TOSHIBA

FILE NO. 810-200104

SERVICE MANUAL
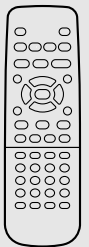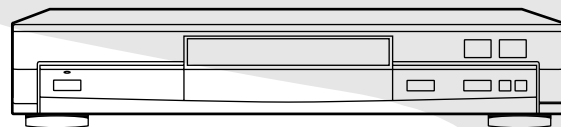
DVD VIDEO | COMPACT disc DIGITAL VIDEO | COMPACT disc DIGITAL AUDIO | ● SPATIALIZER® N-2-2™ | ◻◻ DOLBY DIGITAL | dts DIGITAL OUT

DVD VIDEO PLAYER

SD-110EB
SD-110EE
SD-110EL

Jun., 2001 Ⓢ

LASER BEAM CAUTION LABEL

```
CAUTION                                    ADVARSEL
VISIBLE AND INVISIBLE LASER RADIATION      SYNLIG OG USYNLIG LASERSTRÅLING VED
WHEN OPEN. DO NOT STARE INTO BEAM OR       ÅBNING. SE IKKE IND I STRÅLEN-HELLER IKKE
VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.    MED OPTISKE INSTRUMENTER.
ATTENTION                                  ADVARSEL
RAYONNEMENT VISIBLE ET INVISIBLE           SYNLIG OG USYNLIG LASERSTRÅLING NÅR
LASER EN CAS D'OUVERTURE. NE PAS           DEKSEL ÅPNES. STIRR IKKE INN I STARÅLEN ELLER
REGARDER DANS LE FAISCEAU. NI À L'O EIL    SE DIREKTE MED OPTISKE INSTRUMENTR.
NU NI À L'AIDE D'INSTRUNENTS D'OPTIQUE.    VARO!
VORSICHT                                   AVATTAESSA OLET ALTTINA. NÄKYVÄÄ JA NÄKYMÄTÖN
SICHTBARE UND UNSICHTBARE                  LASERSÄTEIL YLLE. ÄLÄ TUIJOTA SÄTEESEEN
LASERSTRAHLUNG WENN ABDECKUNG              ÄLÄKÄ KATSO SITÄ OPTISEN LAITTEEN LÄPI.
GEÖFFNET. NICHT IN DEN STRAHL BLICKEN      VARNING
AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.     SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR
注 意 ここを開くと可視レーザー光及び不可視レーザー    DENNA DEL ÄR ÖPPNAD. STIRRA EJ IN I STRÅLEN
       光がでます。ビームを直接見たり触れたりしない   OCH BETRAKTA EJ STRÅLEN MED OPTISKA
       こと。光学機器で直接ビームを見ないこと。       INSTRUMENT.
```
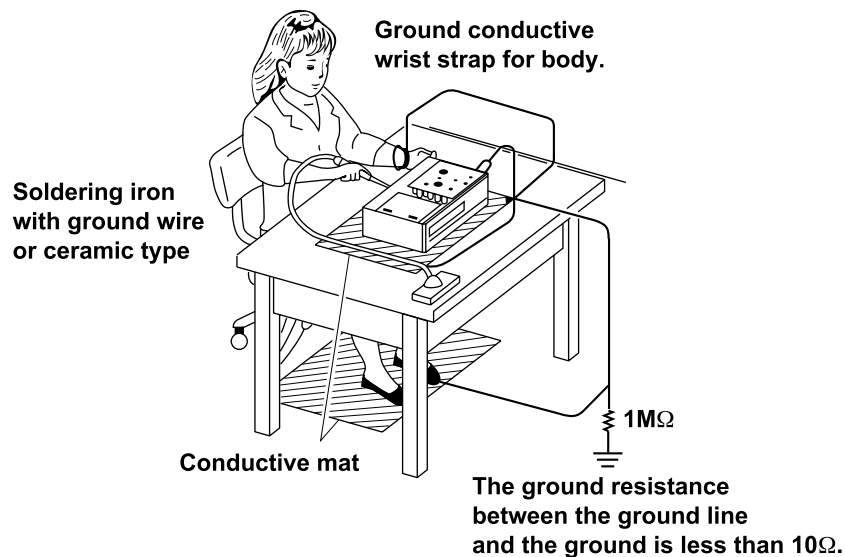
98764189

When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of a laser may be recceived.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electricity.

Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire, etc. to protect the laser diode from damage by static electricity.

And also, the LSI and IC are same as above.

Ground conductive wrist strap for body.

Soldering iron with ground wire or ceramic type

Conductive mat

1MΩ

The ground resistance between the ground line and the ground is less than 10Ω.

CONTENTS

SECTION 1
GENERAL DESCRIPTIONS

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

SECTION 3
SERVICING DIAGRAMS

SECTION 4
PARTS LIST

SECTION 1
GENERAL DESCRIPTIONS

1. OPERATING INSTRUCTIONS (SD-110EB)

SAFETY PRECAUTIONS

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

CAUTION: This Digital Video Disc Player employs a Laser System.
To ensure proper use of this product, please read this owner's manual carefully and retain for future reference. Should the unit require maintenance, contact an authorized service location - see service procedure.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

To prevent direct exposure to laser beam, do not try to open the enclosure.
Visible laser radiation when open and interlocks defeated.
DO NOT STARE INTO BEAM.

CLASS 1

LASER PRODUCT

In the spaces provided below, record the Model and Serial No. located on the rear panel of your DVD video player.

Model No. _____   Serial No. _____

Retain this information for future reference.

The following information applies only to SD-110EB, the model for U.K.

General Information

If the socket outlets in your home are not suitable for the plug supplied with this unit, the plug must be cut off and an appropriate one fitted.

The plug severed from this mains lead must be destroyed as it is hazardous if inserted into a live socket.

IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:
BLUE: NEUTRAL
BROWN: LIVE
As the colours of the wires in the mains lead of this unit may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire that is coloured blue must be connected to the terminal in the plug which is marked with the letter N or coloured black.
The wire that is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Do not connect either wire to the earth terminal which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

Use a 5A fuse which is approved by ASTA or BSI to BS1362.
Always replace the fuse cover after changing the fuse.

Location of the required label

The rating plate and the safety caution are on the rear of the unit.
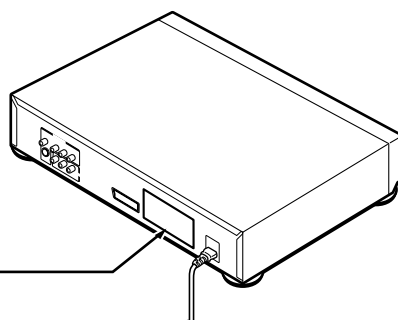
IMPORTANT SAFETY INSTRUCTIONS

CAUTION: **PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.**

This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.
DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

1. Read these instructions.
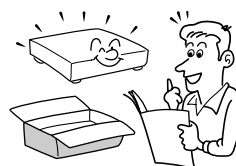
2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.
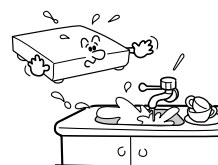
6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
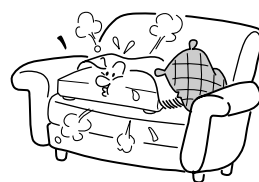
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
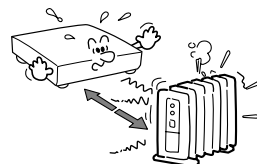
9. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

10. Only use attachments/accessories specified by the manufacturer.

11. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

IMPORTANT SAFETY INSTRUCTIONS

13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
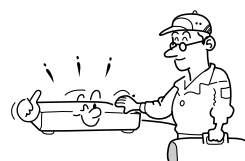
14. When you use headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

15. Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

16. Never insert objects of any kind into this apparatus through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the apparatus.

17. Keep your fingers well clear of the disc tray as it is closing. Neglecting to do so may cause serious personal injury.
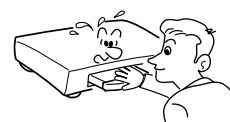
18. Do not place a heavy object on or step on the apparatus. The object may fall, causing serious personal injury and serious damage to the apparatus.
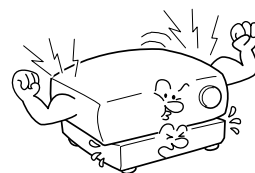
19. Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and apparatus malfunction.

Precautions

Notes on handling

■ When shipping the DVD video player, the original shipping carton and packing materials come in handy. For maximum protection, repack the unit as it was originally packed at the factory.
■ Do not use volatile liquids, such as insect spray, near the DVD video player. Do not leave rubber or plastic products in contact with the DVD video player for a long time. They will leave marks on the finish.
■ The top and rear panels of the DVD video player may become warm after a long period of use. This is not a malfunction.
■ When the DVD video player is not in use, be sure to remove the disc and turn off the power.
■ If you do not use the DVD video player for a long period, the unit may not function properly in the future. Turn on and use the DVD video player occasionally.

Notes on locating

■ Place the DVD video player on a level surface. Do not use it on a shaky or unstable surface such as a wobbling table or inclined stand. The loaded disc may come off the proper position and cause damage to the DVD video player.
■ When you place this DVD video player near a TV, radio, or VTR, the playback picture may become poor and the sound may be distorted. In this case, place the DVD video player away from the TV, radio, or VTR.

Notes on cleaning

Use a soft, dry cloth for cleaning.
● For stubborn dirt, soak the cloth in a weak detergent solution, wring well and wipe. Use a dry cloth to wipe it dry.
  Do not use any type of solvent, such as thinner and benzine, as they may damage the surface of the DVD video player.
● If you use a chemical saturated cloth to clean the unit, follow that product's instructions.

To obtain a clear picture

The DVD video player is a high technology, precision device. If the optical pick-up lens and disc drive parts are dirty or worn down, the picture quality becomes poor. To obtain a clear picture, we recommend regular inspection and maintenance (cleaning or parts replacement) every 1,000 hours of use depending on the operating environment. For details, contact your nearest dealer.

Notes on moisture condensation

Moisture condensation damages the DVD video player. Please read the following carefully.

Moisture condensation occurs, for example, when you pour a cold drink into a glass on a warm day. Drops of water form on the outside of the glass. In the same way, moisture may condense on the optical pick-up lens inside this unit, one of the most crucial internal parts of the DVD video player.

Example of moisture condensation!

Optical pick-up lens
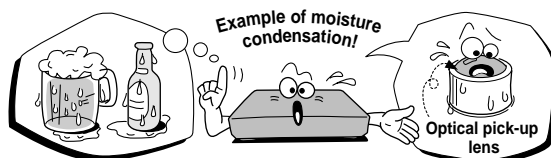
■ **Moisture condensation occurs during the following cases.**

● When you bring the DVD video player directly from a cold place to a warm place.
● When you use the DVD video player in a room where you just turned on the heater, or a place where the cold wind from the air conditioner directly hits the unit.
● In summer, when you use the DVD video player in a hot and humid place just after you move the unit from an air conditioned room.
● When you use the DVD video player in a humid place.

It's too warm!
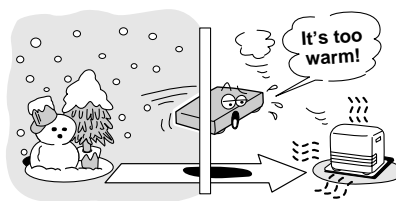
■ **Do not use the DVD video player when moisture condensation may occur.**

If you use the DVD video player in such a situation, it may damage discs and internal parts. Remove the disc, connect the power cord of the DVD video player to the wall outlet, turn on the DVD video player, and leave it for two or three hours. After two or three hours, the DVD video player will have warmed up and evaporated any moisture. Keep the DVD video player connected to the wall outlet and moisture condensation will seldom occur.

Wait!

Wall outlet

Notes on Discs
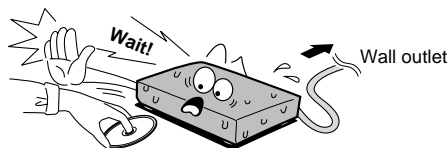
On handling discs

● Do not touch the playback side of the disc.

Playback side
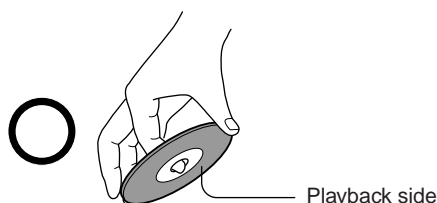
● Do not attach paper or tape to discs.

On cleaning discs

● Fingerprints and dust on the disc cause picture and sound deterioration. Wipe the disc from the center outwards with a soft cloth. Always keep the disc clean.
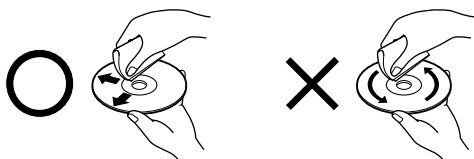
● If you cannot wipe off the dust with a soft cloth, wipe the disc lightly with a slightly moistened soft cloth and finish with a dry cloth.
● Do not use any type of solvent such as thinner, benzine, commercially available cleaners or antistatic spray for vinyl LPs. It may damage the disc.

On storing discs

● Do not store discs in a place subject to direct sunlight or near heat sources.
● Do not store discs in places subject to moisture and dust such as a bathroom or near a humidifier.
● Store discs vertically in a case. Stacking or placing objects on discs outside of their case may cause warping.

Structure of disc contents

Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. Audio CDs are divided into tracks.

DVD video disc

```
┌──────────────── DVD video disc ────────────────┐
├──── Title 1 ────┤├──────── Title 2 ─────────────┤
Chapter 1  Chapter 2   Chapter 1  Chapter 2  Chapter 3
```

Audio CD

```
┌──────────────── Audio CD ────────────────┐
Track 1   Track 2    Track 3    Track 4    Track 5
```
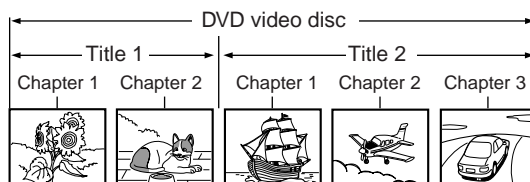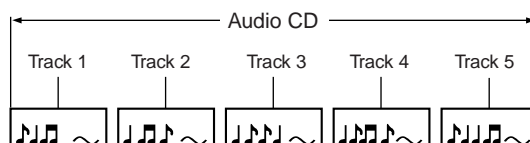
Each title, chapter or track is assigned a number, which is called "title number", "chapter number" or "track number" respectively.
There may be discs that do not have these numbers.

Notes on copyright

It is forbidden by law to copy, broadcast, show, broadcast on cable, play in public, and rent copyrighted material without permission.

DVD video discs are copy protected, and any recordings made from these discs will be distorted.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

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Notes on Discs (continued)

About this owner's manual

This owner's manual explains the basic instructions of this DVD video player. Some DVD video discs are produced in a manner that allows specific or limited operation during playback. As such, the DVD video player may not respond to all operating commands. This is not a defect in the DVD video player. Refer to instruction notes of discs.

"⊘" may appear on the TV screen during operation. A "⊘" means that the operation is not permitted by the DVD video player or the disc.

Notes on region numbers

The region number of this DVD video player is 2. If region numbers, which stand for their playable area, are printed on your DVD video disc and you do not find 🌐 or 🌐 , disc playback will not be allowed by the player. (In this case, the DVD video player will display a message on-screen.)

Playable discs

This DVD video player can play the following discs.

	Disc Mark	Contents	Disc Size	Maximum playback time
DVD video discs	DVD VIDEO DVD VIDEO	Audio + video (moving pictures)	12 cm	Approx. 4 hours (single sided disc)
				Approx. 8 hours (double sided disc)
			8 cm	Approx. 80 minutes (single sided disc)
				Approx. 160 minutes (double sided disc)
Audio CDs	COMPACT DISC DIGITAL AUDIO	Audio	12 cm	Approx. 74 minutes
			8 cm (CD single)	Approx. 20 minutes

• You cannot play discs other than those listed above.
• You cannot play discs of CD-R, CD-RW, DVD-RAM, DVD-RW, etc., even if they may be labeled marks listed above.
• This DVD video player uses the PAL/NTSC colour system, and cannot play DVD video discs recorded in any other colour system (SECAM, etc.).

Table of Contents

Identification of Controls

See the page in ◯〉 for details.

Front panel

ON/STANDBY indicator **20**〉　　Disc tray **20**〉

PAUSE button **21**〉

STOP button **21**〉

PLAY button **20**〉

ON/STANDBY button **20**〉　　DVD display **13**〉

SKIP buttons **25**〉

OPEN/CLOSE button **20**〉

Rear panel

VIDEO OUT jack **17**〉

VIDEO OUT (Y/P$_B$/P$_R$)
(Component video) jacks **16**〉

AC inlet

VIDEO OUT

AV

AC IN ~

S

R L　BITSTREAM
ANALOG　/PCM

AUDIO OUT

AV (SCART) socket **16**〉

BITSTREAM/PCM
AUDIO OUT jack **18**〉**19**〉

ANALOG AUDIO OUT (L/R) jacks **16**〉**17**〉

Power cord

S VIDEO OUT jack **17**〉

DVD display

■ **Pressing of the FL DIM button on the remote control changes the brightness of the display.**

FL DIM   Normal ⟶ Dimmed ⟶ Off

Total playing time indicator

Chapter number indicator

Play mode indicator

Title number indicator

Memory playback indicator

Track number indicator

Random playback indicator

```
▶ ⏸       TITLE  TOTAL  CHP  TRK  M R   A-B
DVD                                        ↻
  CD
```

Multifunctional indicator (indicates operating status or messages, etc.)

DVD/CD indicator

Angle icon indicator

Repeat playback indicator
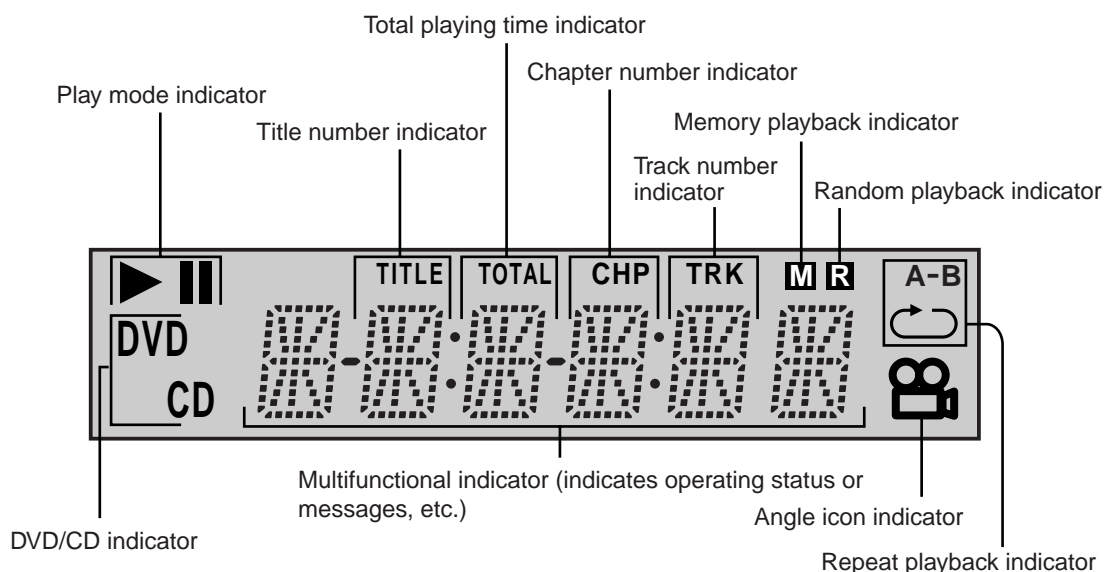
■ **When you start playback, the elapsed time indicators appear. Pressing the FL SELECT button switches them to the title/chapter/track number indicators. Some discs may not permit this operation.**

The indicators vary depending on the kinds of discs you play.

DVD video disc	Audio CD
• During playback:	• During playback:
Example	Example
▶ TITLE CHP DVD 2- 3	▶ TRK CD 6
Playing chapter 3 of title 2	**Playing track 6**
Some discs may not display chapter numbers or elapsed time.	
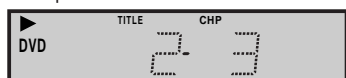
13

Identification of Controls (continued)

The instructions in this manual describe the functions on the remote control. See the page in ☐ for details.

Remote control

OPEN/CLOSE button **20**

REV button **22**

FWD button **22**

PAUSE/STEP button **21 22**

STOP button **21**

TOP MENU button **24**

Direction buttons **38**
(▲/ ▼/ ◄ / ►)

CLEAR button **25**

ANGLE button **33**

SETUP button **38**

DISPLAY button **36**

SUBTITLE button **34**

E.A.M. button **32**

E.P.M. button **31**

Number buttons **24**

RANDOM button **29**

MEMORY button **28**

ON/STANDBY button **20**

SKIP buttons **25**

PLAY button **20**

ENTER button **38**

MENU button*

RETURN button **38**

AUDIO button **35**

SLOW button **23**

ZOOM button **30**

FL DIM button **13**

FL SELECT button **13**

T button **24**

A-B RPT button **27**

REPEAT button **27**

OPEN/CLOSE

REV   FWD   SKIP

PAUSE/STEP   STOP   PLAY

TOP MENU   MENU

ENTER

CLEAR   RETURN

ANGLE   SUBTITLE   AUDIO

SETUP   DISPLAY   ZOOM   SLOW

E.A.M.   E.P.M.   FL SELECT   FL DIM

SEARCH

1   2   3   T

4   5   6   +10

7   8   9   0

RANDOM   MEMORY   REPEAT   A-B RPT

* MENU button
Use the MENU button to display the menu included on
many DVD video discs. To operate a menu, follow the
instructions in "Locating a title using the top menu."
24

■ **About the illustrations of the battery compartment**
There are two types of battery compartment in the supplied remote controls. (This does not mean a difference in performance between the two.)
Refer to either illustration depending on the actual remote control.

Loading batteries

1 Open the cover.
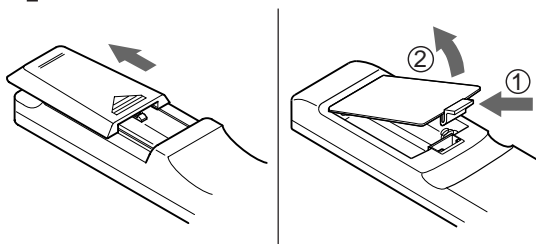
2 Insert batteries (R6 size).
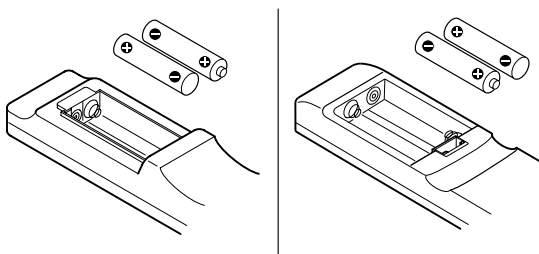
Make sure to match the + and – on the batteries to the marks inside the battery compartment.

3 Close the cover.

Operating with the remote control

Point the remote control at the remote sensor and press the buttons.

30° 30°

Within about 7 m
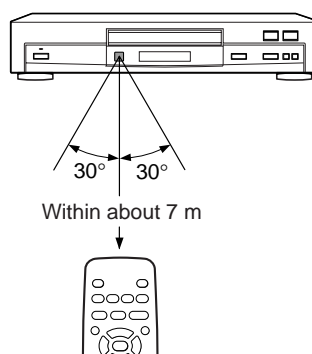
Distance: About 7 m from the front of the remote sensor
Angle: About 30° in each direction of the front of the remote sensor

* Do not expose the remote sensor of the DVD video player to a strong light source such as direct sunlight or other illumination. If you do so, you may not be able to operate the DVD video player via the remote control.

Notes on the remote control
• Direct the remote control at the remote sensor of the DVD video player.
• Do not drop or give the remote control a shock.
• Do not leave the remote control near an extremely hot or humid place.
• Do not spill water or put anything wet on the remote control.
• Do not open the remote control.

Notes on batteries
Improper use of batteries may cause battery leakage and corrosion. To operate the remote control correctly, follow the instructions below.
• Do not insert batteries into the remote control in the wrong direction.
• Do not charge, heat, open, or short-circuit the batteries. Do not throw batteries into a fire.
• Do not leave dead or exhausted batteries in the remote control.
• Do not use different types of batteries together, or mix old and new batteries.
• If you do not use the remote control for a long period of time, remove the batteries to avoid possible damage from battery corrosion.
• If the remote control does not function correctly or if the operating range becomes reduced, replace all batteries with new ones.
• If battery leakage occurs, wipe the battery liquid from the battery compartment, then insert new batteries.

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Connecting to a TV

Connect the DVD video player to your TV.

For details of output sound, see **35** .

Connect the DVD video player directly to your TV. If you connect the DVD video player to a VTR, TV/VTR combination or video selector, the playback picture may be distorted as DVD video discs are copy protected.

Connecting to a TV (Using the SCART socket)

• Normal TV
• TV compatible with S video signals
• RGB monitor
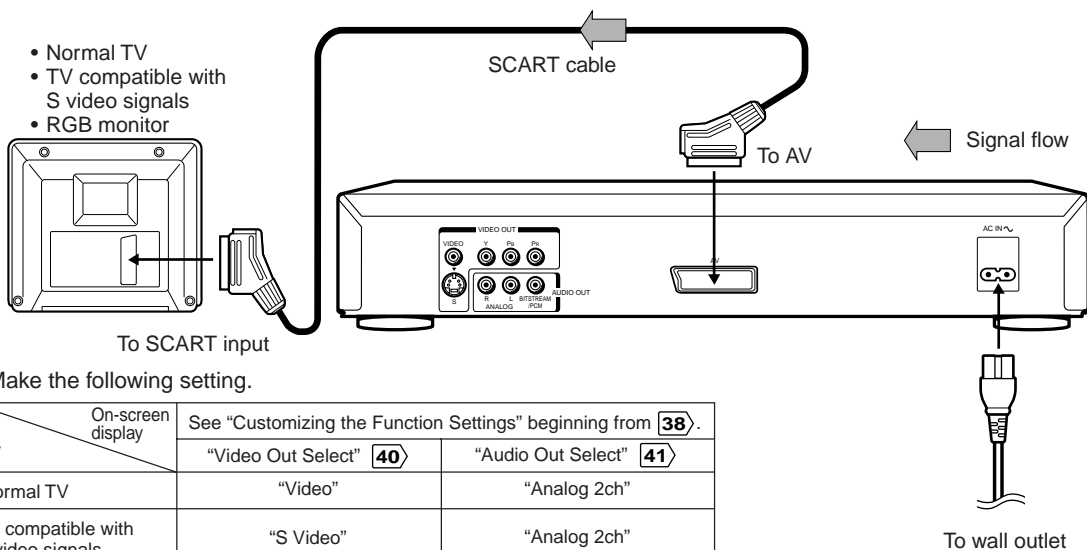
SCART cable

To AV

Signal flow

To SCART input

• Make the following setting.

On-screen display TV	See "Customizing the Function Settings" beginning from **38** .	
	"Video Out Select" **40**	"Audio Out Select" **41**
Normal TV	"Video"	"Analog 2ch"
TV compatible with S video signals	"S Video"	"Analog 2ch"
RGB monitor	"RGB"	"Analog 2ch"

To wall outlet

Connecting to a TV (Using the component video jacks)

TV or monitor with component video inputs

To PR video input

To PB video input

To PB VIDEO OUT

To Y VIDEO OUT

To PR VIDEO OUT

Signal flow

To Y video input

To audio input

To ANALOG AUDIO OUT (R: red, L: white)

Audio cable

To wall outlet

• Make the following setting.

On-screen display TV	See "Customizing the Function Settings" beginning from **38** .	
	"Video Out Select" **40**	"Audio Out Select" **41**
TV or monitor with component video inputs	"Video" or "S Video"	"Analog 2ch"

Component video outputs/inputs
Some TVs or monitors are equipped with component video inputs. Connecting to these inputs allows you to enjoy higher quality picture playback.
Actual labels for component video inputs may vary depending on the TV manufacturer. (ex. Y, R-Y, B-Y or Y, CB, CR)
In some TVs or monitors, the colour levels of the playback picture may be reduced slightly or the tint may change. In such a case, adjust the TV or monitor for optimum performance.

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Connecting to a TV (Using the phono type jacks)

■ **Select the connection type depending on the TV. (TV equipped with an S video input / Normal TV)**

TV equipped with an S video input

Signal flow

VIDEO OUT
VIDEO Y P$_B$ P$_R$

AV

AC IN

AUDIO OUT
ANALOG BITSTREAM /PCM

To S VIDEO OUT

To ANALOG AUDIO OUT (R:red, L:white)

To audio input   To S

S video cable

Audio cable

To wall outlet

Normal TV

Signal flow

VIDEO OUT
VIDEO Y P$_B$ P$_R$

AV

AC IN

S

AUDIO OUT
ANALOG BITSTREAM /PCM

To audio input   To video input (yellow)

To VIDEO OUT (yellow)

To ANALOG AUDIO OUT (R:red, L:white)

Audio/video cable

To wall outlet

• Make the following setting.

On-screen display	See "Customizing the Function Settings" beginning from **38**.	
TV	"Video Out Select" **40**	"Audio Out Select" **41**
TV equipped with an S video input	"S Video"	"Analog 2ch"
Normal TV	No need to set.	"Analog 2ch"

Notes
• Refer to the owner's manual of the connected equipment as well.
• When you connect the DVD video player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
• If you place the DVD video player near a tuner or radio, the radio broadcast sound might be distorted. In this case, place the DVD video player away from the tuner and radio.
• The output sound of the DVD video player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
• Turn off the amplifier before you connect or disconnect the DVD video player's power cord. If you leave the amplifier power on, the speakers may be damaged.
• If your television set has one audio input, connect the DVD video player to a Y cable adapter (not supplied) and then connect to your TV.

17

Connecting to Optional Equipment

You can enjoy high quality dynamic sounds by connecting the DVD video player to optional audio equipment.

For connection to your TV, see "Connecting to a TV" 16 17 .
For details of output sound, see 35 .

■ : Front speaker	◖ : Center speaker
▢ : Rear speaker	⇨ : Signal flow
◫ : Sub woofer	

Connecting to an amplifier equipped with a Dolby Digital decoder

Dolby Digital
Dolby Digital is the surround sound technology used in theaters showing the latest movies, and is now available to reproduce this realistic effect in the home. You can enjoy motion picture and live concert DVD video discs with this dynamic realistic sound by connecting the DVD video player to a 6 channel amplifier equipped with a Dolby Digital decoder or Dolby Digital processor. If you have a Dolby Pro Logic Surround decoder, you will obtain the full benefit of Pro Logic from the same DVD movies that provide full 5.1-channel Dolby Digital soundtracks, as well as from titles with the Dolby Surround mark.

Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic", and the double-D symbol are trademarks of Dolby Laboratories. Confidential unpublished works. ©1992-1997 Dolby Laboratories. All rights reserved.

Amplifier equipped with a Dolby Digital decoder

To COAXIAL type digital audio input

To BITSTREAM/PCM AUDIO OUT

75 Ω coaxial cable

• Use DVD video discs encoded via the Dolby Digital recording system.
• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	38 41
Recording system	▯▯ D	35
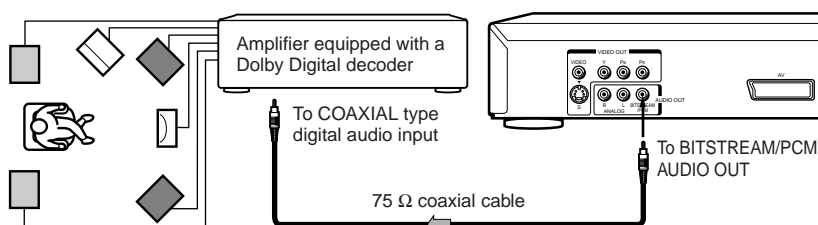
Connecting to an amplifier equipped with Dolby Pro Logic Surround

Dolby Pro Logic Surround
You can enjoy the dynamic realistic sound of Dolby Pro Logic Surround by connecting an amplifier and speaker system (right and left front speakers, a center speaker, and one or two rear speakers).

