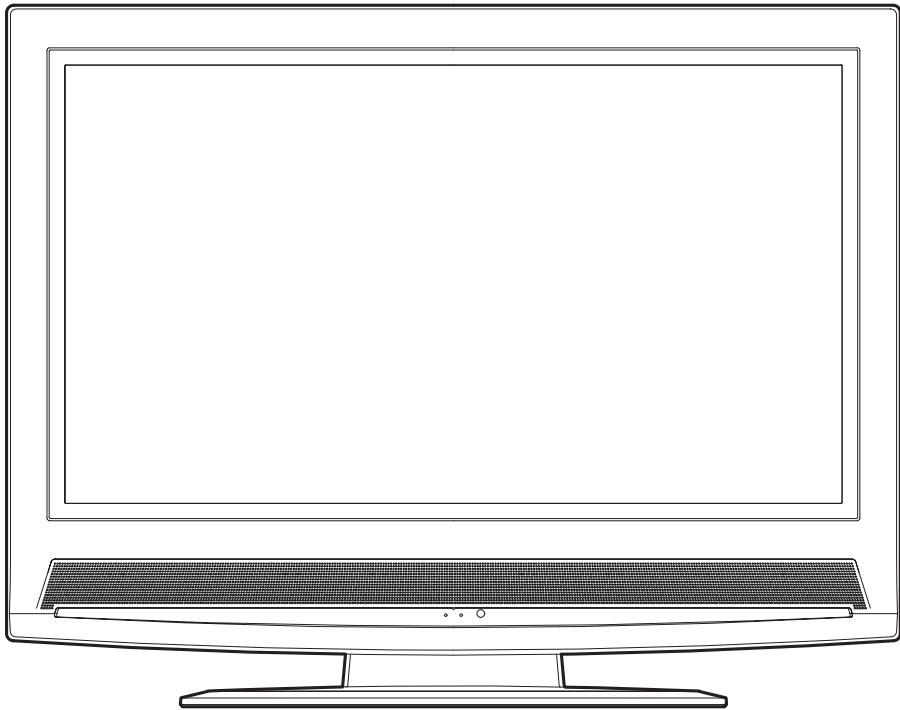




# SERVICE MANUAL

**32" COLOR LCD TELEVISION  
LC5-D32BB**



# **32" COLOR LCD TELEVISION**

## **LC5-D32BB**

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**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.**

# SPECIFICATIONS

## < TUNER >

ANT. Input ----- 75 ohm Unbal., F type  
 Intermediate Freq. ----- Picture 45.75 MHz, Sound 41.25 MHz

Description	Condition	Unit	Nominal	Limit
1. Video S/N	80dB	dB	45	>43
2. Audio S/N	RF	dB	---	>45

## < LCD PANEL >

Description	Condition	Unit	Nominal	Limit
1. Number of Pixels	Horizontal Vertical	pixels pixels	1366x 3 768	---
2. Viewing Angle	Horizontal Vertical	° °	-85 to 85 -85 to 85	---

## < VIDEO >

Description	Condition	Unit	Nominal	Limit
1. Over Scan	Horizontal Vertical	% %	5 5	---
2. Color Temperature	AT 70% WHITE FIELD x y	°K	12000 0.272 0.278	--- ±0.03 ±0.03
3. Resolution	Horizontal Vertical	line line	400 350	---
4. Brightness	AT 100% WHITE FIELD BRT/CNT MAX	cd/m <sup>2</sup>	450	---

## < AUDIO >

All items are measured across 8 Ω load at speaker output terminal.

Description	Condition	Unit	Nominal	Limit
1. Audio Output Power	10% THD: Lch/Rch	W	5.0/5.0	4.5/4.5
2. Audio Distortion	500mW: Lch/Rch	%	1.0/1.0	4.0/4.0
3. Audio Freq. Response	-6dB: Lch -6dB: Rch	Hz Hz	100 to 12 k 100 to 12 k	---
4. Audio S/N	VIDEO 1	dB	---	>45/45

**Note:** Nominal specifications represent the design specifications. All units should be able to approximate these. Some will exceed and some may drop slightly below these specifications. Limit specifications represent the absolute worst condition that still might be considered acceptable. In no case should a unit fail to meet limit specifications.

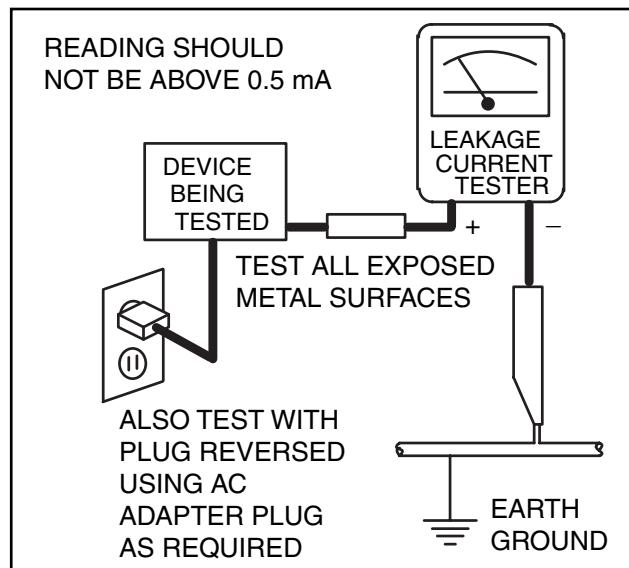
# IMPORTANT SAFETY PRECAUTIONS

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 LCD module 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 230 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 LCD module.
3. **Design Alteration Warning** - Do not alter or add to the mechanical or electrical design of this LCD 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 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	Clearance Distance ( $d$ ), ( $d'$ )
220 to 240 V	$\geq 3\text{mm}(d)$ $\geq 6\text{ mm}(d')$

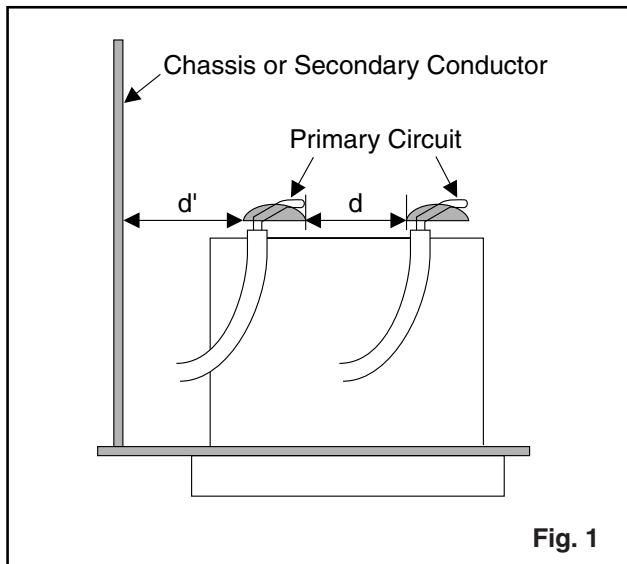
**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

### 2. Leakage Current Test

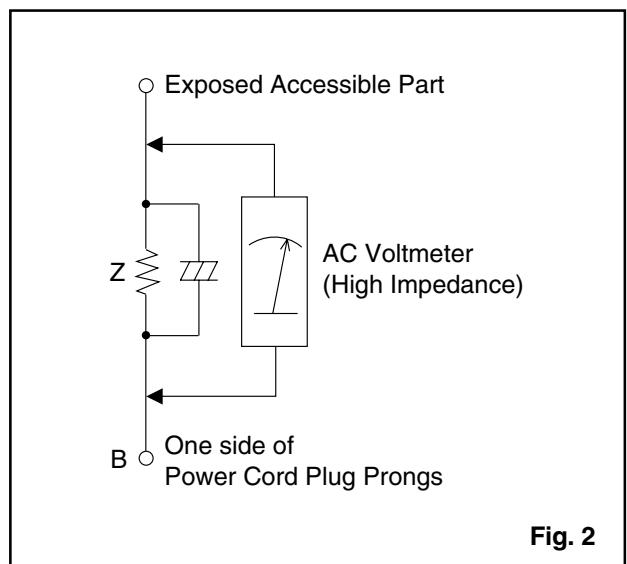
Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

#### 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. 1**



**Fig. 2**

**Table 2: Leakage current ratings for selected areas**

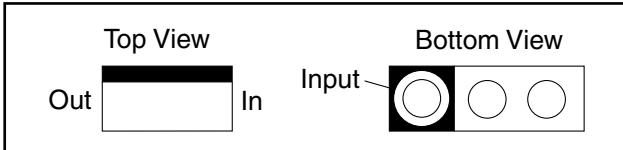
AC Line Voltage	Load Z	Leakage Current (i)	One side of power cord plug prongs (B) to:
220 to 240 V	2k $\Omega$ RES. Connected in parallel	i $\leq 0.7\text{mA}$ AC Peak i $\leq 2\text{mA}$ DC	RF or Antenna terminals
	50k $\Omega$ RES. Connected in parallel	i $\leq 0.7\text{mA}$ AC Peak i $\leq 2\text{mA}$ DC	A/V Input, Output

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

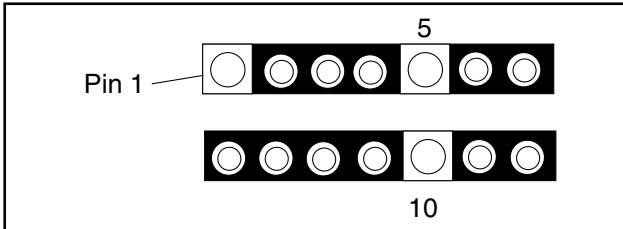
# STANDARD NOTES FOR SERVICING

## Circuit Board Indications

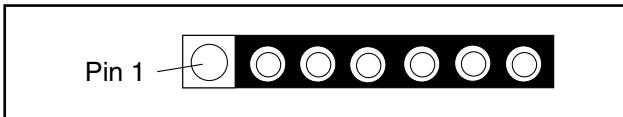
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



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

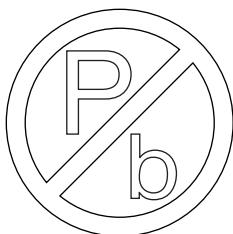


3. The 1st pin of every male connector is indicated as shown.



## 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)

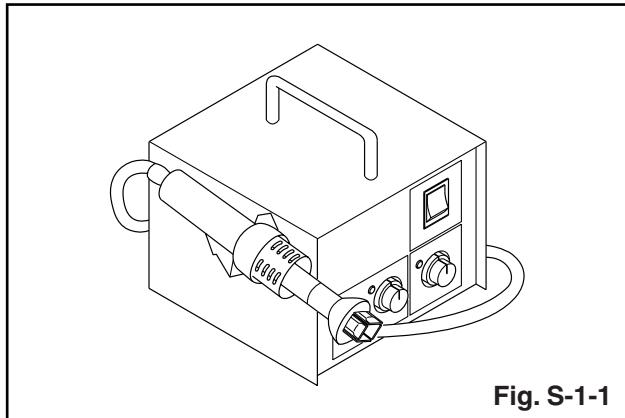


Fig. S-1-1

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.

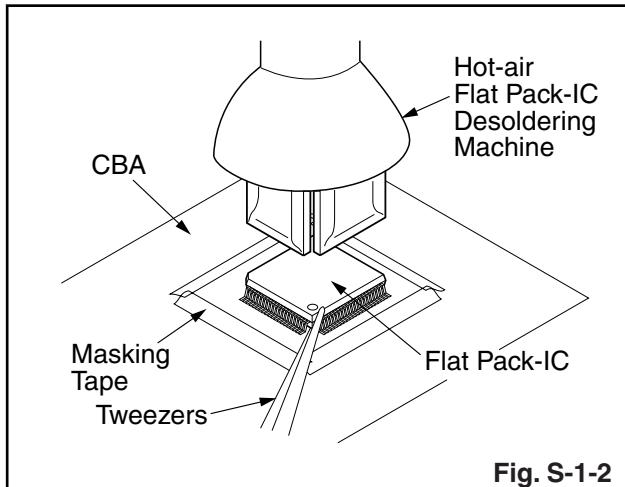
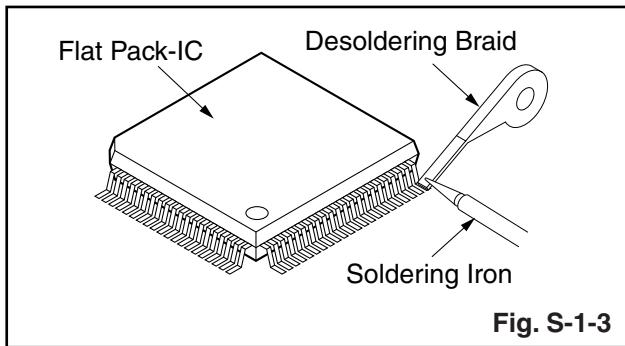


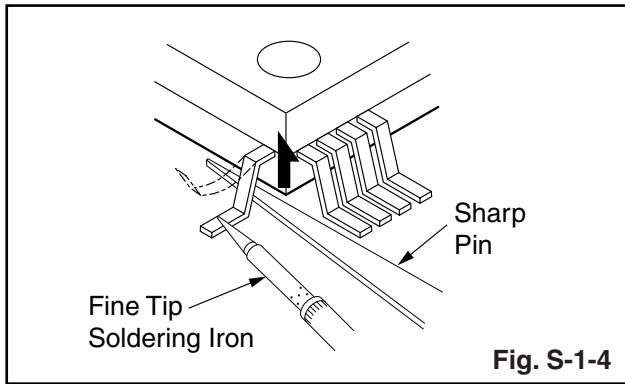
Fig. S-1-2

### 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)

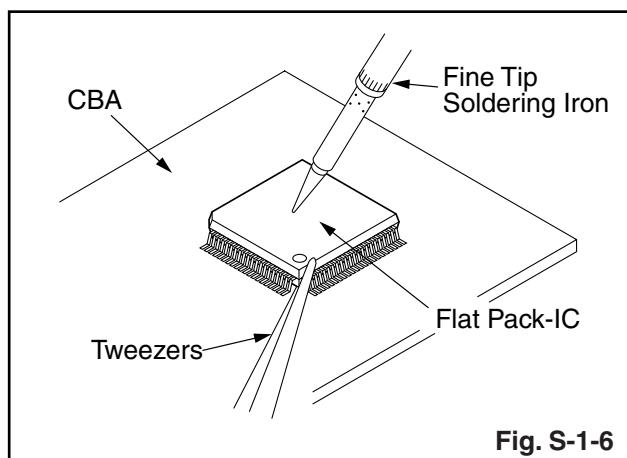
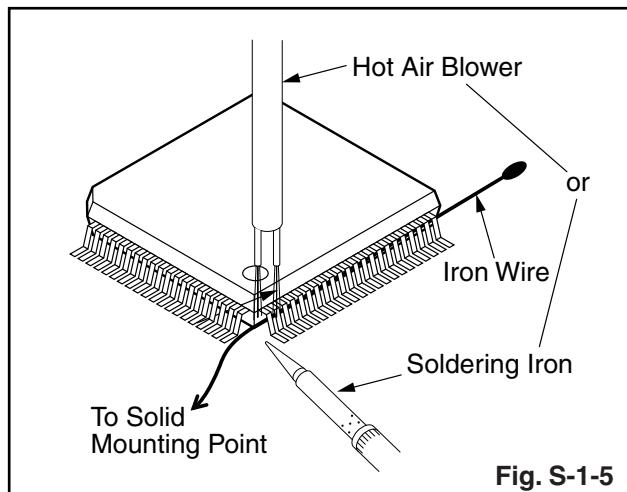


3. Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

### With Iron Wire:

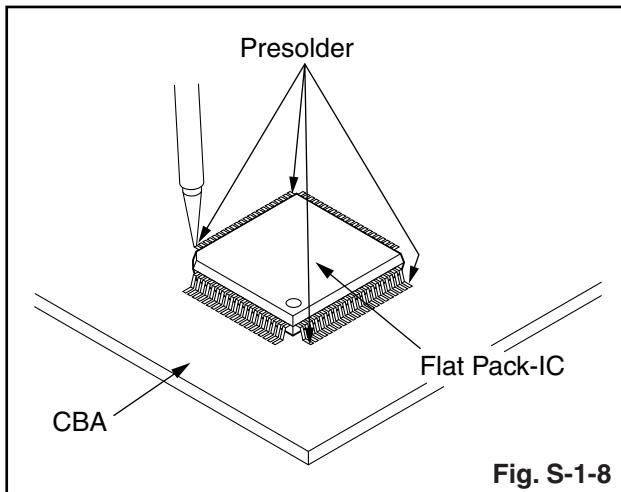
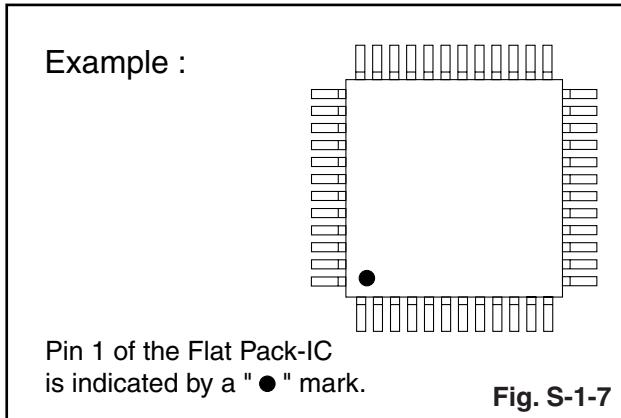
1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins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

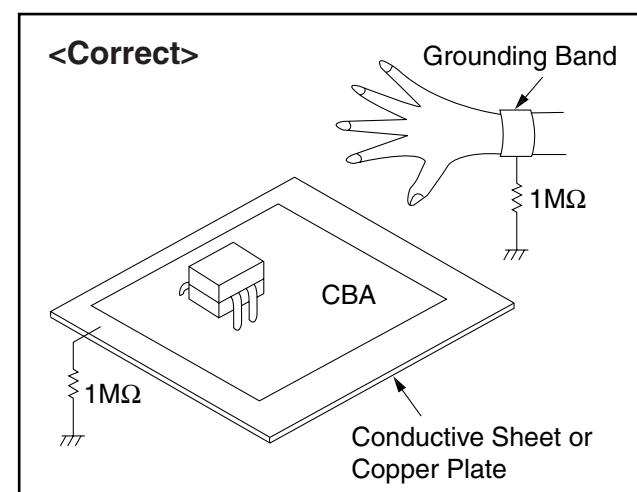
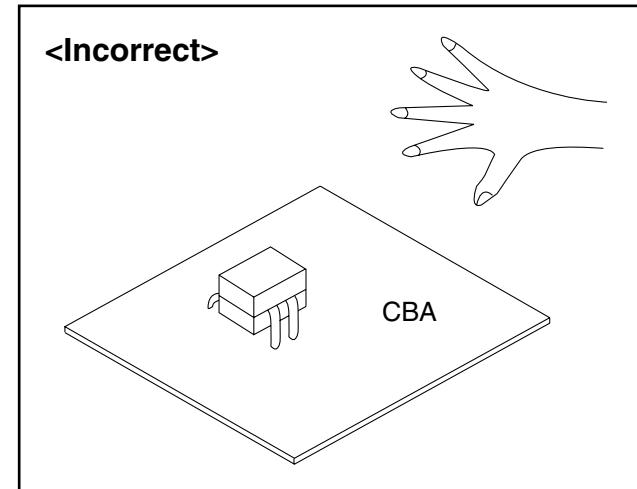
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

### 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

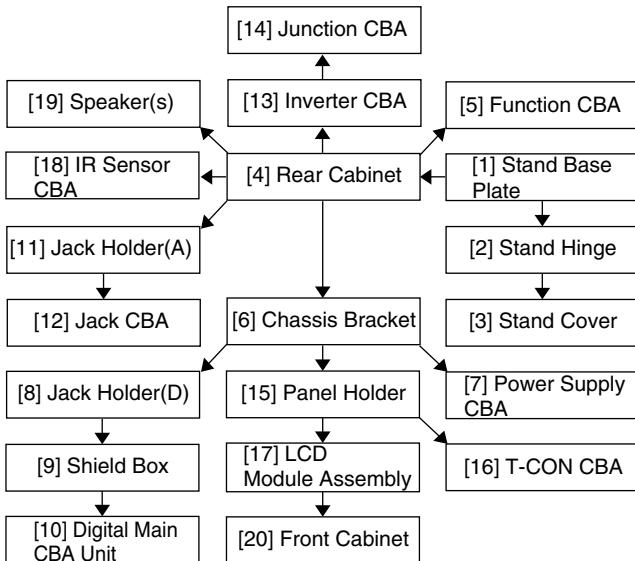
Be sure to place a conductive sheet or copper plate with proper grounding ( $1\text{ M}\Omega$ ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting 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 item(s) 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	Removal		
		Fig. No.	Remove/*Unhook/ Unlock/Release/ Unplug/Unclamp/ Desolder	Note
[1]	Stand Base Plate	D1	4(S-1), 6(S-2), 5(S-3)	---
[2]	Stand Hinge	D1	-----	---
[3]	Stand Cover	D1	-----	---
[4]	Rear Cabinet	D1	10(S-4), 4(S-5)	---
[5]	Function CBA	D1 D5	3(S-6), *CN3501	---
[6]	Chassis Bracket	D2	8(S-7)	---
[7]	Power Supply CBA	D2 D5	4(S-8), *CN501, *CN4501, *CN4502, *CN4503, *CN7001, *CLN51A	---
[8]	Jack Holder(D)	D2	(S-9), 2(S-10), 2(S-11)	---
[9]	Shield Box	D2	6(S-12), *CN3802, Shield Plate	---
[10]	Digital Main CBA Unit	D2 D5	*CN3302	---
[11]	Jack Holder(A)	D3	(S-13)	---

Step/ Loc. No.	Part	Removal		
		Fig. No.	Remove/*Unhook/ Unlock/Release/ Unplug/Unclamp/ Desolder	Note
[12]	Jack CBA	D3 D5	7(S-14)	---
[13]	Inverter CBA	D3 D5	7(S-15), *CN1050, *CN1100, *CN1150, *CN1200, *CN1250, *CN1300	---
[14]	Junction CBA	D3 D5	Desolder	---
[15]	Panel Holder	D3	8(S-16), 2(S-17)	---
[16]	T-CON CBA	D4 D5	6(S-18), Shield Plate, *CN9001, *CN9002, *CN9005	---
[17]	LCD Module Assembly	D4	6(S-19)	---
[18]	IR Sensor CBA	D4 D5	2(S-20) *CN801, *CN802	---
[19]	Speaker(s)	D4	8(S-21)	---
[20]	Front Cabinet	D4	-----	---

### 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.  
N = Nut, L = Locking Tab, S = Screw,  
CN = Connector  
\* = Unhook, Unlock, Release, Unplug, or Desolder  
e.g. 2(S-2) = two Screws (S-2),  
2(L-2) = two Locking Tabs (L-2)
- (5) Refer to the following "Reference Notes in the Table."

