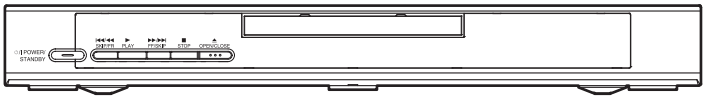
HITACHI

SERVICE MANUAL



TK | No. 9304E

DV-P588A(S)
DV-P588A(ME)
DV-P588A(AU)

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

DVD PLAYER

April 2003 Digital Media Division, Tokai

CONTENTS

1 CAUTIONS FOR SAFETY IN PERFORMING REPAIR 1-1

1-1 LASER BEAM SAFETY PRECAUTIONS 1-1

1-2 IMPORTANT SAFETY PRECAUTIONS 1-2

1-2-1 Product Safety Notice 1-2

1-2-2 Precautions during Servicing. 1-2

1-2-3 Safety Check after Servicing 1-3

1-3 STANDARD NOTES FOR SERVICING. 1-4

1-3-1 Circuit Board Indications 1-4

1-3-2 Instructions for Connectors 1-4

1-3-3 How to Remove/Install Flat Pack-IC 1-4

1-3-4 Instructions for Handling Semi-conductors 1-6

1-4 NOTES WHEN USING SERVICE MANUAL 1-7

2 GENERAL INFORMATION 2-1

2-1 SPECIFICATIONS 2-1

2-2 COMPARISON OF MODELS 2-2

2-3 OPERATING CONTROLS AND FUNCTIONS 2-4

3 MAINTENANCE AND INSPECTION. 3-1

3-1 TROUBLESHOOTING. 3-1

3-2 FIRMWARE RENEWAL MODE 3-7

3-2-1 How to Update the Firmware Version 3-7

3-2-2 How to Verify the Firmware Version 3-7

4 DISASSEMBLY 4-1

4-1 CABINET DISASSEMBLY INSTRUCTIONS 4-1

4-1-1 Disassembly Flowchart 4-1

4-1-2 Disassembly Method 4-1

5 EXPLODED VIEW AND PARTS LIST 5-1

5-1 EXPLODED VIEW 5-1

5-2 REPLACEMENT PARTS LIST. 5-2

5-2-1 Mechanical Parts List 5-2

5-2-2 Electrical Parts List 5-3

SCHEMATIC CIRCUIT BOARD AND BLOCK DIAGRAMS

1 WIRING DIAGRAM. 1

2 SCHEMATIC DIAGRAMS. 2

2-1 DVD Main 1/3 Schematic Diagram 2

2-2 DVD Main 2/3 Schematic Diagram 3

2-3 DVD Main 3/3 Schematic Diagram 5

2-4 AV 1/3 Schematic Diagram 6

2-5 AV 2/3 Schematic Diagram 7

2-6 AV 3/3 & Function Schematic Diagram 8

3 WAVEFORMS. 9

4 CIRCUIT BOARD DIAGRAMS 10

4-1 AV CBA Top View 10

4-2 AV CBA Bottom View. 11

4-3 Function CBA Top/Bottom View 12

5 BLOCK DIAGRAMS 13

5-1 System Control/Servo Block Diagram 13

5-2 Digital Signal Process Block Diagram 14

5-3 Video/Audio Block Diagram. 15

5-4 Power Supply Block Diagram 16

6 SYSTEM CONTROL TIMING CHARTS 17

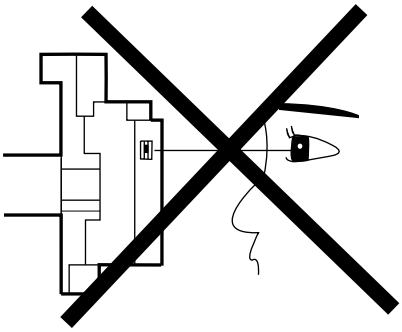
7 IC PIN FUNCTION DESCRIPTIONS 18

8 LEAD IDENTIFICATIONS. 19

1 CAUTION FOR SAFETY IN PERFORMING REPAIR

1-1 LASER BEAM SAFETY PRECAUTIONS

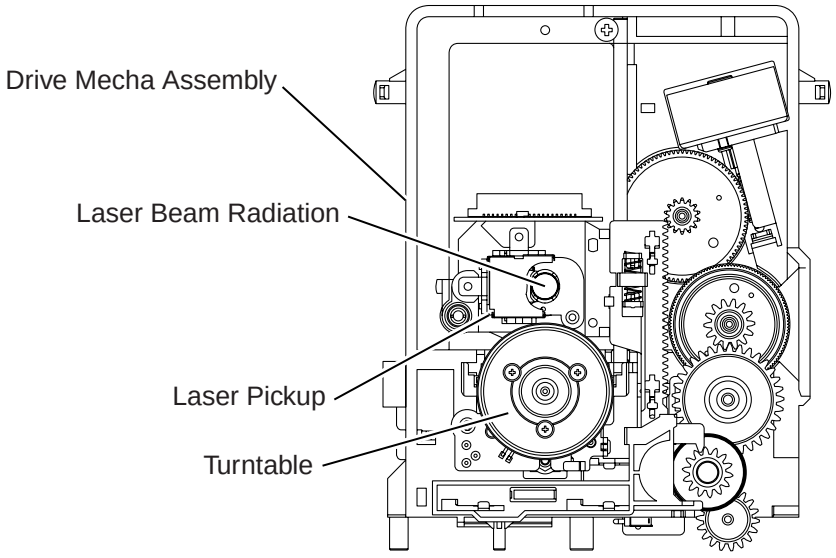
This DVD player uses a pickup that emits a laser beam.



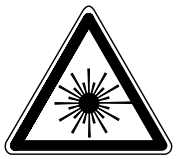
Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

Caution: Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.



CAUTION - VISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID EXPOSURE TO BEAM.



Location: Inside Top of DVD mechanism.

1-2 IMPORTANT SAFETY PRECAUTIONS

1-2-1 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 carefully inspected to confirm 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.

1-2-2 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 (heatsinks, oxide metal film resistors, fusible resistors, etc.).

G. Check that replaced wires do not contact sharp edges 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. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

K. Crimp type wire connector
The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure

1)Remove the old connector by cutting the wires at a point close to the connector.

Important: Do not re-use a connector. (Discard it.)

2)Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

3)Align the lengths of the wires to be connected. Insert the wires fully into the connector.

4)Use a crimping tool to crimp the metal sleeve at its center. Be sure to crimp fully to the complete closure of the tool.

L. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

1-2-3 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 their original positions. Afterwards, do the following tests and confirm the specified values 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. 1-2-1)

Table 1-2-1: Ratings for selected area

AC Line Voltage	Clearance Distance (d) (d')
110 to 240 V (Auto) [DV-P588A(S)/P588A(ME)], 240 V [DV-P588A(AU)]	≥ 3mm(d) ≥ 6mm(d')

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

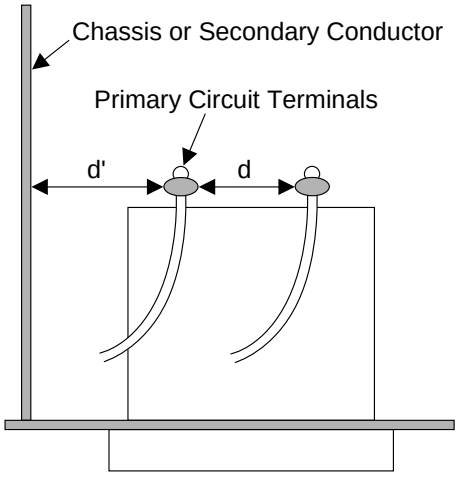


Fig. 1-2-1

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 the terminals of load Z. See Fig. 1-2-2 and the following table.

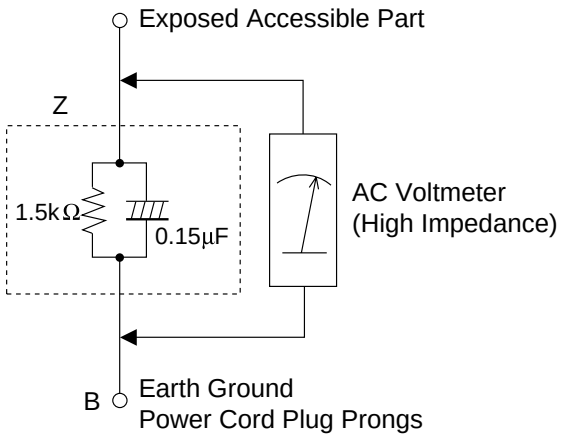


Fig. 1-2-2

Table 1-2-2: Leakage current ratings for selected areas

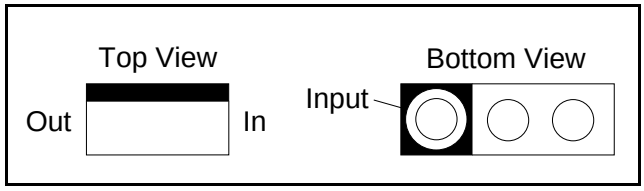
AC Line Voltage	Load Z	Leakage Current (i)	One side of power cord plug prongs (B) to:
110 to 240 V (Auto) [DV-P588A(S)/P588A(ME)],	2kΩ RES. Connected in parallel	i≤0.7mA AC Peak i≤2mA DC	RF or Antenna terminals
240 V [DV-P588A(AU)]	50kΩ RES. Connected in parallel	i≤0.7mA AC Peak i≤2mA DC	A/V Input, Output

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

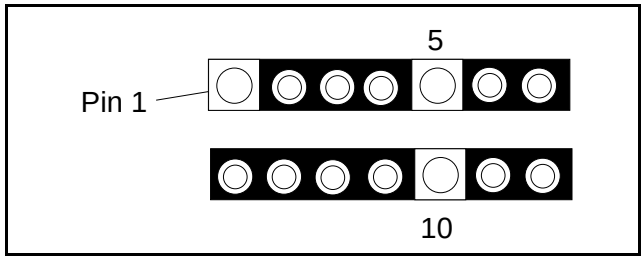
1-3 STANDARD NOTES FOR SERVICING

1-3-1 Circuit Board Indications

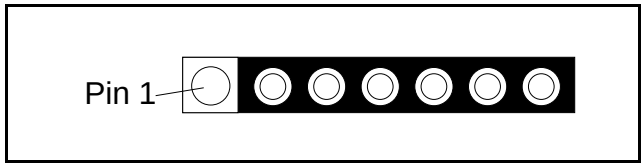
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



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

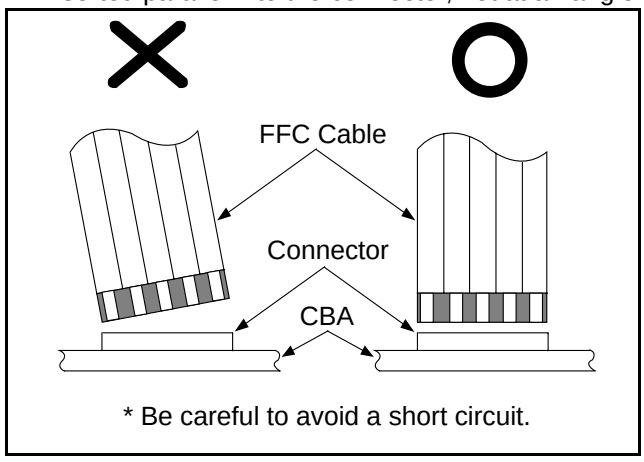


3. The 1st pin of every male connector is indicated as shown.



1-3-2 Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.



1-3-3 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. 1-3-1)

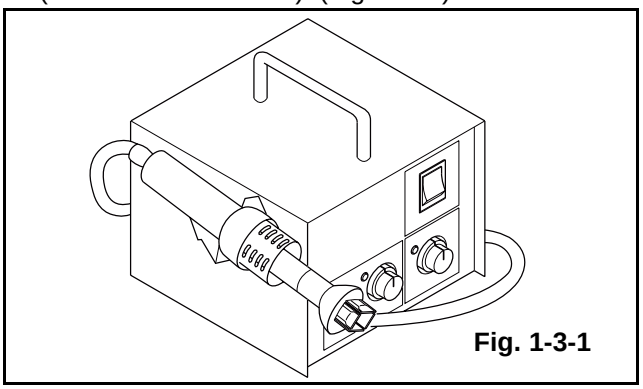


Fig. 1-3-1

(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. 1-3-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

Caution:

1. 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. 1-3-2)
2. 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.

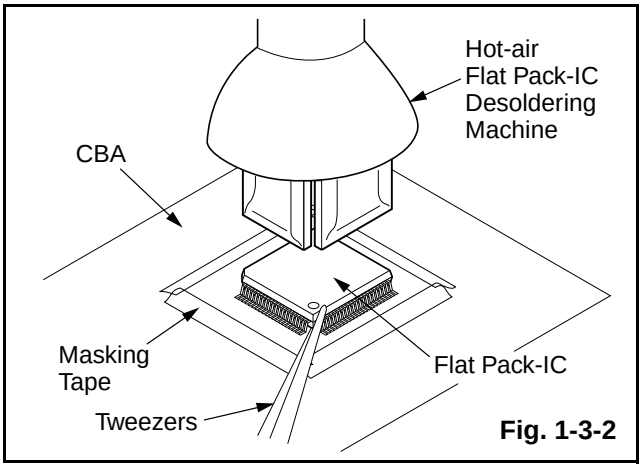


Fig. 1-3-2

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. 1-3-3)

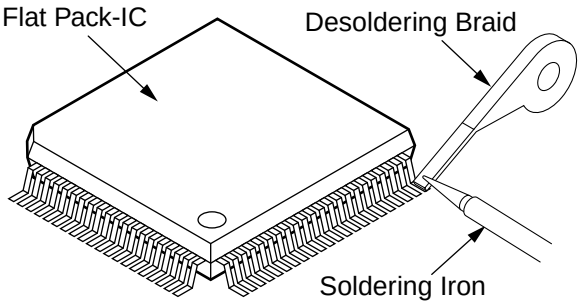


Fig. 1-3-3

(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. 1-3-4)

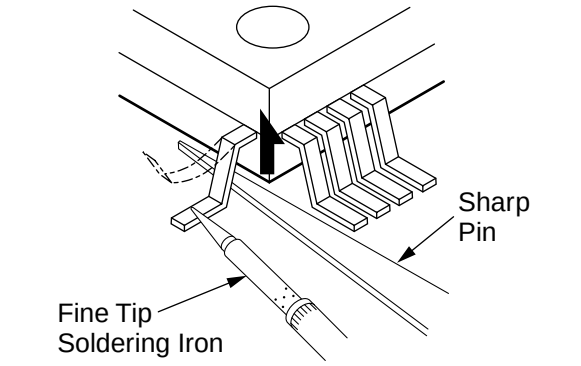


Fig. 1-3-4

(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. 1-3-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

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. 1-3-3)

(2) Affix the wire to a workbench or solid mounting point, as shown in Fig. 1-3-5.

(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. 1-3-5.

(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. 1-3-6)

(5) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

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.

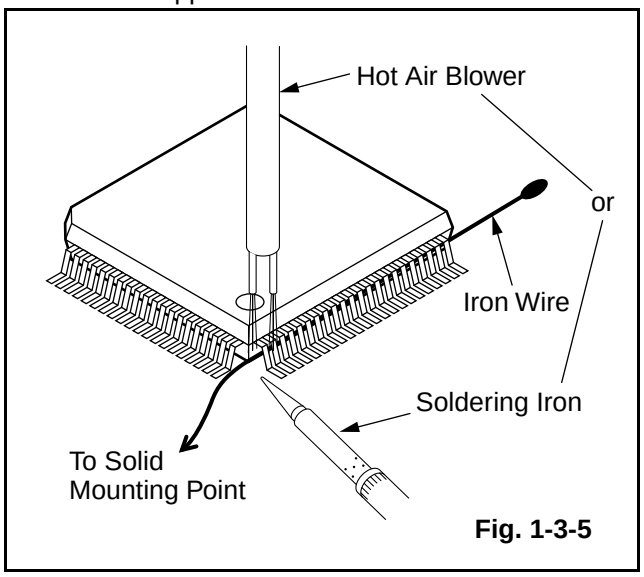


Fig. 1-3-5

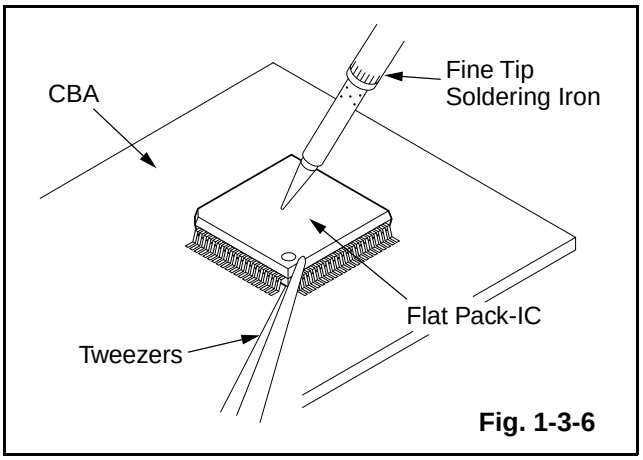


Fig. 1-3-6

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. 1-3-7.) 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. 1-3-8.)

