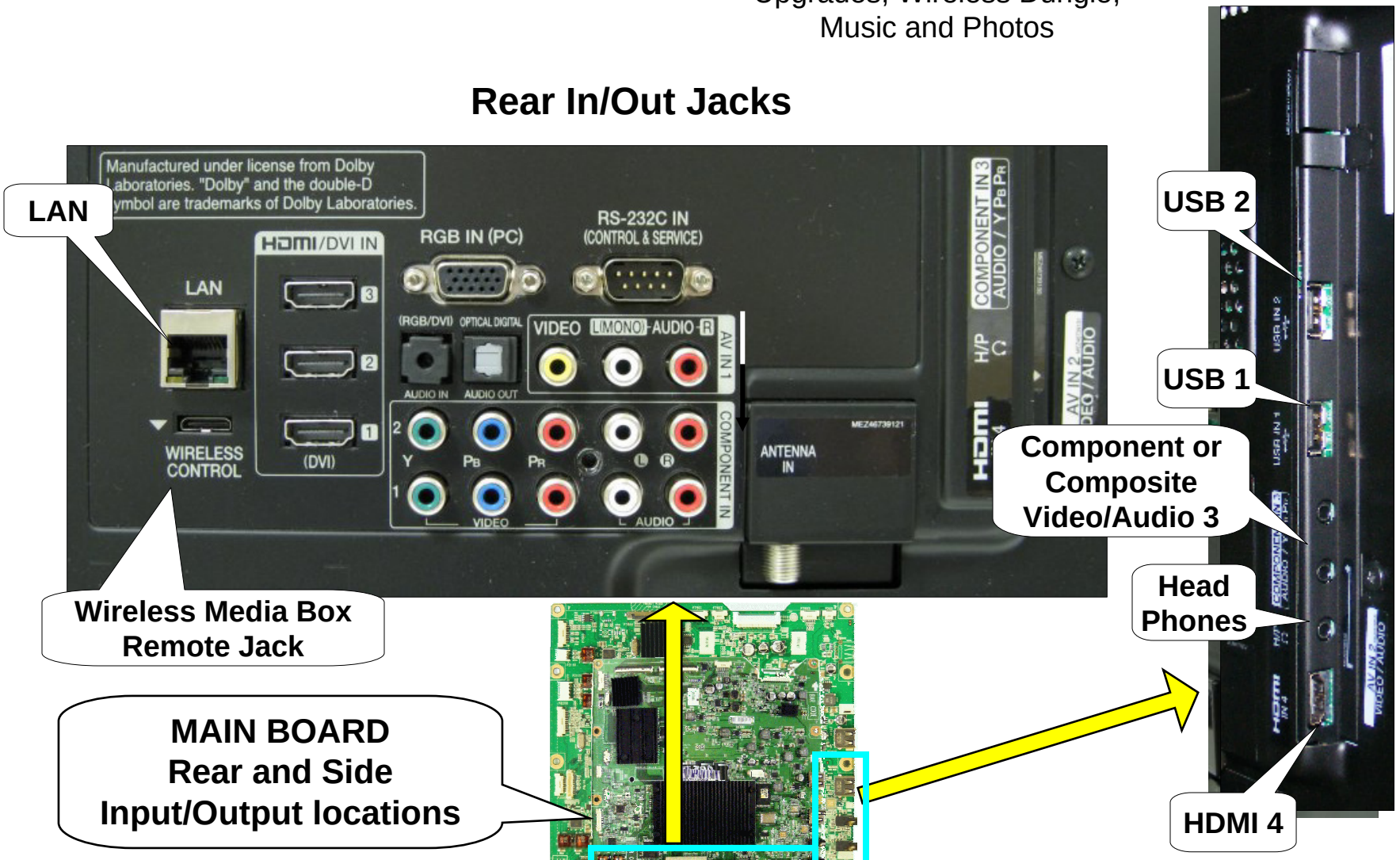
MKJ39170828

TV Rear Input / Output Jacks

USB1 or USB2 for Software Upgrades, Wireless Dungle, Music and Photos

Side In/Out

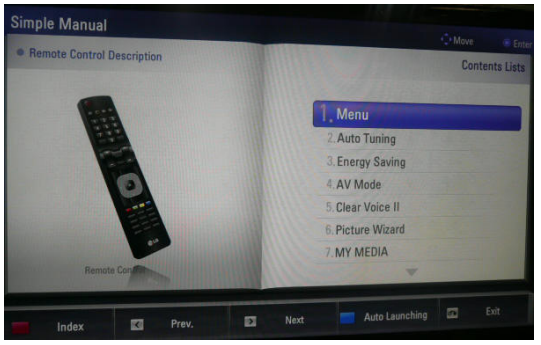
Rear In/Out Jacks



Software Updates (New and Changed Functions)

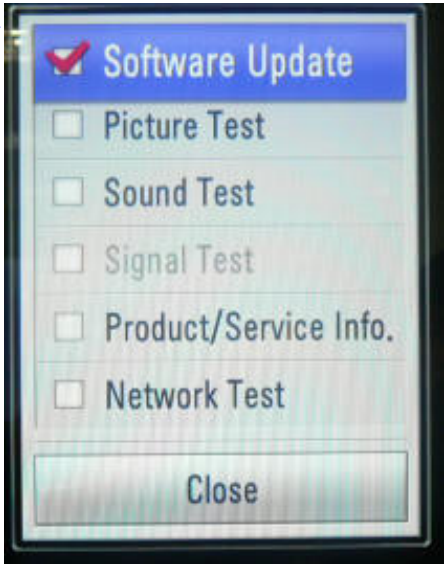
A wireless Internet Connection will work for Automatic Software Downloads., however if there are problems completing download, a Wired Internet Connection is preferred

For network setup assistance, press the green button for the Simple Manual

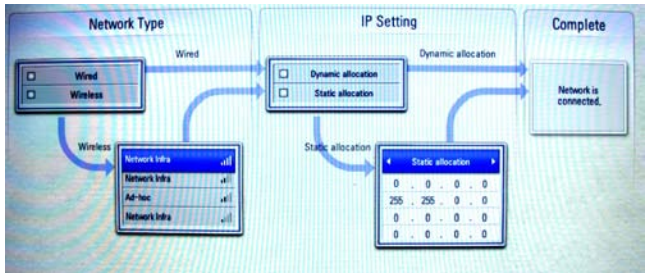


Bring up the Customer's Menu then Press the Red button on Remote

With Software Update Highlighted, Press Select on Remote

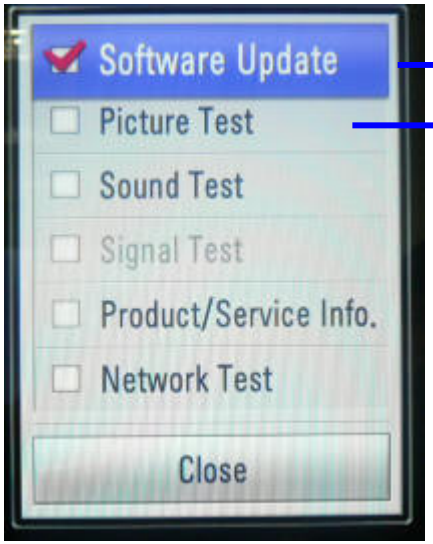


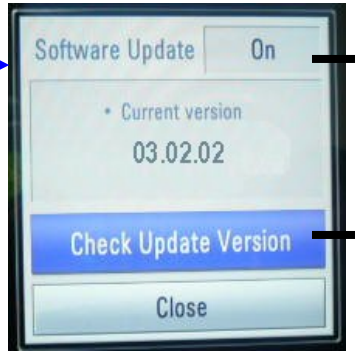
Scroll down to item 9 Network Connections



Continue on next page

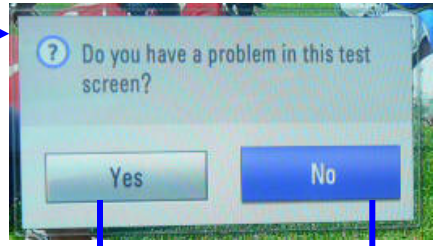
Software Updates (New and Changed Functions) Continued





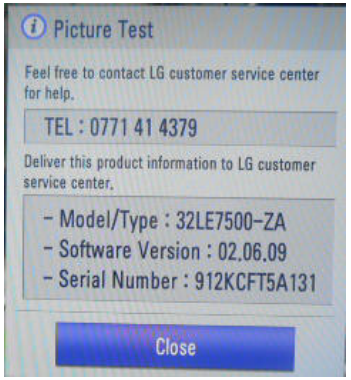
Automatic Internet Software Update
- Off : Automatic Software update does not work
- On : if new Software released, Software download notice appears at turn on with two choices, Yes and Remind Me Later.

Check Update version
- comparison current software version and Released software version



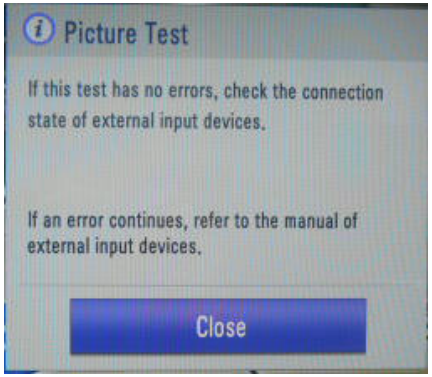
Additional TV Checks can be made by Scrolling down.
Picture, Sound and Network Test

After completion of the test, a Pop up menu is displayed with preloaded back background picture.
Select NO if everything is OK.



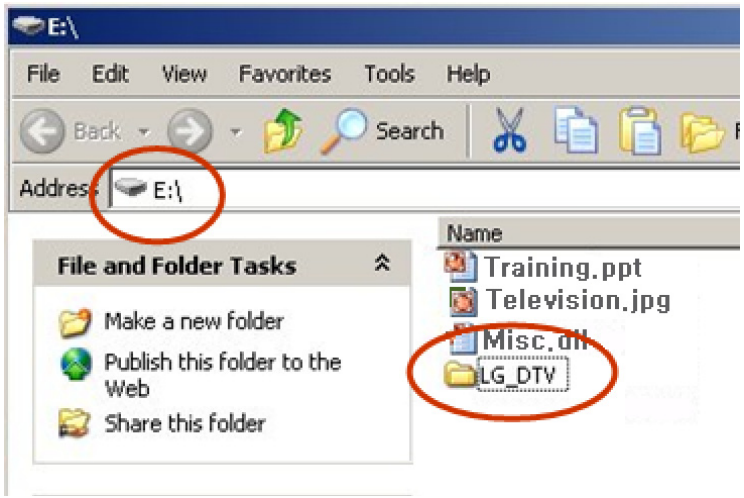
If you select Yes;
Service call number, Model name, SW version and serial No. is displayed.
Note: Confirm the “Suffix” of the model number.

If the Main board is replaced, the Model and Serial number must be reinserted into memory. See Model Number D/L.

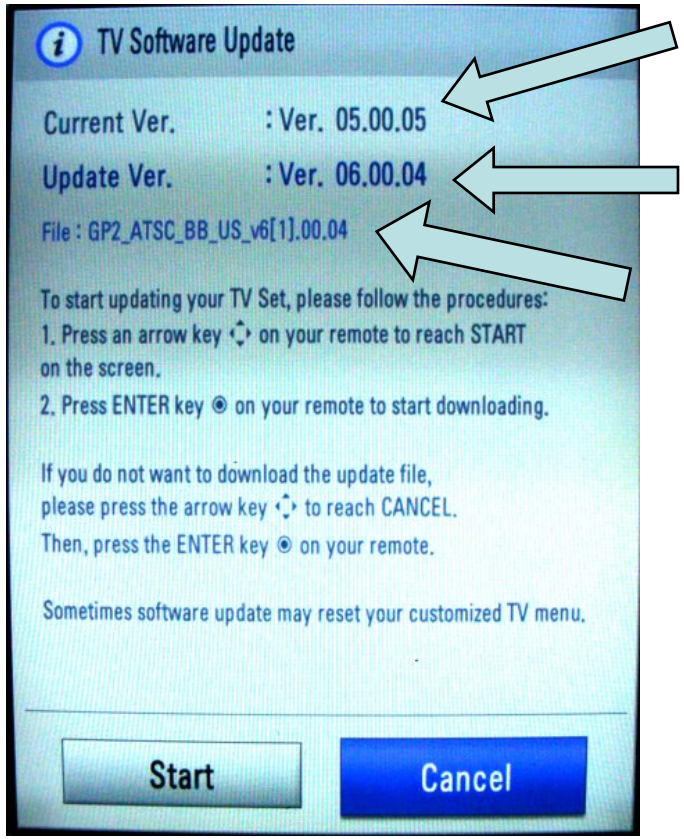


USB Automatic Software Download Instructions (Generic)

1) Create an LG_DTV folder on the USB Flash Drive



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) You can see the message "TV Software Upgrade" (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

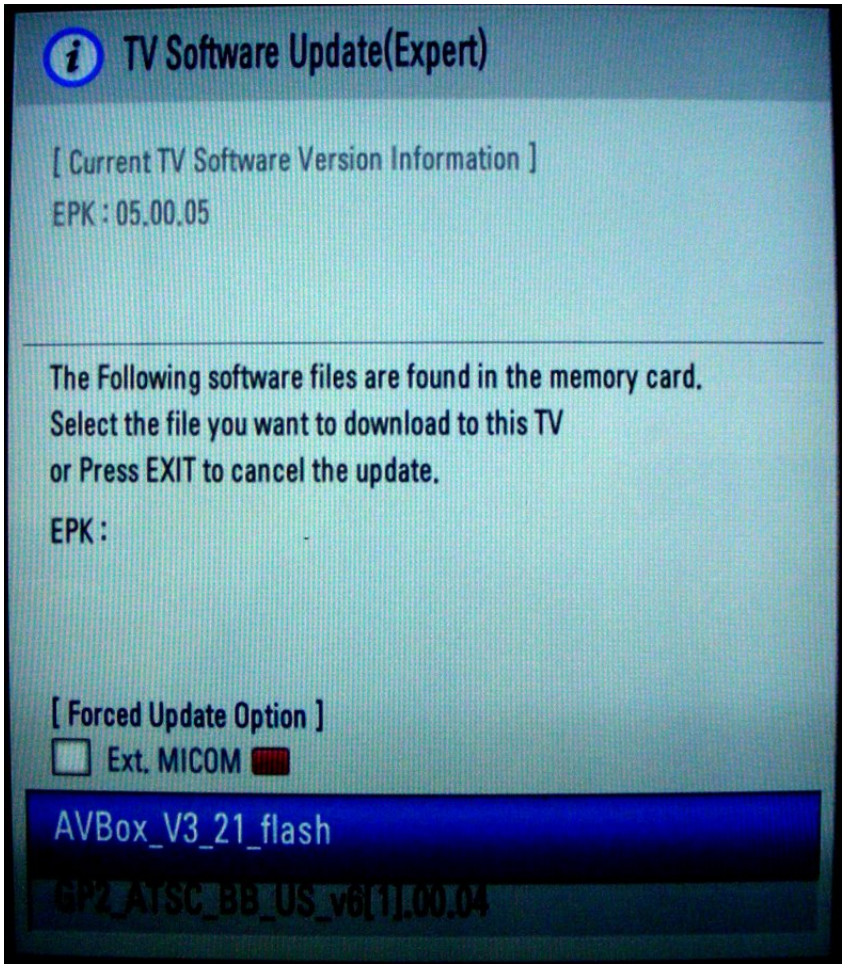
*** CAUTION:**
Do not remove AC power or the USB Flash Drive.
Do not turn off Power, during the upgrade process.

Software Files are now available from LGTechassist.com

Manual Software Download Instructions: Generic

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 and scroll to “OPTIONS”.
Press the “FAV” key 7 times to bring up the Manual Download Screen.

Highlight the Software update file and press “SELECT” to begin the download process.



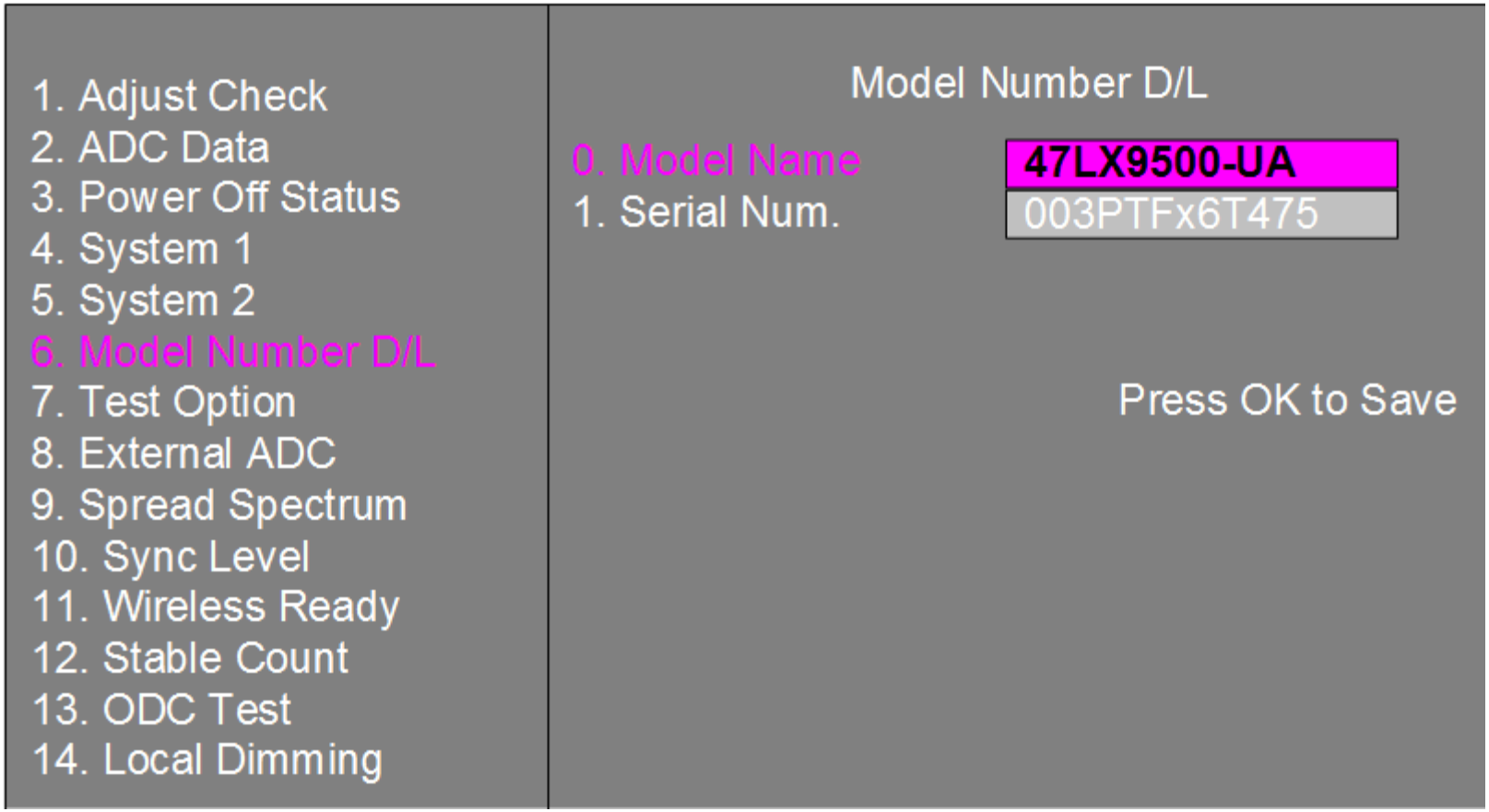
Example of files found
On the Jump Drive

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.

Service Menu: Adding the Model and Serial Number

Bring up the Service Menu using the Service Remote.
Scroll down to item 6. Model Number D/L to highlight.
Press “Select” or “Cursor Right”.

Change the Model and Serial Number to match.
To Change the Model Number
Use the cursor right or left to select the area to change. Use the cursor up or down to change.
Cursor right until there is no text cursor blinking.
Scroll down to highlight “Serial Number” and change.



Service Menu: Downloading EDID Data Pg 1 of 2

1) Press "ADJ" key.

2) Select menu,
Either "PCM EDID D/L" or AC3 EDID D/L

EZ ADJUST

0. Tool Option1
1. Tool Option2
2. Tool Option3
3. Tool Option4
4. Tool Option5
5. Country Group
6. ADC Calibration
7. White Balance
8. 10 Point WB
9. Test Pattern
10. PCM EDID D/L
11. AC3 EDID D/L
12. Sub B/C

EZ ADJUST

0. Tool Option1
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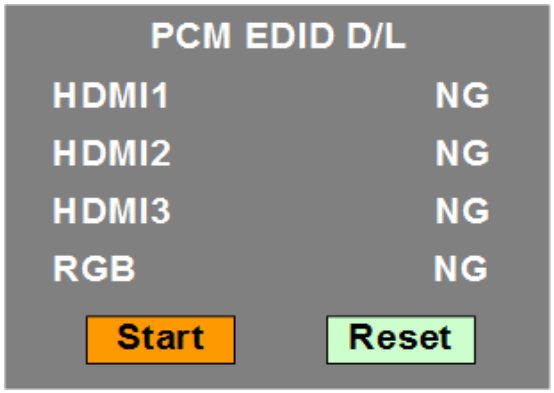
6. ADC Calibration
7. White Balance
8. 10 Point WB
9. Test Pattern
10. PCM EDID D/L
11. AC3 EDID D/L
12. Sub B/C

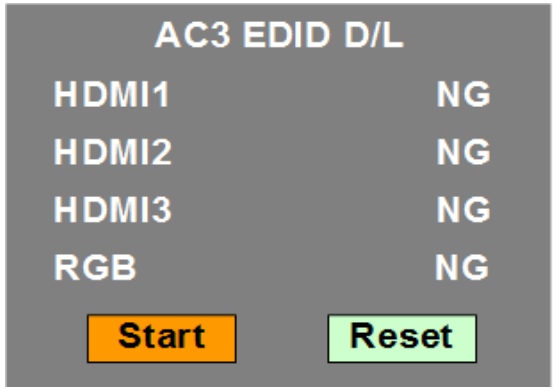
Service Menu: Downloading EDID Data Pg 2 of 2

3) Highlight "Start" then Press "Select" key.

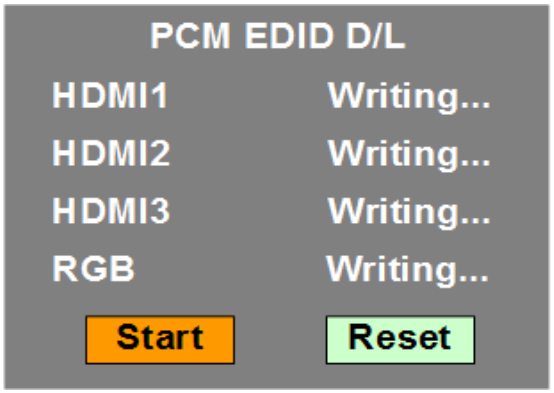
When PCM EDID D/L was selected

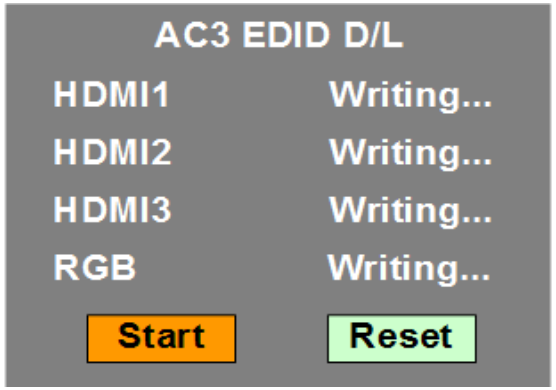


When AC3 EDID D/L was selected

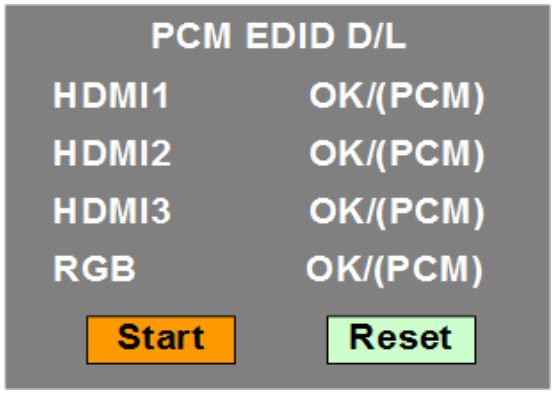


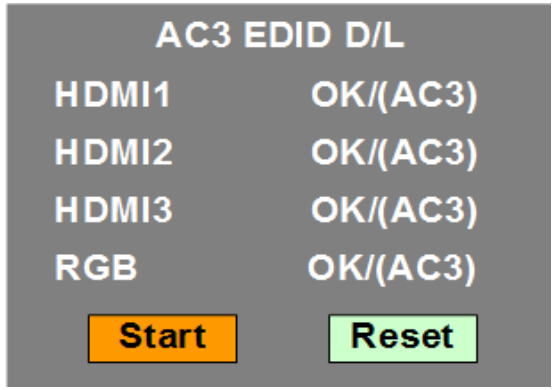
4) When Writing appears Downloading in progress





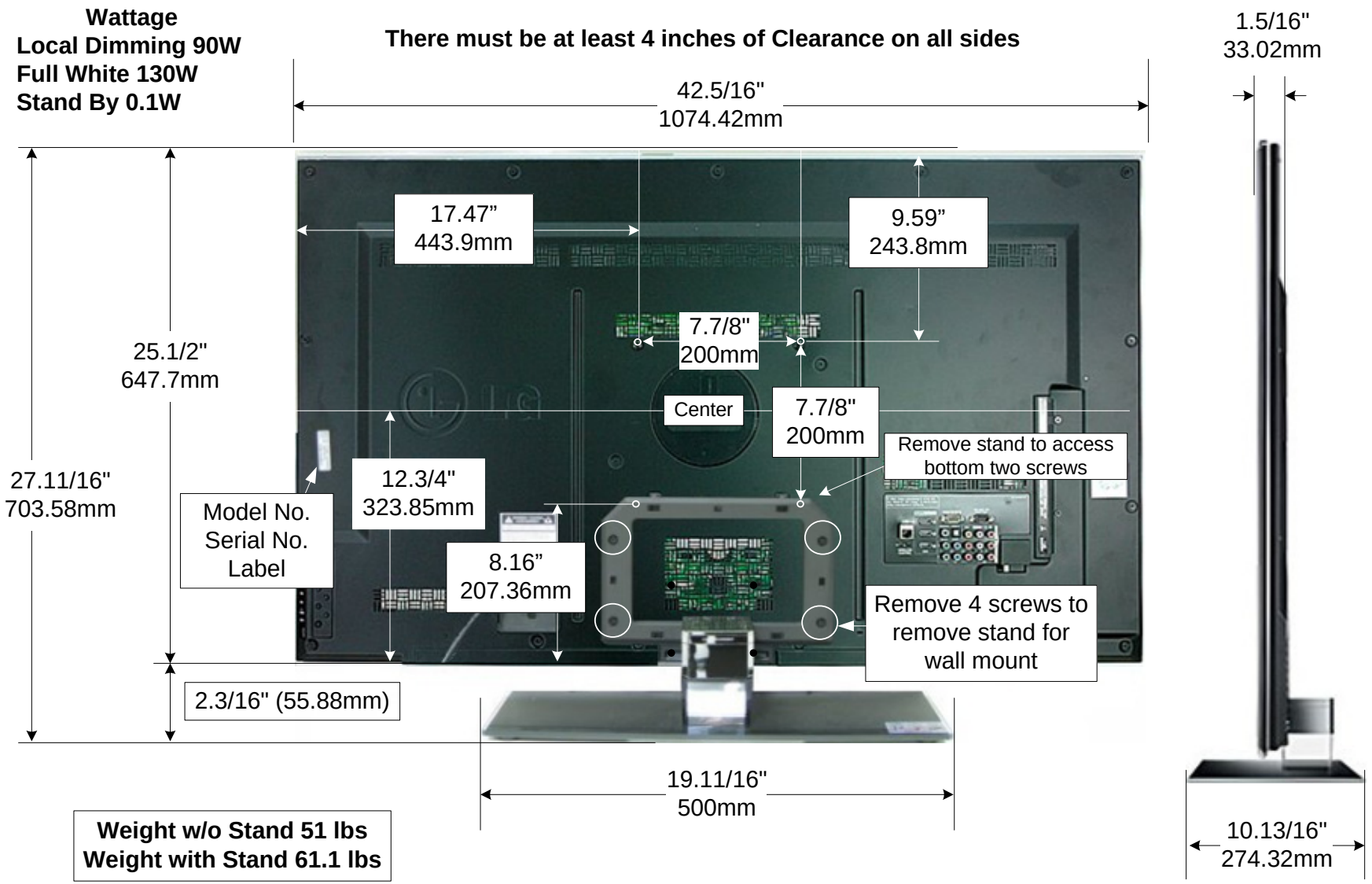
5) Downloading Complete





Note: When PCM is downloaded, AC3 will be N/G and when AC3 is downloaded PCM will be N/G. This means that when PCM is OK, PCM audio is priority and when AC3 is OK, AC3 audio is priority.

47LX9500 Product Dimensions



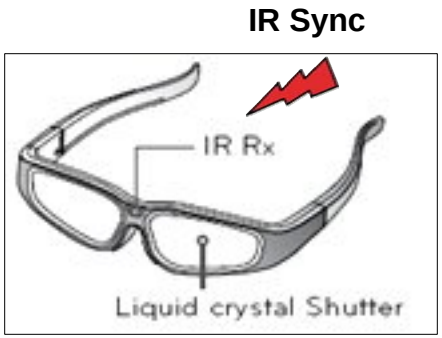
3D

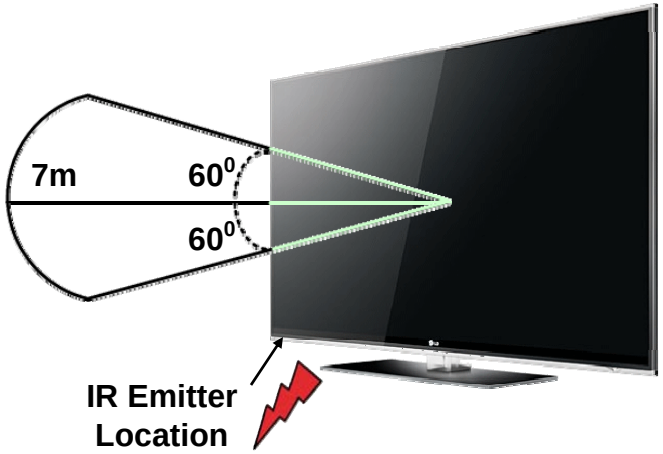
This section of the manual will discuss the 47LX9500 LCD Direct View Television ability to play 3D material.

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

Convenient Emitter built-in to TV

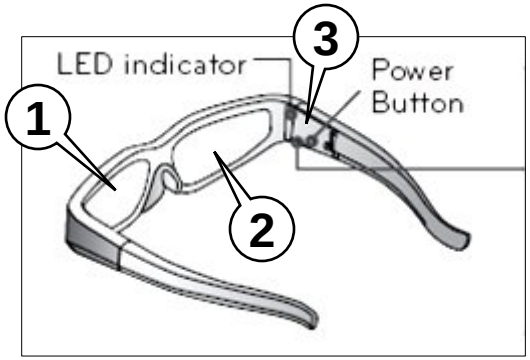
- **Wider viewing angle**
- **Longer Viewing distance**
- **Longer battery life**
  (1.5h charging / 40h battery life)
- **Better sync performance**

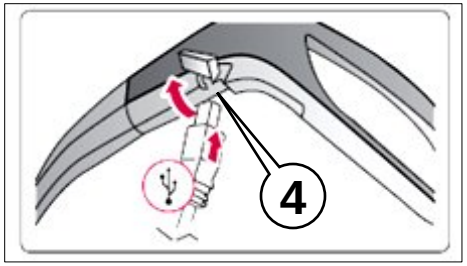




User friendly Glasses

1) **L-frame for glasses users**
2) **UV coating to prevent scratch**
3) **LED indicator for user convenience**
4) **Easy to Recharge with USB port**



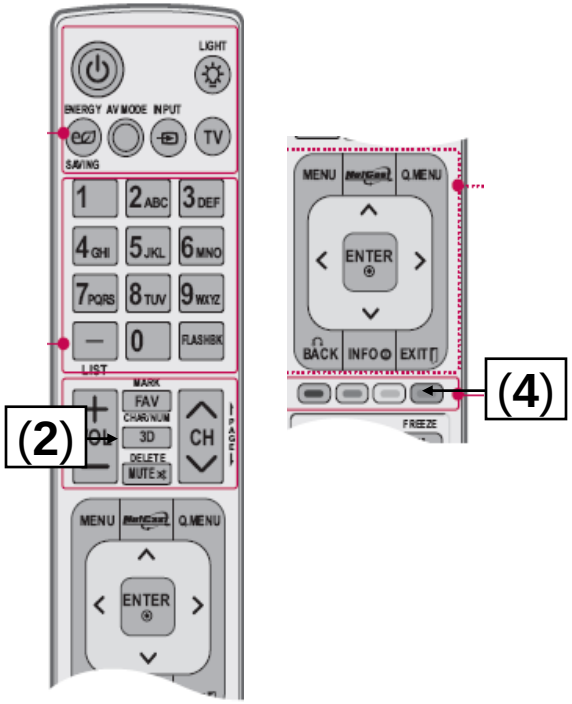


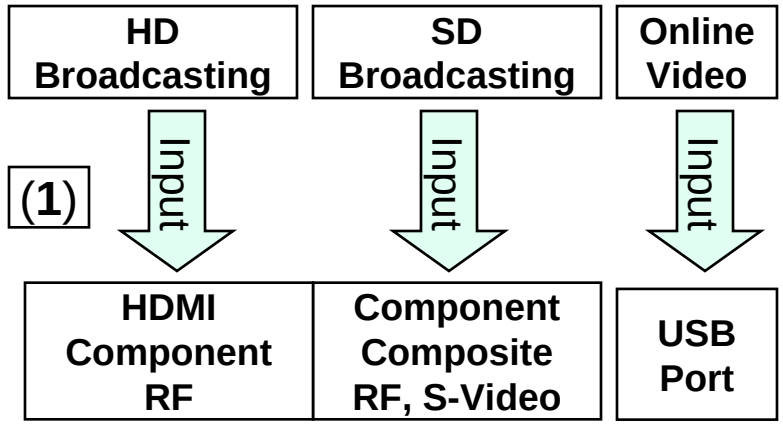
LG 3D TV 3D broadcasting

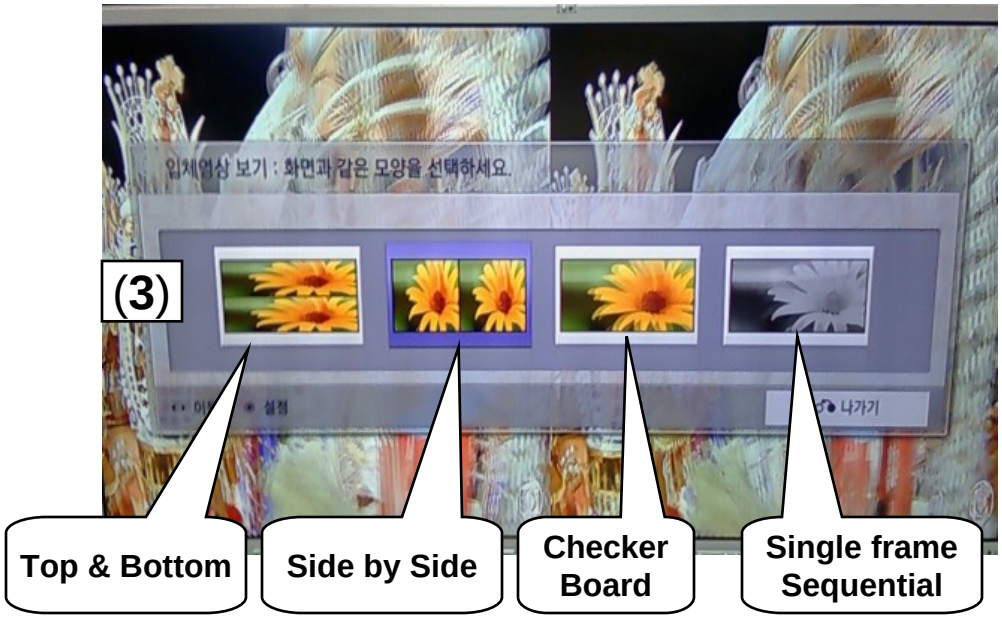
3D for All types of broadcasting signals

1. Input of broadcasting signal
2. Press “3D” button for mode change
3. Select type of input source
4. In case 3D looks *abnormal, press “L/R Select” on remote and select “R/L”.

*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.

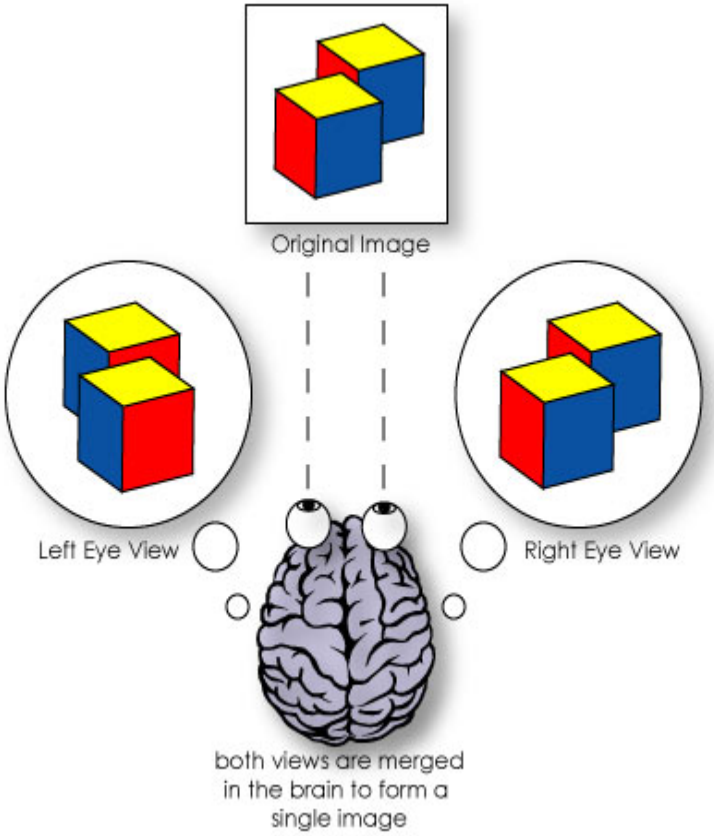






3D Fundamentals

Each eye looks at an image for 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 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.