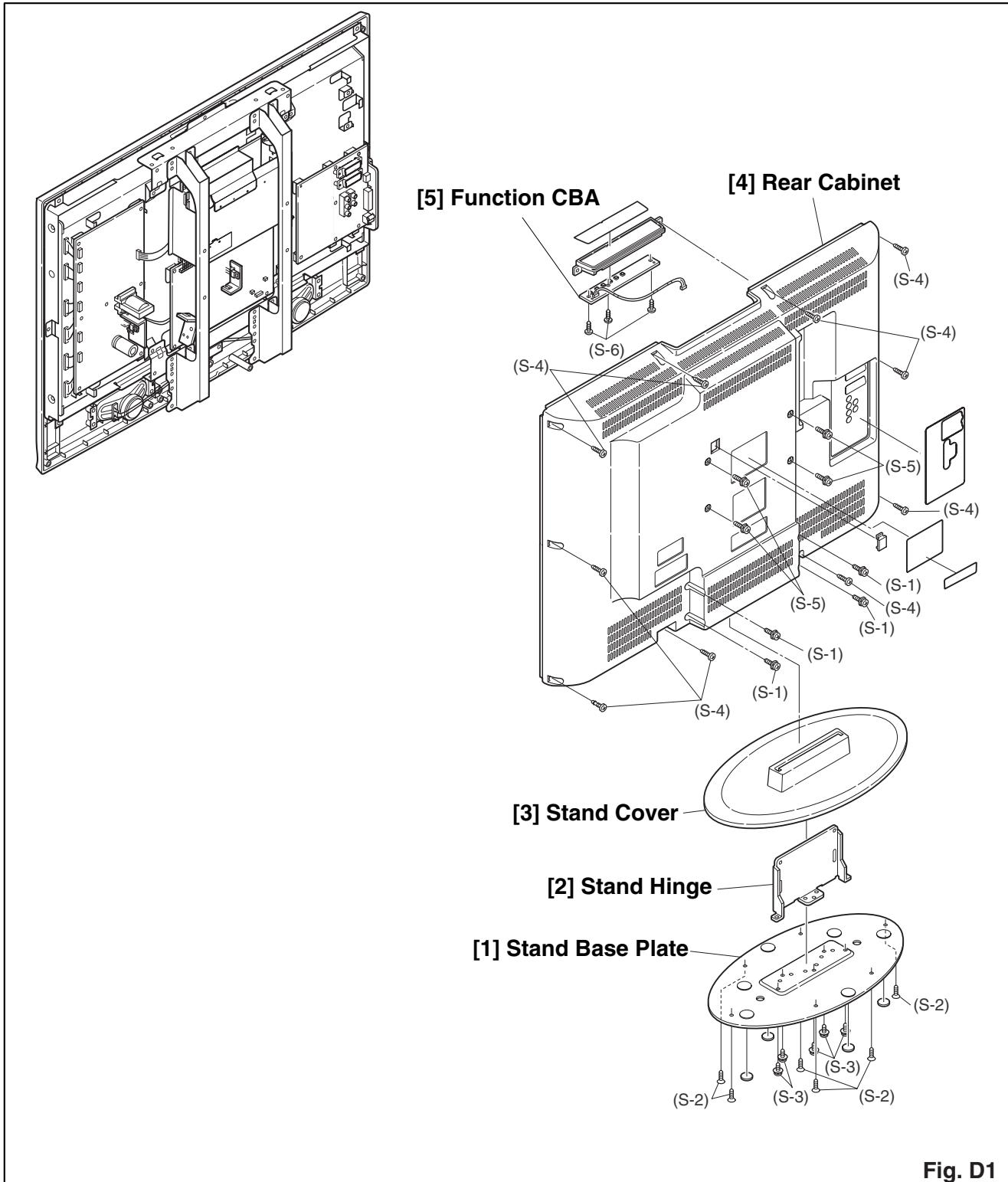


Fig. D1

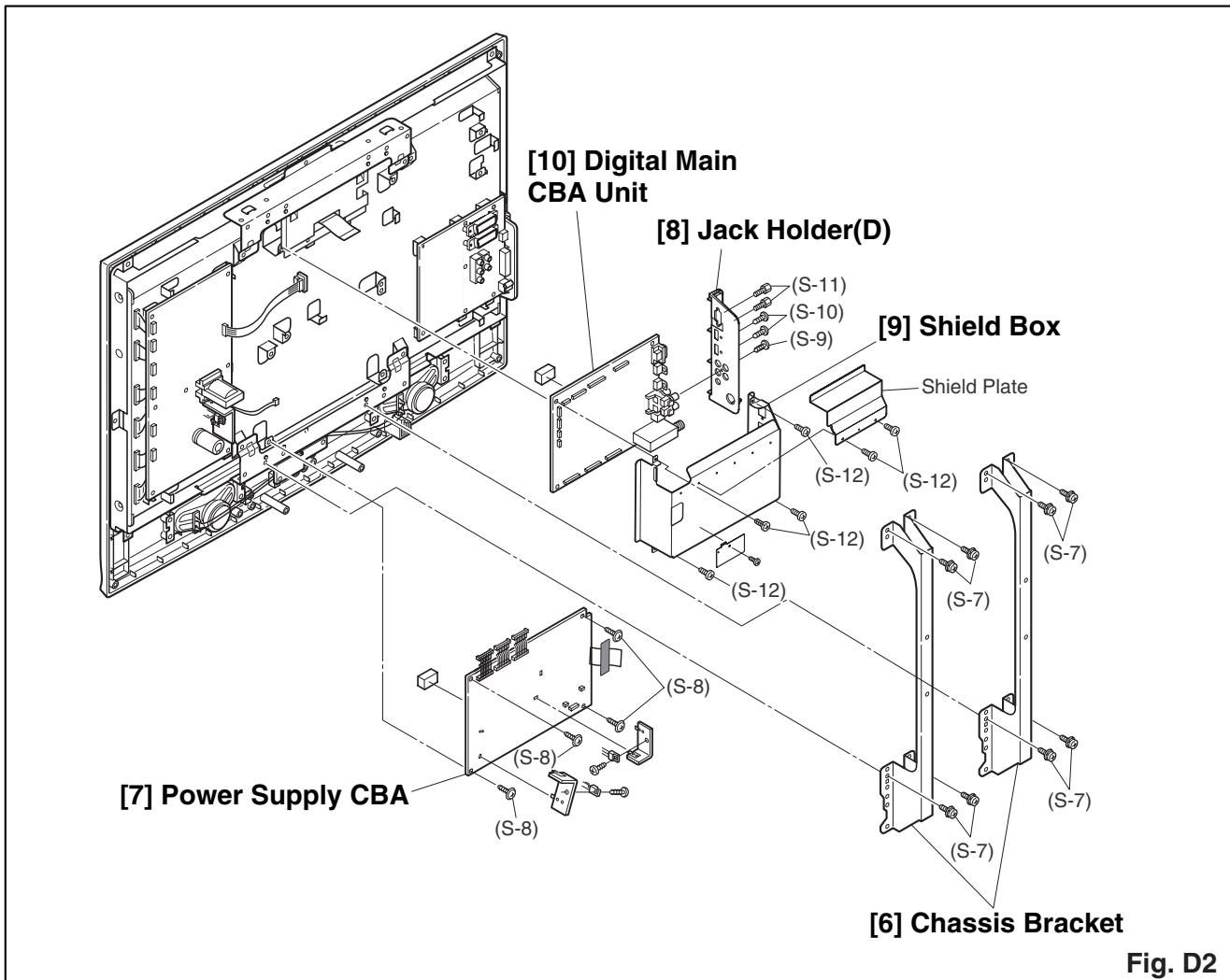


Fig. D2

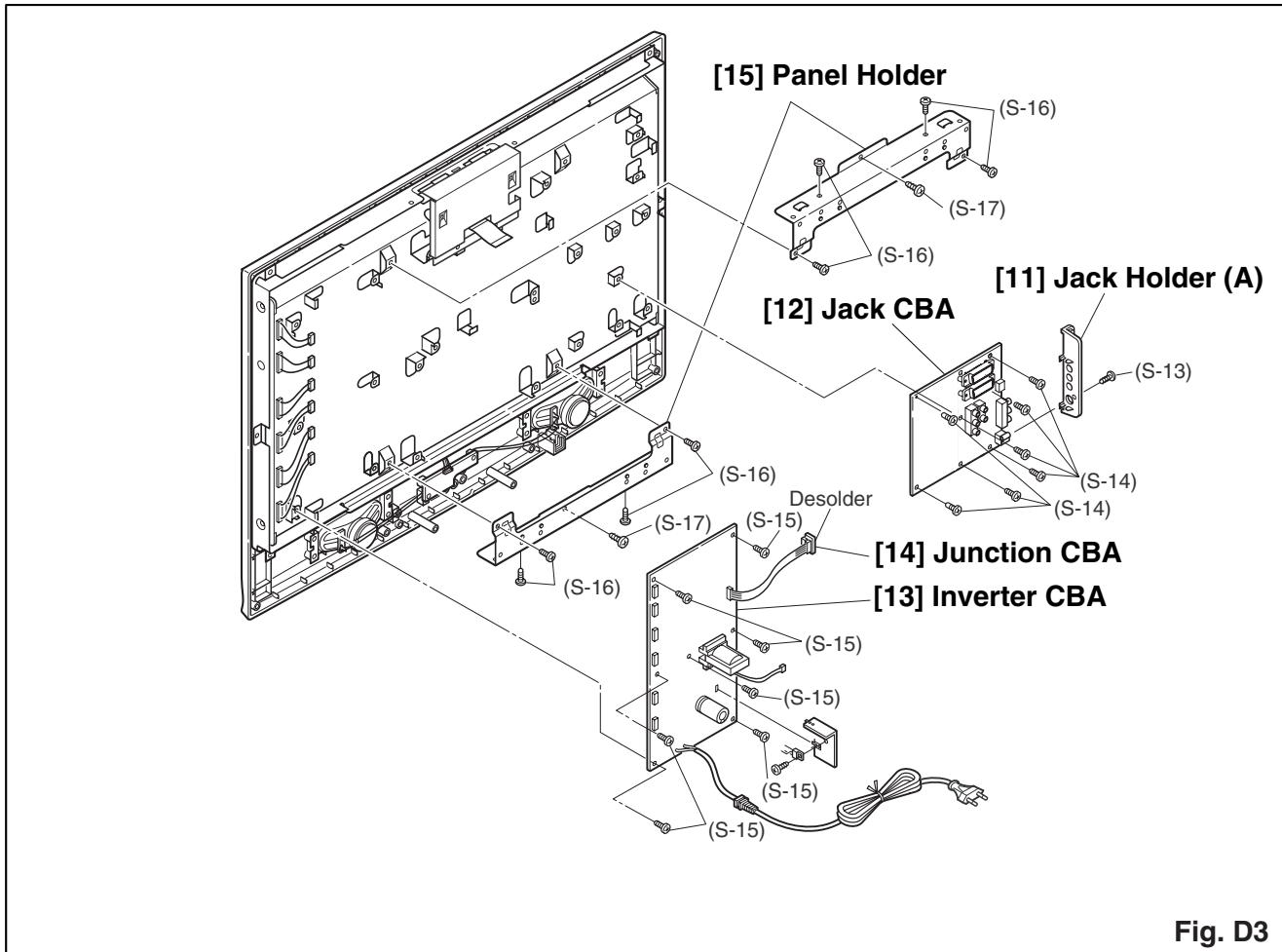


Fig. D3

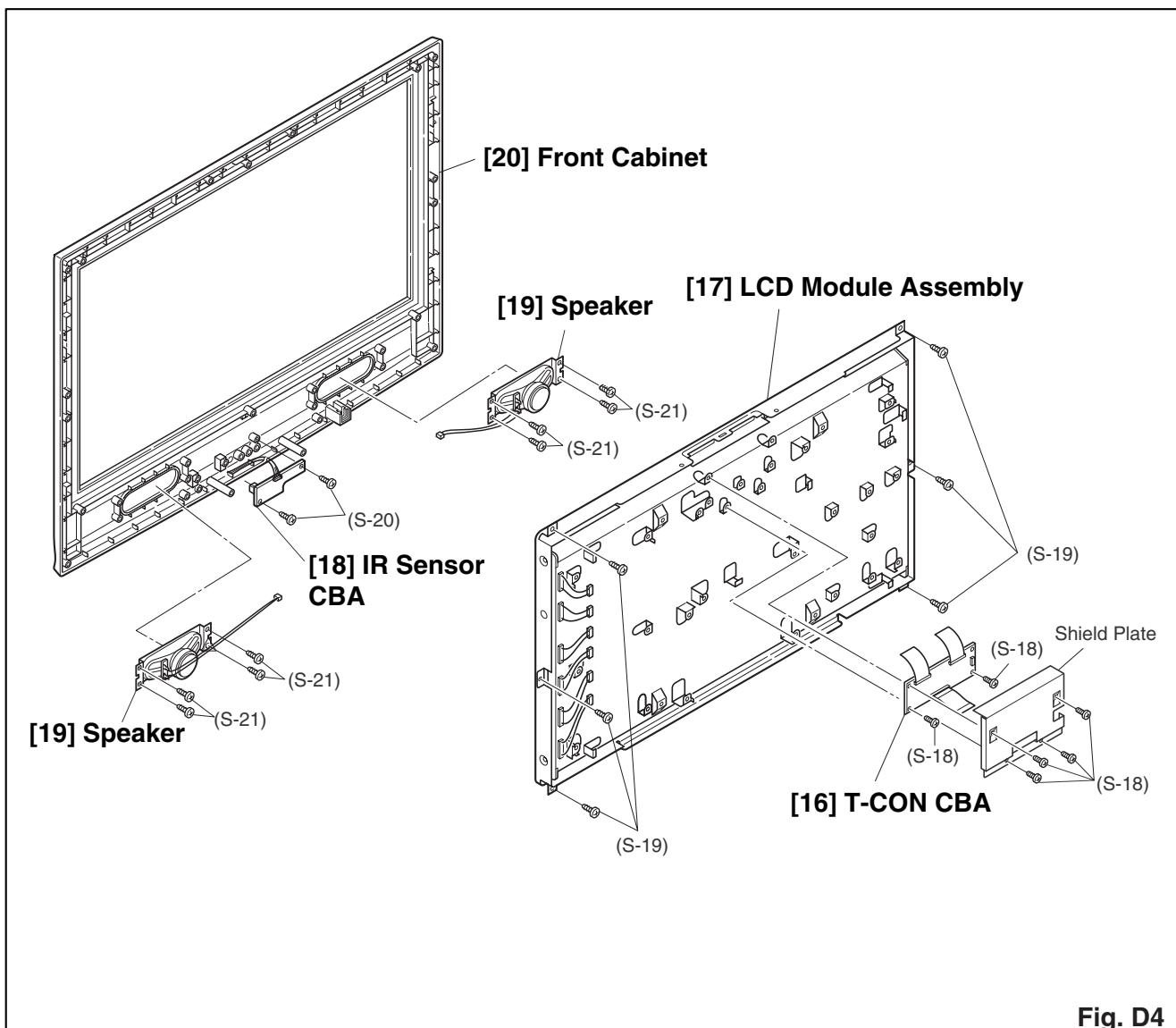


Fig. D4

## TV Cable Wiring Diagram

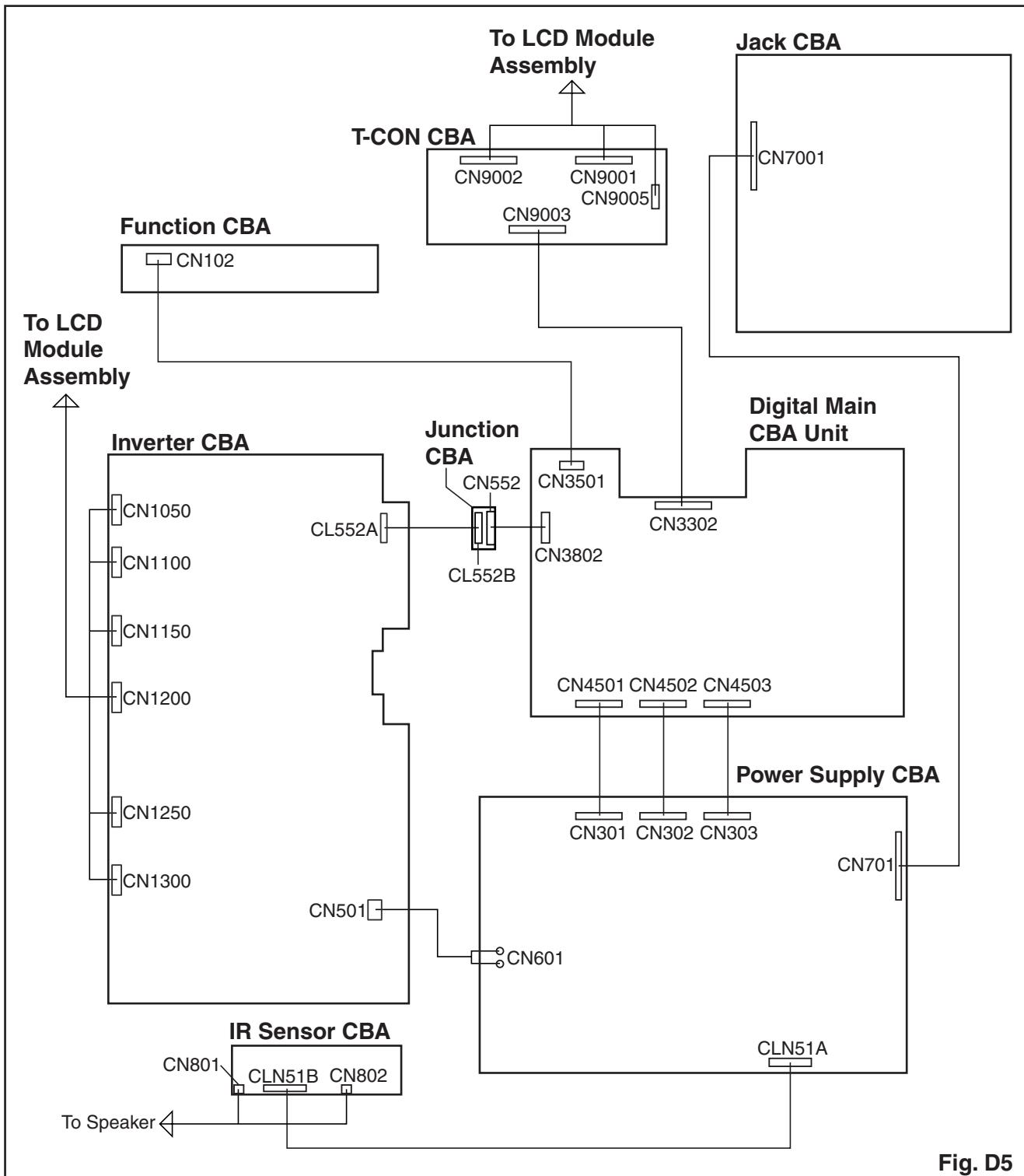


Fig. D5

# **HOW TO INITIALIZE THE LCD TELEVISION**

## **How to initialize the LCD television:**

1. Turn the power off.
2. To enter the service mode, while pressing [SETUP] button, press [STANDBY-ON] button on the TV unit.
  - To cancel the service mode, press [STANDBY-ON] button on the remote control.
3. Press [DISPLAY] button on the remote control unit to initialize the LCD television.
4. Confirm "FF" indication on the upper left of the screen.

# 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. DC Voltmeter
2. Pattern Generator
3. Color Analyzer

## How to Set up the Service mode:

1. Turn the power off.
2. While pressing [SETUP] button, press [STANDBY-ON] button on the TV unit
- To cancel the service mode, press [STANDBY-ON] button on the TV unit.

## 1. Initial Setting

### General

Enter the Service mode.

Set the each initial data as shown on table 1 below.

**Table 1: Initial Data**

ITEM	BUTTON (on the remote control)	DATA VALUE
PAL SECAM RF	BRT	124
	CNT	175
	CLR-R	140
	CLR-B	140
	SHR	112
	[SETUP(PAL SECAM NTSC)] → [1]	
PAL SECAM NTSC CVBS	BRT	125
	CNT	180
	CLR-R	125
	CLR-B	125
	TNT	128
	SHR	143
PAL SECAM NTSC YC	BRT	123
	CNT	200
	CLR-R	115
	CLR-B	115
	TNT	128
	SHR	125
PAL SECAM NTSC RGB	BRT	132
	CNT	150
	CLR-R	200
	CLR-B	200
	TNT	128
	SHR	125
YUV D1	BRT	125
	CNT	120
	CLR-R	130
	CLR-B	130
	TNT	128
	SHR	112
YUV D2	BRT	125
	CNT	120
	CLR-R	150
	CLR-B	150
	TNT	128
	SHR	125
YUV D3	BRT	122
	CNT	125
	CLR-R	155
	CLR-B	155
	TNT	128
	SHR	112

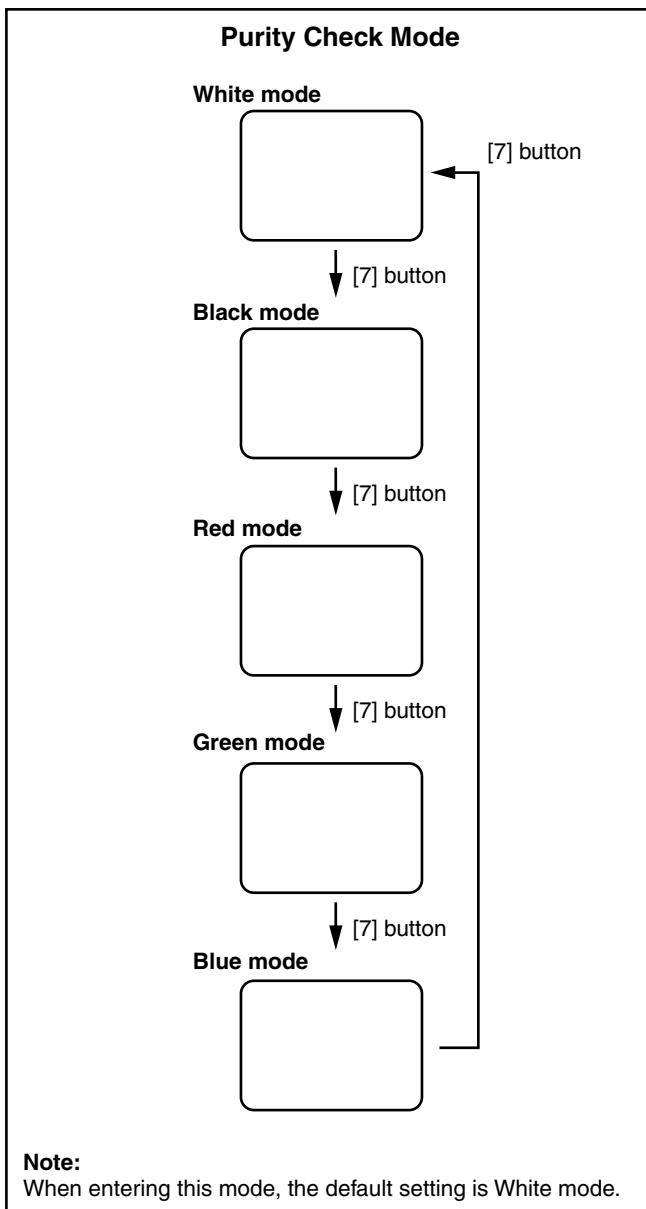
ITEM	BUTTON (on the remote control)	DATA VALUE	
YUV D4	BRT	[SETUP(YUV)] → [4]	123
	CNT		125
	CLR-R		150
	CLR-B		150
	TNT		128
	SHR		130
HDMI D1	BRT	[SETUP(HDMI)] → [1]	125
	CNT		130
	CLR-R		145
	CLR-B		145
	TNT		128
	SHR		125
HDMI D2	BRT	[SETUP(HDMI)] → [2]	126
	CNT		130
	CLR-R		160
	CLR-B		160
	TNT		128
	SHR		128
HDMI D3	BRT	[SETUP(HDMI)] → [3]	121
	CNT		130
	CLR-R		155
	CLR-B		155
	TNT		120
	SHR		128
HDMI D4	BRT	[SETUP(HDMI)] → [4]	121
	CNT		130
	CLR-R		145
	CLR-B		145
	TNT		128
	SHR		128
HDMI VGA	BRT	[SETUP(HDMI)] → [5]	128
	CNT		128
	CLR-R		138
	CLR-B		138
	TNT		128
	SHR		112
PC	BRT	[SETUP(PC DVB-T)] → [1]	122
	CNT		128
DVB-T	BRT	[SETUP(PC DVB-T)] → [2]	142
	CNT		130
	CLR-R		160
	CLR-B		160
	SHR		112
BRIGHT		[0]	255
NORMAL		[0]	150
DARK		[0]	120
LAST POWER		[◀ -]	ON
COR(C/D/S 1)		[◀ -] → [1]	128
COG(C/D/S 1)		[◀ -] → [2]	128
COB(C/D/S 1)		[◀ -] → [3]	128
DR(C/D/S 1)		[◀ -] → [4]	128

ITEM	BUTTON (on the remote control)	DATA VALUE
DG(C/D/S 1)	[◀ -] → [5]	128
DB(C/D/S 1)	[◀ -] → [6]	128
SBR(C/D/S 1)	[◀ -] → [7]	128
SBB(C/D/S 1)	[◀ -] → [9]	128
COR(C/D/S 2)	[◀ -] → [1]	128
COG(C/D/S 2)	[◀ -] → [2]	128
COB(C/D/S 2)	[◀ -] → [3]	128
DR(C/D/S 2)	[◀ -] → [4]	128
DG(C/D/S 2)	[◀ -] → [5]	128
DB(C/D/S 2)	[◀ -] → [6]	128
SBR(C/D/S 2)	[◀ -] → [7]	128
SBB(C/D/S 2)	[◀ -] → [9]	128
COR(C/D/S 3)	[◀ -] → [1]	128
COG(C/D/S 3)	[◀ -] → [2]	128
COB(C/D/S 3)	[◀ -] → [3]	128
DR(C/D/S 3)	[◀ -] → [4]	128
DG(C/D/S 3)	[◀ -] → [5]	128
DB(C/D/S 3)	[◀ -] → [6]	128
SBR(C/D/S 3)	[◀ -] → [7]	128
SBB(C/D/S 3)	[◀ -] → [9]	128
COR(C/D/S 3)	[◀ -] → [1]	121
COG(C/D/S 3)	[◀ -] → [2]	128
COB(C/D/S 3)	[◀ -] → [3]	130
DR(C/D/S 3)	[◀ -] → [4]	134
DG(C/D/S 3)	[◀ -] → [5]	128
DB(C/D/S 3)	[◀ -] → [6]	112

## 2. 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 pressing [7] button on the service remote control unit, the display changes as follows.



