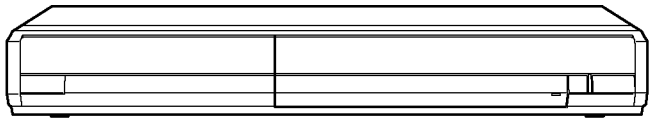
ORDER NO.CHM0705024CE

Service Manual

DVD Recorder



Model No. **DMR-EH57GN**

Vol. 1

Colour

(S).....Silver Type

(K).....Black Type

Notes: This model's RAM/Digital P.C.B. Module is - RFKNEH57GN(GN).

When replacing Main P.C.B. or EEPROM, "UNFORMAT" indication is displayed and HDD must be formatted.

When replacing HDD, it is necessary to update the firmware.
Please prepare the update disc.
(After that, FORMAT is necessary)

After that, programme in the HDD will be lost.
In detail, please refer to each content in this service manual.

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together.
If the either RAM drive or Digital P.C.B. are changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

Panasonic®

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

1 Safety Precaution

1.1. General guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage current cold check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ.

   When the exposed metal does not have a return path to the chassis, the reading must be ∞.

1.1.2. Leakage current hot check (See Figure 1 .)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15µF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliampere. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

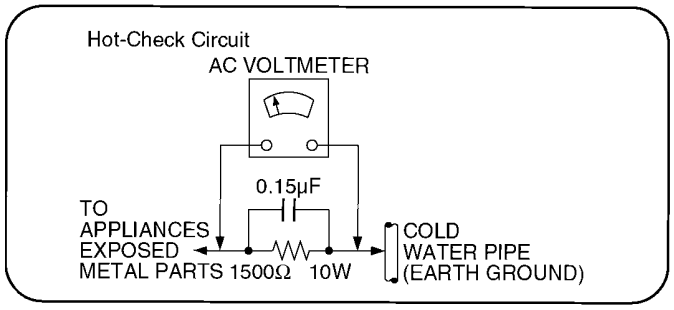


Figure 1

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatic Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistor-sand semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution

   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety.
These parts are marked by ⚠ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2.2. Precaution of Laser Diode

CAUTION:

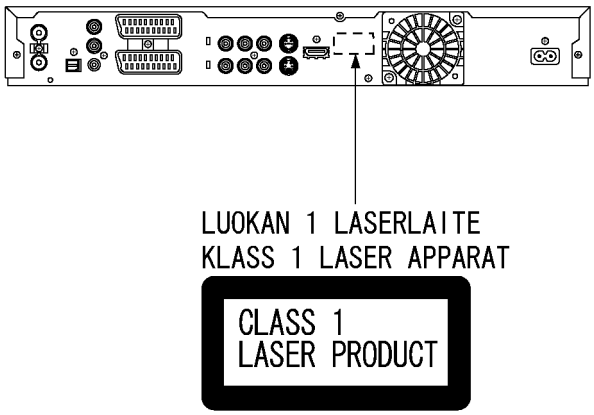
This product utilizes a laser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wave length: 662 nm (DVDs)/780 nm (CDs)
Maximum output radiation power from pickup: 100 μ W/VDE
Laser radiation from the pickup lens is safety level,but be sure the followings:

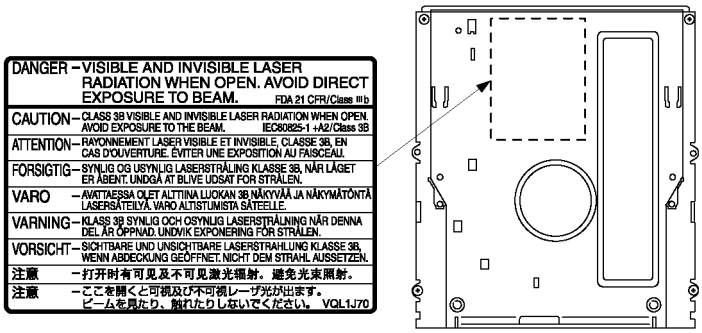
1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG:

Dieses Produkt enthält eine Laserdiode.
Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Laserinheit abgestrahlt.
Wellenlänge: 662 nm (DVDs)/780 nm (CDs)
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE
Die Strahlung der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.





CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

2.3. Service caution based on legal restrictions

2.3.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
  (Definition: The letter of “PbF” is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01K----------(0.3mm 100g Reel)
  RFKZ06D01K----------(0.6mm 100g Reel)
  RFKZ10D01K----------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn), 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

3 Service Navigation

3.1. Service Information

This service manual contains technical information which will allow service personnel's to understand and service this model.
Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

1) This service manual does not contain the following information, because of the impossibility of sevicing at component level.

   * Schematic Diagram, Block Diagram and P.C.B. layout of RAM/Digital P.C.B. Module.
   * Parts List of individual parts for RAM/Digital P.C.B. Module.
   * Exploded View and Parts List of individual parts for RAM/Digital P.C.B. Module.

2) The following category are recycle module part. Please send them to Central Repair Center.

   * RAM/Digital P.C.B. Module
   (EH57GN: RFKNEH57GN)

3.2. Caution for DivX

Please will always pass the customer "Warning for Customers Who Use the DivX Video-on-Demand content." with the product and get it when you unavoidably exchange EEPROM or P.C.B. including EEPROM (When the product is exchanged, it is the same.).
You must use print attached to service part (EEPROM or P.C.B. including EEPROM) or must use copy of print below as "Warning for Customers who use the DivX Video-on-Demand content."
Information needed without fail for the customer for whom it is used continuing DivX Video-on-Demand Service to "Manual for the customer" is recorded.

Appendix:

* Parts that memorize user's information are only EEPROM.
* The registration of Registration Code is possible for half a year up to 6 recorders up to 10 recorders a year. Replacement of EEPROM or P.C.B. including EEPROM spends one of this.

Registration Code is memorized in EEPROM (RFKFxxxxxx).
Model without VHS: Main P.C.B.
Model with VHS: Digital I/F P.C.B. (Power & DVD I/F/P.C.B.)
If exchange above P.C.B. or EEPROM, new registration Code differ from previous Registration Code will be generated. In this case if your customer uses DivX Video-on-Demand service, he/she will no longer be able to play any content that he/she purchased under that same registration code.
Therefore your customer will need to obtain and register the new registration code.

*Copy this page and cut on the dotted line and give the lower half to your customer.

Warning for Customers who use the DivX Video-on-Demand content.

1. The registration code has been changed for the repair of the product or the product exchange.
2. Obtain and register a new registration code, otherwise you will no longer be able to play DivX Video-on-Demand content.
3. Follow the procedure on the DivX Video-on-Demand web site to register at
   http://vod.divx.com/
   * If you do not use the DivX Video-on-Demand content, please ignore this warning.

4 Specifications

Power supply:	AC220 – 240V 50Hz
Power consumption:	Approx. 32W
Power consumption in standby mode:	Approx. 2W (Power save mode) Approx. 11W (Quick start mode)
Operating temperature:	5 ºC - 40 ºC
Operating humidity range:	10% - 80%RH (no condensation)

Television system

Tuner system:	PAL-B	PAL-BGH
Channel Coverage:	Australia	New-Zealand
VHF:	0-12	1-11
UHF:	28-69	21-69
CATV:	45MHz-470MHz	44MHz-470MHz

RF Converter output:	Not provided

Video

Video system:	PAL colour signal, 625 lines, 50 fields NTSC colour signal, 525 lines, 60 fields
Recording system:	MPEG2 (Hybrid VBR)
Video In (PAL/NTSC):	AV1/AV2 (21 pin), AV3/AV4 (pin jack) 1Vp-p 75 termination
S-Video in (PAL/NTSC):	AV2 (21 pin), AV3/AV4 (S terminal) 1Vp-p 75 termination
Video out (PAL/NTSC):	AV1/AV2 (21 pin), Video Out (pin jack) 1Vp-p 75 termination
S-Video out (PAL/NTSC):	AV1 (21 pin), S-Video Out (S terminal) 1Vp-p 75 termination
RGB out (PAL/NTSC):	AV1 (21 pin) 0.7Vp-p (PAL) 75 termination
Component video output (NTSC 480p/480i, PAL 576p/576i)	Y: 1.0Vp-p 75 termination PB: 0.7Vp-p 75 termination PR: 0.7Vp-p 75 termination

Audio

Recording System:	Dolby Digital 2ch, Linear PCM (XP mode)
Audio in:	AV1/AV2 (21 pin), AV3/AV4 (pin jack)
Input level:	Standard: 0.5Vrms, Full scale: 2.0Vrms at 1 kHz
Input impedance:	More than 10k
Audio out:	AV1/AV2 (21 pin), Audio Out (pin jack)
Output level:	Standard: 0.5 Vrms, Full scale: 2.0 Vrms at 1 kHz
Output impedance:	Less than 1k
Digital audio out:	Optical terminal (PCM, Dolby Digital, DTS)

HDMI Output:	19 pin type A: 1 pc
Internal HDD capacity	160GB
DV input:	IEEE 1394 Standard, 4 pin: 1 pc
Region Code	#4

Recording System

DVD-RAM : DVD Video Recording format
DVD-R : DVD-Video format
DVD-R DL (Dual layer): DVD-Video format
DVD-RW : DVD-Video format
+R, +R DL(Double Layer), +RW

Recording time

Approx.

Rec. Mode	DVD-RAM 4.7GB	DVD-RAM 9.4GB (Double side)	DVD-R/ DVD-RW/ +R/+RW/ 4.7GB	DVD-R DL 8.5GB	+R DL 8.5GB	Hard Disc 160GB
XP	1h.	2h.	1h.	1h.45m.	1h.45m.	36h.
SP	2h.	4h.	2h.	3h.35m.	3h.35m.	70h.
LP	4h.	8h.	4h.	7h.10m.	7h.10m.	138h.
EP (6h)	6h.	12h.	6h.	10h.45m.		212h.
EP (8h)	8h.	16h.	8h.	14h.20m.		284h.

Approximate copying times (Max. speed)

On Hard disc		5x speed DVD-RAM		12x speed DVD-R (*1)	
Recording mode	Recorded program	Required time	Speed	Required time	Speed
XP	1h.	12m.	5x	5m.46s.	10x
SP	1h.	6m.	10x	2m.30s.	24x
LP	1h.	3m.	20x	1m.21s.	44x
EP(6h)	1h.	2m.	30x	58s.	62x
EP(8h)	1h.	1m30s.	40x	48s.	75x

4x speed DVD-R DL (Dual layer) (*4)		4x speed DVD-RW (*2)		8x speed +R (*3)	
Required time	Speed	Required time	Speed	Required time	Speed
15m	4x	15m.	4x	8m.20s.	7x
7m30s	8x	7m.30s.	8x	3m.45s.	16x
3m45s	16x	3m.45s.	16x	1m.53s.	32x
2m30s	24x	2m.30s.	24x	-	-
1m53s	32x	1m.57s.	31x	-	-

4x speed +R DL (Double layer) (*4)		4x speed +RW	
Required time	Speed	Required time	Speed
15m.	4x	15m.	4x
7m.30s.	8x	7m.30s.	8x
3m.45s.	16x	3m.45s.	16x
-	-	-	-
-	-	-	--

NOTE) The above rated value indicates the fastest time and speed required for copying one-hour title from HDD to each disc in the above list supporting High-Speed copying. The amount of time and speed may vary depending on the conditions such as the area on where information is written or unique feature on the disc.

*1: In this unit, copying with 16X Speed DVD-R disc will be performed at the same speed as 12X Speed DVD-R takes.

*2: In this unit, copying with 6X Speed DVD-RW disc will be performed at the same speed as 4X Speed DVD-RW disc takes

*3: In this unit, copying with 16X Speed +R disc will be performed at the same speed as 8X Speed +R disc takes.

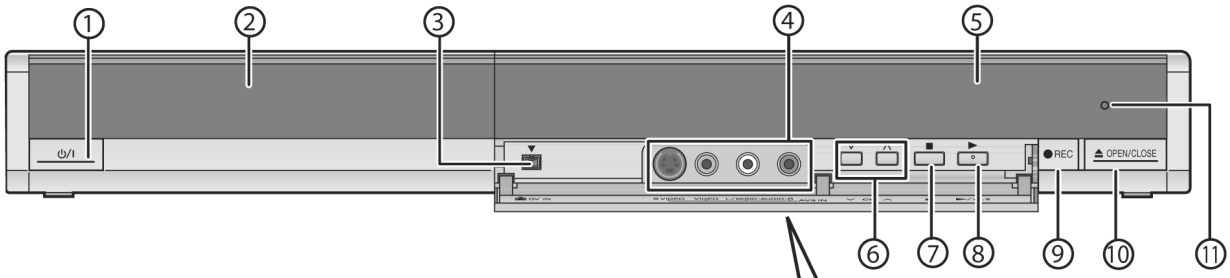
*4: In this unit, copying with 8X Speed discs, DVD-R DL and +R DL, will be performed at the same speed as 4X Speed discs, DVD-R DL and +R DL, take.

Recordable discs	
DVD-RAM:	2X SPEED (Ver. 2.0), 2-3X SPEED (Ver. 2.1) 2-5X SPEED (Ver. 2.2)
DVD-R (SL):	1X SPEED (Ver. 2.0) 1-4X SPEED (Ver. 2.0) 1-8X SPEED (Ver. 2.0) 1-16X SPEED (Ver. 2.1)
DVD-R DL:	2-4X SPEED (Ver. 3.0) 2-8X SPEED (Ver. 3.0)
DVD-RW:	1X SPEED (Ver. 1.1) 1-2X SPEED (Ver. 1.1) 2-4X SPEED (Ver. 1.2) 2-6X SPEED (Ver. 1.2)
+R (SL):	2.4X SPEED (Ver. 1.0) 2.4-4X SPEED (Ver. 1.1) 2.4-8X SPEED (Ver. 1.2) 2.4-16X SPEED (Ver. 1.3)
+R (DL):	2.4X SPEED (Ver. 1.0) 2.4-8X SPEED (Ver. 1.1)
+RW:	2.4X SPEED (Ver. 1.1) 2.4-4X SPEED (Ver. 1.2)
Optical pick-up	System with 1 lens, 2 integration units (662 nm wavelength for DVDs, 780 nm wavelength for CDs)
LASER specification	Class 1 LASER Product (Pickup) Wave length: CD 780 nm wave length DVD 662 nm wave length Laser power: No hazardous radiation is emitted with the safety protection
Quick Start for Recording (Quick Start: ON)	1 Sec. Quick Start for Recording(*6) (When connecting to TV using 21-pin Scart, Component Video, Video or S- Video terminals) *6: From the power on, recording on DVD-RAM and HDD starts in about 1 second after the REC button is pressed. (Quick Start Mode)
Playable discs	
DVD-RAM : DVD Video Recording format DVD-R : DVD-Video format, DivX DVD-R DL (Dual layer): : DVD-Video format, DivX DVD-RW : DVD-Video format, DVD Video Recording format +R, +R DL(Double Layer), +RW DVD-VIDEO CD-Audio (CD-DA), Video CD CD-R/CD-RW : CD-DA, Video CD, MP3, JPEG, DivX	

Completion method *5: Total number of recognizable file including MP3, JPEG, DivX and other type of files is 4000.	
DVD(DivX) CD(DivX)	Plays all versions of DivX video (including DivX 6) with standard playback of DivX media files. Certified to the DivX Home Theater Profile. GMC (Global Motion Compensation) is not supported.
DVD(DivX), CD(DivX) Common Items	Maximum number of folders: 300 Recognizable folders per disc on this unit (including the root folder) Maximum number of DivX files: 200 Recognizable DivX files per disc on this unit (*5)
CD(MP3)	Format: ISO9660 level 1 or 2 (except for extended formats), Joliet Compatible compression rate: 32kbps - 320kbps Compatible sampling rate: 16kHz, 22.05kHz, 24kHz, 32kHz, 44.1kHz, 48kHz This unit is not compatible with ID3 tags.
CD (JPEG)	Format: ISO9660 level 1 or 2 (except for extended formats), Joliet Compatible pixels: between 34×34 and 6144×4096 pixels Sub Sampling 4:2:2 or 4:2:0 This unit is not compatible with MOTION JPEG.
CD(MP3), CD(JPEG) Common Items	Maximum number of folders: 300 Recognizable folders per disc on this unit (including the root folder) Maximum number of MP3 files: 3000 Recognizable MP3 files per disc on this unit (*5) Maximum number of JPEG files: 3000 Recognizable JPEG files per disc on this unit (*5) This unit is compatible with multi-session. This unit is not compatible with packet writing.
HDMI:	HDMI Ver.1.3a (This unit supports “HDAVI Control 2” function.)
Dimensions:	430mm(W) × 59mm(H) × 330mm(D)
Mass:	Approx. 4.2kg

5 Location of Controls and Components

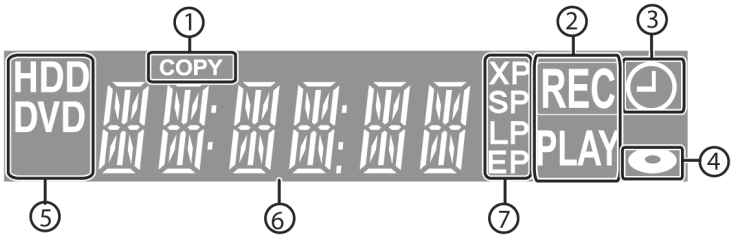
Main unit



Opening the front panel
Place your finger on the protruding section below the ▼ and press down to flip open the front panel.

① **Standby/on switch**
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
② Disc tray
③ Connection for digital video (DV) camcorder
④ Connection for VCR, camcorder etc.
⑤ Display
⑥ Channel select
⑦ Stop
⑧ Start play
⑨ Start recording/Specify a time to stop recording
⑩ Open/close disc tray
⑪ Remote control signal sensor

The unit's display



① Copying indicator
Lights during copy.

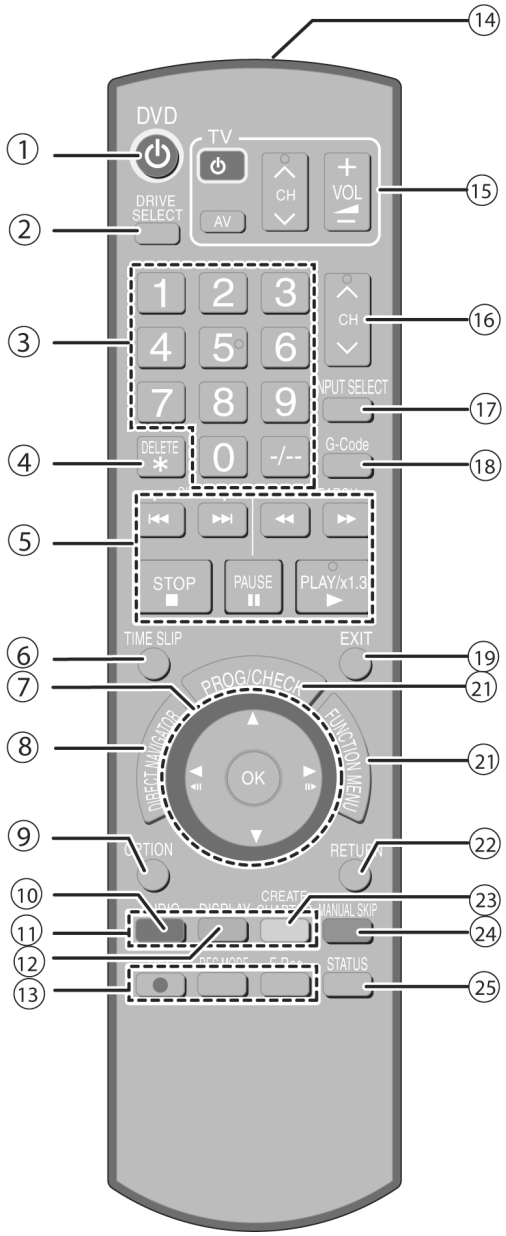
②

Recording indicator	Playback indicator	Recording/ Playback indicator
REC	PLAY	REC PLAY

③ Timer recording indicator
④ Disc indicator
Lights when a disc that is supported by this unit is inserted in the tray.
⑤ Drive [HDD or DVD] indicator
Lights when the HDD or DVD drive is selected.
⑥ Main display section indicator
⑦ Recording mode indicator

Remote control

e.g., [Australia]and]N.Z.]



① Turn the unit on
② Select drive [HDD or DVD]
Drive changes each time you press [DRIVE SELECT].
③ Select channels and title numbers, etc./Enter numbers
④ To delete unnecessary recorded titles
⑤ Basic operations for recording and play
⑥ Skip the specified time
⑦ Selection/OK, Frame-by-frame
⑧ Show Top Menu/DIRECT NAVIGATOR
⑨ Show OPTION menu
This menu is used when playing or editing titles and still pictures, etc.
⑩ Select audio
⑪ Colour buttons for switching between Video and Video/Playlists, manual tuning settings
⑫ Show on-screen menu
⑬ Recording functions
[● REC] Start recording
[REC MODE] Change recording mode
[F Rec] Start Flexible Recording
⑭ Transmit the remote control signal
⑮ Television operation
⑯ Channel select
⑰ Input select (AV1, AV2, AV3, AV4 or DV)
⑱ [For]Australia]and]N.Z.] Show G-CODE screen
⑲ Exit the menu screen
⑳ Show Timer Recording screen
㉑ Show FUNCTION MENU window
By using the FUNCTION MENU window you may access the main functions (Playback, Recording, etc.) quickly and easily
㉒ Return to previous screen
㉓ Create chapter
㉔ Skip approx. 30 seconds forwar
㉕ Show status messages

6 Operation Instructions

6.1. Taking out the Disc from DVD-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

6.1.1. Forcible Disc Eject

6.1.1.1. When the power can be turned off.

1. Turn off the power and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.1.2. When the power can not be turned off.

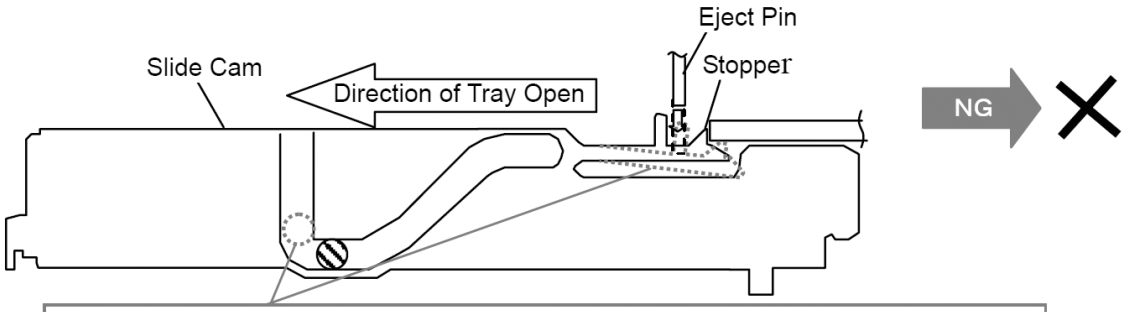
1. Press [POWER] key on the front panel for over 10 seconds to turn off the power forcibly, and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.2. When the Forcible Disc Eject can not be done.

Caution!

1: If you push strong and move the Slide Cam to counter direction of the arrow, the Stopper will be bended and Slide Cam won't stop at Stopper and will reach position for taking out Traverse Base. And Traverse Base might fall down later.

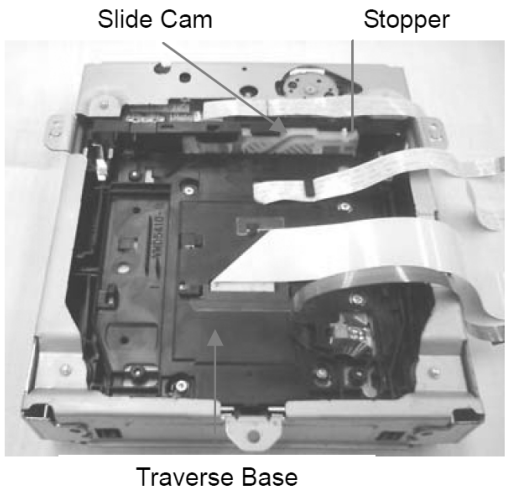
Absolutely, please do not move Slid Cam in the counter direction of the arrow.



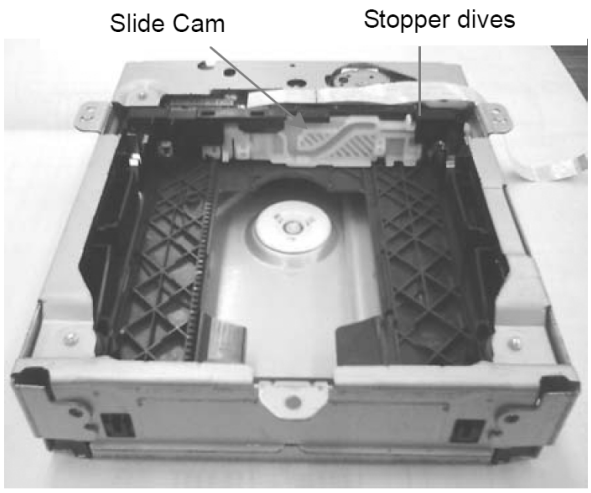
NG Position (Traverse Base might fall down later)

If you move the Slide Cam to counter direction of the arrow, Slide Cam won't stop at Stopper and will reach position for taking out Traverse Base. And Traverse Base might fall down later.

Before fall down of Traverse Base

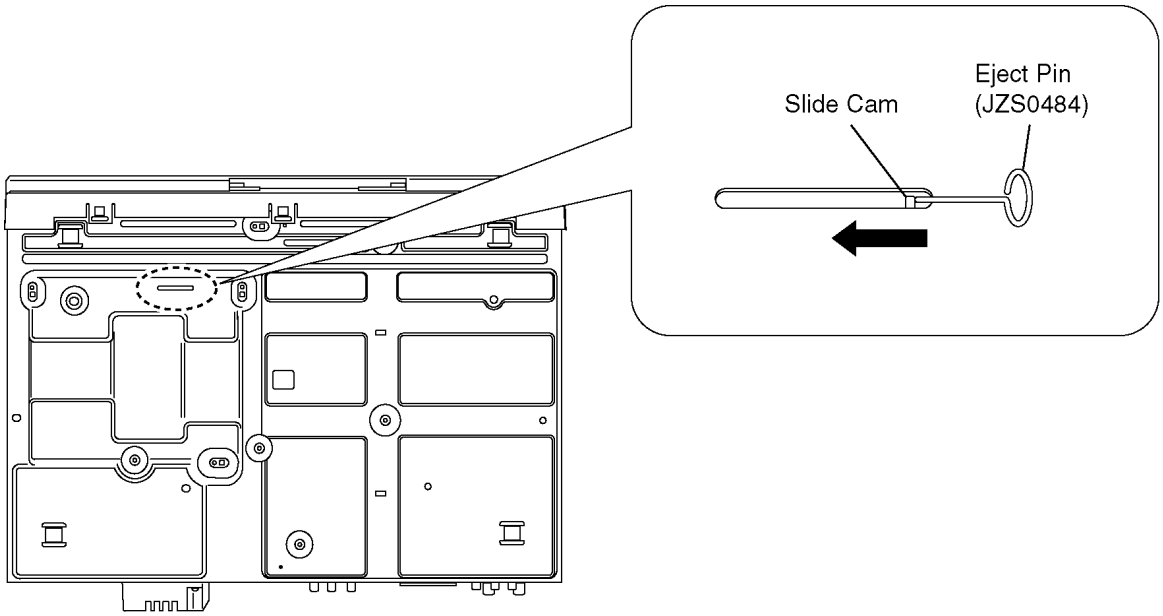


After fall down of Traverse Base

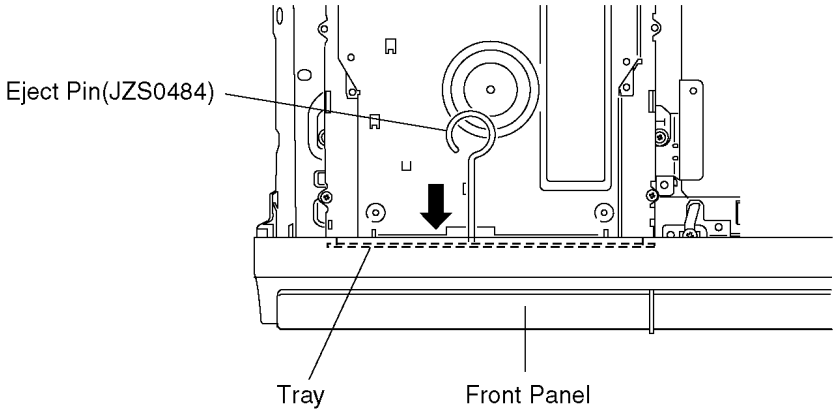


2: Moreover, the slide cam will be on irregular position against condition of the shipment if the tray is pushed by the hand after manual tray ejection is done, the hold of traverse Base becomes imperfect, and the danger of fall of traverse Base increases.
Absolutely, complete close of tray by electricity after manual tray ejection was done.
(Especially finish CLOSE function of tray by electricity when the product will be transported after inspection.

1. Turn off the power and pull out AC cord.
2. Remove the Top Case.
3. Put deck so that bottom can be seen.
4. Slide SLIDE CAM by Eject Pin (JZJ0484) or minus screw driver (small) in the direction of arrow to eject tray slightly.



5. Put deck upward, and push out Tray by Eject Pin (JZS0484) or minus screw driver (small).



7 Service Mode

7.1. Self-Diagnosis and Special Mode Setting

7.1.1. Self-Diagnosis Functions

Self-Diagnosis Function provides information for errors to service personnel by “Self-Diagnosis Display” when any error has occurred.

U, H** and F** are stored in memory and held.**

You can check latest error code by transmitting [0] [1] of Remote Controller in Service Mode.

Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

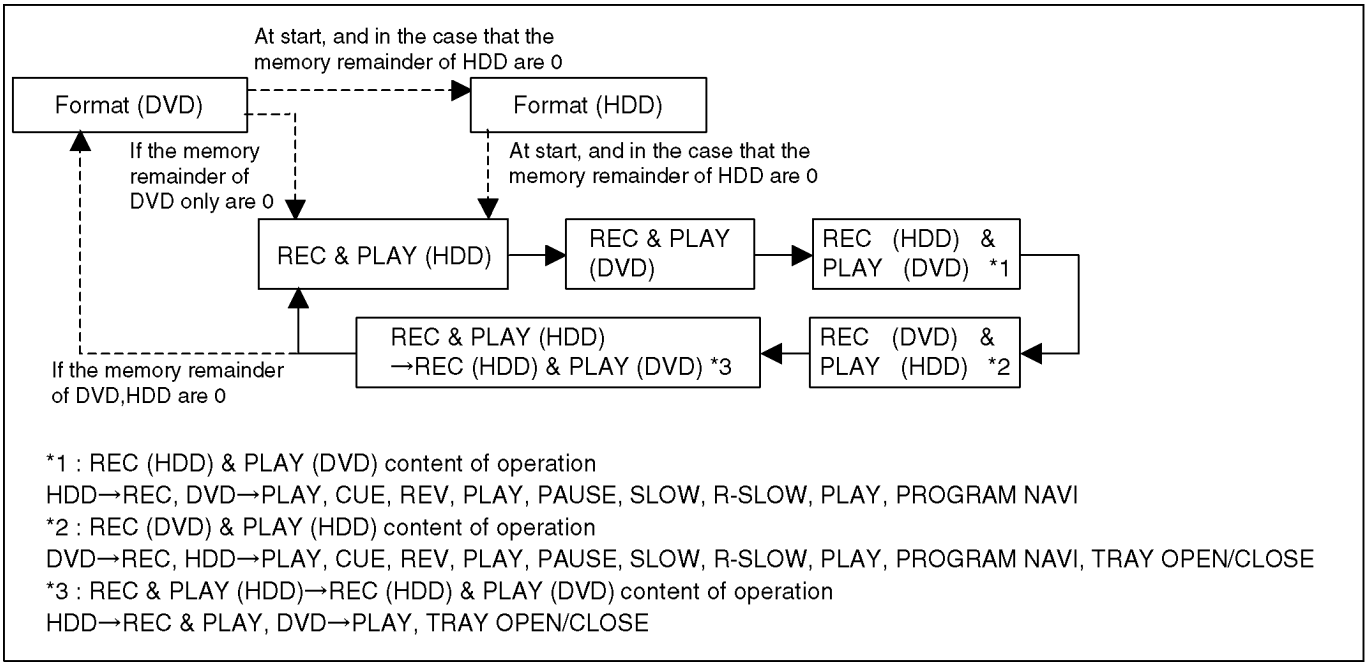
Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	DVD * “*” is remote controller code of the main unit. Display for 5 seconds.
U59	Abnormal inner temperature detected	Display appears when internal temperature of deck reaches limit temperature. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	U59 “U59 is displayed for 30 minutes.
U61	The unit is carrying out its recovery process. (with no disc in the disc tray)	・The unit detected an error while recording or playing with no disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U61
U71	HDMI incompatible error (HDCP incompatible)	Display this error when the equipment (compatible with DVI such as TV, amplifier etc.) connected to the unit by HDMI is incompatible with HDCP. *HDCP=High-bandwidth Digital Content Protection	No display	U71
U72	HDMI connection error (communication error)	This error is displayed when there are any communication problems with the unit and the equipments (TV, amplifier etc.) connected to the unit by HDMI. (or when there is a problem with the HDMI cable)		U72 U72 display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.
U73	HDMI connection error (authentication error)	When authentication error occurs while the equipments (TV, amplifier etc.) are connected by HDMI. (or when there is a problem with the HDMI cable)	No display	U73 U72 display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.
U88	The unit is carrying out its recovery process. (with a disc in the disc tray)	・The unit detected an error while recording or playing with a disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U88
U99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	U99 Displayed is left until the [POWER] key is pressed.
H19	Inoperative fan motor	When inoperative fan motor is detected after powered on, the power is turned off automatically. The event is saved in memory.	No display	No display

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization.)	No display	No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F34	Initialization error when main microprocessor is started up for program recording	When initialization error is detected after starting up main microprocessor for program recording, the power is turned off automatically. The event is saved in memory.	No display	No display
F74	HDIM Device Key Communication error.	HDMI connection could not be authenticated due to a transfer malfunction. Factor of HDMI Device key-road failure • When HDMI LSI is damaged. • When the bus line of I2C doesn´t operate normally. • When device key information recorded is damaged.	No display	F74
F75	HDIM Device Key Information error	HDMI connection could not be authenticated due to an internal data malfunction. Factor of HDMI Device key-road failure • When HDMI LSI is damaged. • When the bus line of I2C doesn´t operate normally. • When device key information recorded is damaged.	No display	F75
UNSUPPORT	Unsupported disc error	*An unsupported format disc was played, although the drive starts normally. *The data format is not supported, although the media type is supported. *Exceptionally in case of the disc is dirty.	**"This disc is incompatible."**	UNSUP ↓ PORT Display for 5 seconds.
NO READ	Disc read error	*A disc is flawed or dirty. *A poor quality failed to start. *The track information could not be read.	**"Cannot read. Please check the disc."**	NOREAD
HARD ERR	Drive error	The drive detected a hard error.	"**DVD drive** error."	Display for 5 seconds. HARD ↓ ERR
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / RAM drive.	No display	SELF ↓ CHECK
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. "BYE" is displayed and power will be turned off. In case "Quick Start" of setup menu is ON, it is displayed in restoration operation for AC off.	No display	PLEASE ↓ WAIT
UNFORMAT	Unformatted disc error	You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recorded on other equipment.	Format This disc is not formatted properly. Format the disc in DISK MANAGEMENT?	UNFOR ↓ MAT
IR ERR	IR communication error	[IR ERR] is displayed when communication between Timer microprocessor and IR microprocessor fails.	No display	IR ERR
No REC	Recording is impossible	[No REC] is displayed when recording is impossible due to the defect, dirt or wound of media.	No display	NoREC

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
HDD ERROR	[HDD ERR] is displayed when start up of HDD was failed. (Except error of setting of Power on Stand-by)	a) When normal start up was failed. b) When start up at HDD boot was failed. c) When start up from state of P-OFF was failed. d) When start up from state of HDD SLEEP was failed. [HDD ERR] is displayed when above each start up of HDD was failed. *In case b), tray opens automatically and [HDDERR] is displayed until version up disc is inserted.	No display	HDDERR
HDD NG	Power on Stand-by setting error	[HDD NG] is displayed when power on Stand-by setting of HDD is NG or when HDD which power on Stand-by is not set to is used. Please try to replace HDD with junine HDD as service parts.	No display	HDD NG

7.1.2. Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
TEST Mode	*All the main unit´s parameters (include tuner) are initialized.	TM∗AV1	Press [STOP], [CH UP] and [OPEN/CLOSE] keys simultaneously for five seconds when power is off.
Rating password	The audiovisual level setting password is initialized to “Level 8”.	INIT	Open the tray, set DRIVE SELECT to DVD, and press [REC] and [PLAY] simultaneously for 5 seconds.
Service Mode	Setting every kind of modes for servicing. *Details are described in “**7.1.3. Service Mode at a glance**”.	SERV	When the power is off, press [CH UP], [OPEN/CLOSE] and [REC] keys simultaneously for 5 seconds.
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. *When Timer REC is ON or EXT-LINK is ON, execute " Forced disc eject " after releasing Timer REC or EXT-LINK. *This command is not effective during "Child lock" is ON. While Demonstration Lock is being set, this Forced disc eject function is not accepted. If this command was executed while TIMER REC is being set, TIMER REC setting will be kept.	The display before execution leaves. ******	When the power is off, press [STOP] and [CH UP] keys simultaneously for 5 seconds.
Child lock/unlock	Set or release “Child Lock”.	X HOLD	Press [ENTER] and [RETURN] by remote controller simultaneously until [X-HOLD] is displayed.
NTSC/PAL system select	To switch PAL/NTSC altemately.	The display before execution leaves. ******	While the power is on (E-E mode), press [STOP] and [OPEN/CLOSE] simultaneously for 5 seconds.
Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly. *When Timer REC is ON or EXT-LINK is ON, execute “Forced Power-off” after releasing Timer REC or EXT-LINK.	Display in P-off mode.	Press [Power] key over than 10 seconds.

<table>
<tr><th colspan="2">Item</th><th rowspan="2">FL display</th><th>Key operation</th></tr>
<tr><th>Mode name</th><th>Description</th><th>Front Key</th></tr>
<tr><td>Aging</td><td>Perform sequence of modes as * Aging Description shown below continually.
Caution:
All programs in DVD-RAM disc will be deleted because Formatting is done once in Aging process.</td><td>Display following the then mode.</td><td>When the power is ON, press [STOP], [POWER] and [OPEN/CLOSE] simultaneously for over 5 seconds and less than 10 seconds.
NOTE1:
If Unit has not turned into Aging mode by operations shown above, execute TEST MODE once and re-execute operation shown above.
(*All the main unit's parameters include tuner are initialized by TEST mode.)
NOTE2:
If the unit has hung-up because of pressing keys for over 10 seconds, once turn off the power, and re-execute this command.
*When releasing Aging mode, press [POWER] key.</td></tr>
<tr><td colspan="4">Aging Contents (Example):
 

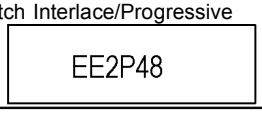
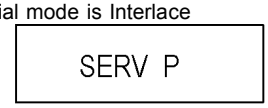
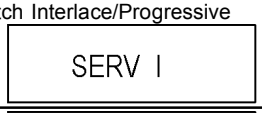
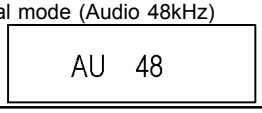
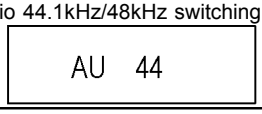
*1 : REC (HDD) & PLAY (DVD) content of operation
HDD→REC, DVD→PLAY, CUE, REV, PLAY, PAUSE, SLOW, R-SLOW, PLAY, PROGRAM NAVI
*2 : REC (DVD) & PLAY (HDD) content of operation
DVD→REC, HDD→PLAY, CUE, REV, PLAY, PAUSE, SLOW, R-SLOW, PLAY, PROGRAM NAVI, TRAY OPEN/CLOSE
*3 : REC & PLAY (HDD)→REC (HDD) & PLAY (DVD) content of operation
HDD→REC & PLAY, DVD→PLAY, TRAY OPEN/CLOSE</td></tr>
<tr><td rowspan="3">Demonstration lock/unlock</td><td rowspan="3">Ejection of the disc is prohibited.
The lock setting is effective until unlocking the tray and not released by "Main unit initialization" of service mode.</td><td>*When lock the tray.
LOCK
"LOCK" is displayed for 3 seconds.</td><td>When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds in the condition that a disc in the tray.
NOTE:
Time difference between pressing [STOP] and [POWER] should be within 0.5 sec.</td></tr>
<tr><td>*When unlock the tray.
UNLOCK
"UNLOCK" is displayed for 3 seconds.</td><td>When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds while the tray being locked.
NOTE:
Time difference between pressing [STOP] and [POWER] should be within 0.5 sec.</td></tr>
<tr><td>*When press OPEN/CLOSE key while the tray being locked.
LOCK
Display "LOCK" for 3 seconds.</td><td>Press [OPEN/CLOSE] key while the tray being locked.</td></tr>
<tr><td>ATP re-execution</td><td>Re-execute ATP.</td><td>Display at ATP executing.
******</td><td>When the power is on (E-E mode), press [CH UP] and [CH DOWN] simultaneously for 5 seconds.</td></tr>
</table>

Item		FL display	Key operation
Mode name	Description		Front Key
Progressive initialization	The progressive setting is initialized to Interlace.	The display before execution leaves. ******	When the power is on (E-E mode), press [STOP] and [PLAY] simultaneously for 5 seconds.

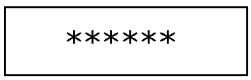
7.1.3. Service Modes at a glance

Service mode setting: While the power is off, press **REC, CH UP and OPEN / CLOSE** simultaneously for five seconds.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	SERV	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in **"7.1.1. Self-Diagnosis Functions".**	♣□□ *♣ shows U/H/F. □□ shows number. If any error history does not exist, [F00] is displayed.	Press [0] [1] in service mode
ROM Version Display	1. Region code (displayed for 5 sec.) 2. Main firm version (displayed for 5 sec.) 3. Timer firm version (displayed for 5 sec.) 4. Drive firm version (displayed for 5 sec.) 5. ROM correction version (displayed for 5 sec.)	1. NO * *: Region of DVD (Example: 1,2.....) 2. ****** 3. ****** 4. **** 5. *** * are version displays.	Press [0] [2] in service mode
White Picture Output	White picture is output as component Output from AV Decoder. *White picture (Saturation rate : 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". WHIT I	Press [1] [1] in service mode.
		Switch Interlace/Progressive WHIT	Press [1] [4] in White Picture Output mode. *I/P are switched alternately.
Magenta Picture Output	Magenta picture is output with Component Output from AV Decoder. *Magenta picture (Saturation rate: 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". MAGE I	Press [1] [2] in service mode.
		Switch Interlace/Progressive MAGE	Press [1] [4] in Magenta Picture Output mode. *I/P are switched alternately.