(3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

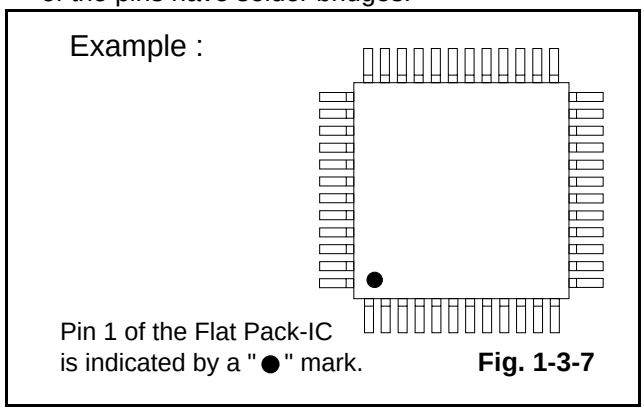


Fig. 1-3-7

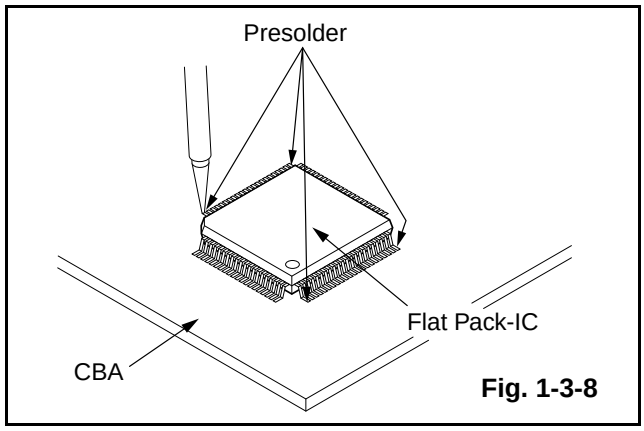


Fig. 1-3-8

1-3-4 Instructions for Handling Semi-conductors

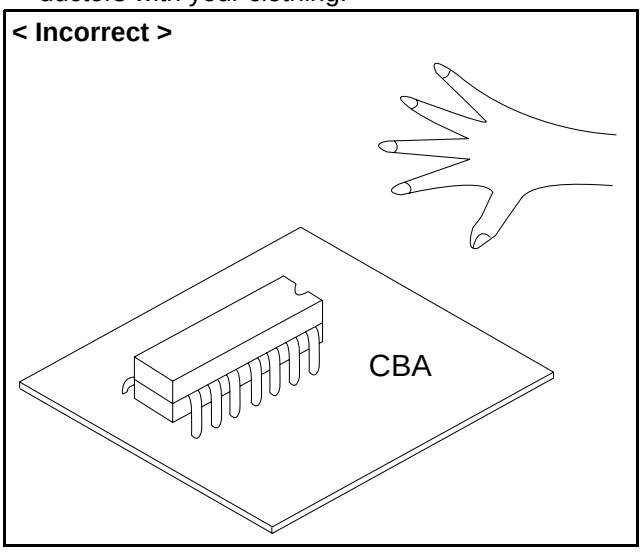
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

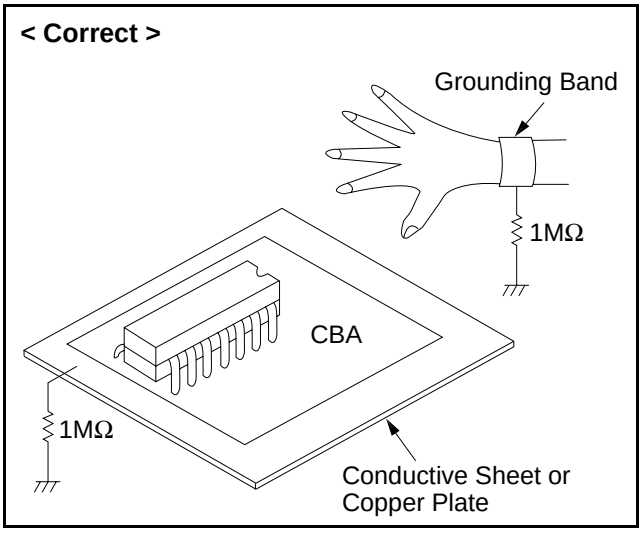
1. Ground for Human Body

Be sure to wear a grounding band (1MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

(1) Be sure to place a conductive sheet or copper plate with proper grounding (1MΩ) 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.





1-4 NOTES WHEN USING SERVICE MANUAL

The following shows the contents to be noted when using service manual:

Standard Notes

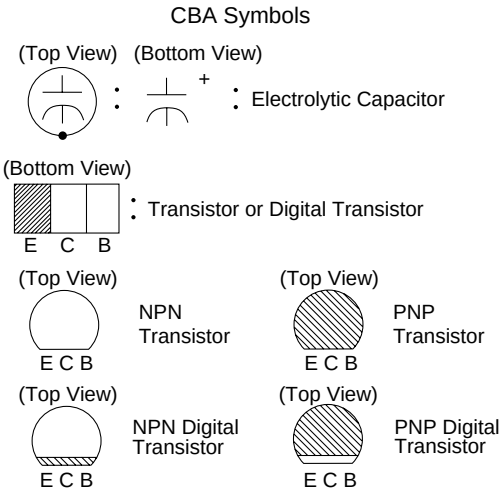
WARNING

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.

Capacitor Temperature Markings

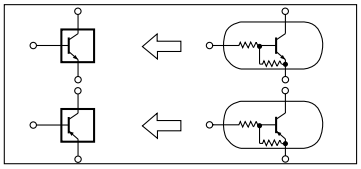
Mark	Capacity change rate	Standard temperature	Temperature range
(B)	±10%	20°C	-25~+85°C
(F)	+30 - 80%	20°C	-25~+85°C
(SR)	±15%	20°C	-25~+85°C
(Z)	+30 - 80%	20°C	-10~+70°C

Capacitors and transistors are represented by the following symbols.



Schematic Diagram Symbols

Digital Transistor



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 voltages are DC voltages unless otherwise speci-fied.

Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication.....Ω K.....kΩ M.....MΩ
Power capacitance	No indication.....1/4W,1/6W All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication.....μF P.....pF
Dielectric strength	No indication.....50V All dielectric strengths other than 50V are indicated in schematic diagrams.

[Coils]

Item	Indication
Value	μ.....μH m.....mH

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

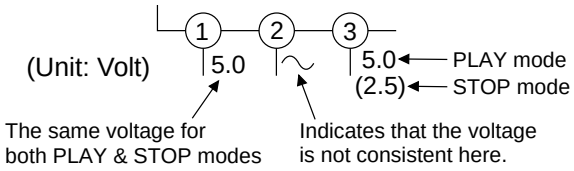
1. CAUTION:
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

2. CAUTION:
Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) 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.

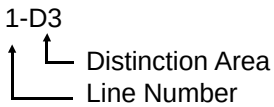
3. Note:
(1) Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
(2) To maintain original function and reliability of repaired units, use only original replacement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

4. Wire Connectors
(1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).
(2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

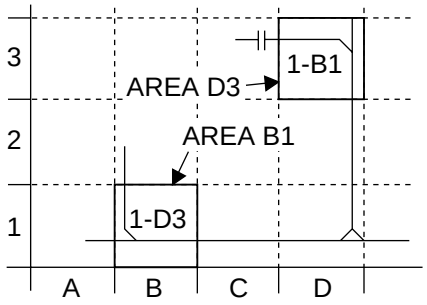
5. Voltage indications for PLAY mode on the schematics are as shown below:



6. How to read converged lines



Examples:
1. "1-D3" means that line number "1" goes to area "D3".
2. "1-B1" means that line number "1" goes to area "B1".



7. 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.

2 GENERAL INFORMATION

2-1 SPECIFICATIONS

Product type :	DVD Player
Discs :	DVD video Video CD Audio CD
Output signal format :	PAL colour/ NTSC colour
Frequency response	
DVD (linear sound) :	20 Hz to 22 kHz (sample rate: 48 kHz) 20 Hz to 44 kHz (sample rate: 96 kHz)
CD :	20 Hz to 20 kHz
Signal-to-noise ratio (S/N ratio)	
CD :	110 dB (JEITA)
Dynamic range	
DVD (linear sound) :	95 dB
CD :	94 dB (JEITA)
Total distortion factor	
CD :	0.005% (JEITA)
Wow and flutter :	Below the measurement limitation (+/-0.001% W PEAK) (JEITA)
Connections	
S-Video output :	Mini DIN 4-pin jack (75 ohm)
Video output :	One RCA connector/ EURO A/V jack, 1 Vp-p (75 ohm)
Coaxial digital audio output :	One pin jack, 500mVp-p (75 ohm)
Analog audio output :	Two RCA connectors (one left channel, one right channel)/ EURO A/V jack, 2 Vrms (47k ohm)
Optical digital audio output :	Optical connector
RGB video output :	EURO A/V jack (R)/(G)/(B), 700 mVp-p (75 ohm)
Power source :	AC 110-240 V, 50 Hz [DV-P588A(S)/(ME)] AC 240 V, 50 Hz [DV-P588A(AU)]
Power consumption :	15 W (standby: 5 W)
Operating temperature :	41°F to 104°F (5°C to 40°C)
Dimensions :	W 17-1/8” (435 mm) H 2-1/4” (55 mm) D 8-5/16” (211 mm)
Weight :	3.8 lbs (1.8 kg)

- **Designs and specifications are subject to change without notice.**

2-2 COMPARISON OF MODELS

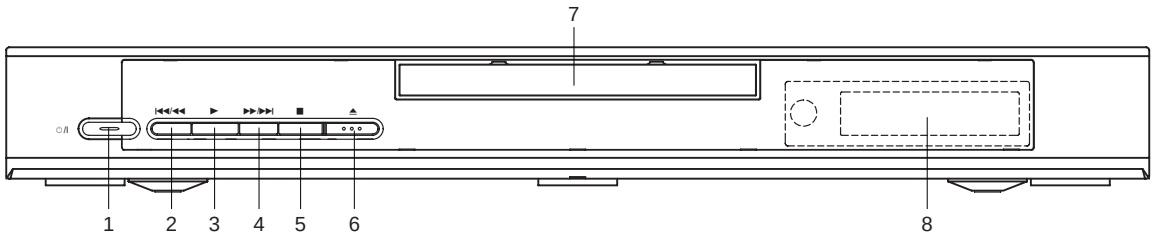
: The halftone parts are the differences from the previous model.

ITEM		DV-P588A(S)/P588A(ME)/P588A(AU)	DV-P388A(S)/P388A(ME)/P388A(AU)
APPEARANCE	Dimensional	435(W) x 55(H) x 211(D) mm	435(W) x 75(H) x 216(D) mm
	Weight	1.8 kg	2.1 kg
	Tray Panel	Clear	Silver
	Color Front / Button	Silver/Silver	Black/Silver
	Hot Stamp	---	---
	Ultra Vision Badge	---	---
GENERAL	Drive Speed	1x	1x
	Laser	2	2
	DVD/VCD/SVCD/CD-DA	O / O / --- / O	O / O / --- / O
	CD-R/CD-RW/DVD-R (Video Format)	O / O / O	O / O / O
	DVD-RAM (VR Format)	---	---
	MP3	O	O
	OSD languages	2 (English, Chinese) [(ME)/(AU)] 2 (English, Russian) [(S)]	2 (English, Chinese)
	Jog Shuttle on Front	---	Only switch shuttle
	Headphone Jack / Volume	--- / ---	--- / ---
VIDEO	PAL Disc NTSC Out	O	---
	Video Out Mode NTSC/PAL/PAL60	O / O / O	--- / O / O
	S-Video / Component / Composite	O / O / O	O / O / O
	Video D/A Converter	10bit	10bit
	Black Level Select	---	O
	Picture Control	---	---
	Progressive Out	---	---
AUDIO	Audio D/A Converter	192kHz / 24bit	192kHz / 24bit
	Digital Audio Out Optical / Coaxial	O / O	O / O
	Dolby Digital 5.1 ch Decode	---	---
	DTS Digital Out	O	O
	Virtual Surround	O	O
	Dynamic Range Compression (Dolby Digital)	O	O
	DVD Audio	---	---
	Power on sound	---	---
TRICK PLAY	Search Speed	2 to 100 (FORWARD/REWIND) (DVD: 2, 8, 50, 100/CD: 16)	2 to 60 (FORWARD/REWIND) (DVD: 2, 8, 30, 60/CD: 16)
	Slow Speed	1/16, 1/8, 1/2 (FORWARD/REWIND)	1/16, 1/8, 1/2 (FORWARD only)
	IP Search (Smooth 2x Play)	O	O
	2x Play with Audio	---	---
	Step Forward / Reverse	O / ---	O / ---
	Still Picture Select (Frame/Field)	Auto Only	Auto Only

ITEM		DV-P588A(S)/P588A(ME)/P588A(AU)	DV-P388A(S)/P388A(ME)/P388A(AU)
FEATURES	Disc Navigation	O	---
	DVD Zoom x2 / x4 / x16	O / O / ---	O / O / ---
	Program and Random Play of DVD / VCD	---	---
	A-B Repeat	O	O
	Repeat	O	O
	Resume Play	O (Resume is not effected affer power off)	O
	Front Panel Display Dimmer	O	O
	Screen Saver	O	O
	Auto Power Off	O	O
REMOTE CONTROLLER	Jog Shuttle on Remote	---	---
	TV Control	---	---

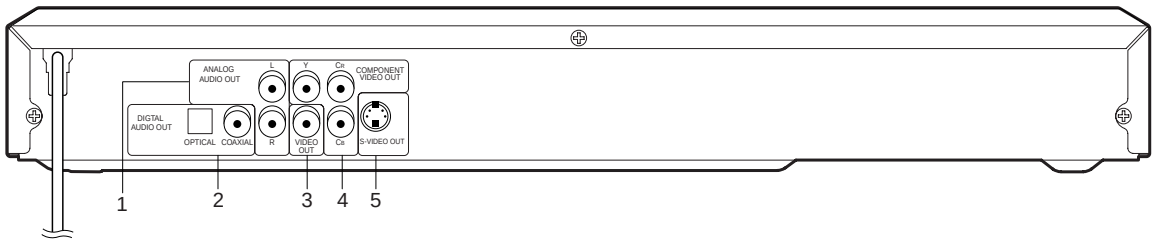
2-3 OPERATING CONTROLS AND FUNCTIONS

FRONT PANEL



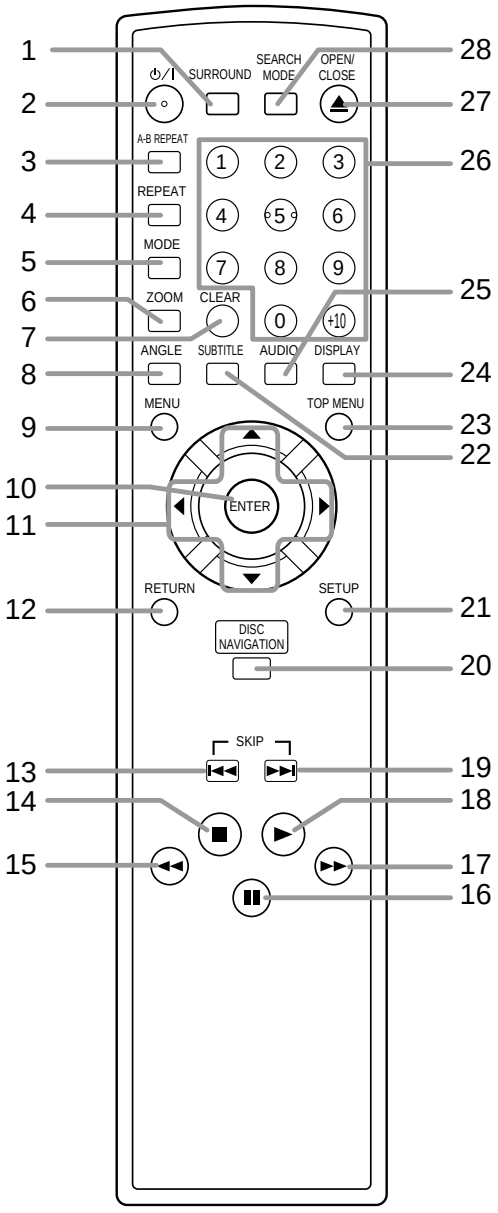
1. ⏻/I **(POWER/STANDBY)**
   to switch the player to ON or OFF
   (As to the indication of the Operate switch, "I" indicates ON and "⏻" indicates electrical power STANDBY)
2. **⏮ / ◀◀ (SKIP/FR)**
   goes to previous chapter or track during playback; press and hold for 1.5 seconds for a reverse search
3. **▶ (PLAY)**
   to start or resume disc playback
4. **▶▶ / ▶▶⏭ (FF/SKIP)**
   goes to next chapter or track during playback; press and hold for 1.5 seconds for a forward search
5. **■ (STOP)**
   to stop playback
6. **⏏ (OPEN/CLOSE)**
   to open/close the disc tray
7. **Disc tray**
8. **Display**

REAR PANEL



1. **ANALOG AUDIO OUT JACKS**
   Connect to the Audio input jacks of A/V-compatible TV or wide screen TV, Stereo system.
2. **DIGITAL AUDIO OUT JACKS:**
   Use either an optical or coaxial digital cable to connect to a compatible Dolby Digital receiver. Use to connect to a Dolby Digital decoder, DTS decoder or MPEG decoder.
3. **VIDEO OUT JACK**
   Use a video cable to connect one of the jack to Video input on your A/V-compatible TV or wide screen TV, Stereo system.
4. **COMPONENT VIDEO OUT**
   Connect to a TV with Component video in jacks.
5. **S-VIDEO OUT JACK**
   Use the S-Video cable to connect this jack to the S-Video jack on your A/V-compatible TV or wide screen TV for a higher quality picture.

REMOTE CONTROL



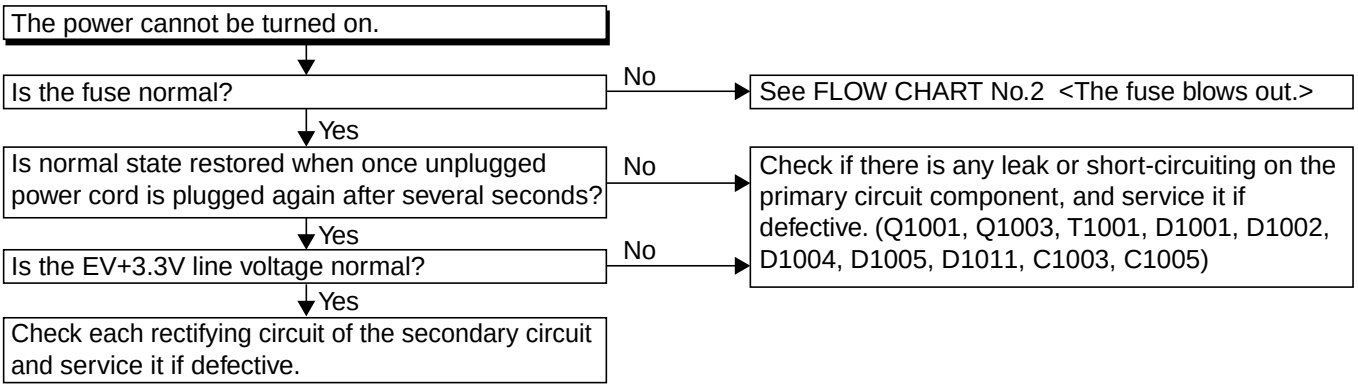
1. **SURROUND**
   Press to activate the virtual sound.
2. ⏻/I **(POWER/STANDBY)**
   to switch the player to ON or OFF
   (As to the indication of the Operate switch, "I" indicates ON and "⏻" indicates electrical power STANDBY)
3. **A-B REPEAT**
   Repeats playback of a selected section.
4. **REPEAT**
   Repeats playback of the current disc, title, chapter or track.
5. **MODE**
   to set up programmed or random playback (Audio CD)
   to set virtual surround during playback
6. **ZOOM**
   enlarge DVD and Video CD image
7. **CLEAR**
8. **ANGLE**
   select DVD camera angle
9. **MENU**
   to display the menu of the DVD disc
10. **ENTER**
    acknowledge menu selection
11. **Arrow Buttons (◄►▼▲)**
    Move the cursor and determines its position.
12. **RETURN**
    to return previous or remove setup menu
13. **SKIP ⏮**
    goes to previous chapter or track during playback
14. **■ (STOP)**
    to stop playback
15. **◄◄**
    to view DVD picture in fast reverse motion
16. **❚❚ (PAUSE/STEP)**
    Press to pause Disc playback. Press repeatedly to advance the DVD picture step by step (or one frame at a time).
17. **►►**
    to view DVD picture in fast forward motion
18. **► (PLAY)**
    to start or resume disc playback
19. **SKIP ⏭**
    goes to next chapter or track during playback
20. **DISC NAVIGATION**
    Press to display the first scenes of each chapter of the title being played.
21. **SETUP**
    Press to enter the setup mode.
22. **SUBTITLE**
    Press to select the desired subtitle language.
23. **TOP MENU**
    Press to call up the title menu.
24. **DISPLAY**
    Press to access or remove the display screen during DVD, Audio CD or Video CD playback.
25. **AUDIO**
    Press to select a desired audio language or sound mode.
26. **Numerical Buttons**
    Press to directly select a Title/Chapter(DVD)/Track (Audio CD/Video CD) for playback.
27. **⏏ (OPEN/CLOSE)**
    to open/close the disc tray
28. **SEARCH MODE**
    Press to access or remove the Search display, which allows you to go directly to a specific Title/Chapter/Track/Time/Marker.

