

PHILIPS

39" LCD TV


Service Manual

39HFL3684S/F7 (Serial No.: DS1)

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IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all P&F Equipment. The service procedures recommended by P&F and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. P&F could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, P&F has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by P&F must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

<p>The LCD panel is manufactured to provide many years of useful life. Occasionally a few non active pixels may appear as a tiny spec of color. This is not to be considered a defect in the LCD screen.</p>

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SPECIFICATIONS

< TUNER / NTSC >

ANT. Input ----- 75 Ω Unbal., F type

Description	Condition	Unit	Nominal	Limit
1. AFT Pull-In Range	---	MHz	± 2.3	± 2.1
2. Synchronizing Sens.	TV.ch.4	dB μ V	18	20
	CA.ch.31	dB μ V	18	20
	CA.ch.87	dB μ V	18	23

< TUNER / ATSC >

Description	Condition	Unit	Nominal	Limit
1. Received Freq. Range (-28dBm)	---	kHz	---	± 100
2. ATSC Dynamic Range (min / max)	ch.4	dBm	---	-76/0
	ch.10	dBm	---	-76/0
	ch.41	dBm	---	-76/+4

< LCD PANEL >

Description	Condition	Unit	Nominal	Limit
1. Native Pixel Resolution	Horizontal	pixels	1920	---
	Vertical	pixels	1080	---
2. Brightness (w / filter)	---	cd/m ²	270	---
3. Viewing Angle	Horizontal	°	-88 to 88	---
	Vertical	°	-88 to 88	---

< VIDEO >

Description	Condition	Unit	Nominal	Limit
1. Over Scan	Horizontal	%	5	5 \pm 5
	Vertical	%	5	5 \pm 5
2. Color Temperature	---	°K	12000	---
	x		0.272	$\pm 5\%$
	y		0.278	$\pm 5\%$
	<Measurement condition> Input signal: HDMI1 Raster (40/80IRE) 1080i@60 Measurement point: Screen center Measuring instrument: Made of KONICA MINOLTA Luminance meter CA-310 Aging time: 60min. (Retail MODE / 100IRE Raster HDMI 1080i@60) MODE setting of TV: Shipment setting / Retail MODE Ambient temperature: 25°C \pm 5°C			
3. Resolution (composite video)	Horizontal	line	400	---
	Vertical	line	350	---

< AUDIO >

All items are measured across 8 Ω load at speaker output terminal with L.P.F.

Description	Condition	Unit	Nominal	Limit
1. Audio MAX Output (ATSC 0dBfs)	Lch/Rch	W	8.0/8.0	7.0/7.0
2. Audio Distortion (NTSC)	500mW: Lch/Rch	%	0.5/0.5	2.0/2.0

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Safety Precautions for LCD TV Circuit

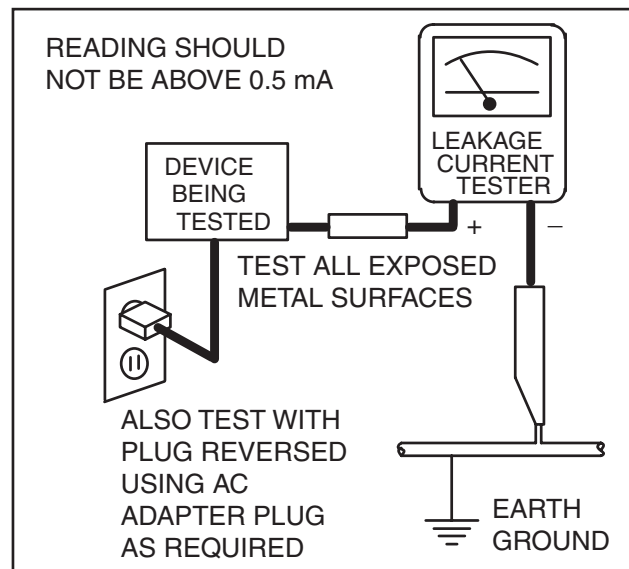
1. Before returning an instrument to the

customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

- a. Be sure that no built-in protective devices are defective and have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
- b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the Liquid Crystal Panel and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.


- c. **Antenna Cold Check** - With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.

- d. **Leakage Current Hot Check** - With the instrument completely reassembled, plug the AC line cord directly into a 120 V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milli-ampere. Reverse the instrument power cord plug in the outlet and repeat the test.



ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the Liquid Crystal Panel.

3. **Design Alteration Warning** - Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.
4. **Hot Chassis Warning** -
 - a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and maybe safety-serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0 V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.
 - b. Some TV receiver chassis normally have 85V AC(RMS) between chassis and earth ground regardless of the AC plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection.
 - c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.
5. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and, e. antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check AC power cord for damage.
6. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
7. **Product Safety Notice** - Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a  on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The product's safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are strictly inspected to confirm they comply with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

- A.** Parts identified by the **▲** symbol are critical for safety.
Replace only with part number specified.
- B.** In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.
- C.** Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- D.** Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulators for transistors.
- E.** When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.
- F.** Observe that the wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.)
- G.** Check that replaced wires do not contact sharp edged or pointed parts.
- H.** When a power cord has been replaced, check that 11~13 lb (5~6 kg) of force in any direction will not loosen it.
- I.** Also check areas surrounding repaired locations.
- J.** Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.
- K.** When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC supply outlet.
- L.** When installing parts or assembling the cabinet parts, be sure to use the proper screws and tighten certainly.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1: Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d), (d')
110 to 130 V	U.S.A. or Canada	≥ 3.2 mm (0.126 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

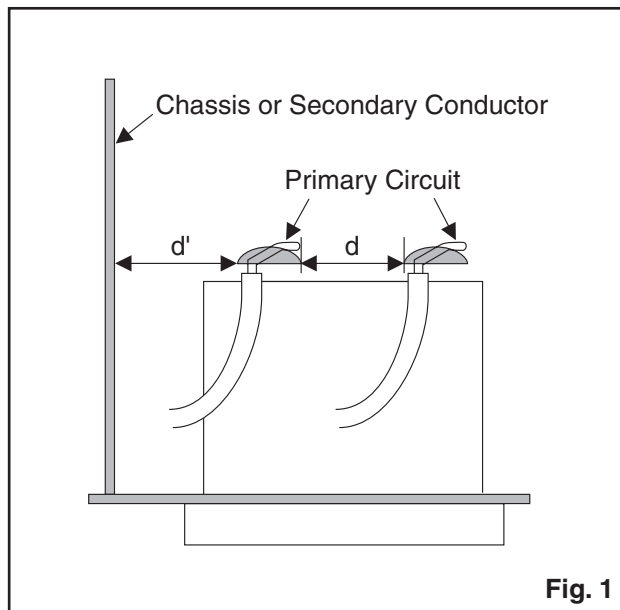


Fig. 1

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method: (Power ON)

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z . See Fig. 2 and following table.

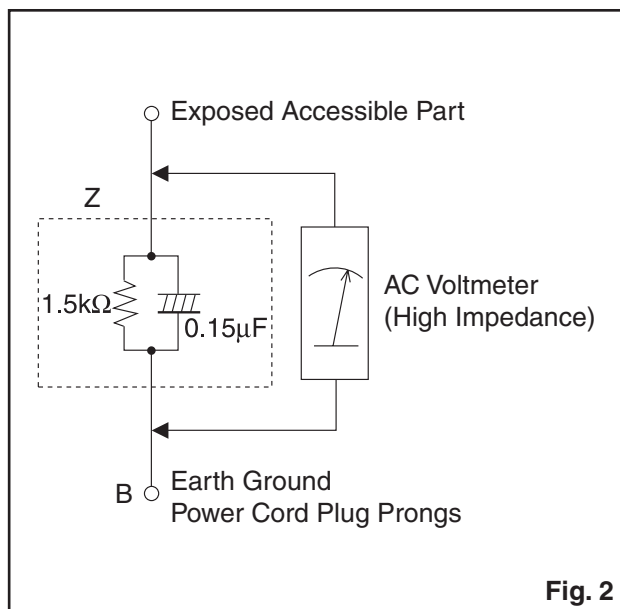


Fig. 2

Table 2: Leakage current ratings for selected areas

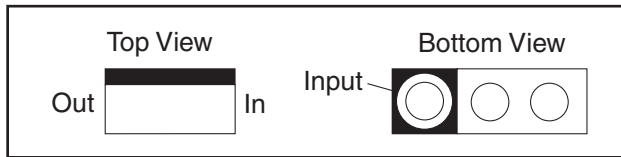
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
110 to 130 V	U.S.A. or Canada	$0.15 \mu F$ CAP. & $1.5 k\Omega$ RES. Connected in parallel	$i \leq 0.5$ mA rms	Exposed accessible parts

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

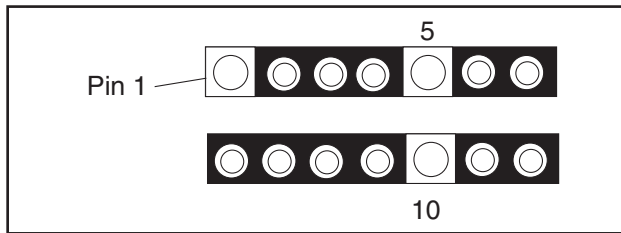
STANDARD NOTES FOR SERVICING

Circuit Board Indications

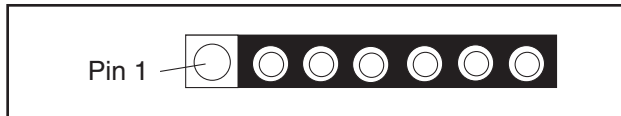
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.

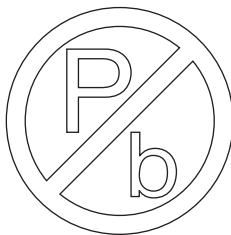


3. The 1st pin of every male connector is indicated as shown.



Pb (Lead) Free Solder

Pb free mark will be found on PCBs which use Pb free solder. (Refer to figure.) For PCBs with Pb free mark, be sure to use Pb free solder. For PCBs without Pb free mark, use standard solder.



Pb free mark

How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

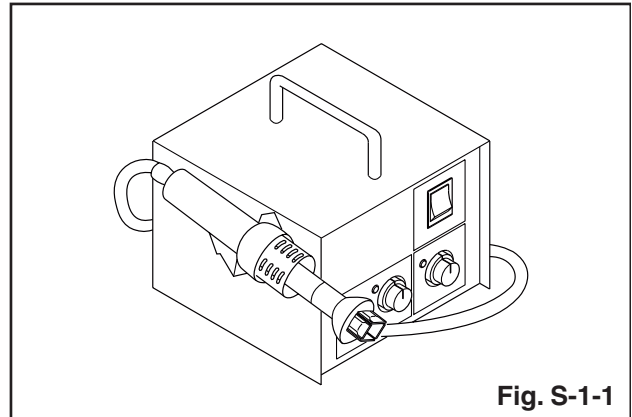


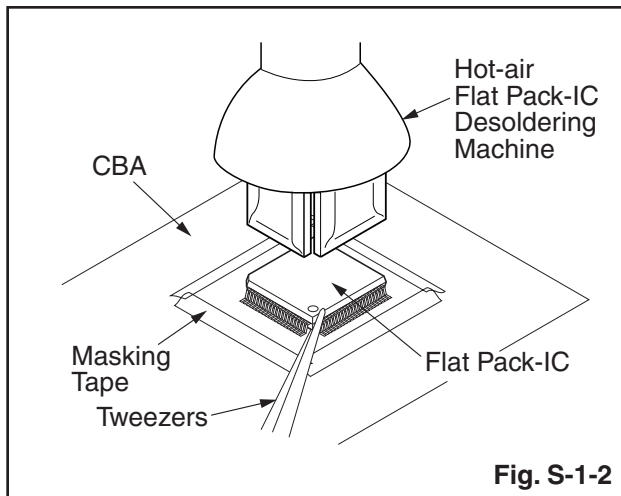
Fig. S-1-1

2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

CAUTION:

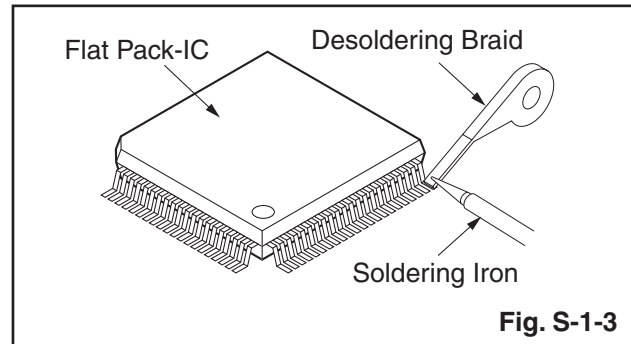
1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)

3. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

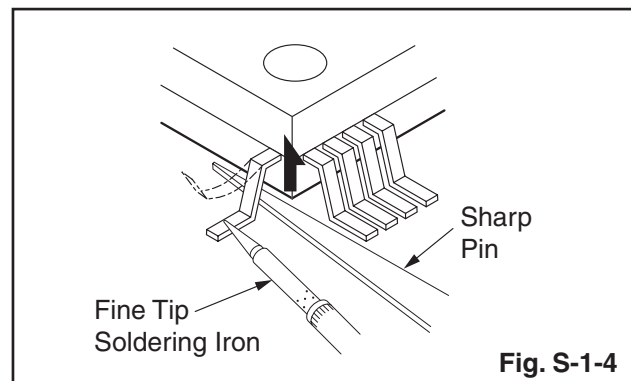


With Soldering Iron:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)



2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

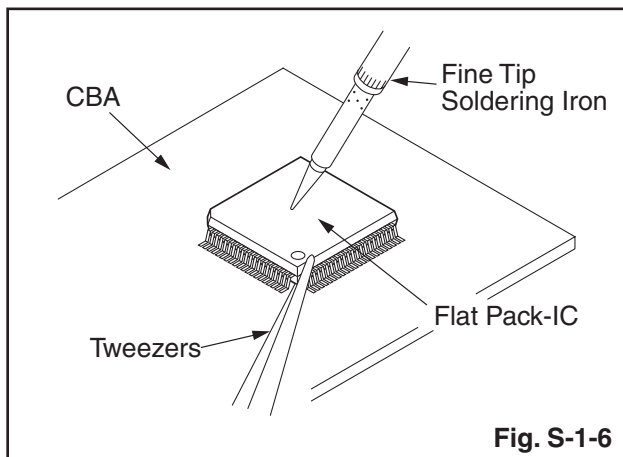
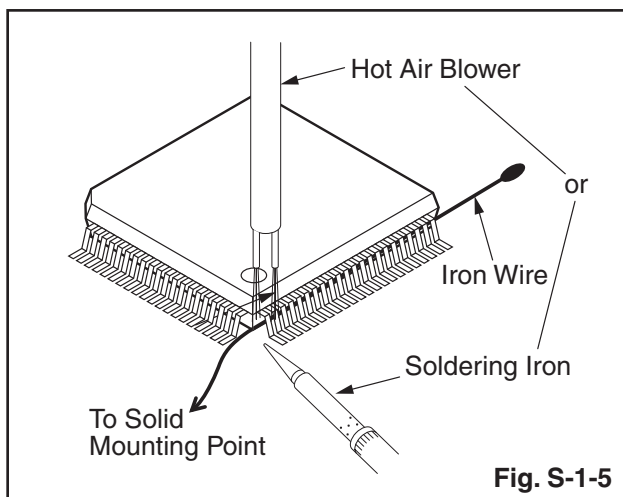


3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

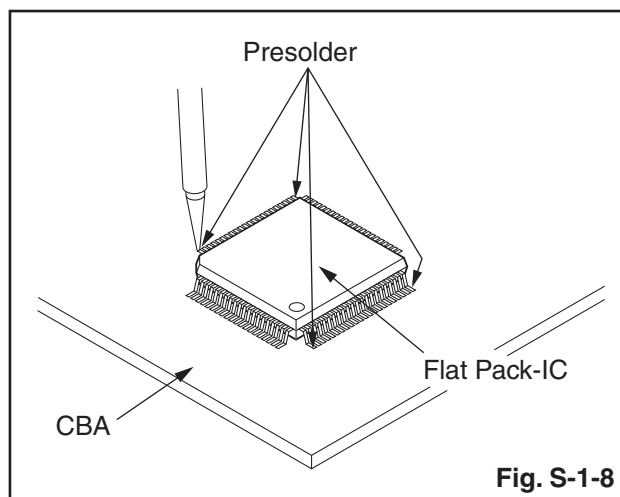
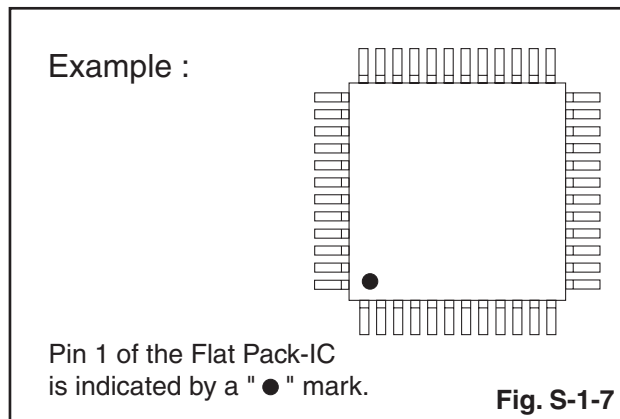
1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

Note: When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.



2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.
2. The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the pin 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.



Instructions for Handling Semi-conductors

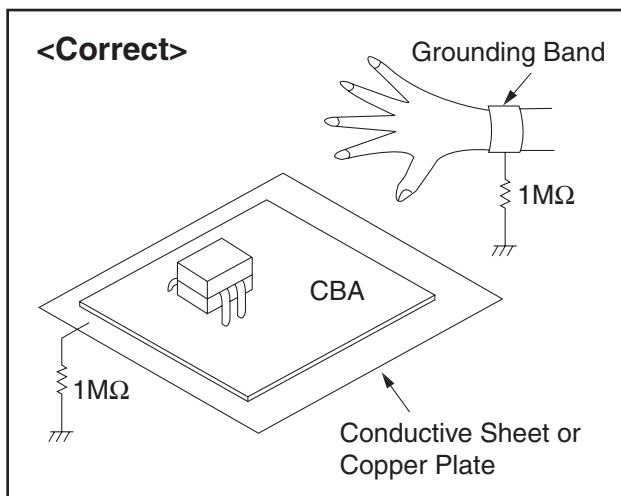
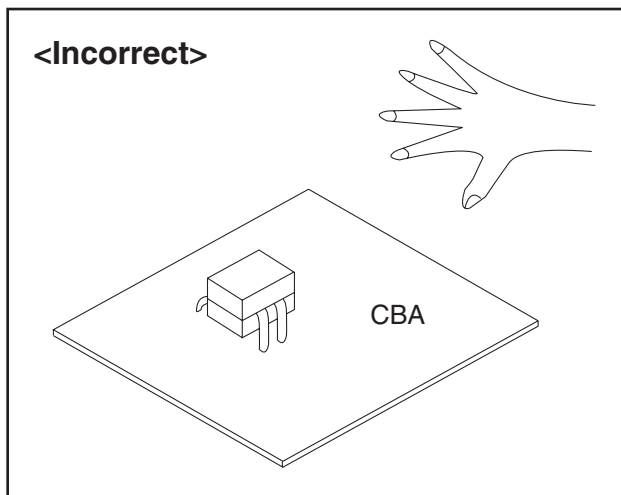
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

1. Ground for Human Body

Be sure to wear a grounding band ($1\text{ M}\Omega$) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding ($1\text{ M}\Omega$) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



CABINET DISASSEMBLY INSTRUCTIONS

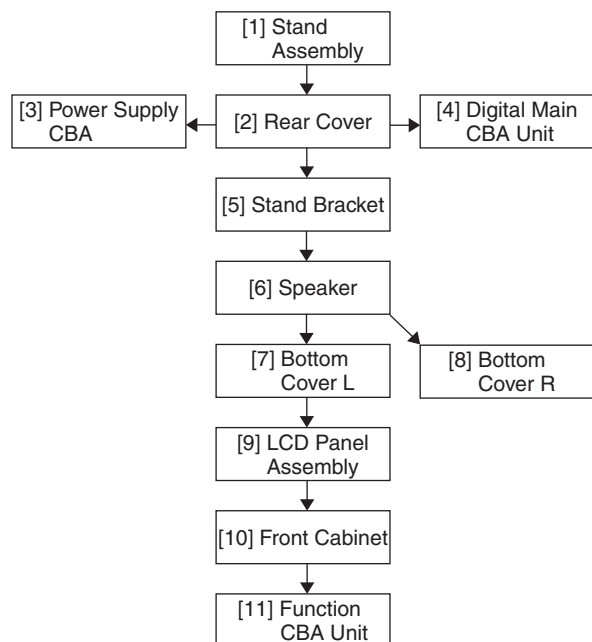
Screw Torque Specification

Ref. No.	Part Number	Part Name	Tightening Torque
L7	GBHP3100	SCREW P-TIGHT (3X10 BIND HEAD+)	6.1±0.9lb-in
L23	GBJS3060	SCREW S-TIGHT (M3X6 BIND HEAD+)	4.3±0.9lb-in
L24	GBHS3060	S-TIGHT SCREW (M3X6 BIND HEAD+BLACK)	
SSK1	1ESA34649	STAND SCREW KIT (DOUBLE SEMS SCREW M4X20 + BLK)	(approx. 8.7±0.9lb-in)*
SSK2	2ESA00308	STAND SCREW KIT (SECURITY SCREW M4X20)	

* For reference

1. Disassembly Flowchart

This flowchart indicates the disassembly steps for the cabinet parts and the CBA in order to gain access to items to be serviced. When reassembling, follow the steps in reverse order. Bend, route and dress the cables as they were.