■ With an amplifier equipped with Dolby Digital
Connect the equipment the same way as described in "Connecting to an amplifier equipped with a Dolby Digital decoder." Refer to that amplifier's owner's manual and set the amplifier so you can enjoy Dolby Pro Logic Surround sound.

■ With an amplifier not equipped with Dolby Digital
Connect the equipment as follows.

• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	38 41

Amplifier equipped with Dolby Pro Logic Surround

To audio input

To ANALOG AUDIO OUT

Audio cable
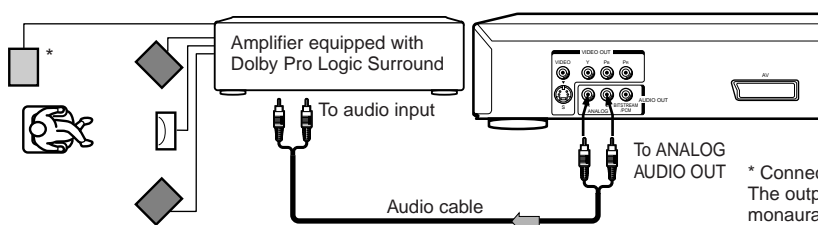
Be sure to set "Audio Out Select" to "Analog 2ch" when you enjoy sounds of Dolby Pro Logic Surround using this connection.

* Connect one or two rear speakers.
The output sound from the rear speakers will be monaural even if you connect two rear speakers.

Connecting to an amplifier equipped with a DTS decoder

Digital Theater Systems (DTS)
DTS is a high quality surround technology used in theaters and now available for home use, on DVD video discs or audio CDs.
If you have a DTS decoder or processor, you can obtain the full benefit of 5.1 channel DTS encoded sound tracks on DVD video discs or audio CDs.

"DTS" and "DTS Digital Surround" are trademarks of Digital Theater Systems, Inc.

Amplifier equipped with a DTS decoder

To COAXIAL type digital audio input

To BITSTREAM/PCM AUDIO OUT

75 Ω coaxial cable

• Use DVD video discs or audio CDs encoded via the DTS recording system.
• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	38 41
Recording system	DTS	35

18
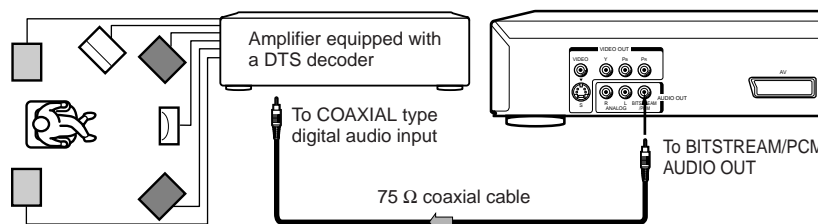
Warning
- When you are connecting (via the BITSTREAM/PCM AUDIO OUT jack) an AV decoder that does not have Dolby Digital, Digital Theater Systems (DTS) or MPEG2 decoding function, be sure to set "Audio Out Select" to "PCM" from the on-screen displays **38** **41** . Otherwise, high volume sound may damage your hearing as well as the speakers.
- When playing DTS-encoded discs (DVD video discs and audio CDs), excessive noise may be output from the analog stereo jacks. To avoid possible damage to the audio system, you should take proper precautions when the ANALOG AUDIO OUT (L/R) jacks of the DVD video player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1 channel DTS Digital Surround™ decoder system must be connected to the BITSTREAM/PCM AUDIO OUT jack of the DVD video player.

Connecting to an amplifier equipped with an MPEG2 audio decoder

MPEG2 sound
You can enjoy motion picture and live concert DVD video discs with dynamic realistic sound by connecting an amplifier equipped with an MPEG2 audio decoder or MPEG2 audio processor.
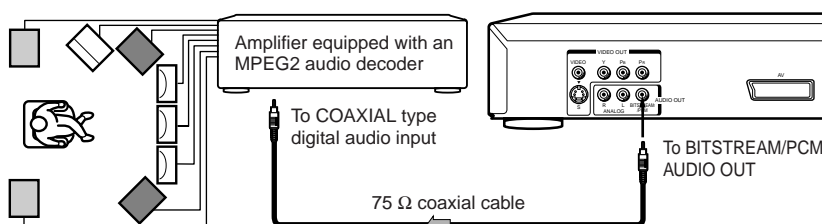
- Use DVD video discs encoded via the MPEG2 recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	**38** **41**
Recording system	MPEG	**35**

Connecting to an amplifier equipped with a digital audio input

2 channel digital stereo
You can enjoy the dynamic sound of 2 channel digital stereo by connecting an amplifier equipped with a digital audio input and speaker system (right and left front speakers).
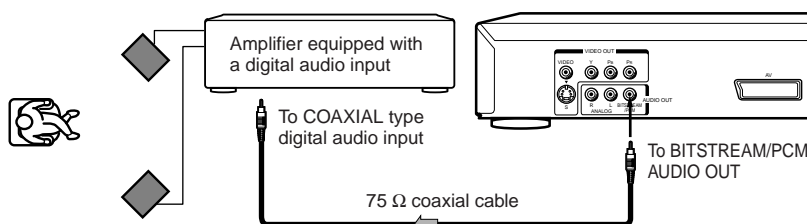
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"PCM"	**38** **41**

Notes
- DO NOT connect the BITSTREAM/PCM AUDIO OUT jack of the DVD video player to the AC-3 RF input of a Dolby Digital Receiver. This input on your A/V Receiver is reserved for Laserdisc use only and is incompatible with the BITSTREAM/PCM AUDIO OUT jack of the DVD video player.
- Connect the BITSTREAM/PCM AUDIO OUT jack of the DVD video player to the "COAXIAL" input of a Receiver or Processor.
- Refer to the owner's manual of the connected equipment as well.
- When you connect the DVD video player to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- The output sound of the DVD video player has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the DVD video player's power cord. If you leave the amplifier power on, the speakers may be damaged.

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Playing a Disc

This section shows you the basics on how to play a disc.

CAUTION
Keep your fingers well clear of the disc tray as it is closing.
Neglecting to do so may cause serious personal injury.

ON/STANDBY indicator **3** STOP PLAY

1 DVD display **2, 4** PAUSE
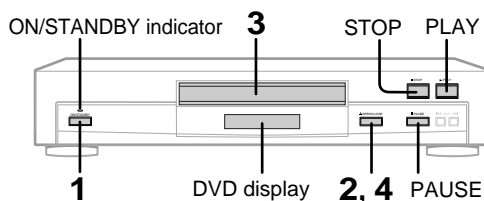
🄳🅅🄳 🄲🄳 **Basic playback**

Preparations
• When you want to view a disc, turn on the TV and select the video input connected to the DVD video player.
• When you want to enjoy the sound of discs from the audio system, turn on the audio system and select the input connected to the DVD video player.

1 Press ON/STANDBY.

I/⏻

The DVD video player turns on and the colour of the ON/STANDBY indicator changes from red (standby) to green (on).

When the DVD video player is turned on for the first time, a message appears. Press ENTER, and make the proper settings before proceeding to step 2. `46`

2 Press OPEN/CLOSE.

▲
OPEN/CLOSE
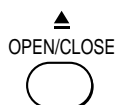
The disc tray opens.

3 Place the disc on the disc tray.
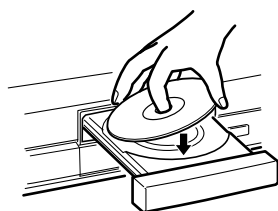
With the playback side down

• There are two different disc sizes. Place the disc in the correct guide on the disc tray. If the disc is out of the guide, it may damage the disc and cause the DVD video player to malfunction.
• Do not place a disc which is unplayable in this DVD video player.

4 Press OPEN/CLOSE to close the disc tray.

▲
OPEN/CLOSE

Playback starts.

If you insert a DVD video disc that contains a top menu, a menu may appear. See "Locating a title using the top menu." `24`
• You may need to press the TOP MENU or MENU button to display disc menu (depending on the actual DVD video disc.)

■ **To start playback in the stop mode**
Press **PLAY**.

PLAY
►

2, 4

1

PAUSE/STEP

PLAY

STOP

MENU

ENTER

▲ / ▼

TOP MENU
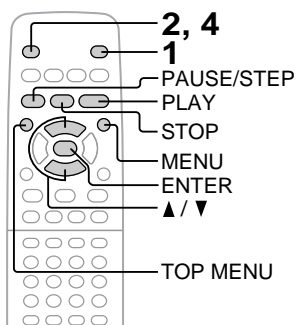
■ **To obtain a higher quality picture**

Occasionally, some picture noise not usually visible during a normal broadcast may appear on the TV screen while playing a DVD video disc because the high resolution pictures on these discs include a lot of information. While the amount of noise depends on the TV you use with this DVD video player, you should generally reduce the sharpness adjustment on your TV when viewing DVD video discs.

■ **About** ⟨DVD⟩ ⟨CD⟩

The ⟨DVD⟩ ⟨CD⟩ icons on the heading bar show the playable discs for the function described under that heading.

⟨DVD⟩ : You can use this function with DVD video discs.

⟨CD⟩ : You can use this function with audio CDs.

■ **To pause playback (still mode)**

Press **PAUSE/STEP** during playback.

PAUSE/STEP

To resume normal playback, press the PLAY button.

• Sound is muted during still mode.

■ **To stop playback**

Press **STOP**.

STOP

■ **To remove the disc**

Press **OPEN/CLOSE**.

▲
OPEN/CLOSE
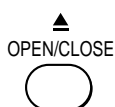
Remove the disc after the disc tray opens completely.
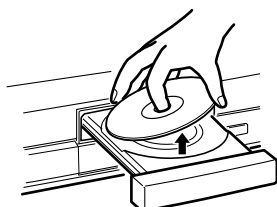
Be sure to press the OPEN/CLOSE button to close the disc tray after you remove the disc.

■ **About the screen saver**

If you pause a picture of a DVD video disc and leave it still for a long while, the screen saver of the DVD video player automatically appears (when "Screen Saver" is set to "On" 43). To turn off the screen saver, press the PLAY button.

■ **Automatic Power Off function**

If the DVD video player is stopped, or the screen saver is engaged for approximately 20 minutes, the DVD video player will automatically turn itself off.

Basic playback

Notes

• Do not move the DVD video player during playback. Doing so may damage the disc.
• Use the OPEN/CLOSE button to open and close the disc tray. Do not push the disc tray while it is moving. Doing so may cause the DVD video player to malfunction.
• Do not push up on the disc tray or put any objects other than discs on the disc tray. Doing so may cause the DVD video player to malfunction.
• In many instances, a menu screen will appear after playback of a movie is completed. Prolonged display of an on-screen menu may damage your television set, permanently etching that image onto its screen. To avoid this, be sure to press the STOP button on your remote control once the movie is completed.

Playing a Disc (continued)

You can play discs at various speeds, and resume playback from the location where you stopped playback.

REV
FWD
PLAY
STOP
PAUSE/STEP
SLOW
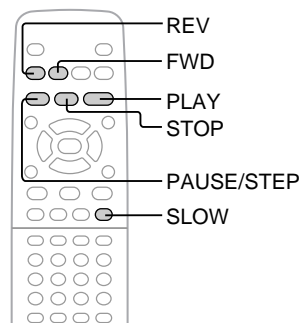
DVD CD Playing in fast reverse or fast forward directions

Press REV or FWD during playback.

REV   FWD
◄◄   ►►

REV: Fast reverse playback
FWD: Fast forward playback

Each time you press the REV or FWD button, the playback speed changes.

■ **To resume normal playback**
Press **PLAY**.
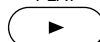
PLAY
►

Notes
• The DVD video player mutes sound and omits subtitles during reverse and forward scan of DVD video discs. However, the DVD video player plays sound during fast forward or fast reverse play of audio CDs.
• The playback speed may differ depending on the disc.

DVD Playing frame by frame

Press PAUSE/STEP during still playback.

PAUSE/STEP
❚❚/❚►

Each time you press the PAUSE/STEP button, the picture advances one frame.

■ **To resume normal playback**
Press **PLAY**.

PLAY
►

Note
The sound is muted during frame by frame playback.

DVD **Playing in slow-motion**

Press SLOW during playback.

SLOW
▐►

Each time you press the SLOW button, the slow-motion speed changes.

■ **To resume normal playback**
Press **PLAY**.

PLAY
►

Notes
• The sound is muted during slow-motion playback.
• The playback speed may differ depending on the disc.

DVD CD **Resuming playback from the same location**

1 Press STOP at the location where you want to interrupt playback.

STOP
■

The DVD video player memorizes the location where playback is stopped.

2 Press PLAY.

PLAY
►

The DVD video player resumes playback from the location where you stopped playback.

■ **To start playback from the beginning regardless of the location where you stopped playback**

1 Press **STOP** twice.

STOP
■

The DVD video player's memory is cleared.

2 Press **PLAY**.

PLAY
►

DVD Playback starts from the beginning of the current title.

CD Playback starts from the beginning of the disc.

• If you want to return to the beginning of a DVD video disc, open and close the disc tray once with the OPEN/CLOSE button before pressing the PLAY button.

Notes
• The DVD video player's memory is also cleared when:
  – you change the parental lock setting 44 or select a disc menu language 42.
  – you open the disc tray.
• There may be a difference in the location where playback resumes depending on the disc.
• Settings you changed using the on-screen displays while the DVD video player keeps a location in the memory may function only after the memory is cleared.

Locating a Specific Title, Chapter, or Track

Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. Audio CDs are divided into tracks. You can quickly locate any specific title, chapter, or track.

DVD video disc
Title 1 — Title 2
Chapter 1 | Chapter 2 | Chapter 1 | Chapter 2 | Chapter 3

Audio CD
Track 1 | Track 2 | Track 3 | Track 4 | Track 5
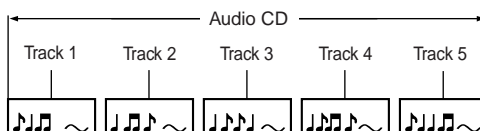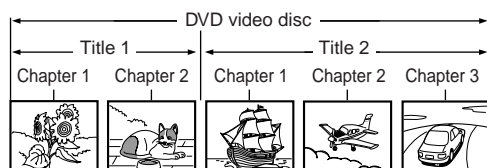
DVD **Locating a title using the top menu**

1 Press TOP MENU.

TOP MENU

The top menu appears on the TV screen.

e.g.

TITLE 1   TITLE 2

TITLE 3   TITLE 4
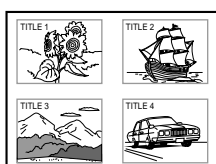
2 Press ▲ / ▼ / ◄ / ► to select the title you want.
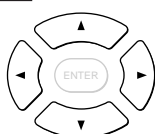
If the titles in the top menu are assigned a number, you can directly locate a specific title by pressing its designated number with the number buttons.

3 Press ENTER.

ENTER
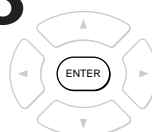
Playback starts from chapter 1 of the selected title.

Notes
- The instructions above describe basic procedures which may vary depending on the contents of the DVD video disc. If different instructions appear on the TV screen, follow those instructions.
- If you display the top menu during playback and press the TOP MENU button again without selecting any title, the DVD video player may resume playback from the point where you first pressed the TOP MENU button (depending on the actual DVD video disc.)
- This method of locating a title is available only on a disc that contains a top menu.
- Instruction notes of discs may refer to the button that displays the top menu as TITLE button.

DVD **Locating a title by entering the title number**

1 Press T.

SEARCH
T

Make sure that the space of "T (Title)" is highlighted.
(You can shift the highlight using the ◄ / ► buttons.)

e.g.

T 1 **C** 1 🕐 –:––:––
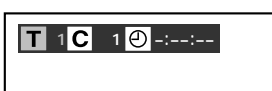
2 Enter the number for the title you want, using ▲ / ▼ or the number buttons.

e.g. To select title 2   2

To select title 12   1 → 2
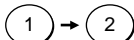
3 Press PLAY.

PLAY
►
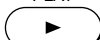
Playback starts from chapter 1 of the selected title.

Notes
- Pressing the CLEAR button resets the title and chapter numbers. To clear the "T (Title)" and "C (Chapter)" display, press the T button several times.
- This method of locating a title is available only on a disc that contains title numbers.

TOP MENU
SKIP
PLAY
▲ / ▼ / ◄ / ►
ENTER
CLEAR
T
Number buttons
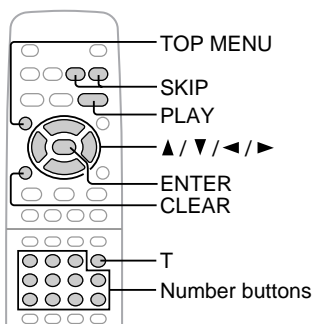
🔲 **Locating a specific chapter or track directly**

1 Press T.

If you are using an audio CD, skip steps 1 and 2, then at step 3, enter the number for the track you want using the number buttons.

SEARCH
(T)

e.g.

T 1**C** 1 🕘 –:--:--

2 Press ► to highlight the space of "C (Chapter)."

e.g.
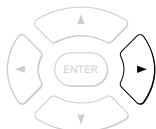
T 1**C** 1 🕘 –:--:--

3 Enter the number for the chapter or track you want, using ▲ / ▼ or the number buttons.

When you use the number buttons, you can use the +10 button to select numbers from 10 through 99.

e.g. To select chapter or track 25

(2) → (5)
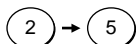
or (+10) → (+10) → (5)

4 Press PLAY.

PLAY

► Playback starts from the selected chapter or track.

■ **To select a title and chapter number at the same time**

Perform step 1, and enter a title number you want in the space of "T (Title)" using the number buttons or the ▲ / ▼ buttons then perform steps 2 to 4.

Note
Pressing the CLEAR button resets the title and chapter numbers. To clear the "T (Title)" and "C (Chapter)" display, press the T button several times.

🔲 **Locating a specific chapter or track**

Press SKIP I◄◄ or ►►I repeatedly to display the chapter or track number you want.

Playback starts from the selected chapter or track.

SKIP
(I◄◄) (►►I)

To locate succeeding chapters or tracks

SKIP
(I◄◄) (►►I)

Playback starts from the beginning of the current chapter or track.
When you press twice, playback starts from the beginning of the preceding chapter or track.

Notes
• Some titles may not display chapter numbers.
• If you press and hold the SKIP I◄◄ or ►►I button on the front panel during playback, the DVD video player performs fast reverse or fast forward playback. You can vary the speed by pressing the button repeatedly.
  To locate chapters or tracks during fast reverse or fast forward playback, first press the PLAY button to resume normal playback, then use the SKIP I◄◄ or ►►I button.
• When you set "Title Stop" to "Off" **45**, you can access chapters in another title. If you go back to the preceding title by pressing the SKIP I◄◄ button, the DVD video player locates the first chapter of the title. When "Title Stop" is set to "On," you can access chapters only within the current title.

25

Accessing a Specific Location Directly

You can access a specific location by entering its corresponding time (hours, minutes, seconds).

3

1

2
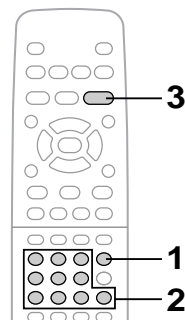
DVD CD **Entering the time of the desired location**

1 Press T three times.

SEARCH
(T)

You may have to press further depending on the disc. Press the button repeatedly until the clock icon is highlighted.

e.g.

| T | 1 | C | 1 | 🕐 | -:--:-- |

2 Press the number buttons to enter the time.

e.g.

(1) → (2) → (5) → (3) → (0)

| T | 1 | C | 1 | 🕐 | 1:25:30 |

3 Press PLAY.

PLAY
(►)

Playback starts from the desired location.

Notes
• Some discs may not respond to this process.
• Some scenes may not be located precisely as you specified.
• This method for accessing specific locations is available only within the current title of the DVD video disc or within the current track of the audio CD.

Playing Repeatedly

You can play a specific title, chapter, track, or segment repeatedly.
(Title repeat, chapter/track repeat, A-B repeat)

PLAY

CLEAR
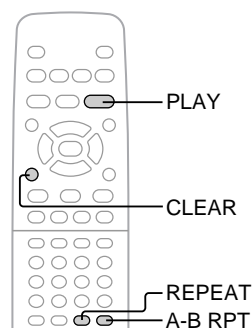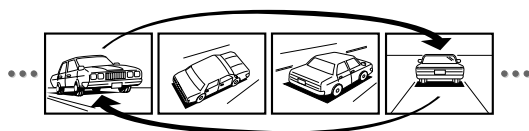
REPEAT
A-B RPT

DVD CD **Repeating a title, chapter, or track**

1 Press REPEAT.

REPEAT

Each time you press the REPEAT button, the repeat mode changes as follows.

Chapter Repeat

DVD	Chapter Repeat	Repeats the current chapter.
↓		
DVD	Title Repeat	Repeats the current title.
CD	Track Repeat	Repeats the current track.
↓		
DVD CD	All Repeat	Repeats the entire disc.
↓		
	Repeat Off	Resumes normal playback.

2 Press PLAY.

PLAY

►
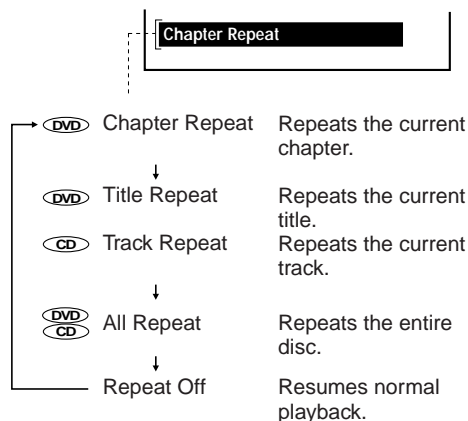
The DVD video player starts repeat playback.
Press the PLAY button within about 5 seconds after you press the REPEAT button.

■ **To resume normal playback**
Press **CLEAR**.

CLEAR

Note
Some discs may not permit repeat operation.

DVD CD **Repeating a specific segment**

1 Press A-B RPT at the beginning of the segment (point A) you want to play repeatedly.

A-B RPT

A–

2 Press A-B RPT again at the end of the segment (point B).

A-B RPT

The DVD video player automatically returns to point A and starts repeat playback of the selected segment (A-B).

A–B

■ **To resume normal playback**
Press **CLEAR**.

CLEAR

Notes
• Some discs may not permit A-B repeat operation.
• You cannot set the A-B repeat function for a segment that includes multiple camera angles 33 .
• You can specify a segment only within the current title.
• There may be a slight difference between point A and the location where playback actually resumes depending on the disc.

Playing in a Favorite Order

You can combine your favorite titles, chapters, or tracks and play them in the order you determine. You can program up to 30 selections into the memory. (Memory playback)

3

▲ / ▼ / ◄ / ►

2

CLEAR

2

1
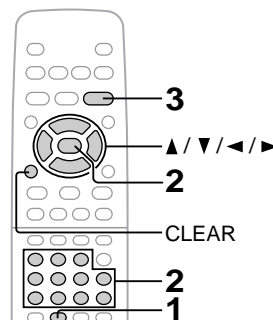
DVD CD Setting titles, chapters, or tracks in a favorite order

1 Insert a disc and press MEMORY during stop.

MEMORY

The following display appears.

e.g.

```
1 T:-- CT:---
2 T:-- CT:---
3 T:-- CT:---
4 T:-- CT:---
5 T:-- CT:---
6 T:-- CT:---
7 T:-- CT:---
```

T: Title number
CT: Chapter number
       or track number

2 Select the items in the order you want by pressing the number buttons, then ENTER for each item.

Each time you press the ◄ / ► button, the spaces of "T" and "CT" are highlighted in turn. Highlight where you want to enter, then press the corresponding number buttons.

To select another chapter in the same title, you do not need to select the title number.

To select tracks from an audio CD in order, press the **number buttons** for the track, then press the **ENTER** button for each selection you want.

Note
The space of "T (Title)" may be showing a number. Neglect this number when using an audio CD.

3 Press PLAY while the display appears on the TV screen.

PLAY

►

The DVD video player starts memory playback.

■ **To change the programmed selections**
1 While the display appears on the TV screen, press ▲ / ▼ / ◄ / ► to move the highlighted bar to the item you want to change.
2 Change the selection following the instructions in step **2**.

■ **To cancel the programmed selections**
1 While the display appears on the TV screen, press ▲ / ▼ to move the highlighted bar to the item you want to cancel.
2 Press **CLEAR**.

■ **To resume normal playback from memory playback**
Press **CLEAR**.

CLEAR

⊖

The memory playback indicator disappears.

■ **To program during playback**
If you press the **MEMORY** button during playback, a programming display appears.
Follow steps **2** and **3**.

Notes
• Some discs may not permit memory playback operation.
• If you press the REPEAT button during memory playback, the DVD video player repeats the current memory playback.
• If you press the MEMORY or RETURN button while the display appears on the TV screen, the display disappears.
• The programmed selections will be cleared when you turn off the DVD video player.

Playing in Random Order

You can play titles, chapters within a title, or tracks in random order.
(Random playback)

2

CLEAR

1
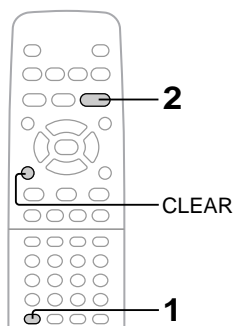
DVD CD **Playing titles, chapters or tracks in random order**

1 Press RANDOM.

RANDOM

Each time you press the RANDOM button, the random playback mode changes as follows.

> Chapter Random

→ **DVD** Chapter Random — Plays chapters within the current title in random order.

↓

DVD Title Random — Plays titles in random order.

CD Track Random — Plays tracks in random order.

↓

Random Off — Resumes normal playback.
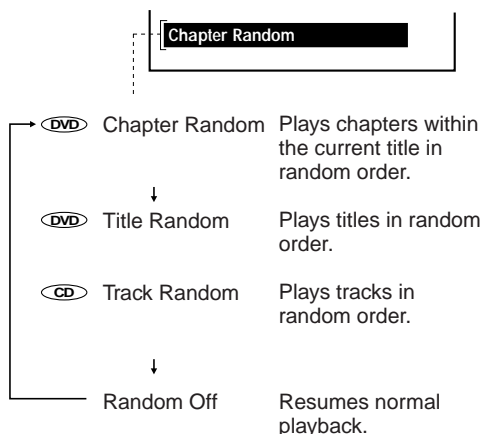
If you press the RANDOM button during playback, the DVD video player automatically starts random playback after finishing the current title, chapter or track.

2 Press PLAY.

PLAY

▶

The DVD video player starts random playback.
Press the PLAY button within about 5 seconds after you press the RANDOM button.

■ To resume normal playback

Press **CLEAR**.

CLEAR

Notes
• Some discs may not permit random playback operation.
• You cannot use the random playback function in conjunction with the memory playback function.

Advanced playback

29

Zooming a Picture

You can magnify areas within a picture.

▲ / ▼ / ◄ / ►
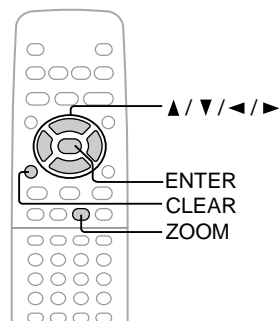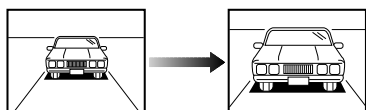
ENTER
CLEAR
ZOOM

⓭ⓥⓓ **Zooming a picture**

Press ZOOM during normal, slow or still playback.

ZOOM

The DVD video player enters the zoom playback mode and displays the icon.

e.g.

ZOOM
EXIT

ZOOM : As you repeatedly press the ENTER (or ZOOM) button while "ZOOM" is selected, the magnification level changes.
Variation of the levels includes reducing.

EXIT : If you press the ENTER button while "EXIT" is selected, you can turn off the icon, keeping the current magnification level.

You can shift the highlight within the icon by the ▲ / ▼ / ◄ / ► buttons.
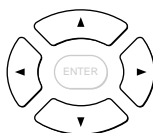
If you press and hold the ▲ / ▼ / ◄ / ► buttons, the zoom point shifts.

ENTER

CLEAR

Pressing the CLEAR button restores the zoom point to the center of the picture.

■ **To resume normal playback**

While "ZOOM" is selected, press **ZOOM** repeatedly to turn off the icon.
Picture restores the size when the icon disappears.

ZOOM

• The ENTER button cannot cancel zoom playback if you have turned off the icon by selecting "EXIT." To restore normal picture size, press the ZOOM button to display the icon, then further press the ZOOM button until the icon turns off.

Notes
• Some discs may not respond to zoom feature.
• During some scenes, the buttons may not work as described.
• Zooming does not work on subtitles or menus included on DVD video discs.
• While the icon is displayed, the ▲ / ▼ / ◄ / ► buttons cannot work on menus included on DVD video discs. If you want to view the menus, turn off the icon.
• The magnification level varies depending on the picture size you select. 〈**40**〉

Selecting the Picture Enhancement (E.P.M.)*

You can easily switch the picture enhancement to your preference.

*E.P.M.: Enhanced Picture Mode

2

ENTER

1, 2
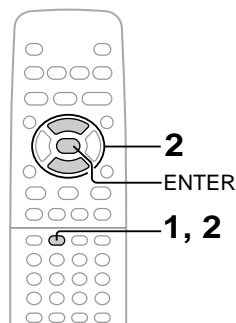
📀 **Selecting the picture enhancement**

1 Press E.P.M.

E.P.M.

The picture enhancement selection appears.

┌─────────────┐
│   EPM   │
│   EPM   │
│   EPM 1   │
│   EPM 2   │
│   EPM   │
└─────────────┘

2 Select the picture enhancement by pressing E.P.M. or ▲ / ▼.

Each time you press the button, the picture enhancement changes.

EPM
Light:
Brighter than in "Normal".

EPM
Normal:
Standard black level.

EPM 1
Movie 1:
To raise brightness to clarify details.

EPM 2
Movie 2:
To deepen colours.

EPM
Animation:
To raise contrast enhancing colours.

■ **To turn off the picture enhancement selection**
Press **ENTER**.
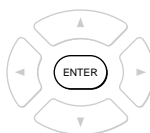
Alternatively leave the DVD video player unoperated for about 5 seconds after having made the selection.

Note
Actual effects to pictures may vary depending on the TV. Make the selection to your preference.

Advanced playback

31

Selecting the Sound Enhancement (E.A.M.)*

You can easily switch the sound enhancement to your preference.

*E.A.M.: Enhanced Audio Mode

2
ENTER
1, 2
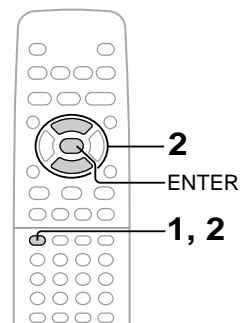
DVD/CD Selecting the sound enhancement

1 Press E.A.M.

E.A.M.

The sound enhancement selection appears.

EAM
EAM
EAM

2 Select the sound enhancement by pressing E.A.M. or ▲ / ▼.

Each time you press the button, the sound enhancement changes.