## 3. Flicker Adjustment

\*This adjustment is required when repairing T-CON CBA.

Test Point	Adj. Point
Screen	[P ^ / √] buttons
M. EQ.	Spec.
Color analyzer	See below
<b>Figure</b>	
<p>It carries out in a darkroom. Perpendicularity L = 3 cm Color Analyzer</p>	

1. Operate the unit for more than 20 minutes.
2. Set the color analyzer and bring the optical receptor to the center on the LCD-Panel surface after zero point calibration as shown above.
- Note:** The optical receptor must be set perpendicularly to the LCD Panel surface.
3. Enter the Service mode.
4. Press [2] button on the remote control unit.
5. Press [P ^ / √] buttons on the remote control unit so that the color analyzer value becomes minimum.

The following adjustment normally are not attempted in the field. Only when replacing the LCD Panel then adjust as a preparation.

## 4. White Balance Adjustment

\*This adjustment is needed when repairing T-CON CBA.

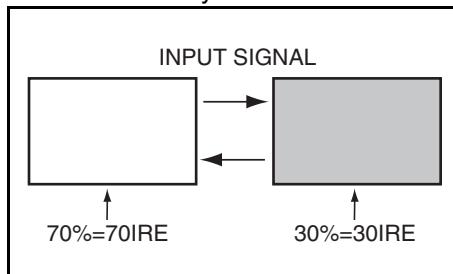
**Purpose:** To mix red, green and blue beams correctly for pure white.

**Symptom of Misadjustment:** White becomes bluish or reddish.

Test Point	Adj. Point	Mode	Input		
Screen	[◀ -] button	[CVBS] C/D/S 1 [YUV] C/D/S 2 [RGB] C/D/S 3	White Purity (APL 70%) or (APL 30%)		
M. EQ.		Spec.			
Pattern Generator, Color analyzer		(APL 70%) $x = 0.272 \pm 0.03$ , $y = 0.278 \pm 0.03$ (APL 30%) $x = 0.272 \pm 0.01$ , $y = 0.278 \pm 0.01$			
<b>Figure</b>					
<p>It carries out in a darkroom. Perpendicularity L = 3 cm INPUT: WHITE 70%, 30% Color Analyzer</p>					

1. Operate the unit for more than 20 minutes.

2. Input the White Purity.



3. Set the color analyzer to the CHROMA mode and bring the optical receptor to the center on the LCD-Panel surface after zero point calibration as shown above.

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

### 4. [CVBS]

Enter the Service mode. Press [◀ -] button on the remote control unit and select "C/D/S 1" mode.

### [YUV]

Enter the Service mode. Press [◀ -] button on the remote control unit and select "C/D/S 2" mode.

### [RGB]

Enter the Service mode. Press [◀ -] button on the remote control unit and select "C/D/S 3" mode.

### 5. [CVBS]---(APL 70%)

Press [6] button to select "DB 1(C/D/S 1)" for Blue adjustment. Press [4] button to select "DR 1(C/D/S 1)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "DB 1(C/D/S 1)" or "DR 1(C/D/S 1)". Refer to "1. Initial Setting."

### [CVBS]---(APL 30%)

Press [3] button to select "COB 1(C/D/S 1)" for Blue adjustment. Press [1] button to select "COR 1(C/D/S 1)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "COB 1(C/D/S 1)" or "COR 1(C/D/S 1)". Refer to "1. Initial Setting."

After adjusting (APL 30%), verify (APL 70%) again and adjust repeatedly until both values are within specification.

### 6. [YUV]---(APL 70%)

Press [6] button to select "DB 2(C/D/S 2)" for Blue adjustment. Press [4] button to select "DR 2(C/D/S 2)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "DB 2(C/D/S 2)" or "DR 2(C/D/S 2)". Refer to "1. Initial Setting."

### [YUV]---(APL 30%)

Press [3] button to select "COB 2(C/D/S 2)" for Blue adjustment. Press [1] button to select "COR 2(C/D/S 2)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "COB 2(C/D/S 2)" or "COR 2(C/D/S 2)".

Refer to "1. Initial Setting."

After adjusting (APL 30%), verify (APL 70%) again and adjust repeatedly until both values are within specification.

### 7. [RGB]---(APL 70%)

Press [6] button to select "DB 3(C/D/S 3)" for Blue adjustment. Press [4] button to select "DR 3(C/D/S 3)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "DB 3(C/D/S 3)" or "DR 3(C/D/S 3)". Refer to "1. Initial Setting."

### [RGB]---(APL 30%)

Press [3] button to select "COB 3(C/D/S 3)" for Blue adjustment. Press [1] button to select "COR 3(C/D/S 3)" for Red adjustment. When "x" value and "y" value are not within specification, adjust "COB 3(C/D/S 3)" or "COR 3(C/D/S 3)".

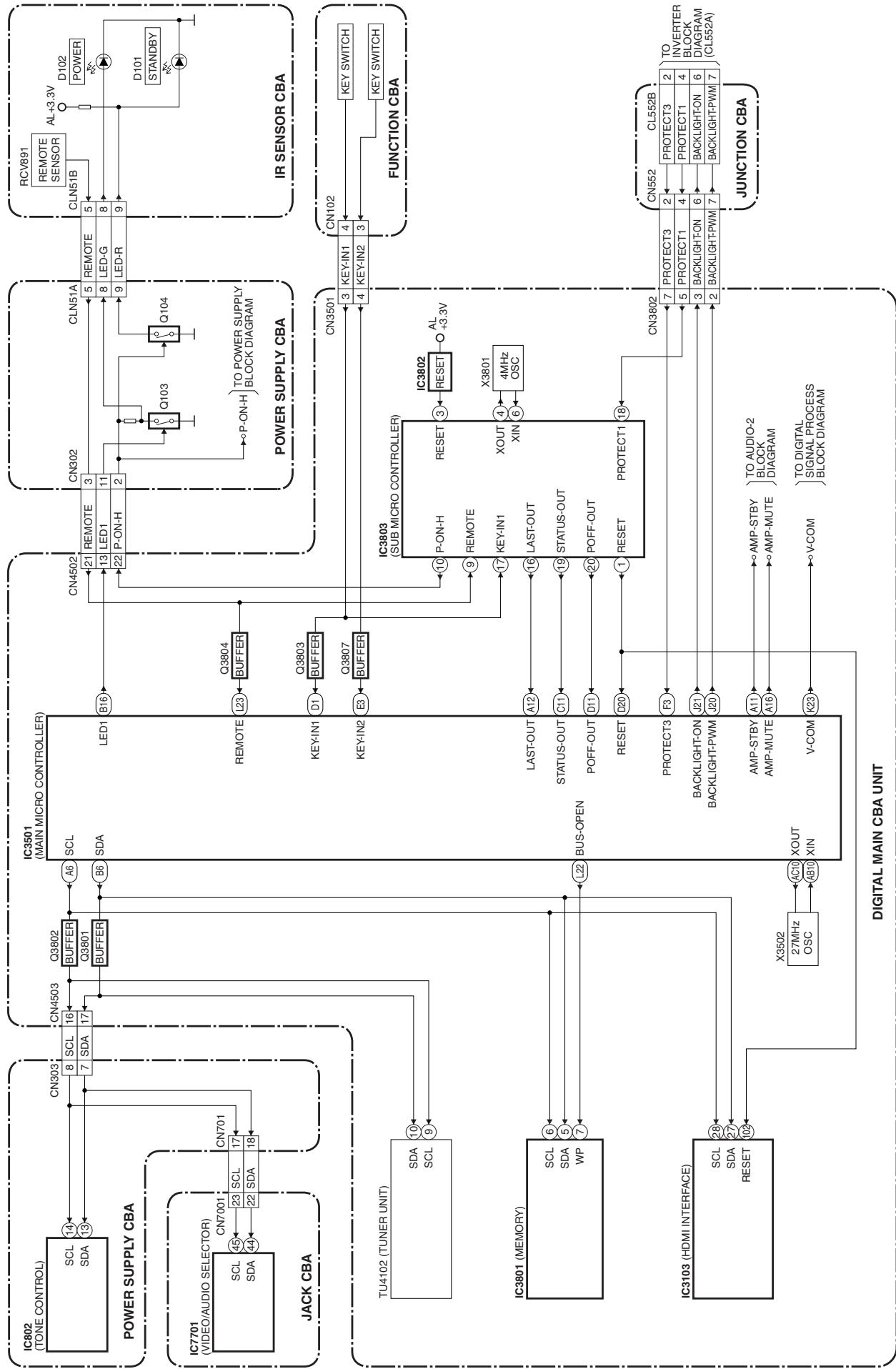
Refer to "1. Initial Setting."

After adjusting (APL 30%), verify (APL 70%) again and adjust repeatedly until both values are within specification.

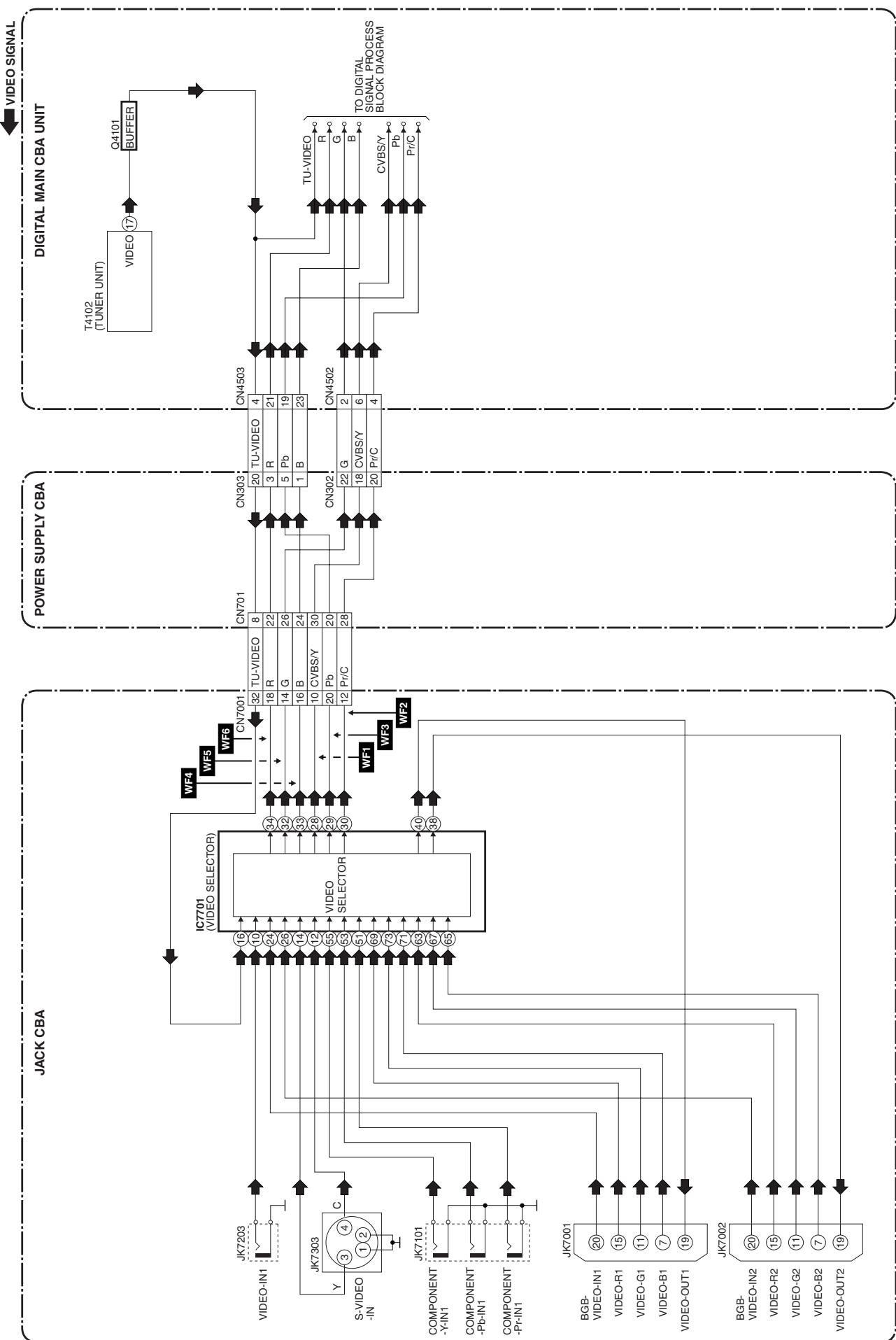
8. Turn the power off and on again.

