Self Diagnosis Supported model

HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

SERVICE / TRAINING MANUAL

AZ3FK *Chassis*

ORIGINAL MANUAL ISSUE DATE: 3/2012

Segment: P-2F

Version	Date	Subject
1.0	2/24/2012	Original Manual Release Date.
2.0	3/5/2012	Insulation Sheets added to Disassembly Section. Replaced page 18.
3.0	3/8/2012	P/N's for Vesa Bracket removed from Disassembly Section. Replaced page 15.
4.0	7/27/2012	New caution added on page ii. Updated Service Adjustments section. Replaced pages 24 - 27.
5.0	8/14/2012	Updated P/N's list from Disassembly Section. Replaced pages 17 - 20.

LCD Digital Color TV

SONY®

9-883-873-05

Self Diagnosis Supported model

SERVICE / TRAINING MANUAL

AZ3FK *Chassis*

Segment: P-2F

KDL-40BX450

LCD Digital Color TV

SONY®

9-883-873-05

MODEL LIST

MODEL	COMMANDER	DESTINATION
KDL-40BX450	*RM-YD080*	*US/CND*
KDL-40BX450	*RM-YD080*	*LA/MX*
KDL-40BX451	*RM-YD080*	*CND*
KDL-40BX451	*RM-YD080*	*MX*

MODEL	COMMANDER	DESTINATION
KDL-46BX450	*RM-YD080*	*US/CND*
KDL-46BX450	*RM-YD080*	*LA/MX*
KDL-46BX451	*RM-YD080*	*MX*

TABLE OF CONTENTS

CAUTIONS AND WARNINGS

CAUTION!!

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, in case of live chassis.

⚠ SAFETY-RELATED COMPONENT WARNING!!

There are critical components used in LCD color TVs that are important for safety. These components are identified with shading and ⚠ mark on the schematic diagrams and the parts list. It is essential that these critical parts be replaced only with the part number specified in the parts list to prevent electric shock, fire or other hazard.

NOTE: Do not modify the original design without obtaining written permission from the manufacturer or you will void the original parts and labor warranty.

ATTENTION!!

For safety reasons, component level repair of the Power Supply Boards and/or the Inverter Boards is prohibited.

ATTENTION!!

Ces instructions de service sont à l'usage du personnel de service qualifié seulement. Pour prévenir le risque de choc électrique, ne pas faire l'entretien autre que celui contenu dans le Mode d'emploi à moins que vous soyez qualifié faire ainsi.

ALERTE!!

Afin d'eviter tout risque d'electrocution provenant d'un châssis sous tension, un transformateur d'isolement doit etre utilisé lors de tout dépannage.

⚠ ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

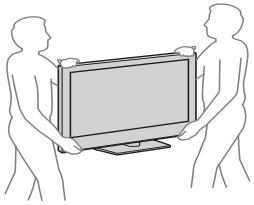
Les composants identifies par une trame et par une marque ⚠ sur les schemas de principe, les vues explosees et les listes de pieces sont d'une importance critique pour la securite du fonctionnement. Ne les remplacer que par des composants Sony dont le numero de piece est indique dans le present manuel ou dans des supplements publies par Sony. Les reglages de circuit dont l'importance est critique pour la securite du fonctionnement sont identifies dans le present manuel. Suivre ces procedures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

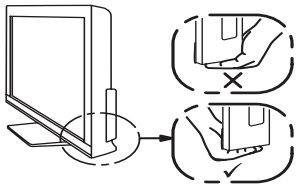
ATTENTION!!

Pour des raisons de sécurité, Interdire de réparer ou remplacer les composantes dans les blocs d'alimentation et/ou sur les modules d'inverseur.

SETTING UP AND CARRYING THE TV

- Disconnect all cables when carrying the TV.
- Carry the TV with the adequate number of people; larger size TVs require two or more people.
- Correct hand placement while carrying the TV is very important for safety and to avoid damage.

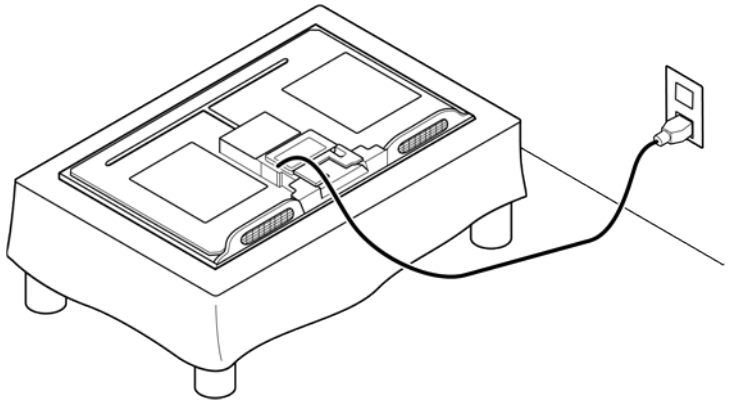




USE CAUTION WHEN HANDLING THE LCD PANEL

When repairing the LCD panel, be sure you are grounded by using a wrist band.
When installing the LCD panel on a wall, the LCD panel must be secured using the 4 mounting holes on the rear cover.

1. Do not press on the panel or frame edge to avoid the risk of electric shock.
2. Do not scratch or press on the panel with any sharp objects.
3. Do not leave the module in high temperatures or in areas of high humidity for an extended period of time.
4. Do not expose the LCD panel to direct sunlight.
5. Avoid contact with water. It may cause a short circuit within the module.
6. Disconnect the AC power when replacing the backlight or inverter circuit.
   (High voltage occurs at the inverter circuit at 650 Vrms).
7. Always clean the LCD panel with a soft cloth material.
8. Use care when handling the wires or connectors of the inverter circuit. Damaging the wires may cause a short.
9. Protect the panel from ESD to avoid damaging the electronic circuit (C-MOS).
10. During the repair, DO NOT leave the Power On for more than 1 hour while the TV is face down on a cloth.



CLEANING THE LCD PANEL

CAUTION: When cleaning the TV, be sure to unplug the power cord to avoid any chance of electric shock.

Clean the cabinet of the TV with a dry soft cloth.

Wipe the LCD screen gently with a soft cloth.

- ☑ Stubborn stains may be removed with a cloth slightly moistened with a solution of mild soap and warm water.
- ☑ If using a chemically pretreated cloth, please follow the instruction provided on the package.
- ☑ Never use strong solvents such as a thinner, alcohol or benzine for cleaning.
- ☑ Periodic vacuuming of the ventilation openings is recommended to ensure proper ventilation.

- ⦸ Do Not use paper towels, any type of abrasive pad, rags, rubber or vinyl materials to clean the screen. Using these materials could easily scratch the screen which may result in permanent damage.
- ⦸ Do Not use any cleaning product containing alkaline/acid cleaner, scouring powder or volatile solvent, such as alcohol, ammonia, benzine, thinner or insecticide. Using any of these harsh cleaners may result in permanent damage to the screen.
- ⦸ Do Not spray water or detergent directly onto the TV screen. If liquid drips into the bottom of the screen it may cause a failure.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the antenna terminals, metal trim, “metallized” knobs, screws and all other exposed metal parts for AC leakage. Check leakage as described in “Leakage Test”.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester.
   Follow the manufacturers’ instructions provided with the tester.
2. A battery-operated AC milliammeter.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable. (see Figure A)

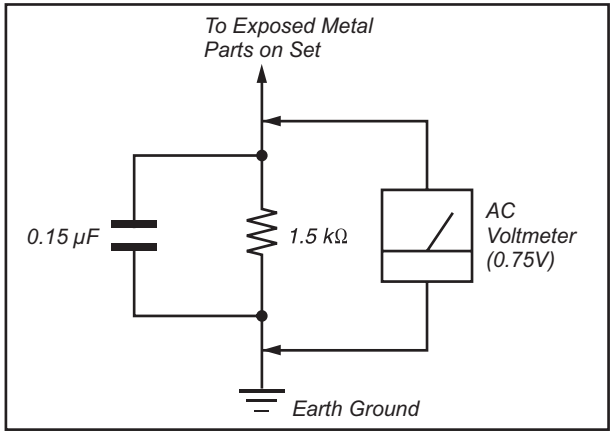


Figure A. Use an AC voltmeter to check AC leakage.

HOW TO FIND A GOOD EARTH GROUND

The cover-plate retaining screw on most AC outlet boxes is at earth ground. Verify the AC outlet box retaining screw ground by connecting a 60W to 100W incandescent (not a neon or fluorescent lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential. (see Figure B)

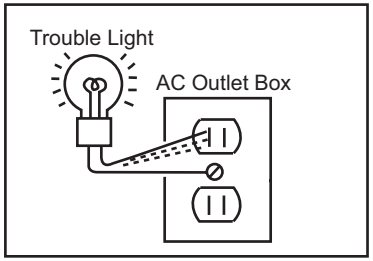


Figure B. Checking for earth ground.

SECTION 1 - FEATURES AND OVERVIEW

FEATURES

The AZ3FK chassis is one of several designs for the 2012 model line of Sony Bravia® LCD televisions. This manual covers the following models:

KDL-40BX450

KDL-40BX451

KDL-46BX450

KDL-46BX451

The BRAVIA® Sync™ BX45x series LED LCD HDTV

- Brilliant Full HD (1080p) picture quality
- Four HD inputs for a cable box, PS3™ and more[1]
- Share your pictures on the big screen via USB input
- Crisp detail & contrast w/ Clear Resolution Enhancer
- Optimized picture based on what you're watching
- Less grain & a clear picture w/ Digital Noise Reduction
- Theater-like movie viewing with 24p True Cinema
- One remote for multiple devices with BRAVIA® Sync™[2]

1. Cables sold separately.
2. Syncs with BRAVIA® Sync or Theatre Sync™ products.

SPECIFICATIONS

System	
Television system	NTSC: American TV standard ATSC (8VSB terrestrial): ATSC compliant 8VSB QAM on cable: ANSI/SCTE 07 2000 (Does not include CableCARD functionality)
Channel coverage	Analog terrestrial: 2 - 69 / Digital terrestrial: 2 - 69 Analog Cable: 1 - 135 / Digital Cable: 1 - 135
Panel system	LCD (Liquid Crystal Display) Panel
Speaker output	KDL-46/40BX450: 6 W + 6 W KDL-46/40BX451: 8 W + 8 W
Input/Output jacks	
CABLE/ANTENNA	75-ohm external terminal for RF inputs
VIDEO IN 1	VIDEO: 1 Vp-p, 75 ohms unbalanced, sync negative AUDIO: 500 mVrms (Typical) / Impedance: 47 kilohms
COMPONENT IN	YPBPR (Component Video): Y: 1.0 Vp-p, 75 ohms unbalanced, sync negative / PB:0.7 Vp-p, 75 ohms PR: 0.7 Vp-p, 75 ohms / Signal format: 480i, 480p, 720p, 1080i, 1080p AUDIO: 500 mVrms (Typical) / Impedance: 47 kilohms
HDMI IN 1/2	HDMI: Video: 480i, 480p, 720p, 1080i, 1080p, 1080/24p Audio: Two channel linear PCM 32, 44.1 and 48 kHz, 16, 20 and 24bits, Dolby Digital PC Input (see Operating Instructions)
AUDIO OUT	500 mVrms (typical)
DIGITAL AUDIO OUT (OPTICAL)	PCM/Dolby Digital optical signal
PC IN	D-sub 15-pin, analog RGB, 0.7 Vp-p, 75 ohms, positive See the PC Input Signal Reference Chart for PC and HDMI IN
PC/HDMI IN 1 AUDIO IN	Stereo mini jack, 500 mVrms, (Typical) / Impedance: 47 kilohms
USB	KDL-46/40BX450: Photo, Music and Video KDL-46/40BX451: Photo and Video

Model name	KDL-46BX450 KDL-46BX451	KDL-40BX450 KDL-40BX451
Power and others		
Power requirement	110-240 V AC, 50/60 Hz (U.S.A./Canada/Mexico 120 V AC, 60 Hz)	
Power consumption in use	188 W	158 W
in standby	Less than 0.2 W with 120 V AC and with 240 V AC less than 0.3 W	
Screen size* (inches measured diagonally)	46	40
Display resolution	1,920 dots (horizontal) × 1,080 lines (vertical)	
Speaker/Full range (2) (mm) (inches)	40 × 100 ($1\frac{5}{8} \times 4$)	
Dimensions* with stand (mm) (inches)	1,112 × 713 × 279 $43\frac{7}{8} \times 28\frac{1}{8} \times 11$	980 × 639 × 231 $38\frac{5}{8} \times 25\frac{1}{4} \times 9\frac{1}{8}$
without stand (mm) (inches)	1,112 × 675 × 97 $43\frac{7}{8} \times 26\frac{5}{8} \times 3\frac{7}{8}$	980 × 601 × 94 $38\frac{5}{8} \times 23\frac{3}{4} \times 3\frac{3}{4}$
wall-mount hole pattern (mm)	300 × 300	
wall-mount screw size (mm)	M6 (length: 8-12mm)	
Mass* with stand (kg) (lb)	17.2 37.9	13.8 30.4
without stand (kg) (lb)	16.0 35.3	12.8 28.2
Supplied accessories common to all models	Remote Control RM-YD080 (1)/Size AA batteries (2)/Operating Instructions (1)/Quick Setup Guide (1)/Warranty Card (1)/Safety and Regulatory Booklet (1)/Software License (1)/Stand installation guide (1)/Table-Top Stand (1 set)/Screw (3)	
Optional accessories	Connecting cables / Support Belt Kit / Wall-Mount Bracket: SU-WL500	

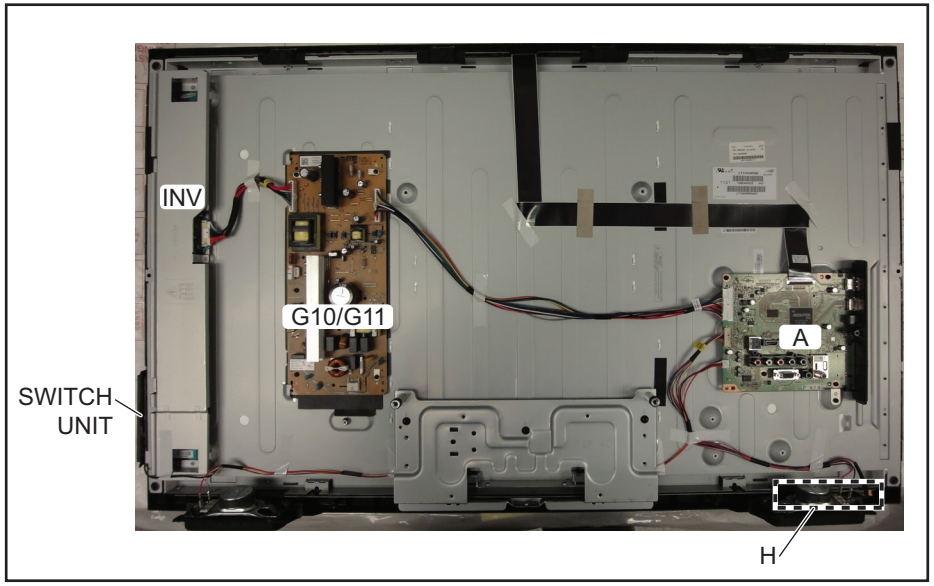
- Optional accessories availability depends on its stock.
- Design and specifications are subject to change without notice.

