

PHILIPS

32" LCD TV


Service Manual

32HFL4663D/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	18	20
	CA.ch.31	dB μ	18	20
	CA.ch.87	dB μ	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	1366	---
	Vertical	pixels	768	---
2. Brightness (w / filter)	---	cd/m ²	280	---
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	$\pm 3\%$
	y		0.278	$\pm 3\%$
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	10.0/10.0	8.0/8.0
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.

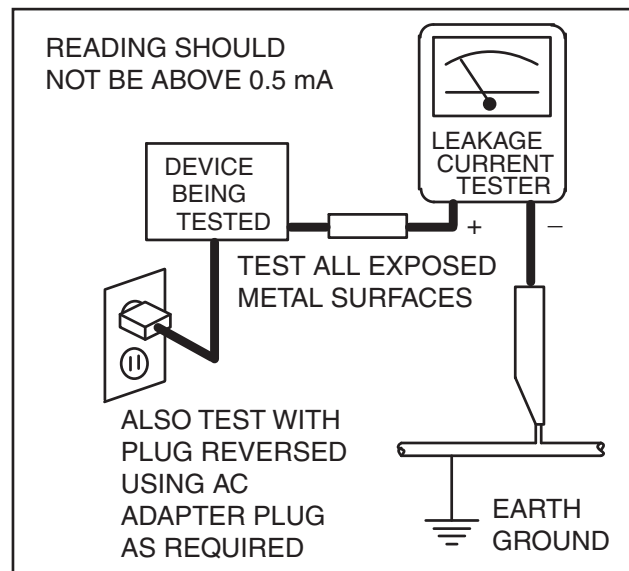
Safety Precautions for LCD TV Circuit

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.

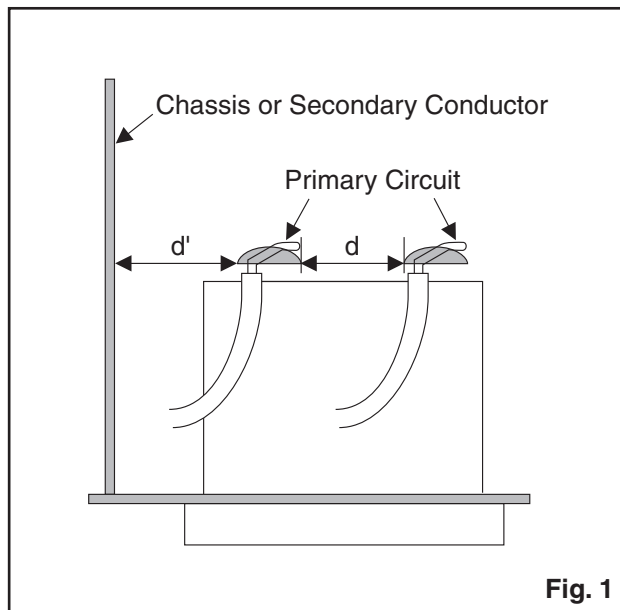


Fig. 1

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.

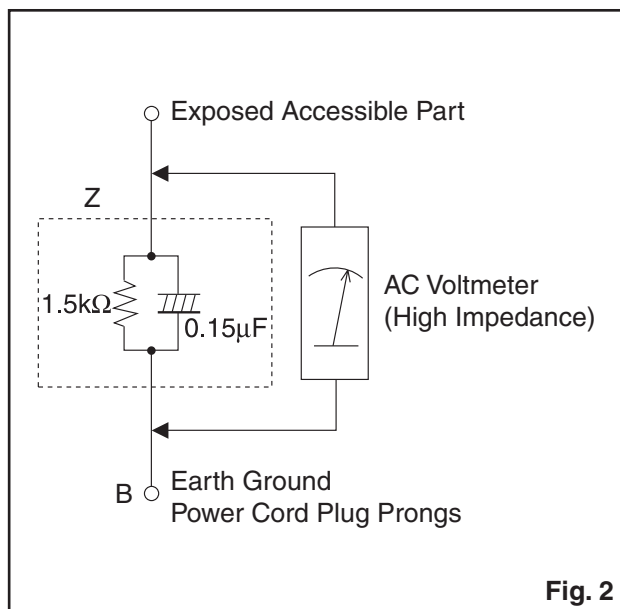


Fig. 2

Table 2: Leakage current ratings for selected areas

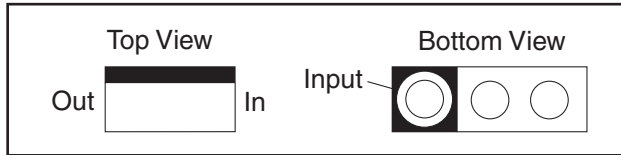
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
110 to 130 V	U.S.A. or Canada	0.15 μ F CAP. & 1.5 k Ω RES. Connected in parallel	$i \leq 0.5$ mA rms	Exposed accessible parts

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

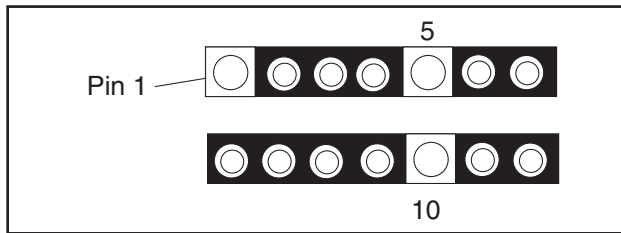
STANDARD NOTES FOR SERVICING

Circuit Board Indications

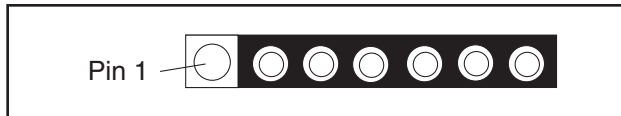
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



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

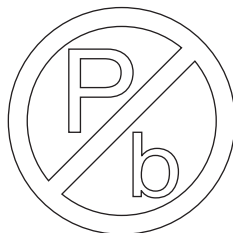


3. The 1st pin of every male connector is indicated as shown.



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.



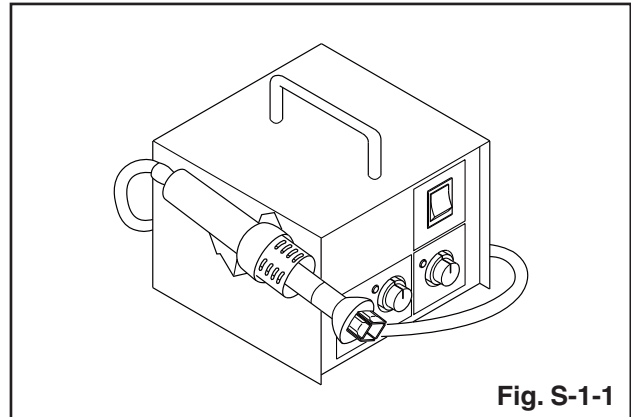
Pb free mark

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)

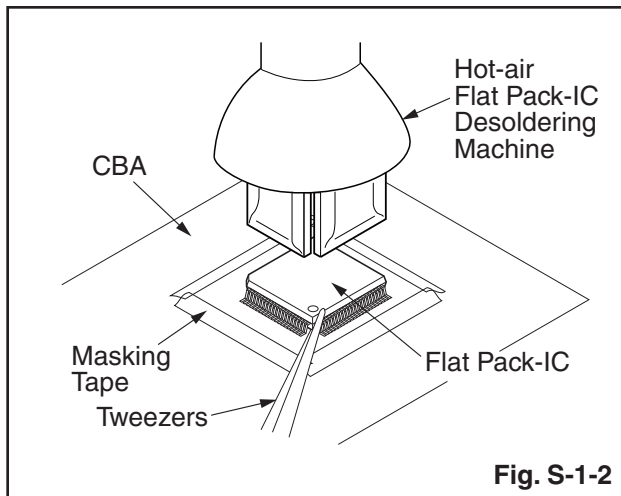


2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat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

CAUTION:

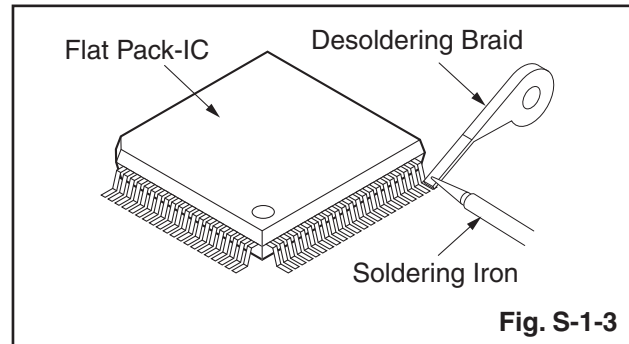
1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape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

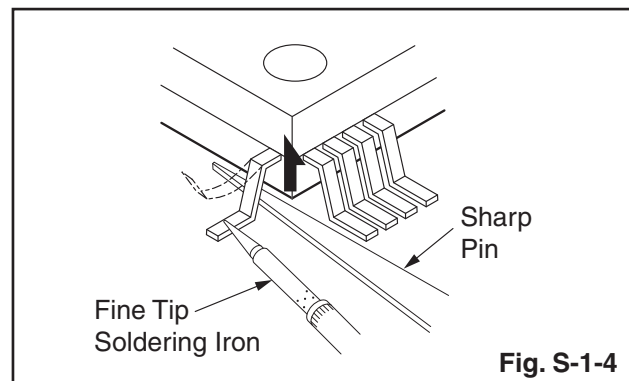


With Soldering Iron:

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)

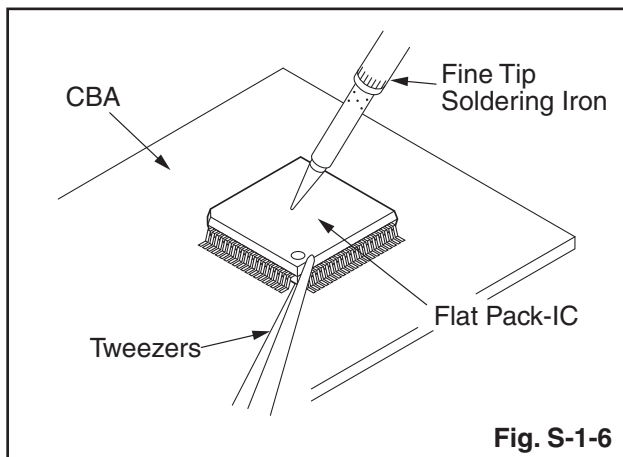
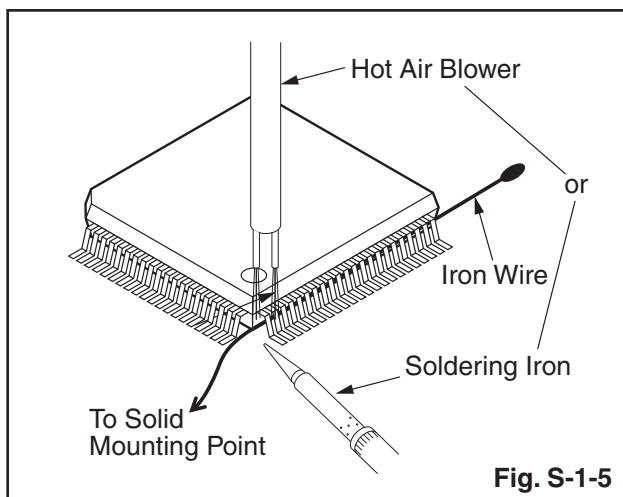


3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

With Iron Wire:

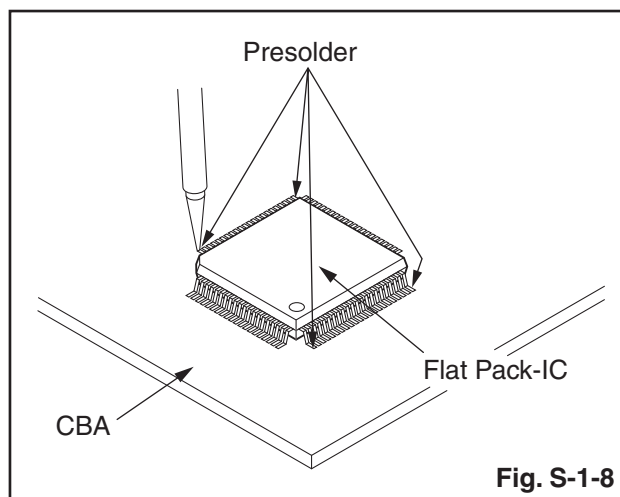
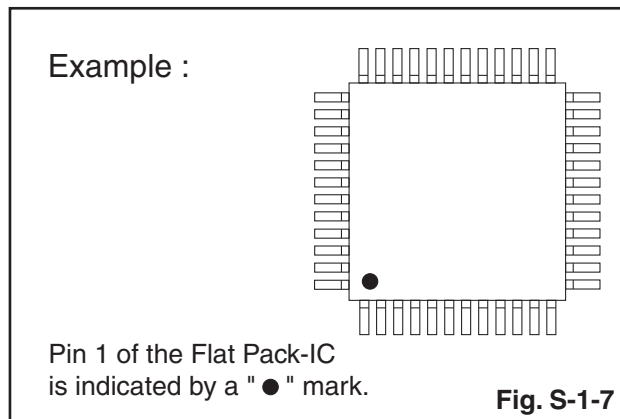
1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins 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

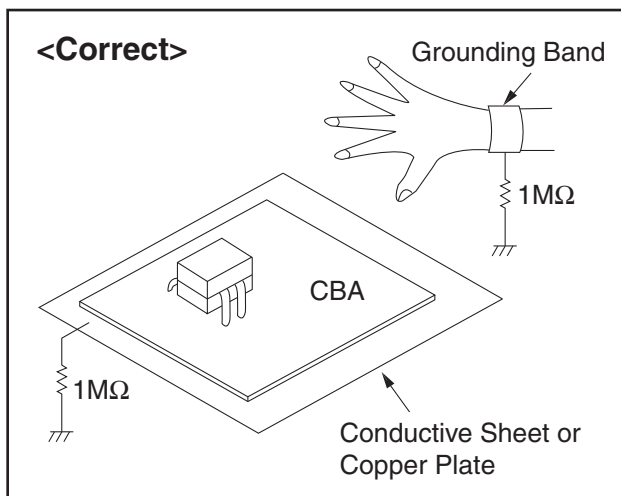
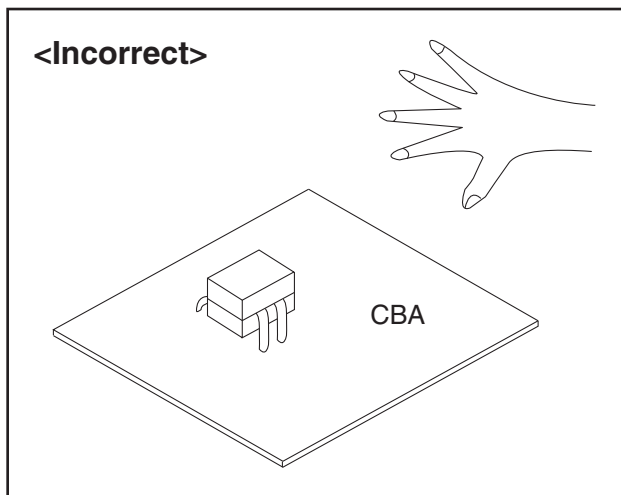
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

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

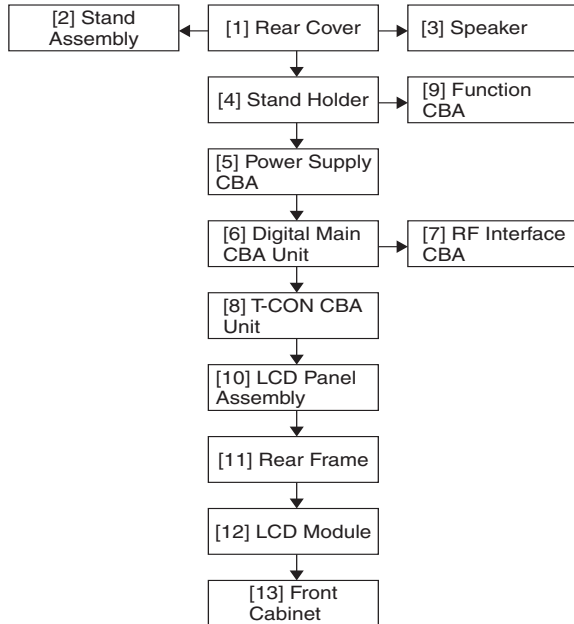
Be sure to place a conductive sheet or copper plate with proper grounding ($1\text{ M}\Omega$) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting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



CABINET DISASSEMBLY INSTRUCTIONS

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]	Rear Cover	D1	6(S-1), 6(S-2)	---
[2]	Stand Assembly	D1	3(S-3)	---
[3]	Speaker	D2 D5	CN3801	---
[4]	Stand Holder	D2	2(S-4), 2(S-5), 2(S-6), CN601, Stand Bracket	---
[5]	Power Supply CBA	D3 D5	4(S-7), CN631, CN1001	---
[6]	Digital Main CBA Unit	D3 D5	3(S-8), CN3105, Jack Holder	---
[7]	RF Interface CBA	D3 D5	3(S-9), CL3001	---
[8]	T-CON CBA Unit	D3 D5	2(S-10), CN2002	---
[9]	Function CBA	D3 D5	Sensor Plate	2,3

Step/ Loc. No.	Part	Fig. No.	Removal	Note
[10]	LCD Panel Assembly	D3	-----	3
[11]	Rear Frame	D4	12(S-11), 2(S-12)	1,3
[12]	LCD Module	D4	-----	1,3
[13]	Front Cabinet	D4	-----	3

↓ ↓ ↓ ↓ ↓
 (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."

Precautions concerning the LCD Panel Assembly:

1. When you disassemble the LCD Panel Assembly

- Be careful not to scratch the Reflection Sheet with the edge of Rear Frame when disassembling/ re-assembling it.
- Be careful not to drop any plastic chip on the Reflection Sheet when/after you remove the Screws.
- Prohibit to put any external pressure on the Reflection Sheet because the scratch on the back of the Reflection Sheet have direct repercussion on the display screen.
- Prohibit to put any external pressure on the Sheet Holder or LED Heat Sink Assembly either because it also has repercussion on the display screen via the Reflection Sheet.
- You need to remove any visible dust from the Reflection Sheet which creates the external

- To prevent the Screw from being stripped, the screw tightening torque should be 13.23 lbf-in(6 kgf-cm) for the Rear Frame Screw and 5.512 lbf-in(2.5 kgf-cm) for the LED Heat Sink Assembly Screw.
- Do not pull the FFC Cable and Board Cable forcefully when you re-assemble.

2. When you disassemble/re-assemble the Function CBA on the Front Cabinet

- Detach the Function CBA, which is attached on the Front Cabinet with double-sided tape, without breaking it.
- When you put the Function CBA back on the New Front Cabinet, you need to use specified new double-sided tape and put the Function CBA onto the New Front Cabinet with equal pressure to the Board. (The gap more than 0.015 inch (0.4 mm)

between the Front Cabinet and Function CBA will impair the sensor sensitivity.)

- Prepare for substitutional Function CBA in case you break it when you detach it from the Front Cabinet.

3. Performance Test after reassembling the LCD Panel Assembly

- After you swap any of the Front Cabinet, Rear Frame or Function CBA, you need to make sure that there is no Gomikami/Black Spot with foreign material or Mura/White Spot on the display screen.
- Make sure there is no malfunction on the display screen by checking the White Mode and White 20% Mode in the Purity Check Mode.
- Check the operational sensitivity on Touch Sensor Control Panel to make sure everything functions normally.