# BLOCK DIAGRAMS

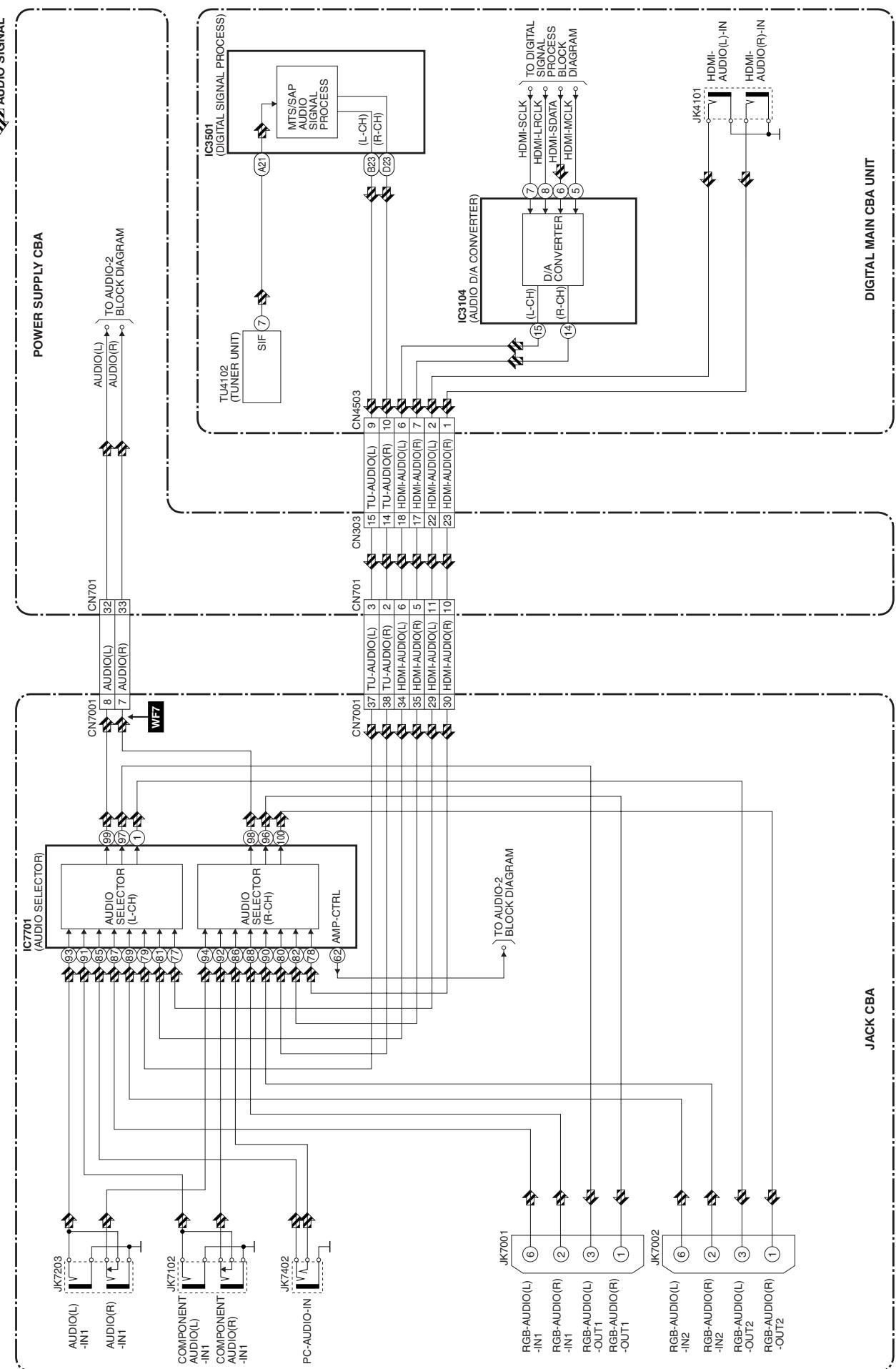
## System Control Block Diagram



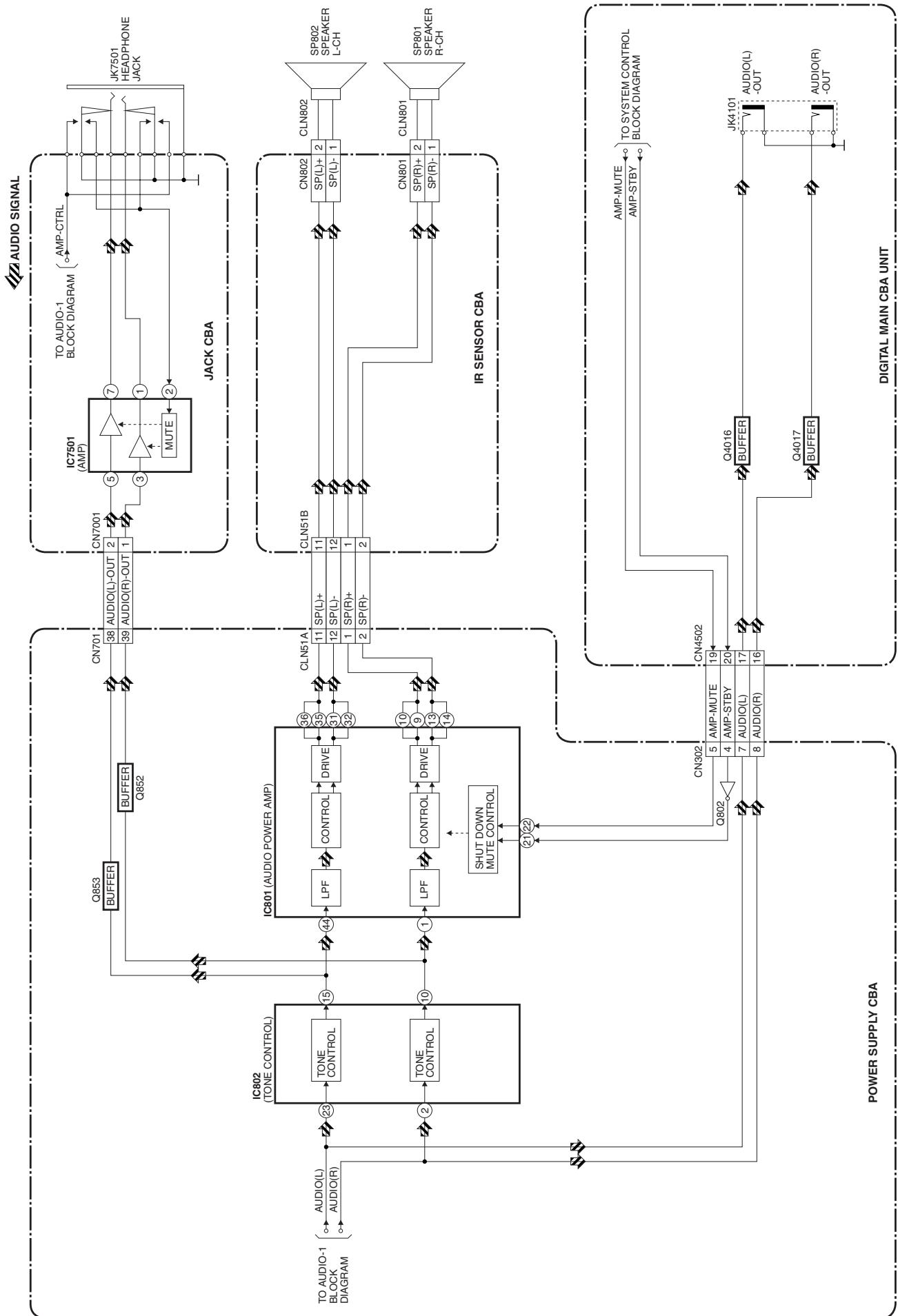
# Video Block Diagram



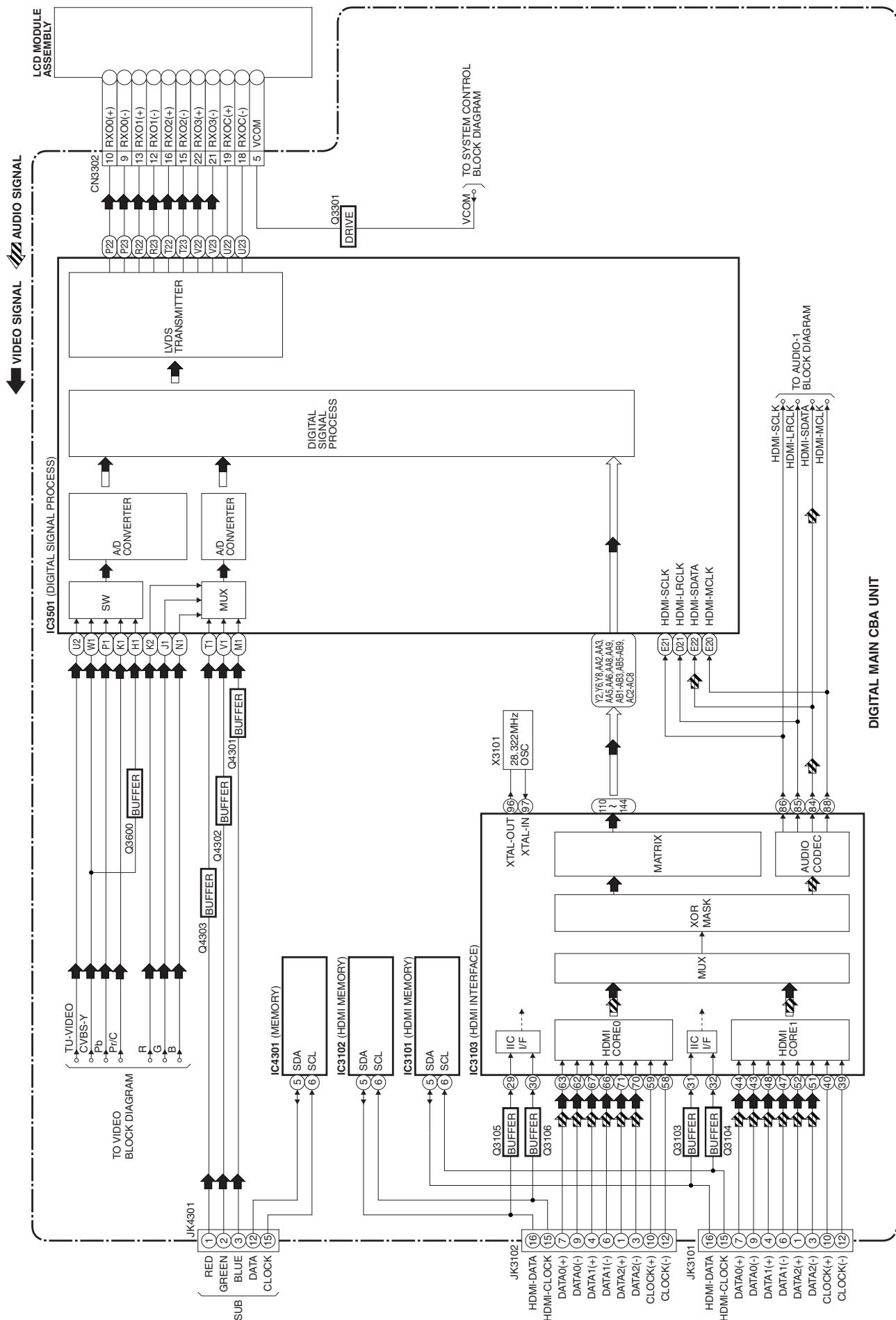
# Audio-1 Block Diagram



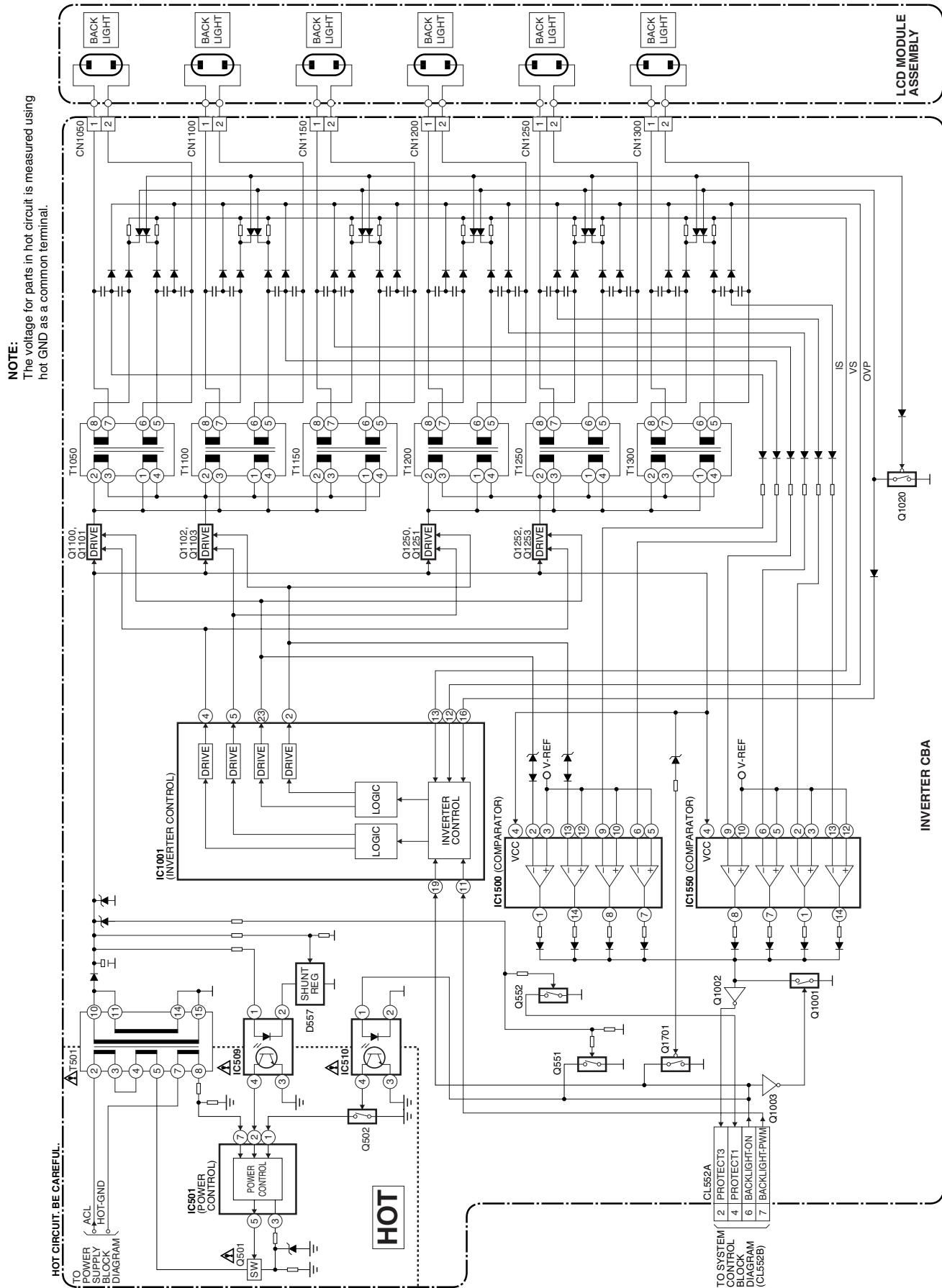
## Audio-2 Block Diagram



# Digital Signal Process Block Diagram



# Inverter Block Diagram

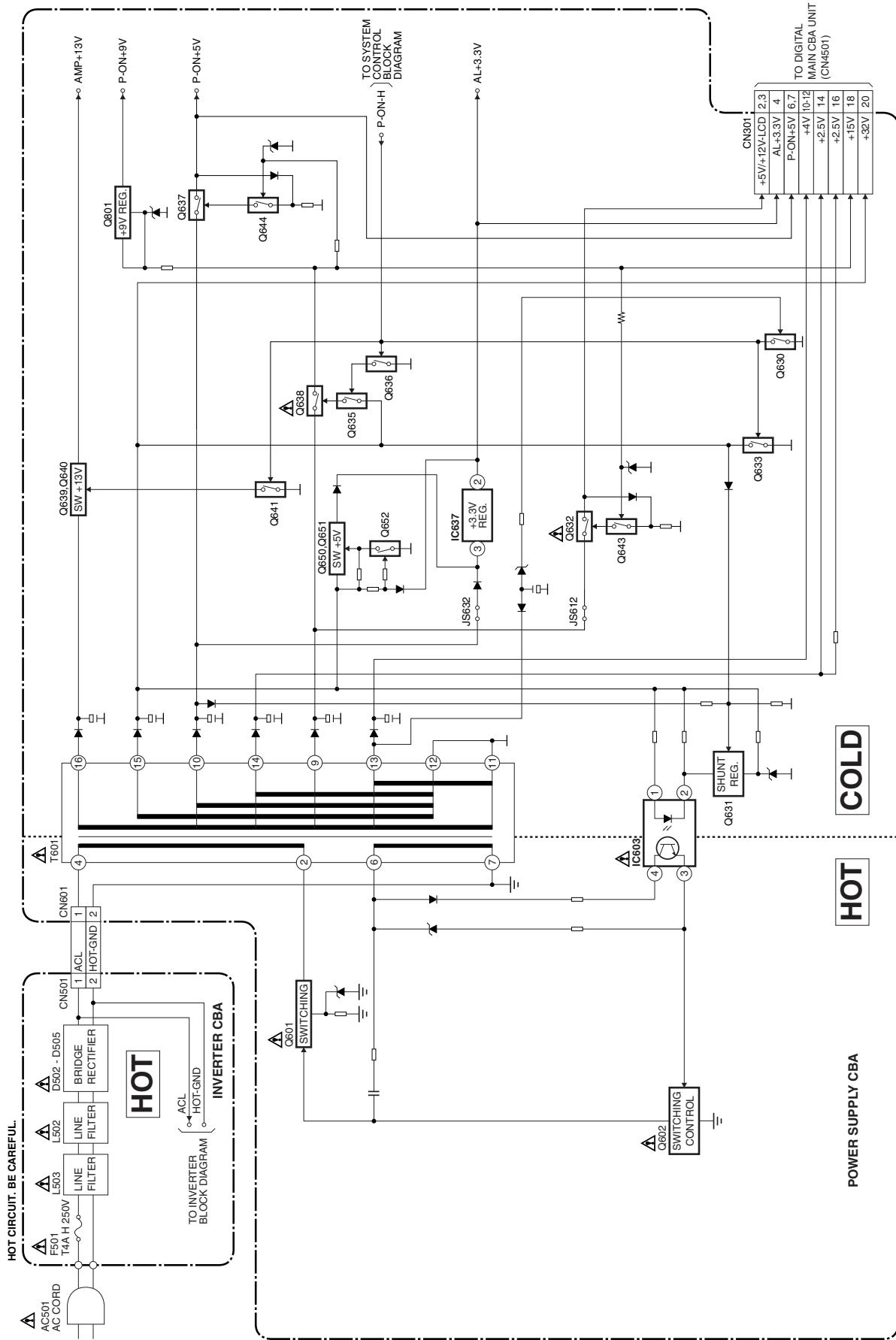


# Power Supply Block Diagram

**CAUTION !**  
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.  
If Main Fuse (F501) 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 fire hazard,  
replace only with the same type fuse.

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



# SCHEMATIC DIAGRAMS / CBA'S 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  $\mu F$  ( $P = 10^{-6} \mu F$ ).
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:

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

### 2. CAUTION:

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

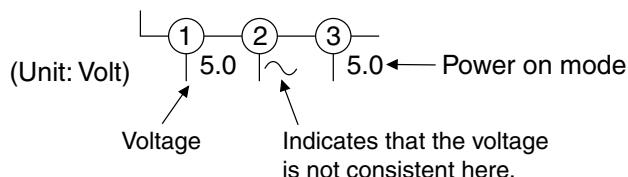
If Main Fuse (F501) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

### 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.:

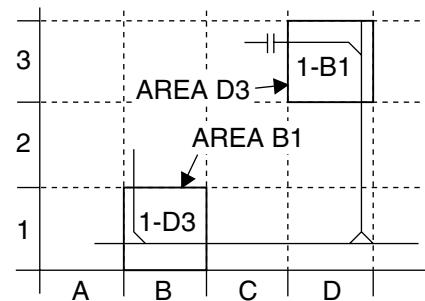


### 5. How to read converged lines

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.

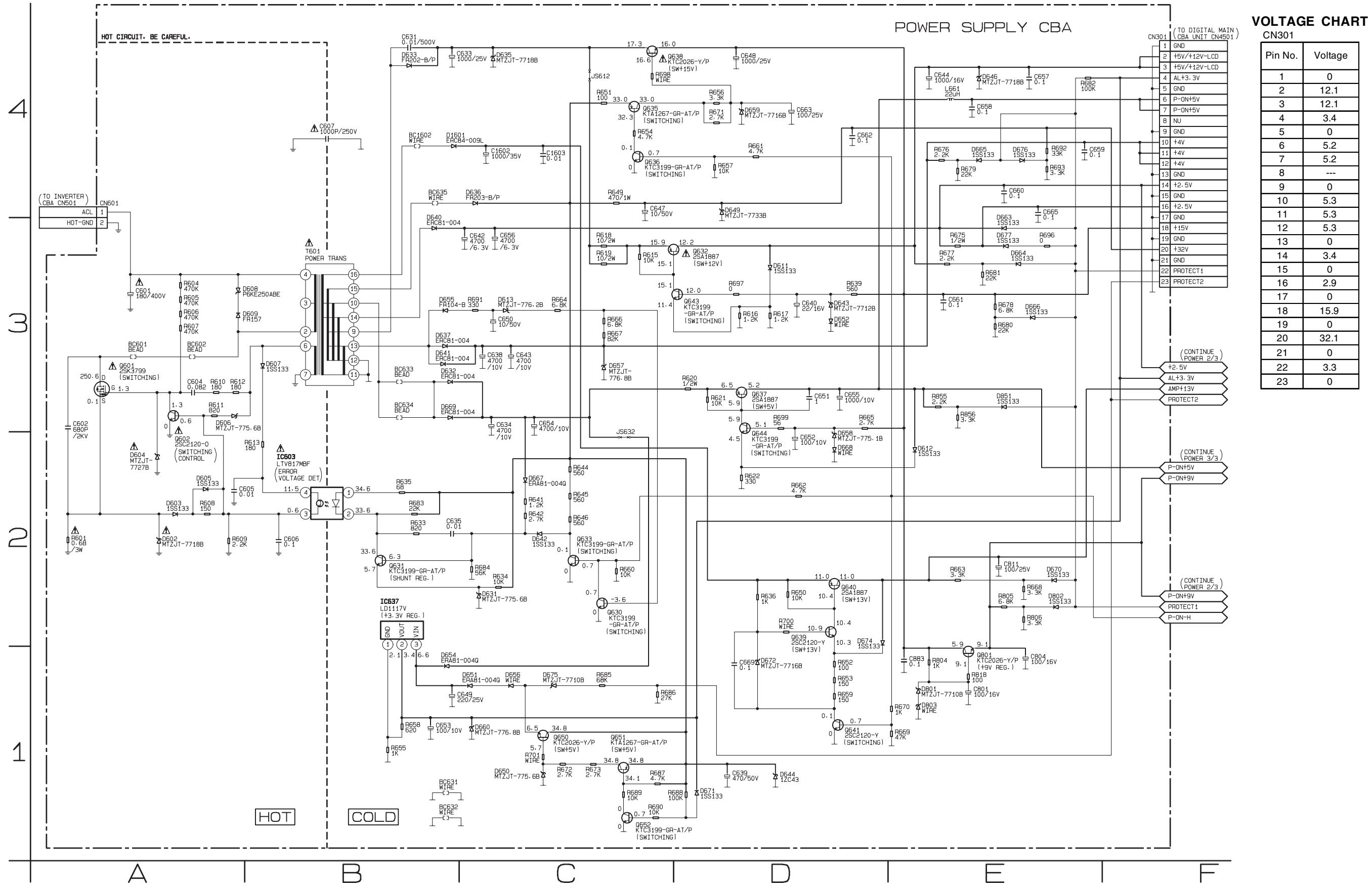
◎ : Used to indicate a test point with no test pin.

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

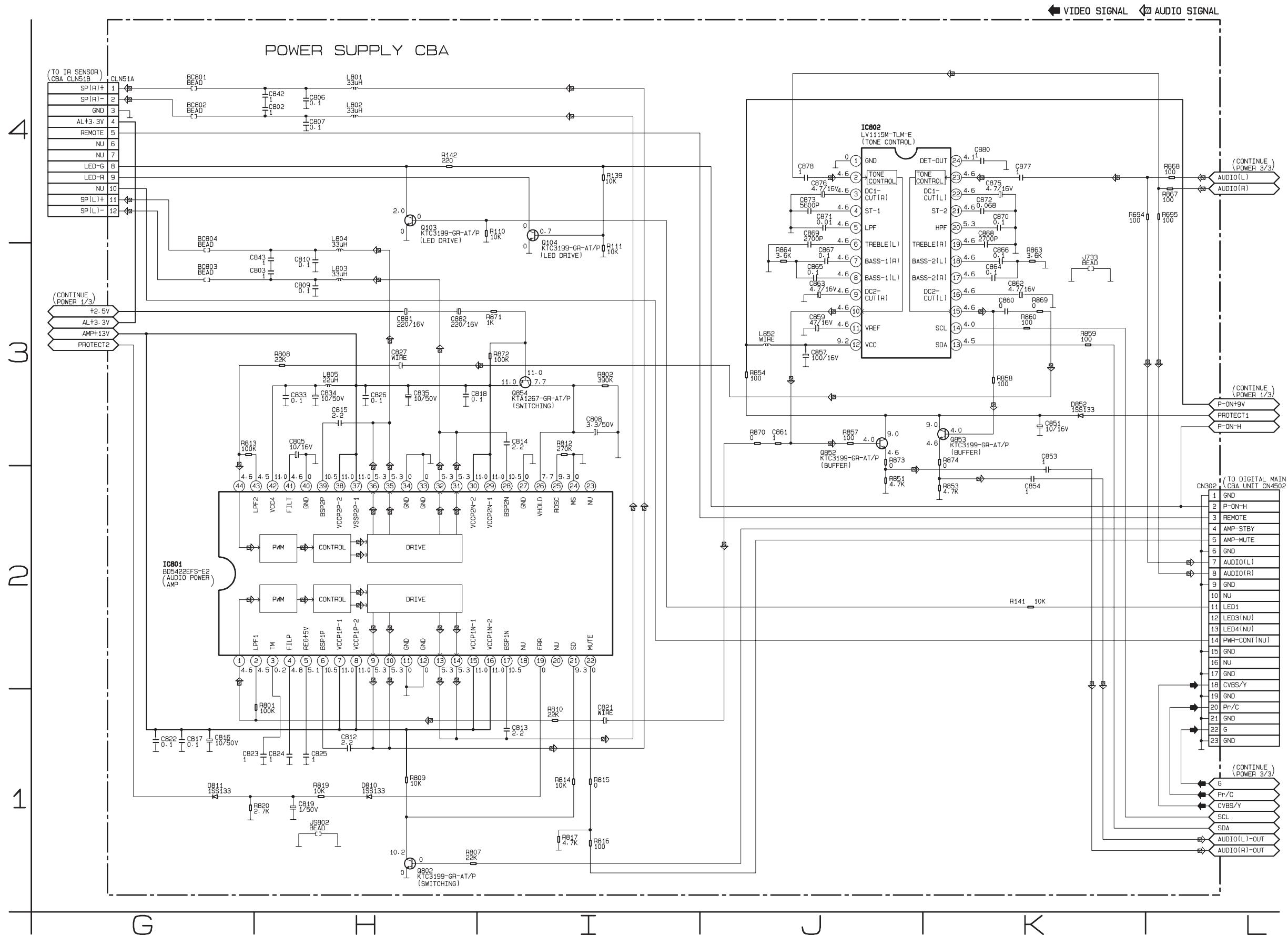
# Power Supply 1/3 Schematic Diagram

## NOTE:

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



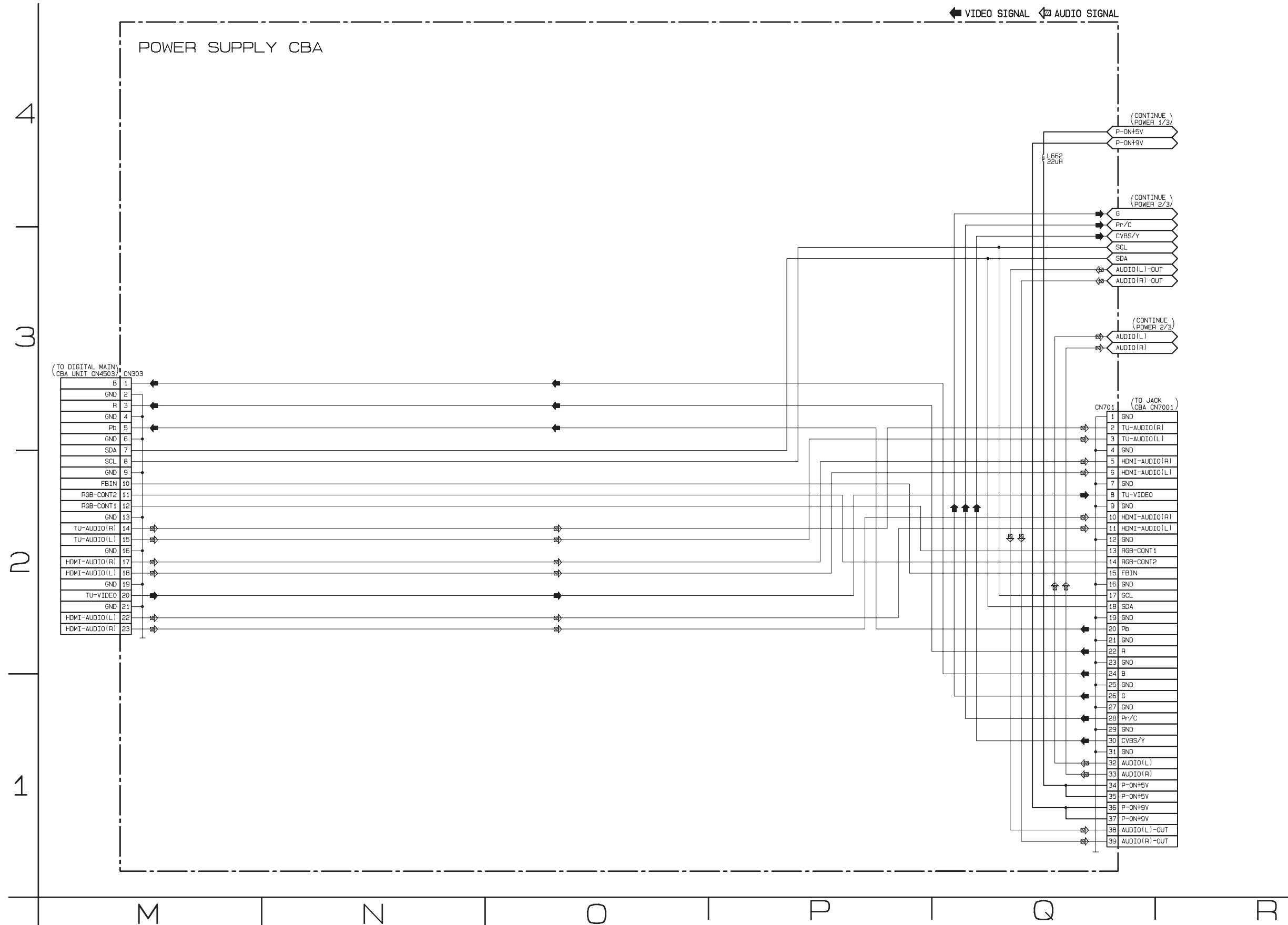
## Power Supply 2/3 Schematic Diagram



VOLTAGE CHART CN302

Pin No.	Voltage
1	0
2	2.4
3	3.4
4	0
5	3.3
6	0
7	4.5
8	4.5
9	0
10	3.3
11	0
12	---
13	---
14	---
15	0
16	---
17	0
18	2.4
19	0
20	2.4
21	0
22	2.4
23	0

## Power Supply 3/3 Schematic Diagram



VOLTAGE CHART CN303

Pin No.	Voltage
1	2.4
2	0
3	2.4
4	0
5	2.5
6	0
7	5
8	5
9	0
10	0
11	5.2
12	5.2
13	0
14	3.3
15	3.2
16	0
17	2.6
18	2.6
19	0
20	2.3
21	0
22	0.6
23	0.6

# Inverter & Junction Schematic Diagram

## CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.  
If Main Fuse (F501) 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 fire hazard,  
replace only with the same type fuse.