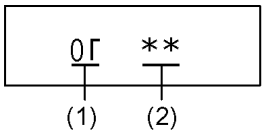
Item		FL display	Key operation
Mode name	Description		(Remote controller key)
RTSC Return in XP (A & V)	AV1 input signal is encoded (XP), decoded (XP) and output decoded signal to external without DISC recording and DISC playback.	Initial mode: EE2/ Interlace/ XP/ Audio 48kHz 	Press [1] [3] in service mode.
		Switch Interlace/Progressive 	Press [1] [4] in RTSC Return XP mode. *I/P are switched alternately.
		Audio 44.1 kHz/ 48 kHz Switch 	Press [2] [4] in RTSC Return XP mode. *48 kHz / 44.1 kHz are switched alternately.
I/P Switch	Switch Interlace and Progressive in EE mode. *Initial setting is “Interlace”. *This command is effective during executing “White Picture Output”, “Magenta Picture Output” and “RTSC Return in XP (A & V)” modes.	Initial mode is Interlace  Switch Interlace/Progressive 	Press [1] [4] in I/P Switch mode. *I/P are switched alternately.
Audio Mute (XTMUTE)	Check whether mute is applied normally by the timer microprocessor.		Press [2] [1] in service mode.
Audio Mute (XDMUTE)	Check whether mute is applied normally by the Digital P.C.B..		Press [2] [2] in service mode.
Audio Pattern Output	The audio pattern stored in the internal memory is output (Lch: 1kHz/-18dB) (Rch: 400Hz/-18dB) *Audio sound clock switching operation of DAC can be confirmed by sub command [2] [4].	Initial mode (Audio 48kHz) 	Press [2] [3] in service mode.
		Audio 44.1kHz/48kHz switching 	Press [2] [4] in Audio Pattern Output mode. *48 kHz / 44.1 kHz are switched alternately.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
HDD READ SEEK Inspection	Inspecting seek time of HSS to inspect performance.	At start AVSCAN ↓ * 00 ↓ The [*] sign is added every 20 seconds while inspecting. Two digits on the right side are the progress level of the inspection (The unit is %). Example on the way of inspection: *** 53 When HDD is OK after inspection: HDD OK (NG is displayed when error is excluding o) (Transfer rate is calculated from the AV scanning result, and when it is less than 35Mbps, NG is displayed.) HDD $## $: [X] is displayed when seek time is over 270msec., there is error or transfer rate is NG. Position at $ is space when excluding those. ##: Number of data of over 100msec. and less than 270msec. When it is over 100, [99] is displayed. When the number is less than 5, we judge it normal.	Press [3] [1] in service mode. * When canceling the inspection mode while executing, do “forced power-off”. Method: Press [POWER] key more than 10 seconds.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
HDD READ VERIFY Inspection	Measure of access time in READ VERIFY MODE of HDD.	At start AVSCAN ↓ * 00 ↓ The [*] sign is added every 20 seconds while inspecting. Two digits on the right side are the progress level of the inspection (The unit is %). Example on the way of inspection: *** 53 When HDD is OK after inspection: HDD OK (NG is displayed when error is excluding o) (Transfer rate is calculated from the AV scanning result, and when it is less than 35Mbps, NG is displayed.) HDD $## $: [X] is displayed when seek time is over 270msec., there is error or transfer rate is NG. Position at $ is space when excluding those. ##: Number of data of over 100msec. and less than 270msec. When it is over 100, [99] is displayed. When the number is less than 5, we judge it normal.	Press [3] [2] in service mode. * When canceling the inspection mode while executing, do “forced power-off”. Method: Press [POWER] key more than 10 seconds.
HDD Spin-up time	The accumulation value of the Spin-up time of HDD is displayed.	******  Spin-up time of HDD is displayed. (The unit of display is hour.)	Press [3] [3] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
HDD High Speed Scan		AVSCAN ↓ * 00 ↓ The [*] sign is added every 10 seconds while inspecting. Two digits on the right side are the progress level of the inspection (The unit is %). Example on the way of inspection: *** 53 When HDD is OK after inspection: HDD OK When HDD is NG after inspection: HDD *** [*] is the number of data of NG.	Press [3] [6] in service mode.
HDD Check	Simple quality judgment of HDD	HDDCHK ↓ When HDD is OK: HDD OK When HDD is NG: HDD NG	Press [3] [7] in service mode.
Laser Used Time Indiction	Check laser used time (hours) of drive.	* ●(*****) is the used time display in hour. ●Laser used time of DVD/ CD in Playback/Recording mode is counted.	Press [4] [1] in service mode.
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.	CLR	Press [9] [5] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
RAM Drive Last Error	RAM Drive error code display. *For details about the drive error code, refer to the Service Manual for the specific RAM Drive.	1. Error Number is displayed for 5 seconds. NO ** 2. Time when the error has occurred is displayed for 5 seconds. DDhhmm DD: Day hh: Hour mm: Minute 3. Last Drive Error (1/2) is displayed for 5 seconds. ****** 03: Bad disc 04: Bad disc or drive malfanction 4. Last Drive Error (2/2) is displayed for 5 seconds. ****** 5. Error occurring Disc type is displayed for 5 seconds. ****** 6. Disc Maker ID is displayed for 5 seconds. ****** 7. Factor of Drive Error occurring is left displayed ******	Press [4] [2] in service mode. When "INFO******" is being displayed, past 19 error histories can be displayed by pressing [0] [1] - [1] [9] In case that the maker cannot be identified, display is black out.
Delete the Last Drive Error	Delete the Last Drive Error information stored on the DVD RAM-Drive.	CLR	Press [9] [6] in service mode.
Laser power confirmation	Drive state is judged based on difference between laser power value at shipping and present laser power value.	CHK * * is judgment result | * | Power value difference | Evaluation | | 0 | 1mW or less | Very good. | | 1 | 2mW or less | Good. | | 2 | 3mW or less | Bad. | | 3 | 4mW or more | Very bad. | If DVD-RAM disc in not inserted, [NO DISC] is displayed. If power value study was filed, [ERROR] is displayed.	1. Insert DVD-RAM disc into RAM Drive in service mode. (Other media are assumed to be non-correspondence.) 2. Press [4] [4].
Turn on all FL/LEDs	All segments of FL and all LEDs are turned on.	All segments are turned on.	Press [5] [1] in service mode.
PB HIGH Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is High (approx. 11V DC).	PB HI	Press [5] [2] in service mode.
PB MIDDLE Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is Middle (approx. 5.5V DC)	PB MID	Press [5] [3] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Front connection inspection	Press all front keys and check the connection between Main P.C.B. and Front key Switches.	 (1) Each time a key is pressed, segment turned on increases one by one. (2) Total umber of keys that have been pressed.	Press [5] [4] in service mode.
Production Date Display	Display the date when the unit was produced.	YYMMDD YY: Year MM: Month DD: Day	Press [6] [1] in service mode.
Display the accumulated working time	Display the accumulated unit´s working time.	****** (Indicating unit: Second)	Press [6] [4] in service mode.
Display the Error History	Display the Error History stored on the unit.	Display reason of error for 5 seconds. NO ** 01: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 02: Defect of RAM Drive. 03: Defect of Disc. 04: Defect of Digital P.C.B. or Communication Error. 05: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 06: Defect of HDD. Display the time when the error has occurred for 5 seconds. DDhhmm DD: Day hh: Hour mm: Minute Accumulated working time till occurring of the error is left displayed. ****** (Indicating unit: Second)	Press [6] [5] in service mode. Then press [0] [1] ~ [9] [9], the past 99 error histories are displayed.
Delete the Error History	Delete Error History information stored on the unit.	CLR	Press [9] [7] in service mode.
AV4(V)/AV1(RGB) I/O Setting	Set input to AV4 (V) and set output to AV1 (RGB) for I/O checking	PAL 01	Press [8] [0] in service mode.
AV2(Y/C)/AV1(V) I/O Setting	Set input to AV2 (Y/C) and set output to AV1 (V) for I/O checking	PAL 02	Press [8] [1] in service mode.
AV2(V)/AV1(Y/C) I/O Setting	Set input to AV2 (V) and set output to AV1 (Y/C) for I/O checking	PAL 03	Press [8] [2] in service mode.
AV2(RGB)/AV1(V) I/O Setting	Set input to AV2 (RGB) and set output to AV1 (V) for I/O checking	PAL 04	Press [8] [3] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
P50(H) Output	Timer Microprocessor IC7501-76 output High signal for AV1-pin 10 passing through inverter (approx. 0V DC at AV1-pin 10).	When OK. P50HOK When NG. P50HNG	Press [8] [4] in service mode.
P50(L) Output	Timer Microprocessor IC7501-76 output Low signal for AV1-pin 10 passing through inverter (approx. 4.4V DC at AV1-pin 10).	When OK. P50LOK When NG. P50LNG	Press [8] [5] in service mode.
Tray OPEN/CLOSE Test	The tray is opened and closed repeatedly.	****** "*" is number of open/close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.
Error code initialization	Initialization of the last error code held by timer (Write in F00)	CLR	Press [9] [8] in service mode.
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.
Finishing service mode	Release Service Mode.	Display in STOP (E-E) mode. ******	Press power button on the front panel or Remote controller in service mode.

8 Service Fixture & Tools

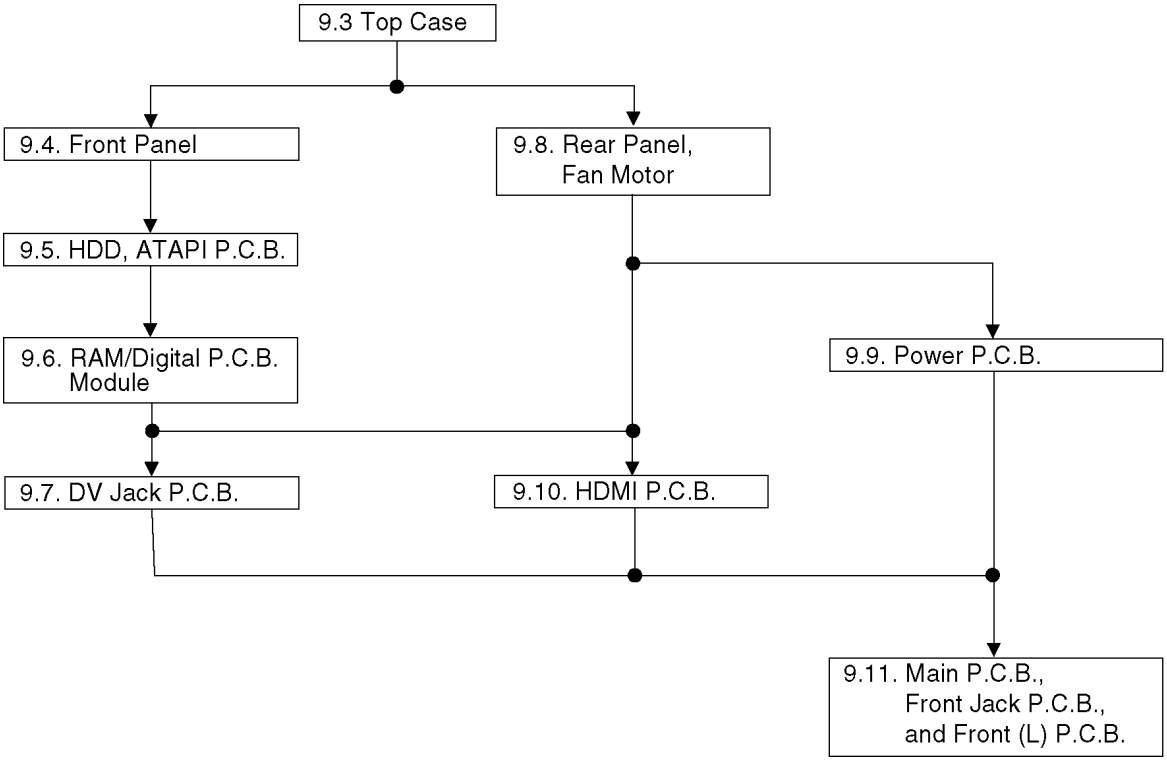
Part Number	Description	Compatibility
RFKZ0260	Extension Cable (MainP.C.B. - RAM/Digital P.C.B. Module/ 88 Pin)	Same as EH50 Series
RFKZ0327	Extension Cable (MainP.C.B. - Power P.C.B./ 15 Pin)	Same as E55 Series
RFKZ0366	Extension FFC (HDD - RAM/Digital P.C.B. Module/ 40 Pin)	Same as EH55 Series
RFKZ0168	Extension Cable (Main P.C.B. - Fan Motor/ 3 Pin)	Same as E50/ E55 Series
RFKZ0339	Extension Cable (MainP.C.B. - HDD / 4 Pin)	Same as EH55 Series
RFKZ0419	Extension Cable (MainP.C.B. - HDMI P.C.B. / 10 Pin)	New
JZS0484	Eject Pin	Same as E50 Series
RFKZ03D01K	Lead Free Solder (0.3mm/100g Reel)	Same as EH55 Series
RFKZ06D01K	Lead Free Solder (0.6mm/100g Reel)	Same as EH55 Series
RFKZ10D01K	Lead Free Solder (1.0mm/100g Reel))	Same as EH55 Series
RFKZ0316	Solder Remover (Lead free low temperature Solder/50g)	Same as EH55 Series
RFKZ0328	Flux	Same as EH55 Series
RFKZ0329	Bottle of Flux	Same as EH55 Series

9 Disassembly and Assembly Instructions

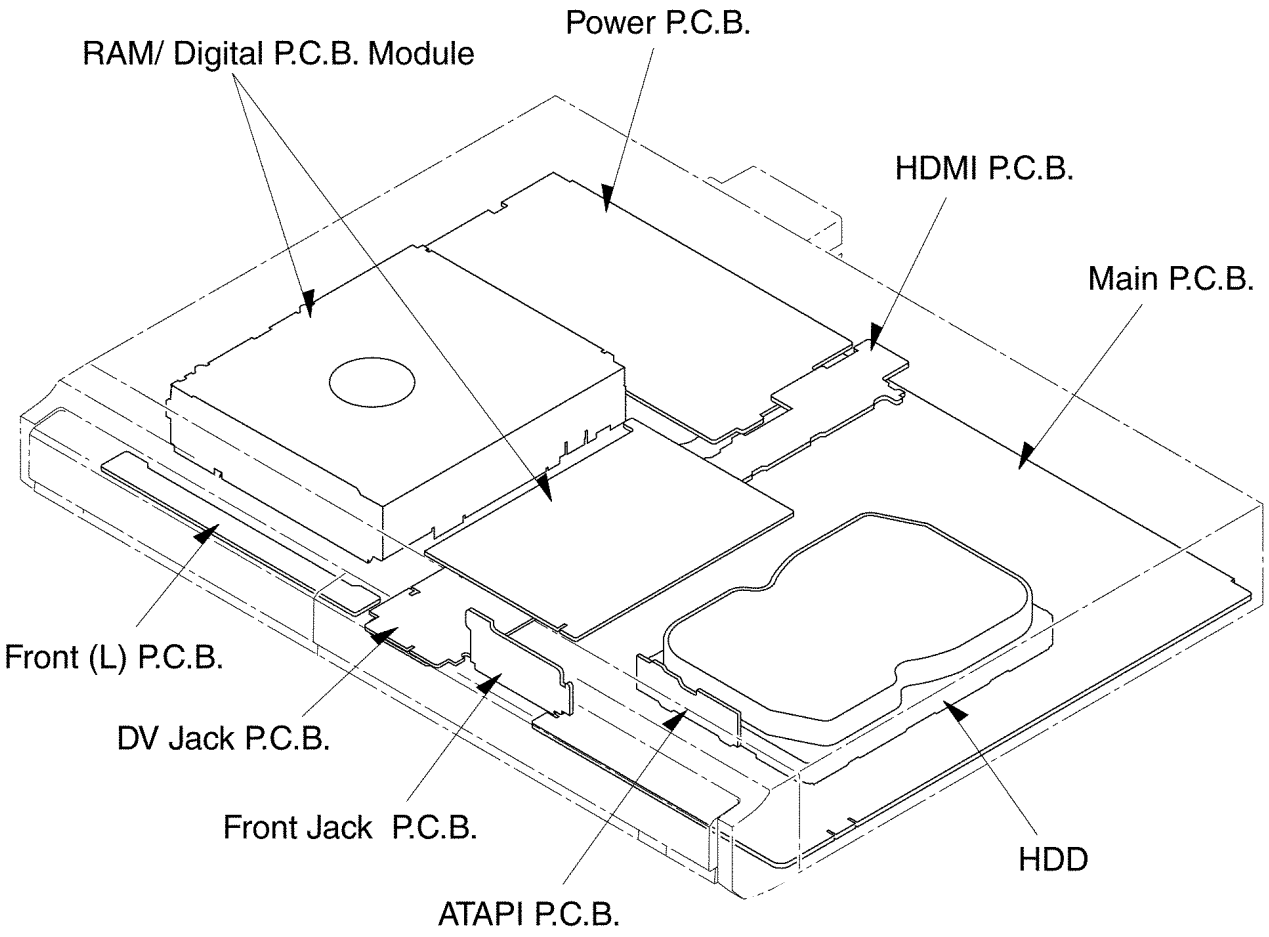
9.1. Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

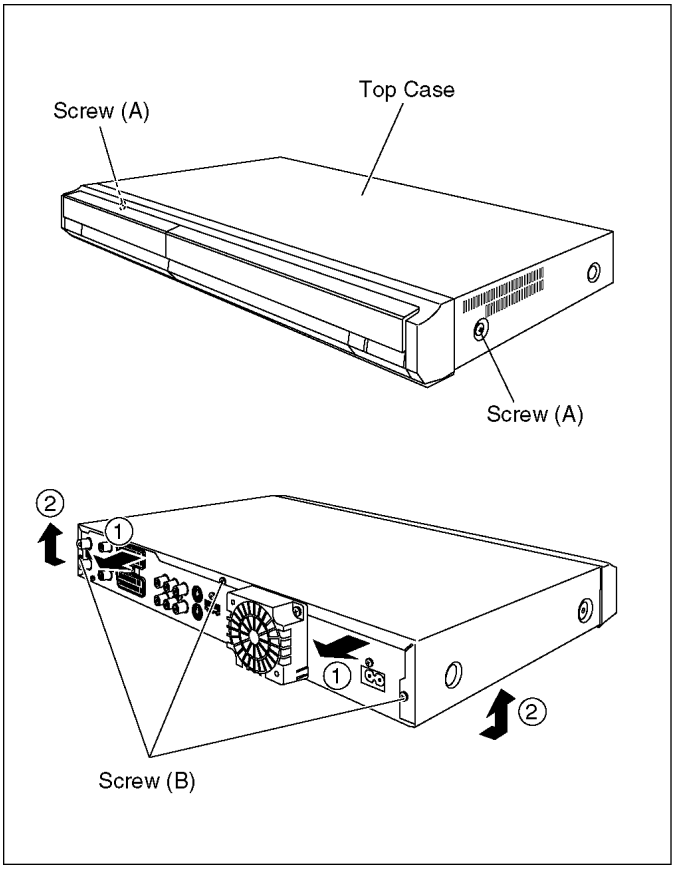


9.2. P.C.B. Positions



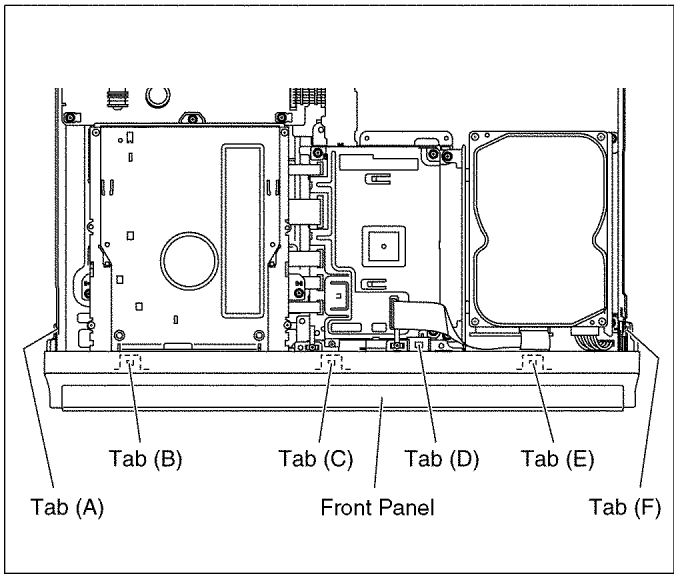
9.3. Top Case

1. Remove the 2 screws (A) and 3 screws (B).
2. Slide Top Case rearward and open the both ends at rear side of the Top Case a little and lift the Top Case in the direction of the arrows.



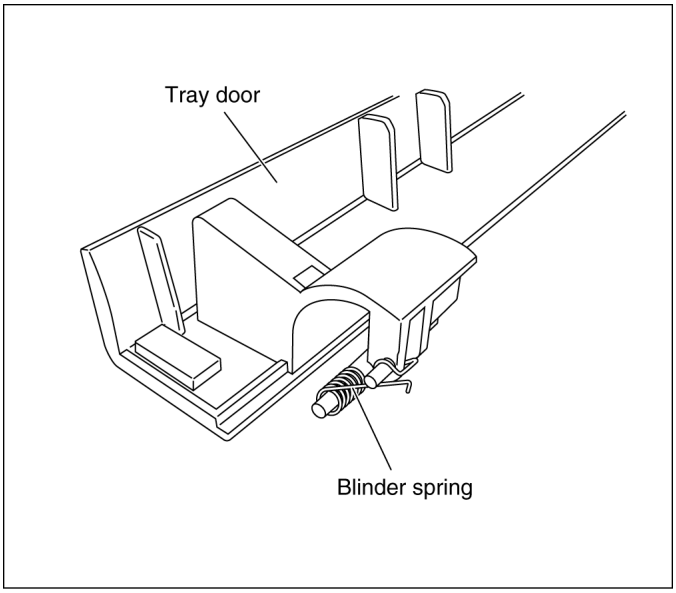
9.4. Front Panel

1. Unlock 6 tabs in (A) - (F) turn.
   Pull with the front panel in the direction of your side.

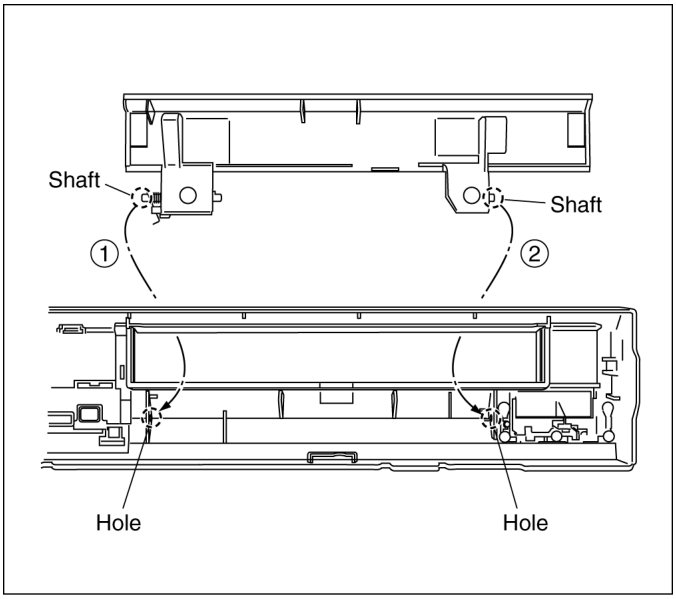


9.4.1. How to assemble Tray door ass'y

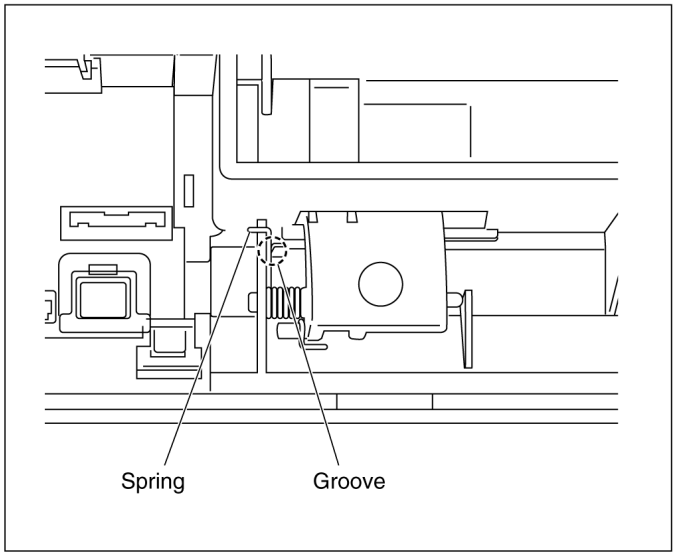
1. Attach Blinder spring to Tray door ass'y.



2. Attach Tray door ass'y in order from ① to ③.
   ① Put the Brinder spring on the groove.
   ② Insert the shaft in the hole.
   ③ Insert the shaft in the hole.



3. Confirm the Brinder spring is attached as following.



9.5. HDD, ATAPI P.C.B.

Caution:
Writing the main firmware to the unit is necessary after replacing the HDD.
Prepare the latest firmware updating disc.

* The main firmware is recorded in the HDD, but the replacement HDD has no data (and needs to be formatted).

Writing Procedure of Main Firm:

Caution:
(1) Writing of Main Firm needs 3, 4 minutes.
(2) Never cut the power of DVD Recorder until writing in Firmware ends.
(3) Initial settings and contents of reservation will not change if writing is normally completed.

1. Prepare latest firmware updating disc.
2. Replace HDD.
3. Turn on power of DVD Recorder.
4. After [PLEASE WAIT] is displayed on FL., [HDD ERR] is displayed on FL.
5. Tray opens automatically.
6. Insert updating disc for Firmware and press OPEN/CLOSE key.
   (If a wrong disc was inserted, [NG DISK] [NO FVU] is displayed on FL.)
7. [LOAD]→[LD FVU]↔[M_FIRM] are displayed on FL alternately.
8. [MAIN]↔[UPD OK] blink alternately and Tray opens.
   Take out disc (Writing was finished).
9. Press Power button to turn off power.
10. Press Power button to turn on power.
11. [HELLO]→[SELF CHECK] are displayed on FL.
12. [UNFORMAT] is displayed on FL.
13. After [UNFORMAT] was displayed, message to request FORMAT is displayed on TV screen.
14. Select [Yes] and press [ENTER] key to format HDD.
    (After FORMAT, program in HDD will be lost, but Main firm will not be lost.)

"Write of the main firm" is completed above.

* Drive firm is not updated by above operation. If you wish update Drive firm, please prepare the disc for latest firmware update, and write it again.
* If the version of the firm you have prepared was same as or later than that has already been written in deck, 'UNSUPPORT' is displayed on FL.
* In a usual updating of firmware, writing is not performed when the timer reservation standby was not released.

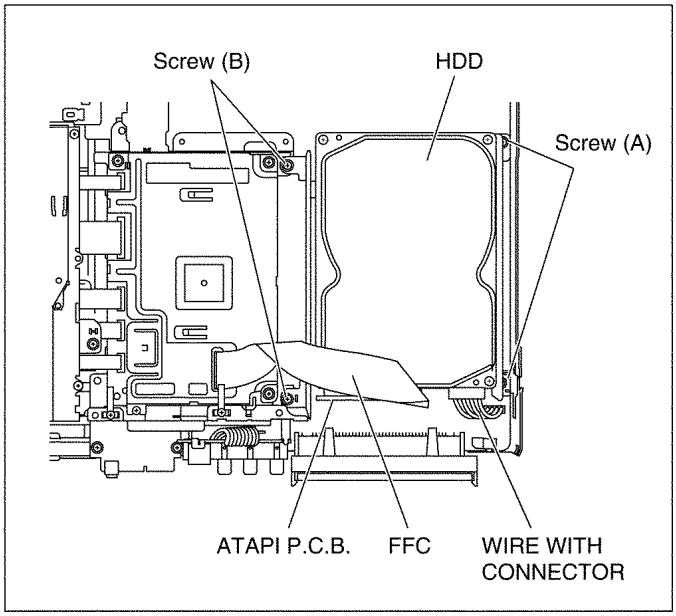
Handling of HDD

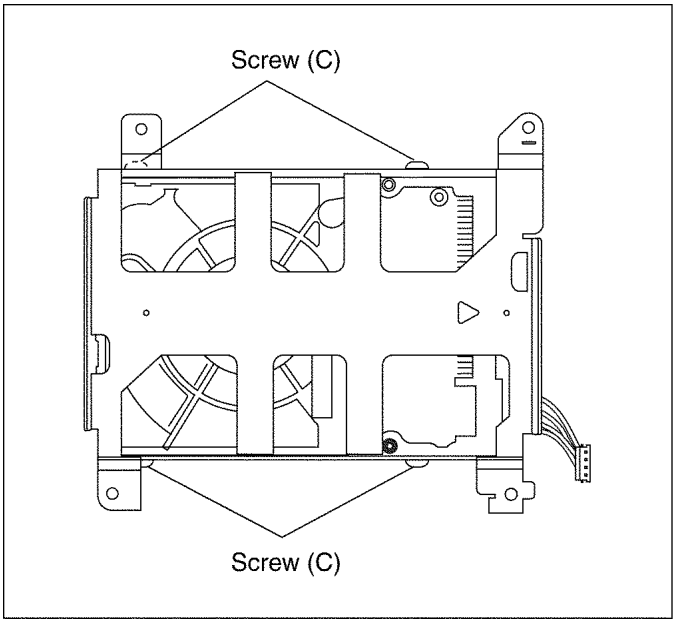
The following precautions should be taken when handling HDD.

1. Never give an impact to HDD. (Even a drop from 1cm height can be a cause of HDD failure.
2. When placing HDD on a workbench, provide a mat on a bench for shock absorption and anti-static purposes.
3. When installing HDD, release it from your hands only after confirming that it is fully set on the chassis.
4. Avoid stacking up HDD.
5. HDD is unstable and easy to fall. Do not stand it on its side face.
6. When handling HDD, hold its side faces to avoid static hazard.
7. Do not place HDD on its wrapping bag after removal. (Prevention of static hazard
8. Use a screwdriver with low impact and anti-static features.

Note:
When replacing HDD, please make the rear jumper slave or cable select configuration.

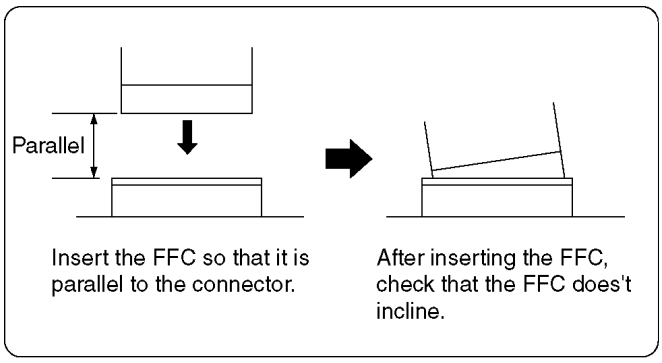
1. Remove the 2 Screws (A) and (B), FFC and Wire with connector to remove HDD with ATAPI P.C.B..



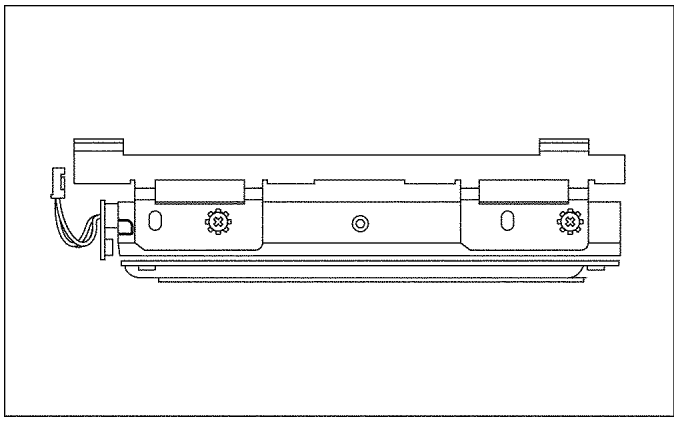


CAUTION:

When replacing HDD, pay attention as below.



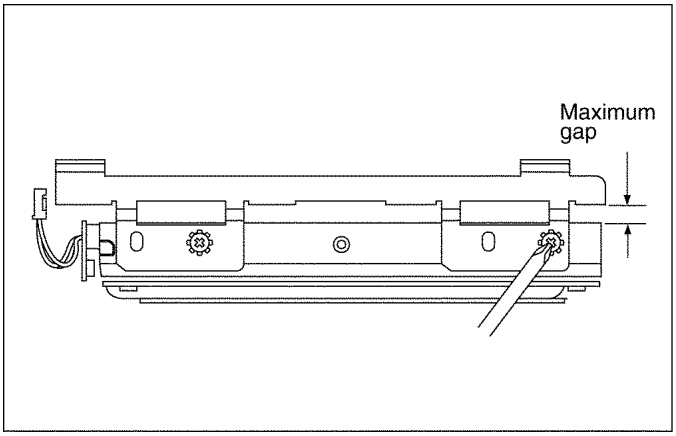
2. Put HDD with HDD angle up and down inversely so as not to give a shock to HDD.



3. Remove 4 Screws (C) to remove HDD from HDD angle.

Caution for Attaching HDD

Put HDD up and down inversely so as not to give a shock to HDD, and put HDD Angle on to HDD and tighten 4 screws while lifting HDD Angle so as to keep maximum gap between HDD and HDD Angle.

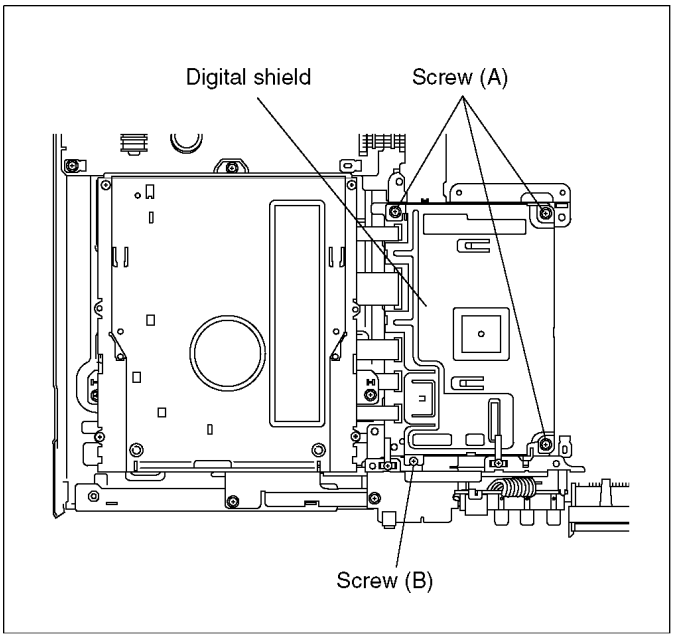


9.6. RAM/Digital P.C.B. Module

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

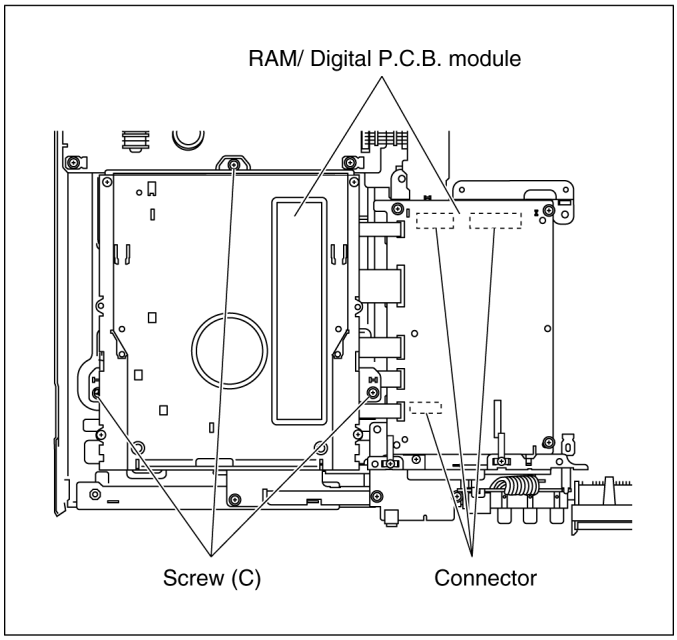
NOTE:
Formatting the HDD is unnecessary after replacing RAM/Digital P.C.B. Module.
[TM AV1] is displayed, once power OFF, and power ON again.

1. Remove the 3 Screws (A) and Screw (B) to remove Digital Shield.

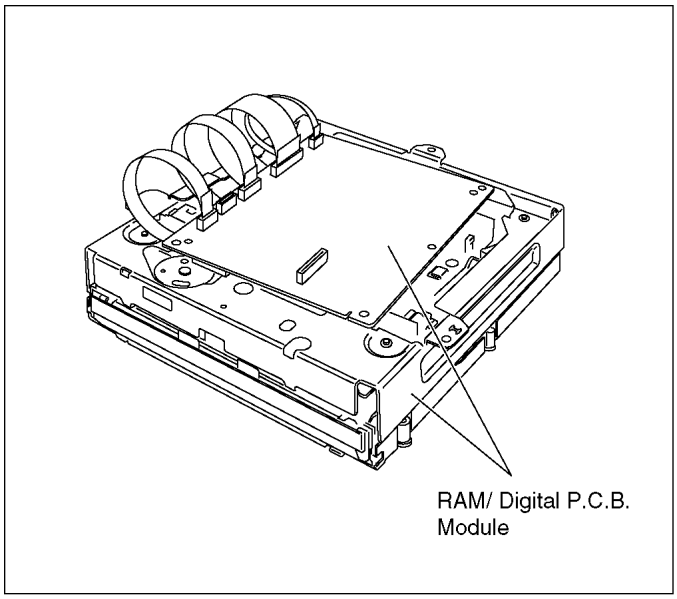


2. Lift up Digital P.C.B. slightly so to disconnect connectors to remove Digital P.C.B..

   And remove 3 Screws (C) to remove DVD drive.



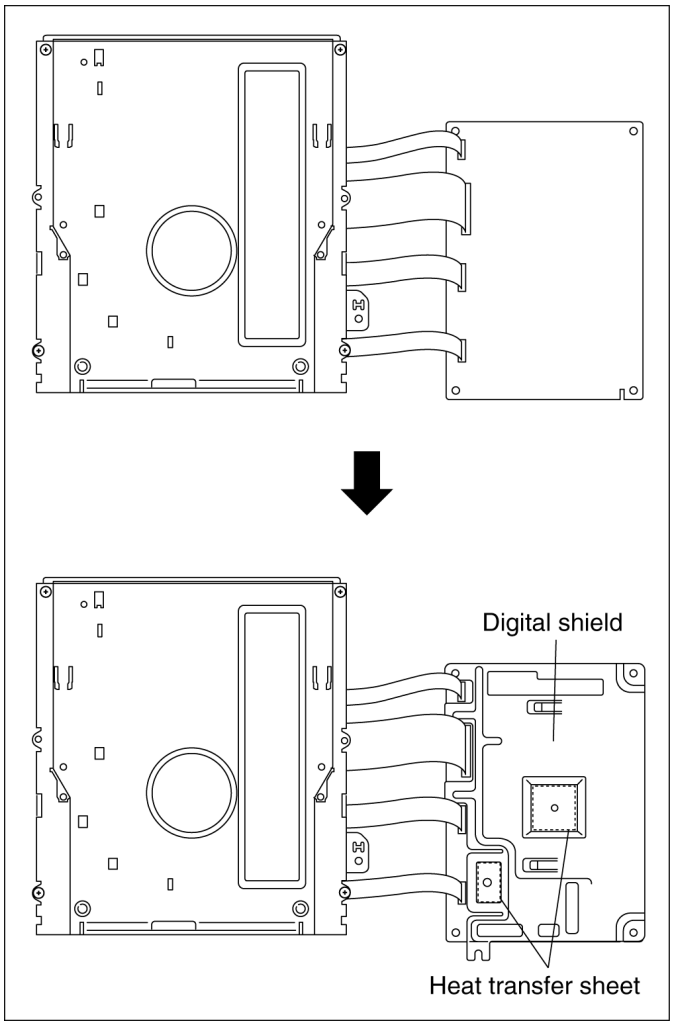
3. Put Digital P.C.B. on DVD drive and remove RAM/Digital P.C.B. Module.



Note:

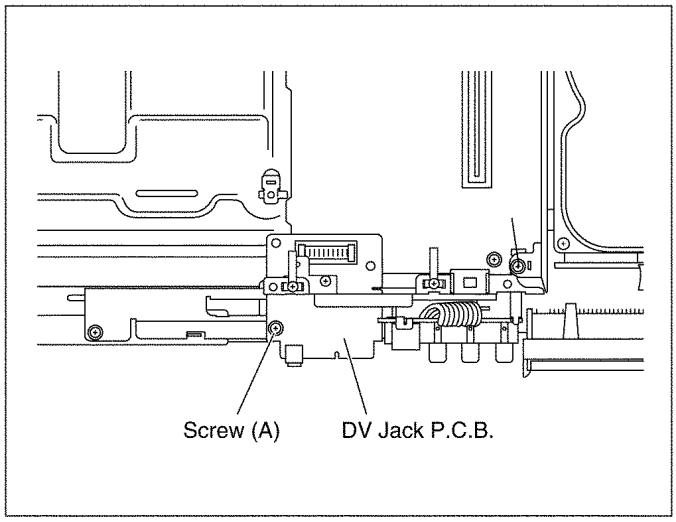
RAM/Digital P.C.B. module as service part has no heat sink and heat transfer sheet.

Before returning to customer, heat sink and heat transfer sheet should be installed on Digital P.C.B..



9.7. DV Jack P.C.B.

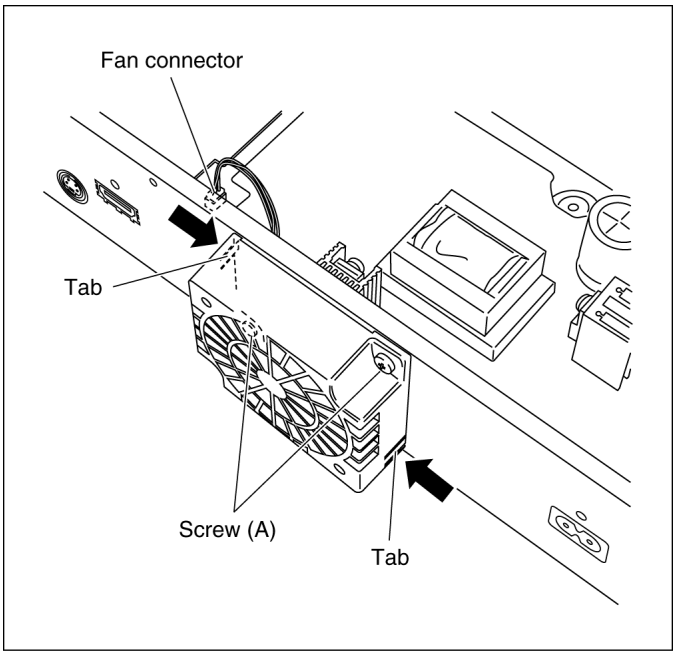
1. Remove Screw (A) to remove DV jack P.C.B..



9.8. Rear Panel

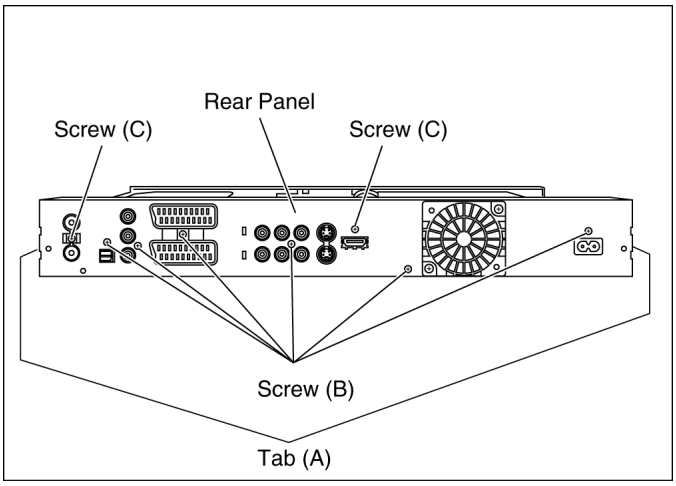
9.8.1. Only Fan Motor

1. Remove the 2 Screws (C) and fan connector, remove the Fan motor with pushing 2 tabs in the direction of arrows.



9.8.2. Rear Panel with Fan Motor

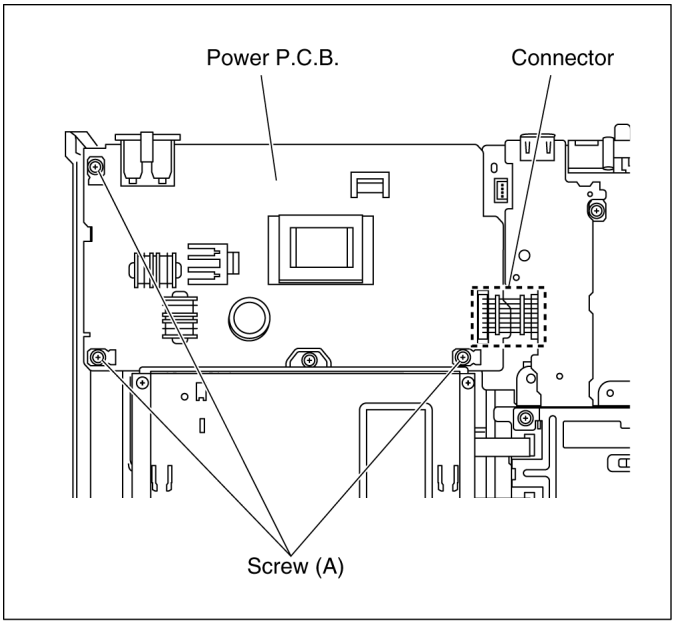
1. Remove 6 Screws (B) and 2 Screws (C).

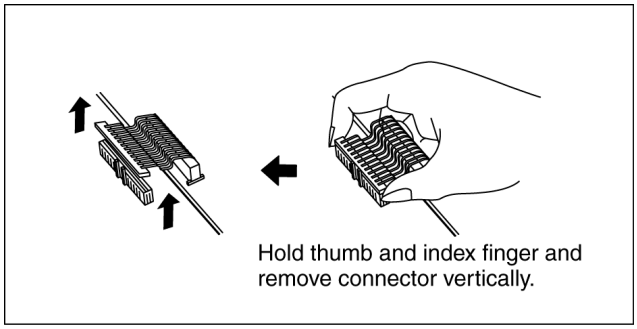


2. Disconnect the Fan Connector and unlock 2 Tabs (A) to remove Rear Panel.

9.9. Power P.C.B.

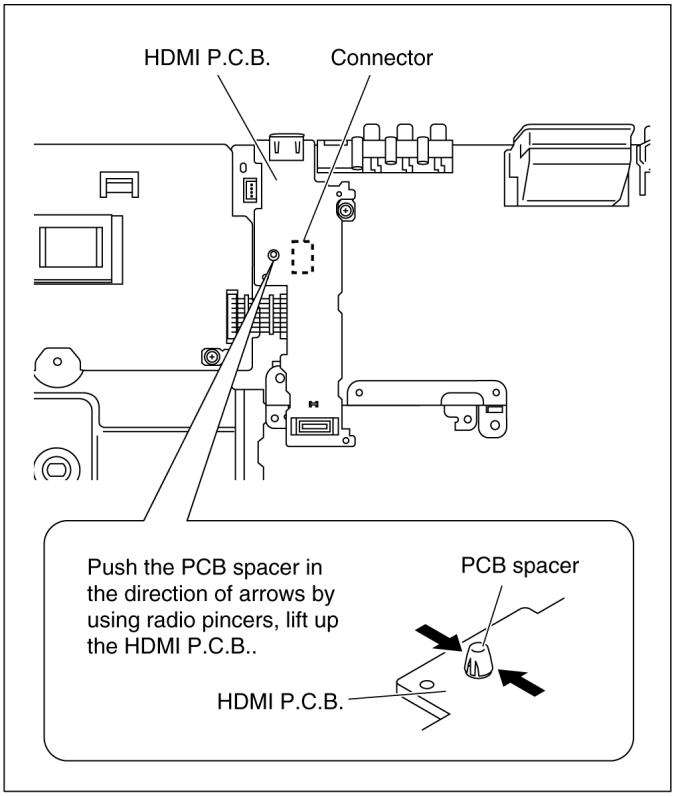
1. Remove 3 Screws (A) and disconnect the connector to remove Power P.C.B..





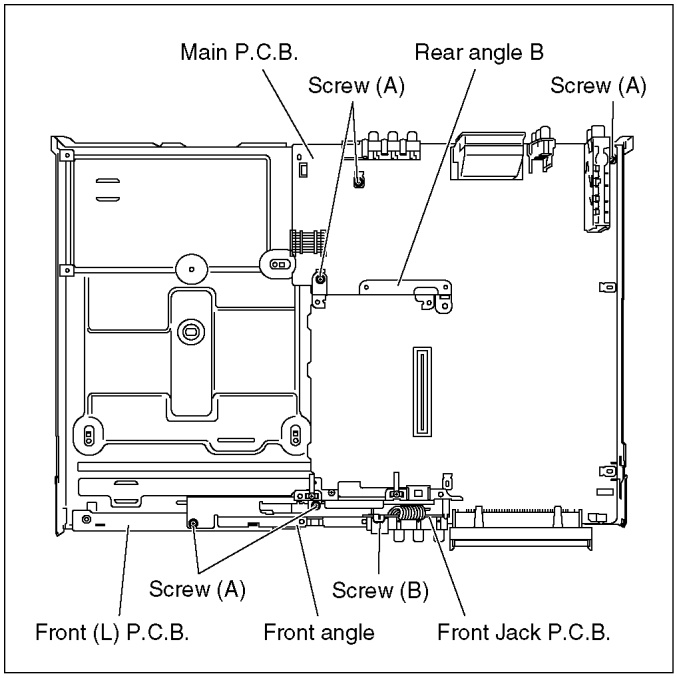
9.10. HDMI P.C.B.

1. Push the PCB spacer in the direction of arrows and lift up HDMI P.C.B. slightly so to disconnect connector to remove HDMI P.C.B..



9.11. Main P.C.B., Front Jack P.C.B. and Front (L) P.C.B.

1. Remove 5 Screws (A) and Screw (B).
2. Remove Front angle and Rear angle B.
3. Remove Main P.C.B., Front jack P.C.B. and Front (L) P.C.B.



10 Measurements and Adjustments

10.1. Service Positions

Note:

For description of the disassembling procedure, see the section 9.