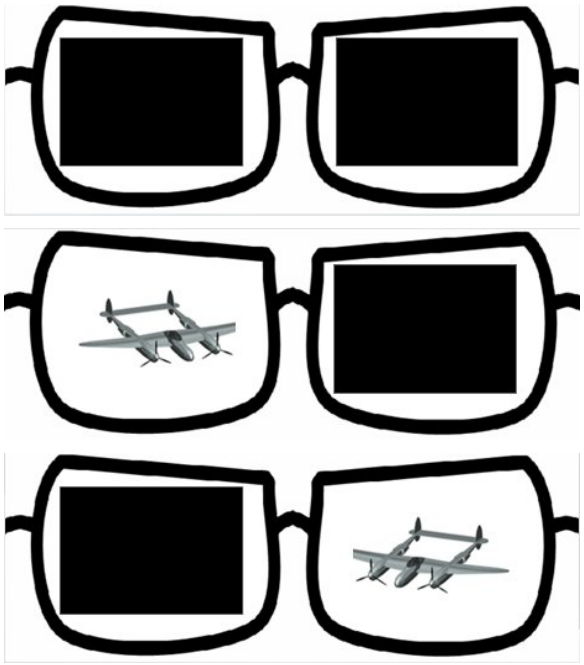
3D Active Glasses Type

Shutter glasses type 3D:
Separating left and right images by synchronizing the TV and the glasses

< Shutter glasses 3D >

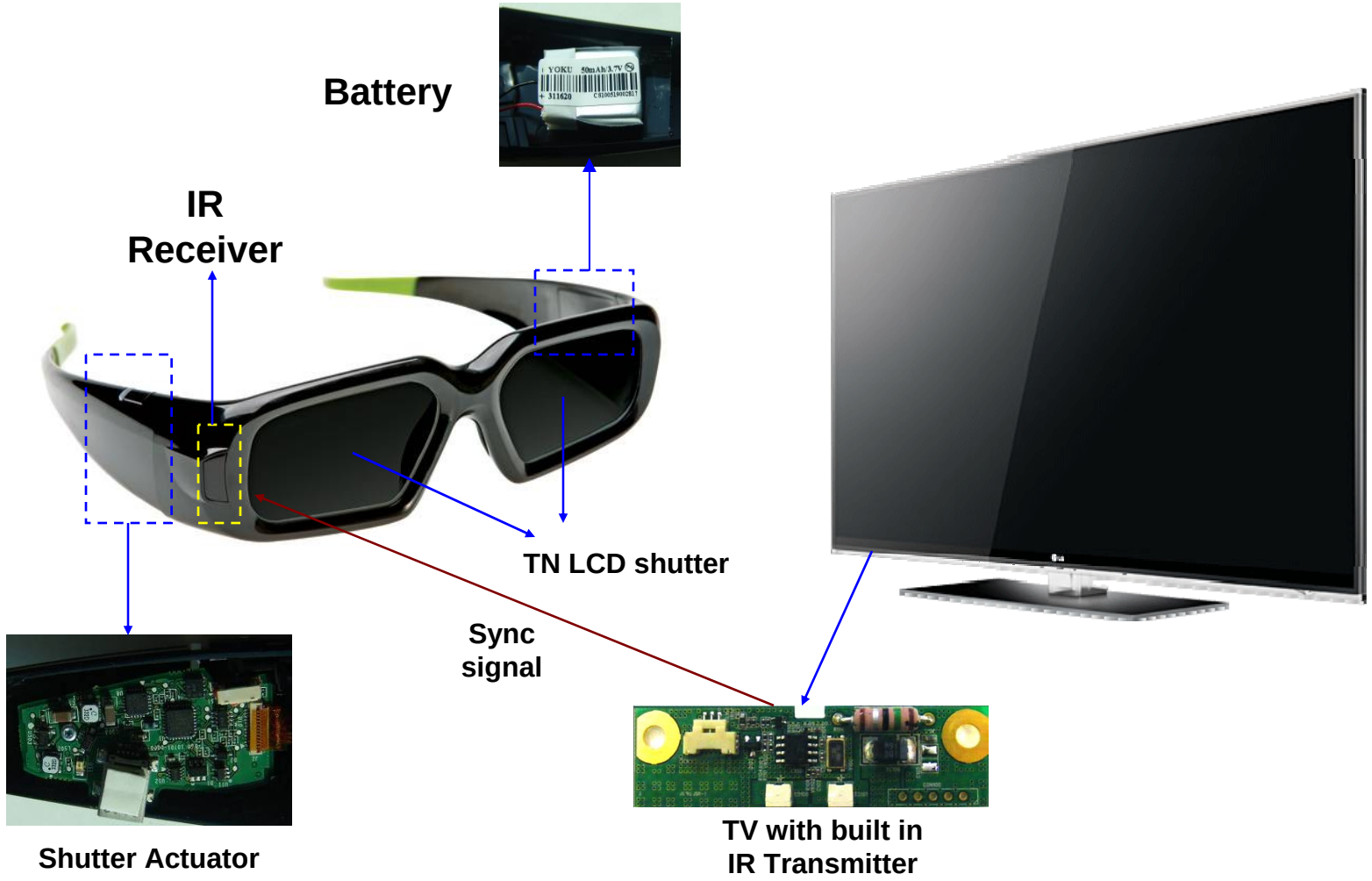
The image is broadcast using two different viewing angles every other frame.

Fundamentals of Shutter glasses



The 3D Glasses are then synchronized with the two different images to give the 3D effect. They are blanked between scene changes.

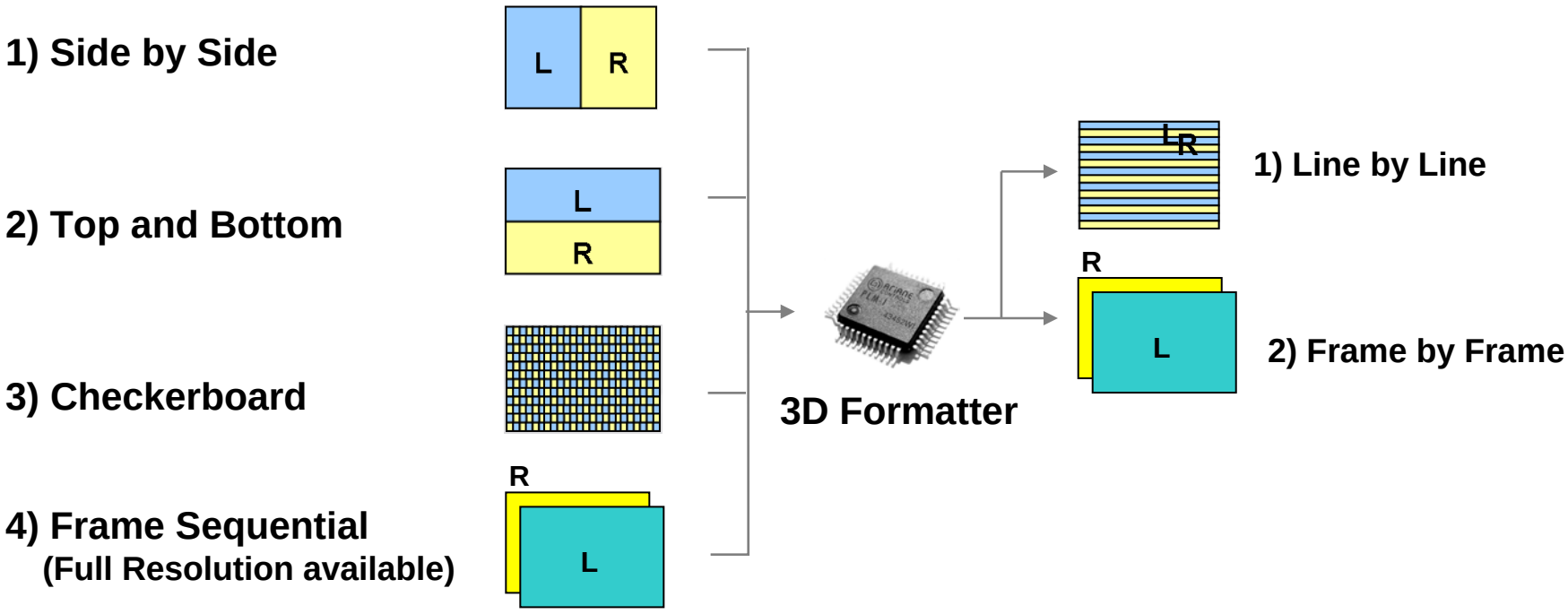
Active glasses 3DTV components



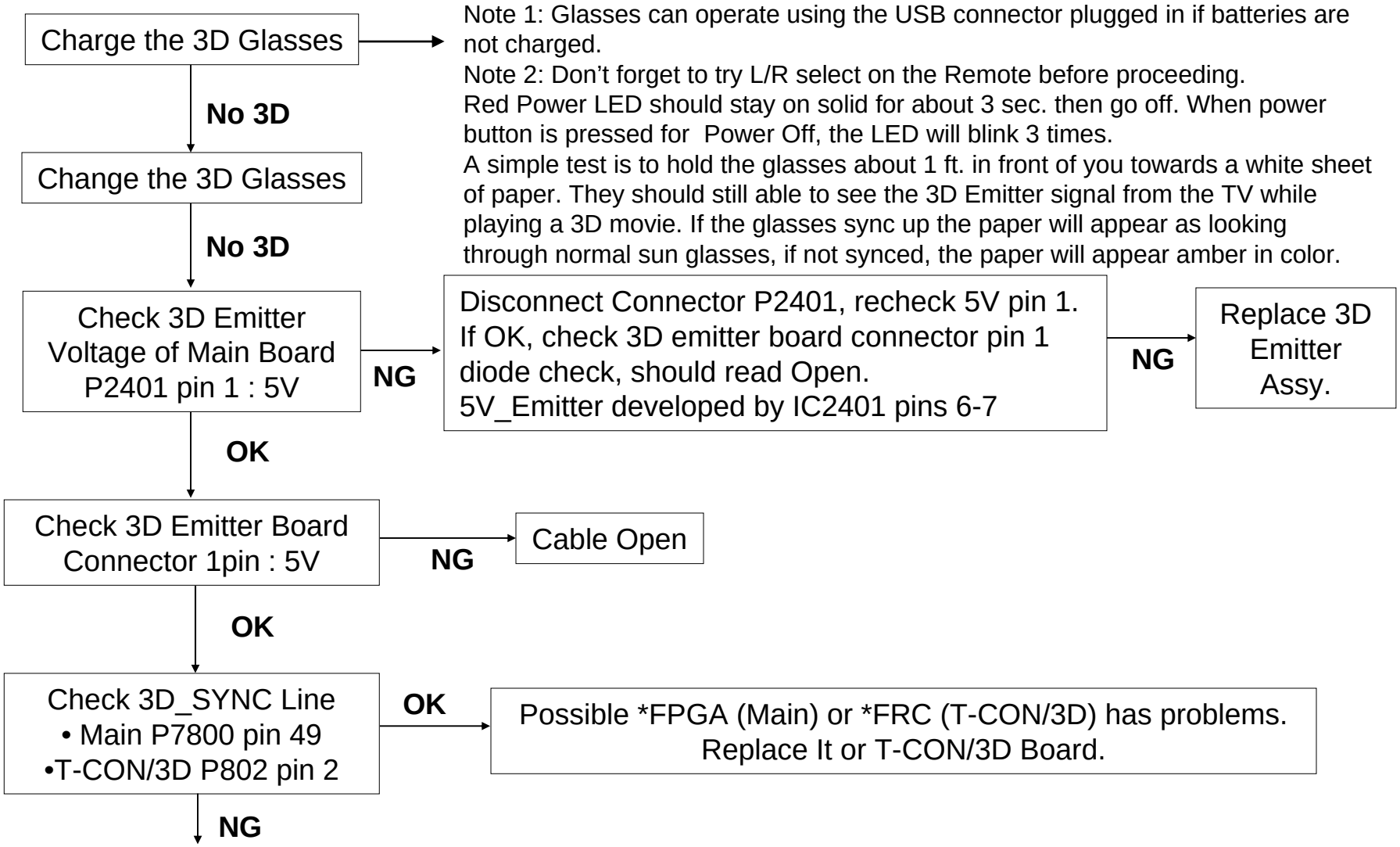
T-CON with 3D Formatter

3D Formatter

- **All Formats of input available and conversion technology development**
- **Full HD input available**
- **3D Enhancement**



3D Troubleshooting: 3D Not Working PG 1



For details about making the 3D Sync line check, see next page.

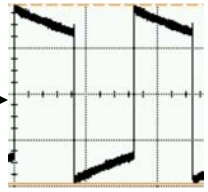
*FPGA: Frame Packer
*FRC: Frame Rate Converter

3D Troubleshooting: 3D Not Working Pg 2

Continued from previous page

Check 3D_SYNC Line
- Main P7800 pin 50
- T-CON/3D P802 pin 2

Should be



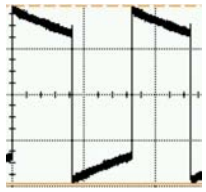
5.5V p/p
60 Hz
1.6VDC

NG

Check Q906, Q907 of T-CON/3D Board

Should be

Q906 (Collector)
5.5V p/p 60 Hz



Q907 (Collector)
3.9V p/p 60 Hz

Q906

B) 0.61V
E) Gnd
C) 0.03V

Q907

B) 0V
E) Gnd
C) 1.9V

NG

Replace
T-CON
(Formatter B/D)

OK

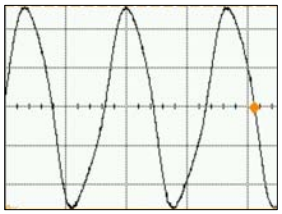
Possible Main or
T-CON/3D has problems.
Replace T-CON/3D or
Main Board

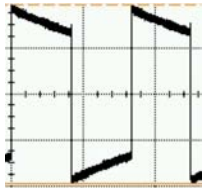
Additional Information
On the 3D Emitter Board

"3D-Emitter" to P2401 "Main"

Pin	LABEL	SBY	Run	Diode Check
1	+5V_EMITTER	0V	5.1V	Open
2	Gnd	Gnd	Gnd	Gnd
3	3D_SYNC	0V	1.6V	Open

5.3V p/p 12 MHz





5.5V p/p
60 Hz

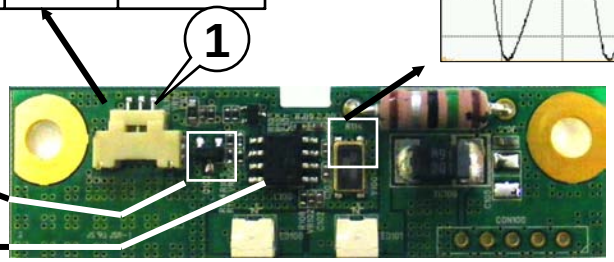
IC100

5) 5.1V
6) 0V
7) 0V
8) Gnd

4) 5.1V
3) 1.6V
2) 2.15V
1) 5.1V

Q102

B) 0V
E) Gnd
C) 3.5V



Eye Tiredness Information

Why your eyes get tired while you're seeing 3D images :

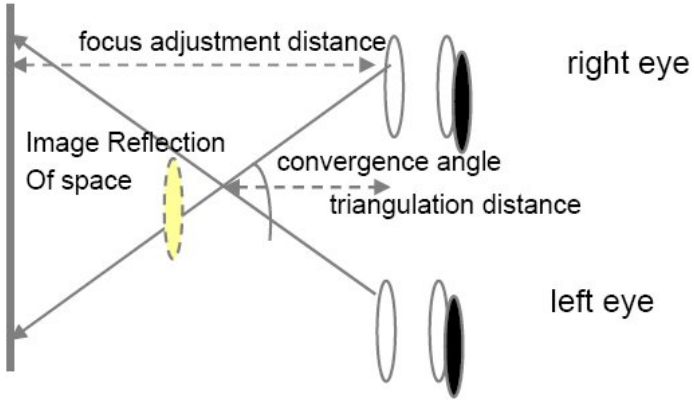
- The color clarity and resolution of 3D images are lower than those of 2D.
- 3D images deliver strong effects. Viewing "popping out" images, which is distorted, for a long time makes you more tired.
- Accommodation and convergence (Your both eyes focus a single point)
- 3D presentation with glasses displays unnatural images due to no time difference during eye movements.

3DC safety guidelines for distribution of 3D displays suitable for human eyes were made at the 3D Consortium 2006

- It is recommended to see 3D images within a distance of 2m.
- The brain is not able to adjust the focus when you are more than 2m away from the TV.
- Customers don't have the condition for seeing a display within 2m, below warning sentence should be noticeable.

  If it is impossible for customer to view 3D image displayed on the screen 2m away from the display, keep in mind that the convergence angle should not exceed 2 degrees.

- For example, when you see the display 1m away from the TV, the distance of any 3D image popping out should be within 38cm.



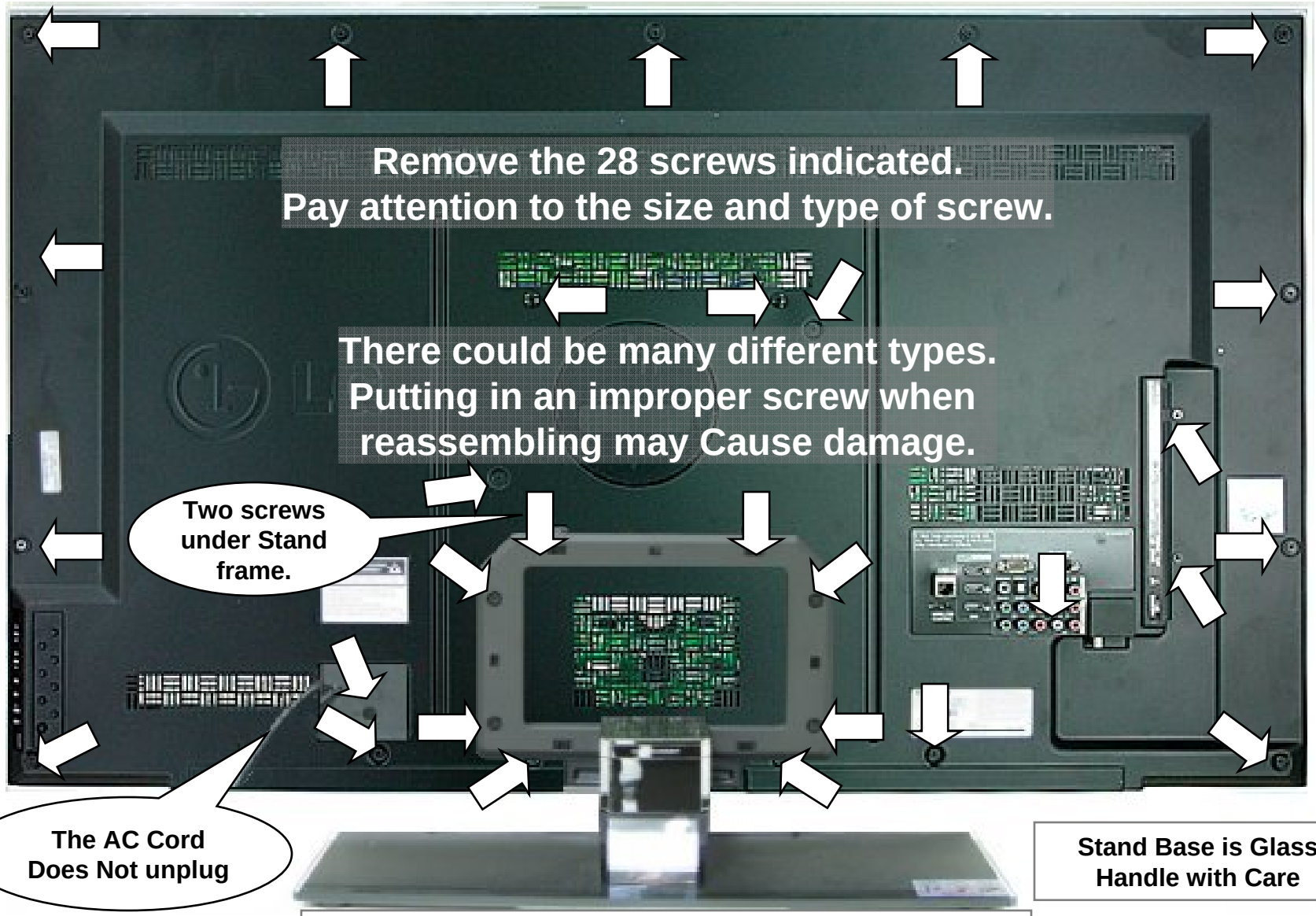
The brain gets confused because of the distance difference between the actual image and the popping up image.

Disassembly:

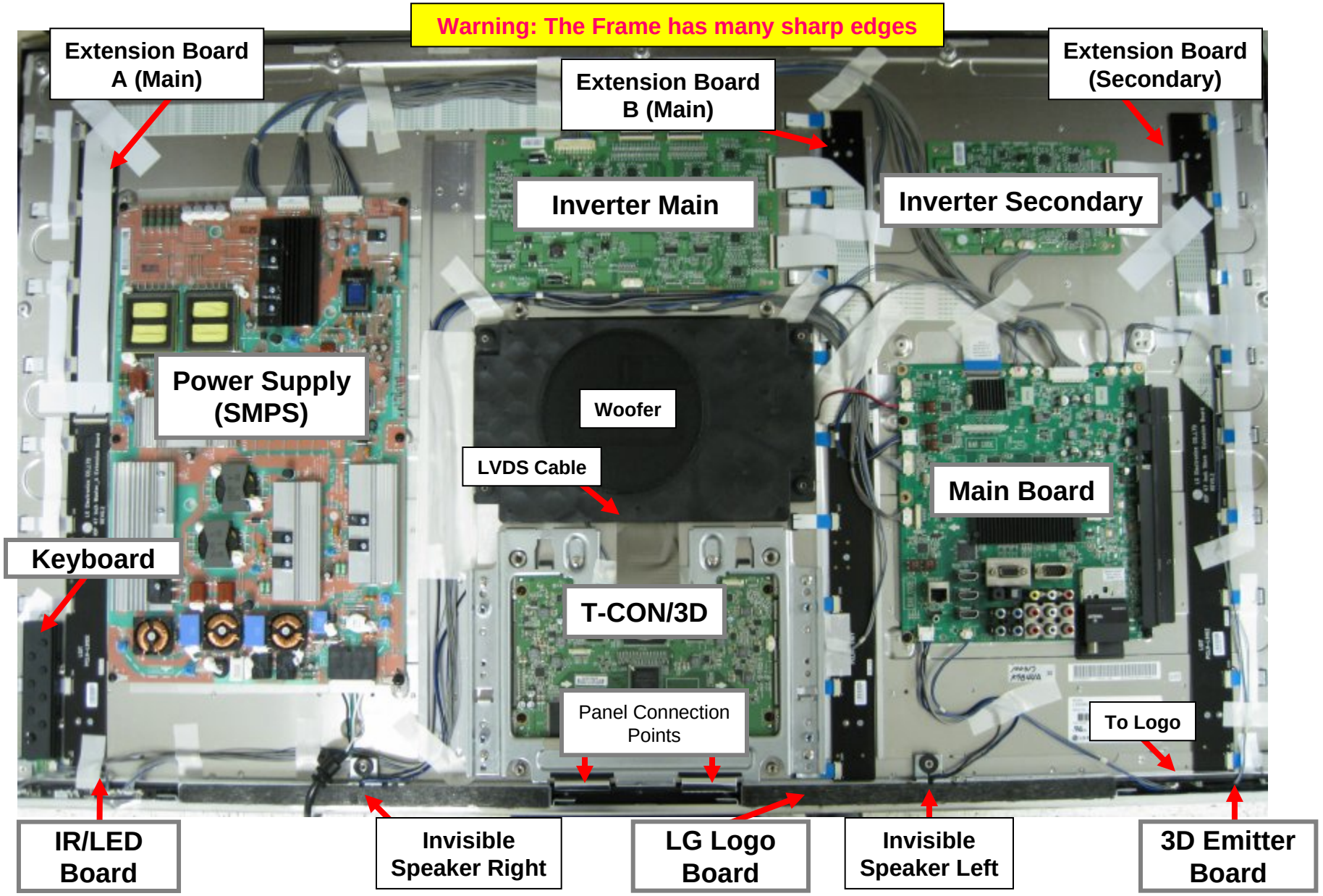
This section of the manual will discuss Disassembly, Layout
(Circuit Board Identification) of the 47LX9500 LCD Direct View Television.

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

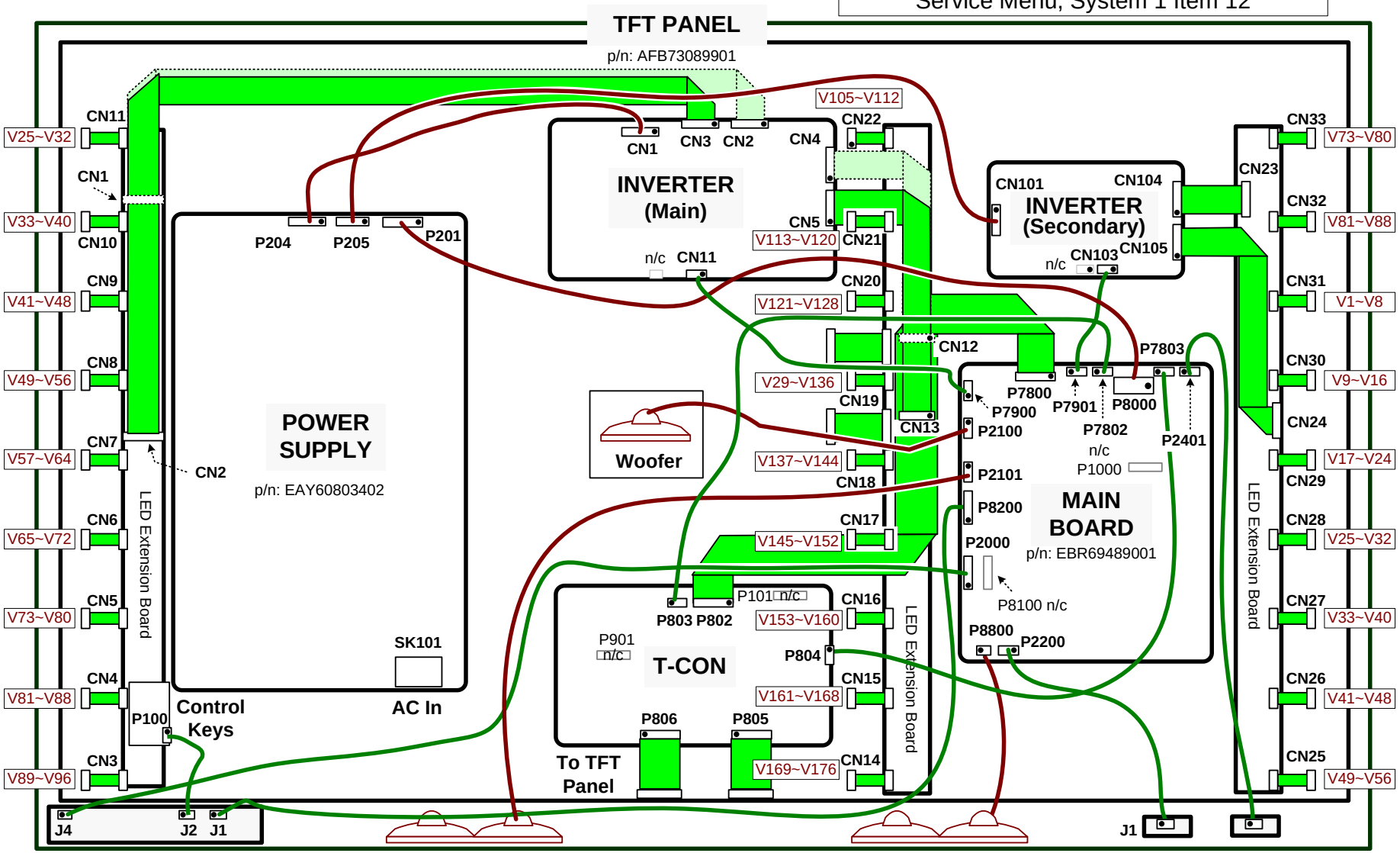


Circuit Board Layout



47LX9500 Connector Identification Diagram

If the Panel is replaced, reset the UTTTime.
Service Menu, System 1 Item 12



IR/Intelligent Sensor board
p/n EBT61093402

Speaker (Front Right)
p/n: EAB61353002

Speaker (Front Left)
p/n: EAB61353002

Logo
Comes with Cabinet Assy.
Item 300 p/n ABJ73128201

3D Emitter board

Power Supply Board Removal

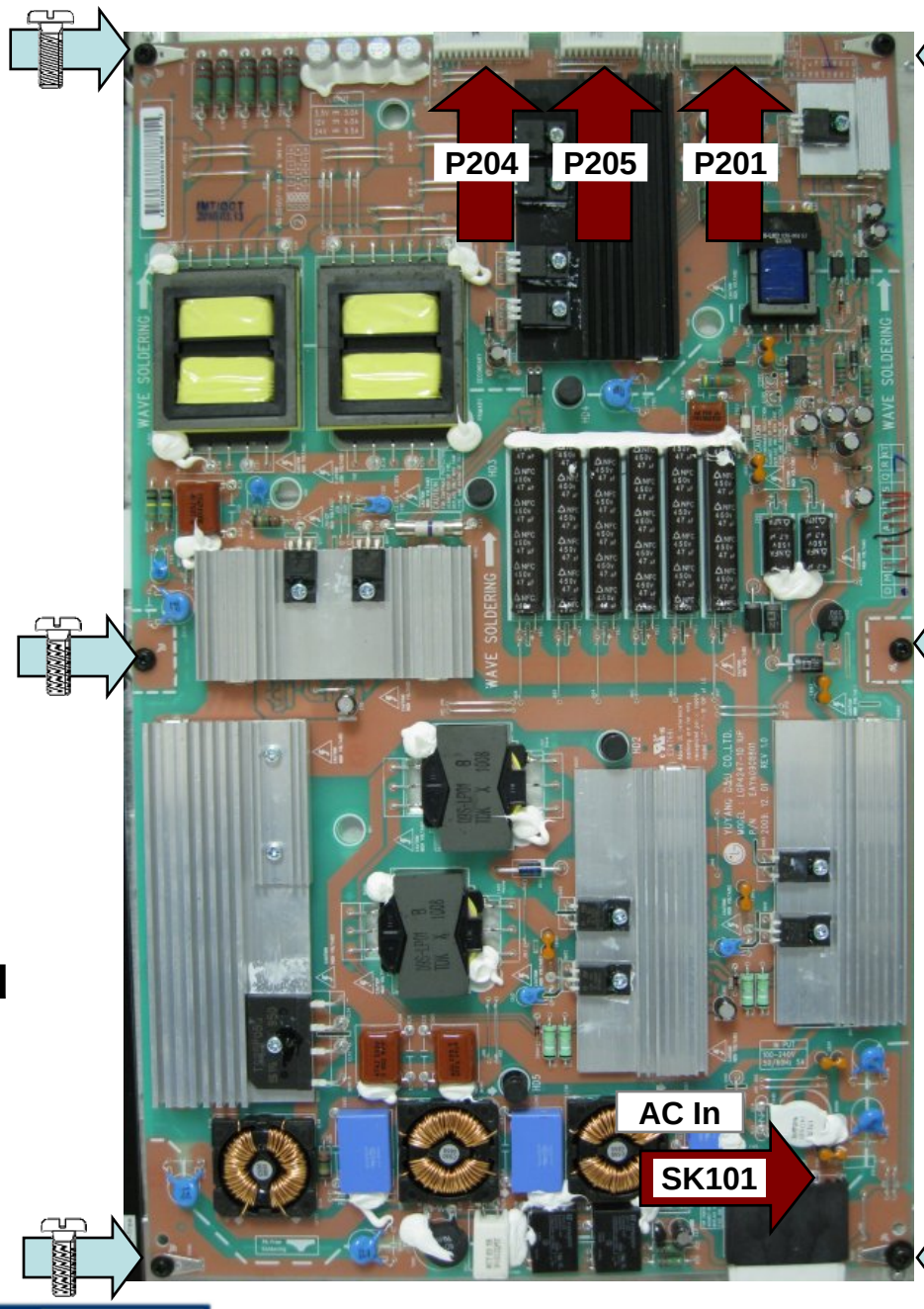
Board is "Thin", be careful not to flex.

1

Disconnect P201, P205, P204 and AC In SK101.

2

Remove the 6 screws indicated by the arrows.

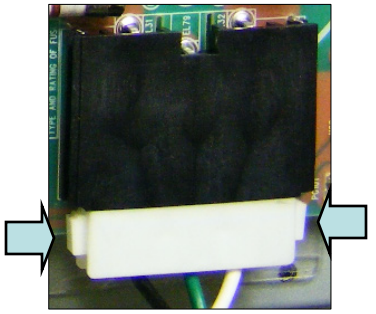


p/n EAY60803402

P201

Press in gently on the two tabs to release lock

SK101 fits very snug into it's connector.



Press in on the two tabs to release lock

Removing the Main Board

p/n EBR69489001

1

Disconnect P7900, P2100, P2101, P8200, P2000, P8800, P2200, P7800, P7901, P7802, P8000, P8003, P2401.

2

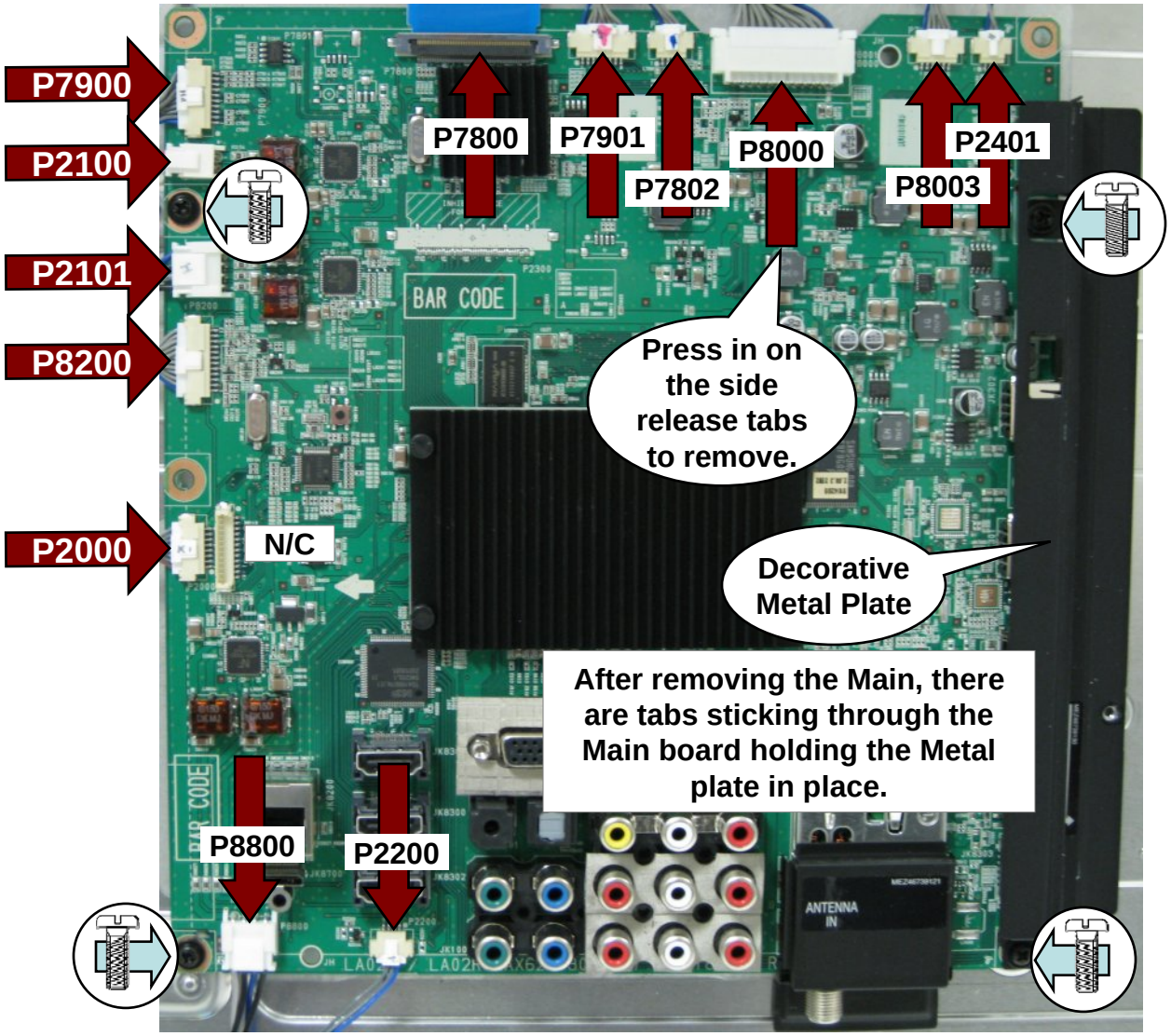
Remove any tape holding down any cables. Remove the 7 screws indicated by the arrows.

3

Remove decorative plastic and remove the board.

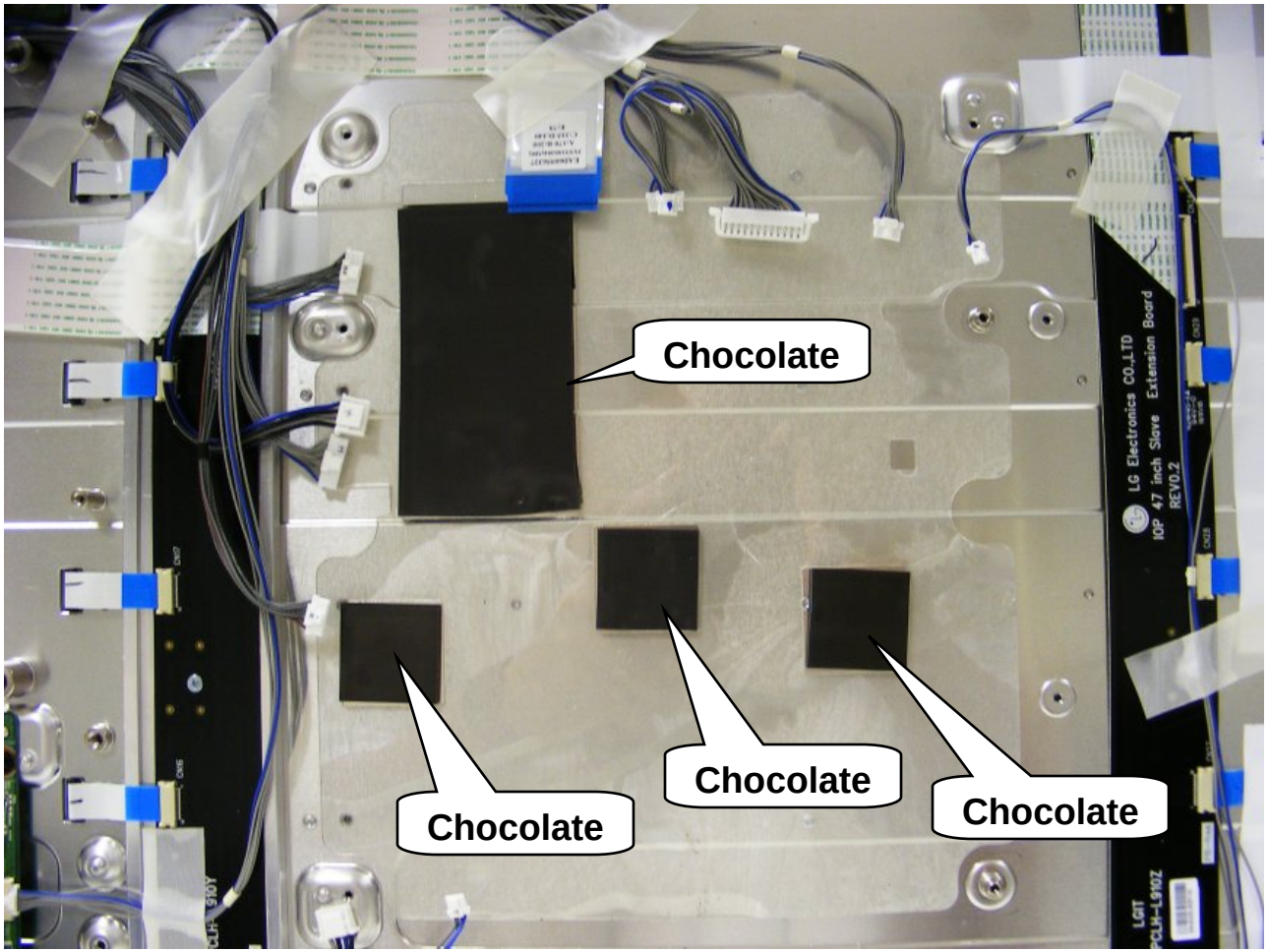
NOTE: Always check on top and behind the Large ICs. And look for a piece of Chocolate (Heat Transfer Material). Be sure to transfer to new Board if present.

Flip the locking tab upward, pull the LVDS ribbon out.



Removing the Main Board notice

Note: Behind the Main board are pieces of Chocolate (Heat transfer material).
Be sure to replace these pieces if any should fall.



Removing the Inverter (Main) Board

Comes with the Panel

1

Disconnect CN1, CN2, CN3 and CN11.

2

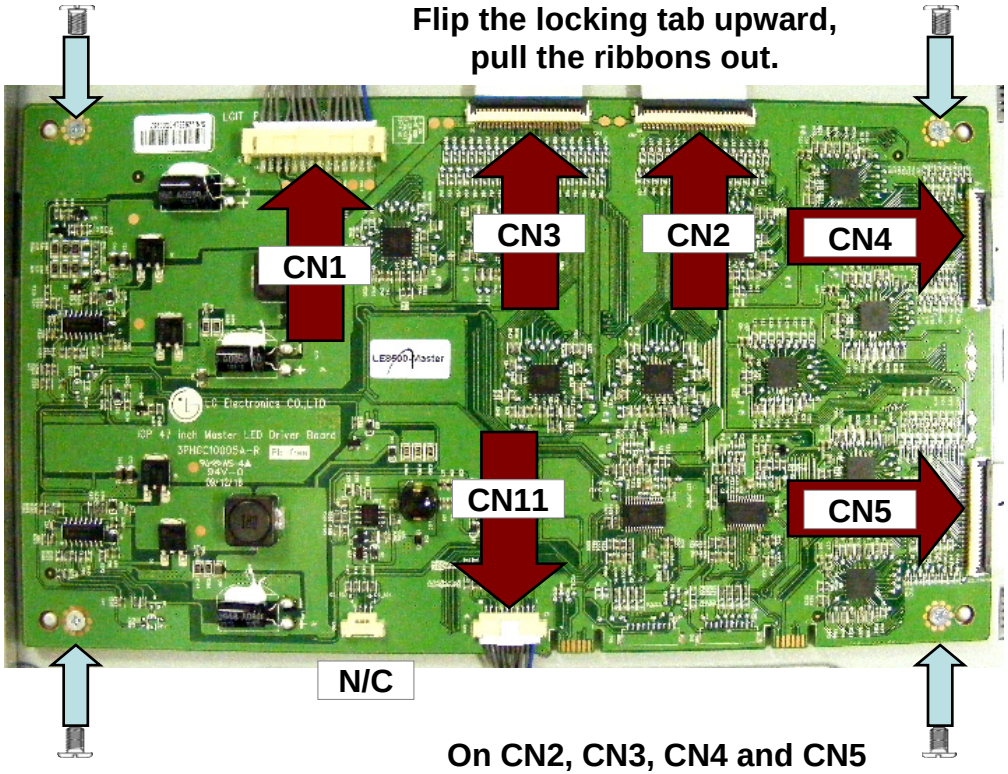
Remove the 4 screws indicated by the arrows. Remove the Inverter.