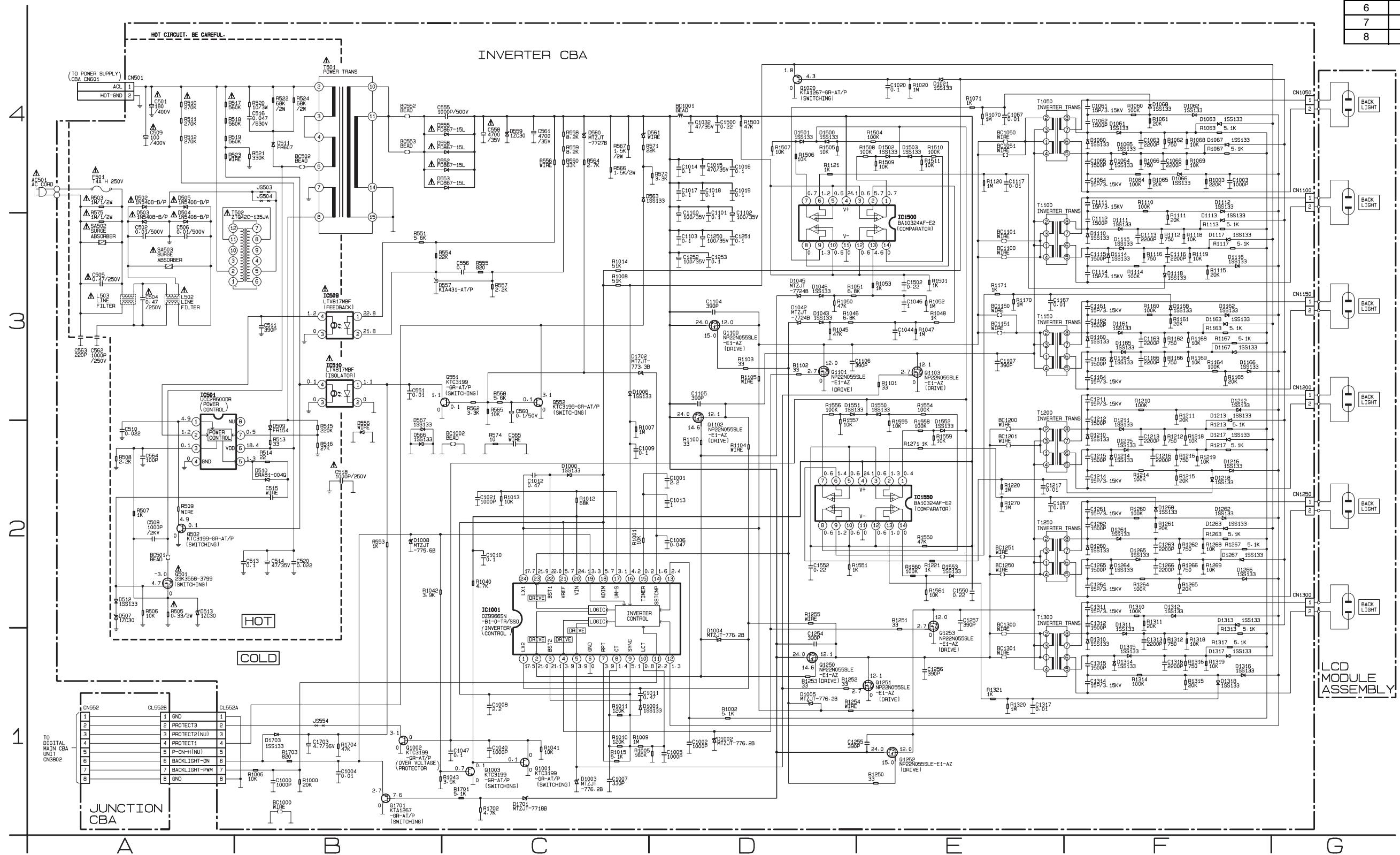
## NOTE:

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

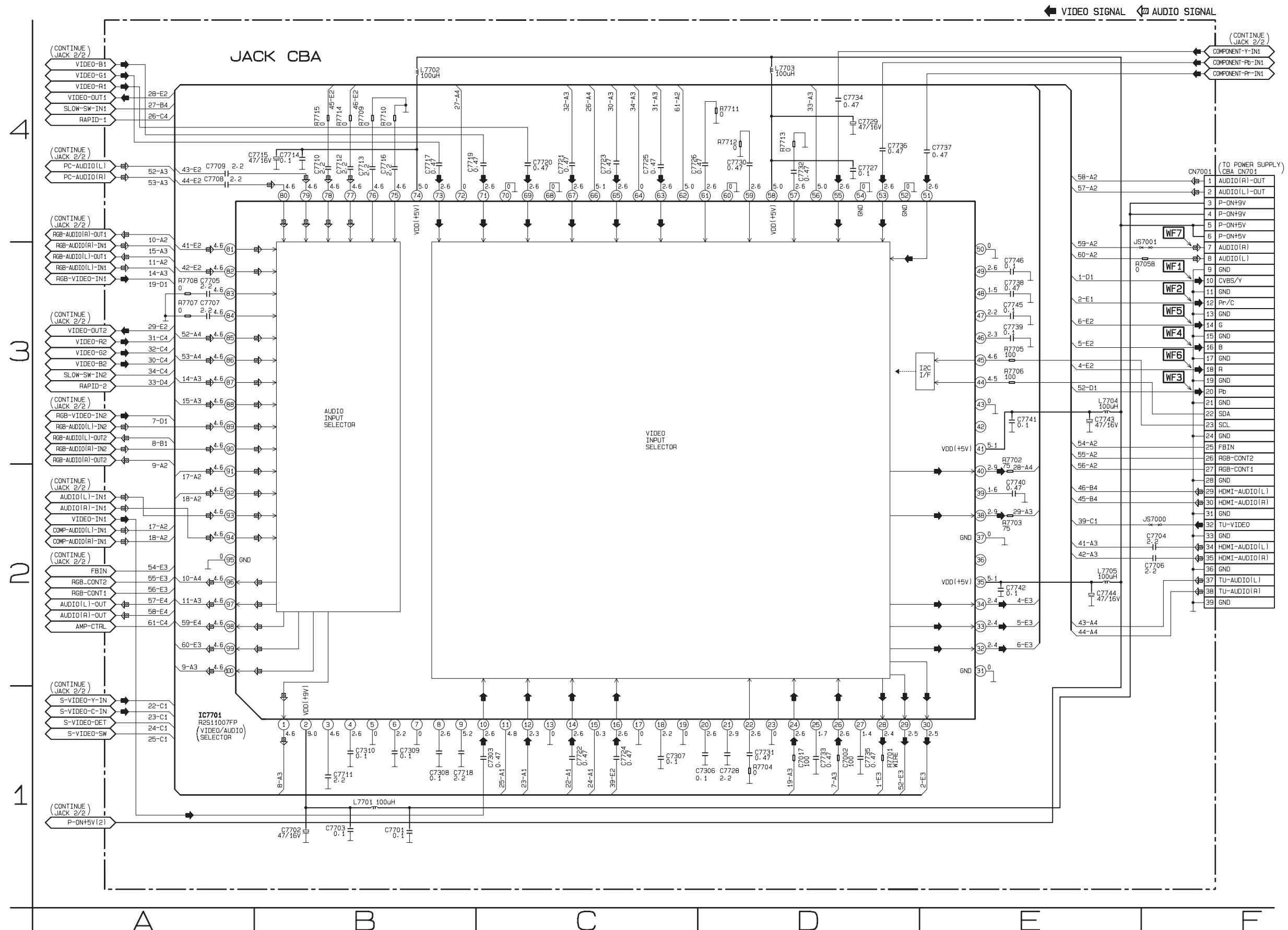
## VOLTAGE CHART

CN552

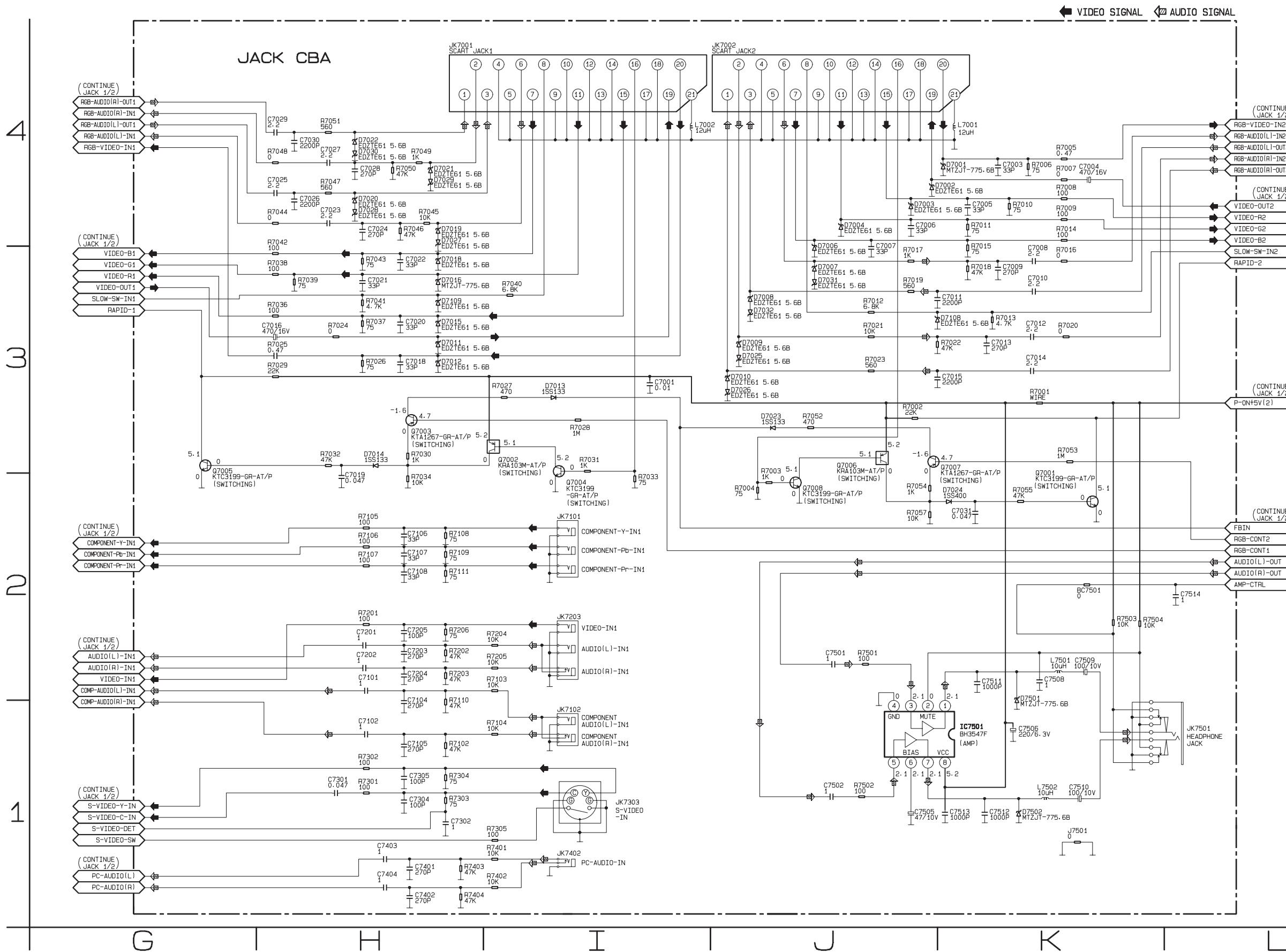
Pin No.	Voltage
1	0
2	3.1
3	---
4	3.1
5	---
6	3.2
7	3.4
8	0



## Jack 1/2 Schematic Diagram



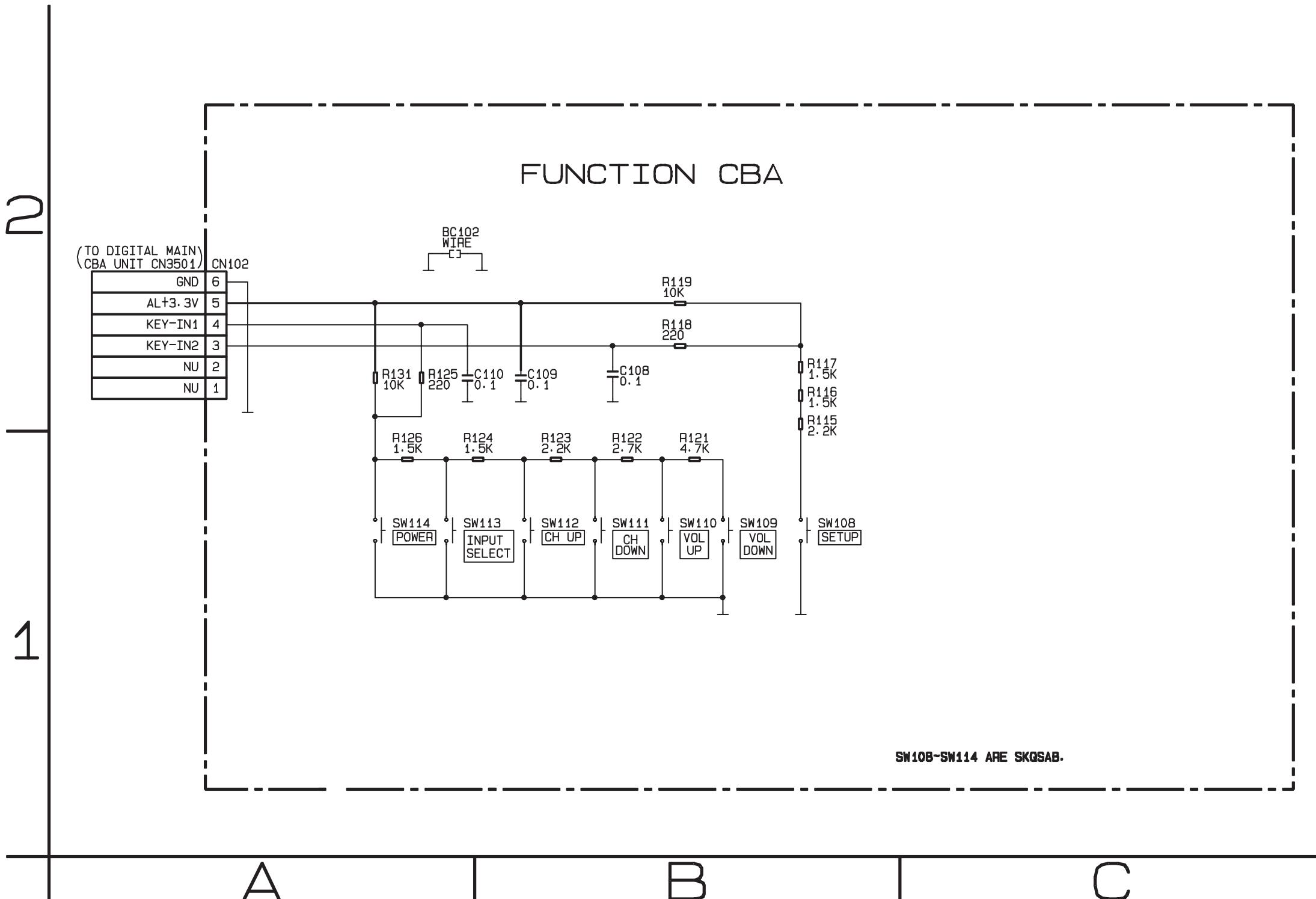
## Jack 2/2 Schematic Diagram



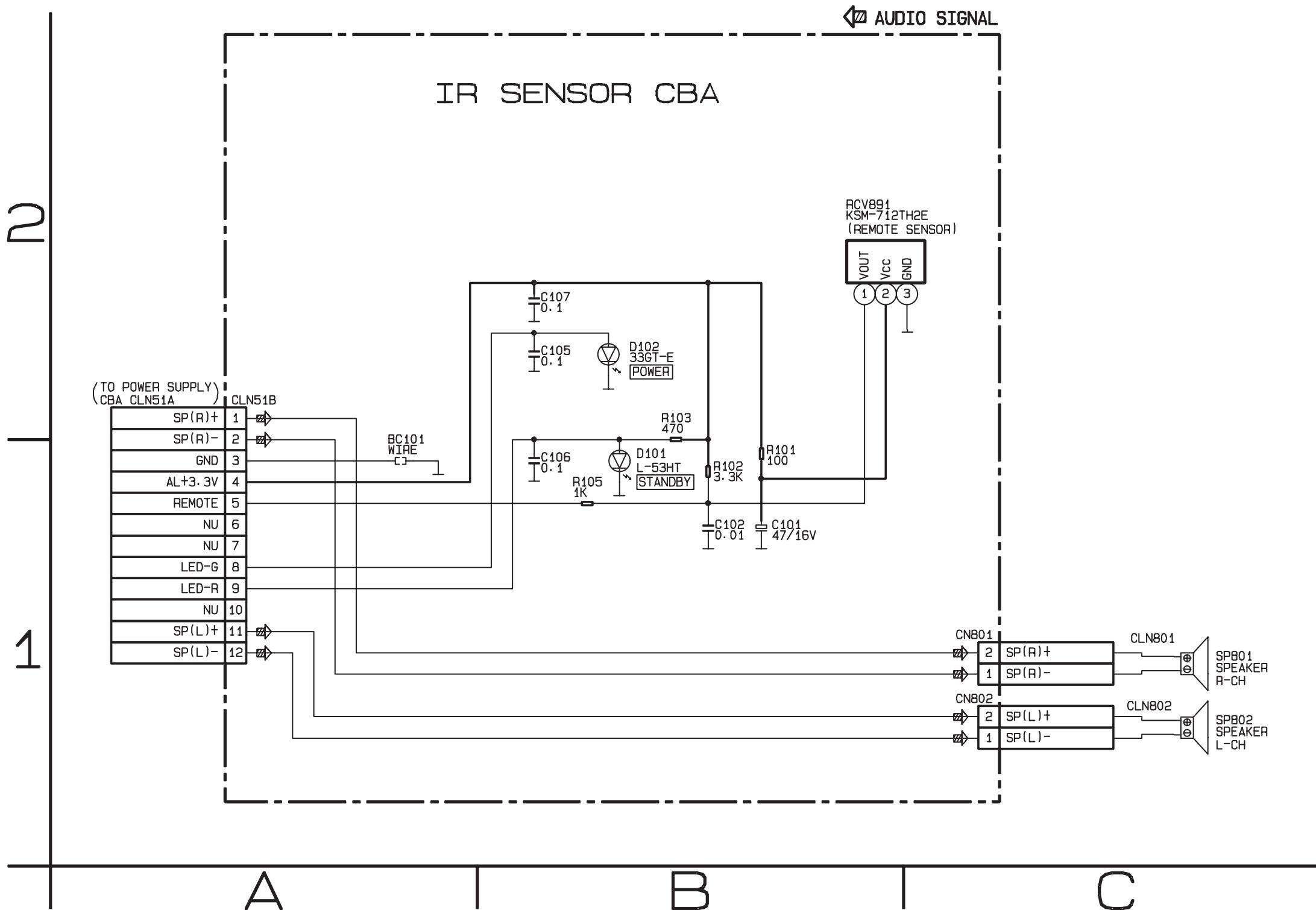
## Function Schematic Diagram

VOLTAGE CHART

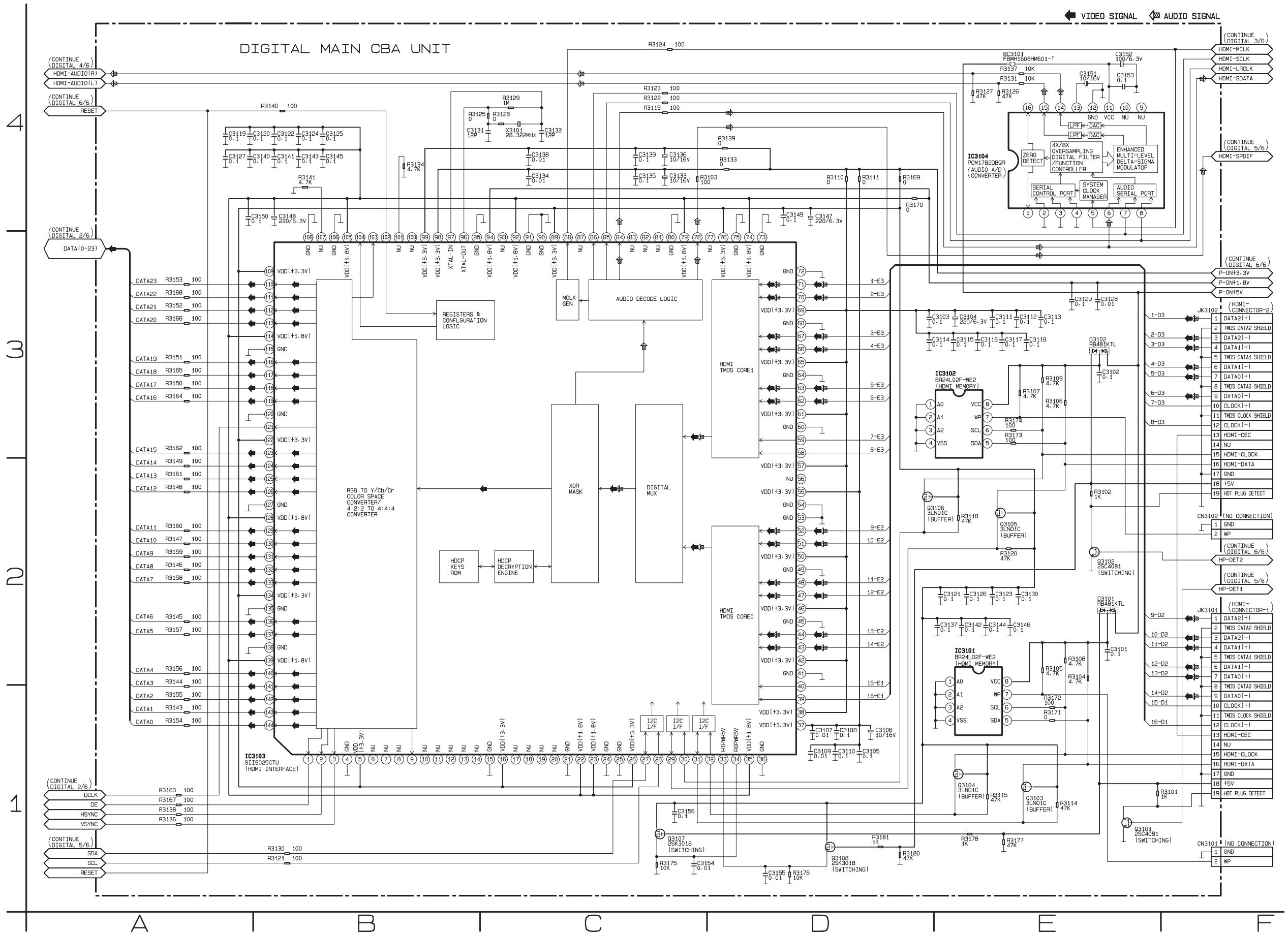
CN102	
Pin No.	Voltage
1	---
2	---
3	3.4
4	3.4
5	3.4
6	0



## IR Sensor Schematic Diagram



## Digital Main 1/6 Schematic Diagram

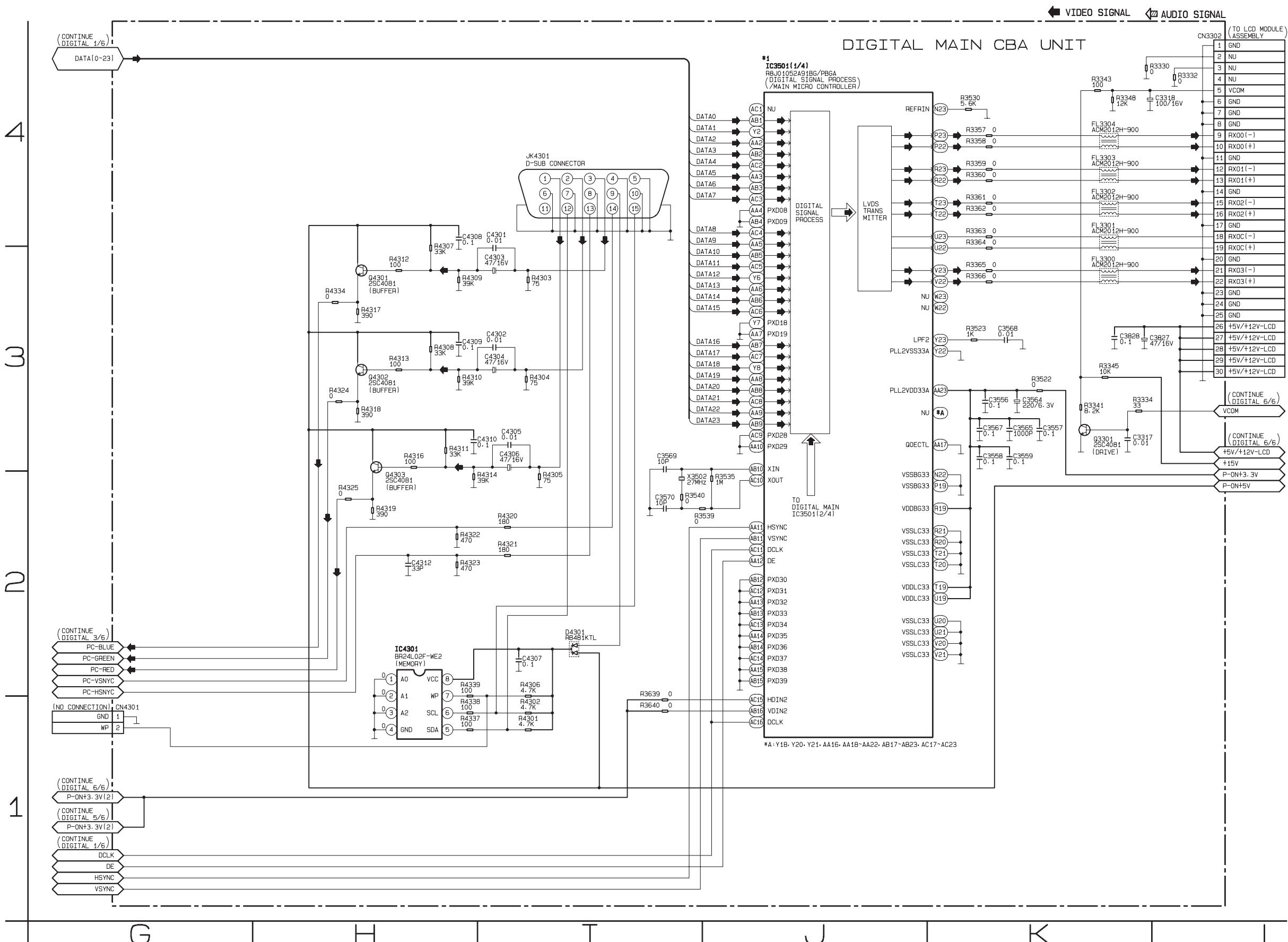


## Digital Main 2/6 Schematic Diagram

\*1 NOTE:

The order of pins shown in this diagram is different from that of actual IC3501.