10.1.1. Checking and Repairing of Power P.C.B.

1. Top Case

Remove 2 Screws (A) on side

Remove 3 rear Screws (B) on rear

Remove Top Case

2. Power P.C.B.

Remove 1 Screw (A) for AC Inlet fixing

Remove 3 Screws (B) for Power P.C.B. fixing

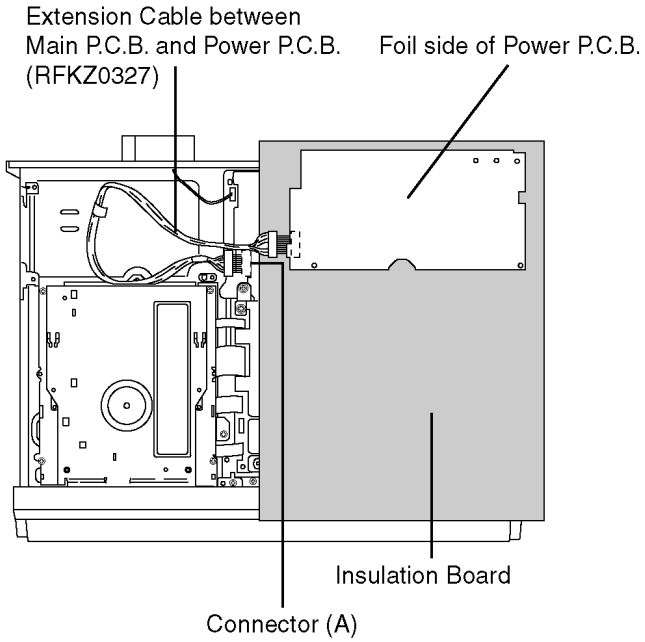
Remove Connector (A) to Main P.C.B.

Connect Extension Cable between Main P.C.B. and Power P.C.B. (RFKZ0327).

Put Power P.C.B. on Insulation Board so that it's foil side faces top.

Caution:

Red wire in the extension cable should be connected to (1) pin.



10.1.2. Checking and Repairing of RAM / Digital P.C.B. Module

1. Top Case

- Remove 2 Screws (A) on side
- Remove 3 rear Screws (B) on rear
- Remove Top Case

2. Front Panel

- Unlock 1 Locking Tab on upper
- Unlock 2 Locking Tabs on side
- Unlock 3 Locking Tabs on bottom
- Remove Front Panel

3. RAM/Digital P.C.B. Module

- Remove 1 FFC from HDD
- Remove 6 Screws (A) and 1 Screw (B) fixing RAM/Digital P.C.B. Module
- Lift up Digital P.C.B. to remove it

4. DV Jack P.C.B.

- Remove 1 Screw (A) fixing DV Jack P.C.B.
- Remove DV Jack P.C.B.

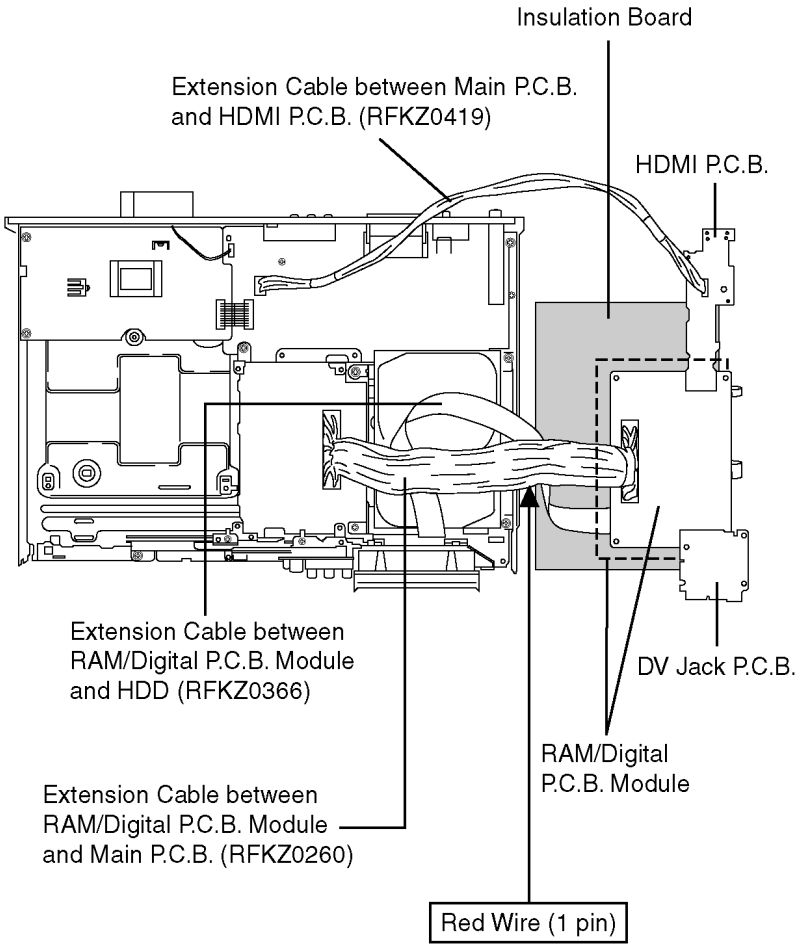
5. HDMI P.C.B.

- Remove 1 Screw (A) fixing HDMI P.C.B.
- Unlock a PCB spacer
- Remove HDMI P.C.B.

Attach DV Jack P.C.B. and HDMI P.C.B. on to Digital P.C.B..
Put RAM/Digital P.C.B. Module on side.

Connect Extension Cable between HDD and RAM/Digital P.C.B. Module (RFKZ0366), and between Main P.C.B. and RAM/Digital P.C.B. Module (RFKZ0260), and between Main P.C.B. and HDMI P.C.B. (RFKZ0419).

Caution:
Red wire in the extension cable should be connected to (1) pin.



10.1.3. Checking and Repairing of Main P.C.B.

1. Top Case

- Remove 2 Screws (A) on side
- Remove 3 rear Screws (B) on rear
- Remove Top Case

2. Front Panel

- Unlock 1 Locking Tab on upper
- Unlock 2 Locking Tabs on side
- Unlock 3 Locking Tabs on bottom
- Remove Front Panel

3. HDD

- Remove 1 FFC from Digital P.C.B.
- Remove 4Pin Power Cable from Main P.C.B.
- Remove 2 Screws (A) and 2 Screws (B) fixing HDD Angle with HDD

4. RAM/Digital P.C.B. Module

- Remove 1 FFC from HDD
- Remove 6 Screws (A) and 1 Screw (B) fixing RAM/Digital P.C.B. Module
- Lift up Digital P.C.B. to remove it

5. DV Jack P.C.B.

- Remove 1 Screw (A) fixing DV Jack P.C.B.
- Remove DV Jack P.C.B.

6. HDMI P.C.B.

- Remove 1 Screw (A) fixing HDMI P.C.B.
- Unlock a PCB spaser
- Remove HDMI P.C.B.

7. Rear Panel

- Disconnect Fan Motor Connector
- Remove 7 Screws (one is for Tuner)
- Unlock 2 Locking Tabs on side
- Remove Rear Panel

8. Power P.C.B.

- Remove 3 Screw (A) fixing Power P.C.B.
- Remove Connector (A) to Main P.C.B.

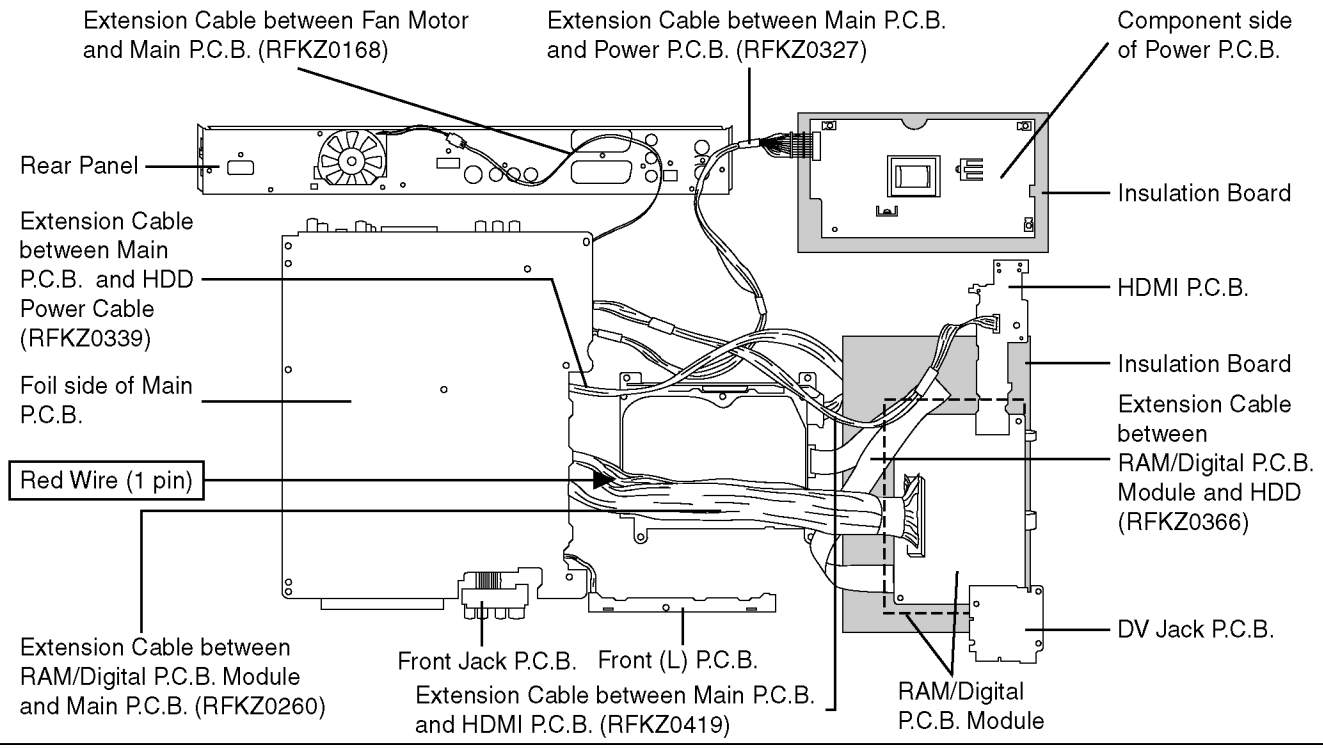
9. Front (L) P.C.B.,Front Jack and Main P.C.B.

- Remove 5 Screws (A) and 1 Screw (B)
- Remove Front Angle and Rear Angle B
- Remove Front (L) P.C.B.,Front Jack P.C.B. and Main P.C.B.

Attach DV Jack P.C.B. and HDMI P.C.B. to Digital P.C.B..
Remove Power P.C.B. from Chassis,and put Power P.C.B. so that its component side faces top.
Remove Front (L), Front Jack P.C.B. and Main P.C.B. from Chassis,and put Front (L) and Main P.C.B. so that its foil side faces top.
Put Insulation Board on DVD Drive, then place Digital P.C.B. on Insulation Board.

Connect Extension Cable between Main P.C.B. and RAM/Digital P.C.B. Module (RFKZ0260), and between Main P.C.B. and Power P.C.B. (RFKZ0327), and between HDD Power Cable and Main P.C.B. (RFKZ0339), and between HDD and RAM/Digital P.C.B. Module (RFKZ0366), and between Fan Motor and Main P.C.B. (RFKZ0168), and between Main P.C.B. and HDMI P.C.B. (RFKZ0419).

Caution: Red wire in the extension cable should be connected to (1) pin.



10.1.4. Checking and Repairing of HDD

1. Top Case

Remove 2 Screws (A) on side

Remove 3 rear Screws (B) on rear

Remove Top Case

2. HDD

Remove 1 FFC from Digital P.C.B.

Remove 4 Pin Power Cable from Main P.C.B.

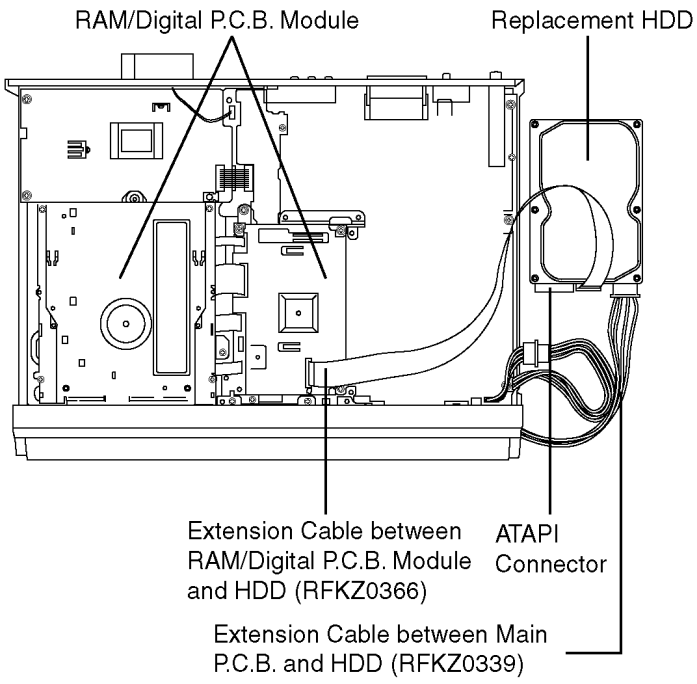
Remove 2 Screws (A) and 2 Screws (B) fixing HDD Angle with HDD

Connect HDD ATAPI Connector to Replacement HDD

Connect 4 Pin Power Cable to Replacement HDD

Put Replacement HDD on Insulation Board.

Connect Extension Cable between Replacement HDD and RAM/Digital P.C.B. Module (RFKZ0366),and between Replacement HDD and Main P.C.B. (RFKZ0339).



10.2. Caution for Replacing Parts

10.2.1. Items that should be done after replacing parts

√ :Necessary — :Unnecessary

Items that Should be done / Replacing Parts	Reset IC7501 (*Note1)	Obtain and register a new registration code.(*Note2)	Main Firm update(*Note3)	HDD Format
Main P.C.B.	√	√	—	√
IC7501 (Timer IC)	√	—	—	—
IC7404 (EEPROM)	—	√	—	√
HDD	—	—	√	√

***Note1:**

Resetting Method

Reset object	Condition of power	Short Terminal
IC7501 (Timer IC)	POWER ON	IC7503-5 (RESET_L) and GND

***Note2:**

Please will always pass the customer "Warning for Customers Who Use the DivX Video-on-Demand content." with the product and get it when you unavoidably exchange EEPROM or P.C.B. including EEPROM (When the product is exchanged, it is the same.).

You must use print attached to service part (EEPROM or P.C.B. including EEPROM) or must use copy of print below as "Warning for Customers who use the DivX Video-on-Demand content."

Information needed without fail for the customer for whom it is used continuing DivX Video-on-Demand Service to "Manual for the customer" is recorded.

Appendix:

* Parts that memorize user's information are only EEPROM.
* The registration of Registration Code is possible for half a year up to 6 recorders up to 10 recorders a year. Replacement of EEPROM or P.C.B. including EEPROM spends one of this.

Registration Code is memorized in EEPROM (RFKFxxxxxx).
Model without VHS: Main P.C.B.
Model with VHS: Digital I/F P.C.B. (Power & DVD I/F/P.C.B.)
If exchange above P.C.B. or EEPROM, new registration Code differ from previous Registration Code will be generated.
In this case if your customer uses DivX Video-on-Demand service, he/she will no longer be able to play any content that he/she purchased under that same registration code.
Therefore your customer will need to obtain and register the new registration code.

*Copy this page and cut on the dotted line and give the lower half to your customer.

Warning for Customers who use the DivX Video-on-Demand content.

1. The registration code has been changed for the repair of the product or the product exchange.
2. Obtain and register a new registration code, otherwise you will no longer be able to play DivX Video-on-Demand content.
3. Follow the procedure on the DivX Video-on-Demand web site to register at
   http://vod.divx.com/
   * If you do not use the DivX Video-on-Demand content, please ignore this warning.

Note3:

Please prepare latest firmware updating disc.

* Main Firm is being recorded in HDD, but new HDD has no data.

Writing Procedure of Main Firm:

<<Caution>>

(1) Writing of Main Firm needs 3, 4 minutes.

(2) Never cut the power of DVD Recorder until writing in Firmware ends.

(3) Initial settings and contents of reservation will not change if writing is normally completed.

1. Prepare updating disc for firm ware.
2. Replace HDD.
3. Turn on power of DVD Recorder.
4. After [PLEASE WAIT] is displayed on FL., [HDD ERR] is displayed on FL.
5. Tray opens automatically.
6. Insert updating disc for Firmware and press OPEN/CLOSE key. (If a wrong disc was inserted, [NG DISK] [NO FVU] is displayed on FL.)
7. [LOAD] → [LD FVU] ←→ [M_FIRM] are displayed on FL alternately.
8. [MAIN] ←→ [UPD OK] blink alternately and Tray opens. Take out disc (Writing was finished).
9. Press Power button to turn off power.
10. Press Power button to turn on power.
11. [HELLO] → [SELF CHECK] are displayed on FL.
12. [UNFORMAT] is displayed on FL.
13. After [UNFORMAT] was displayed, message to request FORMAT is displayed on TV screen.
14. Select [Yes] and press [ENTER] key to format HDD.

(After FORMAT, program in HDD will be lost, but Main firm will not be lost.

“Write of the main farm" is completed above.

* Drive firm is not updated by above operation. If you wish update Drive firm, please prepare the disc for latest firmware update, and write it again.

* If the version of the firm you have prepared was same as or later than that has already been written in deck, ´UNSUPPORT´ is displayed on FL.

* In a usual updating of firmware, writing is not performed when the timer reservation standby was not released.

10.2.2. Notice after replacing RAM/Digital P.C.B. Module

Formatting the HDD is unnecessary after After replacing RAM/Digital P.C.B. Module,

“TM AV1” is displayed on FL, once power off, and start-up again.

10.3. Standard Inspection Specifications after Making Repairs

After making repairs, we recommend performing the following inspection, to check normal operation.

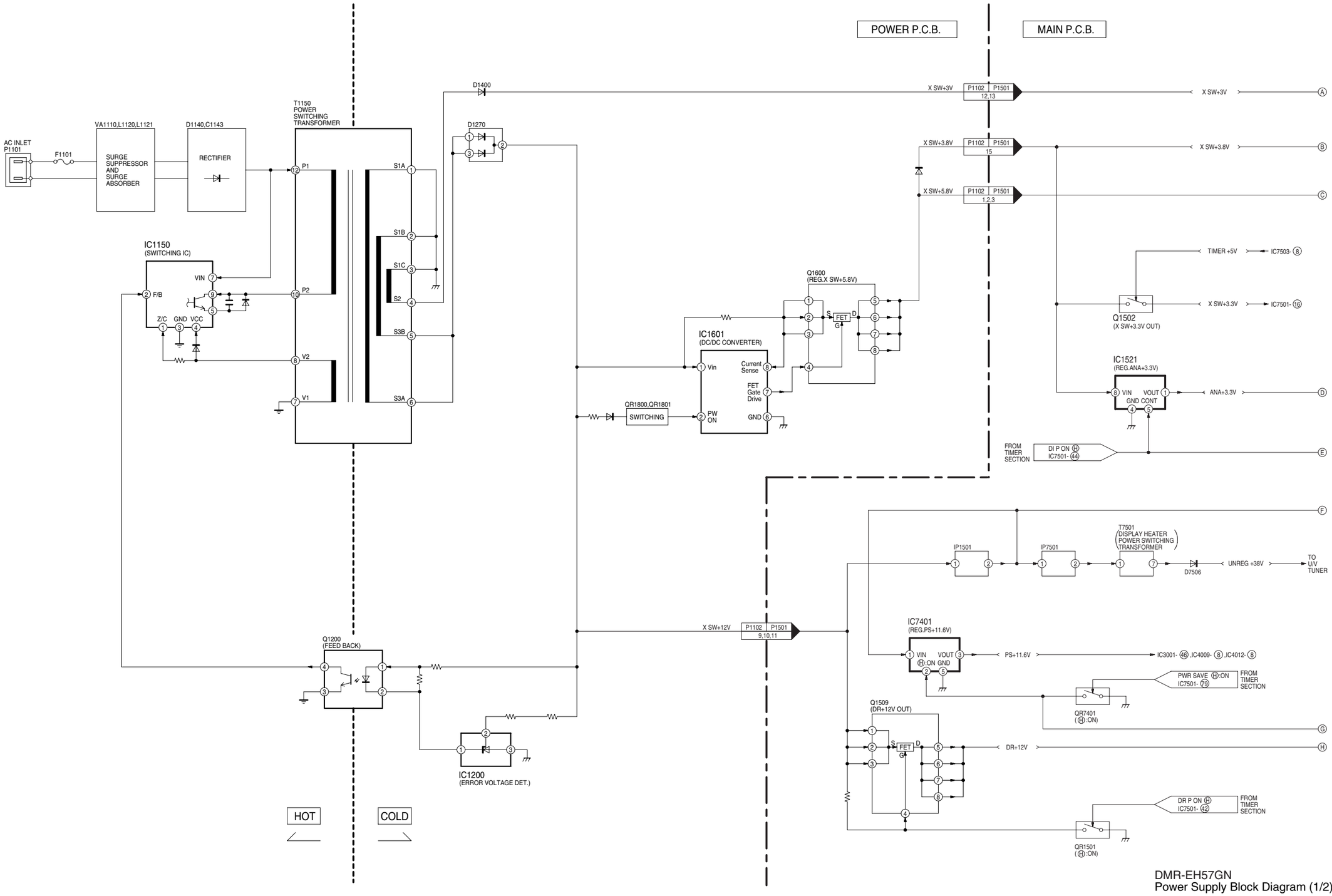
No.	Procedure	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.
2	Insert RAM disc.	The Panasonic RAM disc should be recognized.
3	Enter the EE (TU IN / AV IN - AV OUT) mode.	No abnormality should be seen in the picture, sound or operation.
4	Perform auto recording and playback for one minute using the RAM disc.	No abnormality should be seen in the picture, sound or operation. *Panasonic DVD-RAM disc should be used when recording and playback.
5	Model with the HDD: Perform auto recording and playback for one minute using the HDD.	No abnormality should be seen in the picture, sound or operation.
6	If a problem is caused by a VCD, DVD-R, DVD-Video, Audio-CD, or MP3, playback the test disc.	No abnormality should be seen in the picture, sound or operation.
7	Models with SD Card Slot or DV Input Jack: In case of that the trouble is caused by SD card and/or DV terminal.	Models with SD Card or DV Input Jack; 1) SD Card: Check to be able to display and copy the picture. 2) DV terminal: Check to be able to record from DVC.
8	After checking and making repairs, upgrade the firmware to the latest version.	Make sure that [FIRM_SUCCESS] appears in the FL displays. *[UNSUPPORT] display means the unit is already updated to newest same version. Then version up is not necessary.
9	Transfer [9][9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).	Make sure that [CLR] appears in the FL display. After checking it, turn the power off.

Use the following checklist to establish the judgement criteria for the picture and sound.

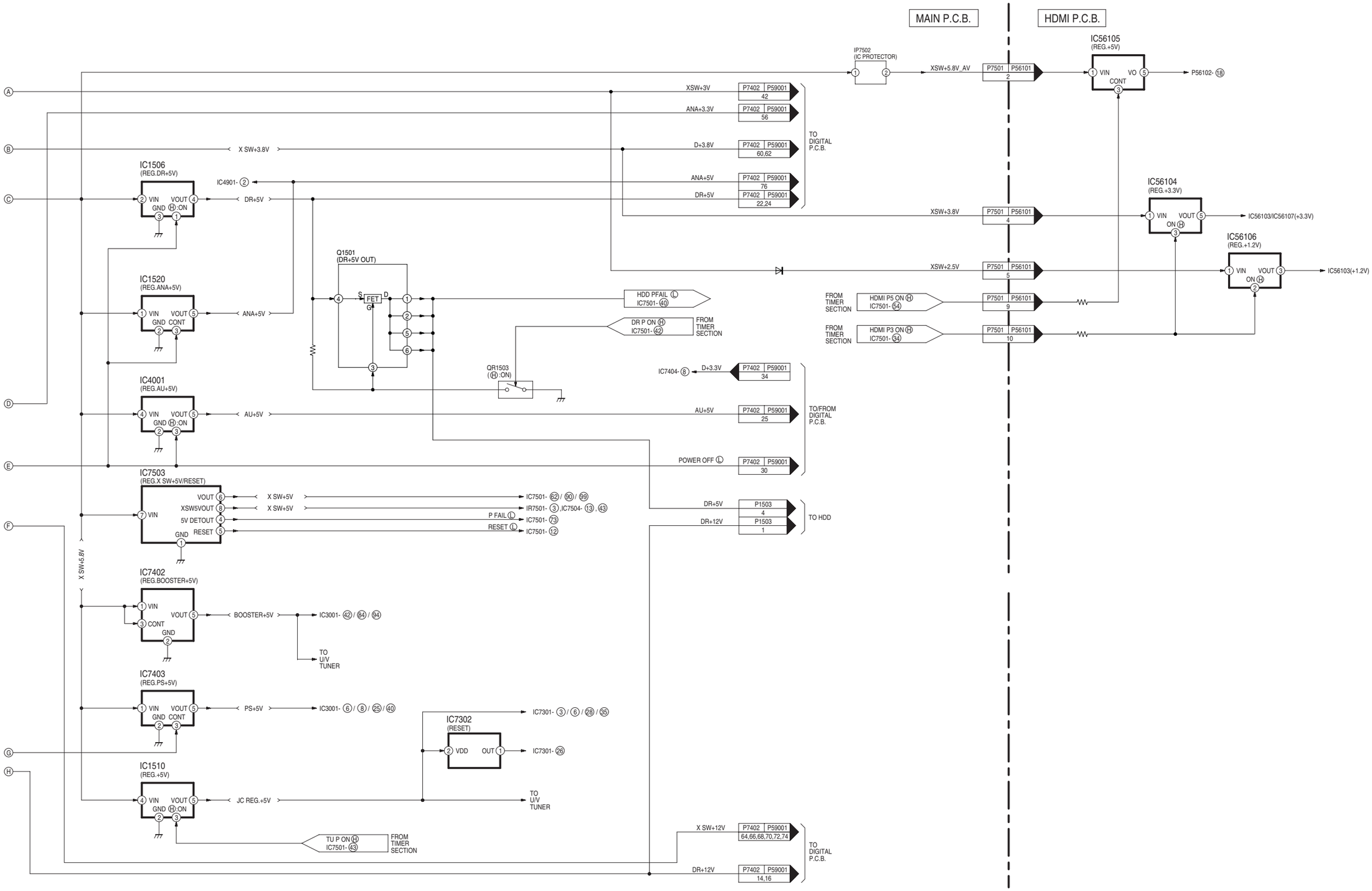
Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering color				
	Color fading				

11 Block Diagram

11.1. Power Supply Block Diagram

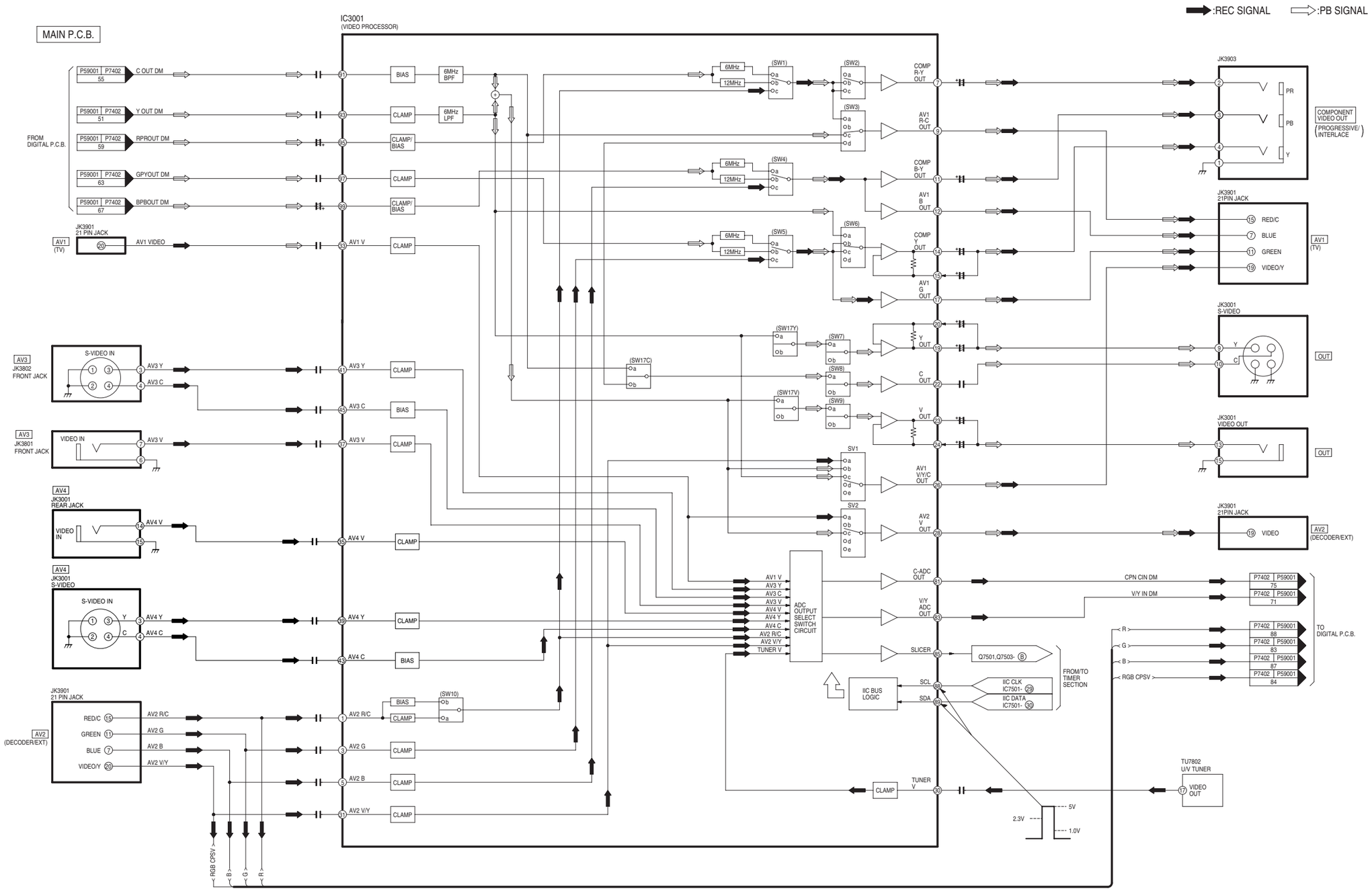


DMR-EH57GN
Power Supply Block Diagram (1/2)



DMR-EH57GN
Power Supply Block Diagram (2/2)

11.2. Analog Video Block Diagram

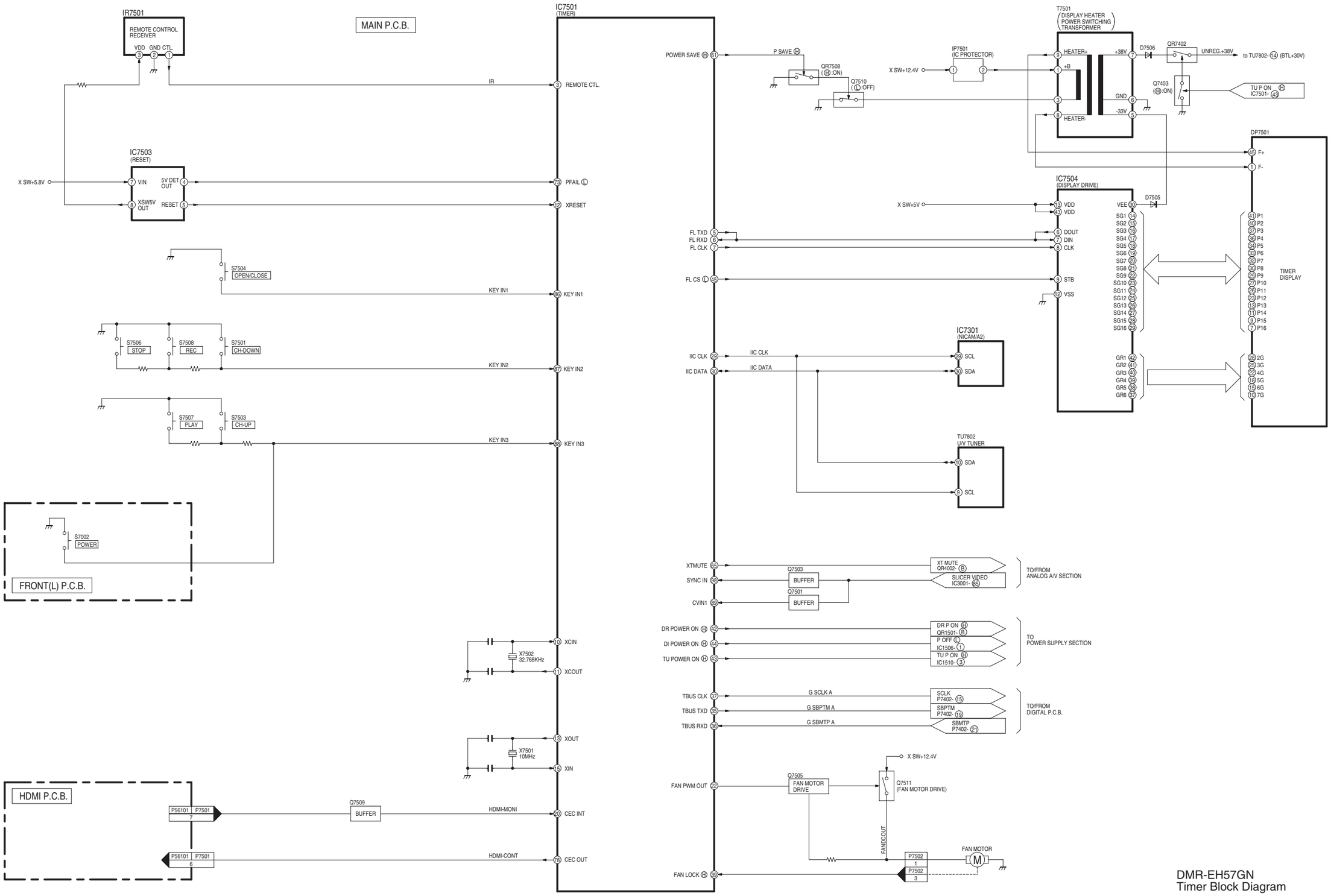


DMR-EH57GN
Analog Video Block Diagram

11.3. Analog Audio Block Diagram

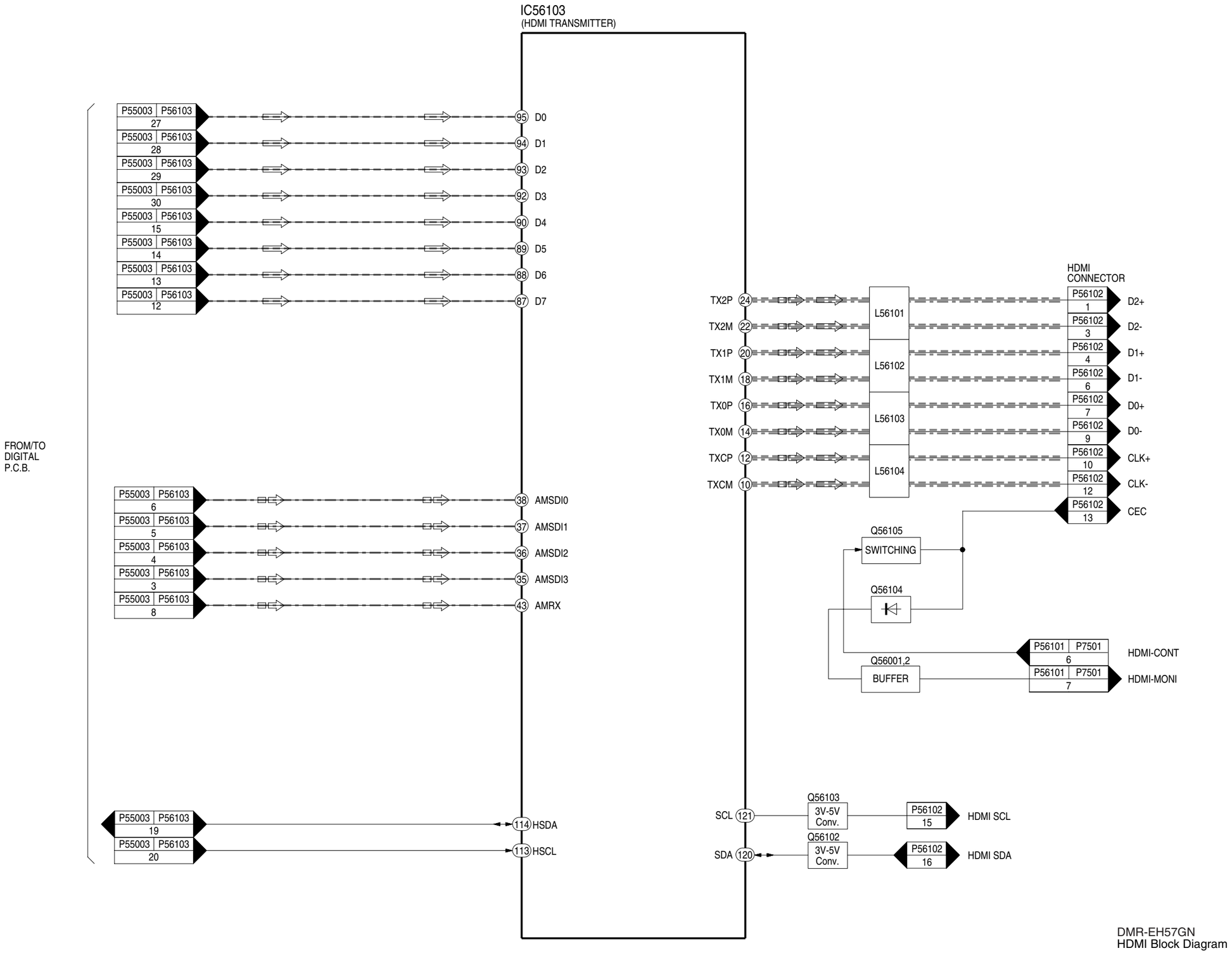
DMR-EH57GN
Analog Audio Block Diagram

11.4. Analog Timer Block Diagram



DMR-EH57GN
Timer Block Diagram

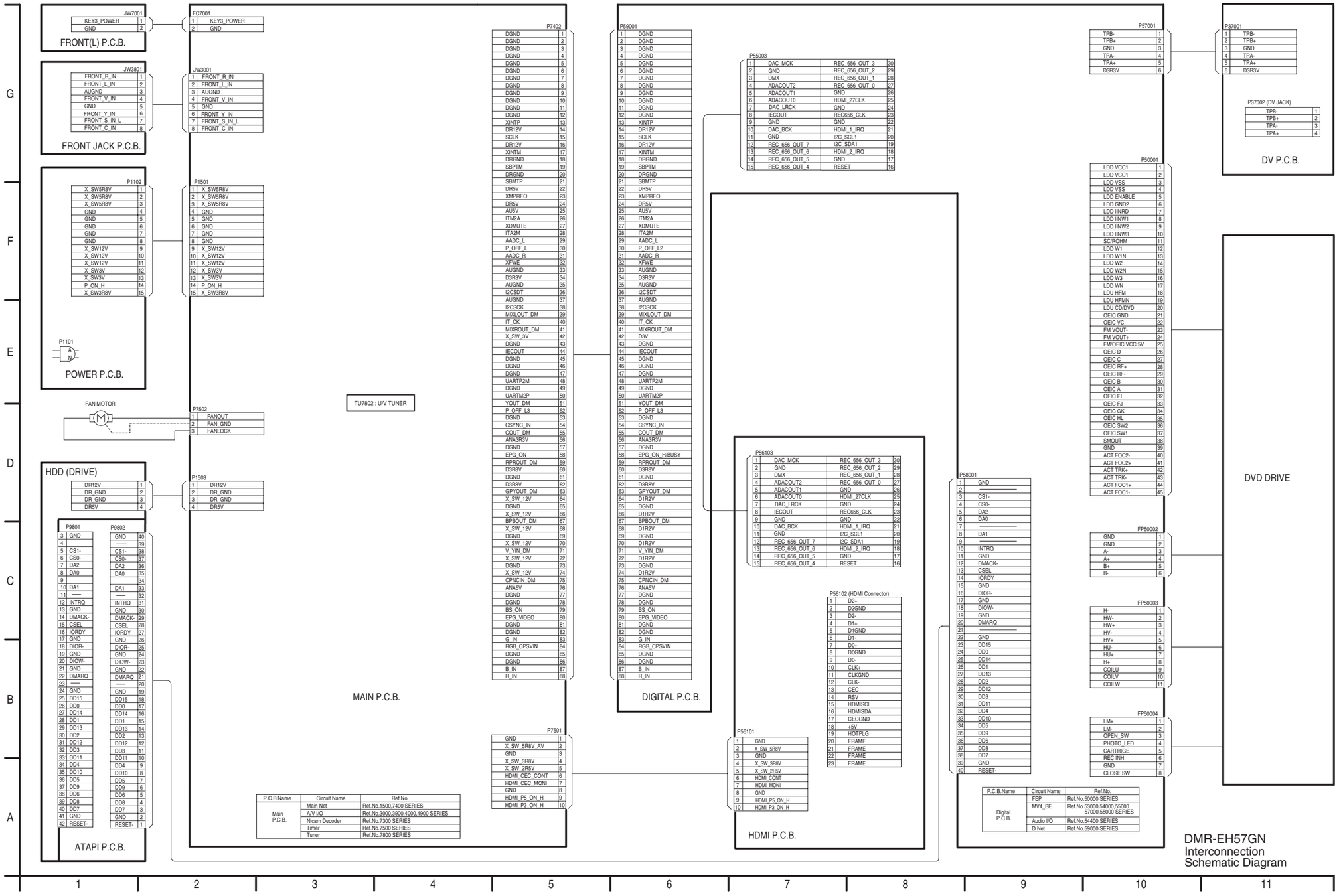
11.5. HDMI Block Diagram



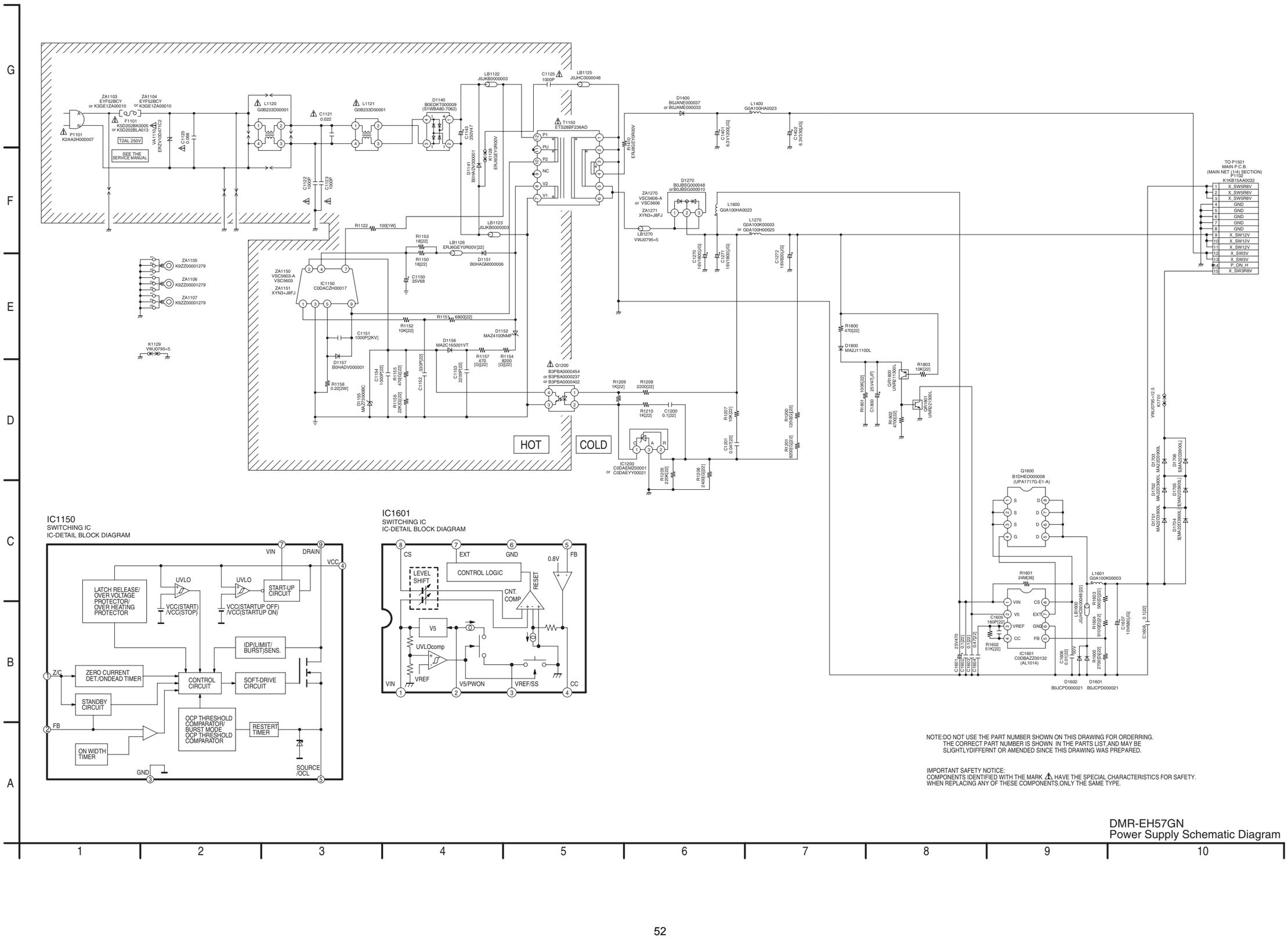
DMR-EH57GN
HDMI Block Diagram

12 Schematic Diagram

12.1. Interconnection Schematic Diagram



12.2. Power Supply Schematic Diagram



IC1150
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM

IC1601
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
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IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.