Use caution, do not allow screws to fall.

NOTE: If Servicing the Board, leave the screws installed to provide stability and grounding.

The Inverter (Main) will run without Inverter (Secondary)

Flip the locking tab upward, pull the ribbons out.



On CN2, CN3, CN4 and CN5 Flip the locking tab upward, pull the ribbons out.

The Inverter (Secondary) will run without Local Dimming signals being provided by CN11

Removing the Inverter (Secondary) Board

Comes with the Panel

1

Disconnect CN101, CN103, CN104 and CN105.

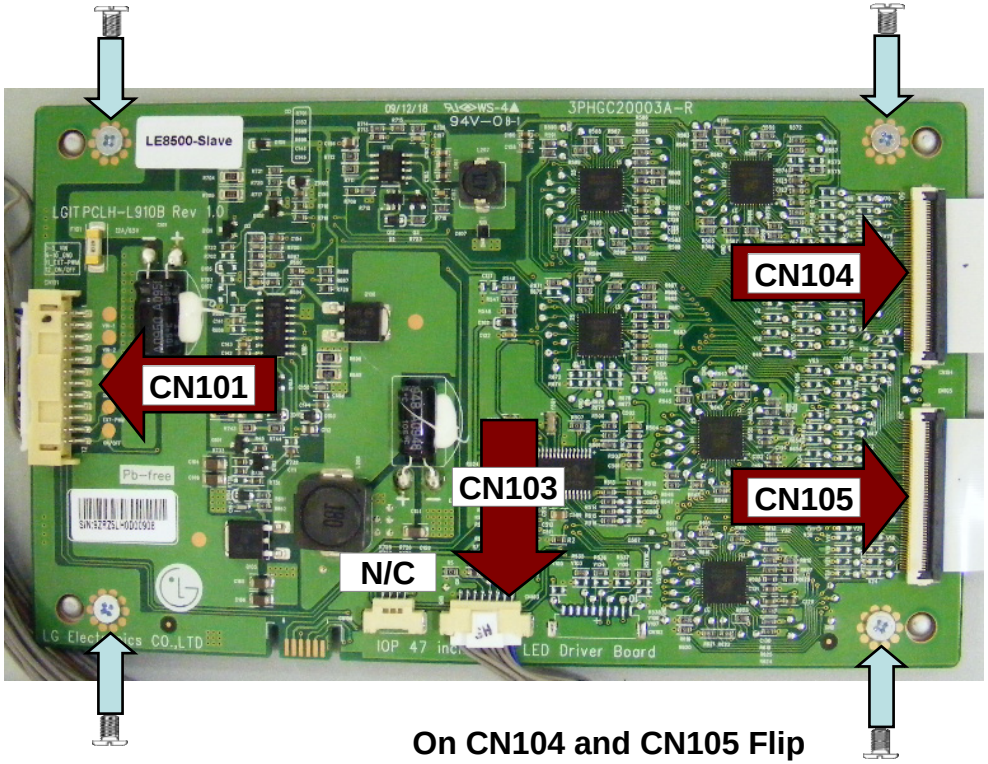
2

Remove the 4 screws indicated by the arrows. Remove the Inverter.

Use caution, do not allow screws to fall.

NOTE: If Servicing the Board, leave the screws installed to provide stability and grounding.

The Inverter (Secondary) will run without Inverter (Main)



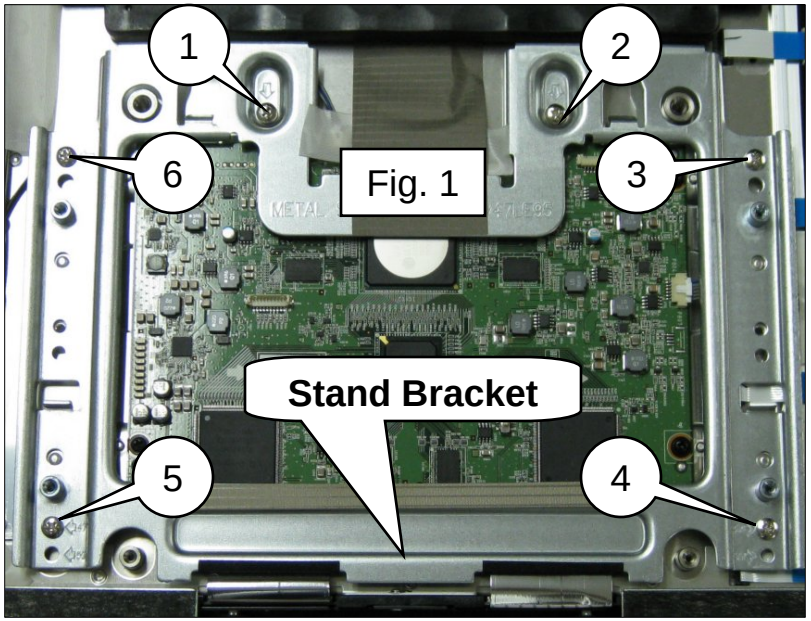
On CN104 and CN105 Flip the locking tab upward, pull the ribbons out.

The Inverter (Secondary) will run without Local Dimming signals being provided by CN103

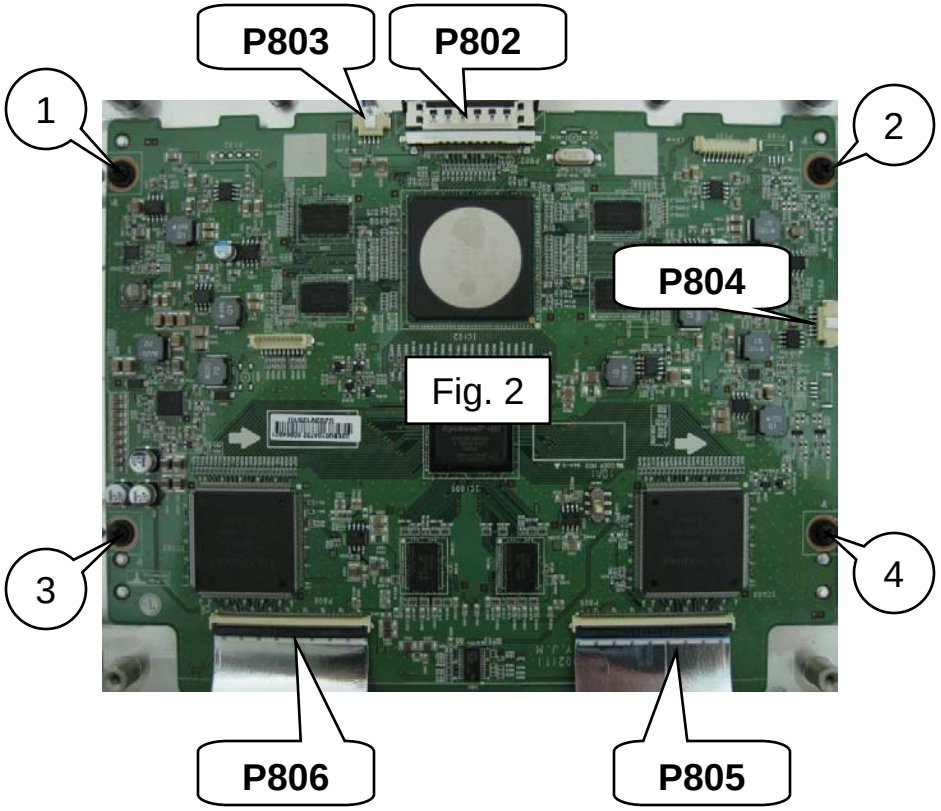
Removing the T-CON/3D Board

Comes with the Panel

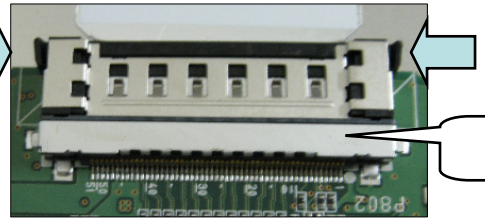
1. Lay the TV down on its face. Use some scratch resistant material to avoid damaging the front frame.
2. Remove the stand support bracket that surrounds the T-CON/3D board. (6 screws) See Fig. 1.



3. Disconnect P802, P803, P804, P805 and P806.
4. Remove the 4 screws securing the T-CON/3D.

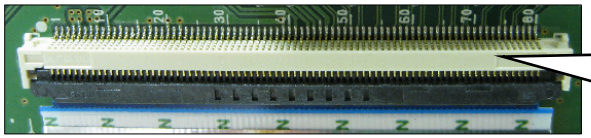


Push In



Push In

P802

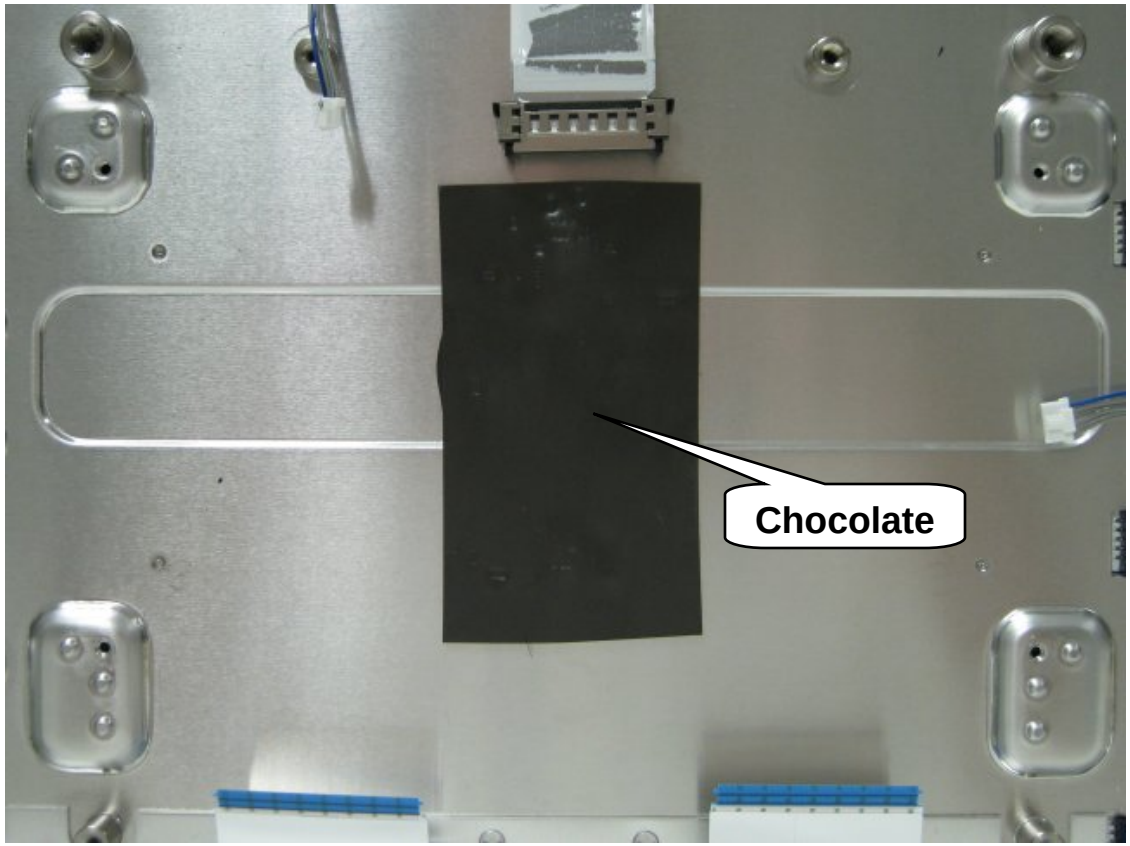


P805
P806

Flip up the Locking mechanism to release ribbon cable.

Removing the T-CON/3D Board Notice

Note: Behind the T-CON/3D is a piece of Chocolate (Heat transfer material).
Be sure to replace this piece if it should fall.

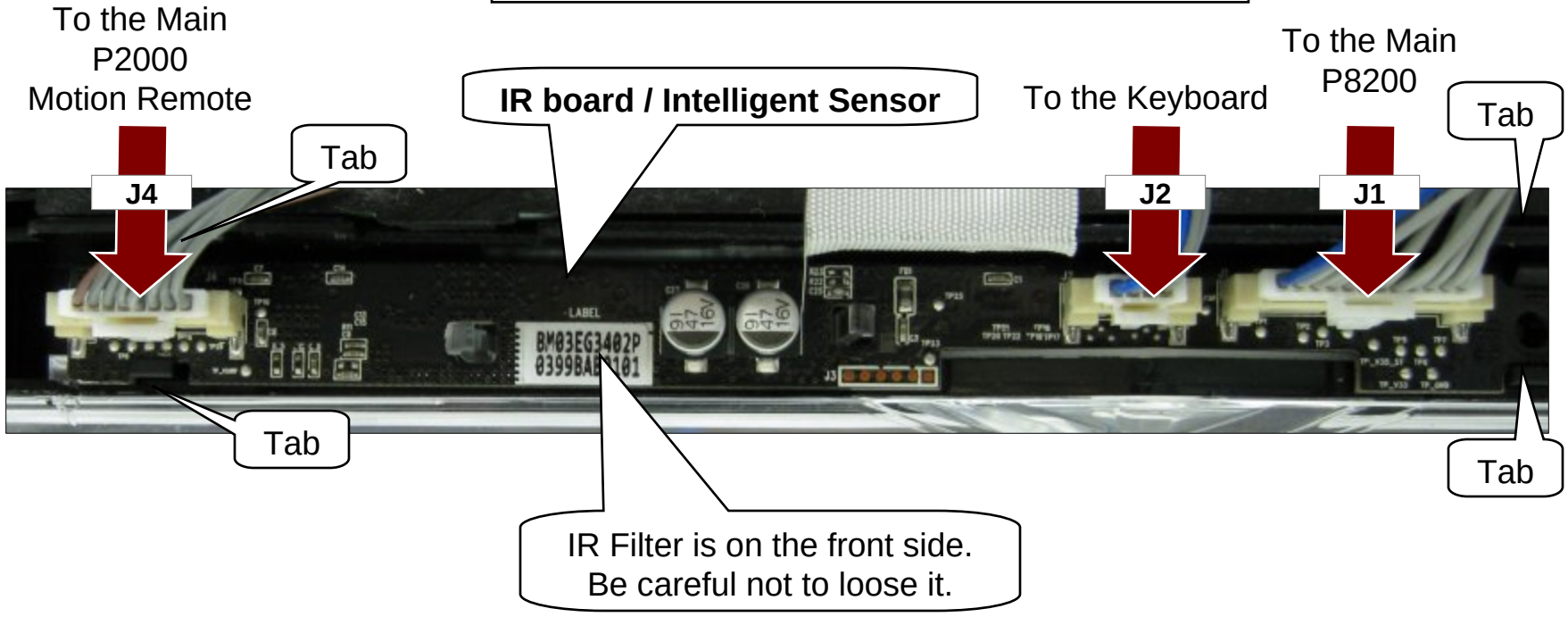


Removing Front IR Board

p/n EBT61093402

Part number is Item 390 on the Exploded View. (May be shown on the wrong side.)

1. **Disconnect J1, J2 and J4 connectors.**
2. **Press gently upward on the two tabs at the top And gently downward on the two tabs at the bottom. Lift the board straight up.**

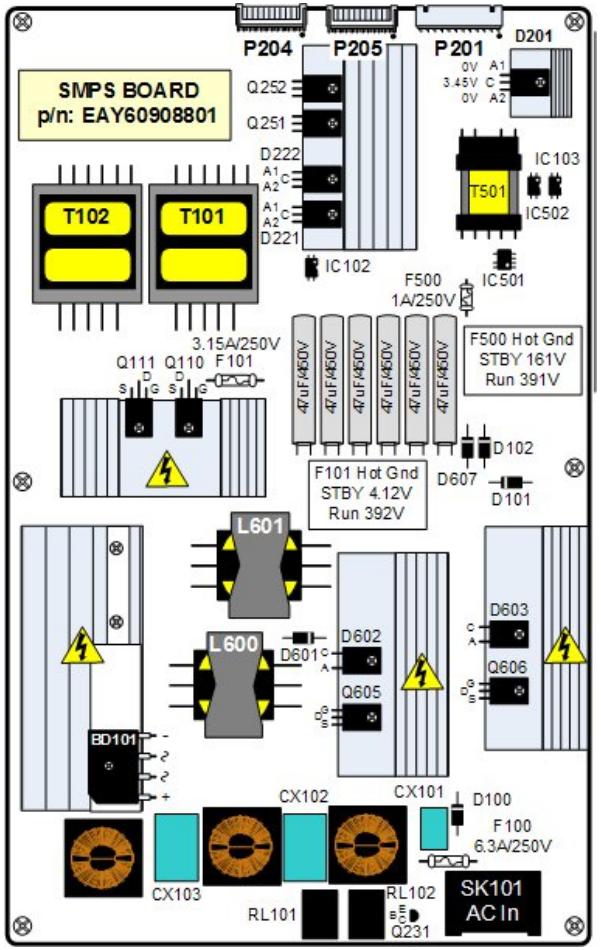


Troubleshooting:

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.

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 And 24V for the Inverters.



This power supply draws less than 1 watt during stand by mode. The fuse F500 reads 161V
(from hot ground) during this time. (F101 is 4.12V)

When the controller chip receives the PWR-ON command 3.3V via P201 Pin 1, the primary section increases its current supplying ability. Both Primary fuses F101 and F500 now read a little more than 391~2V.

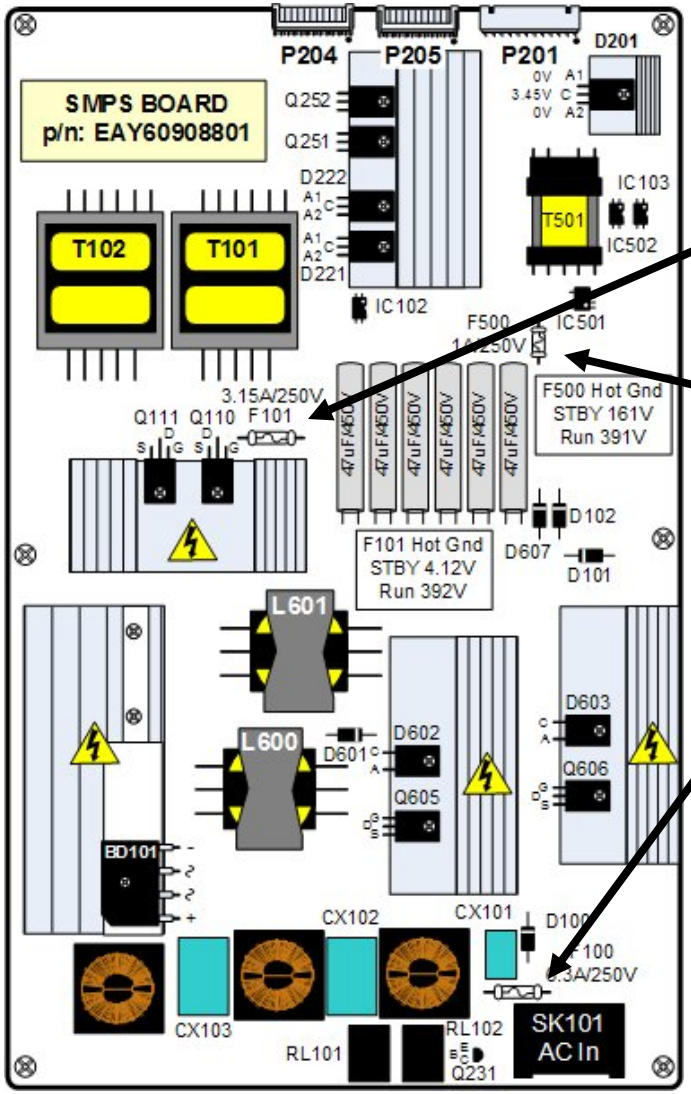
P201 Connector: (To Main Board)
12V is routed out P201 pins 17, 19 and 21 and
24V is routed out P201 pins 2, 3 and 4.

P204 Connector: (To Inverter Main Board)
24V is routed out P204 pins 1 through 5.

P205 Connector: (To Inverter Secondary Board)
24V is routed out P205 pins 1 through 5.

Power Supply (SMPS) Board Layout

p/n EAY60908801



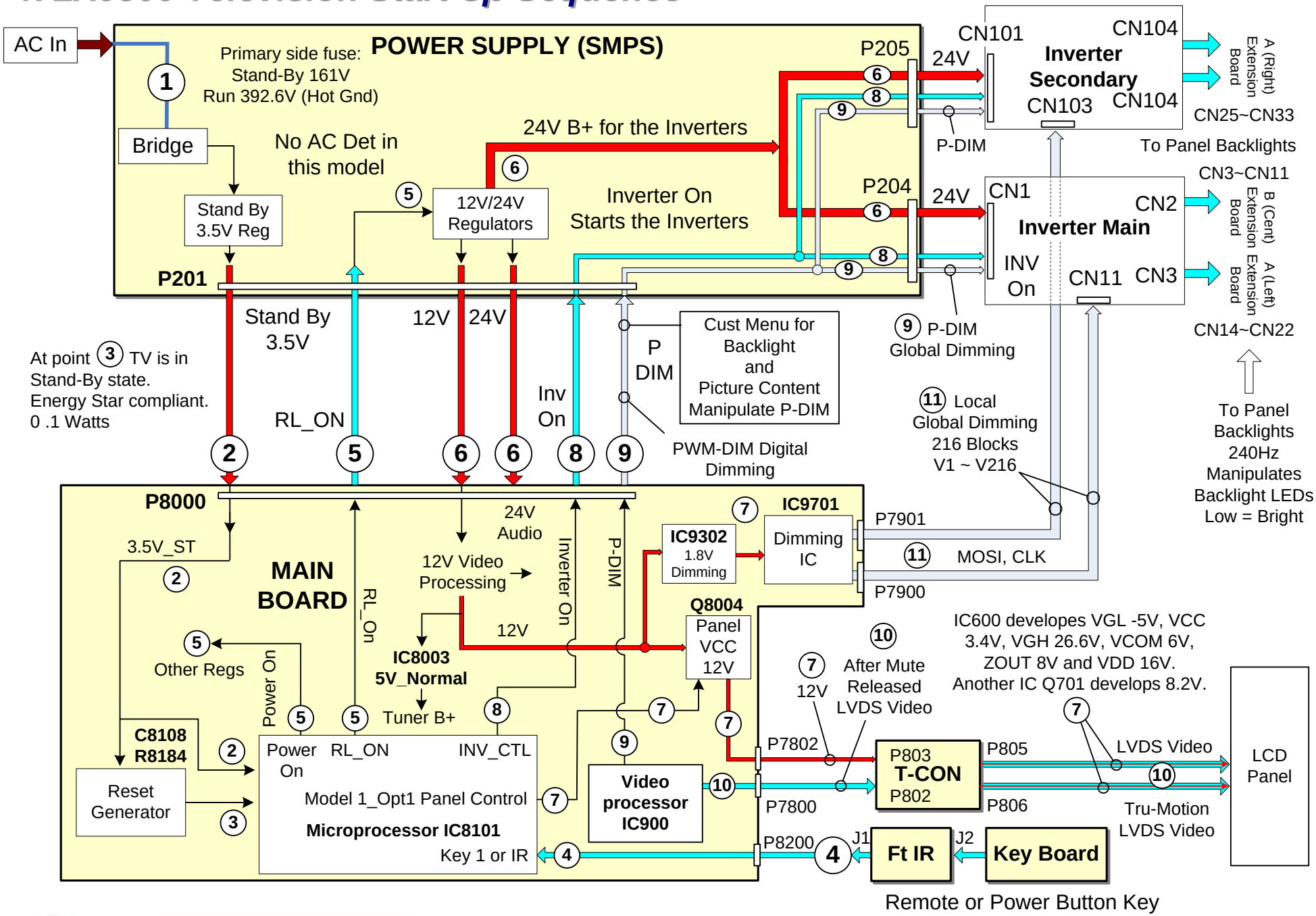
F101
3.15A/250V
STBY 4.11V
Run 392V
From Hot Gnd

F501
3.15A/250V
STBY 161V
Run 391V
From Hot Gnd

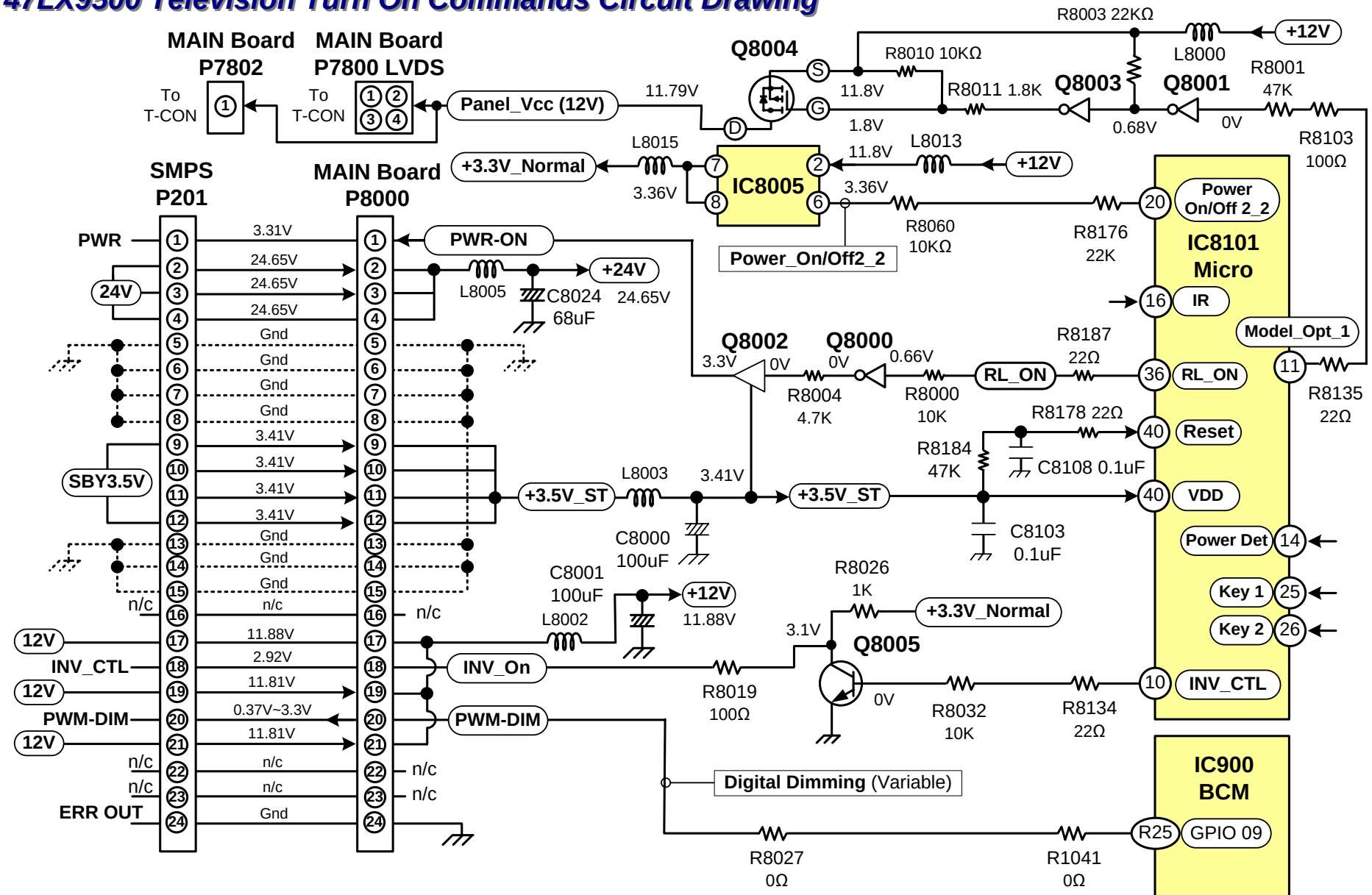
F100
6.3A/250V
AC Protect

Hot Ground
Shock
Hazard

47LX9500 Television Start Up Sequence



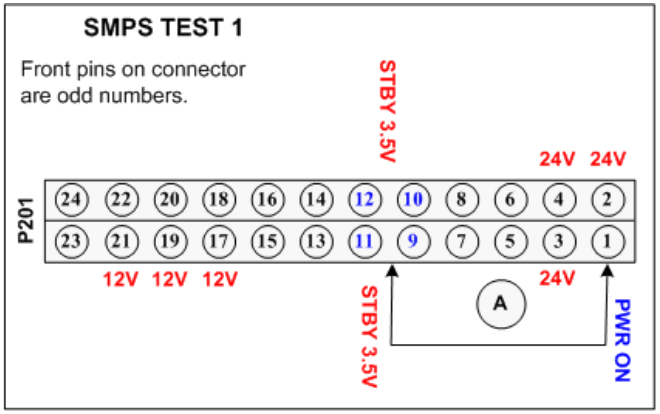
47LX9500 Television Turn On Commands Circuit Drawing



PWM-DIM (PWM Dimming) can vary according to incoming video IRE level, OSD Backlight setting and Intelligent Sensor (room light condition).
Range 0.37V to 3.3V.

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.

Pin 1 is the Brown Wire

(b) Unplug P8000 on the Main Board to make insertion of the Jumpers easier.
Use P700 Side to insert resistors

TEST 1:

No Backlights during this test

(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, relays will click.
a) Check that the 24V and 12V power supplies are turned on,
- P201 (12V pins 17, 19 and 21)
- P201 (24V pins 2, 3 and 4)
- P204 and P205 (24V pins 1 through 5) to the Inverters

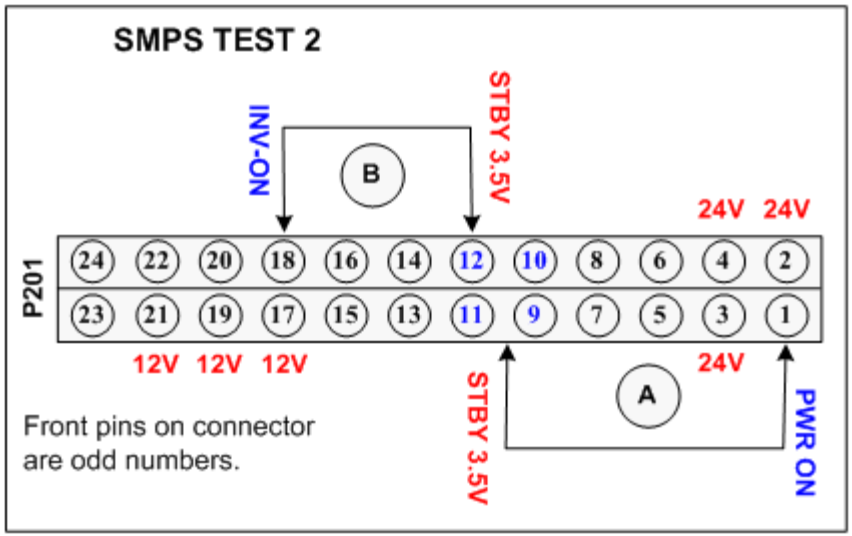
(2) Remove AC power

Power Supply Board Backlights Test 2

Continue if the 1st 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 (INV_On).

(4) Apply AC Power. Simulating a Power and Backlight On command.



Pin 1 is the Brown Wire

Backlights Normal:

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

Backlights Abnormal:

a) Recheck all connections.
b) Confirm the INV On/Off line pulling up to at least 3V and arriving at both Inverters.
c) Check the connections to the Inverters.

If the 24V and the Inverter On command is arriving at the Inverters in, then see Inverter Section for further testing.

Note: Either Inverter can run separately.

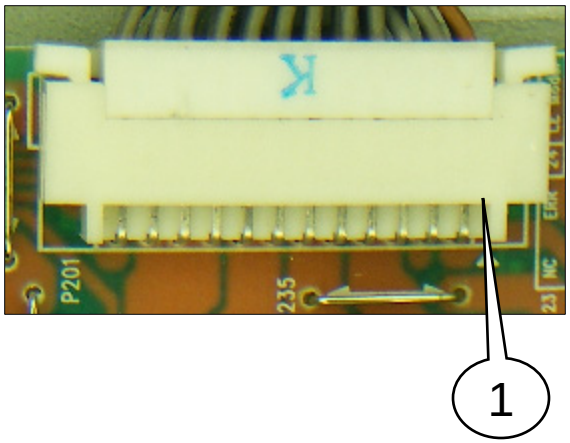
REMOVE AC POWER:

Power Supply Connector P201 Voltage and Diode Check

P201 Connector "SMPS" to "Main" P8000

Pin	Label	STBY	Run	Diode Check
1	**PWR-ON**	0V	3.1V	1.68V
2-4	**24V**	0V	24.7V	0.424V
5-8	**GND**	GND	GND	GND
9-12	**3.5V**	3.45V	3.41V	Open
13-15	**Gnd**	Gnd	Gnd	Gnd
16	**n/c**	n/c	n/c	Open
17	**12V**	0V	11.88V	1.39V
18	**INV-ON**	0V	2.92V	Open
19	**12V**	0.42V	11.88V	1.39V
20	**(1) P-DIM**	0V	0.37V~3.3V	Open
21	**12V**	0V	11.88V	1.39V
22	**n/c**	n/c	0V	Open
23	**n/c**	n/c	0V	Open
24	**ERROR**	0V	0V	Open

P201 Connector



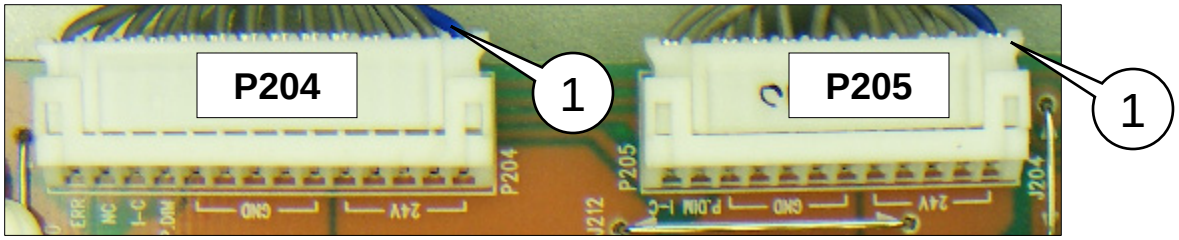
Odd pins are on front row

(1) P-DIM Pin 20 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.

.

Diode Mode values taken with all Connectors Removed

Power Supply Connector P204 / P205 Voltage and Diode Check



P204 "SMPS" to CN14 "Inverter Main"

Pin	Label	STBY	Run	Diode Check
1-5	**24V**	0V	24.65V	0.424V
6-10	**GND**	GND	GND	GND
11	**(1) P-DIM**	0V	0.37V~3.3V	Open
12	**(2) I-C**	0V	2.92V	Open
13	**n/c**	n/c	n/c	Open
14	**ERROR**	0V	0V	Open

P205 "SMPS" to CN201 "Inverter Secondary"

Pin	Label	STBY	Run	Diode Check
1-5	**24V**	0V	24.65V	0.424V
6-10	**GND**	GND	GND	GND
11	**(1) P-DIM**	0V	0.37V~3.3V	Open
12	**(2) I-C**	0V	2.92V	Open

(1) PDIM Pin 20 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.

(2) **I-C** is the Inverter On Control Signal

Diode Mode values taken with all Connectors Removed

Power Supply Connector SK101 Voltage and Diode Check

Diode Mode values taken with all Connectors Removed

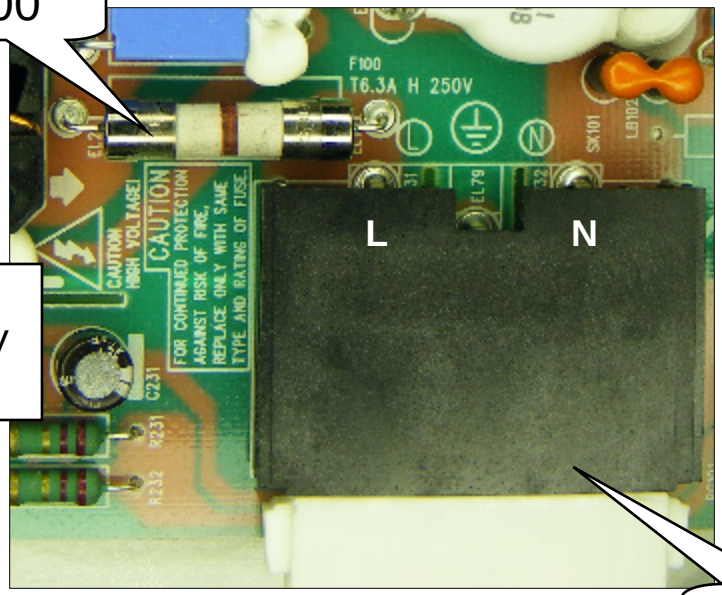
SK101 "SMPS" to AC IN

Pin	Label	STBY	Run	Diode Check
EL131	L	120Vac		OL
EL132	N			OL

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

F100

Bottom Right of SMPS



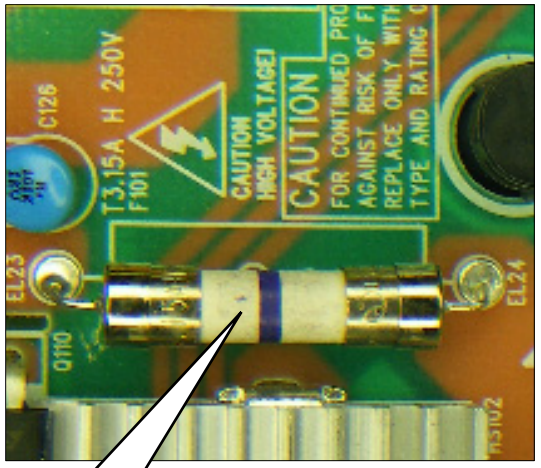
F100
6.3A/250V
AC IN

F100 (Diode Check)
Main Power Switch Closed

Red or Black Lead on Fuse (Open)
Other Lead on Hot Ground

SK101

Power Supply F101 and F501 Voltage Checks



F101

F101
3.15A/250V

From Hot Gnd
STBY 2.9V
Run 393.3V

F500

F500
3.15A/250V

From Hot Gnd
STBY 159.6V
Run 392.6V

If reading the voltage on F101 right after power off, it takes a very long time to bleed down to the reading given here.

INVERTER (LED BACKLIGHTS) SECTION

The Inverter (Main) receives 24V from the SMPS on CN1 pins 1~5 and Inverter (Secondary) receives 24V on CN101 pins 1~5. The Inverter On (INV ON) command arriving on CN1 or CN101 pin 12 starts the Inverter drive signals, (240Hz).
P-DIM is delivered from the Main board through the SMPS to the Inverter on CN1 or CN101 pin 11.
The Inverters are responsible for delivering B+ approx. 13V to each of the 216 LED Blocks. This is accomplished by 3 DC to DC Converters, 2 on Inverter (Main) and 1 on Inverter (Secondary)

Inverter (Main) 13V
- **U101, Q4, Q5, L101 and C75, out CN2 and CN3.**
- **U102, Q7, Q8, L102 and C89, out CN4 and CN5.**

Inverter (Secondary) 13V
- **U101, Q105, Q106, L206 and C151, out CN104 and CN105.**

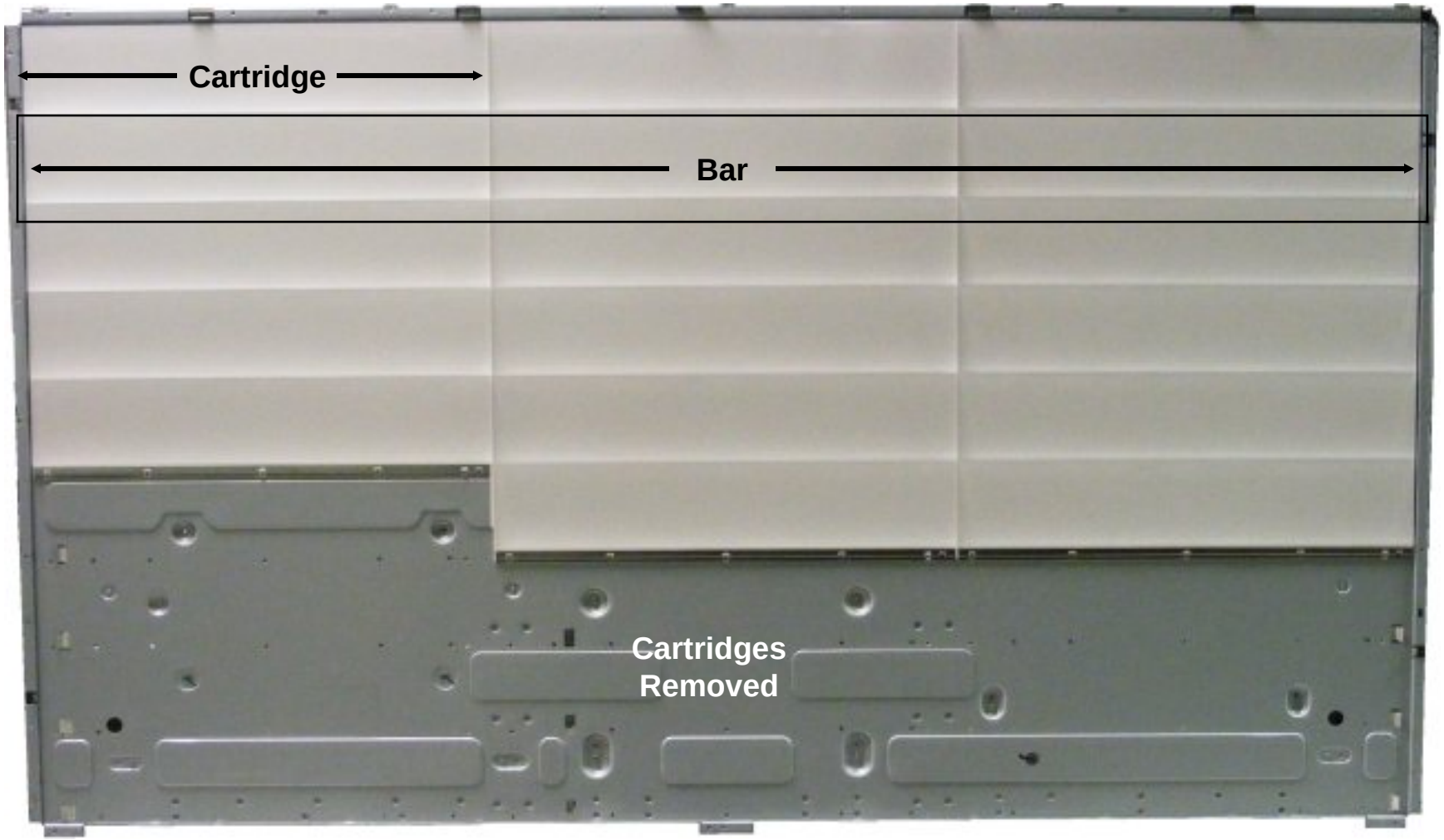
The Inverters must also deliver grounding pulses (Drive Signals) to each of the 216 LED Blocks. This is accomplished by the 14 switching components, 10 on Inverter (Main) U9~U11 and U13 and 5 on Inverter (Secondary) U2~U5 and U13.