* Dimensions and mass are approximate values.

CHASSIS OVERVIEW

The primary circuits in the AZ3FK chassis consist of a Main Board (A Board), Power Supply Board (G10 Board for the 40” models and G11 Board for the 46” models), the IR Board (H Board), the Switch Unit and the LCD Panel Assembly which includes the TCON Board and the Inverter MT Board.

NOTE: For connector part number information, refer to “Connectors” on page 18. For Wire Dressing information, refer to “Wire Dressing” on page 20.



BOARD LAYOUT EXAMPLE FOR ALL MODELS

OVERALL CIRCUIT DESCRIPTION

The "Block Diagram" on page 9 provides an overview of the AZ3FK chassis. The following are descriptions of the boards and their functions.

MAIN BOARD

Common to all models utilizing the AZ3FK chassis, the Main Board (A Board) contains most of the video processing circuitry along with all audio processing. Control of the television is accomplished via a CPU embedded within the MT5389 processor. Below is a list of the key components located on the Main Board.

TUNER

The tuner is a combination ATSC/NTSC unit. It can receive traditional analog NTSC signals via cable or terrestrial along with ATSC digital signals via terrestrial (8VSB) or cable (64 or 256 QAM).

MT5389PROCESSOR

This IC performs the majority of the necessary audio and video processing on the Main Board.

Analog Video Input Switch: All analog video sources are selected and A/D converted and scaled (if necessary) to 1920 X 1080p 60HZ resolution.

Digital Audio and Video Decoder: The MPEG2 and Digital Dolby audio streams are received from the tuner for decompression. All video sources which are not native 1920 X 1080p 60HZ are scaled to this resolution. Digital audio content is output to the class D amplifier for processing and amplification.

Audio Processing: Analog audio sources are selected and A/D converted directly by the MT5389. The audio information is then processed digitally. Digital audio from the tuner and HDMI sources is also input and processed. Class D amplifier provides the drive for the speakers.

HDMI Input and Switching: The customer can select the HDMI1 through HDMI2 input. Each HDMI input contains a dedicated EDI NVM (not shown) to provide display information data to any device connected via the HDMI inputs.

CPU: The CPU internal to the MT5389 processor controls all aspects of the television functions. Input from the user along with monitoring of critical circuits is also performed by this CPU.

LVDS Transmitter: Integrated into the MT5389 is a Low Voltage Differential Signaling (LVDS) transmitter. This circuit converts the 8-bit parallel RGB video information into a set of high speed serial lines for noise-free transmission to the TCON circuits located internally to the LCD panel.

POWER SUPPLY BOARD

There are 2 different Power Supply boards used in the models in this manual. The type of board depends on the size of LCD panel. They are:

- G10 for the 40" models
- G11 for the 46" models

There are 2 distinct sections on the power supply:

Standby Supply: Continuously operational as long as AC power is applied, the standby supply generates 3.3VDC for the circuits requiring power while the unit is turned off. An unregulated 15-volt line is present to provide power to the main relay, PFC and main power supply at turn-on.

Main Supply: Once the power supply receives a power-on command from the CPU on the A board, the main switching supply is turned on to provide a regulated 12V source, a dedicated un-regulated 15V for the audio circuits and an unregulated 24V source for the inverter circuit.

IR BOARD

Designated as the H Board, the IR Board contains the power, standby and timer LED's that is located on this board along with the IR remote receiver and light level sensor.

SWITCH UNIT

This board contains the power, channel and volume up/down and menu buttons.

LCD PANEL ASSEMBLY

The LCD Panel Assembly includes the LCD Panel, TCON Board and Backlight system.

The LCD Panel contains the actual liquid crystals, color filters and polarizers. The liquid crystals are manipulated by the applied voltage to pass a specific amount of light - from the backlight - depending on the level of voltage applied.

The TCON performs all the control, timing, charge and discharge functions driving the operation of the LCD Panel.

A new LCD Panel Assembly from parts will include the following items:

- LCD Panel
- TCON Board
- Inverter MT Board

TCON BOARD

The TCON Board communicates between the LCD Panel and the microprocessor on the Main Board.

NOTE: The TCON Board is not available as a replacement part for all models. To determine if the TCON Board is available as a replacement part, refer to the LCD Panels Manual.

INVERTER MT BOARD

The inverter receives the unregulated 24V from the Power Supply Board and generates the required high voltage AC to power the backlight lamps. A control line to turn on the inverter (backlights on) is used in conjunction with a dimmer control to vary the light level of the CCFL lamps.

SECTION 2 - TROUBLESHOOTING

OVERVIEW

This chapter provides information regarding the Self Diagnosis feature in our TVs.

UPDATING THE SOFTWARE

The Self Diagnosis function is designed to provide information regarding the problem with the TV, however, there are several issues that may be resolved by updating the TV software to the latest version. Always check the Sony Authorized Servicer Portal at http://www.sony.com/asp for any issues that are software related. Most symptoms that are correctable by software updates involve communications issues with other devices or minor glitches in the operation of a specific function. Below is a list of some of the symptoms that may be corrected with a software update:

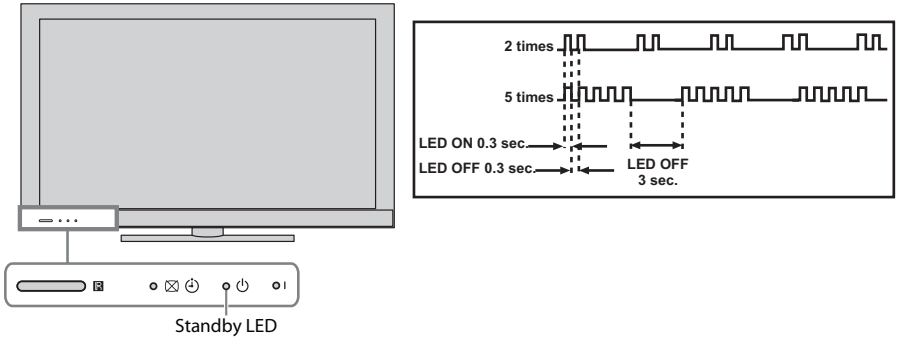
- Fluctuations in picture brightness
- Intermittent picture freezing or noise
- Problems with certain inputs (especially HDMI)
- Intermittent or distorted audio
- Erratic remote control operation
- TV turns on and off by itself
- Loss of color
- Internet connectivity
- Certain features not working correctly (photo or video file viewing)

SELF DIAGNOSIS FUNCTION

Critical voltages and circuit operations are monitored by the CPU on the Main Board. If an error is detected the Self Diagnosis function in the TV will force the TV to shut down by the CPU. The monitored circuit in which the fault occurred will automatically cause the CPU to blink the Standby LED in groups of repeating sequences. The number of times the Standby LED blinks indicates the possible cause of the problem.

Not all of the available protect codes are used in every model. For example, models that don't have the local dimming feature do not use the 4X blink error as this circuit is found in models that are backlit with fluorescent lamps. The information in this section provides guidance in locating the possible component causing the shutdown.

STANDBY LED BLINK COUNT



LED DISPLAY & BLINK COUNT

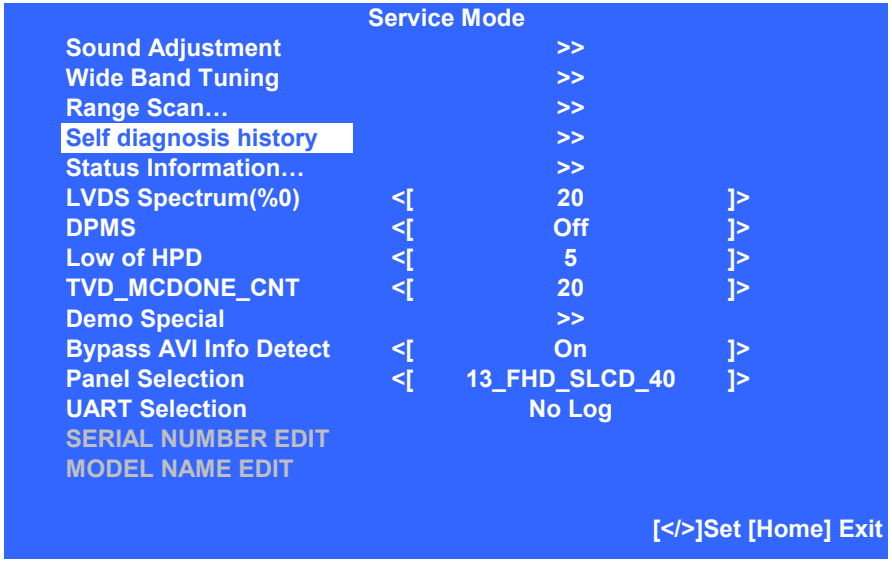
VIEWING THE SELF CHECK DIAGNOSIS HISTORY

When an error is detected, the Self Check screen records the number of times the error occurred. This is helpful in confirming past occurrences of an error and for determining if an error is intermittent when the customer is not sure what is causing the television to shut down. If the screen displays a "0", no error has occurred.

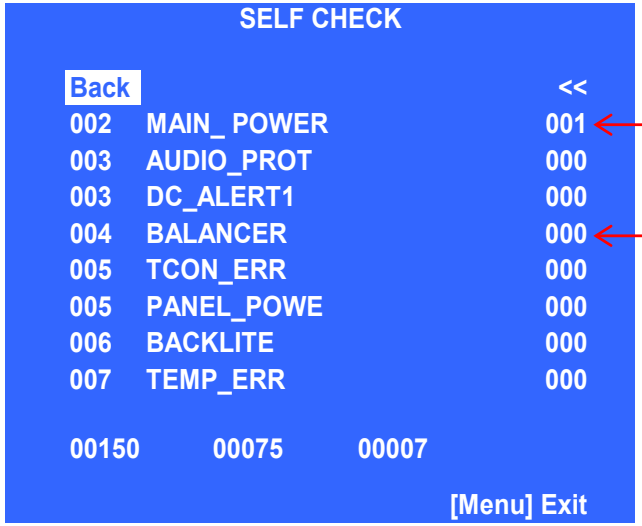
1. TV must be in Standby mode.
2. Press the following buttons on the ***Remote Commander*** within a second of each other:

DISPLAY → Channel 5 → Volume + → POWER

3. To access the Self diagnosis history page, press ⇩ until **Self diagnosis history** is highlighted.



4. Then press ⇨ to view the **Self Check** screen.



SAMPLE SELF CHECK DIAGNOSIS PAGE

2X Blink - Main Power Error

A loss of REG12V from the power supply triggers this protect event. The usual cause is a failure of the main switching supply. In some instances, excessive loading on the secondary supply lines can cause the switching regulator to stop or fail again, if a replacement board is installed.

3X Blink- DC Regulator/Audio Error

The REG 5V and D3.3V source originating on the Main Board is monitored for low-voltage conditions by the CPU. A failure causing a 3X shutdown requires replacing the Main Board.

4X Blink – Balancer Error

NOT USED IN THIS MODEL SERIES.

5X Blink - TCON Error/Panel Error

The 5X blink protection mode indicates a communications error with the timing control circuits (TCON Board) has occurred. If the TCON Board is available for replacement, replace it, if not, replace the LCD Panel Assembly. In rare cases a loose or defective LVDS cable could also be the cause.

6X Blink - Backlight Inverter System Failure

If the inverter circuits fails to generate high voltage or one or more of the backlight lamps fails to light, the television will shut down and display this diagnostics error. Observing for the presence of backlighting is crucial in determining which component is likely at fault.

If the backlights turn on before the 6X shutdown occurs, it is safe to assume that the inverter circuits are functioning and one of the lamps failed to ignite. Replacing the LCD Panel assembly is necessary. If the backlights never turn on before the 6X shutdown, the Inverter MT Board has failed. If this board is available for replacement, replace it, if not, replace the LCD Panel Assembly.

7X Blink - Temperature Failure

A digital thermometer IC located on the Main Board provides a temperature reading of the chassis and LCD panel. If the temperature exceeds a pre-determined point the TV will shut down. If this problem occurs immediately at turn-on, the temperature sensing IC has failed and replacing the main board is required. If this occurs after the TV has been running for a while, check for ventilation issues that could cause the TV to run hotter than normal.

TRIAGE CHART

Use this general Triage Chart to determine what may possibly be causing the error before going out to the customers location.

1. **Confirm the symptom from the customer.**
2. **Select that symptom from the chart.**
3. **Bring the primary component listed for that symptom.**
4. **Follow the associated flowcharts in the Training Manual to isolate the board.**
5. **Chart Color Code.**

RED DOT: (Primary) Most likely defective part.
BLUE Triangle: (Secondary) Possible defective part.