DMR-EH57GN
Power Supply Schematic Diagram

12.3. Main Net (1/4) Section (Main P.C.B. (1/4)) Schematic Diagram (M)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
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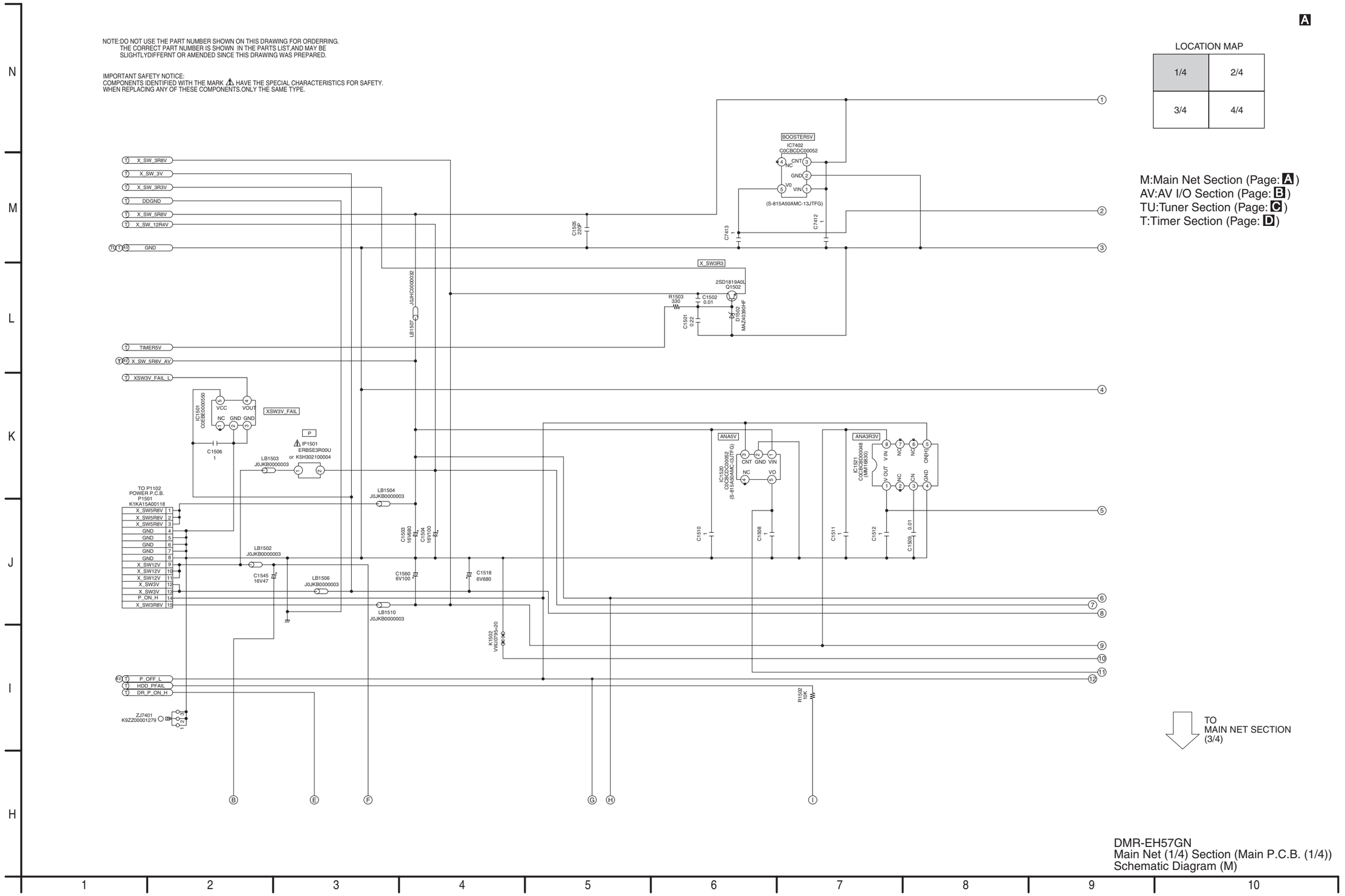
WHEN REPLACING ANY OF THESE COMPONENTS,ONLY THE SAME TYPE.

A

LOCATION MAP

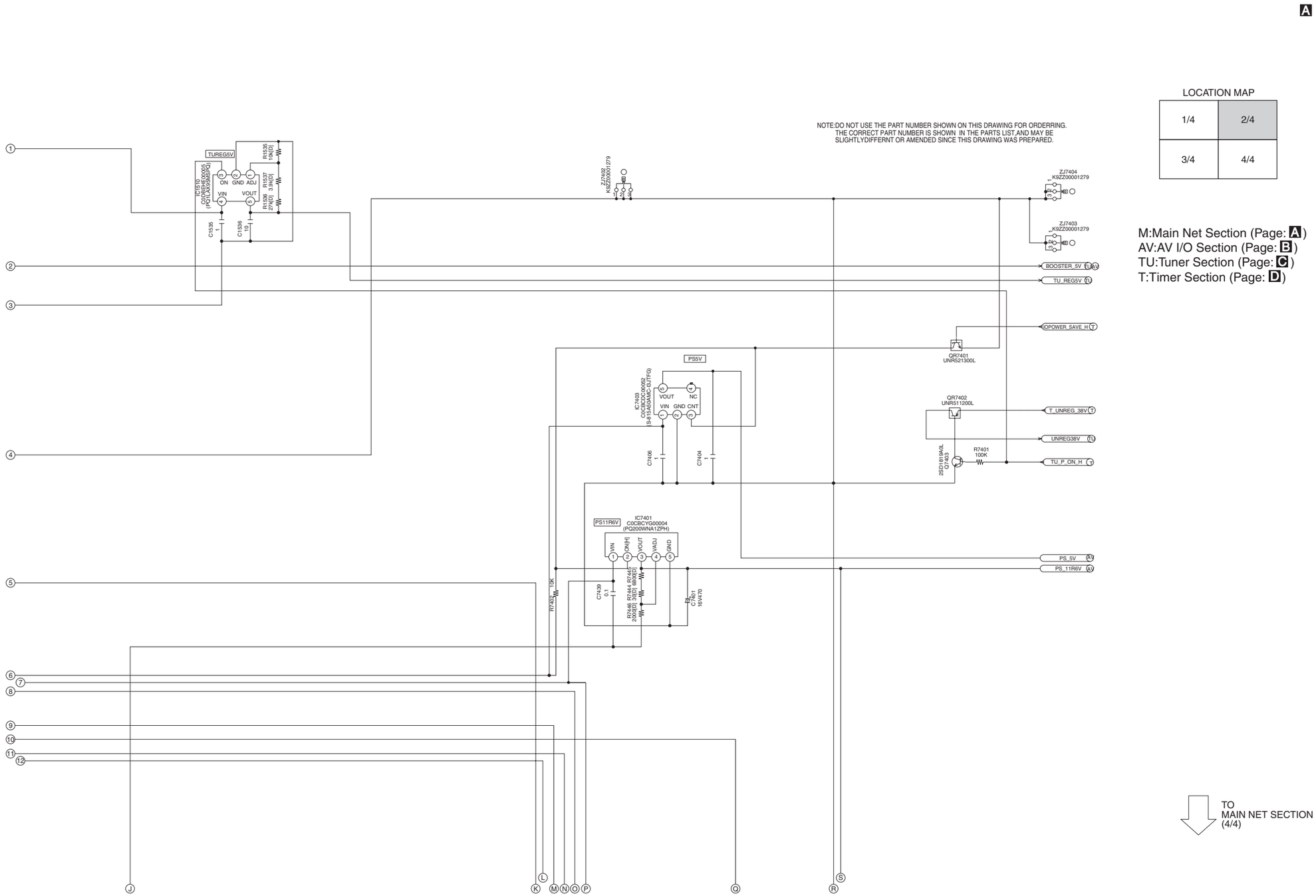
1/4	2/4
3/4	4/4

M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)



DMR-EH57GN
Main Net (1/4) Section (Main P.C.B. (1/4))
Schematic Diagram (M)

12.4. Main Net (2/4) Section (Main P.C.B. (1/4)) Schematic Diagram (M)



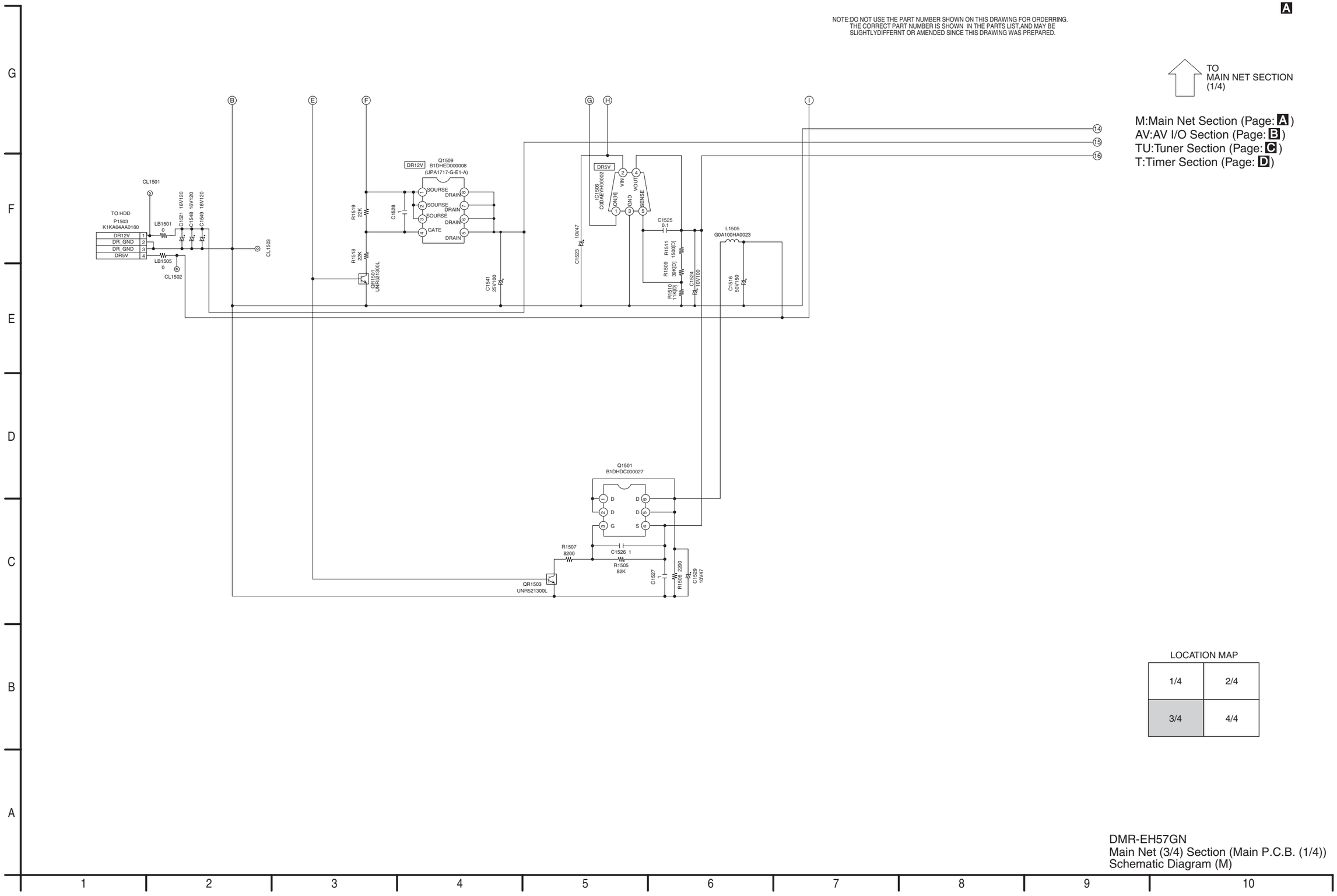
LOCATION MAP

1/4	2/4
3/4	4/4

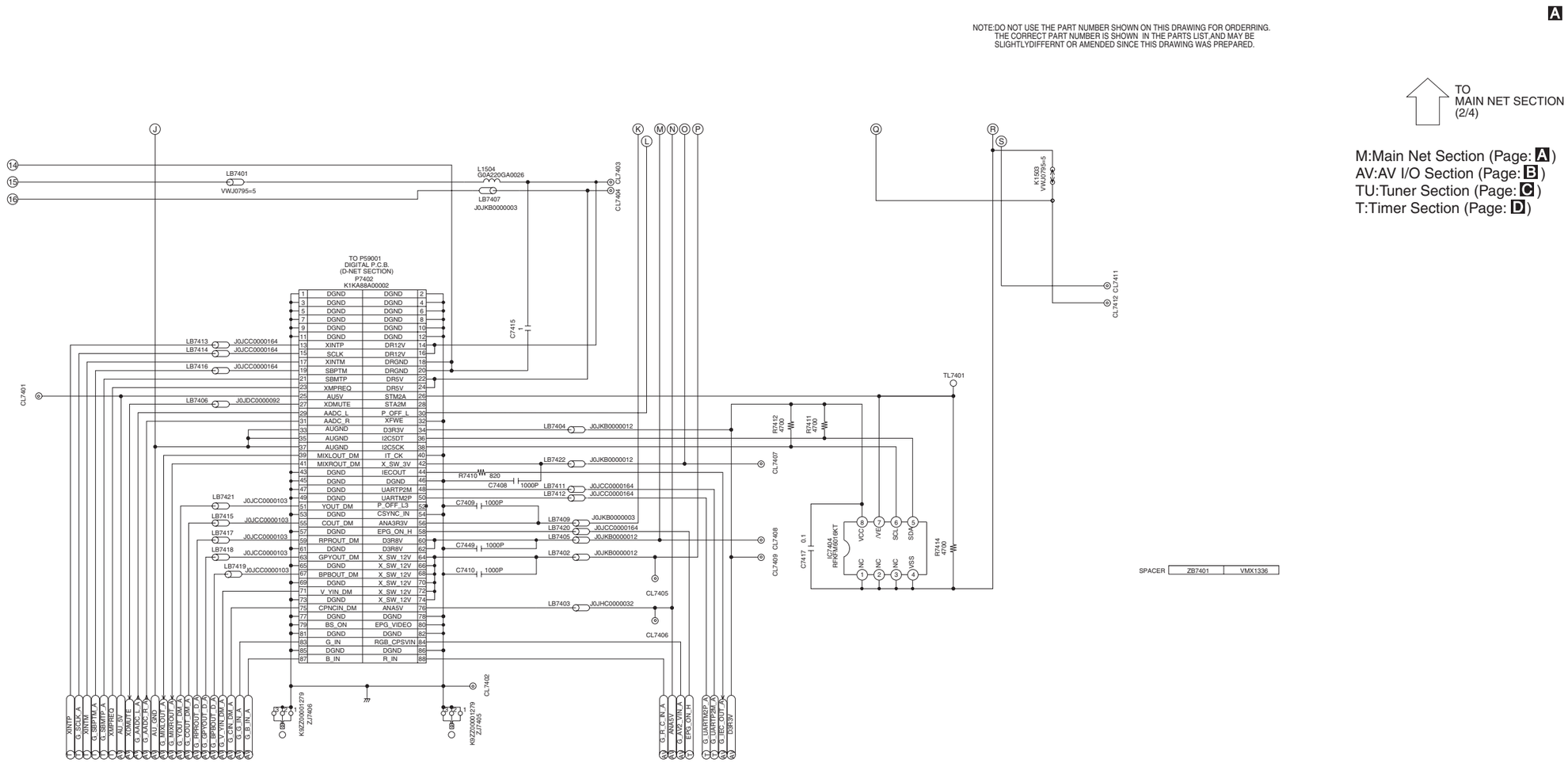
M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)

DMR-EH57GN
Main Net (2/4) Section (Main P.C.B. (1/4))
Schematic Diagram (M)

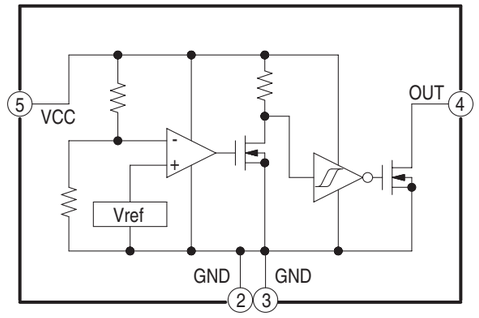
12.5. Main Net (3/4) Section (Main P.C.B. (1/4)) Schematic Diagram (M)



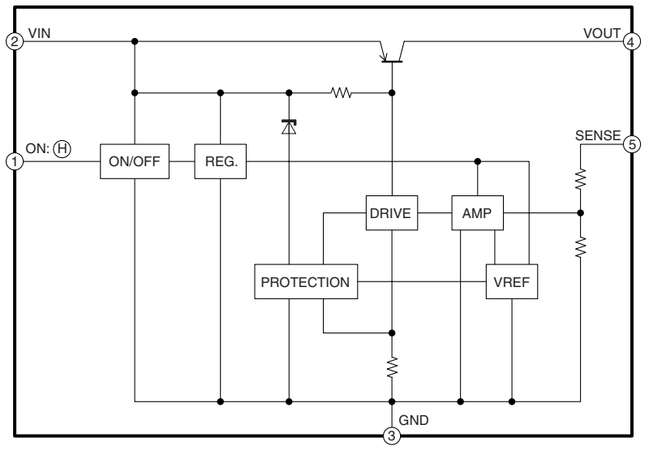
12.6. Main Net (4/4) Section (Main P.C.B. (1/4)) Schematic Diagram (M)



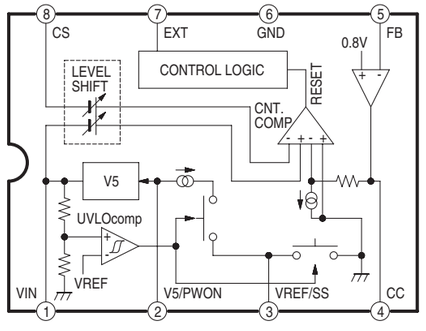
IC1501
RESET
IC-DETAIL BLOCK DIAGRAM



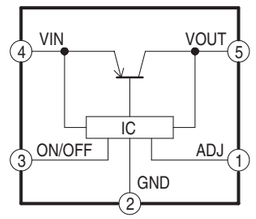
IC1506
DR +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



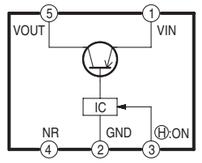
IC1508
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM



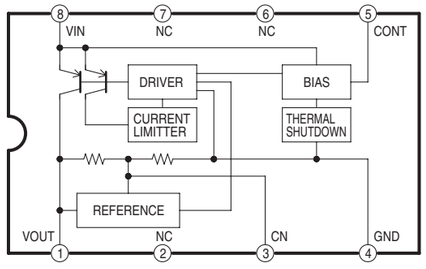
IC1510
TU +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



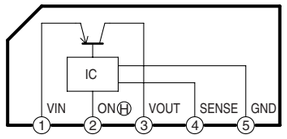
IC1520
ANA +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



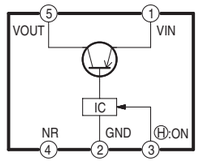
IC1521
ANA +3.3V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC7401
PS +11.6V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC7402,IC7403
BOOSTER +5V SWITCHING REGULATOR,
PS +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC1501 Detail Block Diagram
IC1506 Detail Block Diagram
IC1508 Detail Block Diagram
IC1510 Detail Block Diagram
IC1520 Detail Block Diagram
IC1521 Detail Block Diagram
IC7401 Detail Block Diagram
IC7402 Detail Block Diagram
IC7403 Detail Block Diagram
DMR-EH57GN IC-Detail Block Diagram

12.7. AV I/O (1/4) Section (Main P.C.B. (2/4)) Schematic Diagram (AV)

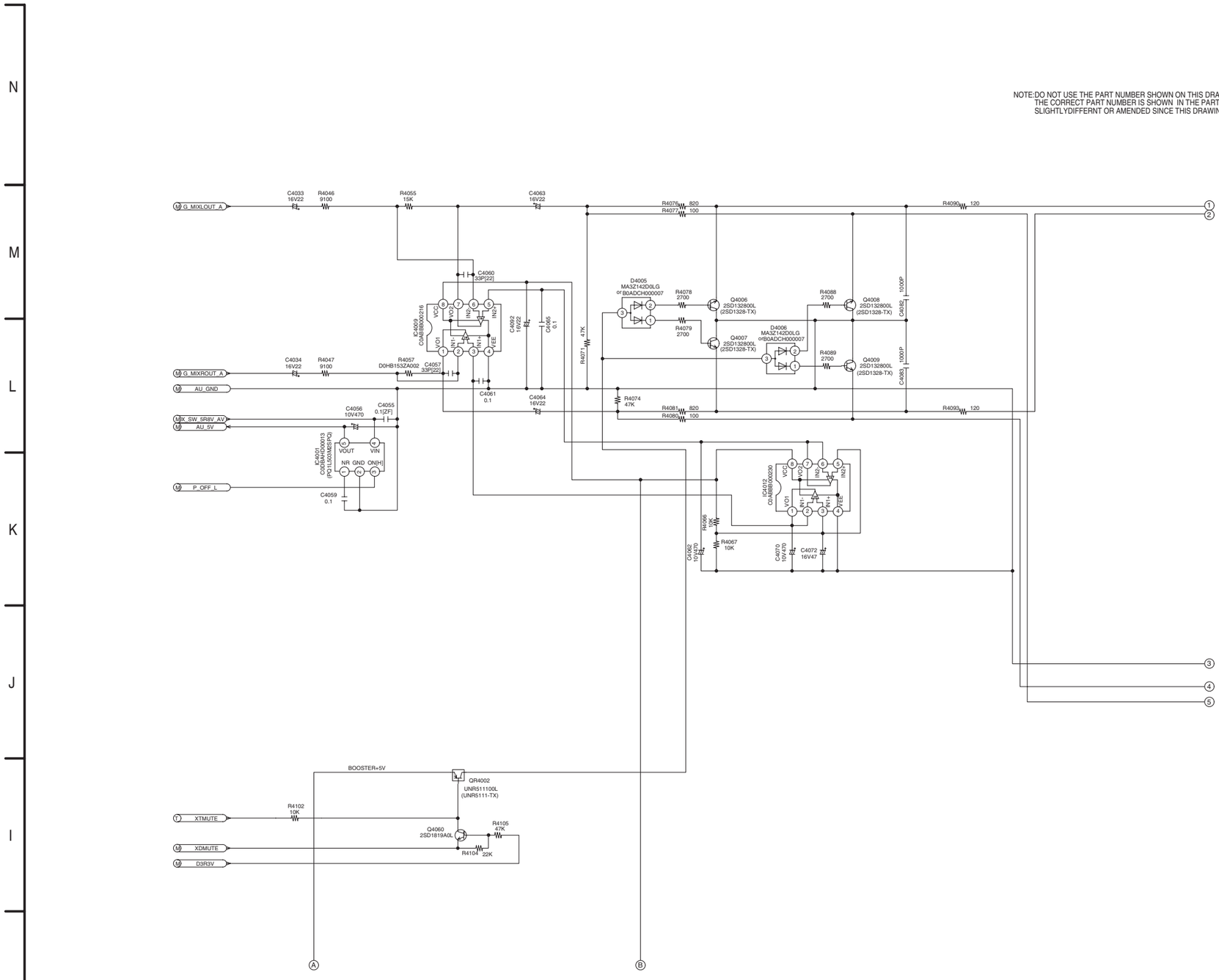
B

LOCATION MAP

1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)



DMR-EH57GN
AV I/O (1/4) Section (Main P.C.B. (2/4))
Schematic Diagram (AV)

12.8. AV I/O (2/4) Section (Main P.C.B. (2/4)) Schematic Diagram (AV)

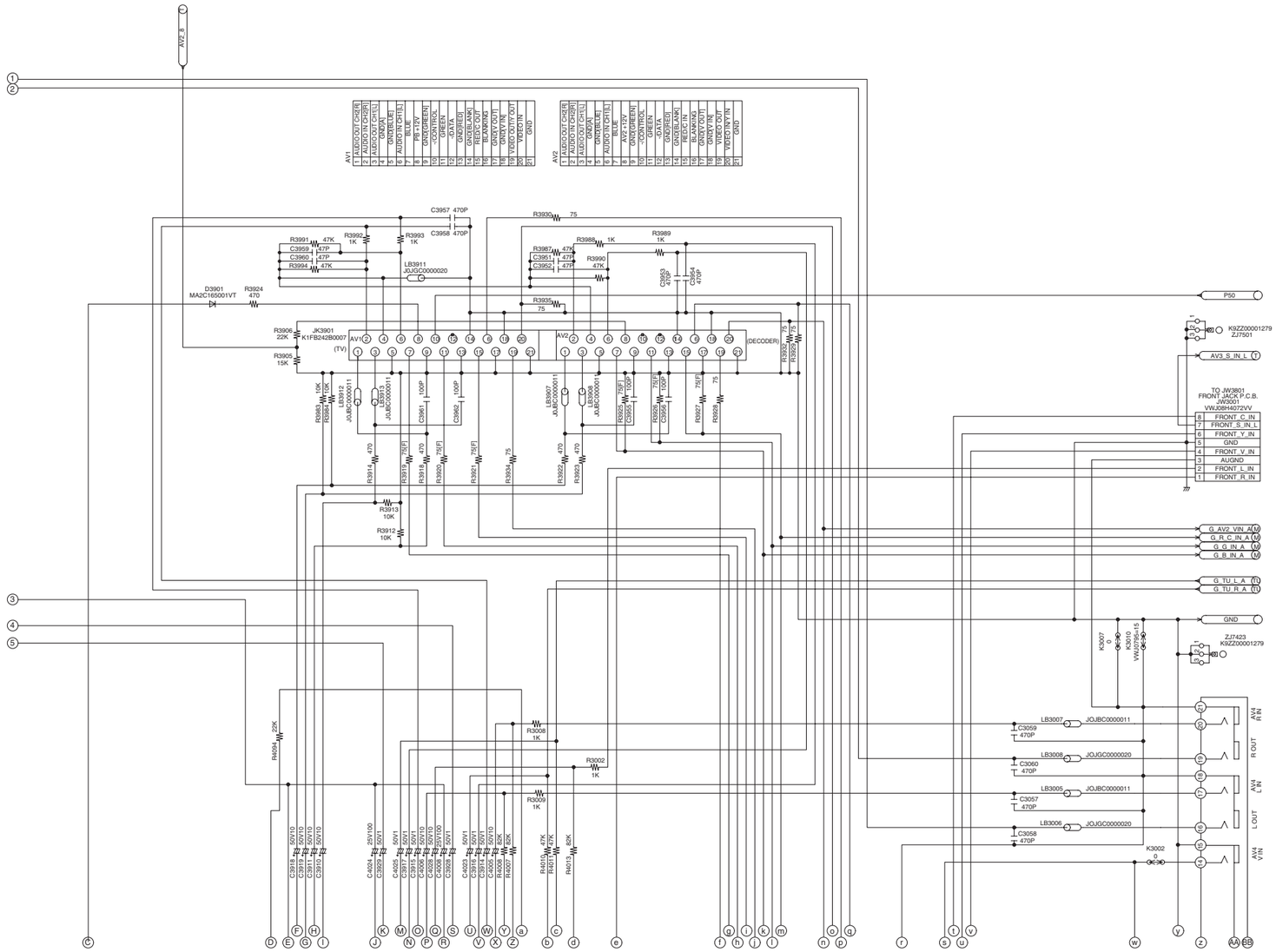
B

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

LOCATION MAP

1/4	2/4
3/4	4/4

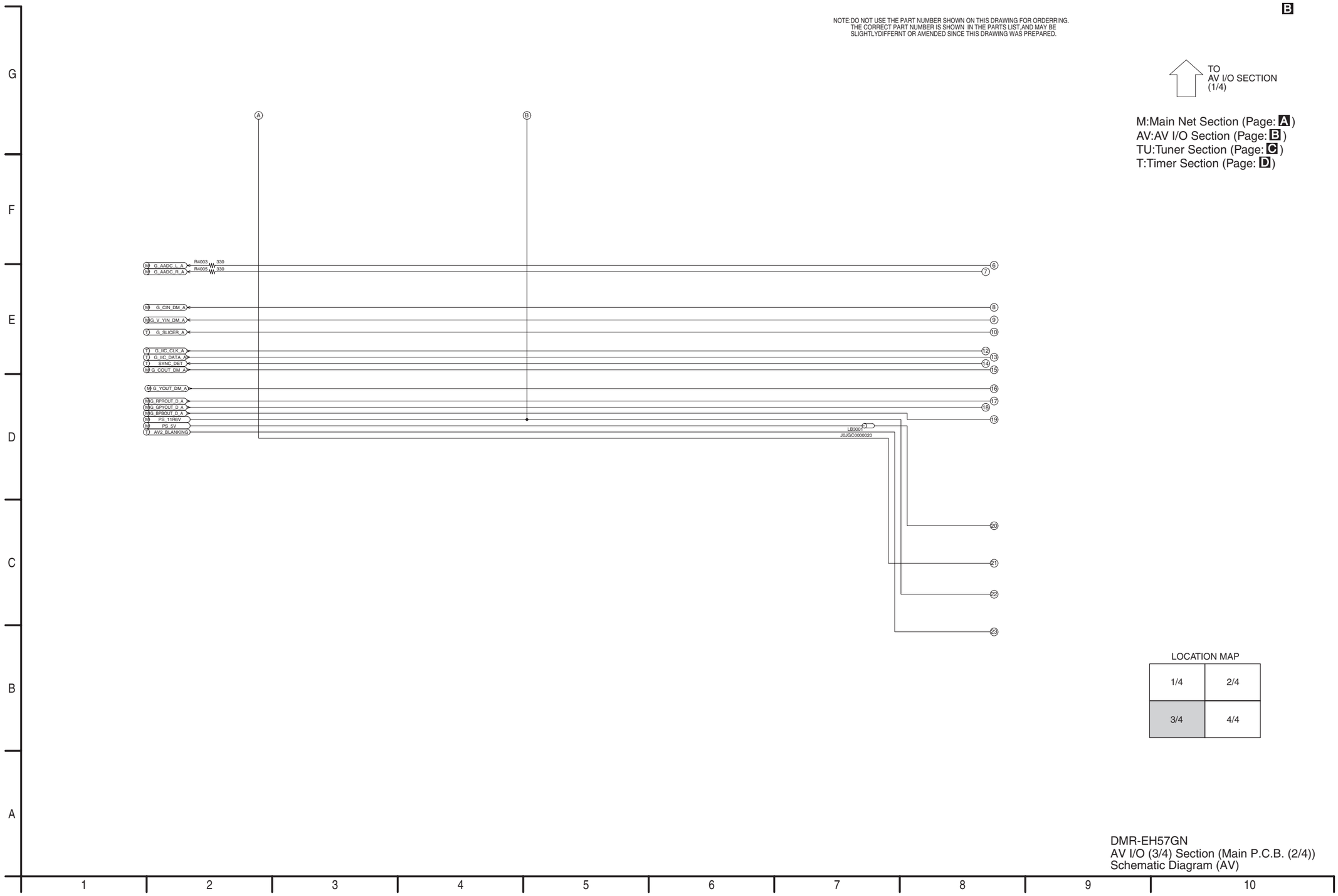
M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)



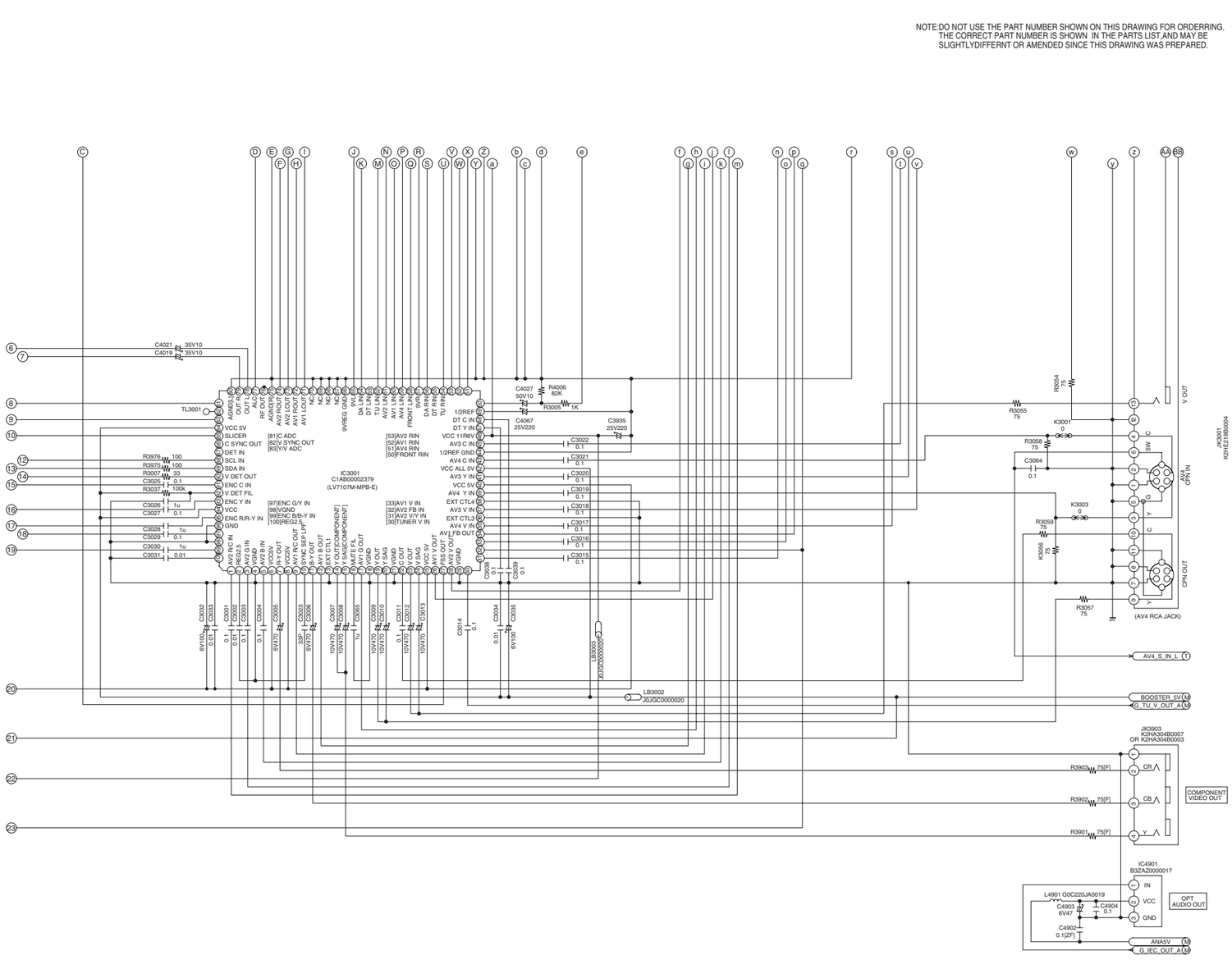
DMR-EH57GN
AV I/O (2/4) Section (Main P.C.B. (2/4))
Schematic Diagram (AV)

11 12 13 14 15 16 17 18 19 20

12.9. AV I/O (3/4) Section (Main P.C.B. (2/4)) Schematic Diagram (AV)

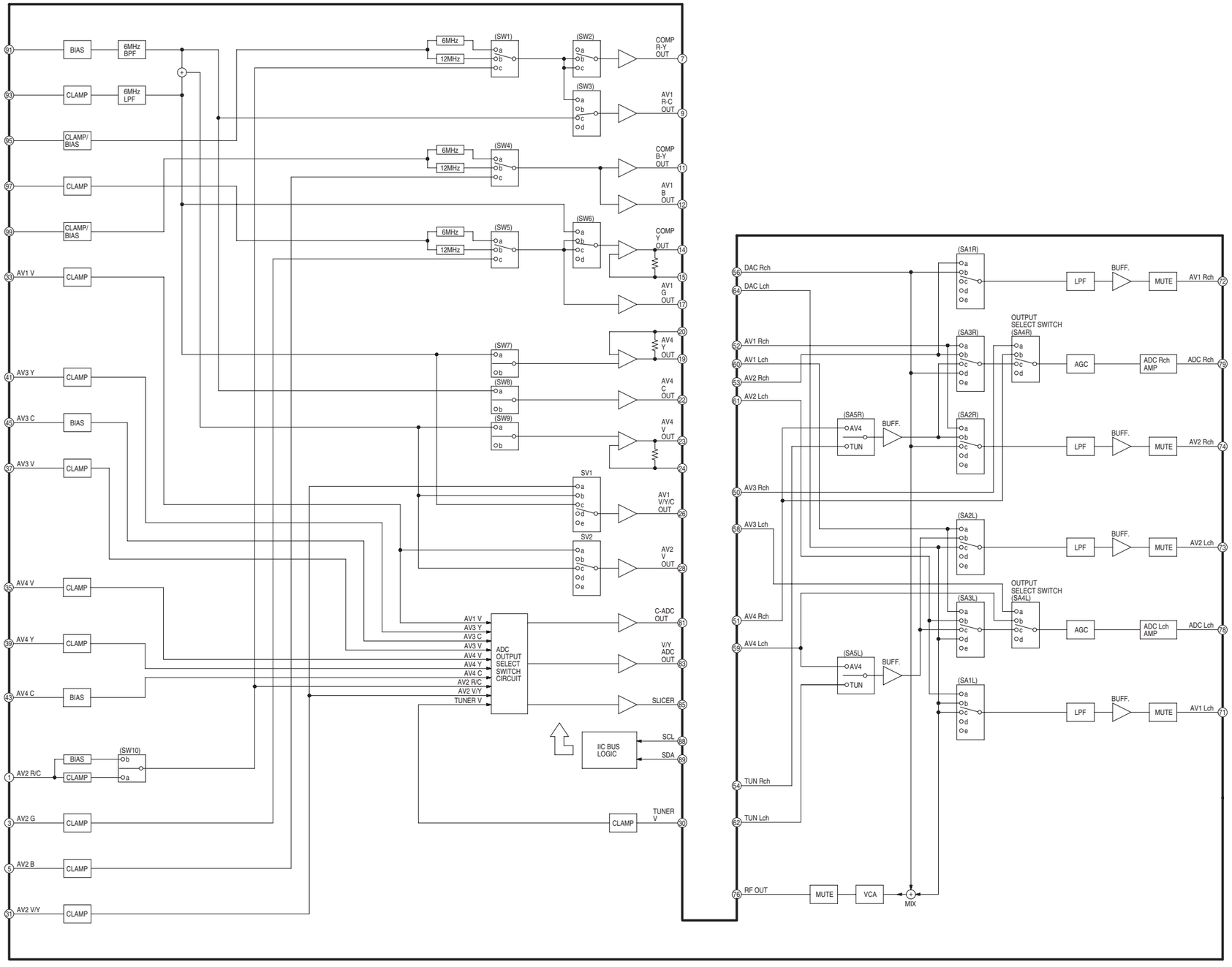


12.10. AV I/O (4/4) Section (Main P.C.B. (2/4)) Schematic Diagram (AV)

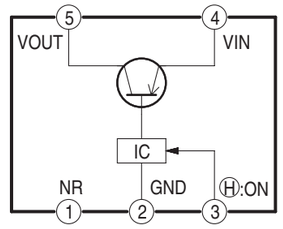


DMR-EH57GN
AV I/O (4/4) Section (Main P.C.B. (2/4))
Schematic Diagram (AV)

IC3001
VIDEO/AUDIO PROCESSOR
IC-DETAIL BLOCK DIAGRAM

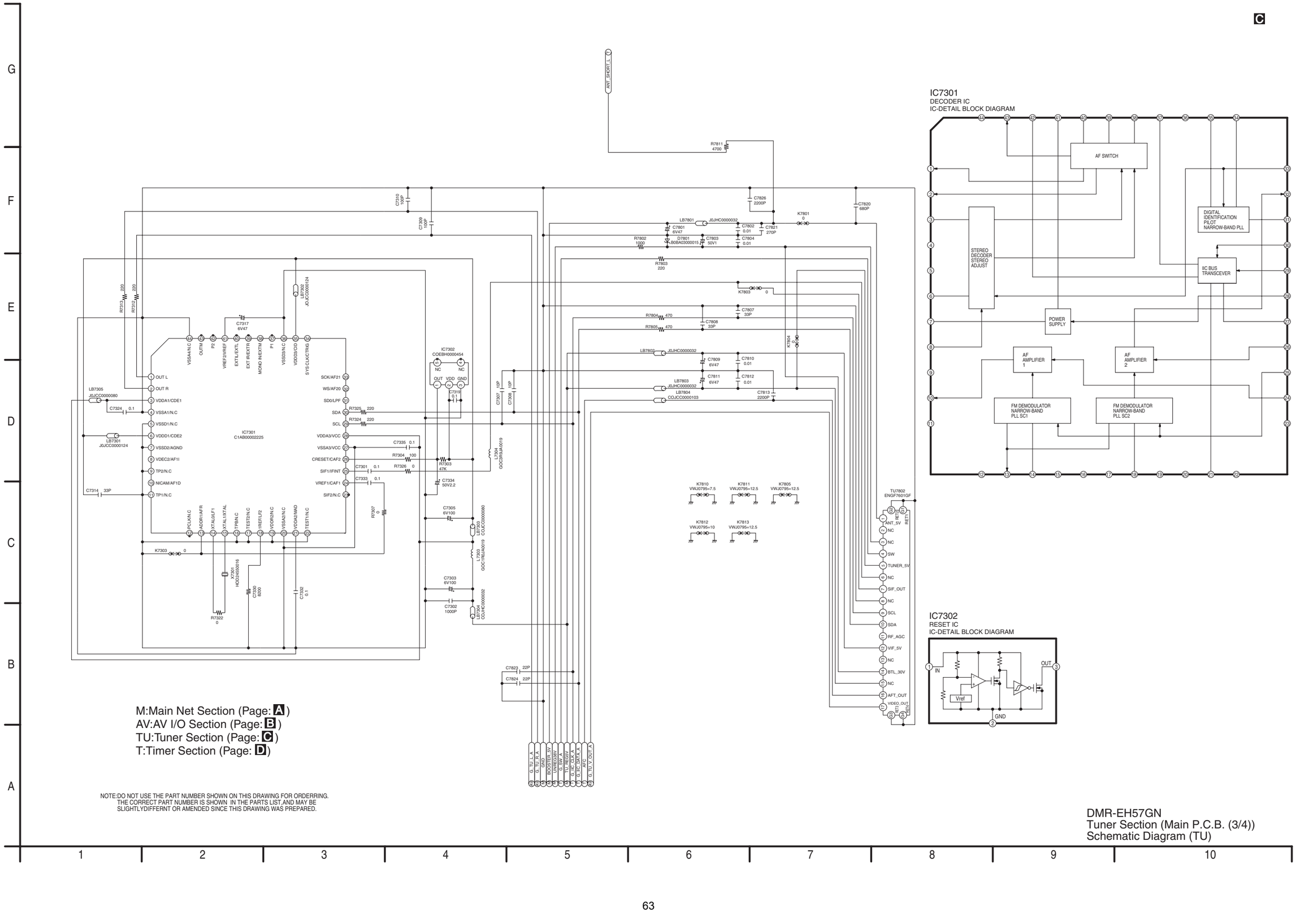


IC4001
AU +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC3001 Detail Block Diagram
IC4001 Detail Block Diagram
DMR-EH57GN IC-Detail Block Diagram

12.11. Tuner Section (Main P.C.B. (3/4)) Schematic Diagram (TU)



12.12. Timer (1/4) Section (Main P.C.B. (4/4)) Schematic Diagram (T)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
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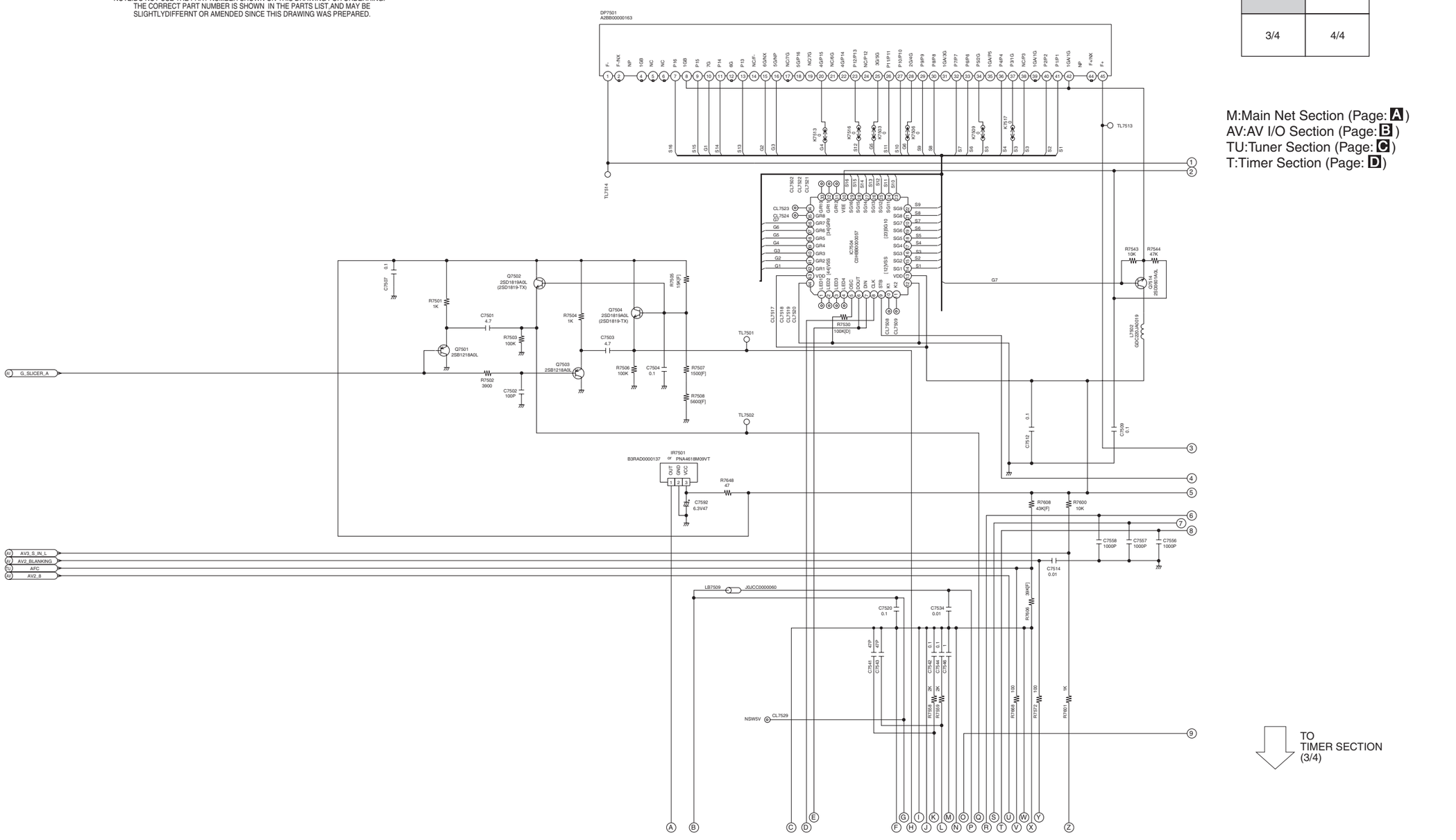
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

LOCATION MAP

1/4	2/4
3/4	4/4

M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)



DMR-EH57GN
Timer (1/4) Section (Main P.C.B. (4/4))
Schematic Diagram (T)