Inverter (Main) has 4 Connectors CN2~CN5 that connect to Extensions boards. The Left hand Extension board (as viewed from the rear) connects to CN2 and CN3 and the Center Extension board connects to CN4 and CN5.

Inverter (Secondary) has 2 Connectors CN104~CN105 that connect to the right hand Extension board (as viewed from the rear) which connects to CN23 and CN24.
Each Extension board has 9 connections to the Backlight LEDs.
There are 4 LEDs per/block, 216 Blocks, 8 Blocks per/cartridge, 3 Cartridges per/bar, 9 bars (rows), 32 LEDs per/cartridge, 96 LEDs per/bar. With a total of 864 LEDs.

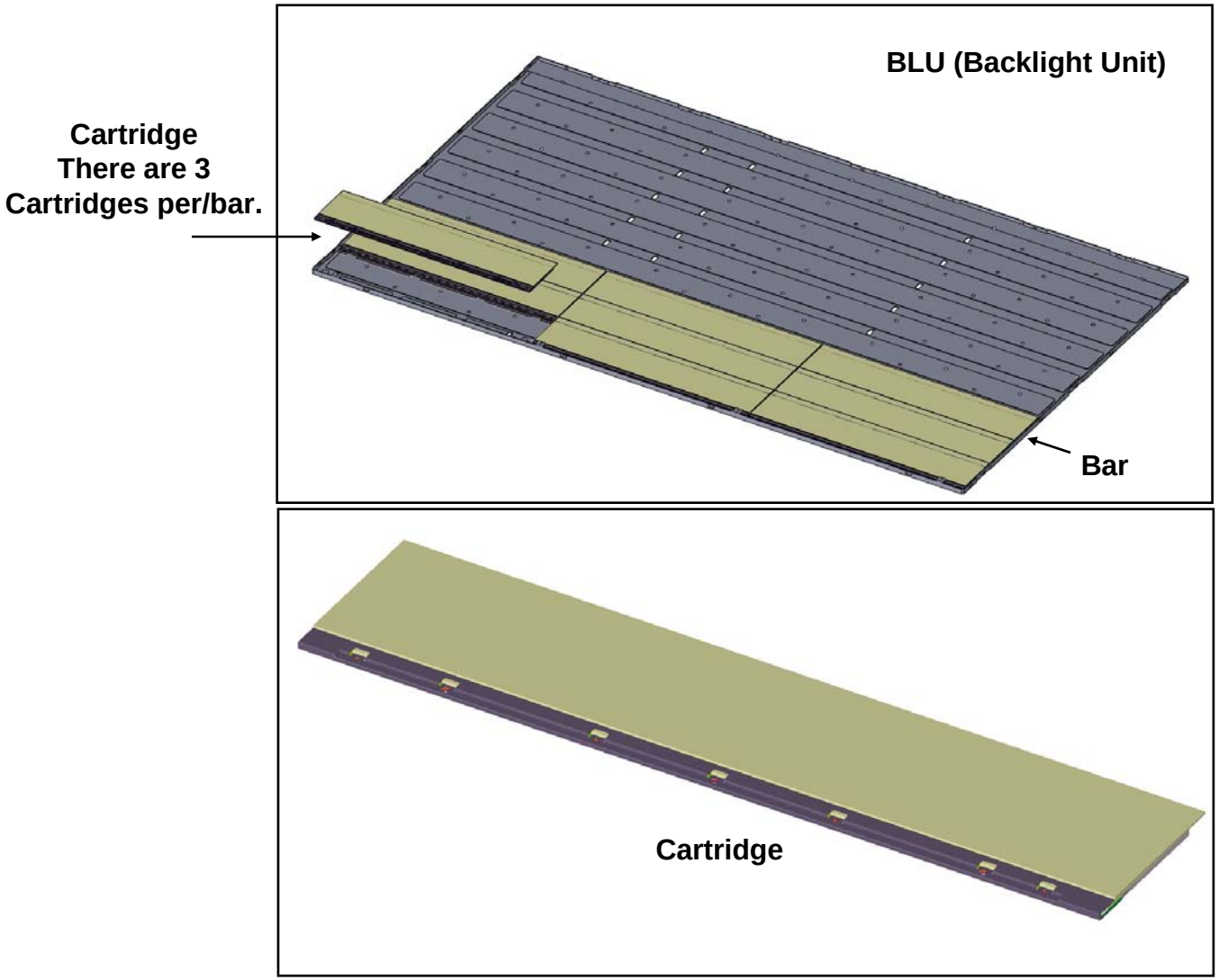
Integrated Optic Plate

The Image below shows the actual Backlight Bars used in the 47LX9500.
The Cartridges are assembled from the bottom to the top, like shingles on a roof.



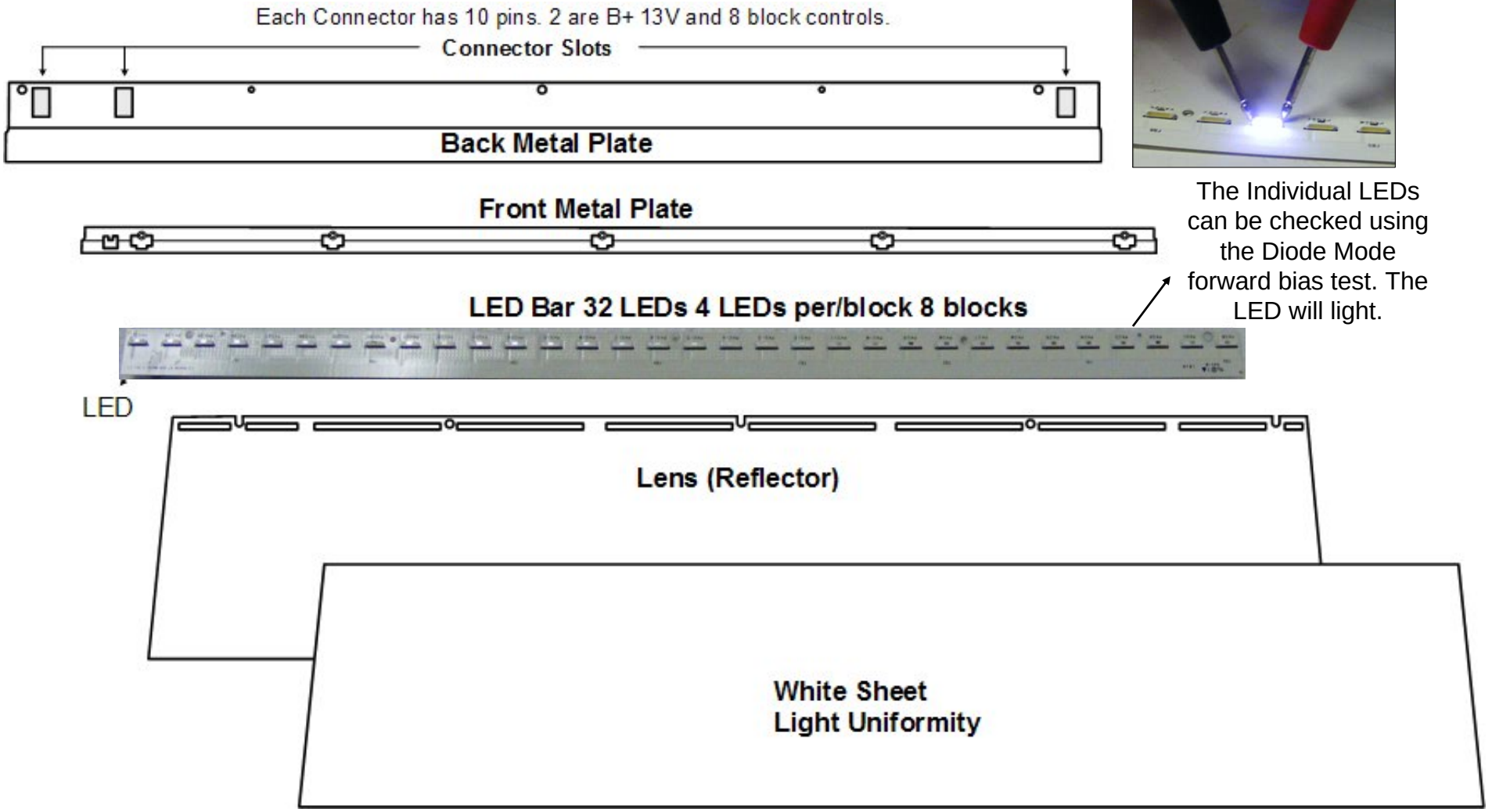
IOP Structure Information

4 LEDs per/block (216 Blocks) 8 Blocks per/cartridge, 9 bars with 3 cartridges per/bar, 32 LEDs per/cartridge, 96 LEDs per/bar. 864 LEDs total.



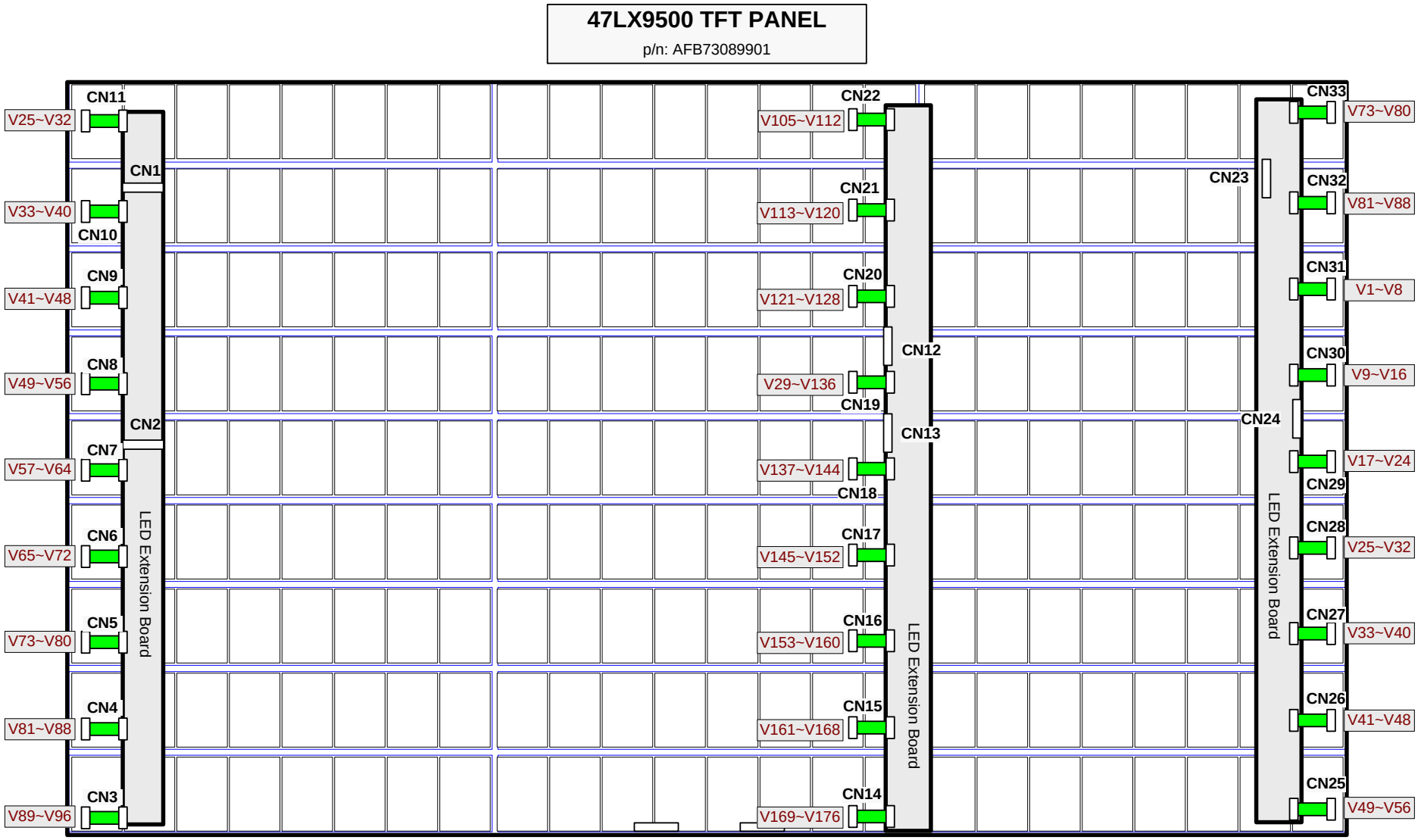
IOP Cartridge Breakdown

This shows the 47” Cartridge Breakdown



The Individual LEDs can be checked using the Diode Mode forward bias test. The LED will light.

47LX9500 IOP Block Structure Information

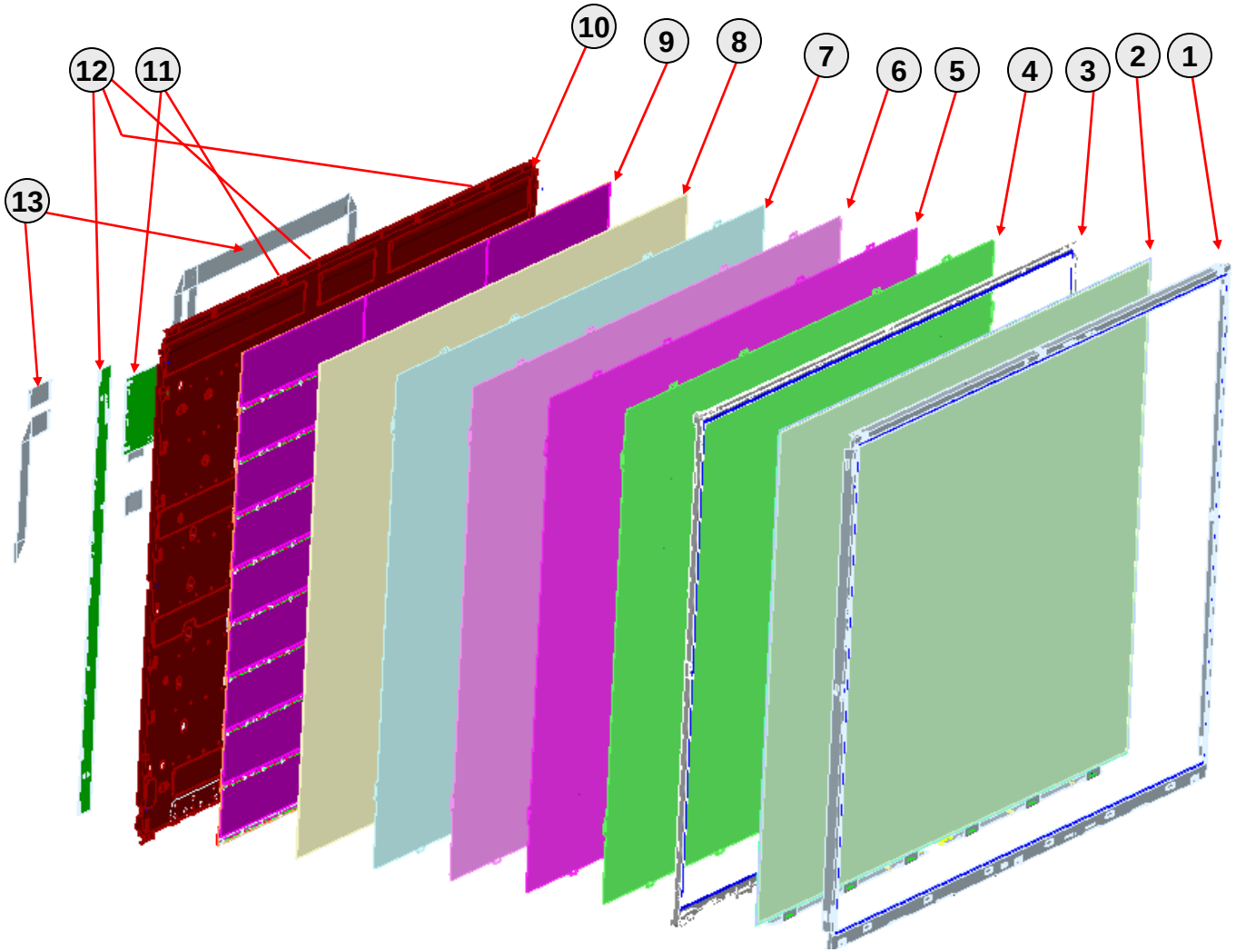


Backlight Blocks
9 Bars (24 Blocks Ea.)
216 Blocks
V1 through V216

LVDS To TFT Panel

3 Extension Boards
9 Connectors Ea.
2 (13V) B+ pins Ea.
8 (V) Connections Ea.
216 (V) Connections

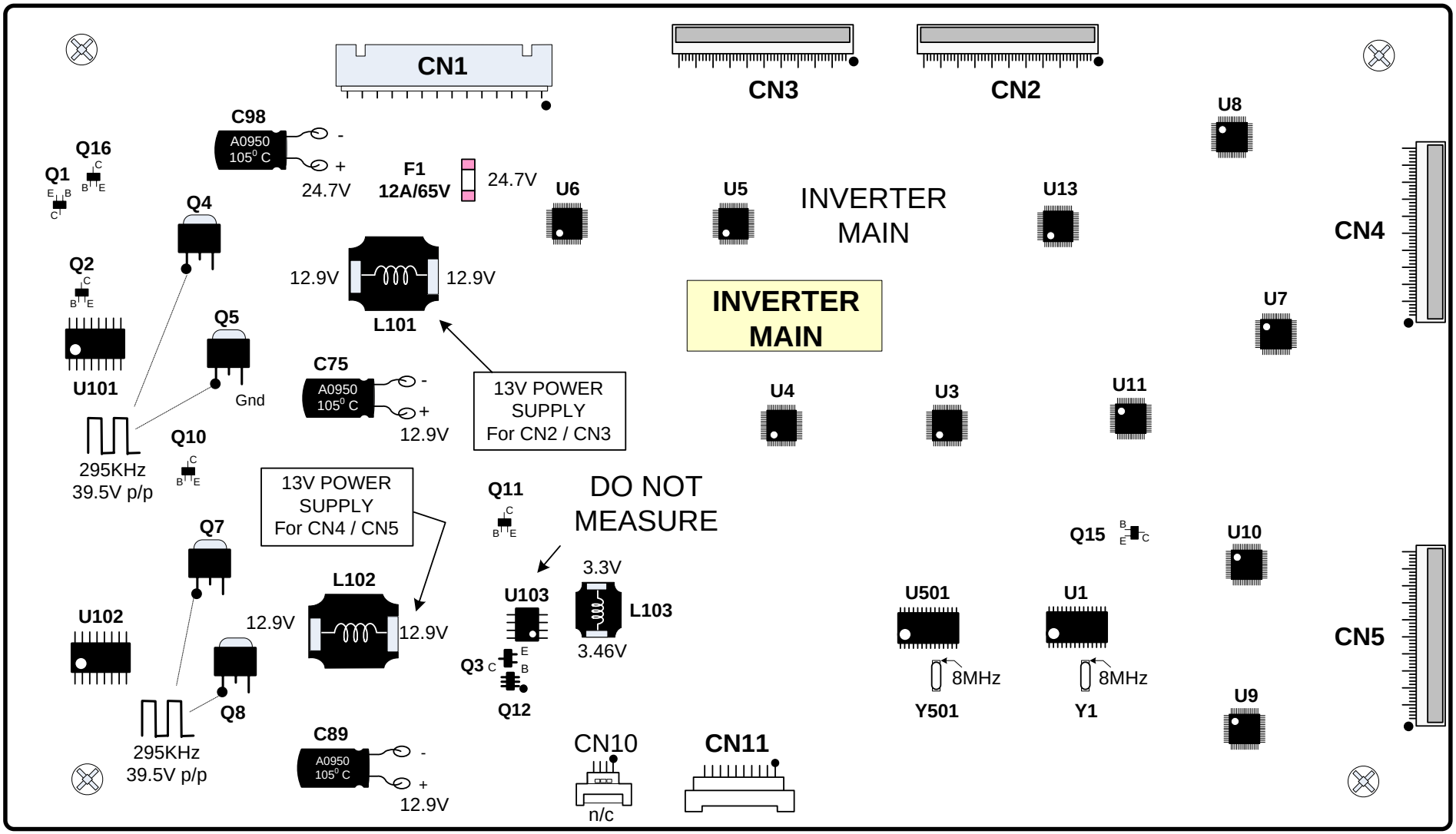
47" Explode View of the IOP Panel



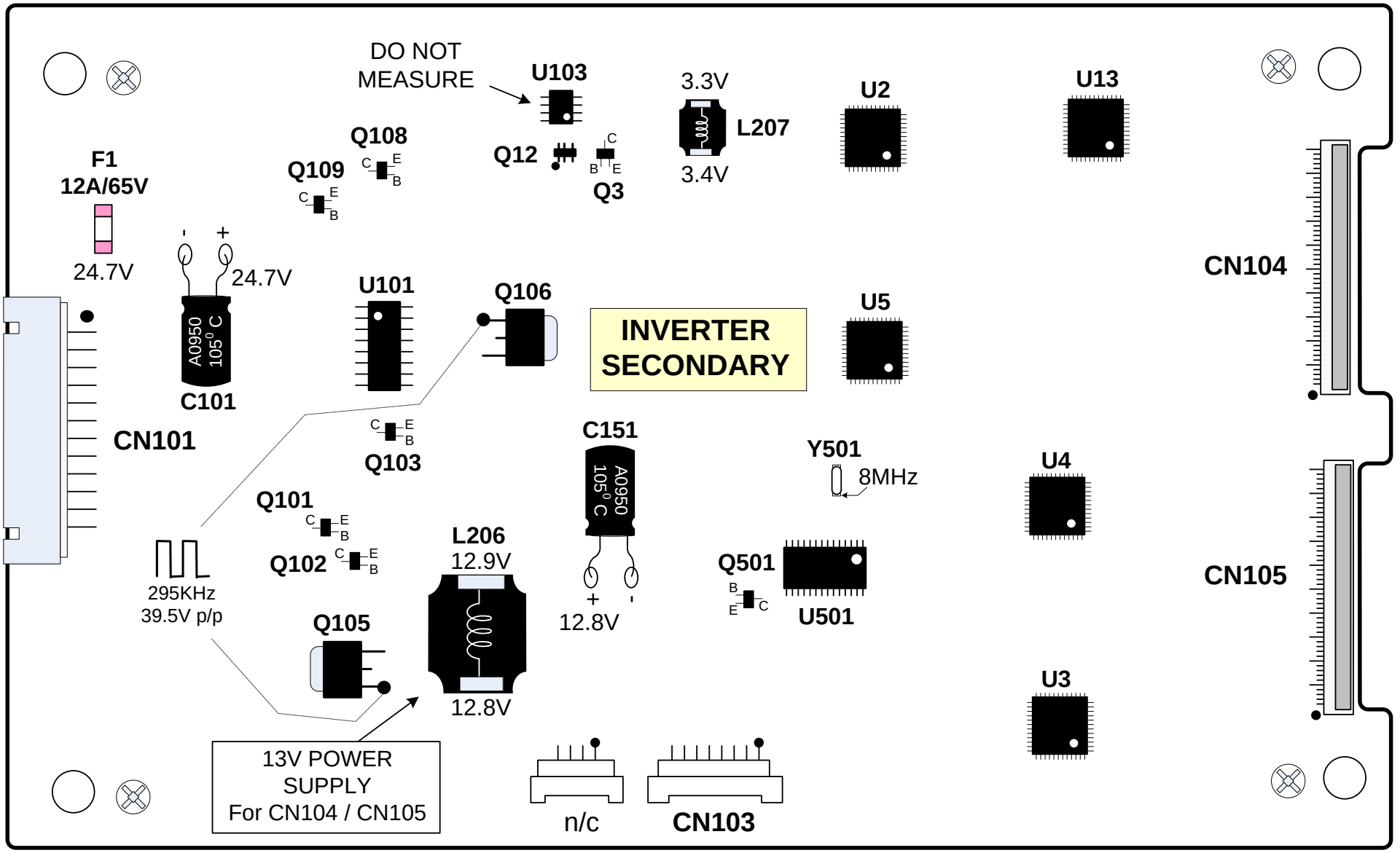
1. Case-Top Ass'y
2. TFT Panel Ass'y
3. Guide Panel
4. Sheet DBEFD
5. Sheet Prism U
6. Sheet Prism L
7. Sheet Diffuser L
8. Plate Diffuser
9. Cartridge Ass'y
10. Cover Bottom
11. Driver Boards (2)
12. Extension Boards (3)
13. FRC

Flexible Ribbon Cables

47LX9500 Inverter Main Layout



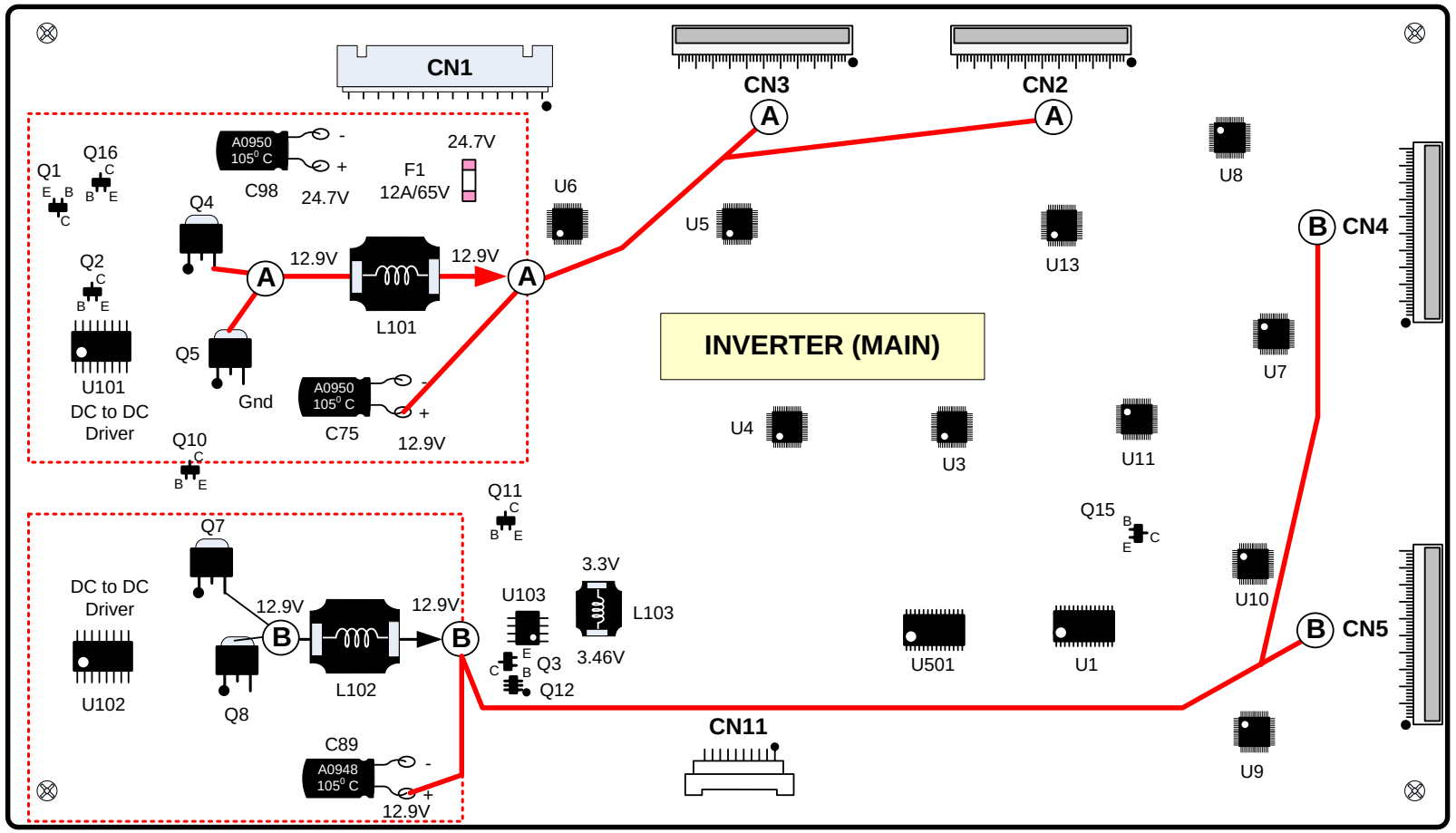
47LX9500 Inverter Secondary Layout



47LX9500 Inverter (Main) B+ Routing

To CN 1 Extension Left
CN3 B+ for LED Blocks.
Pins 1~2, 11~12, 21~22,
31~32, 41~42.

To CN 2 Extension Left
CN2 B+ for LED Blocks.
Pins 9~10, 11~12,
21~22, 31~32



To CN 12
Extension Cent
CN4 B+ for
LED Blocks.
Pins 11~12, 21~22,
31~32, 41~42

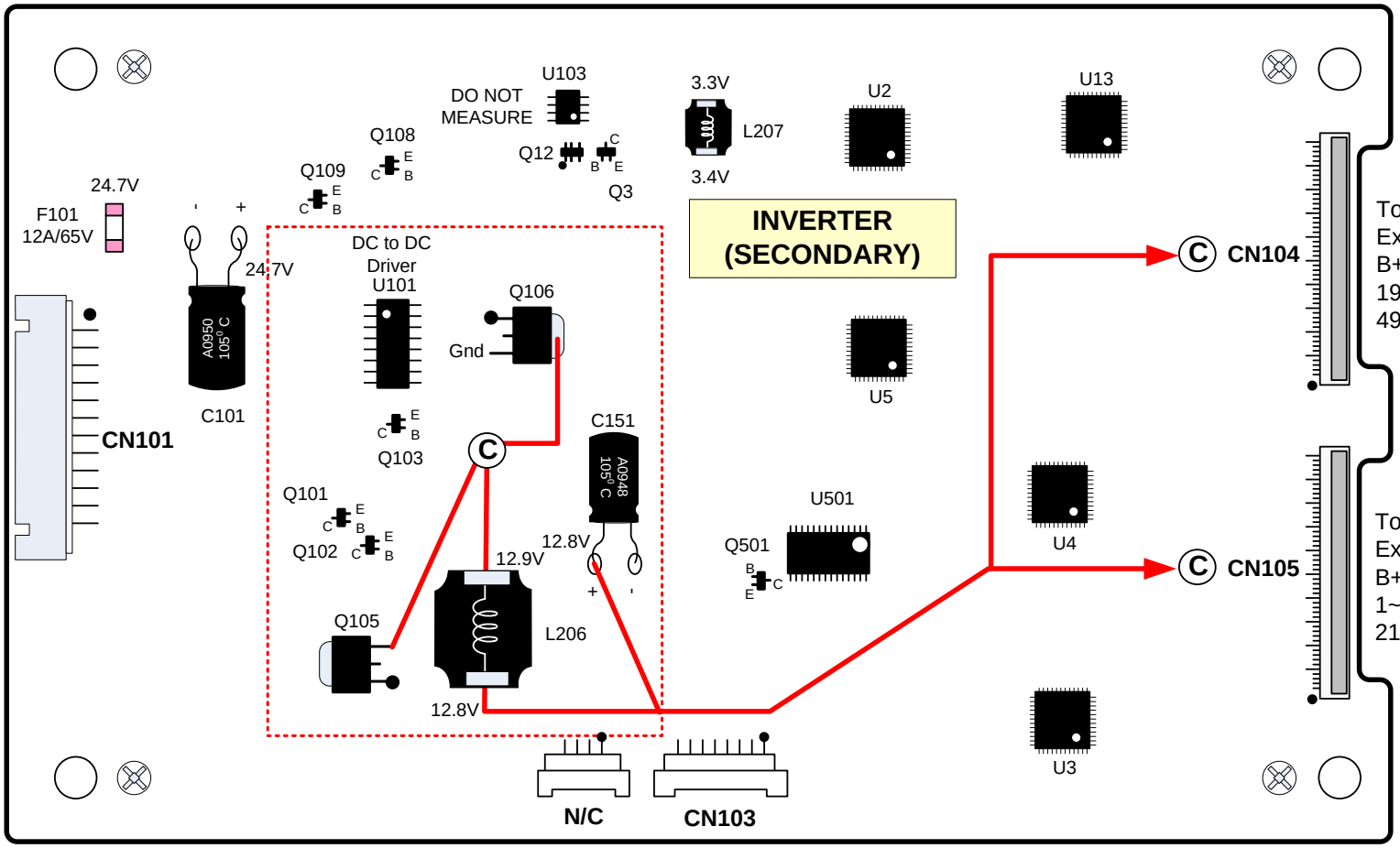
To CN 13
Extension Cent
CN5 B+ for
LED Blocks.
Pins 9~10,
19~20, 29~30,
39~40, 49~50.

Q4 / Q7	Q5 / Q8
1 18.2V	1 5V
2 24.7V	2 12.9V
3 12.9V	3 Gnd

(A) Power for Main Extensions Board A (Left Side). To Connectors CN2 and CN3.

(B) Power for Main Extensions Board B (Center). To Connectors CN4 and CN5.

47LE8500 Inverter (Secondary) B+ Routing



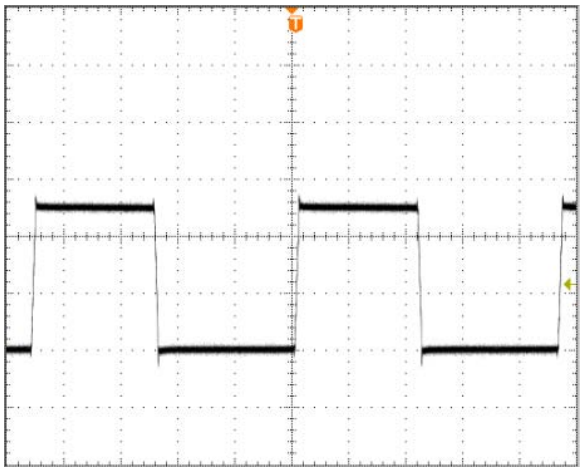
Q105		Q106	
1	18.2V	1	5V
2	24.7V	2	12.9V
3	12.9V	3	Gnd

Ⓒ Power for Secondary Extensions Board (Right Side) Connectors. To Connectors CN23 and CN24.

Inverter 13V LED B+ DC to DC Converter Troubleshooting

Main (Pin 1) Secondary

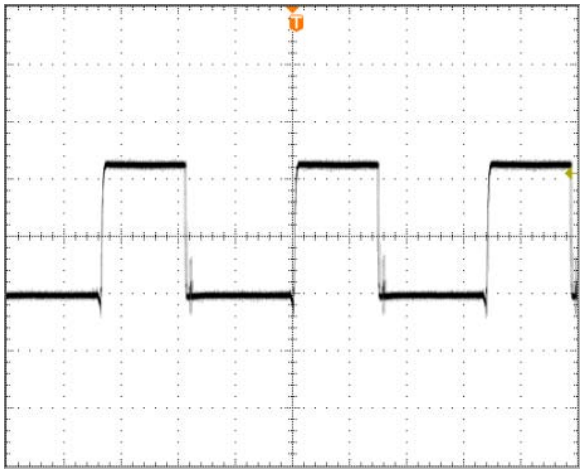
Q5, Q8 Q106



14.5V p/p 296KHz

Main (Pin 1) Secondary

Q4, Q7 Q105



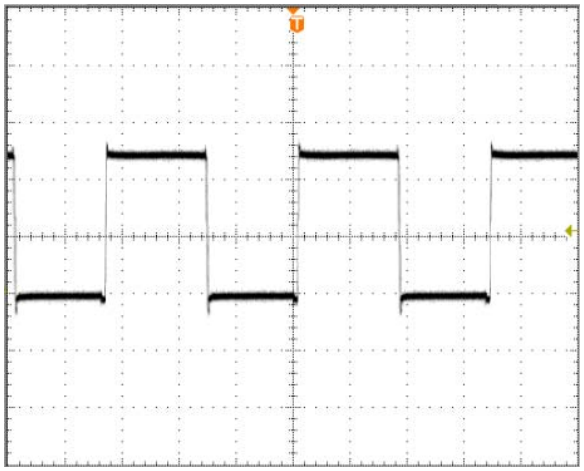
39.53V p/p 296KHz

Main (Pin 2) Secondary

Q5, Q8 Q106

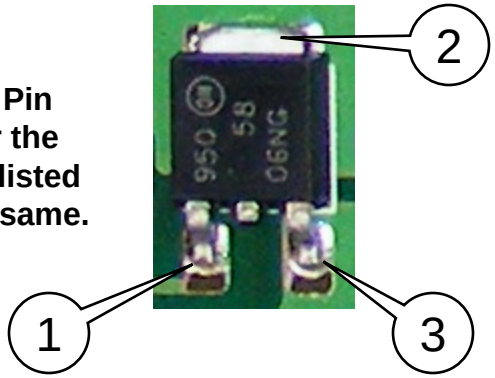
Main (Pin 3) Secondary

Q4, Q7 Q105



30.1V p/p 296KHz

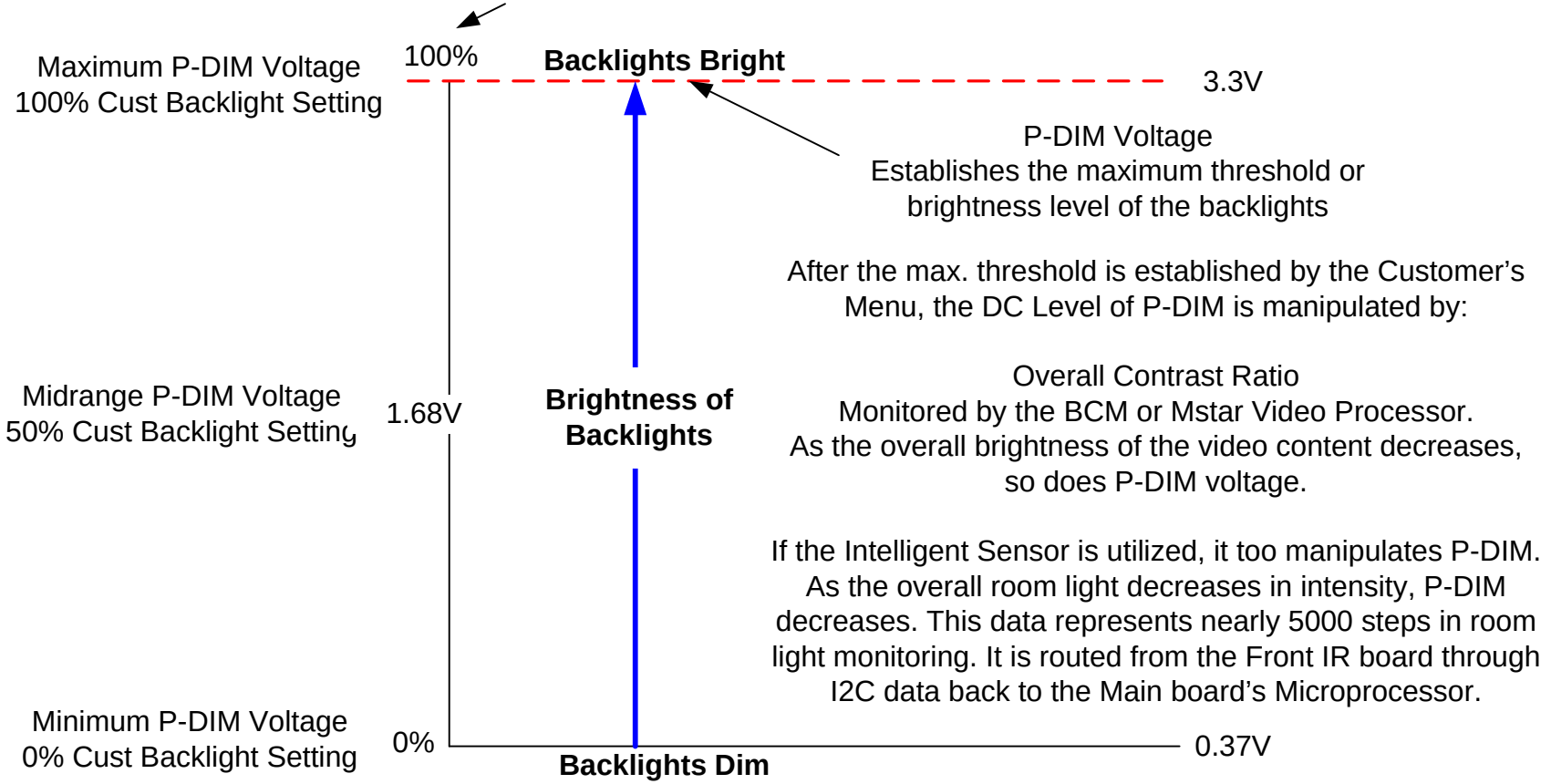
Each of the Pin numbers for the Components listed above are the same.