2. Disassembly Method

Step/ Loc. No.	Part	Fig. No.	Removal	Note
[1]	Stand Assembly	D1	3(S-1)	---
[2]	Rear Cover	D1	5(S-2), 5(S-3)	---

Step/ Loc. No.	Part	Fig. No.	Removal	Note
[3]	Power Supply CBA	D2 D5	5(S-4), CN601, CN501, CN1001	---
[4]	Digital Main CBA Unit	D2 D5	4(S-5), CN3013, CN3101, CN3801, Jack Holder	---
[5]	Stand Bracket	D3	2(S-6)	---
[6]	Speaker	D3	-----	---
[7]	Bottom Cover L	D3	(S-7), (S-8)	---
[8]	Bottom Cover R	D3	(S-9), (S-10)	---
[9]	LCD Panel Assembly	D3	-----	---
[10]	Front Cabinet	D4	10(S-11)	1
[11]	Function CBA Unit	D4	Sensor Lens, Shield Plate, Control Plate	1

(1) (2) (3) (4) (5)

Note:

- (1) Order of steps in procedure. When reassembling, follow the steps in reverse order. These numbers are also used as the Identification (location) No. of parts in figures.
- (2) Parts to be removed or installed.
- (3) Fig. No. showing procedure of part location
- (4) Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P = Spring, L = Locking Tab, S = Screw, H = Hex Screw, CN = Connector
e.g. 2(S-2) = two Screws of (S-2),
2(L-2) = two Locking Tabs of (L-2)
- (5) Refer to the following "Reference Notes in the Table."

Important precautions concerning the LCD Panel Assembly:

When you disassemble/re-assemble the Front Cabinet or Function CBA Unit

- Be careful not to break the hooks. If you pull with too much force, the hooks may be damaged.

- Be careful not to scratch the display panel when assembling.
- Be careful not to scratch the rear frame when disassembling/re-assembling or when tightening the screws.
- Make sure the Shield Plate is placed properly.
- The Function CBA Unit and Sensor Lens are fixed in place by the hooks. Make sure these hooks are not damaged. Make sure the Function CBA Unit and

Sensor Lens are securely in place when re-assembling.

- The screw tightening torque must be 6.1lb-in (7kgf-cm).
- Make sure the tact switches operate normally after replacing the Front Cabinet, Function CBA Unit, Sensor Lens, or Shield Plate.
- Make sure to replace the Control Plate to a new one when replacing the Front Cabinet.

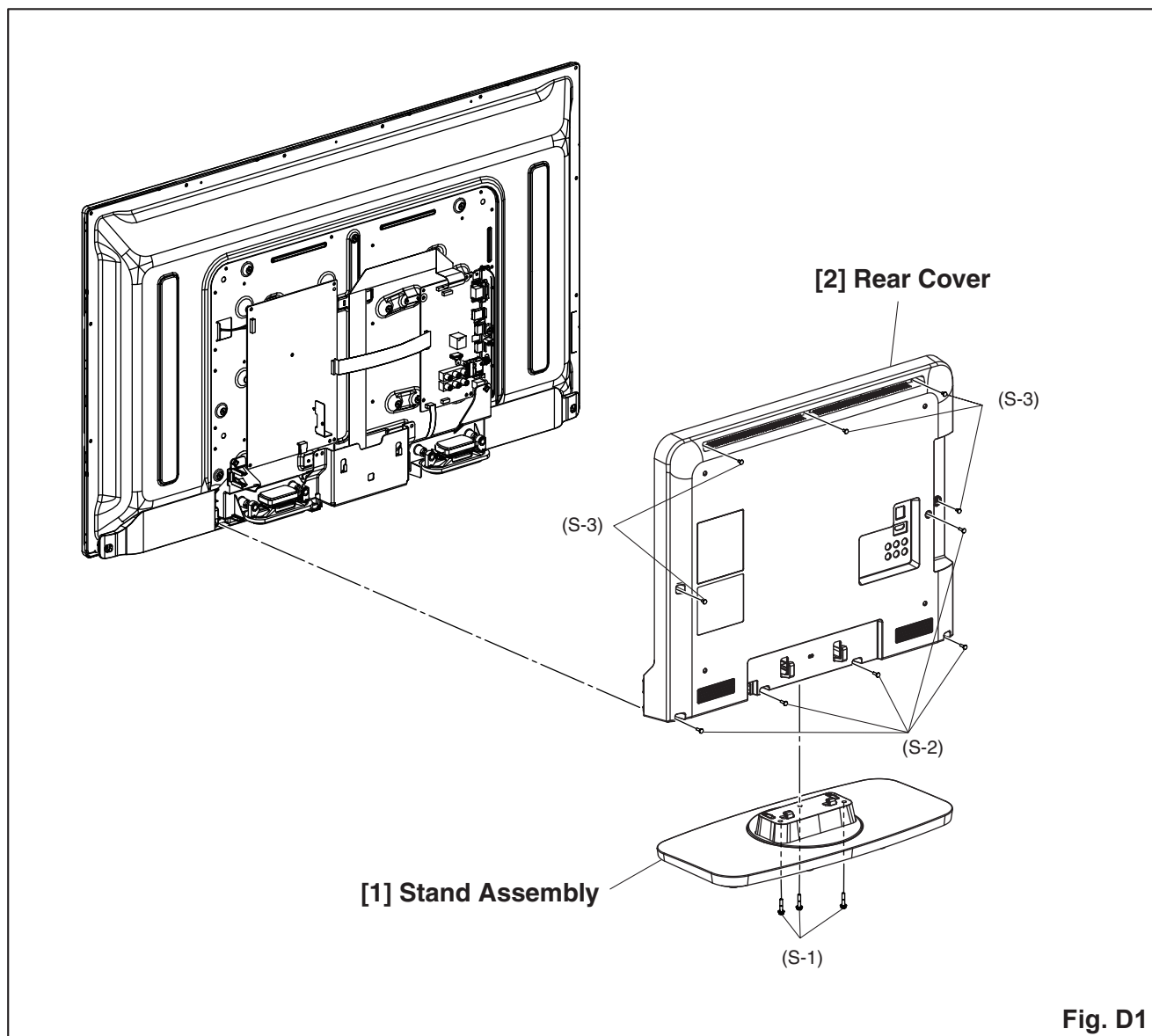
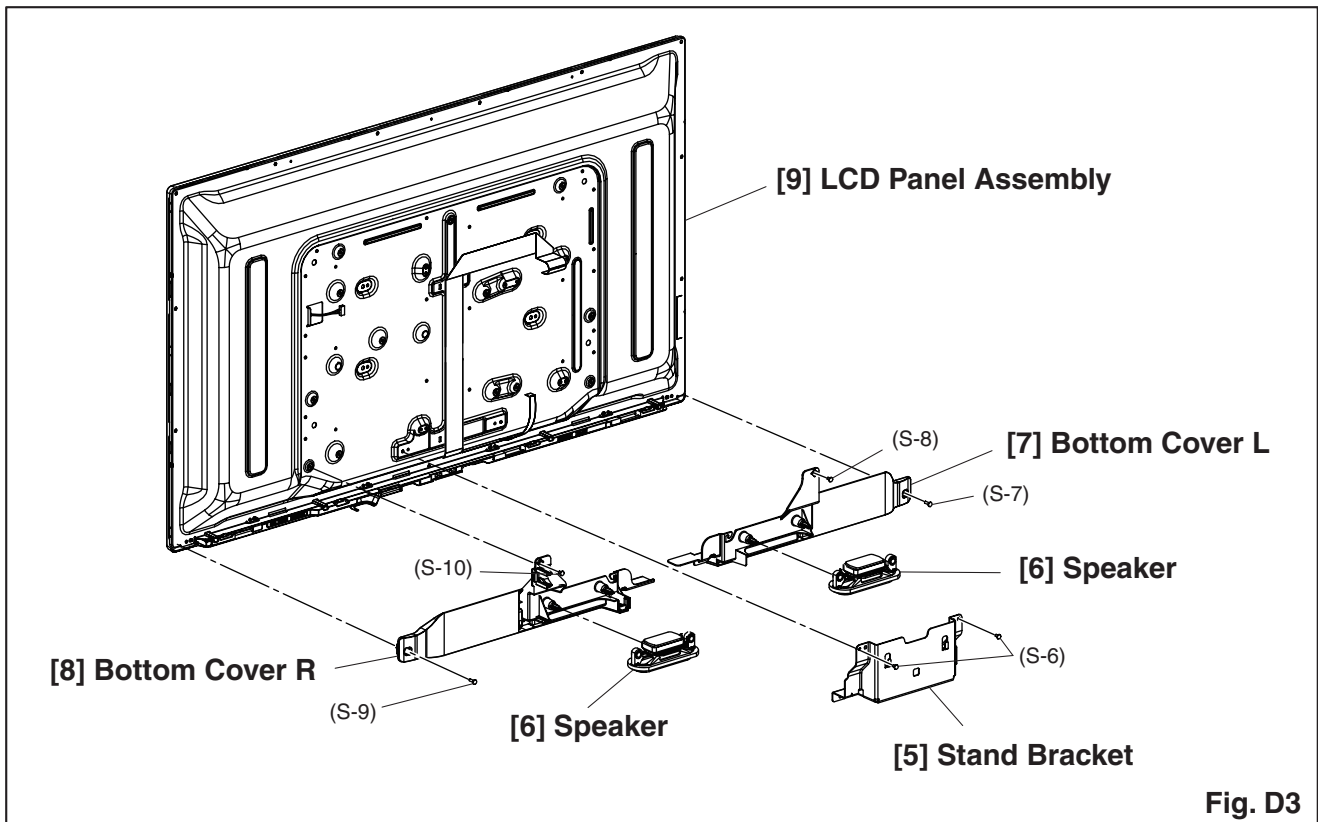
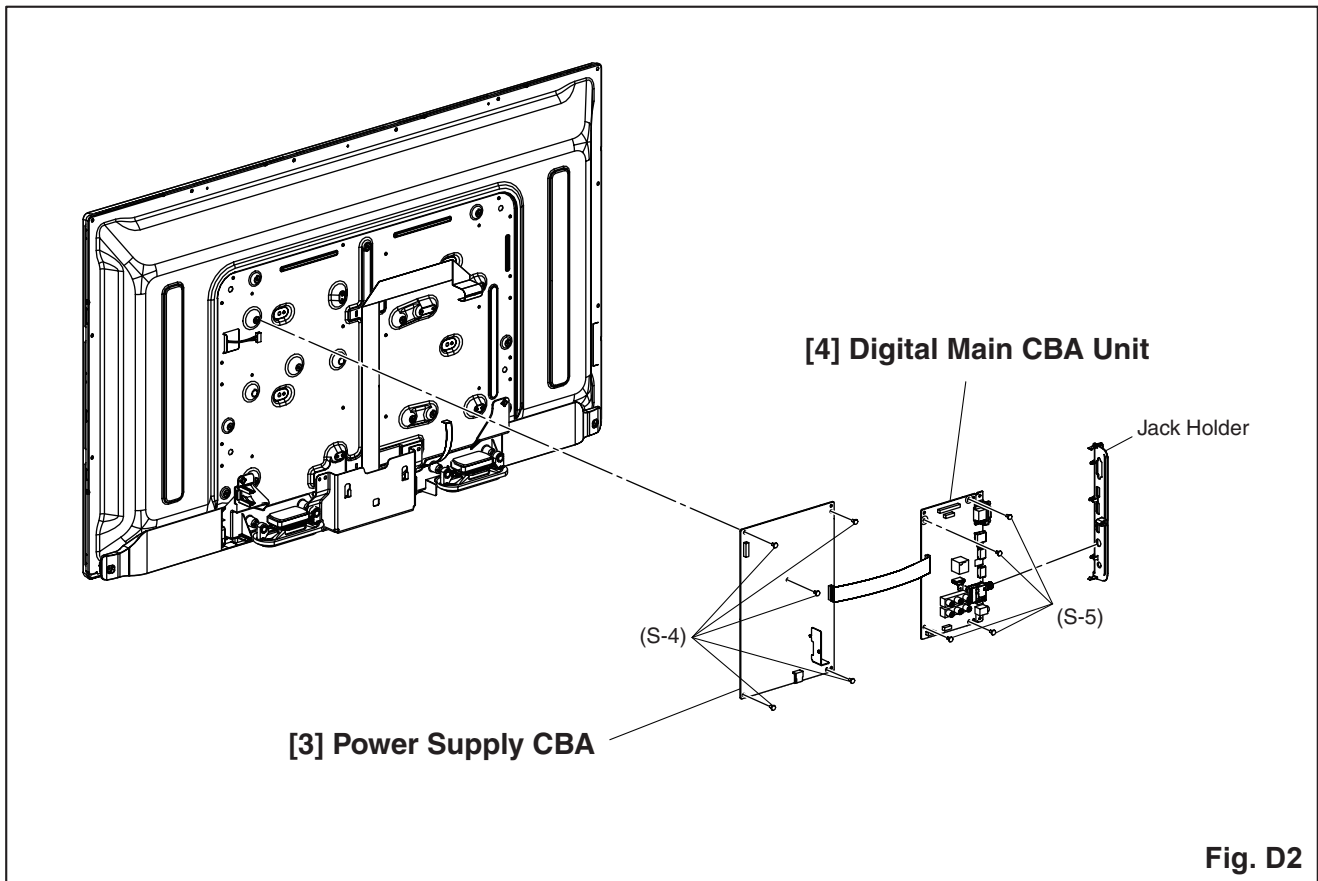


Fig. D1



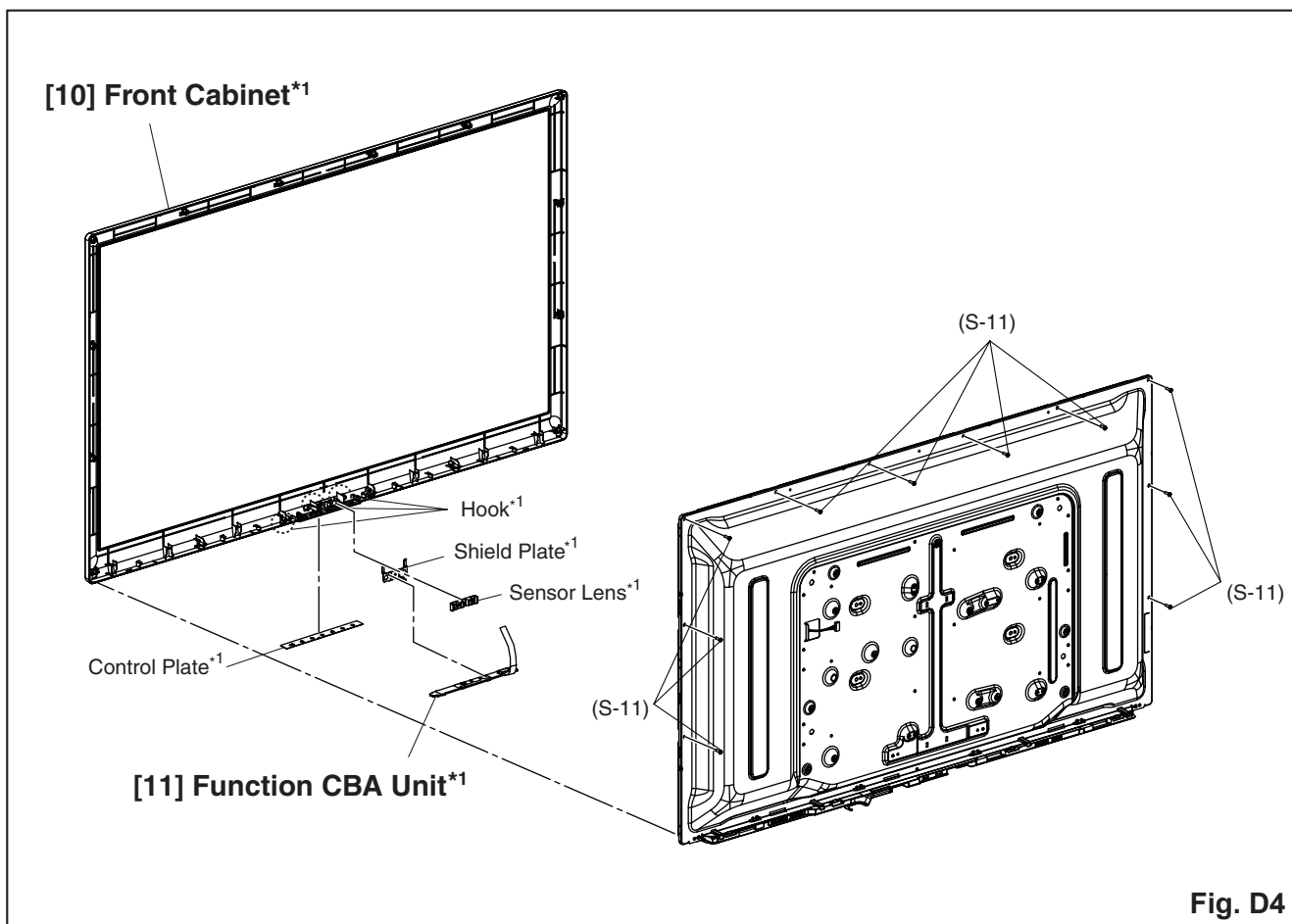
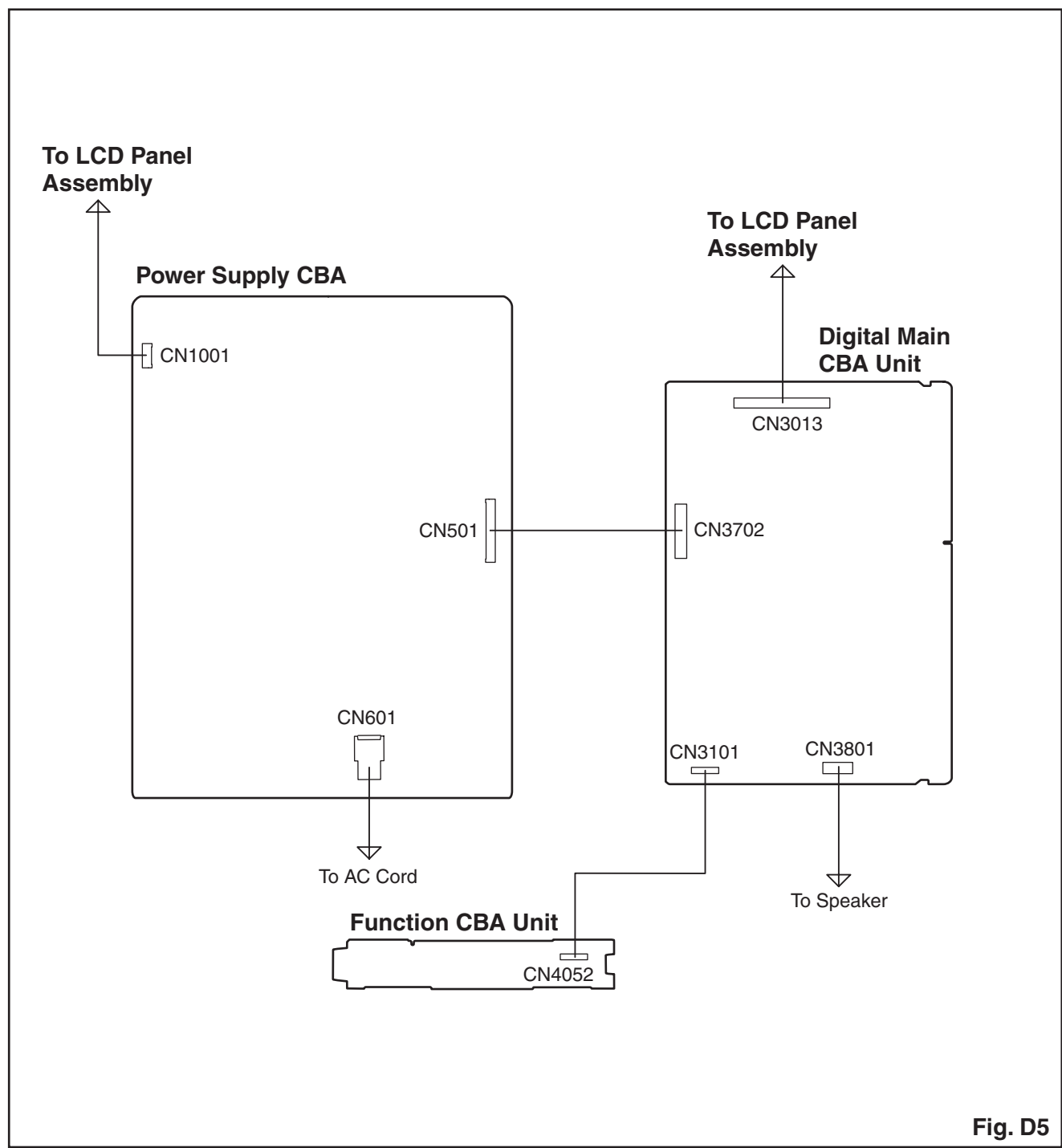


Fig. D4

***1: Make sure to read all the precautions on pages 4-1 and 4-2 when you disassemble/re-assemble the Front Cabinet or Function CBA Unit.**

TV Cable Wiring Diagram



ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note: “CBA” is abbreviation for “Circuit Board Assembly.”

Note: Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

Test Equipment Required

1. Remote control unit
2. Color Analyzer, CA-310 (KONICA MINOLTA Luminance meter) or measuring instrument as good as CA-310.

How to set up the service mode

How to set up the service mode with Guest Remote Control

1. Turn the power on.
2. Press [3], [1], [9], [7], [5], [3] and [MUTE] buttons on the remote control unit in this order to display the menu.
3. Select “Consumer TV setup” and press the [OK] button to display Setup menu.
4. Select “Features”.
5. Select “Current Software Info”.
6. Press [0], [6], [2], [5], [9], [6] and [INFO] buttons on the remote control unit in this order. The following screen appears.

"*" differs depending on the models.