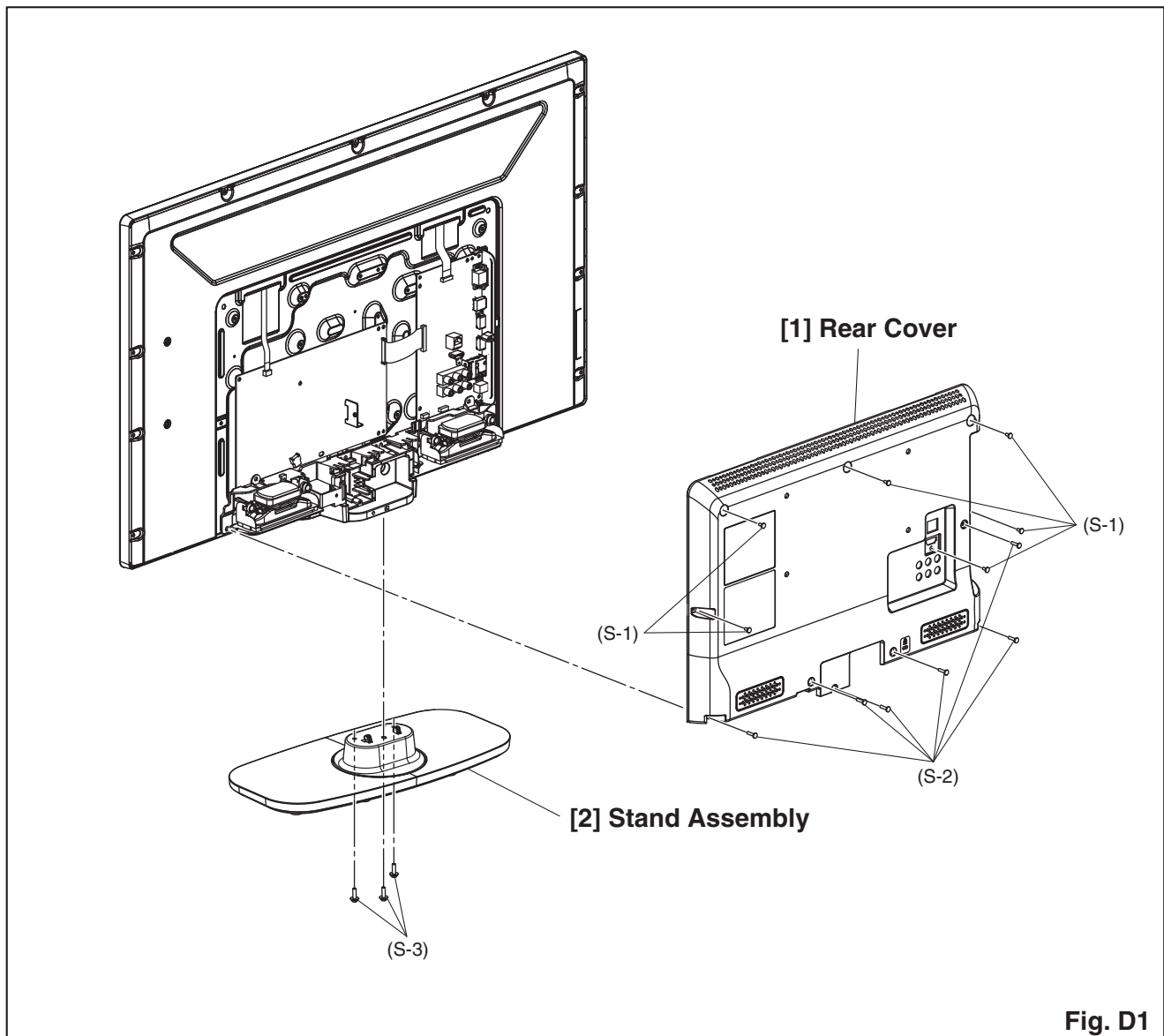
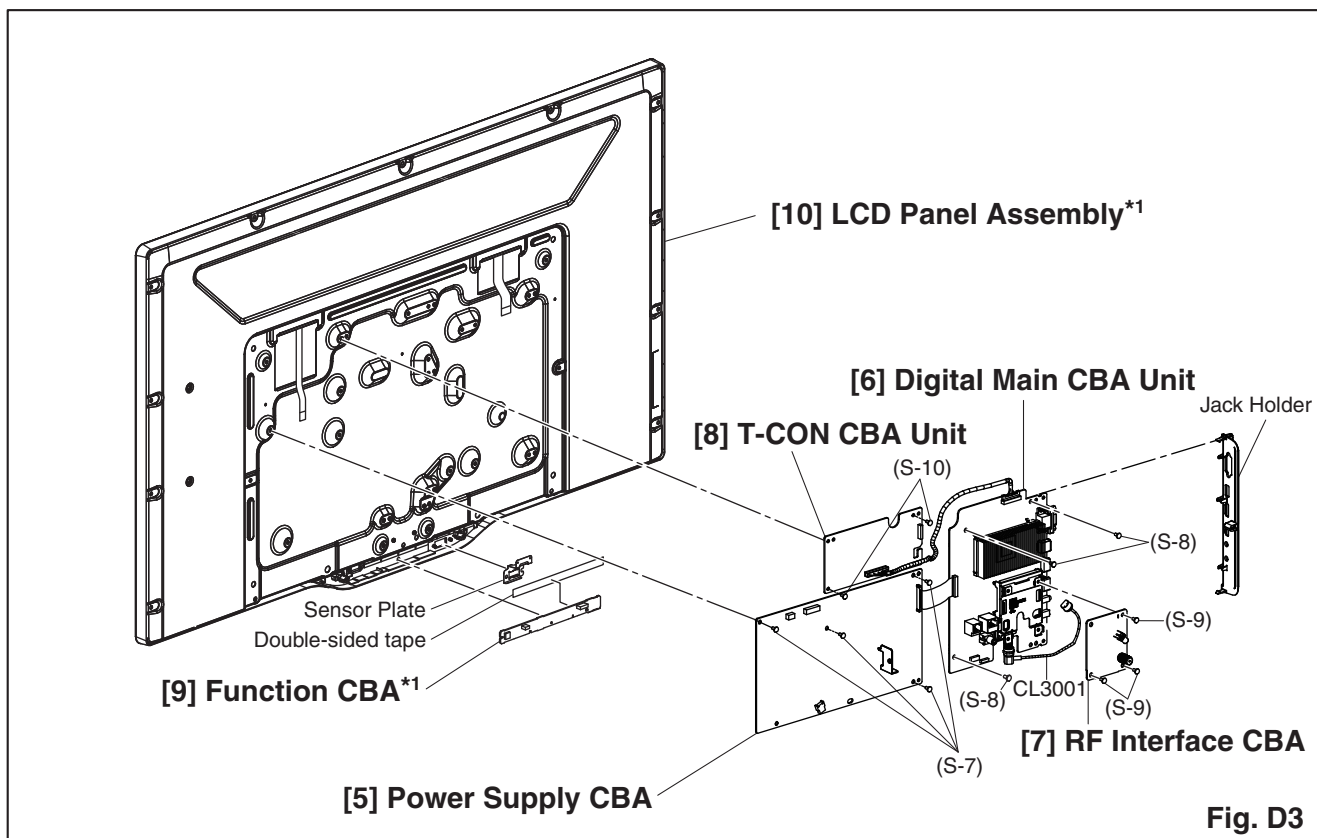
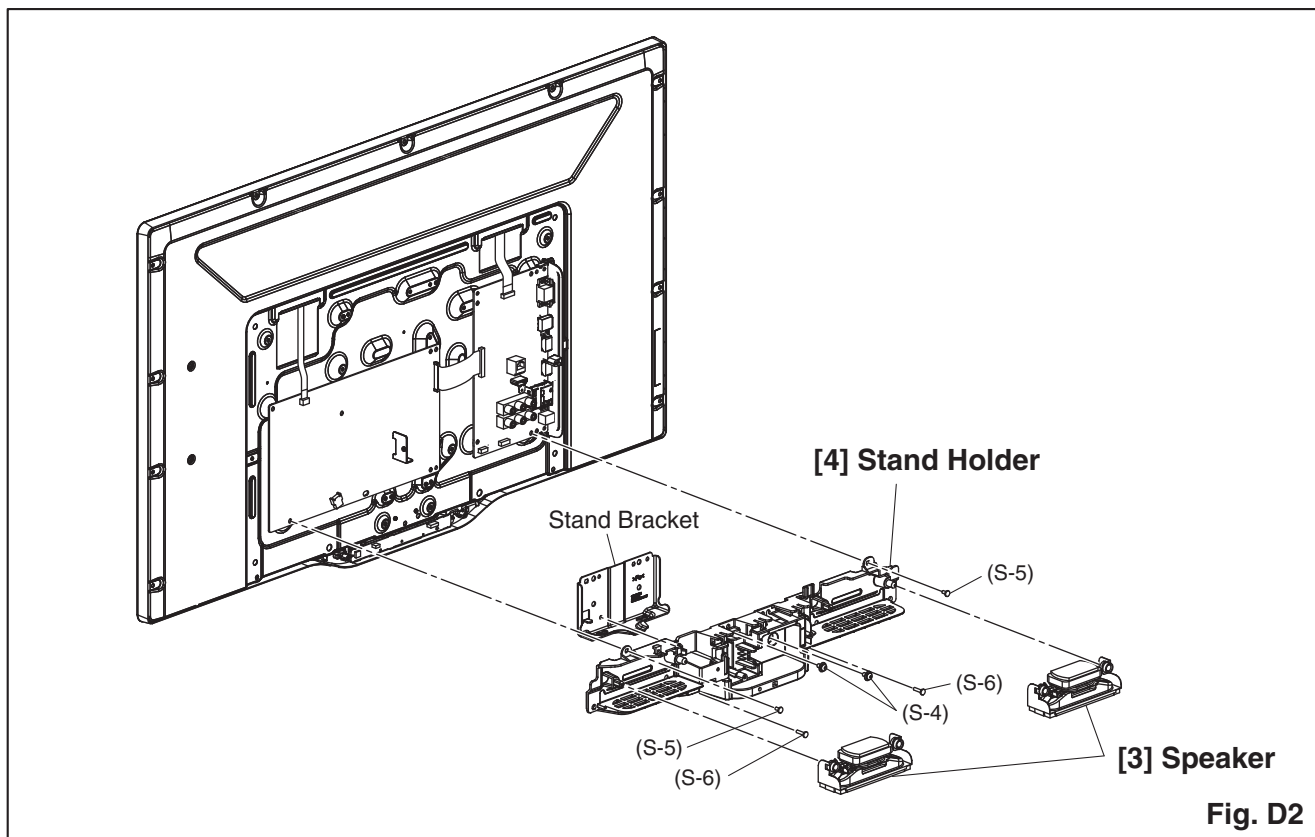
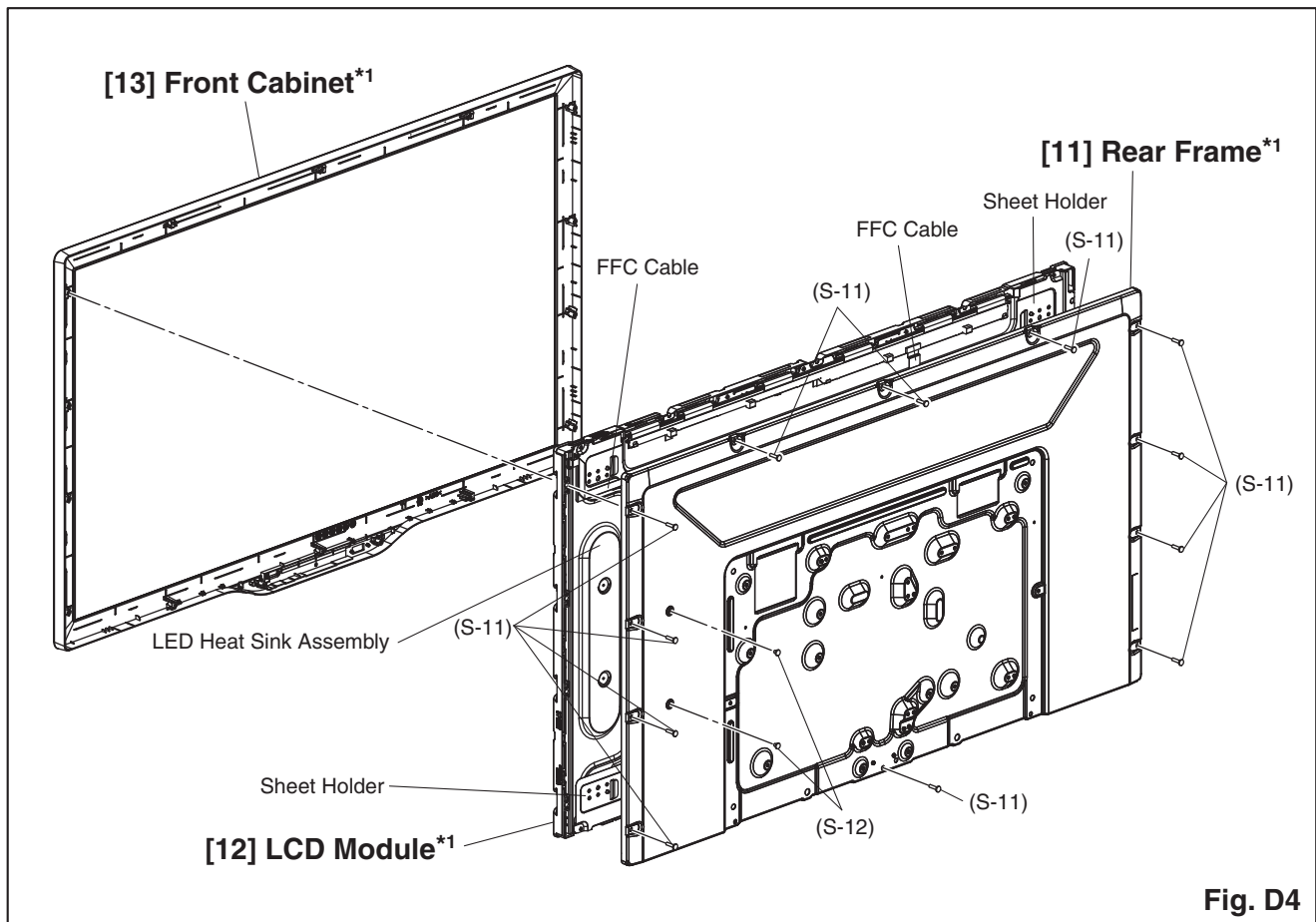


Fig. D1



^{*1}: Make sure to read all the precautions on page 4-1, 4-2 when you disassemble/re-assemble the LCD Panel Assembly.



***1: Make sure to read all the precautions on page 4-1, 4-2 when you disassemble/re-assemble the LCD Panel Assembly.**

TV Cable Wiring Diagram

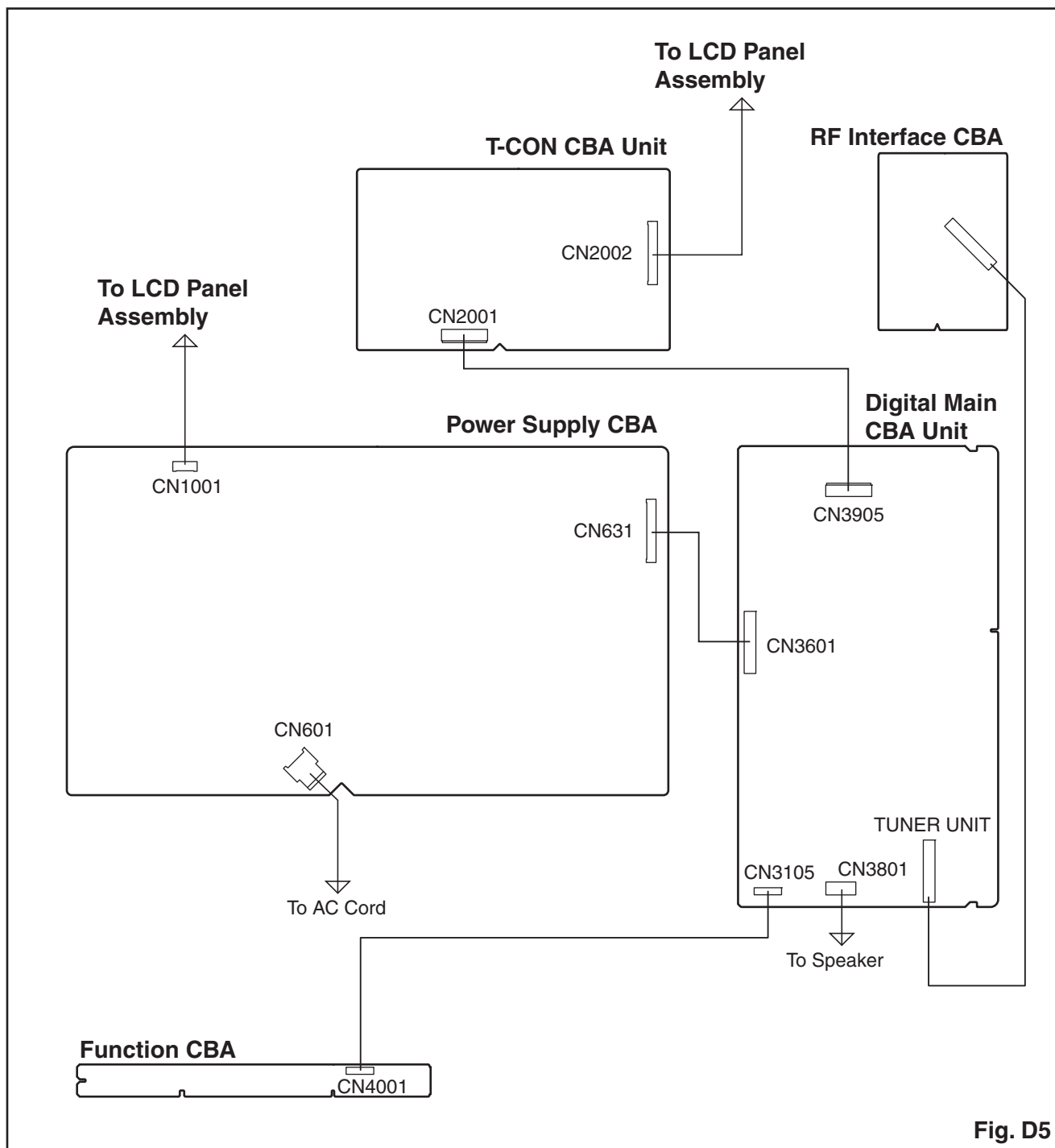


Fig. D5

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 Unit

1. Turn the power on.
2. Press [0], [6], [2], [5], [9], [6] and [INFO] buttons on the remote control unit in this order.
3. Select “Quality” - “BE Factory Mode” and press the [OK] button. The following screen appears.

“*” differs depending on the models.

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

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

1. Turn the power on.
2. Press [0], [6], [2], [5], [9], [6] and [RECALL/INFO] buttons on the set up remote control unit in this order.
3. Select “Quality” - “BE Factory Mode” and press the [OK] button. The following screen appears.

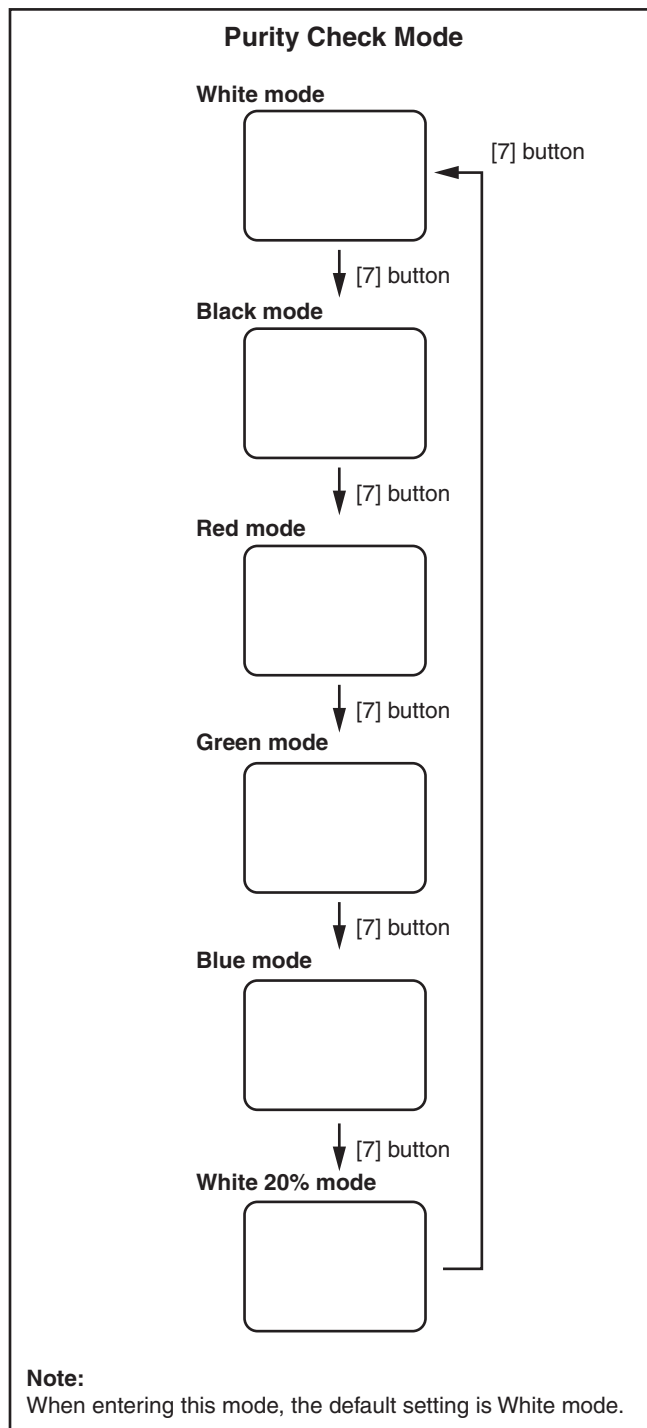
“*” differs depending on the models.

Code:	*****_**_*_*_*_*_*_*_*_*		
Pic code:	*****_*_*_*_*_*_*_*_*		
Option code:	***_*_*_*_*_*_*_*_*		
MIPS:	Push 0 key		
Press "POWER" key to exit.			
Safety:	Safety_Non	Total Watch Time:	****
		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.

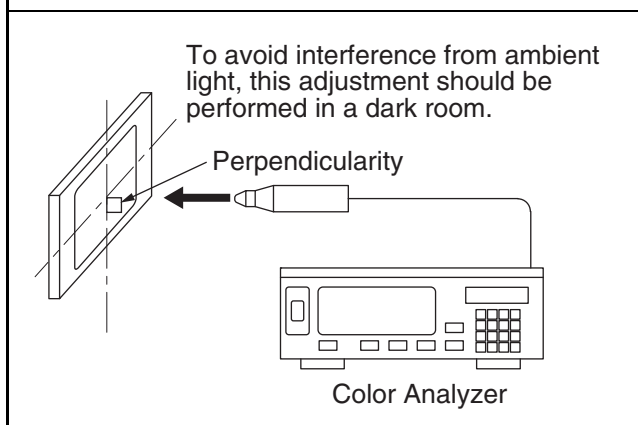


3. To cancel or to exit from the Purity Check Mode, press [BACK] button.

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.

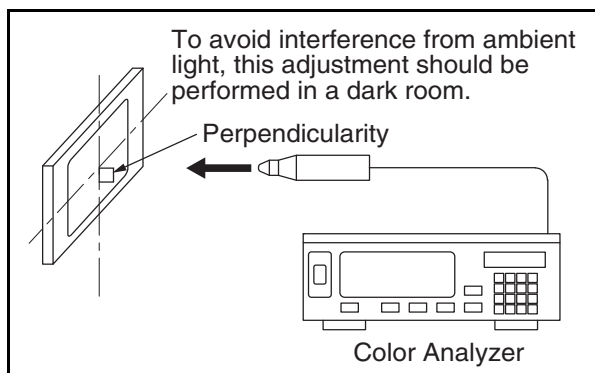
3. White Balance Adjustment

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

Symptom of Misadjustment: White becomes bluish or reddish.