Q5, Q8 or Q106 Pin 3 is Ground

P-DIM (Global Dimming) Explained:
P-DIM (May also be called PWM-DIM, VBR-B, PDS, BCM-VBR-B)

The Video Processor has the output that controls P-DIM. If the Microprocessor is separate from the video processor, then the customer's menu Backlights setting is communicated to the video processor via I2C.

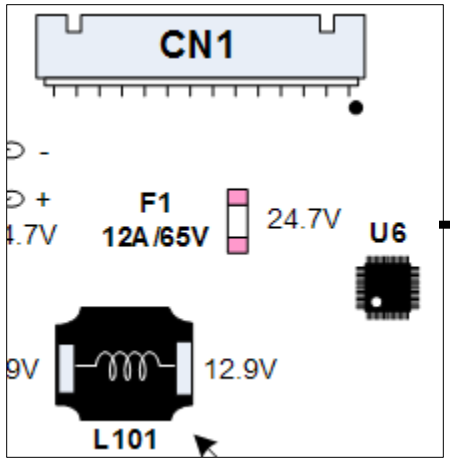


Brightness and Contrast adjustments do not affect P-DIM

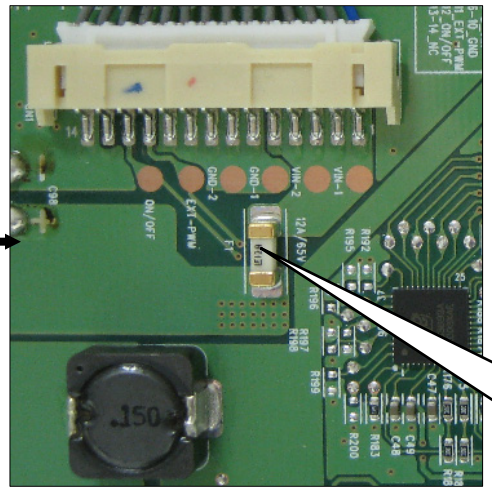
Analog Dimming is not used.
It is a fixed voltage. Also called BR1, VBR-A, BCM-VBR-A, ADM

Inverter (Main) Fuse F1 and Inverter (Secondary) Fuse F101 Check

Top Left of the Board
Just under CN1 Connector



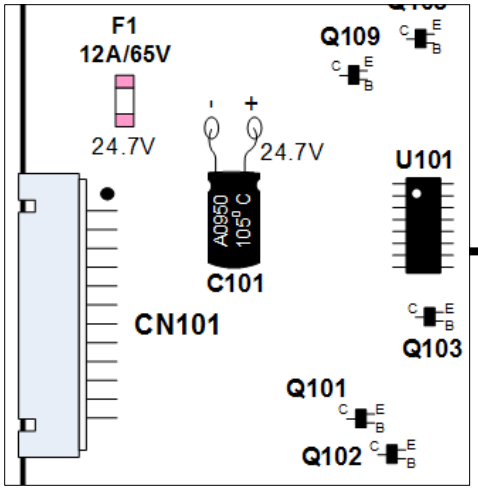
Inverter (Main)



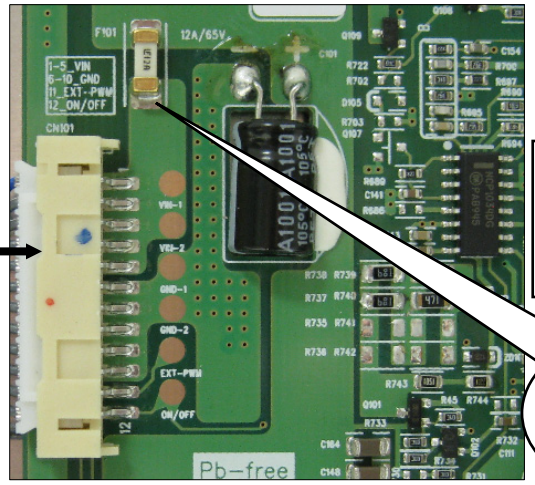
F1 (Diode Mode Check)
1.33V (Red Lead on Fuse)
0.56V (Black Lead on Fuse)

F1
12A/65V

Center Left of the Board
Just up and right of CN101 Connector



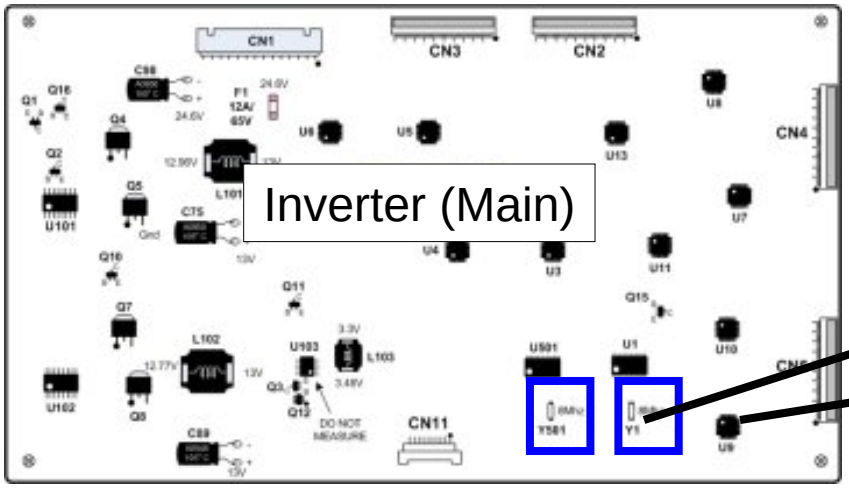
Inverter (Secondary)

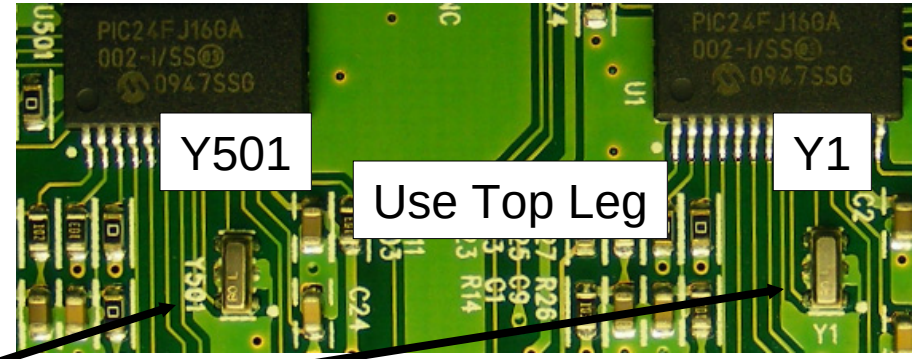


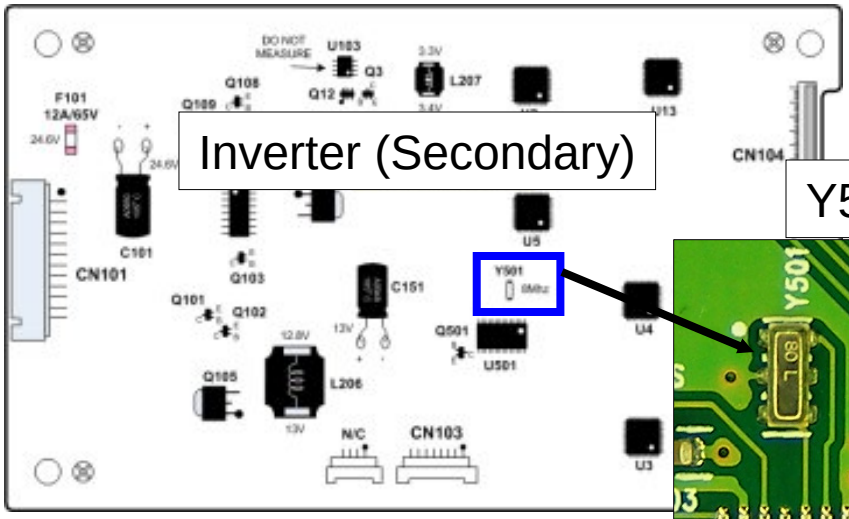
F101 (Diode Mode Check)
1.34V (Red Lead on Fuse)
0.55V (Black Lead on Fuse)

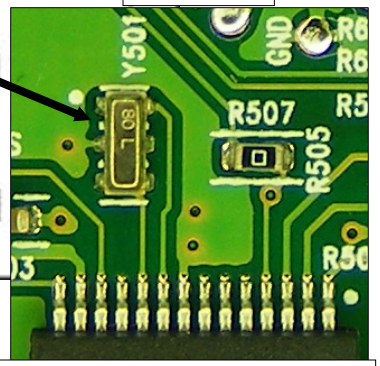
F101
12A/65V

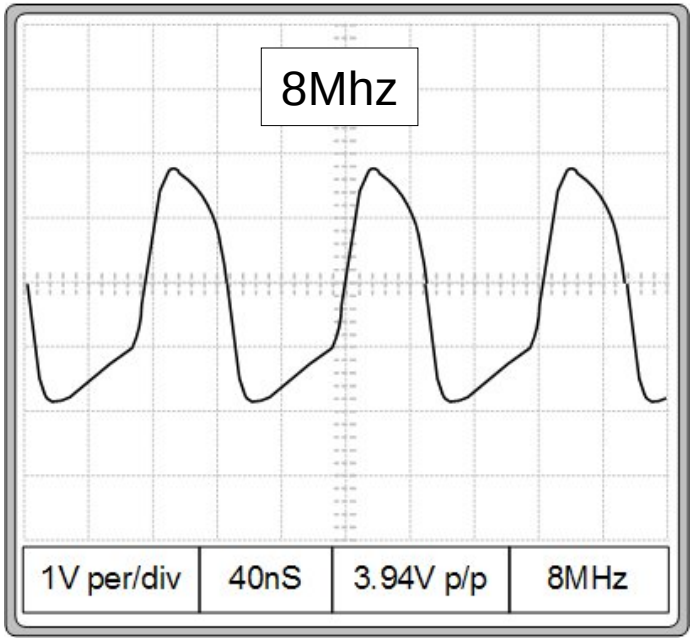
Inverter Crystals Y1, Y501 (Main) and Y501 on (Secondary) Information











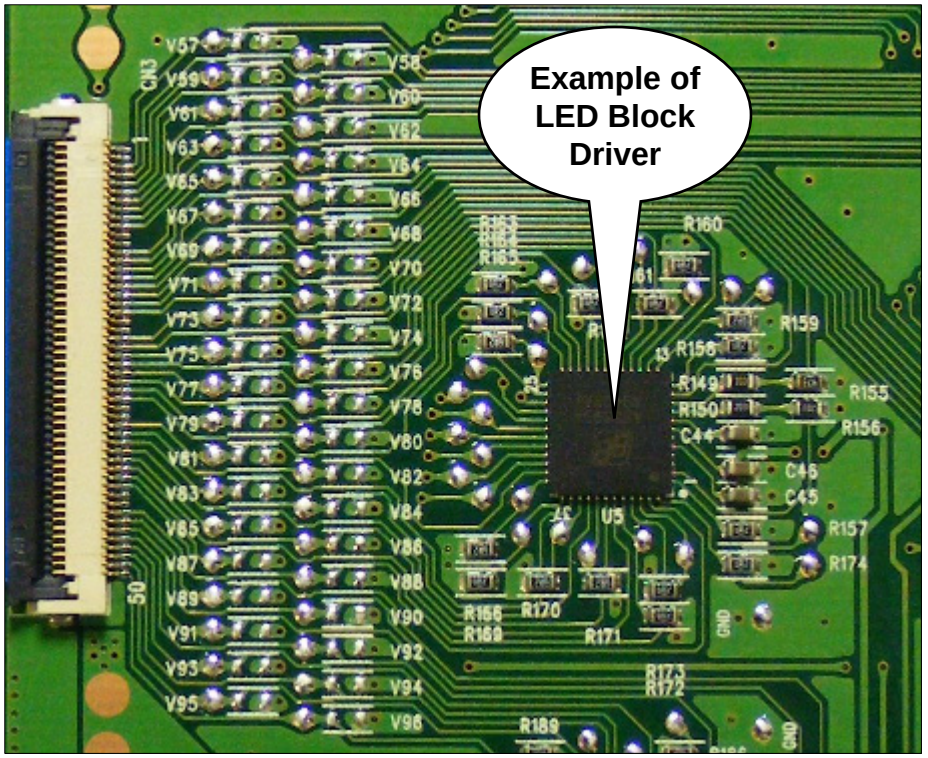
Inverter LED Driver Information

Note: Some of the Vxx numbers are repeated on the Silk Screen between Inverter (Main) and Inverter (Secondary).
But there are a total of 216 (V1 through V216).

The Inverters deliver grounding pulses (Drive Signals) to each of the 216 LED Blocks. This accomplishes Global Dimming and Local Dimming. Each output is labeled Vxx. Grounding each block is accomplished by the 14 switching components, 10 on Inverter (Main) U9~U11 and U13 and 5 on Inverter (Secondary) U2~U5 and U13.

Inverter (Main) has 4 Connectors CN2~CN5 that connect to Extensions boards. The Left hand Extension board (rear view) connects to CN2 and CN3 and the Center Extension board connects to CN4 and CN5.

Example: U5



Inverter (Secondary) has 2 Connectors CN104~CN105 that connect to the right hand Extension board (rear view).

Each Extension board has 9 connections to the Backlight LEDs.

Voltage Supplies from Inverter (Main) To Extension Boards Left and Center

CN2 13V Line Pins	CN3 13V Line Pins	CN4 13V Line Pins	CN5 13V Line Pins
9~10, 11~12, 21~22, 31~32	1~2, 11~12, 21~22, 31~32, 41~42	11~12, 21~22, 31~32, 41~42	9~10, 19~20, 29~30, 39~40, 49~50

Voltage Supplies from Inverter (Secondary) To Extension Board Right

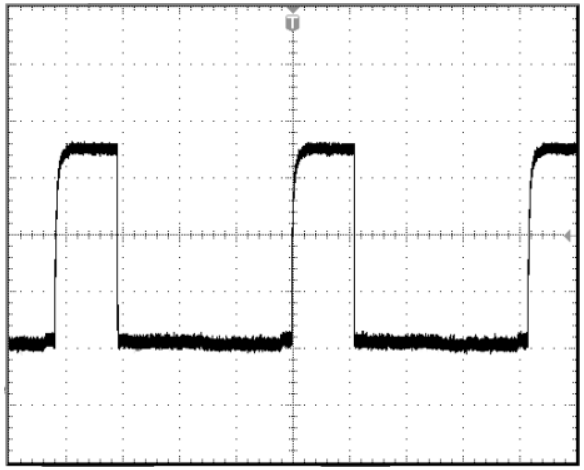
CN104 13V Line Pins
19~20, 29~30, 39~40, 49~50

CN105 13V Line Pins
1~2, 11~12, 21~22,31~32, 41~42

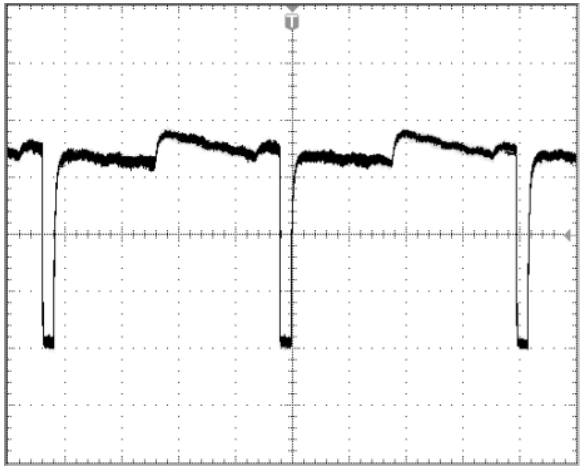
LED Drive Signal and Troubleshooting Information

Global Dimming (which affects every LED block at the same time) is accomplished by the P-DIM signal arriving on pin 11 of CN11 (Inv Main) and CN101 (Inv Secondary). As P-DIM voltage goes up, all drive signals will remain low longer. As P-DIM voltage goes down, all drive signals will remain high longer.
P-DIM has a range of 0.37V to 3.3V.
Local Dimming (which affects individual LED blocks) is also accomplished by these drive signals which are manipulated by the Control Signals entering on CN11 Inv (Main) and CN103 Inv (Secondary).

Drive Signals being delivered to the LED Blocks V1 ~ V216



100 IRE
3.41V p/p 240Hz



5 IRE
3.41V p/p 240Hz

Note: If a particular block is exhibiting a dimmer level than the other 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,
1st Check the P-DIM level, it should rise with the percentage shown on screen. 0% = 0.37V to 100% = 3.3V. Follow the P-DIM signal all the way to each Inverter.
2ND Turn off the set and unplug the connector to the Inverters coming from the Main board. If the brightness returns to normal, the Main board is defective. If not, investigate all inverter voltages, if OK, use the grounding of each V block procedure to test the panel's backlight LEDs.

Inverter Board Connector CN3 to Extension (Left) (Voltages)

This gives an example of how the output from an Inverter gets to the individual LED block, but there are 216 blocks (pins) spread out over 6 (50 pin) connectors, please use the Interconnect Diagram for details on all pins.

Inverter Run voltages taken with built in test pattern full white and black screens

CN3 to CN2		Extension Board Left			
Inverter Main		In	Out to	BLOCK	Bright to Dark
CN3	BLOCK	CN2	Panel		Voltage
50	V96	1	CN3 pin 10	V96	0.7V~3.9V
49	V95	2	CN3 pin 09	V95	0.7V~3.9V
48	V94	3	CN3 pin 08	V94	0.7V~3.9V
47	V93	4	CN3 pin 07	V93	0.7V~3.9V
46	V92	5	CN3 pin 06	V92	0.7V~3.9V
45	V91	6	CN3 pin 05	V91	0.7V~3.9V
44	V90	7	CN3 pin 04	V90	0.7V~3.9V
43	V89	8	CN3 pin 03	V89	0.7V~3.9V
42	B+	9	CN3 pin 02	B+	12.55V
41	B+	10	CN3 pin 01	B+	12.55V
40	V88	11	CN4 pin 10	V88	0.7V~3.9V
39	V87	12	CN4 pin 09	V87	0.7V~3.9V
38	V86	13	CN4 pin 08	V86	0.7V~3.9V
37	V85	14	CN4 pin 07	V85	0.7V~3.9V
36	V84	15	CN4 pin 06	V84	0.7V~3.9V
35	V83	16	CN4 pin 05	V83	0.7V~3.9V
34	V82	17	CN4 pin 04	V82	0.7V~3.9V
33	V81	18	CN4 pin 03	V81	0.7V~3.9V
32	B+	19	CN4 pin 02	B+	12.55V
31	B+	20	CN4 pin 01	B+	12.55V

This chart does not show all 50 pins. For all connectors from the Inverters to the Panel, please use the Interconnect Diagram for details on all pins.

Inverter (Main) CN1 and CN11 Voltage and Diode Check

CN11 “Inverter Main” to “Main” P7900

Pin	Label	STBY	Run	Diode Check
1	L_VS	0V	0.059V	Open
2	M0_MOSI	0V	*0.04V~3.2V	Open
3	M0_SCLK	0V	0.42V	Open
4	Gnd	Gnd	Gnd	Gnd
5	M1_MOSI	0V	*0.04V~3.26V	Open
6	M1_SCLK	0V	0.42V	Open
7	Gnd	Gnd	Gnd	Gnd
8	S_CS_N	0V	1.96V	1.9V
9	S_MOSI	0V	*0.18V~0.28V	1.87V
10	S_SCLK	0V	2.72V	1.87V

*Black to White

CN1 "Inverter Main" Connector To P204 "SMPS"

Pin	Label	STBY	Run	Diode Check
1~5	24V	0V	24.7V	1.33V
6~10	Gnd	Gnd	Gnd	GND
11	(1) P-DIM	0V	0.37V~3.3V	Open
12	(2) I-C	0V	2.92V	Open
13	N/C	N/C	N/C	Open
14	ERROR	0V	0V	Gnd

(1) PDIM Pin 11 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.

(2) Inverter On/Off Control

Diode Mode values taken with all Connectors Removed

Inverter (Secondary) CN101 and CN103 Voltage and Diode Check

Inverter Run voltages taken with built in test pattern

CN101 "Inverter Secondary" to P205 "SMPS"

Pin	Label	STBY	Run	Diode Check
1~5	24V	0V	24.7V	1.34V
6~10	Gnd	Gnd	Gnd	Gnd
11	(1) P-DIM	0V	0.37V~3.3V	Open
12	I-C	0V	2.92V	Open

Inverter On Control

(1) PDIM Pin 11 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.

CN103 “Inverter Secondary” to “Main” P7901

Pin	Label	STBY	Run	Diode Check
1	R_VS	0V	0.046V	1.08V
2	Gnd	Gnd	Gnd	GND
3	M2_MOSI	0V	*0.04V~3.2V	1.08V
4	M2_SCLK	0V	0.43V	1.08V
5	Gnd	Gnd	Gnd	Gnd
6	n/c	0V	0V	1.07V
7	n/c	0V	1.07VZ	1.07V
8	Gnd	Gnd	Gnd	Gnd

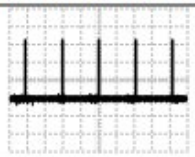
*Black to White

Diode Mode values taken with all Connectors Removed

Inverter Main and Secondary Local Dimming Control Signals Waveforms

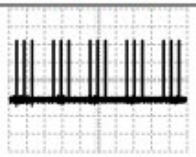
CN11 INVERTER (MAIN) FROM P7900 MAIN BOARD

Inverter Main CN11 pin 01
Black or White Screen



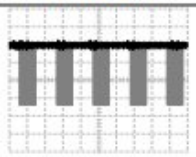
1V per/div | 2M Ses | 3.79V p/p

Inverter Main CN11 pin 02
Black Screen



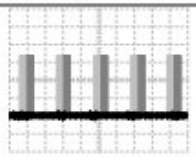
1V per/div | 2M Ses | 3.84V p/p

Inverter Main CN11 pin 02
White Screen



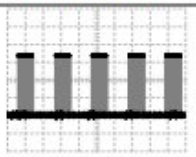
1V per/div | 2M Ses | 4.06V p/p

Inverter Main CN11 pin 03
Black Screen



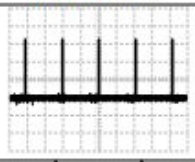
1V per/div | 2M Ses | 3.8V p/p

Inverter Main CN11 pin 03
White Screen



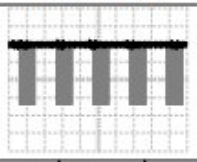
1V per/div | 2M Ses | 4.02V p/p

Inverter Main CN11 pin 05
Black Screen



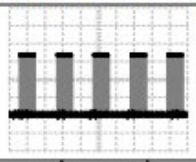
1V per/div | 2M Ses | 3.79V p/p

Inverter Main CN11 pin 05
White Screen



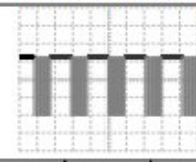
1V per/div | 2M Ses | 4.03V p/p

Inverter Main CN11 pin 06
Black or White Screen



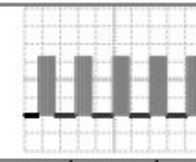
1V per/div | 2M Ses | 3.9V p/p

Inverter Main CN11 pin 08
Black or White Screen



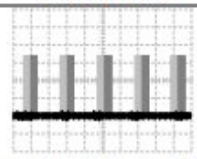
1V per/div | 2M Ses | 4.34V p/p

Inverter Main CN11 pin 09
Black Screen



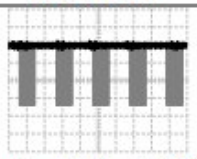
1V per/div | 2M Ses | 3.94V p/p

Inverter Main CN11 pin 09
White Screen



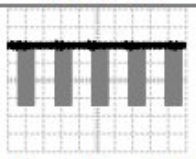
1V per/div | 2M Ses | 4.24V p/p

Inverter Main CN11 pin 10
Black Screen



1V per/div | 2M Ses | 3.4V p/p

Inverter Main CN11 pin 10
White Screen

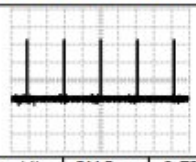


1V per/div | 2M Ses | 4.1V p/p

For clearer details see the Interconnect Diagram

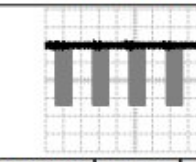
CN103 INVERTER (SECONDARY) FROM P7901 MAIN BOARD

Inverter Secondary CN103 pin 01
Black or White Screen



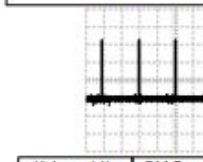
1V per/div | 2M Ses | 3.79V p/p

Inverter Secondary CN103 pin 03
Black Screen



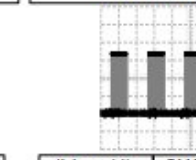
1V per/div | 2M Ses | 4.06V p/p

Inverter Secondary CN103 pin 03
White Screen



1V per/div | 2M Ses | 3.8V p/p

Inverter Secondary CN103 pin 04
Black or White Screen



1V per/div | 2M Ses | 3.9V p/p

LCD Panel Controller Board

The Frame Rate Converter IC **IC102** receives from the Main Boards LVDS Video Signals at **P802**, which is a 51 pin cable. The Video Signal is a 20 Bit (24 pin including clock and data lines) LVDS (Low Voltage Differential Signal) which it processes into TFT Drive Signals. These signals are from IC400 and IC500 to connectors **P805** and **P806** and then to the LCD TFT Panel.

T-CON/3D B+: 12V is supplied to the T-Con Board from the Main Board **P7802** and **P7802.** Delivered by two connectors **P802** and **P803** easily measured at the Test Point just to the left of these connectors, (L801 and L802).

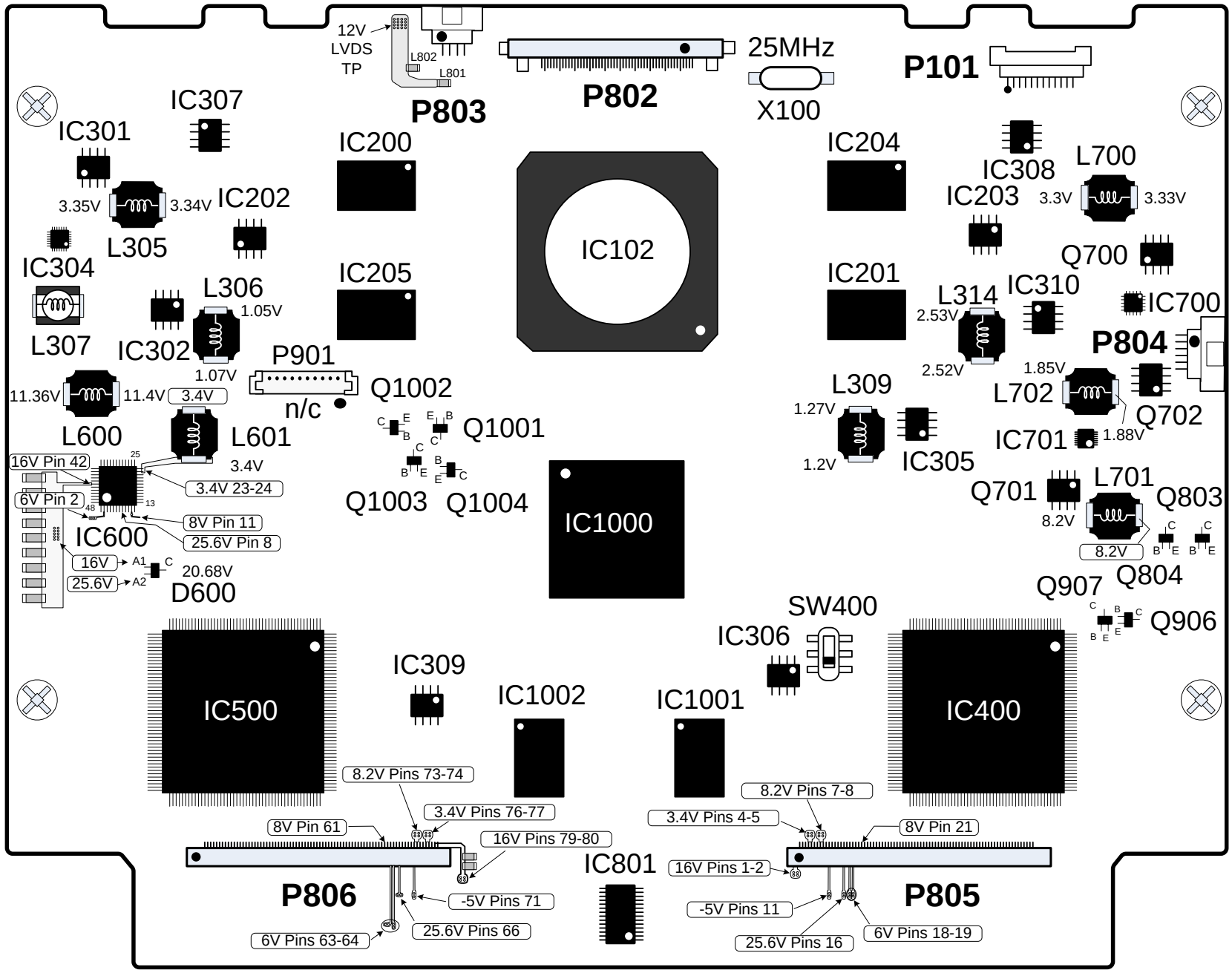
There is a primary DC to DC converter (**IC600**) that creates several voltages;
(8V Measured at pin 11), (25.63V Measured at pin 8), (6V Measured at pin 2), (16V Measured at pin 42), (3.3V Measured at pin 23-24 or L601), (-5V Created by D601 on the back side of the board). Another voltage is generated for the panel (8.17V measured at L701).

These Voltages can also be measured at the ribbon connectors delivering signals to the TFT panel using TPs.
P805: “16V” pins 1-2, “3.34V” pins 4-5, “8.17V” pins 7-8, “-4.9V” pin 11, “25.63V” pin 16, “6V” pins 18-19, “8V” pin 21, “15.75V” pins 23-24 and “3.33V” pin 45.

P806: 16V pins 79-80, 3.34V pins 76-77, 8.17V pins 73-74, -4.9V pin 71, 25.63V pin 66, 6V pins 63-64, “8V” pin 61, 15.75V pins 44 and “3.33V” pin 36.

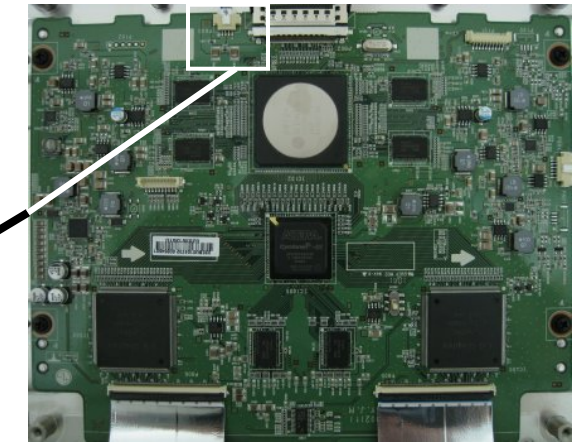
Also, See the 11X17 Foldout (Interconnect Diagram) for more details.

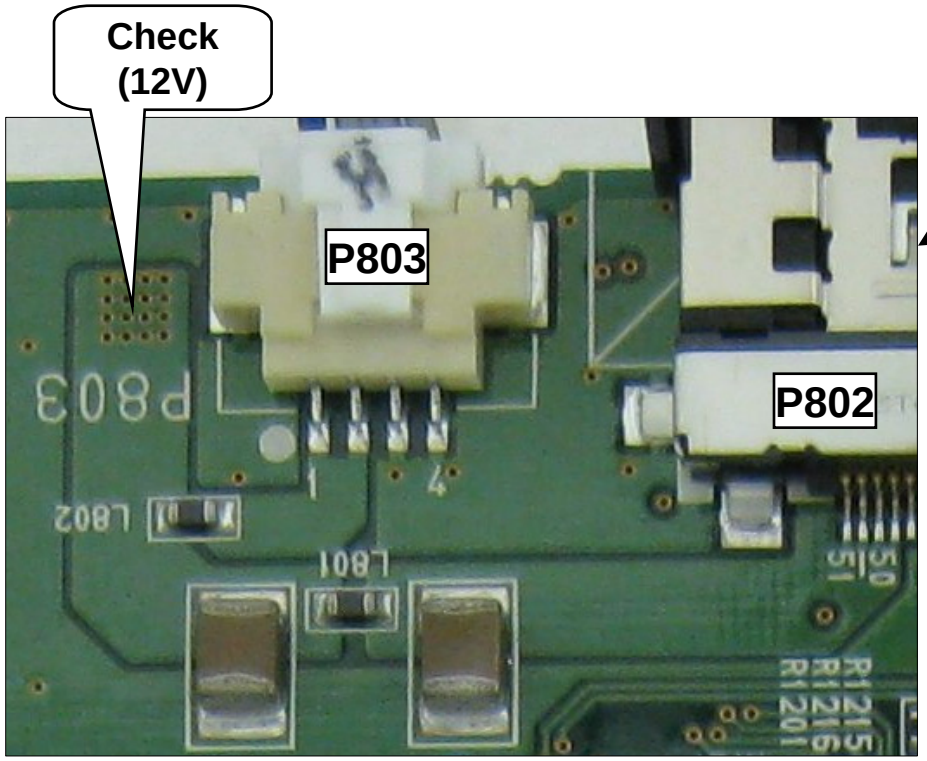
T-CON/3D Board Components Identified



T-CON/3D (TFT Drive) Board Checks

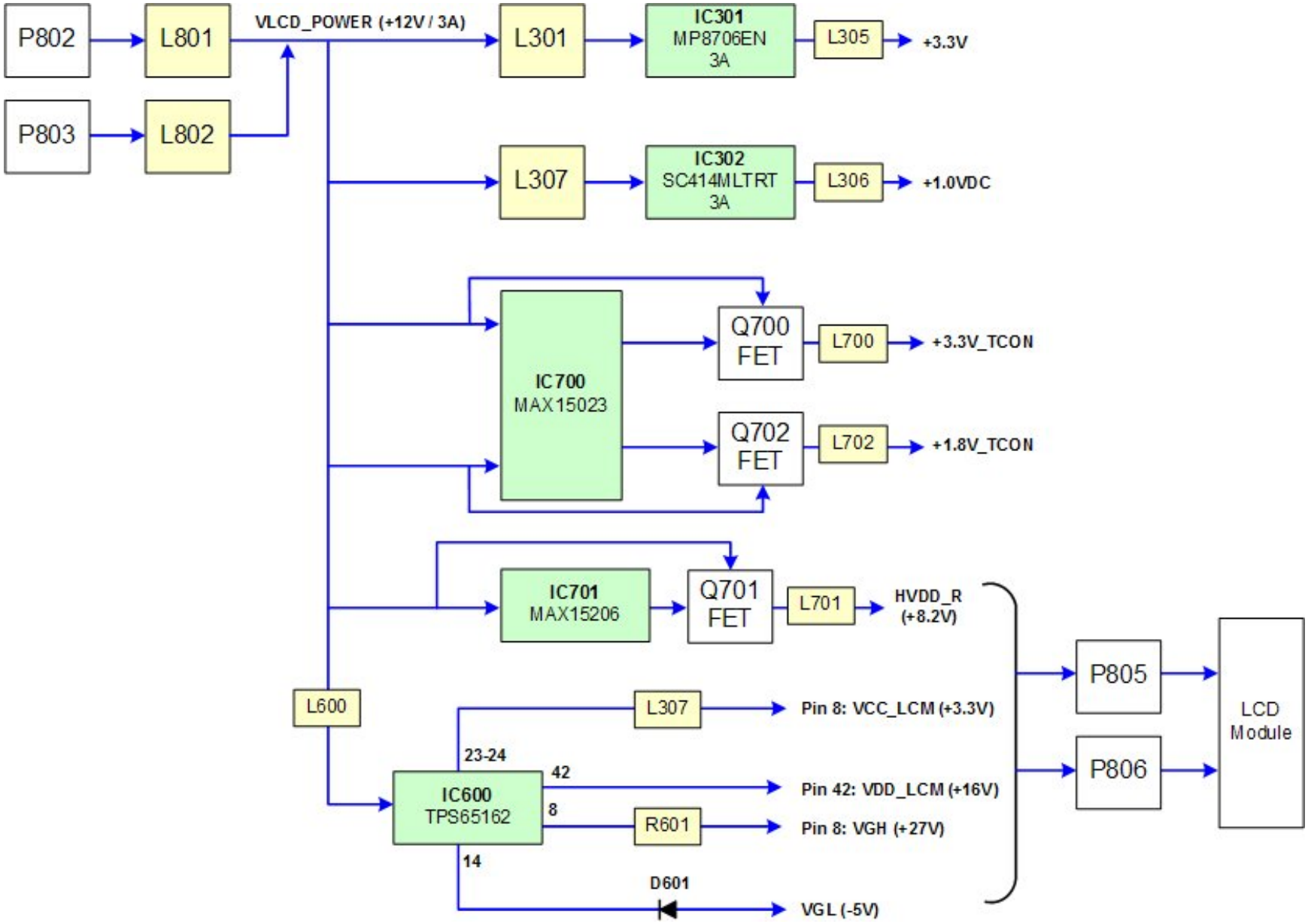
T-CON/3D Board (Locations)



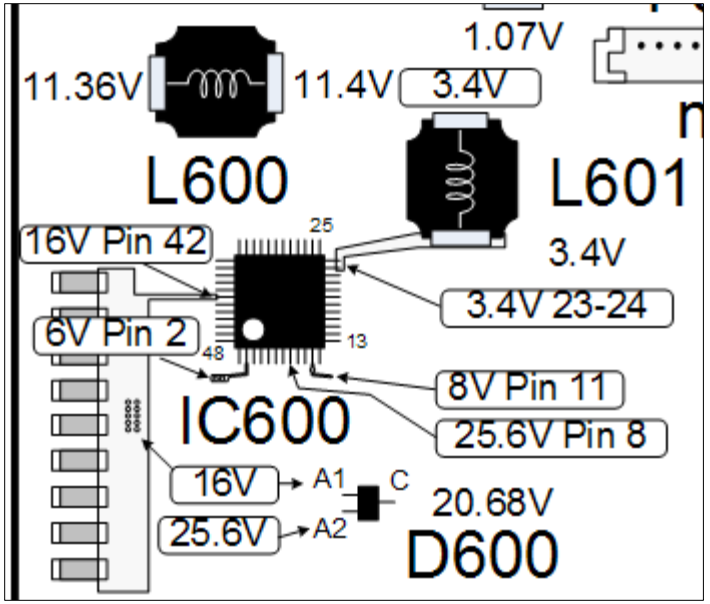


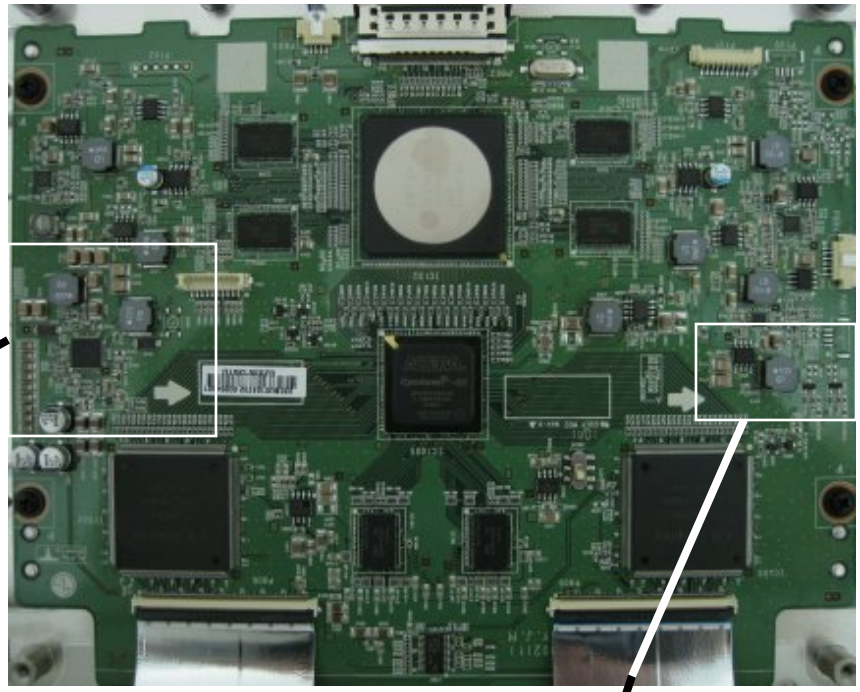
Check for 12V
Voltage supplied from P803 Pins 1-2
and/or P802 pins 49-51.