Code:	*****_*_*_*_*_*_*_*_*_*		
Pic code:	*****_*_*_*_*_*_*_*_*_*		
Panel-Option code:	**_*_*_*_*_*_*_*_*_*_*_*		
MIPS:	Push 0 key		
Press "POWER" key to exit.			
Tuner:	****_*_*_*_*_*_*_*_*_*		
Safety:	Safety_Non	Total Watch Time:	****
HDMI EDID:	**	Lightsensor:	****

How to set up the service mode with Set Up Remote Control (optional)

1. Turn the power on.
2. Press the [RC5 SETUP] and [HOME/MENU] button on the set up remote control in this order to display the menu.
3. Select “Consumer TV setup” and press the [OK] button to display Setup menu.
4. Select “Features”.
5. Select “Current Software Info”.
6. Press the [RC5 GUEST], [0], [6], [2], [5], [9], [6] and [RECALL/INFO] buttons on the set up remote control in this order. The following screen appears.

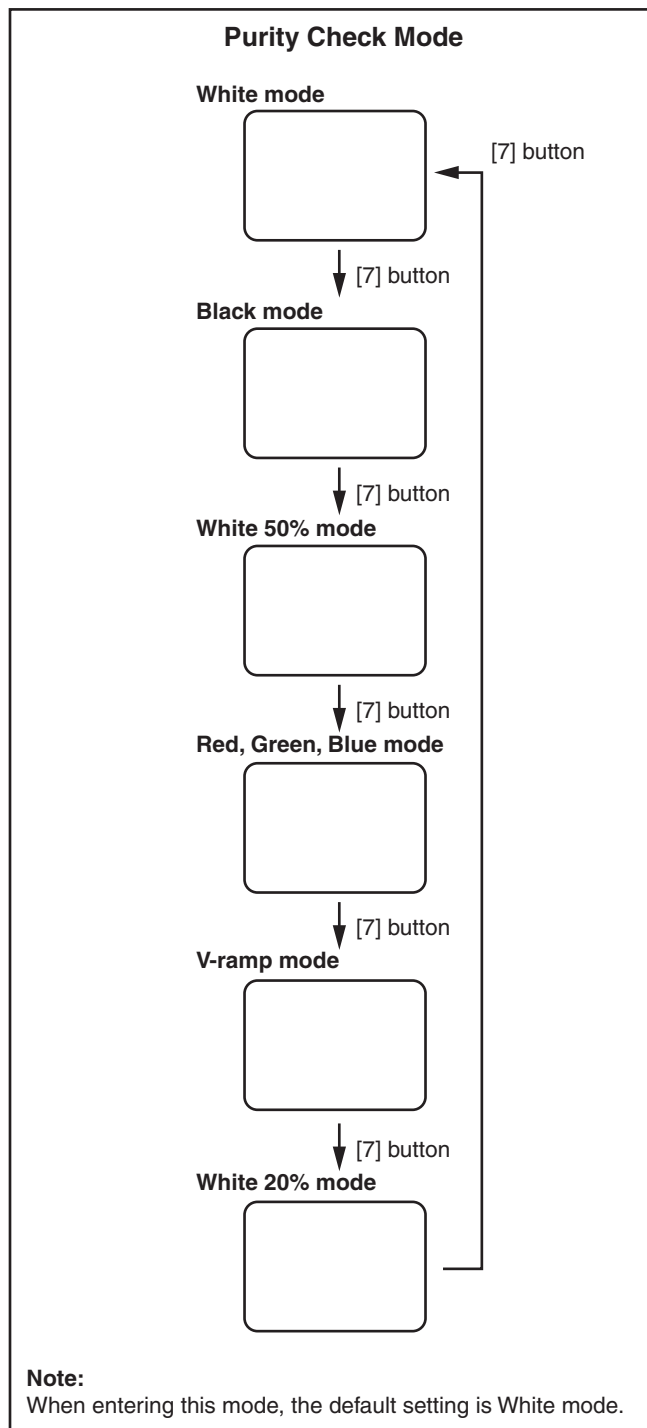
"*" differs depending on the models.

Code:	*****_*_*_*_*_*_*_*_*_*		
Pic code:	*****_*_*_*_*_*_*_*_*_*		
Panel-Option code:	**_*_*_*_*_*_*_*_*_*_*_*		
MIPS:	Push 0 key		
Press "POWER" key to exit.			
Tuner:	****_*_*_*_*_*_*_*_*_*		
Safety:	Safety_Non	Total Watch Time:	****
HDMI EDID:	**	Lightsensor:	****

1. Purity Check Mode

This mode cycles through full-screen displays of red, green, blue, and white to check for non-active pixels.

1. Enter the service mode.
2. Each time the [7] button on the remote control unit is pressed, the display changes as follows.

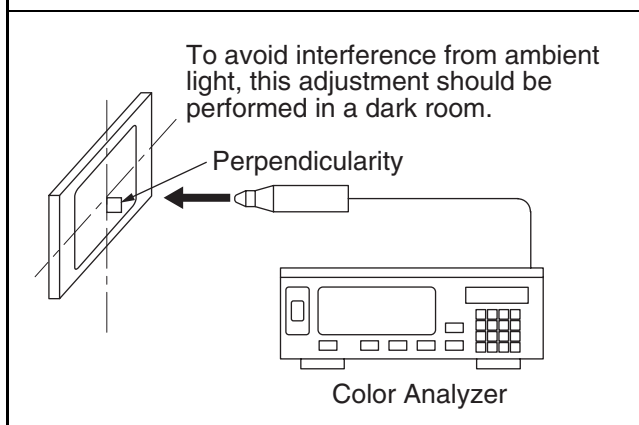


3. To cancel or to exit from the Purity Check Mode, press [BACK] button.

2. VCOM Adjustment

Test Point	Adj. Point
Screen	[CH + or -] buttons
M. EQ.	Spec.
Color analyzer	See below

Figure



1. Set the color analyzer at the zero point calibration and bring the optical receptor pointing at the center of the LCD-Panel.
Note: The optical receptor must be set perpendicularly to the LCD Panel surface.
2. Enter the service mode.
3. Press [2] button on the remote control unit.
4. Press [CH + or -] buttons on the remote control unit so that the color analyzer value becomes minimum.
5. To cancel or to exit from the VCOM Adjustment, press [BACK] button.

The White Balance Adjustment should be performed when replacing the LCD Panel or Digital Main CBA.

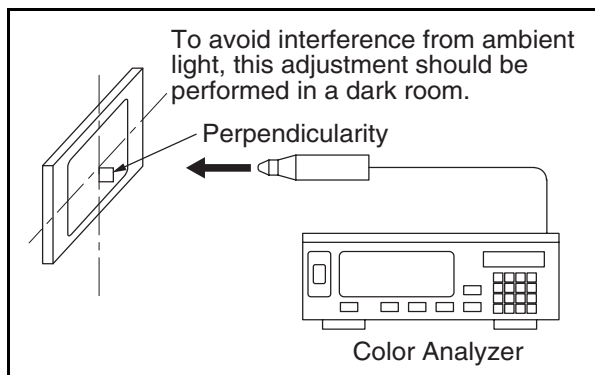
3. White Balance Adjustment

Purpose: To mix red and blue beams correctly for pure white.

Symptom of Misadjustment: White becomes bluish or reddish.

ITEM	SPECIFICATION
Color temperature	$x = 0.272 \pm 0.005$ $y = 0.278 \pm 0.005$
Input Signal	Internal pattern (40/80% raster)
Measurement point	Screen center
M. EQ.	CA-310 (KONICA MINOLTA Luminance meter) or measuring instrument as good as CA-310.
Aging time	60min. (Retail MODE/100IRE Raster HDMI 1080i@60)
MODE setting of TV	Shipment setting/ Retail MODE
Ambient temperature	$25^{\circ}\text{C} \pm 5^{\circ}\text{C}$

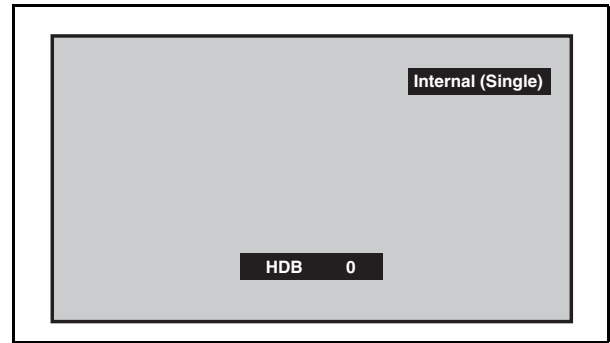
1. Operate the unit for more than 60 minutes.
2. Enter the service mode.
3. Press [VOL -] button three times on the remote control unit to select "Drive setting" mode. "Drive" appears in the screen.
4. Set the color analyzer at the CHROMA mode and zero point calibration. Bring the optical receptor pointing at the center of the LCD-Panel.



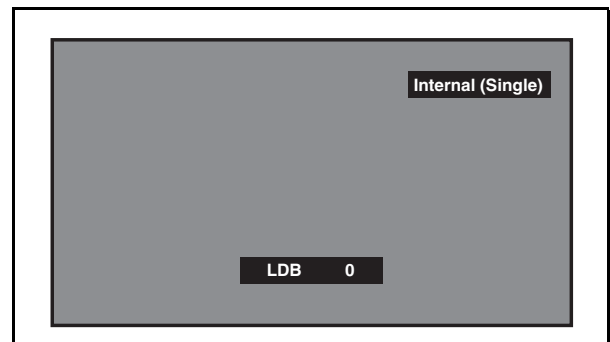
Note: The optical receptor must be set perpendicularly to the LCD Panel surface.

5. Press [3] button to select the "HDB" for High Drive Blue adjustment. ("HDB" appears in the screen.)

6. Press [MENU] button. The internal Raster signal appears in the screen. ("Internal (Single)" appears in the upper right of the screen as shown below.)



7. Press [CH + or -] buttons to adjust the color temperature becomes 12000°K ($x = 0.272 / y = 0.278 \pm 0.002$).
8. Press [1] button to select the "HDR" for High Drive Red adjustment ("HDR" appears in the screen.) and press [CH + or -] buttons to adjust the color temperature.
9. If necessary, adjust the "HDB" or "HDR" again.
10. Press [6] button to select the "LDB" for Low Drive Blue adjustment ("LDB" appears in the screen.) and press [CH + or -] buttons to adjust the color temperature.



11. Press [4] button to select the "LDR" for Low Drive Red adjustment ("LDR" appears in the screen.) and press [CH + or -] buttons to adjust the color temperature.
12. If necessary, adjust the "LDB" or "LDR" again.
13. Press [VOL -] button to shift to the "Debugging Message" mode.
If there is no message under "[WB]" section, this adjustment completes.
If "Drive settings are NG. Retry." is displayed, repeat above steps from 5. to 12. Then check "Debugging Message" again. If "Drive settings are NG. Retry." is displayed, replace the LCD Panel or Digital Main CBA.
14. To cancel or to exit from the White Balance Adjustment, press [BACK] button.

HOW TO INITIALIZE THE LCD TV

The purpose of initialization is to place the set in a new out of box condition. The customer will be prompted to select a language and program channels after the set has been initialized.

To put the program back at the factory-default, initialize the LCD TV using the following procedure.

1. Turn the power on.
2. If the USB storage device is inserted to the USB port, please remove the USB storage device from the USB port.
3. Enter the service mode.
4. Press [RECALL/INFO] button on the set up remote control unit to initialize the LCD television.
5. "SELF CHECK" will appear in the upper right of the screen. "INITIALIZED FINISH AC-OFF" screen will appear when initialization is completed. Unplug the AC power cord.

Note:

- (1) If the "WB" becomes "NG" on the "INITIALIZED FINISH (Failure Result)" screen, refer to the "3. White Balance Adjustment" on the "ELECTRICAL ADJUSTMENT INSTRUCTIONS" section.
- (2) If the "Touch Sensor IC" becomes "NG" on the "INITIALIZED FINISH (Failure Result)" screen, repair or replace the FUNCTION CBA.
- (3) To cancel the service mode, press [⏻] button on the remote control unit.

FIRMWARE RENEWAL MODE

Equipment Required

- USB storage device
- Remote Control Unit

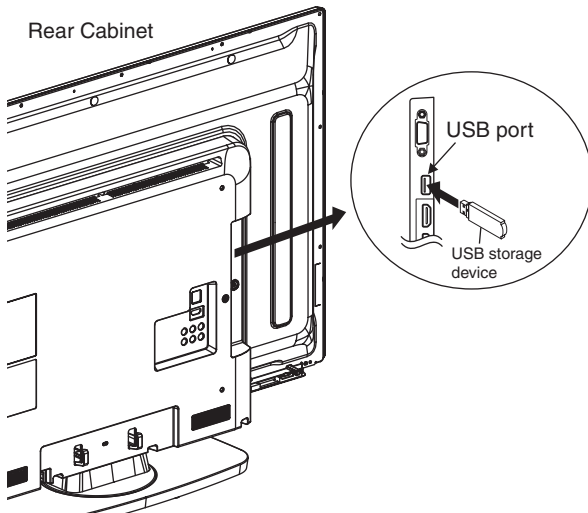
Firmware Update Procedure

Note: There are two states (the User Upgrade and the Factory Upgrade) in firmware update.

User Upgrade	Upgrade the firmware only. The setting values are not initialized.
Factory upgrade	Upgrade the firmware and initialize the setting values.
Factory Upgrade (Flash upgrade)	Upgrade the firmware and initialize the setting values along with the setting data adjusted at the factory such as White Balance, etc.

The identification of User Upgrade and Factory Upgrade are done by the filename.

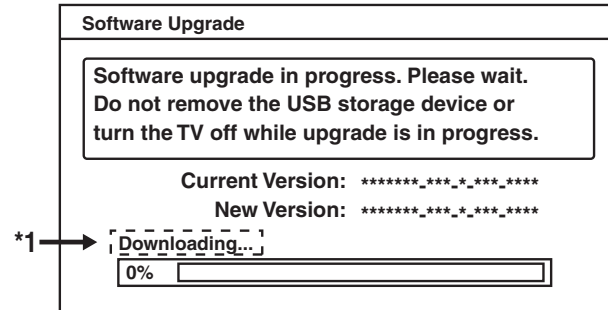
- Turn the power off and unplug the AC Cord.
- Insert the USB storage device to the USB port as shown below.



- Plug the AC cord in the wall outlet and turn the power on.

- The update will start and the following will appear in the screen.

"*" differs depending on the models.

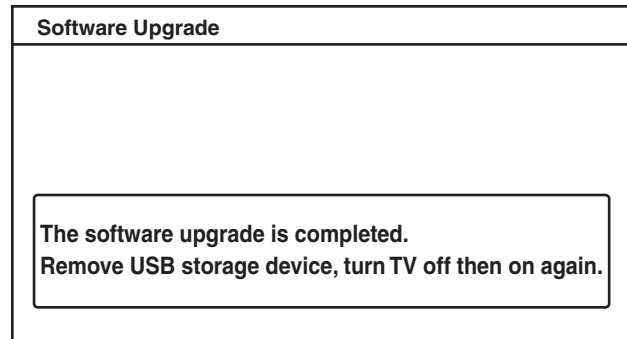


Note: If the above screen isn't displayed, repeat from step 1.

The appearance shown in *1 is described as follows.

Appearance	State
Downloading...	Downloading the firmware from the USB storage device.
Writing...	Writing the downloaded firmware in flash memory.
Checking...	Checking the new firmware.

- When the firmware update is completed, the following will appear in the screen.



Remove the USB storage device from the USB port.

Turn the power off and turn the power on again.

Note:

When the Factory Upgrade is used, after restarting TV, shift to initial screen menu in service mode. "INITIALIZED" will appear in the upper right of the screen. "INITIALIZED" color will change to green from red when initializing is completed.

HOTEL TV MODE

TV to USB settings

- The channel map and all other settings except for the factory setting will be copied from TV to USB storage device.
- The set value will be preserved in the root directory of the USB storage device.
- The channel map will be preserved in two files (one for analog and one for digital) and all other settings will be preserved in the third file.
- When a same file name exists in the USB storage device, the new file will overwrite the previous file.
- All the key input and the shutdown timers will be invalid during the copying process.
- Audio and Video will be muted during the copying process.

How to copy the TV settings to USB storage device

1. Turn the power on.
2. Insert an empty USB storage device to the USB port.
3. Press the [HOME/MENU] button on the setup remote control to display the menu.
4. Select "TV to USB", "Start now" and press the [OK] button.
5. After the successful completion, "Setting copied to USB" message appears on the screen.

NOTE:

In case of any error during the copying process, the copying process will be stopped with the warning message "Failed. Please retry" on the screen.

USB to TV settings

- The channel map and all other settings except for the factory setting will be copied from USB storage device to TV.
- All the key input and the shutdown timers will be invalid during the copying process.
- Audio and Video will be muted during the copying process.
- When illegal data exist in the file, the copying process will be aborted.
- After the successful completion of the copying process, the new set of values will be adopted by the TV.

How to read the setting values from the USB storage device

1. Turn the power on.
2. Insert an USB storage device to the USB port.
3. Press the [HOME/MENU] button on the setup remote control to display the menu screen.
4. Select "USB to TV", "Start now" and press [OK] button.
5. After the successful completion, the TV will restart and initialize with the new values. TV shifts to Standby (Green) and TV shifts to Live mode automatically.

NOTE:

In case of any error during the copying process, the copying process will be stopped with the warning message "Failed. Please retry" on the screen.

Status menu screen (optional)

1. Turn the power on.
2. Press the [RECALL/INFO] button on the setup remote control to display the status menu as shown below.

"*" differs depending on the models.

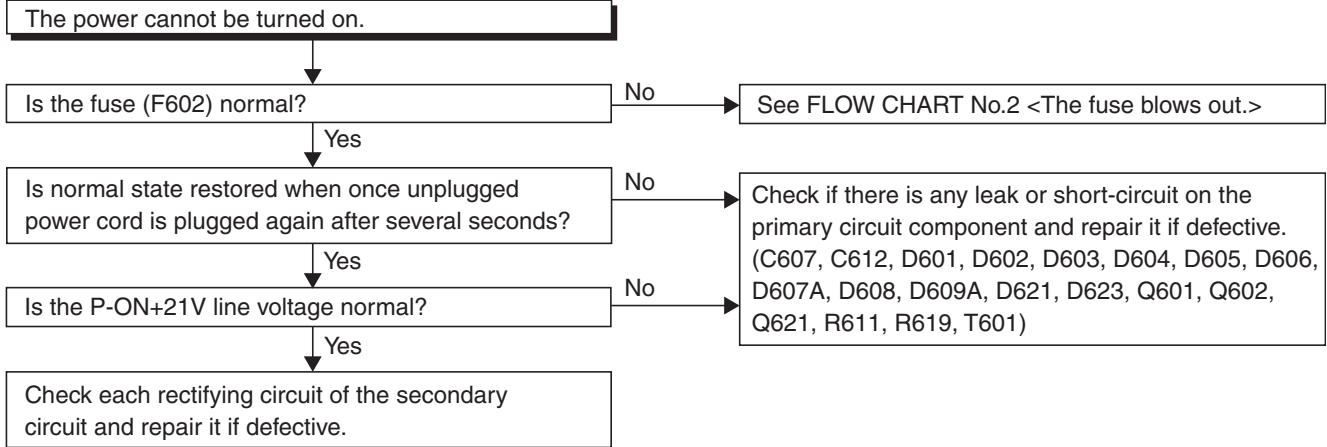
Model number	*****
SW version	*****_**_**_****_**
SPI Port	***
TV**.*	*****

3. Press the [RECALL/INFO] button again to cancel the status menu.

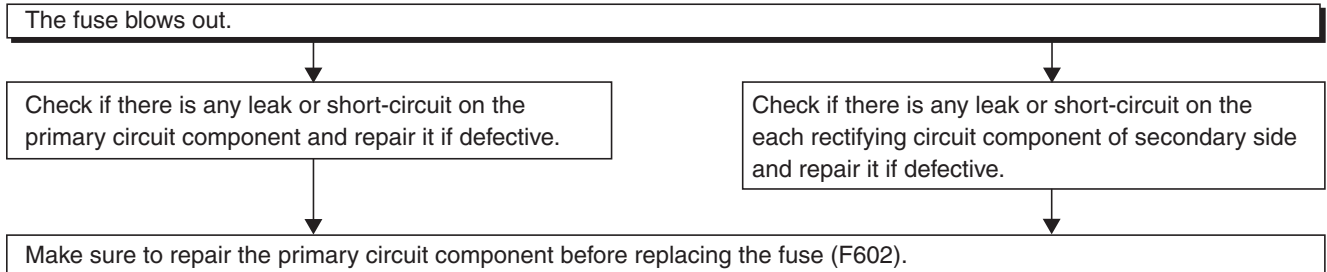
TROUBLESHOOTING

[Power Supply Section]