12.13. Timer (2/4) Section (Main P.C.B. (4/4)) Schematic Diagram (T)

D

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
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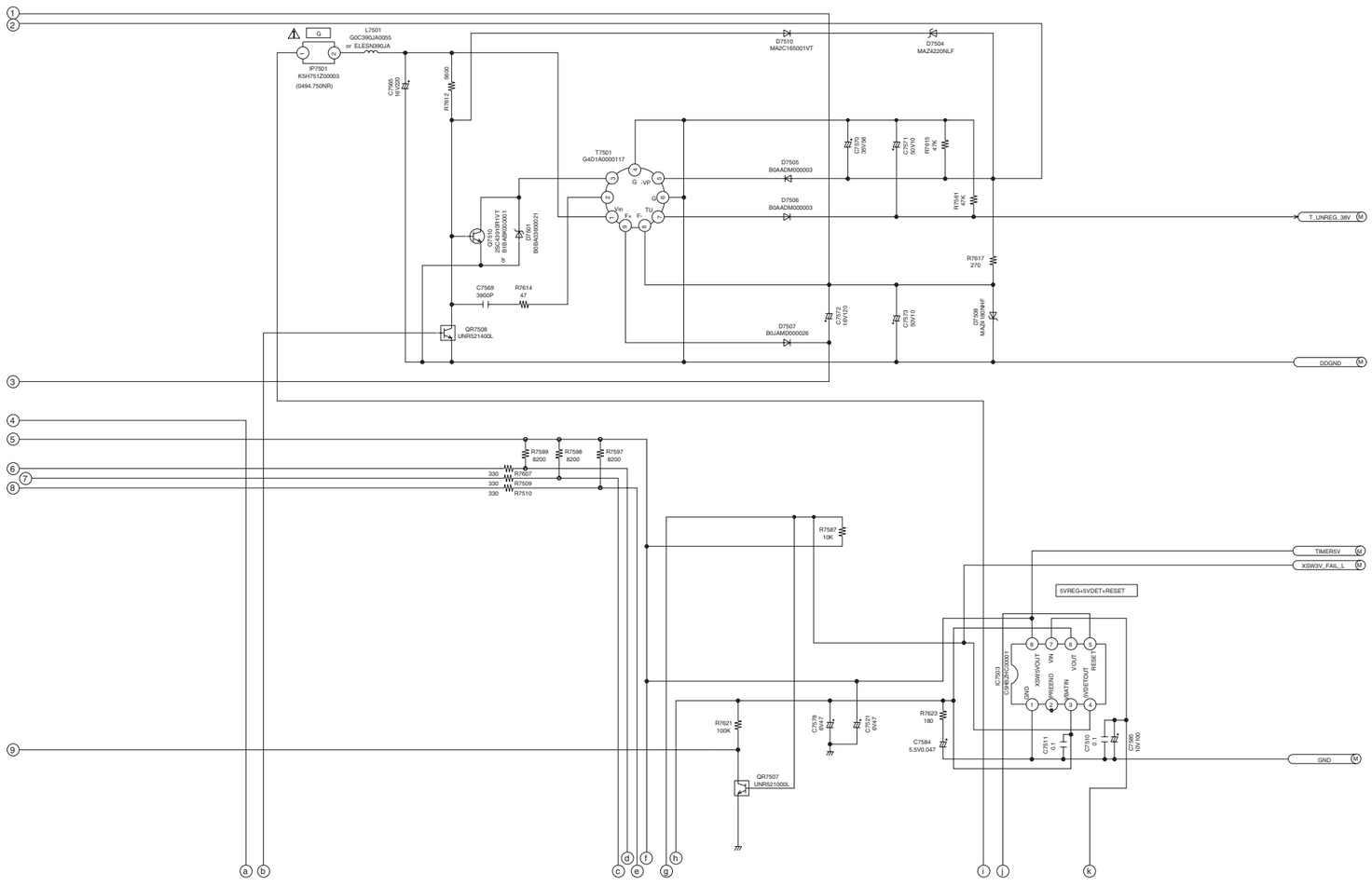
LOCATION MAP

1/4	2/4
3/4	4/4

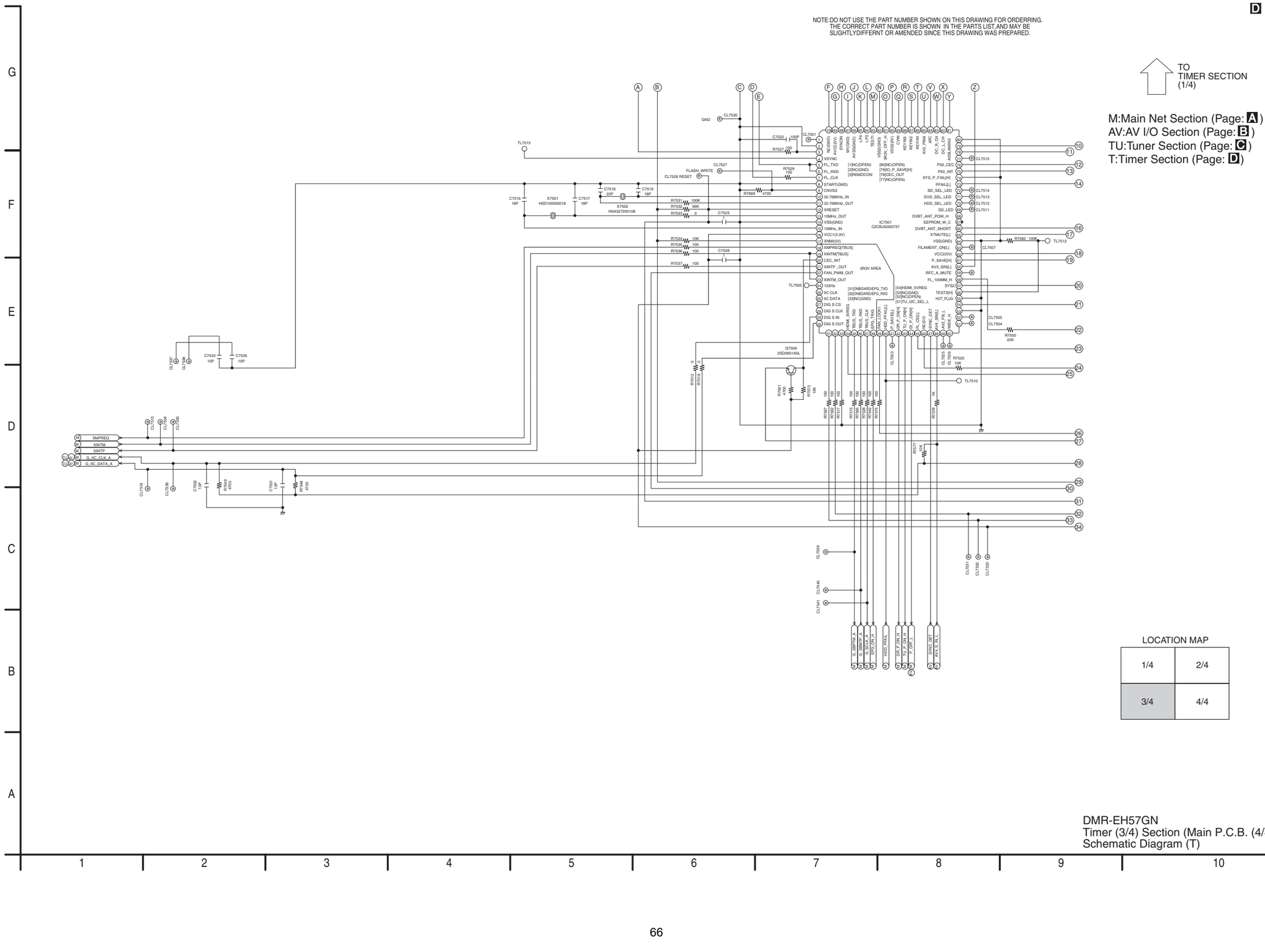
M:Main Net Section (Page: A)
AV:AV I/O Section (Page: B)
TU:Tuner Section (Page: C)
T:Timer Section (Page: D)



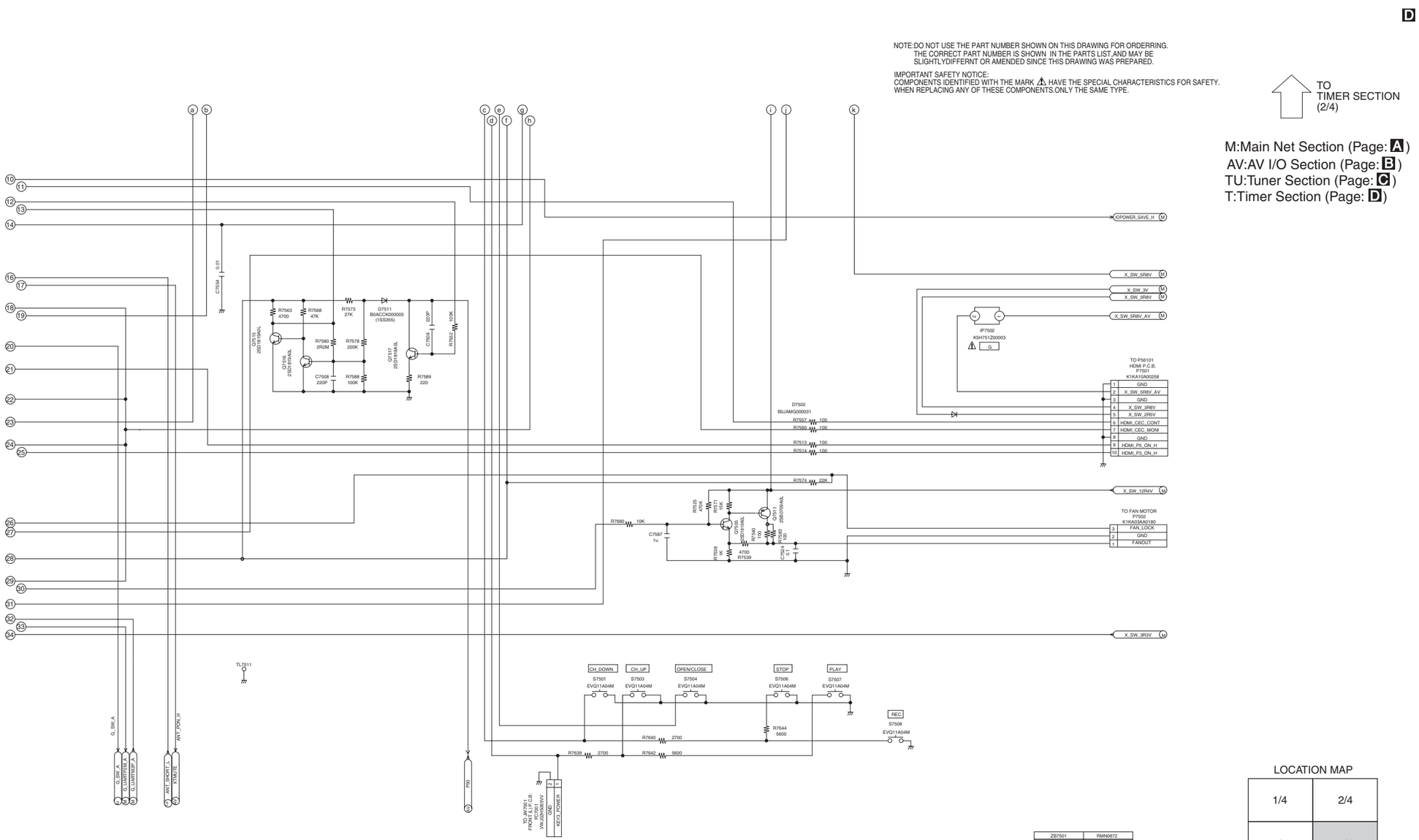
DMR-EH57GN
Timer (2/4) Section (Main P.C.B. (4/4))
Schematic Diagram (T)

11 12 13 14 15 16 17 18 19 20

12.14. Timer (3/4) Section (Main P.C.B. (4/4)) Schematic Diagram (T)



12.15. Timer (4/4) Section (Main P.C.B. (4/4)) Schematic Diagram (T)

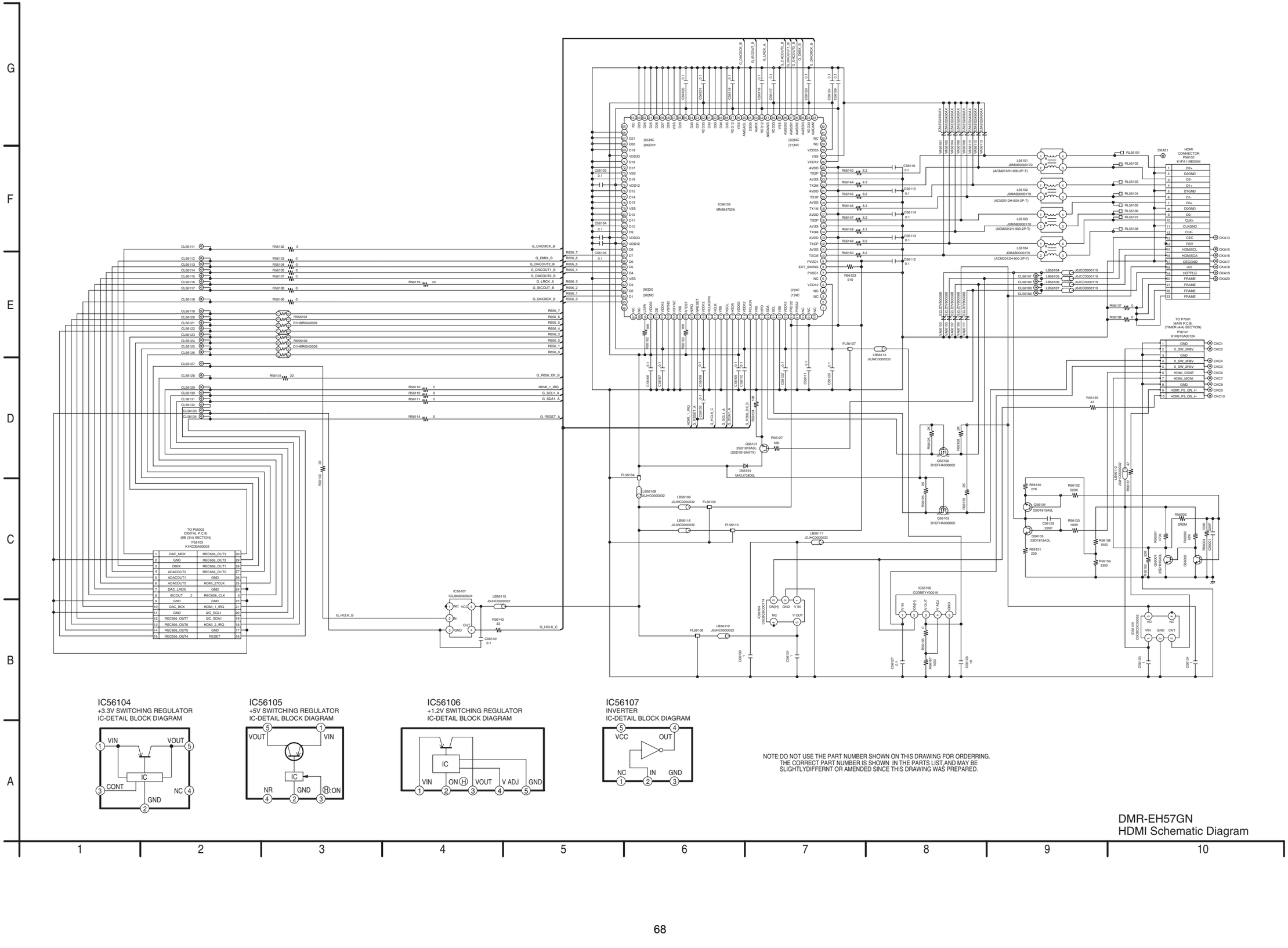


LOCATION MAP

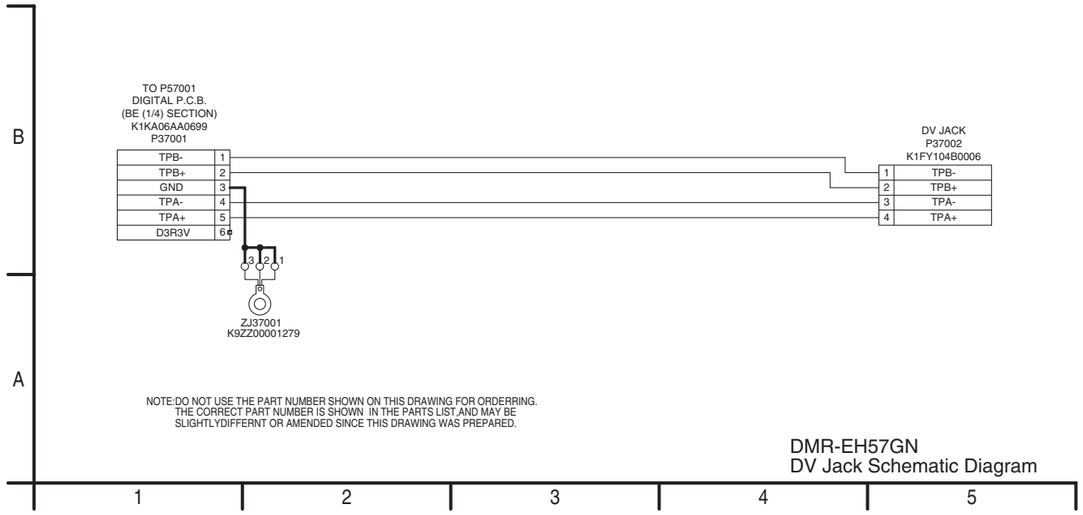
1/4	2/4
3/4	4/4

DMR-EH57GN
Timer (4/4) Section (Main P.C.B. (4/4))
Schematic Diagram (T)

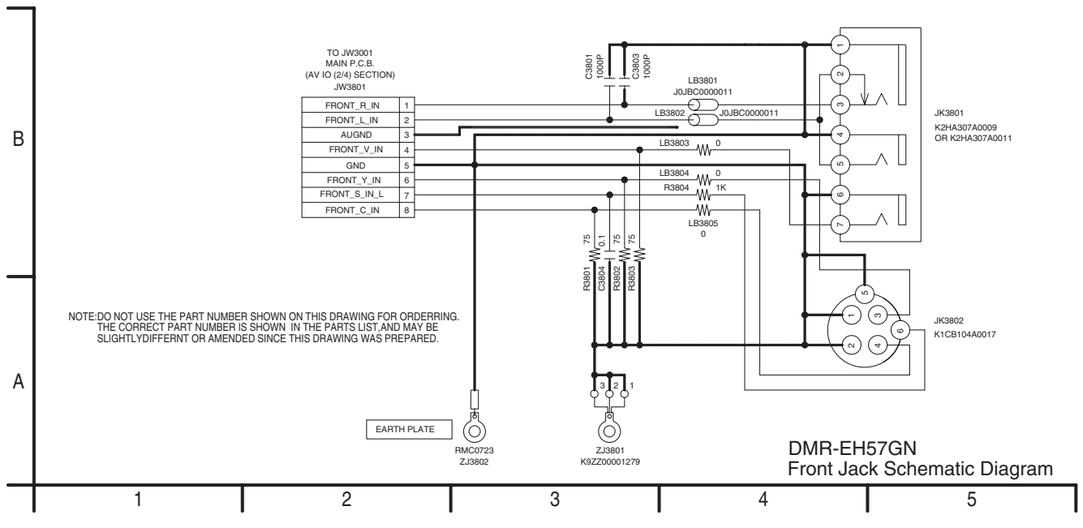
12.16. HDMI Schematic Diagram



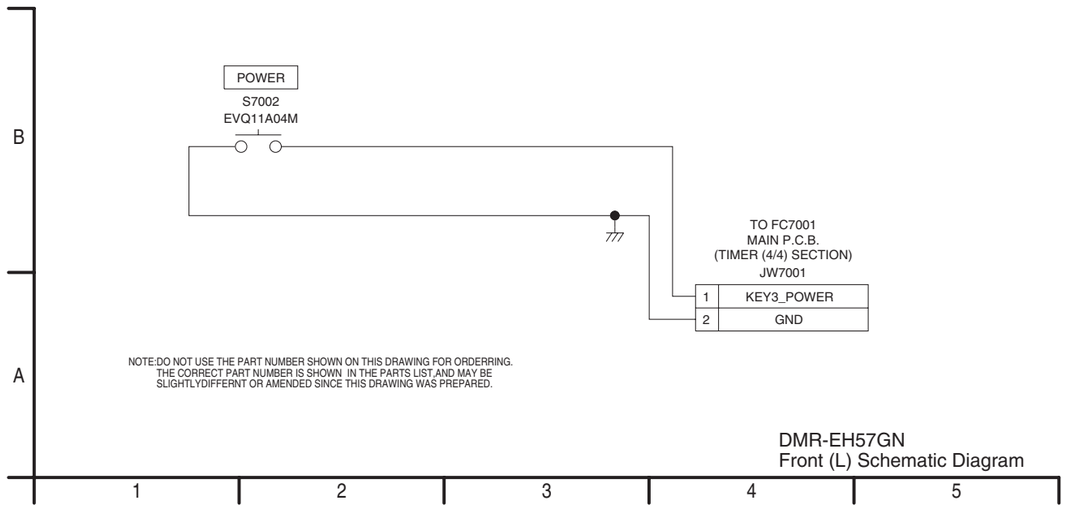
12.17. DV Jack Schematic Diagram



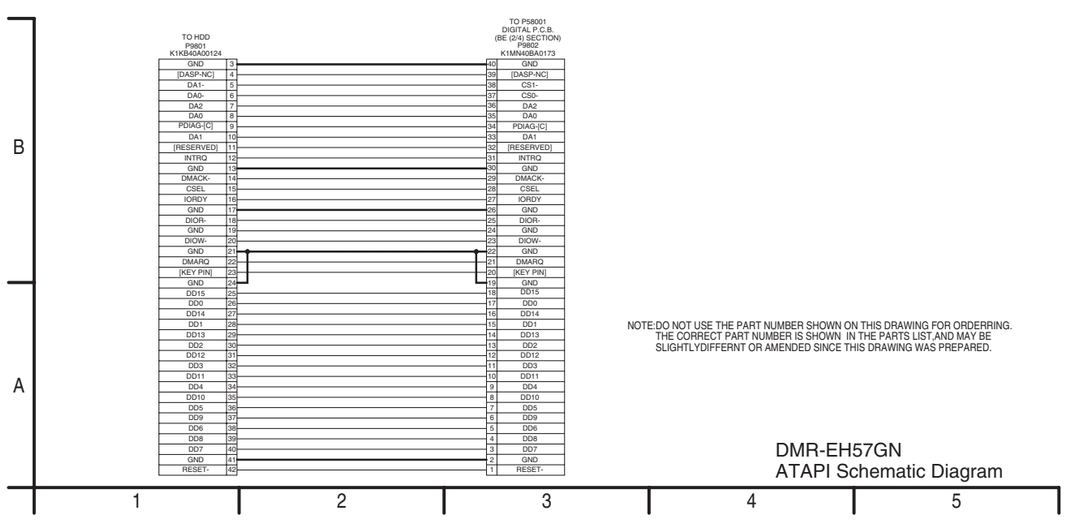
12.18. Front Jack Schematic Diagram



12.19. Front (L) Schematic Diagram

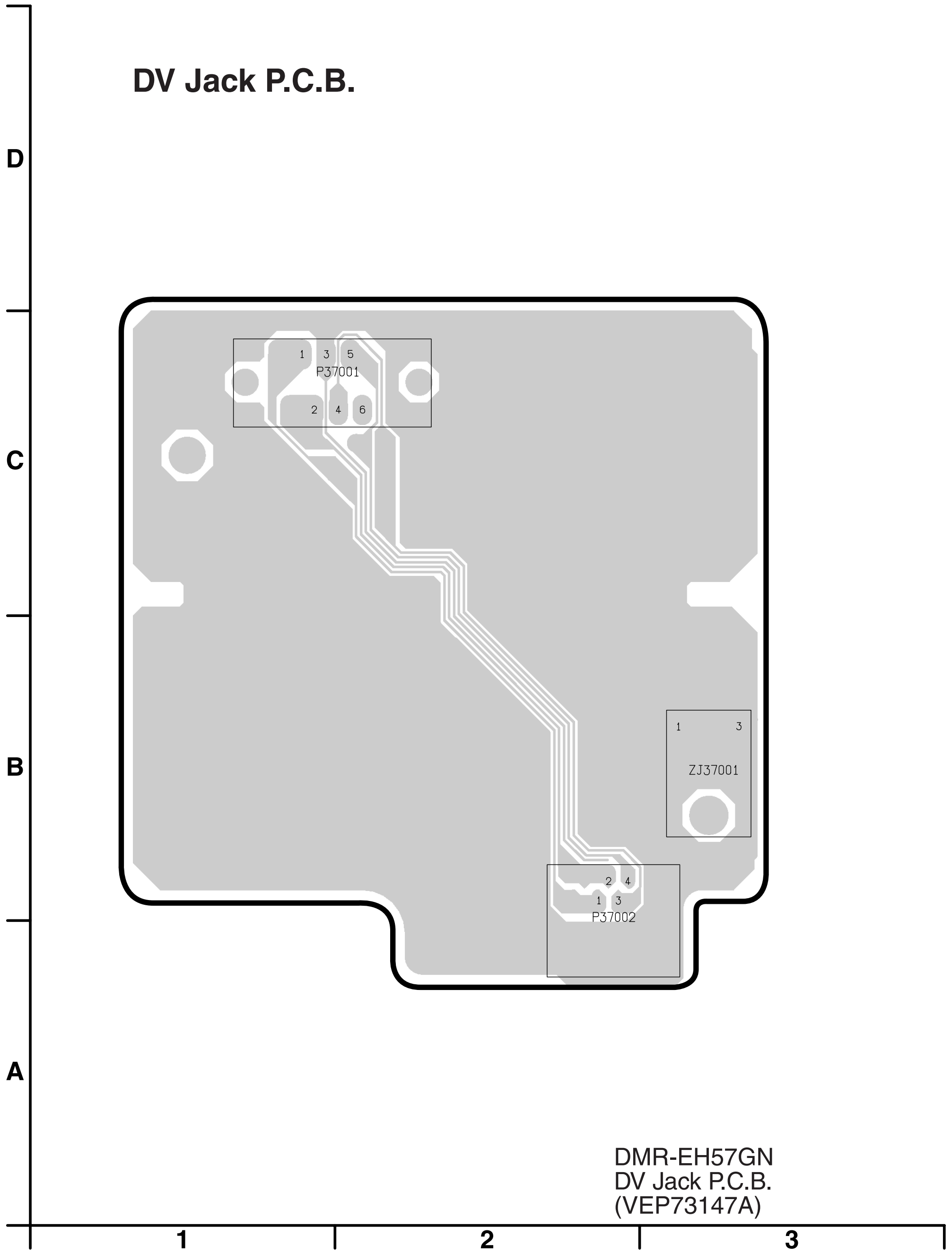


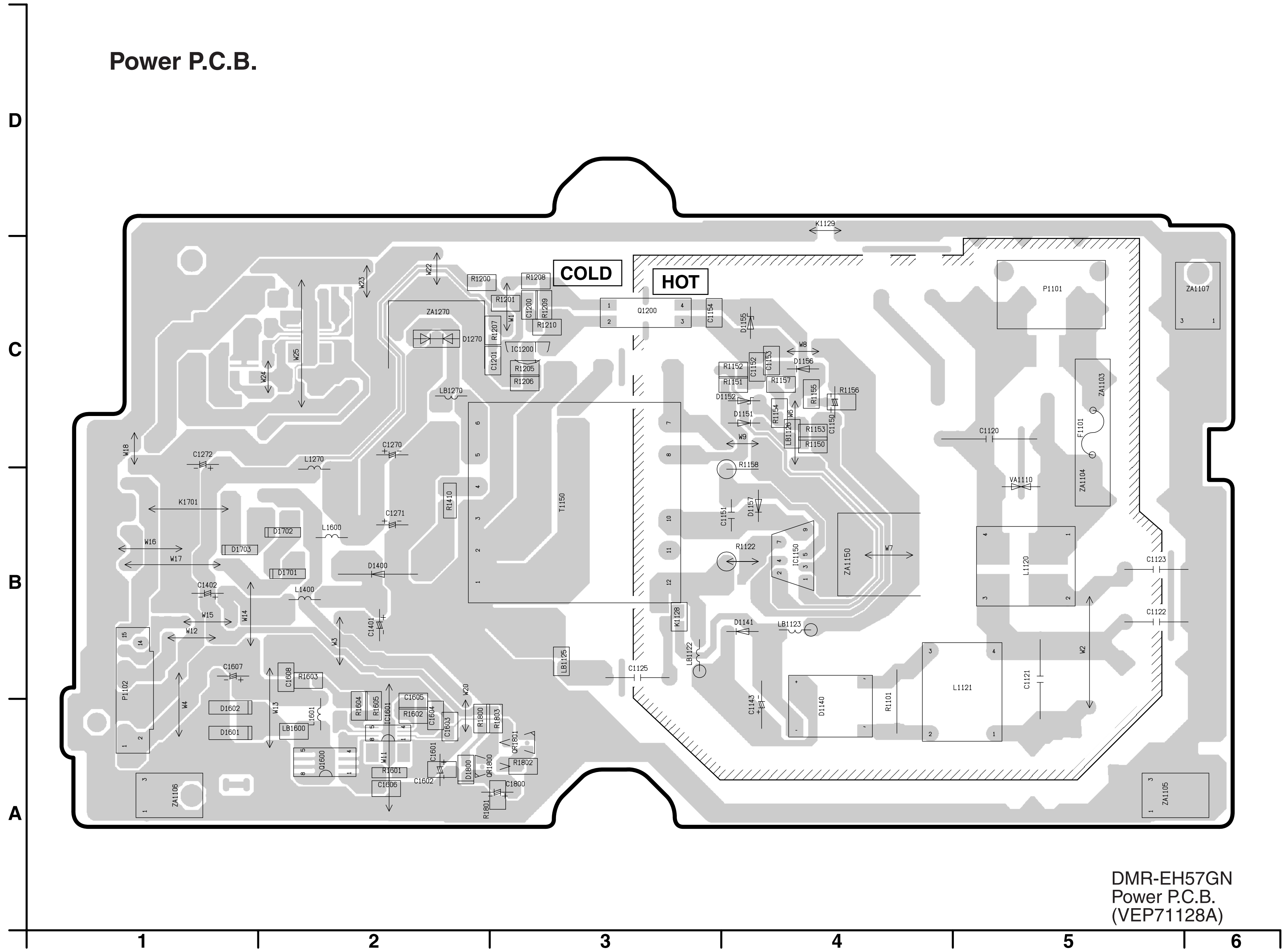
12.20. ATAPI Schematic Diagram



13 Printed Circuit Board

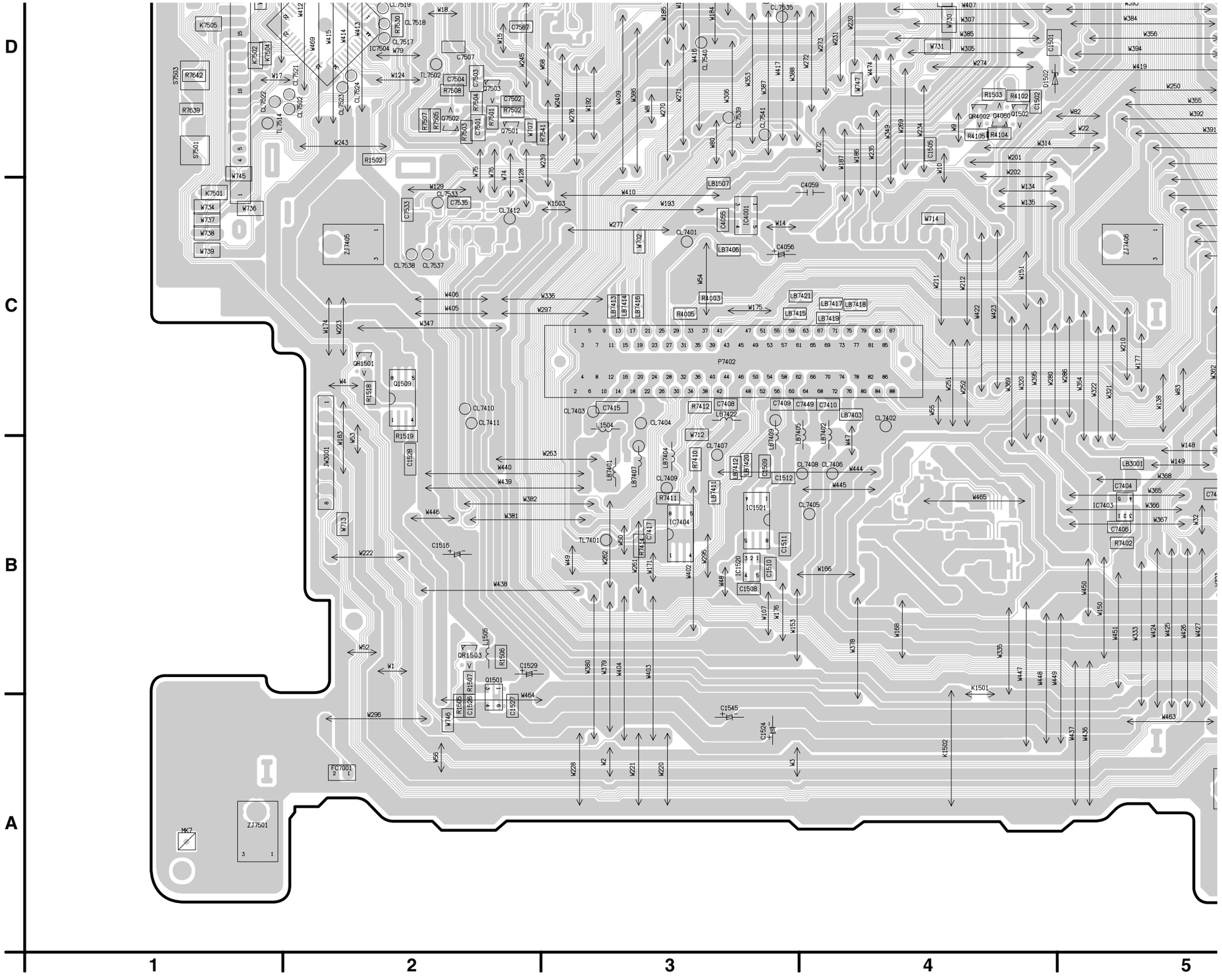
13.1. Power P.C.B. and DV Jack P.C.B.





13.2. Main P.C.B.

13.2.1. Main P.C.B. (1/4 Section)



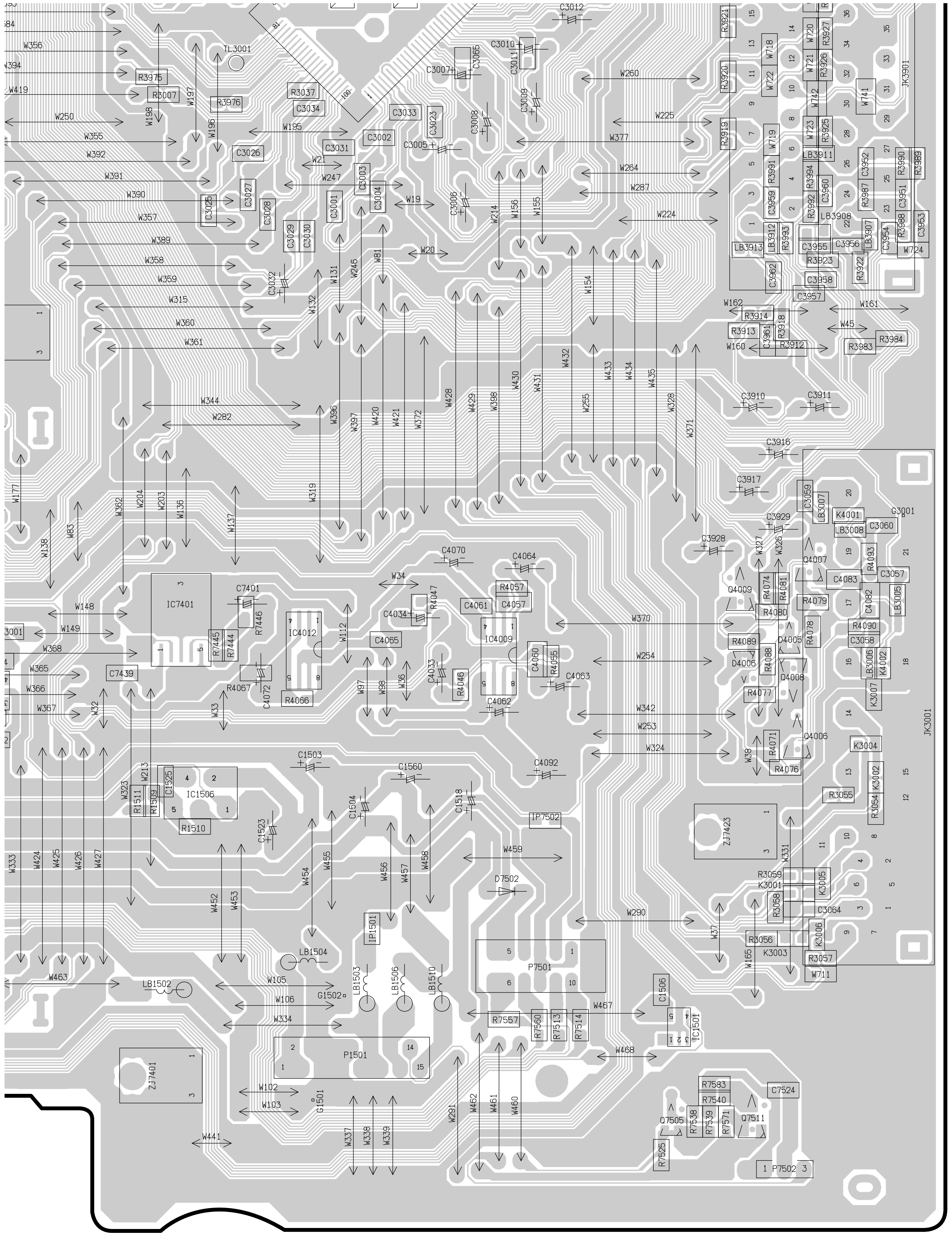
Location Map

(FRONT) (REAR)

3/4	4/4
1/4	2/4

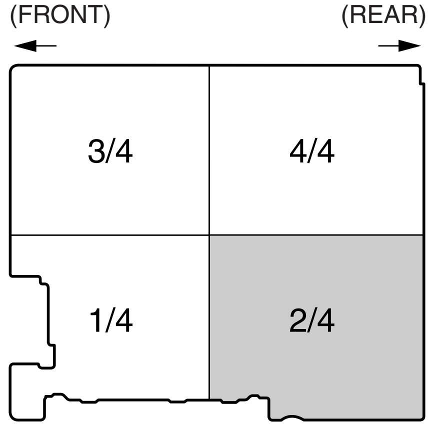
DMR-EH57GN
Main P.C.B.
(RFKB79156DT)
(1/4 Section)

13.2.2. Main P.C.B. (2/4 Section)



5	6	7	8	9

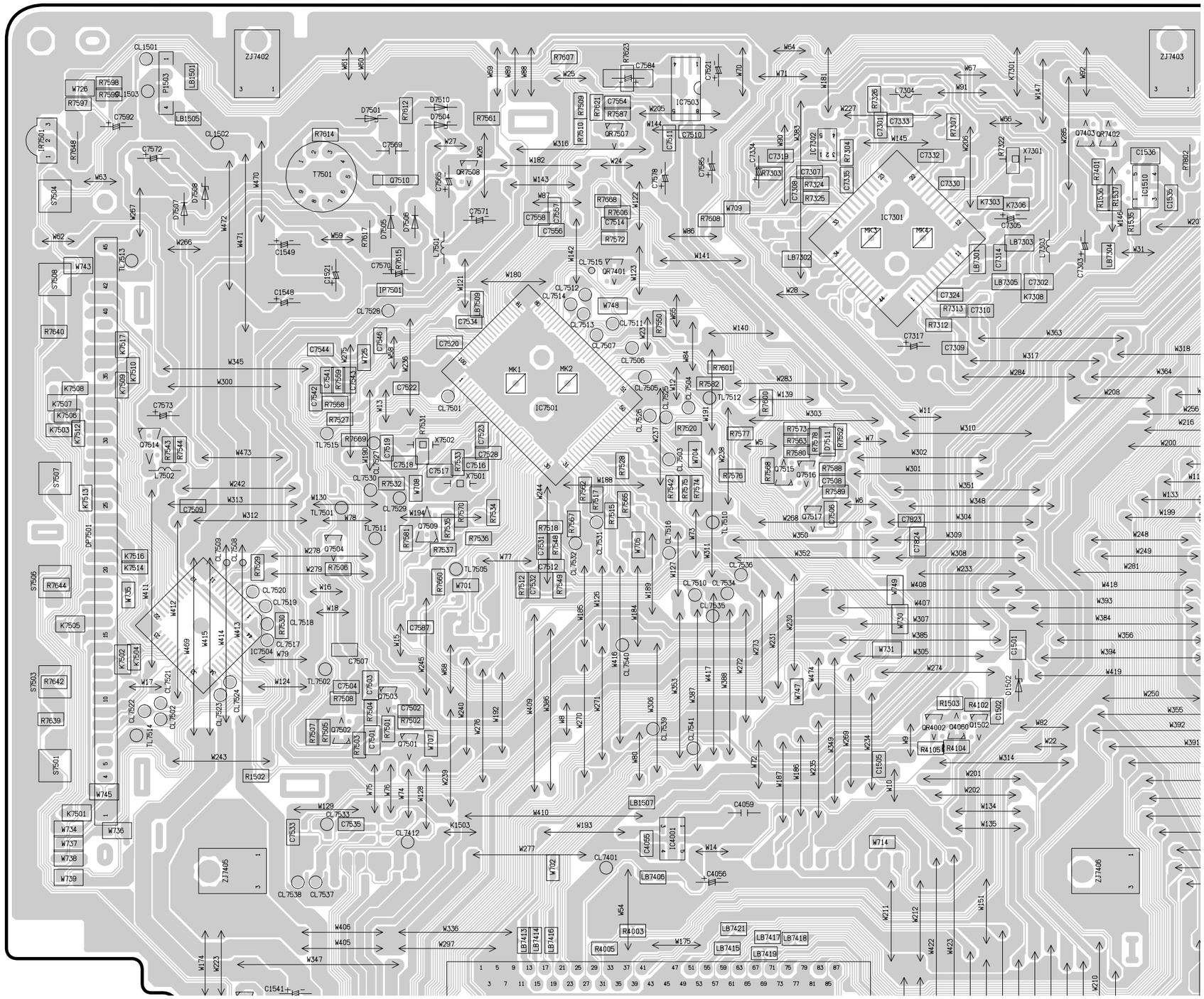
Location Map



DMR-EH57GN
Main P.C.B.
(RFKB79156DT)
(2/4 Section)

13.2.3. Main P.C.B. (3/4 Section)

Main P.C.B.



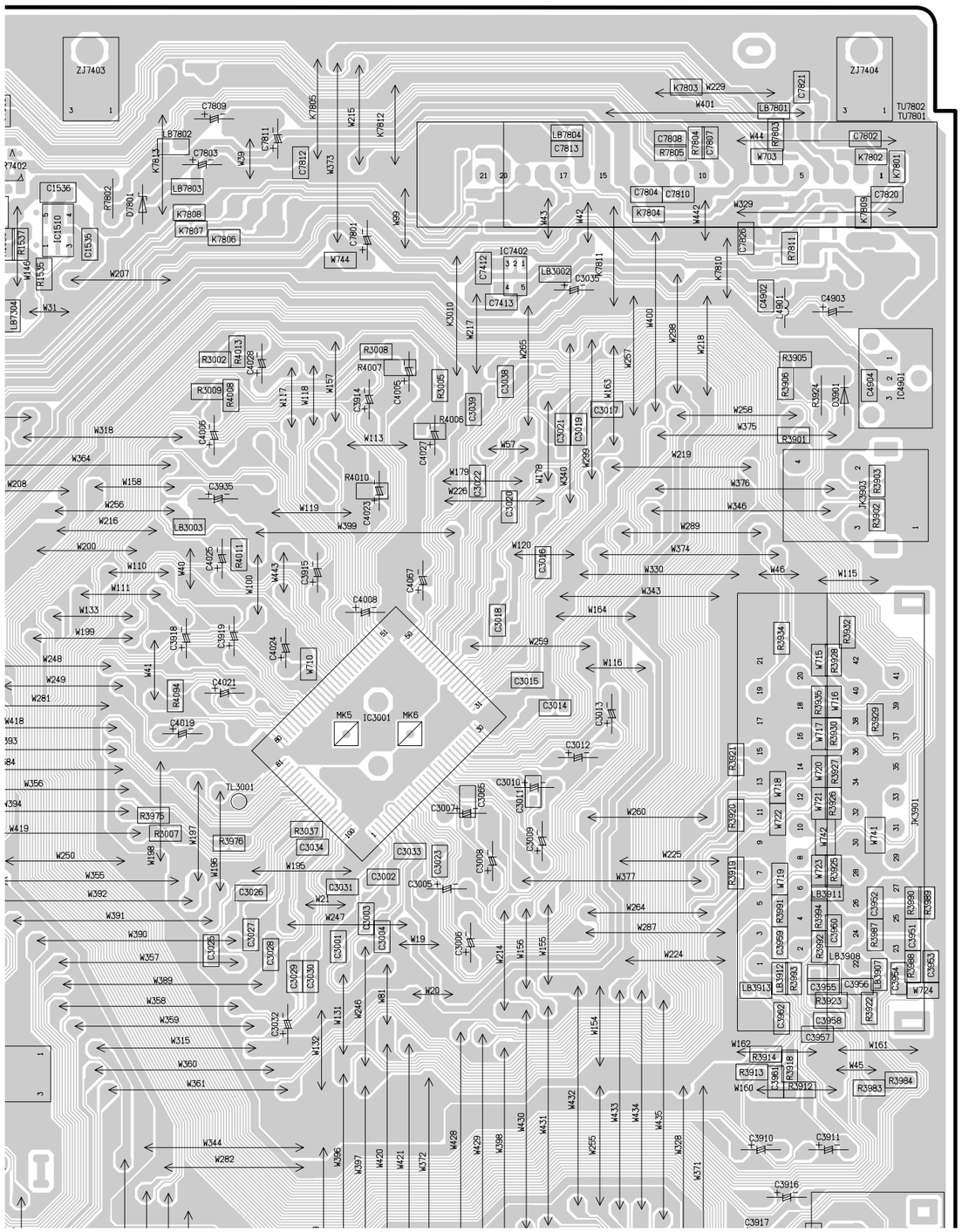
Location Map

(FRONT) (REAR)

3/4	4/4
1/4	2/4

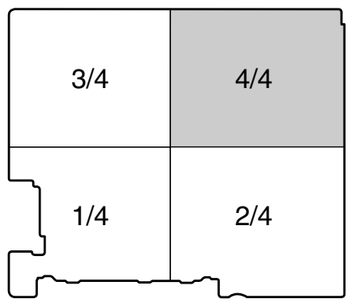
DMR-EH57GN
Main P.C.B.
(RFKB79156DT)
(3/4 Section)

13.2.4. Main P.C.B. (4/4 Section)



Location Map

(FRONT) (REAR)



DMR-EH57GN
Main P.C.B.
(RFKB79156DT)
(4/4 Section)

13.2.5. Main P.C.B. Address Information

Main P.C.B.