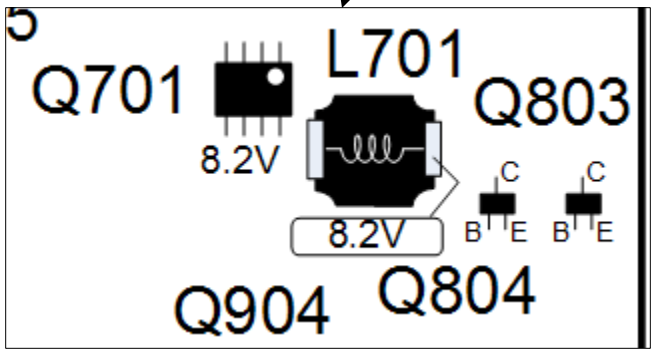
T-CON/3D 12V (VLCD_POWER) Power Development Diagram



T-CON/3D (TFT Drive) Panel Voltage Development Checks

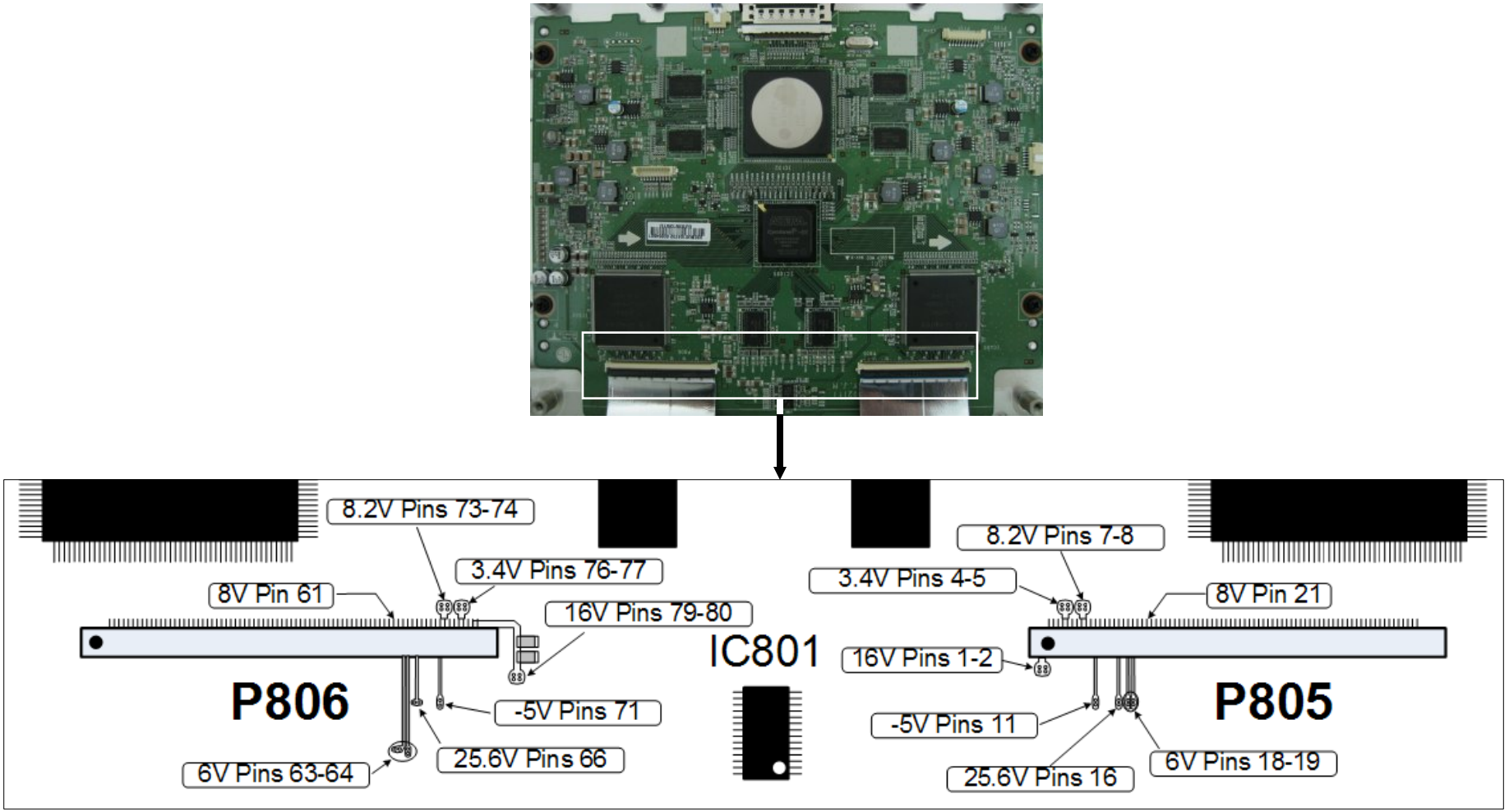






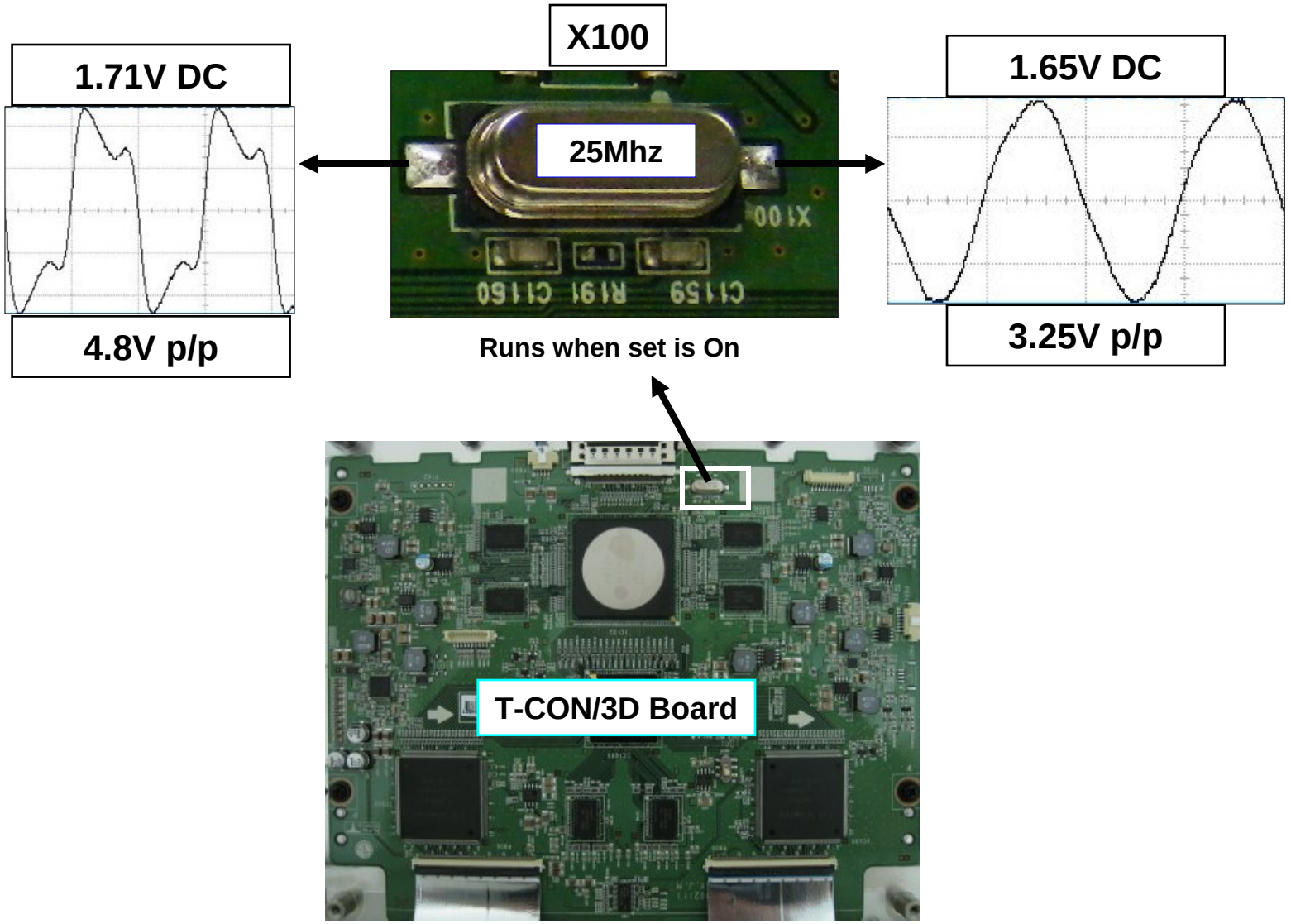
The development for the voltages for P805 and P806 connectors to the panel are shown here.
This is an excerpt from the Interconnect diagram.
Panel voltages are outlined in the rounded cornered boxes.

T-CON/3D (TFT Drive) Panel Voltage Checks



See the previous page for the development for the voltages for P806 and P805 connectors which are Panel voltages.

T-CON/3D Control Board X100 Crystal Checks



47LX9500 T-CON Component Voltages

IC202 — +1.8V DDR Reg
1) Gnd
2) 3.2V
3) 0.09V
4) 0.09V
5) 1.8V
6) 3.34V
7) 1.18V
8) 0.89V

IC203 — +1.8V DDRS Reg
1) Gnd
2) 3.27V
3) 0.89V
4) 0.9V
5) 1.8V
6) 3.34V
7) 1.8V
8) 0.9V

IC301 — +3.3V Reg
1) 11.41V
2) 3.35V
3) 3.35V
4) 8.77V
5) 3.11V
6) 0.81V
7) 5.02V
8) Gnd

IC302 — +1.0V VDC Reg
1) 0.8V
2) Gnd
3) 3.33V
4) 4.26V
5) 3.3V
6) 1.08V
7) 1.08V
8) 3.0V

IC304 — +2.5V VQ Reg
1) 0.75V
2) 5.0V
3) Gnd
4) 0V
5) 2.5V
6) 5.0V
7) 7.55V
8) 11.36V
9) 11.36V
10) 11.36V
11) 11.36V
12) 2.55V
13) Gnd
14) Gnd
15) 2.55V
16) Gnd
17) Gnd
18) Gnd
19) Gnd
20) 2.5V
21) 2.5V
22) n/c
23) 0V
24) 2.5V
25) n/c
26) Gnd
27) 1.13V
28) 10.99V

IC305 — 1V2 Reg
1) 0.8V
2) Gnd
3) 3.32V
4) 4.32V
5) 3.3V
6) 1.22V
7) 1.22V
8) 2.98V

IC306 — 1V2 Reg
1) n/c
2) 2.5V
3) 2.51V
4) n/c
5) n/c
6) 1.81V
7) 0.81V
8) Gnd

IC307 — +1.8V DDR Reg
1) n/c
2) 2.49V
3) 2.51V
4) n/c
5) n/c
6) 1.81V
7) 0.81V
8) Gnd

IC308 — +1.8V DDRS Reg
1) n/c
2) 2.47V
3) 2.49V
4) n/c
5) n/c
6) 1.8V
7) 0.8V
8) Gnd

IC309 — DDR VTT Reg
1) Gnd
2) 3.26V
3) 0.89V
4) 0.9V
5) 1.8V
6) 3.34V
7) 1.8V
8) 0.9V

IC310 — 2V5 Reg
1) 11.41V
2) 2.53V
3) 2.53V
4) 7.97V
5) 3.11V
6) 0.8V
7) 5.07V
8) Gnd

IC600 — DC-DC Conv
1) 5.96V
2) 6.03V
3) 3.15V
4) 0.17V
5) 2.72V
6) 3.3V
7) 0V
8) 25.6V
9) 24.7V
10) 1.26V
11) Gnd
12) 5.54V
13) 0V
14) 0V
15) Gnd
16) 0V
17) 1.26V
18) 4.24V
19) Gnd
20) Gnd
21) 1.27V
22) 11.45V
23) 3.4V
24) 3.4V
25) 11.38V
26) 11.38V
27) 11.07V
28) 0V
29) 4.24V
30) 1.9V
31) 0.59V
32) 3.3V
33) 3.13V
34) 0V
35) 0V
36) 0V
37) 11.33V
38) 11.37V
39) n/c
40) n/c
41) 1.27V
42) 16V
43) 5.96V
44) 5.96V
45) 5.96V
46) 5.96V
47) Gnd
48) 5.97V

IC700 — DC-DC Conv / For +3.3V TCON
1) 0.59V
2) 3.3V
3) 3.3V
4) 0V
5) 4.26V
6) Gnd
7) 1.8V
8) 7V
9) 2.7V
10) 4.78V
11) 8.47V
12) 3.33V
13) Gnd
14) 3.6V
15) 0.12V
16) 5.21V
17) 0.6V
18) 1.13V
19) 1.18V
20) Gnd
21) 11.4V
22) 0.56V
23) 0.81V
24) 0.9V

IC701 — DC-DC Conv For HVDD
1) Gnd
2) 11.68V
3) 5.26V
4) 0.73V
5) 0.58V
6) 1.97V
7) 0.59V
8) 1.20V
9) Gnd
10) 5.20V
11) 1.40V
12) 13.1V
13) 8.10V
14) 11.68V

IC801 — Data Buffer
1) 8.01V
2) 15.7V
3) 15.7V
4) 14.05V
5) 13.35V
6) 12.27V
7) 11.07V
8) Gnd
9) 16.02V
10) 10.28V
11) 8.31V
12) 7.72V
13) 3.33V
14) 3.33V
15) 3.33V
16) Gnd
17) 0V
18) Gnd
19) 4.94V
20) 3.75V
21) 2.67V
22) 16.02V
23) 0V
24) Gnd
25) 0.27V
26) 0.27V
27) 0.25V
28) 5.96V

Q803
B) 2.52V
E) 2.52V
C) 2.27V

Q804
B) 2.52V
E) 2.52V
C) 2.27V

Q906
B) 0.61V
E) Gnd
C) 0.03V

Q907
B) 0.0V
E) Gnd
C) 1.9V

Q1001
B) 0V
E) Gnd
C) 1.97V

Q1002
B) 0.6V
E) Gnd
C) 0.02V

Q1003
B) 0.59V
E) Gnd
C) 0.02V

Q1004
B) 0.02V
E) Gnd
C) 3.33V

Q700 — +3.3V TCON Reg
1) Gnd
2) 3.26V
3) 3.33V
4) 4.79V
5) 11.42V
6) 11.42V
7) 3.34V
8) 3.34V

Q701 — +8.2V HVDD Reg
1) Gnd
2) 1.42V
3) 8.16V
4) 11.7V
5) 11.42V
6) 11.42V
7) 8.2V
8) 8.2V

Q702 — +1.8V TCON Reg
1) Gnd
2) 4.27V
3) 1.89V
4) 2.72V
5) 11.41V
6) 11.41V
7) 0V
8) 1.89V

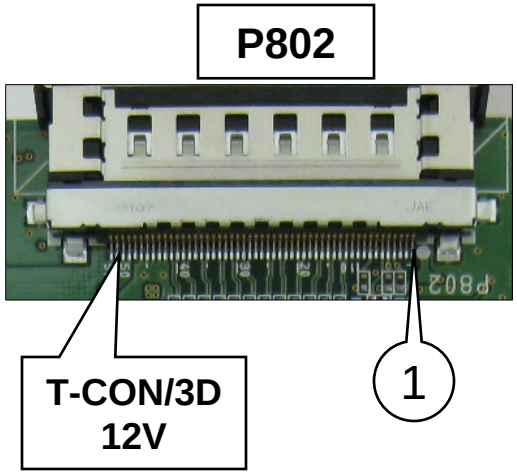
D600
A1) 16V
A2) 25.6V
C) 20.68V

T-CON/3D Board LVDS P802 to Main Board P7800 Voltage and Diode Check

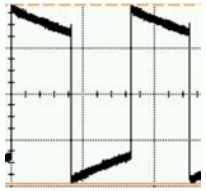
P802 LVDS Connector "T-CON/3D Board“ to P7800 "Main"

Pin	Label	Run	Diode Check
1	Gnd	Gnd	Gnd
2	3D_Sync_Out	0.03V	2.34V
3	*V_SYNC	3.33V	1V
4	SDA3_3.3V	3.34V	1.73V
5	SCL3_3.3V	3.34V	1.73V
6	FRC_RESET	3.32V	Open
7	n/c	n/c	n/c
8	3DTV	0V	Open
9	3D_DIM	0V	Open
10	3D_DIM_2	0.05V	Open
11	n/c	n/c	n/c
12	RRXA0-	1.17V	1.67V
13	RRXA0+	1.19V	1.67V
14	RRXA1-	1.19V	1.67V
15	RRXA1+	1.17V	1.67V
16	RRXA2-	1.22V	1.67V
17	RRXA2+	1.14V	1.67V
18	Gnd	Gnd	Gnd
19	RRXACK-	1.16V	1.67V
20	RRXACK+	1.20V	1.67V
21	Gnd	Gnd	Gnd
22	RRXA3-	1.20V	1.67V
23	RRXA3+	1.14V	1.67V

Pin	Label	Run	Diode Check
24	RRXA4-	1.26V	1.67V
25	RRXA4+	1.08V	1.67V
26	Gnd	Gnd	Gnd
27	n/c	n/c	n/c
28	RRXB0-	1.19V	1.67V
29	RRXB0+	1.19V	1.67V
30	RRXB1-	1.19V	1.67V
31	RRXB1+	1.16V	1.67V
32	RRXB2-	1.2V	1.67V
33	RRXB2+	1.14V	1.67V
34	Gnd	Gnd	Gnd
35	RRXBCK-	1.16V	1.67V
36	RRXBCK+	1.2V	1.67V
37	Gnd	Gnd	Gnd
38	RRXB3-	1.22V	1.67V
39	RRXB3+	1.14V	1.67V
40	RRXB4-	1.26V	1.67V
41	RRXB4+	1.09V	1.67V
42-46	Gnd	Gnd	Gnd
47	n/c	n/c	n/c
48-51	PANEL_VCC	11.59V	Open



Text in Blue are LVDS video signals.



*Pin 2
5.5V p/p 60 Hz
3D-Sync

*Pin 2 Only active when a 3D source is played. (1.63V)

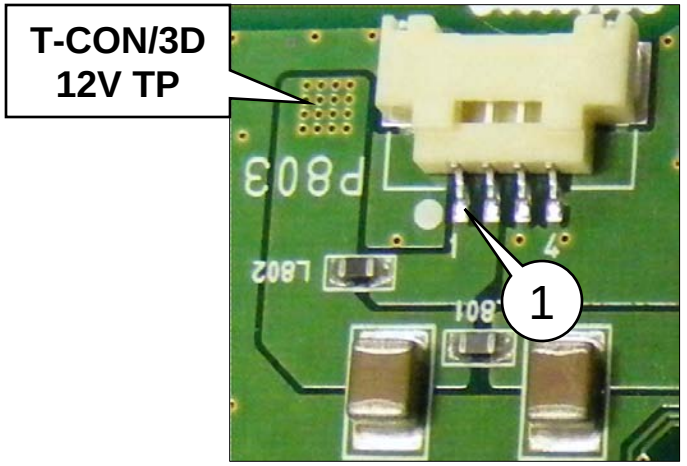
T-CON/3D B+

Diode Check taken with meter in Diode Mode with all Connectors Removed

T-CON/3D Board P803 and P804 to Main Board Voltage and Diode Check

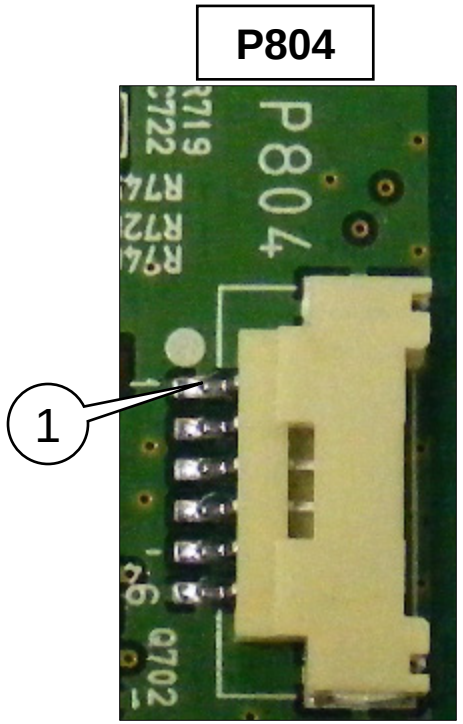
P803 Connector "T-CON/3D Board“ to P7802 "Main"

Pin	LABEL	Run	Diode Check
1	PANEL_VCC	11.55V	Open
2	PANEL_VCC	11.55V	Open
3	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd



P804 Connector "T-CON/3D Board“ to P7803 "Main"

Pin	LABEL	Run	Diode Check
1	Gnd	Gnd	Gnd
2	E_TCK	0V	Open
3	E_TDO	3.33V	Open
4	E_TMS	0.35V	Open
5	E_TDI	3.32V	Open
6	Gnd	Gnd	Gnd



Diode Check taken with meter in Diode Mode with all Connectors Removed

T-CON/3D Board P805 to the Panel Voltages

1	**VDD (16V)**	16V
2	**VDD (16V)**	16V
3	Gnd	Gnd
4	**VCC (3.3V)**	3.4V
5	**VCC (3.3V)**	3.4V
6	Gnd	Gnd
7	**HVDD (8V)**	8.2V
8	**HVDD (8V)**	8.2V
9	Gnd	Gnd
10	OPT_P	n/c
11	**VGL (-5V)**	(-5V)
12	Gnd	Gnd
13	GOE	0.83V
14	GSC	2.3V
15	Gnd	Gnd
16	**VGH (26V)**	25.6V
17	Gnd	Gnd
18	**VCOMRFB**	6V
19	**VCOM ROUT**	6V
20	Gnd	Gnd
21	Z_OUT	8V
22	Gnd	Gnd
23	V1	15.75V
24	V2	15.75V
25	V3	14V
26	V4	13.35V
27	V5	12.27V

28	V6	11.08V
29	V7	10.28V
30	V9	8.31V
31	V10	7.71V
32	V12	3.37V
33	V13	4.94V
34	V14	3.75V
35	V15	2.68V
36	V16	1.97V
37	V17	0.27V
38	V18	0.26V
39	Gnd	Gnd
40	GSP	0V
41	POL	1.66V
42	Gnd	Gnd
43	SOE_R	0.25V
44	H_CONV	0.44V
45	OPT_N	3.33V
46	Gnd	Gnd
47	RLMVOP	0.15V
48	RLMVON	0.17V
49	RLMV1P	0.14V
50	RLMV1N	1.24V
51	RLMV2P	1.13V
52	RLMV2N	1.22V
53	Gnd	Gnd

54	RLMVCLKP	1.19V
55	RLMVCLKN	1.18V
56	Gnd	Gnd
57	RLMV4P	1.15V
58	RLMV4N	1.24V
59	RLMV5P	1.34V
60	RLMV5N	1.22V
61	RLMV6P	1.12V
62	RLMV6N	1.23V
63	Gnd	Gnd
64	RRMV0P	1.13V
65	RRMV0N	1.23V
66	RRMV1P	1.15V
67	RRMV1N	1.23V
68	RRMV2P	1.15V
69	RRMV2N	1.23V
70	Gnd	Gnd
71	RRMVCLKP	1.19V
72	RRMVCLKN	1.18V
73	Gnd	Gnd
74	RRMV4P	1.13V
75	RRMV4N	1.24V
76	RRMV5P	1.11V
77	RRMV5N	1.12V
78	RRMV6P	1.12V
79	RRMV6N	1.22V
80	Gnd	Gnd

T-CON/3D Board P806 to the Panel Voltages

1	Gnd	Gnd
2	LLMV0P	1.19V
3	LLMV0N	1.24V
4	LLMV1P	1.18V
5	LLMV1N	1.3V
6	LLMV2P	1.15V
7	LLMV2N	1.29V
8	Gnd	Gnd
9	LLMVCLKP	1.22V
10	LLMVCLKN	1.23V
11	Gnd	Gnd
12	LLMV4P	1.18V
13	LLMV4N	1.26V
14	LLMV5P	1.26V
15	LLMV5N	1.27V
16	LLMV6P	1.16V
17	LLMV6N	1.26V
18	Gnd	Gnd
19	LRMV0P	1.17V
20	LRMV0N	1.28V
21	LRMV1P	1.15V
22	LRMV1N	1.26V
23	LRMV2P	1.17V
24	LRMV2N	1.27V
25	Gnd	Gnd
26	LRMVCLKN	1.21V
27	LRMVCLKP	1.23V

28	Gnd	Gnd
29	LRMV4P	1.15V
30	LRMV4N	1.25V
31	LRMV5P	1.18V
32	LRMV5N	1.26V
33	LRMV6P	1.17V
34	LRMV6N	1.25V
35	Gnd	Gnd
36	OPT_N	3.33V
37	H_CONV	Gnd
38	GSP	0V
39	POL	1.66V
40	Gnd	Gnd
41	SOE_L	0.24V
42	Gnd	Gnd
43	V1	15.75V
44	V2	15.75V
45	V3	14V
46	V4	12.26V
47	V5	11.07V
48	V6	11.07V
49	V7	10.27V
50	V9	8.31V
51	V10	5.74V
52	V12	Gnd
53	V13	4.94V

54	V14	3.75V
55	V15	2.68V
56	V16	0.27V
57	V17	0.26V
58	V18	0.26V
59	Gnd	Gnd
60	Gnd	Gnd
61	Z_OUT	8V
62	Gnd	Gnd
63	**VCOMLOUT**	6V
64	**VCOMLFB**	6V
65	Gnd	Gnd
66	**VGH (26V)**	25.6V
67	Gnd	Gnd
68	GSC	2.3V
69	GOE	0.83V
70	Gnd	Gnd
71	**VGL (-5V)**	(-5V)
72	Gnd	Gnd
73	**HVDD (8V)**	8.2V
74	**HVDD (8V)**	8.2V
75	Gnd	Gnd
76	**VCC (3.3V)**	3.4V
77	**VCC (3.3V)**	3.4V
78	Gnd	Gnd
79	**VDD (16V)**	16V
80	**VDD (16V)**	16V

MAIN BOARD SECTION

The Main board receives its operational B+ from the Power Supply via P8000.
There are a single LVDS cable that feeds the Video to the T-CON/3D (TFT Driver) board that drives the Panel. The LVDS cable carries the 20 bit LVDS Video and the TruMotion (Motion Estimated Motion Compensated) video. The Main board also includes the Tuner, Audio and Audio/Video inputs and selection circuits.

Input Voltages from SMPS.

STAND-BY
- **STBY 3.5V (P8000 pins 9~12)**

RUN
- **12V pins 13, 19 and 21.**
- **24V pins 2-4.**

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

STAND-BY VOLTAGES
- **3.3V_ST (Voltage direct from SMPS)**

LVDS
- **Panel_VCC (12V Not generated, but switched from the 12V arriving from the SMPS.**

TUNER and VSB CIRCUIT (Made from the 12V)
- **5V_Normal which is used to make 5V TU**
- **5V_TU**
- **3.3V_TU**
- **1.26V_TU**

WIRELESS VOLTAGES
- **24V (Switched from 24V from SMPS)**

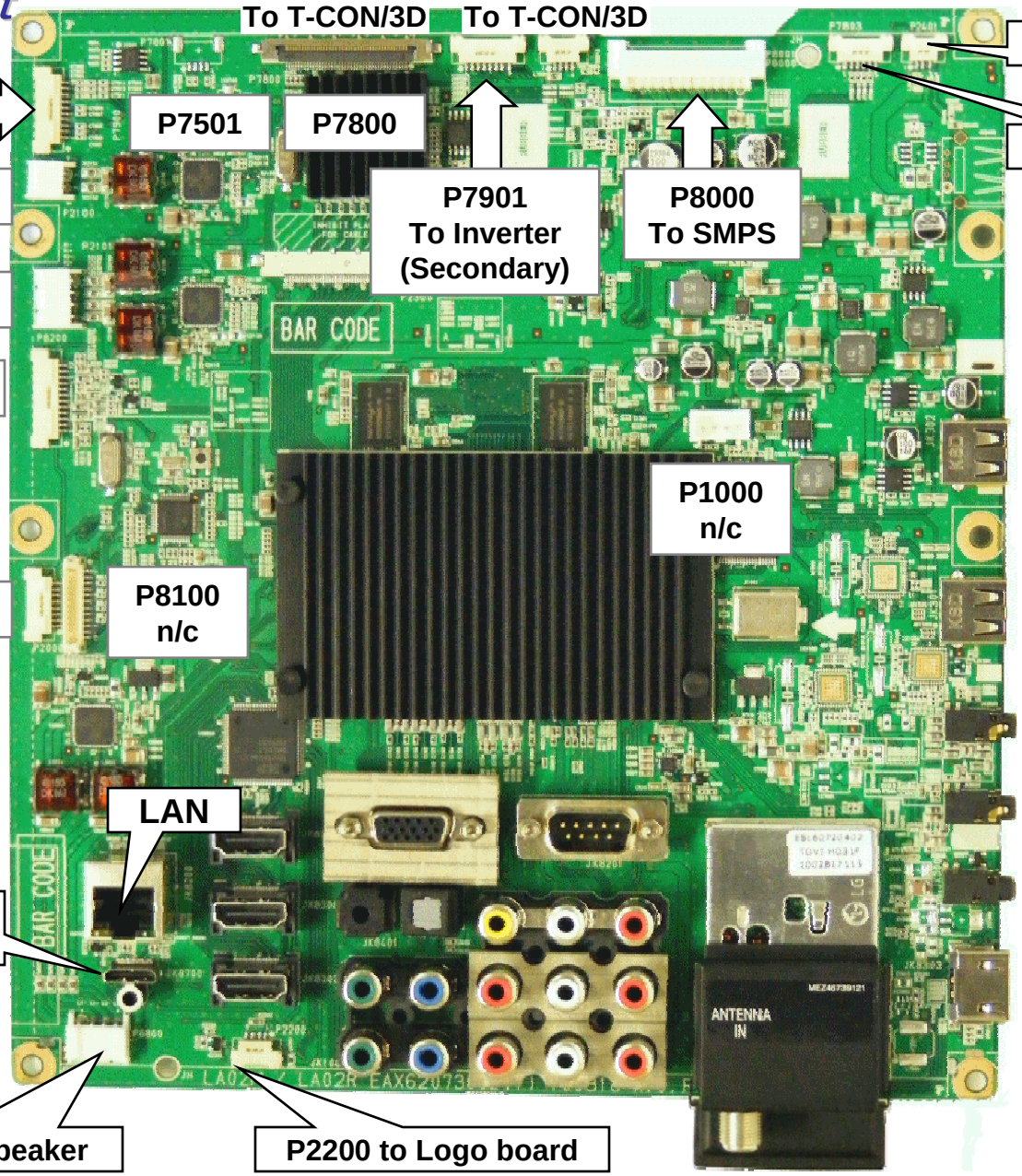
GENERAL
- **5V_Normal**
- **5V USB**

AUDIO (IC8801)
- **1.8V**
- **3.3V**

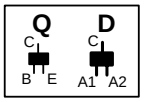
BCM IC900 Video Processors
- **1.2V**

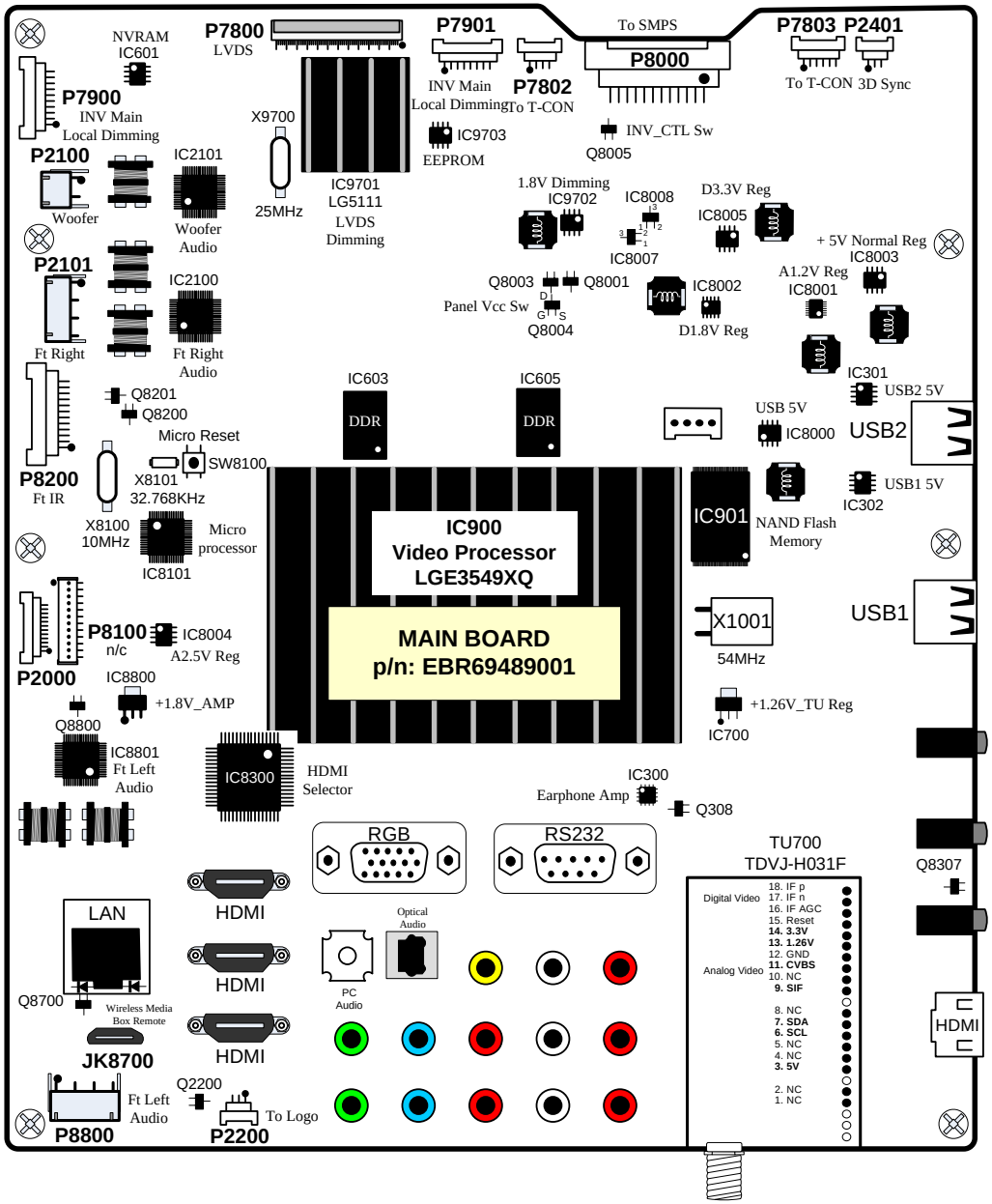
IC9701 Tru-Motion and Local Dimming IC.
- **1.26V_MEMC, 1.5V_MEMC, D1.5V, D1.8V, and 3.3V**

Main Board Layout



47LX9500 Main Layout





47LX9500 Main (Front Side) Component Voltages

IC300 Earphone Amp

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V (HP R Out)
[6]	3.3V
[7]	3.3V
[8]	(-1.8V)
[9]	(-0.88V)
[10]	Gnd
[11]	0.94V
[12]	1.83V
[13]	3.32V (Mute)
[14]	3.32V (B+)
[15]	Gnd
[16]	0V (HP L Out)

IC301 USB 2 5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC302 USB 1 5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

Q8005 INV_ON Driver

Pin	
B	0V (INV ON) En
C	2.97V (Out)
E	Gnd

IC601 NVRAM

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

IC700 (+1.26V_TU) Regulator

Pin	
[1]	0V (Gnd)
[2]	1.27V (Out)
[3]	3.32V (B+)

IC8000 5V Regulator for USB

Pin	
[1]	11.75V (B+)
[2]	5.1V (Out)
[3]	5.1V (Out)
[4]	10.5V
[5]	3.3V
[6]	0.81V
[7]	5.06V
[8]	0V (Gnd)

IC8001 D1.2V and A1.2V Regulator

Pin	
[1]	0V (Gnd)
[2]	3.3V
[3]	0V (Gnd)
[4]	1.27V
[5]	3.32V
[6]	n/c
[7]	4.48V
[8]	3.32V
[9]	3.32V
[10]	3.34V
[11]	1.28V
[12]	Gnd
[13]	3.3V
[14]	0.82V

Q8307 Side HDMI Hot Swap

Pin	
B	0V
C	4.32V
E	Gnd

IC8002 D1.8V Regulator

Pin	
[1]	5V
[2]	3.35V (B+)
[3]	1.83V (Out)
[4]	Gnd
[5]	Gnd
[6]	2.36V
[7]	0.91V
[8]	1.05V
[9]	2.4V
[10]	3.37V (PWR On/Off1 Ctl)

IC8003 (+5V_NORMAL) Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.86V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	5.17V (In)
[8]	5.17V (In)

IC8004 A2.5V Regulator for USB

Pin	
[1]	n/c
[2]	3.26V (B+)
[3]	3.26V (B+)
[4]	n/c
[5]	n/c
[6]	2.57V (Out)
[7]	0.83V
[8]	Gnd

Q8200 IR Buffer 2nd

Pin	
B	0.56V
C	0V
E	Gnd

Q8201 IR Buffer 1st

Pin	
B	0V
C	3.36V
E	Gnd

IC8005 (+3.3V_NORMAL) And D3.3V Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.89V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	3.36V (Out)
[8]	3.36V (Out)

IC8007 Power Det Gen (+12V and +3.5V)

Pin	
[1]	Gnd
[2]	3.6V (B+
[3]	3.5V (Out)

IC8008 Power Det Gen (+24V)

Pin	
[1]	Gnd
[2]	3.64V (B+)
[3]	3.76V (Out)

IC8800 (+1.8V_AMP) Regulator

Pin	
[1]	Gnd
[2]	1.8V (Out)
[3]	3.3V (B+)

IC9702 (+1.8V_L/Dimming) Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V (FB)
[5]	0.77V
[6]	3.34V
[7]	3.32V (Out)
[8]	3.34V (Out)

Q8700 Wireless PWR Turns on Q8701

Dongle In

B	0.66V (0.0V w/Dongle In)
C	0.14V (24V w/Dongle In)
E	Gnd

Dongle Out

B	0V (0.0V w/Dongle Out)
C	24.6V (24V w/Dongle Out)
E	Gnd

IC9703 EEPROM for LG5111

Pin	
[1]	Gnd
[2]	3.34V
[3]	Gnd
[4]	Gnd
[5]	3.34V
[6]	3.34V
[7]	3.32V
[8]	3.34V (B+)