ITEM	SPECIFICATION
Color temperature	$x = 0.272 \pm 0.002$ $y = 0.278 \pm 0.002$
Input Signal	Internal pattern (40/70% raster)
Measurement point	Screen center
M. EQ.	CA-310 (KONICA MINOLTA Luminance meter) or measuring instrument as good as CA-310.
Aging time	60min. (Rich MODE/100IRE Raster HDMI 1080i @ 60)
MODE setting of TV	Rich MODE
Ambient temperature	$25^{\circ}\text{C} \pm 5^{\circ}\text{C}$

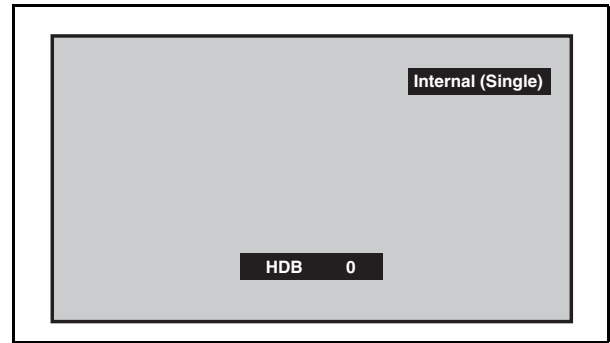
1. Operate the unit for more than 60 minutes.
2. Enter the service mode.
3. Press [VOL -] button two times on the remote control unit to select "Drive setting" mode. "Drive" appears in the screen.
4. Set the color analyzer at the CHROMA mode and zero point calibration. Bring the optical receptor pointing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



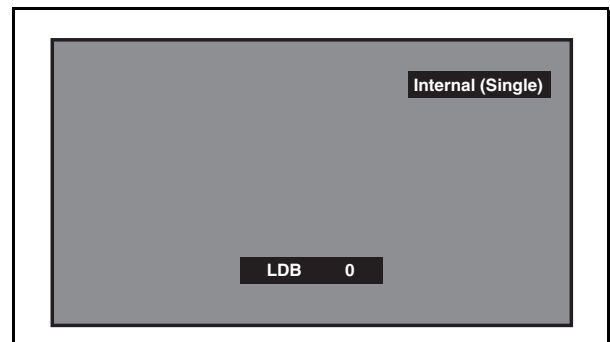
Note: The optical receptor must be set perpendicularly to the LCD Panel surface.

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.

Note: Disconnect any device from the USB Port before you conduct on this procedure.

1. Turn the power on.
2. Enter the service mode.
3. Press [RC5 GUEST] button on the set up remote control unit.
4. Press [RECALL/INFO] button on the set up remote control unit to initialize the LCD television.
5. After confirming that "INITIALIZED FINISH" appears on the screen, unplug the AC cord.

Note: To cancel the service mode, press [⏻] button on the set up remote control unit.

HOW TO INITIALIZE THE SMART MODULE SETTINGS

Note:

Make sure to clone the setting data if necessary before you conduct on this procedure.
Refer to the “HOSPITALITY TV MODE” for further detail.

1. Press [RC5 GUEST] button on the set up remote control unit.
2. Press [0], [6], [2], [5], [9], [6] and [RECALL/INFO] buttons on the set up remote control unit in this order to enter the service mode.
3. Press [▲], [▼], [▶] or [◀] button to select “Quality”.
4. Press [▲], [▼], [▶] or [◀] button to select “Initialize Settings” and press the [OK] button.

FIRMWARE RENEWAL MODE

This section enables the upgrading of the TV software via USB, RF or IP. It also allows the configuration of the Auto Update feature to enable the TV to be automatically upgraded.

Configuration	Source	IP
Channels	Type	USB
System	Direction	RF
Settings	Version Check	
Applications	Execute	
Upgrades		
Factory Default		

- **Source: “IP”, “USB”, “RF”** – This function allows you to select the Source from which the TV Upgrade data will be received. Like the TV Clone function, the RF option requires a PSG installed in the property head end to broadcast the data to the TVs. For more information, contact your P&F sales representative.

Configuration	Source	All
Channels	Type	Software
System	Direction	Assets
Settings	Version Check	Clone
Applications	Execute	P:I Key
Upgrades		
Factory Default		

- **Upgrade Type: “All”, “Software”, “Assets”, “Clone”, “P:I Key”**
- This section allows you to select the type of software to be upgraded to the TV.
 - If set to ALL, then all software types (Software, Assets, Clone and P:I Key) will be upgraded automatically.
 - If set to Software, there is an option to selectively upgrade individual software components such as main software, standby software and back-end software.
 - If set to Assets, there is an option to selectively upgrade individual software assets such as Hotel Logo, Channel Logo, Welcome Logo, Customizable UI, Programmable UI and SmartModule Clone Data.
 - If set to Clone, there is an option to selectively upgrade individual software assets such as setup menu settings, channel logos.

- If set to P:I Key, there is an option to selectively upgrade individual software assets such as Pro:Idiom Key.

Configuration	Source	To TV
Channels	Type	From TV
System	Direction	
Settings	Version Check	
Applications	Execute	
Upgrades		
Factory Default		

- **Direction: “To TV”, “From TV”**

Configuration	Source	On
Channels	Type	Off
System	Direction	
Settings	Version Check	
Applications	Execute	
Upgrades		
Factory Default		

- **Version Check: “On”, “Off”** - If set to Yes, this feature causes the TV to perform a version check of the TV upgrade software to ensure that only a newer version will be installed.

Configuration	Source	USB
Channels	Type	All
System	Direction	To TV
Settings	Version Check	On
Applications	Execute	Start
Upgrades		
Factory Default		

- **Start** - This function will initiate the TV upgrading process.

Configuration	Source	4 Hours
Channels	Type	1 Hours
System	RF Channel	30 min
Settings	Version Check	10 min
Applications	Execute	
Upgrades	Auto Update	
Factory Default		

- **Auto Update:** “4 Hours”, “1 Hours”, “30 min”, “10 min” - When TV goes into standby, Auto Update will automatically check for new TV upgrades and upgrade the TV software and/or clone data after 4 hours, 1hours, 30 min or 10 min if newer versions are found. Like all previous RF download functions, this too requires a PSG to be installed in the property head end.

Configuration	Source	RF
Channels	Type	All
System	RF Channel	87.1
Settings	Version Check	On
Applications	Execute	Start
Upgrades	Auto Update	4 Hours
Factory Default		

- **RF Channel Number.**

HOSPITALITY 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 Clone data will be stored in the root directory of the USB storage device.
- The picture data such as logos will be stored in “BUH_Logos” file and any other setting such as the channel map will be stored in “BUH_SmartSettings” 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 cloning process.
- Audio and Video will be muted during the cloning process.

How to clone 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 set up remote control to display the menu.
4. Select “Upgrades”.
5. Select “Source” and select “USB” then press the [OK] button.
6. Select “Direction” and select “From TV” then press the [OK] button.
7. Select “Execute” and press the [OK] button.
8. After the successful completion, “Setting copied to USB” message appears on the screen.

USB to TV settings

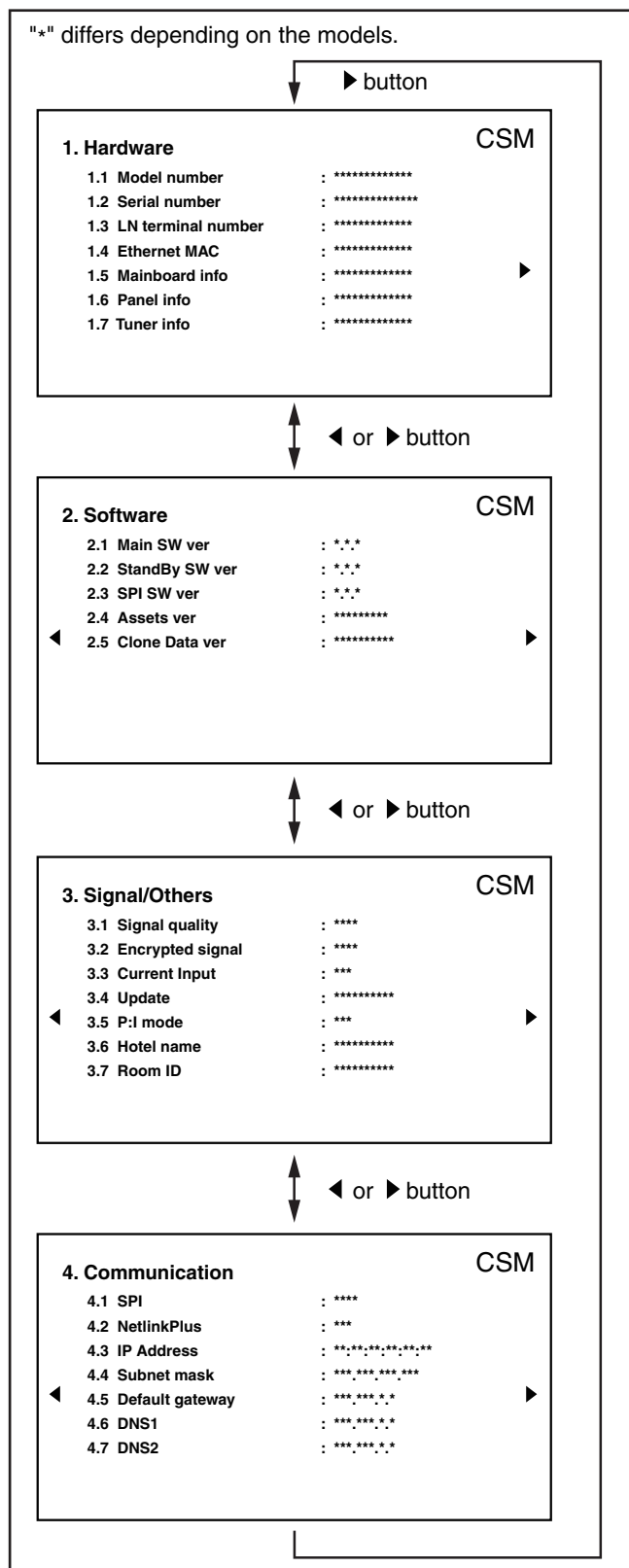
- The channel map and all other settings except for the factory setting will be copied from USB storage device to TV.
- All the key input and the shutdown timers will be invalid during the cloning process.
- Audio and Video will be muted during the cloning process.
- When illegal data exist in the file, the cloning process will be aborted.
- After the successful completion of the cloning 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 set up remote control to display the menu screen.
4. Select “Upgrades”.
5. Select “Source” and select “USB” then press the [OK] button.
6. Select “Direction” and select “To TV” then press the [OK] button.
7. Select “Execute” and press the [OK] button.
8. 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.

Status menu screen (optional)

1. Turn the power on.
2. Press the [RECALL/INFO] button on the set up remote control to display the status menu.
You can switch the screen by using [▶] or [◀] button as shown below.
3. Press the [RECALL/INFO] button again to cancel the status menu.

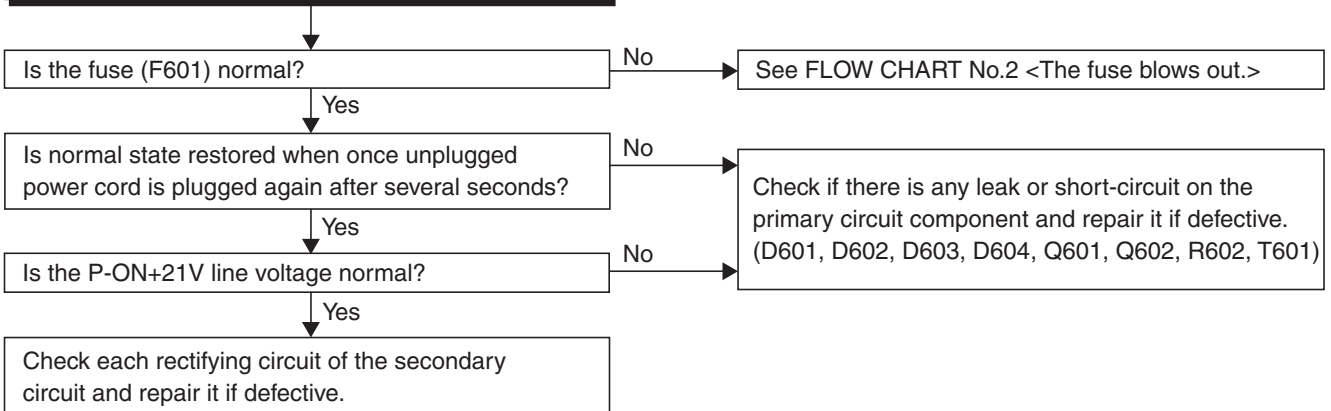


TROUBLESHOOTING

[Power Supply Section]

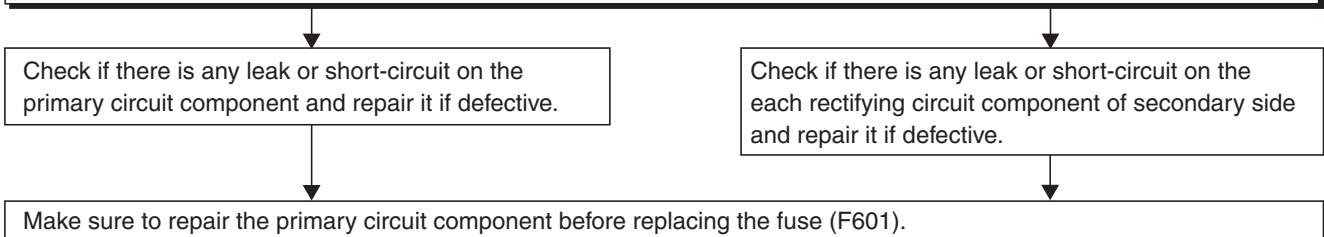
FLOW CHART NO.1

The power cannot be turned on.



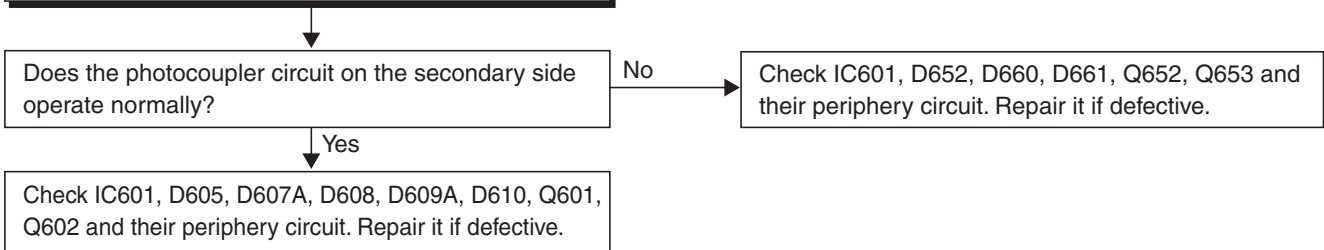
FLOW CHART NO.2

The fuse blows out.



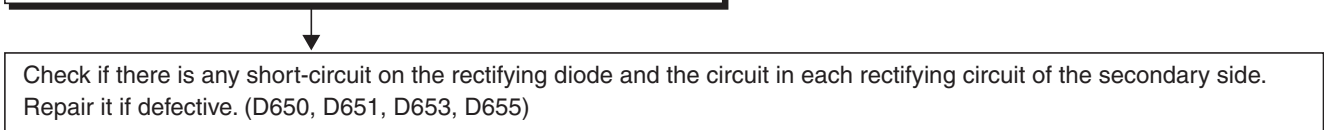
FLOW CHART NO.3

When the output voltage fluctuates.

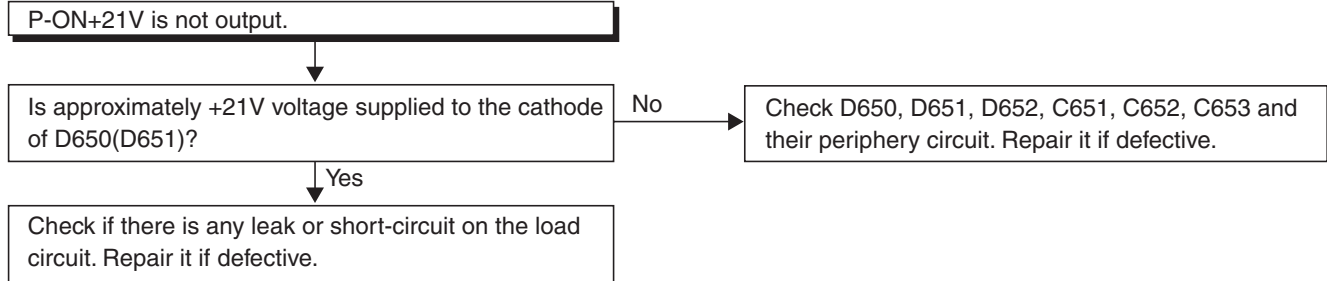


FLOW CHART NO.4

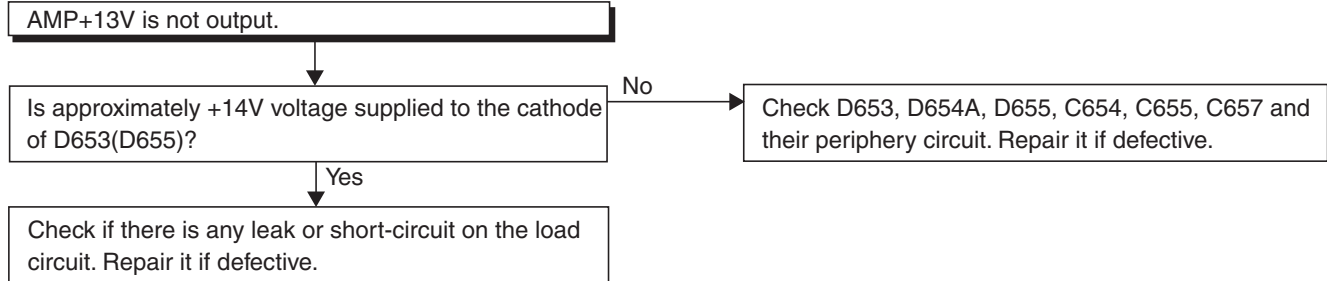
When buzz sound can be heard in the periphery of power circuit.



FLOW CHART NO.5

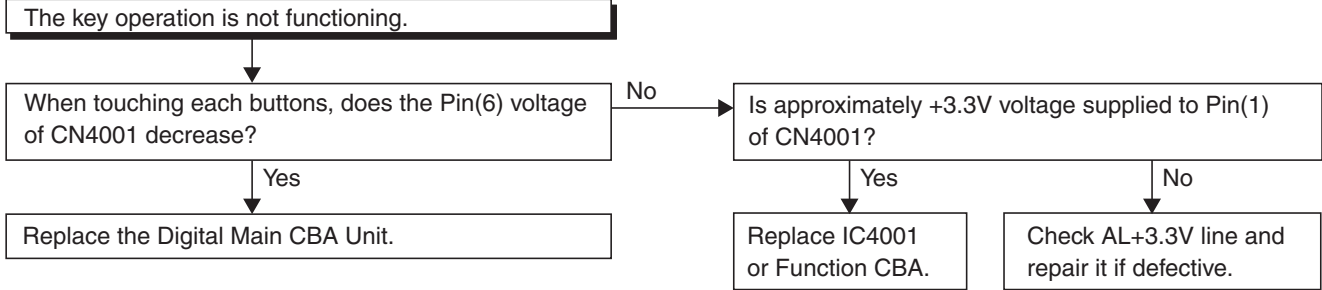


FLOW CHART NO.6

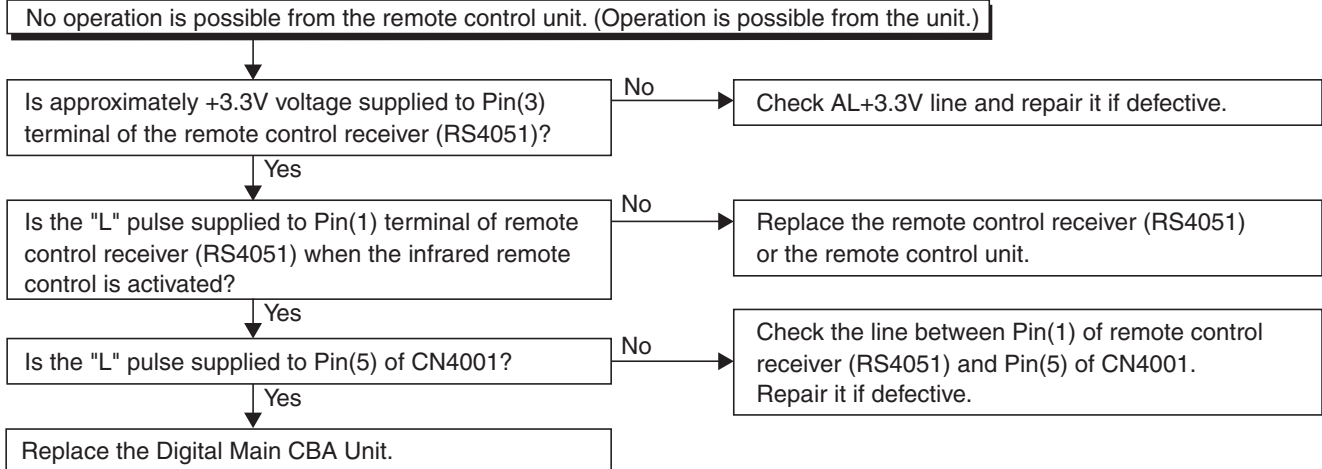


[Video Signal Section]