IC3501 is divided into four and shown as IC3501 (1/4) ~ IC3501 (4/4) in this Digital Main Schematic Diagram Section.

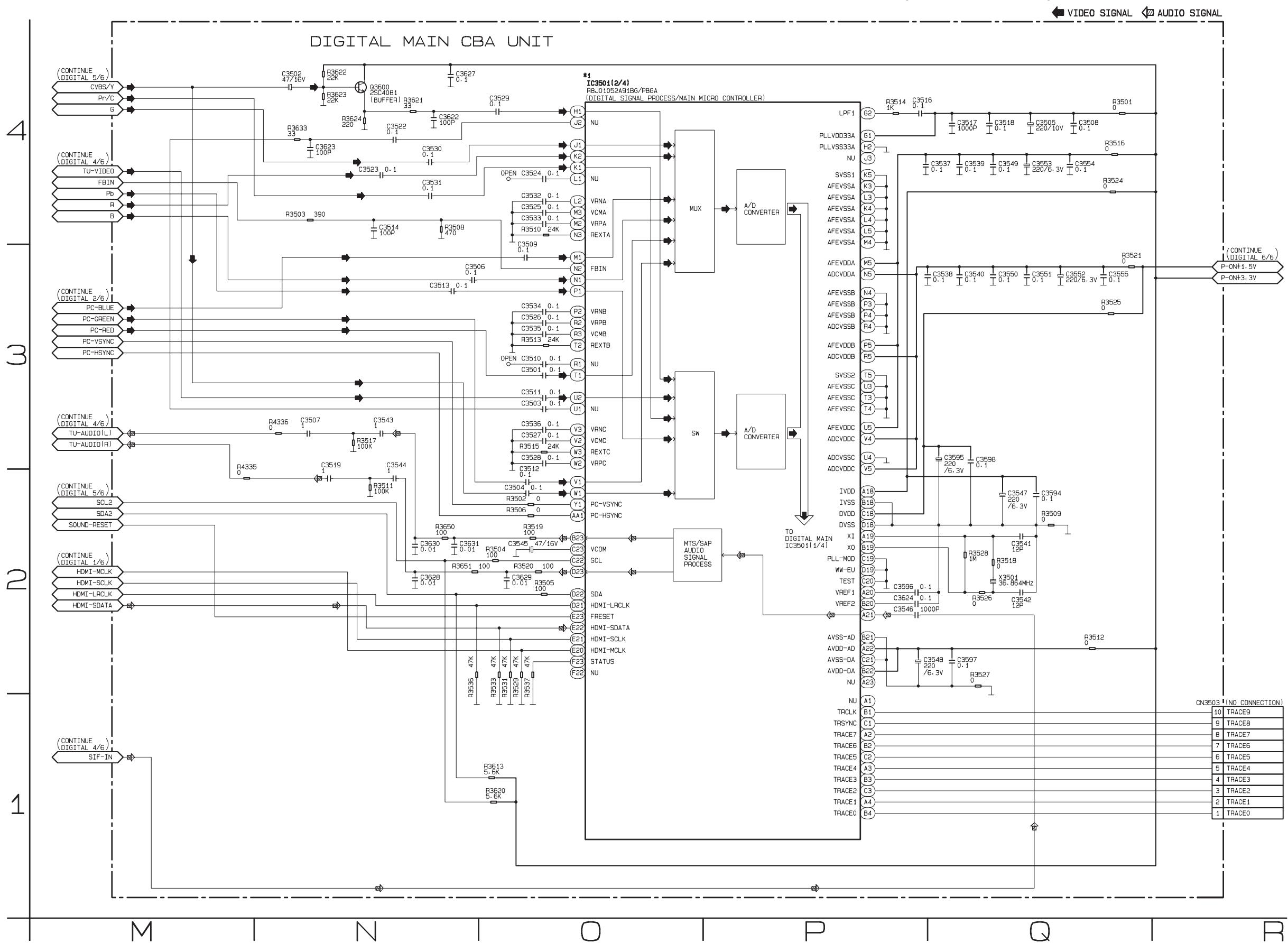


## Digital Main 3/6 Schematic Diagram

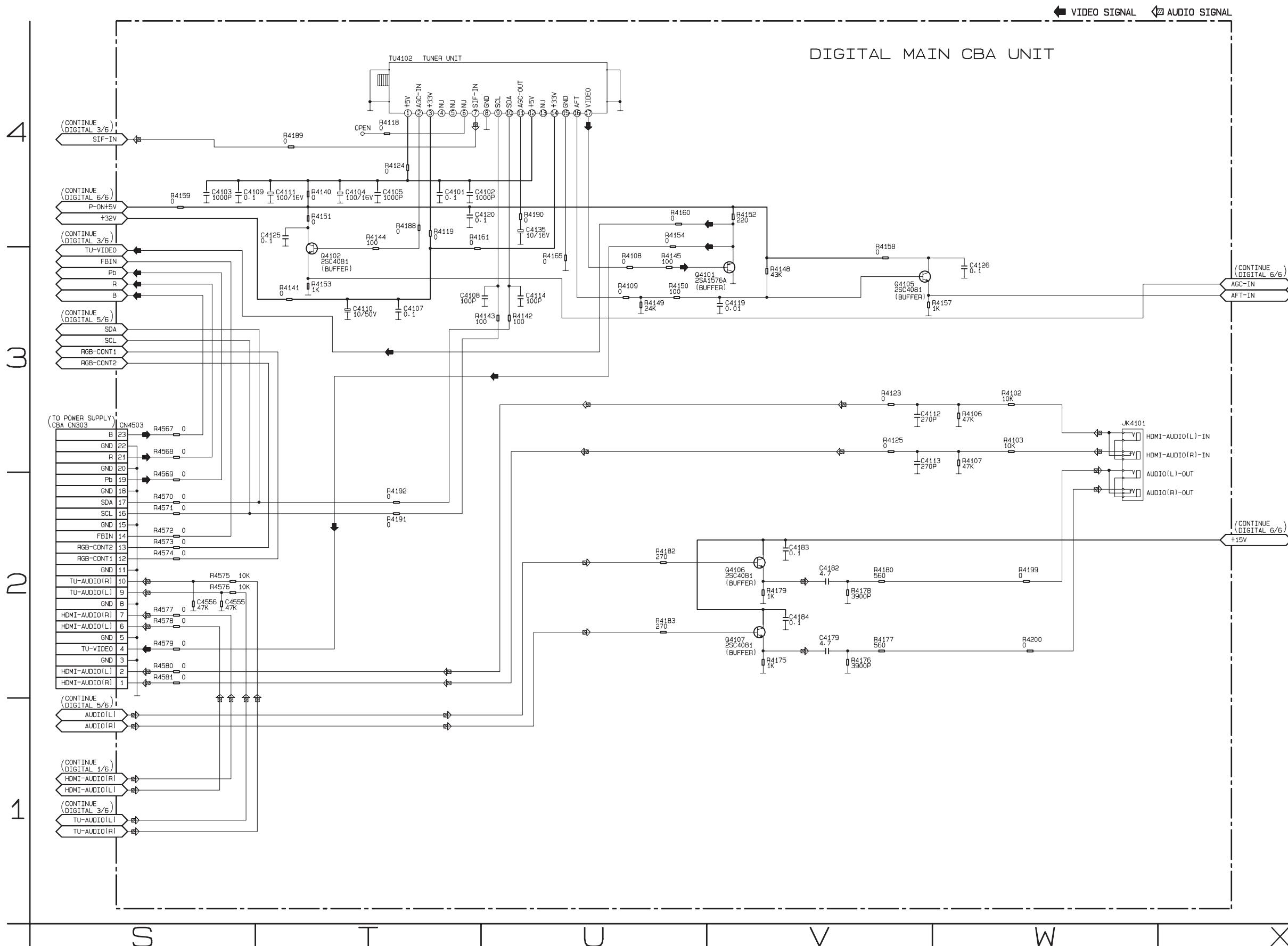
### \*1 NOTE:

The order of pins shown in this diagram is different from that of actual IC3501.

IC3501 is divided into four and shown as IC3501 (1/4) ~ IC3501 (4/4) in this Digital Main Schematic Diagram Section.



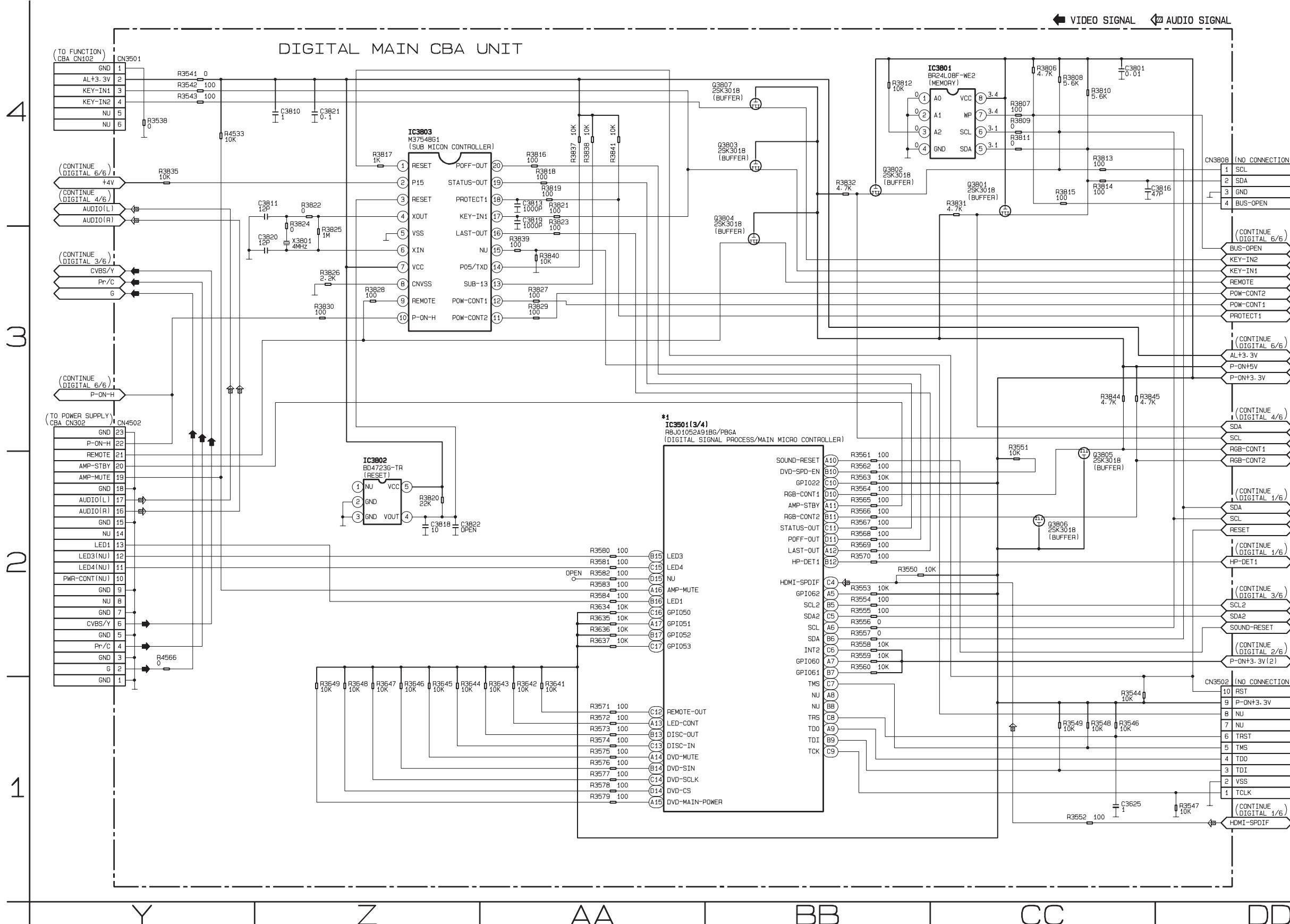
## Digital Main 4/6 Schematic Diagram



## Digital Main 5/6 Schematic Diagram

\*1 NOTE:

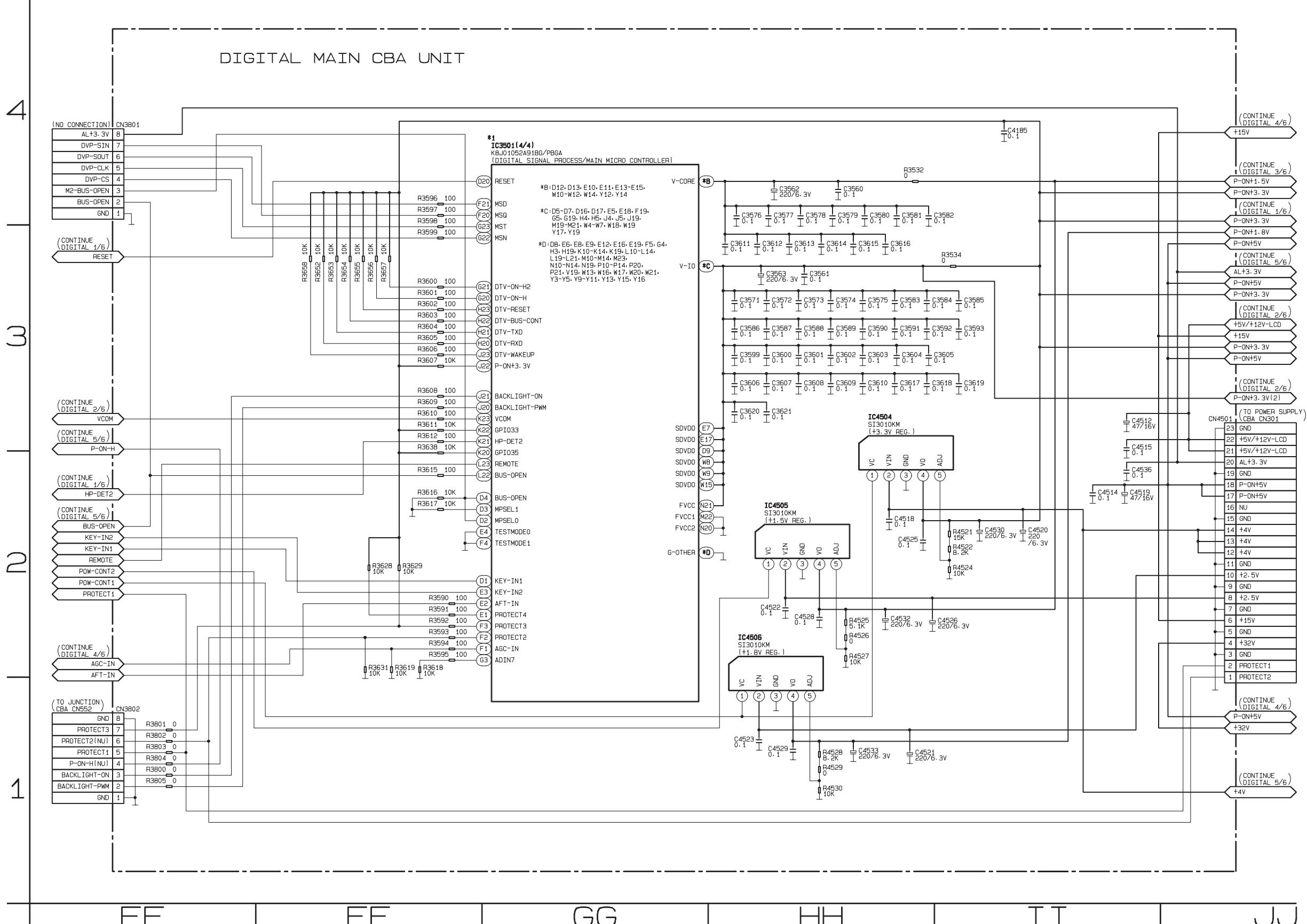
The order of pins shown in this diagram is different from that of actual IC3501.  
IC3501 is divided into four and shown as IC3501 (1/4) ~ IC3501 (4/4) in this Digital Main Schematic Diagram Section.



## Digital Main 6/6 Schematic Diagram

\*1 NOTE:

The order of pins shown in this diagram is different from that of actual IC3501.  
IC3501 is divided into four and shown as IC3501 (1/4) ~ IC3501 (4/4) in this Digital Main Schematic Diagram Section.