EAM
Normal:
Normal sound.

EAM
3D (N-2-2):
To obtain expansive virtual surround sound effects from just two speakers.

EAM
Dialogue:
To control dynamic range to make dialogues easier to hear (only when playing a DVD video disc recorded on the Dolby Digital recording system).
• To use this enhancement on sounds output from the BITSTREAM/PCM AUDIO OUT jack, be sure to set "Audio Out Select" to "PCM". 41

■ **To turn off the audio enhancement selection**
Press **ENTER**.
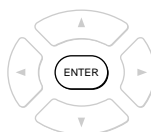
ENTER

Alternatively leave the DVD video player unoperated for about 5 seconds after having made the selection.

Notes
• Actual effects to sounds may vary depending on the speakers. Make the selection to your preference.
• Actual effects to sounds may vary depending on the disc.
• When the DVD video player is connected to an amplifier equipped with Dolby Pro Logic Surround, select "Normal". Otherwise, Dolby Pro Logic Surround may function differently than usual.
• Selecting "Dialogue" disables "Dynamic Range Control" function 41.

Spatializer® 3-Dimensional Sound Processing provided by Desper Products. Inc.
Certain audio features of this product manufactured under a license from Desper Products, Inc., Spatializer® and the circle-in-square device are trademarks owned by Desper Products, Inc.

Selecting the Camera Angle

If the scene was recorded from multiple angles, you can easily change the camera angle of the scene you are watching.

2

1, 2
CLEAR
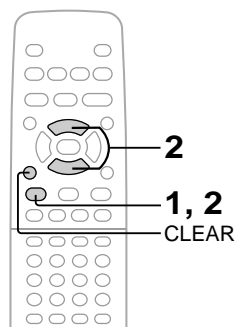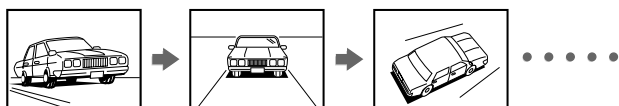
⓭ Changing the camera angle

1 Press ANGLE while playing a scene recorded with multiple angles.

ANGLE

While playing a scene recorded with multiple angles, the angle icon (📹) flashes in the DVD display.
Press the ANGLE button while the angle icon is flashing.

e.g.

1
2
3

2 Press ANGLE or ▲ / ▼ while the angle number is displayed on the TV screen.

ANGLE

Each time you press the ANGLE button, the camera angle changes.

ENTER
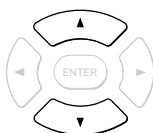
You can change the camera angle directly by pressing the number buttons corresponding to its angle number instead of using the ▲ / ▼ buttons.

■ **To turn off the angle number display**
Press **CLEAR**.

CLEAR

Notes
• You can change the camera angle during still playback. The camera angle changes to the new setting when you resume normal playback.
• If you pause a picture immediately after changing a camera angle, the resumed playback picture may not display the new camera angle.

Advanced playback

33

Selecting Subtitles

You can display subtitles on the TV screen and select a subtitle language from those included on the DVD video disc.

Good evening! → Bonsoir! → Buenas tardes! • • • • •

▲ / ▼ / ◄ / ►
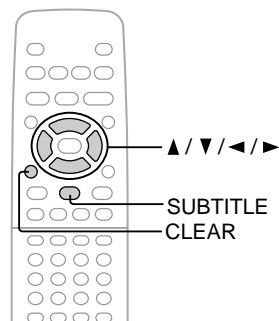
SUBTITLE
CLEAR

DVD **Selecting a subtitle language**

1 Press SUBTITLE during playback.

SUBTITLE

The current subtitle setting is displayed.

e.g.

Off
JPN 1
FRE 1
SPA 1

The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations.

2 Press SUBTITLE or ▲ / ▼ while the subtitle setting is displayed on the TV screen.

SUBTITLE

Each time you press the SUBTITLE button, the subtitle languages included on the DVD video disc change.
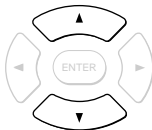
ENTER

To turn off the subtitle setting display, press the CLEAR or ENTER button.

■ To turn subtitles on or off

1 Press **SUBTITLE** during playback.

SUBTITLE

2 Press ◄ / ► while the subtitle setting is displayed on the TV screen, to select "On" or "Off."

ENTER
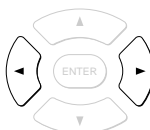
Notes
- Some DVD video discs are set to display subtitles automatically, and you cannot turn them off even if you set the subtitle function to off.
- During some scenes, the subtitles may not appear immediately after you select "On."
- Some DVD video discs will allow you to make subtitle selections and turn subtitles on or off only via the disc menu.

Notes
- When you turn on the DVD video player or replace a disc, the player returns to the initial default setting .
  When you select a subtitle language which is not included on the disc, the DVD video player plays a prior language programmed on the disc.
- During some scenes, the subtitles may not appear immediately after you change the subtitle language.

Selecting a Language

You can select a preferred language and sound recording system from those included on the DVD video disc.

Good morning! **Bonjour!** **¡Buenos días!** • • •
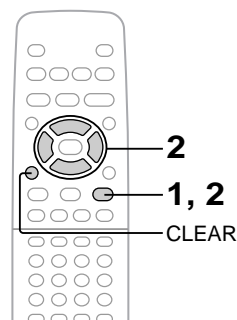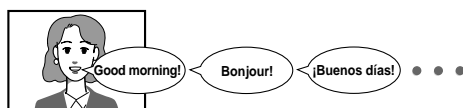
DVD **Selecting a playback audio setting**

1 Press AUDIO during playback.

AUDIO

The current audio setting is displayed.

e.g.

> ENG1 PCM 2CH
> ENG2 ⫿⫿ D 2CH

The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. 47

2 Press AUDIO or ▲ / ▼ while the audio setting is displayed on the TV screen.

AUDIO

Each time you press the AUDIO button, the audio settings included on the DVD video disc change.

ENTER
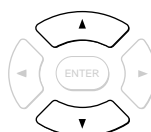
If you press the ◄ / ► buttons, you can select output sound format. 41

To turn off the audio setting display, press the CLEAR button.

Notes
• When you turn on the DVD video player or replace a disc, player returns to the initial default setting 42.
  If you select a sound track which is not included on the disc, the DVD video player plays a prior sound track programmed on the disc.
• Some discs allow you to change audio selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate language from the selections on the disc menu.

■ Output sound conversion table (sampling frequency/quantization bit)

Discs	Recording system		Audio selection from the menu 38 41 and output jacks on the rear panel					
			Bitstream		Analog 2ch		PCM	
			BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks	BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks	BITSTREAM/PCM jack	ANALOG AUDIO OUT jacks
DVD video discs	Dolby Digital		Bitstream	48 kHz/20 bit	Bitstream	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
	Linear PCM	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
		96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	—	96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	—	96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	—	96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
	DTS		Bitstream	—	Bitstream	—	—	—
	MPEG1, MPEG2		Bitstream	48 kHz/16 bit	Bitstream	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
Audio CDs	Linear PCM 44.1 kHz/16 bit		44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
	DTS		Bitstream	(Noise)	Bitstream	(Noise)	Bitstream	(Noise)

▭ : 3D (N-2-2) sound enhancement can function.

35

Operating in the On-screen Display Mode

When you turn on the on-screen display, you can view information on operational status and access the features and settings on-screen.

◄ / ►

ENTER
DISPLAY
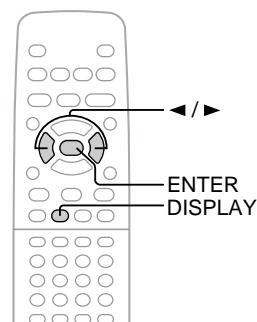
DVD CD **Operating in the on-screen display mode**

Press DISPLAY.

DISPLAY

The following display appears.
Each time you press the DISPLAY button, the on-screen display changes as follows.
If you press the ◄ / ► buttons to select an icon, then press the ENTER button, you can access the feature.
When you select an icon (∗), no need to press the ENTER button.
See the pages in ◯ for details on the features.

e.g. When playing a DVD video disc

T 2 **C** 3 🕒 0:08:16 ◯▥🎦🎵 ►

Press DISPLAY again.

↓

T 2 **C** 3 🕒 -0:21:28 EAM EPM ZOOM ◀🎦 ►
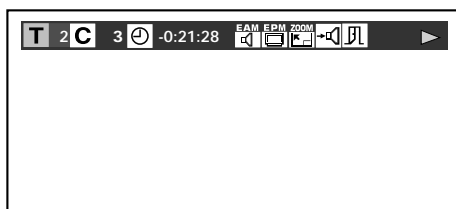
Press DISPLAY again.

↓

T ∗ : Title number (Track number)
To locate a title or track using the number. 24

C ∗ : Chapter number
To locate a chapter using the number. 25

🕒 ∗ : Elapsed time of the current title
To enter the time to locate a desired location. 26

◯ : Audio setting 35

▥ : Subtitle setting 34

🎦 : Angle setting 33

🎵 : To turn off the display.

T ∗ : Title number (Track number)
To locate a title or track using the number. 24

C ∗ : Chapter number
To locate a chapter using the number. 25

🕒 ∗ : Remaining time of the current title
To enter the time to locate a desired location. 26

EAM
◀ : E.A.M. (Enhanced Audio Mode) setting 32

EPM
🖵 : E.P.M. (Enhanced Picture Mode) setting 31

ZOOM
▱ : To zoom a picture. 30

◀ : "Audio Out Select" setting 41
BST: Bitstream   2CH: Analog 2ch   PCM: PCM

🎵 : To turn off the display.

(continued)

36

`T` 2 `C` 3 □ |◁◁ ◁◁ ▷ ▷▷ ▷▷| ||▷ || ⅃⅃   ▶

T * : Title number (Track number)
To locate a title or track using the number. 24⟩

C * : Chapter number
To locate a chapter using the number. 25⟩

□ : To stop playback. 21⟩

|◁◁ : Playback starts from the beginning of the
current chapter or track. 25⟩

◁◁ : Fast reverse playback 22⟩

▷ : To start playback. 20⟩

▷▷ : Fast forward playback 22⟩

▷▷| : To locate succeeding chapters or tracks. 25⟩

||▷ : To slow motion playback. 23⟩

|| : To pause playback. 21⟩

⅃⅃ : To turn off the display.

Press DISPLAY again.

`T` 2 `C` 3 🕘 0:08:16 ⅃⅃ BIT RATE ||||||||||| 9.6 Mbps

OFF
To turn off the on-screen display, press
DISPLAY again.

The on-screen display will vary depending on the disc.

DVD : Data transfer rate (Mbit/s)
= Amount of picture, sound and subtitle data in the
DVD video disc transferred per second.
The larger the value is, the more data processed,
but this does not necessarily insure better picture
quality.

CD : CD-Text
Displays CD-Text data if included on the audio
CDs. (Some letters may not be displayed properly
depending on the disc.)

37

Customizing the Function Settings

You can change the default settings to customize performance to your preference.

2

RETURN

3, 4

1, 6
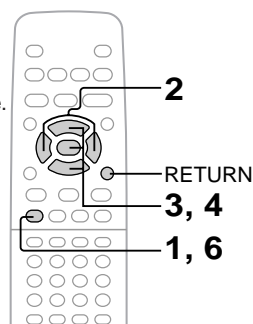
DVD CD **Setting procedure**

1 **Press SETUP during stop.**

SETUP

The following on-screen display appears.

Picture
TV Shape   4:3 LB
PAL/Auto   PAL
Video Out Select   Video
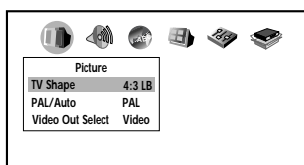
2 **Press ◄ / ► to select a symbol for the setting you want to change.**

(See the next page.)
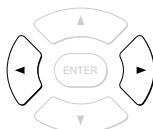
ENTER

Picture performance settings

Output sound settings

ABC Language settings

Display settings

Operational settings

Initial settings

3 **Press ▲ / ▼ to select the setting you want to change, then press ENTER.**

ENTER → ENTER
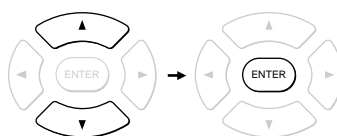
4 **Change the selection by ▲ / ▼ or other buttons, by referring to the corresponding pages 39 , then press ENTER.**

ENTER → ENTER
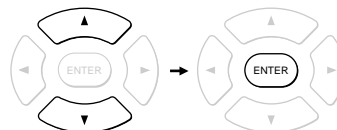
5 **Repeat steps 3 and 4 to change other settings.**

To select another operation, go back to step 2.

6 **Press SETUP.**

SETUP

The on-screen display disappears.

■ **To return to the previous display**
Press **RETURN**.

RETURN

Notes
• The on-screen display disappears when you press the SETUP button.
• The SETUP button can function even during normal playback, however some operations may be inaccessible, and a message will appear. In this case, try again after playback is stopped.

Setting		Details	Page
TV Shape	DVD	**To select a picture size according to the aspect ratio of your TV.**	**40**
PAL/Auto	DVD	**To select the video system of a disc.**	**40**
Video Out Select	DVD	**To select the video output type corresponding to your TV system**	**40**
Audio Out Select	DVD CD	**To select an output sound format corresponding to your system connection.**	**41**
Dynamic Range Control	DVD	**To turn on or off a function that makes faint sounds easier to hear even if you lower the volume during late hours playback.**	**41**
Karaoke Vocal	DVD	**To turn on or off the vocal output during DVD KARAOKE disc playback.**	**41**
On-Screen Language	DVD CD	**To select a preferred language for on-screen displays.**	**42**
Disc Menu Language	DVD	**To select a preferred language for disc menus.**	**42**
Audio Language	DVD	**To select a preferred language for the sound track.**	**42**
Subtitle Language	DVD	**To select a preferred language for subtitles.**	**42**
On-Screen Displays	DVD CD	**To turn on or de-activate the operational status display on the TV screen.**	**43**
Background	DVD CD	**To select the background colour or background picture.**	**43**
Screen Saver	DVD	**To turn the screen saver on or off.**	**43**
Pause/Still	DVD	**To select the resolution of still pictures. (Field/Frame)**	**44**
Parental Lock	DVD	**To turn the parental lock function on or off.**	**44**
Title Stop	DVD	**To turn on or off a feature that automatically stops playback after a title has been viewed.**	**45**
On-Screen Language TV Shape Audio Out Select	DVD CD	**To install the initial system setting.**	**46**

Function setup

39

Customizing the Function Settings (continued)

Setting details
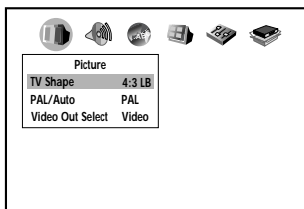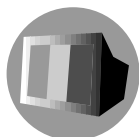
TV Shape ⟨DVD⟩

4:3 Letterbox: Select when a standard 4:3 TV is connected.
Displays theatrical images with masking bars above and below the picture.

4:3 Normal: Select when a standard 4:3 TV is connected.
Displays pictures cropped to fill your TV screen. Either or both sides of the picture are cut off.

16:9 Widescreen: Select when a 16:9 wide TV is connected.

Notes
• The displayable picture size is preset on the DVD video disc. Therefore, the playback picture of some DVD video discs may not conform to the picture size you select.
• When you play DVD video discs recorded in the 4:3 picture size only, the playback picture always appears in the 4:3 picture size regardless of the TV shape setting.
• If you select "16:9 Widescreen" and you own a 4:3 TV set, the DVD playback picture will be horizontally distorted during playback. Images will appear to be horizontally compressed. Always be sure that your TV shape conforms to the actual TV in use.

PAL/Auto ⟨DVD⟩

PAL: To play a PAL disc. Connect a PAL TV to view a picture.
Auto: The DVD video player automatically identifies PAL or NTSC video system of a disc. Connect a multisystem TV (PAL/NTSC compatible) to view a picture.
A playback picture may be distorted when detected a signal change between PAL and NTSC on the disc.

Picture
TV Shape   4:3 LB
PAL/Auto   PAL
Video Out Select Video

Video Out Select ⟨DVD⟩

Video: Select when connected to a normal TV. **16**

S Video: Select when connected to a TV compatible with S video signals. **16** **17**

RGB: Select when connected to an RGB monitor. **16**

Notes
• When you connect a TV equipped with the component video inputs, select "Video" or "S Video". **16**
• If the on-screen display disappears immediately after you select "RGB", you can restore it by connecting the DVD player using the VIDEO OUT (yellow) jack.

```
        🔳 🔊 🔤 📃 🎬 💿
              Audio
Audio Out Select        Bitstream
Dynamic Range Control   On
Karaoke Vocal           Off
```

Karaoke Vocal ⟨DVD⟩

Off: The primary vocal is not output.
On: The primary vocal is output when it is recorded
     on the disc.

Notes
• The vocal output feature is used during playback of
  Dolby Digital (multi-channel) recorded DVD KARAOKE
  discs. This feature allows you to turn off vocal audio
  tracks, or restore them for background
  accompaniment.
• When playing KARAOKE, connect appropriate audio
  equipment such as an amplifier to the DVD video
  player.

Audio Out Select ⟨DVD⟩ ⟨CD⟩

Select the output sound format corresponding to your
system connection.
For details of sound recording systems, see ⟨35⟩.

Bitstream: Select when connected to an amplifier
             equipped with a Dolby Digital, DTS,
             MPEG1 or MPEG2 decoder. ⟨18⟩ ⟨19⟩
             The DVD video player outputs digital
             audio information in the bitstream
             format when you play a DVD video disc
             recorded on the Dolby Digital, DTS,
             MPEG1 or MPEG2 recording system.

Analog 2ch: Select when connected to a TV, or
             Dolby Pro Logic or stereo system via
             the analog audio jacks. ⟨16⟩ ⟨17⟩ ⟨18⟩

PCM: Select when connected to a 2 channel
             digital stereo amplifier. ⟨19⟩
             The DVD video player outputs sounds
             in the PCM 2ch format when you play a
             DVD video disc recorded on the Dolby
             Digital, MPEG1 or MPEG2 recording
             system.

Dynamic Range Control ⟨DVD⟩

Off: Full dynamic range is maintained.
On: Dynamic range is reduced.

Notes
• This function works only during playback of Dolby
  Digital recorded discs.
• The level of Dynamic Range Reduction may differ
  depending on the DVD video disc.

Function setup

41

Customizing the Function Settings (continued)

Setting details

On-Screen Language DVD CD

English: To view on-screen displays in English.
Français: To view on-screen displays in French.
Deutsch: To view on-screen displays in German.

Disc Menu Language DVD

English: To display disc menus in English.
French: To display disc menus in French.
German: To display disc menus in German.
Others: To make a further choice.
           After pressing the ENTER button, follow
           steps 1) - 4) below.
1) Obtain the abbreviation of the preferred
   language from the list |47⟩.
2) Select the first character by pressing the ▲ / ▼
   buttons.
3) Press the ◄ / ► buttons to shift and select the
   second character by pressing the ▲ / ▼ buttons.
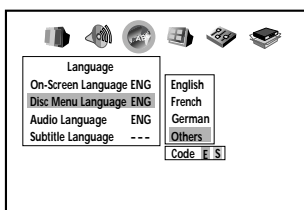
4) Press the ENTER button.

Note
Some DVD video discs may not include your pre-
selected language. In this case, the DVD video player
automatically displays disc menus consistent with the
disc's initial language setting.

Audio Language DVD

English: To play sound tracks in English.
French: To play sound tracks in French.
German: To play sound tracks in German.
Others: To make a further choice.
           After pressing the ENTER button, follow
           steps 1) - 4) below.
1) Obtain the abbreviation of the preferred
   language from the list |47⟩.
2) Select the first character by pressing the ▲ / ▼
   buttons.
3) Press the ◄ / ► buttons to shift and select the
   second character by pressing the ▲ / ▼ buttons.
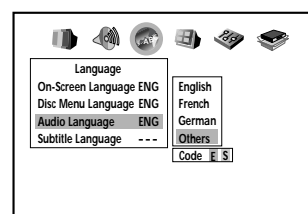
4) Press the ENTER button.

Note
Some DVD video discs may be played in a different
language than you selected. A prior language may be
programmed on the disc.

Subtitle Language DVD

English: To display subtitles in English.
French: To display subtitles in French.
German: To display subtitles in German.
No Subtitle: To disable subtitles.
Others: To make a further choice.
               After pressing the ENTER button,
               follow steps 1) - 4) below.
1) Obtain the abbreviation of the preferred
   language from the list |47⟩.
2) Select the first character by pressing the ▲ / ▼
   buttons.

3) Press the ◄ / ► buttons to shift and select the second character by pressing the ▲ / ▼ buttons.

Language
On-Screen Language	ENG	English
Disc Menu Language	ENG	French
Audio Language	ENG	German
Subtitle Language	---	No Subtitle
		Others
		Code A A
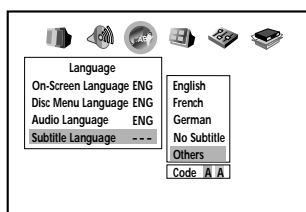
4) Press the ENTER button.

Notes
• Some DVD video discs may be set to display subtitles in a different language than you selected. A prior subtitle language may be programmed on the disc.
• Some DVD video discs allow you to change subtitle selections only via the disc menu. If this is the case, press the MENU button and choose the appropriate subtitle language from the selection on the disc menu.

Display
On-Screen Displays	On
Background	Gray
Screen Saver	On
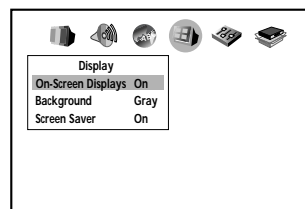
On-Screen Displays DVD CD

Off: Operational modes (e.g. "▯▯", "▷▷") are not displayed.
On: Operational modes (e.g. "▯▯", "▷▷") are displayed on-screen.

Background DVD CD

Blue: Blue background.
Gray: Gray background.
Picture: To use the picture which appears when you turn on the DVD video player as a background.
Jacket: To use the jacket picture included on some discs as a background. If it is not included, a gray background will be substituted.

Screen Saver DVD

Off: The screen saver is disengaged.
On: The screen saver operates.

Function setup

43

Customizing the Function Settings (continued)

Setting details
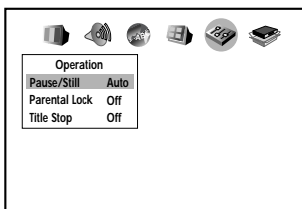
Pause/Still DVD

Auto: For normal use. Still and fast motion images can be paused.

Frame: The resolution of still pictures is improved, so that you can make a motionless picture more clearer when you pause it.

Parental Lock DVD

DVD video discs equipped with the parental lock function are rated according to their content. The contents allowed by a parental lock level and the way a DVD video disc can be controlled may vary from disc to disc. For example, if the disc allowed you could edit out violent scenes unsuitable for children and replace them with more suitable scenes, or lock out playback of the disc altogether.

• DVD video discs may or may not respond to the parental lock settings. This is not a defect in the DVD video player. Make sure this function works with your DVD video discs.

Off: The parental lock feature does not function. After pressing the ENTER button, follow step 1) below.

On: To activate the parental lock feature or change the settings. After pressing the ENTER button, follow steps 1) - 3) below.
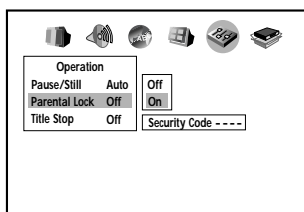
1) Press the number buttons to create a personal 4-digit security code, then press the ENTER button.
   If you make a mistake before pressing the ENTER button, press the CLEAR button and enter your 4-digit security code again.

2) Enter the code of a country/area whose standards were used to rate the DVD video disc, referring to the list below.

Country/Area	Code
AUSTRALIA	AU
BELGIUM	BE
CANADA	CA
CHINA	CN
CHINA HONG KONG	HK
DENMARK	DK
FINLAND	FI
FRANCE	FR
GERMANY	DE
INDONESIA	ID
ITALY	IT
JAPAN	JP
MALAYSIA	MY
NETHERLANDS	NL
NORWAY	NO
PHILIPPINES	PH
RUSSIAN FEDERATION	RU
SINGAPORE	SG
SPAIN	ES
SWEDEN	SE
SWITZERLAND	CH
TAIWAN	TW
THAILAND	TH
UNITED KINGDOM	GB
UNITED STATES	US

a) Select the first character by pressing the ▲ / ▼ buttons.

b) Press the ◄ / ► buttons to shift and select the second character by pressing the ▲ / ▼ buttons.

c) Press the ENTER button.

3) Press the ▲ / ▼ buttons to select the parental lock level, then press the ENTER button.

Operation			
Pause/Still	Auto	Off	
Parental Lock	Off	On	
Title Stop	Off	Area Code	U S
		Level	7
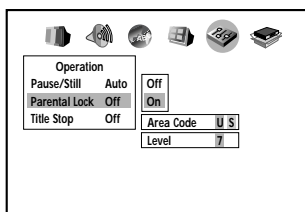
You cannot play DVD video discs rated higher than the level you selected unless you cancel the parental lock function.
For example, when you select level 7, discs rated higher than level 7 are locked out and cannot be played.

The parental lock level is equivalent to the following USA movie ratings.
  Level 7: NC-17
  Level 6: R
  Level 4: PG 13
  Level 3: PG
  Level 1: G

The parental lock levels for other countries/areas than U.S. are included for future use. Check the appropriate parental lock level when you buy a DVD video disc equipped with the parental lock feature in the future.

■ **To change the parental lock level**
  Follow steps 1) - 3).

■ **To change your 4-digit security code**
1) After selecting "On" or "Off," press the STOP button four times, then press the ENTER button.

STOP → STOP → STOP → STOP → ENTER
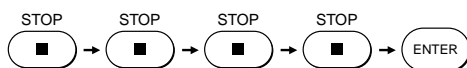
  The 4-digit security code is cleared.
2) Press the number buttons to create a new 4-digit security code.
3) Press the ENTER button.

Title Stop DVD

Off: The DVD video player continues after playback of a title is completed.
On: The DVD video player stops after playback of a title is completed.

Function setup

45

Customizing the Function Settings (continued)

Setting details
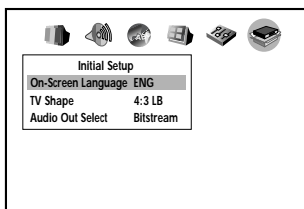
Initial Setup DVD CD

1) Press the ▲ / ▼ buttons to select "On-Screen Language," and press the **ENTER** button.
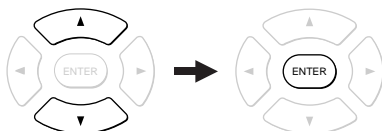
2) Select a language pressing the ▲ / ▼ buttons, and press the **ENTER** button.

See page 42, "On-Screen Language."
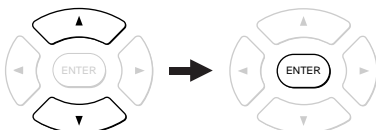
3) Make your selection in the same manner as step 1) then step 2).

See page 40, "TV Shape."
See page 41, "Audio Out Select."

Table of Languages

Table of languages and their abbreviations

Abbreviation	Language	Abbreviation	Language	Abbreviation	Language
– – –	No alternate language	GN	Guarani	PT	Portuguese
CHI (ZH)	Chinese	GU	Gujarati	QU	Quechua
DUT (NL)	Dutch	HA	Hausa	RM	Rhaeto-Romance
ENG (EN)	English	HI	Hindi	RN	Kirundi
FRE (FR)	French	HR	Croatian	RO	Rumanian
GER (DE)	German	HU	Hungarian	RU	Russian
ITA (IT)	Italian	HY	Armenian	RW	Kinyarwanda
JPN (JA)	Japanese	IA	Interlingua	SA	Sanskrit
KOR (KO)	Korean	IE	Interlingue	SD	Sindhi
MAY (MS)	Malay	IK	Inupiak	SG	Sango
SPA (ES)	Spanish	IN	Indonesian	SH	Serbo-Croatian
AA	Afar	IS	Icelandic	SI	Singhalese
AB	Abkhazian	IW	Hebrew	SK	Slovak
AF	Afrikaans	JI	Yiddish	SL	Slovenian
AM	Amharic	JW	Javanese	SM	Samoan
AR	Arabic	KA	Georgian	SN	Shona
AS	Assamese	KK	Kazakh	SO	Somali
AY	Aymara	KL	Greenlandic	SQ	Albanian
AZ	Azerbaijani	KM	Cambodian	SR	Serbian
BA	Bashkir	KN	Kannada	SS	Siswati
BE	Belorussian	KS	Kashmiri	ST	Sesotho
BG	Bulgarian	KU	Kurdish	SU	Sundanese
BH	Bihari	KY	Kirghiz	SV	Swedish
BI	Bislama	LA	Latin	SW	Swahili
BN	Bengali, Bangla	LN	Lingala	TA	Tamil
BO	Tibetan	LO	Laotian	TE	Telugu
BR	Breton	LT	Lithuanian	TG	Tajik
CA	Catalan	LV	Latvian, Lettish	TH	Thai
CO	Corsican	MG	Malagasy	TI	Tigrinya
CS	Czech	MI	Maori	TK	Turkmen
CY	Welsh	MK	Macedonian	TL	Tagalog
DA	Danish	ML	Malayalam	TN	Setswana
DZ	Bhutani	MN	Mongolian	TO	Tongan
EL	Greek	MO	Moldavian	TR	Turkish
EO	Esperanto	MR	Marathi	TS	Tsonga
ET	Estonian	MT	Maltese	TT	Tatar
EU	Basque	MY	Burmese	TW	Twi
FA	Persian	NA	Nauru	UK	Ukrainian
FI	Finnish	NE	Nepali	UR	Urdu
FJ	Fiji	NO	Norwegian	UZ	Uzbek
FO	Faroese	OC	Occitan	VI	Vietnamese
FY	Frisian	OM	(Afan) Oromo	VO	Volapük
GA	Irish	OR	Oriya	WO	Wolof
GD	Scottish Gaelic	PA	Panjabi	XH	Xhosa
GL	Galician	PL	Polish	YO	Yoruba
		PS	Pashto, Pushto	ZU	Zulu

Others

Before Calling Service Personnel

Check the following guide for the possible cause of a problem before contacting service.