Q308 Headphone Mute

Pin	
B	0V
C	3.32V
E	Gnd

Q2200 LOGO Driver

Pin	
B	0.36V
C	0.66V
E	Gnd

Q8001 PANEL_VCC Control 1st Driver

Pin	
B	0V
C	0.68V
E	Gnd

Q8003 PANEL_VCC Control 2nd Driver

Pin	
B	0.66V
C	0V
E	Gnd

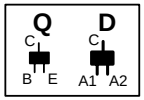
Q8004 PANEL_VCC Switch

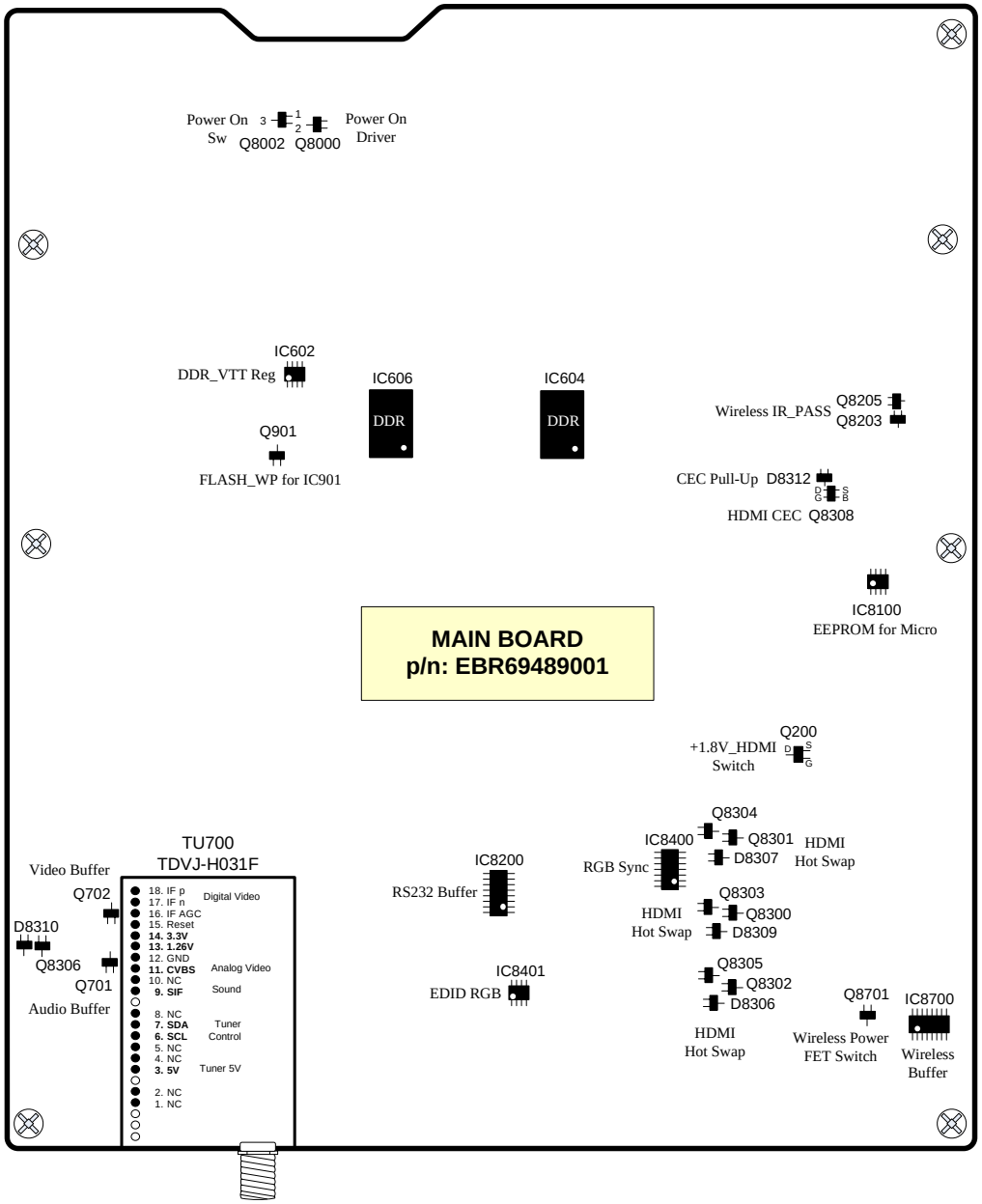
Pin	
S	11.62V (In)
G	1.8V (Enable)
D	11.8V (Out)

Q8800 AMP Mute to AMP_MUTE1 IC8801

Pin	
B	0V
C	3.34V
E	Gnd

47LX9500 Main (Back Side) Layout





47LX9500 Main (Back Side) Component Voltages

IC602 — D1.8V Regulator

Pin	
[1]	0V (Gnd)
[2]	3.29V (PWR On/Off1 Ctl)
[3]	0.9V (DDR_VTT)
[4]	0.93V
[5]	1.83V
[6]	3.38V (In)
[7]	1.8V (Out)
[8]	0.91V (DDR_VTT)

IC8100 — EEPROM Micro

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	0V (Gnd)
[8]	3.37V

IC8200 — RS232 Routing

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V
[6]	(-5.47V)
[7]	n/c (5.59V)
[8]	n/c (0V)
[9]	n/c (3.3V)
[10]	n/c (0.2V)
[11]	n/c (3.3V)
[12]	3.35V
[13]	0V
[14]	(-5.47V)
[15]	0V (Gnd)
[16]	3.37V

IC8400 — RGB H/V Sync

Pin	
[1]	1.9V
[2]	1.9V
[3]	4.4V
[4]	0V
[5]	0.9V
[6]	n/c (4.5V)
[7]	0V (Gnd)
[8]	n/c (4.5V)
[9]	n/c (1.9V)
[10]	n/c (1.9V)
[11]	n/c (4.5V)
[12]	0.9V
[13]	0.9V
[14]	5V

IC8401 — EDID Data PC

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	0.7V
[6]	4.1V
[7]	4.5V
[8]	4.5V (In)

IC8700 — Wireless Buffer

Pin	
[1]	0V (3.3V Dongle In)
[2]	3.3V (0.3V Dongle In)
[3]	n/c
[4]	n/c
[5]	n/c
[6]	Gnd
[7]	Gnd
[8]	Gnd
[9]	n/c
[10]	0.02V
[11]	0V
[12]	3.3V
[13]	0V (3.3V Dongle In)
[14]	3.3V
[15]	3.3V
[16]	3.3V

D8306,7,9,10 — 5V Pull Up Routing HDMI SCL/SDA

Pin	
A1	5.04V
C	4.58V
A2	0V

D8312 — 3.5V Pull Up HDMI CEC

Pin	
A1	0V
C	3.26V
A2	3.2V

Q200 — (1.8V_HDMI) Switch

Pin	
S	1.83V (Out)
G	3.35V (PWR On/Off2 Ctl)
D	1.83V (In)

Q701 — Tuner SIF (Sound) Buffer

Pin	
B	0.16V
C	Gnd
E	0.83V

Q702 — Tuner Video (Analog) Buffer

Pin	
B	2.05V
C	2.75V
E	Gnd

Q901 — FLASH_WP for IC901

Pin	
B	0V (Flash_WP)
C	3.36V
E	Gnd

Q8000 — RL_ON (PWR_On) 1st Driver

Pin	
B	0.66V
C	0V
E	Gnd

Q8002 — PWR_ON Switch

Pin	
[1]	3.36V (In)
[2]	0V
[3]	3.3V (Out)

Q8203 — IR Wireless Pass 2nd Driver

Pin	
B	0V
C	3.3V
E	Gnd

Q8205 — IR Wireless Pass 1st Driver

Pin	
B	0.6V
C	0V
E	Gnd

Q8300,1,2,6 — HDMI 1 Hot Swap

Pin	
B	4.2V
C	0V
E	Gnd

Q8303,4,5,7 — HDMI Hot Swap

Pin	
B	0V
C	4.2V
E	Gnd

Q8308 — CEC Remote HDMI CEC

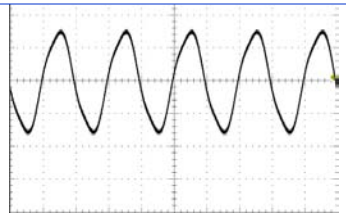
Pin	
[B]	2.72V
[G]	2.73V
[S]	3.27V
[D]	3.37V

Q8701 — IR Wireless Pass 2nd Driver

Pin	
G	24.5V (2.3V Dongle In)
S	24V
D	0V (24.5V Dongle In)

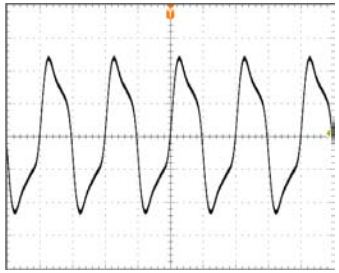
Main Board X9701 and X1001 Crystal Checks

IC9701 TruMotion / Dimming Crystal



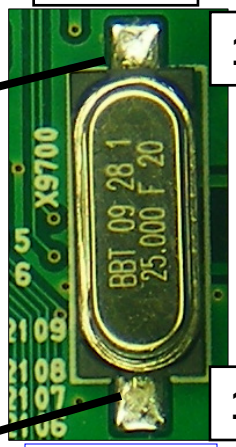
3.55V p/p

4.5V p/p



Runs when set is On

X9701



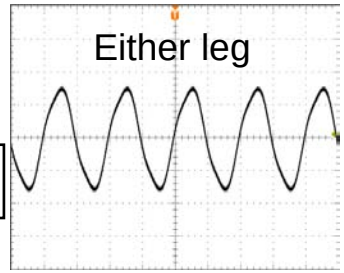
1.6V

1.6V

25Mhz

Runs when set is On

746mV p/p

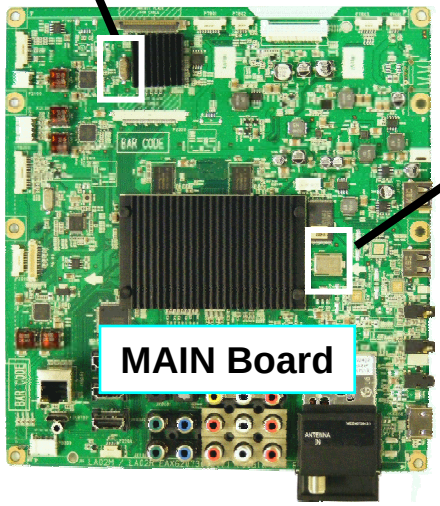


725mV p/p

IC1001 BCM Overtone

X1001 (54Mhz)

Do not measure with Digital Volt meter



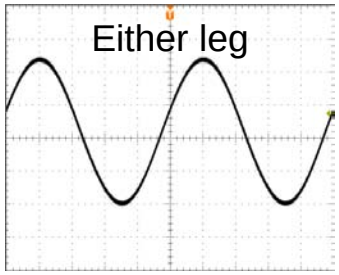
MAIN Board

Main Board X8100 and X8101 Crystal Checks

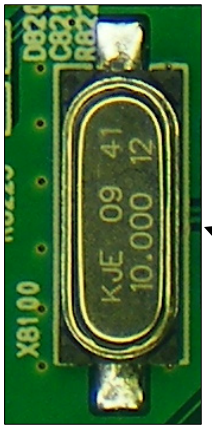
IC8100 Micro Crystal

X8100

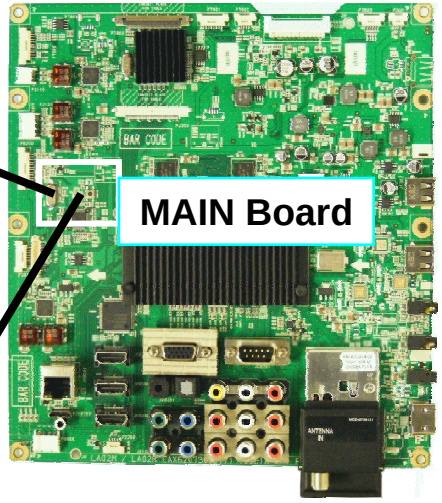
3.48V p/p Top leg



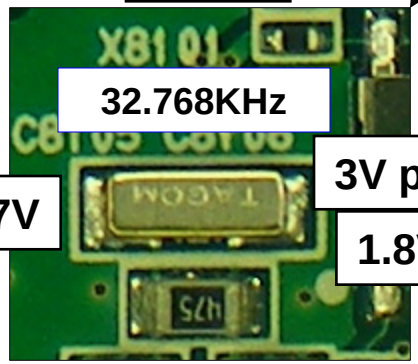
2.46V p/p Bottom leg



Runs all the time



X8101

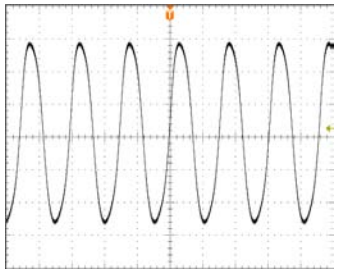


Can not read
A Waveform on
left side

1.47V

3V p/p

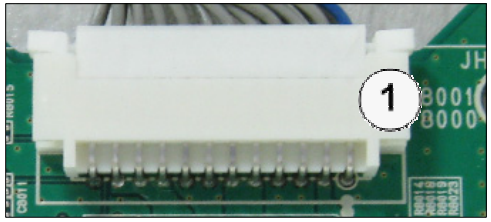
1.8V



Runs all the time

Main Board Connector P8000 to Power Supply Voltage and Diode Check

P8000



Odd Pins Front Row

P8000 "Main Board" to P201 "SMPS"

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	Open
2-4	24V	0V	24.7V	Open
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.45V	3.41V	1.18V
13-15	Gnd	Gnd	Gnd	Gnd
16	n/c	n/c	n/c	Open
17	12V	0V	11.88V	Open
18	INV-ON	0V	2.92V	1.61V
19	12V	0V	11.881V	Open
20	[1]P-DIM	0V	0.37V~3.3V	Open
21	12V	0V	11.88V	Open
22	n/c	n/c	n/c	Open
23	n/c	n/c	n/c	Open
24	ERROR	0V	0V	Open

(1) PDIM Pin 20 can vary according to incoming video IRE level, OSD Backlight setting and Intelligent Sensor (room light condition). Range 0.37V to 3.3V.

Diode Mode values taken with all Connectors Removed

Main Board Connector P7800 to T-CON/3D P802 Voltage and Diode Check

P7800 Connector “Main" to “T-CON/3D“ P802

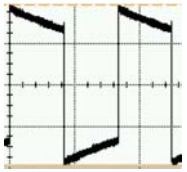
There are no Stand-By Voltages for the Connector
Diode Mode values taken with all Connectors Removed

Pin	Label	Run	Diode Check
1	PANEL_VCC	11.59V	Open
2	PANEL_VCC	11.59V	Open
3	PANEL_VCC	11.59V	Open
4	PANEL_VCC	11.59V	Open
5	n/c	n/c	n/c
6	Gnd	Gnd	Gnd
7	Gnd	Gnd	Gnd
8	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd
10	Gnd	Gnd	Gnd
11	RRXB4+	1.09V	0.97V
12	RRXB4-	1.26V	1.15V
13	RRXB3+	1.14V	0.97V
14	RRXB3-	1.22V	1.15V
15	Gnd	Gnd	Gnd
16	RRXBCK+	1.2V	0.97V
17	RRXBCK-	1.16V	1.15V

Pin	Label	Run	Diode Check
18	Gnd	Gnd	Gnd
19	RRXB2+	1.14V	0.97V
20	RRXB2-	1.2V	1.15V
21	RRXB1+	1.16V	0.97V
22	RRXB1-	1.19V	1.15V
23	RRXB0+	1.19V	0.97V
24	RRXB0-	1.19V	1.15V
25	n/c	n/c	n/c
26	Gnd	Gnd	Gnd
27	RRXA4+	1.08V	0.97V
28	RRXA4-	1.26V	1.15V
29	RRXA3+	1.14V	0.97V
30	RRXA3-	1.2V	1.15V
31	Gnd	Gnd	Gnd
32	RRXACK+	1.2V	0.97V
33	RRXACK-	1.16V	1.15V
34	Gnd	Gnd	Gnd

Pin	Label	Run	Diode Check
35	RRXA2+	1.14V	0.97V
36	RRXA2-	1.22V	1.15V
37	RRXA1+	1.17V	0.97V
38	RRXA1-	1.19V	1.15V
39	RRXA0+	1.19V	0.97V
40	RRXA0-	1.17V	1.15V
41	n/c	n/c	n/c
42	3D_DIM_2	0.05V	1.03V
43	3D_DIM	0V	1.03V
44	3DTV	0V	Open
45	n/c	n/c	n/c
46	FRC_RESET	3.32V	Open
47	SCL3_3.3V	3.34V	1.04V
48	SDA3_3.3V	3.34V	1.04V
49	V_SYNC	3.33V	0.998V
50	*3D_Sync_Out	0.03V	Open
51	Gnd	Gnd	Gnd

*Pin 50 Only active when a 3D source is played. (1.63V) → 5.5V p/p 60 Hz 3D-Sync

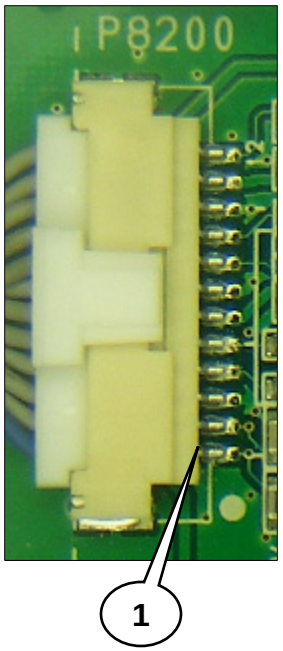


Main Board P8200 to (Ft. IR/Intelligent Sensor) Voltage and Diode Check

P8200 Connector "MAIN Board" To J1 "IR Board"

Pin	Label	STBY	Run	Diode Check
1	[1]SCL	3.45V	3.37V	Open
2	[1]SDA	3.45V	3.37V	Open
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.45V	3.37V	1.86V
5	KEY 2	2.76V	2.7V	1.86V
6	3.5V_ST	3.46V	3.37V	1.18V
7	Gnd	Gnd	Gnd	Gnd
8	LED_LOGO	0V	0.82V	2.2V
9	[2]IR	1.57V	1.52V	Open
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0V	3.33V	0.51V
12	LED_R/BUZZ	0V	0V	Open

P8200



(1) Clock pulses only present when Intelligent Sensor is turned on. (3.7V p/p)
(2) IR pulses (2.5V p/p)

Diode Mode values taken with all Connectors Removed

Main P7900 / P7901 to Inverters and P2200 (Voltage and Diode Check)

Inverter Run voltages taken with built in test pattern white or black where indicated.

P7900 "Main" to "Inverter Main" CN11

Pin	Label	STBY	Run *White to Black	Diode Check
1	L_VS	0V	0.059V	1.05V
2	M0_MOSI	0V	*0.04V~3.26V	1.05V
3	M0_SCLK	0V	0.42V	1.05V
4	GND	GND	GND	GND
5	M1_MOSI	0V	*0.04V~3.26V	1.05V
6	M1_SCLK	0V	0.42V	1.05V
7	GND	GND	GND	GND
8	S_CS_N	0V	1.96V	1.05V
9	S_MOSI	0V	*0.15V~0.32V	1.05V
10	S_SCLK	0V	2.72V	1.05V

P7901 "Main" to "Inverter Secondary" CN103

Pin	Label	STBY	Run *White to Black	Diode Check
1	R_VS	0V	0.04V	1.08V
2	Gnd	Gnd	Gnd	Gnd
3	M2_MOSI	0V	*0.04V~3.2V	1.08V
4	M2_SCLK	0V	0.23V	1.08V
5	Gnd	Gnd	Gnd	Gnd
6	M3_MOSI	0V	0V	1.07V
7	M3_SCLK	0V	0V	1.07V
8	Gnd	Gnd	Gnd	Gnd

P2200 "Main" To "LG LOGO"

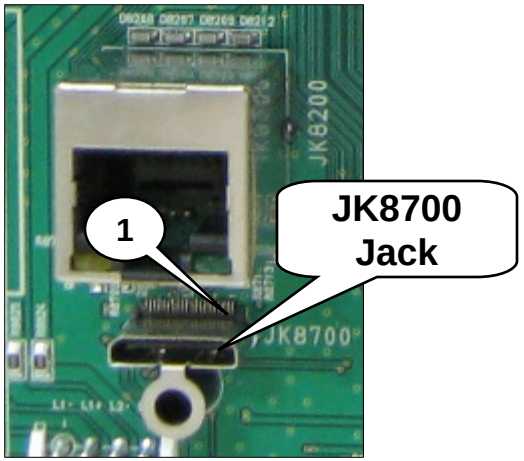
Pin	LABEL	SBY	Run	Diode Check
1	**3.5V_ST**	3.46V	3.37V	Open
2	**Gnd**	Gnd	Gnd	Gnd
3	**Logo Drive**	2.19V	0.69V	Open
4	**Gnd**	Gnd	Gnd	Gnd

Diode Mode values taken with all Connectors Removed

Main JK8700 Wireless Media Box Dongle Jack (Voltage and Diode Check)

JK8700 Jack "MAIN Board" To "Wireless Dungle"

Pin	Label	STBY	Run	Diode Check
1-6	*24V	0V	24.65V	Open
7	Detect	0V	0.3V	2.8V
8	Interrupt	0V	3.3V	Open
9	Gnd	0V	Gnd	Gnd
10	n/c	0V	3.3V	Open
11	Gnd	0V	Gnd	Gnd
12	I2C_SCL	0V	3.3V	1.04V
13	I2C_SDA	0V	3.3V	1.04V
14	Gnd	0V	Gnd	Gnd
15	Wireless_RX	0V	3.3V	1.8V
16	Wireless_TX	0V	3.3V	1.8V
17	Gnd	0V	Gnd	Gnd
18	IR	0.67V	3.3V	Open
19-20	Gnd	0V	Gnd	Gnd



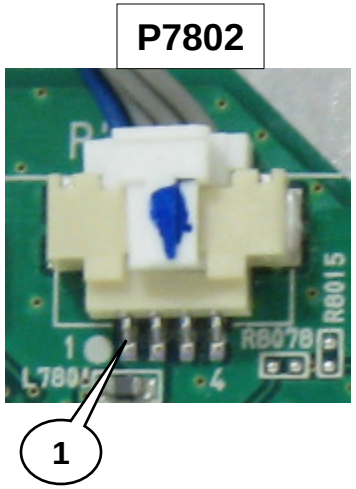
Diode Mode values taken with all Connectors Removed

Voltages with Wireless Media Box Dongle plugged in.
(Use Dongle side to read voltages. Remove cover).
*24V Switched from Q8701 Drain Back side of the board.
Q8701 turned on by Q8700 front side of the board.
Q8700 turned on by Microprocessor pin 38.

Main P7802, P7803 to T-CON/3D board (Voltage and Diode Check)

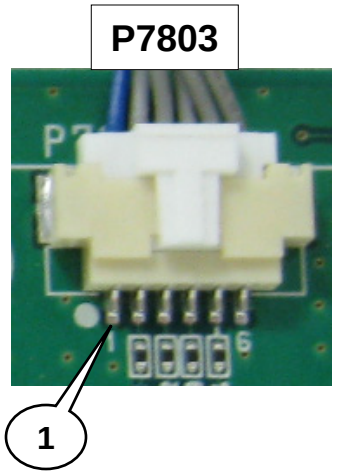
P7802 "Main" To "T-CON/3D" P803

Pin	LABEL	SBY	Run	Diode Check
1	PANEL_VCC	0V	11.55V	Open
2	PANEL_VCC	0V	11.55V	Open
3	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd



P7803 "Main" To "T-CON/3D" P807

Pin	LABEL	SBY	Run	Diode Check
1	Gnd	Gnd	Gnd	Gnd
2	E_TCK	0V	0V	Open
3	E_TDO	0V	3.33V	Open
4	E_TMS	0V	0.35V	Open
5	E_TDI	0V	3.32V	Open
6	Gnd	Gnd	Gnd	Gnd

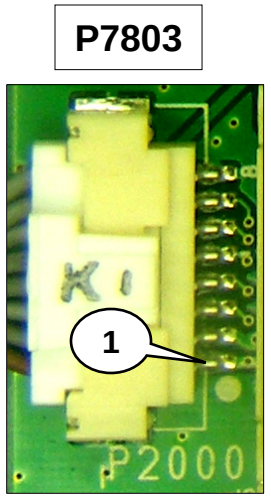


Diode Mode values taken with all Connectors Removed

Main P2000 and P2401 Connectors (Voltage and Diode Check)

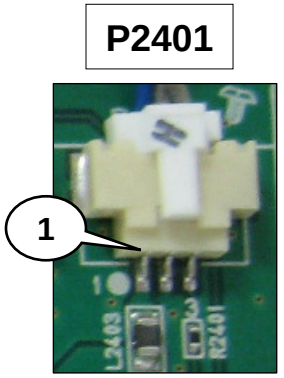
P2000 "MAIN Board" To J4 "Ft IR" for Motion Remote Sensor

Pin	Label	STBY	Run	Diode Check
1	3.3V_Normal	0V	3.33V	0.51V
2	Gnd	Gnd	Gnd	Gnd
3	M_REMOTE_RX	0V	3.3V	Open
4	M_REMOTE_TX	0V	3.3V	Open
5	M_RFModule_Reset	0V	3.05V	Open
6	DC	0V	2.98V	Open
7	DD	0V	2.98V	Open
8	Gnd	Gnd	Gnd	Gnd



P2401 "Main" To "3D-Emitter"

Pin	LABEL	SBY	Run	Diode Check
1	+5V_EMITTER	0V	5.1V	Open
2	Gnd	Gnd	Gnd	Gnd
3	3D_SYNC	0V	0.03V	Open



Diode Mode values taken with all Connectors Removed

Main Board Speaker Plugs P8800, P2101, P2100 Voltage and Diode Check

P8800 "Main" To "Speaker Left"

Pin	LABEL	SBY	Run	Diode Check
1	SPK-R(-)	0V	12.35V	Open
2	SPK-R(+)	0V	12.35V	Open
3	SPK-L(-)	0V	12.35V	Open
4	SPK-L(+)	0V	12.35V	Open

P2101 "Main" To "Speaker Right"

Pin	LABEL	SBY	Run	Diode Check
1	SPK2-R(+)	0V	12.35V	Open
2	SPK2-R(-)	0V	12.35V	Open
3	SPK2-R(+)	0V	12.35V	Open
4	SPK2-R(-)	0V	12.35V	Open

P2100 "Main" To "Speaker Woofer"

Pin	LABEL	SBY	Run	Diode Check
1	SPK_Woofer(-)	0V	12.35V	Open
2	SPK_Woofer(+)	0V	12.35V	Open

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

Main Board Audio Voltage Checks

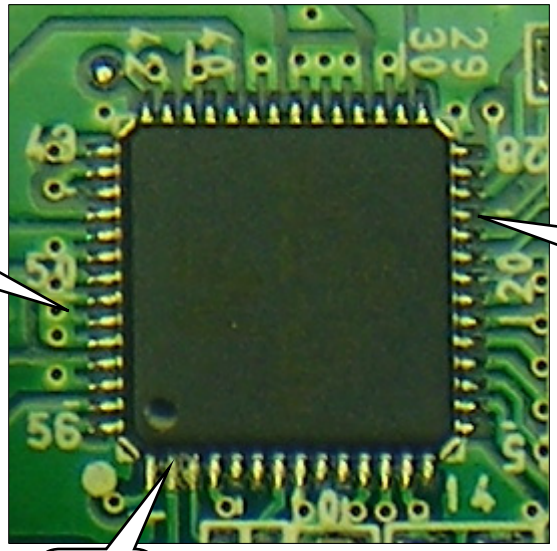
This general information covers;

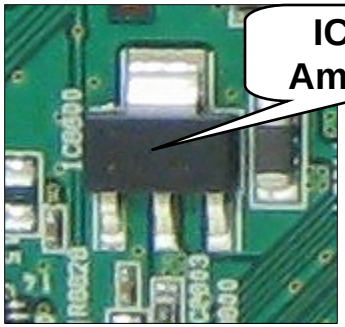
- **IC2101 Woofer Audio Out)**
- **IC2100 Front Right Audio Out) and**
- **IC8801 Front Left Audio Out)**

Use speaker outputs to test for defective Audio Amp Note: (Normal, ½ Audio B+ 12.35V)

Speaker Output Connectors;

- **P2100 Woofer Audio Out)**
- **P2101 Front Right Audio Out) and**
- **P8800 Front Left Audio Out)**





IC8800 Pin	(+1.8V_AMP) Regulator
[1]	0V (Gnd)
[2]	1.8V (Out)
[3]	3.3V (In)

Q8800 Pin	AMP_MUTE Pin 25 IC8801
B	0V
C	3.34V
E	Gnd

E B C

Q8800 (Mute) Active Low. Location: Top left of IC8801. Normal 3.3V Collector to Pin 25 of all three ICs.

Note: 3.3V input (pin 3) from IC8005 3.3V_Normal Regulator

FRONT (IR, INTELLIGENT SENSOR and MOVING 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 connects with the Soft Touch Key Board and the Center LG Logo board. The Center LG Logo lights after power on and the picture appears. Then dims down in about 2 seconds. At power off, it does the reverse.

The IR board receives it operating B+ via J1 pin 6 (STBY 3.5V).

The IR (Infrared) remote receiver can be measured (1.57V) at pin 9 of connector J1 or P8200 on the Main board in Stand-By. During run pin 9 reads (1.54V).

The IR pulses (1.6V p/p) J1 pin 9 are sent to P8200 on the Main board and on to the Microprocessor (IC8101) via pin 16.

The Intelligent Sensor communicates with the Micro/Video Processor IC900 BCM Chip via clock and data lines SCL1 and SDA1 arriving on connector J1 from P8200 pins 1 and 2 on the Main board.

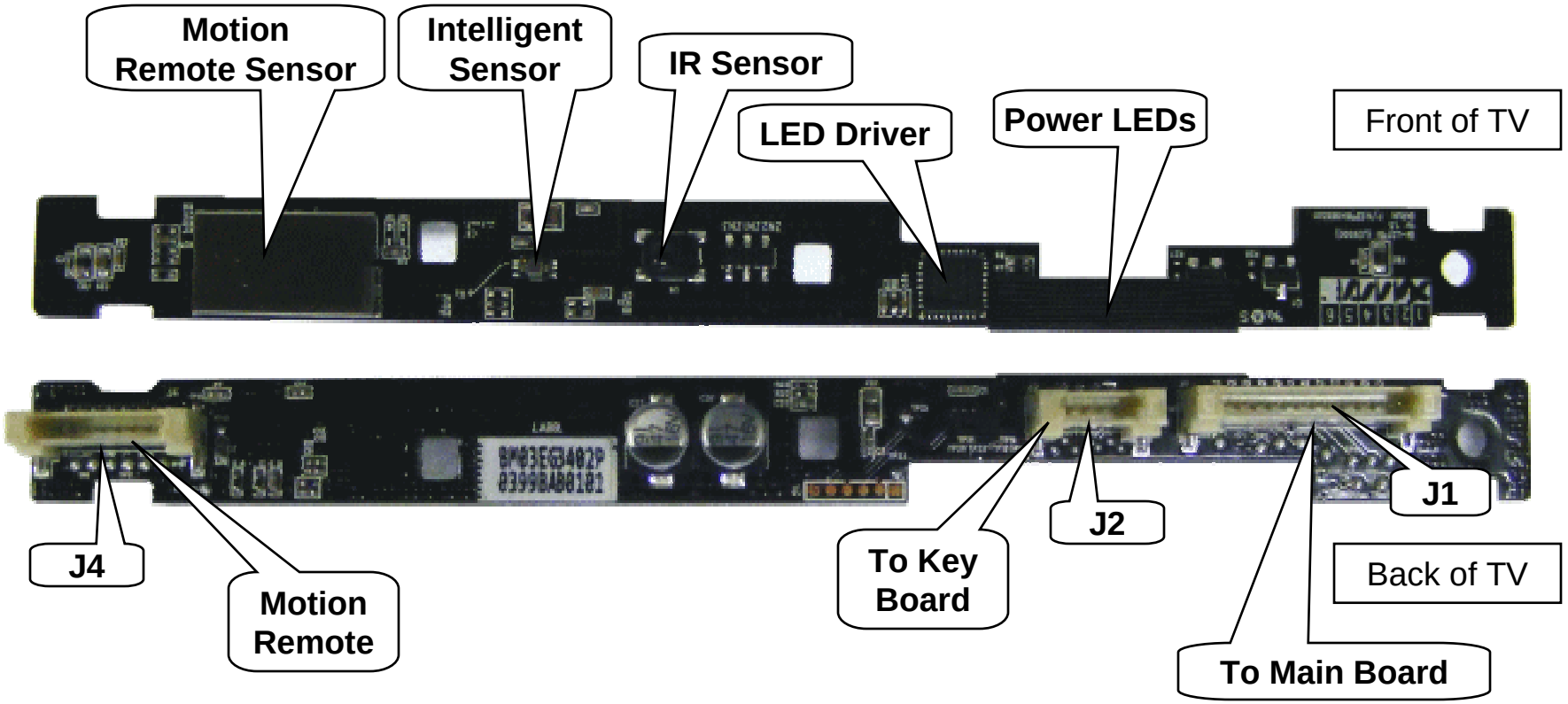
The Front Power LEDs are controlled by these same Clock and Data lines which communicate with the LED Driver IC on the IR board.

The Key board is routed to the IR board via CON2 and output on J1 Key 1 and Key 2 lines, (Key 1 pin 4 and Key 2 pin 5). Arriving at P8200 pins 4 and 5 on the Main Board.
Then to the Microprocessor 25 and 26 lines.

NEW: This TV also has a Motion Remote which allows the customer to manipulate a pointer by pointing the Motion Remote at the screen. The Sensor for the Motion Remote is on the Front IR board.

Front IR Board (Connections Identified)

p/n EBT61093402



Front Board Connectors J1 Voltage and Diode Check

J1 "Front IR" to P8200 " MAIN"

Pin	Label	STBY	Run	Diode Check
1	[1]SCL	3.45V	3.37V	Open
2	[1]SDA	3.45V	3.37V	Open
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.45V	3.37V	Open
5	KEY 2	2.76V	2.7V	Open
6	3.5V_ST	3.46V	3.37V	Open
7	Gnd	Gnd	Gnd	Gnd
8	LED_LOGO	0V	0.82V	Open
9	[2]IR	1.57V	1.52V	Open
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0V	3.33V	Open
12	LED_R/BUZZ	0V	0V	Open

(1) Pulses only present when Intelligent Sensor is turned on. (3.7V p/p)
(2) IR pulses (2.5V p/p)

Diode Mode values taken with all Connectors Removed

Front Board Connectors J2 Key Board Voltage, Resistance and Diode Check

J2 "Front IR" to “Key Board"

Pin	Label	STBY	Run	Diode Check
1	Key 1	3.45V	3.37V	Gnd
2	Gnd	Gnd	Gnd	Gnd
3	Key 2	2.76V	2.7V	Gnd
4	Gnd	Gnd	Gnd	Gnd

Resistance when key is pressed

BUTTON	KEY LINE	RESISTANCE
CH+	Key 2	10K
CH-	Key 2	4.7K
VOL+	Key 1	10K
VOL-	Key 1	4.7K
ENTER	Key 1	270Ω
MENU	Key 1	1.82K
INPUT	Key 2	270Ω
POWER	Key 2	1.82K

Diode Mode values taken with all Connectors Removed

MOTION REMOTE SECTION

The first time the Motion Remote has it's 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.

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

The Motion Remote utilizes a specialized receiver to receive the IR signal and this information is then routed to P2000 and on to the BCM IC for pointer positioning and the other functions.

Motion Remote "Magic Remote" AKB73035402

Front Board Connectors J4 Voltage and Diode Check

J4 "Front IR" to “Main Board“ P2000 Motion Remote

Pin	Label	STBY	Run	Diode Check
1	3.3V_Normal	0V	3.33V	1.17V
2	Gnd	Gnd	Gnd	Gnd
3	M_REMOTE_RX	0V	3.3V	1.95V
4	M_REMOTE_TX	0V	3.3V	1.95V
5	M_RFModule_Reset	0V	3.05V	Open
6	DC	0V	2.98V	1.96V
7	DD	0V	2.98V	1.96V
8	Gnd	Gnd	Gnd	Gnd

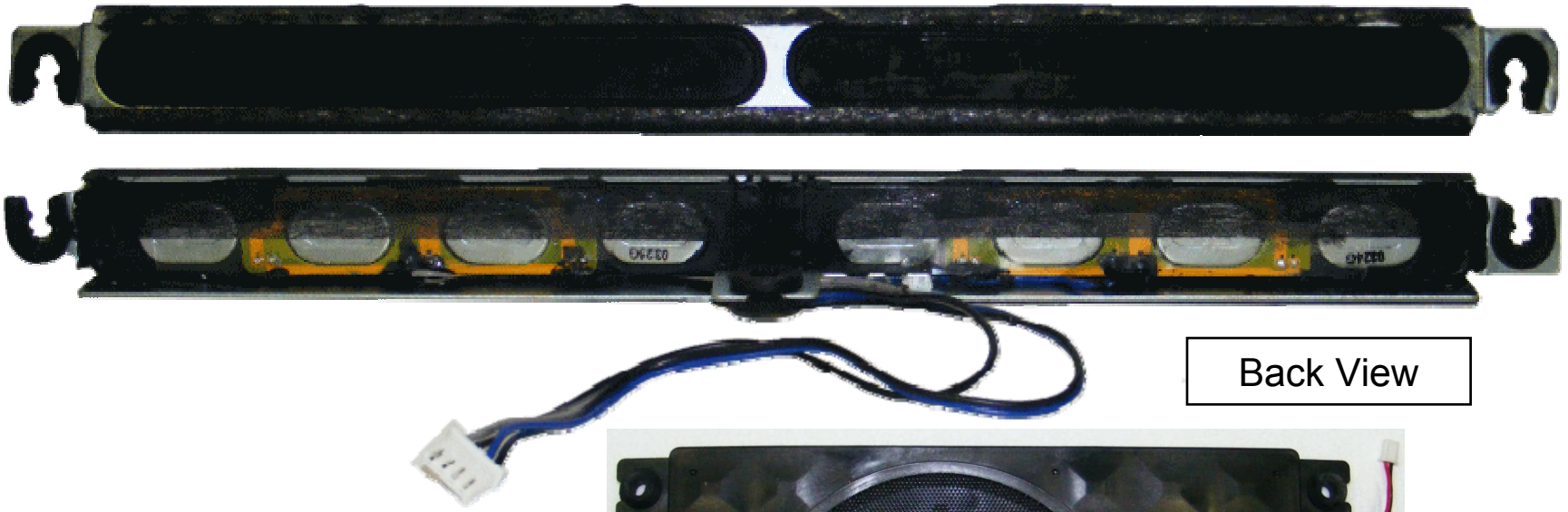
Diode Mode values taken with all Connectors Removed

INVISIBLE SPEAKER SECTION

Full Range Speaker
p/n EAB61353002

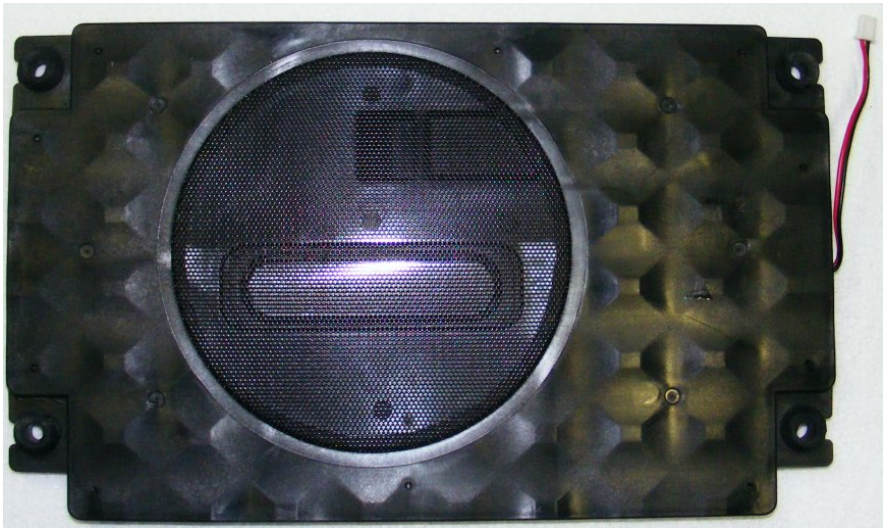
The 47LX9500 contains the 8 Magnet Invisible Speaker system.
The Full Range Speakers point downward, so there is no front viewable speaker grill or air ports.

Front View



Back View

Woofer



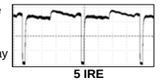
INTERCONNECT DIAGRAM (11 X 17 FOLDOUT SECTION)

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

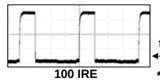
The Adobe version of this Training Manual allows the viewer to zoom in and out making reading of the small text easier.
This Power Point shows a graphical representation of the 11 X 17 foldout page so clarity is limited.

47LX9500 INTERCONNECT DIAGRAM

Note: If a particular block is exhibiting a dimmer level that the other 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,
1st: 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 each Inverter.
2nd: Turn off the set and unplug the connector to the Inverters coming from the Main board. If the brightness returns to normal, the Main board is defective.



5 IRE
3.88V p/p 240Hz



100 IRE
3.68V p/p 240Hz

Each connector (27 total) to the LED Blocks (216) have two pins delivering B+ 13V and 8 Drive Signals

Drive Signals to LED Blocks

*To force a Block to turn on, simply ground the pin. Providing the 13V source is present.