Board	Protection Modes					Power	Video			Audio
	2X	3X	5X	6X	7X	Dead set	No Video	Whole Screen Distortion	Isolated Area Distortion	No Audio
Main Board		●			●*	▲	▲	●		●
Power Supply	●			●***		●				
H Board										
Inverter				▲*						
LCD Panel				●**					●	
TCON			●				●	▲	▲	

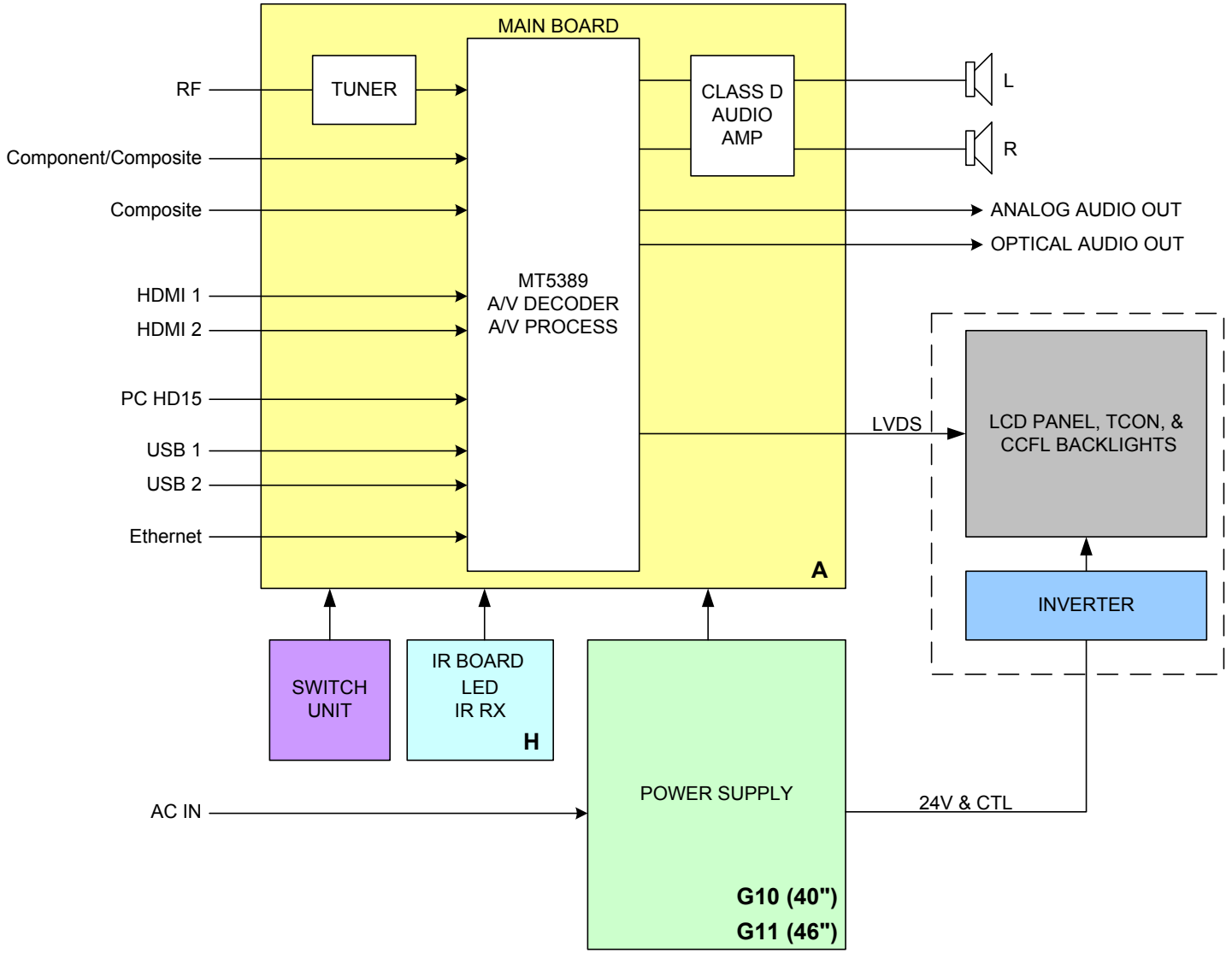
***NOTE:** REFER TO LCD PANEL SERVICE MANUAL IN REFERENCE LIBRARY DATABASE FOR CORRECT REPLACEMENT PARTS BASED ON SERIAL NUMBER.

●* TV Immediate Shuts Off After Power ON & 7X
●Backlight Turns ON before TV Shuts Off**
●*Backlight Does NOT Turn ON before TV Shuts**
▲* Secondary Component

To access the most recent version of the Triage documents for the models listed in this manual, login into the Sony Authorized Servicer Portal at http://www.sony.com/asp.

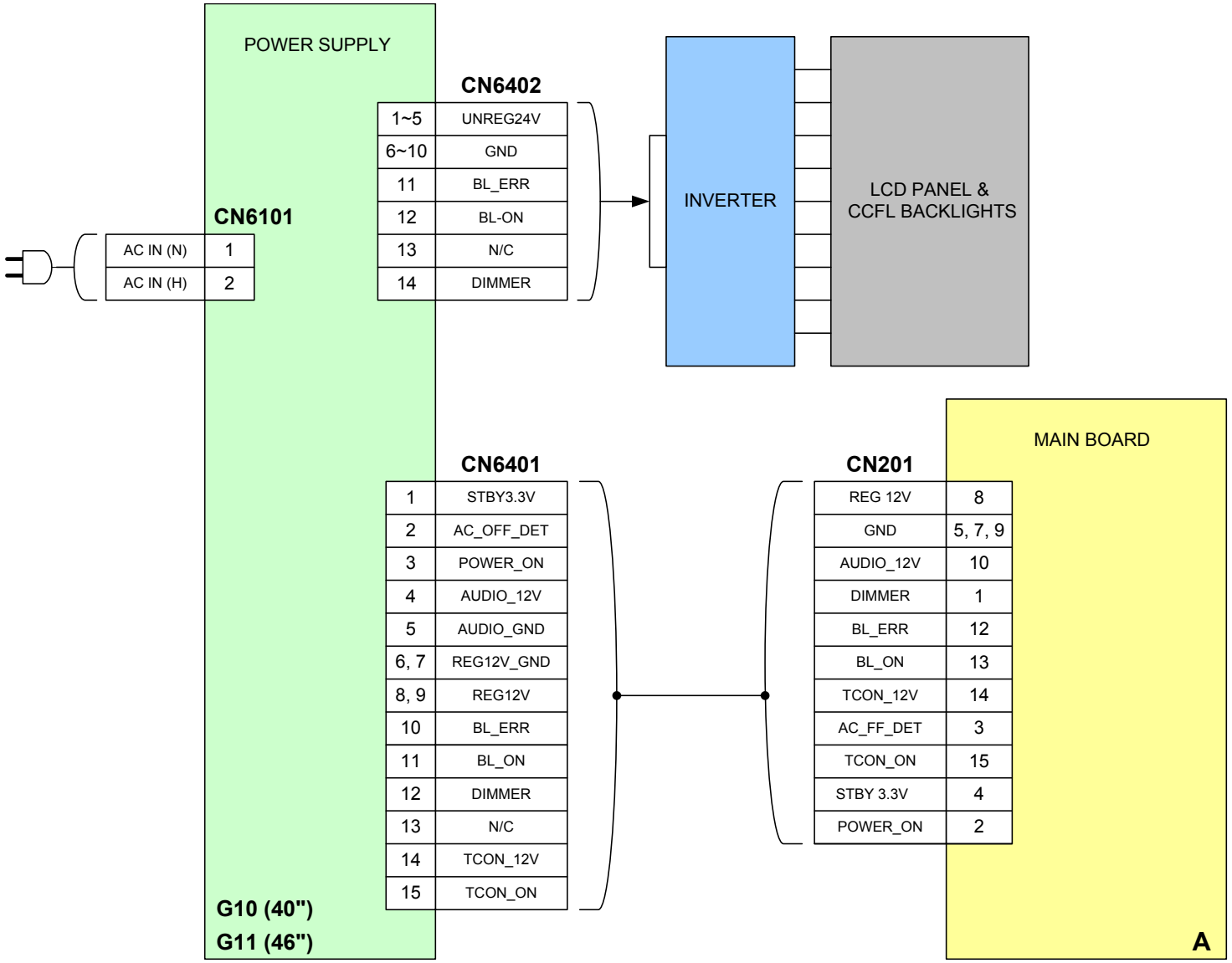
SECTION 3 - FLOW CHARTS AND DIAGRAMS

BLOCK DIAGRAM

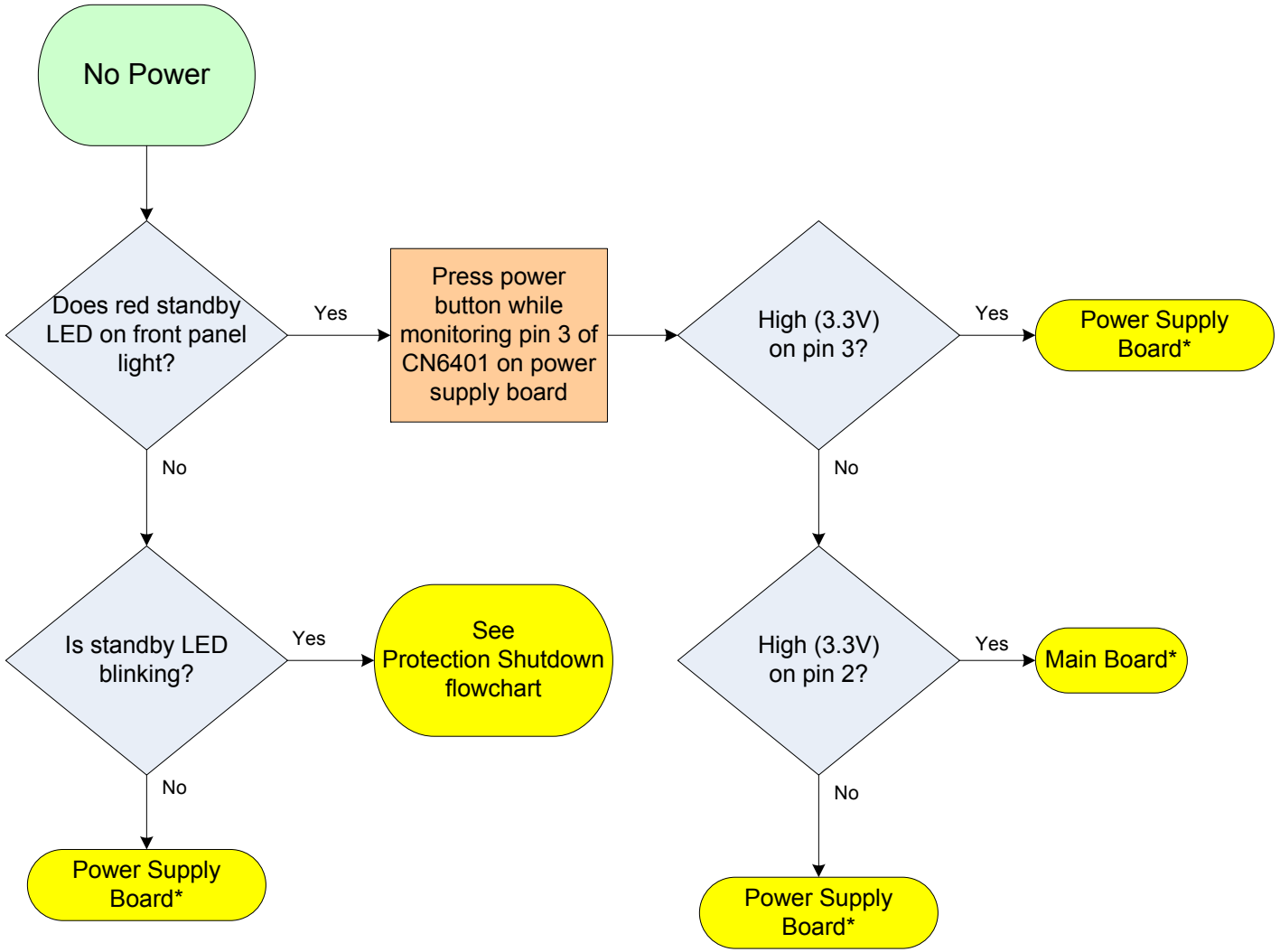


OVERALL BLOCK DIAGRAM

NO POWER



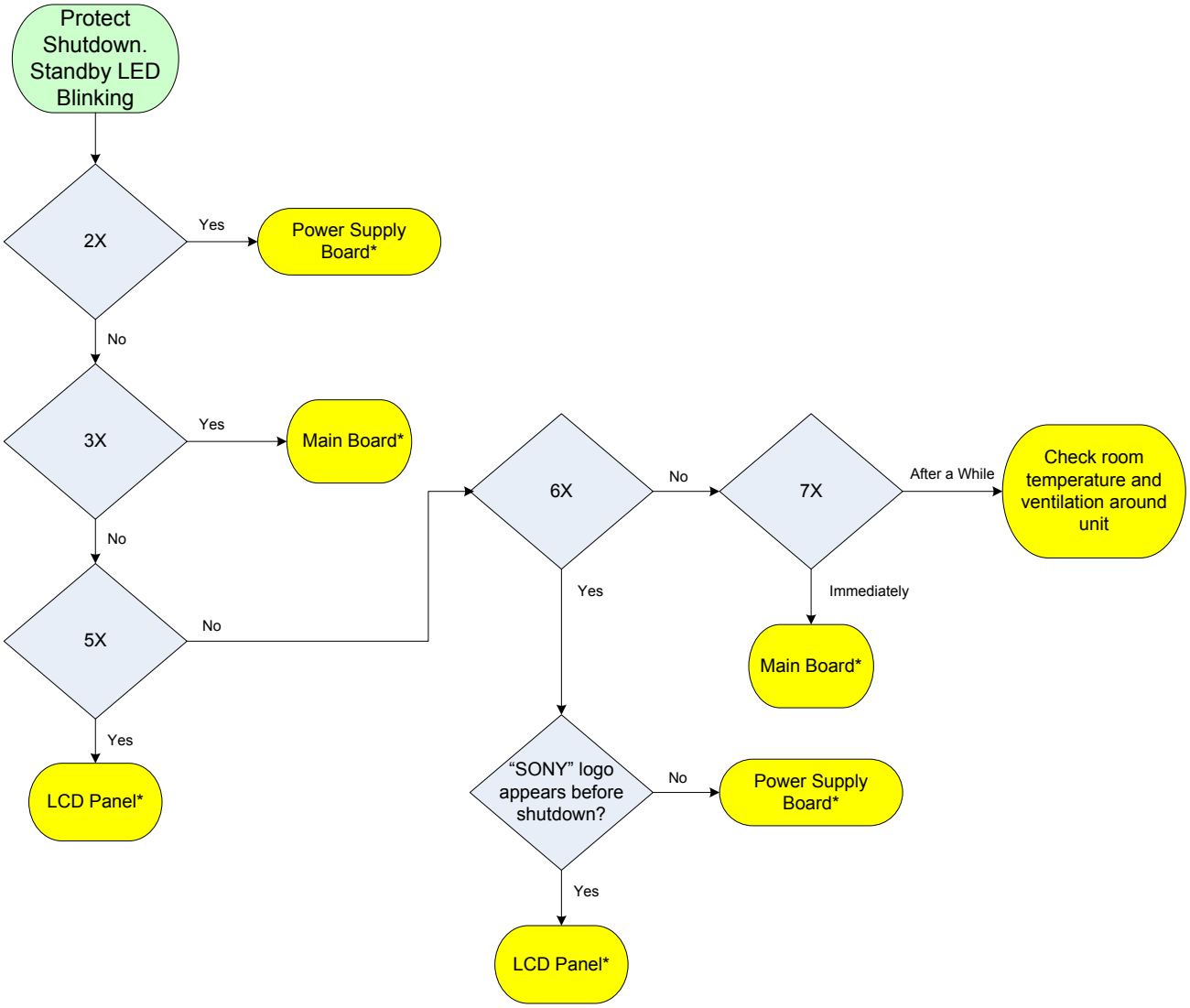
POWER AND CONTROL BLOCK DIAGRAM



NO POWER FLOWCHART

*For Part Number information, Refer to "Section 4 - Disassembly/Part Number Information" on page 15.