Symptoms and correction

Symptom	Cause	Correction	Page
No power.	• The power plug is disconnected.	• Connect the power plug securely into the wall outlet.	**16**
The DVD video player turned off by itself.	• The automatic power off function turned the unit off.	• Press the PLAY button.	**21**
No picture.	• The TV is not set to receive DVD signal output.	• Select the appropriate video input mode on the TV so the picture from the DVD video player appears on the TV screen.	**20**
	• The video cable is not connected securely.	• Connect the video cable securely into the appropriate jacks.	**16, 17**
No sound.	• The equipment connected with the audio cable is not set to receive DVD signal output.	• Select the correct input mode of the audio receiver so you can listen to the sound from the DVD video player.	**20**
	• The audio cable is not connected securely.	• Connect the audio cable securely into the appropriate jacks.	**16, 17 18, 19**
	• The audio receiver or TV is turned off.	• Turn on the equipment connected with the audio cable.	**20**
	• The setting of output sound format is incorrect.	• Select the proper audio setting.	**35, 38 41**
The playback picture has occasional distortion.	• The disc is dirty.	• Eject the disc and clean it.	**9**
	• It is in fast forward or fast reverse playback.	• Sometimes a small amount of picture distortion may appear. This is not a malfunction.	**–**
Brightness is unstable or noises are present in the playback pictures.	• The effect of copy protection.	• Connect the DVD video player directly to the TV. Avoid connecting the DVD video player to a VTR or TV/VTR combination.	**16**
The DVD video player does not start playback.	• No disc is inserted.	• Insert a disc.	**20**
	• An unplayable disc is inserted.	• Insert a playable disc. (Check the disc type and colour system.)	**10**
	• The disc is placed upside down.	• Place the disc with the playback side down.	**20**
	• The disc is not placed within the guide.	• Place the disc correctly inside the guide on the disc tray.	**20**
	• The disc is dirty.	• Clean the disc.	**9**
	• The parental lock function is set.	• Cancel the parental lock function or change the parental lock level.	**38, 44**
Playback does not follow the course of the disc's program.	• It is in the mode of repeat playback, memory playback, etc.	• These operations may prevent a proper progress of the contents.	**–**
Buttons do not work.	• Power supply fluctuations or other abnormalities such as static electricity may interrupt correct operations.	• Turn the power on or off with the ON/ STANDBY button. Or disconnect the power plug and insert it into the wall outlet again.	**–**
The remote control does not work properly.	• The remote control is not pointed at the remote sensor of the DVD video player.	• Point the remote control at the remote sensor of the DVD video player.	**15**
	• The remote control is too far from the DVD video player.	• Operate the remote control within about 7 m.	**15**
	• The batteries in the remote control are exhausted.	• Replace the batteries with new ones.	**15**

Specifications

DVD video player / outputs / supplied accessories

DVD Video Player

Power supply	100-240 V AC, 50/60 Hz
Power consumption	17 W
Mass	2.4 kg
External dimensions	430 × 81 × 225 mm (W/H/D)
Signal system	PAL/3.58 NTSC
Laser	Semiconductor laser, wavelength 650 nm
Frequency range	DVD linear sound : 48 kHz sampling 4 Hz to 22 kHz 96 kHz sampling 4 Hz to 44 kHz
Signal-to-noise ratio	More than 112 dB
Audio dynamic range	More than 108 dB
Harmonic distortion	Less than 0.002 %
Wow and flutter	Below measurable level (less than ±0.001 % (W.PEAK))
Operating conditions	Temperature: 5 °C to 35 °C, Operation status: Horizontal

Outputs

Video output (SCART)	1.0 V (p-p), 75 Ω, SCART socket × 1
Video output (phono type)	1.0 V (p-p), 75 Ω, negative sync., pin jack × 1
S video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., Mini DIN 4-pin × 1 (C) 0.3 V (p-p), 75 Ω
Component video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., pin jack × 1 (P_B)/(P_R) 0.7 V (p-p), 75 Ω, pin jack × 2
Audio output (SCART)	2.0V (rms), 220 Ω, SCART socket × 1
Audio output (BITSTREAM/PCM COAXIAL)	0.5V (p-p), 75 Ω, pin jack × 1
Audio output (ANALOG AUDIO OUT)	2.0 V (rms), 220 Ω, pin jacks (L, R) × 1

Supplied Accessories

Audio/video cable 1
Remote control (SE-R0047 or SE-R0049) 1
Batteries (R6) 2
Power cord 1

• Designs and specifications are subject to change without notice.

Others

2. LOCATION OF MAIN PARTS AND MECHANISM PARTS

2-1. Location of Main Parts

Disc motor PC board

Feed motor PC board

EU02 Power supply PC board

EU09 Output-RGB PC board

EU04 Power SW PC board

EU01 Main PC board

Loading motor PC board

EU03 Front display PC board
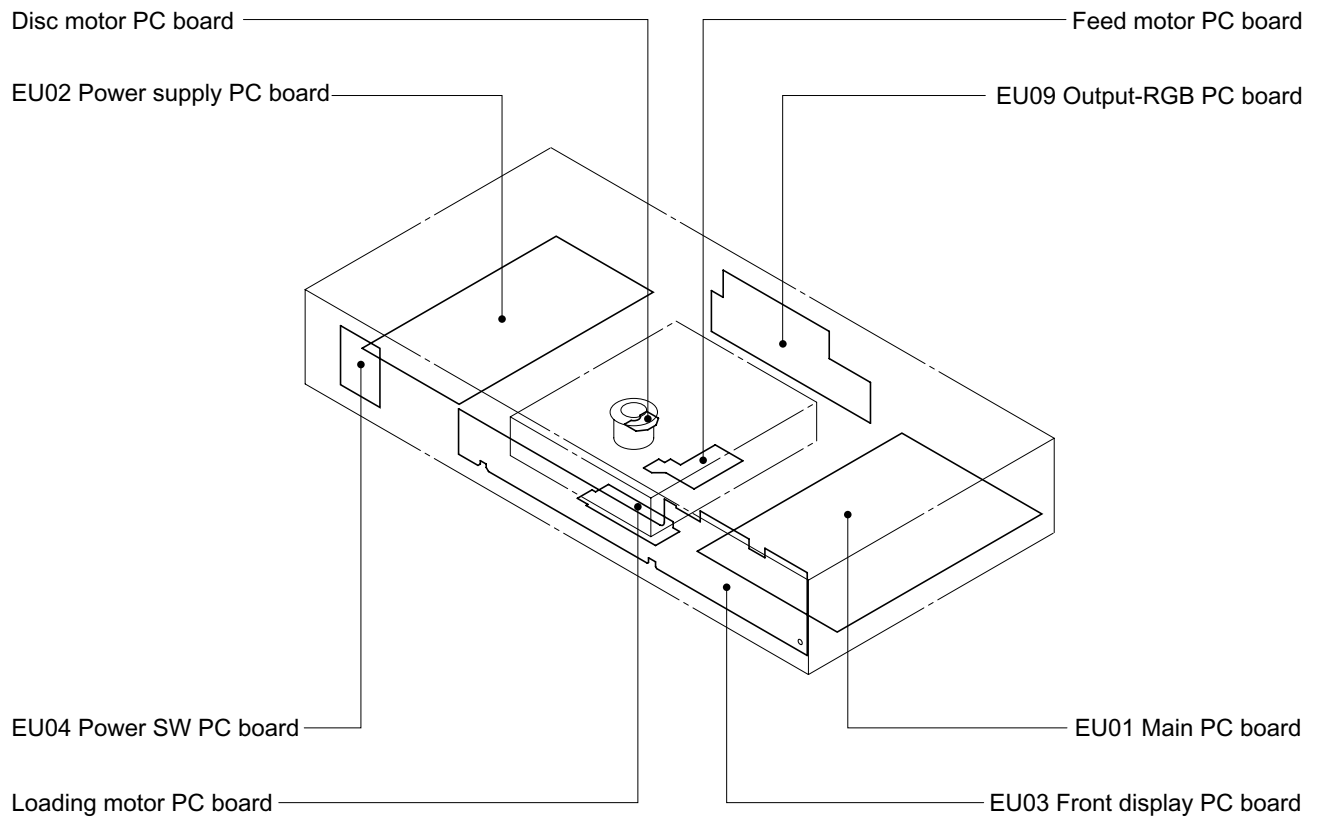
Fig. 1-2-1

2-2. Location of Mechanism Parts

Tray

Clamper stay
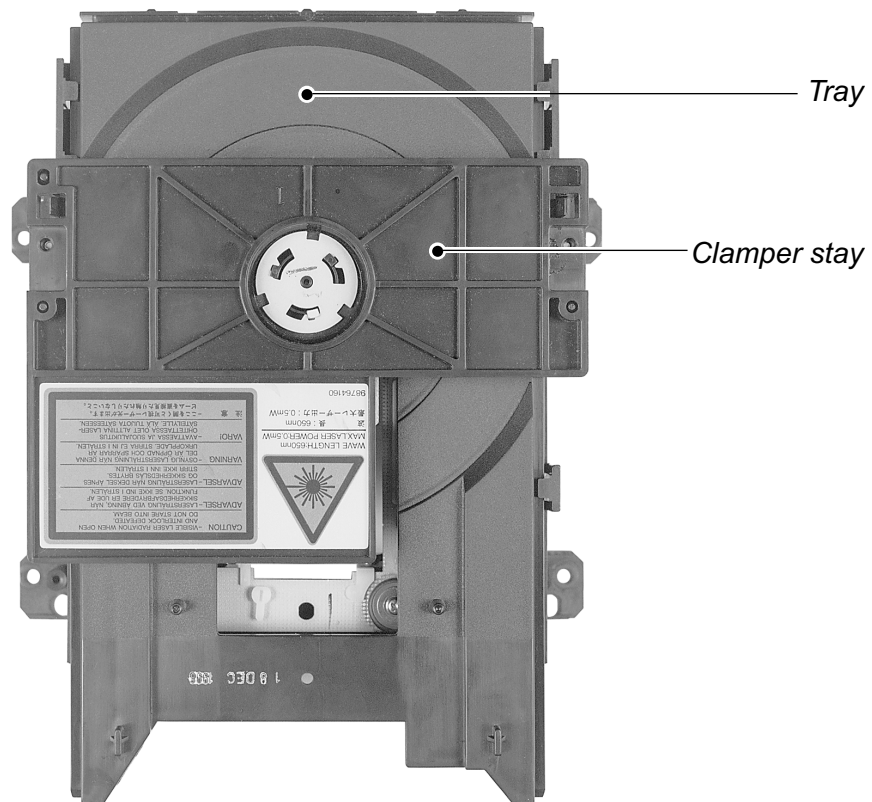
Fig. 1-2-2 Mechanism chassis assembly (Top side)

Loading motor
PC board
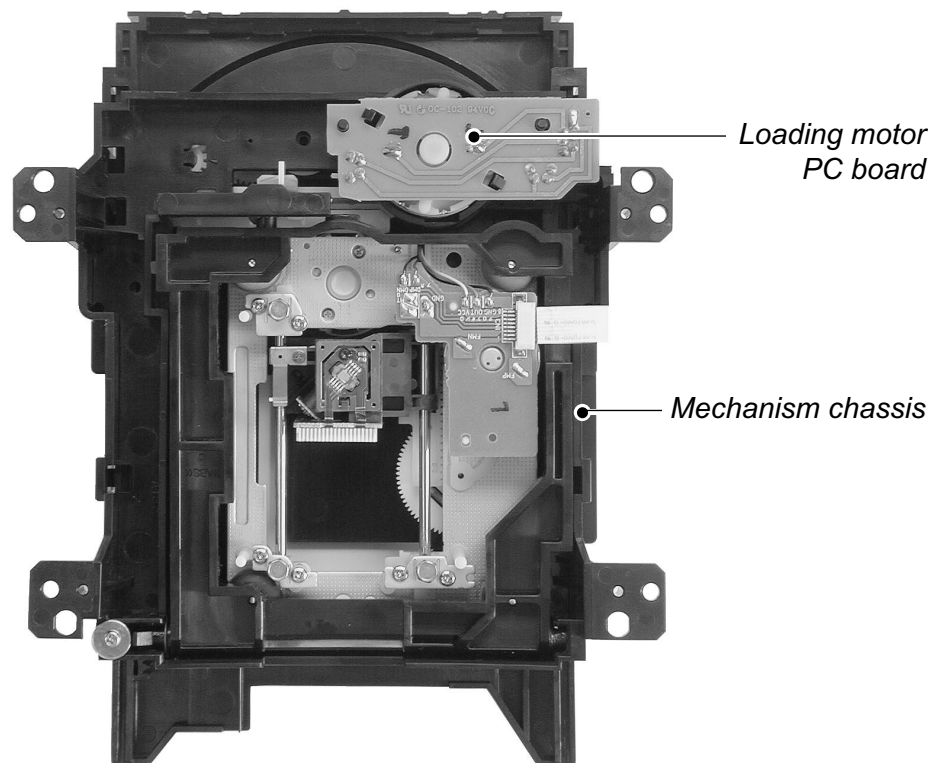
Mechanism chassis

Fig. 1-2-3 Mechanism chassis assembly (Bottom side)

Loading belt

Kick lever

Loading motor

Disc motor

Gear

Gear

Gear

Cam Slider

04271B
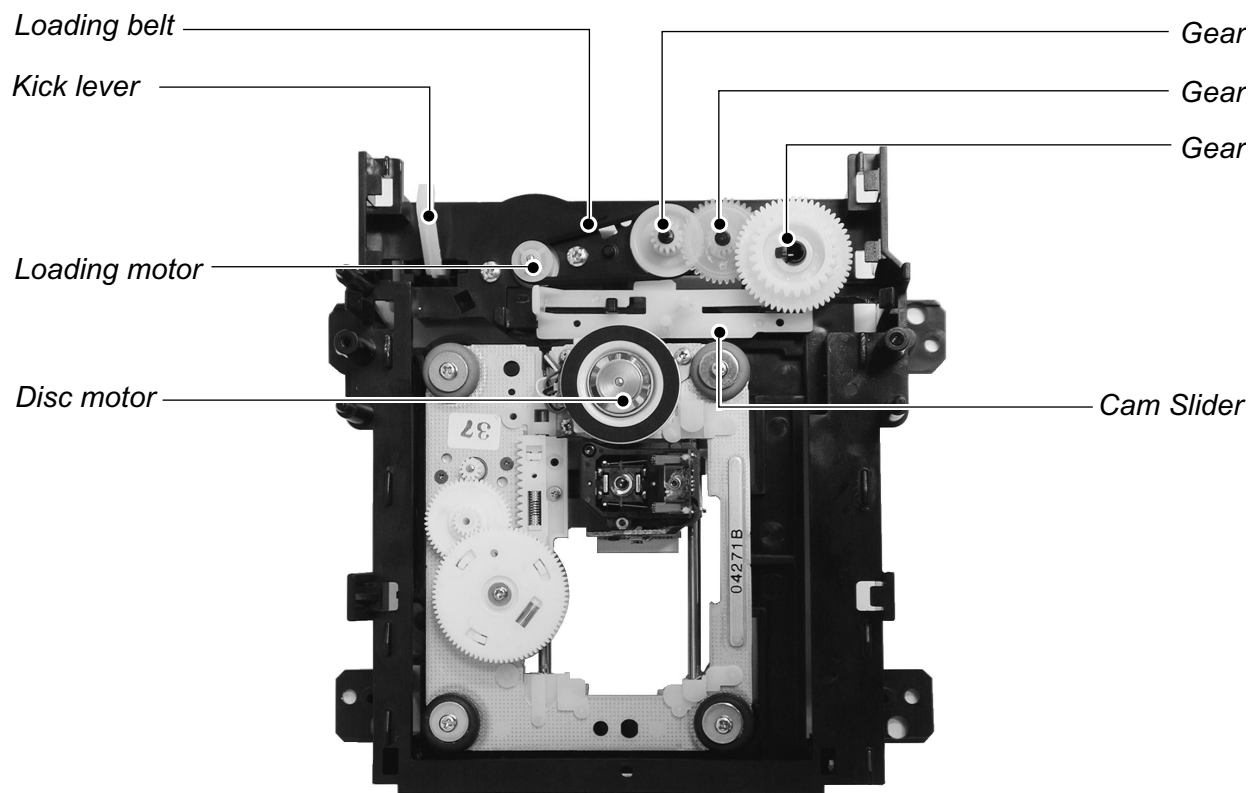
Fig. 1-2-4 Mechanism chassis assembly (Internal side)

<Type A>

Note:

When servicing, note that this model has two types of the pickup mechanism assembly.

The main PC board is different depending on the type of pickup mechanism assembly.

	Pickup mechanism assembly (MP01)	Main PC board (EU01)
Type A	79070467	79083080
Type B	79070415	79083081
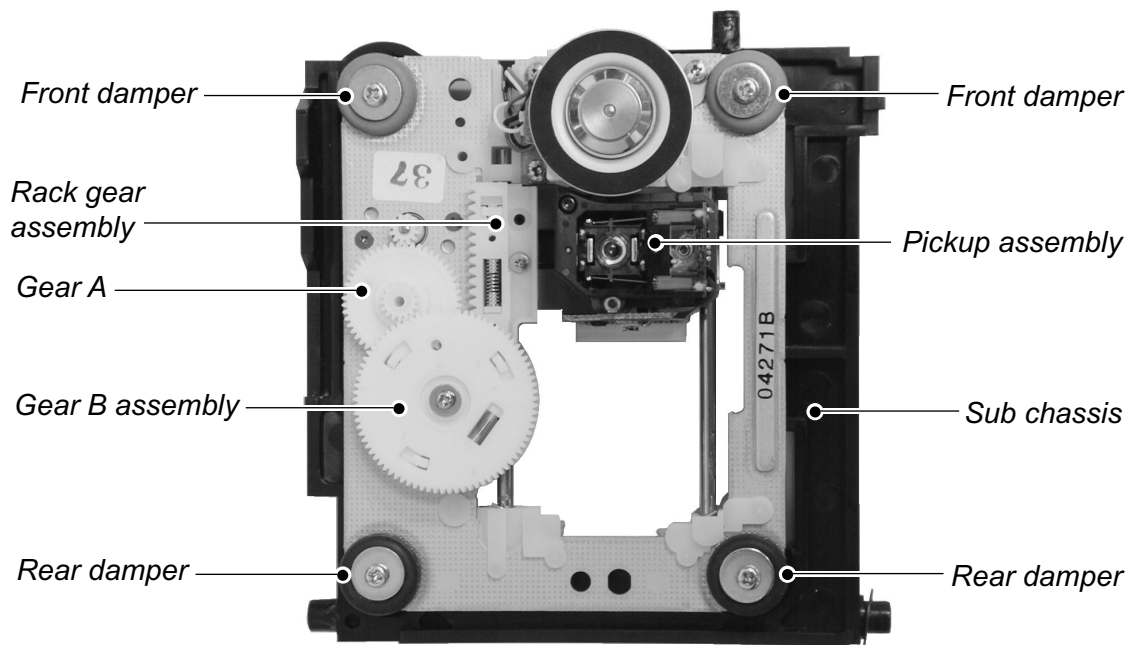
Fig. 1-2-5 Pickup mechanism chassis assembly (Top side)

- Front damper
- Rack gear assembly
- Gear A
- Gear B assembly
- Rear damper
- Front damper
- Pickup assembly
- Sub chassis
- Rear damper

Fig. 1-2-6 Pickup mechanism chassis assembly (Bottom side)

- Feed motor
- Feed motor PC board

Front damper

Front damper

Gear A

Pickup assembly

Gear B assembly

Sub chassis

Rack gear
assembly

Rear damper

Rear damper
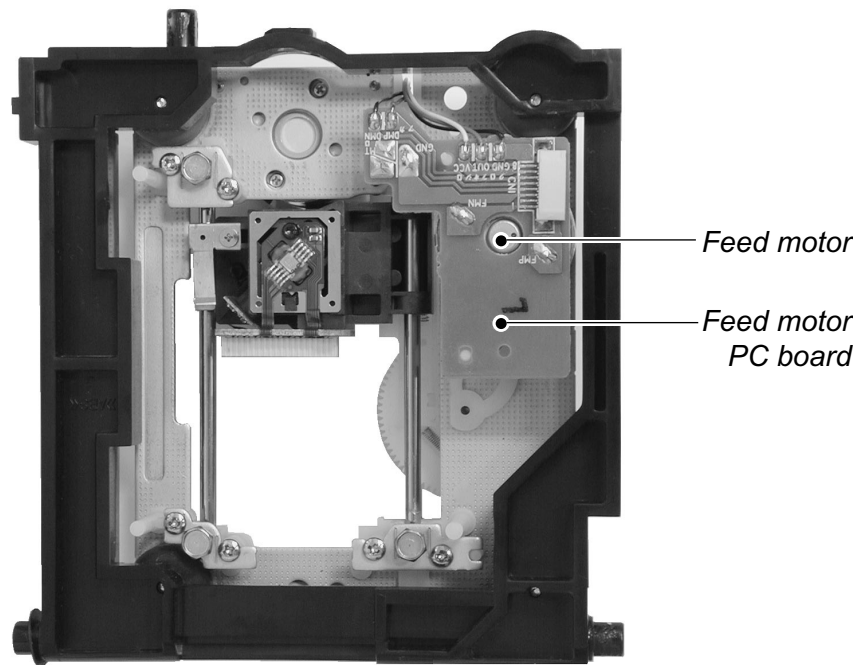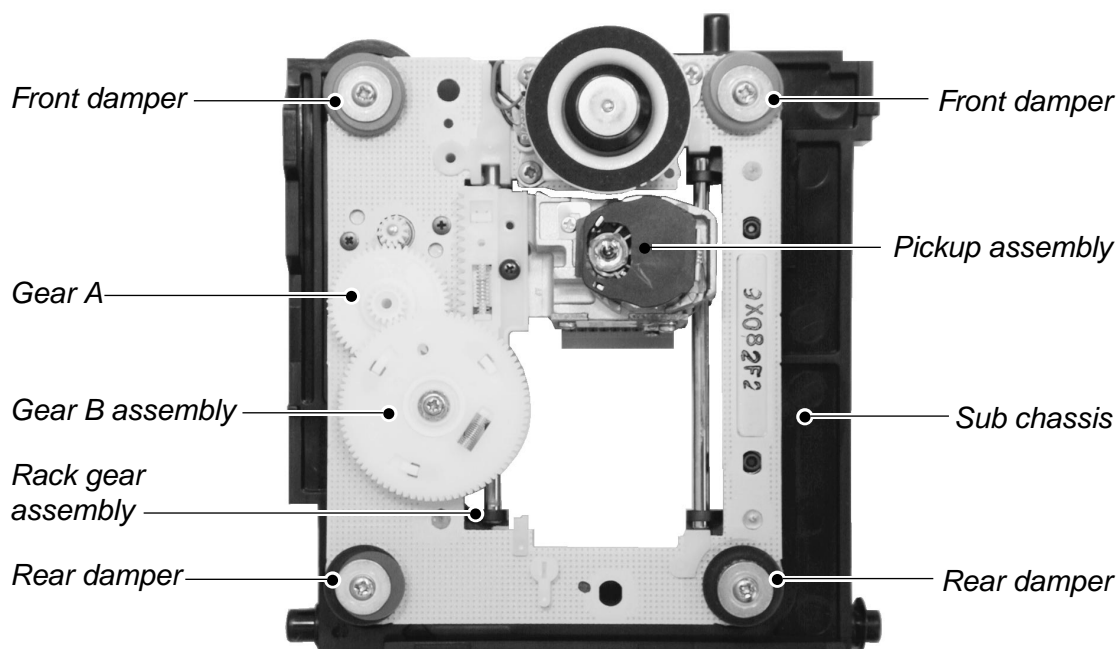
Fig. 1-2-7 Pickup mechanism chassis assembly (Top side)

Feed motor

Feed motor
PC board
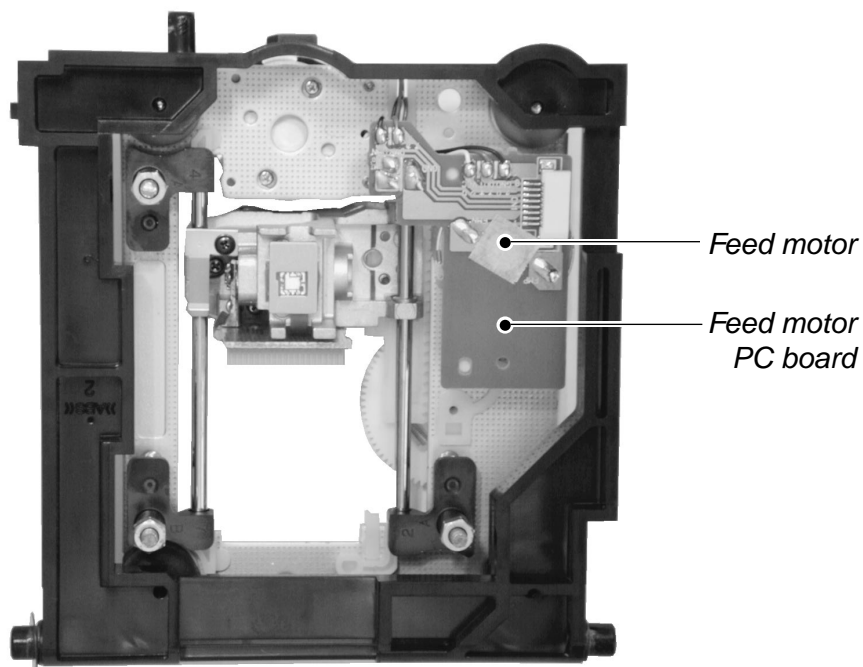
Fig. 1-2-8 Pickup mechanism chassis assembly (Bottom side)

3. TROUBLESHOOTING

3-1. Main Circuit

3-1-1. Servo System

(1) Initial Operation after Power ON

Fig. 1-3-1

1

Pickup (P.U.) transmission initial operation does not occur.

The pickup transmission initial operation is carried out to determine the initial position by transmitting the pickup to the innermost position once (start-limit switch (pin 4 of CN503) develops "L".) and to the external direction at low speed (start-limit switch develops "H", turning off the switch.).

Does pulse of 1.65V ± 1.65V develop at pin 162 of IC401?

N → Check BUS between IC401 and IC605 and oscillation.

Y

Check feed gear.

Fig. 1-3-2

2-1

"No disc" misjudgement display of disc presence.

Does lens move with UP/DOWN full stroke in focus direction?

N

Y

Is laser current normal? → **N** → 3

Y

Does RFSB signal develop more than 0.3V? → **N**

Y

Check peripheral circuit of IC605.

Check IC502.

Lens cleaning.

Replace pickup head.

Does focus search voltage of 1.65V ± 0.4V develop at pin 1 of IC503 (E537)? → **N** → Check IC401.

Y

Does search signal output at both edges of focus coil? (Pins 15 to 18 of CN501) → **N**

Y

Check pickup head and wiring.

Check IC502.

Fig. 1-3-3

2-2

Disc kind misjudgement
(Initial setting is NG.)

Are FE and RFSB
signals for each disc normal?

N

Check IC502.

Lens cleaning.

Replace pickup head.

Y

Check peripheral
circuit of IC605.

Fig. 1-3-4

3

Check laser operating current.

		Laser operating current		
		min	typ	max
Tape A : DVD/CD Iop		15mA	25mA	70mA
Tape B : DVD/CD Iop		40mA	70mA	110mA

DVD/CD Iop = Voltage between (E536 and E591) /10Ω

Iop ≦ I min

Check laser current.
I min ≦ Iop ≦ I max

Iop ≧ I max

Check wiring for
pickup head.

Check pins 13, 14
and 15 of IC502
serial bus.

Check peripheral
circuits of IC502,
Q501, Q502.

Y

Check FE and RFSB signal

Iop ≧ 200 mA

N

Y

Check solder removal
of the short land for
laser diode protection.

Replace pickup
mechanism.

To turn on each laser diode forcibly, press the following buttons on the remote controller.
DVD LD: ZOOM, 0, 3, 0, ZOOM
CD LD: ZOOM, 0, 3, 1, ZOOM
After checked the laser current, press POWER or OPEN/CLOSE button to turn it off.

CAUTION
・The laser ray emitting out from the pickup head is very harmful to your eyes.
 Keep your eyes from the objective lens at least 300mm distance during the pickup head operating.
・When you perform solder removal work, please turn OFF a set power supply and perform the
 ground of human body and a tool.

Fig. 1-3-5

**DVD single (single-layer) disc
detection waveform**

TP405 FE signal

1.65V

TP503 RFSB signal

V : 500 mV/div
H : 2 ms/div

Fig. 1-3-6

**DVD dual (dual-layer) disc
detection waveform**

V : 500 mV/div
H : 2 ms/div

Fig. 1-3-7

**CD disc
detection waveform**

V : 500 mV/div
H : 2 ms/div
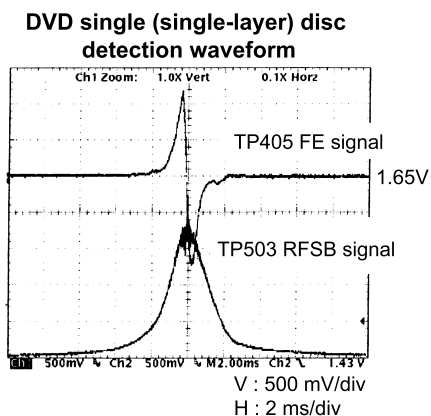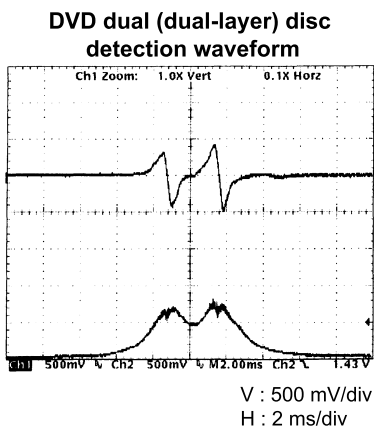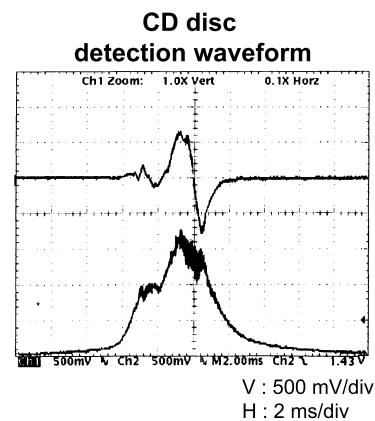
Fig. 1-3-8

(2) Picture appears (PLAY)

```
                           ┌─────────────────────┐
                           │        PLAY          │
                           └──────────┬───────────┘
                                      │
                                      ▼
        N     ┌──────────────────────────────────┐
   ( 4 )◄─────│  Disc motor (D.M.) forced         │
              │  accelleration (500 ms)           │
              └──────────────┬───────────────────┘
                           Y │
        N     ┌──────────────────────────────────┐      ┌────────────────────────┐
  (2-1)◄──────│         Focus search              │      │  Repeat three times.   │──►( 5 )
              └──────────────┬───────────────────┘      └────────────────────────┘
                           Y │
                             ▼
                   ◇ Is forcus servo ◇  ── N ──►
                   ◇     ON?         ◇
                           Y │
                             ▼
              ┌──────────────────────────────────┐   N
              │          CLV servo ON.            │────────────────────►( 4 )
              └──────────────┬───────────────────┘
                           Y │
              ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
              │   Tracking balance adjustment     │
              └ ─ ─ ─ ─ ─ ─ ─┬─ ─ ─ ─ ─ ─ ─ ─ ─ ─┘
                             ▼
              ┌──────────────────────────────────┐   N
              │        Tracking servo ON.         │────────────────────►( 6 )
              └──────────────┬───────────────────┘
                           Y │
              ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
              │       Focus gain adjustment       │
              └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
              ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
              │      Tracking gain adjustment     │
              └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
              ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
              │      Focus balance adjustment     │
              └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
              ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
              │         RF gain adjustment        │
              └ ─ ─ ─ ─ ─ ─ ─┬─ ─ ─ ─ ─ ─ ─ ─ ─ ─┘
                             ▼
                   ◇ Is address code  ◇  ── N ──►
                   ◇ possible to read?◇
                           Y │
                             ▼
              ┌──────────────────────────────────┐
              │   Search ─► Picture appears.      │
              └──────────────────────────────────┘
```

┌ ─ ─ ─ ┐
└ ─ ─ ─ ┘ :
Automatic adjustment is carried out when a disc is replaced after power ON.

```
        N
   ◄──────── ◇ Does NG continue ◇
             ◇ more than 3 s.?  ◇
                     Y │
                       ▼
              ┌──────────────────┐
              │ Disc playback NG │
              └──────────────────┘
```

Fig. 1-3-9

(4)

Disc motor (D.M.) does not rotate.

Does pin 117 of IC401 (TP409) PLCK oscillate around 10 MHz ?