V25~V32 CN11 CN1 V33~V40 CN10 V41~V48 CN9 V49~V56 CN8 V57~V64 CN7 V65~V72 CN6 V73~V80 CN5 V81~V88 CN4 V89~V96 CN3 — LED Extension Board

CN22 V105~V112 CN21 V113~V120 CN20 V121~V128 CN12 CN19 V29~V136 CN13 CN18 V137~V144 CN17 V145~V152 CN16 V153~V160 CN15 V161~V168 CN14 V169~V176 — LED Extension Board

V73~V80 CN33 CN23 V81~V88 CN32 V1~V8 CN31 V9~V16 CN30 CN24 V17~V24 CN29 V25~V32 CN28 V33~V40 CN27 V41~V48 CN26 V49~V56 CN25

Keys

J1 J4 Front IR J2

P204 "SMPS" To CN1 "Inverter Main"

Pin	Label	STBY	Run	Diode Check
1-5	24V	0V	24.7V	0.424V
6-10	Gnd	Gnd	Gnd	Gnd
11	*P-DIM	0V	0.37V~2.8V	Open
12	*I-C	0V	2.92V	Open
13	n/c	n/c	n/c	Open
14	ERROR	0V	0V	Open

I-C is Inverter On (INV_ON)

P205 "SMPS" To CN201 "Inverter Secondary"

Pin	Label	STBY	Run	Diode Check
1-5	24V	0V	24.7V	0.424V
6-10	Gnd	Gnd	Gnd	Gnd
11	*P-DIM	0V	0.37V~2.8V	Open
12	*I-C	0V	2.92V	Open

P201 "SMPS" To P8000 "MAIN"

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	1.68V
2-4	24V	0V	24.7V	0.424V
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.45V	3.41V	Open
13-15	Gnd	Gnd	Gnd	Gnd
16	n/c	n/c	n/c	Open
17	12V	0V	11.88V	1.29V
18	INV-ON	0V	2.92V	Open
19	12V	0V	11.88V	1.29V
20	P-DIM	0V	0.37V~3.3V	Open
21	12V	0V	11.88V	1.3V
22	n/c	n/c	n/c	Open
23	n/c	n/c	n/c	Open
24	ERROR	0V	0V	Open

Indicates Hot Ground

SMPS BOARD p/n: EAY60908801

P204 P205 P201 D201 Q252 Q251 D222 D221 T102 T101 T501 IC103 IC502 IC102 IC501 F500 1A/250V 3.15A/250V Q111 Q110 F101 47uF/450V F501 Hot Gnd STBY 159.6V Run 392.6V F101 Hot Gnd STBY 2.9V Run 393.3V D607 D102 D101 L601 L600 D602 D601 Q605 D603 Q606 BD101 CX102 CX101 D100 F100 6.3A/250V CX103 RL101 RL102 Q231 SK101 AC In

P806 LVDS to Panel

PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN
1	Gnd	Gnd	28	Gnd	Gnd	54	V14	3.75V
2	LMV0P	1.19V	29	LRMV4P	1.15V	55	V15	2.68V
3	LMV0N	1.24V	30	LRMV4N	1.25V	56	V16	0.27V
4	LMV1P	1.18V	31	LRMV5P	1.18V	57	V17	0.26V
5	LMV1N	1.3V	32	LRMV5N	1.26V	58	V18	0.26V
6	LMV2P	1.15V	33	LRMV6P	1.17V	59	Gnd	Gnd
7	LMV2N	1.29V	34	LRMV6N	1.25V	60	Gnd	Gnd
8	Gnd	Gnd	35	Gnd	Gnd	61	Z_OUT	8V
9	LMVCLKP	1.22V	36	OPT_N	3.33V	62	Gnd	Gnd
10	LMVCLKN	1.23V	37	H_CONV	Gnd	63	**VCOMLOUT**	6V
11	Gnd	Gnd	38	OSP	0V	64	**VCOMLFB**	6V
12	LMV4P	1.18V	39	POL	1.66V	65	Gnd	Gnd
13	LMV4N	1.26V	40	Gnd	Gnd	66	**VGH (26V)**	25.6V
14	LMV5P	1.26V	41	SOE_L	0.24V	67	Gnd	Gnd
15	LMV5N	1.27V	42	Gnd	Gnd	68	OSC	2.3V
16	LMV6P	1.16V	43	V1	15.75V	69	GOE	0.83V
17	LMV6N	1.26V	44	V2	15.75V	70	Gnd	Gnd
18	Gnd	Gnd	45	V3	14V	71	**VGL (6V)**	-6V
19	LRMV0P	1.17V	46	V4	12.26V	72	Gnd	Gnd
20	LRMV0N	1.28V	47	V5	11.07V	73	**HVDD (8V)**	8.2V
21	LRMV1P	1.15V	48	V6	11.07V	74	**HVDD (8V)**	8.2V
22	LRMV1N	1.26V	49	V7	10.27V	75	Gnd	Gnd
23	LRMV2P	1.17V	50	V9	8.31V	76	**VCC (3.3V)**	3.4V
24	LRMV2N	1.27V	51	V10	5.74V	77	**VCC (3.3V)**	3.4V
25	Gnd	Gnd	52	V12	Gnd	78	Gnd	Gnd
26	LRMVCLKN	1.21V	53	V13	4.94V	79	**VDD (18V)**	16V
27	LRMVCLKP	1.23V				80	**VDD (16V)**	16V

P805 LVDS to Panel

PIN	LABEL	RUN	PIN	LABEL	RUN	PIN	LABEL	RUN
1	**VDD (16V)**	16V	28	V6	11.08V	54	RLMVCLKP	1.19V
2	**VDD (16V)**	16V	29	V7	10.28V	55	RLMVCLKN	1.18V
3	Gnd	Gnd	30	V9	8.31V	56	Gnd	Gnd
4	**VCC (3.3V)**	3.4V	31	V10	7.71V	57	RLMV4P	1.15V
5	**VCC (3.3V)**	3.4V	32	V12	3.37V	58	RLMV4N	1.24V
6	Gnd	Gnd	33	V13	4.94V	59	RLMV5P	1.34V
7	**HVDD (8V)**	8.2V	34	V14	3.75V	60	RLMV5N	1.22V
8	**HVDD (8V)**	8.2V	35	V15	2.68V	61	RLMV6P	1.12V
9	Gnd	Gnd	36	V16	1.97V	62	RLMV6N	1.23V
10	OPT_P	n/c	37	V17	0.27V	63	Gnd	Gnd
11	**VGL-(6V)**	-6V	38	V18	0.26V	64	RRMV0P	1.13V
12	Gnd	Gnd	39	Gnd	Gnd	65	RRMV0N	1.23V
13	GOE	**0.83V**	40	GSP	0V	66	RRMV1P	1.15V
14	GSC	2.3V	41	POL	1.66V	67	RRMV1N	1.23V
15	Gnd	Gnd	42	Gnd	Gnd	68	RRMV2P	1.15V
16	**VGH (26V)**	25.6V	43	SOE_R	0.25V	69	RRMV2N	1.23V
17	**Gnd**	Gnd	44	H_CONV	0.44V	70	Gnd	Gnd
18	**VCOMRFB**	6V	45	OPT_N	3.33V	71	RRMVCLKP	1.19V
19	**VCOM ROUT**	6V	46	Gnd	Gnd	72	RRMVCLKN	1.18V
20	Gnd	Gnd	47	RLMV0P	0.15V	73	Gnd	Gnd
21	Z_OUT	8V	48	RLMV0N	0.17V	74	RRMV4P	1.13V
22	Gnd	Gnd	49	RLMV1P	0.14V	75	RRMV4N	1.24V
23	V1	15.75V	50	RLMV1N	1.24V	76	RRMV5P	1.11V
24	V2	15.75V	51	RLMV2P	1.13V	77	RRMV5N	1.12V
25	V3	14V	52	RLMV2N	1.22V	78	RRMV6P	1.12V
26	V4	13.35V	53	Gnd	Gnd	79	RRMV6N	1.22V
27	V5	12.27V				80	Gnd	Gnd

CN1 CN3 CN2 CN4 CN5 CN10 CN11 — INVERTER MAIN — 13V POWER SUPPLY For CN2 / CN3 — 13V POWER SUPPLY For CN4 / CN5 — DO NOT MEASURE

SMPS TEST 1
Front pins on connector are odd numbers.
P201 STBY 3.4V 24V 24V 12V 12V 12V STBY 3.5V PWR ON

SMPS TEST 2
INV-ON B STBY 3.5V 24V 24V 12V 12V 12V A 24V PWR ON STBY 3.5V
Front pins on connector are odd numbers.

SMPS TEST 1: To Force Power Supply On. Disconnect P8000 on Main board. (A) Jump pins 9, 10, 11 or 12 (3.5V) to pin 1. (Test Voltage Outputs 12V, 24V to Main and 24V to both Inverters). Remove AC power. Leave the jumper in place.

SMPS TEST 2: (B) Jump pins 9, 10, 11 or 12 (3.5V) to pin 18 (INV-ON). Apply AC power, the Backlights should turn on.

Note; If Inverter Main or Secondary is loading down 24V, each Inverter can be run separately:
Remove AC and Disconnect P204. When AC is reapplied, the Backlight LEDs on the Right (Back View) should turn on.
Remove AC and Disconnect P205 and reinstall P204. When AC is reapplied, the Backlight LEDs on the Left (Back View) should turn on.

P803 "T- CON" to P7802 "Main"

Pin	LABEL	Run	Diode Check
1	PANEL_VCC	11.55V	Open
2	PANEL_VCC	11.55V	Open
3	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd

5V (1.6V) with 3D source 5.5V p/p 60 Hz 3D-Sync

P7800 "MAIN Board" To "T-CON" P802

Label	Run	Diode Check	Pin	Label	Run	Diode Check	Pin	Label	Run	Diode Check
PANEL_VCC	11.55V	Open	18	Gnd	Gnd	Gnd	35	RRXA2+	1.14V	0.97V
PANEL_VCC	11.55V	Open	19	RRXB2+	1.14V	0.97V	36	RRXA2-	1.22V	1.15V
PANEL_VCC	11.55V	Open	20	RRXB2-	1.2V	1.15V	37	RRXA1+	1.17V	0.97V
PANEL_VCC	11.55V	Open	21	RRXB1+	1.16V	0.97V	38	RRXA1-	1.19V	1.15V
n/c	n/c	n/c	22	RRXB1-	1.19V	1.15V	39	RRXA0+	1.19V	0.97V
Gnd	Gnd	Gnd	23	RRXB0+	1.19V	0.97V	40	RRXA0-	1.17V	1.15V
Gnd	Gnd	Gnd	24	RRXB0-	1.19V	1.15V	41	n/c	n/c	n/c
Gnd	Gnd	Gnd	25	n/c	n/c	n/c	42	3D_DIM_2	0.05V	1.03V
Gnd	Gnd	Gnd	26	Gnd	Gnd	Gnd	43	3D_DIM	0V	1.03V
Gnd	Gnd	Gnd	27	RRXA4+	1.08V	0.97V	44	3DTY	0V	Open
RRXB4+	1.26V	0.97V	28	RRXA4-	1.26V	1.15V	45	n/c	n/c	n/c
RRXB4-	1.26V	1.15V	29	RRXA3+	1.14V	0.97V	46	FRC_RESET	3.32V	Open
RRXB3+	1.14V	0.97V	30	RRXA3-	1.2V	1.15V	47	SCL3_3.3V	3.34V	1.04V
RRXB3-	1.22V	1.15V	31	Gnd	Gnd	Gnd	48	SDA3_3.3V	3.34V	1.04V
Gnd	Gnd	Gnd	32	RRXACK+	1.2V	0.97V	49	V_SYNC	3.32V	0.998V
RRXBCK+	1.2V	0.97V	33	RRXACK	1.16V	1.15V	*50	3D_Sync_Out	0.02V	Open
RRXBCK	1.16V	1.15V	34	Gnd	Gnd	Gnd	51	Gnd	Gnd	Gnd

P804 "TCON" to P7803 "Main Board"

Pin	LABEL	Run	Diode
1	Gnd	Gnd	Gnd
2	E_TCK	0V	Open
3	E_TDO	3.33V	Open
4	E_TMS	0.35V	Open
5	E_TDI	3.32V	Open
6	Gnd	Gnd	Gnd

P802 "T-CON" to P7800 "MAIN Board"

Pin	Label	Run	Diode Check	Pin	Label	Run	Diode Check
1	Gnd	Gnd	Gnd	24	RRXA4	1.26V	1.67V
2	3D_Sync_Out	0.03V	2.34V	25	RRXA4+	1.08V	1.67V
3	V_SYNC	3.33V	1V	26	Gnd	Gnd	Gnd
4	SDA3_3.3V	3.34V	1.73V	27	n/c	n/c	n/c
5	SCL3_3.3V	3.34V	1.73V	28	RRXB0-	1.19V	1.67V
6	FRC_RESET	3.32V	Open	29	RRXB0+	1.19V	1.67V
7	n/c	n/c	n/c	30	RRXB1-	1.19V	1.67V
8	3DTY	0V	Open	31	RRXB1+	1.16V	1.67V
9	3D_DIM	0V	Open	32	RRXB2-	1.19V	1.67V
10	3D_DIM_2	0.05V	Open	33	RRXB2+	1.14V	1.67V
11	n/c	n/c	n/c	34	Gnd	Gnd	Gnd
12	RRXA0-	1.17V	1.67V	35	RRXBCK-	1.16V	1.67V
13	RRXA0+	1.19V	1.67V	36	RRXBCK+	1.2V	1.67V
14	RRXA1-	1.19V	1.67V	37	Gnd	Gnd	Gnd
15	RRXA1+	1.17V	1.67V	38	RRXB3-	1.22V	1.67V
16	RRXA2-	1.22V	1.67V	39	RRXB3+	1.14V	1.67V
17	RRXA2+	1.14V	1.67V	40	RRXB4-	1.26V	1.67V
18	Gnd	Gnd	Gnd	41	RRXB4+	1.09V	1.67V
19	RRXACK-	1.16V	1.67V	42-46	Gnd	Gnd	Gnd
20	RRXACK+	1.20V	1.67V	47	n/c	n/c	n/c
21	Gnd	Gnd	Gnd	48-51	PANEL_VCC	11.59V	Open
22	RRXA3-	1.20V	1.67V				
23	RRXA3+	1.14V	1.67V				

P205 "SMPS" To CN201 "INVERTER B"

Pin	Label	STBY	Run	Diode Check
1-5	24V	0V	24.7V	0.424V
6-10	Gnd	Gnd	Gnd	Gnd
11	*P-DIM	0V	0.37V~2.8V	Open
12	*I-C	0V	2.92V	Open

P204 "SMPS" To CN1 "INVERTER M"

Pin	Label	STBY	Run	Diode Check
1-5	24V	0V	24.7V	0.424V
6-10	Gnd	Gnd	Gnd	Gnd
11	*P-DIM	0V	0.37V~2.8V	Open
12	*I-C	0V	2.92V	Open
13	n/c	n/c	n/c	Open
14	ERROR	0V	0V	Open

I-C is Inverter On (INV_ON)

P201 "SMPS" To P8000 "MAIN"

Pin	Label	STBY	Run	Diode Check
1	PWR-ON	0V	3.31V	1.68V
2-4	24V	0V	24.7V	0.424V
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V	3.45V	3.41V	Open
13-15	Gnd	Gnd	Gnd	Gnd
16	n/c	n/c	n/c	Open
17	12V	0V	11.88V	1.29V
18	INV-ON	0V	2.92V	Open
19	12V	0V	11.88V	1.29V
20	P-DIM	0V	0.37V~3.3V	Open
21	12V	0V	11.88V	1.3V
22	n/c	n/c	n/c	Open
23	n/c	n/c	n/c	Open
24	ERROR	0V	0V	Open

P803 P802 P804 P101 X100 25MHz IC301 IC307 IC200 IC202 IC305 IC304 L305 L306 IC205 IC302 L307 L600 L601 IC600 D600 IC102 TCON/3D Q1001 Q1002 Q1003 Q1004 IC1000 IC500 IC309 IC1002 IC1001 SW400 IC306 IC400 IC801 P806 P805 IC204 IC308 IC203 L700 IC201 L314 IC310 IC700 P804 L309 L702 IC305 IC701 L701 Q803 Q907 Q804 Q906 Q700 Q702

8.2V Pins 73-74 · 3.4V Pins 76-77 · 16V Pins 79-80 · 8V Pin 61 · 8V Pins 63-64 · 25.6V Pins 66 · 5V Pin 71 · 3.4V Pins 4-5 · 8.2V Pins 7-8 · 8V Pin 71 · 16V Pins 1-2 · 5V Pins 11 · 25.6V Pins 16 · 8V Pins 18-19

To TFT Panel · To TFT Panel

P7800 LVDS NVRAM IC601 P7900 INV Main Drive P2100 Woofer IC2101 Woofer Audio P2101 Ft Right IC2100 Ft Right Audio Q8205 Q8201 Q8200 32.768KHz X8101 Micro Reset SW8100 P8200 Ft IR X8100 10MHz D8312 Q8308 Micro processor IC8101 IC8100 P8100 n/c IC8004 A2.5V Reg P2000 Q8800 IC8800 +1.8V_AMP +1.8V_HDMI IC8801 Ft Left Audio Q200 IC8300 HDMI Selector Q8304 HDMI Q8301 D8307 Q8300 D8309 Q8302 D8306 LAN Q8700 IC8700 Q8701 JK8700 Wireless Media Box Remote Q2200 P8800 P2200 To Logo

P7901 INV 2 Drive P7802 To T-CON P8000 To SMPS Power On Sw Q8000 Q8002 Q8005 INV_CTL Sw P7803 P2401 To T-CON To 3D Sync X9700 25MHz IC9701 LG5111 LVDS Dimming IC9703 EEPROM 1.8V Dimming IC9702 IC8008 IC8007 D3.3V Reg IC8005 + 5V Normal Reg IC8003 A1.2V Reg IC8001 D1.8V Reg IC8002 Q8003 Panel Vcc Sw Q8001 Q8004 IC602 DDR_VTT Reg IC603 IC604 IC605 IC606 DDR Q901 USB 5V IC8000 USB2 IC301 USB2 5V IC302 USB1 5V USB1 IC900 Video Processor LGE3549XQ MAIN BOARD p/n: EBR69489001 IC901 NAND Flash Memory X1001 54MHz +1.26V_TU Reg IC700 IC300 Earphone Amp Q308 Q8307 RGB RS232 RS232 Buffer IC8200 IC8400 Q8303 Optical Audio IC8401 EDID RGB D8310 Q8306 Q702 Q701 HDMI TU700 TDVJ-H031F Digital Video Analog Video 18. IF p 17. IF n 16. IF AGC 15. Reset **14. 3.3V** **13. 1.26V** 12. GND **11. CVBS** 10. NC **9. SIF** 8. NC **7. SDA** **6. SCL** 5. NC 4. NC **3. 5V** 2. NC 1. NC

P8000 "MAIN Board" To J4 "Ft IR" for Motion Remote Sensor

Pin	Label	Run	Diode Check
1	3.3V_Normal	3.33V	0.51V
2	Gnd	Gnd	Gnd
3	M_REMOTE_RX	3.3V	Open
4	M_REMOTE_TX	3.3V	Open
5	M_RFModule_Reset	1.05V	Open
6	DC	0.88V	Open
7	DD	2.98V	Open
8	Gnd	Gnd	Gnd

P2401 "Main" To "3D Emitter"

Pin	LABEL	Run	Diode Check
1	+5V_EMITTER	5.1V	Open
2	Gnd	Gnd	Gnd
3	3D_SYNC	3.03V	Open

J1 "IR Board" To P8200 "Main Board"

Pin	Label	STBY	Run	Diode Check
1	SCL	3.45V	3.37V	Open
2	SDA	3.45V	3.37V	Open
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.45V	3.37V	Open
5	KEY 2	2.78V	2.7V	Open
6	3.5V_ST	3.46V	3.37V	Open
7	Gnd	Gnd	Gnd	Gnd
8	LED_LOGO	0V	0.82V	Open
9	IR	1.57V	1.52V	Open
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0V	3.33V	Open
12	LED_R/BUZZ	0V	0V	Open

LG Logo

J4 "Ft IR Motion Sensor" To P2000 "MAIN"

Pin	Label	STBY	Run	Diode Check
1	3.3V_Normal	0V	3.33V	1.17V
2	Gnd	Gnd	Gnd	Gnd
3	M_REMOTE_RX	0V	3.3V	1.95V
4	M_REMOTE_TX	0V	3.3V	1.95V
5	M_RFModule_Reset	0V	3.05V	Open
6	DC	0V	2.98V	1.96V
7	DD	0V	2.98V	1.96V
8	Gnd	Gnd	Gnd	Gnd

P7802 "Main" To "T-CON" P803

Pin	LABEL	Run	Diode Check
1	PANEL_VCC	11.55V	Open
2	PANEL_VCC	11.55V	Open
3	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd

J2 "IR Board" To "Key Board"

Pin	Label	STBY	Run	Diode Check
1	Key 1	3.45V	3.37V	Open
2	Gnd	Gnd	Gnd	Gnd
3	Key 2	2.76V	2.7V	Open
4	Gnd	Gnd	Gnd	Gnd

P2200 "Main" To "LG LOGO"

Pin	LABEL	STBY	Run	Diode Check
1	3.5V_ST	3.46V	3.37V	Open
2	Gnd	Gnd	Gnd	Gnd
3	Logo Drive	2.19V	0.69V	Open
4	Gnd	Gnd	Gnd	Gnd

P2101 "Main" To "Speaker Right"

Pin	LABEL	Run	Diode Check
1	SPK2-R(+)	12.35V	Open
2	SPK2-R(-)	12.35V	Open
3	SPK2-R(+)	12.35V	Open
4	SPK2-R(-)	12.35V	Open

3D IR

JK8700 Jack "MAIN Board" To "Wireless Dungle"

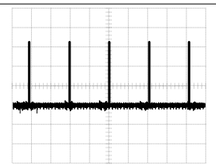
Pin	Label	STBY	Run	Diode Check
1-5	*24V	0V	24.65V	Open
7	Detect	0V	0.3V	2.98V
8	Interrupt	0V	3.3V	2.98V
9	Gnd	0V	Gnd	Gnd
10	nc	0V	3.3V	Open
11	Gnd	0V	Gnd	Gnd
12	I2C_SCL	0V	3.3V	1.04V
13	I2C_SDA	0V	3.3V	1.04V
14	Gnd	0V	Gnd	Gnd
15	Wireless_RX	0V	3.3V	1.8V
16	Wireless_TX	0V	3.3V	1.8V
17	Gnd	0V	Gnd	Gnd
18	IR	0.67V	3.3V	Open
19-20	Gnd	0V	0V	Gnd

Voltages with Dongle plugged in.
(Use Dongle side to read voltages. Remove cover).
*24V Switched from Q8701 Drain
Q8701 turned on by Q8700

42LE8500 Inverter Main and Secondary Local Dimming Control Signals Waveforms

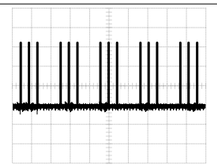
CN11 INVERTER (MAIN) FROM P7900 MAIN BOARD

Inverter Main CN11 pin 01 Black or White Screen



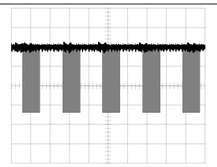
1V per/div	4MSes	3.66V p/p

Inverter Main CN11 pin 02 Black Screen



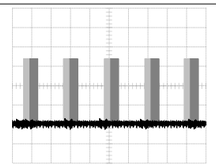
1V per/div	4MSes	3.70V p/p

Inverter Main CN11 pin 02 White Screen



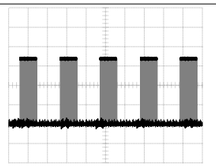
1V per/div	4MSes	4.22V p/p

Inverter Main CN11 pin 03 Black Screen



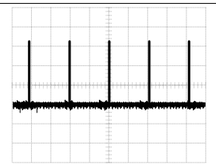
1V per/div	4MSes	3.70V p/p

Inverter Main CN11 pin 03 White Screen



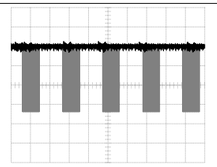
1V per/div	4MSes	3.96V p/p

Inverter Main CN11 pin 05 Black Screen



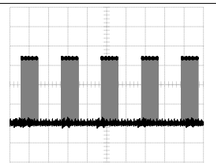
1V per/div	4MSes	3.66V p/p

Inverter Main CN11 pin 05 White Screen



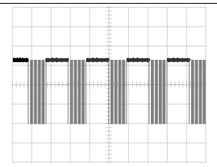
1V per/div	4MSes	3.98V p/p

Inverter Main CN11 pin 06 Black or White Screen



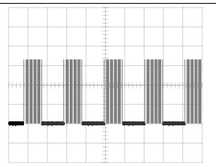
1V per/div	4MSes	3.98V p/p

Inverter Main CN11 pin 08 Black or White Screen



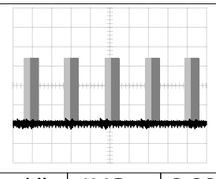
1V per/div	4MSes	3.76V p/p

Inverter Main CN11 pin 09 Black Screen



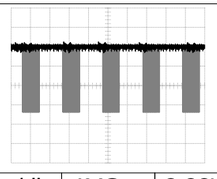
1V per/div	4MSes	3.66V p/p

Inverter Main CN11 pin 09 White Screen



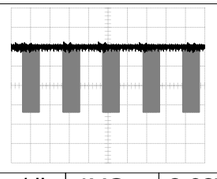
1V per/div	4MSes	3.88V p/p

Inverter Main CN11 pin 11 Black Screen



1V per/div	4MSes	3.88V p/p

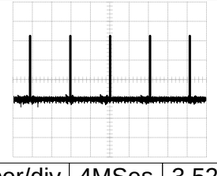
Inverter Main CN11 pin 11 White Screen



1V per/div	4MSes	3.68V p/p

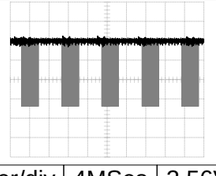
CN103 INVERTER (SECONDARY) FROM P7901 MAIN BOARD

Inverter Secondary CN103 pin 01 Black or White Screen



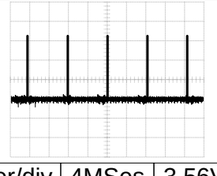
1V per/div	4MSes	3.52V p/p

Inverter Secondary CN103 pin 02 Black Screen



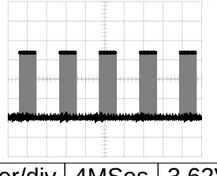
1V per/div	4MSes	3.56V p/p

Inverter Secondary CN103 pin 03 White Screen



1V per/div	4MSes	3.56V p/p

Inverter Secondary CN103 pin 04 Black or White Screen



1V per/div	4MSes	3.62V p/p

47LX9500 MAIN (FRONT SIDE) SIMICONDUCTORS

IC300 Earphone Amp

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V (HP R Out)
[6]	3.3V
[7]	3.3V
[8]	(-1.8V)
[9]	(-0.88V)
[10]	Gnd
[11]	0.94V
[12]	1.83V
[13]	3.32V (Mute)
[14]	3.32V (B+)
[15]	Gnd
[16]	0V (HP L Out)

IC301 USB 2 5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC302 USB 1 5V

Pin	
[1]	Gnd
[2]	5.1V (In)
[3]	5.1V
[4]	3.33V
[5]	3.33V
[6]	5.1V (Out)
[7]	5.1V (Out)
[8]	n/c

IC601 NVRAM

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

IC700 (+1.26V_TU) Regulator

Pin	
[1]	0V (Gnd)
[2]	1.27V (Out)
[3]	3.32V (B+)

IC8000 5V Regulator for USB

Pin	
[1]	11.75V (B+)
[2]	5.1V (Out)
[3]	5.1V (Out)
[4]	10.5V
[5]	3.3V
[6]	0.81V
[7]	5.06V
[8]	0V (Gnd)

IC8001 D1.2V and A1.2V Regulator

Pin	
[1]	0V (Gnd)
[2]	3.3V
[3]	0V (Gnd)
[4]	1.27V
[5]	3.32V
[6]	n/c
[7]	4.48V
[8]	3.32V
[9]	3.32V
[10]	3.34V
[11]	1.28V
[12]	Gnd
[13]	3.3V
[14]	0.82V

IC8002 D1.8V Regulator

Pin	
[1]	5V
[2]	3.35V (B+)
[3]	1.83V (Out)
[4]	Gnd
[5]	Gnd
[6]	2.36V
[7]	0.91V
[8]	1.05V
[9]	2.4V
[10]	3.37V (PWR On/Off1 Ctl)

IC8003 (+5V_NORMAL) Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.86V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	5.17V (In)
[8]	5.17V (In)

IC8004 A2.5V Regulator for USB

Pin	
[1]	n/c
[2]	3.26V (B+)
[3]	3.26V (B+)
[4]	n/c
[5]	n/c
[6]	2.57V (Out)
[7]	0.83V
[8]	Gnd

IC8005 (+3.3V_NORMAL) And D3.3V Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V
[5]	0.89V
[6]	3.34V (PWR On/Off2 Ctl)
[7]	3.36V (Out)
[8]	3.36V (Out)

IC8007 Power Det Gen (+12V and +3.5V)

Pin	
[1]	Gnd
[2]	3.6V (B+
[3]	3.5V (Out)

IC8008 Power Det Gen (+24V)

Pin	
[1]	Gnd
[2]	3.64V (B+)
[3]	3.76V (Out)

IC8800 (+1.8V_AMP) Regulator

Pin	
[1]	Gnd
[2]	1.8V (Out)
[3]	3.3V (B+)

IC9702

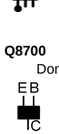
IC9703

Q308

Q2200

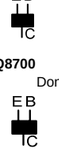
Q8001

Q8700 Wireless PWR Turns on Q8701



Dongle In	
B	0.66V (0.0V w/Dongle In)
C	0.14V (24V w/Dongle In)
E	Gnd

Q8700 Wireless PWR Turns on Q8701



Dongle Out	
B	0V (0.0V w/Dongle Out)
C	24.6V (24V w/Dongle Out)
E	Gnd

IC9702 (+1.8V_L/Dimming) Regulator

Pin	
[1]	Gnd
[2]	11.74V (B+)
[3]	Gnd
[4]	0.81V (FB)
[5]	0.77V
[6]	3.34V
[7]	3.32V (Out)
[8]	3.34V (Out)

IC9703 EEPROM for LG5111

Pin	
[1]	Gnd
[2]	3.34V
[3]	Gnd
[4]	Gnd
[5]	3.34V
[6]	3.34V
[7]	3.32V
[8]	3.34V (B+)

Q308 Headphone Mute

Pin	
B	0V
C	3.32V
E	Gnd

Q2200 LOGO Driver

Pin	
B	0.36V
C	0.66V
E	Gnd

Q8001 PANEL_VCC Control 1st Driver

Pin	
B	0V
C	0.68V
E	Gnd

Q8003 PANEL_VCC Control 2nd Driver

Pin	
B	0.66V
C	0V
E	Gnd

Q8004 PANEL_VCC Switch

Pin	
S	11.62V (In)
G	1.8V (Enable)
D	11.8V (Out)

Q8005 INV_ON Driver

Pin	
B	0V (INV ON) En
C	2.97V (Out)
E	Gnd

Q8200 IR Buffer 2nd

Pin	
B	0.56V
C	0V
E	Gnd

Q8201 IR Buffer 1st

Pin	
B	0V
C	3.36V
E	Gnd

Q8307 Side HDMI Hot Swap

Pin	
B	0V
C	4.32V
E	Gnd

Q8800 AMP Mute to AMP_MUTE1 IC8801

B	0V
C	3.34V
E	Gnd

47LX9500 MAIN (BACK SIDE) SIMICONDUCTORS

IC602 D1.8V Regulator

Pin	
[1]	0V (Gnd)
[2]	3.29V (PWR On/Off1 Ctl)
[3]	0.9V (DDR_VTT)
[4]	0.93V
[5]	1.83V
[6]	3.38V (In)
[7]	1.8V (Out)
[8]	0.91V (DDR_VTT)

IC8100 EEPROM Micro

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	0V (Gnd)
[8]	3.37V

IC8200 RS232 Routing

Pin	
[1]	0V
[2]	0V
[3]	0V
[4]	0V
[5]	0V
[6]	(-5.47V)
[7]	n/c (5.59V)
[8]	n/c (0V)
[9]	n/c (3.3V)
[10]	n/c (0.2V)
[11]	n/c (3.3V)
[12]	3.35V
[13]	0V
[14]	(-5.47V)
[15]	0V (Gnd)
[16]	3.37V

IC8400 RGB H/V Sync

Pin	
[1]	1.9V
[2]	1.9V
[3]	4.4V
[4]	0V
[5]	0.9V
[6]	n/c (4.5V)
[7]	0V (Gnd)
[8]	n/c (4.5V)
[9]	n/c (1.9V)
[10]	n/c (1.9V)
[11]	n/c (4.5V)
[12]	0.9V
[13]	0.9V
[14]	5V

IC8401 EDID Data PC

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	0.7V
[6]	4.1V
[7]	4.5V
[8]	4.5V (In)

IC8700 Wireless Buffer

Pin	
[1]	0V (3.3V Dongle In)
[2]	3.3V (0.3V Dongle In)
[3]	n/c
[4]	n/c
[5]	n/c
[6]	Gnd
[7]	Gnd
[8]	Gnd
[9]	n/c
[10]	0.02V
[11]	0V
[12]	3.3V
[13]	0V (3.3V Dongle In)
[14]	3.3V
[15]	3.3V
[16]	3.3V

IC9000 Serial Flash T-CON

Pin	
[1]	0.06V
[2]	0.67V
[3]	3.3V (In)
[4]	0V (Gnd)
[5]	0V
[6]	0.34V
[7]	3.31V (In)
[8]	3.34V (In)

IC9303 EEPROM for LG5111

Pin	
[1]	0V (Gnd)
[2]	0V (Gnd)
[3]	0V (Gnd)
[4]	0V (Gnd)
[5]	3.37V
[6]	3.37V
[7]	3.34V
[8]	3.37V (In)

Q200 (1.8V_HDMI) Switch

Pin	
S	1.83V (Out)
G	3.35V (PWR On/Off2 Ctl)
D	1.83V (In)

Q701 Tuner SIF (Sound) Buffer

Pin	
B	0.16V
C	Gnd
E	0.83V

Q702 Tuner Video (Analog) Buffer

Pin	
B	2.05V
C	2.75V
E	Gnd

Q901 FLASH_WP for IC901

Pin	
B	0V (Flash_WP)
C	3.36V
E	Gnd

Q8000 RL_ON (PWR_On) 1st Driver

Pin	
B	0.66V
C	0V
E	Gnd

Q8002 PWR_ON Switch

Pin	
[1]	3.36V (In)
[2]	0V
[3]	3.3V (Out)

Q8203 IR Wireless Pass 2nd Driver

Pin	
B	0V
C	3.3V
E	Gnd

Q8205 IR Wireless Pass 1st Driver

Pin	
B	0.6V
C	0V
E	Gnd

Q8300,1,2,6 HDMI 2 Det

Pin	
B	4.2V
C	0V
E	Gnd

Q8303,4,5,7 HDMI 3 Det

Pin	
B	0V
C	4.2V
E	Gnd

Q8308 CEC Remote HDMI CEC

Pin	
[B]	2.72V
[G]	2.73V
[S]	3.27V
[D]	3.37V

D8312 3.5V Pull Up HDMI CEC

Pin	
A1	0V
C	3.26V
A2	3.2V

D8306,7,9,10 5V Pull Up Routing HDMI SCL/SDA

Pin	
A1	5.04V
C	4.58V
A2	0V

47LX9500 T-CON/3D Component Voltages

IC202 — +1.8V DDR Reg
1) Gnd
2) 3.2V
3) 0.09V
4) 0.09V
5) 1.8V
6) 3.34V
7) 1.18V
8) 0.89V

IC203 — +1.8V DDRS Reg
1) Gnd
2) 3.27V
3) 0.89V
4) 0.9V
5) 1.8V
6) 3.34V
7) 1.8V
8) 0.9V

IC301 — +3.3V Reg
1) 11.41V
2) 3.35V
3) 3.35V
4) 8.77V
5) 3.11V
6) 0.81V
7) 5.02V
8) Gnd

IC302 — +1.0V VDC Reg
1) 0.8V
2) Gnd
3) 3.33V
4) 4.26V
5) 3.3V
6) 1.08V
7) 1.08V
8) 3.0V

IC304 — +2.5V VQ Reg
1) 0.75V
2) 5.0V
3) Gnd
4) 0V
5) 2.5V
6) 5.0V
7) 7.55V
8) 11.36V
9) 11.36V
10) 11.36V
11) 11.36V
12) 2.55V
13) Gnd
14) Gnd
15) 2.55V
16) Gnd
17) Gnd
18) Gnd
19) Gnd
20) 2.5V
21) 2.5V
22) n/c
23) 0V
24) 2.5V
25) n/c
26) Gnd
27) 1.13V
28) 10.99V

IC305 — 1V2 Reg
1) 0.8V
2) Gnd
3) 3.32V
4) 4.32V
5) 3.3V
6) 1.22V
7) 1.22V
8) 2.98V

IC306 — 1V2 Reg
1) n/c
2) 2.5V
3) 2.51V
4) n/c
5) n/c
6) 1.81V
7) 0.81V
8) Gnd

IC307 — +1.8V DDR Reg
1) n/c
2) 2.49V
3) 2.51V
4) n/c
5) n/c
6) 1.81V
7) 0.81V
8) Gnd

IC308 — +1.8V DDRS Reg
1) n/c
2) 2.47V
3) 2.49V
4) n/c
5) n/c
6) 1.8V
7) 0.8V
8) Gnd

IC309 — DDR VTT Reg
1) Gnd
2) 3.26V
3) 0.89V
4) 0.9V
5) 1.8V
6) 3.34V
7) 1.8V
8) 0.9V

IC310 — 2V5 Reg
1) 11.41V
2) 2.53V
3) 2.53V
4) 7.97V
5) 3.11V
6) 0.8V
7) 5.07V
8) Gnd

IC600 — DC-DC Conv
1) 5.96V
2) 6.03V
3) 3.15V
4) 0.17V
5) 2.72V
6) 3.3V
7) 0V
8) 25.6V
9) 24.7V
10) 1.26V
11) Gnd
12) 5.54V
13) 0V
14) 0V
15) Gnd
16) 0V
17) 1.26V
18) 4.24V
19) Gnd
20) Gnd
21) 1.27V
22) 11.45V
23) 3.4V
24) 3.4V
25) 11.38V
26) 11.38V
27) 11.07V
28) 0V
29) 4.24V
30) 1.9V
31) 0.59V
32) 3.3V
33) 3.13V
34) 0V
35) 0V
36) 0V
37) 11.33V
38) 11.37V
39) n/c
40) n/c
41) 1.27V
42) 16V
43) 5.96V
44) 5.96V
45) 5.96V
46) 5.96V
47) Gnd
48) 5.97V

IC700 — DC-DC Conv / For +3.3V TCON
1) 0.59V
2) 3.3V
3) 3.3V
4) 0V
5) 4.26V
6) Gnd
7) 1.8V
8) 7V
9) 2.7V
10) 4.78V
11) 8.47V
12) 3.33V
13) Gnd
14) 3.6V
15) 0.12V
16) 5.21V
17) 0.6V
18) 1.13V
19) 1.18V
20) Gnd
21) 11.4V
22) 0.56V
23) 0.81V
24) 0.9V

IC701 — DC-DC Conv For HVDD
1) Gnd
2) 11.68V
3) 5.26V
4) 0.73V
5) 0.58V
6) 1.97V
7) 0.59V
8) 1.20V
9) Gnd
10) 5.20V
11) 1.40V
12) 13.1V
13) 8.10V
14) 11.68V

IC801 — Data Buffer
1) 8.01V
2) 15.7V
3) 15.7V
4) 14.05V
5) 13.35V
6) 12.27V
7) 11.07V
8) Gnd
9) 16.02V
10) 10.28V
11) 8.31V
12) 7.72V
13) 3.33V
14) 3.33V
15) 3.33V
16) Gnd
17) 0V
18) Gnd
19) 4.94V
20) 3.75V
21) 2.67V
22) 16.02V
23) 0V
24) Gnd
25) 0.27V
26) 0.27V
27) 0.25V
28) 5.96V

Q803
B) 2.52V
E) 2.52V
C) 2.27V

Q804
B) 2.52V
E) 2.52V
C) 2.27V

Q906
B) 0.61V
E) Gnd
C) 0.03V

Q907
B) 0.0V
E) Gnd
C) 1.9V

Q1001
B) 0V
E) Gnd
C) 1.97V

Q1002
B) 0.6V
E) Gnd
C) 0.02V

Q1003
B) 0.59V
E) Gnd
C) 0.02V

Q1004
B) 0.02V
E) Gnd
C) 3.33V

Q700 — +3.3V TCON Reg
1) Gnd
2) 3.26V
3) 3.33V
4) 4.79V
5) 11.42V
6) 11.42V
7) 3.34V
8) 3.34V

Q701 — +8.2V HVDD Reg
1) Gnd
2) 1.42V
3) 8.16V
4) 11.7V
5) 11.42V
6) 11.42V
7) 8.2V
8) 8.2V

Q702 — +1.8V TCON Reg
1) Gnd
2) 4.27V
3) 1.89V
4) 2.72V
5) 11.41V
6) 11.41V
7) 0V
8) 1.89V

D600
A1) 16V
A2) 25.6V
C) 20.68V

47LX9500 Conclusion Page

LG TRAINING CENTER

Direct View LCD

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Life's Good

This concludes the 47LX9500 training session.