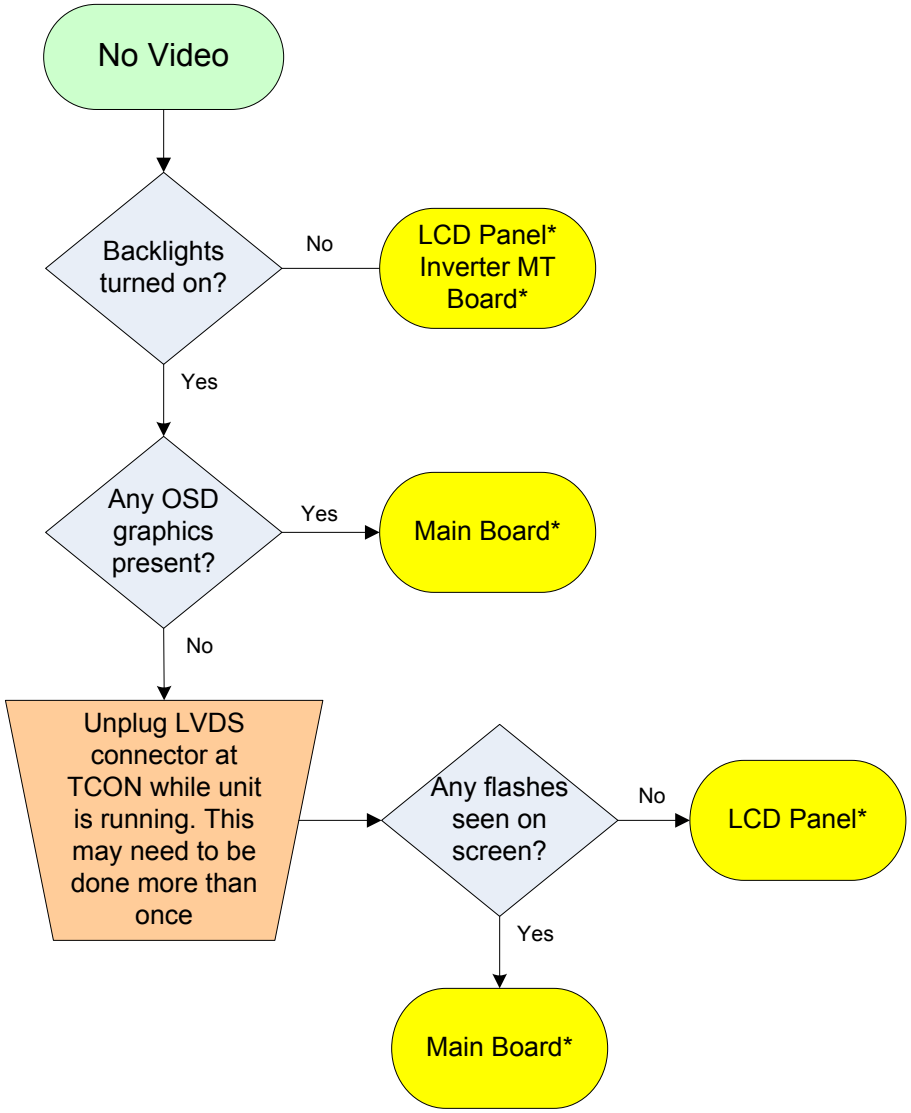
STANDBY LED BLINKING



PROTECTION SHUTDOWN FLOWCHART

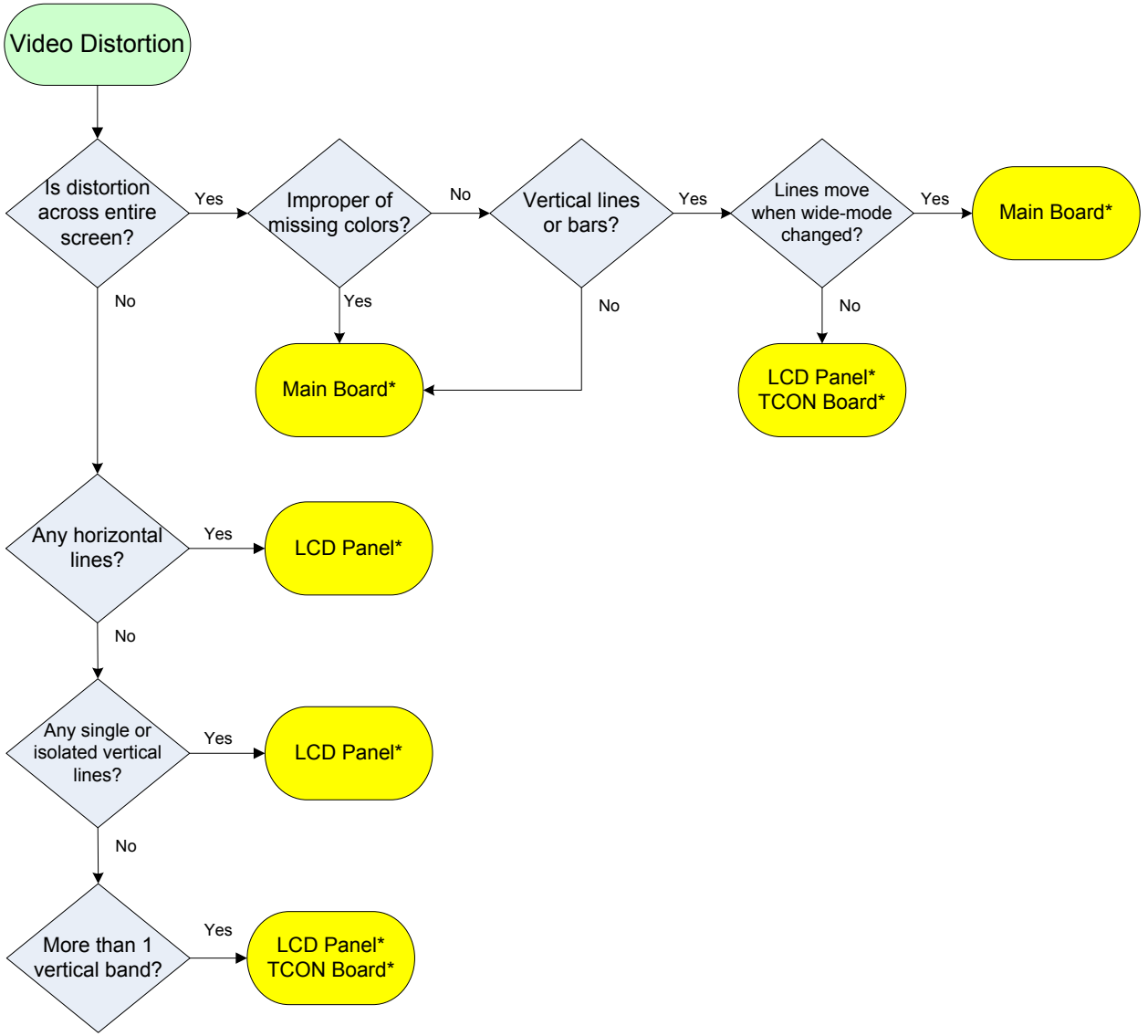
*For Part Number information, Refer to "Section 4 - Disassembly/Part Number Information" on page 15.

NO VIDEO



NO VIDEO FLOWCHART

*For Part Number information, Refer to "Section 4 - Disassembly/Part Number Information" on page 15.



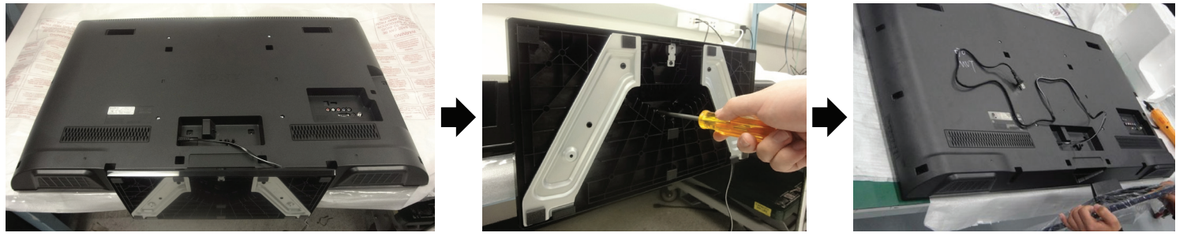
VIDEO DISTORTION FLOWCHART

*For Part Number information, Refer to "Section 4 - Disassembly/Part Number Information" on page 15.

SECTION 4 - DISASSEMBLY/PART NUMBER INFORMATION

TABLE-TOP STAND AND REAR COVER REMOVAL

Ⓐ Gently place LCD TV face down onto a soft cloth and remove 3 screws from Table-Top Stand.

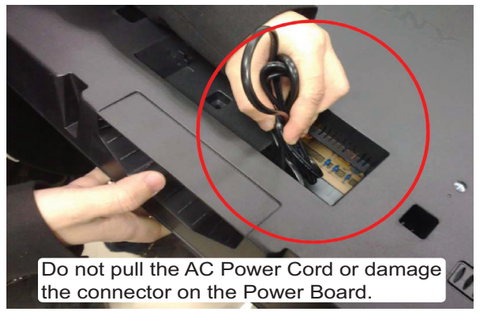


Ⓑ Remove screws from Rear Cover.
17 from KDL-40BX450/40BX451 Only
19 from KDL-46BX450/46BX451 Only

CAUTION: Do not damage the Power Board Connector and AC Power Cord when removing the Rear Cover.

Ⓒ Carefully lift Rear Cover from the bottom and push forward to release top hooks.

Ⓓ Hold Power Supply Cord while lifting up Rear Cover, then pass Power Supply Cord through Rear Cover opening.



Components not identified by a part number or description are not stocked because they are seldom required for routine service.

The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

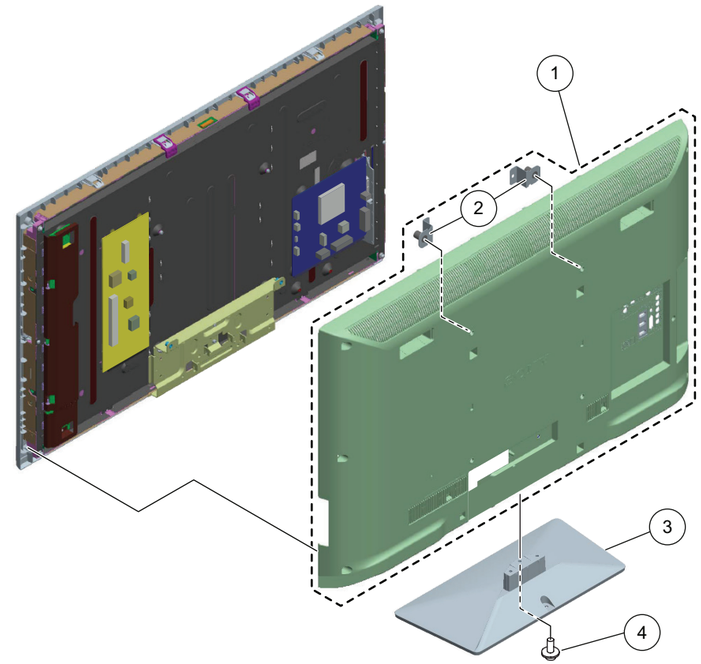
* Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

NOTE: The components identified by a red outline and a 🔒 mark contain confidential information. Specific instructions must be adhered to whenever these components are repaired and/or replaced.
See Appendix A: Encryption Key Components in the back of this manual.

(Check the Sony Authorized Servicer Portal at http://www.sony.com/asp website for any additional service related issues.)

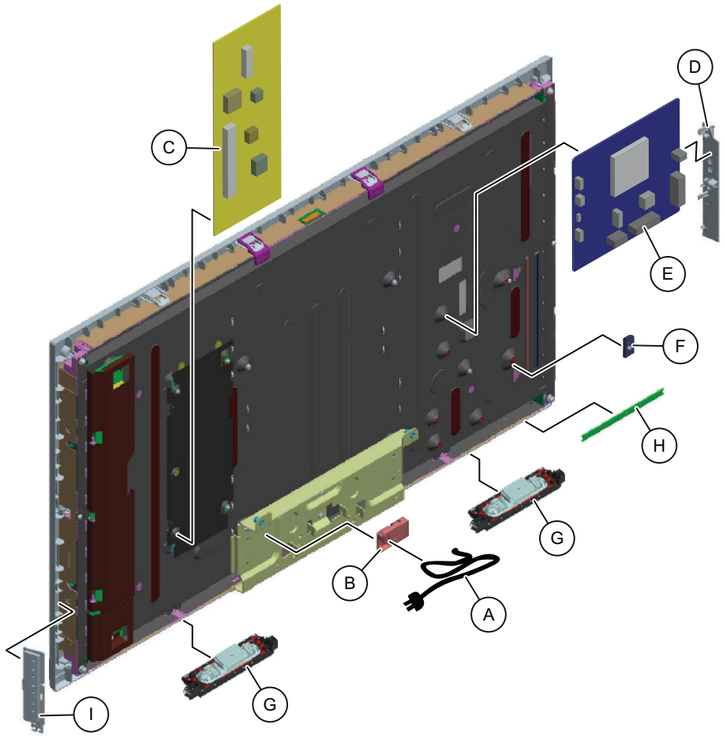


REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	4-409-856-11	REAR COVER (40APOF) (KDL-40BX450/40BX451 ONLY)	[2]
1	4-409-857-11	REAR COVER (46APOF) (KDL-46BX450/46BX451 ONLY)	[2]
2	N/A	BRACKET, VESA (40APOF)	
3	X-2583-463-1	STAND ASSEMBLY (40APOF) (KDL-40BX450/40BX451 ONLY)	
3	X-2583-464-1	STAND ASSEMBLY (46APOF) (KDL-46BX450/46BX451 ONLY)	
4	2-580-608-11	SCREW, +PSW M5X16 (SCREWS TO ATTACH TABLE-TOP STAND TO LCD TV)	

For product protection and safety reasons, Sony strongly recommends that you use the screws provided with the TV.
CAUTION: These screws cannot be used to secure the TV to the Wall Mount Brackets

MAIN BOARD (A) AND POWER SUPPLY BOARD (G10/G11) REMOVAL

Ⓐ Disconnect Power Supply Cord from G10/G11 Board.
Ⓑ Release clips and lift-up AC Cord Cover.
Ⓒ Remove 4 screws and disconnect 2 connectors from G10/G11 Board.
Ⓓ Release clips and slide-out Side Bracket.
Ⓔ Remove 4 screws and disconnect 4 connectors from A Board.
Ⓕ Remove 1 screw from MB Bracket.
Ⓖ Remove 4 screws and disconnect connectors from Left and Right Speakers.
Ⓗ Release clips and disconnect 1 connector from H Board.
Ⓘ Disconnect 1 connector, then tilt Switch Unit left and lift-up.