N

Y

Check peripheral circuits of IC402.

Check disc motor and wiring.

Check peripheral circuit of IC402.

Fig. 1-3-10

(5)

Focus servo is NG.

Are FE, RFSB, FSON signals normal?

N

Y

Check peripheral circuit of IC604.

Do signals output to pins 4 to 9 of CN501?

N

Y

Check IC502.

Check wiring for pickup head.

Lens cleaning.

Replace pickup mechanism.

Fig. 1-3-11

Focus servo ON signal waveform

FE signal
Pin 150 (TP405)
of IC401

≧0.3V

1.65V

≧0.3V

RFSB signal
Pin 152 (TP503)
of IC401

Focus search | Focus servo on

Fig. 1-3-12

```
        ( 6 )
          │
          ▼
  ┌──────────────────┐
  │ Tracking servo is NG. │
  └──────────────────┘
          │
          ▼
        ◇ Is TE signal normal? ◇ ──N──┐
          │ Y                          │
          ▼                            ▼
  ┌──────────────────┐      ┌──────────┐
  │ Check peripheral │      │ Check IC502. │
  │ circuit of IC604. │      └──────────┘
  └──────────────────┘
```

Fig. 1-3-13

**Signal waveform at
tracking servo ON (CD)**

TE signal
Pin 151 (TP406) of IC401
1.65V

RFRP signal
Pin 153 (TP408) of IC401

Search ON (SRCH)
Pin 38 (TP411) of IC401

ON search | Tracking servo on

Fig. 1-3-14

**Signal waveform at
tracking servo ON (DVD)**

Fig. 1-3-15

Fig. 1-3-16

PLL works as a servo loop to generate a clock signal for reading RF signal binary data. With the PLL locked, the eye pattern is identified clearly when triggered with the read clock PLCK.

DVD RF signal

DVD RF signal
Pin 30 (TP502) of IC502

V : 500 mV/div
H : 50 ns/div

Fig. 1-3-17

DVD playback waveform

DVD RF signal
Pin 30 (TP502) of IC502

DVD PLCK
Pin 117 (TP409) of IC401

CH1 : TP502 DVDRF 500 mV/div
CH2 : TP409 DVDPLCK   5 V/div
50 ns/div

Fig. 1-3-19

CD RF signal

CD RF signal
Pin 30 (TP502) of IC502

V : 500 mV/div
H : 100 ns/div

Fig. 1-3-18

CD playback waveform

CD RF signal
Pin 30 (TP502) of IC502

CD PLCK
Pin 117 (TP409) of IC401

CH1 : TP502 CDRF 500 mV/div
CH2 : TP409 CDPLCK   5 V/div
100 ns/div

Fig. 1-3-20

3-1-2. Location Diagram of Servo Test Point

E536 (LD)

E591 (+5V)
TP503 RFSB
TP504 RFCT

TP502 RFO

CN503
CN501
CN701
IC503
IC502
IC401
CN502
IC606
IC201
CN603
IC605
IC304
IC301
CN601

TP401 VRFED
TP408 RFRP

TP405 FE
TP406 TE

TP409 PLCK

TP410 FLGA

TP411 FLGB

TP412 VMCK
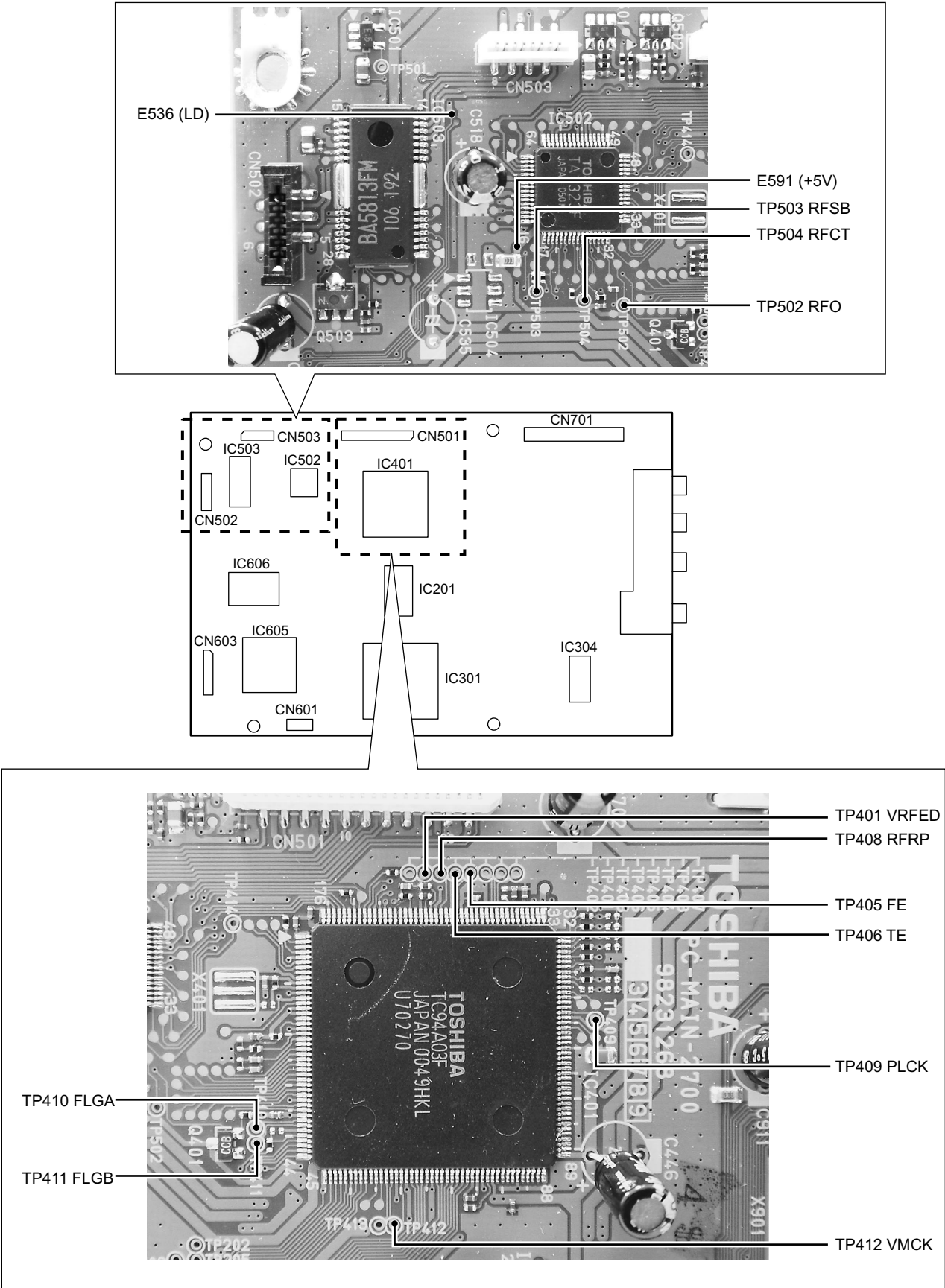
Fig. 1-3-21

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

―― CAUTIONS BEFORE STARTING SERVICING ――

Electronic parts are susceptible to static electricity and may easily damaged, so do not forget to take a proper grounding treatment as required.

Many screws are used inside the unit. To prevent missing, dropping, etc. of the screws, always use a magnetized screwdriver in servicing. Several kinds of screws are used and some of them need special cautions. That is, take care of the tapping screws securing molded parts and fine pitch screws used to secure metal parts. If they are used improperly, the screw holes will be easily damaged and the parts can not be fixed.

1. REPLACEMENT OF MECHANICAL PARTS

1-1. Cabinet Replacement

1-1-1. Top Cover
1. Remove five screws (1) and remove the top cover (2).
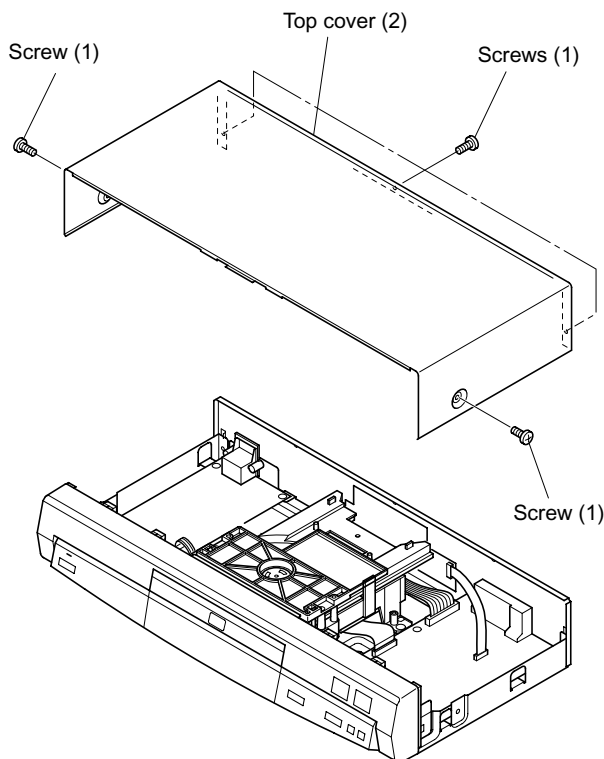
Fig. 2-1-1

1-1-2. Clamper Stay
<Removal>

1. Remove two screws (1).

2. Release two claws and remove the clamper stay (2).
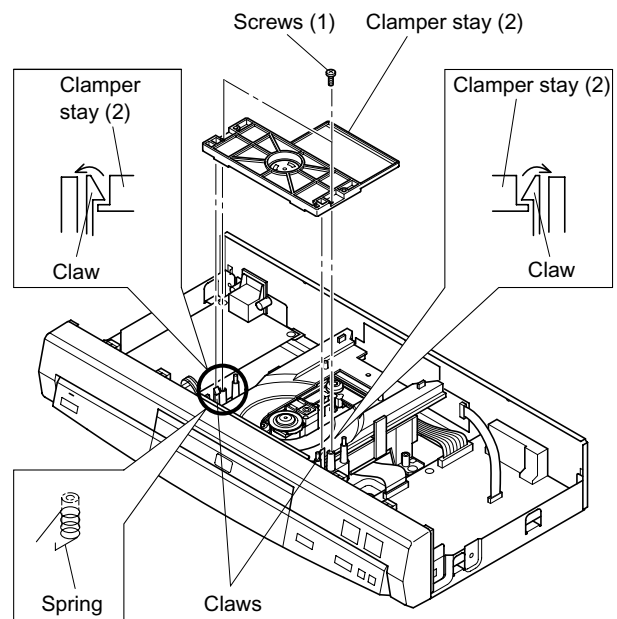
Fig. 2-1-2

<Mounting >

1. The spring for tray side pressure is inserted into the portion "A". (Refer to Fig. 2-1-2.)

2. By referring to Fig. 2-1-3, insert the spring normally and mount the clamper stay.
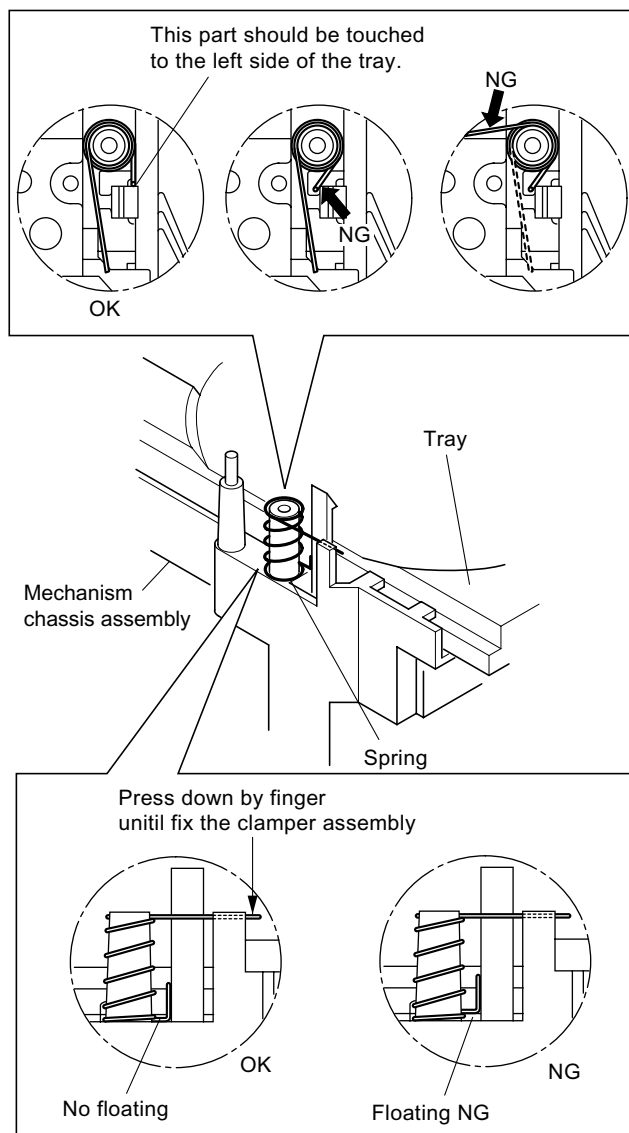
Fig. 2-1-3

1-1-3. Tray Panel
<Tray Ejection>

1. Slide the slider (2) of the mechanism chassis assembly (1) with a screwdriver, etc. in the arrow direction, so that the tray (3) is ejected.

Note:

• Take care not to damage the pickup and other parts.
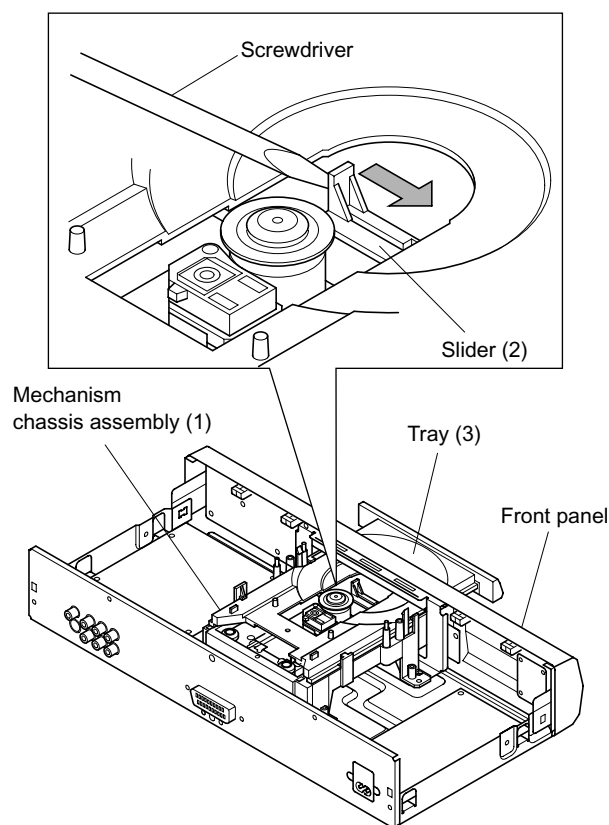
Fig. 2-1-4

<Tray Panel Removal>

1. Eject the tray (3).

2. Twist the tray panel (4) a little in the arrow A direction with the tray (3) hold by hand to release two claws and lift up the tray panel (4) in the arrow B direction, then the tray panel (4) is removed.
(Refer to Fig. 2-1-5.)

3. When mounting the tray panel (4), insert the tray panel (4) along the grooves of the both sides of the tray (3) until clicking.
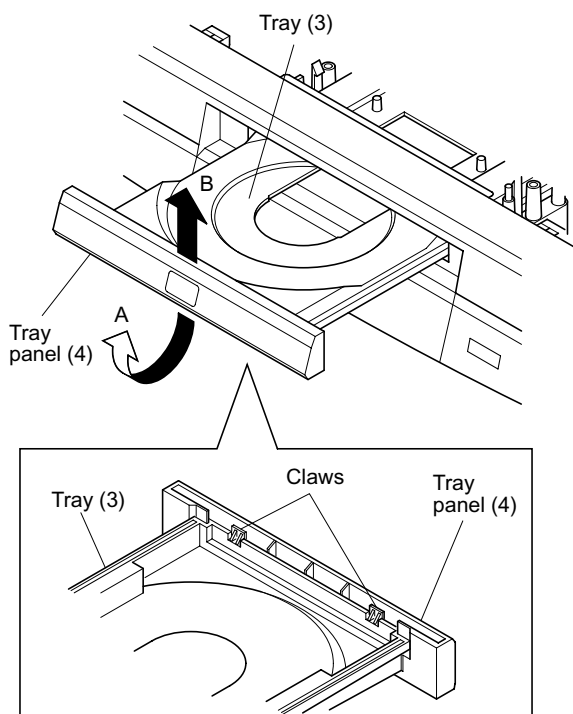
Fig. 2-1-5

1-1-4. Front Panel and Tray

1. Remove the flexible cable (1).

2. Release four claws and remove the front panel (3).

3. Pull out the tray (2) to this side.
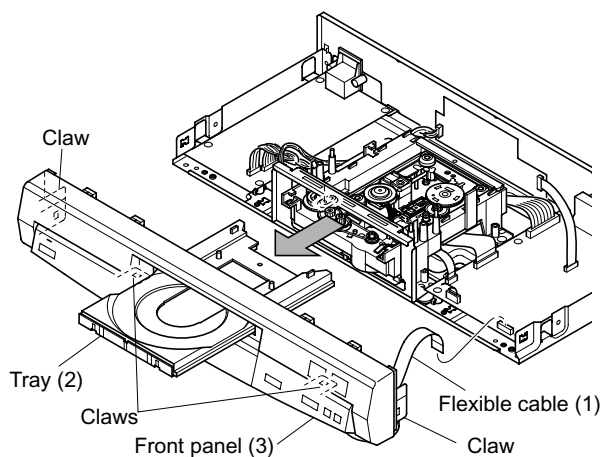
Fig. 2-1-6

Note:

• Insert the tray (2) with the front side of the pickup mechanism assembly descended. (The slider positions to the left side.)

• The gears are required to match their phases each other. After setting the gear (3) as shown in the figure "A", insert the tray (2). When inserting a tray (2), push the rack gear side shown by the arrow.

• Confirm that the mark of the gear matches with the triangle mark on the reverse side of the tray in the tray close status. (The gear is rotated with the slider locks.) (Refer to Fig. B.)
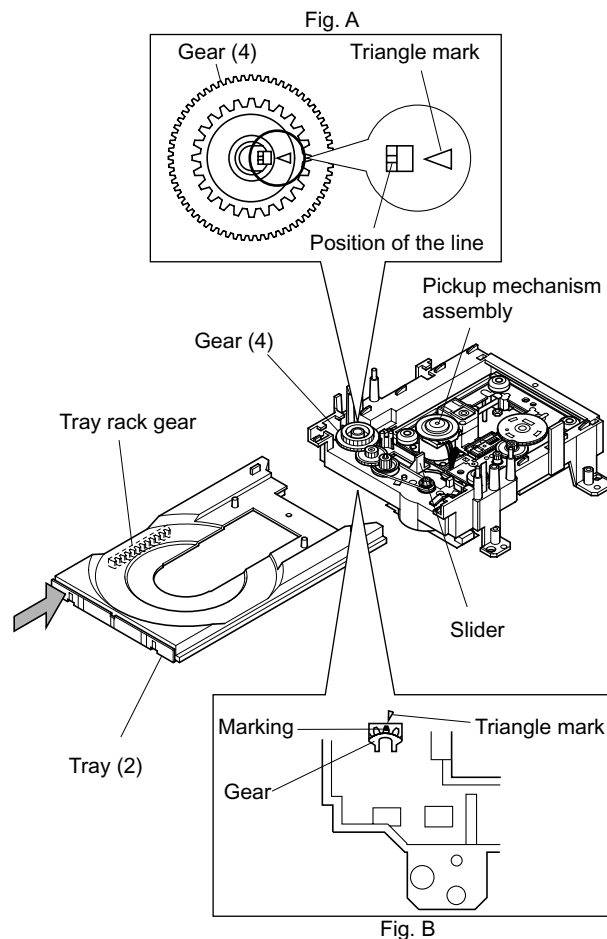
Fig. 2-1-7

1-1-5. Rear Panel

1. Remove seven screws (1) and remove the rear panel (2).
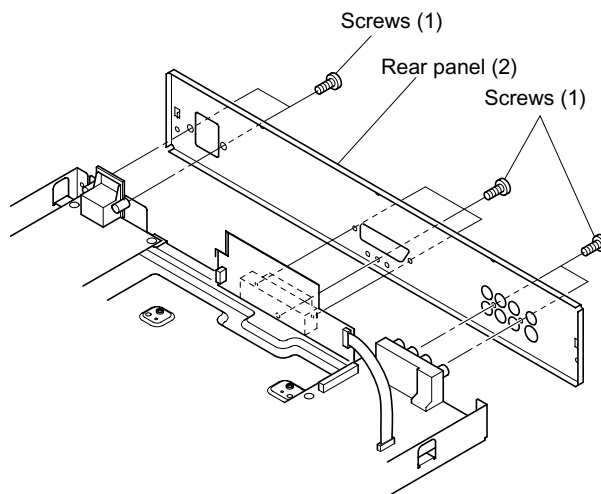
Fig. 2-1-8

1-2. PC Board Replacement

1-2-1. Main PC Board

Note:

• Before removing the main PC board (5), be sure to short-circuit the laser diode output land.

   After replacing, open the land as it was after inserting the flexible cables (1).

1. Remove the top cover. (Refer to item 1-1-1.)

2. Remove five flexible cables (1) and remove one connector (2).

3. Remove four screws (3).

4. Remove two screws (4) and remove the main PC board (5).

Note:

• When mounting, be sure to twist the wire for the connector (3) several times.
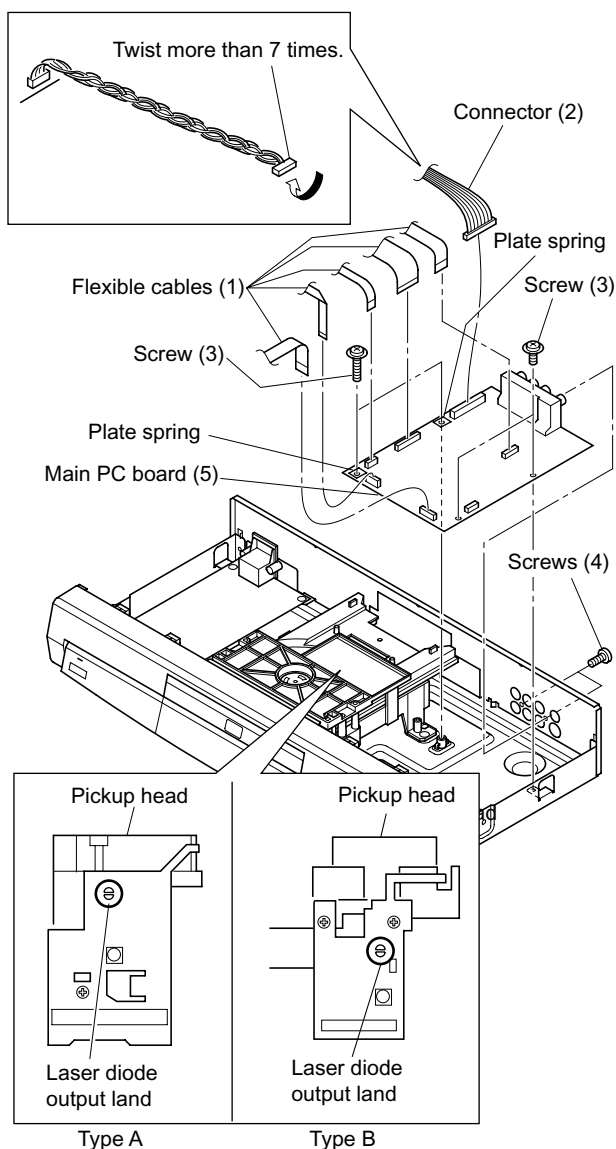
Fig. 2-1-9

1-2-2. Power PC board

1. Peel off two tapes (1).

2. Remove the connectors (2).

3. Remove four screws (3).

4. Remove two screws (4) and remove the power supply PC board (5).

Note:

• When mounting, be sure to twist the wire for the connectors (2) several times.
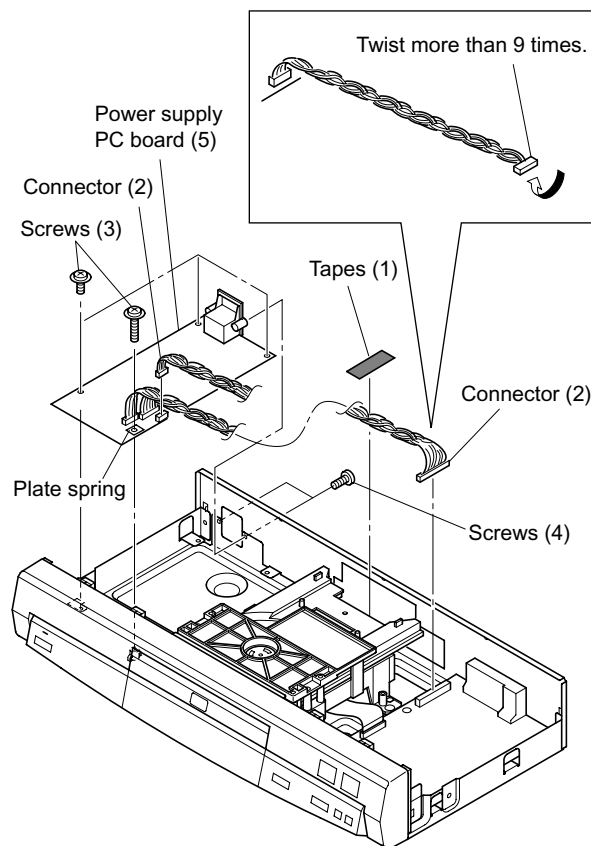
Fig. 2-1-10

1-2-3. Front PC Board

1. Remove the front panel. (Refer to item 1-1-4.)

2. Remove six screws (1) and remove the front display PC board (2)

3. Remove two screws (3) and remove the power switch PC board (4).
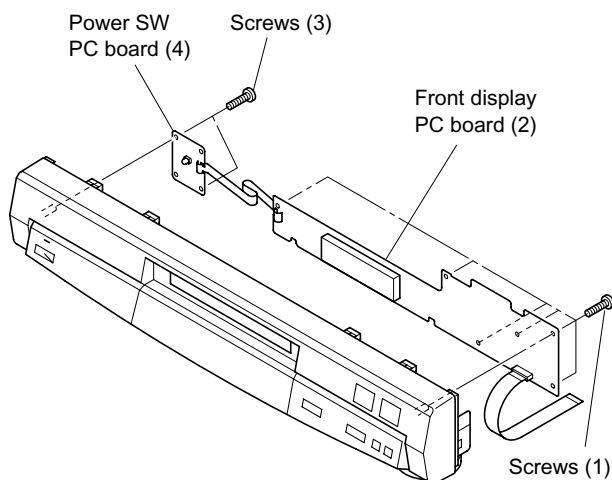
Fig. 2-1-11

1-2-4. Output-RGB PC Board

1. Remove two screws (1).

2. Remove the flexible cable (2).

3. Remove the connector (3) and remove the Output-RGB PC board (4).
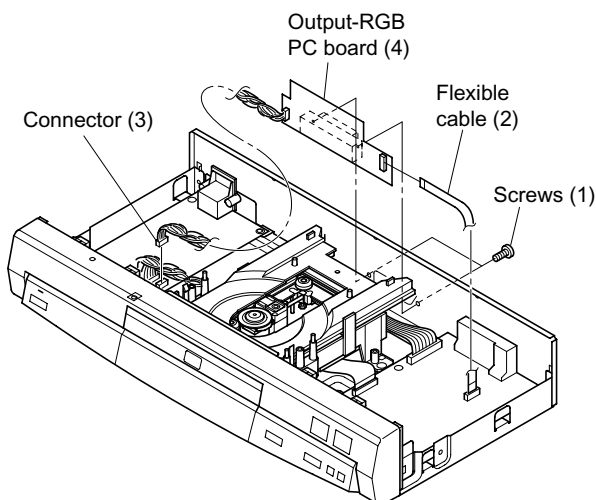
Fig. 2-1-12

1-3. Mechanism Parts

1-3-1. Mechanism Chassis Assembly

Note:

• When removing the mechanism chassis assembly (3), be sure to short-circuit the laser diode output land before removing the connector and the flexible cables.

After replacing, open the land as it was after inserting the connector and flexible cables.

1. Remove the tray. (Refer to items 1-1-3 and 1-1-4.)

2. Remove three flexible cables (1).

3. Remove four screws (2) and remove the mechanism chassis assembly (3).
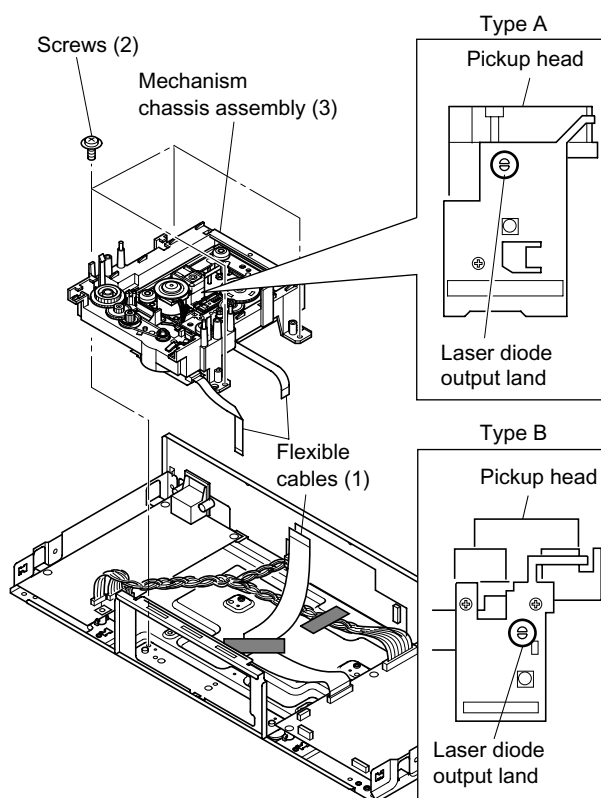
Fig. 2-1-13

1-3-2. Loading Belt

1. Remove the gear (1) by releasing the claw.

2. Remove the gear (2).

3. Remove the gear (3) and the loading belt (4).

4. Replace the loading belt (4) with a new one.

5. When mounting, perform the reverse order of the removal.

Note:

• When mounting the loading belt (4), twisting and attaching of a grease, etc. are not allowed.
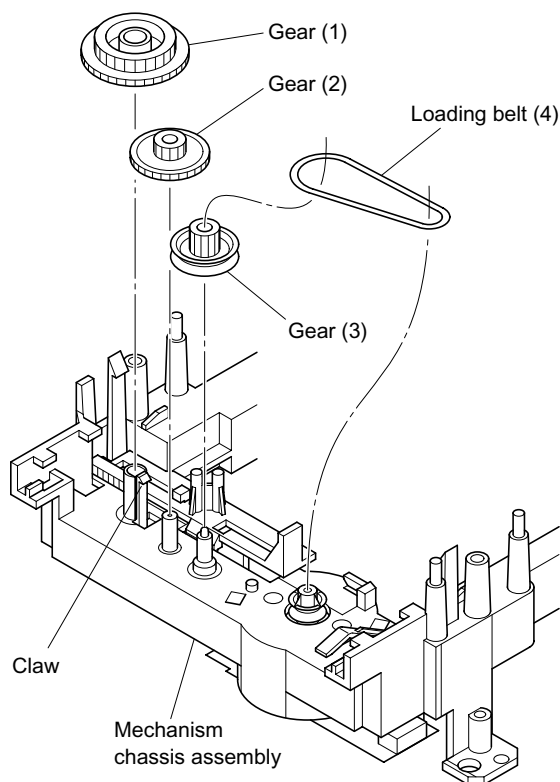
Fig. 2-1-14

1-3-3. Loading Motor

1. Remove the loading belt. (Refer to item 1-3-2.)

2. Remove two screws (1) and two claws. Then remove the loading motor (2) (with the loading motor PC board (3) attached).