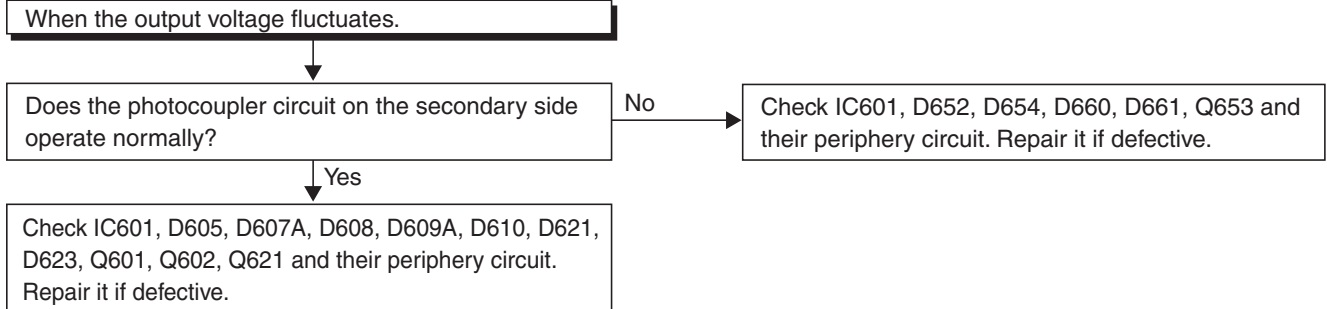
FLOW CHART NO.1



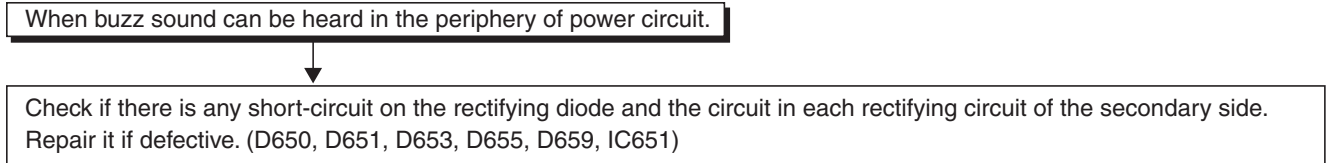
FLOW CHART NO.2



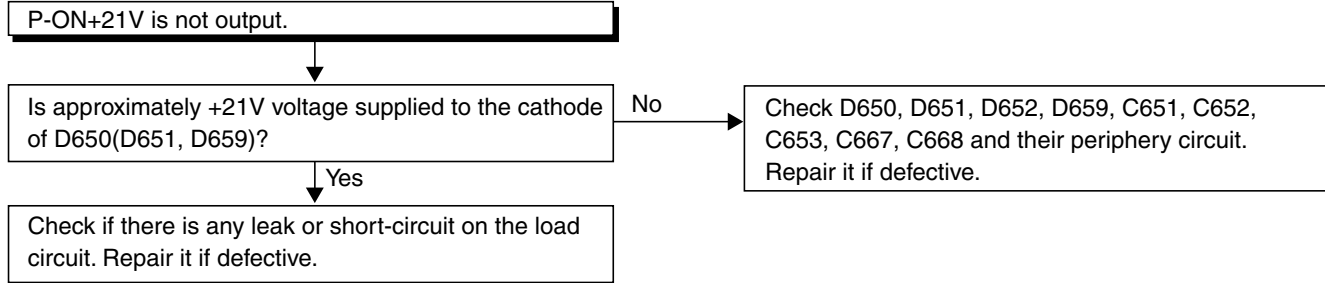
FLOW CHART NO.3



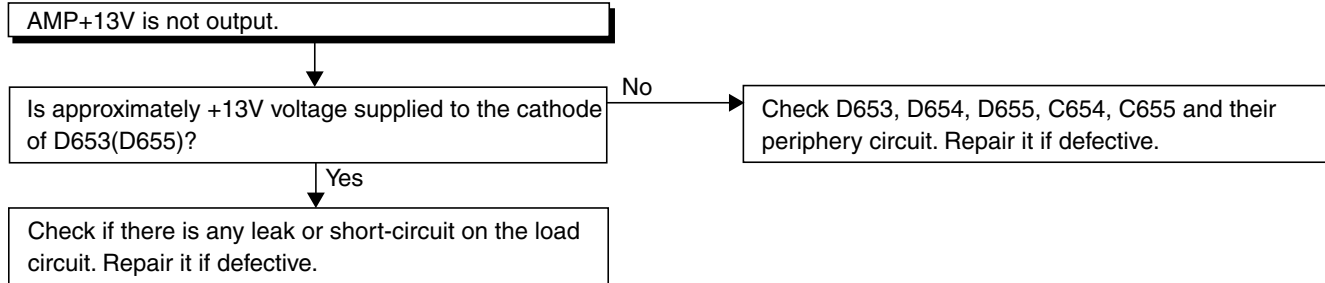
FLOW CHART NO.4



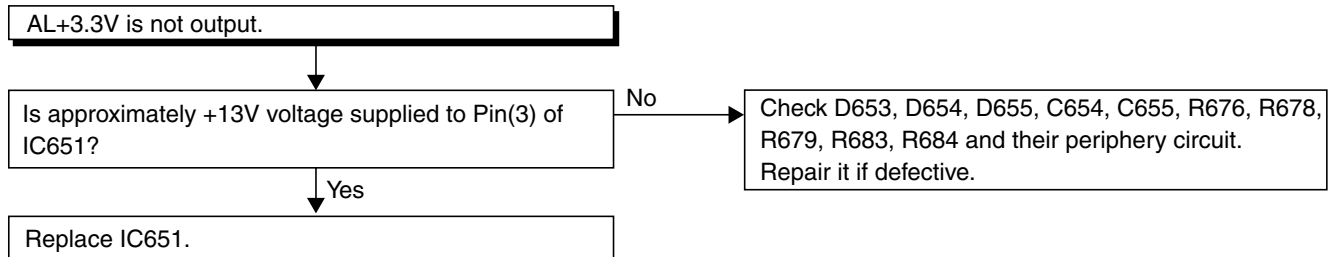
FLOW CHART NO.5



FLOW CHART NO.6

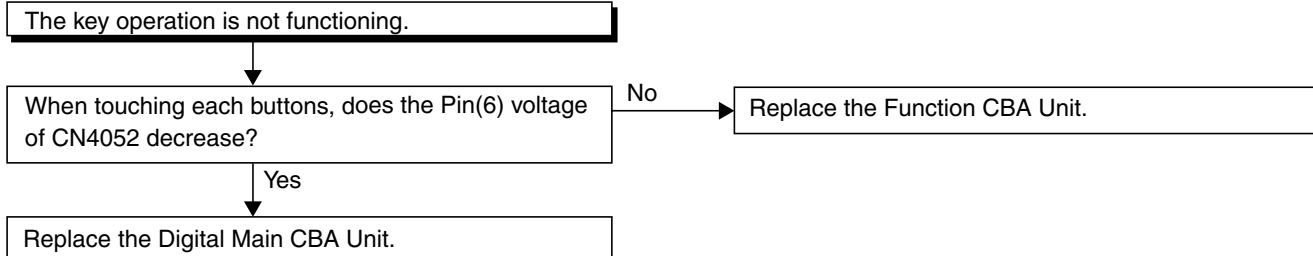


FLOW CHART NO.7

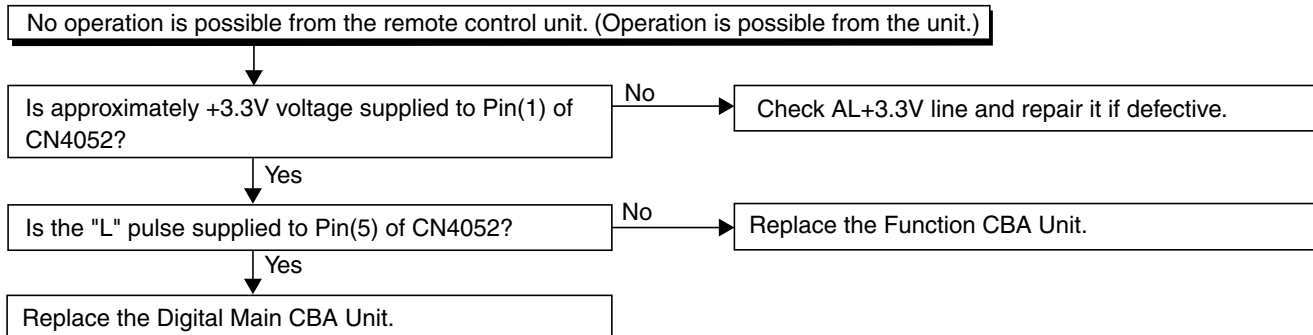


[Video Signal Section]

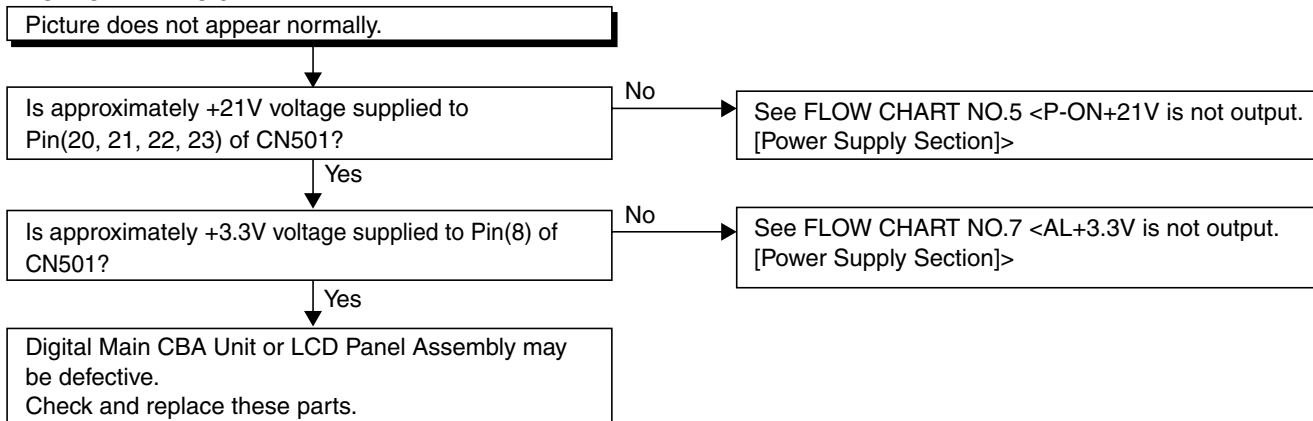
FLOW CHART NO.1



FLOW CHART NO.2

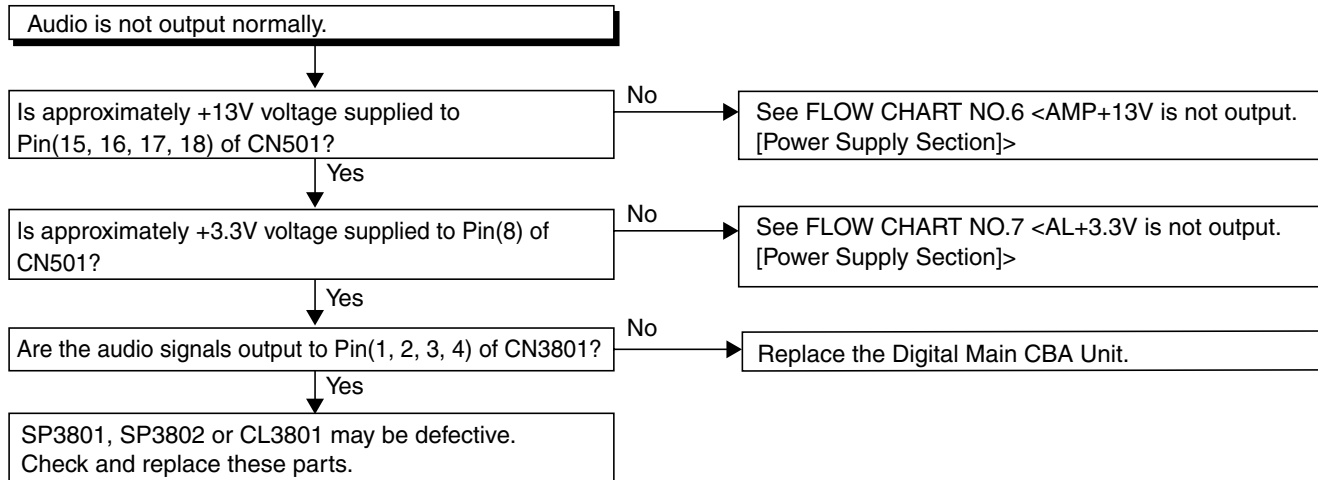


FLOW CHART NO.3



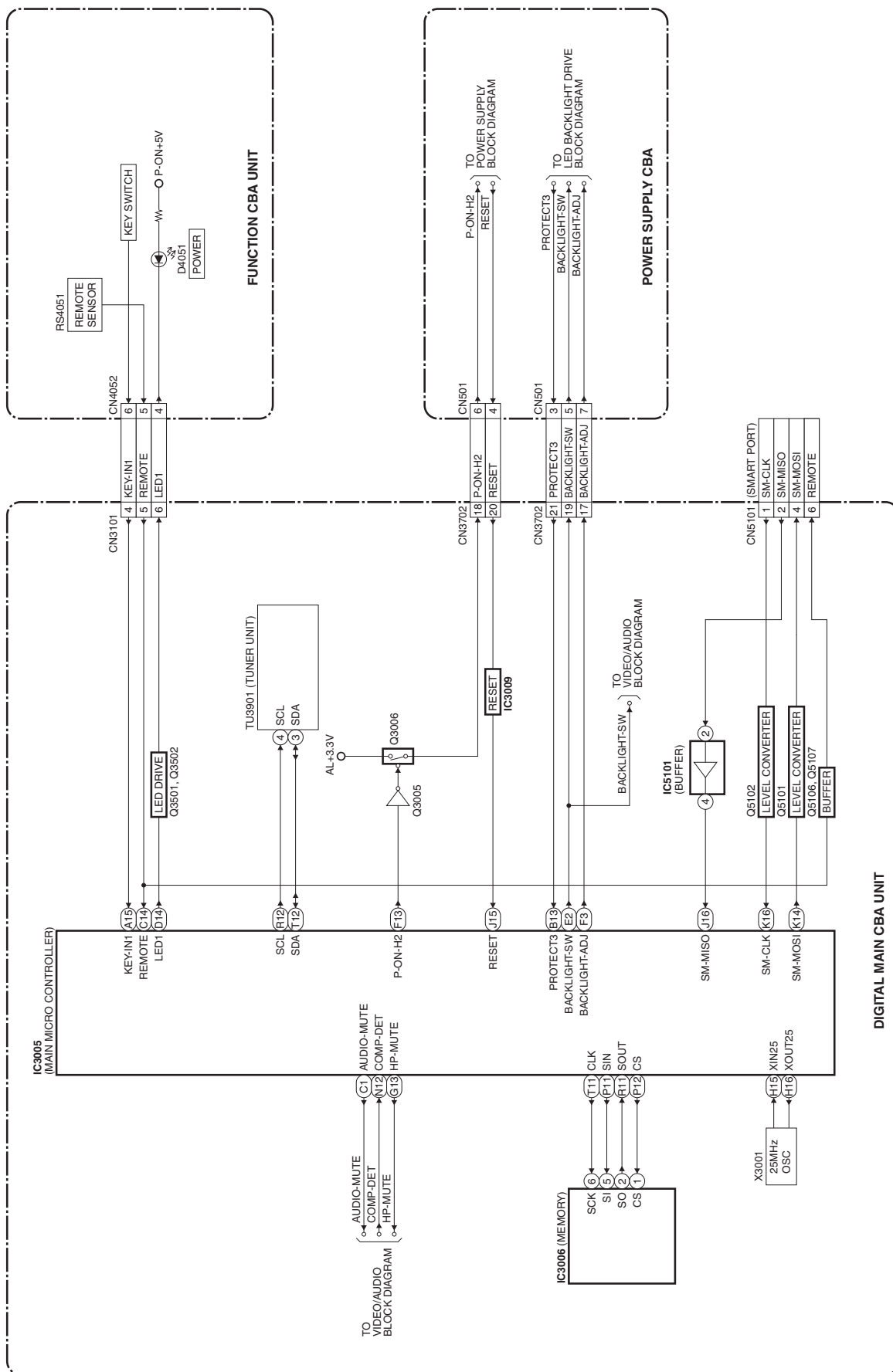
[Audio Signal Section]