Integrated Circuit	
IC1501	A-7
IC1506	B-5
IC1510	E-5
IC1520	B-3
IC1521	B-3
IC3001	D-6
IC4001	C-3
IC4009	B-6
IC4012	B-6
IC4901	E-7
IC7301	E-4
IC7302	F-4
IC7401	B-5
IC7402	E-6
IC7403	B-5
IC7404	B-3
IC7501	E-3
IC7503	F-3
IC7504	D-2
Q1501	A-2
Q1502	D-4
Q1509	C-2
Q4006	B-7
Q4007	C-7
Q4008	B-7
Q4009	B-7
Q4060	D-4
Q7403	F-5
Q7501	D-2
Q7502	D-2
Q7503	D-2
Q7504	D-2
Q7505	A-7
Q7509	D-2
Q7510	E-2
Q7511	A-7
Q7514	E-2
Q7515	D-4
Q7516	D-4
Q7517	D-4
Transistor-resistor	
QR1501	C-2
QR1503	B-2
QR4002	D-4
QR7401	E-3
QR7402	F-5
QR7507	F-3
QR7508	E-3
Test Point	
CL1501	F-2
CL1502	F-2
CL1503	F-2
CL7401	C-3
CL7402	B-4
CL7403	C-3
CL7404	B-3
CL7405	B-4
CL7406	B-4
CL7407	B-3
CL7408	B-3
CL7409	B-3
CL7410	C-2
CL7411	B-2

CL7412	C-2
CL7501	E-3
CL7502	D-2
CL7503	E-3
CL7504	E-3
CL7505	E-3
CL7506	E-3
CL7507	E-3
CL7508	D-2
CL7509	D-2
CL7510	D-3
CL7511	E-3
CL7512	E-3
CL7513	E-3
CL7514	E-3
CL7515	E-3
CL7516	D-3
CL7517	D-2
CL7518	D-2
CL7519	D-2
CL7520	D-2
CL7521	D-2
CL7522	D-2
CL7523	D-2
CL7524	D-2
CL7525	E-3
CL7526	E-3
CL7527	E-2
CL7528	E-2
CL7529	D-2
CL7530	D-2
CL7531	D-3
CL7532	D-3
CL7533	C-2
CL7534	D-3
CL7535	D-3
CL7536	D-4
CL7537	C-2
CL7538	C-2
CL7539	D-3
CL7540	D-3
CL7541	D-3
TL3001	D-5
TL7401	B-3
TL7501	D-2
TL7502	D-2
TL7505	D-3
TL7510	D-3
TL7511	D-2
TL7512	E-3
TL7513	E-1
TL7514	D-1
TL7515	E-2
Connector	
JK3001	B-7
JK3901	D-7
JK3903	E-7
P1501	A-6
P1503	F-2
P7402	C-3
P7501	A-6
P7502	A-7
Diode	
D1502	D-4
D3901	E-7

D4005	B-7
D4006	B-7
D7501	F-2
D7502	B-6
D7504	F-2
D7505	E-2
D7506	E-2
D7507	E-2
D7508	E-2
D7510	F-2
D7511	E-4
D7801	E-5
Crystal Osillator	
X7301	F-4
X7501	D-3
X7502	E-2
IC Protector	
IP1501	B-6
IP7501	E-2
IP7502	B-6
Coil	
L1504	B-3
L1505	B-2
L4901	E-7
L7303	E-5
L7304	F-4
L7501	E-3
LB1501	F-2
LB1502	A-5
LB1503	A-6
LB1504	A-6
LB1505	F-2
LB1506	A-6
LB1507	C-3
LB1510	A-6
LB3001	B-5
LB3002	E-6
LB3003	E-5
LB3005	B-7
LB3006	B-7
LB3007	C-7
LB3008	C-7
LB3907	C-7
LB3908	C-7
LB3911	D-7
LB3912	C-7
LB3913	C-7
LB7301	E-4
LB7302	E-4
LB7303	E-4
LB7304	E-5
LB7305	E-4
LB7401	B-3
LB7402	B-4
LB7403	B-4
LB7404	B-3
LB7405	B-3
LB7406	C-3
LB7407	B-3
LB7409	B-3
LB7411	B-3
LB7412	B-3
LB7413	C-3
LB7414	C-3
LB7415	C-3

LB7416	C-3
LB7417	C-4
LB7418	C-4
LB7419	C-4
LB7420	B-3
LB7421	C-3
LB7422	B-3
LB7509	E-3
LB7801	F-7
LB7802	F-5
LB7803	F-5
LB7804	F-6
Capacitor	
C1501	D-4
C1502	D-4
C1503	B-6
C1504	B-6
C1505	C-4
C1506	A-7
C1508	B-3
C1509	B-3
C1510	B-3
C1511	B-3
C1512	B-3
C1516	B-2
C1518	B-6
C1521	E-2
C1523	B-5
C1524	A-3
C1525	B-5
C1526	A-2
C1527	A-2
C1528	B-2
C1529	B-2
C1535	E-5
C1536	F-5
C1541	C-2
C1545	A-3
C1548	E-2
C1549	E-2
C1560	B-6
C3001	C-6
C3002	D-6
C3003	D-6
C3004	D-6
C3005	D-6
C3006	C-6
C3007	D-6
C3008	D-6
C3009	D-6
C3010	D-6
C3011	D-6
C3012	D-6
C3013	D-6
C3014	D-6
C3015	D-6
C3016	E-6
C3017	E-6
C3018	D-6
C3019	E-6
C3020	E-6
C3021	E-6
C3022	E-6
C3023	D-6
C3025	C-5

C3026	D-5
C3027	D-5
C3028	C-5
C3029	C-5
C3030	C-6
C3031	D-6
C3032	C-5
C3033	D-6
C3034	D-6
C3035	E-6
C3038	E-6
C3039	E-6
C3057	B-7
C3058	B-7
C3059	C-7
C3060	C-7
C3064	B-7
C3065	D-6
C3910	C-7
C3911	C-7
C3914	E-6
C3915	D-6
C3916	C-7
C3917	C-7
C3918	D-5
C3919	D-5
C3928	C-7
C3929	C-7
C3935	E-5
C3951	D-7
C3952	D-7
C3953	C-7
C3954	C-7
C3955	C-7
C3956	C-7
C3957	C-7
C3958	C-7
C3959	C-7
C3960	D-7
C3961	C-7
C3962	C-7
C4005	E-6
C4006	E-5
C4008	D-6
C4019	D-5
C4021	D-5
C4023	E-6
C4024	D-5
C4025	E-5
C4027	E-6
C4028	E-5
C4033	B-6
C4034	B-6
C4055	C-3
C4056	C-3
C4057	B-6
C4059	C-4
C4060	B-6
C4061	B-6
C4062	B-6
C4063	B-6
C4064	B-6
C4065	B-6
C4067	D-6
C4070	C-6

C4072	B-5
C4082	B-7
C4083	B-7
C4092	B-6
C4902	E-7
C4903	E-7
C4904	E-7
C7301	F-4
C7302	E-4
C7303	E-5
C7305	E-4
C7307	E-4
C7308	E-4
C7309	E-4
C7310	E-4
C7314	E-4
C7317	E-4
C7319	F-4
C7324	E-4
C7330	E-4
C7332	F-4
C7333	F-4
C7334	E-4
C7335	E-4
C7401	B-5
C7404	B-5
C7406	B-5
C7408	C-3
C7409	C-3
C7410	C-4
C7412	E-6
C7413	E-6
C7415	C-3
C7417	B-3
C7439	B-5
C7449	C-3
C7501	D-2
C7502	D-2
C7503	D-2
C7504	D-2
C7505	D-2
C7506	D-4
C7507	D-2
C7508	D-4
C7509	D-2
C7510	F-3
C7511	F-3
C7512	D-3
C7514	E-3
C7516	D-3
C7517	D-3
C7518	D-2
C7519	E-2
C7520	E-3
C7521	F-3
C7522	E-2
C7523	E-3
C7524	A-7
C7528	E-3
C7531	D-3
C7532	D-3
C7533	C-2
C7534	E-3
C7535	C-2
C7541	E-2
C7542	E-2

C7543	E-2
C7544	E-2
C7546	E-2
C7554	F-3
C7556	E-3
C7557	E-3
C7558	E-3
C7565	E-3
C7569	F-2
C7570	E-2
C7571	E-3
C7572	F-2
C7573	E-2
C7578	E-3
C7584	F-3
C7585	E-3
C7587	D-2
C7592	F-1
C7801	E-6
C7802	F-7
C7803	F-5
C7804	F-6
C7807	F-7
C7808	F-7
C7809	F-5
C7810	F-7
C7811	F-5
C7812	F-6
C7813	F-6
C7820	F-7
C7821	F-7
C7823	D-4
C7824	D-4
C7826	E-7
Resistor	
R1502	C-2
R1503	D-4
R1505	A-2
R1506	B-2
R1507	A-2
R1509	B-5
R1510	B-5
R1511	B-5
R1518	C-2
R1519	B-2
R1535	E-5
R1536	E-5
R1537	E-5
R3002	E-5
R3005	E-6
R3007	D-5
R3008	E-6
R3009	E-5
R3037	D-6
R3054	B-7
R3055	B-7
R3056	A-7
R3057	A-7
R3058	B-7
R3059	B-7
R3901	E-7
R3902	E-7
R3903	E-7
R3905	E-7
R3906	E-7

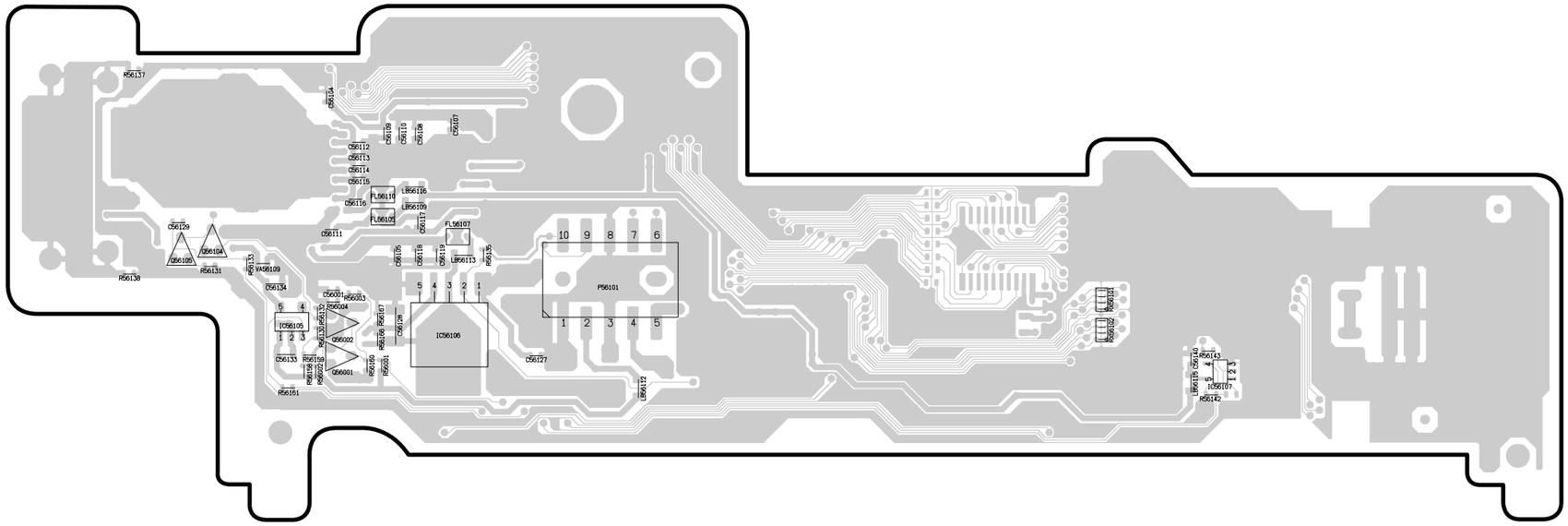
R3912	C-7
R3913	C-7
R3914	C-7
R3918	C-7
R3919	D-7
R3920	D-7
R3921	D-7
R3922	C-7
R3923	C-7
R3924	E-7
R3925	D-7
R3926	D-7
R3927	D-7
R3928	D-7
R3929	D-7
R3930	D-7
R3932	D-7
R3934	D-7
R3935	D-7
R3975	D-5
R3976	D-5
R3983	C-7
R3984	C-7
R3987	D-7
R3988	C-7
R3989	D-7
R3990	D-7
R3991	D-7
R3992	C-7
R3993	C-7
R3994	D-7
R4003	C-3
R4005	C-3
R4006	E-6
R4007	E-6
R4008	E-5
R4010	E-6
R4011	E-5
R4013	E-5
R4046	B-6
R4047	B-6
R4055	B-6
R4057	B-6
R4066	B-6
R4067	B-5
R4071	B-7
R4074	B-7
R4076	B-7
R4077	B-7
R4078	B-7
R4079	B-7
R4080	B-7
R4081	B-7
R4088	B-7
R4089	B-7
R4090	B-7
R4093	C-7
R4094	D-5
R4102	D-4
R4104	D-4
R4105	D-4
R7303	E-4
R7304	F-4
R7307	F-4
R7312	E-4

R7313	E-4
R7322	E-4
R7324	E-4
R7325	E-4
R7326	F-4
R7401	E-5
R7402	B-5
R7410	B-3
R7411	B-3
R7412	C-3
R7414	B-3
R7444	B-5
R7445	B-5
R7446	B-5
R7501	D-2
R7502	D-2
R7503	D-2
R7504	D-2
R7505	D-2
R7506	D-2
R7507	D-2
R7508	D-2
R7509	F-3
R7510	F-3
R7512	D-3
R7513	A-6
R7514	A-6
R7515	D-3
R7517	D-3
R7518	D-3
R7520	E-3
R7525	A-7
R7527	E-2
R7528	D-3
R7529	D-2
R7530	D-2
R7531	E-2
R7532	D-2
R7533	D-3
R7534	D-3
R7535	D-3
R7536	D-3
R7537	D-3
R7538	A-7
R7539	A-7
R7540	A-7
R7542	D-3
R7543	E-2
R7544	E-2
R7548	D-3
R7549	D-3
R7550	E-3
R7552	E-4
R7557	A-6
R7558	E-2
R7559	E-2
R7560	A-6
R7561	F-3
R7562	D-3
R7563	E-4
R7565	D-3
R7567	D-3
R7568	D-4
R7570	D-3
R7571	A-7

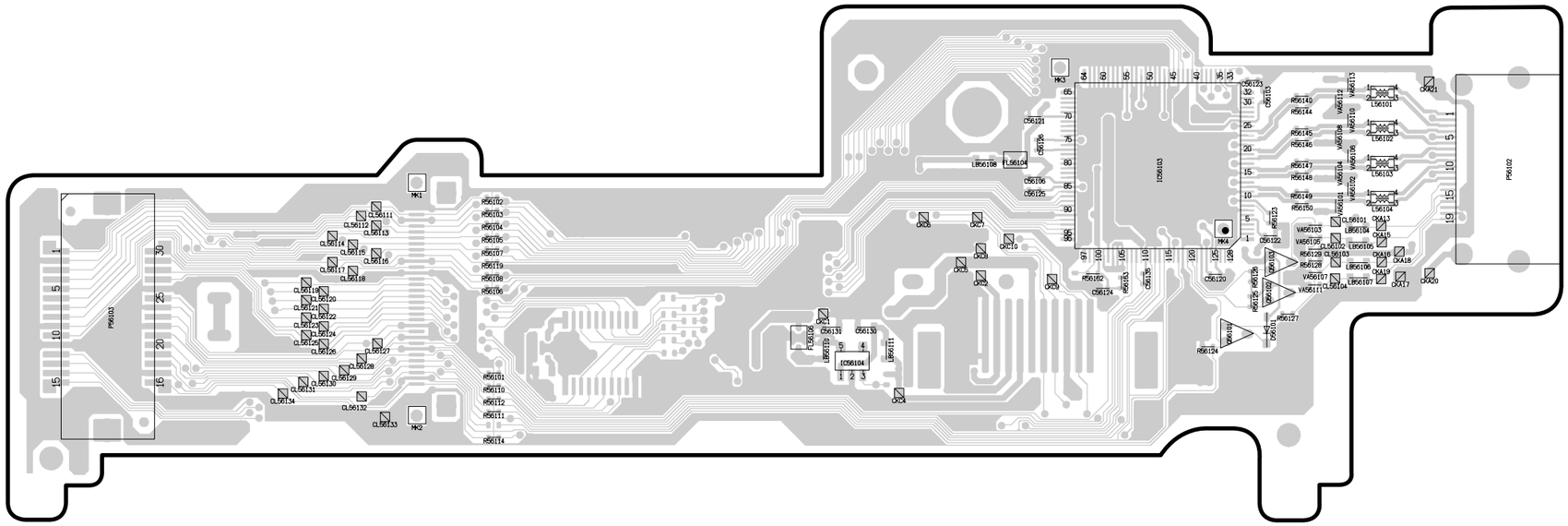
R7572	E-3
R7573	E-4
R7574	D-3
R7575	D-3
R7576	D-3
R7577	E-4
R7578	E-4
R7580	E-4
R7581	D-2
R7582	E-3
R7583	A-7
R7587	F-3
R7588	D-4
R7589	D-4
R7597	F-1
R7598	F-1
R7599	F-1
R7600	E-4
R7601	E-3
R7606	E-3
R7607	F-3
R7608	E-3
R7612	F-2
R7614	F-2
R7615	E-2
R7617	E-2
R7621	F-3
R7623	F-3
R7639	D-1
R7640	E-1
R7642	D-1
R7644	D-1
R7648	F-1
R7660	D-2
R7668	E-3
R7669	E-2
R7802	E-5
R7803	F-7
R7804	F-7
R7805	F-7
R7811	E-7
Switch	
S7501	C-1
S7503	D-1
S7504	E-1
S7506	D-1
S7507	D-1
S7508	E-1
Transformer	
T7501	E-2
Display	
DP7501	D-1

13.3. HDMI P.C.B.

HDMI P.C.B.



(COMPONENT SIDE)

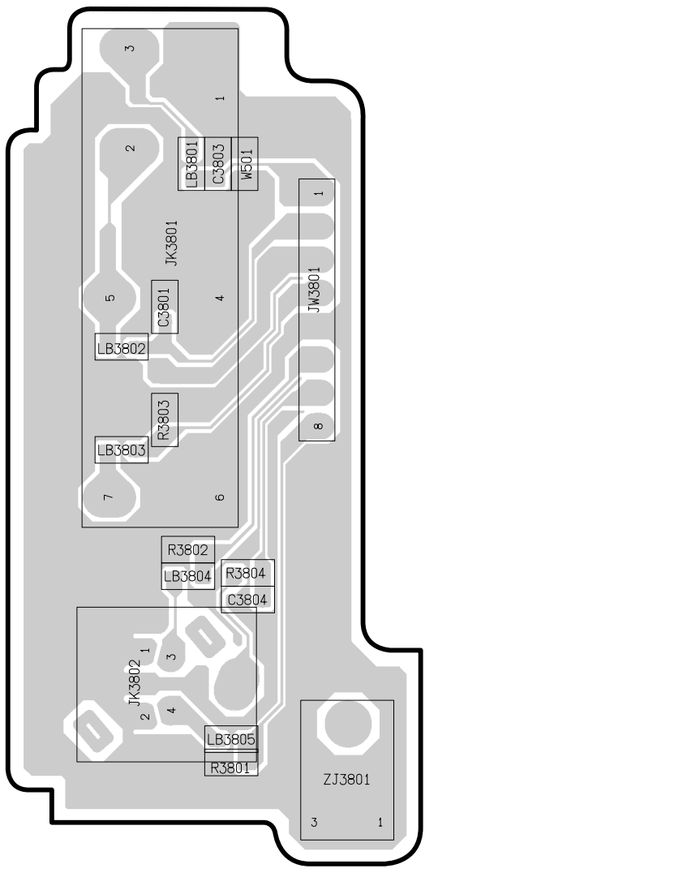


(FOIL SIDE)

DMR-EH57GN
HDMI P.C.B.
(VEP73148A)

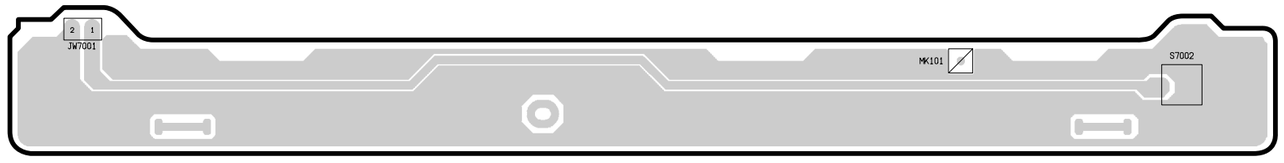
13.4. Front Jack P.C.B. and Front (L) P.C.B.

Front Jack P.C.B.



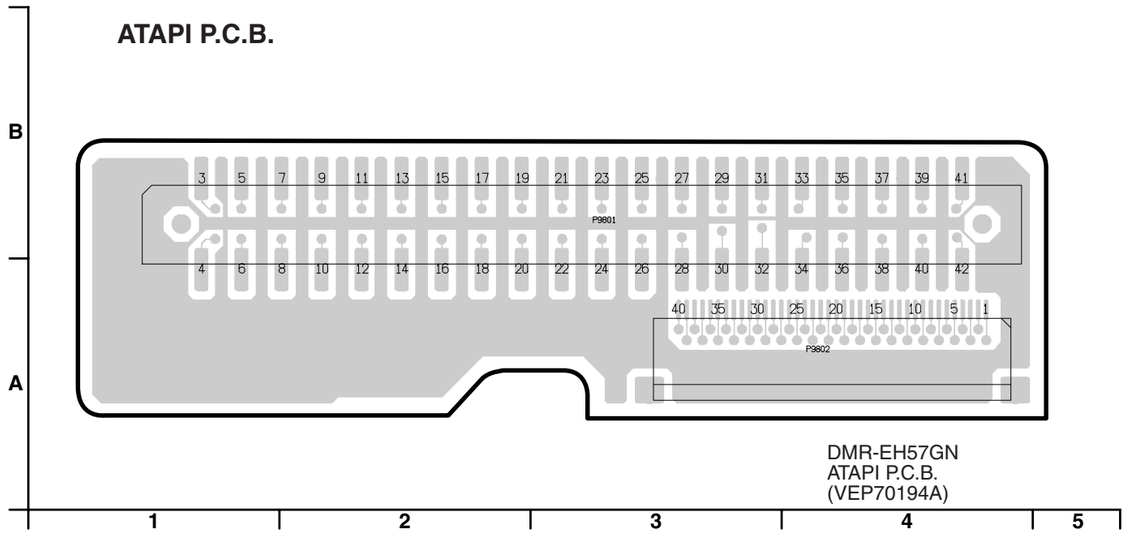
DMR-EH57GN
Front Jack P.C.B.
(VEP73146A)

Front (L) P.C.B.



DMR-EH57GN
Front (L) P.C.B.
(VEP70187A)

13.5. ATAPI P.C.B.



14 Appendix for Schematic Diagram

14.1. Voltage and Waveform Chart

Note)

Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

14.1.1. Power P.C.B.

Ref No.	IC1150										IC1200									
MODE	1	2	3	4	5	6	7	8	9		1	2	3							
REC	3.0	1.5	0	11.6	0	-	-	-	-		8.3	2.5	0							
PLAY	3.0	1.5	0	11.6	0	-	-	-	-		8.3	2.5	0							
STOP	3.0	1.5	0	11.6	0	-	-	-	-		8.3	2.5	0							
Ref No.	IC1601																			
MODE	1	2	3	4	5	6	7	8												
REC	12.3	4.5	1.2	1.3	0.8	0	7.2	12.3												
PLAY	12.3	4.5	1.2	1.3	0.8	0	7.2	12.3												
STOP	12.3	4.5	1.2	1.3	0.8	0	7.2	12.3												
Ref No.	Q1200					Q1600														
MODE	1	2	3	4		1	2	3	4	5	6	7	8							
REC	9.3	8.3	0	1.5		12.3	12.3	12.3	7.2	6.1	6.1	6.1	6.1							
PLAY	9.3	8.3	0	1.5		12.3	12.3	12.3	7.2	6.1	6.1	6.1	6.1							
STOP	9.3	8.3	0	1.5		12.3	12.3	12.3	7.2	6.1	6.1	6.1	6.1							
Ref No.	QR1800				QR1801															
MODE	E	C	B		E	C	B													
REC	11.9	0	12.3		0	4.5	0													
PLAY	11.9	0	12.3		0	4.5	0													
STOP	11.9	0	12.3		0	4.5	0													

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Ref No.	IC1501						IC1506													
MODE	1	2	3	4	5		1	2	3	4	5									
REC	-	0	0	3.0	3.2		4.8	6.1	0	5.2	5.2									
PLAY	-	0	0	3.0	3.2		4.8	6.1	0	5.2	5.2									
STOP	-	0	0	3.0	3.2		4.8	6.1	0	5.2	5.2									
Ref No.	IC1510						IC1520													
MODE	1	2	3	4	5		1	2	3	4	5									
REC	5.0	0	4.8	6.1	5.0		6.1	0	4.8	-	5.1									
PLAY	5.0	0	4.8	6.1	5.0		6.1	0	4.8	-	5.1									
STOP	5.0	0	4.8	6.1	5.0		6.1	0	4.8	-	5.1									
Ref No.	IC1521																			
MODE	1	2	3	4	5	6	7	8												
REC	3.3	-	2.0	0	4.8	-	-	4.1												
PLAY	3.3	-	2.0	0	4.8	-	-	4.1												
STOP	3.3	-	2.0	0	4.8	-	-	4.1												
Ref No.	IC3001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.0	2.5	1.6	0	1.6	5.0	1.6	5.0	0.4	0.3	1.6	0.4	0	1.7	1.7	1.6	0.4	0	1.7	1.7
PLAY	2.0	2.5	1.6	0	1.6	5.0	1.6	5.0	0.4	0.3	1.6	0.4	0	1.7	1.7	1.6	0.4	0	1.7	1.7
STOP	2.0	2.5	1.6	0	1.6	5.0	1.6	5.0	0.4	1.6	1.6	0.4	0	1.7	1.7	1.6	0.4	0	1.7	1.7
Ref No.	IC3001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	0	1.7	1.7	1.7	5.0	1.4	0.1	1.4	0	2.1	1.6	0	1.6	0	2.1	0	1.6	0	1.6	5.0
PLAY	0	1.7	1.7	1.7	5.0	1.4	0.1	1.4	0	2.1	1.6	0	1.6	0	2.1	0	1.6	0	1.6	5.0
STOP	0	1.7	1.6	1.7	5.0	1.4	0.2	1.4	0	2.1	1.6	0	1.6	0	2.1	0	1.6	0	1.6	5.0
Ref No.	IC3001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	1.6	5.1	2.0	0	2.0	11.6	1.6	2.0	4.5	4.4	4.4	4.0	4.5	4.5	4.5	4.5	9.1	4.4	4.4	4.5
PLAY	1.6	5.1	2.0	0	2.0	11.6	1.6	2.0	4.5	4.4	4.4	4.0	4.5	4.5	4.5	4.5	9.1	4.4	4.4	4.5
STOP	1.6	5.1	2.0	0	2.0	11.6	1.6	2.0	4.5	4.5	4.0	4.5	4.5	4.4	4.5	3.9	9.1	4.0	4.3	3.7
Ref No.	IC3001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	4.5	4.5	4.5	4.5	9.0	0	0	0	0	0	4.5	4.5	4.5	4.5	0	-	9.5	4.5	4.5	0
PLAY	4.5	4.5	4.5	4.5	9.0	0	0	0	0	0	4.5	4.5	4.5	4.5	0	-	9.5	4.5	4.5	0
STOP	3.7	3.7	3.7	3.8	9.0	0	0	0	0	0	4.5	4.5	4.5	4.5	0	-	0.3	4.5	4.5	0
Ref No.	IC3001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	2.1	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.0	2.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5
PLAY	2.1	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.0	2.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5
STOP	4.7	5.0	1.5	5.1	2.1	4.5	3.6	4.8	4.6	5.1	5.0	2.8	2.1	5.1	2.0	0	2.1	0	2.0	2.5

Ref No.	IC4001						IC4009													
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8						
REC	3.4	0	4.8	6.1	5.0		5.8	5.8	5.8	0	5.8	5.8	5.8	11.6						
PLAY	3.4	0	4.8	6.1	5.0		5.8	5.8	5.8	0	5.8	5.8	5.8	11.6						
STOP	3.4	0	4.8	6.1	5.0		5.8	5.8	5.8	0	5.8	5.8	5.8	11.6						
Ref No.	IC4012								IC4901											
MODE	1	2	3	4	5	6	7	8		1	2	3								
REC	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6		1.7	5.0	0								
PLAY	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6		1.7	5.0	0								
STOP	5.8	5.8	5.8	0	5.8	5.8	5.8	11.6		1.7	5.0	0								
Ref No.	IC7301																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.4	2.4	2.4	0	0	2.4	0	2.4	0	2.4	0	-	0	2.9	2.6	0	0	2.8	0	0
PLAY	2.4	2.4	2.4	0	0	2.4	0	2.4	0	2.4	0	-	0	2.9	2.6	0	0	2.8	0	0
STOP	2.4	2.4	2.4	0	0	2.4	0	2.4	0	2.4	0	-	0	2.9	2.6	0	0	2.8	0	0
Ref No.	IC7301																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.3	0	-	1.5	2.4	1.4	0	5.0	5.0	5.0	2.9	2.4	2.4	2.5	2.5	0	-	2.4	-	-
PLAY	2.3	0	-	1.5	2.4	1.4	0	5.0	5.0	5.0	2.9	2.4	2.4	2.5	2.5	0	-	2.4	-	-
STOP	2.3	0	-	1.5	2.4	1.4	0	5.0	5.0	5.0	2.9	2.4	2.4	2.5	2.5	0	-	2.4	-	-
Ref No.	IC7301																			
MODE	41	42	43	44																
REC	2.4	-	-	0																
PLAY	2.4	-	-	0																
STOP	2.4	-	-	0																
Ref No.	IC7302						IC7401						IC7402							
MODE	1	2	3	4	5		1	2	3	4	5		1	2	3	4	5			
REC	5.0	0	4.9	-	-		12.4	4.2	11.6	2.6	0		6.1	0	6.1	-	5.1			
PLAY	5.0	0	4.9	-	-		12.4	4.2	11.6	2.6	0		6.1	0	6.1	-	5.1			
STOP	5.0	0	4.9	-	-		12.4	4.2	11.6	2.6	0		6.1	0	6.1	-	5.1			
Ref No.	IC7403						IC7404													
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8						
REC	6.1	0	4.2	-	5.0		0	0	0	0	3.2	3.2	0	3.3						
PLAY	6.1	0	4.2	-	5.0		0	0	0	0	3.2	3.2	0	3.3						
STOP	6.1	0	4.2	-	5.0		0	0	0	0	3.2	3.2	0	3.3						
Ref No.	IC7501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0.3	0	4.9	3.8	0.8	0.8	4.4	0	0	2.1	1.2	4.9	1.4	0	2.1	3.3	4.9	3.3	3.2	3.3
PLAY	0.3	0	4.9	3.8	0.8	0.8	4.4	0	0	0.7	1.2	4.9	1.4	0	2.1	3.3	4.9	3.3	3.2	3.3
STOP	0.3	0	4.9	4.5	0.9	0.9	4.4	0	0	0.7	1.2	4.9	1.4	0	2.1	3.3	4.9	3.3	3.2	3.3
Ref No.	IC7501																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	3.1	1.3	3.2	0	-	-	0.1	3.3	3.3	3.2	3.3	3.3	0	3.3	3.3	3.2	3.3	0	0	4.9
PLAY	3.1	1.3	3.2	0	-	-	0.1	3.3	3.3	3.2	3.3	3.3	0	3.3	3.3	3.2	3.3	0	0	4.9
STOP	3.1	1.3	3.2	0	-	-	0.1	3.3	3.3	3.2	3.3	3.3	0	3.3	3.3	3.2	3.3	0	0	4.9
Ref No.	IC7501																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	4.9	4.9	4.8	0	4.9	5.0	5.0	-	-	-	-	0	4.8	0	0	0	3.3	-	5.0
PLAY	0	4.9	4.9	4.8	0	4.9	5.0	5.0	-	-	-	-	0	4.8	0	0	0	3.3	-	5.0
STOP	4.9	4.9	4.9	4.8	0	4.9	5.0	5.0	-	-	-	-	0	4.8	0	0	0	3.3	-	5.0
Ref No.	IC7501																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	0	5.0	-	0	4.9	0	-	0	-	-	-	-	4.9	0	5.0	0	-	0	0	0
PLAY	0	5.0	-	0	4.9	0	-	0	-	-	-	-	4.9	0	5.0	0	-	0	0	0
STOP	0	5.0	-	0	4.9	0	-	0	-	-	-	-	4.9	0	5.0	0	-	0	0	0
Ref No.	IC7501																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	3.3	0	0	4.7	3.2	5.0	5.0	5.0	2.0	5.0	0	0	2.5	1.2	1.6	0	0	2.0	5.0	0
PLAY	3.3	0	0	4.7	3.2	5.0	5.0	5.0	2.0	5.0	0	0	2.5	1.2	1.6	0	0	2.0	5.0	0
STOP	3.3	0	0	4.7	3.2	5.0	5.0	5.0	2.0	5.0	0	0	2.5	1.2	1.6	0	0	2.0	5.0	0
Ref No.	IC7503																			
MODE	1	2	3	4	5	6	7	8												
REC	0	0.2	5.0	4.2	5.0	5.0	5.4	5.0												
PLAY	0	0.2	5.0	4.2	5.0	5.0	5.4	5.0												
STOP	0	0.2	5.0	4.2	5.0	5.0	5.4	5.0												
Ref No.	IC7504																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	0	2.9	0.3	0.3	4.8	4.3	0.1	0.1	0	4.7	-17.8	-17.8	-9.3	-17.8	-20.7	-17.9	-6.5
PLAY	0	0	0	0	2.9	0.3	0.3	4.8	4.3	0.1	0.1	0	4.7	-17.8	-17.8	-9.3	-17.8	-20.7	-17.9	-6.5
STOP	0	0	0	0	2.9	0.2	0.2	4.8	4.3	0.1	0.1	0	4.8	-20.7	-20.7	-20.7	-17.9	-20.7	-20.7	-20.7
Ref No.	IC7504																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	-15.0	0	-9.4	-9.3	-17.8	-20.7	-20.7	-20.7	-12.2	-21.4	-20.9	-20.9	-20.9	-20.9	-20.9	-18.4	-18.1	-18.1	-18.1	-18.1
PLAY	-15.0	0	-9.4	-9.3	-17.8	-20.7	-20.7	-20.7	-12.2	-21.4	-20.9	-20.9	-20.9	-20.9	-20.9	-18.4	-18.1	-18.1	-18.1	-18.1
STOP	-17.9	-15.1	12.2	-20.7	-20.7	-20.7	-20.7	-20.8	-20.8	-21.4	-21.0	-20.8	-21.0	-21.0	-21.0	-18.4	-18.2	-18.2	-18.2	-18.2
Ref No.	IC7504															IC7801				
MODE	41	42	43	44												1	2	3	4	5
REC	-18.1	-18.1	5.0	0												0	6.1	5.0	-	4.8
PLAY	-18.1	-18.1	5.0	0												0	6.1	5.0	-	4.8
STOP	-18.2	-18.2	0	0												0	6.1	5.0	-	4.8

Ref No.	Q1501							Q1502												
MODE	1	2	3	4	5	6		E	C	B										
REC	5.1	5.1	2.6	5.2	5.1	5.1		3.3	4.1	3.9										
PLAY	5.1	5.1	2.6	5.2	5.1	5.1		3.3	4.1	3.9										
STOP	5.1	5.1	2.6	5.2	5.1	5.1		3.3	4.1	3.9										
Ref No.	Q1509									Q4006				Q4007				Q4008		
MODE	1	2	3	4	5	6	7	8		E	C	B		E	C	B		E	C	B
REC	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		0	0	-0.1
PLAY	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		0	0	-0.1
STOP	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		0	0	-0.1
Ref No.	Q4009				Q4060				Q7403				Q7501				Q7502			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	0	0	-0.1		0	5.1	0		0	0	4.9		2.7	0	2.1		2.0	5.0	1.6	
PLAY	0	0	-0.1		0	5.1	0		0	0	4.9		2.7	0	2.1		2.0	5.0	1.6	
STOP	0	0	-0.1		0	5.1	0		0	0	4.9		2.7	0	2.1		2.0	5.0	1.6	
Ref No.	Q7503				Q7504				Q7505				Q7509				Q7510			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	2.7	0	2.1		2.0	5.0	1.6		1.1	11.3	1.6		4.5	3.3	3.3		0	9.1	-0.2	
PLAY	2.7	0	2.1		2.0	5.0	1.6		1.1	11.3	1.6		4.5	3.3	3.3		0	9.3	-0.1	
STOP	2.7	0	2.1		2.0	5.0	1.6		1.1	11.3	1.6		4.5	3.3	3.3		0	9.1	-0.2	
Ref No.	Q7511				Q7514				Q7515				Q7516				Q7517			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	12.3	7.6	11.3		-18.5	5.0	-18.4		0	5.0	0		0	0	4.6		0	4.6	0	
PLAY	12.3	7.6	11.3		-18.5	5.0	-18.4		0	5.0	0		0	0	4.6		0	4.6	0	
STOP	12.3	7.6	11.3		-18.5	5.0	-18.4		0	5.0	0		0	0	5.1		0	5.1	0.1	
Ref No.	Q7802				Q7803															
MODE	E	C	B		E	C	B													
REC	0	0	0.5		0	0.5	0													
PLAY	0	0	0.5		0	0.5	0													
STOP	0	0	0.5		0	0.5	0													
Ref No.	QR1501				QR1503				QR4002											
MODE	E	C	B		E	C	B		E	C	B									
REC	0	0	4.9		0	0	4.9		5.1	-0.1	5.1									
PLAY	0	0	4.9		0	0	4.9		5.1	-0.1	5.1									
STOP	0	0	4.9		0	0	4.9		5.1	-0.1	5.1									
Ref No.	QR7401				QR7402															
MODE	E	C	B		E	C	B													
REC	0	4.2	0		38.1	38.0	0													
PLAY	0	4.2	0		38.1	38.0	0													
STOP	0	4.2	0		38.1	38.0	0													
Ref No.	QR7507				QR7508															
MODE	E	C	B		E	C	B													
REC	0	0	4.9		0	-0.2	0													
PLAY	0	0	4.9		0	-0.1	0													
STOP	0	0	4.9		0	-0.2	0													

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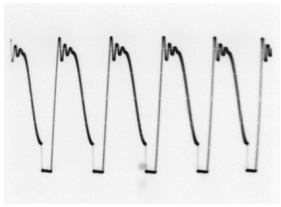
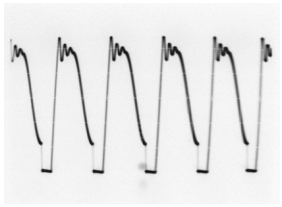
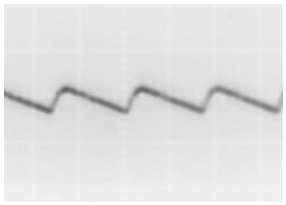
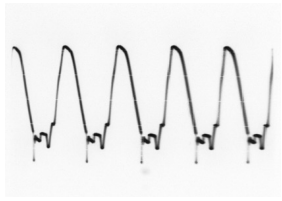
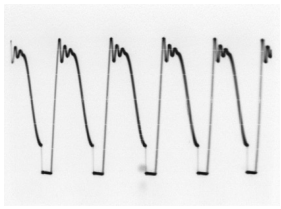
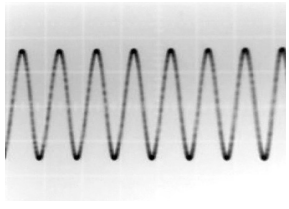
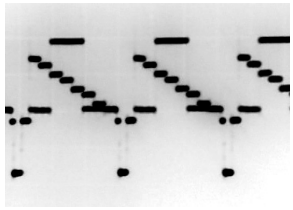
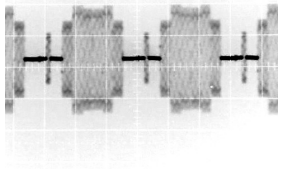
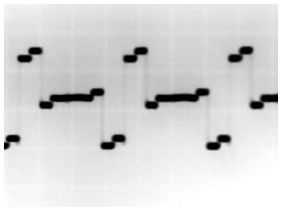
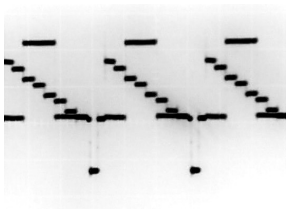
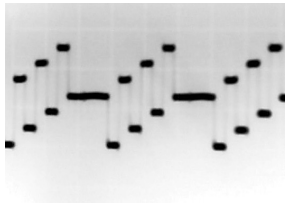
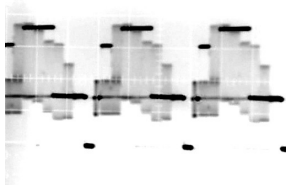
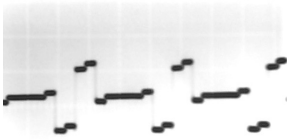
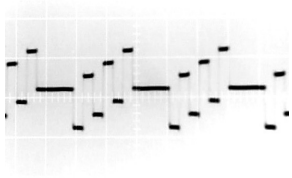
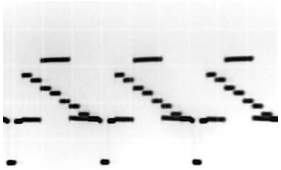
Ref No.	IC56103																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	-	-	-	-	1.2	-	0	2.8	3.3	0	0	0	3.3	0	0	0	3.3	0	0	0
PLAY	-	-	-	-	1.2	-	0	2.8	3.3	0	0	0	3.3	0	0	0	3.3	0	0	0
STOP	-	-	-	-	1.2	-	0	2.8	3.3	0	0	0	3.3	0	0	0	3.3	0	0	0
Ref No.	IC56103																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	3.3	0	0	0	3.3	1.2	0	3.3	-	-	-	-	1.5	3.3	1.3	0	0	1.3	0	3.3
PLAY	3.3	0	0	0	3.3	1.2	0	3.3	-	-	-	-	1.5	3.3	1.3	0	0	1.3	0	3.3
STOP	3.3	0	0	0	3.3	1.2	0	3.3	-	-	-	-	1.5	3.3	1.3	0	0	1.3	0	3.3
Ref No.	IC56103																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	1.7	1.2	1.6	0	1.6	0	1.2	0	0	0	0	3.3	0	0	1.2	0	0	0	0	0
PLAY	1.7	1.2	1.6	0	1.6	0	1.2	0	0	0	0	3.3	0	0	1.2	0	0	0	0	0
STOP	1.7	1.2	1.6	0	1.6	0	1.2	0	0	0	0	3.3	0	0	1.2	0	0	0	0	0
Ref No.	IC56103																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	0	0	0	-	-	0	0	0	0	3.3	0	0	0	0	1.2	0	0	0	0	0
PLAY	0	0	0	-	-	0	0	0	0	3.3	0	0	0	0	1.2	0	0	0	0	0
STOP	0	0	0	-	-	0	0	0	0	3.3	0	0	0	0	1.2	0	0	0	0	0
Ref No.	IC56103																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0	0	0	3.3	1.2	0	1.8	0.9	1.1	1.4	0	0.8	0.9	0.9	0.9	-	-	-	3.3	3.3
PLAY	0	0	0	3.3	1.2	0	1.8	0.9	1.1	1.4	0	0.8	0.9	0.9	0.9	-	-	-	3.3	3.3
STOP	0	0	0	3.3	1.2	0	1.8	0.9	1.1	1.4	0	0.8	0.9	0.9	0.9	-	-	-	3.3	3.3
Ref No.	IC56103																			
MODE	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
REC	0	1.2	0	0	0	3.3	3.3	3.3	1.2	0	1.5	0	3.3	3.3	3.3	1.2	0	0	0	0.1
PLAY	0	1.2	0	0	0	3.3	3.3	3.3	1.2	0	1.5	0	3.3	3.3	3.3	1.2	0	0	0	0.1
STOP	0	1.2	0	0	0	3.3	3.3	3.3	1.2	0	1.5	0	3.3	3.3	3.3	1.2	0	0	0	0.1
Ref No.	IC56103									IC56104						IC56105				
MODE	121	122	123	124	125	126	127	128		1	2	3	4	5		1	2	3	4	5
REC	0.1	0	1.2	3.3	0	-	-	-		4.6	0	3.3	-	3.3		5.7	0	4.8	-	5.0
PLAY	0.1	0	1.2	3.3	0	-	-	-		4.6	0	3.3	-	3.3		5.7	0	4.8	-	5.0
STOP	0.1	0	1.2	3.3	0	-	-	-		4.6	0	3.3	-	3.3		5.7	0	4.8	-	5.0
Ref No.	IC56106						IC56107													
MODE	1	2	3	4	5		1	2	3	4	5									
REC	2.5	3.2	1.2	1.2	0		-	1.6	0	1.5	3.3									
PLAY	2.5	3.2	1.2	1.2	0		-	1.6	0	1.5	3.3									
STOP	2.5	3.2	1.2	1.2	0		-	1.6	0	1.5	3.3									
Ref No.	Q56001				Q56002				Q56101				Q56102				Q56103			
MODE	E	C	B		E	C	B		E	C	B		S	D	G		S	D	G	
REC	0	4.5	0		0	0	0.6		0	3.2	0		0.1	0.1	3.3		0.1	0.1	3.3	
PLAY	0	4.5	0		0	0	0.6		0	3.2	0		0.1	0.1	3.3		0.1	0.1	3.3	
STOP	0	4.5	0		0	0	0.6		0	3.2	0		0.1	0.1	3.3		0.1	0.1	3.3	
Ref No.	Q56104				Q56105															
MODE	E	C	B		E	C	B													
REC	3.4	3.0	3.4		0	3.0	0													
PLAY	3.4	3.0	3.4		0	3.0	0													
STOP	3.4	3.0	3.4		0	3.0	0													