3. Desolder the terminal section of the loading motor (2) and remove the loading motor PC board (3).

4. Replace the loading motor (2) with a new one.

5. When mounting, perform the reverse order of the removal.

Note:

• When replacing the loading motor, meet the polarity phase of the terminals. (Mount the motor with the label positioned as shown in Fig. 2-1-15.)
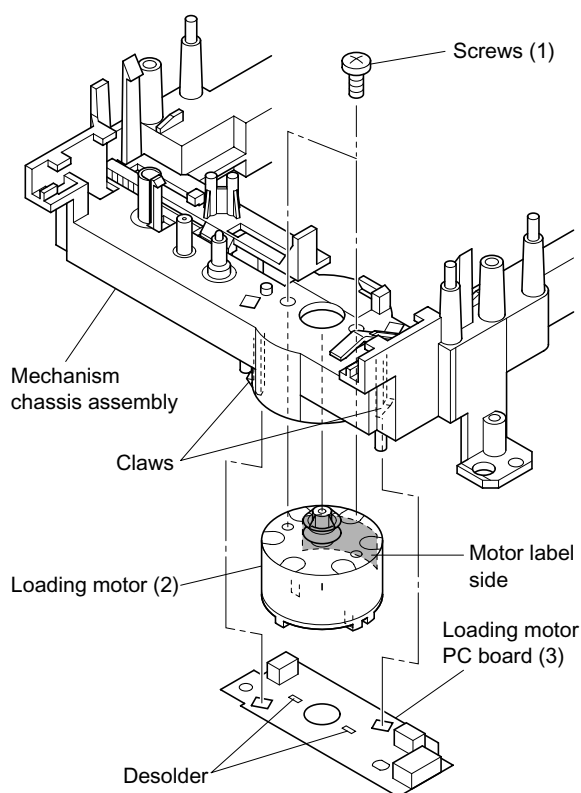
Fig. 2-1-15

1-3-4. Sub Chassis (with a pickup mechanism)

1. Turn the mechanism chassis assembly (1) upside down.

2. Remove one screw (2) and one washer (3) release the boss "A" from the claw. Then remove the sub chassis (4) (with the pickup mechanism) by sliding in the arrow direction.

3. When mounting, perform the reverse order of the removal.

Note:

• When mounting the sub chassis (4) (with the pickup mechanism), first, insert the boss "C" along the groove of the cam slider up/down cam (5) and next, the boss "B" and "A".

• The boss "A" may be used with washers. (One or two washers are used to prevent from the slust rattling. In some cases, no washer is used.)

When the washer(s) is used, be sure to assemble as it was without losing.
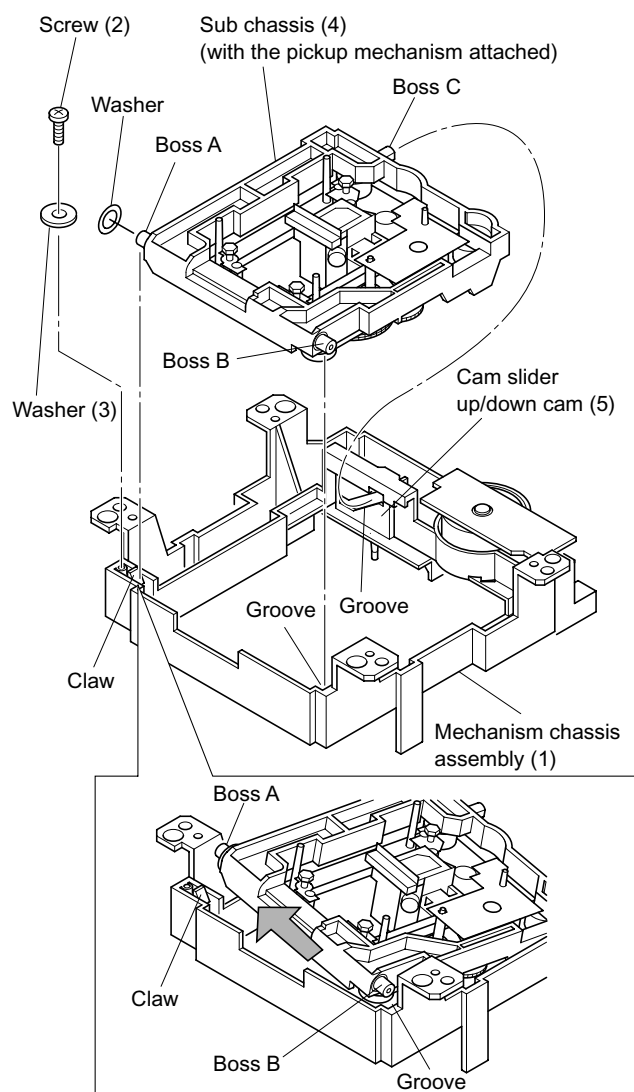
Fig. 2-1-16

1-3-5. Pickup Mechanism Assembly

<Removal>

1. Remove four screws (1) and four washers (2) then remove the pickup mechanism assembly (3).

<Mounting>

1. Replace the pickup mechanism assembly (3) with a new one.

2. When mounting, perform the reverse order of the removal.
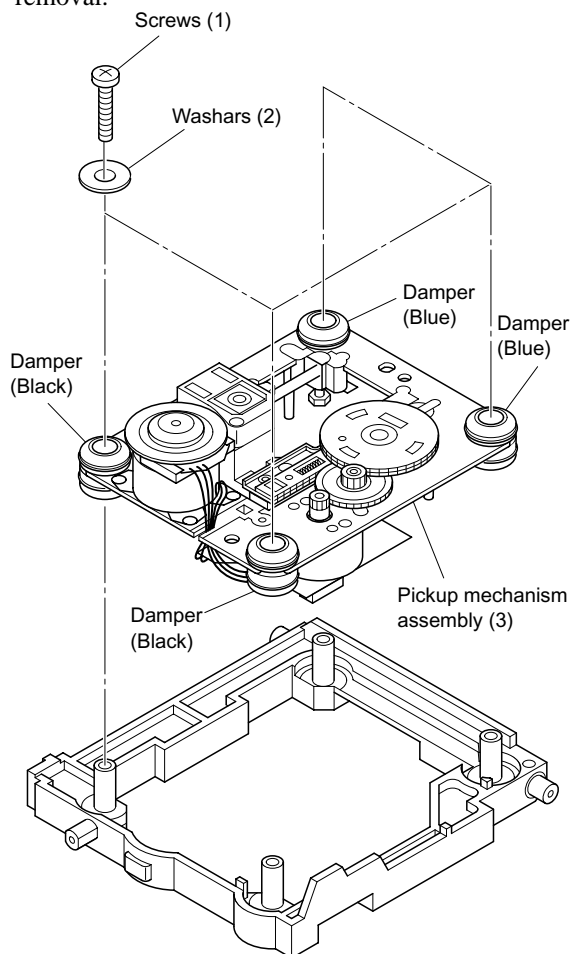
Fig. 2-1-17

Note:

• The dampers' color differs when used for the front side and the rear.

• When mounting the pickup mechanism assembly (2) with the screws (1), push the pickup mechanism assembly (2) downward without being caught and tighten the screws (1) after placing the washer with the damper bent.
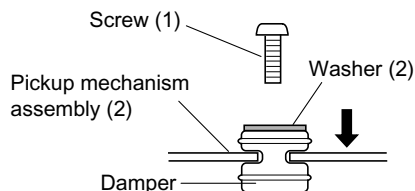
Fig. 2-1-18

1-3-6. Gear B Assembly, Gear A and Rack Gear Assembly

<Removal>

1. Remove one screw (3) and remove the gear B assembly (1).

2. Remove the gear A (2).

3. Remove one screw (5) and remove the rack gear assembly (4).
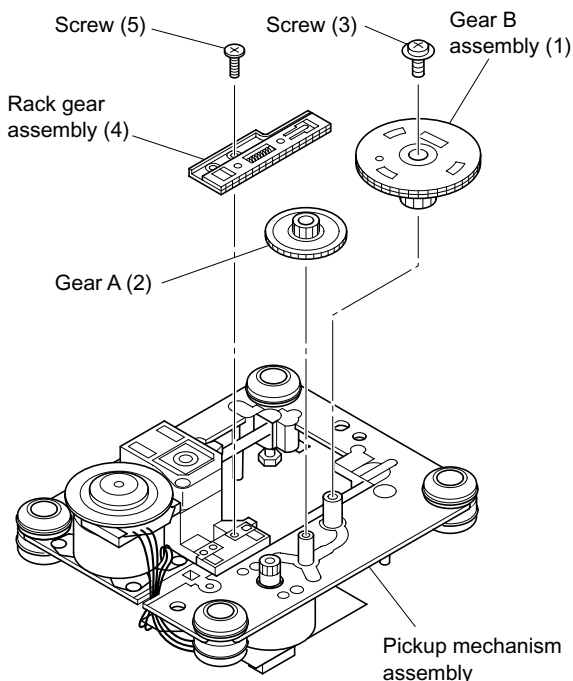
Fig. 2-1-19

<Mounting>

1. When mounting, perform the reverse order of the removal.

2. Mount the gear B assembly (1) by pushing the pickup head (5) to the disc motor side (arrow A direction) and shifting the upper gear of the rack gear assembly (4) in the arrow B direction. (Refer to Fig. 2-1-20.)

3. Fit the positioning holes on the upper gear and lower gear of the gear B assembly (1) and mount on the pickup mechanism assembly with the phase matched.

   At this time, note that the phase of the gear B assembly (1) and the gear A (2) shows the status in the Fig. 2-1-21.
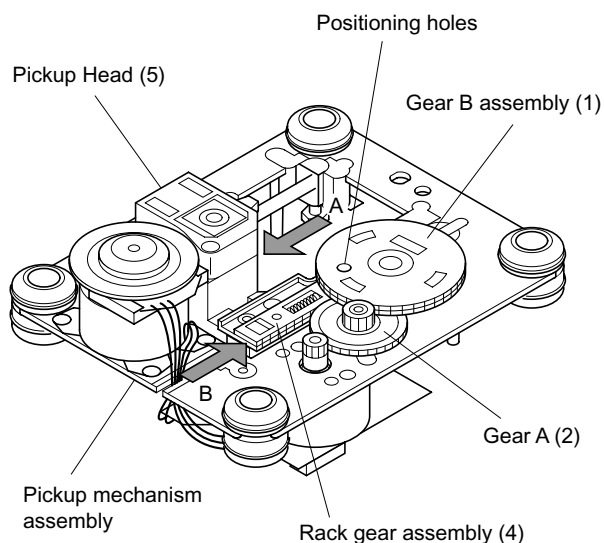
Fig. 2-1-20

Note:

• Mount the gear B assembly (1) and the gear A (2) with their gear teeth placed more than one tooth at least inside the shaded portion.
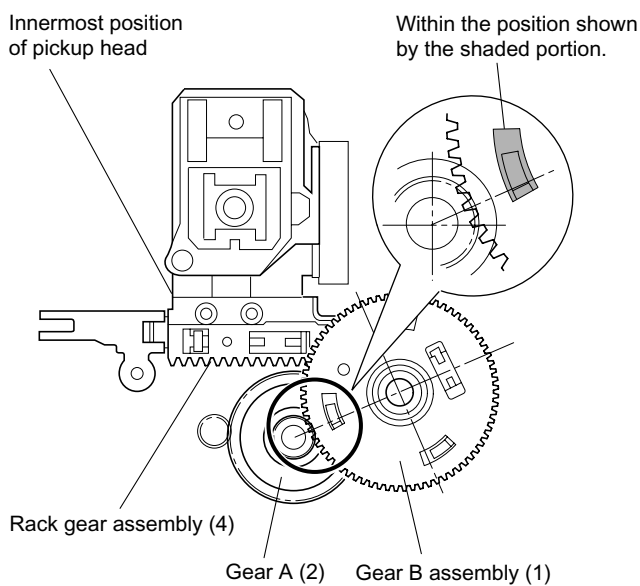
Fig. 2-1-21

1-3-7. Feed Motor

\<Removal\>

1. Remove the gear B assembly and the gear A. (Refer to item 1-3-6.)

2. Remove two screws (1) and remove the feed motor (2) (with the feed motor PC board (3) attached). (Refer to Fig. 2-1-22.)

3. Desolder the terminals of the feed motor (2) and remove the feed motor PC board (3).

\<Mounting\>

1. Tighten the feed motor (2) on the pickup mechanism assembly with two screws (1).

2. Insert the feed motor PC board (3) with the positioning pin on the chassis matched and solder the terminals.

3. Perform the reverse order of the removal.

Note:

• After mounting, put the lead wires through the notch of the pickup mechanism assembly.

• When replacing the loading motor, meet the polarity phase of the terminals. (Mount the motor with the label positioned as shown in Fig. 2-1-22.)
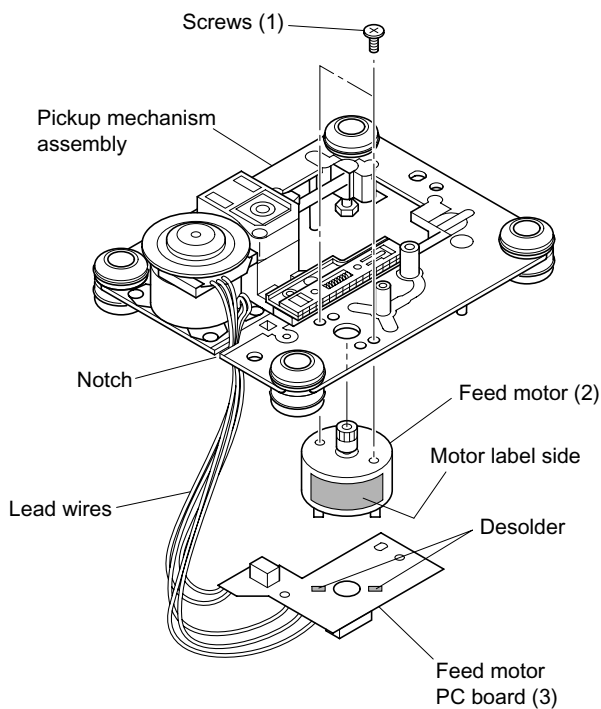
Fig. 2-1-22

SECTION 3
SERVICING DIAGRAMS

1. STANDING PC BOARDS FOR SERVICING

EU02 Power supply PC board

EU09 Output-RGB PC board

EU04 Power SW PC board

EU03 Front display PC board

EU01 Main PC board
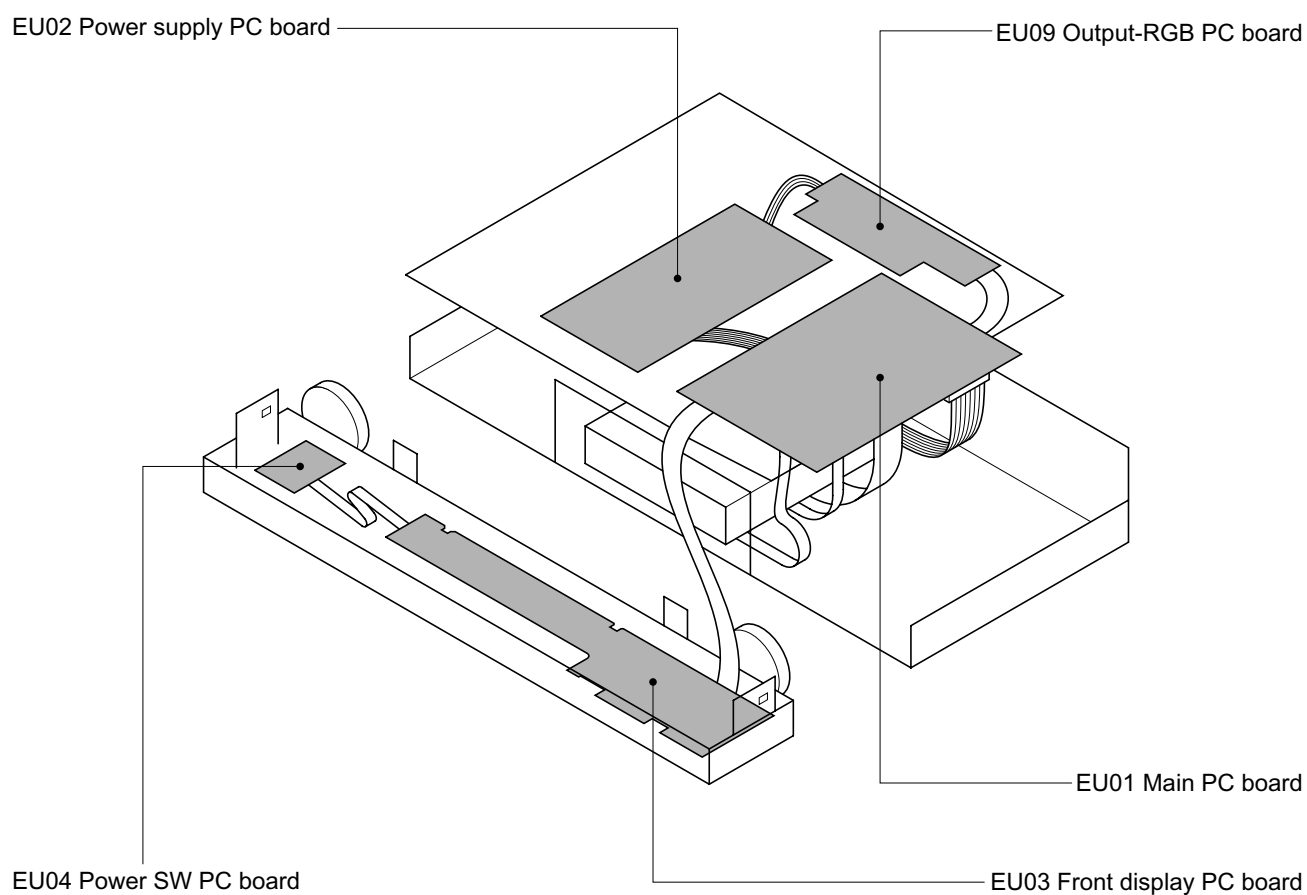
Fig. 3-1-1

2. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION

2-1. Precautions for Part Replacement

• In the schematic diagram, parts marked ⚠ (ex. ⚠ F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.

• Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire etc.

2-2. Solid Resistor Indication

Unit	None ....Ω K ....kΩ M ....MΩ
Tolerance	None ....±5% B ....±0.1% C ....±0.25% D ....±0.5% F ....±1% G ....±2% K ....±10% M ....±20%
Rated Wattage	(1) Chip Parts 　　None ....1/16W (2) Other Parts 　　None ....1/6W Other than above, described in the Circuit Diagram.
Type	None ....Carbon film S ....Solid R ....Oxide metal film W ....Metal film W ....Cement FR ....Fusible

Eg. 1
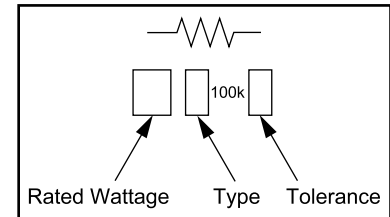
FIg. 3-2-1

2-3. Capacitance Indication

Symbol	...........Electrolytic, Special electrolytic ....Non polarity electrolytic ....Ceramic, plastic ....Film ....Trimmer
Unit	None ....F μ ....μF p ....pF
Rated voltage	None ....50V For other than 50V and electrolytic capacitors, described in the Circuit Diagram.
Tolerance	(1) Ceramic, plastic, and film capacitors of which 　　capacitance are more than 10 pF. None ....±5% or more B ....±0.1% C ....±0.25% D ....±0.5% F ....±1% G ....±2% (2) Ceramic, plastic, and film capacitors of which 　　capacitance are 10 pF or less. None ....more than ±5% pF B ....±0.1 pF C ....±0.25 pF (3) Electrolytic, Trimmer 　　Tolerance is not described.
Temperature characteristic (Ceramic capacitor)	None ....SL For others, temperature characteristics are described. (For capacitors of 0.01 μF and no indications are described as F.)
Static electricity capacity (Ceramic capacitor)	Sometimes described with abbreviated letters as shown in Eg. 3.

Eg. 2
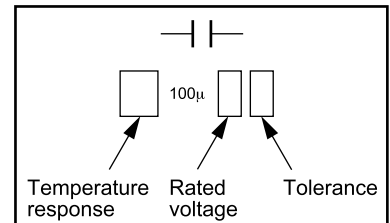
Fig. 3-2-2

Eg. 3
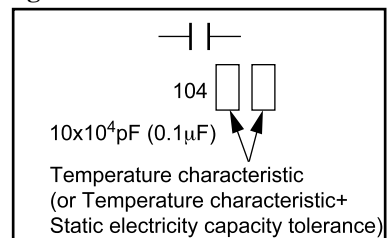
Fig. 3-2-3

2-4. Inductor Indication

Unit	None	...........H
	μ	...........μH
	m	...........mH
Tolerance	None	...........±5%
	B	...........±0.1%
	C	...........±0.25%
	D	...........±0.5%
	F	...........±1%
	G	...........±2%
	K	...........±10%
	M	...........±20%

Eg. 4
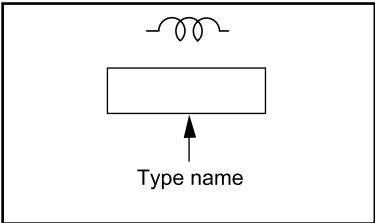
Fig. 3-2-4

2-5. Waveform and Voltage Measurement

• The waveforms for CD/DVD and RF shown in the circuit diagrams are obtained when a test disc is played back.

• All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

2-6. Others

• The parts indicated with "NC" or "KETU" etc. are not used in the circuits of this model.

Eg. 5

Fig. 3-2-5

3. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

EU09 OUTPUT-RGB

CNV01

V/N/G-IN	C/C/CV-/IN	U/U/B-IN	V/V/R-IN	VGND	RGBON	SOUTX	ASP1	Lch-IN	AGND	Rch-IN
1	2	3	4	5	6	7	8	9	10	11

4P Press-fit

CN803

4	E+12V	1
3	VCC+9V	2
2	VCC+5V	3
1	GND	4

CNV02 Board-in

W301 FFC 1mm 11P

11	10	9	8	7	6	5	4	3	2	1
V/N/G-IN	C/C/CV-/IN	U/U/B-IN	V/V/R-IN	VGND	RGBON	SOUTX	ASP1	Lch-IN	AGND	Rch-IN

CN301

16P(10P+6P) Press-fit

CN801 Board-in

1	VCC+9.0V	1
2	GND	2
3	VCC-9.0V	3
4	PWON	4
5	E+5.0V	5
6	E+6.0V	6
1	VDD+5.0V	7
2	VDD+3.3V	8
3	VDD+3.3V	9
4	GND	10
5	GND	11
6	M+8V	12
7	MGND	13
8	VKK-31V	14
9	F-(0.0)	15
10	F+(3.7V)	16

CN802 Board-in

CN701

Mechanism

W501 FFC 1mm 18P

PUH

18	VCC	1
17	RF	2
16	LD2	3
15	MON2	4
14	VOR2	5
13	GND	6
12	VREF	7
11	VCC	8
10	F0	9
9	E0	10
8	A0	11
7	D0	12
6	C0	13
5	B0	14
4	F+	15
3	T-	16
2	T+	17
1	F-	18

CN501

EU02 POWER

EU01 MAIN

CN601

GND	1
5V	2
TXD	3
CTS	4
RXD	5
RTS	6

W502 FFC 1.25mm 6P

TRAY

6	GND	1
5	LDMP	2
4	TOPN	3
3	LDMN	4
2	TCLS	5
1	TRAY	6

CN502

W503 FFC 1mm 8P

MOTOR

8	FMN	1
7	FMP	2
6	GND	3
5	LMT	4
4	DMN	5
3	DMP	6
2	VCC	7
1	DMFG	8

CN503

CN603

1	2	3	4	5	6	7	8	9	10	11	12	13
RSTOX	PWRCNT	E+5V	HMUTE	DSPRST	DSPSI	DSPS0	DSPCKX	DSTBX	GND	VKK-31V	F+	F-

13	12	11	10	9	8	7	6	5	4	3	2	1
RSTOX	PWRCNT	E+5V	HMUTE	DSPRST	DSPSI	DSPS0	DSPCKX	DSTBX	GND	VKK-31V	F+	F-

CN101

W602 FFC 1mm 13P

EU04 POWER SW

W102 WIRE 2mm AWG26#2651 4P

CN103

4	GND	1
3	E+5V	2
2	POWLED	3
1	POWKEY	4

CN102

EU03 FRONT

Fig. 3-3-1

4. BLOCK DIAGRAMS

4-1. Overall Block Diagram

MAIN PROCESSOR UNIT

Data/Control Bus
DVD AV Data

Tray Motor

SPM

PUH

Feed Motor

RF Amp.
IC502
TA1323F

PUH Driver & Motor Driver
IC503
BA5813FM-E2

IC402
M11B11664A-30T
1M-DRAM

Interated Data processor
IC401
TC94A03F

IC202
TC203G08AF-0103

IC201
MSM514800C-70JSR1
4M-DRAM

Track Buffer

IEC958 Audio Out

27MHz Xtal OSC

IC901
AD1959YRSRL
Audio-DAC

IC912
NJM4580E
Audio LPF Amplifire

Analog Audio Out

IC606
MBM29F800BA-55PFTN
8M-FROM

EE-PROM
IC601
S-24C04BFJ-TB

IC605
TMP94C251AF
Main-CPU

X601
9MHz CeraOSC

IC301
ZR36732
AV-1Chip Processor

1M-DRAM
IC603
M11B11664A-30T

16M-S-DRAM
IC305,306
HY57V161610DTC-8

IC304
MM1540AFBE
Video Driver

YPBPR/S Composite

ICV01
MM1540AFBE
Video Driver

AV 21P-RGB

OUTPUT-RGB UNIT

SW POWER SUPPLY

Display (FL)

Display-CPU
IC101
TMP87CH74AF-2C07

FRONT DISPLAY UNIT

Fig.3-4-1

4-2. Power Supply Block Diagram

Fig. 3-4-2

4-3. Front Display, Power Switch Block Diagram

4-3-1. Front Display

Fig. 3-4-3

4-3-2. Front Display Pattern

	8G	7G	6G	5G	4G	3G	2G	1G
P1	▶	a	a	a	a	a	a	A
P2	‖	f	f	f	f	f	f	-B
P3	DVD	h	h	h	h	h	h	↻
P4	S	j	j	j	j	j	j	📹
P5	V	k	k	k	k	k	k	—
P6	CD	b	b	b	b	b	b	—
P7	—	g	g	g	g	g	g	—
P8	—	s	s	s	s	s	s	—
P9	—	m	m	m	m	m	m	—
P10	—	e	e	e	e	e	e	—
P11	—	r	r	r	r	r	r	—
P12	—	p	p	p	p	p	p	—
P13	—	n	n	n	n	n	n	—
P14	—	c	c	c	c	c	c	—
P15	—	d	d	d	d	d	d	—
P16	—	—	col2	col2	col1	col1	M	—
P17	—	◆	◆	◆	◆	—	R	—
P18	—	HDCD	TITLE	TOTAL	CHP	TRK	—	—

Fig. 3-4-4

4-3-3. Front Display, Power Switch Block Diagram
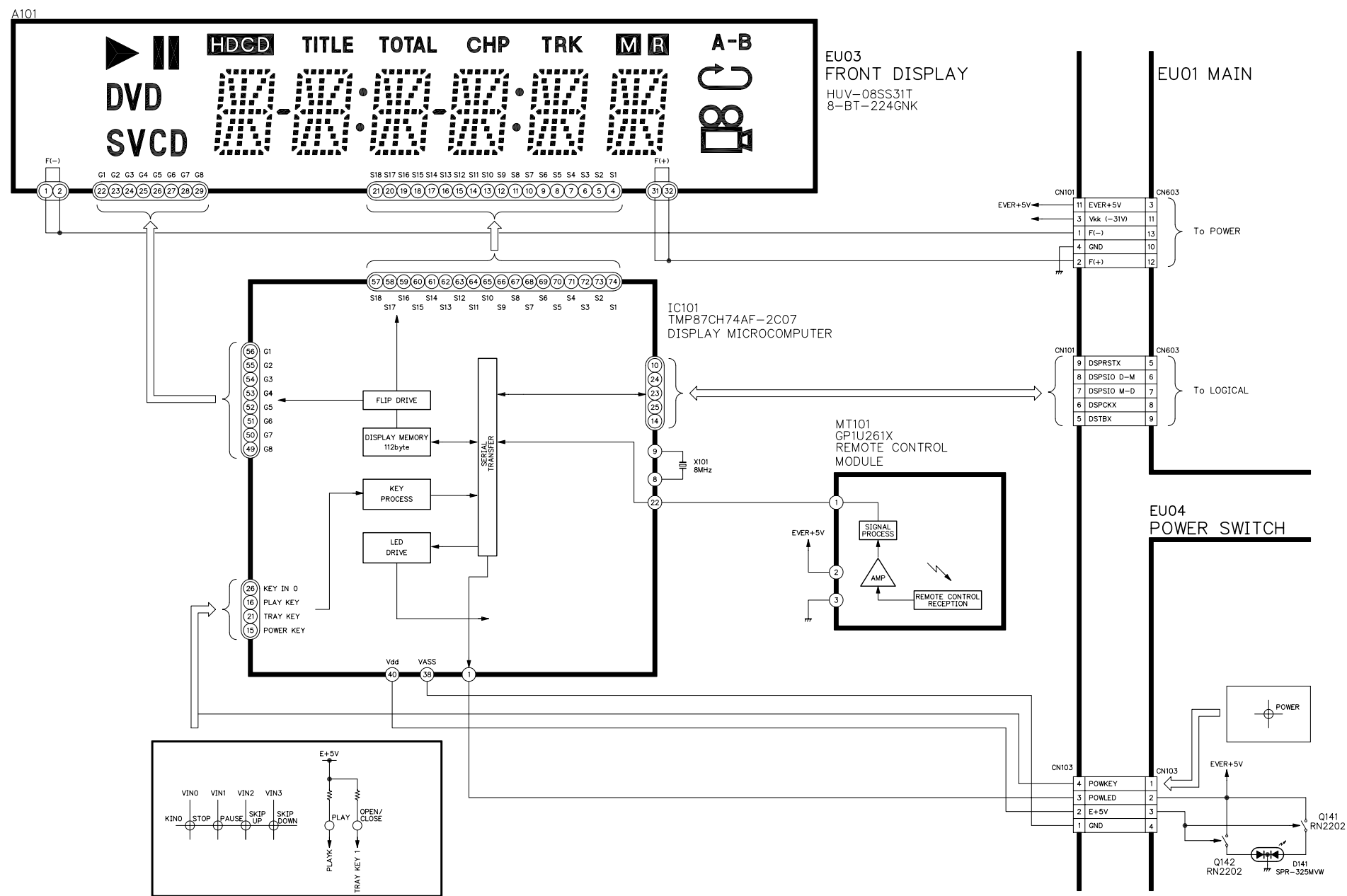
Fig. 3-4-5