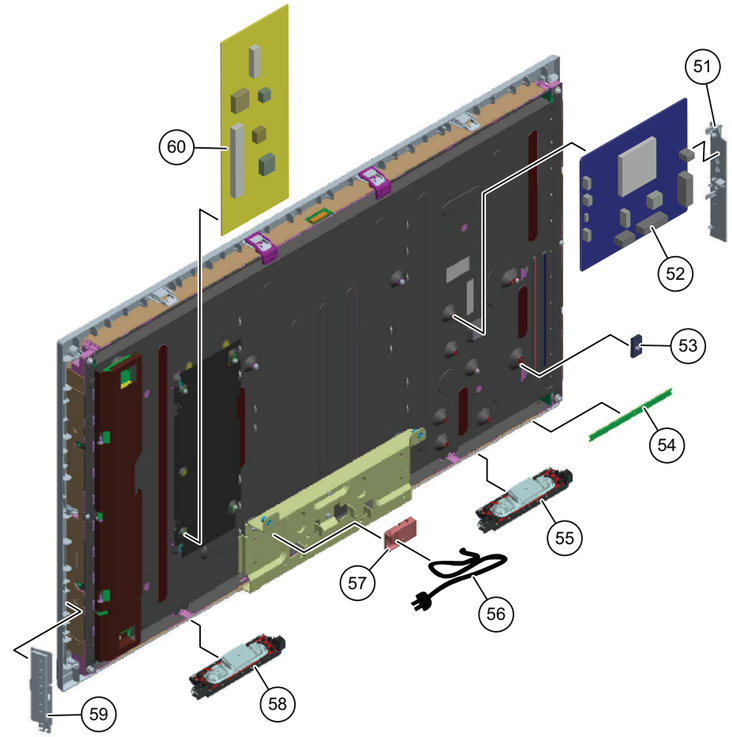


NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

NOTE: The components identified by a red outline and a 🔒 mark contain confidential information. Specific instructions must be adhered to whenever these components are repaired and/or replaced.
See Appendix A: Encryption Key Components in the back of this manual.

(Check the Sony Authorized Servicer Portal at http://www.sony.com/asp website for any additional service related issues.)



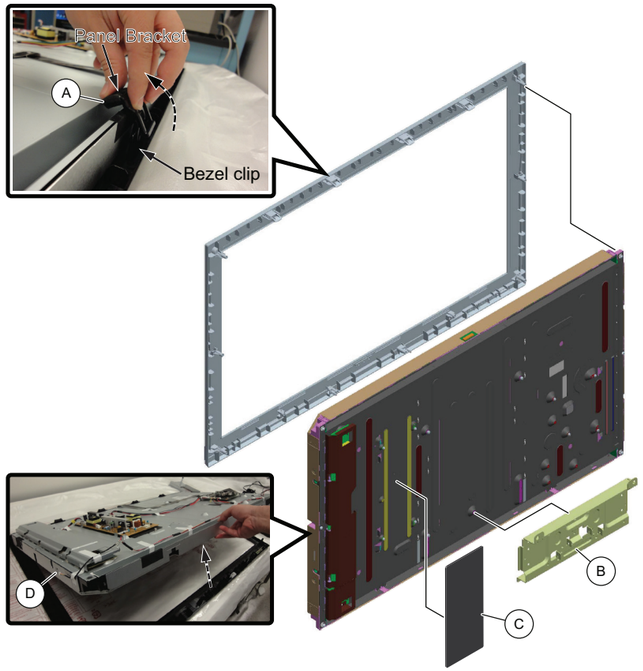
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
51	4-300-805-11	BRACKET, SIDE (APOF)	
🔒 52	1-895-182-11	A BOARD, COMPLETE	
		(KDL-40BX450/46BX450 ALL EXCEPT LA MODELS)	
		AFTER REPLACING THE MAIN BOARD, YOU MUST UPDATE THE SOFTWARE TO THE LATEST VERSION	
🔒 52	1-895-182-21	A BOARD, COMPLETE	
		(KDL-40BX450/46BX450 FOR LA MODELS ONLY)	
		AFTER REPLACING THE MAIN BOARD, YOU MUST UPDATE THE SOFTWARE TO THE LATEST VERSION	
🔒 52	1-895-182-31	A BOARD, COMPLETE	
		(KDL-40BX451/46BX451 ONLY)	
		AFTER REPLACING THE MAIN BOARD, YOU MUST UPDATE THE SOFTWARE TO THE LATEST VERSION	

REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
53	4-300-807-01	BRACKET, MB (40APOF)	
54	1-895-183-11	H BOARD, MOUNTED	
55	1-858-771-11	SPEAKER 4X10 (L)	
⚠ 56	1-839-938-31	POWER-SUPPLY CORD	
57	4-300-803-01	COVER, AC CORD (40APOF)	
58	1-858-771-21	SPEAKER 4X10 (R)	
59	1-490-188-11	SWITCH UNIT	
60	1-474-380-11	G10 BOARD, COMPLETE	
		(KDL-40BX450/40BX451 ONLY)	
60	1-474-382-12	G11 BOARD, COMPLETE	
		(KDL-46BX450/46BX451 ONLY)	

PANEL BRACKETS AND LCD PANEL REMOVAL

NOTE: The Insulation Sheet is NOT included with the replacement LCD Panel.

Ⓐ Remove Panel Brackets from Bezel.
4 from KDL-40BX450/40BX451 Only
6 from KDL-46BX450/46BX451 Only
Ⓑ Remove 5 screws from Bottom Frame.
Ⓒ Carefully remove the Insulation Sheet from the original LCD Panel to use on the replacement LCD Panel.
(The Insulation Sheet is securely attached to the Bezel using double-sided tape).
Ⓓ Gently lift up LCD Panel.



CLEANING THE LCD PANEL

CAUTION: When cleaning the TV, be sure to unplug the power cord to avoid any chance of electric shock.

Clean the cabinet of the TV with a dry soft cloth and wipe the LCD screen gently with a soft cloth.

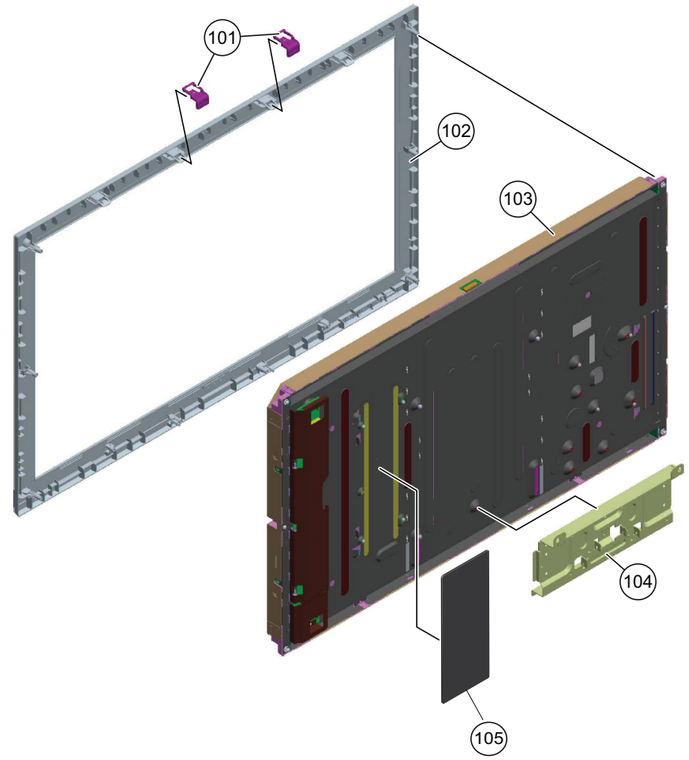
- ☑ Stubborn stains may be removed with a cloth slightly moistened with a solution of mild soap and warm water.
- ☑ If using a chemically pretreated cloth, please follow the instruction provided on the package.
- ☑ Never use strong solvents such as a thinner, alcohol or benzine for cleaning.
- ☑ Periodic vacuuming of the ventilation openings is recommended to ensure proper ventilation.
- ⦸ Do Not use paper towels, any type of abrasive pad, rags, rubber or vinyl materials to clean the screen. Using these materials could easily scratch the screen which may result in permanent damage.
- ⦸ Do Not use any cleaning product containing alkaline/acid cleaner, scouring powder or volatile solvent, such as alcohol, ammonia, benzine, thinner or insecticide. Using any of these harsh cleaners may result in permanent damage to the screen.
- ⦸ Do Not spray water or detergent directly onto the TV screen. If liquid drips into the bottom of the screen it may cause a failure.

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

NOTE: The components identified by a red outline and a 🔒 mark contain confidential information. Specific instructions must be adhered to whenever these components are repaired and/or replaced.
See Appendix A: Encryption Key Components in the back of this manual.

(Check the Sony Authorized Servicer Portal at http://www.sony.com/asp website for any additional service related issues.)



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
101	4-166-126-21	SUPPORT, PANEL	
102	4-409-853-01	BEZEL (40APOF)	(KDL-40BX450 ONLY)
102	4-409-853-11	BEZEL (40APOF)	(KDL-40BX451 ONLY)
102	4-409-854-01	BEZEL (46APOF)	(KDL-46BX450 ONLY)
102	4-409-854-11	BEZEL (46APOF)	(KDL-46BX451 ONLY)
103	NA	LCD PANEL	FOR ALL LCD PANEL AND TCON BOARD PART NUMBER INFORMATION REFER TO THE LCD PANELS SERVICE MANUAL

REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
104	4-300-797-01	FRAME, BOTTOM (40APOF)	(KDL-40BX450/40BX451 ONLY)
104	4-300-798-02	FRAME, BOTTOM (46APOF)	(KDL-46BX450/46BX451 ONLY)
105	4-289-497-02	SHEET, INSULATION (GF40)G	(ALL MODELS EXCEPT KDL-46BX450)
		ORDER THIS PART WHEN REPLACING THE LCD PANEL	
105	4-268-449-01	SHEET, INSULATION (G3)	(KDL-46BX450 ONLY)
		ORDER THIS PART WHEN REPLACING THE LCD PANEL	

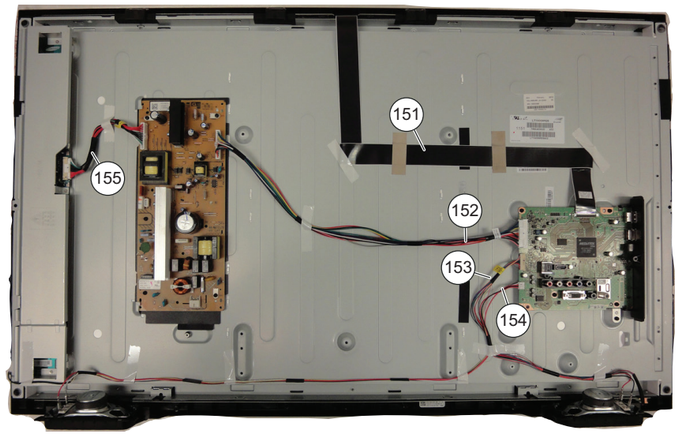
NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

NOTE: The components identified by a red outline and a 🔒 mark contain confidential information. Specific instructions must be adhered to whenever these components are repaired and/or replaced.
See Appendix A: Encryption Key Components in the back of this manual.

(Check the Sony Authorized Servicer Portal at http://www.sony.com/asp website for any additional service related issues.)

CONNECTORS



REF. NO.	PART NO.	DESCRIPTION [ASSEMBLY INCLUDES]
151	1-910-103-98	(LVDS) CONNECTOR ASSEMBLY 46 51P (FFC) (KDL-40BX450/40BX451 ONLY)
151	1-910-103-97	(LVDS) CONNECTOR ASSEMBLY 46 51P (FFC) (KDL-46BX450/46BX451 ONLY)
152	1-910-106-00	CONNECTOR ASSEMBLY 40 15P MB-PSU (KDL-40BX450/40BX451 ONLY)
152	1-910-103-95	CONNECTOR ASSEMBLY 46 15P MB-PSU (KDL-46BX450/46BX451 ONLY)
153	1-910-105-99	CONNECTOR ASSEMBLY 40 14P MB-H&KEY (KDL-40BX450/40BX451 ONLY)
154	1-910-105-98	CONNECTOR ASSEMBLY 40 4P MB-SP (KDL-40BX450/40BX451 ONLY)
154	1-910-103-93	CONNECTOR ASSEMBLY 46 4P MB-SP (KDL-46BX450/46BX451 ONLY)
155	1-910-103-96	CONNECTOR ASSEMBLY 46 14P PSU-INV

SCREWS

SCREW INFORMATION NOT AVAILABLE FOR THESE MODELS

ACCESSORIES AND PACKAGING

PART NO.	DESCRIPTION
1-756-988-21	BATTERY, MANGANESE (R6)
3-299-071-05	FLYER, SAFETY
4-418-207-11	GUIDE, QUICK SET UP (ENGLISH VERSION)
4-418-207-21	GUIDE, QUICK SET UP (FRENCH VERSION)
4-418-207-31	GUIDE, QUICK SET UP (SPANISH VERSION)
4-418-206-11	MANUAL, INSTRUCTION (ENGLISH VERSION)
4-418-206-21	MANUAL, INSTRUCTION (FRENCH VERSION)
4-418-206-31	MANUAL, INSTRUCTION (SPANISH VERSION)
2-580-608-11	SCREW, +PSW M5X16 (SCREWS TO ATTACH TABLE-TOP STAND TO LCD TV) For product protection and safety reasons, Sony strongly recommends that you use the screws provided with the TV. CAUTION: These screws cannot be used to secure the TV to the Wall Mount Brackets.
4-416-690-11	SUPPLEMENT (STAND INSTALLATION)

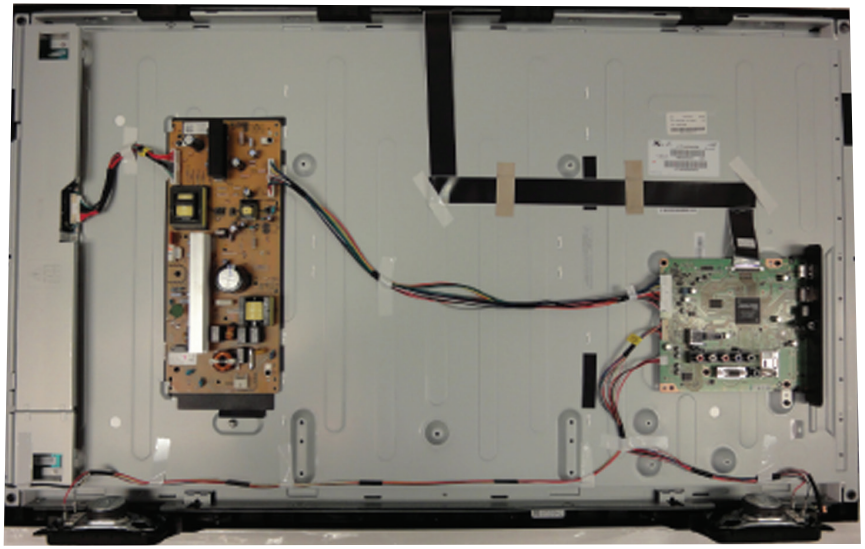
MISCELLANEOUS

PART NO.	DESCRIPTION
4-419-435-11	LABEL, MX ENERGY (APO) (KDL-40BX450/40BX451 ONLY)
4-419-435-21	LABEL, MX ENERGY (APO) (KDL-46BX450/46BX451 ONLY)

REMOTE COMMANDER

PART NO.	DESCRIPTION
1-489-990-11	REMOTE COMMANDER (RM-YD080)

WIRE DRESSING



LAYOUT EXAMPLE FOR ALL MODELS

SECTION 5 - UPDATES AND ADJUSTMENTS

OVERVIEW

The models in this manual utilize a “generic” type of Main Board, therefore a software update must be performed and certain service adjustment settings must be changed or confirmed whenever the Main Board, LCD Panel or TCON Board is replaced.