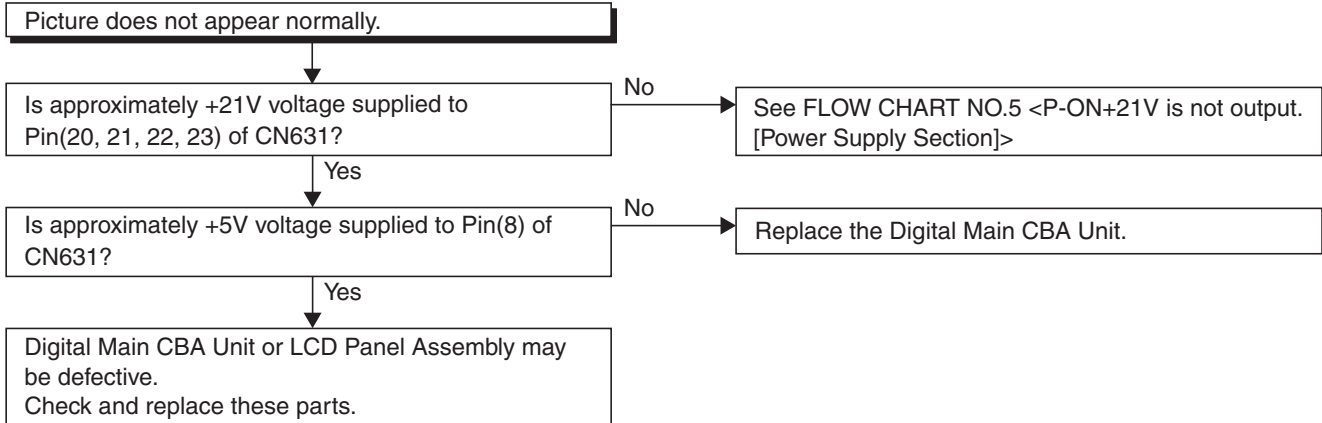
FLOW CHART NO.1



FLOW CHART NO.2

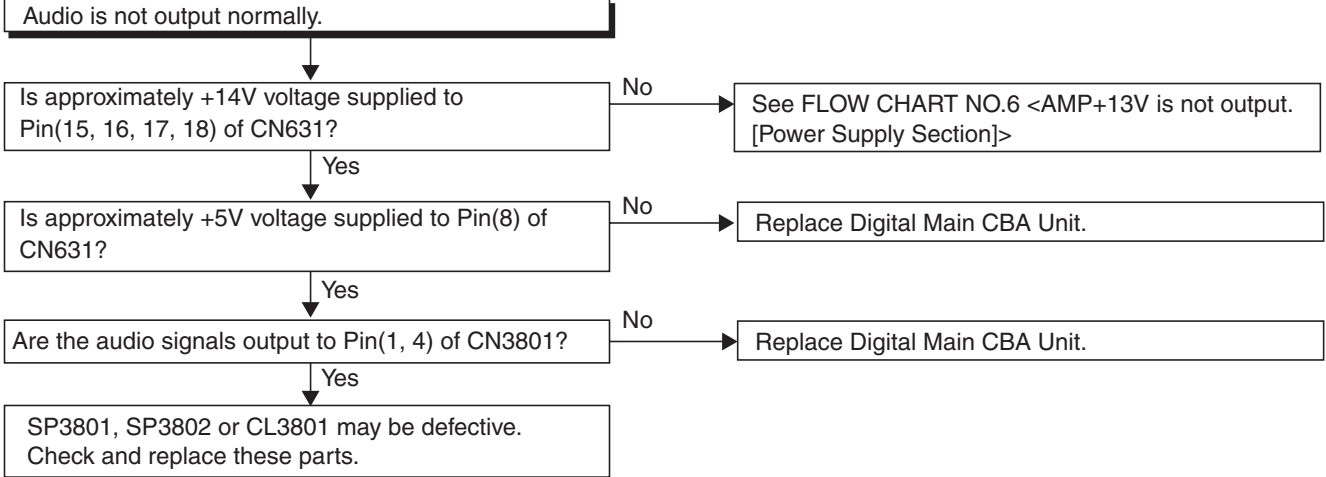


FLOW CHART NO.3

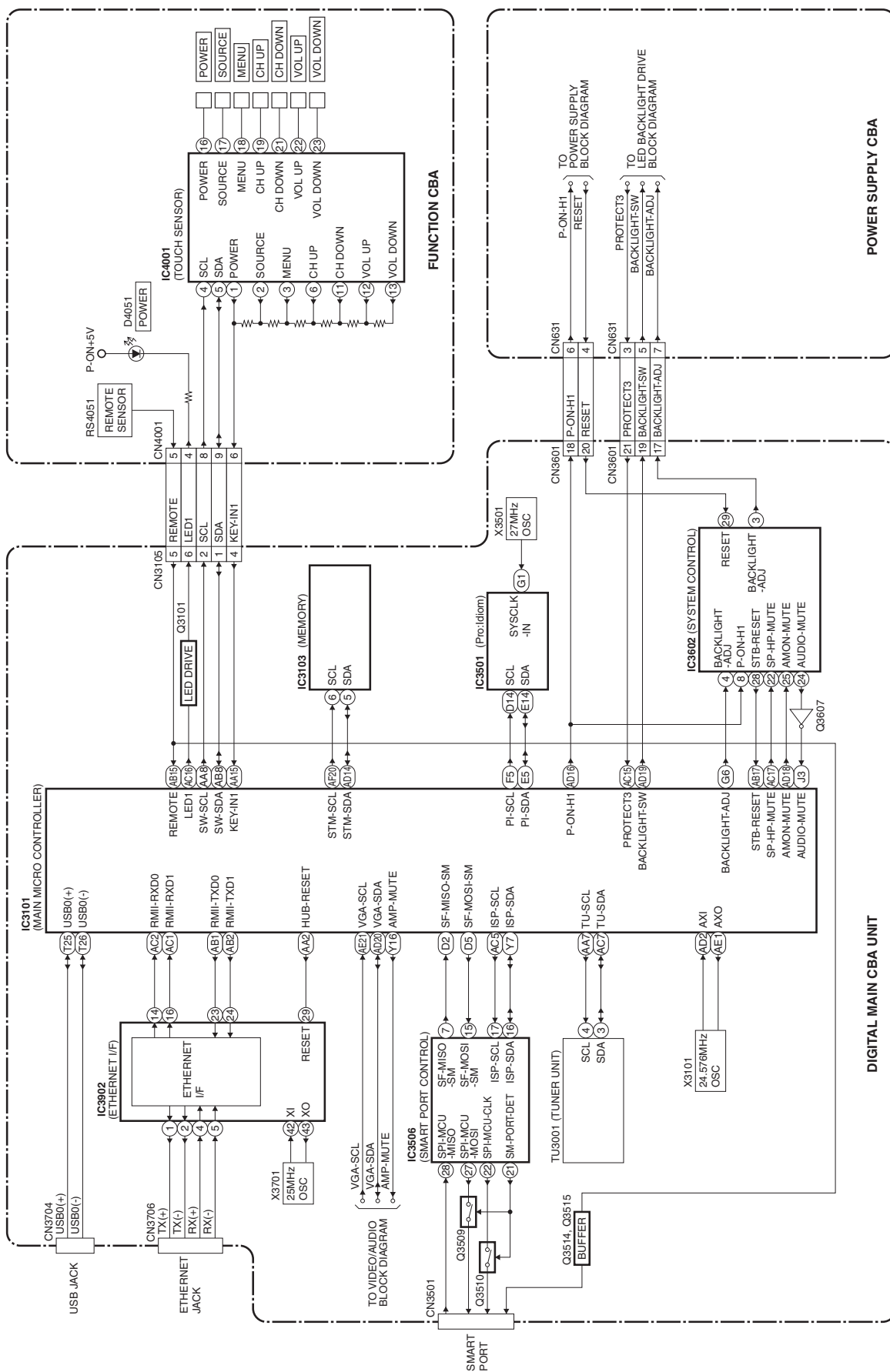


[Audio Signal Section]

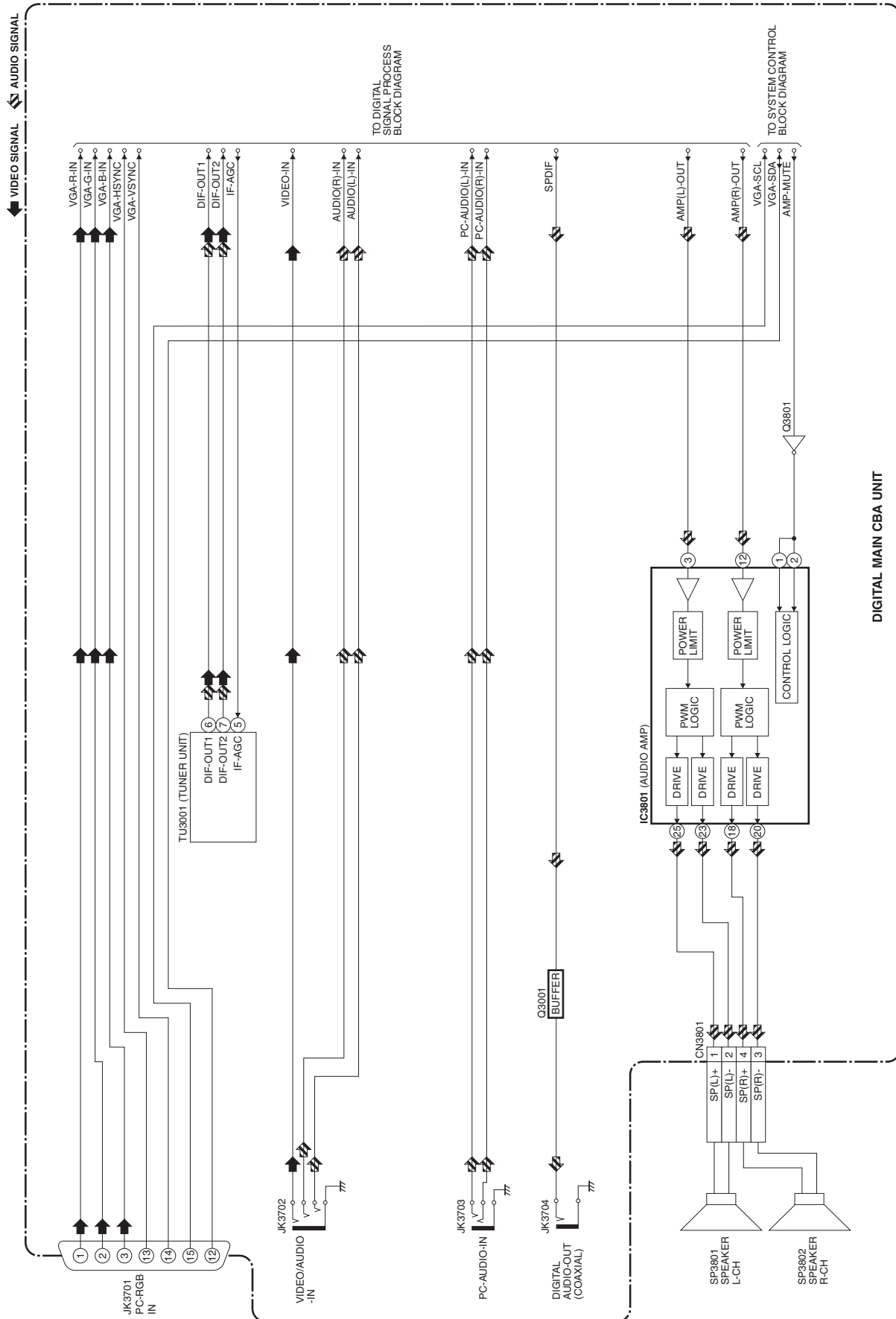
FLOW CHART NO.1



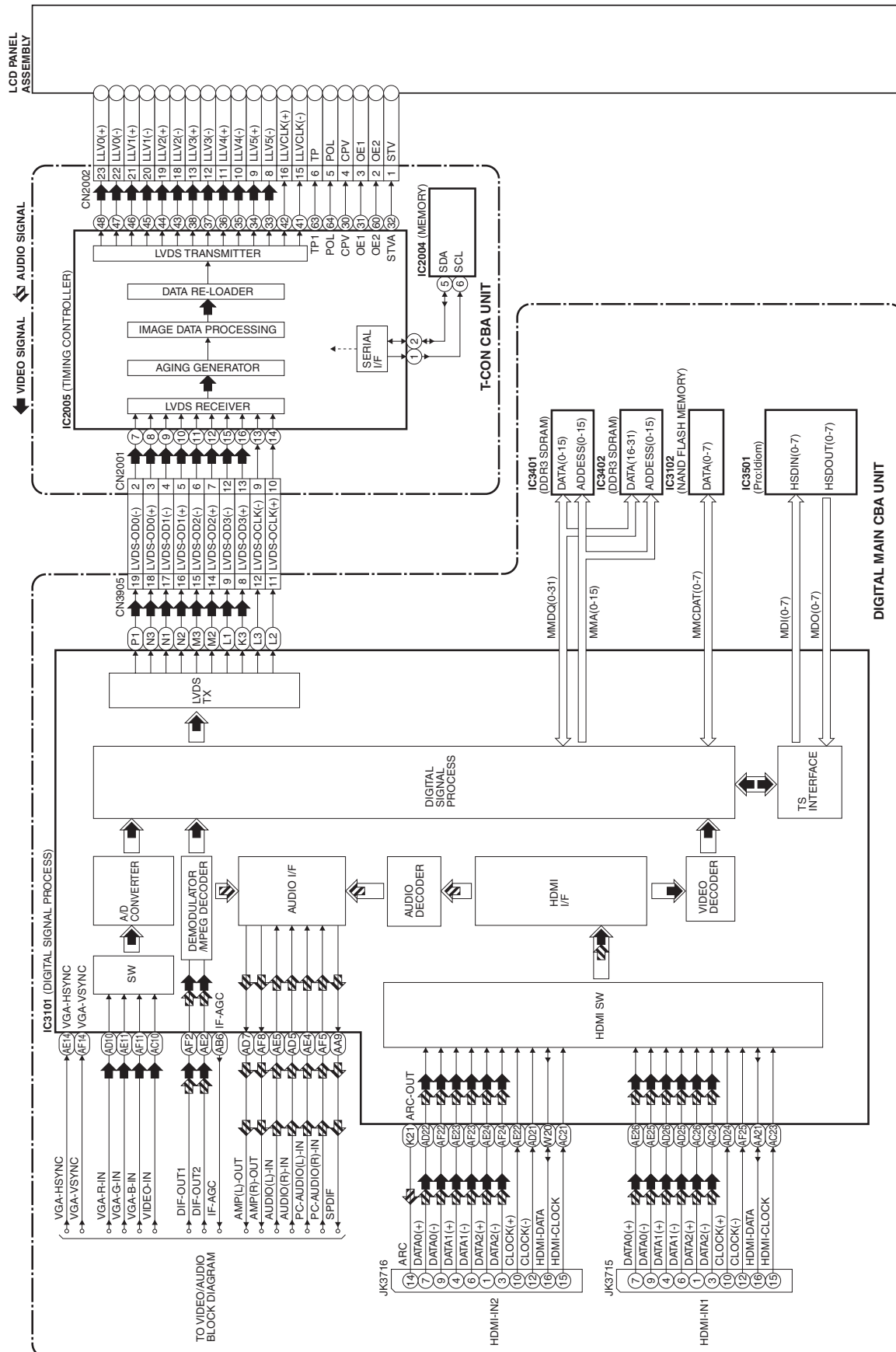
1. System Control Block Diagram



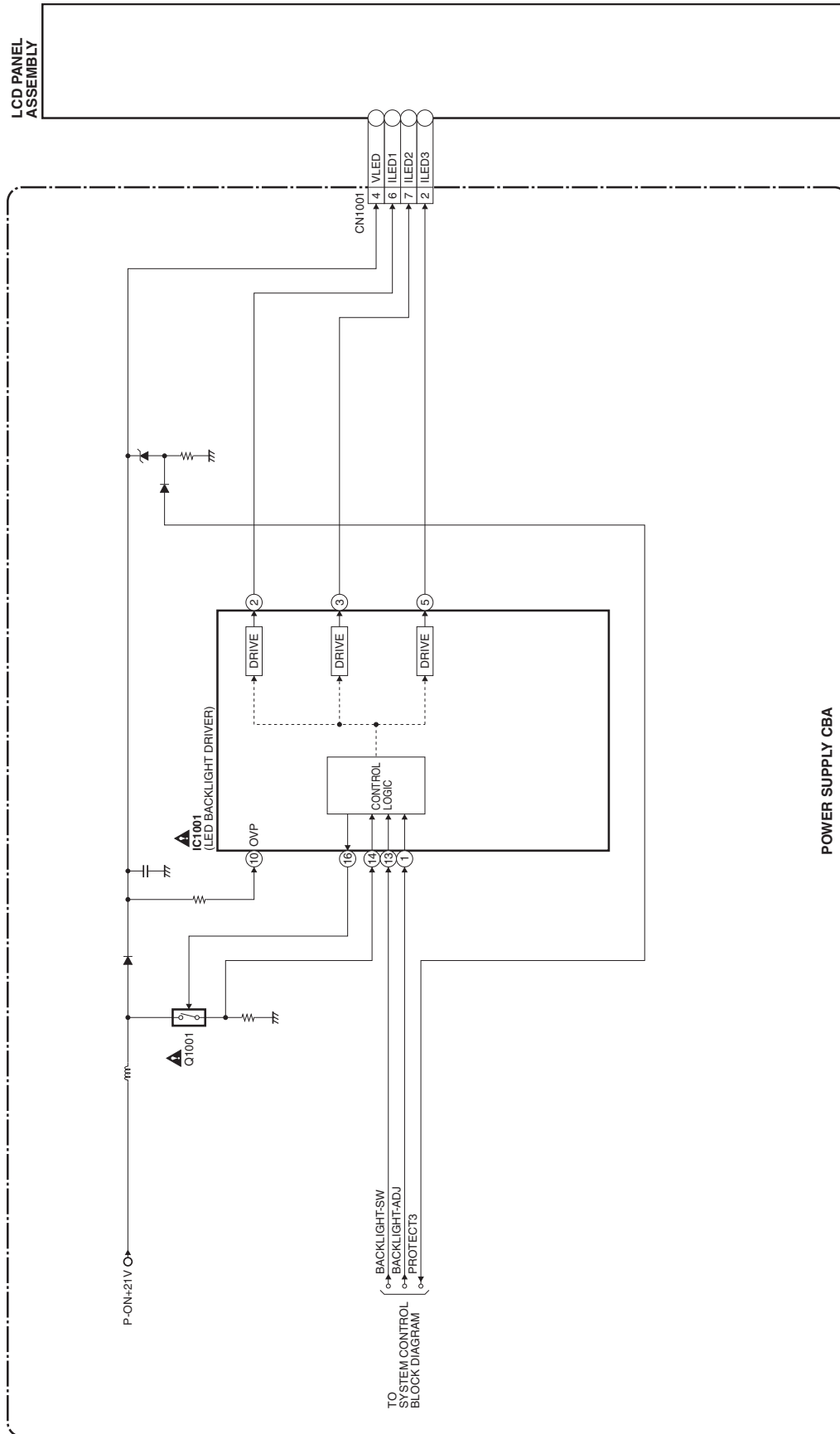
2. Video/Audio Block Diagram



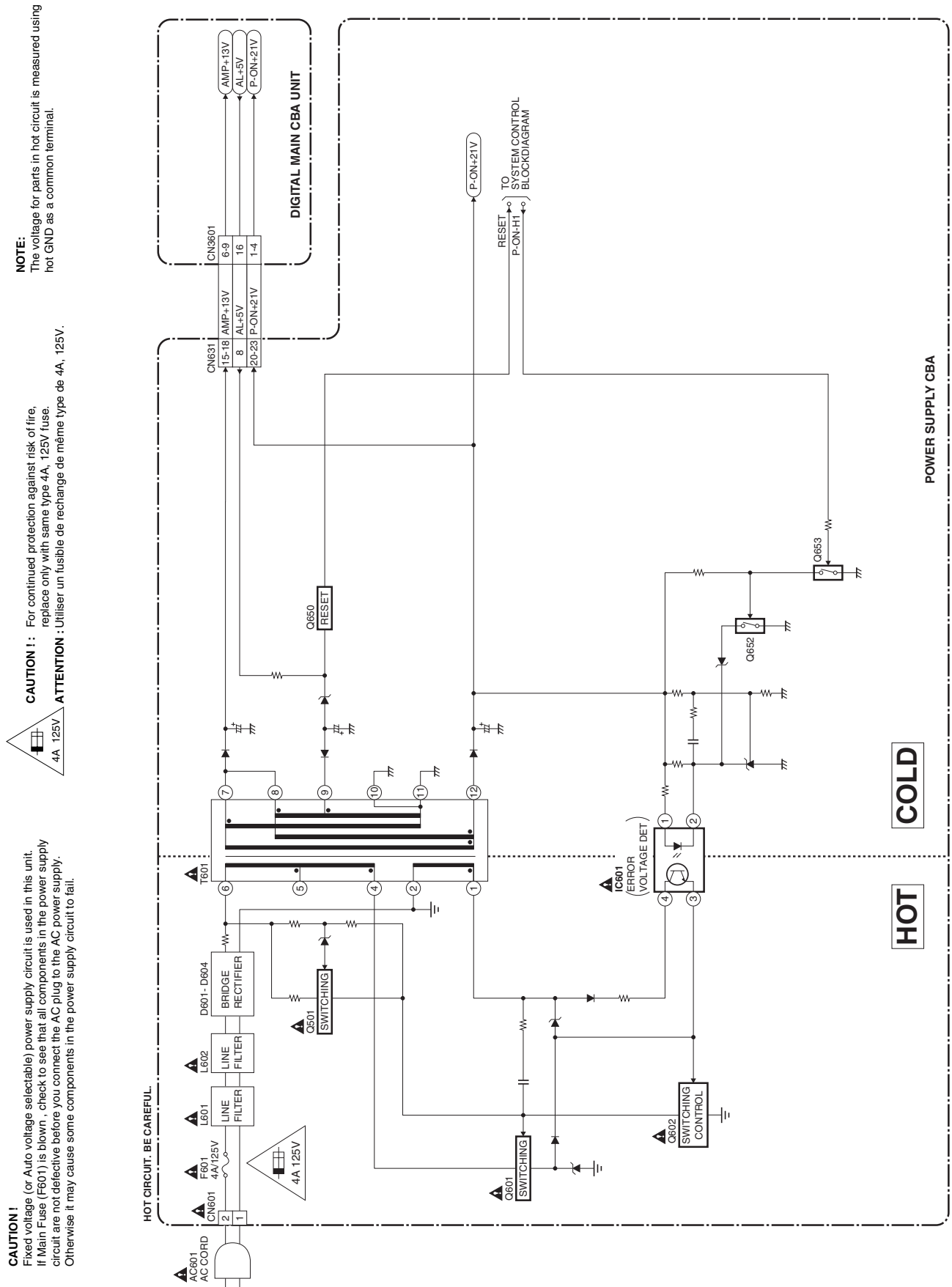
3. Digital Signal Process Block Diagram



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.