3 MAINTENANCE AND INSPECTION

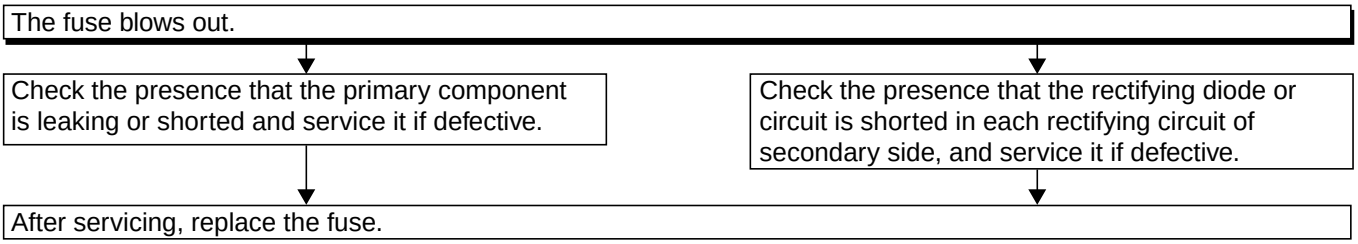
3-1 TROUBLESHOOTING

Troubleshooting is how to service for the specifying malfunction or poor parts.
Detect malfunction or poor parts and service as the following charts.

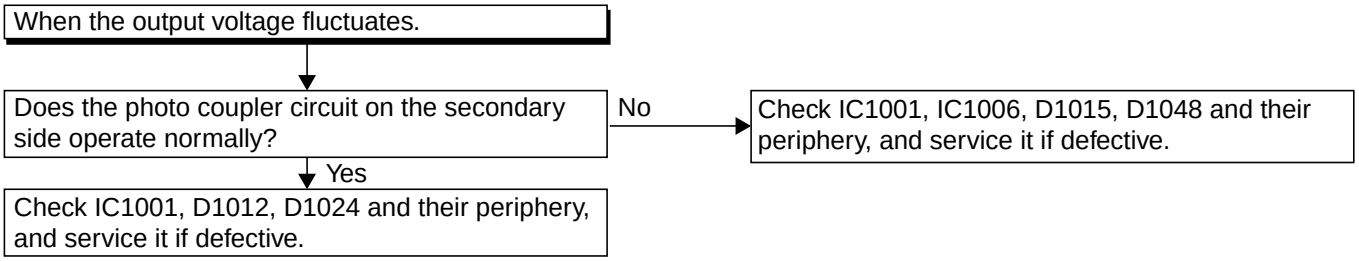
FLOW CHART NO.1



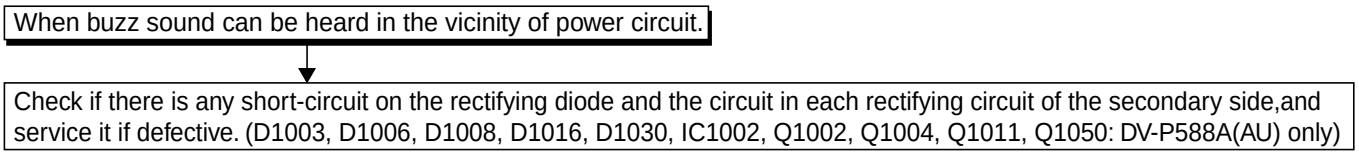
FLOW CHART NO.2



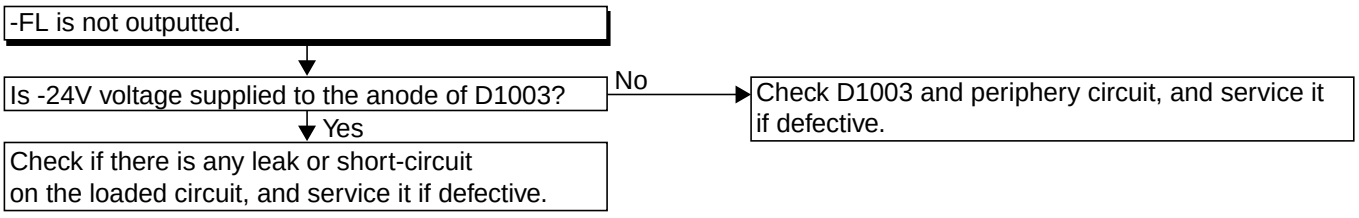
FLOW CHART NO.3



FLOW CHART NO.4



FLOW CHART NO.5



FLOW CHART NO.6

P-ON+9V is not outputted.

↓

Is 9V voltage supplied to the emitter of Q1002? — No → Check D1030, D1048, L1009, C1035, C1048 and the periphery circuit, and service it if defective.

↓ Yes

Is the voltage of base on Q1002 lower than the voltage of emitter on Q1002 when turning the power on? — No → Check Q1016 and PWRCON line and service it if defective.

↓ Yes

Replace Q1002.

FLOW CHART NO.7 (DV-P588A(AU) only)

EV+9V is not outputted.

↓

Is 9V voltage supplied to the collector of Q1050? — No → Check D1030, D1048, L1009, C1035, C1048, R1097 and the periphery circuit, and service it if defective.

↓ Yes

Is the "H" pulse inputted into the base of Q1050? — No → Check D1072, C1070, R1098 and service it if defective.

↓ Yes

Replace Q1050.

FLOW CHART NO.8

P-ON+5V is not outputted. (EV+9V is outputted normally.)

↓

Is the "H" pulse inputted into the base of Q1004? — No → Check R1068 and D1046, and service it if defective.

↓ Yes

Replace Q1004.

FLOW CHART NO.9

P-ON+3.3V (EV+3.3V) is not outputted. (P-ON+9V is outputted normally.)

↓

Is 3.3V voltage supplied to the collector of Q1011? — No → Check D1008, D1015, C1007, C1038 and the periphery circuit, and service it if defective.

↓ Yes

Replace Q1011 and R1067.

FLOW CHART NO.10

EV+5V is not outputted.

↓

Is EV+9V outputted normally? — No → Refer to "FLOW CHART NO.6" <EV+9V is not outputted.>

↓ Yes

Check D1047 and the periphery circuit, and service it if defective.

FLOW CHART NO.11

EV+1.5V is not outputted.

↓

Is approximately 2.5V voltage supplied to Pin(1) of IC1002? — No → Check D1006,C1014,C1050, and their periphery, and service it if detective.

↓ Yes

Replace IC1002.

FLOW CHART NO.12

The fluorescent display tube does not light up.

↓

Is 3.3V voltage supplied to Pin(6) and Pin(24) of IC2001?

No → Check the EV+3.3V line and service it if detective.

↓ Yes

Is the voltage of approximately -24V to -28V supplied to Pin(15) of IC2001?

No → Check the -FL (-28V) line and service it if detective.

↓ Yes

Is there 500kHz oscillation at Pin(26) of IC2001?

No → Check R2015, IC2001 and their periphery, and service it if detective.

↓ Yes

Are the filament voltage supplied between Pins(1, 2) and Pins(34, 35) of the fluorescent display tube? And the negative voltage applied between these pins and GND?

No → Check D1016, D1017, R1079, C1018, and their periphery, and service it if detective.

↓ Yes

Replace the fluorescent display tube.

FLOW CHART NO.13

The key operation is not functioning.

↓

Are the contact point and the installation state of the key switches (SW2002, 2003, 2005-2008) normal?

No → Re-install the switches (SW2002, 2003, 2005-2008) correctly or replace the poor switch.

↓ Yes

When pressing each switches (SW2002, 2003, 2005-2008), do the voltage of each pin of IC2001 (shown below) switch to 75mV from 6mV?
SW2002, 2006, 2008 : IC2001 3PIN
SW2003, 2005, 2007 : IC2001 4PIN

No → Check the switches (SW2002, 2003, 2005-2008) and their periphery, and service it if detective.

↓ Yes

Replace IC2001.

FLOW CHART NO.14

No operation is possible from the remote control unit.

↓

Operation is possible from the DVD, but no operation is possible from the remote control unit.

↓ Yes

Is 5V voltage supplied to the Pin(3) terminal of the infrared remote control receiver (RM2001)?

No → Check EV+5V line and service it if detective.

↓ Yes

Is the "L" pulse sent out Pin(1) terminal of receiver (RM2001) when the infrared remote control is activated?

No → Replace the infrared remote control receiver (RM2001). Or replace the remote control unit.

↓ Yes

Is the "L" pulse signal supplied to the Pin(22) of CN1001?

No → Check the line between Pin(1) of the infrared remote control receiver (RM2001) and Pin(22) of CN1001, and service it if detective.

↓ Yes

Replace DVD Main CBA.

FLOW CHART NO.15

The disc tray cannot be opened and closed. (It can be done using the remote control unit.)

↓

Does the voltage of Pin(4) on IC2001 become 75mV when pressing "OPEN/CLOSE" button on the unit?

No → Replace the "OPEN/CLOSE" button (SW2005).

↓ Yes

Refer to "FLOW CHART NO.16" <The disc tray cannot be opened and closed.>

FLOW CHART NO.16

The disc tray cannot be opened and closed.

↓

Replace the DVD Main CBA.

↓

No improvement can be found.

No → Original DVD Main CBA is poor.

↓ Yes

Replace the DVD Mecha.

FLOW CHART NO.17

[No Disc] indicated. (When the focus error occurs.)

↓

Replace the DVD Main CBA.

↓

No improvement can be found.

No → Original DVD Main CBA is poor.

↓ Yes

Replace the DVD Mecha.

FLOW CHART NO.18

[No Disc] indicated. (When the focus servo is not functioning.)

↓

Replace the DVD Main CBA.

↓

No improvement can be found.

No → Original DVD Main CBA is poor.

↓ Yes

Replace the DVD Mecha.

FLOW CHART NO.19

[No Disc] indicated. (When the laser beam does not light up.)

↓

Replace the DVD Main CBA.

↓

No improvement can be found.

No → Original DVD Main CBA is poor.

↓ Yes

Replace the DVD Mecha.

FLOW CHART NO.20

Both functions of picture and sound do not operate normally.

↓

Replace the DVD Main CBA.

↓

No improvement can be found. — No → Original DVD Main CBA is poor.

↓ Yes

Replace the DVD Mecha.

FLOW CHART NO.21

Picture does not appear normally.

↓

Set the disc on the disc tray, and playback.

↓

Are the video signals outputted to each pin of CN1601 on the AV CBA? — No → Replace the DVD Main CBA or DVD Mecha.

CN1601	5PIN	S-Y
CN1601	7PIN	S-C
CN1601	1PIN	Cr
CN1601	3PIN	Cb

↓ Yes

Are the video signals shown above inputted into each pin of IC1401? — No → Check the line between each pin of CN1601 and each pin of IC1401 on the AV CBA, and service it if detective.

IC1402	6PIN	S-Y	CN1601	5PIN → IC1402	6PIN S-Y
IC1402	2PIN	S-C	CN1601	7PIN → IC1402	2PIN S-C
IC1402	11PIN	Cr	CN1601	1PIN → IC1402	11PIN Cr
IC1402	9PIN	Cb	CN1601	3PIN → IC1402	9PIN Cb

↓ Yes

Are the video signals outputted to each pin of IC1401? — No → Is 5V voltage applied to the pin(1, 24) of IC1401?

IC1402	21PIN	CVBS
IC1402	18PIN	S-Y
IC1402	23PIN	S-C
IC1402	13PIN	Cr
IC1402	15PIN	Cb

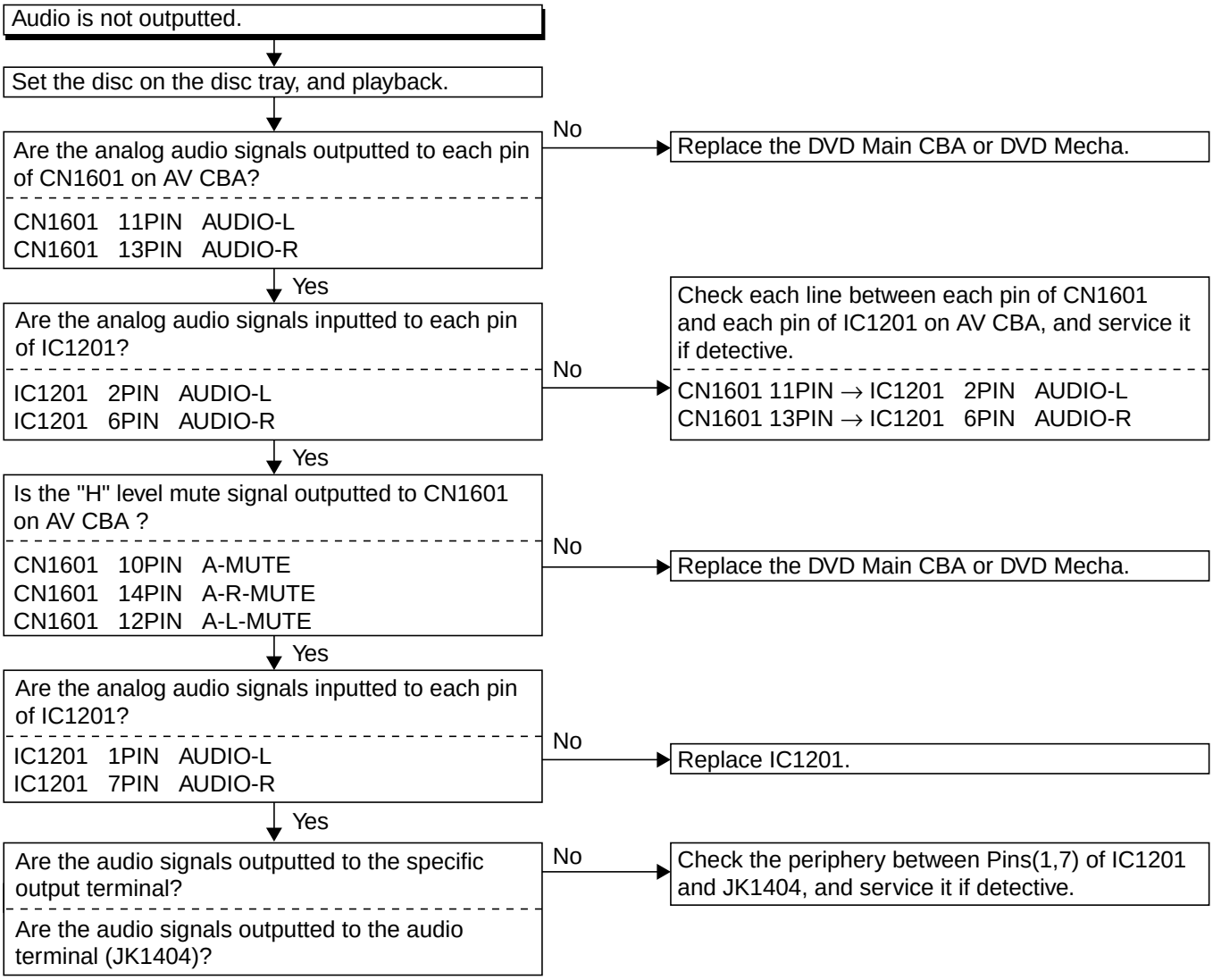
Is 5V voltage applied to the pin(1, 24) of IC1401?
- Yes → Replace IC1401.
- No → Check P-ON+5V line and service it if detective.

↓ Yes

Are the video signals outputted to the specific output terminal?

Are the luminance signals outputted to the S-OUT terminal (JK1401)?	No	Check the periphery of JK1401 from Pin (18) of IC1401 and service it if detective.
Are the chroma signals outputted to the S-OUT terminal (JK1401)?	No	Check the periphery of JK1401 from Pin (23) of IC1401 and service it if detective.
Are the component video signals outputted to the VIDEO OUT terminal (JK1404)?	No	Check the periphery of JK1404 from Pins (13, 15, 18) of IC1401 and service it if detective.
Are the composite video signals outputted to the VIDEO OUT terminal (JK1404)?	No	Check the periphery of JK1404 from Pin(21) of IC1401 and service it if detective.

FLOW CHART NO.22



3-2 FIRMWARE RENEWAL MODE

3-2-1 How to Update the Firmware Version

1. Turn the power on and remove the disc on the tray.
2. To put the DVD player into version up mode, press [9], [8], [7], [6], and [SEARCH MODE] buttons on the remote control unit in that order. The tray will open automatically.
   Fig. 3-2-1 appears on the screen and Fig. 3-2-2 appears on the VFD.
   The DVD player can also enter the version up mode with the tray open. In this case, Fig. 3-2-1 will be shown on the screen while the tray is open.

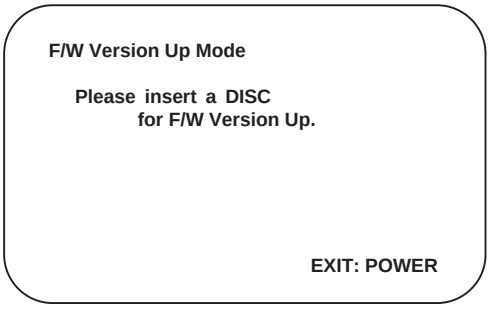


Fig. 3-2-1 Version Up Mode Screen

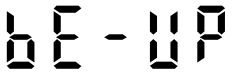


Fig. 3-2-2 VFD in Version Up Mode

3. Load the disc for version up.
4. The DVD player enters the F/W version up mode automatically. Fig. 3-2-3 appears on the screen and Fig. 3-2-4 appears on the VFD.

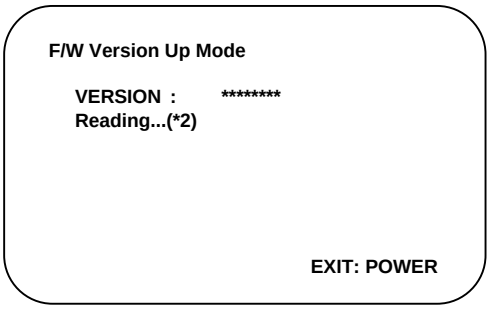


Fig. 3-2-3 Programming Mode Screen

Fig. 3-2-4 VFD in Programming Mode (Example)

The appearance shown in (*2) of Fig. 3-2-3 is described as follows:

No.	Appearance	State
1	Reading...	Sending files into the memory
2	Erasing...	Erasing previous version data
3	Programming...	Writing new version data

5. After programming is finished, the tray opens automatically. Fig. 3-2-5 appears on the screen and the checksum in (*3) of Fig. 3-2-5 appears on the VFD. (Fig. 3-2-6)
   At this time, no buttons are available.