14.1.4. P59001 Connector

Ref No.	P59001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	0	0	0	0	0	0	0	0	0	3.3	12.3	4.9	12.3	3.3	0	4.9	0
PLAY	0	0	0	0	0	0	0	0	0	0	0	0	3.3	12.3	4.9	12.3	3.3	0	4.9	0
STOP	0	0	0	0	0	0	0	0	0	0	0	0	3.3	12.3	4.9	12.3	3.3	0	4.9	0
Ref No.	P59001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	3.3	5.1	3.3	5.1	5.0	3.3	2.3	3.1	2.5	4.9	2.5	3.3	0	3.3	0	3.3	0	3.3	2.5	-
PLAY	3.3	5.1	3.3	5.1	5.0	3.3	2.3	3.1	2.5	4.9	2.5	3.3	0	3.3	0	3.3	0	3.3	2.5	-
STOP	3.3	5.1	3.3	5.1	5.0	3.3	2.3	3.2	2.5	4.9	2.5	3.3	0	3.3	0	3.3	0	3.3	2.5	-
Ref No.	P59001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.5	3.2	0	1.7	0	0	0	3.3	0	3.3	1.1	-	0	0.3	1.5	3.3	0	-	1.0	4.8
PLAY	2.5	3.2	0	1.7	0	0	0	3.3	0	3.3	1.1	-	0	0.3	1.5	3.3	0	-	1.0	4.8
STOP	2.5	3.2	0	1.7	0	0	0	3.3	0	3.3	1.1	-	0	0.3	1.5	3.3	0	-	1.0	4.8
Ref No.	P59001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	0	4.8	1.1	12.3	0	12.3	1.0	12.3	0	12.3	1.3	12.3	0	12.3	2.1	5.0	0	0	-	-
PLAY	0	4.8	1.1	12.3	0	12.3	1.0	12.3	0	12.3	1.3	12.3	0	12.3	2.1	5.0	0	0	-	-
STOP	0	4.8	1.1	12.3	0	12.3	1.0	12.3	0	12.3	1.3	12.3	0	12.3	2.1	5.0	0	0	-	-
Ref No.	P59001																			
MODE	81	82	83	84	85	86	87	88												
REC	0	0	0	.33	0	0	0	0												
PLAY	0	0	0	0.3	0	0	0	0												
STOP	0	0	0	0.3	0	0	0	0												

14.1.5. Waveform Chart

 T1150-4 STOP 8.6Vp-p (50 μ sec.div)	 T1150-5,6 STOP 34Vp-p (50 μ sec.div)	 T1150-12 STOP 10Vp-p (2m sec.div)	 IC1150-1 STOP 8.0Vp-p (50 μ sec.div)
 IC1150-9 STOP 580Vp-p (50 μ sec.div)	 P7402-29,31 REC/PLAY 0.8Vp-p (1m sec.div)	 P7402-51 REC/PLAY 1.0Vp-p (20 μ sec.div)	 P7402-55 REC/PLAY 0.8Vp-p (20 μ sec.div)
 P7402-59 REC/PLAY 0.6Vp-p (20 μ sec.div)	 P7402-63 REC/PLAY 1.0Vp-p (20 μ sec.div)	 P7402-67 REC/PLAY 0.6Vp-p (20 μ sec.div)	 P7402-71 REC/PLAY 1.0Vp-p (20 μ sec.div)
 JK3903-2 REC/PLAY 1.0Vp-p (20 μ sec.div)	 JK3903-4 REC/PLAY 1.0Vp-p (20 μ sec.div)	 JK3903-6 REC/PLAY 2.0Vp-p (20 μ sec.div)	

14.1.6. Abbreviations

INITIAL/LOGO		ABBREVIATIONS
A	A0~UP	ADDRESS
	ACLK	AUDIO CLOCK
	AD0~UP	ADDRESS BUS
	ADATA	AUDIO PES PACKET DATA
	ALE	ADDRESS LATCH ENABLE
	AMUTE	AUDIO MUTE
	AREQ	AUDIO PES PACKET REQUEST
	ARF	AUDIO RF
	ASI	SERVO AMP INVERTED INPUT
	ASO	SERVO AMP OUTPUT
	ASYNC	AUDIO WORD DISTINCTION SYNC
B	BCK	BIT CLOCK (PCM)
	BCKIN	BIT CLOCK INPUT
	BDO	BLACK DROP OUT
	BLKCK	SUB CODE BLOCK CLOCK
	BOTTOM	CAP. FOR BOTTOM HOLD
	BYP	BYPATH
	BYTCK	BYTE CLOCK
C	CAV	CONSTANT ANGULAR VELOCITY
	CBDO	CAP. BLACK DROP OUT
	CD	COMPACT DISC
	CDSCK	CD SERIAL DATA CLOCK
	CDSRDATA	CD SERIAL DATA
	CDRF	CD RF (EFM) SIGNAL
	CDV	COMPACT DISC-VIDEO
	CHNDATA	CHANNEL DATA
	CKSL	SYSTEM CLOCK SELECT
	CLV	CONSTANT LINEAR VELOCITY
	COFTR	CAP. OFF TRACK
	CPA	CPU ADDRESS
	CPCS	CPU CHIP SELECT
	CPDT	CPU DATA
	CPUADR	CPU ADDRESS LATCH
	CPUADT	CPU ADDRESS DATA BUS
	CPUIRQ	CPU INTERRUPT REQUEST
	CPRD	CPU READ ENABLE
	CPWR	CPU WRITE ENABLE
	CS	CHIP SELECT
	CSYNCIN	COMPOSITE SYNC IN
	CSYNCOUT	COMPOSITE SYNC OUT
D	DACCK	D/A CONVERTER CLOCK
	DEEMP	DEEMPHASIS BIT ON/OFF
	DEMPH	DEEMPHASIS SWITCHING
	DIG0~UP	FL DIGIT OUTPUT
	DIN	DATA INPUT
	DMSRCK	DM SERIAL DATA READ CLOCK
	DMUTE	DIGITAL MUTE CONTROL
	DO	DROP OUT
	DOUT0~UP	DATA OUTPUT
	DRF	DATA SLICE RF (BIAS)
	DRPOUT	DROP OUT SIGNAL
	DREQ	DATA REQUEST
	DRESP	DATA RESPONSE
	DSC	DIGITAL SERVO CONTROLLER
	DSLF	DATA SLICE LOOP FILTER
	DVD	DIGITAL VIDEO DISC

INITIAL/LOGO		ABBREVIATIONS
E	EC	ERROR TORQUE CONTROL
	ECR	ERROR TORQUE CONTROL REFERENCE
	ENCSEL	ENCODER SELECT
	ETMCLK	EXTERNAL M CLOCK (81MHz/40.5MHz)
	ETSCLK	EXTERNAL S CLOCK (54MHz)
F	FBAL	FOCUS BALANCE
	FCLK	FRAME CLOCK
	FE	FOCUS ERROR
	FFI	FOCUS ERROR AMP INVERTED INPUT
	FEO	FOCUS ERROR AMP OUTPUT
	FG	FREQUENCY GENERATOR
	FSC	FREQUENCY SUB CARRIER
	FSCK	FS (384 OVER SAMPLING) CLOCK
G	GND	COMMON GROUNDING (EARTH)
H	HA0~UP	HOST ADDRESS
	HD0~UP	HOST DATA
	HINT	HOST INTERRUPT
	HRXW	HOST READ/WRITE

INITIAL/LOGO		ABBREVIATIONS
I	IECOUT	IEC958 FORMAT DATA OUTPUT
	IPFRAG	INTERPOLATION FLAG
	IREF	I (CURRENT) REFERENCE
	ISEL	INTERFACE MODE SELECT
L	LDON	LASER DIODE CONTROL
	LPC	LASER POWER CONTROL
	LRCK	L CH/R CH DISTINCTION CLOCK
M	MA0~UP	MEMORY ADDRESS
	MCK	MEMORY CLOCK
	MCKI	MEMORY CLOCK INPUT
	MCLK	MEMORY SERIAL COMMAND CLOCK
	MDATA	MEMORY SERIAL COMMAND DATA
	MDQ0~UP	MEMORY DATA INPUT/OUTPUT
	MDQM	MEMORY DATA I/O MASK
	MLD	MEMORY SERIAL COMMAND LOAD
	MPEG	MOVING PICTURE EXPERTS GROUP
O	ODC	OPTICAL DISC CONTROLLER
	OFTR	OFF TRACKING
	OSCI	OSCILLATOR INPUT
	OSCO	OSCILLATOR OUTPUT
	OSD	ON SCREEN DISPLAY
P	P1~UP	PORT
	PCD	CD TRACKING PHASE DIFFERENCE
	PCK	PLL CLOCK
	PDVD	DVD TRACKING PHASE DIFFERENCE
	PEAK	CAP. FOR PEAK HOLD
	PLLCLK	CHANNEL PLL CLOCK
	PLLOK	PLL LOCK
	PWMCTL	PWM OUTPUT CONTROL
	PWMDA	PULSE WAVE MOTOR DRIVE A
	PWMOA, B	PULSE WAVE MOTOR OUT A, B

INITIAL/LOGO		ABBREVIATIONS
R	RE	READ ENABLE
	RFENV	RF ENVELOPE
	RFO	RF PHASE DIFFERENCE OUTPUT
	RS	(CD-ROM) REGISTER SELECT
	RSEL	RF POLARITY SELECT
	RST	RESET
	RSV	RESERVE
S	SBI0, 1	SERIAL DATA INPUT
	SBO0	SERIAL DATA OUTPUT
	SBT0, 1	SERIAL CLOCK
	SCK	SERIAL DATA CLOCK
	SCKR	AUDIO SERIAL CLOCK RECEIVER
	SCL	SERIAL CLOCK
	SCLK	SERIAL CLOCK
	SDA	SERIAL DATA
	SEG0~UP	FL SEGMENT OUTPUT
	SELCLK	SELECT CLOCK
	SEN	SERIAL PORT ENABLE
	SIN1, 2	SERIAL DATA IN
	SOUT1, 2	SERIAL DATA OUT
	SPDI	SERIAL PORT DATA INPUT
	SPDO	SERIAL PORT DATA OUTPUT
	SPEN	SERIAL PORT R/W ENABLE
	SPRCLK	SERIAL PORT READ CLOCK
	SPWCLK	SERIAL PORT WRITE CLOCK
	SQCK	SUB CODE Q CLOCK
	SQCX	SUB CODE Q DATA READ CLOCK
	SRDATA	SERIAL DATA
	SRMADR	SRAM ADDRESS BUS
	SRMDT0~7	SRAM DATA BUS 0~7
	SS	START/STOP
	STAT	STATUS
	STCLK	STREAM DATA CLOCK
	STD0~UP	STREAM DATA
	STENABLE	STREAM DATA INPUT ENABLE
	STSEL	STREAM DATA POLARITY SELECT
	STVALID	STREAM DATA VALIDITY
	SUBC	SUB CODE SERIAL
	SBCK	SUB CODE CLOCK
	SUBQ	SUB CODE Q DATA
	SYSCLK	SYSTEM CLOCK

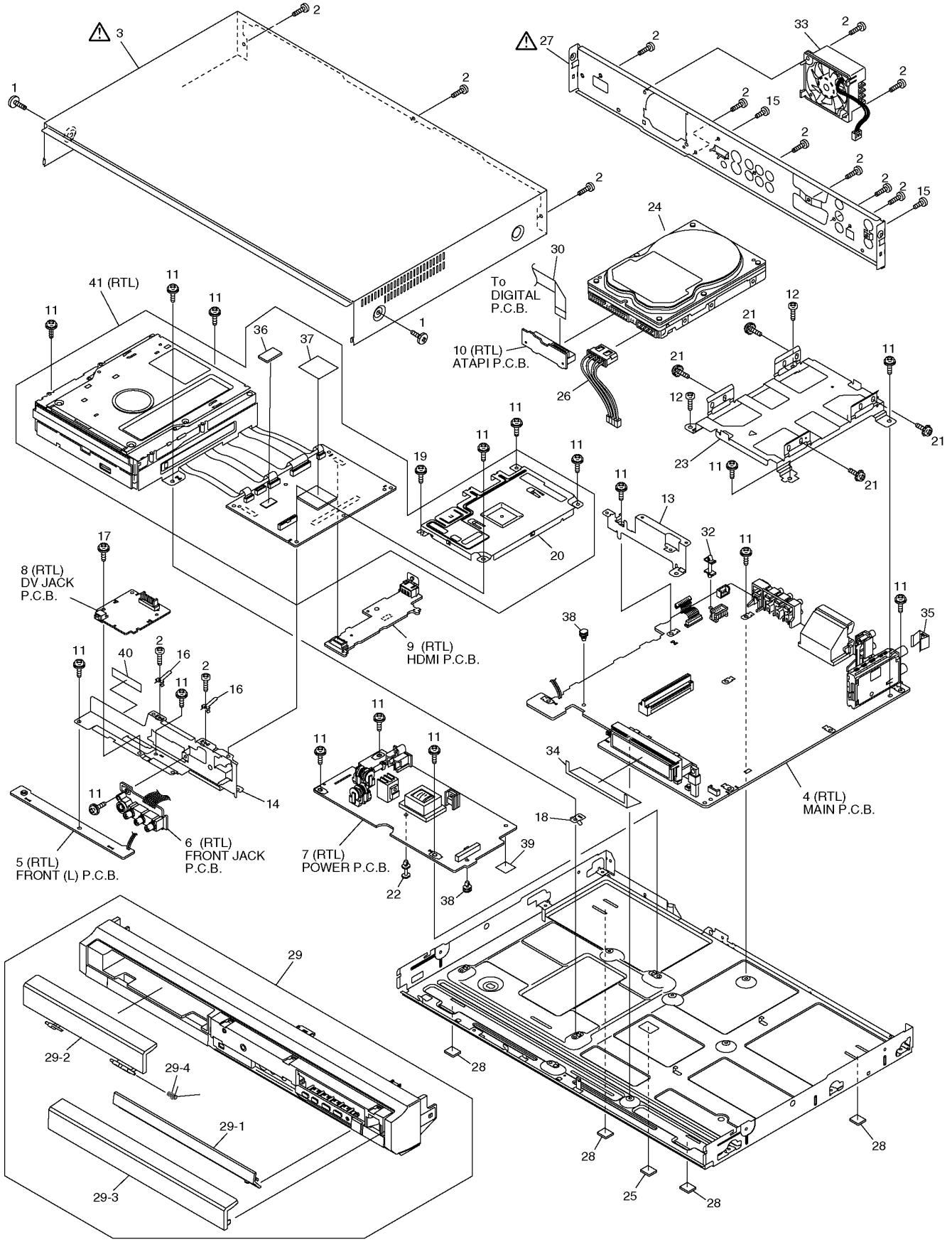
INITIAL/LOGO		ABBREVIATIONS
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VCDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER
X	X	X´ TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X´ TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X´ TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS STROBE
	XVSYNCO	X VERTICAL SYNC OUTPUT

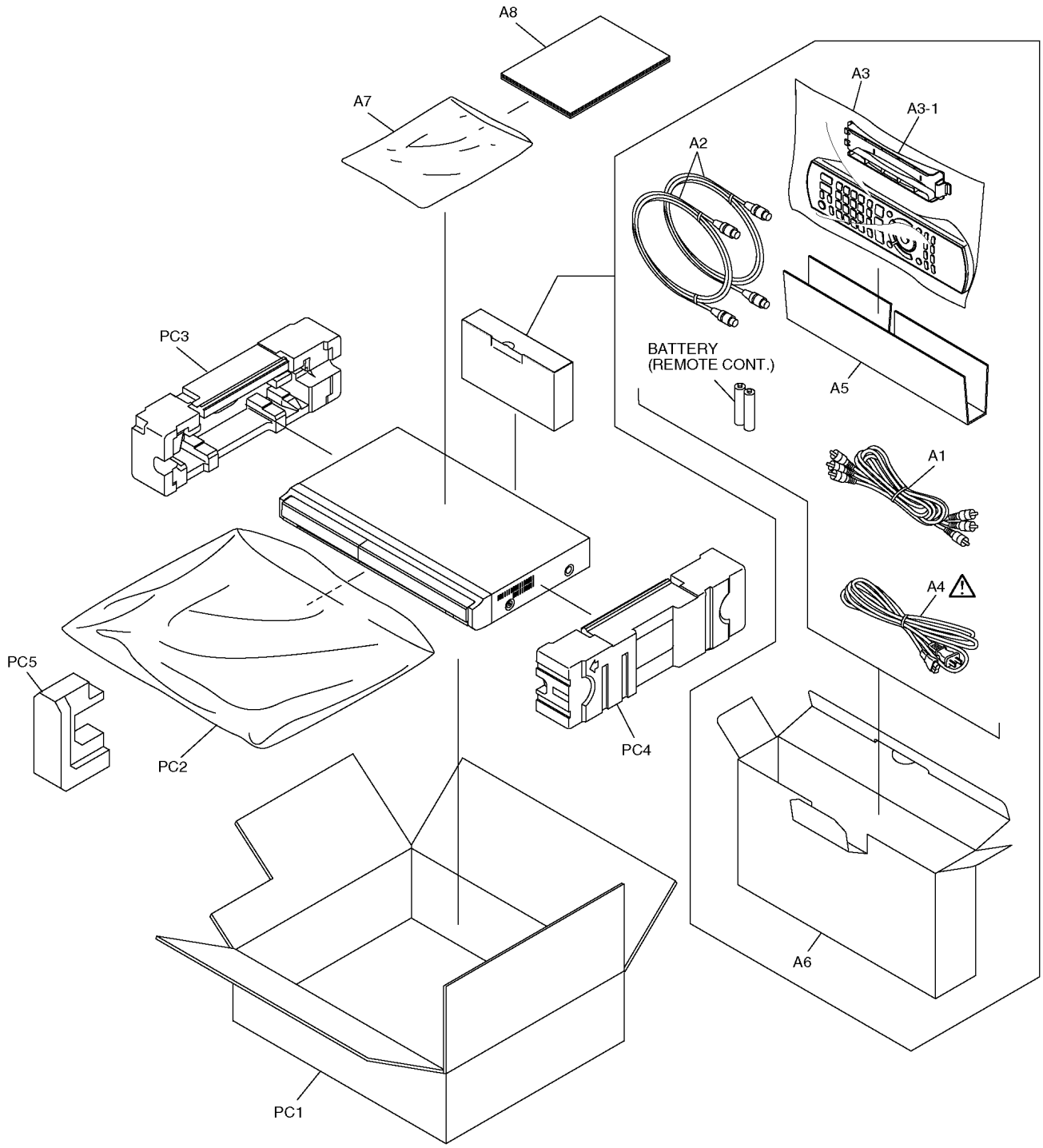
15 Parts and Exploded Views

15.1. Exploded Views

15.1.1. Casing Parts & Mechanism Section



15.1.2. Packing & Accessories Section



15.2. Replacement Parts List

Notes:

*Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

*Capacity values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

*"(IA)", mark in Remarks indicates language of instruction manual. [(IA): English]

*Parts indicated with PAVC-CSG in the Remarks column are supplied by PAVC-CSG.