There are 2 reasons for updating the software on the TVs.

- Software updates for customers

  These updates are for enhancements or improvements that have been made to the software after the TV was released. These updates are accessed by the customer from the Sony Support Site at http://esupport.sony.com.

- Software update for servicers

  These updates are specifically for servicers to use during a service call and are only available on the Sony Authorized Servicer Portal at http://www.sony.com/asp.

SOFTWARE UPDATES FOR CUSTOMERS

The subject of software updates is very important. The televisions of today have advanced to the point where they are not simply a television anymore. They are evolving into devices that are designed to integrate with numerous other devices found in the home. Some examples are: portable audio and video devices, still cameras, home computer networks and accessing the internet to name a few.

Communications with these varying devices requires that the television be compatible with varying communications protocols. Although standards are detailed for each of these protocols, the real world dictates that occasional errors may occur that could prevent devices from operating or communicating properly.

Keeping the software in the television up-to-date is a procedure that is normally handled by the owner of the television. Most customers who own computers and other digital devices are familiar with and are accustomed to updating the software in their products. If a customer contacts the Sony Customer Support Center and it is deemed to be correctable with a software update, the issue is handled at the customer level.

Software updates can be performed by:

- Customer Manual Downloads

  Software updates can be accessed by the customer from the Sony Support Site at http://esupport.sony.com where they can be downloaded and placed on a USB thumb drive to be loaded onto the TV. The instructions for downloading the software file vary from chassis to chassis and sometimes from model to model. The customer is provided with the instructions to properly format the USB thumb drive, unzip the file, and the procedures for loading the software into the television

SOFTWARE UPDATES FOR SERVICERS

Replacement Main Boards are now stocked with basic software. Once the replacement board is installed in the TV, the most current software needs to be installed using a USB thumb drive containing the necessary software.

This new method of supplying Main Boards significantly reduces the complexity of replacing the Main Boards. Information about the LCD panel is stored on the TCON circuits. This information is automatically loaded onto the Main Board when the TV is powered up. With the correct software version the Main Board and/or the TCON can be replaced more efficiently. The software update and procedures for the software installation are located on the Sony Authorized Servicer Portal at

http://www.sony.com/asp.

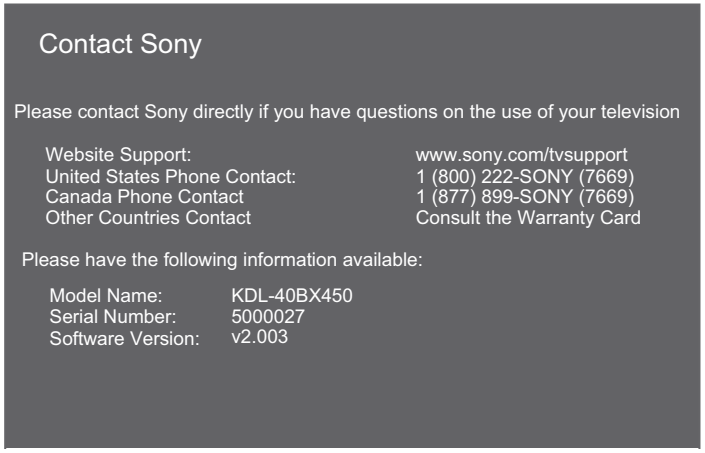
SOFTWARE UPDATE RESPONSIBILITY

Software updates are designed to be performed by the customer. Warranty repairs in which the issue can be resolved by a software update ***are not reimbursable***. Most issues involving software updates are handled by the customer service center and should not be directed to an authorized service center. It is the responsibility of the servicer to prevent service calls for issues that involve software updates. Exceptions to this are certain cases whereby the customer is unable or unwilling to perform the task. In this situation, the servicer will be notified and receive the proper authorization for reimbursement.

It is the servicer's responsibility, however, to ***make certain that any TV requiring a legitimate service is running the latest software version and to install it if necessary.***

CHECKING THE SOFTWARE VERSION

The easiest way to check the version of software that is currently on the TV is to access the Contact Sony screen by using the customer menu.



EXAMPLE OF SOFTWARE VERSION LOCATED ON THE CONTACT SONY SCREEN

EXAMPLES OF SOFTWARE CORRECTABLE SYMPTOMS

Always check the Sony Authorized Servicer Portal at www.sony.com/asp site for any known and/or listed issues that are software related. Most symptoms that are correctable by software updates involve communications issues with other devices or minor glitches in the operation of a specific function. Below is a list of some of the symptoms that may be corrected with a software update:

- Fluctuations in picture brightness
- Intermittent picture freezing or noise
- Problems with certain inputs (especially HDMI)
- Intermittent or distorted audio
- Erratic remote control operation
- Unit turns on and off by itself
- Loss of color
- Internet connectivity

- Certain features not working correctly (photo or video file viewing)

OVERVIEW

As mentioned in page 21, the models in this manual utilize a “generic” type main board, therefore certain service adjustments settings must be changed or confirmed when either the Main Board, LCD Panel or TCON Board are replaced.

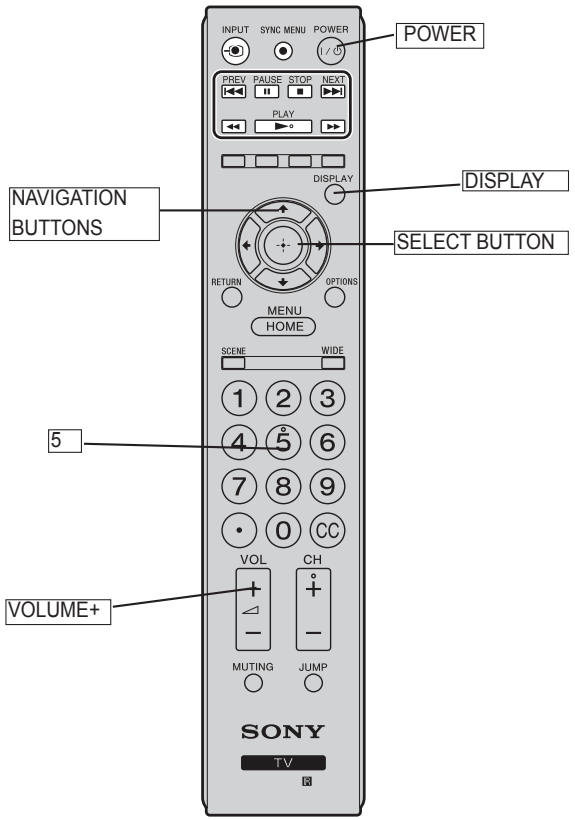
UPDATING THE SOFTWARE

After replacing the Main Board, LCD Panel or TCON Board, you MUST UPDATE the SOFTWARE to the latest version.

ACCESSING SERVICE ADJUSTMENT MODE

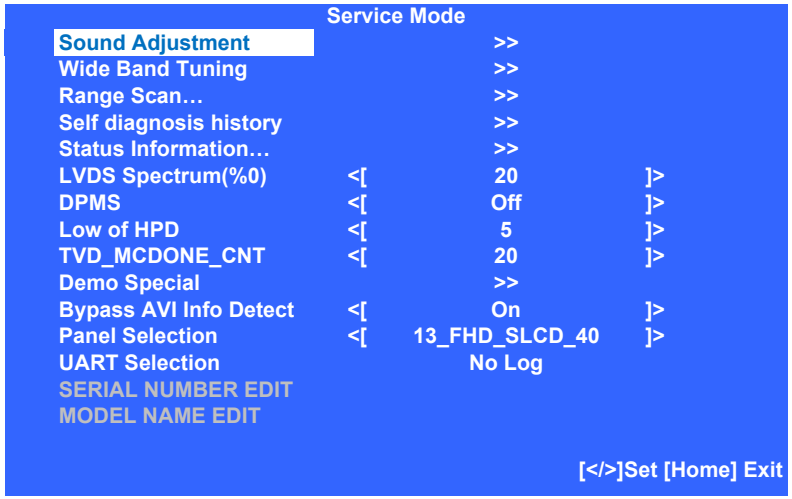
1. TV must be in Standby mode.
2. Press the following buttons on the Remote Commander within a second of each other:

DISPLAY → Channel 5 → Volume + → POWER



RM-YD080

3. The **Service Mode** initial screen, will be displayed.



4. Do one of the following:

   a. Proceed to **Completing Service Requirements when Replacing the Main Board.**

   b. Proceed to **Completing Service Requirements when Replacing the LCD Panel**.

COMPLETING SERVICE REQUIREMENTS WHEN REPLACING THE MAIN BOARD

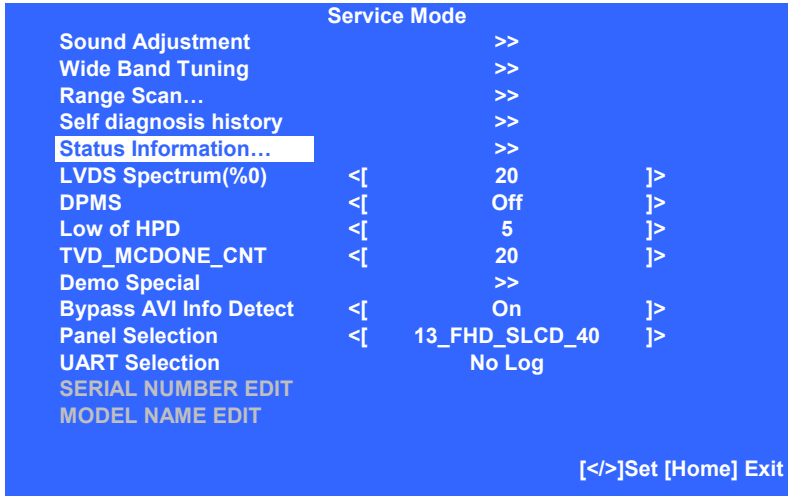
The following must be performed after replacing the Main Board to ensure that all of the features for the TV will be available.

- ☑ View the Status Information
- ☑ Select the Panel ID Code
- ☑ Add the Serial Number
- ☑ Add the Model Name

VIEWING THE STATUS INFORMATION

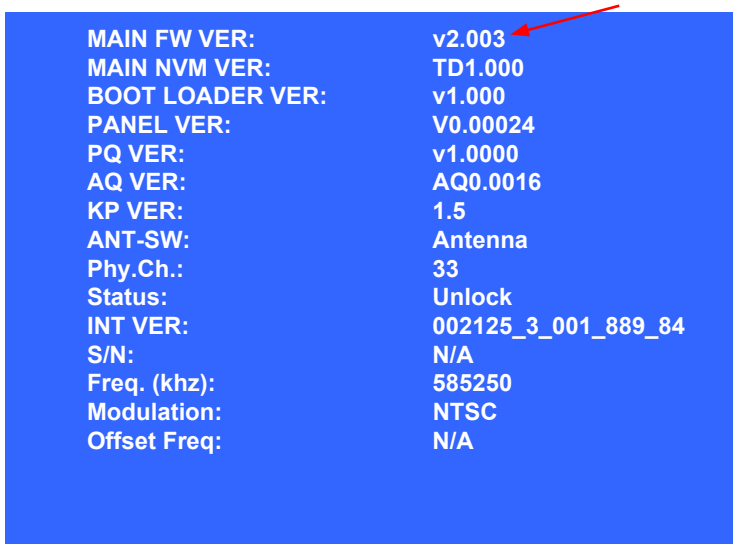
After replacing the Main Board you MUST UPDATE the SOFTWARE to the latest version.

5. Verify the latest software is installed before proceeding to the service adjustments.
6. Press ⇩ until **Status Information** is selected.



7. Then press ⇨ to view the **Status Information** screen.

8. The latest version is displayed as shown:



9. Do one of the following:

   a. If the latest software is installed, proceed to **Selecting the Panel ID Code**.

   b. If the latest software is not installed, update the software and then proceed to **Selecting the Panel ID Code**.

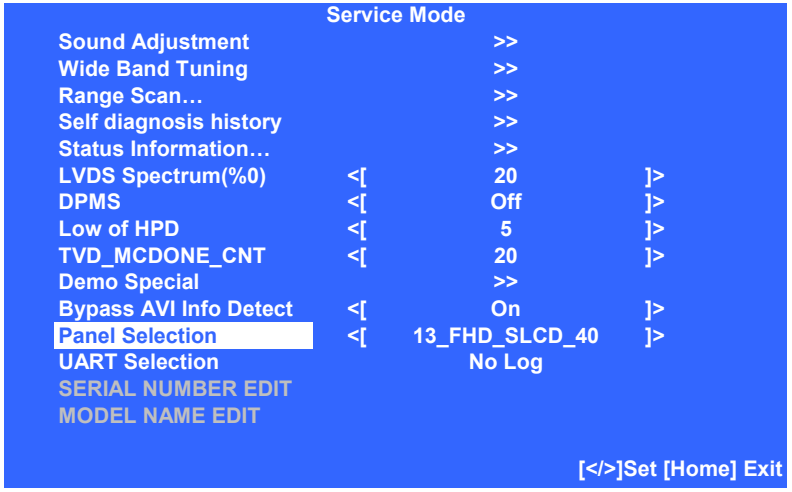
SELECTING THE PANEL ID CODE

CAUTION: You MUST SELECT THE CORRECT PANEL ID CODE for the picture to display propertly.