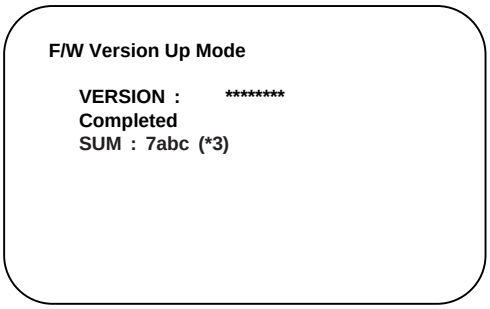


Fig. 3-2-5 Completed Program Mode Screen

Fig. 3-2-6 VFD upon Finishing the Programming Mode (Example)

6. Unplug the AC cord from the AC outlet. Then plug it again.
7. To finish this mode, press [POWER] button.

3-2-2 How to Verify the Firmware Version

1. After making sure that no disc is in unit, turn the power on.
2. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order. The B/E version appears on the VFD, and the F/E and B/E versions appear on TV screen.
3. Turn the power off to reset the unit.

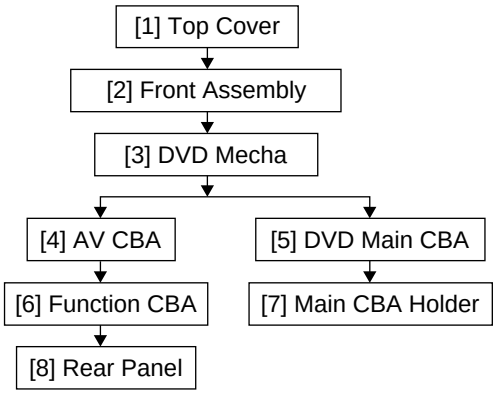
Note:
If the firmware has been changed, etc., we will use Service News, etc. to report on how to obtain new firmware data and create an upgraded disc.

4 DISASSEMBLY

4-1 CABINET DISASSEMBLY INSTRUCTIONS

4-1-1 Disassembly Flowchart

This flowchart indicates the disassembly steps 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 originally.



4-1-2 Disassembly Method

ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	Note
[1]	Top Cover	4-1-1	5(S-1)	-
[2]	Front Assembly	4-1-2	*2(L-1), Tray Panel, *2(L-2), *5(L-3), *3(L-4)	1-1 1-2 1-3 1-4 1-5 1-6
[3]	DVD Mecha	4-1-3, 4-1-4	*CN301, 3(S-2), *CN201	2 2-1 2-2 2-3 3
[4]	AV CBA	4-1-5	5(S-3), 3(S-4), *CN1001, *CN1601	-
[5]	DVD Main CBA	4-1-5	2(S-5)	-
[6]	Function CBA	4-1-5	Desolder	-
[7]	Main CBA Holder	4-1-6	(S-6)	-
[8]	Rear Panel	4-1-6	(S-7)	-
		↓ (3)	↓ (4)	↓ (5)

(1): Identification (location) No. of parts in the figures

(2): Name of the part

(3): Figure Number for reference

(4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P=Spring, 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 “Reference Notes.”

Reference Notes

CAUTION 1: Locking Tabs (L-1), (L-2), (L-3) and (L-4) are fragile. Be careful not to break them.

1-1. Connect the wall plug to an AC outlet and press the OPEN/CLOSE button to open the Tray.

1-2. Remove the Tray Panel by releasing two Locking Tabs (L-1).

1-3. Press the OPEN/CLOSE button again to close the Tray.

1-4. Press the POWER button to turn the power off. and unplug an AC cord.

1-5. Release two Locking Tabs (L-2). Then, release five Locking Tabs (L-3) (to do this, first release two Locking Tabs (A) at the side, and then three Locking Tabs (B) at the bottom.)

1-6. Release three Locking Tabs (L-4). Then remove the Front Assembly.

CAUTION 2: Electrostatic breakdown of the laser diode in the optical system block may occur as a potential difference caused by electrostatic charge accumulated on cloth, human body etc, during unpacking or repair work.

To avoid damage of pickup follow next procedures.

2-1. Disconnect Connector (CN301). Remove three Screws (S-2) and lift the DVD Mecha. (Fig. 4-1-3)

2-2. Slide out the pickup unit as shown in Fig. 4-1-4.

2-3. Short the three short lands of FPC cable with solder before removing the FFC cable (CN201) from it. If you disconnect the FFC cable (CN201), the laser diode of pickup will be destroyed. (Fig. 4-1-4)

CAUTION 3: When reassembling, confirm the FFC cable (CN201) is connected completely. Then remove the solder from the three short lands of FPC cable. (Fig. 4-1-4)

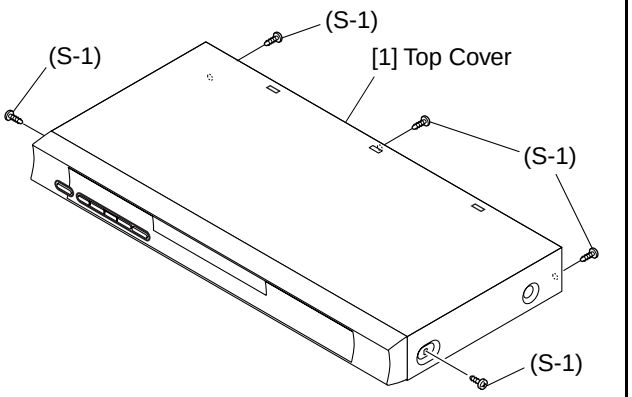


Fig. 4-1-1

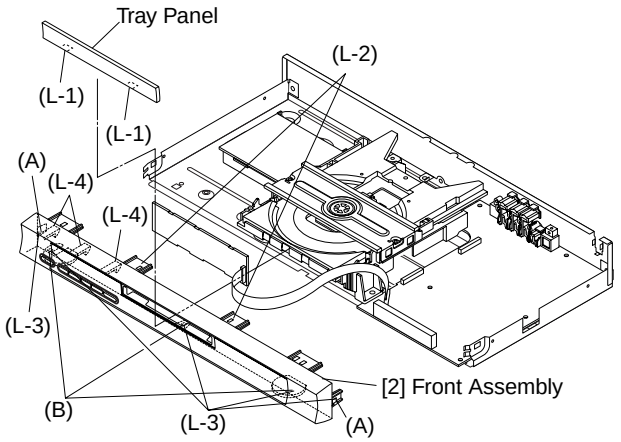


Fig. 4-1-2

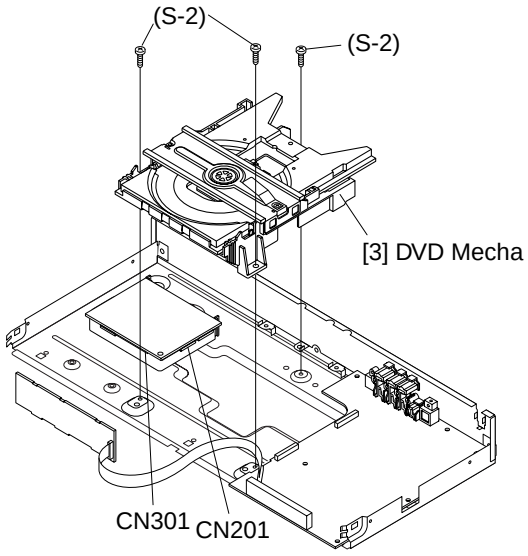


Fig. 4-1-3

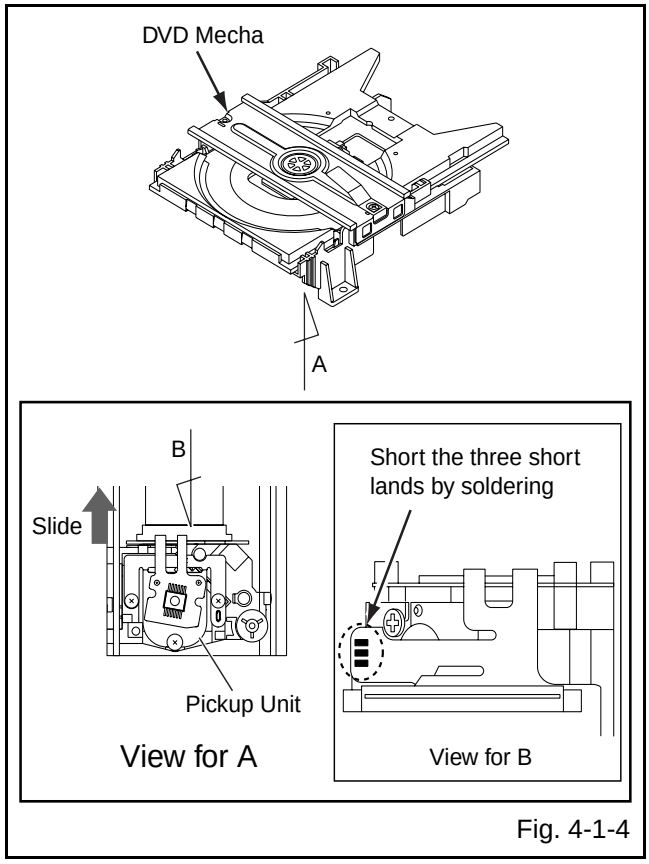


Fig. 4-1-4

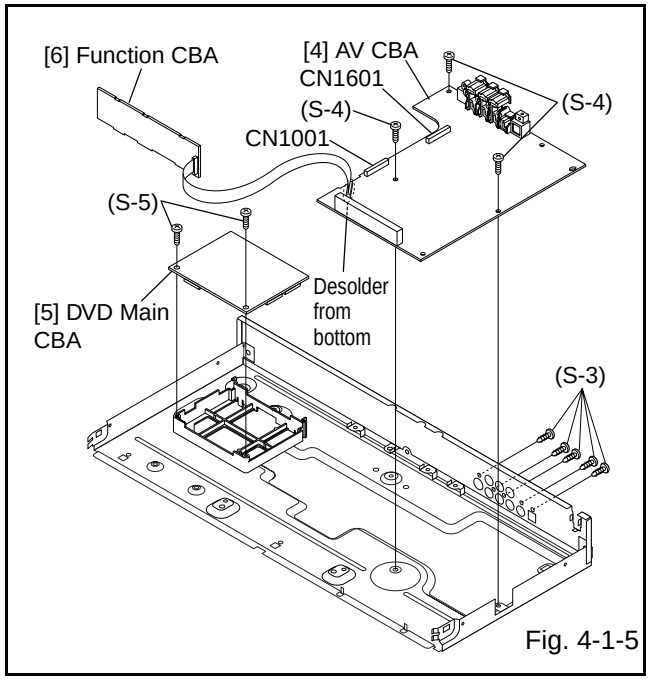


Fig. 4-1-5

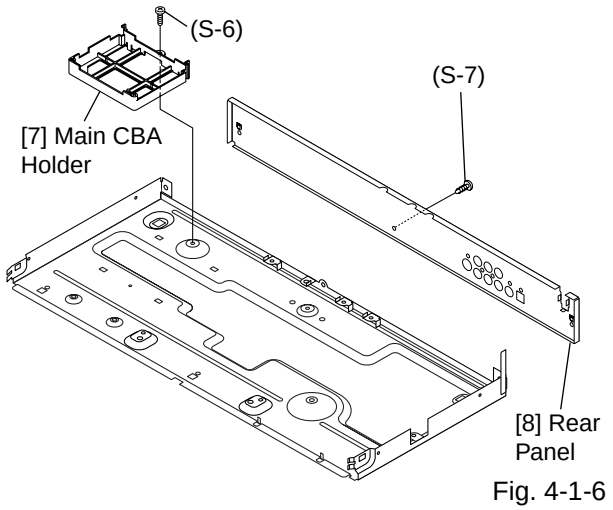
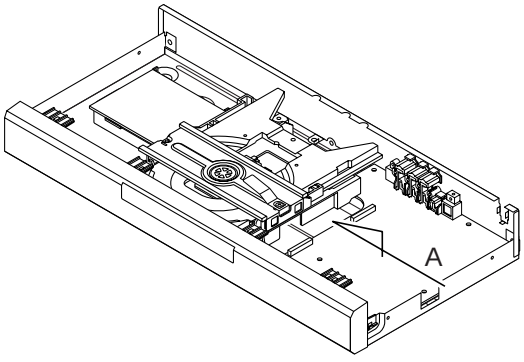
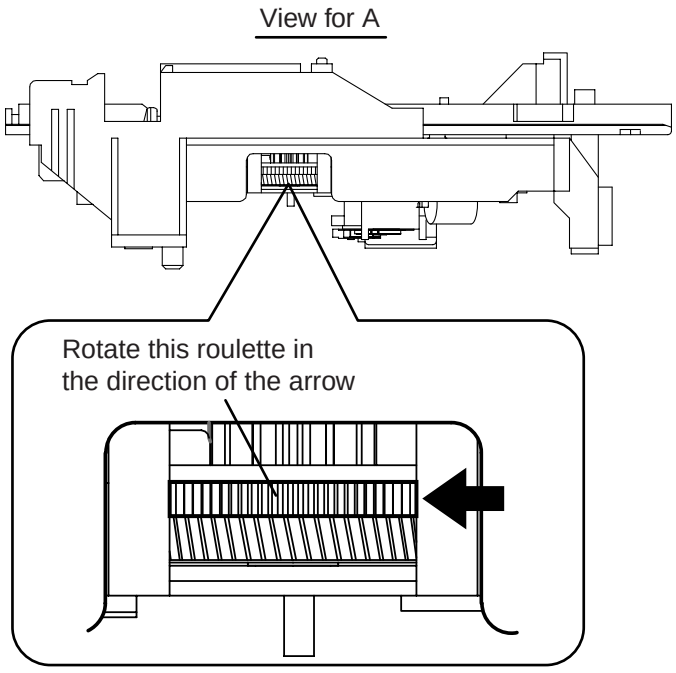


Fig. 4-1-6

To Remove the Disc manually

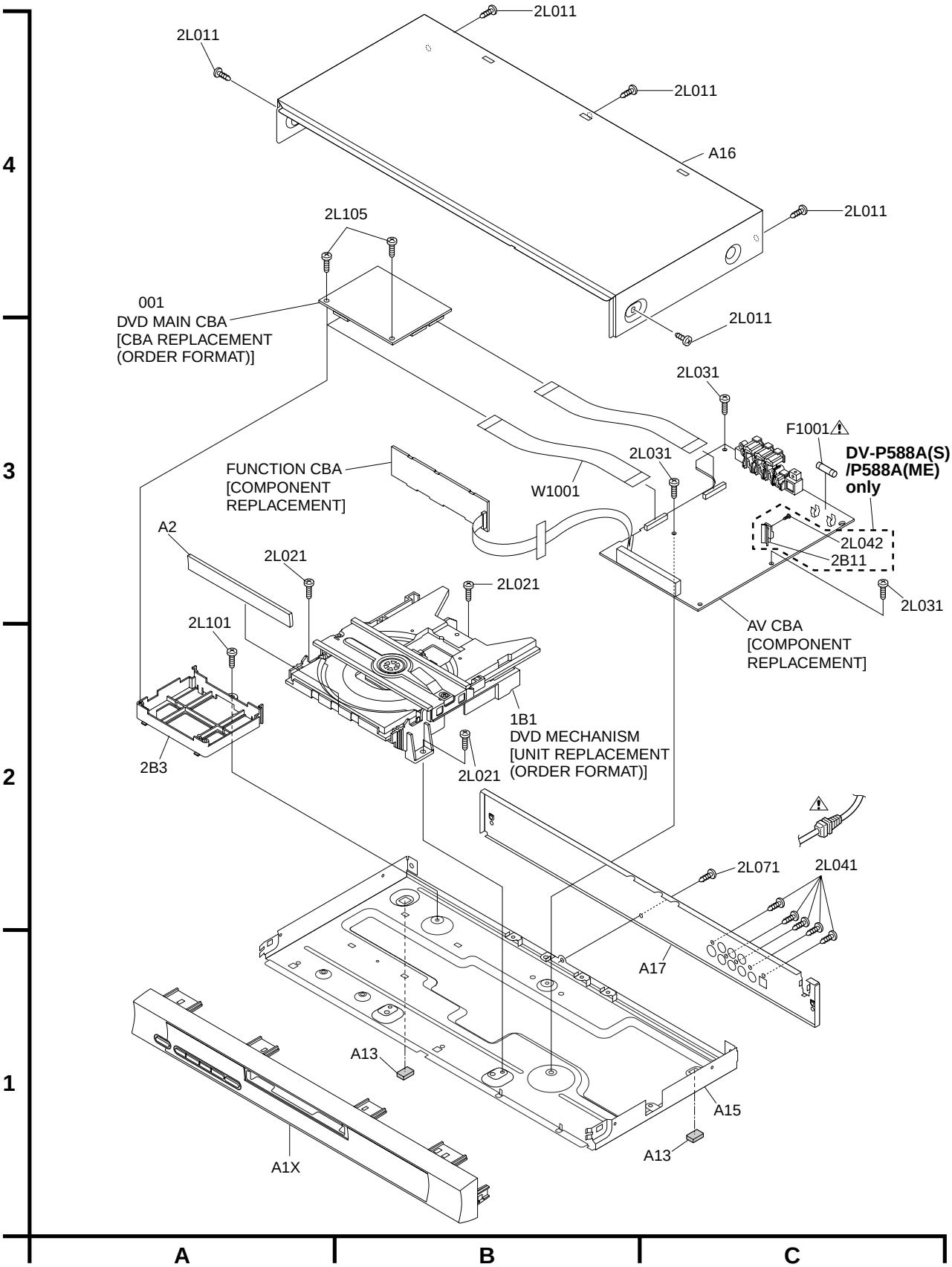
1. Remove the Top Cover.
2. Rotate the roulette in the direction of the arrow as shown below.