*All parts except parts indicated with (PAVC-CSG) in the Remarks column are supplied by PAVCSG.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	RFKB79156DT	MAIN P.C.B.	1	
C1501	ECJ2FB1A225K	10V 2.2U	1	
C1502	ECJ1VB1H103K	50V 0.01U	1	
C1503	F2A1A681A870	10V 680P	1	
C1504	F2A1C101B110	16V 100P	1	
C1505	ECJ1VC1H221J	50V 220P	1	
C1506	F1H1A105A028	10V 1U	1	
C1508	F1H1A105A028	10V 1U	1	
C1509	ECJ1VB1H103K	50V 0.01U	1	
C1510	F1H1A105A028	10V 1U	1	
C1511	F1H1A105A028	10V 1U	1	
C1512	F1H1A105A028	10V 1U	1	
C1516	F2A1H1510006	50V 150P	1	
C1518	F2A0J681A833	6.3V 680P	1	
C1521	F2A1C121A453	16V 120P	1	
C1523	F2A1A470A388	10V 47U	1	
C1524	F2A1A101A389	10V 100U	1	
C1525	F1H1C104A071	16V 0.1U	1	
C1526	F1H1A105A028	10V 1U	1	
C1527	F1H1A105A028	10V 1U	1	
C1528	F1K1C105A026	16V 1U	1	
C1529	F2A1A470A388	10V 47U	1	
C1535	F1H1A105A028	10V 1U	1	
C1536	F1J0J106A014	6.3V 10U	1	
C1541	F2A1E1010067	25V 100U	1	
C1545	F2A1C470B110	16V 47P	1	
C1548	F2A1C121A453	16V 120P	1	
C1549	F2A1C121A453	16V 120P	1	
C1560	F2A0J101A825	6.3V 100U	1	
C3001	F1H1C104A071	16V 0.1U	1	
C3002	ECJ1VB1H103K	50V 0.01U	1	
C3003	F1H1C104A071	16V 0.1U	1	
C3004	F1H1C104A071	16V 0.1U	1	
C3005	F2A0J471A832	6.3V 470P	1	
C3006	F2A0J471A832	6.3V 470P	1	
C3007	F2A1A471A869	10V 470P	1	
C3008	F2A1A101A868	10V 100U	1	
C3009	F2A1A471A869	10V 470P	1	
C3010	F2A1A101A868	10V 100U	1	
C3011	F1H1C104A071	16V 0.1U	1	
C3012	F2A1A471A869	10V 470P	1	
C3013	F2A1A101A868	10V 100U	1	
C3014	F1H1C104A071	16V 0.1U	1	
C3015	F1H1C104A071	16V 0.1U	1	
C3016	F1H1C104A071	16V 0.1U	1	
C3017	F1H1C104A071	16V 0.1U	1	
C3018	F1H1C104A071	16V 0.1U	1	
C3019	F1H1C104A071	16V 0.1U	1	
C3020	F1H1C104A071	16V 0.1U	1	
C3021	F1H1C104A071	16V 0.1U	1	
C3022	F1H1C104A071	16V 0.1U	1	
C3023	ECJ1VC1H330J	50V 33P	1	
C3025	F1H1C104A071	16V 0.1U	1	
C3026	ECJ1VB0J105K	6.3V 1U	1	
C3027	F1H1C104A071	16V 0.1U	1	
C3028	ECJ1VB0J105K	6.3V 1U	1	
C3029	F1H1C104A071	16V 0.1U	1	
C3030	ECJ1VB0J105K	6.3V 1U	1	
C3031	ECJ1VB1H103K	50V 0.01U	1	
C3032	F2A0J101A167	6.3V 100P	1	
C3033	ECJ1VB1H103K	50V 0.01U	1	
C3034	ECJ1VB1H103K	50V 0.01U	1	
C3035	F2A0J101A167	6.3V 100P	1	
C3038	F1H1C104A071	16V 0.1U	1	
C3039	F1H1C104A071	16V 0.1U	1	
C3057	ECJ1VC1H471J	50V 470P	1	
C3058	ECJ1VC1H471J	50V 470P	1	
C3059	ECJ1VC1H471J	50V 470P	1	
C3060	ECJ1VC1H471J	50V 470P	1	
C3064	F1H1C104A071	16V 0.1U	1	
C3065	ECJ1VB0J105K	6.3V 1U	1	
C3910	F2A1H100A236	50V 10U	1	
C3911	F2A1H100A236	50V 10U	1	
C3914	F2A1H100A236	50V 10U	1	
C3915	F2A1H100A236	50V 10U	1	
C3916	F2A1H1R0A236	50V 1U	1	
C3917	F2A1H1R0A236	50V 1U	1	
C3918	F2A1H100A236	50V 10U	1	
C3919	F2A1H100A236	50V 10U	1	
C3928	F2A1H1R0A638	50V 1U	1	
C3929	F2A1H1R0A638	50V 1U	1	
C3935	F2A1E2210050	25V 220U	1	
C3951	F1H1H470A799	50V 47P	1	
C3952	F1H1H470A799	50V 47P	1	
C3953	ECJ1VC1H471J	50V 470P	1	
C3954	ECJ1VC1H471J	50V 470P	1	
C3955	ECJ1VC1H101J	50V 100P	1	
C3956	ECJ1VC1H101J	50V 100P	1	
C3957	ECJ1VC1H471J	50V 470P	1	
C3958	ECJ1VC1H471J	50V 470P	1	
C3959	F1H1H470A799	50V 47P	1	
C3960	F1H1H470A799	50V 47P	1	
C3961	ECJ1VC1H101J	50V 100P	1	
C3962	ECJ1VC1H101J	50V 100P	1	
C4005	F2A1H100A236	50V 10U	1	
C4006	F2A1H100A236	50V 10U	1	
C4008	F2A1E1010067	25V 100U	1	
C4019	F2A1V100A534	35V 10U	1	
C4021	F2A1V100A534	35V 10U	1	
C4023	F2A1H1R0A236	50V 1U	1	
C4024	F2A1E1010067	25V 100U	1	
C4025	F2A1H1R0A236	50V 1U	1	
C4027	F2A1H100A236	50V 10U	1	
C4028	F2A1H100A236	50V 10U	1	
C4033	F2A1C220B173	16V 22P	1	
C4034	F2A1C220B173	16V 22P	1	
C4055	ECJ1VF1C104Z	16V 0.1U	1	
C4056	F2A1A471A550	10V 470U	1	
C4057	F1J1H330A688	50V 33U	1	
C4059	ECQV1H104JL3	50V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C4060	F1J1H330A688	50V 33U	1	
C4061	ECJ1VF1C104Z	16V 0.1U	1	
C4062	F2A1A471A550	10V 470U	1	
C4063	F2A1C220B173	16V 22P	1	
C4064	F2A1C220B173	16V 22P	1	
C4065	ECJ1VF1C104Z	16V 0.1U	1	
C4067	F2A1E2210050	25V 220U	1	
C4070	F2A1A471A550	10V 470U	1	
C4072	F2A1C470A637	16V 47U	1	
C4082	ECJ2VC1H102J	50V 1000P	1	
C4083	ECJ2VC1H102J	50V 1000P	1	
C4092	F2A1C221A637	16V 220U	1	
C4902	ECJ1VF1C104Z	16V 0.1U	1	
C4903	F2A0J470A599	6.3V 47U	1	
C4904	F1H1C104A071	16V 0.1U	1	
C7301	F1H1C104A071	16V 0.1U	1	
C7302	ECJ2VC1H102J	50V 1000P	1	
C7303	F2A0J101A825	6.3V 100U	1	
C7305	F2A0J101A825	6.3V 100U	1	
C7307	ECJ1VC1H100D	50V 10P	1	
C7308	ECJ1VC1H100D	50V 10P	1	
C7309	ECJ1VC1H101J	50V 100P	1	
C7310	ECJ1VC1H101J	50V 100P	1	
C7314	ECJ1VC1H330J	50V 33P	1	
C7317	F2A0J470A245	6.3V 47U	1	
C7319	F1H1C104A071	16V 0.1U	1	
C7324	F1H1C104A071	16V 0.1U	1	
C7330	ERJ3GEYJ822V	1/10W 8.2K	1	
C7332	F1H1C104A071	16V 0.1U	1	
C7333	F1H1C104A071	16V 0.1U	1	
C7334	F2A1H2R2A234	50V 2.2U	1	
C7335	F1H1C104A071	16V 0.1U	1	
C7401	F2A1C471A628	16V 470U	1	
C7404	F1H1A105A028	10V 1U	1	
C7406	F1H1A105A028	10V 1U	1	
C7408	ECJ1VB1H102K	50V 1000P	1	
C7409	ECJ1VB1H102K	50V 1000P	1	
C7410	ECJ1VB1H102K	50V 1000P	1	
C7412	F1H1A105A028	10V 1U	1	
C7413	F1H1A105A028	10V 1U	1	
C7415	F1K1C105A026	16V 1U	1	
C7417	F1H1C104A071	16V 0.1U	1	
C7439	F1H1C104A071	16V 0.1U	1	
C7449	ECJ1VB1H102K	50V 1000P	1	
C7501	F1J0J475A008	6.3V 4.7U	1	
C7502	ECJ1VC1H101J	50V 100P	1	
C7503	F1J0J475A008	6.3V 4.7U	1	
C7504	F1H1C104A071	16V 0.1U	1	
C7506	ECJ1VC1H221J	50V 220P	1	
C7507	F1H1C104A071	16V 0.1U	1	
C7508	ECJ1VC1H221J	50V 220P	1	
C7509	ECJ1VB1H104K	50V 0.1U	1	
C7510	F1H1C104A071	16V 0.1U	1	
C7511	F1H1C104A071	16V 0.1U	1	
C7512	F1H1C104A071	16V 0.1U	1	
C7514	ECJ1VB1H103K	50V 0.01U	1	
C7516	ECJ1VC1H180J	50V 18P	1	
C7517	ECJ1VC1H180J	50V 18P	1	
C7518	F1H1H220A799	50V 22P	1	
C7519	ECJ1VC1H180J	50V 18P	1	
C7520	F1H1C104A071	16V 0.1U	1	
C7521	F2A0J470A824	6.3V 47P	1	
C7522	ECJ1VC1H101J	50V 100P	1	
C7523	F1H1A105A028	10V 1U	1	
C7524	F1H1C104A071	16V 0.1U	1	
C7528	ECJ1VB0J105K	6.3V 1U	1	
C7531	ECJ1VC1H100D	50V 10P	1	
C7532	ECJ1VC1H100D	50V 10P	1	
C7533	ECJ1VC1H100D	50V 10P	1	
C7534	ECJ1VB1H103K	50V 0.01U	1	
C7535	ECJ1VC1H100D	50V 10P	1	
C7541	F1H1H470A799	50V 47P	1	
C7542	F1H1C104A071	16V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7543	F1H1H470A799	50V 47P	1	
C7544	F1H1C104A071	16V 0.1U	1	
C7546	ECJ1VB0J105K	6.3V 1U	1	
C7554	ECJ1VB1H103K	50V 0.01U	1	
C7556	ECJ1VB1H102K	50V 1000P	1	
C7557	ECJ1VB1H102K	50V 1000P	1	
C7558	ECJ1VB1H102K	50V 1000P	1	
C7565	F2A1C2210095	16V 220P	1	
C7569	ECQB1H392KF3	50V 3900P	1	
C7570	F2A1V560A387	35V 56U	1	
C7571	F2A1H100A454	50V 10U	1	
C7572	F2A1C121A453	16V 120P	1	
C7573	F2A1H100B034	50V 10U	1	
C7578	F2A0J470A824	6.3V 47P	1	
C7584	F4D55473A013	5.5V 0.047U	1	
C7585	F2A1A101A864	10V 100U	1	
C7587	ECJ1VB0J105K	6.3V 1U	1	
C7592	F2A0J470A824	6.3V 47P	1	
C7801	F2A0J470A824	6.3V 47P	1	
C7802	ECJ1VB1H103K	50V 0.01U	1	
C7803	F2A1H1R0B032	50V 1U	1	
C7804	ECJ1VB1H103K	50V 0.01U	1	
C7807	ECJ1VC1H330J	50V 33P	1	
C7808	ECJ1VC1H330J	50V 33P	1	
C7809	F2A0J470A824	6.3V 47P	1	
C7810	ECJ1VB1H103K	50V 0.01U	1	
C7811	F2A0J470A824	6.3V 47P	1	
C7812	ECJ1VB1H103K	50V 0.01U	1	
C7813	F1H1H222A798	50V 2200P	1	
C7820	F1H1H681A799	50V 0.68U	1	
C7821	ECJ1VC1H271J	50V 270P	1	
C7823	F1H1H220A799	50V 22P	1	
C7824	F1J1H220A688	50V 22U	1	
C7826	F1H1H222A798	50V 2200P	1	
D1502	MAZ40390HF	DIODE	1	
D3901	MA2C165001VT	DIODE	1	
D4005	MA3Z142D0LG	DIODE	1	
D4006	MA3Z142D0LG	DIODE	1	
D7501	B0BA03600021	DIODE	1	
D7502	B0JAMG000031	DIODE	1	
D7504	MAZ4220NLF	DIODE	1	
D7505	B0AADM000003	DIODE	1	
D7506	B0AADM000003	DIODE	1	
D7507	B0JAMD000026	DIODE	1	
D7508	MAZ4180NHF	DIODE	1	
D7510	MA2C165001VT	DIODE	1	
D7511	B0ACCK000005	DIODE	1	
D7801	B0BA03000015	DIODE	1	
DP7501	A2BB00000163	DIODE	1	
FC7001	VWJ02H5065VV	WIRE(2P)	1	
IC1501	C0EBE0000550	IC	1	
IC1506	C0DAEYH00002	IC	1	
IC1510	C0DBEHE00005	IC	1	
IC1520	C0CBCDC00052	IC	1	
IC1521	C0CBCBD00048	IC	1	
IC3001	C1AB00002379	IC	1	
IC4001	C0DBAHD00013	IC	1	
IC4009	C0ABBB000216	IC	1	
IC4012	C0ABBB000230	IC	1	
IC4901	B3ZAZ0000017	IC	1	
IC7301	C1AB00002225	IC	1	
IC7302	C0EBH0000454	IC	1	
IC7401	C0CBCYG00004	IC	1	
IC7402	C0CBCDC00052	IC	1	
IC7403	C0CBCDC00052	IC	1	
IC7404	RFKFM6016KT	IC	1	
IC7501	C2CBJG000737	IC	1	
IC7503	C5HBZHC00001	IC	1	
IC7504	C0HBB0000057	IC	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
IP1501	ERBSE3R00U	IC PROTECTOR	1	⚠
IP7501	K5H751Z00003	IC PROTECTOR	1	⚠
IP7502	K5H751Z00003	IC PROTECTOR	1	⚠
IR7501	B3RAD0000137	REMOTE SENSOR	1	
JK3001	K2HE219B0004	JACK,OUT/IN1	1	
JK3901	K1FB242B0007	JACK,AV2	1	
JK3903	K2HA304B0007	JACK,COMPONENT VIDEO OUT	1	
JW3001	VWJ08H4072VV	WIRE(8P)	1	
K3001	ERJ3GEY0R00V	1/10W 0	1	
K3002	ERJ3GEY0R00V	1/10W 0	1	
K3003	ERJ3GEY0R00V	1/10W 0	1	
K3007	ERJ3GEY0R00V	1/10W 0	1	
K7303	ERJ3GEY0R00V	1/10W 0	1	
K7503	ERJ3GEY0R00V	1/10W 0	1	
K7506	ERJ3GEY0R00V	1/10W 0	1	
K7509	ERJ3GEY0R00V	1/10W 0	1	
K7513	ERJ3GEY0R00V	1/10W 0	1	
K7516	ERJ3GEY0R00V	1/10W 0	1	
K7517	ERJ3GEY0R00V	1/10W 0	1	
K7801	ERJ3GEY0R00V	1/10W 0	1	
K7803	ERJ3GEY0R00V	1/10W 0	1	
K7804	ERJ3GEY0R00V	1/10W 0	1	
L1504	G0A220GA0026	COIL 22UH	1	
L1505	G0A100HA0023	COIL 10UH	1	
L4901	G0C220JA0019	COIL 22UH	1	
L7303	G0C1R0JA0019	COIL 1UH	1	
L7304	G0C3R9JA0019	COIL	1	
L7501	G0C390JA0055	COIL 39UH	1	
L7502	G0C220JA0019	COIL 22UH	1	
LB1501	ERJ3GEY0R00V	1/10W 0	1	
LB1502	J0JKB0000003	COIL	1	
LB1503	J0JKB0000003	COIL	1	
LB1504	J0JKB0000003	COIL	1	
LB1505	ERJ3GEY0R00V	1/10W 0	1	
LB1506	J0JKB0000003	COIL	1	
LB1507	J0JHC0000032	COIL	1	
LB1510	J0JKB0000003	COIL	1	
LB3001	J0JGC0000020	COIL	1	
LB3002	J0JGC0000020	COIL	1	
LB3003	J0JGC0000020	COIL	1	
LB3005	J0JBC0000011	COIL	1	
LB3006	J0JGC0000020	COIL	1	
LB3007	J0JBC0000011	COIL	1	
LB3008	J0JGC0000020	COIL	1	
LB3907	J0JBC0000011	COIL	1	
LB3908	J0JBC0000011	COIL	1	
LB3911	J0JGC0000020	COIL	1	
LB3912	J0JBC0000011	COIL	1	
LB3913	J0JBC0000011	COIL	1	
LB7301	J0JCC0000124	COIL	1	
LB7302	J0JCC0000124	COIL	1	
LB7303	J0JCC0000080	COIL	1	
LB7304	J0JHC0000032	COIL	1	
LB7305	J0JCC0000080	COIL	1	
LB7402	J0JKB0000012	COIL	1	
LB7403	J0JHC0000032	COIL	1	
LB7404	J0JKB0000012	COIL	1	
LB7405	J0JKB0000012	COIL	1	
LB7406	J0JDC0000092	COIL	1	
LB7407	J0JKB0000003	COIL	1	
LB7409	J0JKB0000003	COIL	1	
LB7411	J0JCC0000164	COIL	1	
LB7412	J0JCC0000164	COIL	1	
LB7413	J0JCC0000164	COIL	1	
LB7414	J0JCC0000164	COIL	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
LB7415	J0JCC0000103	COIL	1	
LB7416	J0JCC0000164	COIL	1	
LB7417	J0JCC0000103	COIL	1	
LB7418	J0JCC0000103	COIL	1	
LB7419	J0JCC0000103	COIL	1	
LB7420	J0JCC0000164	COIL	1	
LB7421	J0JCC0000103	COIL	1	
LB7422	J0JKB0000012	COIL	1	
LB7509	J0JCC0000060	COIL	1	
LB7801	J0JHC0000032	COIL	1	
LB7802	J0JHC0000032	COIL	1	
LB7803	J0JHC0000032	COIL	1	
LB7804	J0JCC0000103	COIL	1	
P1501	K1KA15A00118	CONNECTOR(15P)	1	
P1503	K1KA04AA0180	CONNECTOR(4P)	1	
P7402	K1KA88A00002	CONNECTOR(88P)	1	
P7501	K1KA10A00258	CONNECTOR(10P)	1	
P7502	K1KA03AA0180	CONNECTOR(3P)	1	
Q1501	B1DHDC000027	TRANSISTOR	1	
Q1502	2SD1819A0L	TRANSISTOR	1	
Q1509	B1DHED000008	TRANSISTOR	1	
Q4006	2SD132800L	TRANSISTOR	1	
Q4007	2SD132800L	TRANSISTOR	1	
Q4008	2SD132800L	TRANSISTOR	1	
Q4009	2SD132800L	TRANSISTOR	1	
Q4060	2SD1819A0L	TRANSISTOR	1	
Q7403	2SD1819A0L	TRANSISTOR	1	
Q7501	2SB1218A0L	TRANSISTOR	1	
Q7502	2SD1819A0L	TRANSISTOR	1	
Q7503	2SB1218A0L	TRANSISTOR	1	
Q7504	2SD1819A0L	TRANSISTOR	1	
Q7505	2SD1819A0L	TRANSISTOR	1	
Q7509	2SD0601A0L	TRANSISTOR	1	
Q7510	2SC43910R1VT	TRANSISTOR	1	
Q7511	2SB0709A0L	TRANSISTOR	1	
Q7514	2SD0601A0L	TRANSISTOR	1	
Q7515	2SD1819A0L	TRANSISTOR	1	
Q7516	2SD1819A0L	TRANSISTOR	1	
Q7517	2SD1819A0L	TRANSISTOR	1	
QR1501	UNR521300L	TRANSISTOR	1	
QR1503	UNR521300L	TRANSISTOR	1	
QR4002	UNR511100L	TRANSISTOR	1	
QR7401	UNR521300L	TRANSISTOR	1	
QR7402	UNR511200L	TRANSISTOR	1	
QR7507	UNR521000L	TRANSISTOR	1	
QR7508	UNR521400L	TRANSISTOR	1	
R1502	ERJ3GEYJ103V	1/10W 10K	1	
R1503	ERJ3GEYJ331V	1/10W 330	1	
R1505	ERJ3GEYJ823V	1/10W 82K	1	
R1506	ERJ3GEYJ222V	1/10W 2.2K	1	
R1507	ERJ3GEYJ822V	1/10W 8.2K	1	
R1509	ERJ3RBD393V	1/16W 39K	1	
R1510	ERJ3RBD113V	1/16W 11K	1	
R1511	ERJ3RBD152V	1/16W 1.5K	1	
R1518	ERJ3GEYJ223V	1/10W 22K	1	
R1519	ERJ3GEYJ223V	1/10W 22K	1	
R1535	ERJ3RBD103V	1/16W 10K	1	
R1536	ERJ3RBD273V	1/16W 27K	1	
R1537	ERJ3RBD392V	1/16W 3.9K	1	
R3002	ERJ3GEYJ102V	1/10W 1K	1	
R3005	ERJ3GEYJ102V	1/10W 1K	1	
R3007	ERJ3GEYJ330V	1/10W 33	1	
R3008	ERJ3GEYJ102V	1/10W 1K	1	
R3009	ERJ3GEYJ102V	1/10W 1K	1	
R3037	ERJ3GEYJ104V	1/10W 100K	1	
R3054	ERJ3GEYJ750V	1/10W 75	1	
R3055	ERJ3GEYJ750V	1/10W 75	1	
R3056	ERJ3GEYJ750V	1/10W 75	1	
R3057	ERJ3GEYJ750V	1/10W 75	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R3058	ERJ3GEYJ750V	1/10W 75	1	
R3059	ERJ3GEYJ750V	1/10W 75	1	
R3901	ERJ3GEYF750V	1/10W 75	1	
R3902	ERJ3GEYF750V	1/10W 75	1	
R3903	ERJ3GEYF750V	1/10W 75	1	
R3905	ERJ3GEYJ153V	1/10W 15K	1	
R3906	ERJ3GEYJ223V	1/10W 22K	1	
R3912	ERJ3GEYJ103V	1/10W 10K	1	
R3913	ERJ3GEYJ103V	1/10W 10K	1	
R3914	ERJ3GEYJ471V	1/10W 470	1	
R3918	ERJ3GEYJ471V	1/10W 470	1	
R3919	ERJ3GEYF750V	1/10W 75	1	
R3920	ERJ3GEYF750V	1/10W 75	1	
R3921	ERJ3GEYF750V	1/10W 75	1	
R3922	ERJ3GEYJ471V	1/10W 470	1	
R3923	ERJ3GEYJ471V	1/10W 470	1	
R3924	ERDS2TJ471T	1/4W 470	1	
R3925	ERJ3GEYF750V	1/10W 75	1	
R3926	ERJ3GEYF750V	1/10W 75	1	
R3927	ERJ3GEYF750V	1/10W 75	1	
R3928	ERJ3GEYJ750V	1/10W 75	1	
R3929	ERJ3GEYJ750V	1/10W 75	1	
R3930	ERJ3GEYJ750V	1/10W 75	1	
R3932	ERJ3GEYJ750V	1/10W 75	1	
R3934	ERJ3GEYJ750V	1/10W 75	1	
R3935	ERJ3GEYJ750V	1/10W 75	1	
R3975	ERJ3GEYJ101V	1/10W 100	1	
R3976	ERJ3GEYJ101V	1/10W 100	1	
R3983	ERJ3GEYJ103V	1/10W 10K	1	
R3984	ERJ3GEYJ103V	1/10W 10K	1	
R3987	ERJ3GEYJ473V	1/10W 47K	1	
R3988	ERJ3GEYJ102V	1/10W 1K	1	
R3989	ERJ3GEYJ102V	1/10W 1K	1	
R3990	ERJ3GEYJ473V	1/10W 47K	1	
R3991	ERJ3GEYJ473V	1/10W 47K	1	
R3992	ERJ3GEYJ102V	1/10W 1K	1	
R3993	ERJ3GEYJ102V	1/10W 1K	1	
R3994	ERJ3GEYJ473V	1/10W 47K	1	
R4003	ERJ3GEYJ331V	1/10W 330	1	
R4005	ERJ3GEYJ331V	1/10W 330	1	
R4006	ERJ3GEYJ823V	1/10W 82K	1	
R4007	ERJ3GEYJ823V	1/10W 82K	1	
R4008	ERJ3GEYJ823V	1/10W 82K	1	
R4010	ERJ3GEYJ473V	1/10W 47K	1	
R4011	ERJ3GEYJ473V	1/10W 47K	1	
R4013	ERJ3GEYJ823V	1/10W 82K	1	
R4046	D0HB912ZA002	1/10W 9.1K	1	
R4047	D0HB912ZA002	1/10W 9.1K	1	
R4055	D0HB153ZA002	1/10W 15K	1	
R4057	D0HB153ZA002	1/10W 15K	1	
R4066	D0HB103ZA002	1/10W 10K	1	
R4067	D0HB103ZA002	1/10W 10K	1	
R4071	ERJ3GEYJ473V	1/10W 47K	1	
R4074	ERJ3GEYJ473V	1/10W 47K	1	
R4076	ERJ3GEYJ821V	1/10W 820	1	
R4077	ERJ3GEYJ101V	1/10W 100	1	
R4078	ERJ3GEYJ272V	1/10W 2.7K	1	
R4079	ERJ3GEYJ272V	1/10W 2.7K	1	
R4080	ERJ3GEYJ101V	1/10W 100	1	
R4081	ERJ3GEYJ821V	1/10W 820	1	
R4088	ERJ3GEYJ272V	1/10W 2.7K	1	
R4089	ERJ3GEYJ272V	1/10W 2.7K	1	
R4090	ERJ3GEYJ121V	1/10W 120	1	
R4093	ERJ3GEYJ121V	1/10W 120	1	
R4094	ERJ3GEYJ223V	1/10W 22K	1	
R4102	ERJ3GEYJ103V	1/10W 10K	1	
R4104	ERJ3GEYJ223V	1/10W 22K	1	
R4105	ERJ3GEYJ473V	1/10W 47K	1	
R7303	ERJ3GEYJ473V	1/10W 47K	1	
R7304	ERJ3GEYJ101V	1/10W 100	1	
R7307	ERJ3GEY0R00V	1/10W 0	1	
R7312	ERJ3GEYF221V	1/10W 220	1	
R7313	ERJ3GEYF221V	1/10W 220	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7322	ERJ3GEY0R00V	1/10W 0	1	
R7324	ERJ3GEYJ221V	1/10W 220	1	
R7325	ERJ3GEYJ221V	1/10W 220	1	
R7326	ERJ3GEY0R00V	1/10W 0	1	
R7401	ERJ3GEYJ104V	1/10W 100K	1	
R7402	ERJ3GEYJ103V	1/10W 10K	1	
R7410	ERJ3GEYJ821V	1/10W 820	1	
R7411	ERJ3GEYJ472V	1/10W 4.7K	1	
R7412	ERJ3GEYJ472V	1/10W 4.7K	1	
R7414	ERJ3GEYJ472V	1/10W 4.7K	1	
R7444	ERJ3RED300V	1/16W 30	1	
R7445	ERJ3RBD682V	1/16W 6.8K	1	
R7446	ERJ3RBD202V	1/16W 2K	1	
R7501	ERJ3GEYJ102V	1/10W 1K	1	
R7502	ERJ3GEYJ392V	1/10W 3.9K	1	
R7503	ERJ3GEYJ104V	1/10W 100K	1	
R7504	ERJ3GEYJ102V	1/10W 1K	1	
R7505	ERJ3GEYF153V	1/10W 15K	1	
R7506	ERJ3GEYJ104V	1/10W 100K	1	
R7507	ERJ3GEYF152V	1/10W 1.5K	1	
R7508	ERJ3GEYF562V	1/10W 5.6K	1	
R7509	ERJ3GEYJ331V	1/10W 330	1	
R7510	ERJ3GEYJ331V	1/10W 330	1	
R7512	ERJ3GEY0R00V	1/10W 0	1	
R7513	ERJ3GEYJ101V	1/10W 100	1	
R7514	ERJ3GEYJ101V	1/10W 100	1	
R7515	ERJ3GEYJ101V	1/10W 100	1	
R7517	ERJ3GEYJ101V	1/10W 100	1	
R7518	ERJ3GEY0R00V	1/10W 0	1	
R7520	ERJ3GEYJ103V	1/10W 10K	1	
R7525	ERJ3GEYJ474V	1/10W 470K	1	
R7527	ERJ3GEYJ101V	1/10W 100	1	
R7528	ERJ3GEYJ101V	1/10W 100	1	
R7529	ERJ3GEYJ101V	1/10W 100	1	
R7530	ERJ3RBD104V	1/16W 100K	1	
R7531	ERJ3GEYJ104V	1/10W 100K	1	
R7532	ERJ3GEYJ563V	1/10W 56K	1	
R7533	ERJ3GEY0R00V	1/10W 0	1	
R7534	ERJ3GEYJ103V	1/10W 10K	1	
R7535	ERJ3GEYJ101V	1/10W 100	1	
R7536	ERJ3GEYJ101V	1/10W 100	1	
R7537	ERJ3GEYJ101V	1/10W 100	1	
R7538	ERJ3GEYJ102V	1/10W 1K	1	
R7539	ERJ3GEYJ472V	1/10W 4.7K	1	
R7540	ERJ3GEYJ101V	1/10W 100	1	
R7542	ERJ3GEYJ101V	1/10W 100	1	
R7543	ERJ3GEYJ103V	1/10W 10K	1	
R7544	ERJ3GEYJ473V	1/10W 47K	1	
R7548	ERJ3GEYJ472V	1/10W 4.7K	1	
R7549	ERJ3GEYJ472V	1/10W 4.7K	1	
R7550	ERJ3GEYJ223V	1/10W 22K	1	
R7552	ERJ3GEYJ104V	1/10W 100K	1	
R7557	ERJ3GEYJ101V	1/10W 100	1	
R7558	ERJ3GEYJ202V	1/10W 2K	1	
R7559	ERJ3GEYJ202V	1/10W 2K	1	
R7560	ERJ3GEYJ101V	1/10W 100	1	
R7561	ERJ3GEYJ473V	1/10W 47K	1	
R7562	ERJ3GEYJ101V	1/10W 100	1	
R7563	ERJ3GEYJ472V	1/10W 4.7K	1	
R7565	ERJ3GEYJ101V	1/10W 100	1	
R7567	ERJ3GEYJ101V	1/10W 100	1	
R7568	ERJ3GEYJ473V	1/10W 47K	1	
R7570	ERJ3GEYJ103V	1/10W 10K	1	
R7571	ERJ3GEYJ153V	1/10W 15K	1	
R7572	ERJ3GEYJ101V	1/10W 100	1	
R7573	ERJ3GEYJ273V	1/10W 27K	1	
R7574	ERJ3GEYJ223V	1/10W 22K	1	
R7575	ERJ3GEYJ101V	1/10W 100	1	
R7576	ERJ3GEYJ102V	1/10W 1K	1	
R7577	ERJ3GEYJ103V	1/10W 10K	1	
R7578	ERJ3GEYJ224V	1/10W 220K	1	
R7580	ERJ3GEYJ225V	1/10W 2.2M	1	
R7581	ERJ3GEYJ472V	1/10W 4.7K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7582	ERJ3GEYJ104V	1/10W 100K	1	
R7583	ERJ3GEYJ101V	1/10W 100	1	
R7587	ERJ3GEYJ103V	1/10W 10K	1	
R7588	ERJ3GEYJ104V	1/10W 100K	1	
R7589	ERJ3GEYJ221V	1/10W 220	1	
R7597	ERJ3GEYJ822V	1/10W 8.2K	1	
R7598	ERJ3GEYJ822V	1/10W 8.2K	1	
R7599	ERJ3GEYJ822V	1/10W 8.2K	1	
R7600	ERJ3GEYJ103V	1/10W 10K	1	
R7601	ERJ3GEYJ102V	1/10W 1K	1	
R7606	ERJ3GEYF393V	1/10W 39K	1	
R7607	ERJ3GEYJ331V	1/10W 330	1	
R7608	ERJ3GEYF433V	1/10W 43K	1	
R7612	ERJ3GEYJ562V	1/10W 5.6K	1	
R7614	ERJ3GEYJ470V	1/10W 47	1	
R7615	ERJ3GEYJ473V	1/10W 47K	1	
R7617	ERDS2TJ271T	1/4W 270	1	
R7621	ERJ3GEYJ104V	1/10W 100K	1	
R7623	ERJ3GEYJ181V	1/10W 180	1	
R7639	ERJ3GEYJ272V	1/10W 2.7K	1	
R7640	ERJ3GEYJ272V	1/10W 2.7K	1	
R7642	ERJ3GEYJ562V	1/10W 5.6K	1	
R7644	ERJ3GEYJ562V	1/10W 5.6K	1	
R7648	ERDS2TJ470T	1/4W 47	1	
R7660	ERJ3GEYJ103V	1/10W 10K	1	
R7668	ERJ3GEYJ101V	1/10W 100	1	
R7669	ERJ3GEYJ472V	1/10W 4.7K	1	
R7802	ERDS2TJ102T	1/4W 1K	1	
R7803	ERJ3GEYJ221V	1/10W 220	1	
R7804	ERJ3GEYJ471V	1/10W 470	1	
R7805	ERJ3GEYJ471V	1/10W 470	1	
R7811	ERJ3GEYJ472V	1/10W 4.7K	1	
S7501	EVQ11A04M	SWITCH,	1	
S7503	EVQ11A04M	SWITCH,	1	
S7504	EVQ11A04M	SWITCH,	1	
S7506	EVQ11A04M	SWITCH,	1	
S7507	EVQ11A04M	SWITCH,	1	
S7508	EVQ11A04M	SWITCH,	1	
T7501	G4D1A0000117	TRANSFORMER	1	
TU7802	ENGF7602GF	TUNER	1	
W701	ERJ3GEY0R00V	1/10W 0	1	
W702	ERJ3GEY0R00V	1/10W 0	1	
W703	ERJ3GEY0R00V	1/10W 0	1	
W704	ERJ3GEY0R00V	1/10W 0	1	
W705	ERJ3GEY0R00V	1/10W 0	1	
W707	ERJ3GEY0R00V	1/10W 0	1	
W708	ERJ3GEY0R00V	1/10W 0	1	
W709	ERJ3GEY0R00V	1/10W 0	1	
W710	ERJ3GEY0R00V	1/10W 0	1	
W711	ERJ3GEY0R00V	1/10W 0	1	
W712	ERJ3GEY0R00V	1/10W 0	1	
W713	ERJ3GEY0R00V	1/10W 0	1	
W714	ERJ3GEY0R00V	1/10W 0	1	
W715	ERJ3GEY0R00V	1/10W 0	1	
W716	ERJ3GEY0R00V	1/10W 0	1	
W717	ERJ3GEY0R00V	1/10W 0	1	
W718	ERJ3GEY0R00V	1/10W 0	1	
W719	ERJ3GEY0R00V	1/10W 0	1	
W720	ERJ3GEY0R00V	1/10W 0	1	
W721	ERJ3GEY0R00V	1/10W 0	1	
W722	ERJ3GEY0R00V	1/10W 0	1	
W723	ERJ3GEY0R00V	1/10W 0	1	
W724	ERJ3GEY0R00V	1/10W 0	1	
W725	ERJ3GEY0R00V	1/10W 0	1	
W726	ERJ6GEY0R00V	1/8W 0	1	
W730	ERJ6GEY0R00V	1/8W 0	1	
W731	ERJ6GEY0R00V	1/8W 0	1	
W734	ERJ6GEY0R00V	1/8W 0	1	
W735	ERJ3GEY0R00V	1/10W 0	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
W736	ERJ6GEY0R00V	1/8W 0	1	
W737	ERJ6GEY0R00V	1/8W 0	1	
W738	ERJ6GEY0R00V	1/8W 0	1	
W739	ERJ6GEY0R00V	1/8W 0	1	
W741	ERJ6GEY0R00V	1/8W 0	1	
W742	ERJ6GEY0R00V	1/8W 0	1	
W743	ERJ6GEY0R00V	1/8W 0	1	
W744	ERJ3GEY0R00V	1/10W 0	1	
W745	ERJ6GEY0R00V	1/8W 0	1	
W746	ERJ3GEY0R00V	1/10W 0	1	
W747	ERJ3GEY0R00V	1/10W 0	1	
W748	ERJ6GEY0R00V	1/8W 0	1	
W749	ERJ6GEY0R00V	1/8W 0	1	
X7301	H0D245500016	CRYSTAL OSCILLATOR	1	
X7501	H0D100500018	CRYSTAL OSCILLATOR	1	
X7502	H0A327200108	CRYSTAL OSCILLATOR	1	
ZB7501	RMN0872J	FL HOLDER(A)	1	
ZB7502	RMN0873A	FL HOLDER(B)	1	
ZJ7401	K9ZZ00001279	EARTH PLATE	1	
ZJ7402	K9ZZ00001279	EARTH PLATE	1	
ZJ7403	K9ZZ00001279	EARTH PLATE	1	
ZJ7404	K9ZZ00001279	EARTH PLATE	1	
ZJ7405	K9ZZ00001279	EARTH PLATE	1	
ZJ7406	K9ZZ00001279	EARTH PLATE	1	
ZJ7423	K9ZZ00001279	EARTH PLATE	1	
ZJ7501	K9ZZ00001279	EARTH PLATE	1	
■	VEP70187A	FRONT(L)P.C.B.	1	(RTL)
S7002	EVQ11A04M	SWITCH,	1	
■	VEP73146A	FRONT JACK P.C.B.	1	(RTL)
C3801	ECJ1VB1H102K	50V 1000P	1	
C3803	ECJ1VB1H102K	50V 1000P	1	
C3804	F1H1C104A071	16V 0.1U	1	
JK3801	K2HA307A0009	JACK	1	
JK3802	K1CB104A0017	JACK	1	
LB3801	J0JBC0000011	COIL	1	
LB3802	J0JBC0000011	COIL	1	
LB3803	ERJ3GEY0R00V	1/10W 0	1	
LB3804	ERJ3GEY0R00V	1/10W 0	1	
LB3805	ERJ3GEY0R00V	1/10W 0	1	
R3801	ERJ3GEYJ750V	1/10W 75	1	
R3802	ERJ3GEYJ750V	1/10W 75	1	
R3803	ERJ3GEYJ750V	1/10W 75	1	
R3804	ERJ3GEYJ102V	1/10W 1K	1	
W501	ERJ3GEY0R00V	1/10W 0	1	
ZJ3801	K9ZZ00001279	EARTH PLATE	1	
ZJ3802	RMC0723	EARTH PLATE	1	
■	VEP71128A	POWER P.C.B.	1	(RTL)
C1120	ECQU2A683MLC	0.068U	1	⚠
C1121	ECQU2A223MLC	0.022U	1	⚠
C1122	ECKWNA102MEV	1000P	1	⚠
C1123	ECKWNA102MEV	1000P	1	⚠
C1125	ECKWNA102MEV	1000P	1	⚠
C1143	F2B2W4700003	450V 47U	1	
C1150	F2A1V6800002	35V 68P	1	
C1151	F1B3D102A011	2V 1000P	1	
C1152	ECJ2VC1H331J	50V 330P	1	
C1153	ECJGVB1H222K	50V 2200P	1	
C1154	ECJGVB1H102K	50V 1000P	1	
C1200	ECJ2VB1E104K	25V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C1201	ECJ2VB1E473K	25V 0.047U	1	
C1270	F2A1C1820005	16V 1800P	1	
C1271	F2A1C1820005	16V 1800P	1	
C1272	F2A1C8210008	16V 820P	1	
C1401	F2A0J1220028	6.3V 1200P	1	
C1402	F2A0J3310059	6.3V 330U	1	
C1601	F2A1E4710061	25V 470U	1	
C1602	ECJ2VB1E104K	25V 0.1U	1	
C1603	ECJ2VB1E104K	25V 0.1U	1	
C1604	ECJ2FB1C474K	16V 0.47U	1	
C1605	ECJ2VC1H181J	50V 180P	1	
C1606	ECJGVB1H103K	50V 0.01U	1	
C1607	F2A1A6810022	10V 680P	1	
C1608	ECJ2VB1E104K	25V 0.1U	1	
C1800	F2A1E4700048	25V 47U	1	
D1140	B0EDKT000009	DIODE	1	
D1141	B0HADV000001	DIODE	1	
D1151	B0HAGM000006	DIODE	1	
D1152	MAZ4100NMF	DIODE	1	
D1155	MAZ73000BC	DIODE	1	
D1156	MA2C165001VT	DIODE	1	
D1157	B0HADV000001	DIODE	1	
D1270	B0JBSG000048	DIODE	1	
D1400	B0JANE000037	DIODE	1	
D1601	B0JCPD000021	DIODE	1	
D1602	B0JCPD000021	DIODE	1	
D1701	MA22D3900L	DIODE	1	
D1702	MA22D3900L	DIODE	1	
D1703	MA22D3900L	DIODE	1	
D1800	MA2J11100L	DIODE	1	
F1101	K5D202BK0005	FUSE	1	⚠
IC1150	C0DACZH00017	IC	1	
IC1200	C0DAEMZ00001	IC	1	
IC1601	C0DBAZZ00132	IC	1	
K1128	ERJ6GEY0R00V	1/8W 0	1	
L1120	G0B233D00001	COIL	1	⚠
L1121	G0B233D00001	COIL	1	⚠
L1270	G0A100K00003	COIL	1	
L1400	G0A100HA0023	COIL 10UH	1	
L1600	G0A100HA0023	COIL 10UH	1	
L1601	G0A100K00003	COIL	1	
LB1122	J0JKB0000003	COIL	1	
LB1123	J0JKB0000003	COIL	1	
LB1125	J0JHC0000048	FILTER	1	
LB1126	ERJ6GEY0R00V	1/8W 0	1	
LB1600	J0JHC0000048	FILTER	1	
P1101	K2AA2H000007	AC INLET	1	⚠
P1102	K1KB15AA0032	CONNECTOR(15P)	1	
Q1200	B3PBA0000454	TRANSISTOR	1	⚠
Q1600	B1DHED000008	TRANSISTOR	1	
QR1800	UNR211300L	TRANSISTOR	1	
QR1801	UNR221300L	TRANSISTOR	1	
R1122	ERG1SJ101E	1W 100	1	
R1150	ERJ6GEYJ180V	1/8W 18	1	
R1151	ERJ6GEYJ682V	1/8W 6.8K	1	
R1152	ERJ6GEYJ103V	1/8W 10K	1	
R1153	ERJ6GEYJ180V	1/8W 18	1	
R1154	ERJ6GEYG822V	1/8W 8.2K	1	
R1155	ERJ6GEYG471V	1/8W 470	1	
R1156	ERJ6GEYG223V	1/8W 22K	1	
R1157	ERJ6GEYG471V	1/8W 470	1	
R1158	ERX2SJR22E	2W 22	1	
R1200	ERJ6GEYG122V	1/8W 1.2K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R1201	ERJ6GEYG822V	1/8W 8.2K	1	
R1205	ERJ6GEYJ224V	1/8W 220K	1	
R1206	ERJ6GEYG242V	1/8W 2.4K	1	
R1207	ERJ6GEYJ103V	1/8W 10K	1	
R1208	ERJ6GEYJ222V	1/8W 2.2K	1	
R1209	ERJ6GEYJ102V	1/8W 1K	1	
R1210	ERJ6GEYJ102V	1/8W 1K	1	
R1410	ERJ8GEY0R00V	1/4W 0	1	
R1601	D1BFR0240001	1/2W 0.024U	1	
R1602	ERJ6GEYJ513V	1/8W 51K	1	
R1603	ERJ6RBD561V	1/10W 560	1	
R1604	ERJ6RBD912V	1/10W 9.1K	1	
R1605	ERJ6RBD272V	1/10W 2.7K	1	
R1800	ERJ6GEYJ471V	1/8W 470	1	
R1801	ERJ6GEYJ104V	1/8W 100K	1	
R1802	ERJ6GEYJ472V	1/8W 4.7K	1	
R1803	ERJ6GEYJ103V	1/8W 10K	1	
T1150	ETS28BF236AD	TRANSFORMER	1	⚠
VA1110	ERZV10D471C2	VARISTOR	1	⚠
ZA1103	EYF52BCY	FUSE HOLDER	1	
ZA1104	EYF52BCY	FUSE HOLDER	1	
ZA1105	K9ZZ00001279	EARTH PLATE	1	
ZA1106	K9ZZ00001279	EARTH PLATE	1	
ZA1107	K9ZZ00001279	EARTH PLATE	1	
ZA1150	VSC5603-A	HEAT SINK	1	
ZA1151	XYN3+J8FJ	SCREW	1	
ZA1270	VSC5606-A	HEAT SINK	1	
ZA1271	XYN3+J8FJ	SCREW	1	
■	VEP73147A	DV JACK P.C.B.	1	(RTL)
P37001	K1KA06AA0699	CONNECTOR(6P)	1	
P37002	K1FY104B0006	CONNECTOR(4P)	1	
ZJ37001	K9ZZ00001279	EARTH PLATE	1	
■	VEP73148A	HDMI P.C.B.	1	(RTL)
C56001	ECJ0EC1H221J	50V 220P	1	
C56103	F1G1A104A014	10V 0.1U	1	
C56104	F1G1A104A014	10V 0.1U	1	
C56105	F1G1A104A014	10V 0.1U	1	
C56106	F1G1A104A014	10V 0.1U	1	
C56107	F1G1A104A014	10V 0.1U	1	
C56108	F1G1A104A014	10V 0.1U	1	
C56109	F1G1A104A014	10V 0.1U	1	
C56110	F1G1A104A014	10V 0.1U	1	
C56111	F1G1A104A014	10V 0.1U	1	
C56112	F1G1A104A014	10V 0.1U	1	
C56113	F1G1A104A014	10V 0.1U	1	
C56114	F1G1A104A014	10V 0.1U	1	
C56115	F1G1A104A014	10V 0.1U	1	
C56116	F1G1A104A014	10V 0.1U	1	
C56117	F1G1A104A014	10V 0.1U	1	
C56118	F1G1A104A014	10V 0.1U	1	
C56119	F1G1A104A014	10V 0.1U	1	
C56120	F1G1A104A014	10V 0.1U	1	
C56121	F1G1A104A014	10V 0.1U	1	
C56122	F1G1A104A014	10V 0.1U	1	
C56123	F1G1A104A014	10V 0.1U	1	
C56124	F1G1A104A014	10V 0.1U	1	
C56125	F1G1A104A014	10V 0.1U	1	
C56126	F1G1A104A014	10V 0.1U	1	
C56127	F1G1A104A014	10V 0.1U	1	
C56128	F1K0J106A003	6.3V 10U	1	
C56129	ECJ0EC1H221J	50V 220P	1	
C56130	F1H1A105A028	10V 1U	1	
C56131	F1H1A105A028	10V 1U	1	
C56133	F1H1A105A028	10V 1U	1	
C56134	F1H1A105A028	10V 1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C56135	F1G1A104A014	10V 0.1U	1	
C56140	F1G1A104A014	10V 0.1U	1	
D56101	MA2J72800L	DIODE	1	
FL56104	F1H0J1050025	FILTER	1	
FL56105	F1H0J1050025	FILTER	1	
FL56106	F1H0J1050025	FILTER	1	
FL56107	F1H0J1050025	FILTER	1	
FL56110	F1H0J1050025	FILTER	1	
IC56103	MN864702A	IC	1	
IC56104	C0CBCBC00174	IC	1	
IC56105	C0CBCDC00052	IC	1	
IC56106	C0DBEYY00016	IC	1	
IC56107	C0JBAB000604	IC	1	
L56101	J0MAB0000170	COIL	1	
L56102	J0MAB0000170	COIL	1	
L56103	J0MAB0000170	COIL	1	
L56104	J0MAB0000170	COIL	1	
LB56104	J0JCC0000119	COIL	1	
LB56105	J0JCC0000119	COIL	1	
LB56106	J0JCC0000119	COIL	1	
LB56107	J0JCC0000119	COIL	1	
LB56108	J0JHC0000032	COIL	1	
LB56109	J0JHC0000032	COIL	1	
LB56110	J0JHC0000032	COIL	1	
LB56111	J0JHC0000032	COIL	1	
LB56112	J0JHC0000032	COIL	1	
LB56113	J0JHC0000032	COIL	1	
LB56115	J0JHC0000032	COIL	1	
LB56116	J0JHC0000032	COIL	1	
P56101	K1KB10A00124	CONNECTOR(10P)	1	
P56102	K1FA119E0004	JACK,HDMI	1	
P56103	K1KC30A00003	CONNECTOR(30P)	1	
Q56001	2SD1819A0L	TRANSISTOR	1	
Q56002	2SD1819A0L	TRANSISTOR	1	
Q56101	2SD1819A0L	TRANSISTOR	1	
Q56102	B1CFHA000002	TRANSISTOR	1	
Q56103	B1CFHA000002	TRANSISTOR	1	
Q56104	2SD1819A0L	TRANSISTOR	1	
Q56105	2SD1819A0L	TRANSISTOR	1	
R56001	ERJ2GEJ472X	1/16W 4.7K	1	
R56002	ERJ2GEJ473X	1/16W 47K	1	
R56003	ERJ2GEJ225X	1/16W 2200K	1	
R56004	ERJ2GEJ104X	1/16W 100K	1	
R56101	ERJ2GEJ220X	1/16W 22	1	
R56102	ERJ2GE0R00X	1/16W 0	1	
R56103	ERJ2GE0R00X	1/16W 0	1	
R56104	ERJ2GE0R00X	1/16W 0	1	
R56105	ERJ2GE0R00X	1/16W 0	1	
R56106	ERJ2GE0R00X	1/16W 0	1	
R56107	ERJ2GE0R00X	1/16W 0	1	
R56108	ERJ2GE0R00X	1/16W 0	1	
R56110	ERJ2GE0R00X	1/16W 0	1	
R56111	ERJ2GE0R00X	1/16W 0	1	
R56112	ERJ2GE0R00X	1/16W 0	1	
R56114	ERJ2GE0R00X	1/16W 0	1	
R56119	ERJ2GEJ330X	1/16W 33	1	
R56123	ERJ2GEJ511X	1/16W 510	1	
R56124	ERJ2GEJ103X	1/16W 10K	1	
R56125	ERJ2GEJ202X	1/16W 2K	1	
R56126	ERJ2GEJ202X	1/16W 2K	1	
R56127	ERJ2GEJ103X	1/16W 10K	1	
R56128	ERJ2GEJ202X	1/16W 2K	1	
R56129	ERJ2GEJ202X	1/16W 2K	1	
R56130	ERJ2GEJ273X	1/16W 27K	1	
R56131	ERJ2GEJ221X	1/16W 220	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R56132	ERJ2GEJ224X	1/16W 220K	1	
R56133	ERJ2GEJ104X	1/16W 100K	1	
R56135	ERJ2GEJ470X	1/16W 47	1	
R56137	ERJ2GE0R00X	1/16W 0	1	
R56138	ERJ2GE0R00X	1/16W 0	1	
R56140	ERJ2GEJ8R2X	1/16W 8.2	1	
R56142	ERJ2GEJ330X	1/16W 33	1	
R56143	ERJ2GEJ330X	1/16W 33	1	
R56144	ERJ2GEJ8R2X	1/16W 8.2	1	
R56145	ERJ2GEJ8R2X	1/16W 8.2	1	
R56146	ERJ2GEJ8R2X	1/16W 8.2	1	
R56147	ERJ2GEJ8R2X	1/16W 8.2	1	
R56148	ERJ2GEJ8R2X	1/16W 8.2	1	
R56149	ERJ2GEJ8R2X	1/16W 8.2	1	
R56150	ERJ2GEJ8R2X	1/16W 8.2	1	
R56158	ERJ2GEJ152X	1/16W 1.5K	1	
R56159	ERJ2GEJ332X	1/16W 3.3K	1	
R56160	ERJ2GEJ223X	1/16W 22K	1	
R56161	ERJ2GEJ470X	1/16W 47	1	
R56162	ERJ2GEJ103X	1/16W 10K	1	
R56163	ERJ2GEJ103X	1/16W 10K	1	
R56166	ERJ2GE0R00X	1/16W 0	1	
R56167	ERJ2GEJ102X	1/16W 1K	1	
RX56101	D1H8R0040009	RESISTOR-RESISTOR	1	
RX56102	D1H8R0040009	RESISTOR-RESISTOR	1	
VA56101	EZAEG2A50AX	FILTER	1	
VA56102	EZAEG2A50AX	FILTER	1	
VA56103	EZJZ0V80008B	FILTER	1	
VA56104	EZAEG2A50AX	FILTER	1	
VA56105	EZJZ0V80008B	FILTER	1	
VA56106	EZAEG2A50AX	FILTER	1	
VA56107	EZJZ0V80008B	FILTER	1	
VA56108	EZAEG2A50AX	FILTER	1	
VA56109	EZJZ0V80008B	FILTER	1	
VA56110	EZAEG2A50AX	FILTER	1	
VA56111	EZJZ0V80008B	FILTER	1	
VA56112	EZAEG2A50AX	FILTER	1	
VA56113	EZAEG2A50AX	FILTER	1	
■	VEP70194A	ATAPI P.C.B.	1	(RTL)
P9801	K1KB40A00124	CONNECTOR(40P)	1	
P9802	K1MN40BA0173	CONNECTOR(40P)	1	
■		CASSING/ACCESSORY/ PACKING		
1	RHD30113	SCREW	2	(S)
1	RHD30113-1K	SCREW	2	(K)
2	RHD30119-L	SCREW	13	
3	RKM0552A-S	TOP COVER	1	(S) ⚠
3	RKM0552A-K	TOP COVER	1	(K) ⚠
4	RFKB79156DT	MAIN P.C.B.	1	(RTL)
5	VEP70187A	FRONT(L)P.C.B.	1	(RTL)
6	VEP73146A	FRONT JACK P.C.B.	1	(RTL)
7	VEP71128A	POWER P.C.B.	1	(RTL)
8	VEP73147A	DV JACK P.C.B.	1	(RTL)
9	VEP73148A	HDMI P.C.B.	1	(RTL)
10	VEP70194A	ATAPI P.C.B.	1	(RTL)
11	RHD30111-3	SCREW	17	
12	RHD30102-1	SCREW	2	
13	RMA2051	REAR ANGLE B	1	
14	RMA2047	FRONT ANGLE	1	
15	XSN3+4FJ	SCREW	2	
16	VMC1534	EARTH SPRING	2	
17	RHD30151	SCREW	1	
18	RMA2052	DRIVE SPACER	1	
19	XTN3+6JFJ	SCREW	1	
20	RSC0805	DIGITAL SHIELD	1	
21	RHD32001	SCREW	4	
22	VKC0392	PCB SUPPORT	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
23	RMN0841	HDD BRACKET	1	
24	RFKV0092HDK	HDD 160GB	1	
25	RKA0184-J	FOOT RUBBER	1	
26	VEE0Z41	WIRE WITH CONNECTOR	1	
27	RGR0365K-B	REAR PANEL	1	⚠
28	RKA0186-K	FOOT RUBBER B	4	
29	RYP1372E-S	FRONT PANEL ASS'Y 1	1	(S)
29	RYP1372E-K	FRONT PANEL ASS'Y 1	1	(K)
29-1	RKF0787D-S	DOOR	1	(S)
29-1	RKF0787D-K	DOOR	1	(K)
29-2	RKF0786B-K	TRAY DOOR	1	
29-3	RYF0814B-K	FL WINDOW ASS'Y	1	
29-4	RMB0871-1	BLINDER SPRING	1	
30	VWJ1982	FFC	1	
32	RMX0286	PCB SPACER	1	
33	L6FAJDAE0002	FAN MOTOR	1	
34	RMZ0917	FL BARRIER SHEET	1	
35	RMC0625	TUNER END	1	
36	RMQ1612	HEAT TRANSFER SHEET	1	
37	RMQ1614	HEAT TRANSFER SHEET	1	
38	VMX1336	MINI CARD SPACER	2	
39	RMX0361-J	PCB SPACER	1	
40	RMX0393	FRONT SPACER	1	
41	RFKNEH57GN	RAM/DIGITAL P.C.B. MODULE	1	(RTL)
A1	K2KA6BA00003	AV CORD	1	
A2	K1TWACC00001	RF COAXIAL CABLE	2	
A3	N2QAYB000133	REMOTE CONTROL ASS'Y	1	
A3-1	100300035100	BATTERY COVER	1	
A4	K2CJ2DA00008	AC CORD	1	⚠
A5	RPHC0085	PAD(C)	1	
A6	RPQF0254	ACCESSORY CASE	1	
A7	RPFC0031-B	POLYETHYLENE BAG	1	
A8	RQT8906-L	OPERATING INSTRUCTIONS	1	(IA)
PC1	RPG8261	PACKING CASE	1	(S)
PC1	RPG8307	PACKING CASE	1	(K)
PC2	RPF0460	POLYETHYLENE BAG	1	
PC3	RPN1969A-1	CUSHION(A)	1	
PC4	RPN1969B-1	CUSHION(B)	1	
PC5	RPN1985	FRONT PAD	1	

ORDER NO. CHM0707503SE

Service Manual

DVD Recorder

Supplement

Model No. **DMR-EH57GC**
DMR-EH57GCS
DMR-EH57GN

Vol. 1

Colour

(S).....Silver Type
(EH57GC/EH57GCS/EH57GN)

(K).....Black Type (EH57GN)

Subject : Reducing the noise of hard disk and changing service parts

Please use this supplement manual together with the service manuals for Model No. DMR-EH57GCGCS (NO. CHM0707029AE) and DMR-EH57GN(NO. CHM0705024CE).

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

Panasonic®

1 Modifying disassembly and assembly instructions

Note:

When servicing a part not included in this manual, please replace all the parts of hard disk assembly.

1.1. Modifying "9.5. HDD, ATAPI P.C.B."

Caution:
Writing the main firmware to the unit is necessary after replacing the HDD.
Prepare the latest firmware updating disc.

* The main firmware is recorded in the HDD, but the replacement HDD has no data (and needs to be formatted).

Writing Procedure of Main Firm:

Caution:
(1) Writing of Main Firm needs 3, 4 minutes.
(2) Never cut the power of DVD Recorder until writing in Firmware ends.
(3) Initial settings and contents of reservation will not change if writing is normally completed.

1. Prepare latest firmware updating disc.
2. Replace HDD.
3. Turn on power of DVD Recorder.
4. After [PLEASE WAIT] is displayed on FL., [HDD ERR] is displayed on FL.
5. Tray opens automatically.
6. Insert updating disc for Firmware and press OPEN/CLOSE key.
   (If a wrong disc was inserted, [NG DISK] [NO FVU] is displayed on FL.)
7. [LOAD] → [LD FVU] ⟷ [M_FIRM] are displayed on FL alternately.
8. [MAIN] ⟷ [UPD OK] blink alternately and Tray opens.
   Take out disc (Writing was finished).
9. Press Power button to turn off power.
10. Press Power button to turn on power.
11. [HELLO] → [SELF CHECK] are displayed on FL.
12. [UNFORMAT] is displayed on FL.
13. After [UNFORMAT] was displayed, message to request FORMAT is displayed on TV screen.
14. Select [Yes] and press [ENTER] key to format HDD.
    (After FORMAT, program in HDD will be lost, but Main firm will not be lost.)

"Write of the main firm" is completed above.

* Drive firm is not updated by above operation. If you wish update Drive firm, please prepare the disc for latest firmware update, and write it again.
* If the version of the firm you have prepared was same as or later than that has already been written in deck, 'UNSUPPORT' is displayed on FL.
* In a usual updating of firmware, writing is not performed when the timer reservation standby was not released.

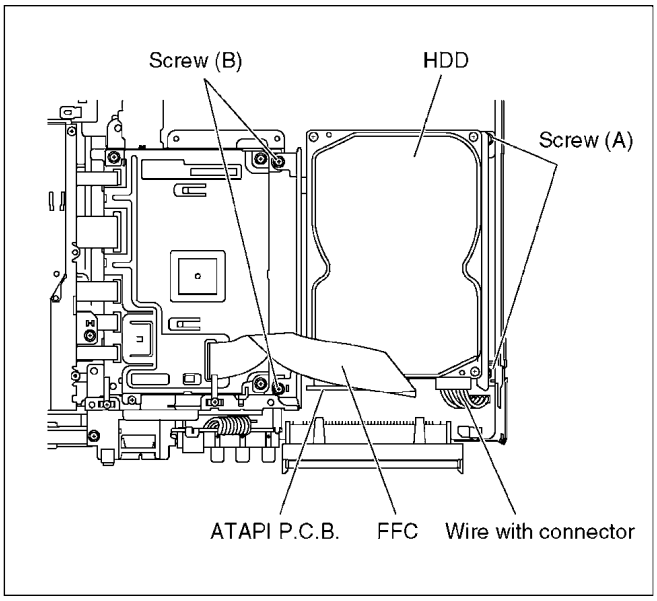
Handling of HDD

The following precautions should be taken when handling HDD.

a. Never give an impact to HDD. (Even a drop from 1cm height can be a cause of HDD failure.
b. When placing HDD on a workbench, provide a mat on a bench for shock absorption and anti-static purposes.
c. When installing HDD, release it from your hands only after confirming that it is fully set on the chassis.
d. Avoid stacking up HDD.
e. HDD is unstable and easy to fall. Do not stand it on its side face.
f. When handling HDD, hold its side faces to avoid static hazard.
g. Do not place HDD on its wrapping bag after removal. (Prevention of static hazard
h. Use a screwdriver with low impact and anti-static features.

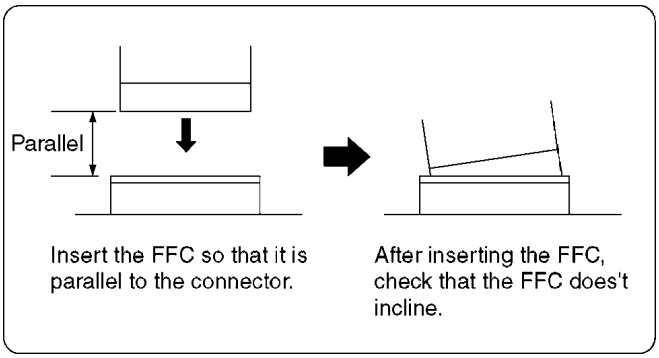
Note:
When replacing HDD, please make the rear jumper slave or cable select configuration.

1. Remove the 2 Screws (A) and (B), FFC and Wire with connector to remove HDD with ATAPI P.C.B..

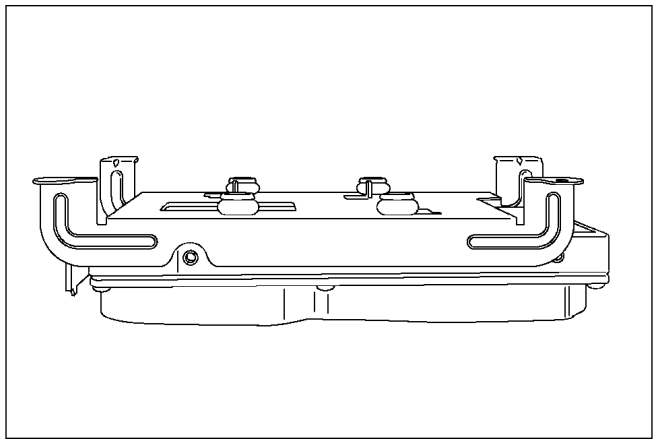


CAUTION:

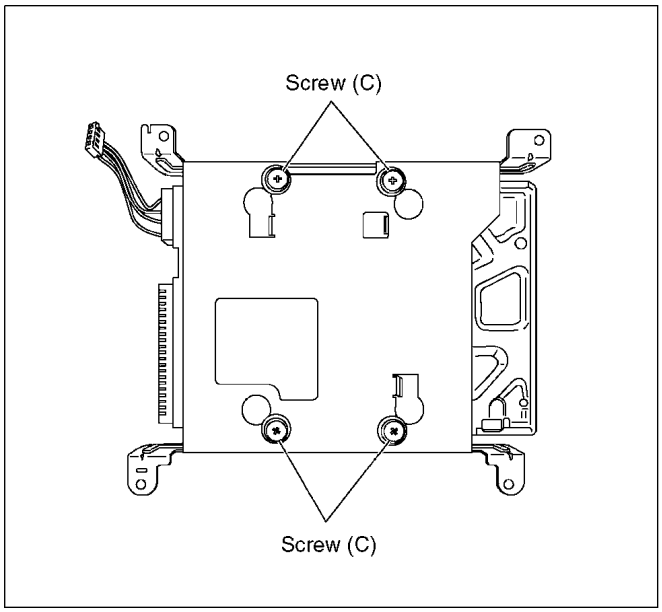
When replacing HDD, pay attention as below.



2. Put HDD with HDD angle up and down inversely so as not to give a shock to HDD.

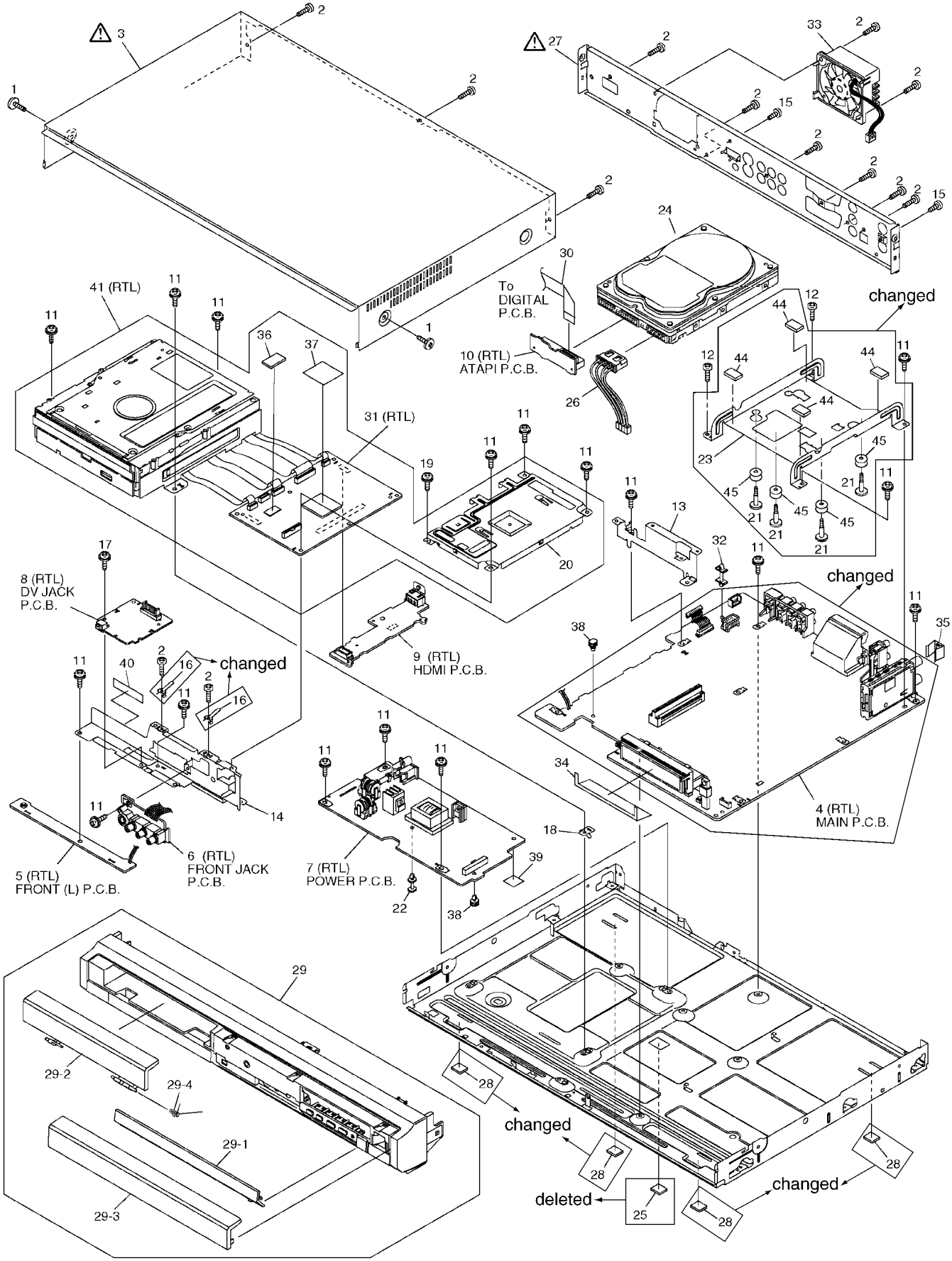


3. Remove 4 Screws (C) to remove HDD from HDD angle.

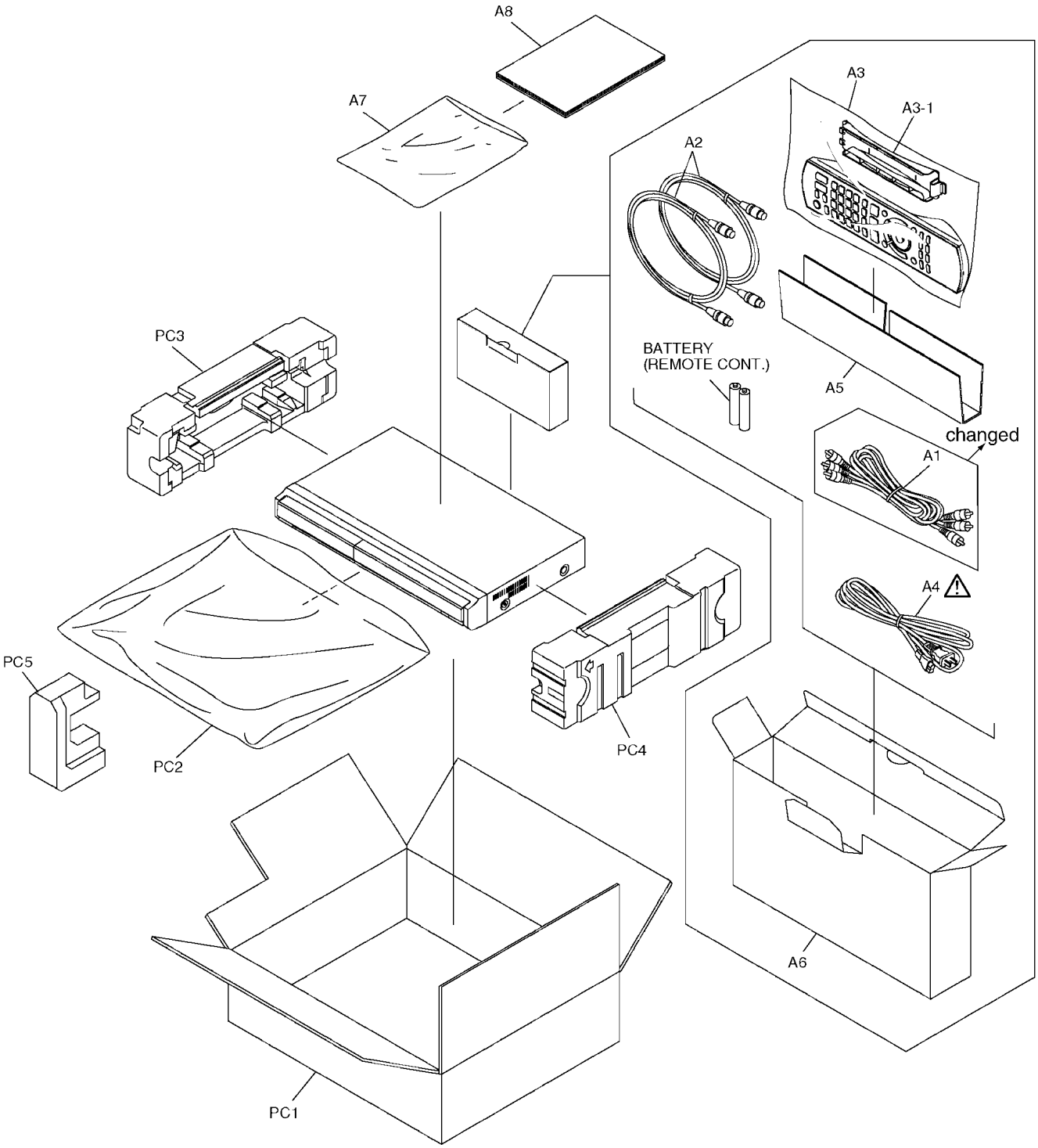

Screw (C)
Screw (C)

2 Changes of “Exploded Views”

2.1. Changes of “Casing Parts & Mechanism Section”



2.2. Changes of “Packing & Accessories Section”



3 Changes of “Replacement Parts List”

Compatibility CODE (See the C/C column on the following Part Number List)											
	Parts Production			Parts Production			Parts Production			Parts Production				
A	Original	→	Early	B	Original	→	Early	C	Original	→	Early	D	Original → Early	E	Addition
	New	→	Late		New	→	Late		New	→	Late		New → Late	F	Deletion
														G	Other

3.1. Changes of parts list

Ref.No.	Part No.		Part Name & & Description	C/C	Remarks
	Original Part No.	New Part No.			
4	RFKB79156DT	———	MAIN P.C.B.	F	(RTL)
	———	RFKB79156DNT		E	(RTL) GN
	———	RFKB79156DCT		E	(RTL) GC
	———	RFKB79156DST		E	(RTL) GCS
16	VMC1534	RMC0728	EARTH SPRING	C	
21	RHD32001	RHD30152	SCREW	C	
23	RMN0841	RMN0874A-1	HDD BRACKET	C	
25	RKA0184-J	———	FOOT RUBBER	F	
28	RKA0186-K	RKA0144-K	FOOT RUBBER B	C	
44	———	RMX0382	HDD CUSHION	E	
45	———	RMG0677-K	DAMPER	E	
A1	K2KA6BA00003	K2KA6BA00004	AV CORD	C	

Note:

1. In order to differentiate area codes of destinations, part numbers of servicing parts on main board are changed;
2. Hard disk assembly includes following parts: 21, 23, 44, 45.