Verify before proceeding to the next step:

☑ Verified the Status Information

10. Press ⇩ until **Panel Selection** is selected.



11. Using the table below, press the ⇦ or ⇨ to select the correct Panel Code for the Panel ID.

Modle Name	Panel Code	Panel Type	Panel ID
KDL-40BX450 KDL-40BX451	13_FHD_SLCD_40	SLCD	LTY400HM
KDL-46BX450 KDL-46BX451	14_FHD_SLCD_46	SLCD	LTY460HM

CAUTION: If you do not select the correct Panel ID Code, the picture may not display.

12. Verify the Panel ID Code is correct before proceeding to the next step.

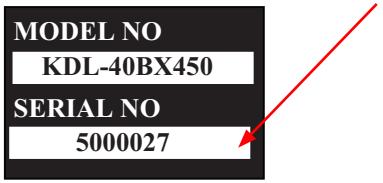
13. Proceed to **Adding the Serial Number.**

ADDING THE SERIAL NUMBER

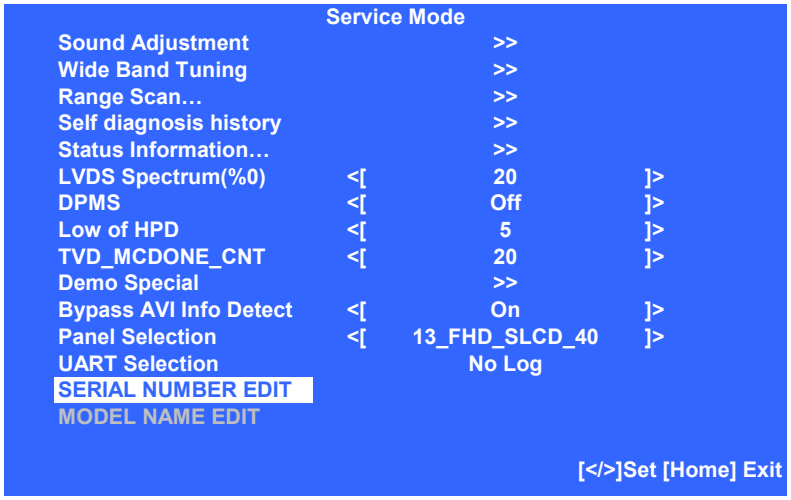
Verify before proceeding to the next step:

- ☑ Verified Status Information
- ☑ Selected the Panel ID Code

14. Locate the ***Serial Number*** for the TV on the side of the Rear Cover of the TV.

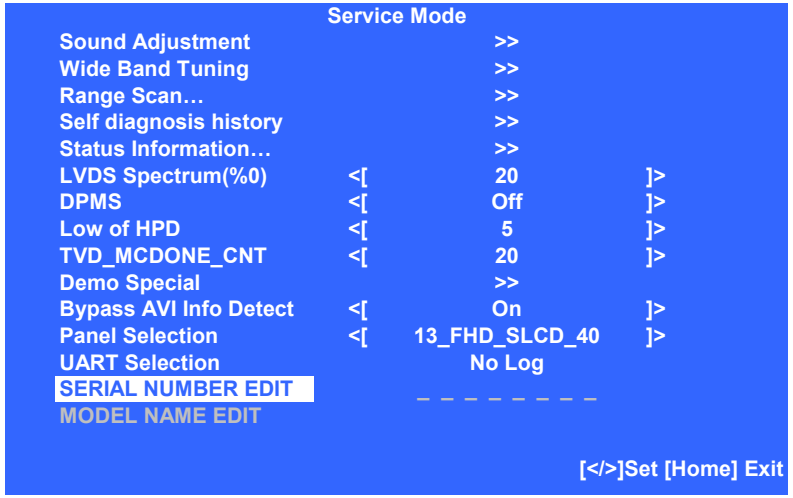


15. Press ⇩ until **SERIAL NUMBER EDIT** is selected.

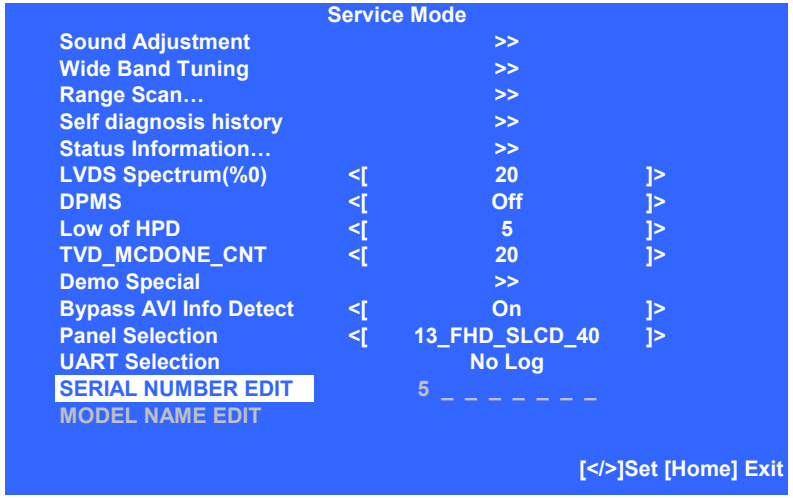


16. Press ⇨ to be able to select the first digit.

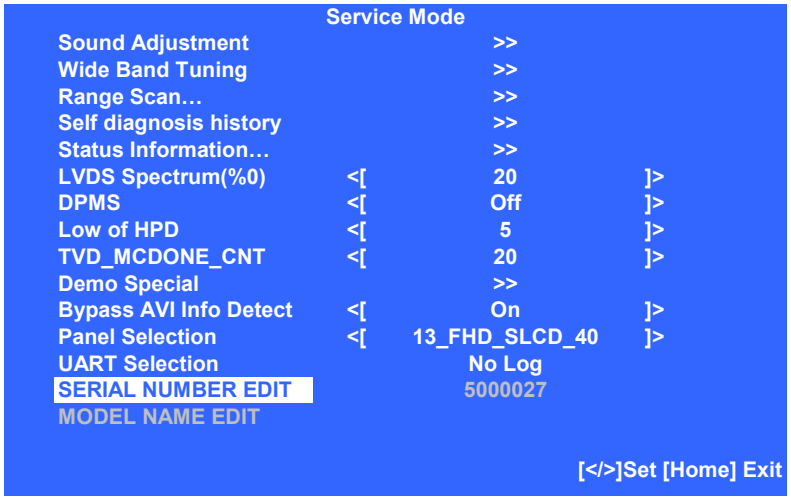
CAUTION: The Serial Number can only be selected once. Be sure to verify the information is correct before saving the changes.



17. Press ⇧ or ⇩ until the first digit of the Serial Number of the TV displays.



18. Continue to use the ⇨ and ⇧ or ⇩ to enter the remaining digits of the Serial Number.



19. Verify the Serial Number is correct before proceeding to the next step.
20. When the complete Serial Number is displayed, press ⊕.
21. When the confirmation screen displays, press ⇦ to select **YES**, and then press ⊕.
22. Proceed to **Adding the Model Name**.

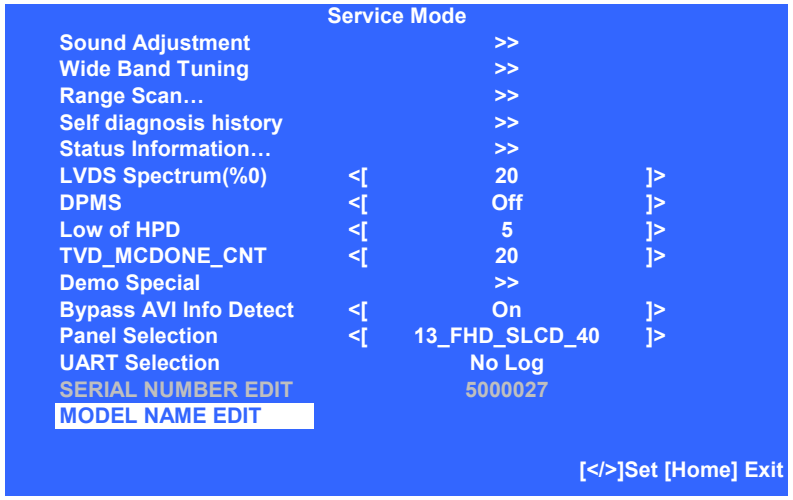
ADDING THE MODEL NAME

Verify before proceeding to the next step:

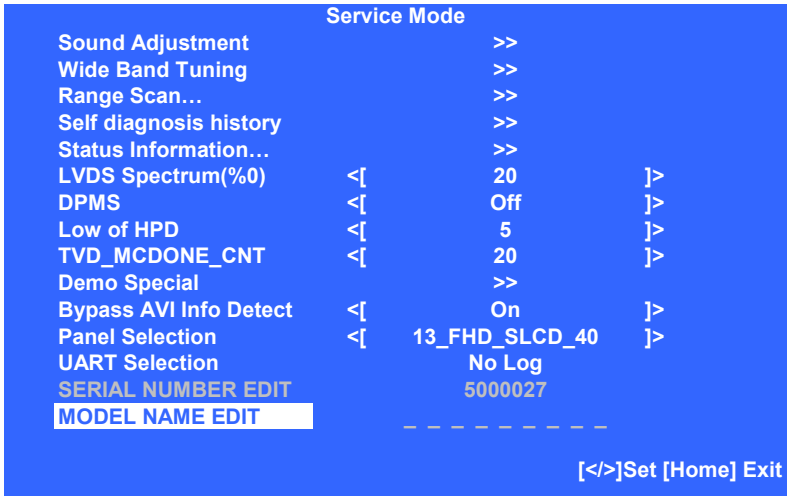
- ☑ Verified Status Information
- ☑ Selected the Panel ID Code
- ☑ Added the Serial Number

CAUTION: The Model Name can only be selected once. Be sure to verify the information is correct before saving the changes.

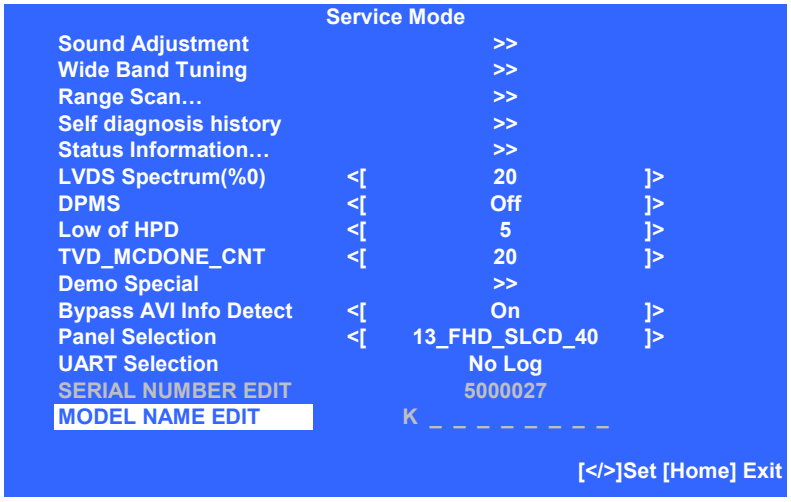
23. Press ⇩ until **MODEL NAME EDIT** is selected.



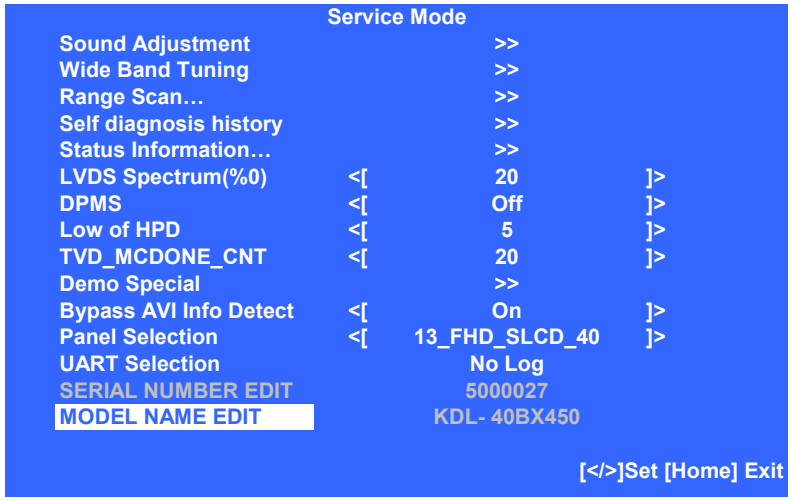
24. Press ⇨ to be able to select the first character.



25. Press ⇧ or ⇩ until the first character of the Model Name of the TV displays.



26. Continue to use the ⇨ and ⇧ or ⇩ to enter the remaining characters of the Model Name.



27. Verify the Model Name is correct before proceeding to the next step.
28. When the complete Model Name is displayed, press ⊕.
29. When the confirmation screen displays, press ⇦ to select **YES**, and then press ⊕.
30. Press POWER to exit **Service Mode.**

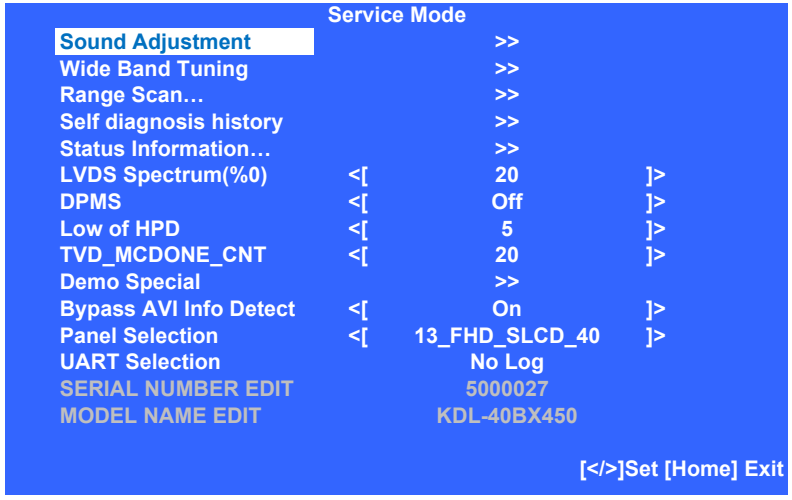
COMPLETING SERVICE REQUIREMENTS WHEN REPLACING THE LCD PANEL

The following must be performed after replacing the LCD Panel.