FLOW CHART NO.1

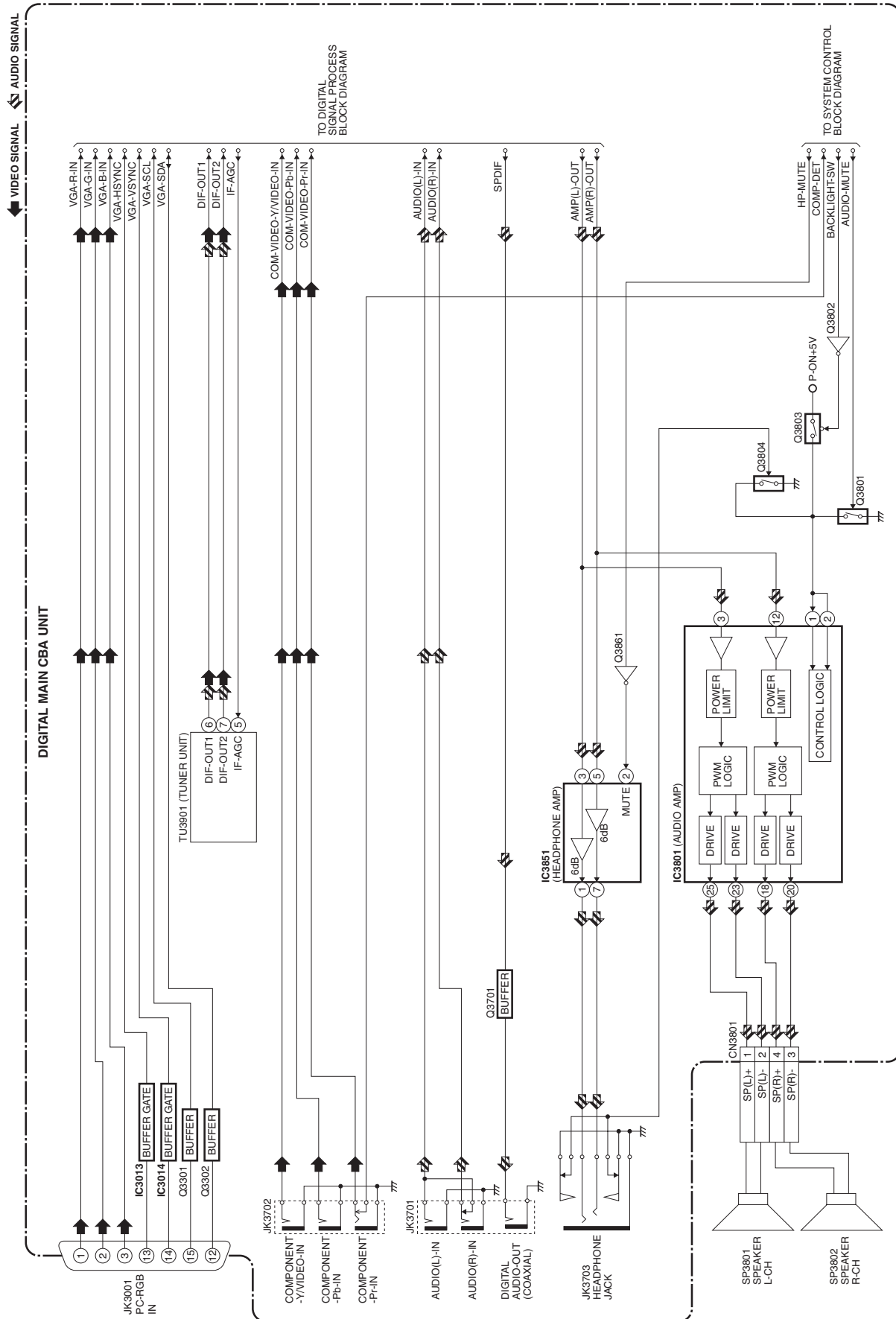


BLOCK DIAGRAMS

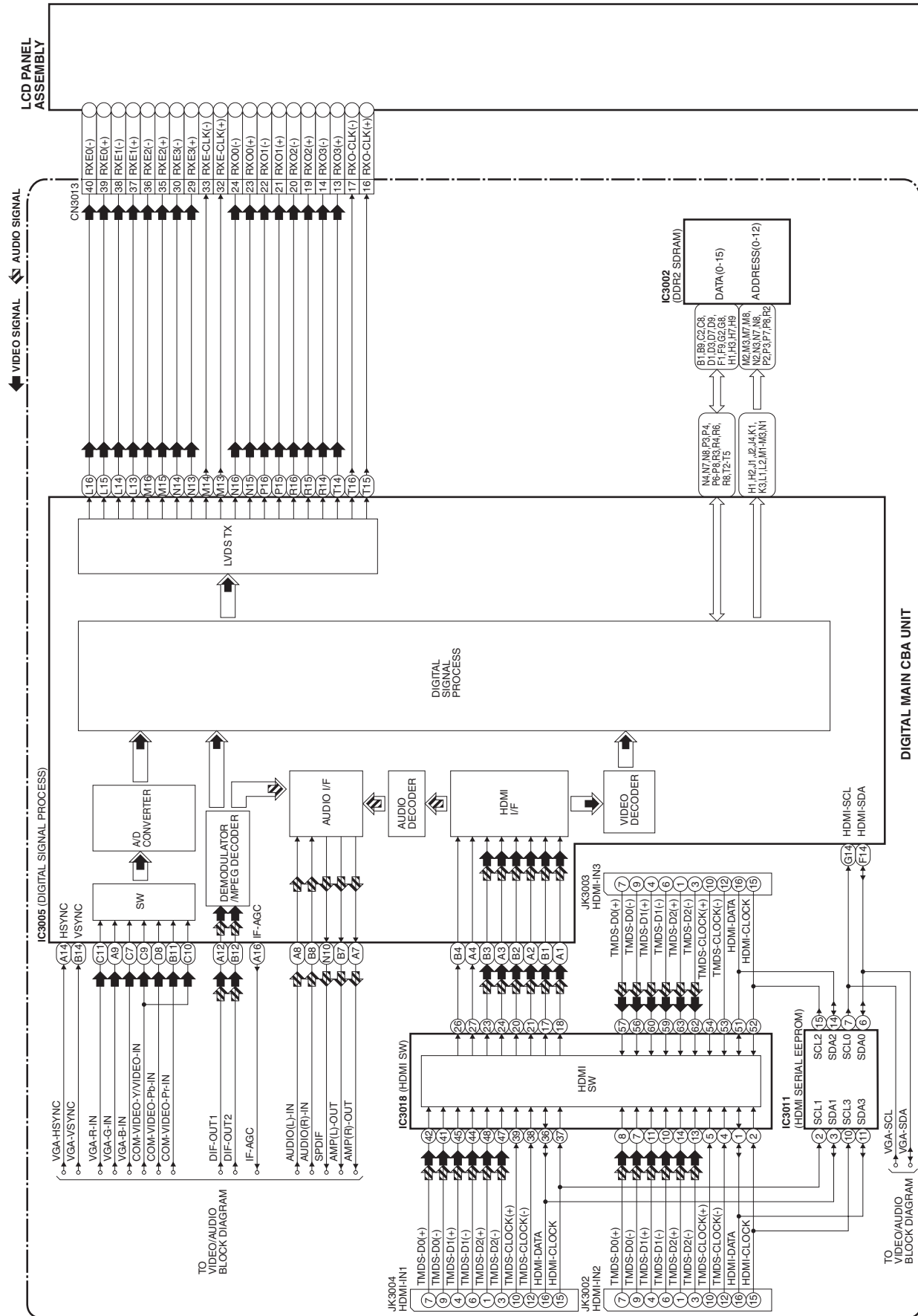
1. System Control Block Diagram



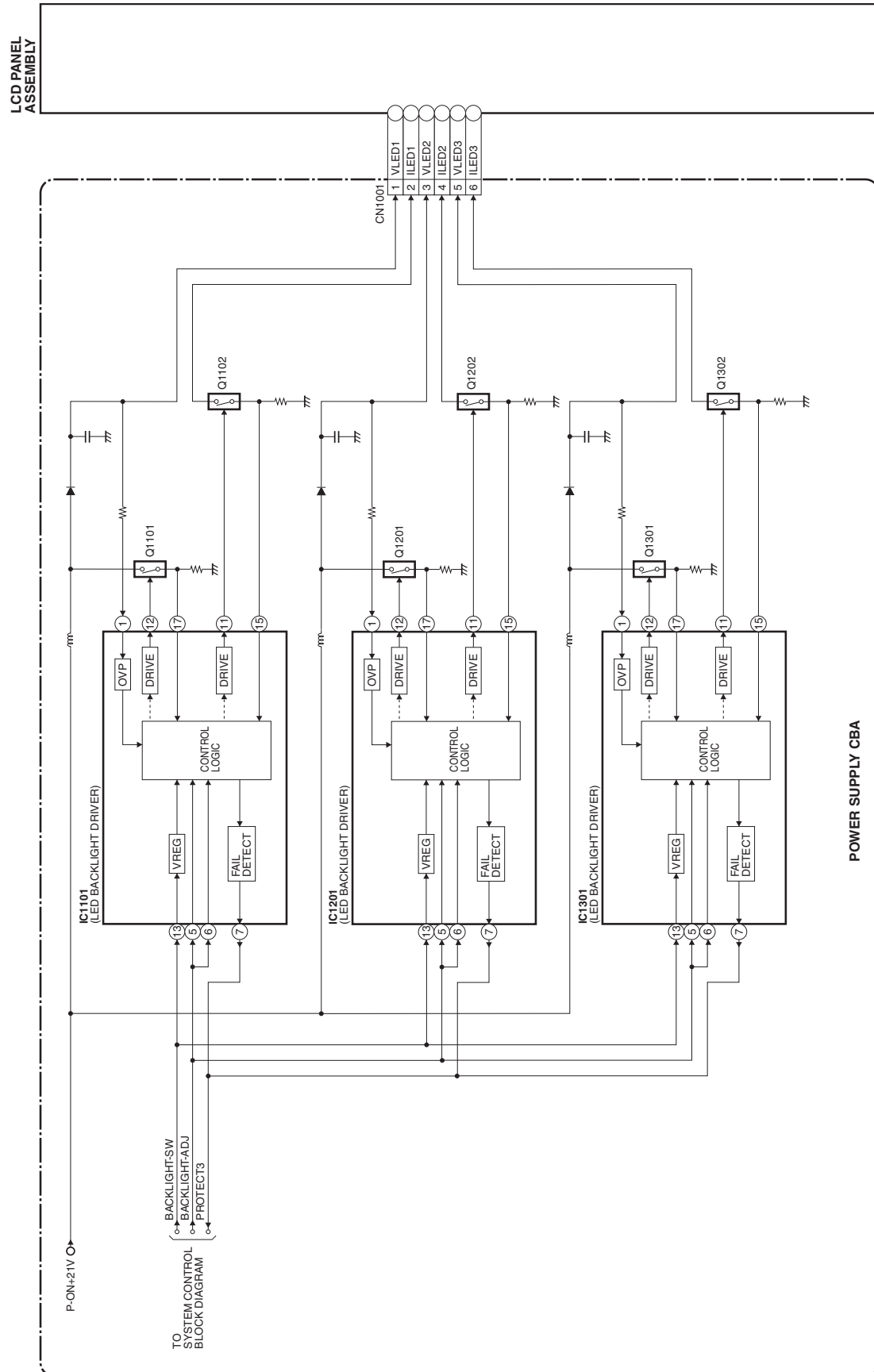
2. Video/Audio Block Diagram



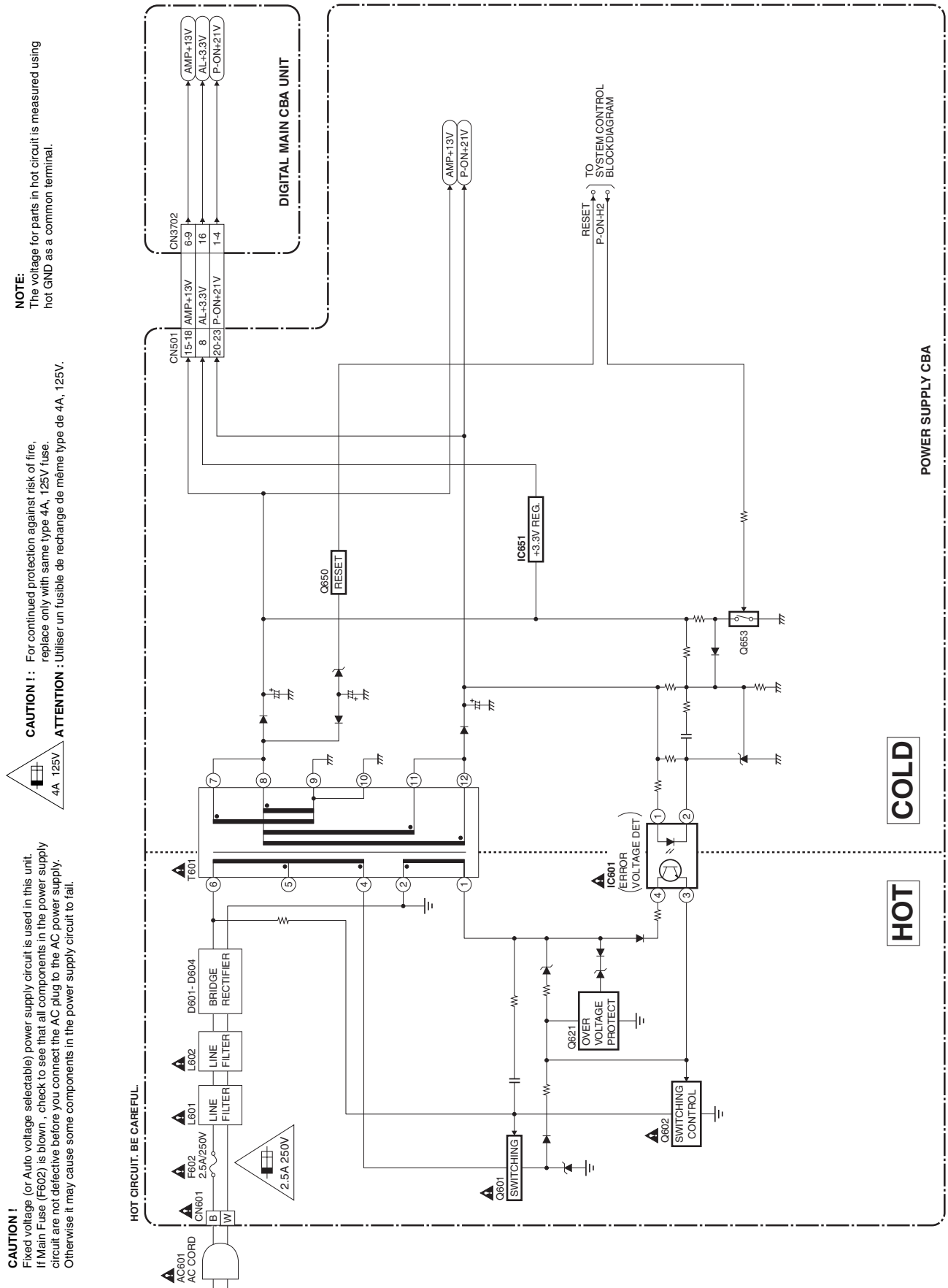
3. Digital Signal Process Block Diagram



4. LED Backlight Drive Block Diagram



5. Power Supply Block Diagram



SCHEMATIC DIAGRAMS / CBA AND TEST POINTS

Standard Notes

WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark “▲” in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K = 10^3$, $M = 10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P = 10^{-6} \mu F$).
5. All voltages are DC voltages unless otherwise specified.

LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION:

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE_A,_V FUSE.

ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE_A,_V.

2. CAUTION:

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.

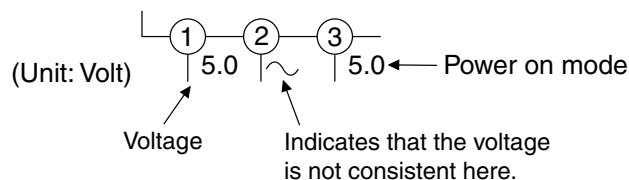
If Main Fuse (F602) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. Note:

1. Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
2. To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Voltage indications on the schematics are as shown below:

Plug the TV power cord into a standard AC outlet.:



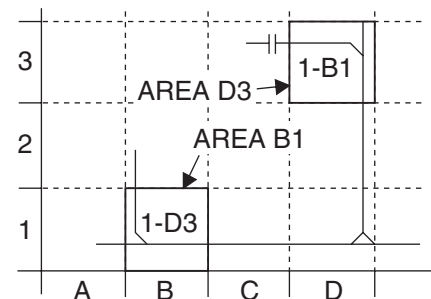
5. How to read converged lines

1-D3

 Distinction Area
 Line Number
 (1 to 3 digits)

Examples:

1. "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
2. "1-B1" means that line number "1" goes to the line number "1" of the area "B1".



6. Test Point Information

: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

: Used to indicate a test point with no test pin.

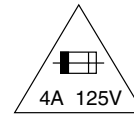
: Used to indicate a test point with a test pin.

The reference number of parts on Schematic Diagrams/CBA can be retrieved by application search function.

Power Supply Schematic Diagram

CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F602) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

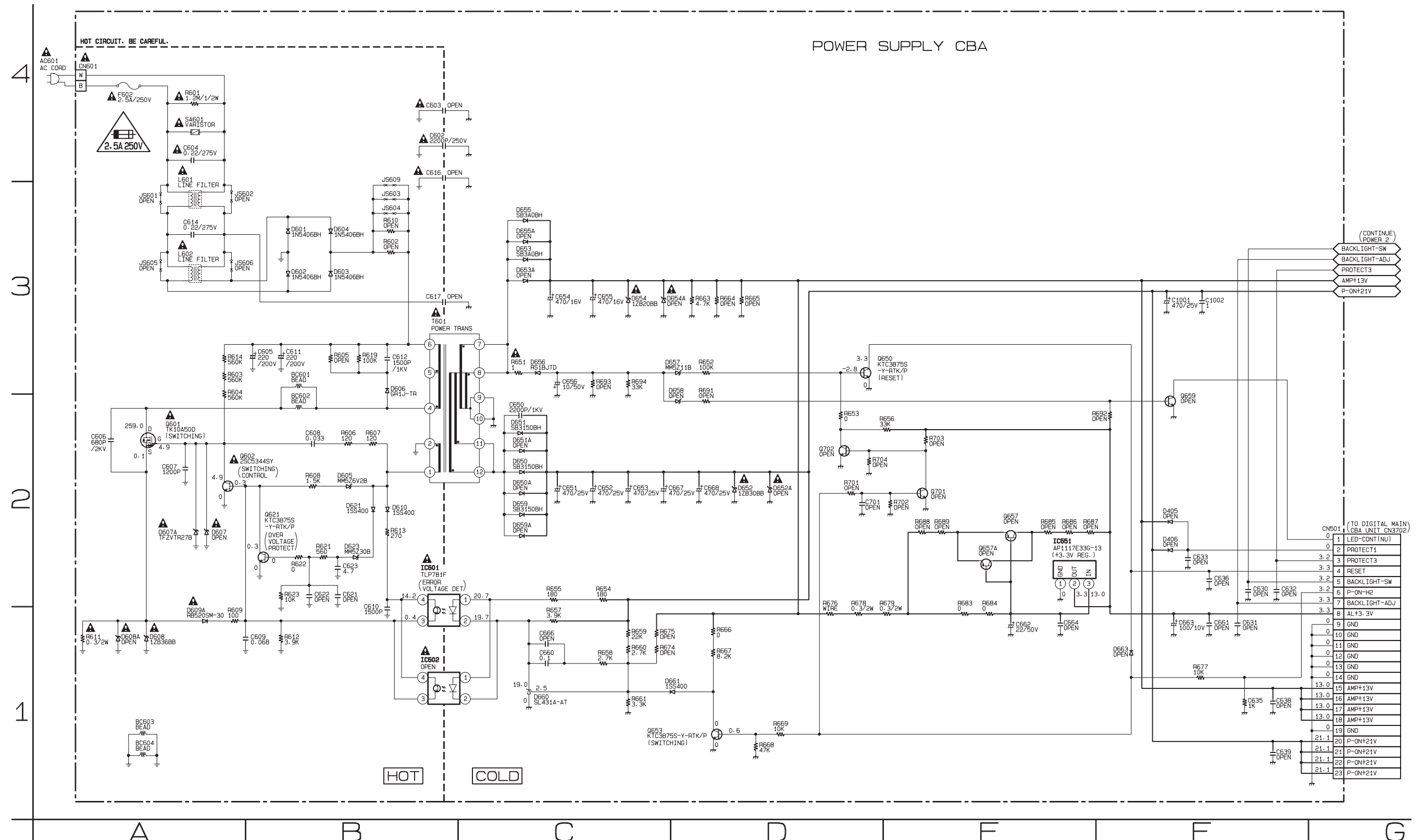


CAUTION ! : For continued protection against risk of fire,
replace only with same type 4A, 125V fuse.

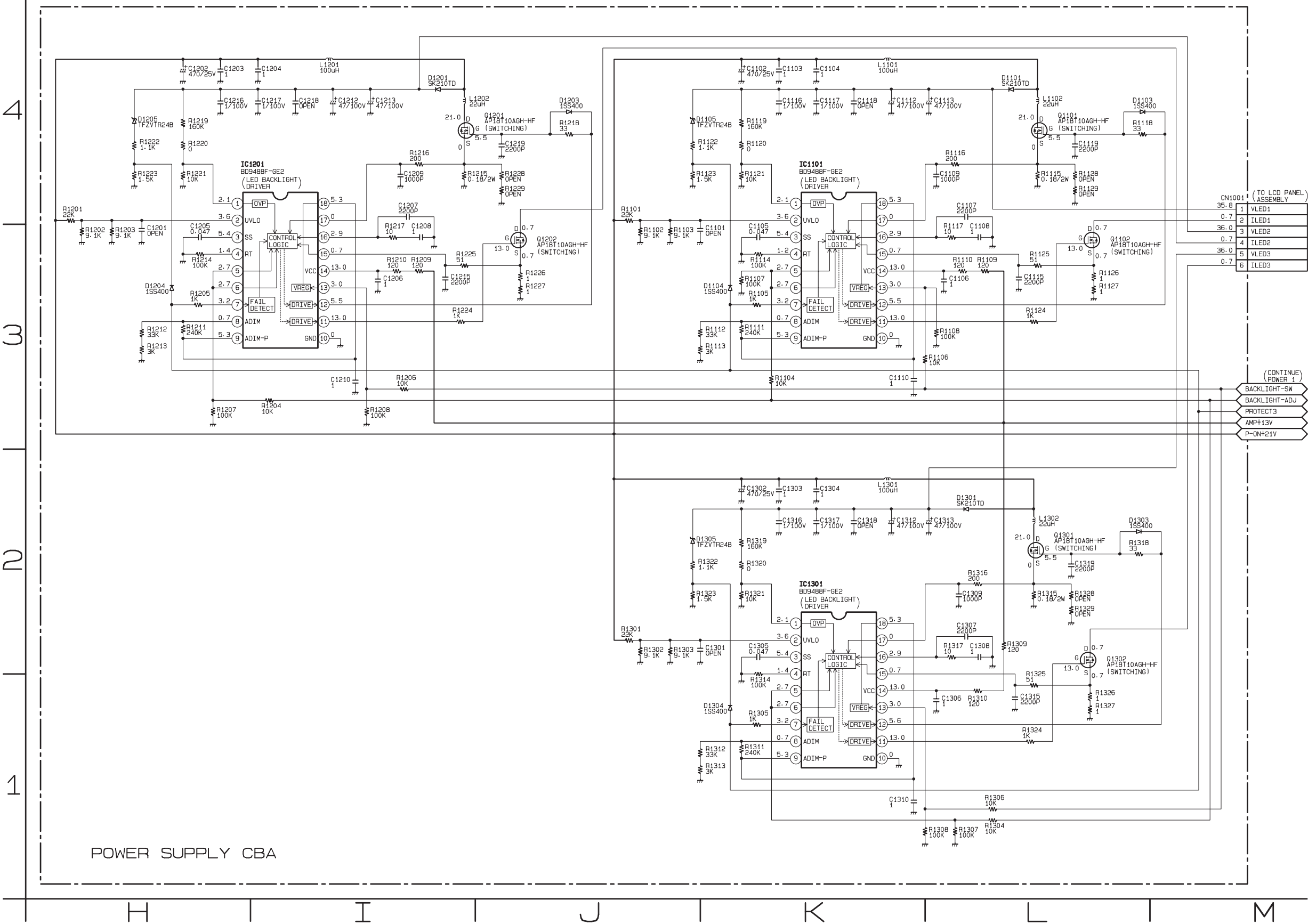
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

NOTE:

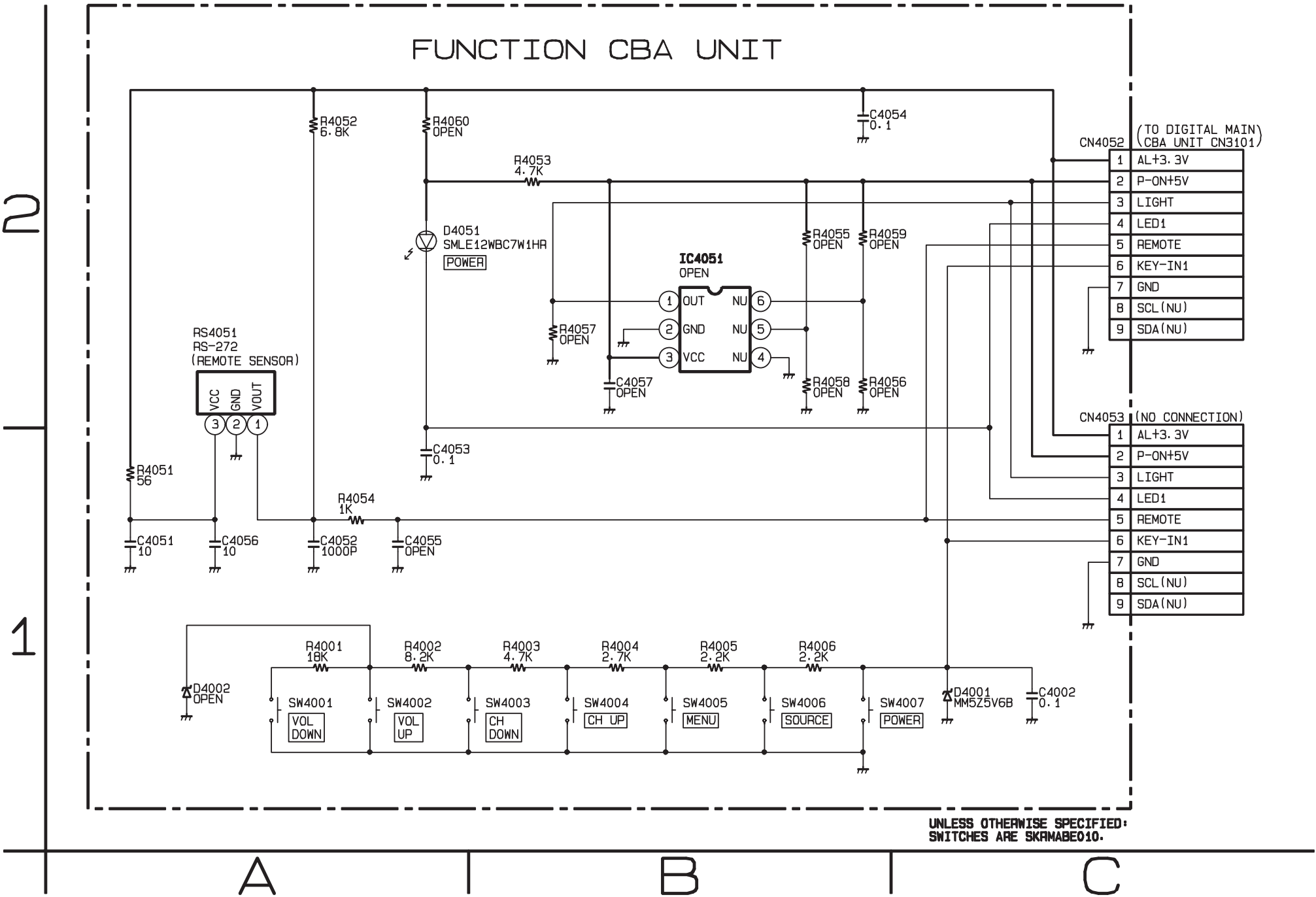
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