5 EXPLODED VIEW AND PARTS LIST

5-1 EXPLODED VIEW



5-2 REPLACEMENT PARTS LIST

5-2-1 Mechanical Parts List

SYMBOL-NO	P-NO	DESCRIPTION
		MECHANISM SECTION
A1X	TS18571	FRONT ASSEMBLY [P588A(S)]
A1X	TS18572	FRONT ASSEMBLY [P588A(ME)/P588A(AU)]
A2	TS18383	TRAY ASSEMBLY
A13	TJ16981	FOOT(REAR)
A15	TS18384	MAIN CHASSIS
A16	TJ16832	TOP COVER(SILVER)
A17	TJ17001	REAR PANEL [P588A(S)]
A17	TJ17002	REAR PANEL [P588A(ME)]
A17	TJ17003	REAR PANEL [P588A(AU)]
1B1	TS18391	DVD MECHA (THIN TYPE)
2B3	TJ16837	HOLDER, MAIN PCB
2L011	TJ16023	SCREW (M3X5)
2L021	TJ15952	SCREW (3X8)
2L031	TJ15683	SCREW (M3X6)
2L041	TJ15892	SCREW (M3X8)
2L042	TJ15956	SCREW (M3X8) [P588A(S)/P588A(ME)]
2L071	TJ15683	SCREW (M3X6)
2L101	TJ15683	SCREW (M3X6)
2L105	TJ10177	SCREW (3X8)
001	TS18573	DVD MAIN CBA UNIT
		ACCESSORIES
X1	TS18332	REMOTE CONTROL UNIT
X5	TJ15698	AV CORD

SYMBOL-NO	P-NO	DESCRIPTION

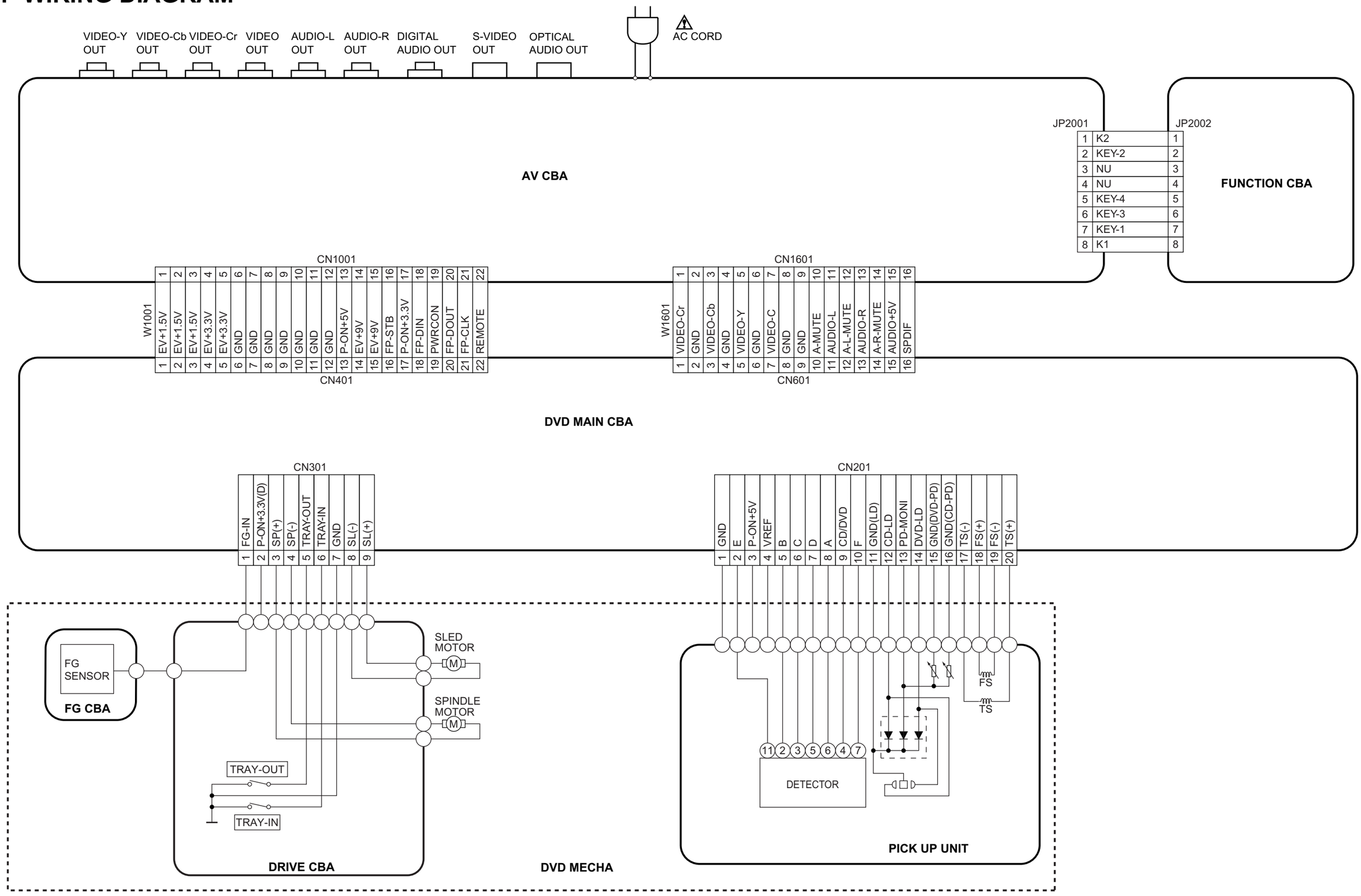
5-2-2 Electrical Parts List

Note: Although some parts in the schematic diagrams have different names from those in the parts list, there is no problem in replacing parts.

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
D1001	TC10752	RECTIFIER DIODE 1N4005
D1002	TC10752	RECTIFIER DIODE 1N4005
D1003	TC10753	FAST RECOVERY DIODE ERA18-04
D1004	TC10752	RECTIFIER DIODE 1N4005
D1005	TC10752	RECTIFIER DIODE 1N4005
D1006	TC10877	SCHOTTKY BARRIER DIODE SB140
D1008	TC10877	SCHOTTKY BARRIER DIODE SB140
D1011	TC10753	FAST RECOVERY DIODE ERA18-04
D1012	TC10112	SWITCHING DIODE 1SS133(T-77)
D1015	TC12191	ZENER DIODE DZ-6.8BSBT265
D1016	TC10753	FAST RECOVERY DIODE ERA18-04
D1017	TJ13897	ZENER DIODE MTZJT-7722B
D1018	TC10112	SWITCHING DIODE 1SS133(T-77)
D1022	TC10112	SWITCHING DIODE 1SS133(T-77)
D1024	TC10112	SWITCHING DIODE 1SS133(T-77)
D1025	TC10112	SWITCHING DIODE 1SS133(T-77)
D1030	TJ15128	RECTIFIER DIODE FR202
D1046	TJ14689	ZENER DIODE MTZJT-775.6C
D1047	TC12611	ZENER DIODE DZ-5.1BSBT265
D1048	TC12681	ZENER DIODE DZ-15BSAT265
D1051	TJ14752	ZENER DIODE MTZJT-776.2B
D1055	TC10112	SWITCHING DIODE 1SS133(T-77)
D1058	TC10752	RECTIFIER DIODE 1N4005
D1070	TC10607	ZENER DIODE MTZJT-7733D [P588A(S)/P588A(ME)]
D1072	TJ13919	ZENER DIODE MTZJT-7710B [P588A(AU)]
D1073	TC10112	SWITCHING DIODE 1SS133(T-77) [P588A(S)/P588A(ME)]
D1301	TJ13895	ZENER DIODE MTZJT-775.6B
D2005	TC10112	SWITCHING DIODE 1SS133(T-77)
D2006	TC10112	SWITCHING DIODE 1SS133(T-77)
D2007	TC10112	SWITCHING DIODE 1SS133(T-77)
D2008	TC10112	SWITCHING DIODE 1SS133(T-77)
R1074	TC10752	RECTIFIER DIODE 1N4005
⚠ IC1001	TE13224	PHOTOCOUPLER LTV-817B-F
IC1002	TC12682	IC PQ070XF01SZ
IC1006	TC12241	IC KIA431-AT
IC1201	TC12251	IC KIA4558P
IC1204	TC12261	TRANS.MODULE 0C-0805T*002
IC1402	TC12683	IC MM1622XJBE
IC2001	TC12684	IC PT6313-S-TP
Q1002	TC10782	TRANSISTOR KTA1267(Y)
Q1003	TC10778	TRANSISTOR KTC3199(GR)
Q1004	TC12687	TRANSISTOR KTC3198(Y)
Q1005	TC12687	TRANSISTOR KTC3198(Y)
Q1006	TC12411	TRANSISTOR KRA110M
Q1008	TC10778	TRANSISTOR KTC3199(GR)
Q1011	TC12634	TRANSISTOR 2SC2120-Y(TPE2)
Q1015	TC12411	TRANSISTOR KRA110M
Q1016	TC10778	TRANSISTOR KTC3199(GR)
Q1050	TC12301	TRANSISTOR KTC3205(Y) [P588A(AU)]
Q1201	TC10778	TRANSISTOR KTC3199(GR)
Q1202	TC10778	TRANSISTOR KTC3199(GR)
Q1203	TC10784	TRANSISTOR KTA1266(Y)
Q1204	TC10784	TRANSISTOR KTA1266(Y)
Q1351	TC10778	TRANSISTOR KTC3199(GR)
Q1352	TC10778	TRANSISTOR KTC3199(GR)
Q2002	TC10784	TRANSISTOR KTA1266(GR)
		COILS
⚠ L1001	TJ14696	LINE FILTER 50MH
L1007	TA14471	CHOKE COIL 22UH
L1008	TA14471	CHOKE COIL 22UH
L1009	TA14471	CHOKE COIL 22UH
L1011	TA12554	BEAD CORE
L1043	TA12554	BEAD CORE
L1060	TA12554	BEAD CORE
L1350	TA12561	INDUCTOR 100UH
L1351	TA14481	INDUCTOR 0.47UH
L1521	TA14471	CHOKE COIL 22UH
L1522	TC12686	CHIP BEAD
L2002	TA12561	INDUCTOR 100UH
		MISCELLANEOUS
CN1001	TE15464	FMN CONNECTOR 22P
⚠ F1001	TJ14705	FUSE T1.6AL/250V
FH1001	TE11084	FUSE HOLDER
FH1002	TE11084	FUSE HOLDER
FL2001	TE15471	V.F.D. 7-BT-292GN
JK1202	TE15465	RCA JACK(BLACK)
JK1401	TE14821	S TYPE JACK
JK1404	TE15466	RCA JACK
JP2001	TE15472	PARALLEL WIRE (8P)
RM2001	TC12331	REMOTE RECEIVER
⚠ SA1001	TC10891	SURGE ABSORBER
SW2002	TE11957	TACT SWITCH
SW2003	TE11957	TACT SWITCH
SW2005	TE11957	TACT SWITCH
SW2006	TE11957	TACT SWITCH
SW2007	TE11957	TACT SWITCH
SW2008	TE11957	TACT SWITCH
W1001	TE15461	22P FFC

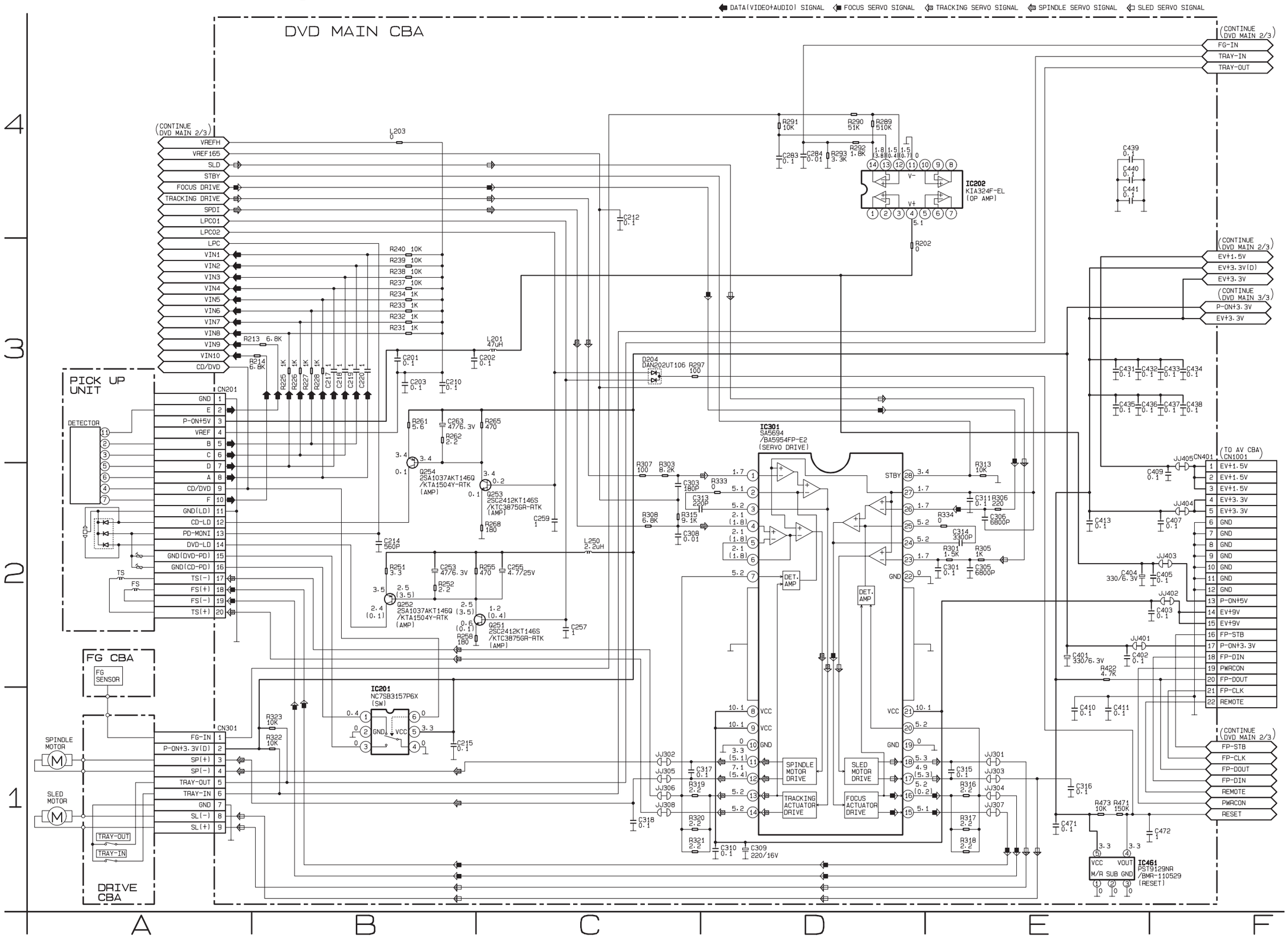
SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS

1 WIRING DIAGRAM

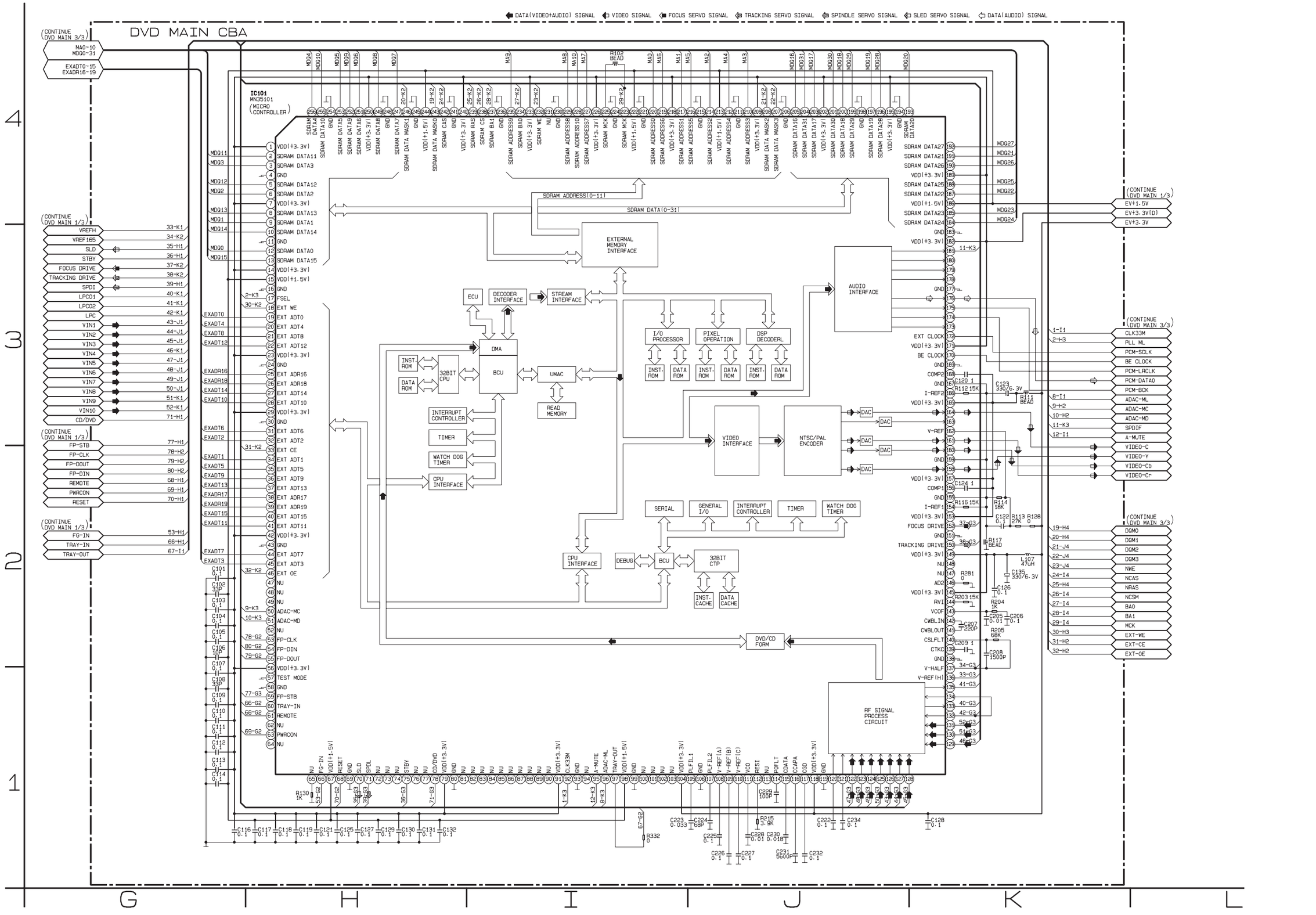


2 SCHEMATIC DIAGRAMS

2-1 DVD Main 1/3 Schematic Diagram



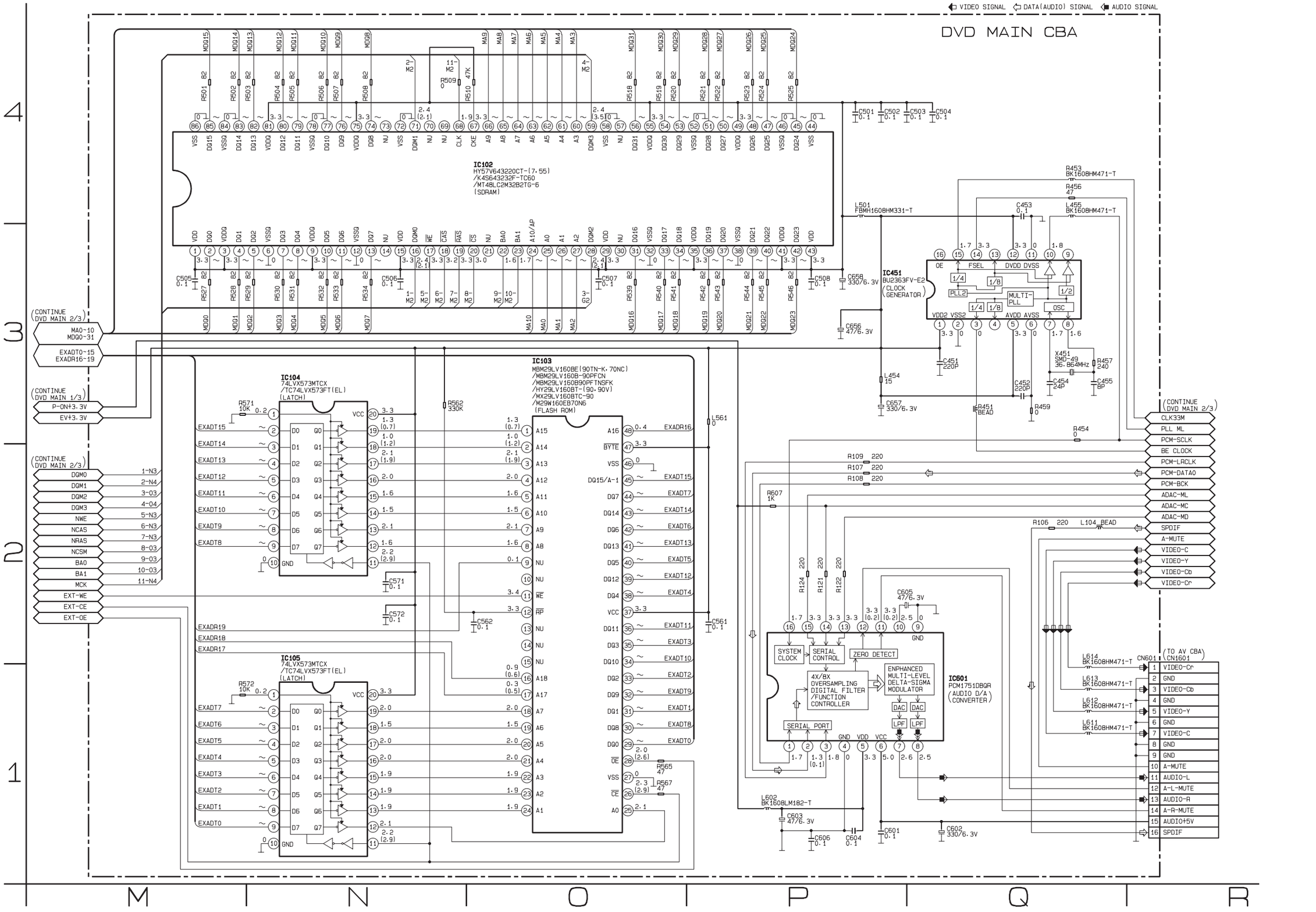
2-2 DVD Main 2/3 Schematic Diagram



IC101 VOLTAGE CHART

PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP	PIN.NO	PLAY	STOP
1	3.3	3.3	33	2.2	2.9	65	0.1	0.1	97	3.4	3.4	129	2.0	2.0	161	0.5	0.5	193	~	~	225	1.9	1.9
2	~	~	34	~	~	66	1.2	2.5	98	1.6	1.6	130	2.2	2.2	162	1.4	1.4	194	0	0	226	3.3	3.3
3	~	~	35	~	~	67	1.6	1.6	99	0	0	131	2.3	2.3	163	-----	-----	195	3.3	3.3	227	~	~
4	0	0	36	~	~	68	3.4	3.4	100	-----	-----	132	0.4	0.1	164	0.9	0.9	196	~	~	228	~	~
5	~	~	37	~	~	69	0	0	101	-----	-----	133	1.2	0.4	165	3.3	3.3	197	~	~	229	~	~
6	~	~	38	0.3	0.5	70	1.7	1.7	102	-----	-----	134	0.4	0.1	166	1.5	1.5	198	0	0	230	0	0
7	3.3	3.3	39	0.1	0.1	71	2.4	1.7	103	-----	-----	135	0.2	0.2	167	0	0	199	~	~	231	-----	-----
8	~	~	40	~	~	72	-----	-----	104	3.3	3.3	136	2.3	2.3	168	2.1	2.1	200	~	~	232	3.3	3.3
9	~	~	41	~	~	73	-----	-----	105	0.9	0.9	137	1.7	1.7	169	0	0	201	~	~	233	3.3	3.3
10	~	~	42	3.3	3.3	74	-----	-----	106	0	0	138	0	0	170	0.8	0.8	202	3.3	3.3	234	1.6	1.6
11	0	0	43	0	0	75	3.4	3.4	107	0.8	0.8	139	1.7	1.7	171	3.3	3.3	203	~	~	235	~	~
12	~	~	44	~	~	76	-----	-----	108	1.6	1.6	140	1.7	1.7	172	1.6	1.6	204	~	~	236	0	0
13	~	~	45	~	~	77	-----	-----	109	2.1	2.1	141	1.7	1.7	173	-----	-----	205	~	~	237	1.7	1.7
14	3.3	3.3	46	2.0	2.6	78	0.1	0.1	110	2.6	2.6	142	1.7	1.7	174	1.8	1.8	206	0	0	238	3.0	3.0
15	1.5	1.5	47	-----	-----	79	3.3	3.3	111	2.0	2.0	143	0.5	0.5	175	1.7	1.7	207	2.4	3.5	239	3.3	3.3
16	0	0	48	-----	-----	80	0	0	112	0.7	0.9	144	1.6	1.6	176	1.4	0.1	208	2.4	2.1	240	3.3	3.3
17	3.4	3.4	49	-----	-----	81	-----	-----	113	-----	-----	145	3.3	3.3	177	0	0	209	3.3	3.3	241	0	0
18	3.4	3.4	50	3.4	3.4	82	-----	-----	114	1.8	1.8	146	0	0	178	-----	-----	210	~	~	242	3.2	3.2
19	~	~	51	3.4	3.4	83	-----	-----	115	1.4	1.4	147	-----	-----	179	-----	-----	211	0	0	243	2.4	2.1
20	~	~	52	-----	-----	84	-----	-----	116	0.3	0.3	148	-----	-----	180	-----	-----	212	~	~	244	1.5	1.5
21	~	~	53	3.4	3.4	85	-----	-----	117	1.6	1.6	149	3.3	3.3	181	1.7	1.7	213	1.5	1.5	245	0	0
22	~	~	54	3.4	3.4	86	-----	-----	118	3.3	3.3	150	1.7	1.7	182	3.3	3.3	214	~	~	246	2.4	2.1
23	3.3	3.3	55	3.3	3.3	87	-----	-----	119	0	0	151	0	0	183	0	0	215	0	0	247	~	~
24	0	0	56	3.3	3.3	88	-----	-----	120	1.9	1.9	152	1.7	1.7	184	~	~	216	~	~	248	0	0
25	0.4	0.4	57	0	0	89	-----	-----	121	1.9	1.9	153	3.3	3.3	185	~	~	217	~	~	249	~	~
26	0.9	0.6	58	0	0	90	-----	-----	122	2.4	2.4	154	1.4	1.4	186	1.5	1.5	218	3.3	3.3	250	3.3	3.3
27	~	~	59	3.3	3.3	91	3.3	3.3	123	2.4	2.4	155	0	0	187	~	~	219	~	~	251	~	~
28	~	~	60	3.4	3.4	92	1.7	1.5	124	2.4	2.4	156	2.2	2.2	188	~	~	220	~	~	252	~	~
29	3.3	3.3	61	3.1	3.1	93	0	0	125	2.4	2.4	157	3.3	3.3	189	3.3	3.3	221	0	0	253	~	~
30	0	0	62	-----	-----	94	-----	-----	126	2.0	2.0	158	0.7	0.7	190	~	~	222	1.5	1.5	254	0	0
31	~	~	63	3.4	3.4	95	3.4	0.1	127	2.0	2.0	159	0	0	191	~	~	223	1.9	1.9	255	~	~
32	~	~	64	-----	-----	96	3.4	3.4	128	2.0	2.0	160	0.5	0.5	192	~	~	224	0	0	256	~	~

2-3 DVD Main 3/3 Schematic Diagram

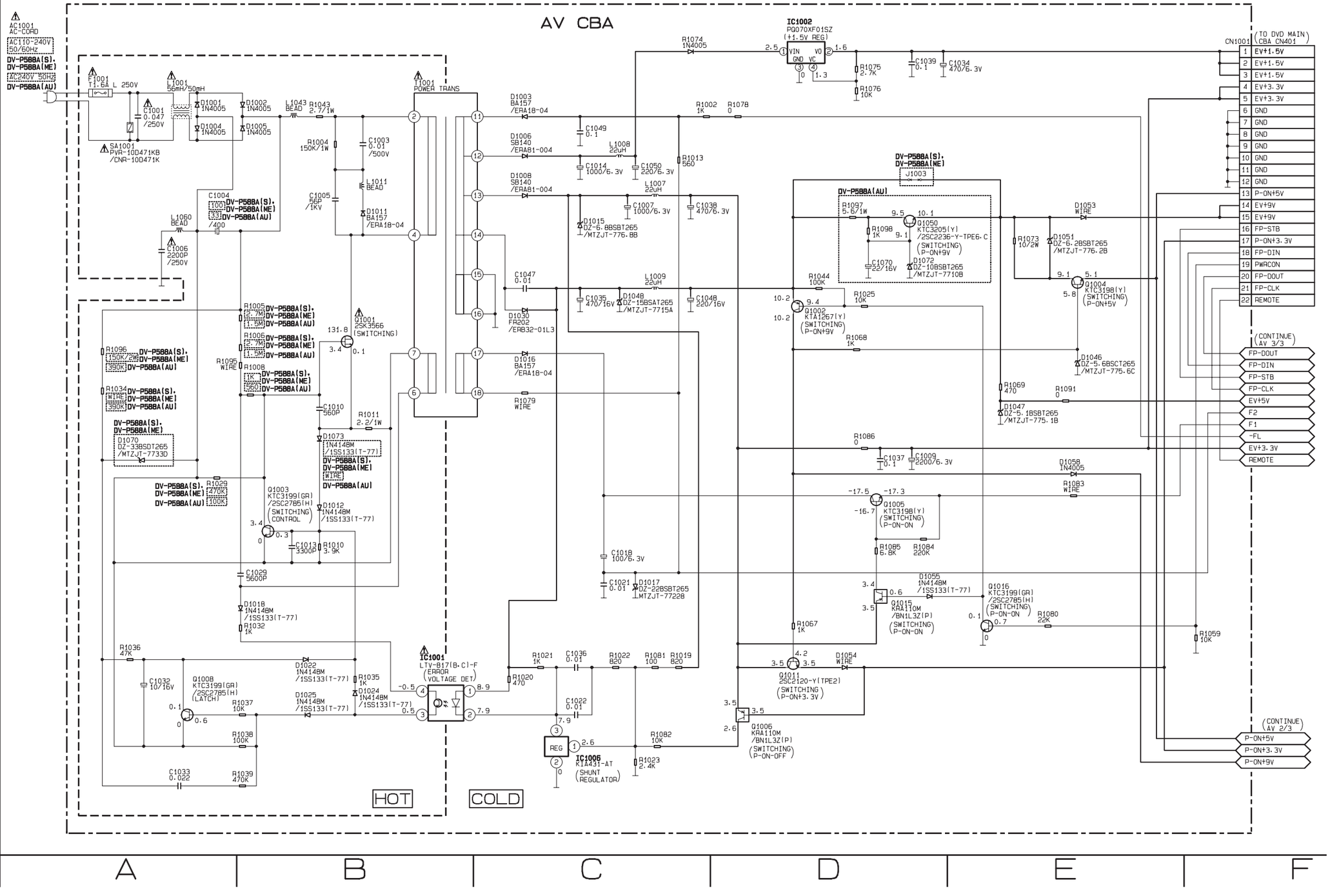


2-4 AV 1/3 Schematic Diagram

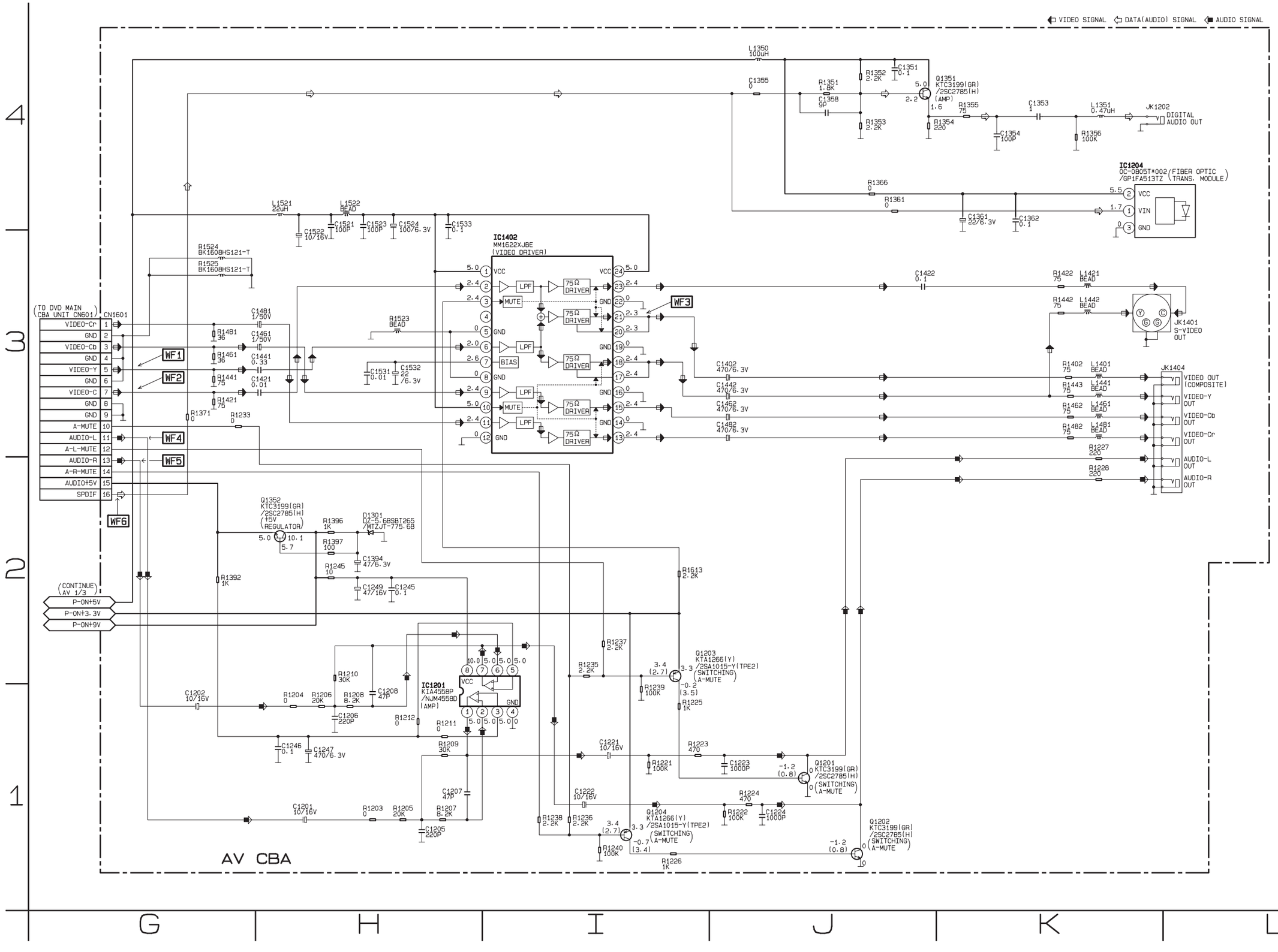
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in 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.



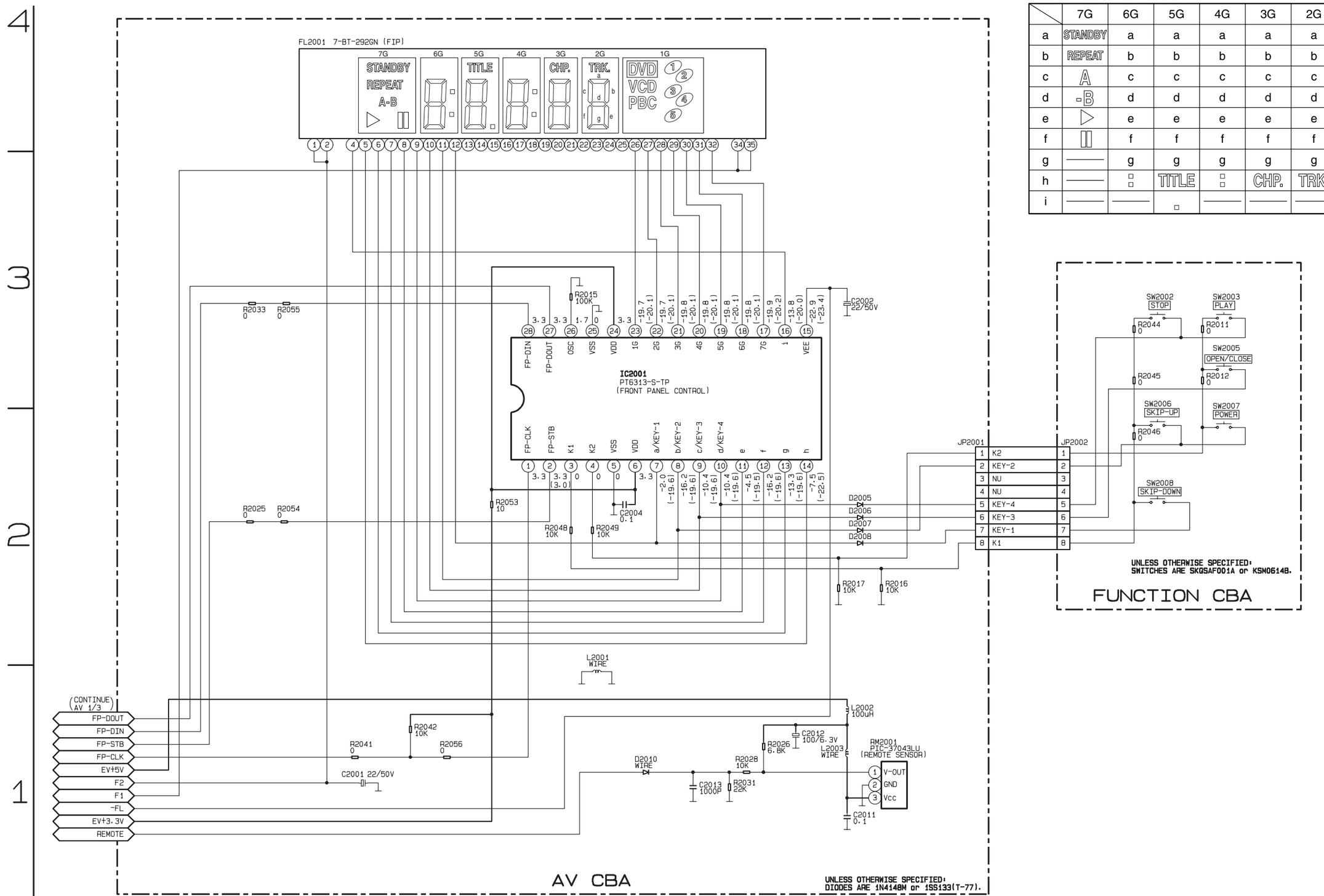
2-5 AV 2/3 Schematic Diagram



2-6 AV 3/3 & Function Schematic Diagram

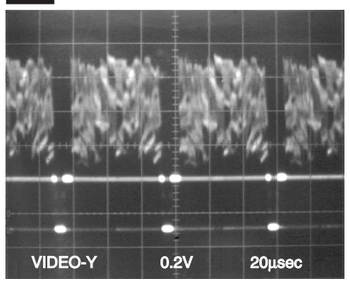
FL2001 MATRIX CHART

	7G	6G	5G	4G	3G	2G	1G
a	STANDBY	a	a	a	a	a	1
b	REPEAT	b	b	b	b	b	2
c	A	c	c	c	c	c	3
d	-B	d	d	d	d	d	4
e	▷	e	e	e	e	e	5
f	▯▯	f	f	f	f	f	DVD
g	———	g	g	g	g	g	PBC
h	———	□ □	TITLE	□ □	CHP.	TRK.	CD
i	———	———	□	———	———	———	V