- ☑ View the Status Information
- ☑ Verify the Panel ID Code
- ☑ Reset the Panel Operation Time

1. TV must be in Standby mode.
2. Press the following buttons on the ***Remote Commander*** within a second of each other:

DISPLAY → Channel 5 → Volume + → POWER



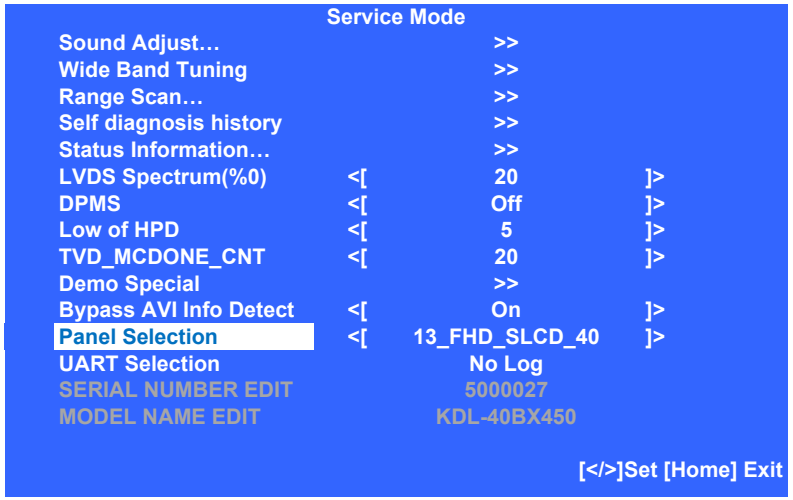
VIEWING THE STATUS INFORMATION

After replacing the LCD Panel you MUST UPDATE the SOFTWARE to the latest version. Verify the latest software is installed before proceeding to the service adjustments.

3. For instructions refer to the section "Viewing the Status Information" on page 24.
4. Do one of the following:
   a. If the latest software is installed, proceed to **Verifying the Panel ID Code.**
   b. If the latest software is not installed, update the software and then proceed to **Verifying the Panel ID Code.**

VERIFYING THE PANEL ID CODE

5. Press ⇩ until **Panel Selection** is selected.



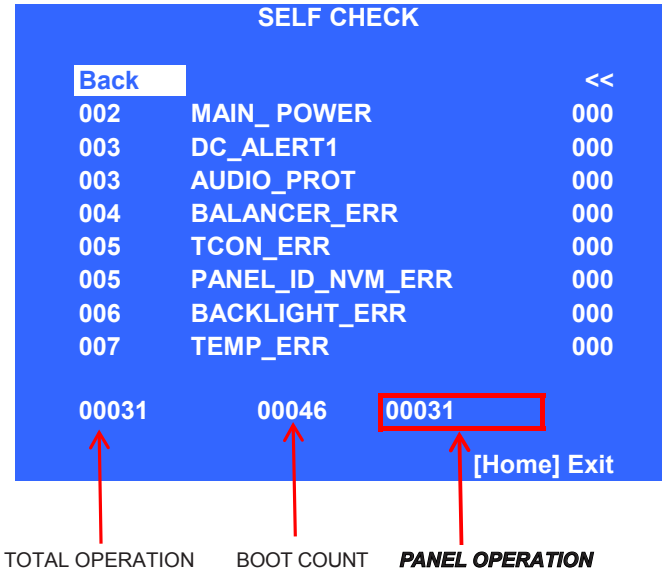
6. Using the table below, verify the correct Panel Code for the Panel ID.

Modle Name	Panel Code	Panel Type	Panel ID
KDL-40BX450 KDL-40BX451	13_FHD_SLCD_40	SLCD	LTY400HM
KDL-46BX450 KDL-46BX451	14_FHD_SLCD_46	SLCD	LTY460HM

7. Proceed to **Resetting the Panel Operation Time.**

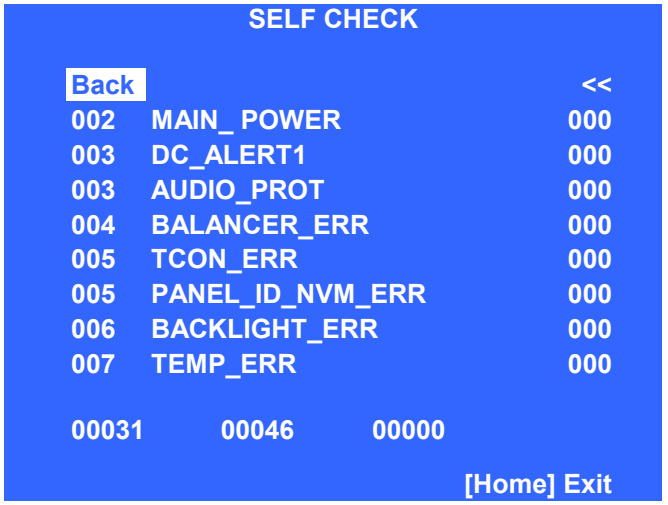
RESETTING PANEL OPERATION TIME

8. Press ⇧ until **Self diagnosis history** is selected.
9. On the **Self Check** screen, identify the ***Panel Operation Time*** location.



10. Press 7 → 0.

11. Verify ***Panel Operation Time*** has been changed to 00000.

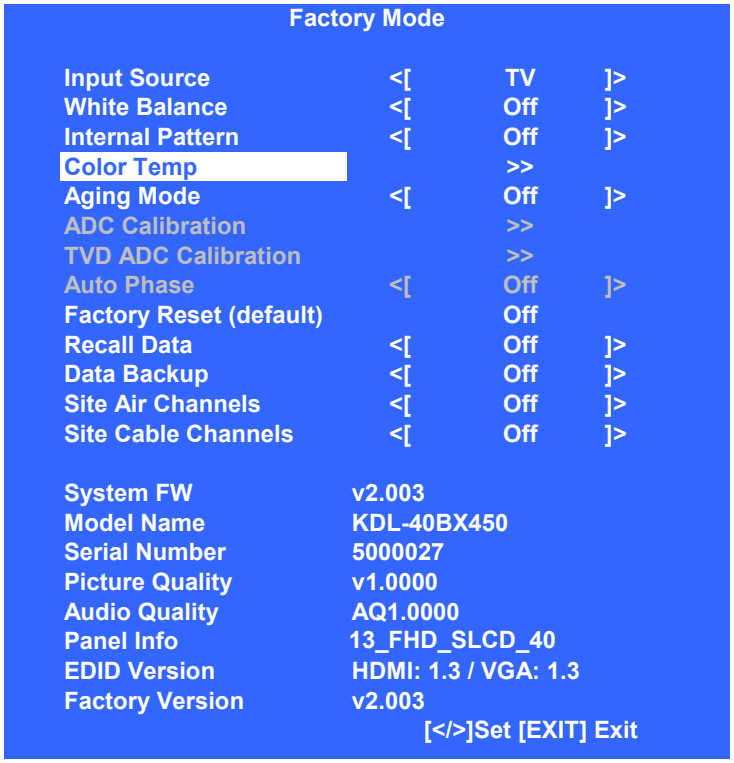


12. To exit the **Self Check,** press HOME.

ACCESSING FACTORY ADJUSTMENT MODE

1. TV must be ON.
2. Press the following buttons on the ***Remote Commander*** within a second of each other:

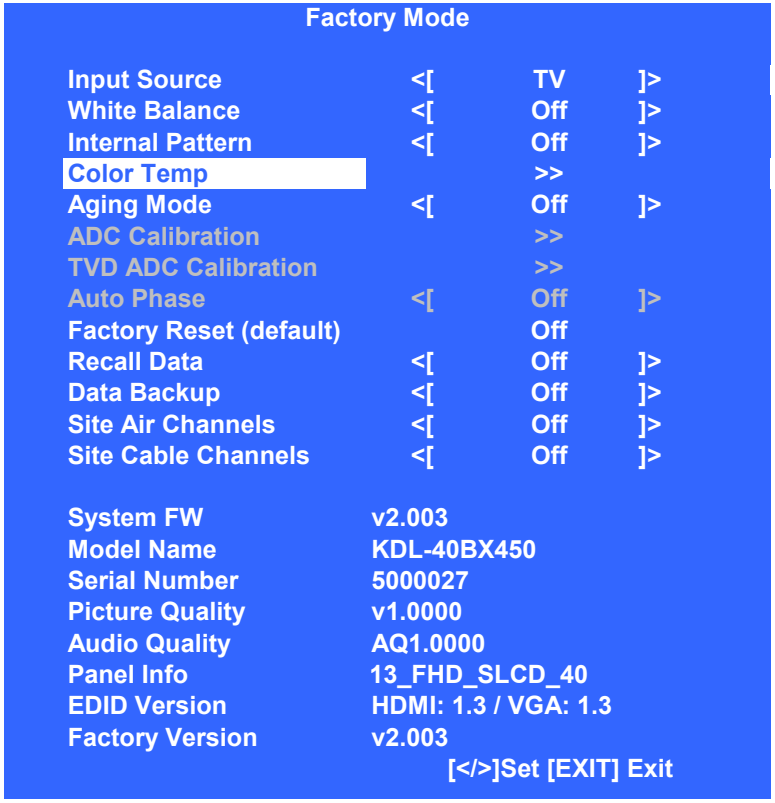
NOTE: The instructions to access Factory Mode are NOT THE SAME as the Service Mode procedure.



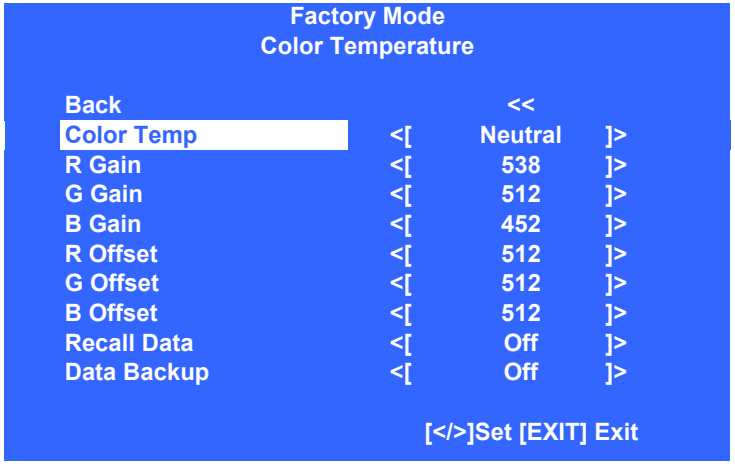
ADJUSTING THE COLOR TEMPERATURE

The default White Balance data values are set for optimal viewing. The following instructions are for technicians who have been requested to customize calibrations for their customers.

3. Using the ↓, scroll down to select **Color Temp**.

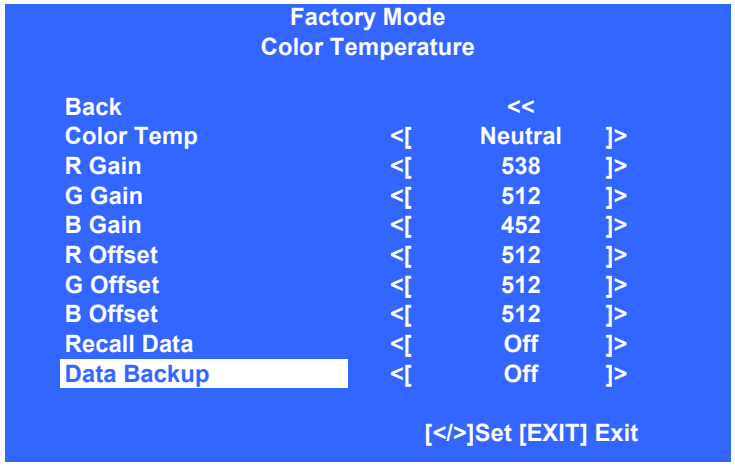


4. Press ⊕ to access **Color Temp** adjustments.

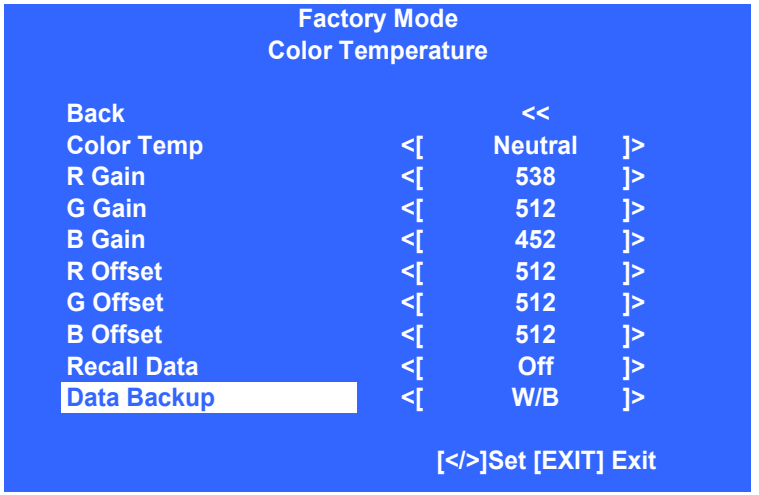


5. Press the ◁ or ▷ to select the **Color Temp** type (Cool, Neutral, Warm1, or Warm2).
6. After the correct Color Temperature is selected, press the ▽ to select the temperature type that needs to be modified.
7. After the correct temperature type is selected, press the ▷ to increase the data value or press ◁ to decrease the data value.
8. Complete the data value adjustments to the remaining temperature items within the selected temperature type.

   NOTE: Changes to the data value must be saved within the temperature type selected before making changes to one of the other temperature types.
9. To save the changes, press the ▽ to select **Data Backup**, then press ⊕.



10. Press ▷ to select the option: W/B and press ⊕.



11. Do one of the following:

    a. To make changes to one of the other temperature types, repeat steps 5 through 10.

    b. To exit **Factory mode**, press HOME.

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APPENDIX A: ENCRYPTION KEY COMPONENTS

Encryption key components developed by Sony Corporation contain confidential information and shall be handled under the non-disclosure obligations provided in the applicable agreement with Sony Corporation (and/or its subsidiary).

As part of this agreement specific instructions must be adhered to whenever a Circuit Board containing encryption key components is repaired and/or replaced pursuant to the following:

1. In the service manual the Circuit Board(s) containing encryption key components shall be identified with a red outline and a .
2. Only repair boards or components listed in the service manual shall be utilized for replacement and/or repair.
3. Disassembly, decryption or reverse-engineering component(s) is strictly prohibited.
4. Any board in which the Servicer replaces an encryption key component must be placed back into the set it orignally came from and the replaced defective component MUST BE DESTROYED. Boards cannot be swapped.
5. If a Circuit Board identified with a red outline and a in the service manual is deemed to be defective:
   a. and if a core charge is imposed and is covered under the product warranty, the defective un-repaired or modified board MUST BE RETURNED to Sony.
   b. and if the core charge is NOT covered under the product warranty, the defective un-repaired or modified board MUST BE DESTROYED.
6. If a unit is destroyed (such as field scrap), the Circuit Board identified with a red outline and a in the service manual MUST BE DESTROYED.