Power Supply Schematic Diagram



Function Schematic Diagram

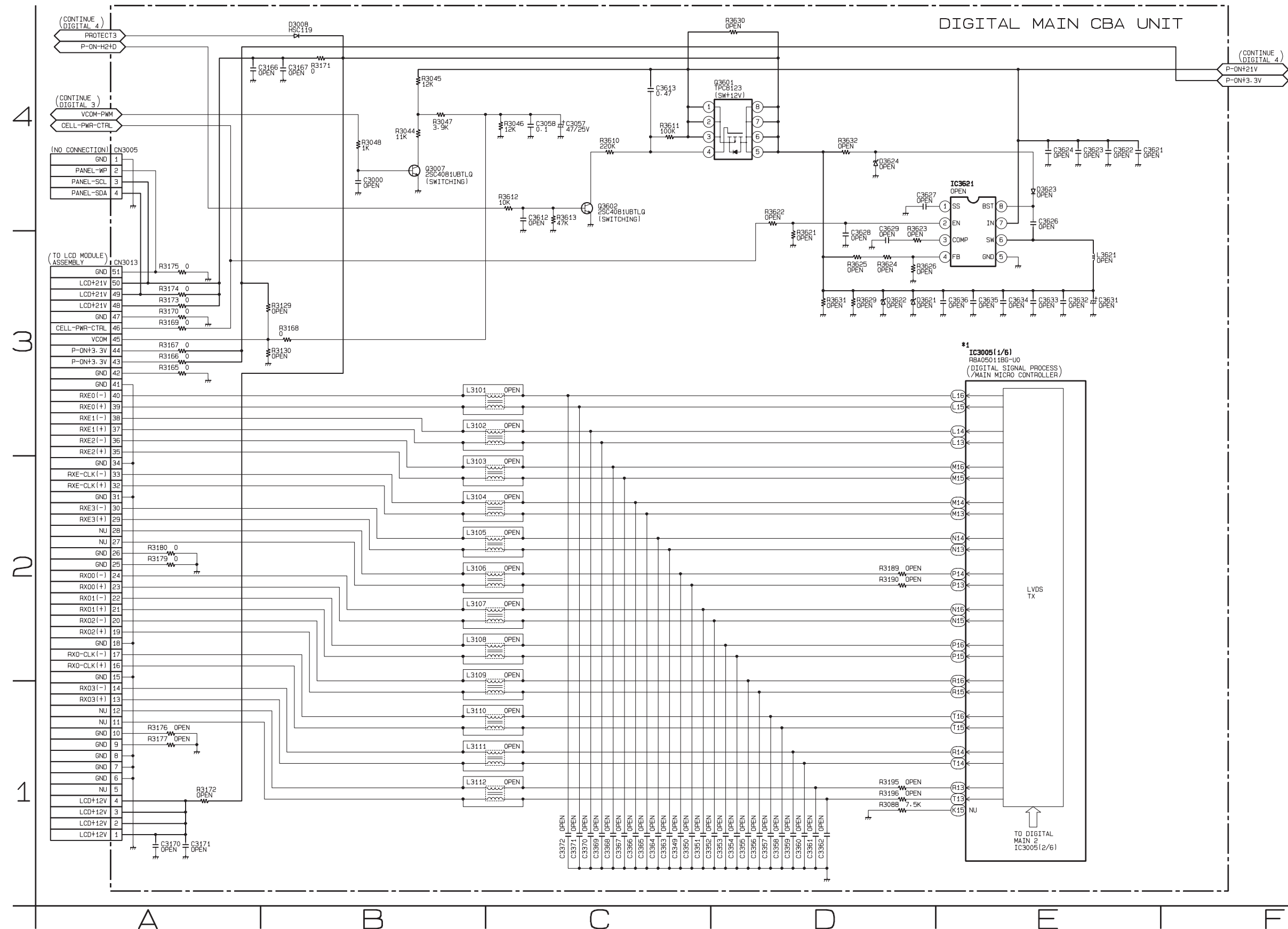


Digital Main 1 Schematic Diagram

***1 NOTE:**

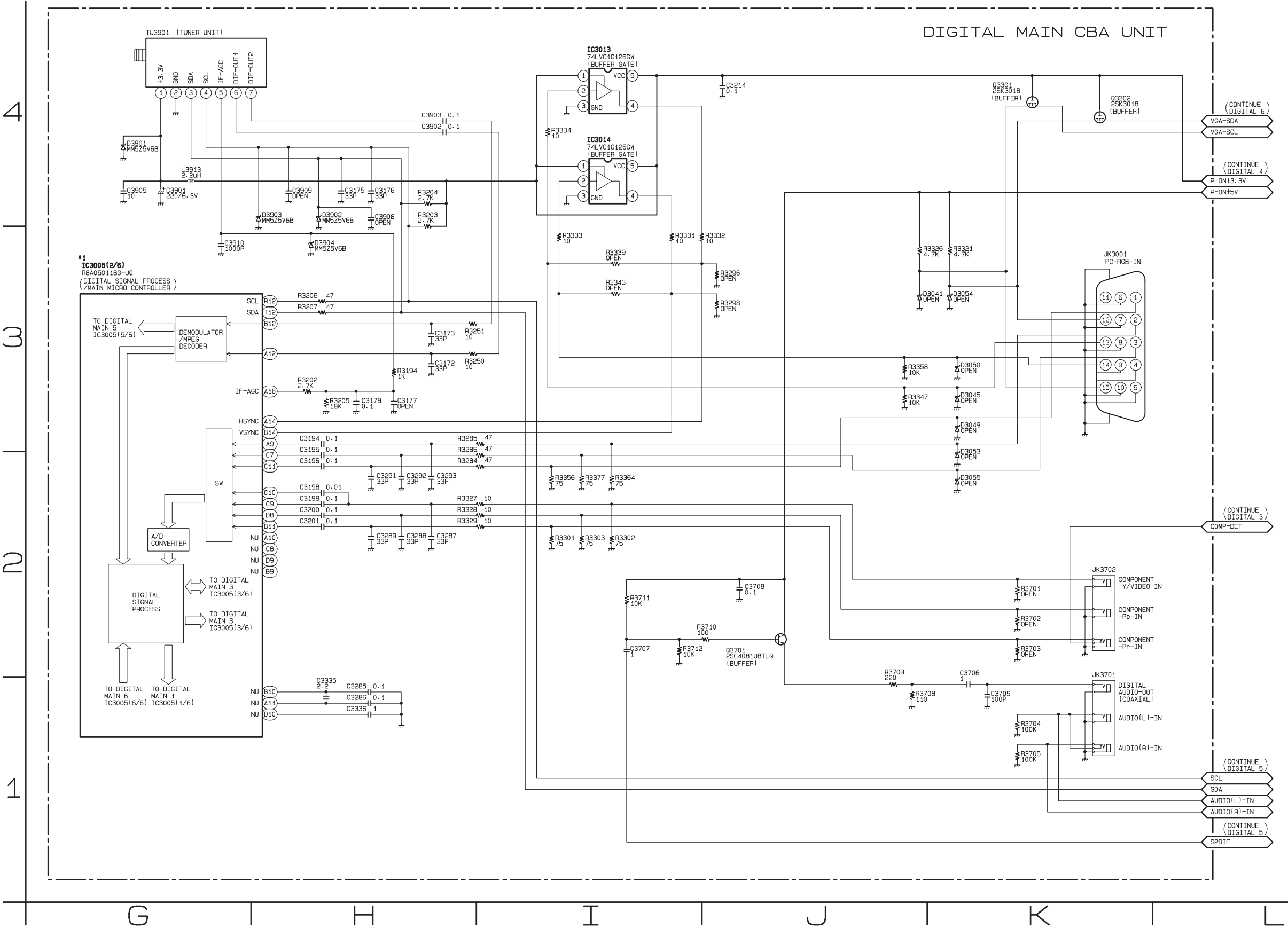
The order of pins shown in this diagram is different from that of actual IC3005.

IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.



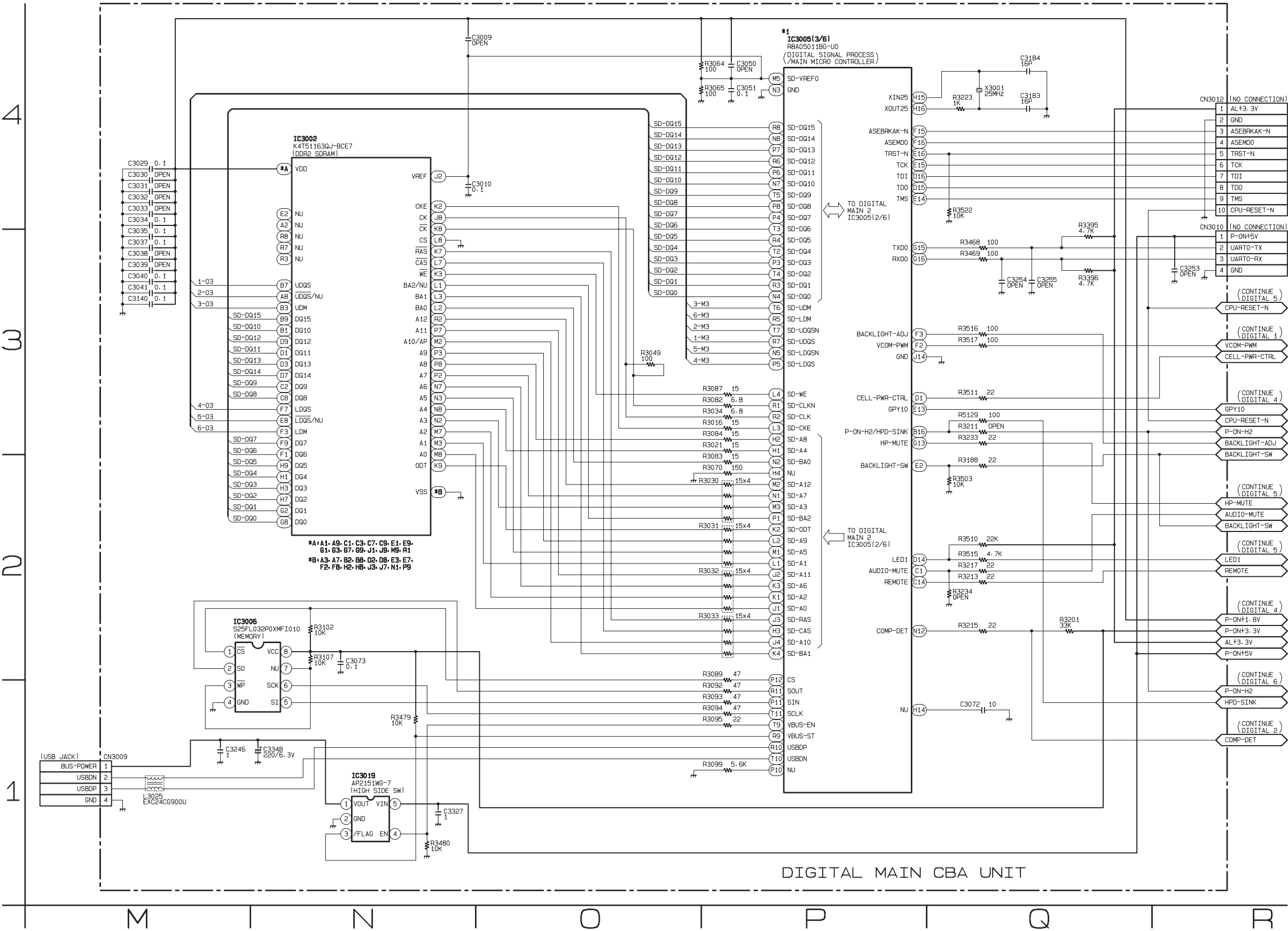
Digital Main 2 Schematic Diagram

*1 NOTE:
The order of pins shown in this diagram is different from that of actual IC3005.
IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.



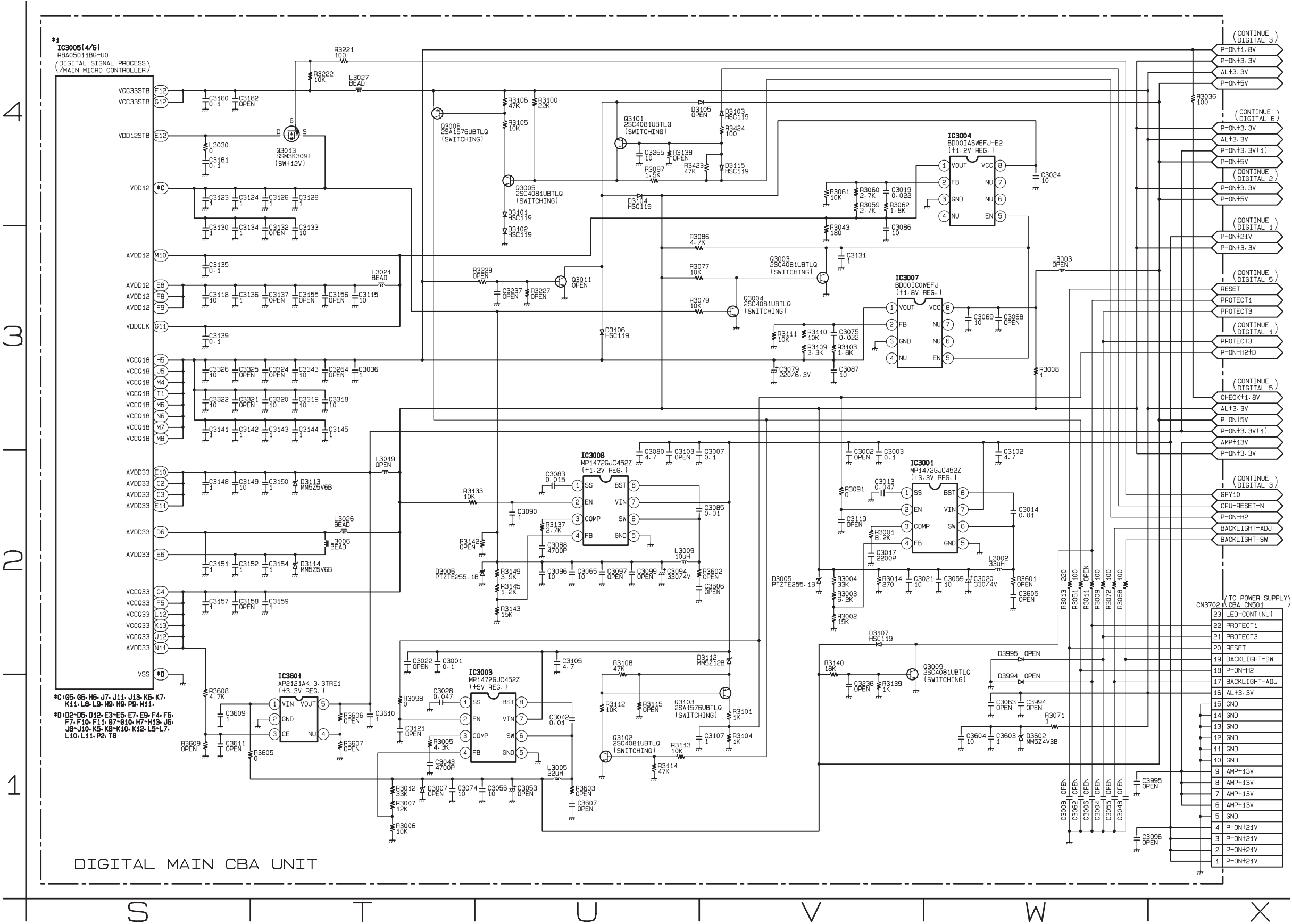
Digital Main 3 Schematic Diagram

*1 NOTE:
The order of pins shown in this diagram is different from that of actual IC3005.
IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.



Digital Main 4 Schematic Diagram

*1 NOTE:
The order of pins shown in this diagram is different from that of actual IC3005.
IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.

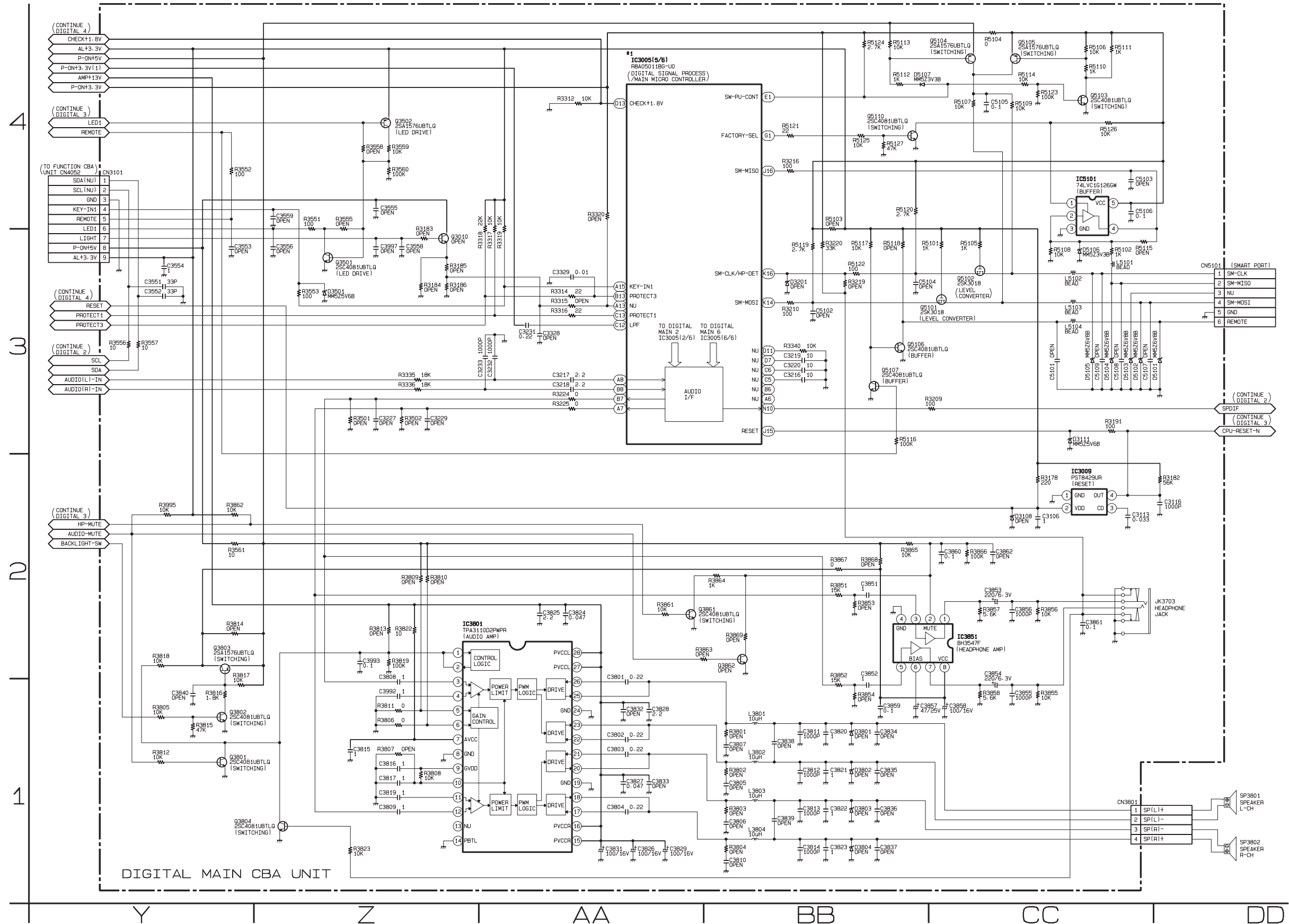


Digital Main 5 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3005.

IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.