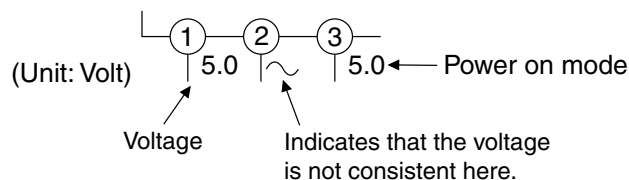
If Main Fuse (F601) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

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.:

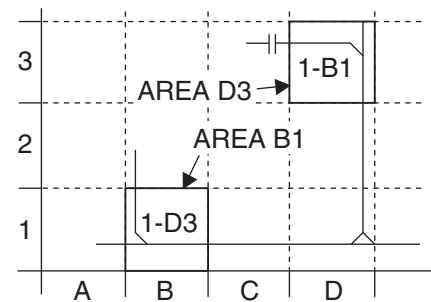


5. How to read converged lines

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.

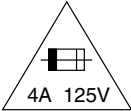
● : Used to indicate a test point with a test pin.

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

Power Supply Schematic Diagram

CAUTION !

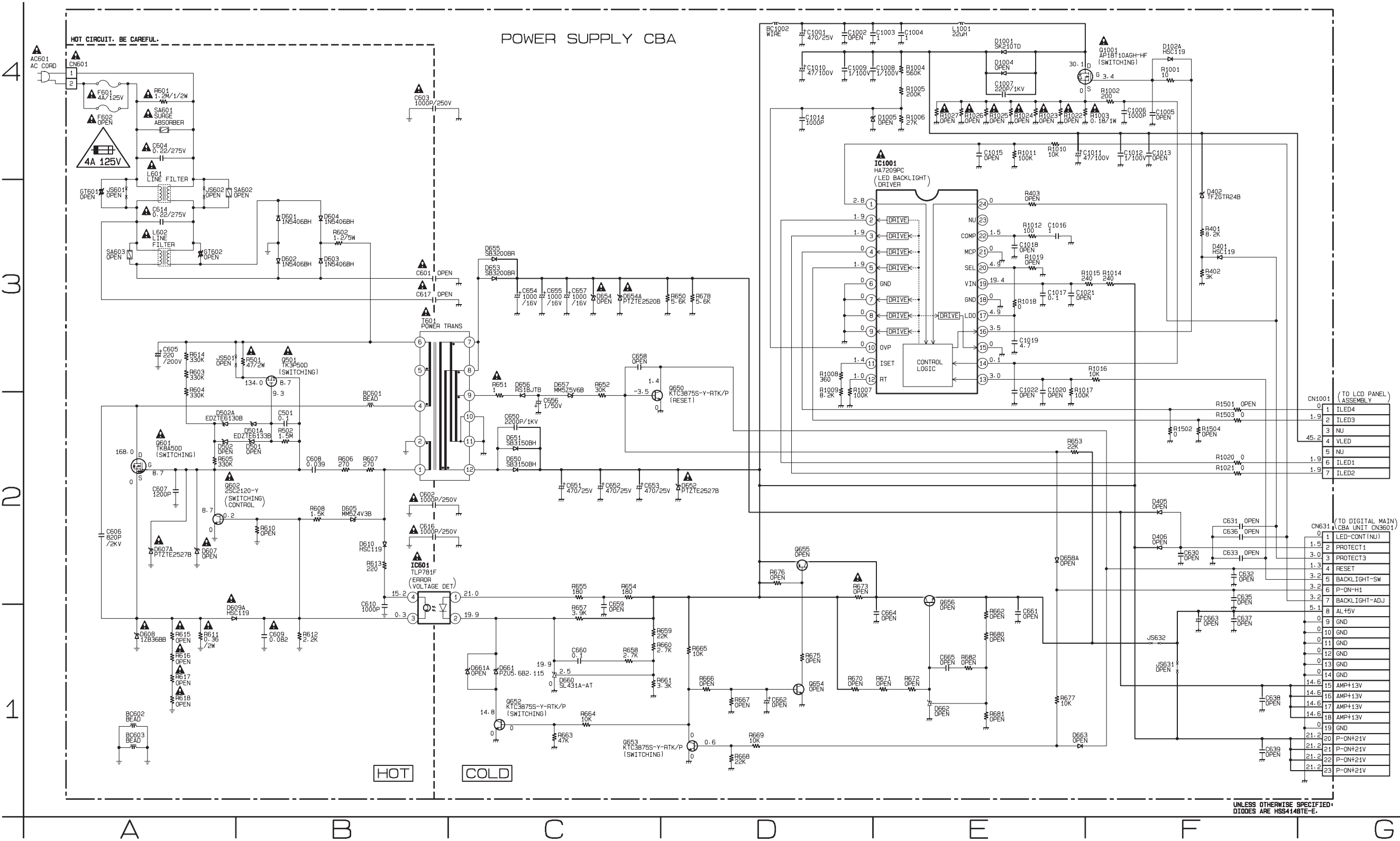
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.



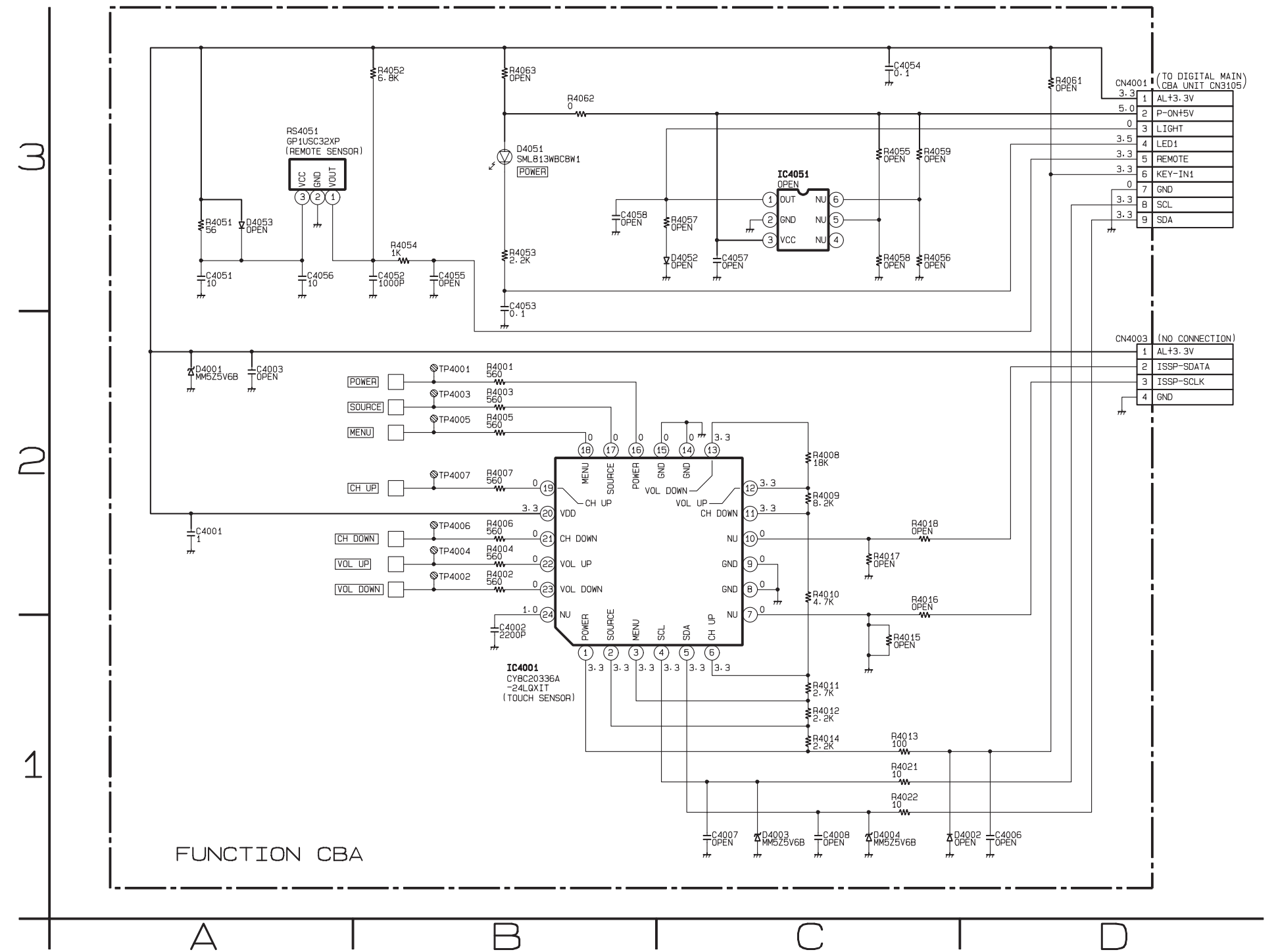
CAUTION ! : For continued protection against risk of fire,
replace only with same type 4A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

NOTE:

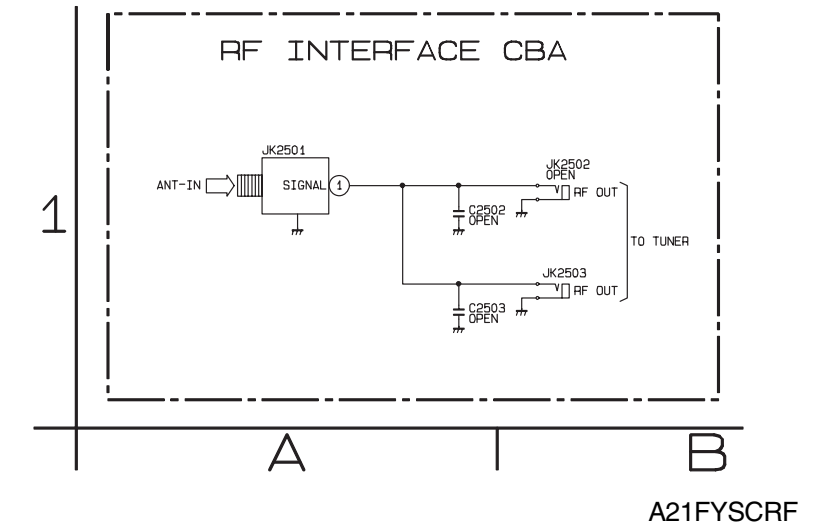
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



Function Schematic Diagram

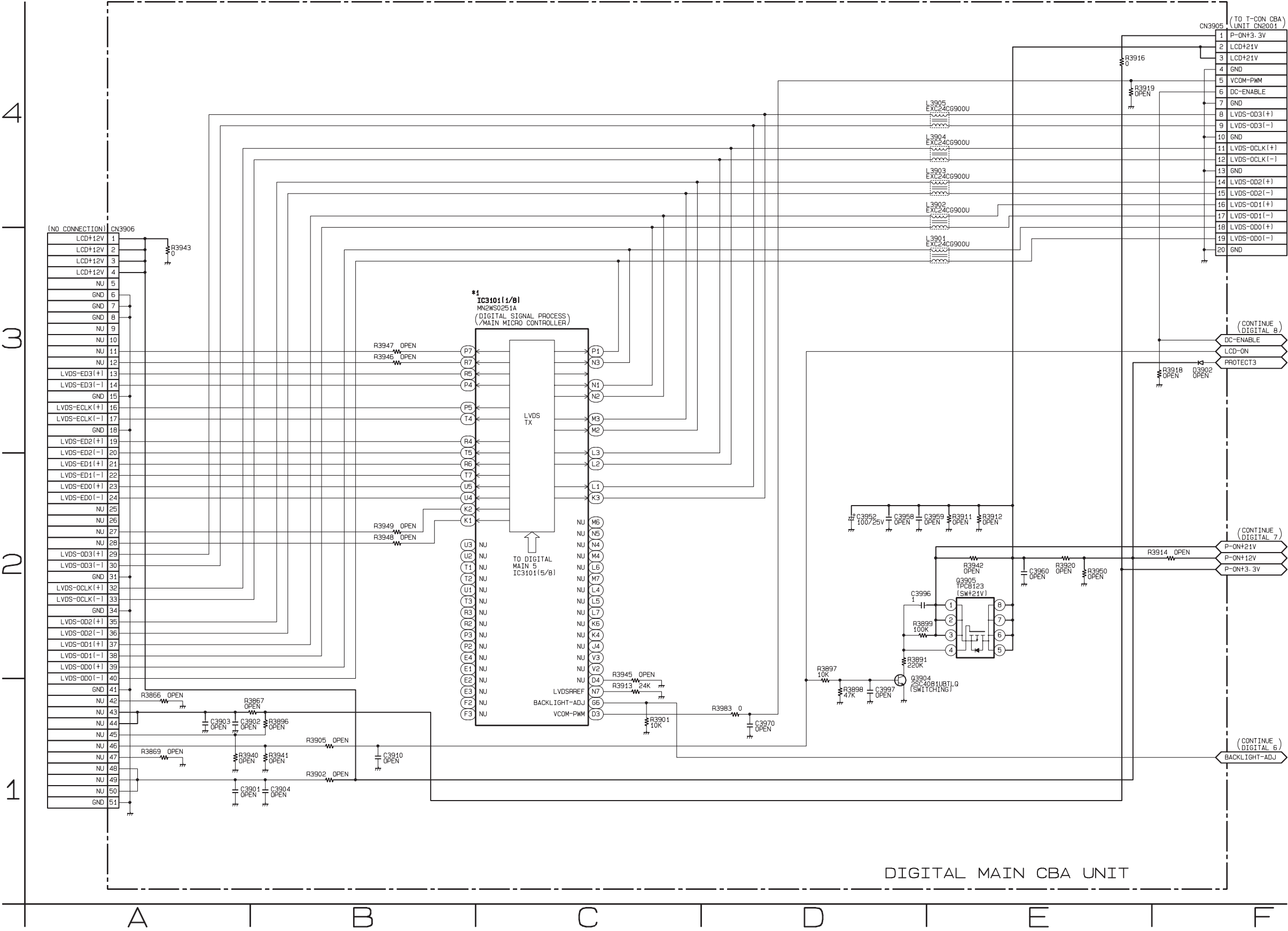


RF Interface Schematic Diagram



Digital Main 1 Schematic Diagram

*1 NOTE:
The order of pins shown in this diagram is different from that of actual IC3101.
IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.

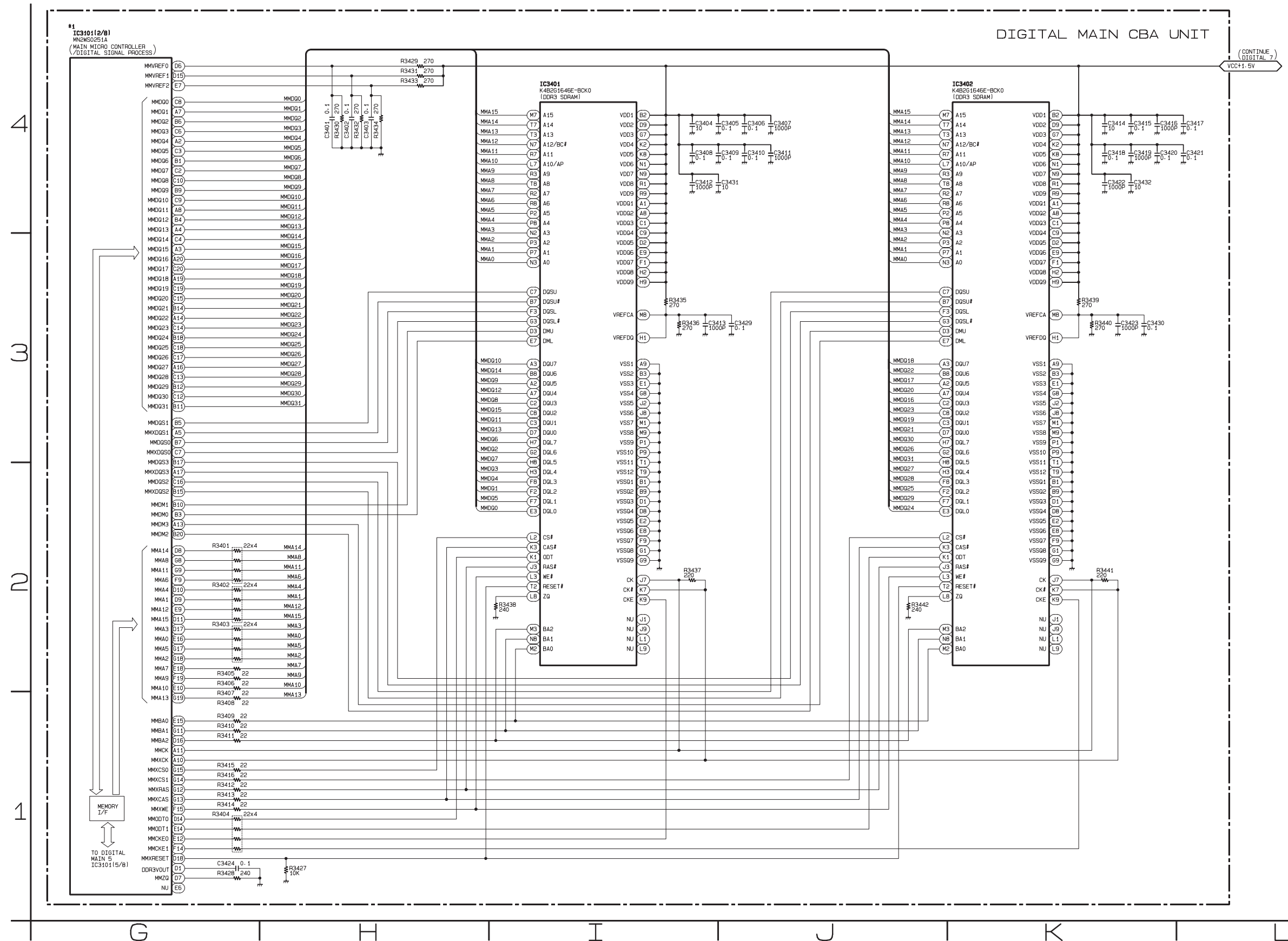


Digital Main 2 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3101.

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.

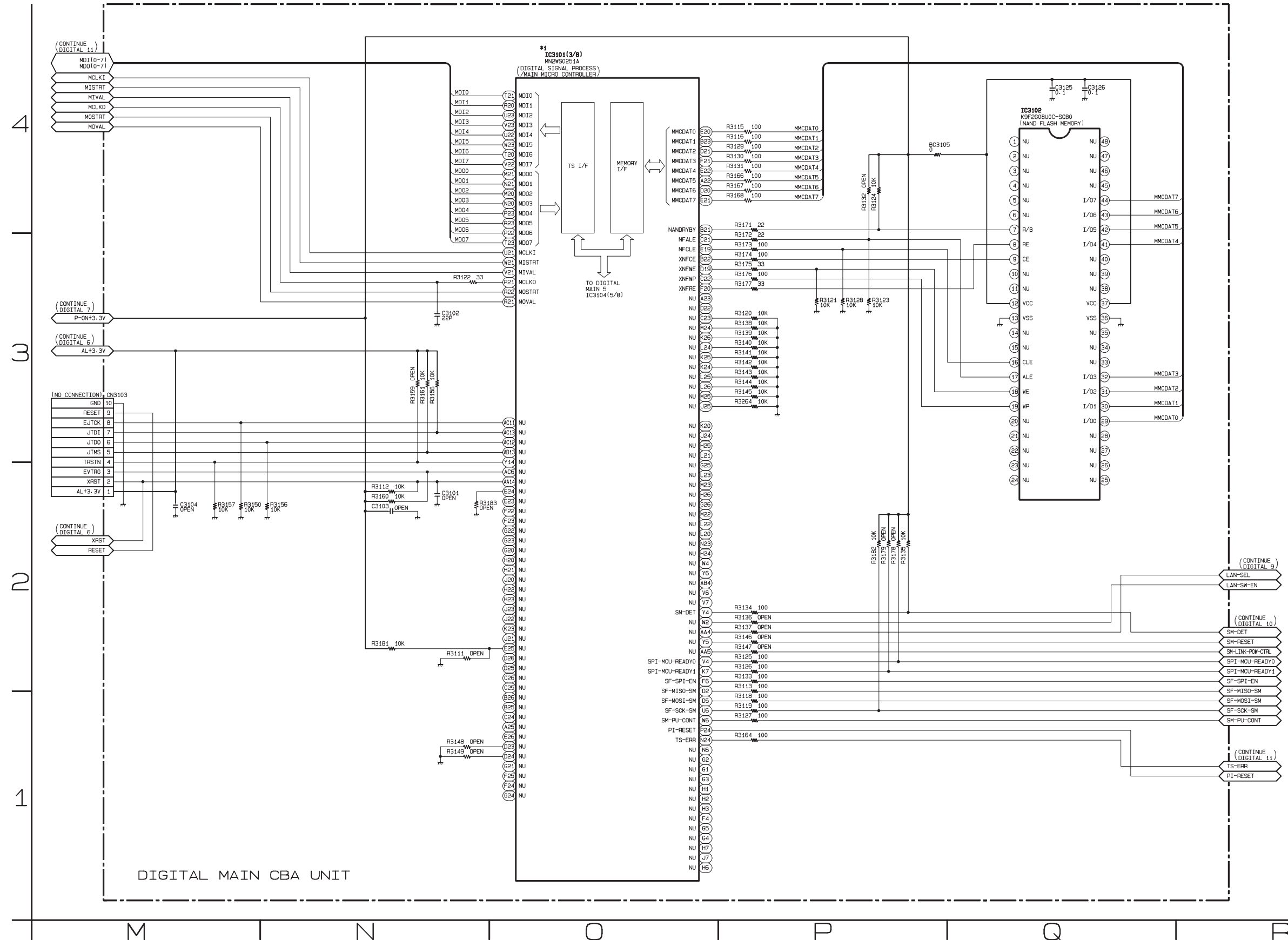


Digital Main 3 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3101.