4-4. Main Block Diagrams

4-4-1. Servo System Block Diagram
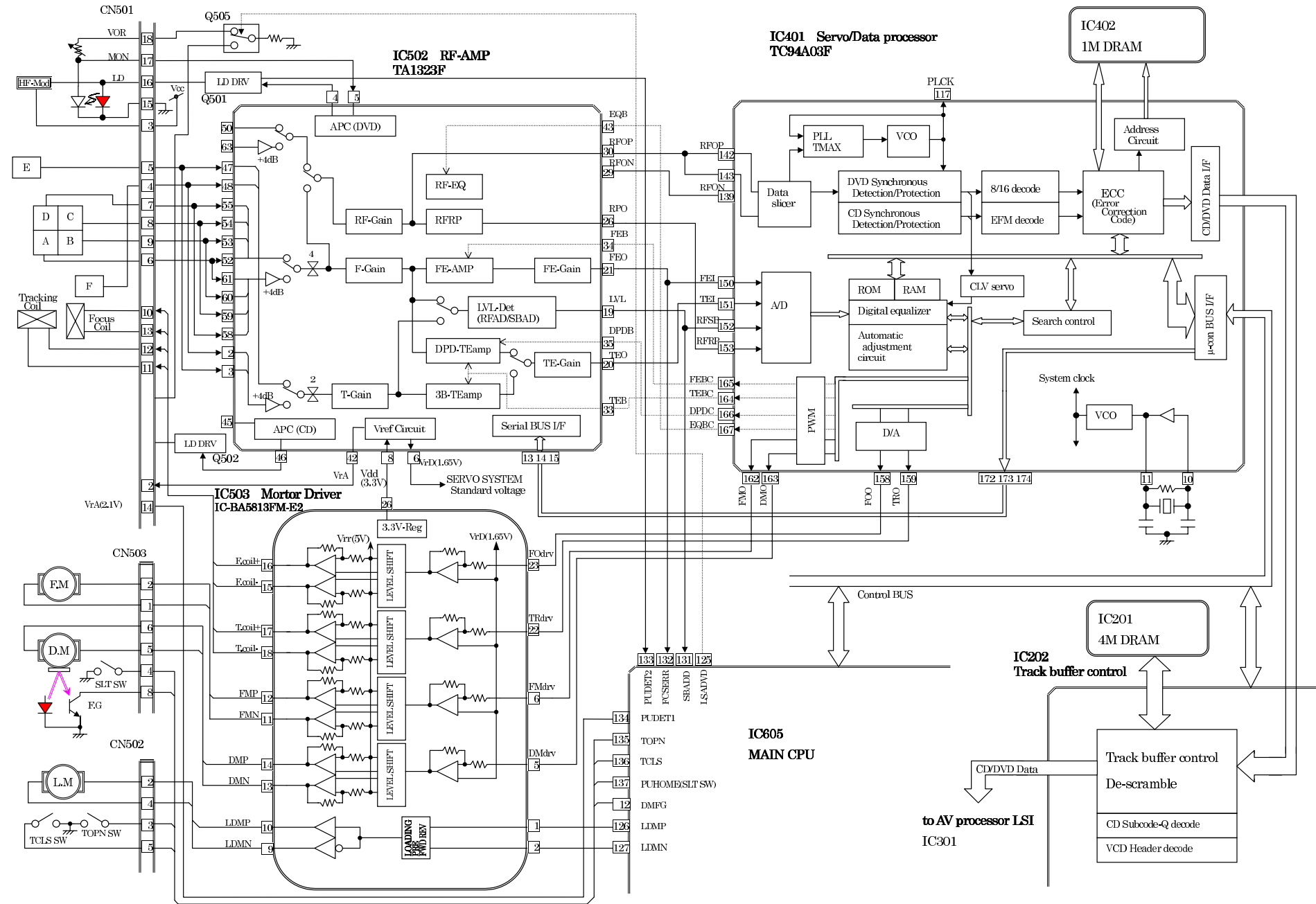
Fig.3-4-6

4-4-2. Signal System Block Diagram
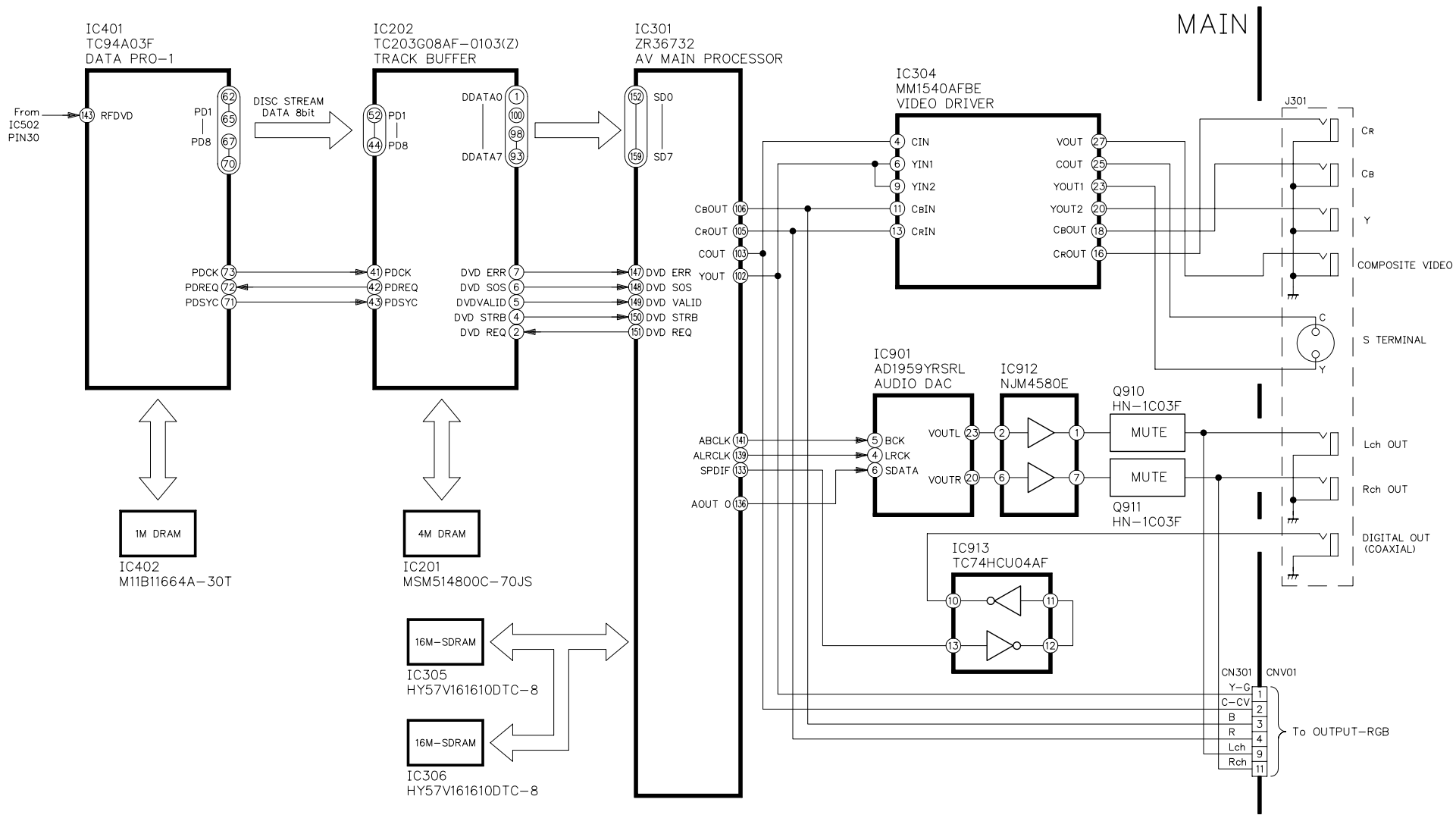
Fig. 3-4-7

4-5. Output-RGB Block Diagram
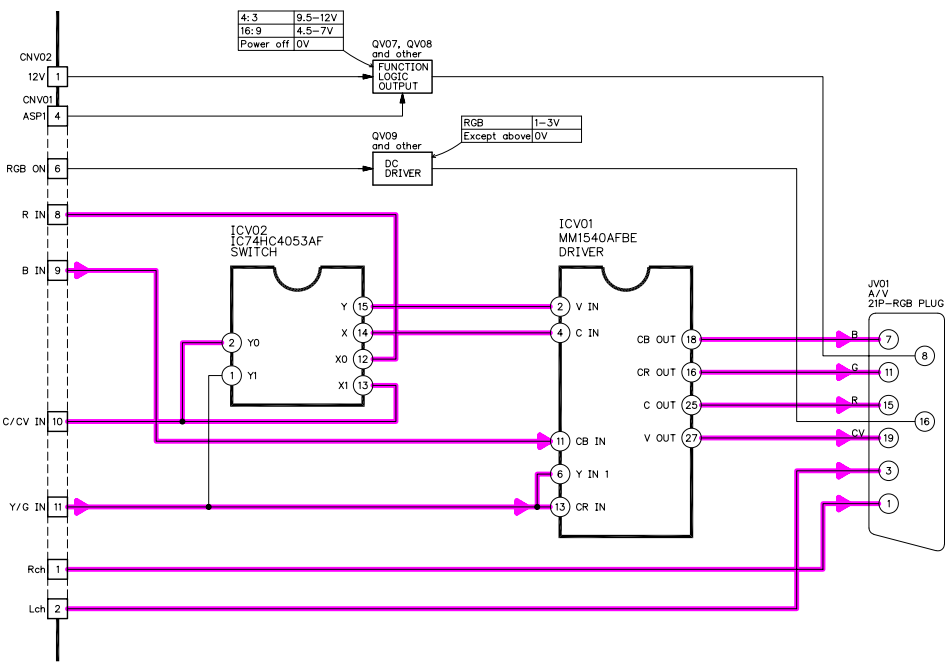
Fig. 3-4-8

5. CIRCUIT DIAGRAMS

5-1. Power Supply Circuit Diagram

EU02 POWER
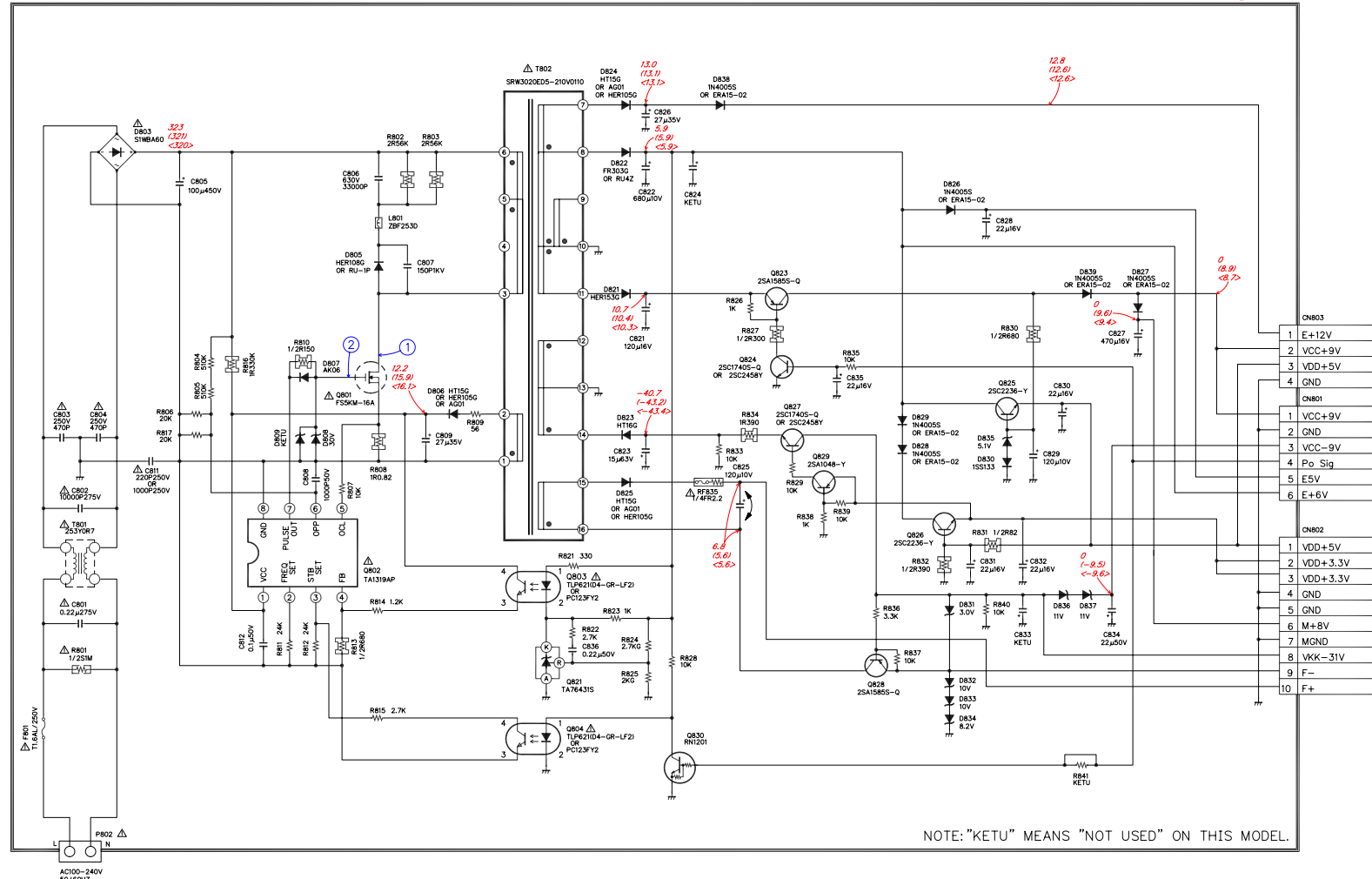
NOTE:"KETU" MEANS "NOT USED" ON THIS MODEL.

	Q802						Q821			Q823			Q824		(V)
	1	2	3	4	6	8	K	R	A	E	C	B	E	C	B
OFF	12.2	1.5	0.5	2.8	3.0	0	4.0	2.5	0	10.7	0	10.7	0	10.7	0
ON	15.9	1.0	1.7	2.4	3.0	0	4.2	2.5	0	10.4	9.6	9.0	0	0.1	0.7
PLAY	16.1	1.0	1.7	2.3	3.0	0	4.2	2.5	0	10.3	9.4	8.8	0	0.1	0.7

	Q825			Q826			Q827			Q828			Q829			Q830		(V)
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
OFF	0	5.9	0	0	5.8	0	−40.7	0	−40.2	0	−6.7	0	0	−40.0	0	0	1.0	0
ON	5.0	5.9	5.7	3.4	4.4	4.1	−31.4	−31.3	−30.6	−27.7	−27.8	−28.4	2.6	3.3	3.4	0	0	4.8
PLAY	5.0	5.9	5.7	3.3	4.3	4.0	−31.4	−31.3	−30.6	−27.8	−27.9	−28.5	2.7	3.4	3.4	0	0	4.8

Fig. 3-5-1

Power Supply Circuit Diagram

① Q802   Drain-Sourse   C-4

ON MODE
(AC230V 50Hz in)

V:100 V/div
H:2 μs/div

② Q802   Gate-Sourse   C-3

ON MODE
(AC230V 50Hz in)

V:5 V/div
H:2 μs/div

Fig. 3-5-2

A B C D E F G
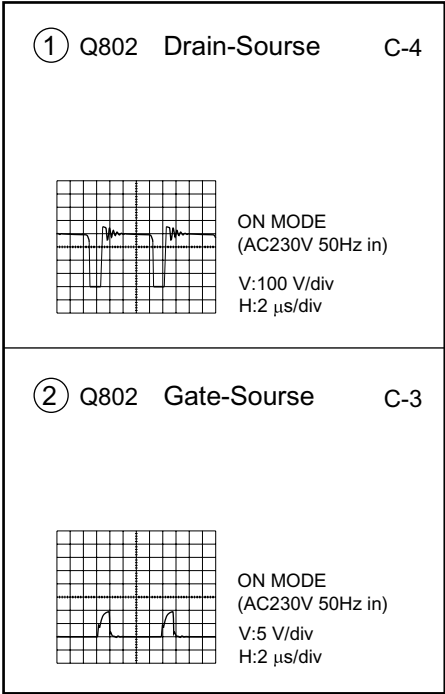
5-2. Front Display, Power Switch Circuit Diagram

EU03 FRONT

A101
HUV-08SS31T
FL-DISPLAY-PANNEL

▶ ❚❚   HDCD TITLE TOTAL CHP TRK Ⓜ Ⓡ A-B

DVD
SVCD

R122 56
R123 56

EF01   EF02

MT101
GP1U261X

E022
Vout Vcc GND

L101 NC
C102 104FZ
C101 47u16V

C105 NC
C106 NC
C107 NC

R181 NC
R182 NC

IC101
TMP87CH74AF-2C07
DISPLAY-CPU

E037
R128 10k
C104 47u16V
C103 104FZ

E036 E035 E034 E033 E032 E031 E030

E047 E045 E043 E041
E048 E046 E044 E042

E027
E026
E028
E029

R150 3k R151 3k R152 3k

EU04
POWER SWITCH

Q141 RN2202
Q142 RN2202 DTA114ESA
DTA114ESA
E147

E146
R145 NC R144 220 R143 220 R142 NC R141 2.2k
D141 SPR-325MVW
POWER S141 SKQNAB
E146   R146 NC E145

CN103 4P to. FRONT
E141 E142 E143 E144

CN102
to. PowerLED-UNIT
GND
Ever+5V
PowerLED
PowerKEY
Ribon cable 4P
Board in Pitch 2mm

R117 100 E117
R118 100 E118
R119 10k

FG102 NC

R120 1M E009
X101
CSTB.00MTW
E018

R137 3k S106 SKQNAB STOP
R138 1k S105 SKQNAB PAUSE
R139 2k S108 SKQNAB SKIP_UP
R140 6.2k S107 SKQNAB SKIP_DWN

S110 SKQNAB PLAY
R114 10k
E016
S111 SKQNAB TRAY1
R115 10k
E021

D103 NC
E127
R116 10k
E020

BZ101 NC
R127 NC

CN101
13P
to. MAIN-UNIT
F- E101
F+ E102
Vkk -31V E103
GND E104
DSTBX E105 R105 100 E014
DSPCKX E106 R106 100 E025
DSPSIO_M-D E107 R107 100 E023
DSPSIO_D-M E108 R108 100 E024
DSPRSTX E109 R109 100 E010
HMUTE E110 R110 100 E011
Ever+5V E111
PWRCNT E112 R112 100 E017
RSTOX E113 R113 100 E079

R149 4.7k

FG101

Fig. 3-5-3

Front Display, Power Switch Circuit Diagram

① IC101, Pin ⑧   E-4

X-OUT

V: 2 V/div
H: 100 ns/div

⑤ IC101, Pin ㉕   D-5

SCK

V: 2 V/div
H: 5 ms/div

② IC101, Pin ⑭   E-5

STB

V: 2 V/div
H: 5 ms/div

⑥ IC101, Pin ㊺   C-4

G1

V: 10 V/div
H: 5 ms/div

③ IC101, Pin ㉓   D-5

SI

V: 2 V/div
H: 5 ms/div

⑦ IC101, Pin ㉔   D-4

S1

V: 10 V/div
H: 5 ms/div

④ IC101, Pin ㉔   D-5

SO

V: 2 V/div
H: 5 ms/div

Fig. 3-5-4

5-3. Main Circuit Diagrams

5-3-1. New Main ICs Information

ZR36732
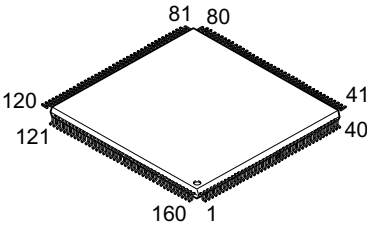
TA1319P/TA1319AP
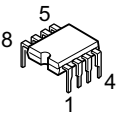
TMP94C251AF(Z)
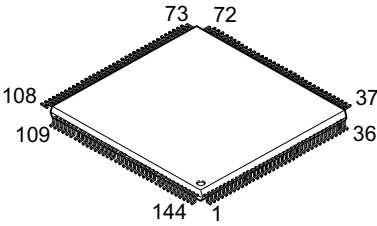
S-814A50AUC-BDO-T2

TMP87CH74AF-2C07

BA5813FM-E2

AD1959YRSRL

SYMBOL	MODEL	SD1700, 1750 200X	SD2700, 1300	SD1500	SD210E	SD110E
IC202		NC	203G08F0103	203G08F0103	203G08F0103	NC
RM201, 202, 203		EXB28V100	NC	NC	NC	EXB28V100
J302		NC	NC	YKF45-3001	NC	NC
CN501		52806-1891	52806-2391	52806-2391	52806-2391	52806-1891
R504		4.7	NC	NC	NC	4.7
CN301		NC	NC	NC	52806-1191	52806-1191
R325, 327, 330		NC	NC	75F	NC	NC
R318		NC	NC	NC	10k	NC
R319		NC	NC	NC	12k	NC
R331		NC	NC	NC	4.7k	NC
Q304		NC	NC	NC	2SA1162Y	2SA1162Y
Q305, Q308		NC	NC	NC	RN1402	RN1402
C305		NC	NC	NC	10μ16V	10μ16V
R317		NC	NC	NC	2.2k	2.2k
R320		NC	NC	NC	0	0
R328		NC	0	0	NC	NC
R339, 340		NC	NC	NC	100k	100k

SYMBOL DIFFERENCE LIST

Fig. 3-5-5

5-3-2. Main Circuit Diagram

LASER DRIVE SIGNAL

PICKUP
ERROR
SIGNAL

PU-HEAD-I/F
CN501
52806-2391

VCC
RF
LD2
MON2
VOR2
GND
VREF
VCC
FO
EO
AO
DO
CO
BO
F+
T-
T+
F-
VCC
GND
LD
MON
VOR
NC

IC502
TA1323F

TRY-I/F 2300/6200
CN502
6207-3217

GND
LDMP
TOPN
LDMN
TCLS
NC

IC501
TC7S04F

FG

TP501

BA5813FM

IC503

2SA1213Y

TRACKING
SERVO SIGNAL

FOCUS
SERVO
SIGNAL

DISC-MOTER-I/F
CN503
52808-0891

FMN
FMP
GND
LMT
DMN
DMP
VCC
DMFG

TRAY
CONTROL
SIGNAL

IC611
TC7S08F

IC504

A+5V
A+3V
AGND

VCC+5V2
VDD+3V3

TP502
TP503

TC94A03F
IC401

M11B11664A-30T
IC402

FOCUS ERROR
TRACKING ERROR
FEED MOTOR SERVO SIGNAL
DISC MOTOR SERVO SIGNAL

Q401
2SC3326B

R402
22k

IC201
MSM514800C-70JS

TD[0-7]

C204
CH100p

TA[0-9]

| 28 VSS | 27 TD[7] | 26 TD[6] | 25 TD[5] | 24 TD[4] | 23 XMCAS | 22 XMOE | 21 NC | 20 TA[8] | 19 TA[7] | 18 TA[6] | 17 TA[5] | 16 TA[4] | 15 VSS |
| MDAT7 | MDAT6 | MDAT5 | MDAT4 | XMWRITE | XMRAS | MADD8 | MADD7 | MADD6 | MADD5 | MADD4 | VCC |

VCC MDAT0 MDAT1 MDAT2 MDAT3 NC XMWRITE XMRAS MADD9 MADD0 MADD1 MADD2 MADD3 VCC

C202
FZ0.1u

TD[0] 2 TD[1] 4 TD[2] 6 TD[3] 8 TA[9] 9 TA[0] 10 TA[1] 11 TA[2] 12 TA[3] 13 14

IC202
203G08F0103

TA[9-0]
TA[B][9]

R648 0 / R342 0 / R948 0
R649 0 / R652 0 / R949 0
R650 0 / R702 0 / R950 0
R653 0 / R703 0 / R951 0
R654 0 / R942 0 / R952 0
R655 0 / R943 0 / R953 0
R656 0 / R947 0 / R954

MADR9 MADR8 MADR7 VDD5 MADR6 MADR5 MADR4 MADR3 MADR2 MADR1 MADR0 VSS VDD3 TEST1 TEST0 VSS PDCK PDREQ PSCYD PDA8 PDA7 PDA6 PDA5 PDA4 PDA3 VDD5

VSS MDAT0 MDAT1 MDAT2 MDAT3 MDAT4 MDAT5 MDAT6 VDD5 MDAT7 WR OE RAS CAS CASR VSS ERR SYNC VDACK STRB VDD3 REQ

DDAT1 VSS DDAT2 DDAT3 DDAT4 DDAT5 DDAT6 DDAT7 VDD3 MCLK VSS HADR15 HADR14 HADR13 HADR12 HADR11 HADR10 HADR9 HADR8 HADR7 HADR6 HADR5 VDD5 HADR4 HADR3 HADR2

PDA2 PDA1 VDD3 PDA0 VSS HDAT7 HDAT6 HDAT5 HDAT4 HDAT3 HDAT2 VDD5 HDAT1 HDAT0 VSS RSTX HRD HWR WAIT INT5 VSS HADR0 HADR1

R205 4.7k

C203 FZ0.1u

C201 FZ0.1u

C205 FZ0.1u

C206 NC

C207 NC

RM203 NC

SD[0-7]

TP205 TP201 TP202 TP203 TP204 TP

E202
E204

100 SD[1] 99 98 SD[2] 97 96 SD[3] 95 SD[4] 94 SD[5] 93 SD[6] 92 91 90 89 A[15] 88 A[14] 87 A[13] 86 A[12] 85 A[11] 84 A[10] 83 A[9] 82 A[8] 81 A[7] 80 A[6] 79 A[5] 78 77 A[4] 76 A[3]

A[2] A[1] A[0]

SD[0-7]

DACSDX
33.8688MHz

SYMBOL

| SYMBOL |
| IC202 |
| RM201, 20 |
| J302 |
| CN501 |
| R504 |
| CN301 |
| R325, 327 |
| R318 |
| R319 |
| R331 |
| Q304 |
| Q305, Q3 |
| C305 |
| R317 |
| R320 |
| R328 |
| R339, 340 |

IC901
AD1959

CCLK CDATA MUTE RSTX ZERO FILTB AVDD AGND FILTA AGND LF1 LFO PGND PVDD

CCLK CLATCH RSTX LRCK BCLK SDATA DVDD DGND MCLK XOUT XIN SCLK0 SCLK1 SCLK2

R909 220
R907 100
R910 100
R945 10k

C902
C623 FZ0.1u
C910 10u16V
C905
C933 10u16V
C906 FLO.001
C90B FZ0.1u
C903 FLO.0033u
C935 FLO.0018u
C936 FLO.0033u

R903 680
R941 680

DAOUTL
DAOUTR

Q914 RN1402
Q912

RN4601

Q901 RN2402

R913
R912 1K
R911 5.6k

E905
E906

HMUTE

G+60B

A

SYMBOL DIFFERENCE LIST

SYMBOL \ MODEL	SD1700, 1750 200X	SD2700, 1300	SD1500	SD210E	SD110E
C202	NC	203G08F0103	203G08F0103	203G08F0103	NC
RM201, 202, 203	EXB28V100	NC	NC	NC	EXB28V100
302	NC	NC	YKF45−3001	NC	NC
N501	52806−1891	52806−2391	52806−2391	52806−2391	52806−1891
504	4.7	NC	NC	NC	4.7
N301	NC	NC	NC	52806−1191	52806−1191
325, 327, 330	NC	NC	75F	NC	NC
318	NC	NC	10k	NC	NC
319	NC	NC	12k	NC	NC
331	NC	NC	4.7k	NC	NC
304	NC	NC	NC	2SA1162Y	2SA1162Y
305, Q308	NC	NC	NC	RN1402	RN1402
305	NC	NC	NC	10μ16V	10μ16V
317	NC	NC	NC	2.2k	2.2k
320	NC	NC	NC	0	0
328	0	0	0	NC	NC
339, 340	NC	NC	NC	100k	100k

B

C

AUDIO SIGNAL L

IC301
ZR36732
AV-MAIN-PROCESSOR

RM605 EXB28V101
RM606 EXB28V101
RM607 EXB28V101
RM608 EXB28V101
RM609 EXB28V101
RM610 EXB28V101
RM611 EXB28V101
RM612 EXB28V101
RM614 RNA4A8E103JT

IC607 NC
IC608 TC7S08F
IC610 TC7W241FU
IC606 MBM29F800TB-55
IC303 HY57V1616DTC-8
IC305 HY57V1616DTC-8

L302 NLC322522T-150

R641 4.7k
R635 0
R644 22k
R643 10k
R642 10k
R301 4.7k

C621 NC
C620 FZ0.1u
C619 F0.1u
C301 FZ0.1u
C302 FZ0.1u
C303 FZ0.1u
C314 FZ0.1u
C315 FZ0.1u
C336 100u16V
C613 CH220p

SD[0-7]
TP303
BCK
LCK
ADATA0
SPDIF

	IC303	IC305,306
64MSDRAM SYSTEM	64MSDRAM	NC
16MSDRAM SYSTEM	NC	16MSDRAM

HORD
HWID
VDDP
HTYPE
HD15
HD14
HD13
HD12
HD11
GND
HD10
VDDC
HD9
GND
HD8
VDDP
HD7
HD6
VDDIP
HD5
HD4
HD3
HD2
HD1
HD0
VDDP
HA3
HA2
HA1
HA0
HWR
HCS
VDDC
HRD
GND
HRDY
HIRQ
VDDP
HACK
GND

IC903
TC7SH08FU

IC907
S814A50AUC

R907
100

CCLK CLATC RSTX LRCK BCLK SDAT7A DVDD DGND DGND MCLK XOUT XIN SCLK2

R904
4.7k

R944
150F

X901
SMD49-27MHz

C907
CH33p

C905
CH33p

C904
CH10p

C911
100u16V

C914 FZ0.1u
C915 FZ0.1u

Vout Vin
Vss
NC ON

R901
4.7k

JP301
0

C304 FZ0.1u
R304 10k

Q301
2SA1213Y

C313
FZ2.2u

R310
0

MCK22M

SPDIF

C901
BK0.01u

L303
NLC322221-150

C310
100u16V

D308
ERA15-02

SB16
IC302

Vout
EXT Vss
ON Vin

C622
FZ0.1u

C912
100u16V

C913
BK0.01u

IC913
TC74HCU04AF

SPDIF
AGND
AMCLK
VDDAM
TEST
GND
VCLKX2
RSETX
AGND
STBYX
VDDA

GCLK 120
X0 119
PLLCFG0 118
GCLK1 117
VDDC 116
PLLCFG1 115
GND 114
AIN 113
ICEMODE 112
VREF 111
VGND 110
VGND 109
RSET 108
VGND 107
C-B-U 106
Y-R-V 105
VDDD 104
CVBS-C 103
CVBS-G-Y 102
VGND 101
CSYNC 100
VDDIP 99
VDDP 98
GND 97
FI 96
HSYNC 95
VDDP 94
VSYNC 93
VCLK 92
RDA0 91
RDA15 90
VDDP 89
RDA1 88
RDA14 87
GND 86
RDA2 85
RDA13 84
VDDP 83
RDA3 82
RDA12 81