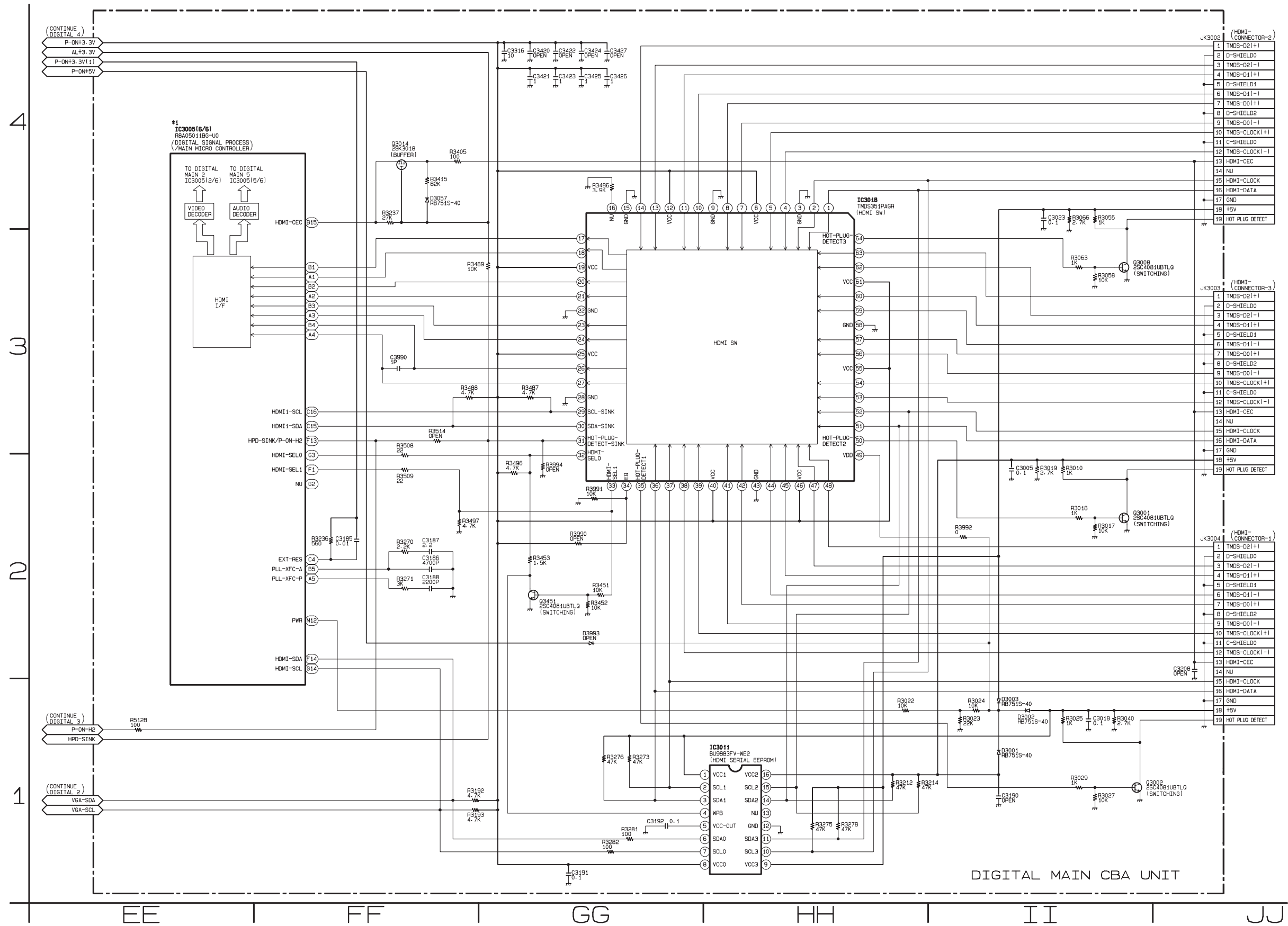


Digital Main 6 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3005.

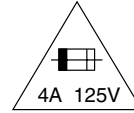
IC3005 is divided into six and shown as IC3005 (1/6) ~ IC3005 (6/6) in this Digital Main Schematic Diagram Section.



Power Supply CBA Top View

CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F602) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.



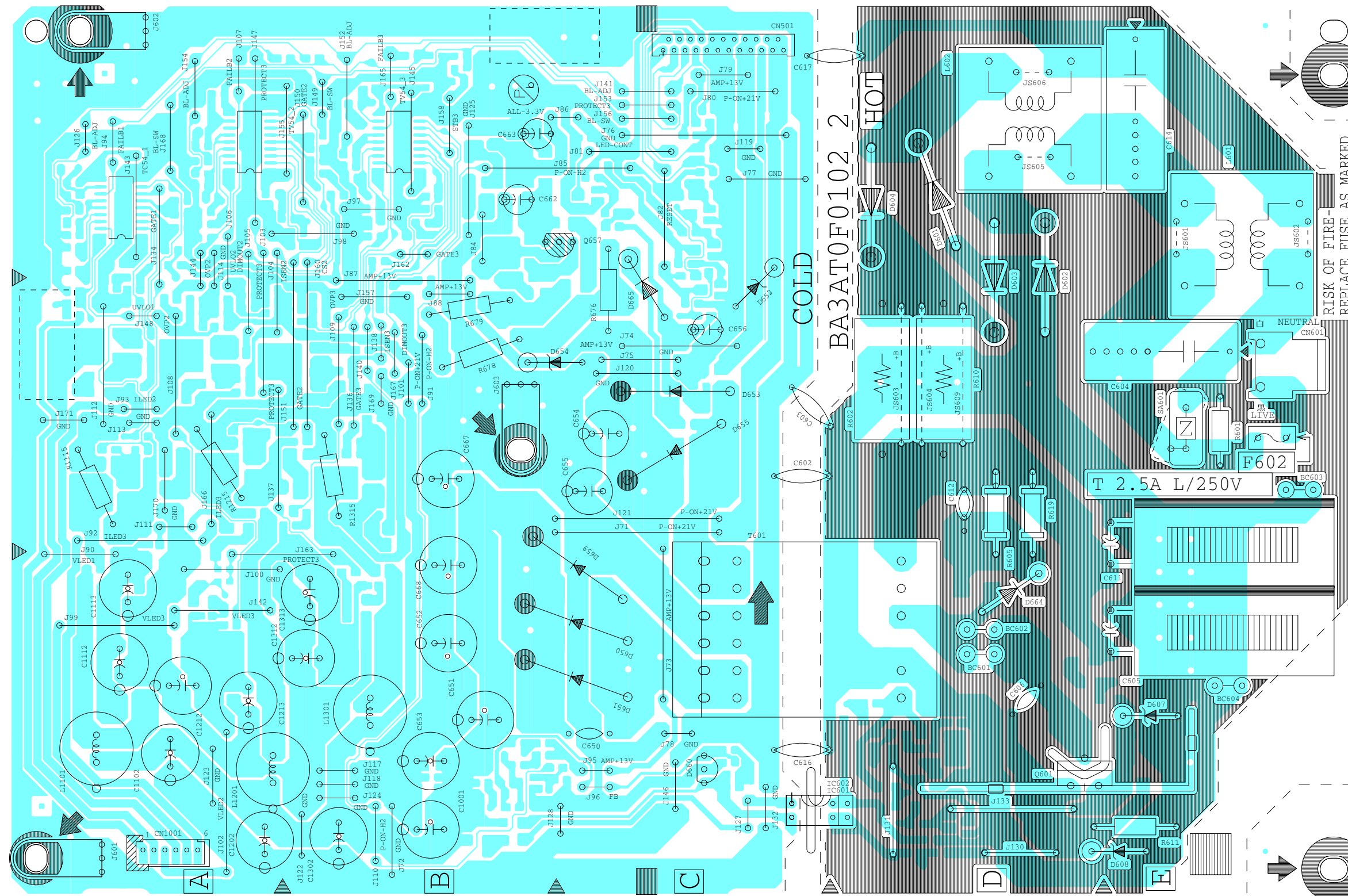
CAUTION ! : For continued protection against risk of fire, replace only with same type 4A, 125V fuse.

ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used when repairing. Also, in order to have the ability to increase the input slowly, when troubleshooting this type of power supply circuit, a variable isolation transformer is required.

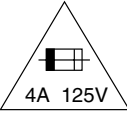
NOTE:

The voltage for parts in hot circuit is measured using hot GND as a common terminal.



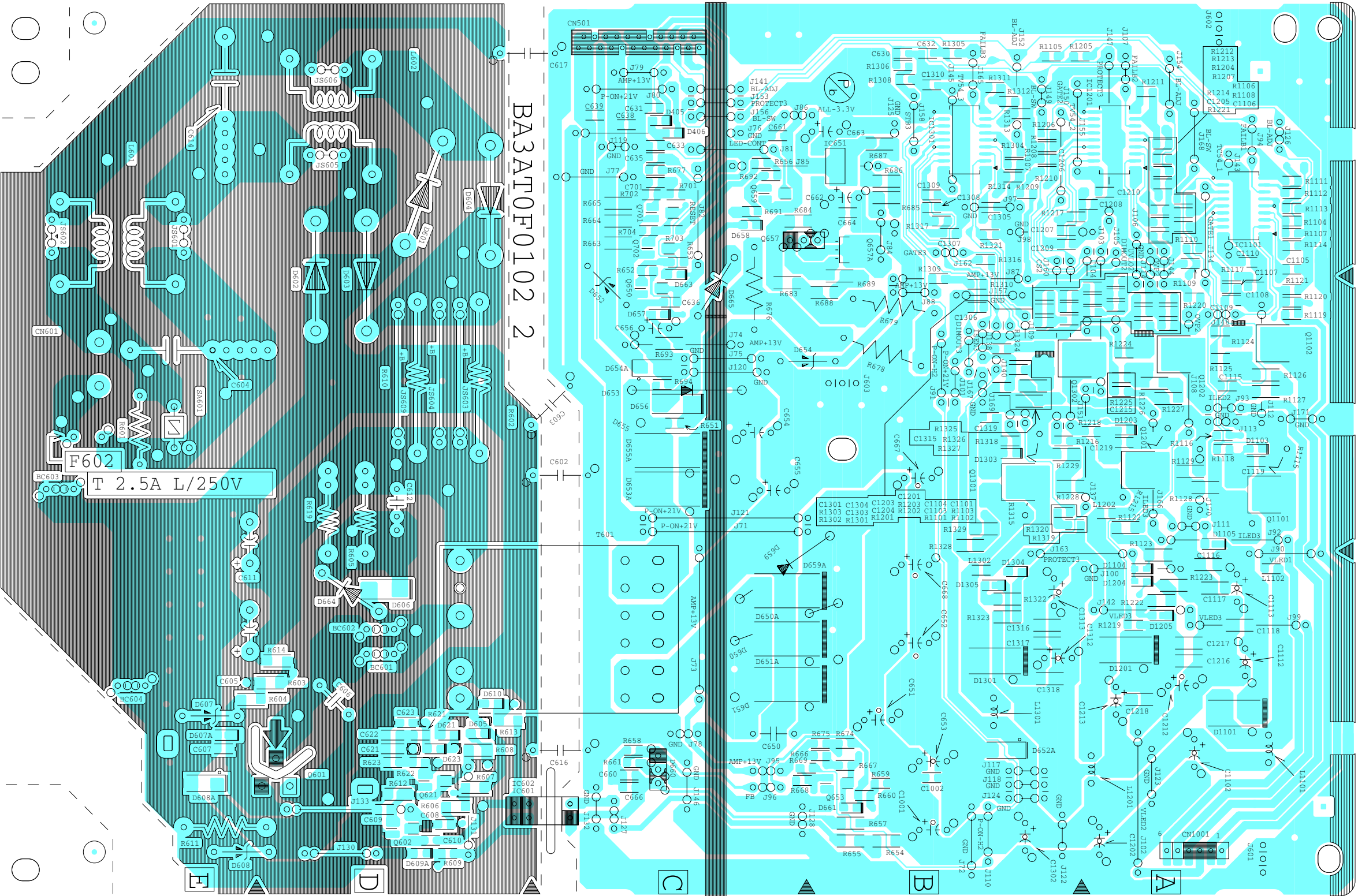
Power Supply CBA Bottom View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F602) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

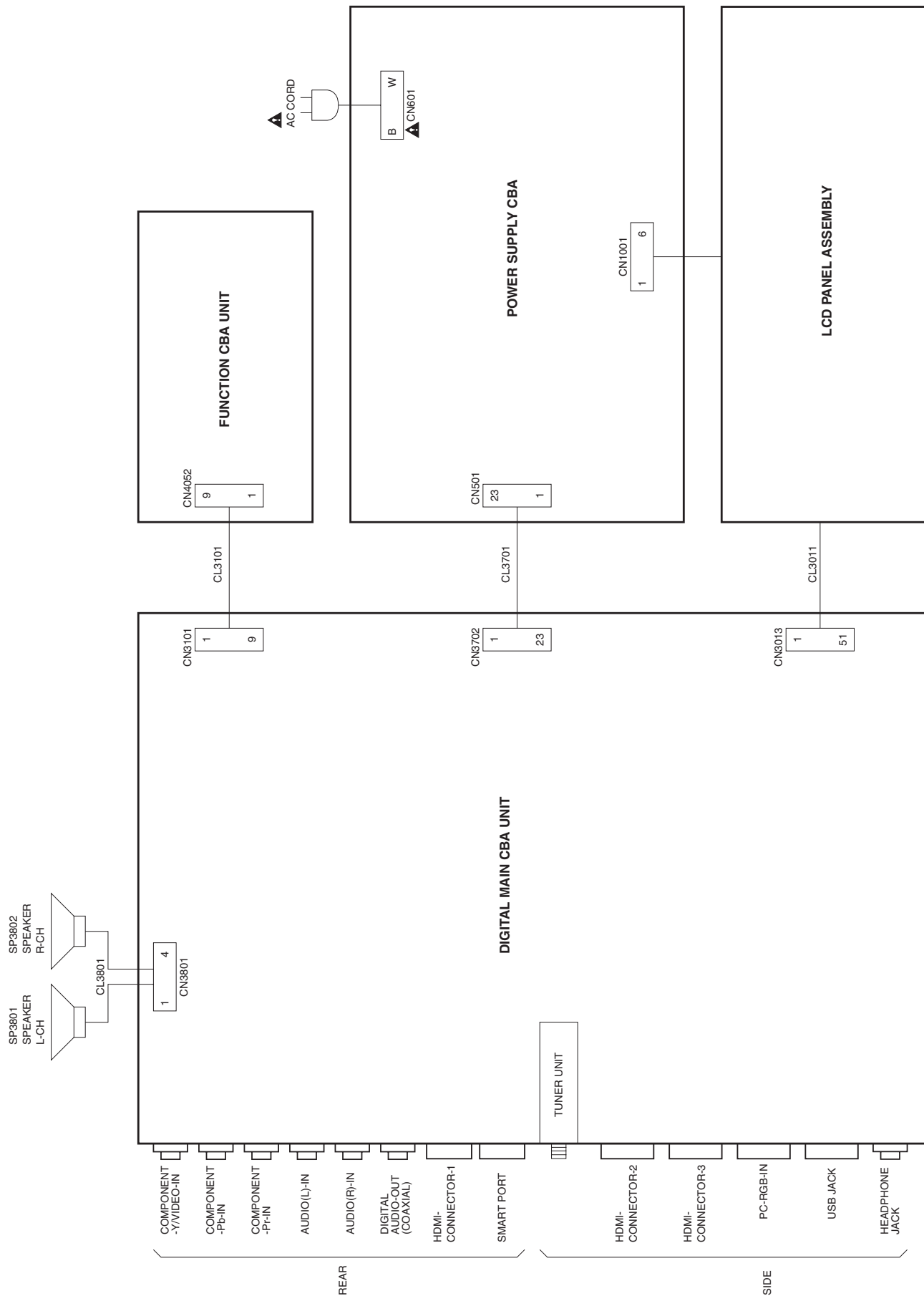
 **CAUTION ! :** For continued protection against risk of fire,
replace only with same type 4A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used when repairing.
Also, in order to have the ability to increase the input slowly, when troubleshooting this type of power supply circuit, a variable isolation transformer is required.

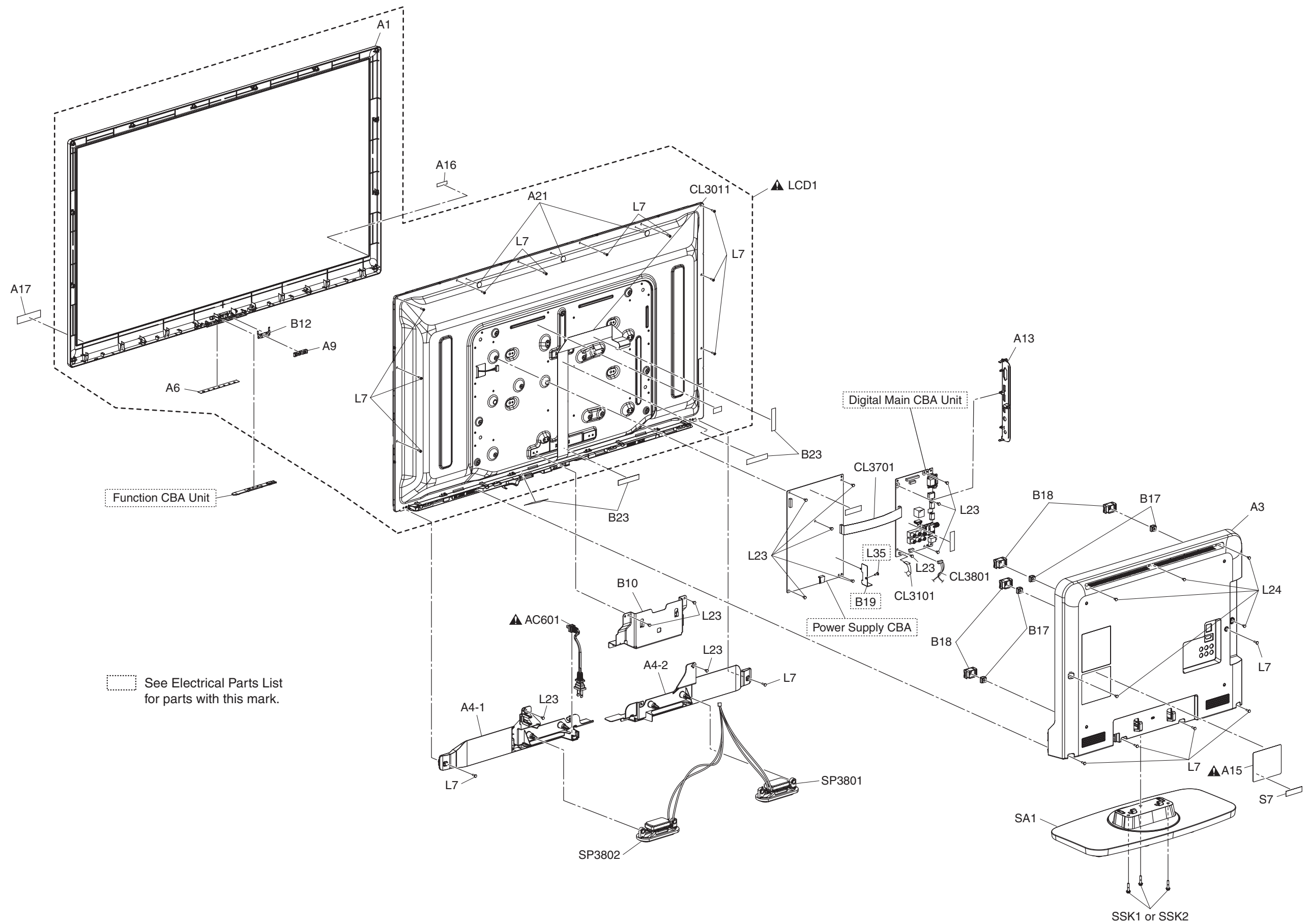
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



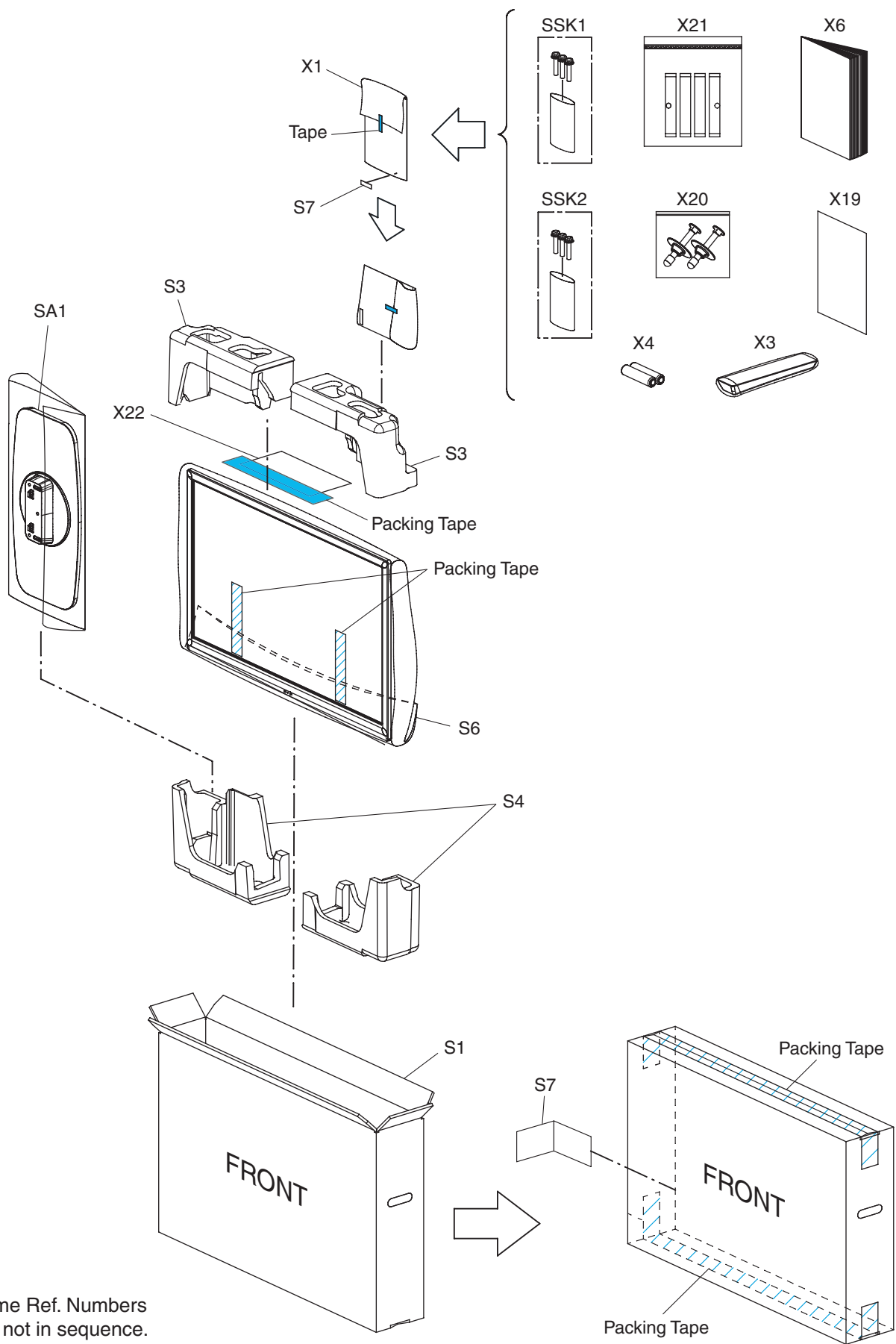
WIRING DIAGRAM



EXPLODED VIEWS




Packing





Some Ref. Numbers
are not in sequence.


MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.


NOTE: Parts that are not assigned part numbers (-----) are not available

Ref. No.	Description	Part No.
A3	REAR COVER A3ATZUH	1EM128493
A4-1	BOTTOM COVER R A3AT0UH	1EM030208
A4-2	BOTTOM COVER L A3AT0UH	1EM030209
A13	JACK HOLDER A3AU0UH	1EM334651
A15 	RATING LABEL A3ATZUH	-----
A16	LOGO LABEL A3AQZUH	-----
A17	ENERGY GUIDE LABEL A3ATZUH	-----
AC601 	AC CORD W/O A GND WIRE UL/CSA/1700/NO/BLACK	WAC172LTE005
B10	STAND BRACKET A3AT0UH	1EM127821
B17	WALL MOUNT BRACKET A11N0UH	1EM434637
B18	WALL MOUNT COVER A2170UT	1EM332137
B23	WIRE LABEL A3AF0UT	-----
CL3101	FFC WIRE ASSEMBLY 9PIN 9PIN/WHITE/240MM	WX1A3AT0S106
CL3701	FFC WIRE ASSEMBLY 23PIN 23PIN/WHITE/195MM	WX1A3AT0S105
CL3801	WIRE ASSEMBLY 4PIN 4PIN/395MM&110MM	WX1A3AT0C301
L7	SCREW P-TIGHT 3X10 BIND HEAD+	GBHP3100
L23	SCREW S-TIGHT M3X6 BIND HEAD+	GBJS3060
L24	S-TIGHT SCREW M3X6 BIND HEAD+BLACK	GBHS3060
SA1	39D STAND ASSEMBLY A3ATZUH	1EM031045
SP3801	SPEAKER MAGNETIC 8Ω8W S0310F15	DS08110XQ003
SP3802	SPEAKER MAGNETIC 8Ω8W S0310F15	DS08110XQ003
SSK1	STAND SCREW KIT A3AT0UH(DOUBLE SEMS SCREW M4X20 + BLK)	1ESA34649
SSK2	STAND SCREW KIT(SEcurity) A3ATZUH(SEcurity SCREW M4X20 A3ATZUH)	2ESA00308
PACKING		
S1	CARTON A3ATZUH	2EMC00066
S3	STYROFOAM TOP A3AT0UH	1EM030605
S4	STYROFOAM BOTTOM A3AT0UH	1EM030606
S6	SET BAG A31PBUH	2EMC00084
S7	SERIAL NO. LABEL A17FZUH	-----
ACCESSORIES		
X1	POLYETHYLENE BAG HDPE 180X340XT0.03	1EM435579
X3	REMOTE CONTROL UNIT YKF230-032	URMT36JHG003
X4	BATTERY R03-B500/01S	XB0M451CZB01
X6	QUICK START GUIDE A3ATZUH	2EMN00043
X19	WARRANTY SHEET A17FZUH	1EMN29039
X20	SECURITY SCREW KIT A17FZUH	1EM332298
X21	SECURITY TAPE KIT A17FZUH	1EM332299
X22	WARNING MESSAGE FLIER A3AU2UH	2EMN00059A

LCD PANEL ASSEMBLY

Ref. No.	Description	Part No.
LCD1 	LCD PANEL ASSEMBLY	U30T2P1
	Consists of the following	
A1	FRONT CABINET A3ATAMA	2EMM00092
A6	CONTROL PLATE A31F0UT	1EM334317
A9	SENSOR LENS A3AF0UT	1EM334258
A21	BLIND LABEL A3AU0UH	-----
B12	SHIELD PLATE A3AF0UT	1EM334260
CL3011	FFC WIRE ASSEMBLY 51PIN(W/SHIELD) 51P/FFC/SHIELD/664MM	WX1A3AT0P401
L7	SCREW P-TIGHT 3X10 BIND HEAD+	GBHP3100
	LCD MODULE	-----

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

NOTES:

- Parts that are not assigned part numbers (-----) are not available.
- Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%
 G.....±2% J.....±5% K.....±10%
 M.....±20% N.....±30% Z.....+80/-20%

DIGITAL MAIN CBA UNIT

Ref. No.	Description	Part No.
	DIGITAL MAIN CBA UNIT	A3ATZMMA-001
IC3001	IC DC-DC CONVERTER MP1472GJC452Z	NSCA0T09M021
IC3002	IC 512MB DDR2 SDRAM K4T51163QJ-BCE7	NSCA0R0SM048
IC3003	IC DC-DC CONVERTER MP1472GJC452Z	NSCA0T09M021
IC3004	IC REGULATOR BD00IA5WEFJ-E2	QSCA0T0RM233
IC3005	IC DTV-C7V R8A05011BG-U0/256FHP	QSAAR0RHT057
IC3006	32MBIT C-MOS SERIAL FLASH S25FL032P0XMF1010/S	QSCA0R0FJ008
IC3007	IC LDO REGULATOR BD00IC0WEFJ-HTSOP-J8	QSCA0T0RM397
IC3008	IC DC-DC CONVERTER MP1472GJC452Z	NSCA0T09M021
IC3009	IC RESET IC-PST8429UR	QSCA0T0MM075
IC3011	IC EEPROM BU9883FV-WE2	QSCA0T0RM105
IC3013	IC SINGLE BUS BUFFER 74LVC1G126GW	NSCA0TNXP004
IC3014	IC SINGLE BUS BUFFER 74LVC1G126GW	NSCA0TNXP004
IC3018	IC HDMI SW TMDS351PAGR/PAG-64	NSCA0T0TY068
IC3019	IC USB HIGH-SIDE SW AP2151WG-7/SOT25/5PI	NSCA0TDES015
IC3601	IC REGULATOR AP2121AK-3.3TRE1	NSCA0TBCD026
IC3801	IC D-CLASS AUDIO POWER AMPLIFI TPA3110D2PWPR	NSCA0T0TY073
IC3851	IC HEADPHONE AMP BH3547F SOP 8PIN	QSZBA0TRM119
IC5101	IC SINGLE BUS BUFFER 74LVC1G126GW	NSCA0TNXP004
TU3901	TUNER UNIT U9001UH	U9001UH

FUNCTION CBA UNIT

Ref. No.	Description	Part No.
	FUNCTION CBA UNIT	A3ATZMSW-001

POWER SUPPLY CBA

Ref. No.	Description	Part No.
	POWER SUPPLY CBA Consists to the following	A3ATZMPW-001
CAPACITORS		
C602▲	SAFTY CAP. 2200pF/250V KX	CA2E222MR101
C604▲	CAP METALLIZED FILM 0.22µF/275V/K	CTA224PKR001
C605	CAP ELE 220µF/200V/M/85	CEB2210S6016

Ref. No.	Description	Part No.
C606	CERAMIC CAP. 680pF/2kV	CA3D681PAN04
C607	CHIP CERAMIC CAP. B K 1200pF/50V	CHD1JK30B122
C608	CHIP CERAMIC CAP.(1608) B K 0.033µF/50V	CHD1JK30B333
C609	CHIP CERAMIC CAP. B K 0.068µF/50V	CHD1JK30B683
C610	CHIP CERAMIC CAP. B K 1500pF/50V	CHD1JK30B152
C611	CAP ELE 220µF/200V/M/85	CEB2210S6016
C612	CAP CERAMIC HV 1500PF 1kV B K	CA3A152TE006
C614	CAP METALLIZED FILM 0.22µF/275V/K	CTA224PKR001
C623	CHIP CERAMIC CAP.(1608) B K 4.7µF/6.3V	CHD0KK30B475
C635	RES CHIP 1608 1/10W J 1.0kΩ	RRXA102HH013
C650	CAP CERAMIC HV 2200pF/1kV B K	CA3A222TE006
C651	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C652	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C653	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C654	ELECTROLYTIC CAP. 470µF/16V M(105C)	CE1CMASTH471
C655	ELECTROLYTIC CAP. 470µF/16V M(105C)	CE1CMASTH471
C656	ELECTROLYTIC CAP. 10µF/50V M(105C)	CE1JMASTH100
C660	CHIP CERAMIC CAP.(1608) B K 0.1µF/50V	CHD1JK30B104
C662	ELECTROLYTIC CAP. 22µF/50V M(105C)	CE1JMASTH220
C663	ELECTROLYTIC CAP. 100µF/10V M(105C)	CE1AMASTH101
C667	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C668	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1001	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1002	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1102	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1103	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1104	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1105	CHIP CERAMIC CAP.(1608) B K 0.047µF/25V	CHD1EK30B473
C1106	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1107	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1108	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1109	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1110	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1112	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1113	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1115	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1116	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1117	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1119	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1202	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1203	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1204	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1205	CHIP CERAMIC CAP.(1608) B K 0.047µF/25V	CHD1EK30B473
C1206	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1207	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1208	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1209	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1210	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1212	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1213	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1215	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1216	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1217	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1219	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1302	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1303	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1304	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1305	CHIP CERAMIC CAP.(1608) B K 0.047µF/25V	CHD1EK30B473
C1306	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105

Ref. No.	Description	Part No.
C1307	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1308	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1309	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1310	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1312	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1313	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1315	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
C1316	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1317	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1319	CHIP CERAMIC CAP. B K 2200pF/50V	CHD1JK30B222
CONNECTORS		
CN501	FFC CONNECTOR IMSA-9615S-23A-PP-A	JC96J23ER007
CN601▲	CONNECTOR S2P3-VH (LF)(SN)	JCVHC02JG002
CN1001	PH CONNECTOR TOP 6P B6B-PH-K-S (LF)(SN)	J3PHC06JG029
DIODES		
D601	DIODE 1N5406BH	NDL1001N5406
D602	DIODE 1N5406BH	NDL1001N5406
D603	DIODE 1N5406BH	NDL1001N5406
D604	DIODE 1N5406BH	NDL1001N5406
D605	ZENER DIODE MM5Z6V2B	ND1BMM5Z6V2B
D606	DIODE FAST RECOVERY SMD GR1J-TR	ND1Z00GR1JTR
D607▲	ZENER DIODE SMD TFZVTR27B	QD1B00TFZV27
D608▲	DIODE ZENER 1ZB36BB	NDWZ0001ZB36
D609▲	DIODE SCHOTTKY SMD RB520SM-30 T2R	QD1ZRB520SM3
D610	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D621	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D623	ZENER DIODE MM5Z30B	ND1B0MM5Z30B
D650	DIODE SCHOTTKY SB3150BH	NDWZ00SB3150
D651	DIODE SCHOTTKY SB3150BH	NDWZ00SB3150
D652▲	DIODE ZENER 1ZB30BB	NDWZ0001ZB30
D653	DIODE SCHOTTKY SB3A0BH	NDWZ000SB3A0
D654▲	DIODE ZENER 1ZB20BB	NDWZ0001ZB20
D655	DIODE SCHOTTKY SB3A0BH	NDWZ000SB3A0
D656	DIODE FAST RECOVERY RS1BJTD	ND1Z0RS1BJTD
D657	ZENER DIODE MM5Z11B	ND1B0MM5Z11B
D659	DIODE SCHOTTKY SB3150BH	NDWZ00SB3150
D660	IC SHUNT REGULATOR SL431A-AT	NSZBA0TAUK01
D661	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1101	DIODE SCHOTTKY SMD SK210TD	ND1Z0SK210TD
D1103	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1104	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1105	ZENER DIODE SMD TFZVTR24B	QD1B00TFZV24
D1201	DIODE SCHOTTKY SMD SK210TD	ND1Z0SK210TD
D1203	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1204	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1205	ZENER DIODE SMD TFZVTR24B	QD1B00TFZV24
D1301	DIODE SCHOTTKY SMD SK210TD	ND1Z0SK210TD
D1303	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1304	SWITCHING DIODE 1SS400 TE61	QD1Z001SS400
D1305	ZENER DIODE SMD TFZVTR24B	QD1B00TFZV24
ICS		
IC601▲	IC PHOTOCOUPLER TLP781F(D4-FUNBLL F)	QPEL781FBLLF
IC651	IC REGULATOR AP1117E33G-13 /3PIN	NSCA0TDES017
IC1101	IC LED BACKLIGHT CONTROLLER BD9488F-GE2/SOP/18P	QSCA0T0RM418
IC1201	IC LED BACKLIGHT CONTROLLER BD9488F-GE2/SOP/18P	QSCA0T0RM418
IC1301	IC LED BACKLIGHT CONTROLLER BD9488F-GE2/SOP/18P	QSCA0T0RM418
COILS		
L601▲	LINE FILTER JLB24136	LLEG0Z0XB032
L602▲	LINE FILTER JLB24136	LLEG0Z0XB032

Ref. No.	Description	Part No.
L1101	COIL POWER INDUCTORS DIP RP1315BNP-101M/100µH	LLF1010SF013
L1102	CHIP INDUCTOR BK1608HS220-T	LLC220NTU017
L1201	COIL POWER INDUCTORS DIP RP1315BNP-101M/100µH	LLF1010SF013
L1202	CHIP INDUCTOR BK1608HS220-T	LLC220NTU017
L1301	COIL POWER INDUCTORS DIP RP1315BNP-101M/100µH	LLF1010SF013
TRANSISTORS		
Q601▲	FET MOS TK10A50D(LS1FN3 QM	QEEZTK10A50D
Q602▲	NPN TRANSISTOR SMD 2SC5344SY	NQZY2SC5344S
Q621	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q650	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q653	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q1101	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
Q1102	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
Q1201	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
Q1202	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
Q1301	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
Q1302	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
RESISTORS		
R601▲	RES. CARBON FILM J 1/2W J 1.2M Ω	RCX2125T1003
R603	RES CHIP 3216 1/4W J 560k Ω	RRX4564HH034
R604	RES CHIP 3216 1/4W J 560k Ω	RRX4564HH034
R606	RES CHIP 3216 1/4W J 120 Ω	RRX4121HH034
R607	RES CHIP 3216 1/4W J 120 Ω	RRX4121HH034
R608	RES CHIP 3216 1/4W J 1.5k Ω	RRX4152HH034
R609	RES CHIP 1608 1/10W J 100 Ω	RRXA101HH013
R611▲	METAL OXIDE RES. 2W J 0.3 Ω	RN02R30ZU001
R612	RES CHIP 3216 1/4W J 3.9k Ω	RRX4392HH034
R613	RES CHIP 3216 1/4W J 270 Ω	RRX4271HH034
R614	RES CHIP 3216 1/4W J 560k Ω	RRX4564HH034
R619	METAL OXIDE FILM RES. 1W J 100k Ω	RN01104ZU001
R621	RES CHIP 1608 1/10W J 560 Ω	RRXA561HH013
R622	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R623	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R651▲	RES CHIP 1608 1/10W J 1.0 Ω	RRXA1R0HH013
R652	RES CHIP 1608 1/10W F 100k Ω	RTW1003HH008
R653	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R654	RES CHIP 3216 1/4W J 180 Ω	RRX4181HH034
R655	RES CHIP 3216 1/4W J 180 Ω	RRX4181HH034
R656	RES CHIP 1608 1/10W F 33.0k Ω	RTW3302HH008
R657	RES CHIP 3216 1/4W J 3.9k Ω	RRX4392HH034
R658	RES CHIP 1608 1/10W J 2.7k Ω	RRXA272HH013
R659	RES CHIP 1608 1/10W F 22.0k Ω	RTW2202HH008
R660	RES CHIP 1608 1/10W F 2.70k Ω	RTW2701HH008
R661	RES CHIP 1608 1/10W F 3.30k Ω	RTW3301HH008
R663	RES CHIP 3216 1/4W J 4.7k Ω	RRX4472HH034
R666	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R667	RES CHIP 1608 1/10W J 8.2k Ω	RRXA822HH013
R668	RES CHIP 1608 1/10W J 47k Ω	RRXA473HH013
R669	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R676	WIRE CP STP-S-0.50	XZ40F0REN001
R677	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R678	METAL OXIDE RES. 2W J 0.3 Ω	RN02R30ZU001
R679	METAL OXIDE RES. 2W J 0.3 Ω	RN02R30ZU001
R683	RES CHIP 3216 1/4W 0 Ω	RRX4000HH036
R684	RES CHIP 3216 1/4W 0 Ω	RRX4000HH036
R694	RES CHIP 1608 1/10W J 33k Ω	RRXA333HH013
R1101	RES CHIP 1608 1/10W F 22.0k Ω	RTW2202HH008
R1102	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1103	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1104	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013

Ref. No.	Description	Part No.
R1105	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1106	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1107	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1108	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1109	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1110	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1111	RES CHIP 1608 1/10W F 240k Ω	RTW2403HH008
R1112	RES CHIP 1608 1/10W F 33.0k Ω	RTW3302HH008
R1113	RES CHIP 1608 1/10W F 3.00k Ω	RTW3001HH008
R1114	RES CHIP 1608 1/10W F 100k Ω	RTW1003HH008
R1115	METAL OXIDE FILM RES. 2W J 0.18 Ω	RN02R18ZU001
R1116	RES CHIP 1608 1/10W J 200 Ω	RRXA201HH013
R1117	RES CHIP 1608 1/10W J 10 Ω	RRXA100HH013
R1118	RES CHIP 1608 1/10W J 33 Ω	RRXA330HH013
R1119	RES CHIP 1608 1/10W F 160k Ω	RTW1603HH008
R1120	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1121	RES CHIP 1608 1/10W F 10.0k Ω	RTW1002HH008
R1122	RES CHIP 3216 1/4W J 1.1k Ω	RRX4112HH034
R1123	RES CHIP 3216 1/4W J 1.5k Ω	RRX4152HH034
R1124	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1125	RES CHIP 1608 1/10W J 51 Ω	RRXA510HH013
R1126	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
R1127	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
R1201	RES CHIP 1608 1/10W F 22.0k Ω	RTW2202HH008
R1202	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1203	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1204	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1205	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1206	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1207	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1208	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1209	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1210	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1211	RES CHIP 1608 1/10W F 240k Ω	RTW2403HH008
R1212	RES CHIP 1608 1/10W F 33.0k Ω	RTW3302HH008
R1213	RES CHIP 1608 1/10W F 3.00k Ω	RTW3001HH008
R1214	RES CHIP 1608 1/10W F 100k Ω	RTW1003HH008
R1215	METAL OXIDE FILM RES. 2W J 0.18 Ω	RN02R18ZU001
R1216	RES CHIP 1608 1/10W J 200 Ω	RRXA201HH013
R1217	RES CHIP 1608 1/10W J 10 Ω	RRXA100HH013
R1218	RES CHIP 1608 1/10W J 33 Ω	RRXA330HH013
R1219	RES CHIP 1608 1/10W F 160k Ω	RTW1603HH008
R1220	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1221	RES CHIP 1608 1/10W F 10.0k Ω	RTW1002HH008
R1222	RES CHIP 3216 1/4W J 1.1k Ω	RRX4112HH034
R1223	RES CHIP 3216 1/4W J 1.5k Ω	RRX4152HH034
R1224	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1225	RES CHIP 1608 1/10W J 51 Ω	RRXA510HH013
R1226	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
R1227	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
R1301	RES CHIP 1608 1/10W F 22.0k Ω	RTW2202HH008
R1302	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1303	RES CHIP 1608 1/10W F 9.10k Ω	RTW9101HH008
R1304	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1305	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1306	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1307	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1308	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1309	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1310	RES CHIP 1608 1/10W J 120 Ω	RRXA121HH013
R1311	RES CHIP 1608 1/10W F 240k Ω	RTW2403HH008
R1312	RES CHIP 1608 1/10W F 33.0k Ω	RTW3302HH008
R1313	RES CHIP 1608 1/10W F 3.00k Ω	RTW3001HH008

Ref. No.	Description	Part No.
R1314	RES CHIP 1608 1/10W F 100k Ω	RTW1003HH008
R1315	METAL OXIDE FILM RES. 2W J 0.18 Ω	RN02R18ZU001
R1316	RES CHIP 1608 1/10W J 100 Ω	RRXA201HH013
R1317	RES CHIP 1608 1/10W J 10 Ω	RRXA100HH013
R1318	RES CHIP 1608 1/10W J 33 Ω	RRXA330HH013
R1319	RES CHIP 1608 1/10W F 160k Ω	RTW1603HH008
R1320	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1321	RES CHIP 1608 1/10W F 10.0k Ω	RTW1002HH008
R1322	RES CHIP 3216 1/4W J 1.1k Ω	RRX4112HH034
R1323	RES CHIP 3216 1/4W J 1.5k Ω	RRX4152HH034
R1324	RES CHIP 1608 1/10W J 1.0k Ω	RRXA102HH013
R1325	RES CHIP 1608 1/10W J 51 Ω	RRXA510HH013
R1326	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
R1327	RES CHIP 3216 1/4W F 1.00 Ω	RT1R00RYL007
MISCELLANEOUS		
B19	HEAT SINK PNL A31T0UH	1EM439707
BC601	BEAD INDUCTORS B29 RID 2.3X7.5X7.5T	LLEF0S0XM002
BC602	BEAD INDUCTORS B29 RID 2.3X7.5X7.5T	LLEF0S0XM002
BC603	BEAD INDUCTORS B29 RID 2.3X7.5X7.5T	LLEF0S0XM002
BC604	BEAD INDUCTORS B29 RID 2.3X7.5X7.5T	LLEF0S0XM002
F602▲	FUSE TIME RAG SLT250V2.5A	PDGSLB0NG252
JS603	WIRE CP STP-S-0.50	XZ40F0REN001
JS604	WIRE CP STP-S-0.50	XZ40F0REN001
JS609	WIRE CP STP-S-0.50	XZ40F0REN001
L35	SCREW B-TIGHT D3X8 BIND HEAD+	GBJB3080
SA601▲	VARIATOR 10D 471K SVR	NVQZVR10D471
T601▲	TRANS POWER BCK-28F0	LTT2PCMEK058