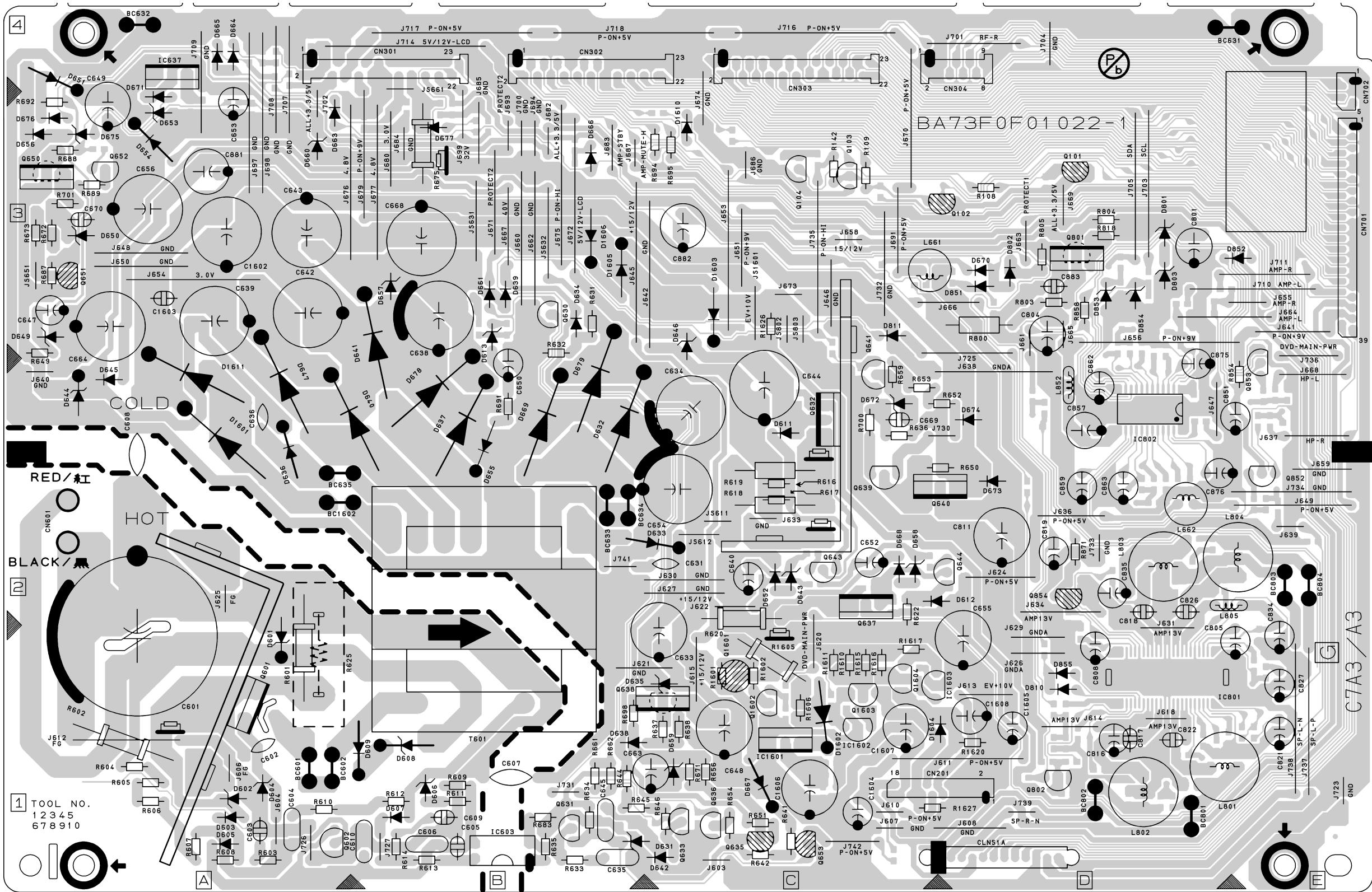


## Power Supply CBA Top View

**NOTE:**

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

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

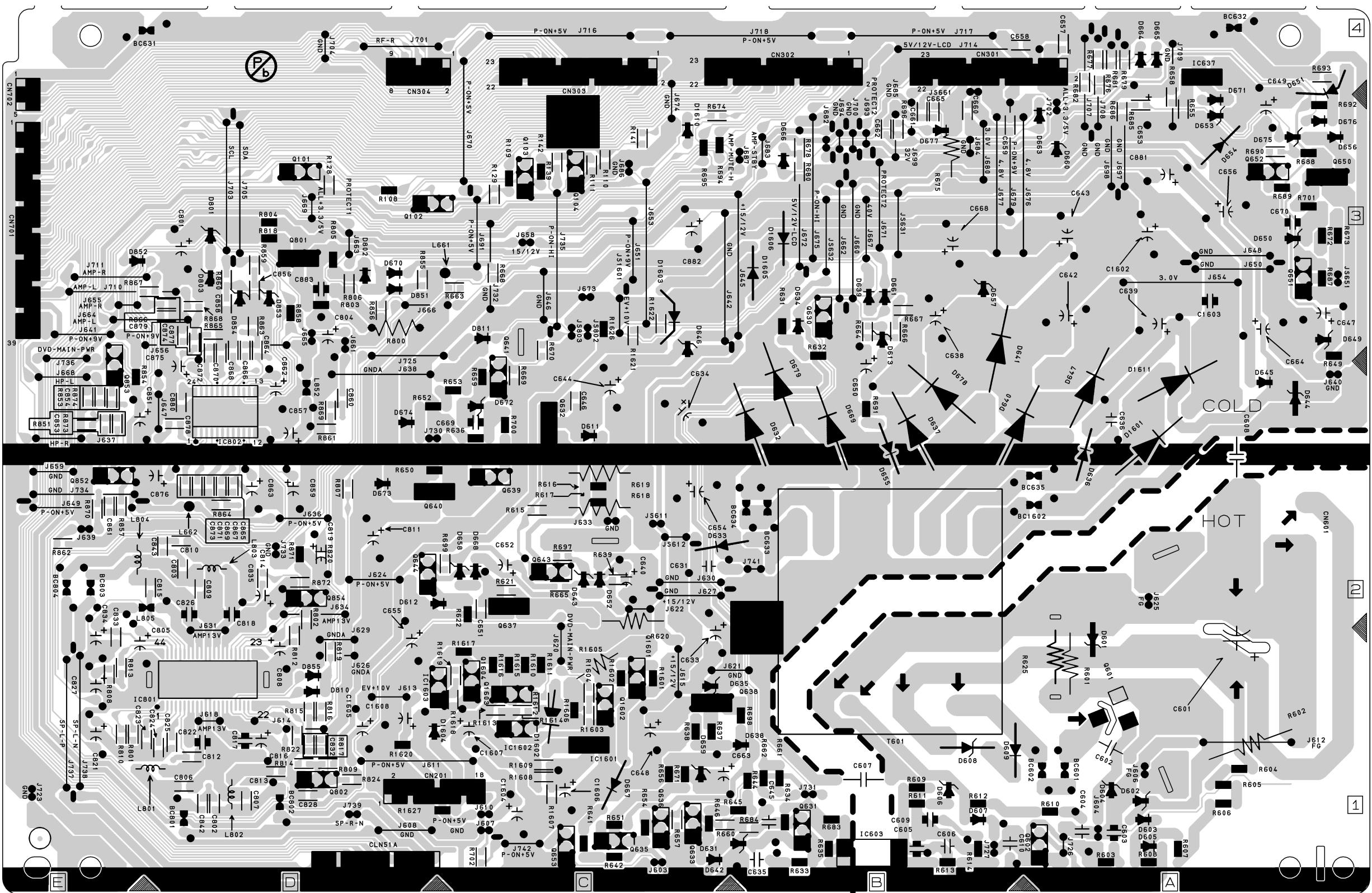


## Power Supply CBA Bottom View

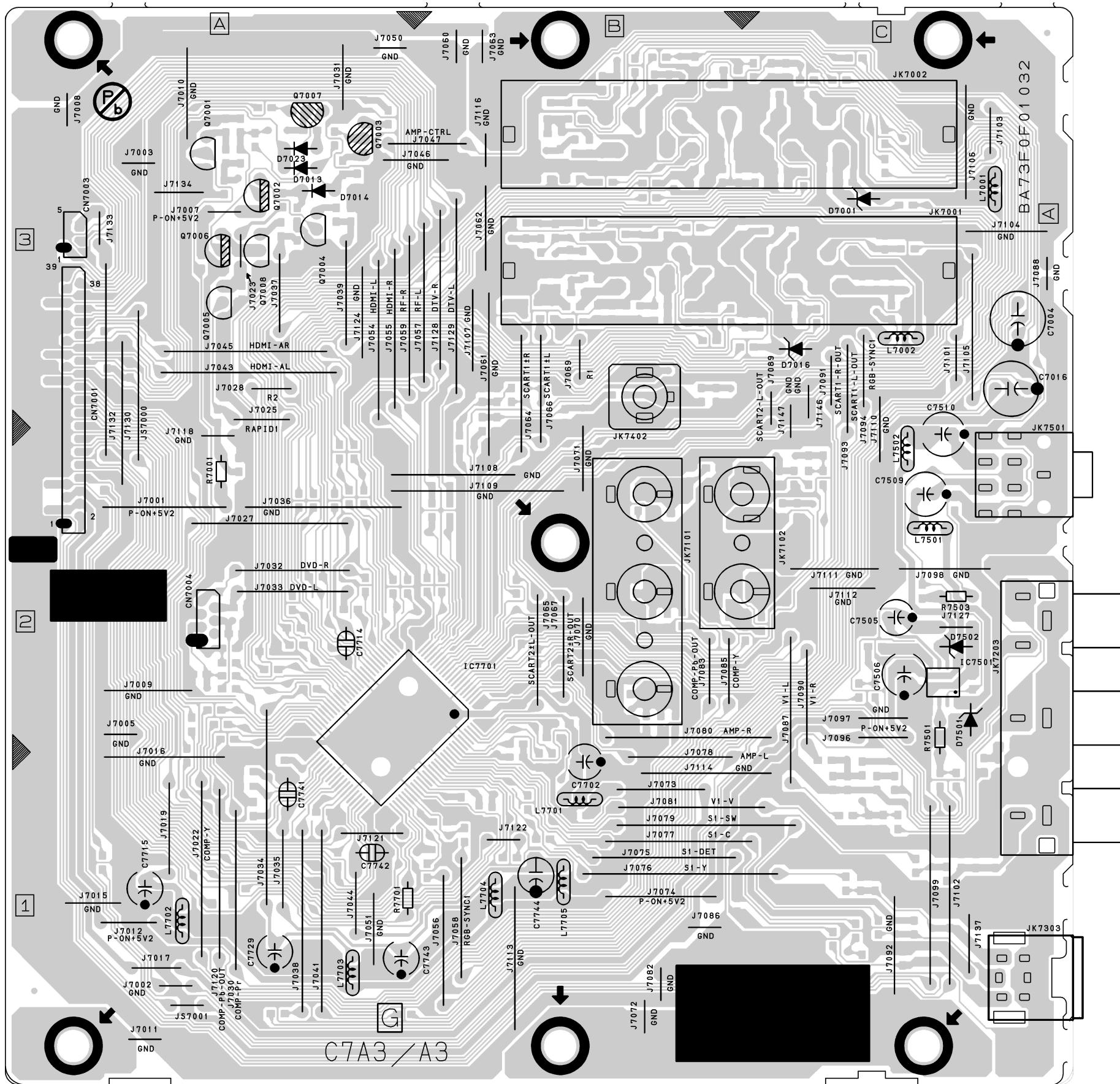
**NOTE:**

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

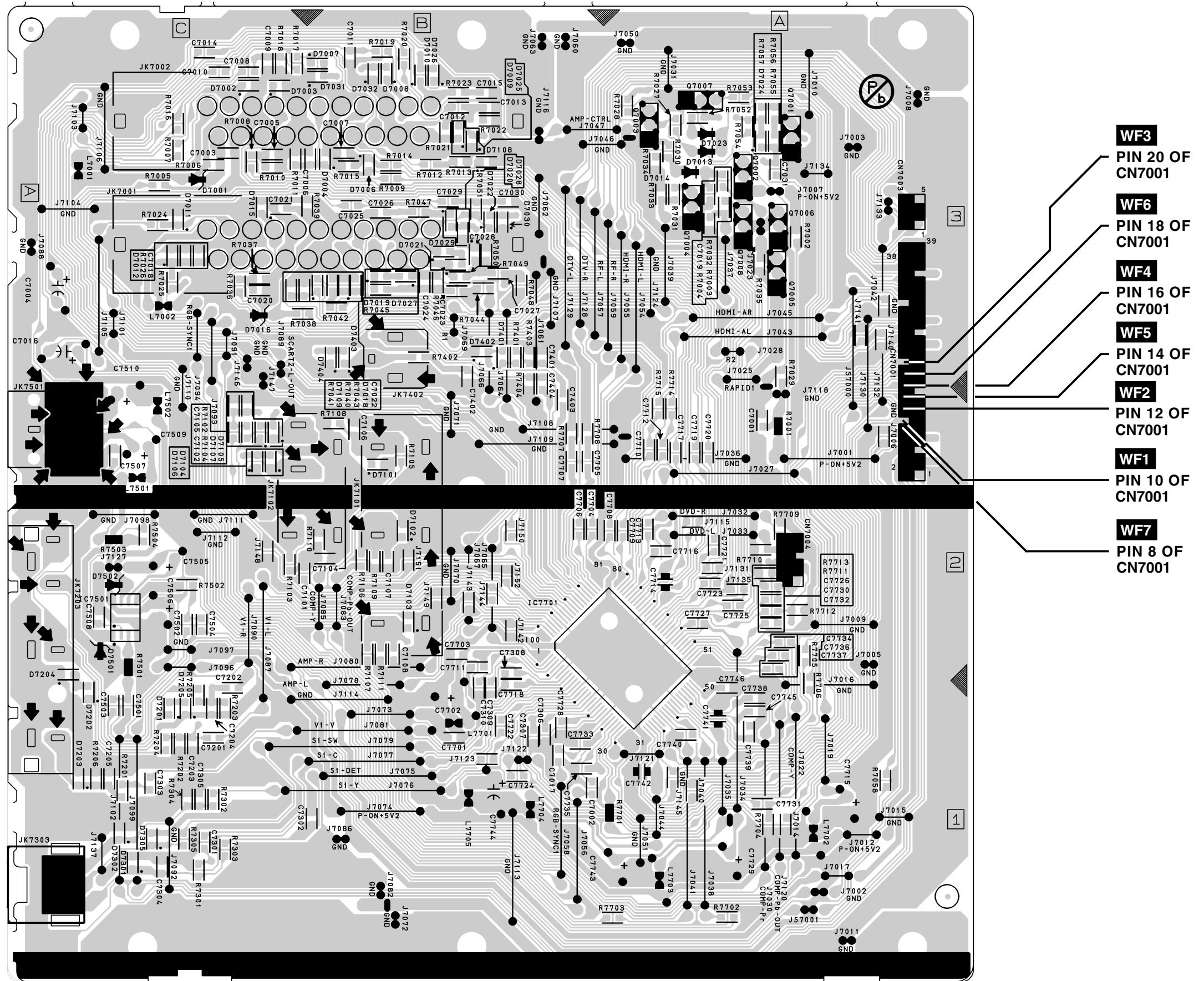
Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.



## Jack CBA Top View



## Jack CBA Bottom View



## Inverter CBA Top View

### CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.  
If Main Fuse (F501) 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.

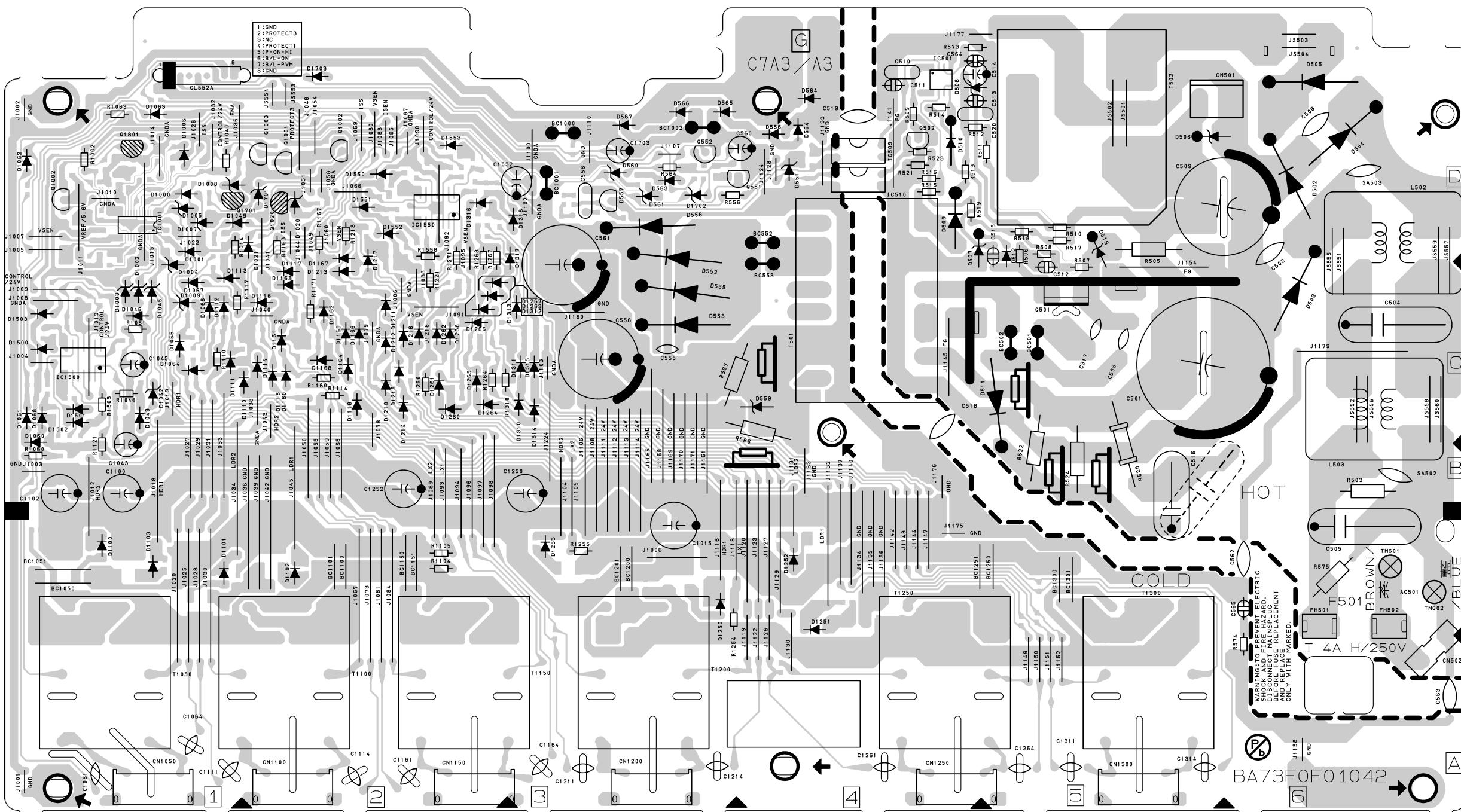
### CAUTION !

For continued protection against fire hazard, replace only with the same type fuse.

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



## Inverter CBA Bottom View

### CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F501) 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.

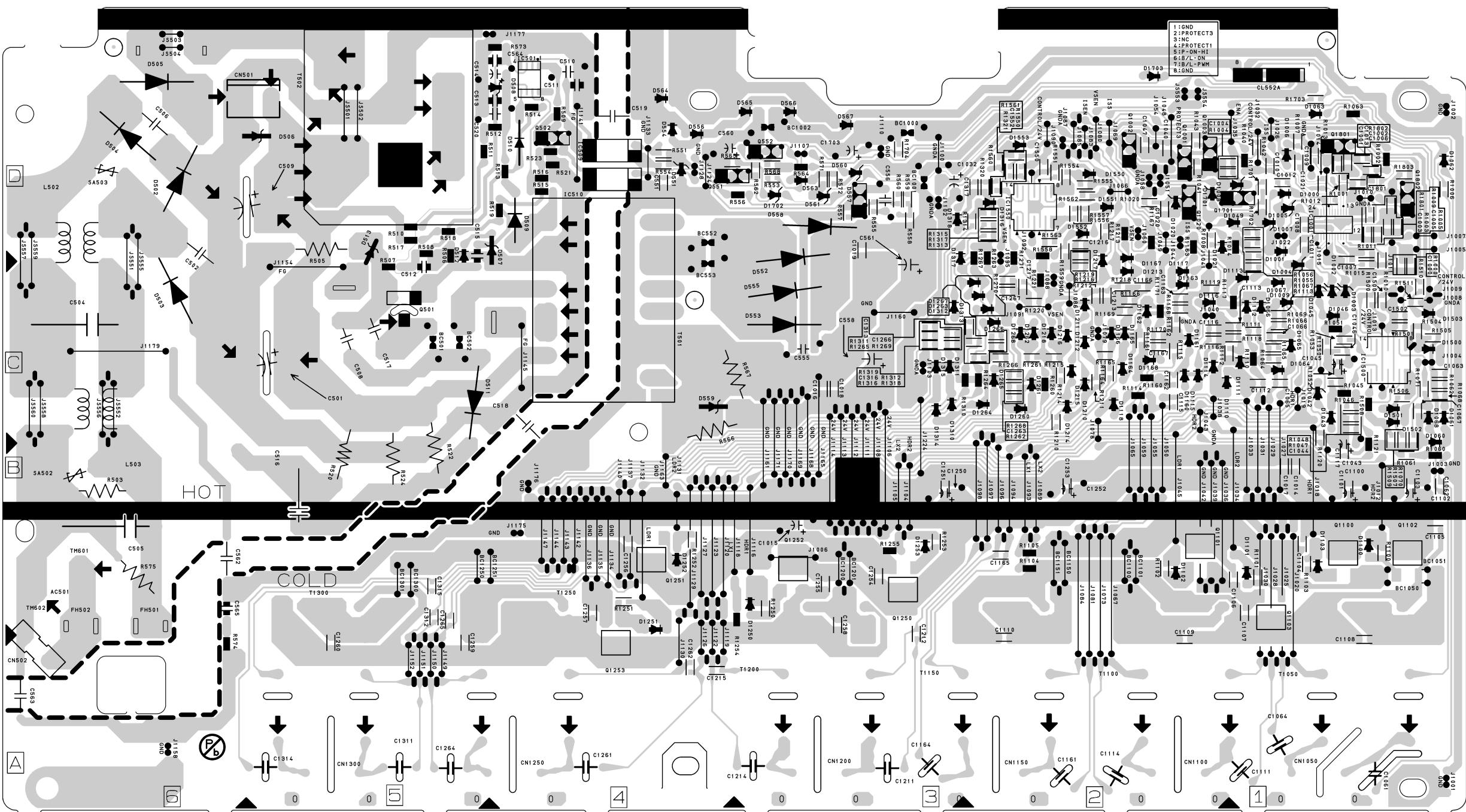
### CAUTION !

For continued protection against fire hazard, replace only with the same type fuse.

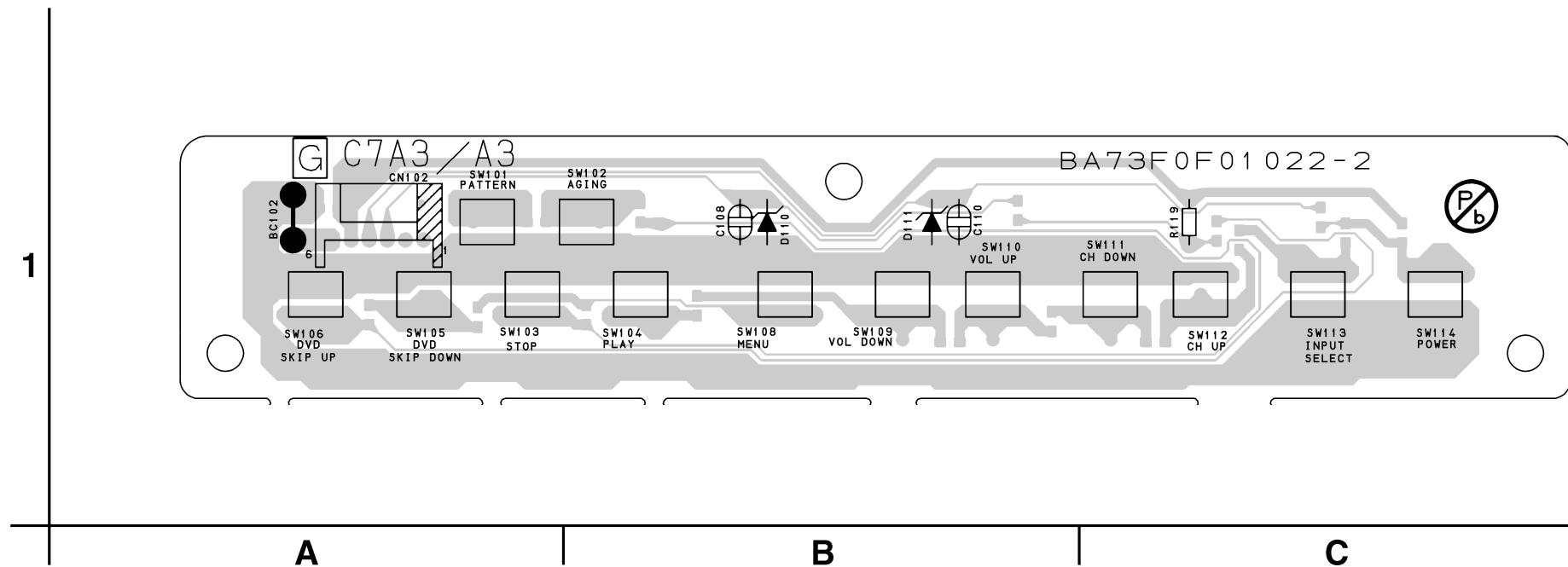
Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly,when troubleshooting this type power supply circuit, a variable isolation transformer is required.

### NOTE:

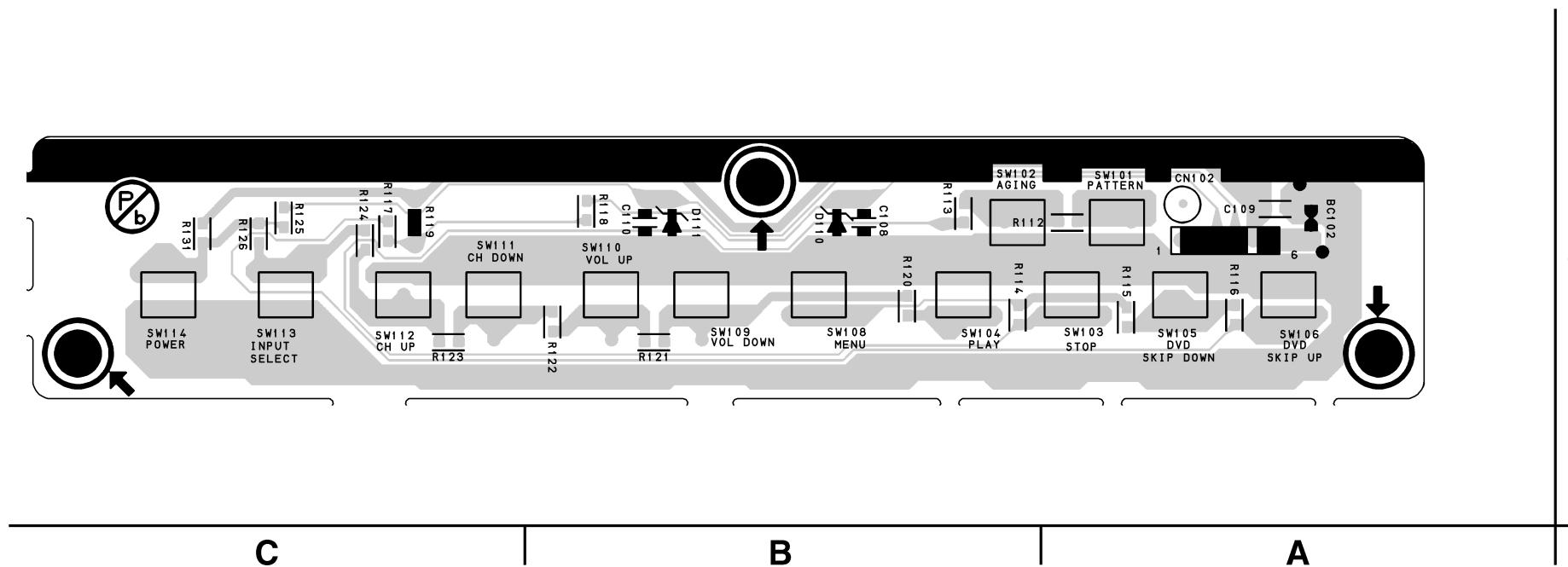
The voltage for parts in hot circuit is measured using hot GND as a common terminal.