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.

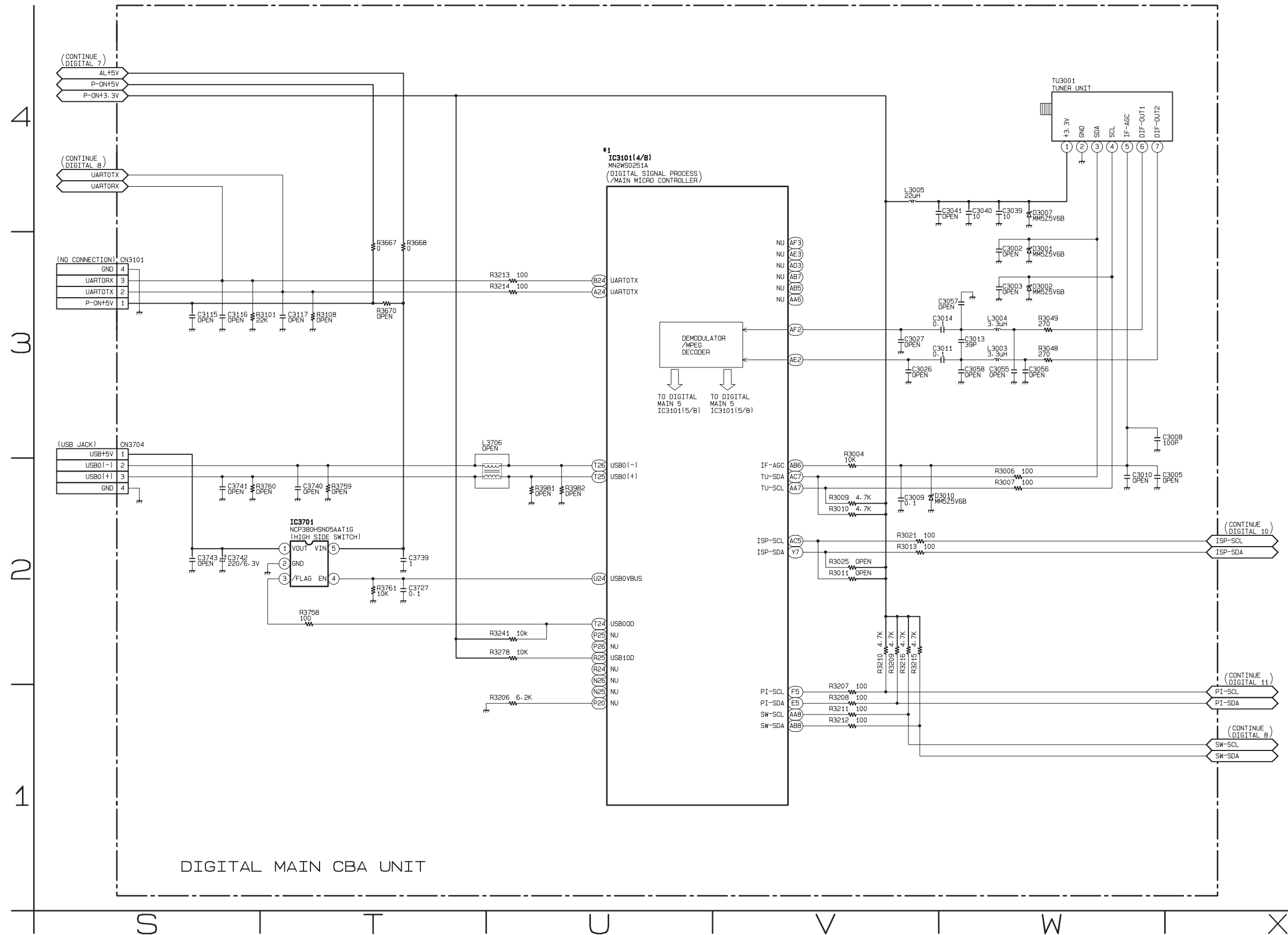


Digital Main 4 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3101.

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.



1

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.

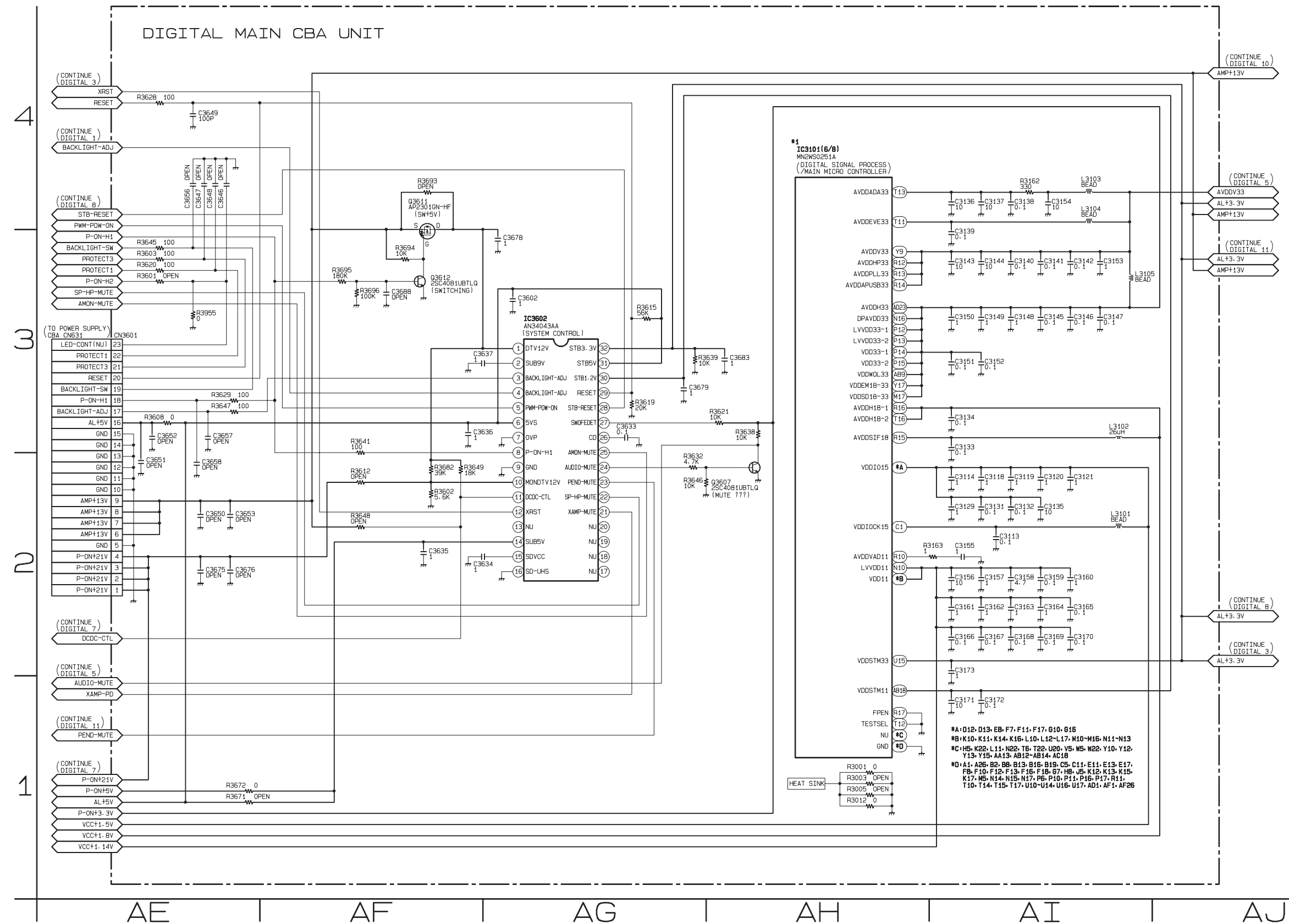


Digital Main 6 Schematic Diagram

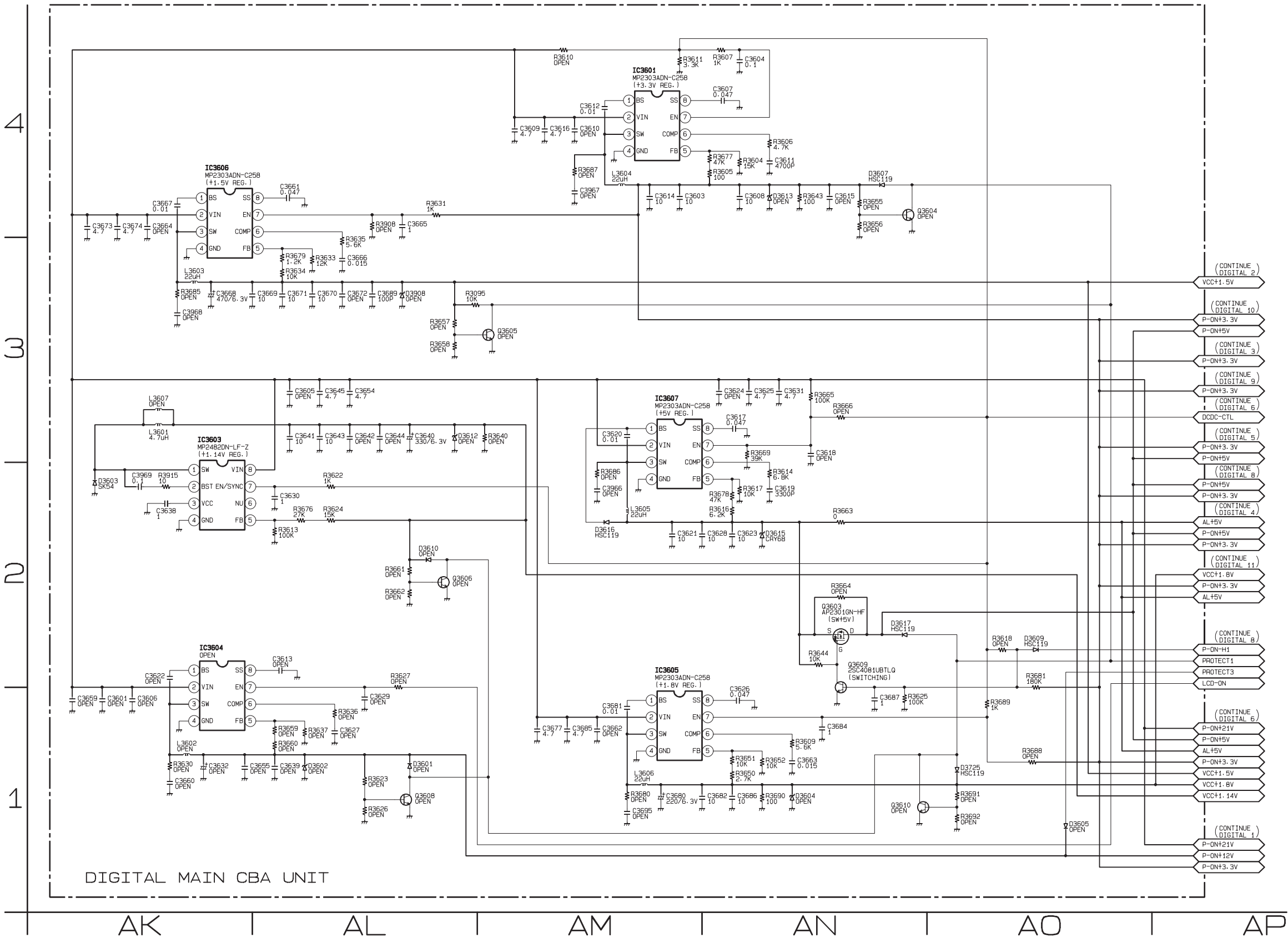
***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3101.

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.



Digital Main 7 Schematic Diagram

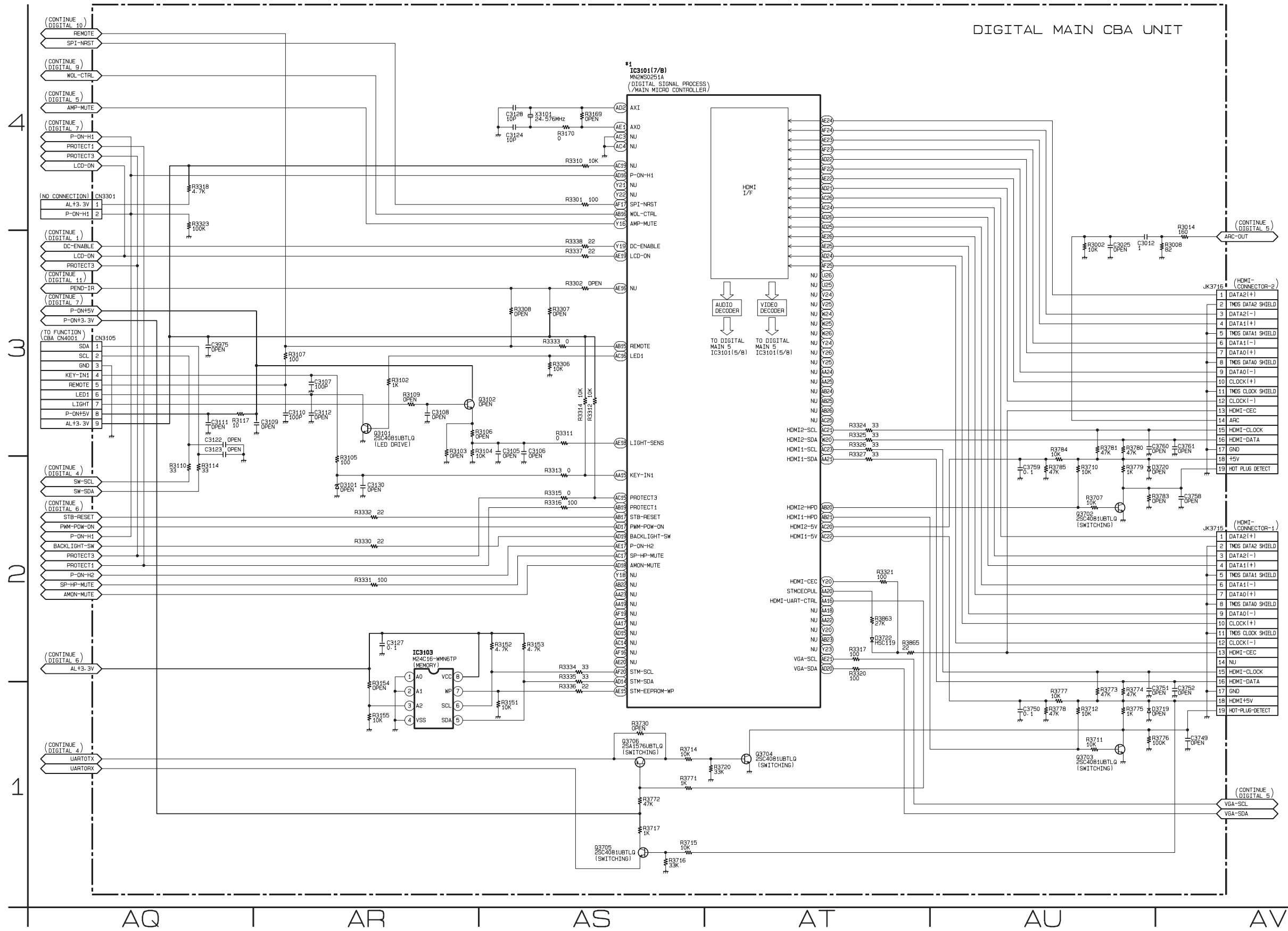


Digital Main 8 Schematic Diagram

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC3101.

IC3101 is divided into eight and shown as IC3101 (1/8) ~ IC3101 (8/8) in this Digital Main Schematic Diagram Section.