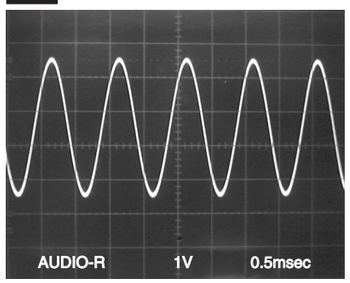


3 WAVEFORMS

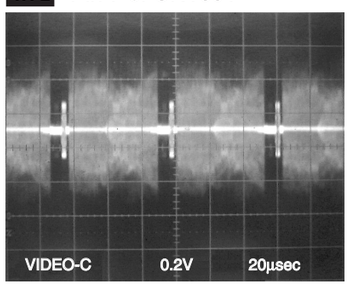
WF1 Pin 5 of CN1601



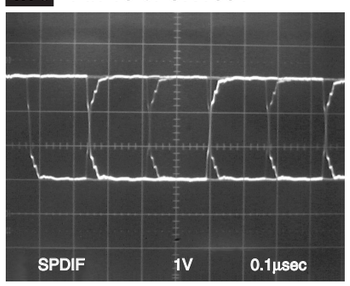
WF5 Pin 13 of CN1601



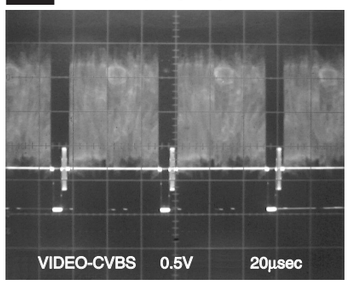
WF2 Pin 7 of CN1601



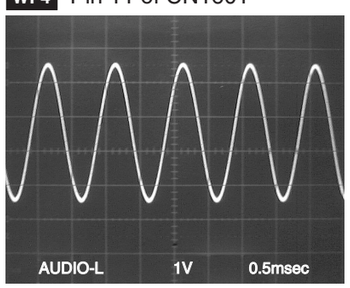
WF6 Pin 16 of CN1601



WF3 Pin 21 of IC1402



WF4 Pin 11 of CN1601



NOTE:

Input

CD: 1kHz PLAY
(WF4~WF6)

DVD: POWER ON (STOP) MODE
(WF1~WF3)

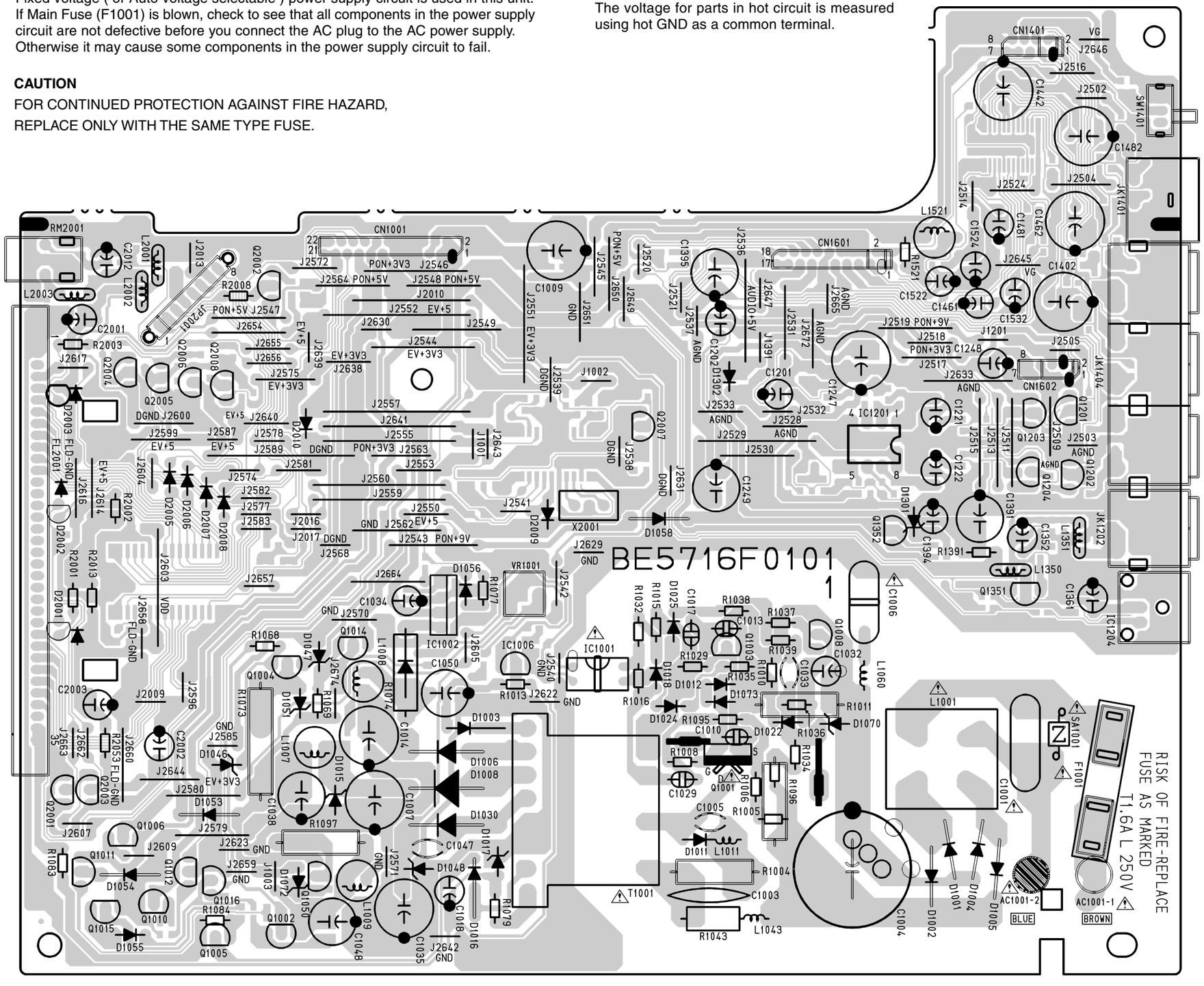
4 CIRCUIT BOARD DIAGRAMS

4-1 AV CBA Top View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) 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.

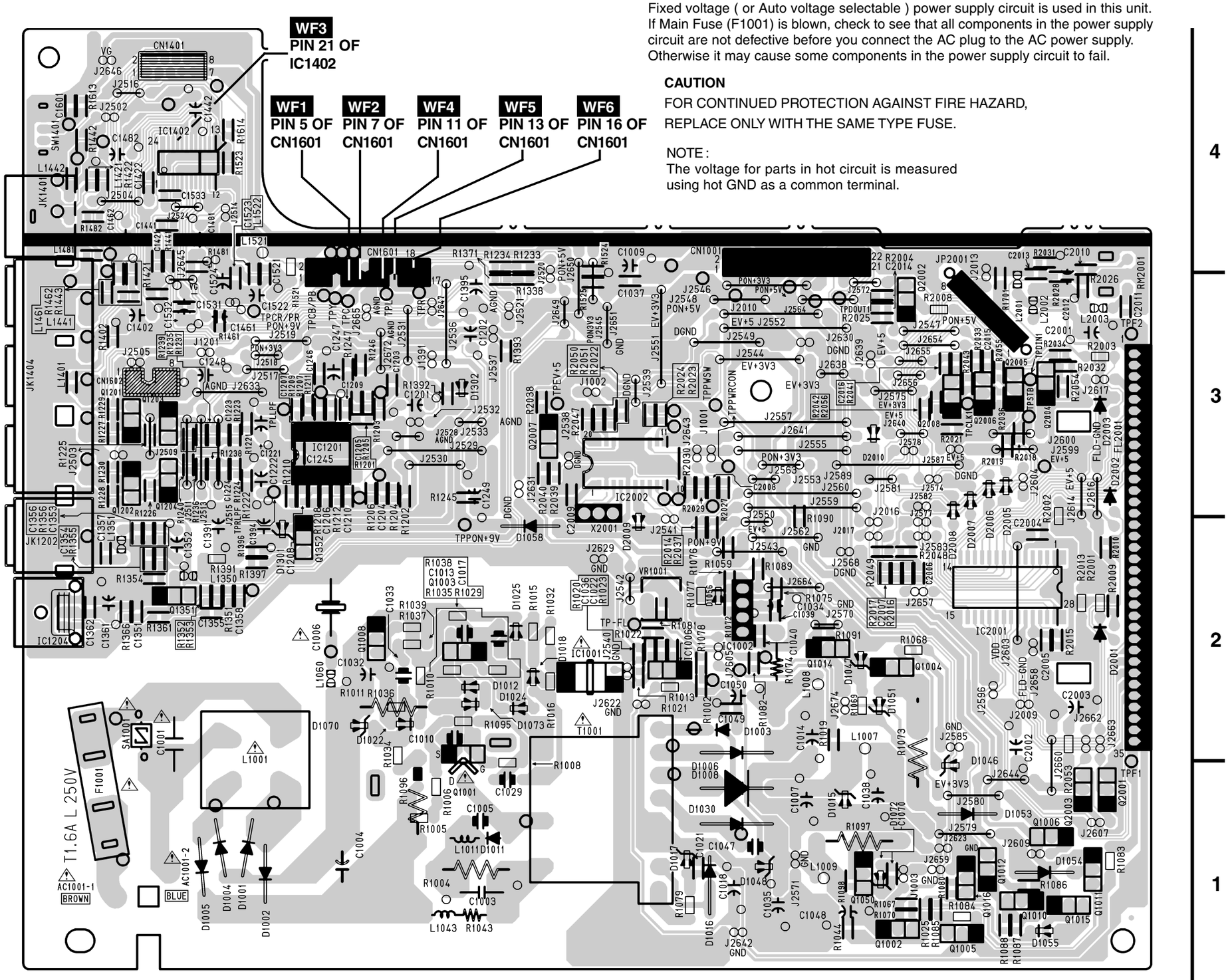


4-2 AV CBA Bottom View

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1001) 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.

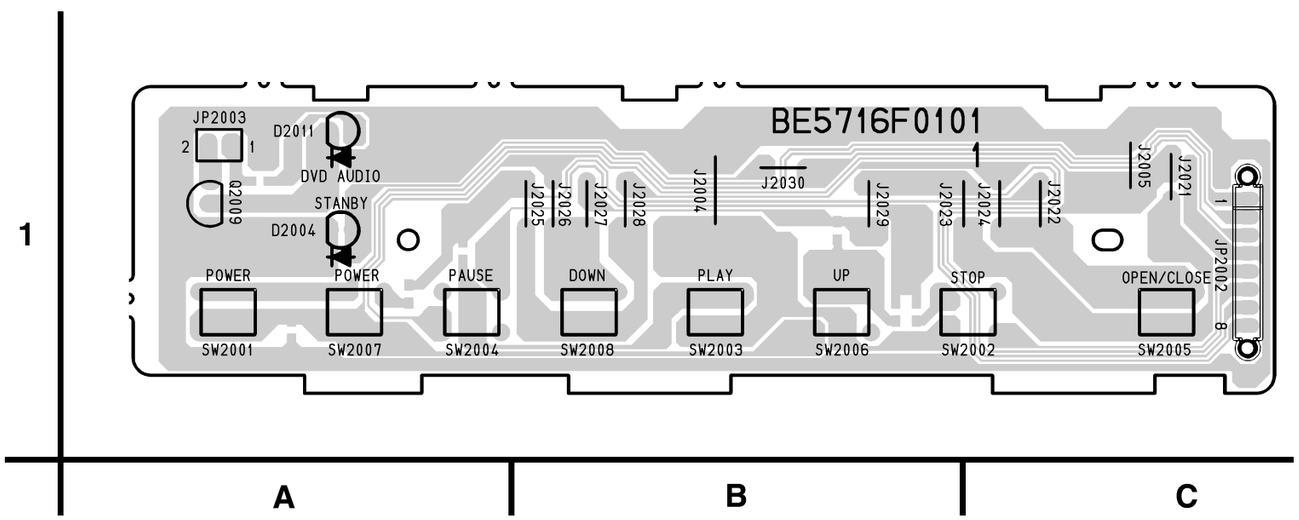
CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