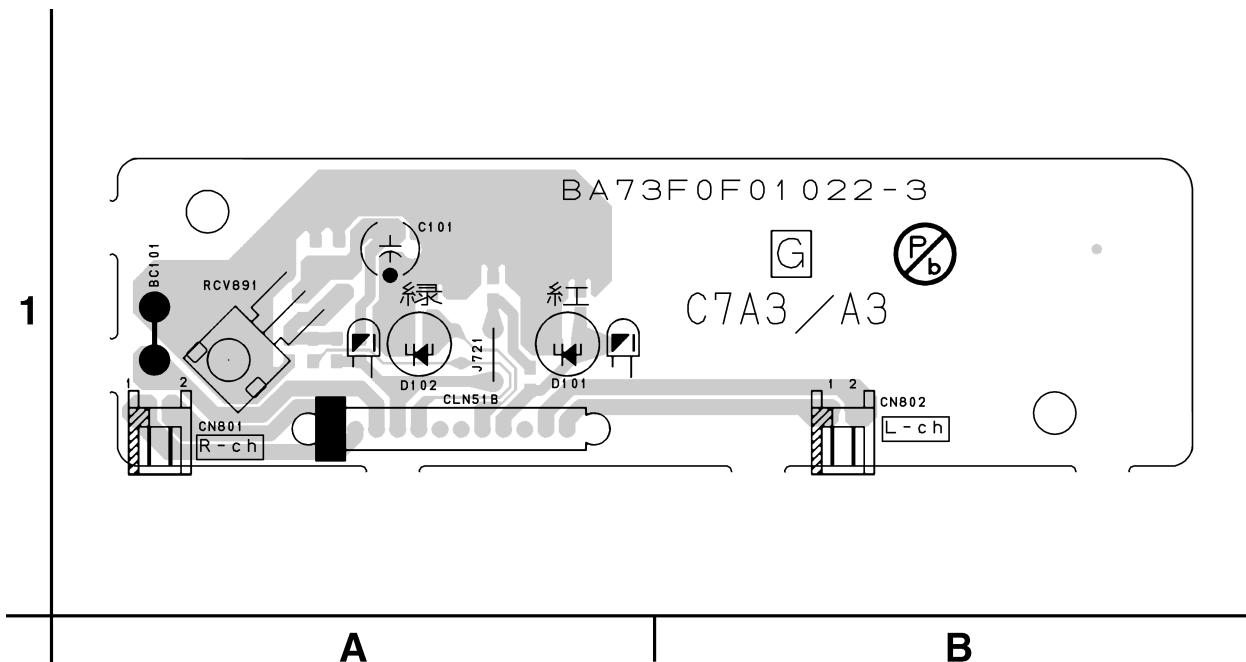
## Function CBA Top View



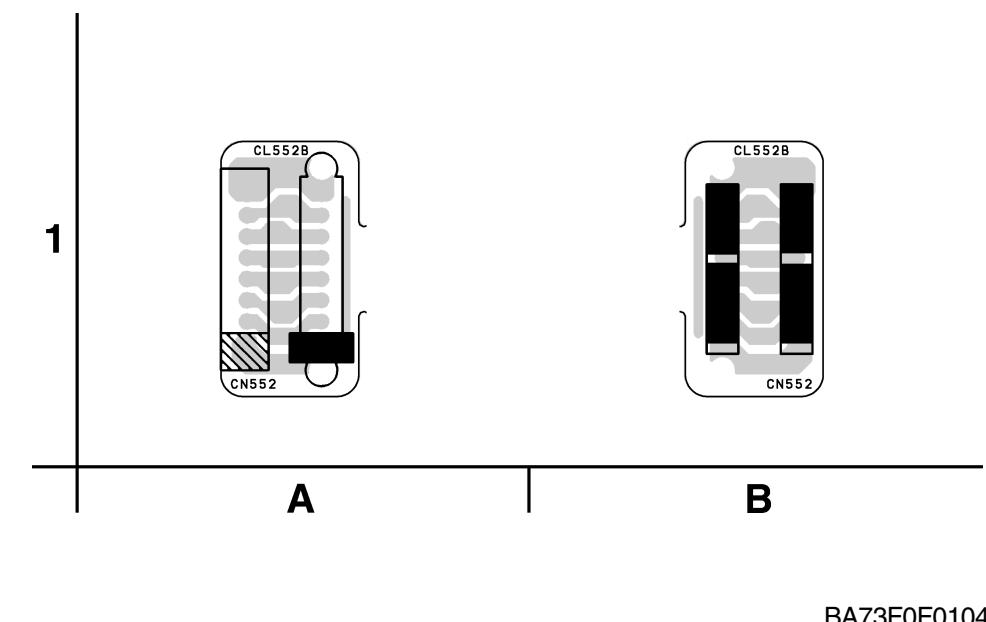
## Function CBA Bottom View



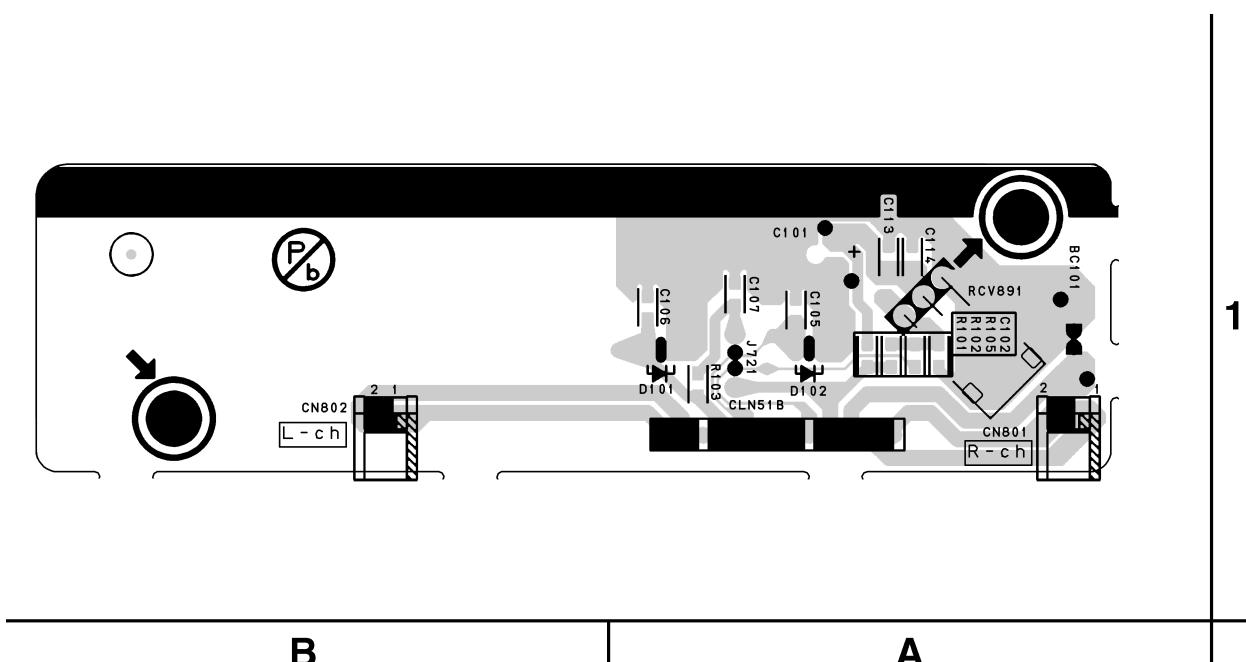
**IR Sensor CBA Top View**



**Junction CBA Top & Bottom View**



**IR Sensor CBA Bottom View**



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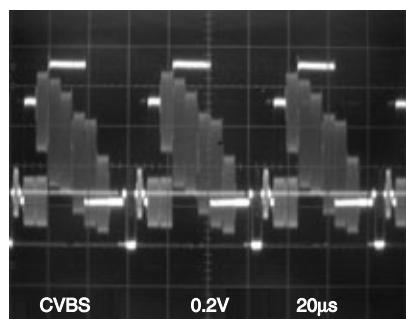
# WAVEFORMS

**WF1 ~ WF3 =** Waveforms to be observed at  
Waveform check points.  
(Shown in Schematic Diagram.)

**Input:** PAL Color Bar Signal (with 1kHz Audio Signal)

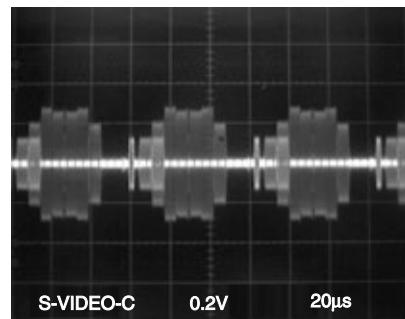
**WF1** Pin 10 of CN7001

(VIDEO IN)

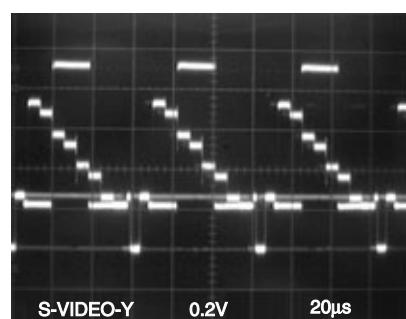


**WF2** Pin 12 of CN7001

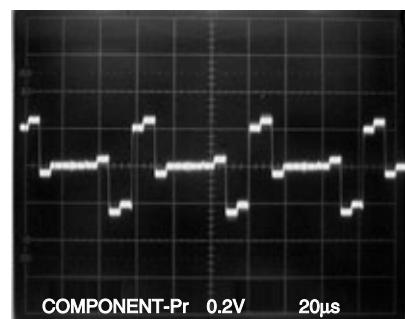
(S-VIDEO IN)



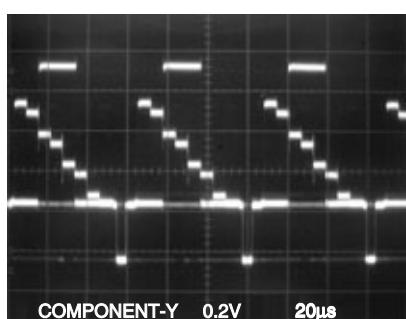
(S-VIDEO IN)



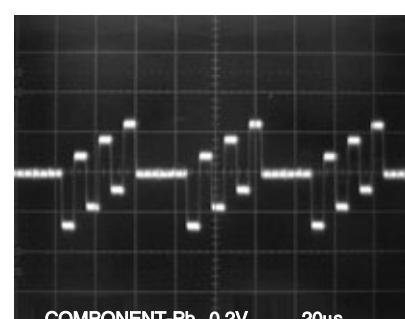
(COMPONENT IN)



(COMPONENT IN)



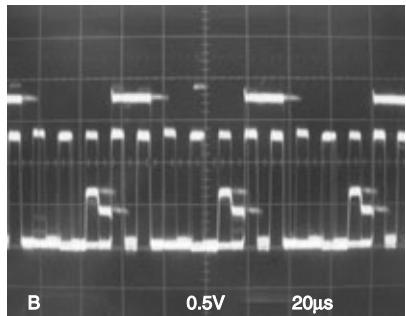
**WF3** Pin 20 of CN7001



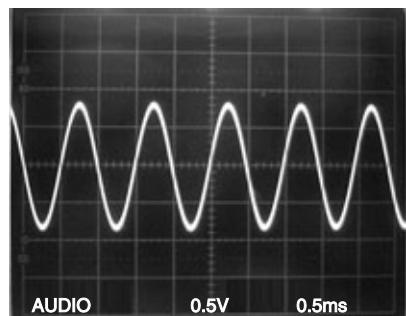
**WF4 ~ WF7 =** Waveforms to be observed at  
Waveform check points.  
(Shown in Schematic Diagram.)

**Input:** PAL Color Bar Signal (with 1kHz Audio Signal)

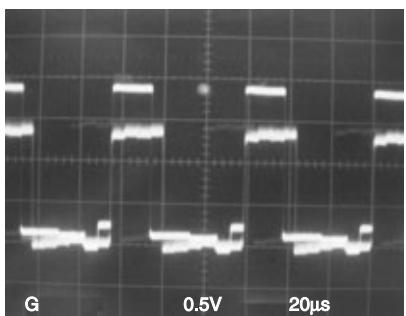
**WF4** Pin 16 of CN7001



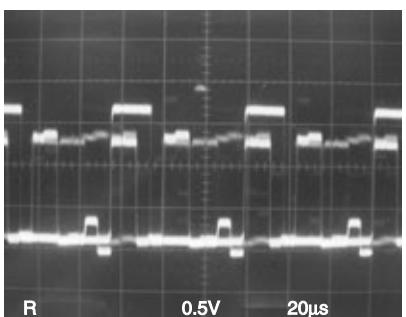
**WF7** Pin 8 of CN7001



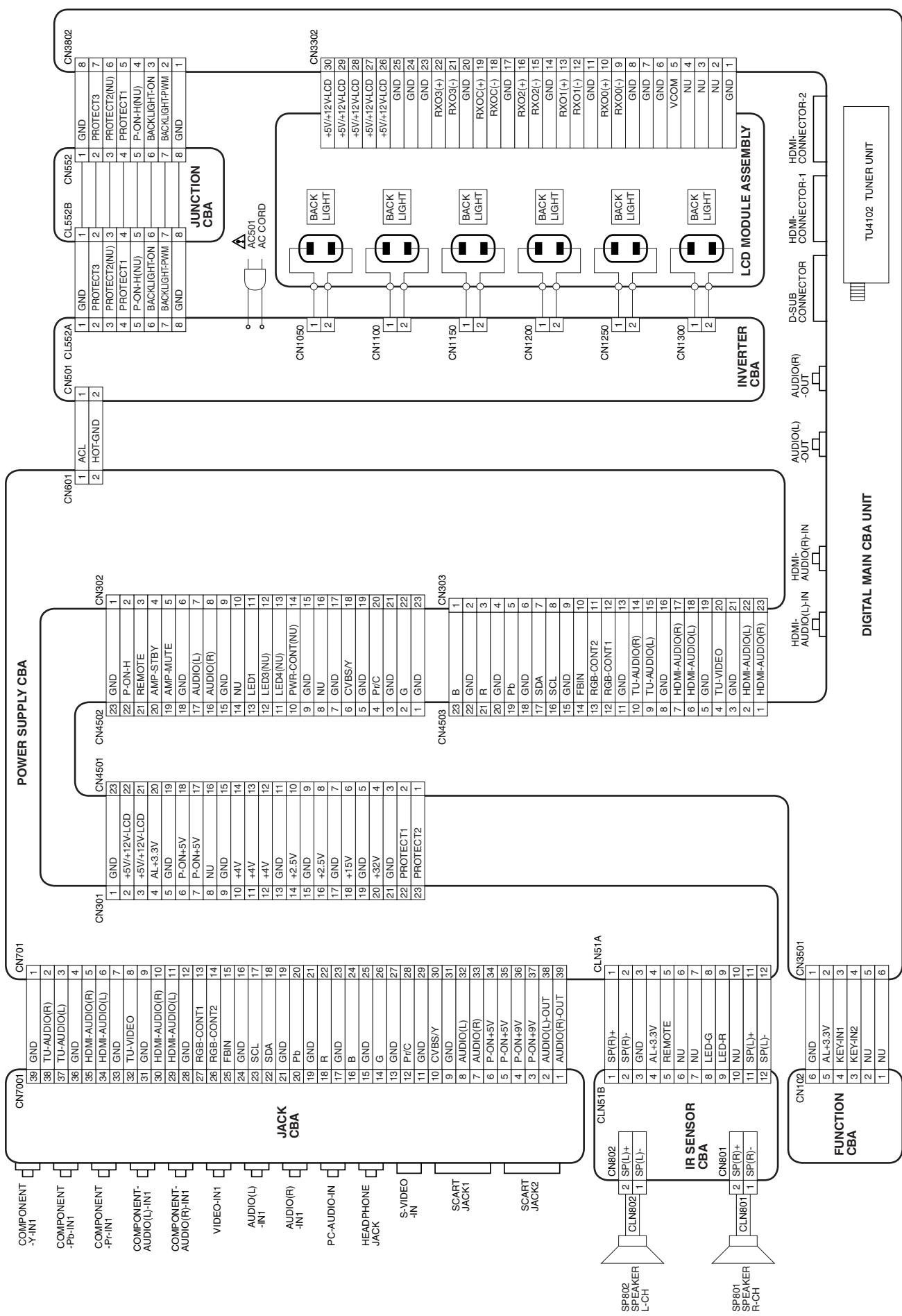
**WF5** Pin 14 of CN7001



**WF6** Pin 18 of CN7001

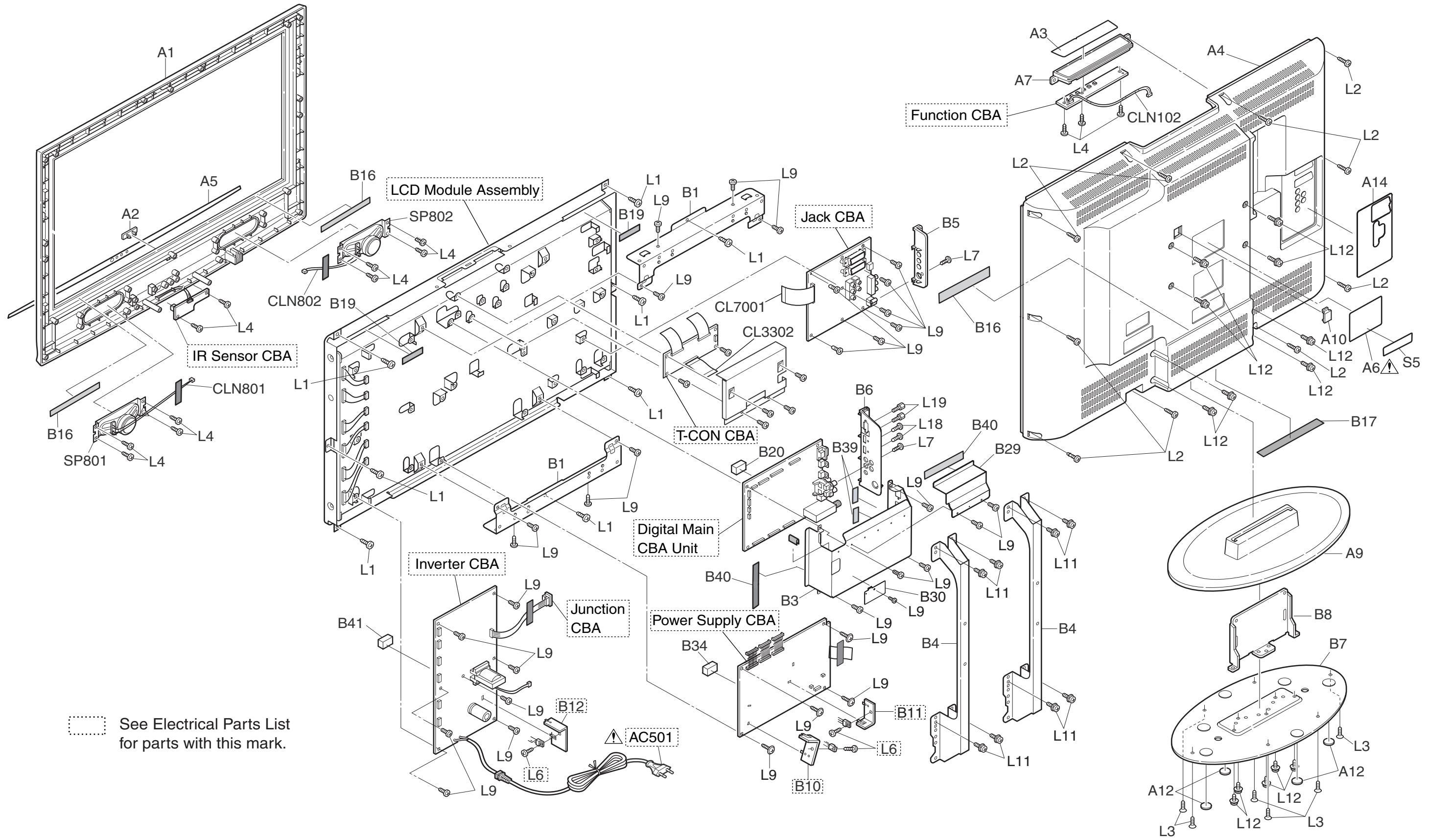


# WIRING DIAGRAMS

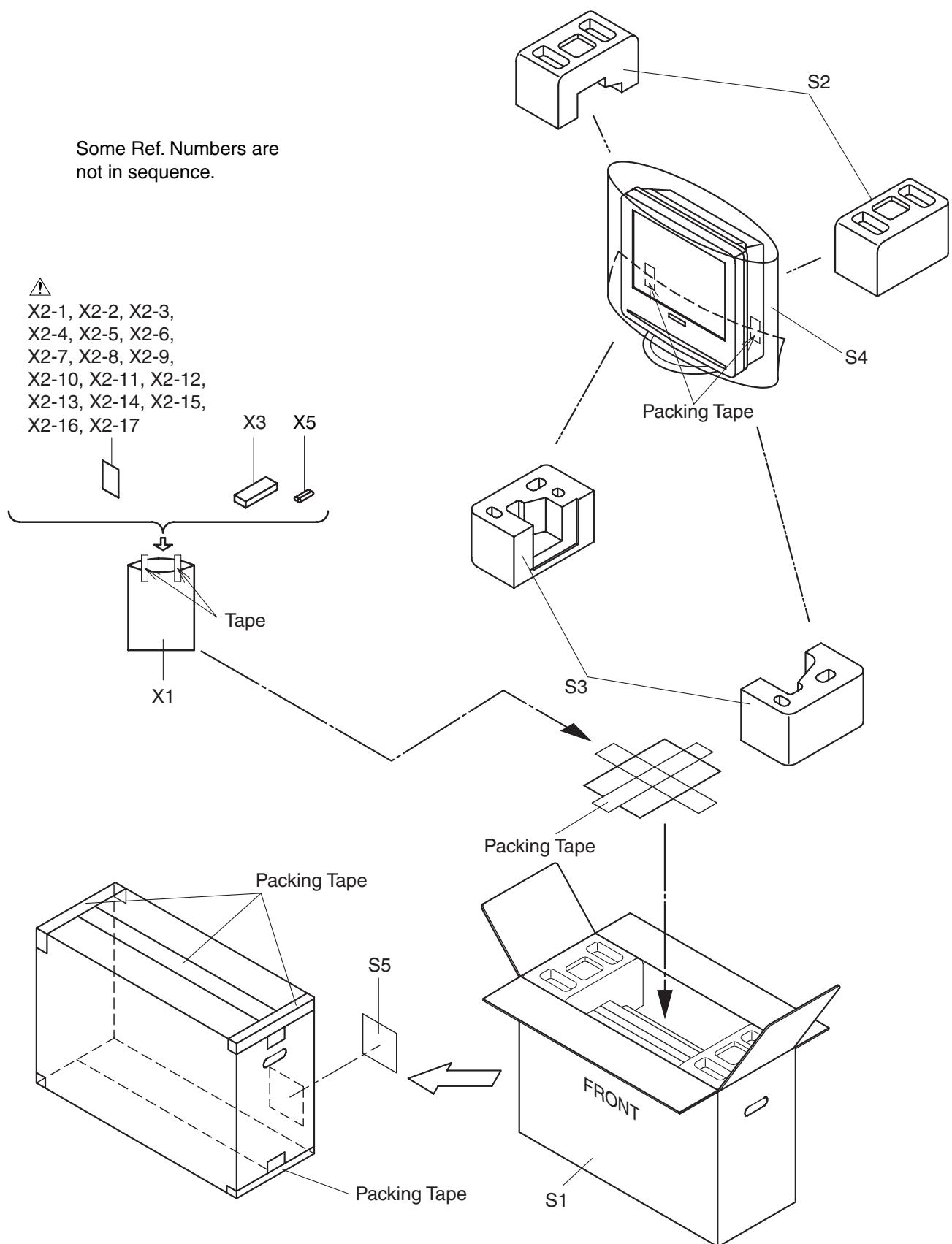


# EXPLODED VIEWS

## Cabinet



## Packing



































LC5-D32BB  
A73F0EP  
2007-11-16