4

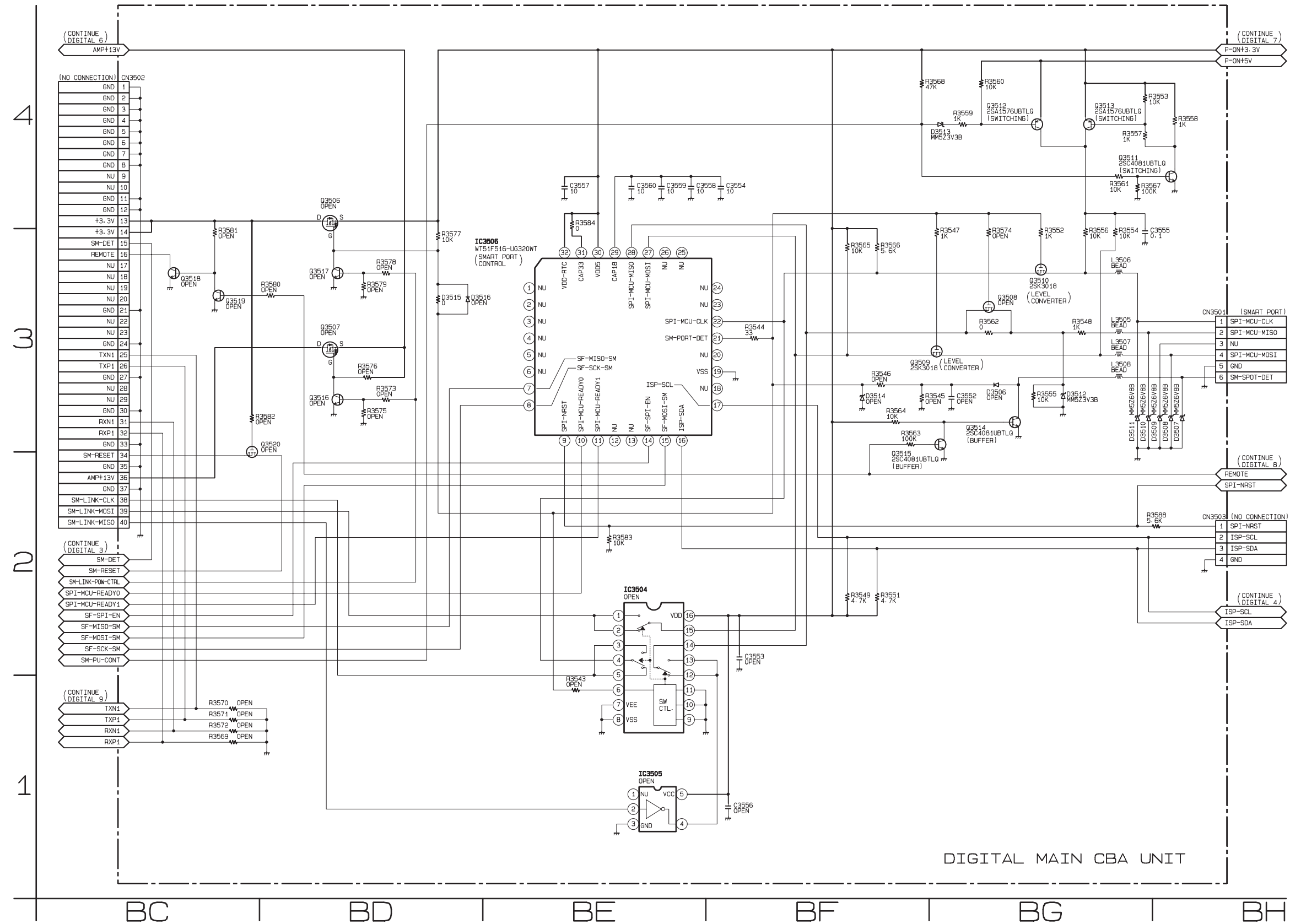
3

2

1

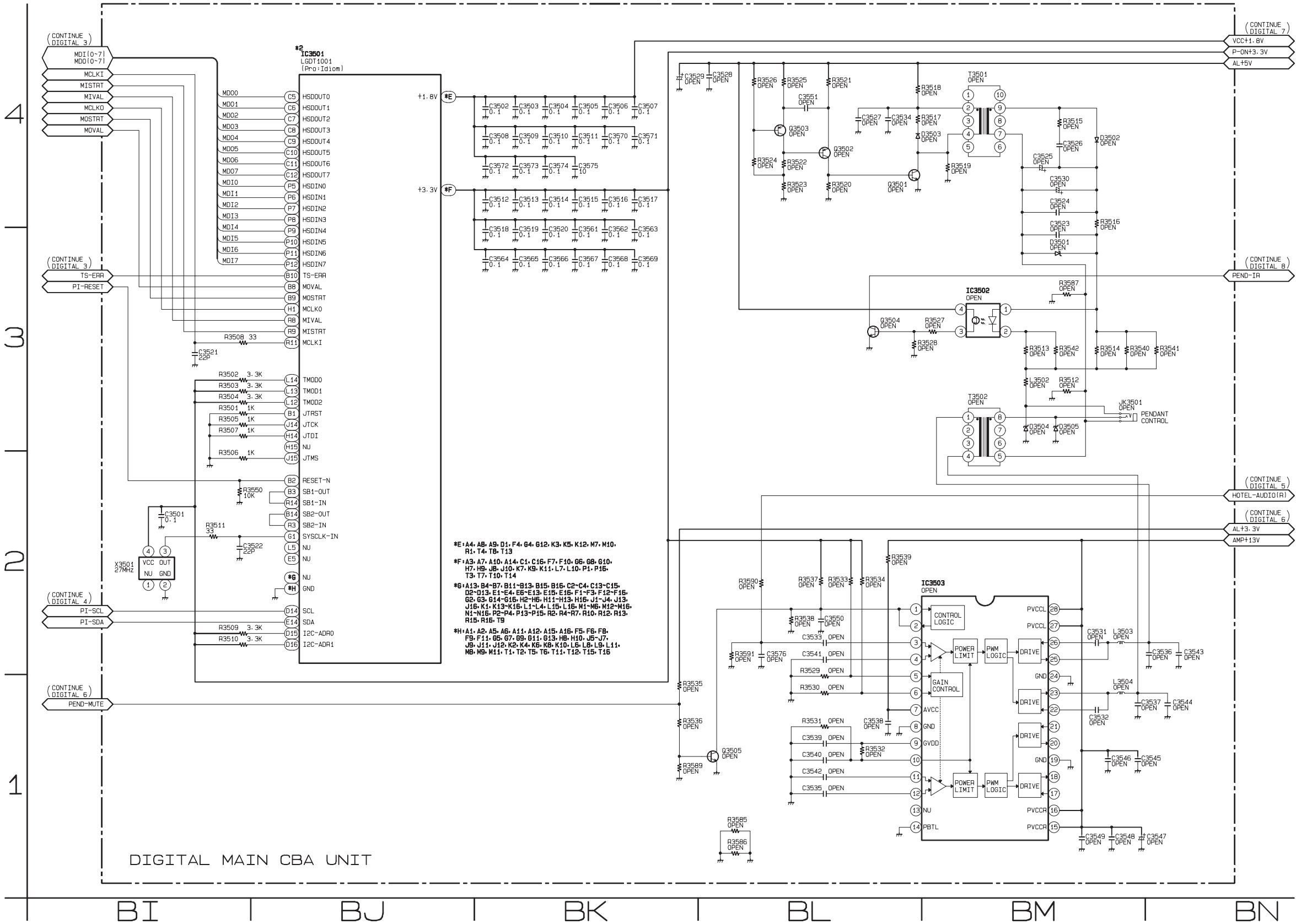


Digital Main 10 Schematic Diagram

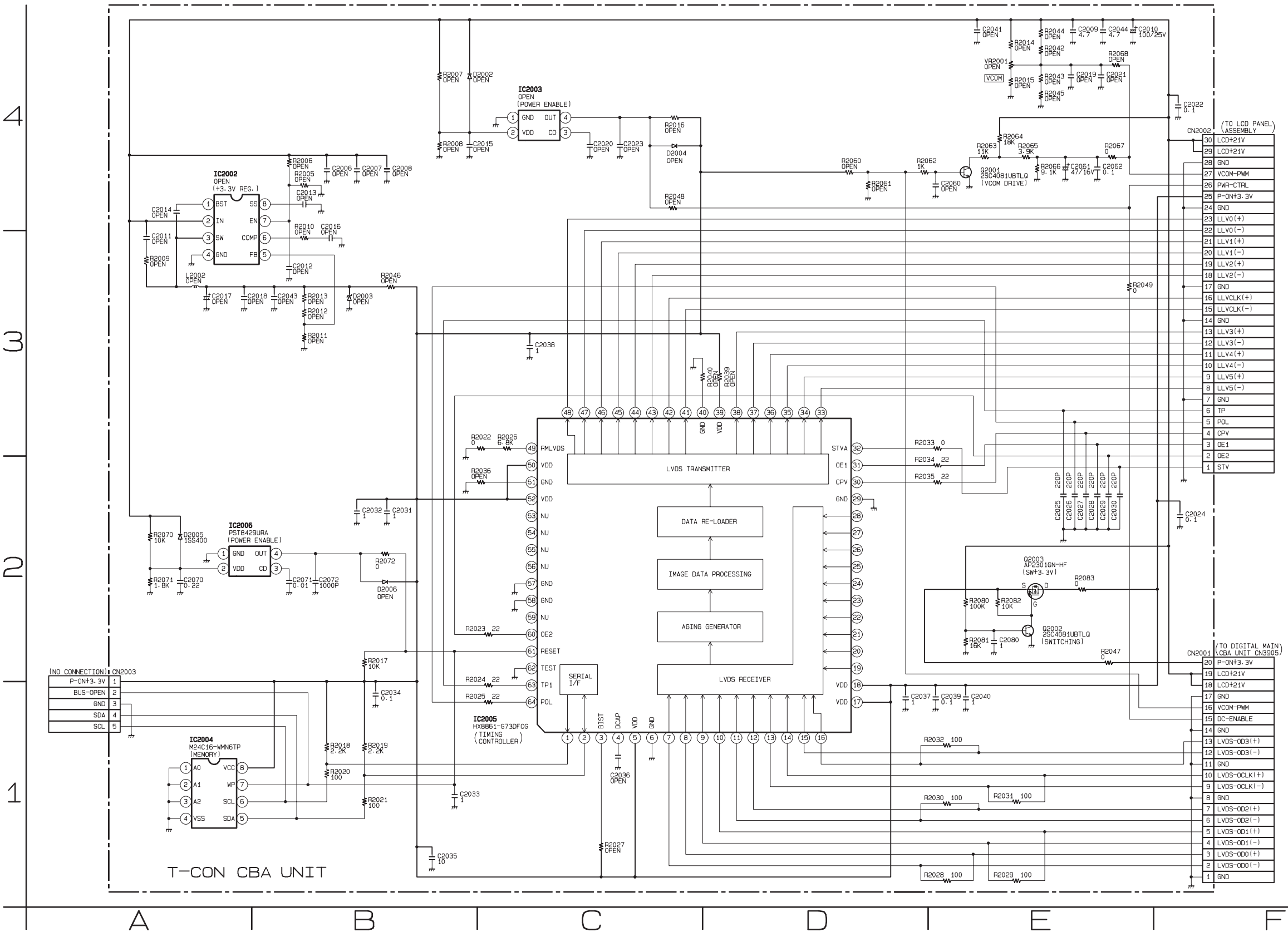


Digital Main 11 Schematic Diagram

*2 NOTE:
The order of pins shown in this diagram is different from that of actual IC3501.

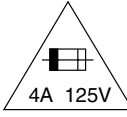


T-CON Schematic Diagram



Power Supply CBA Top View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) 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.



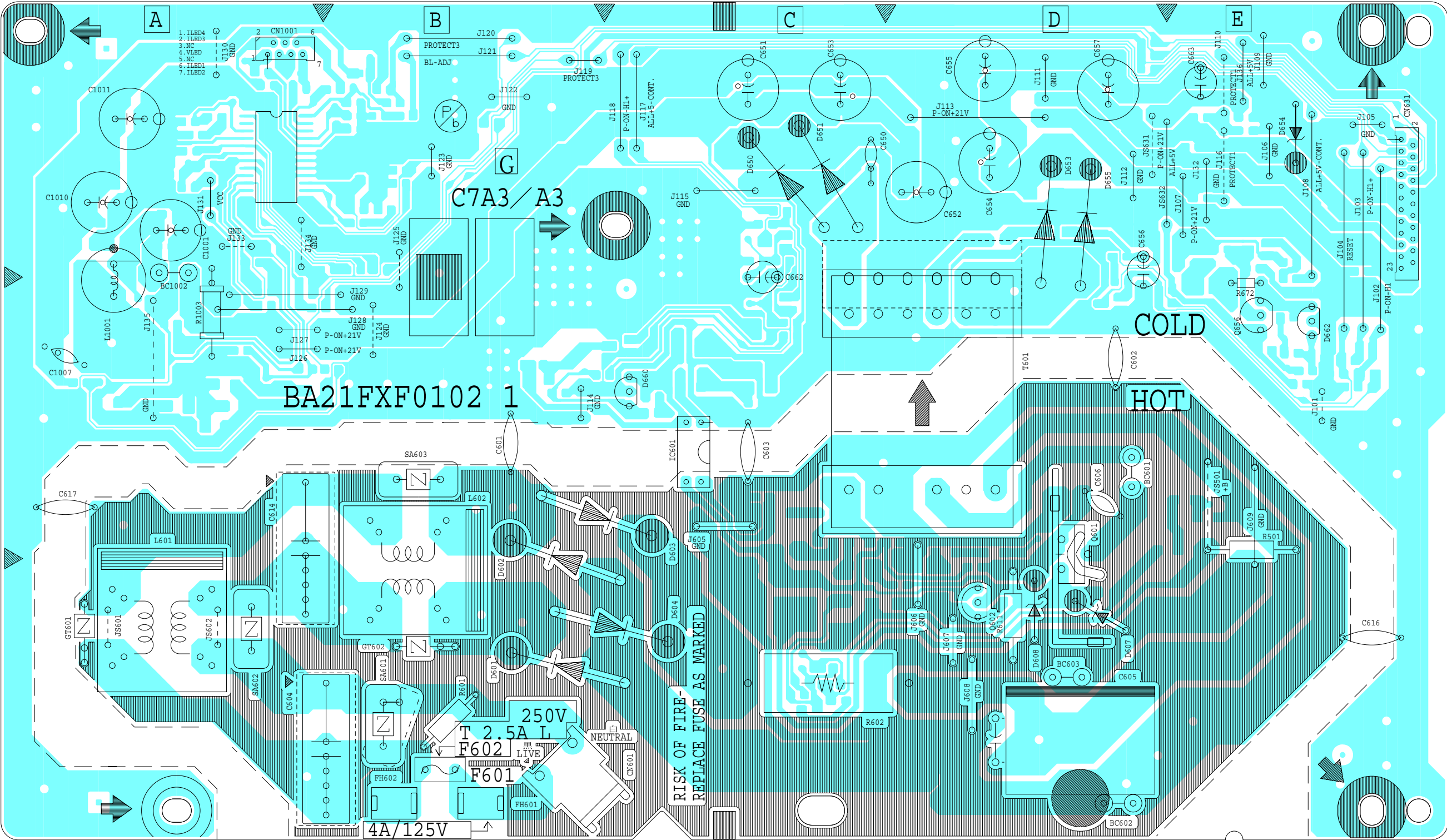
4A 125V

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.

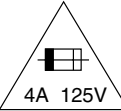
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



Power Supply CBA Bottom View

CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F601) 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.

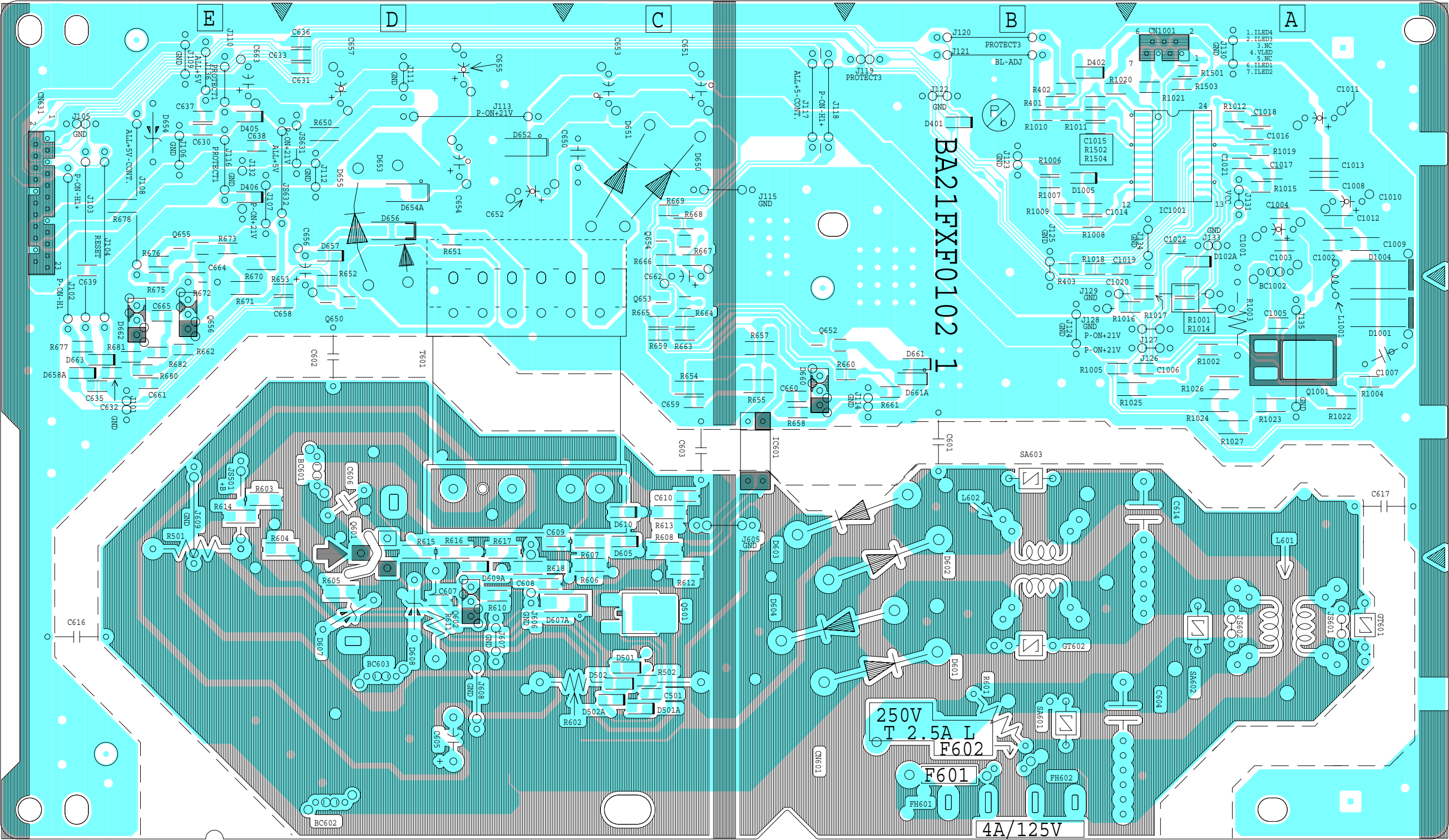


CAUTION ! : For continued protection against risk of fire,
replace only with same type 4A, 125V fuse.
ATTENTION : Utiliser un fusible de rechange de même type de 4A, 125V.

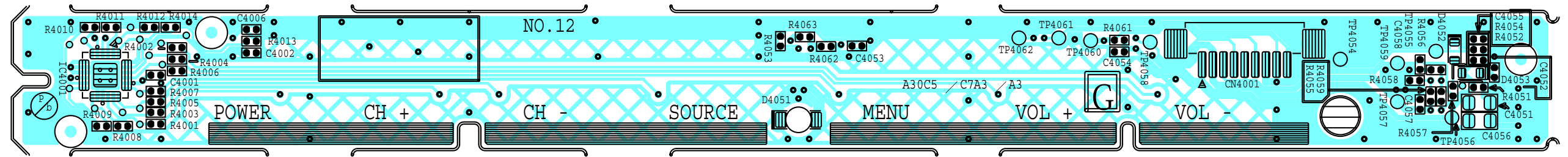
Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used when repairing.
Also, in order to have the ability to increase the input slowly, when troubleshooting this type of power supply circuit, a variable isolation transformer is required.

NOTE:

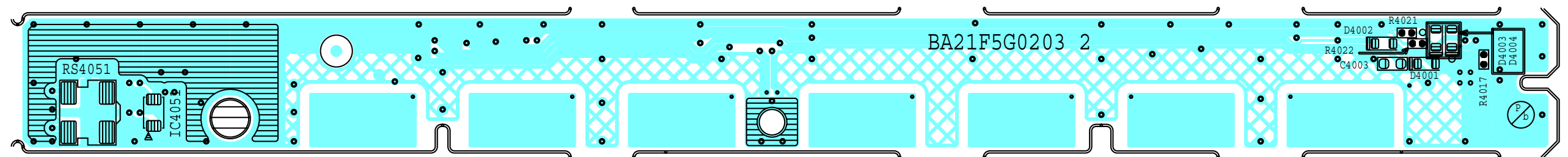
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