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

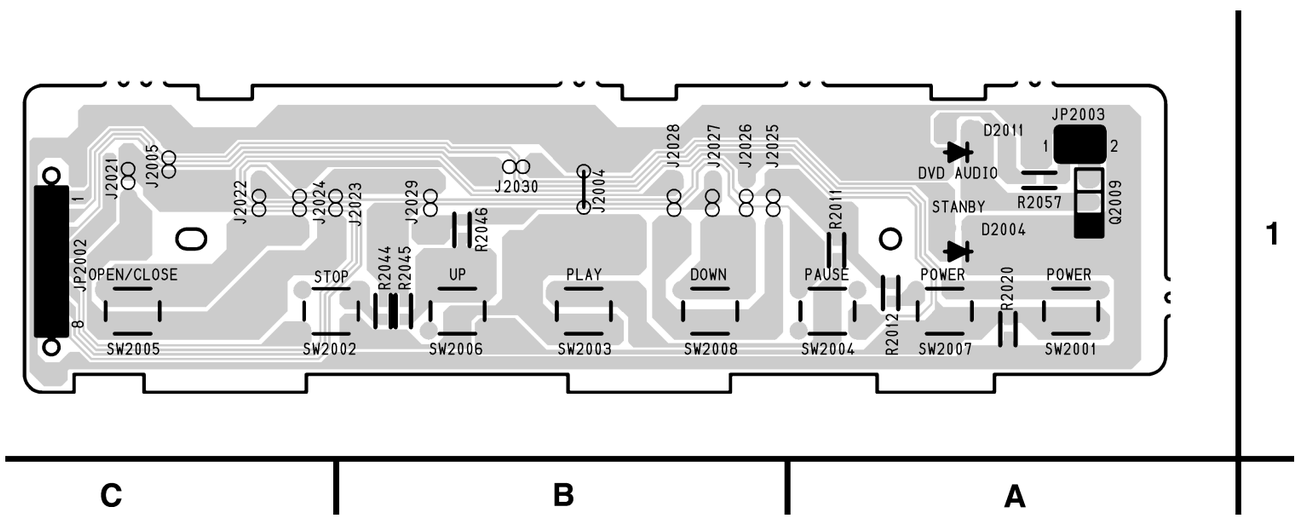


4-3 Function CBA Top/Bottom View

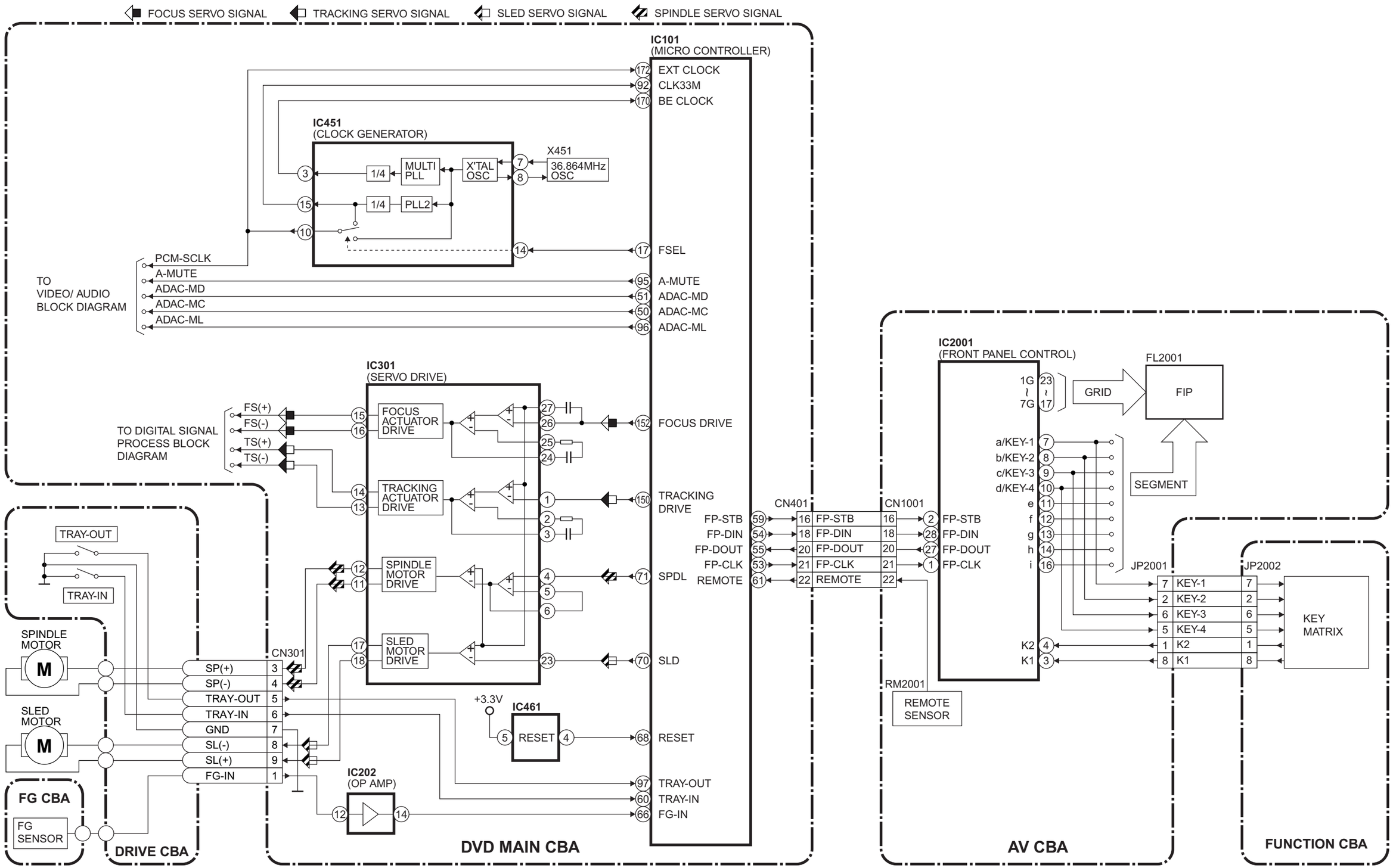
FUNCTION CBA Top View



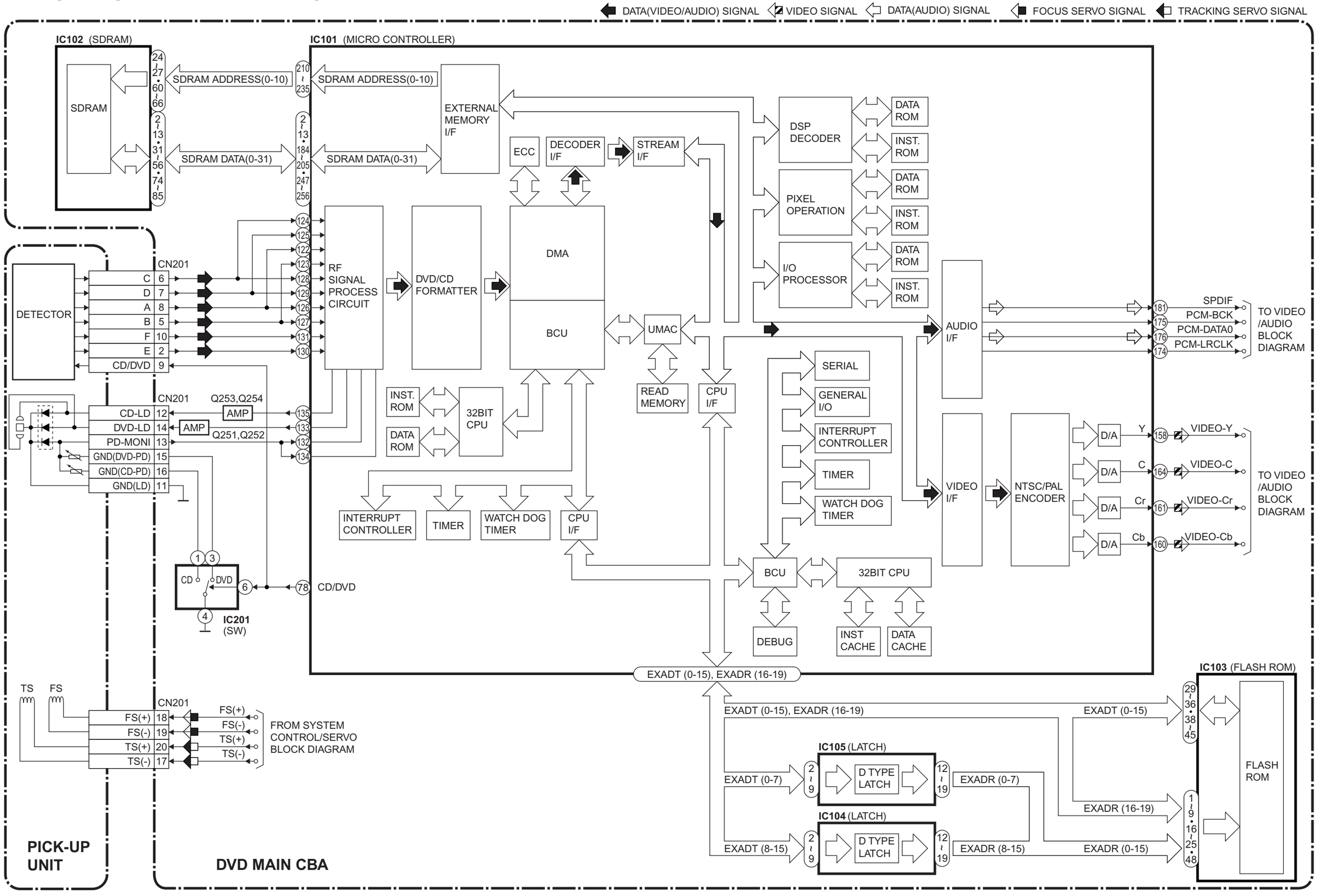
FUNCTION CBA Bottom View



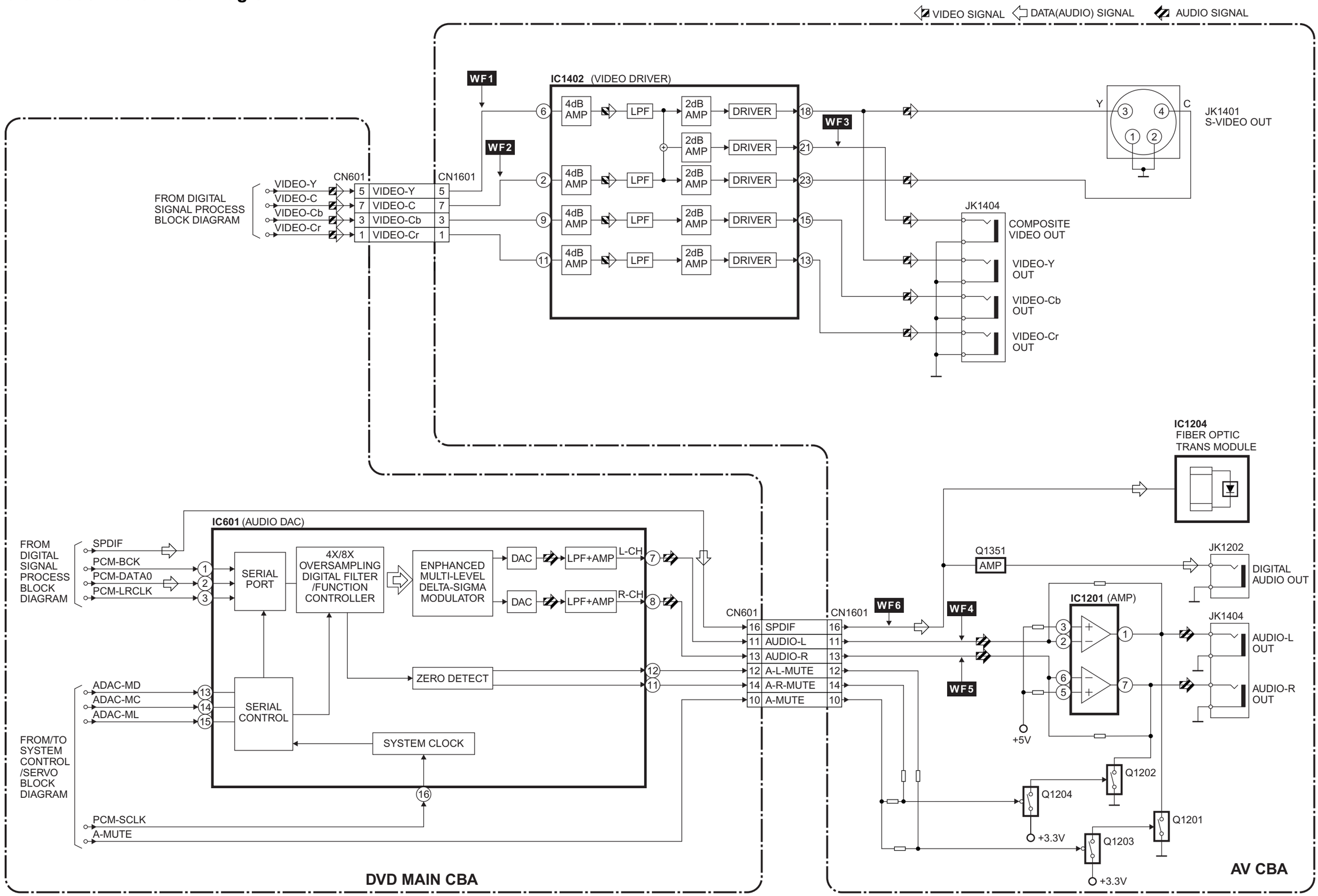
5 BLOCK DIAGRAMS
5-1 System Control/Servo Block Diagram



5-2 Digital Signal Process Block Diagram



5-3 Video / Audio Block Diagram

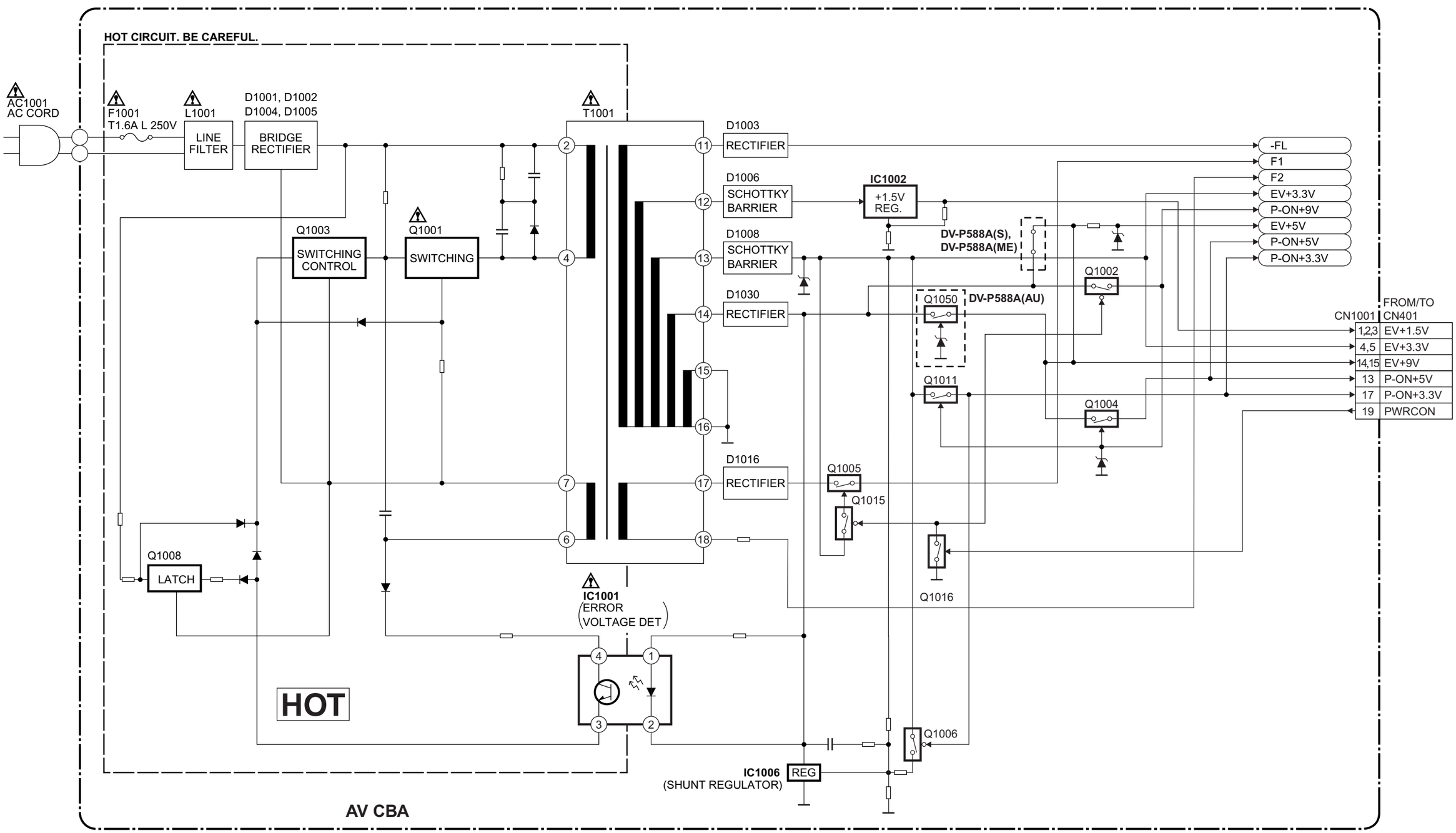


5-4 Power Supply Block Diagram

CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) 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.

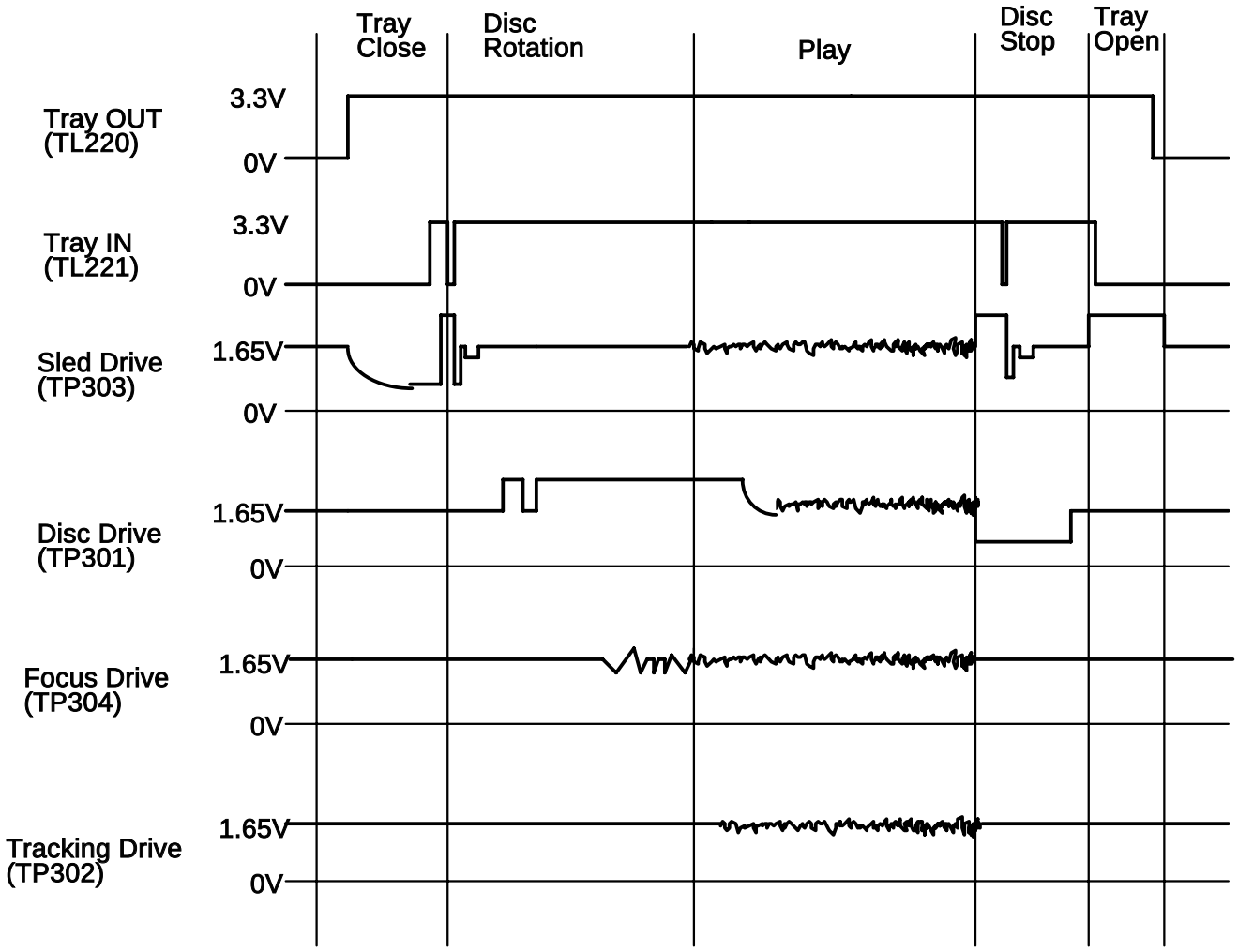
CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE.

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



6 SYSTEM CONTROL TIMING CHARTS

Tray Close ~ Play / Play ~ Tray Open

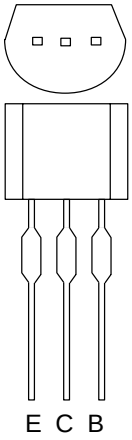


7 IC PIN FUNCTION DESCRIPTIONS

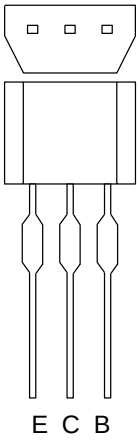
IC2001 [PT6313-S-TP]

Pin No.	In/Out	Signal Name	Name Function
1	In	FP-CLK	Clock Input
2	In	FP-STB	Serial Interface Strobe
3	In	K1	Key Data 1 Input
4	In	K2	Key Data 2 Input
5	-	VSS	GND
6	-	VDD	Power Supply
7	Out	a / KEY-1	Segment Output / Key Source-1
8	Out	b / Key-2	Segment Output / Key Source-2
9	Out	c / Key-3	Segment Output / Key Source-3
10	Out	d / Key-4	Segment Output/ Key Source-4
11	Out	e	Segment Output
12	Out	f	
13	Out	g	
14	Out	h	
15	-	VEE	Pull Down Level
16	Out	i	Segment Output
17	Out	7G	Grid Output
18		6G	
19		5G	
20		4G	
21		3G	
22		2G	
23		1G	
24	-	VDD	Power Supply
25	-	VSS	GND
26	In	OSC	Oscillator Input
27	Out	FP-DOUT	Serial Data Output
28	In	FP-DIN	Serial Data Input

8 LEAD IDENTIFICATIONS

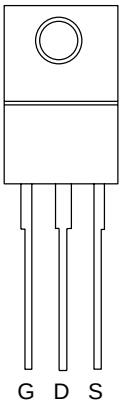


2SA1015-(Y,GR) (TPE2)
KTA1266 (Y,GR)
KTC3198 (Y)
2SC2120-Y(TPE2)
KTC3205 (Y)
2SC2236-Y-TPE6,C

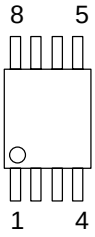


2SC2785 (H)
KTC3199 (GR)
KRA110M
KTA1267 (Y)
BN1L3Z (P)

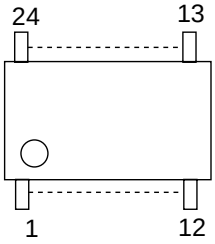
2SK3566



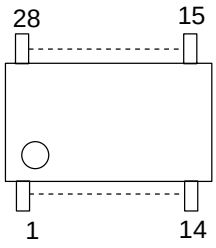
NJM4558D
KIA4558P



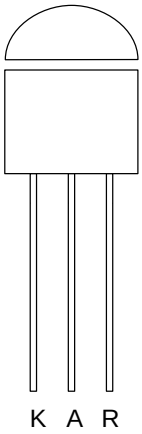
MM1622XJBE



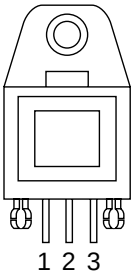
PT6313-S-TP



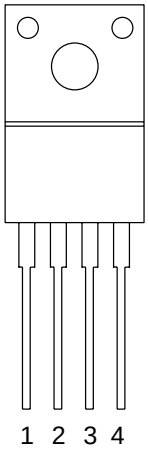
KIA431-AT



0C-0805T*002
GP1FA513TZ



PQ070XF01SZ



1: Vin
2: Vo
3: GND
4: Vc

LTV-817(B,C)-F

Note:
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
G: Gate
D: Drain
S: Source

HITACHI

DV-P588A(S)/DV-P588A(ME)/DV-P588A(AU)

DV-P588A(S)/DV-P588A(ME)/DV-P588A(AU)

DV-P588A(S)
DV-P588A(ME)
DV-P588A(AU)

TK No. 9304E

Digital Media Division, Tokai

Printed in Japan (F)