Function CBA Top View

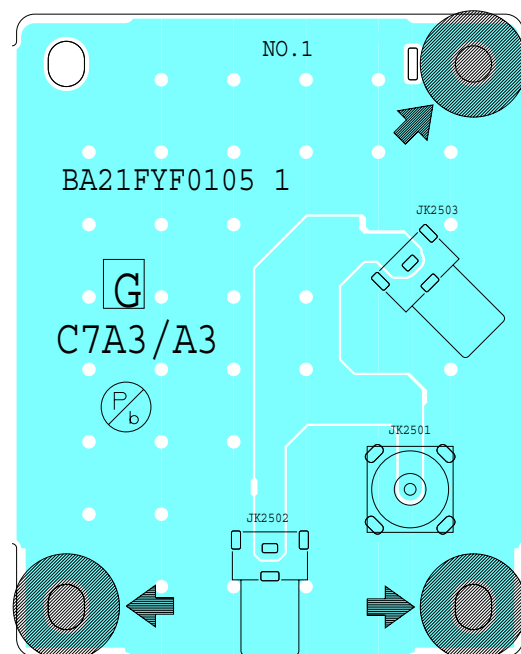


Function CBA Bottom View

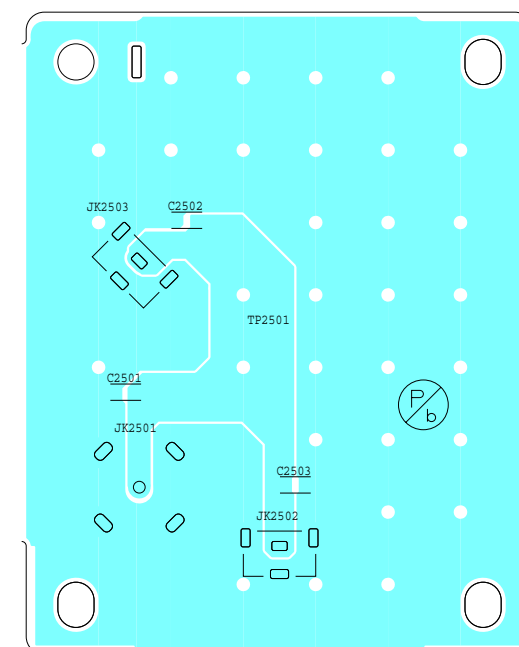


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RF Interface CBA Top View

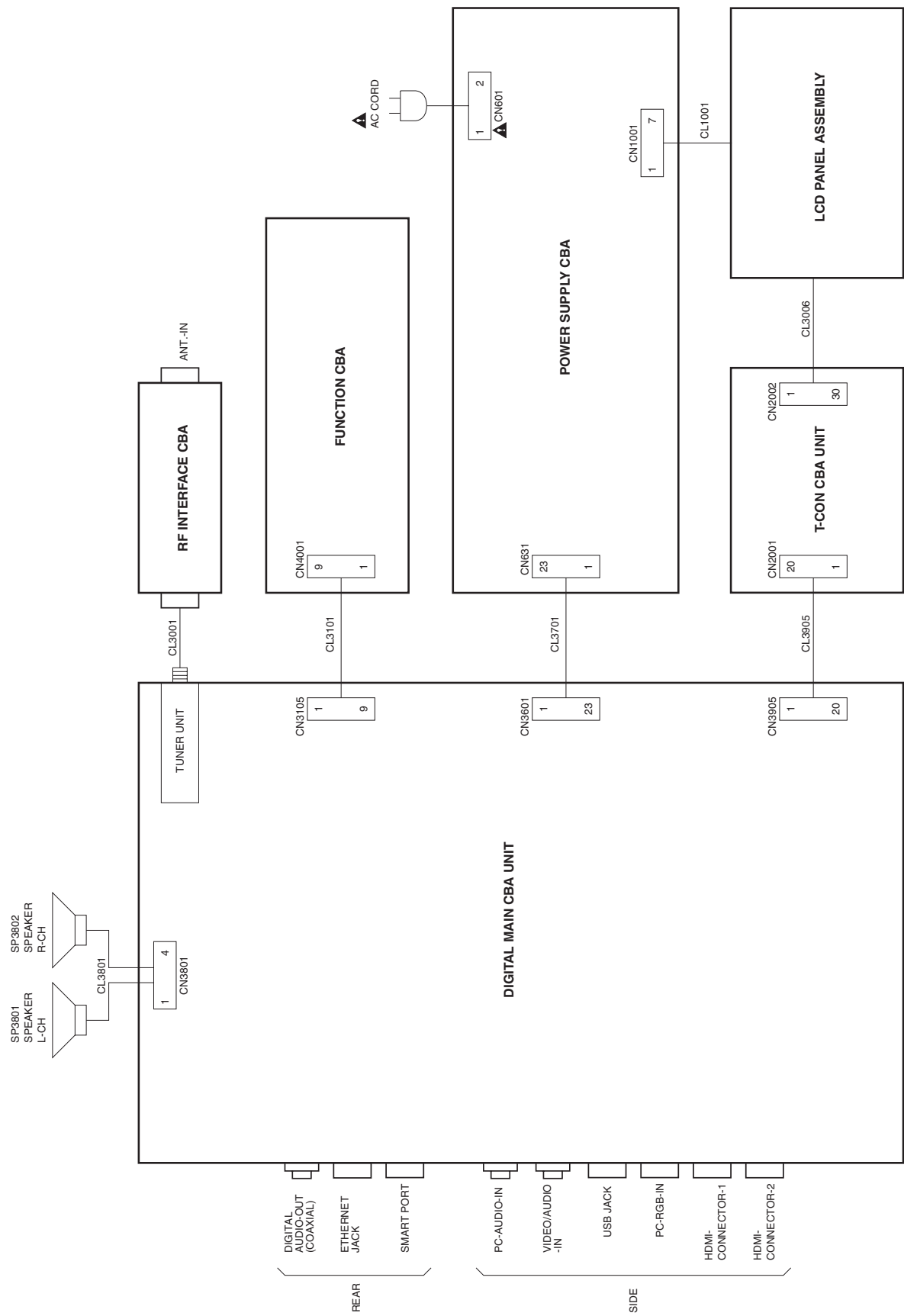


RF Interface CBA Bottom View

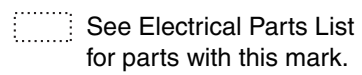


BA21FYF01051

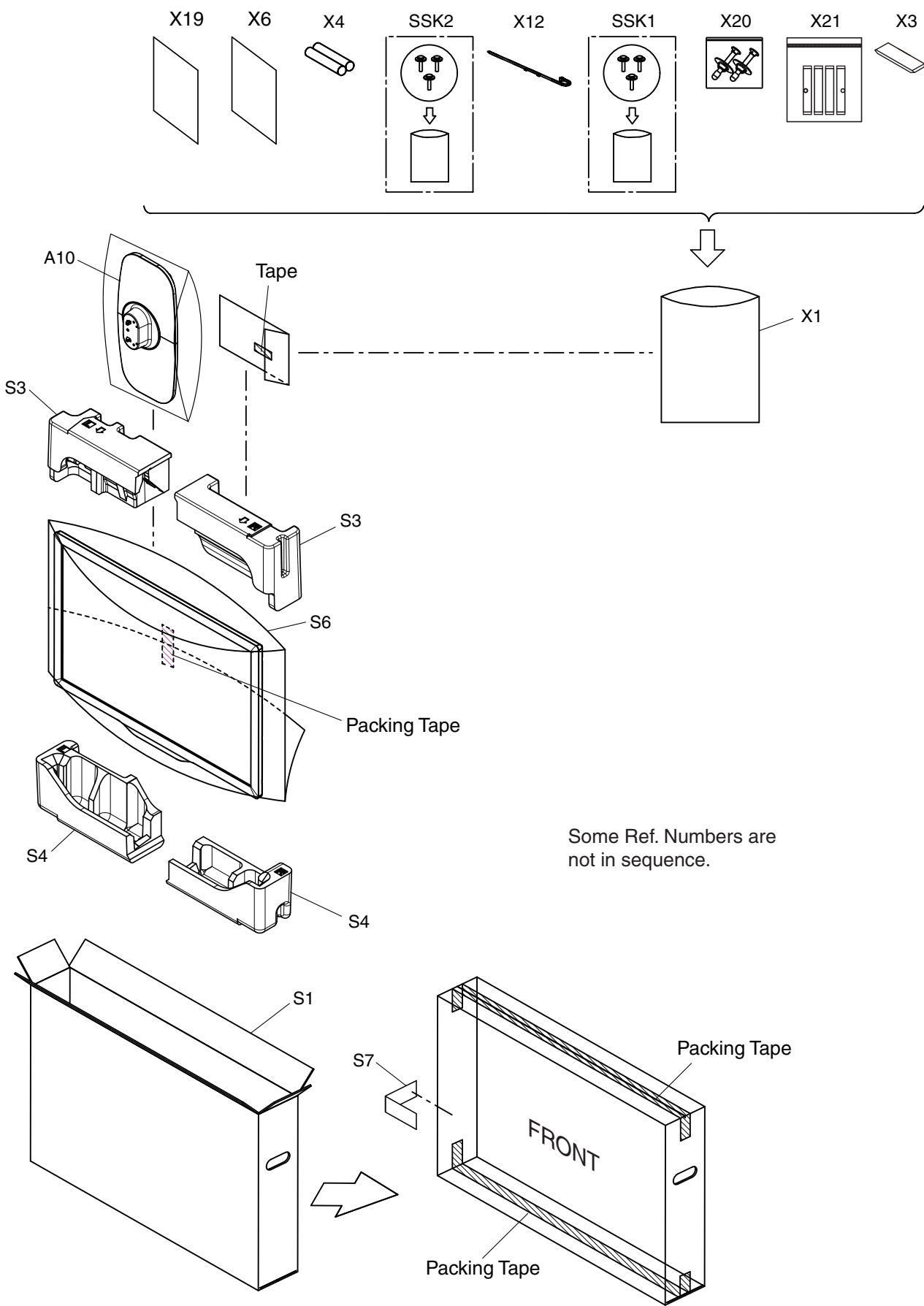
WIRING DIAGRAM



Cabinet




Packing



PARTS LIST [32HFL4663D/F7 (Serial No.: DS1)]


Mechanical Parts

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.
X12	CABLE MANAGEMENT TIE(BLACK) A01F2UH	1EM431197
X19	WARRANTY SHEET A17FZUH	1EMN29039
X20	SECURITY SCREW KIT A17FZUH	1EM332298
X21	SECURITY TAPE KIT A17FZUH	1EM332299

LCD PANEL ASSEMBLY

Ref. No.	Description	Part No.
LCD1 	LCD PANEL ASSEMBLY Consists of the following	U24F1P1
A1	FRONT CABINET A21F5UH	1EM028928
A2	REAR FRAME PAINT A21F0UH	1EM332238
CL1001	FFC 7PIN 7P/P1.0/470MM	WX1U24F0-F03
CL3006	FFC 30PIN 30P/P0.5/284MM	WX1A21FY-301
L4	SCREW P-TIGHT 3X12 BIND HEAD+ BLK	GBHP3120
L51	SCREW M3X4 M3X4 BIND+ (B-NI)	SBH33040
	LCD MODULE U24F0XH	-----

Ref. No.	Description	Part No.
A3	REAR COVER A21FYUH	1EM127986
A4	DECORATION PLATE A21F5UH	1EM227003
A10	32W STAND ASSEMBLY A17FZUH	1EM029953
A14	JACK HOLDER A21FXUH	1EM334520
A18 	RATING LABEL A21FYUH	-----
A20	LOGO LABEL A21FXUH	-----
A23	ENERGY GUIDE LABEL A21FYUH	-----
AC601 	AC CORD W/O A GND WIRE UL/CSA/3160/NO/BLACK	WAC312ZHN001
B9	STAND HOLDER A21F5UH	1EM028931A
B11	SENSOR PLATE A21F5UH	1EM437078
B14	SMART PCB HOLDER A21FXUH	1EM228150
B17	WALL MOUNT BRACKET A11N0UH	1EM434637
B18	WALL MOUNT COVER A2170UT	1EM332137
B24	STAND BRACKET A21F5UH	1EM226984
B26	HEAT SINK EAR ASSEMBLY A21FXUH	1EM439866
CL3001	JACK COMPOUND ANT RCA WIRE G9851HA007-003	JZAA01WET001
CL3101	FFC WIRE ASSEMBLY 9PIN 9PIN/WHITE/ 143MM	WX1A21F0-111
CL3701	FFC WIRE ASSEMBLY 23PIN 23PIN/WHITE/ 55MM	WX1A27F0-101
CL3801	WIRE ASSEMBLY 4PIN 4PIN/341MM&36MM	WX1A21F5-302
CL3905	WIRE ASSEMBLY 20PIN 20PIN/210MM	WX1A21FY-201
L4	SCREW P-TIGHT 3X12 BIND HEAD+ BLK	GBHP3120
L13	SCREW S-TIGHT M3X6 BIND HEAD+	GBJS3060
L14	S-TIGHT SCREW M3X6 BIND HEAD+BLACK	GBHS3060
L17	SCREW S-TIGHT M3X8 BIND HEAD+	GBHS3080
L32	DOUBLE SEMS SCREW M4X10 + BLK	FPH34100
SP3801	SPEAKER MAGNETIC 8Ω/10W S0313F17	DS08100XQ001
SP3802	SPEAKER MAGNETIC 8Ω/10W S0313F17	DS08100XQ001
SSK1	STAND SCREW KIT A21F5UH(DOUBLE SEMS SCREW M4X14 + BLK)	1ESA31176
SSK2	STAND SCREW KIT(SECURITY) A21FZUH(SECURITY SCREW M4X14 A17FZUH)	1ESA32125
TH3101	THERMAL SHEET TMS-14-10 15X15HC	XK10000X4020
PACKING		
S1	CARTON A21FXUH	1EM439865
S3	STYROFOAM TOP A21FZUH	1EM029406
S4	STYROFOAM BOTTOM A21FZUH	1EM029407
S6	SET BAG A21F5UH	1EM334727
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 A21FYUH	1EMN30350

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	A21FYMMA-001

T-CON CBA UNIT

Ref. No.	Description	Part No.
	T-CON CBA UNIT	A21FXTCN-001

POWER SUPPLY CBA

Ref. No.	Description	Part No.
	POWER SUPPLY CBA Consists of the following	A21FXMPW-001
CAPACITORS		
C501	CHIP CERAMIC CAP.(1608) F Z 0.1µF/50V	CHD1JZ30F104
C602▲	SAFTY CAP. 1000pF/250V KX	CA2E102MR101
C603▲	SAFTY CAP. 1000pF/250V KX	CA2E102MR101
C604▲	CAP METALLIZED FILM 0.22µF/275V/K	CTA224PKR001
C605	ELECTROLYTIC CAP. 220µF/200V/M/105	CV9E221M02D1
C606	CERAMIC CAP. 820pF/2kV	CA3D821PAN04
C607	CHIP CERAMIC CAP. B K 1200pF/50V	CHD1JK30B122
C608	CHIP CERAMIC CAP. B K 0.039µF/50V	CHD1JK30B393
C609▲	CHIP CER. BK 0.082µF/50V	CHD1JK30B823
C610	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C614▲	CAP METALLIZED FILM 0.22µF/275V/K	CTA224PKR001
C616▲	SAFTY CAP. 1000pF/250V KX	CA2E102MR101
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. 1000µF/16V M(105C)	CE1CMASTH102
C655	ELECTROLYTIC CAP. 1000µF/16V M(105C)	CE1CMASTH102
C656	ELECTROLYTIC CAP. 1µF/50V M(105C)	CE1JMASTH1R0
C657	ELECTROLYTIC CAP. 1000µF/16V M(105C)	CE1CMASTH102
C660	CHIP CERAMIC CAP.(1608) B K 0.1µF/50V	CHD1JK30B104
C1001	ELECTROLYTIC CAP. 470µF/25V M(105C)	CE1EMASTH471
C1003	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1004	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105

Ref. No.	Description	Part No.
C1006	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1007	CERAMIC CAP. 220pF/1kV	CCD3AKNOB221
C1008	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1009	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1010	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1011	ELECTROLYTIC CAP SK100M470YZZP50R	CE2AMASTH470
C1012	CHIP CERAMIC CAP.(3216) X7R K 1.0µF/100V	CA2A105MR080
C1014	CHIP CERAMIC CAP.(1608) B K 1000pF/50V	CHD1JK30B102
C1016	CHIP CERAMIC CAP.(1608) B K 1µF/25V	CHD1EK30B105
C1017	CHIP CERAMIC CAP.(1608) F Z 0.1µF/50V	CHD1JZ30F104
C1019	CHIP CERAMIC CAP.(1608) B K 4.7µF/6.3V	CHD0KK30B475
CONNECTORS		
CN601▲	CONNECTOR S2P3-VH (LF)(SN)	JCVHC02JG002
CN631	FFC CONNECTOR IMSA-9615S-23A-PP-A	JC96J23ER007
CN1001	FPC/FFC CONNECTOR IMSA-9615S-07A-PP-A	JC96J07ER007
DIODES		
D102A	DIODE SWITCHING HSC119 TRF -E	QD1Z00HSC119
D401	DIODE SWITCHING HSC119 TRF -E	QD1Z00HSC119
D402	ZENER DIODE SMD TFZGTR24B	QD1B000TFZ24
D501A	ZENER DIODE EDZTE61 33B	QD1B000EDZ33
D502A	ZENER DIODE EDZTE61 30B	QD1B000EDZ30
D601	DIODE 1N5406BH	NDL1001N5406
D602	DIODE 1N5406BH	NDL1001N5406
D603	DIODE 1N5406BH	NDL1001N5406
D604	DIODE 1N5406BH	NDL1001N5406
D605	ZENER DIODE MM5Z4V3B	ND1BMM5Z4V3B
D607A▲	ZENER DIODE PTZTE2527B	QD1B000PTZ27
D608▲	DIODE ZENER 1ZB36BB	NDWZ0001ZB36
D609A▲	DIODE SWITCHING HSC119 TRF -E	QD1Z00HSC119
D610	DIODE SWITCHING HSC119 TRF -E	QD1Z00HSC119
D650	DIODE SCHOTTKY SB3150BH	NDWZ00SB3150
D651	DIODE SCHOTTKY SB3150BH	NDWZ00SB3150
D652	ZENER DIODE PTZTE2527B	QD1B000PTZ27
D653	DIODE SHOTTKY SB3200BR	NDWZ3200D027
D654A▲	ZENER DIODE PTZTE2520B	QD1B000PTZ20
D655	DIODE SHOTTKY SB3200BR	NDWZ3200D027
D656	DIODE FAST RECOVERY RS1BJTB	ND1Z0RS1BJTB
D657	ZENER DIODE MM5Z5V6B	ND1BMM5Z5V6B
D660	IC SHUNT REGULATOR SL431A-AT	NSZBA0TAUK01
D661	DIODE ZENER SMD PZU5.6B2.115	ND1200PZU5R6
D1001	DIODE SCHOTTKY SMD SK210TD	ND1Z0SK210TD
ICS		
IC601▲	IC PHOTOCOUPLER TLP781F(D4-FUNBLL F)	QPEL781FBLLF
IC1001▲	IC LED BACKLIGHT CONTROLLER HA7209PC /SOP /24PIN	NSCA0T00H003
COILS		
L601▲	COIL LINE FILTER JLB20154/18MH	LLEG0Z0XB022
L602▲	COIL LINE FILTER JLB20154/18MH	LLEG0Z0XB022
L1001	POWER INDUCTORS CWKBNP-220K	LLF2200KV002
TRANSISTORS		
Q501▲	FET MOS TK3P50D RQ(S)	QF2Z0TK3P50D
Q601▲	FET MOS TK8A50D(LS1FND3 QM	QEE1TK8A50DM
Q602▲	TRANSISTOR 2SC2120-Y(T2E F T)	QQSY2SC2120F
Q650	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q652	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q653	CHIP TRANSISTOR KTC3875S-Y-RTK/P	NQ1YKTC3875S
Q1001▲	FET MOS SMD AP18T10AGH-HF	NF2Z18T10AGH
RESISTORS		
R401	RES CHIP 1608 1/10W J 8.2k Ω	RRXA822HI013

Ref. No.	Description	Part No.
R402	RES CHIP 1608 1/10W J 3.0k Ω	RRXA302HH013
R501▲	METAL OXIDE FILM RES. 2W J 47 Ω	RN02470ZU001
R502	RES CHIP 1608 1/10W J 1.5M Ω	RRXA155HH013
R601▲	RES. CARBON FILM J 1/2W J 1.2M Ω	RCX2125T1003
R602	RES CEMENT 5W/J1.2 Ω	RWJ1R2PAK007
R603	RES CHIP 3216 1/4W J 330k Ω	RRX4334HH034
R604	RES CHIP 3216 1/4W J 330k Ω	RRX4334HH034
R605	RES CHIP 3216 1/4W J 330k Ω	RRX4334HH034
R606	RES CHIP 3216 1/4W J 270 Ω	RRX4271HH034
R607	RES CHIP 3216 1/4W J 270 Ω	RRX4271HH034
R608	RES CHIP 3216 1/4W J 1.5k Ω	RRX4152HH034
R611▲	METAL OXIDE RES. 2W J 0.36 Ω	RN02R36ZU001
R612	RES CHIP 3216 1/4W J 2.2k Ω	RRX4222HH034
R613	RES CHIP 3216 1/4W J 220 Ω	RRX4221HH034
R614	RES CHIP 3216 1/4W J 330k Ω	RRX4334HH034
R650	RES CHIP 3216 1/4W J 5.6k Ω	RRX4562HH034
R651▲	RES CHIP 1608 1/10W J 1.0 Ω	RRXA1R0HH013
R652	RES CHIP 1608 1/10W F 30.0k Ω	RTW3002HH008
R653	RES CHIP 1608 1/10W F 22.0k Ω	RTW2202HH008
R654	RES CHIP 3216 1/4W J 180 Ω	RRX4181HH034
R655	RES CHIP 3216 1/4W J 180 Ω	RRX4181HH034
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 1608 1/10W J 47k Ω	RRXA473HH013
R664	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R665	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R668	RES CHIP 1608 1/10W J 22k Ω	RRXA223HH013
R669	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R677	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R678	RES CHIP 3216 1/4W J 5.6k Ω	RRX4562HH034
R1001	RES CHIP 1608 1/10W J 10 Ω	RRXA100HH013
R1002	RES CHIP 1608 1/10W J 200 Ω	RRXA201HH013
R1003▲	METAL OXIDE RES. 1W J 0.18 Ω	RN01R18ZU001
R1004	RES CHIP 1608 1/10W F 560k Ω	RTW5603HH008
R1005	RES CHIP 1608 1/10W F 200k Ω	RTW2003HH008
R1006	RES CHIP 1608 1/10W F 27.0k Ω	RTW2702HH008
R1007	RES CHIP 1608 1/10W F 100k Ω	RTW1003HH008
R1008	RES CHIP 1608 1/10W F 360 Ω	RTW3600HH008
R1009	RES CHIP 1608 1/10W F 8.20k Ω	RTW8201HH008
R1010	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1011	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1012	RES CHIP 1608 1/10W F 100 Ω	RTW1000HH008
R1014	RES CHIP 1608 1/10W J 240 Ω	RRXA241HH013
R1015	RES CHIP 1608 1/10W J 240 Ω	RRXA241HH013
R1016	RES CHIP 1608 1/10W J 10k Ω	RRXA103HH013
R1017	RES CHIP 1608 1/10W J 100k Ω	RRXA104HH013
R1018	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1020	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1021	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1502	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
R1503	RES CHIP 1608 1/10W 0 Ω	RRXA000HH014
MISCELLANEOUS		
B3	HEAT SINK PNI A11N5UH	1EM435557
BC601	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC602	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC603	BEADS INDUCTOR FBR07HA121SB-00	LLBF00STU030
BC1002	WIRE CP STP-S-0.50	XZ40F0REN001
F601▲	FUSE STC4A125V U/CT	PAGE20CW3402
FH601	FUSE HOLDER MSF-015-RS-SN (B110)	XH001Z0LY001

Ref. No.	Description	Part No.
FH602	FUSE HOLDER MSF-015-RS-SN (B110)	XH001Z0LY001
JS632	WIRE CP STP-S-0.50	XZ40F0REN001
L23	SCREW B-TIGHT D3X8 BIND HEAD+	GBJB3080
SA601▲	SURGE ABSORBER 470V+-10PER	NVQZ10D471KB
T601▲	TRANS POWER T021269-8	LTT2PCCPT007

FUNCTION CBA

Ref. No.	Description	Part No.
	FUNCTION CBA Consists of the following	A21FZMSW-001
CAPACITORS		
C4001	CHIP CERAMIC CAP.(1005) B K 1 μ F/6.3V	CHB0KK30B105
C4002	CHIP CERAMIC CAP.(1005) B K 2200pF/50V	CHB1JK30B222
C4051	CHIP CERAMIC CAP.(2125) B K 10 μ F/6.3V	CHE0KK30B106
C4052	CHIP CERAMIC CAP.(1005) B K 1000pF/50V	CHB1JK30B102
C4053	CHIP CERAMIC CAP.(1005) F Z 0.1 μ F/16V	CHB1CZ30F104
C4054	CHIP CERAMIC CAP.(1005) F Z 0.1 μ F/16V	CHB1CZ30F104
C4056	CHIP CERAMIC CAP.(2125) B K 10 μ F/6.3V	CHE0KK30B106
CONNECTOR		
CN4001	FFC CONNECTOR 9P 9611S-09Y916	JC96D09ER014
DIODES		
D4001	ZENER DIODE MM5Z5V6B	ND1BMM5Z5V6B
D4003	ZENER DIODE MM5Z5V6B	ND1BMM5Z5V6B
D4004	ZENER DIODE MM5Z5V6B	ND1BMM5Z5V6B
D4051	LED WHITE SMD SML813WBC8W1	QP1Z13WBC8W1
IC		
IC4001	IC TOUCH SENSOR MICON CY8C20336A-24LQXIT	NSCB0T0TY063
RESISTORS		
R4001	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4002	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4003	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4004	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4005	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4006	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4007	CHIP RES. 1/16W J 560 Ω	RRXG561HH004
R4008	RES CHIP 1005 1/16W J 18k Ω	RRXG183HH004
R4009	CHIP RES.(1005) 1/16W J 8.2k Ω	RRXG822HH004
R4010	CHIP RES. 1/16W J 4.7k Ω	RRXG472HH004
R4011	CHIP RES.(1005) 1/16W J 2.7k Ω	RRXG272HH004
R4012	CHIP RES.(1005) 1/16W J 2.2k Ω	RRXG222HH004
R4013	CHIP RES.(1005) 1/16W J 100 Ω	RRXG101HH004
R4014	CHIP RES.(1005) 1/16W J 2.2k Ω	RRXG222HH004
R4021	CHIP RES. 1/16W J 10 Ω	RRXG100HH004
R4022	CHIP RES. 1/16W J 10 Ω	RRXG100HH004
R4051	CHIP RES. 1/16W J 56 Ω	RRXG560HH004
R4052	RES CHIP 1005 1/16W J 6.8k Ω	RRXG682HH004
R4053	CHIP RES.(1005) 1/16W J 2.2k Ω	RRXG222HH004
R4054	CHIP RES.(1005) 1/16W J 1k Ω	RRXG102HH004
R4062	CHIP RES.(1005) 1/16W 0 Ω	RRXG000HH005
MISCELLANEOUS		
RS4051	SENSOR REMOTE RECEIVER GP1USC32XP	USEJRS0SH004

RF INTERFACE CBA

Ref. No.	Description	Part No.
	RF INTERFACE CBA Consists of the following	A21FYM1F-001
MISCELLANEOUS		
JK2501	JACK ANT PCB J FNF-001	JXAJ01LND001
JK2503	JACK RCA PCB L FNAV-001	JXRL01LND001