R305
47K

R306
10K

C308
FZ0.1u

R307
1.2KF
R338
22KF
R316
1.2KF

C309
1000u10V

C312
100u16V

C319
FZ0.1u

CBOUT
CROUT
COUT
YOUT

R315
2.2k
R317
NC
R328
0

Q302
2SA1162Y

Q304
NC

Q305
NC

R302
75F

R303
75F

R309
75F

R311
75F

Q303
2SA1162Y

Q306
2SA1162Y

Q307
2SA1162Y

R312
2.2k

R313
2.2k

R314
2.2k

C307
10u16V

C311
10u16V

C316
10u16V

C317
10u16V

C305
NC

C306
FZ0.1u

R320

R333
10k

R339
NC

R340
NC

C318
100u16V

C329
FZ0.1u

Q309
HN1C03F

R308
680

C322
1000u10V

R337
10k

IC304
MM1540AF

VCC 28
VIN 27
YCMIX 26
CIN 25
CLP 24
YIN1 23
MUTE1 22
MUTE2 21
YIN2 20
GND 19
CBIN 18
D/S 17
CRIN 16
VEE1 15

VCC2
VOUT
PS1
COUT
VEE2
YOUT1
VEE2
VEE2
YOUT2
VEE2
CBOUT
PS2
CROUT
VEE2

Q308
NC

C321
100u16V

C320
FZ0.1u

C332
NC

R321
75F

R326
75F

C323
FZ0.1u

C327
1000u10V

C328
1000u10V

C325
1000u10V

C326
1000u10V

COMPOSITE VIDEO SIGNAL

C SIGNAL

Y SIGNAL

CB SIGNAL

CR SIGNAL

D303
1SS226
D304
1SS226
D301
1SS226
D302
1SS226
D305
1SS226

E309
E310
E311
E312
E313
E301
E306
E307
E342
E343
E344

1 Y-Y-G
2 C-C-CVBS
3 U-U-B
4 Y-V-R
5 GND
6 RGBON
7 SOUTX
8 ASP1
9 Lch OUTPUT
10 GND
11 Rch OUTPUT

CN301
NC

C337
NC

C338
NC

M+BV

IC306
HY57V1616DTC-8

VCC A3 A5 A6 A7 A8 A10 BS CSX RASX CASX WEX VCCQ DQ7 DQ6 VSSQ DQ5 DQ4 VCCQ DQ3 DQ2 VSSQ DQ1 DQ0 VCC

VSS A4 A5 A6 A7 A8 A9 CKE CLK UDQM VCCQ DQ9 DQ8 VSSQ DQ11 DQ10 VCCQ DQ13 DQ12 VSSQ DQ15 DQ14 VSS

DIGITAL SIGNAL

AUDIO SIGNAL R

Y SIGNAL

Q904
RN2402
Q902
2SC2712Y
R917 10k
R918 10k
R919 10k
R920 RN2402
Q905 RN2402
R946
Q908 2SC3325B
R922 5.1kD
C917 100u16V
C919 100u16V
R923 3.9k
R925 10kD
R916 5.1kD
C937 FZ0.1u
C922 FL0.0012u
E909

VSS
IC912 NJM45BOE
VCC
FL1500
C925 FZ0.1u
C926 100u16V
C927 100u16V
R932 47k
R933 2.7k
Q909 2SC2712Y
R929 100
C932 47u10V-NP
R934 47k
R935 4.7k
R928 47k
R937 100
Q911 HN1C03F

VDD+3V
VDD+5V2

R939 91
E917
E903
D-IN
VCC
GND
IC914 NC
C931 FZ0.1u

R908 330
C930 330
FZ0.1u
E901
E902
R938 91

J301 YKC22-0494
R322 75F
E328
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
COAXAL-DIGITAL PR-OUTPUT ⑤
R323 75F
E322
E323
C333 FL0.0047u
Lch-OUTPUT PB-OUTPUT ③
C327 100u10V
R324 75F
C334 FL0.0047u
Rch-OUTPUT Y-OUTPUT ④ ③
R329 75F
E329
COMPOSIT OUTPUT
R334 8.2k
C335 FZ0.1u
R332 1.8k
E319
S-VIDEO ① ②

J302 NC
C331 NC
E326
R325 NC
E320
R327 NC
E321
R330 NC
E315
R318 NC
R331 NC
E327
R319 NC
1 Y-OUT
2 GND
3 PB-OUT
4 GND
5 PR-OUT
6 GND
7 RESERVE
8 LINE1
9 LINE2
10 RESERVE2
11 LINE3
12 SW-GND
13 RESERVE3
14 SW

M+8V

POWER-SUPPLY
C713 NC
C714 FZ0.1u

CN701 B16B-PH-SM3-TB
E707
E708
E709
E710
E730
E724
E725
E726
E727
E728
E729
E704
1 VCC+9V
2 GND
3 VEE-9V
4 PWON
5 E+5V
6 E+6V
7 VDD+5V
8 VDD+3V
9 VDD+2.5V
10 GND
11 GND
12 M+8V
13 MGND
14 VKK-31V
15 F-
16 F+

JP701
E706
E701
C707 100u15V
C705 100u16V
C706 FZ0.1u
C701 FZ0.1u
C712 NC
C703 100u16V
C715
C716
C704 100u16V
E702
E703
C709
BK0.0022u
C717 FZ0.1u
R701 220
C702 100u16V
E713
E714
C710 C711
BK0.0022u
C708 BK0.0022u
E715
FZ0.1u
E716

R701 220

Fig. 3-5-5

Main Circuit Diagram

① J301 Composite   E-7
    video output

CVBS output
75Ω terminated
100% color bar

V: 500 mV/div
H: 20 µs/div

④ J301 L ch output   E-7
    / R ch output   E-7
      (1 kHz, FS)

L ch output

R ch output

V: 2 V/div
H: 200 µs/div

② J301
    (a) S-video output Y   E-7
    (b) S-video output C   E-7

S-Y/C
75Ω terminated
100% color bar
(a) Y
(b) C
V: 500 mV/div
H: 20 µs/div

⑤ J301 COAXIAL   D-7
    -DIGITAL OUTPUT

75Ω terminated

V: 500 mV/div
H: 0.1 µs/div

③ J301 Y/P$_B$/P$_R$ D-7
    output

Component output
75Ω terminated
100% color bar
(Play)
Y
P$_B$
P$_R$
V: 500 mV/div
H: 20 µs/div

Output-RGB Circuit Diagram

⑥ JV01 SCART output   C-10
   (Video out select : RGB)

NTSC 100% color bar (Play)
75Ω terminated

(a) Pin ⑲ : CV } V: 1 V/div
                H: 20 µs/div
(b) Pin ⑦ : B
(c) Pin ⑪ : G } V: 500 mV/div
(d) Pin ⑮ : R   H: 20 µs/div

Fig. 3-5-6

5-4. Output-RGB Circuit Diagram

EU09 OUTPUT-RGB

Fig. 3-5-7

5-5. Motor System Circuit Diagram
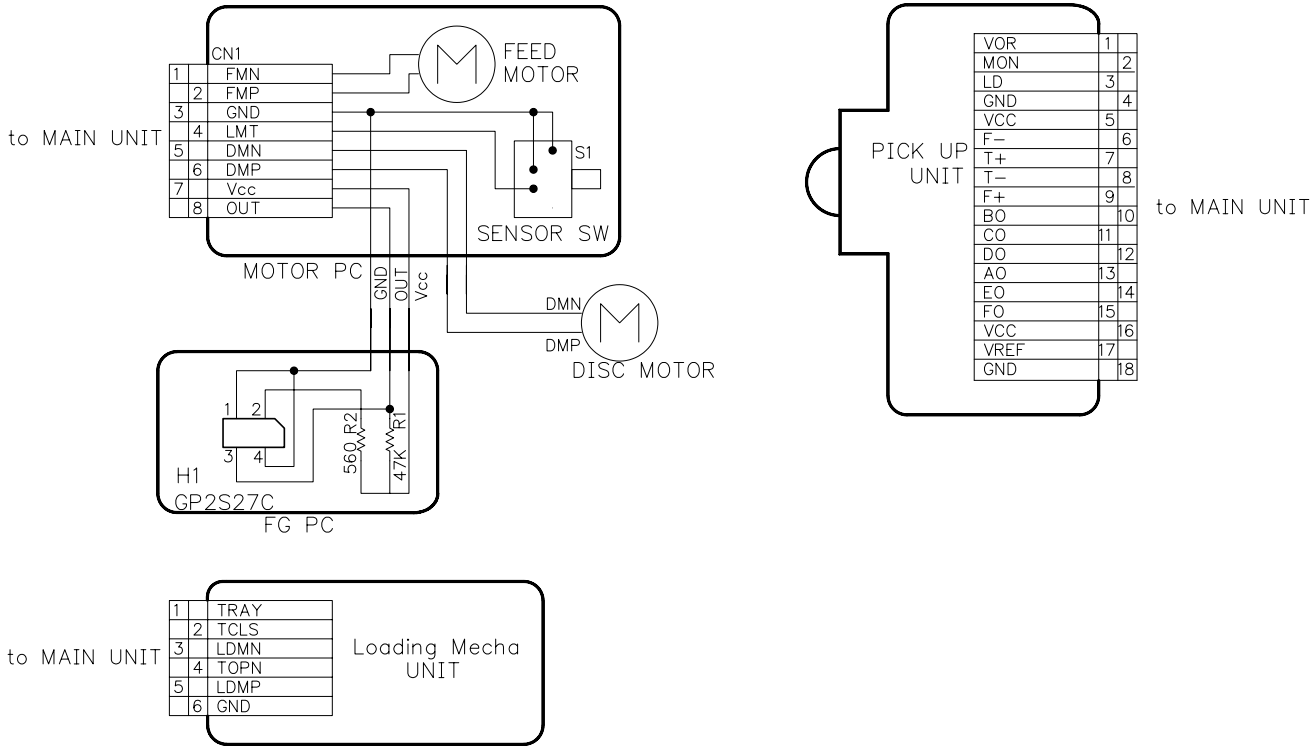
Fig. 3-5-8

6. PC BOARDS

6-1. Power Supply PC Board
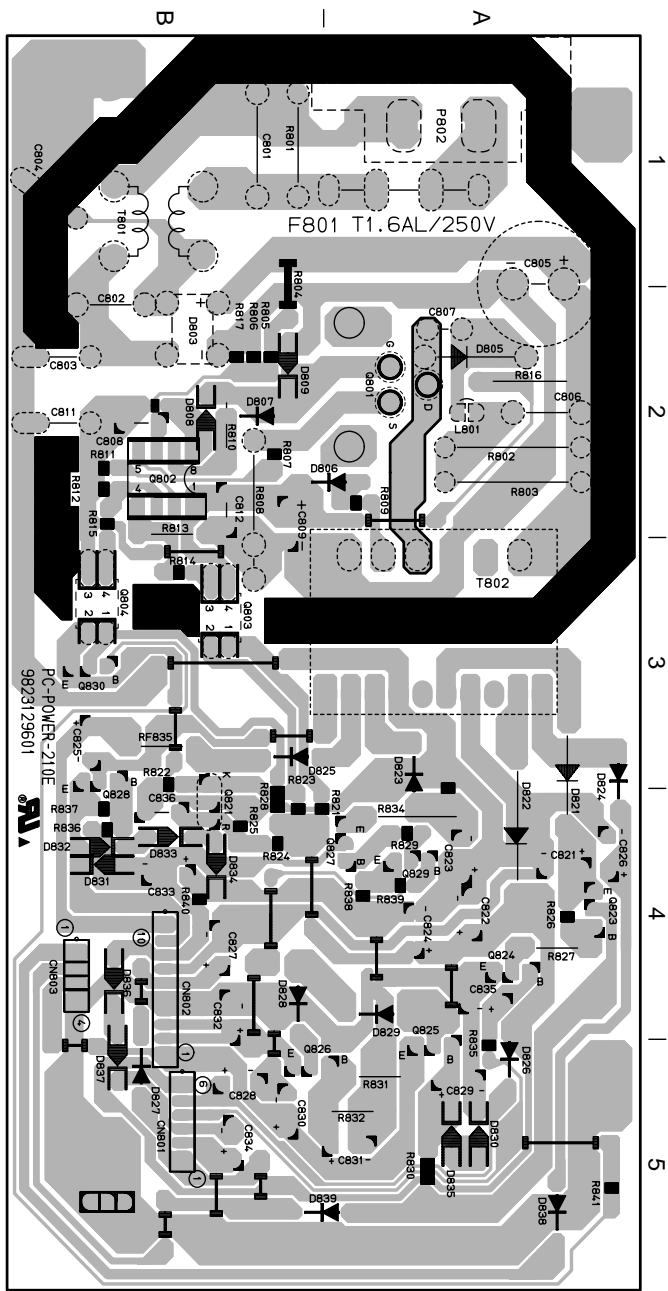
Part No.	Location	Part No.	Location
C801	B1	L801	A2
C802	B2	P802	A1
C803	B2	Q801	A2
C804	B1	Q802	B2
C805	A1	Q803	B3
C806	A2	Q804	B3
C807	A2	Q821	B4
C808	B2	Q823	A4
C809	B3	Q824	A4
C811	B2	Q825	A5
C812	B2	Q826	B5
C821	A4	Q827	A4
C822	A4	Q828	B3
C823	A4	Q829	A4
C824	A4	Q830	B3
C825	B3	R801	B1
C826	A4	R802	A2
C827	B4	R803	A2
C828	B5	R804	B2
C829	A5	R805	B2
C830	B5	R806	B2
C831	A5	R807	B2
C832	B4	R808	B2
C833	B4	R809	A2
C834	B5	R810	B2
C835	A4	R811	B2
C836	B4	R812	B2
CN801	B5	R813	B2
CN802	B4	R814	B3
CN803	B4	R815	B2
D803	B2	R816	A2
D805	A2	R817	B2
D806	B2	R821	B4
D807	B2	R822	B3
D808	B2	R823	B4
D809	B2	R824	B4
D821	A4	R825	B4
D822	A4	R826	A4
D823	A3	R827	A4
D824	A4	R828	B3
D825	B3	R829	A4
D826	A5	R830	A5
D827	B4	R831	A5
D828	B4	R832	B5
D829	A4	R833	A3
D830	A5	R834	A4
D831	B4	R835	A4
D832	B4	R836	B4
D833	B4	R837	B4
D834	B4	R838	A4
D835	A5	R839	A4
D836	B4	R840	B4
D837	B5	R841	A5
D838	A5	RF835	B3
D839	B5	T801	B1
F801	A1	T802	A3

Fig. 3-6-1 EU02 Power Supply PC Board (Bottom side)

6-2. Power Switch PC Board
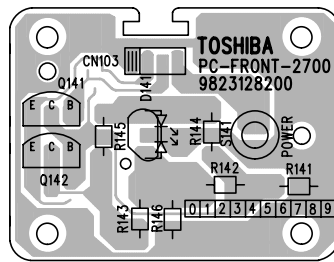
Fig. 3-6-2 EU04
Power Switch PC Board (Top side)
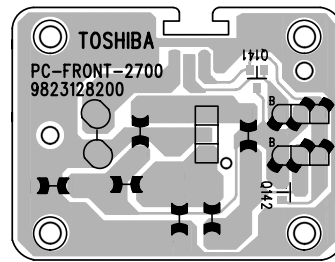
Fig. 3-6-3 EU04
Power Switch PC Board (Bottom side)

6-3. Output-RGB PC Board
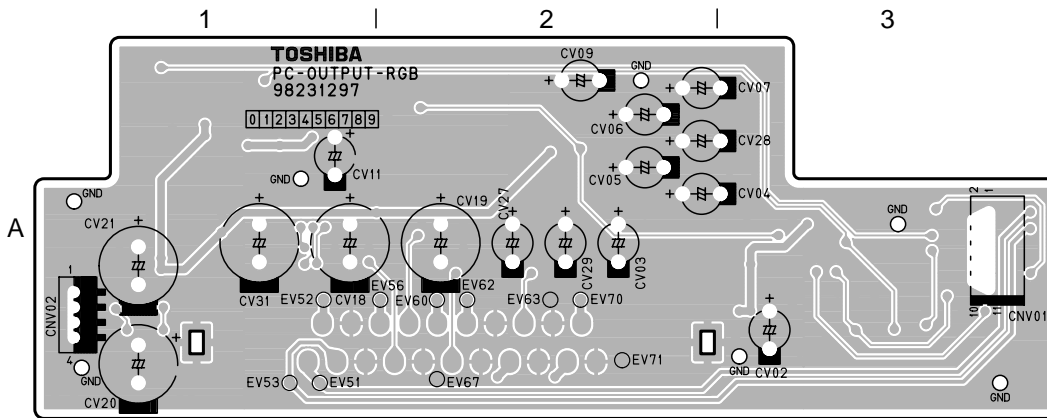
Fig. 3-6-4 EU09 Output-RGB PC Board (Top side)

Part No.	Location
CNV01	A3
CNV02	A1
CV02	A3
CV03	A2
CV04	A2
CV05	A2
CV06	A2
CV07	A2
CV09	A2
CV11	A1
CV18	A1
CV19	A2
CV20	A1
CV21	A1
CV27	A2
CV28	A2
CV29	A2
CV31	A1
EV51	A1
EV52	A1
EV53	A1
EV56	A2
EV60	A2
EV62	A2
EV63	A2
EV67	A2
EV70	A2
EV71	A2
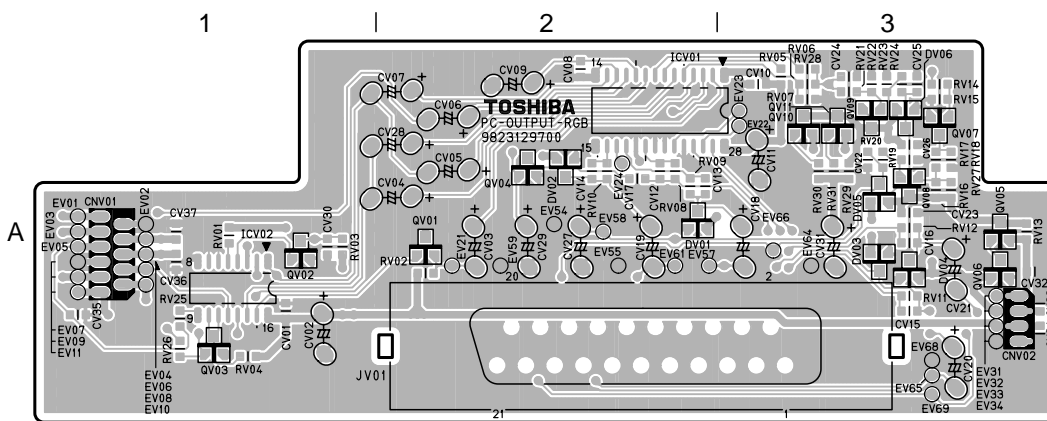
Fig. 3-6-5 EU09 Output-RGB PC Board (Bottom side)

Part No.	Location	Part No.	Location
CV01	A1	EV61	A2
CV08	A2	EV64	A3
CV10	A3	EV65	A3
CV12	A2	EV66	A3
CV13	A2	EV68	A3
CV14	A2	EV69	A3
CV15	A3	ICV01	A2
CV16	A3	ICV02	A1
CV17	A2	JV01	A2
CV22	A3	QV01	A2
CV23	A3	QV02	A1
CV24	A3	QV03	A1
CV25	A3	QV04	A2
CV26	A3	QV05	A3
CV30	A1	QV06	A3
CV32	A3	QV07	A3
CV33	A3	QV08	A3
CV34	A3	QV09	A3
CV35	A1	QV10	A3
CV36	A1	QV11	A3
CV37	A1	RV01	A1
DV01	A2	RV02	A2
DV02	A2	RV03	A1
DV03	A3	RV04	A1
DV04	A3	RV05	A3
DV05	A3	RV06	A3
DV06	A3	RV07	A3
EV01	A1	RV08	A2
EV02	A1	RV09	A2
EV03	A1	RV10	A2
EV04	A1	RV11	A3
EV05	A1	RV12	A3
EV06	A1	RV13	A3
EV07	A1	RV14	A3
EV08	A1	RV15	A3
EV09	A1	RV16	A3
EV10	A1	RV17	A3
EV11	A1	RV18	A3
EV21	A2	RV19	A3
EV22	A3	RV20	A3
EV23	A3	RV21	A3
EV24	A2	RV22	A3
EV31	A3	RV23	A3
EV32	A3	RV24	A3
EV33	A3	RV25	A1
EV34	A3	RV26	A1
EV54	A2	RV27	A3
EV55	A2	RV28	A3
EV57	A2	RV29	A3
EV58	A2	RV30	A3
EV59	A2	RV31	A3
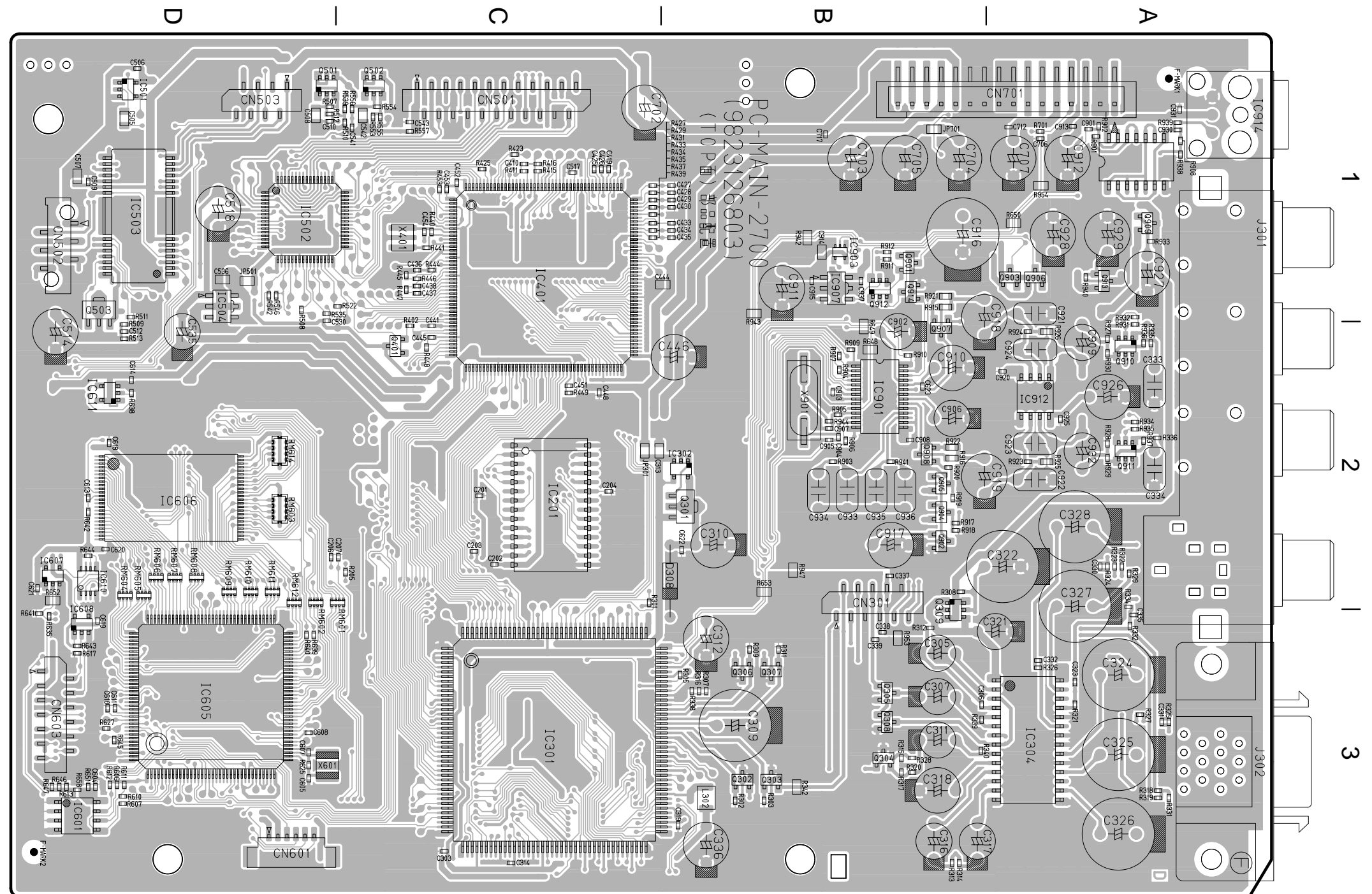
Fig. 3-6-6 EU01 Main PC Board (Top pattern and Top parts location diagram)

Fig. 3-6-7 EU01 Main PC Board (Bottom pattern and bottom parts location diagram)

Main PC Board (Top Side)

Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
C201	C2	C611	D3	IC913	A1	R435	C1	R928	A2
C202	C2	C613	D2	IC914	A1	R437	C1	R929	A2
C203	C2	C614	D2	J301	A1	R439	C1	R930	A2
C204	C2	C618	D2	J302	A3	R440	C1	R931	A2
C206	D2	C619	D3	JP301	C2	R441	C1	R932	A1
C207	C2	C620	D2	JP501	D1	R444	C1	R933	A1
C303	C3	C621	D2	JP701	B1	R445	C1	R934	A2
C305	B3	C622	B2	L302	B3	R446	C1	R935	A2
C306	B3	C623	B2	Q301	B2	R447	C1	R936	A2
C307	B3	C702	C1	Q302	B3	R448	C2	R937	A2
C309	B3	C703	B1	Q303	B3	R449	C2	R938	A1
C310	B2	C704	B1	Q304	B3	R453	C1	R939	A1
C311	B3	C705	B1	Q305	B3	R507	D1	R940	A1
C312	B3	C706	A1	Q306	B3	R508	D1	R941	B2
C313	C2	C707	A1	Q307	B3	R509	D2	R942	B1
C314	C3	C712	A1	Q308	B3	R510	C1	R943	B1
C316	B3	C717	B1	Q309	B3	R511	D1	R944	B2
C317	B3	C901	A1	Q401	C2	R512	D1	R947	B2
C318	B3	C902	B2	Q501	D1	R513	D2	R953	B3
C319	B3	C903	B2	Q502	C1	R522	C1	R954	A1
C321	A3	C904	B2	Q503	D1	R535	D1	RM601	C2
C322	A2	C905	B2	Q901	B1	R539	C1	RM602	D2
C323	A3	C906	B2	Q902	B2	R542	D1	RM603	D2
C324	A3	C907	B2	Q903	A1	R546	D1	RM604	D2
C325	A3	C908	B2	Q904	B2	R553	C1	RM605	D2
C326	A3	C909	A2	Q905	B2	R554	C1	RM606	D2
C327	A2	C910	B2	Q906	A1	R555	C1	RM607	D2
C328	A2	C911	B1	Q907	B2	R556	C1	RM608	D2
C330	A2	C912	A1	Q908	B2	R557	C1	RM609	D2
C331	A3	C913	A1	Q909	A1	R606	D3	RM610	D2
C332	A3	C914	B1	Q910	A2	R607	D3	RM611	D2
C333	A2	C915	B1	Q911	A2	R610	D3	RM612	D2
C334	A2	C916	B1	Q912	B1	R611	D3	RM614	D2
C335	A3	C917	B2	Q913	A1	R612	D3	X401	C1
C336	B3	C918	B1	Q914	B1	R613	D3	X601	D3
C337	B2	C919	B2	R205	C2	R617	D3	X901	B2
C338	B3	C920	A2	R301	C2	R625	D3		
C339	B3	C921	A1	R302	B3	R627	D3		
C410	C1	C922	A2	R303	B3	R635	D3		
C419	C1	C923	A2	R305	B3	R638	D2		
C425	C1	C924	A2	R307	B3	R639	D3		
C426	C1	C925	A2	R308	B2	R640	D3		
C427	B1	C926	A2	R309	B3	R641	D3		
C428	B1	C927	A1	R311	B3	R642	D2		
C429	B1	C928	A1	R312	B3	R643	D3		
C430	B1	C929	A1	R313	B3	R644	D2		
C433	B1	C930	A1	R314	B3	R645	D3		
C434	B1	C931	A1	R315	B3	R646	D3		
C435	B1	C932	A2	R316	B3	R647	D3		
C436	C1	C933	B2	R317	B3	R648	B2		
C437	C1	C934	B2	R318	A3	R649	B2		
C438	C1	C935	B2	R319	A3	R650	A1		
C441	C2	C936	B2	R320	B3	R651	D3		
C444	B1	C937	B1	R321	A3	R652	D2		
C445	C2	CN301	B2	R322	A2	R653	B2		
C446	B2	CN501	C1	R323	A2	R658	D3		
C448	C2	CN502	D1	R324	A2	R701	A1		
C451	C2	CN503	D1	R325	A3	R901	A1		
C452	C1	CN601	D3	R326	A3	R902	A1		
C453	C1	CN603	D3	R327	A3	R903	B2		
C454	C1	CN701	A1	R328	B3	R904	B2		
C505	D1	D308	B2	R329	A2	R905	B2		
C506	D1	IC201	C2	R331	A3	R906	B2		
C507	D1	IC301	C3	R332	A3	R907	B2		
C508	D1	IC302	B2	R334	A2	R908	A1		
C509	D1	IC304	A3	R335	A2	R909	B2		
C510	D1	IC401	C1	R336	A2	R910	B2		
C512	D2	IC501	D1	R338	B3	R911	B1		
C514	D2	IC502	D1	R339	B3	R912	B1		
C517	C1	IC503	D1	R340	B3	R915	B1		
C518	D1	IC504	D1	R342	B3	R916	B2		
C530	D1	IC601	D3	R402	C2	R917	B2		
C535	D2	IC605	D3	R411	C1	R918	B2		
C536	D1	IC606	D2	R415	C1	R919	B2		
C541	C1	IC607	D2	R416	C1	R920	B2		
C542	C1	IC608	D3	R423	C1	R921	B1		
C543	C1	IC610	D2	R425	C1	R922	B2		
C604	D3	IC611	D2	R427	C1	R923	A2		
C605	D3	IC901	B2	R429	C1	R924	A2		
C607	D3	IC903	B1	R431	C1	R925	A2		
C608	D3	IC907	B1	R433	C1	R926	A2		
C610	D3	IC912	A2	R434	C1	R927	A2		

Main PC Board (Bottom Side)

Part No.	Location	Part No.	Location	Part No.	Location
C205	D2	C708	B3	R501	C3
C301	C1	C709	B3	R502	C3
C302	C1	C710	B3	R503	C3
C304	C1	C711	B3	R504	C3
C308	B1	C713	A3	R505	C3
C315	C1	C714	A3	R506	C3
C320	A1	C715	A3	R514	D3
C329	A1	C716	A3	R515	D3
C401	C3	D301	A1	R516	D3
C402	C3	D302	A2	R517	D3
C403	C3	D303	A1	R518	D3
C404	C3	D304	A1	R519	C3
C405	C3	D305	A1	R520	D3
C406	C3	D501	C3	R521	D3
C408	C3	D502	C3	R525	C3
C409	C3	D901	A3	R526	D3
C411	C3	IC202	C2	R527	D3
C412	C3	IC303	C1	R528	D3
C413	C3	IC305	C1	R529	D3
C415	C3	IC306	C1	R536	C3
C416	C3	IC402	C3	R545	C3
C417	C3	IC602	D1	R547	D3
C418	C3	IC603	D2	R551	D3
C420	C3	IC604	D1	R552	C3
C421	C3	IC609	D1	R601	D1
C422	C3	L303	A3	R602	D1
C423	C3	Q504	D3	R603	D1
C424	C3	Q505	D3	R604	D1
C431	C3	Q601	D1	R605	D1
C432	C3	Q602	D1	R608	D1
C439	C2	Q603	D1	R609	D1
C440	C2	Q604	D1	R614	D1
C442	C3	R304	C2	R615	D1
C443	C2	R306	C1	R616	D1
C447	C2	R310	C1	R618	D1
C449	C2	R330	A1	R619	D1
C450	C2	R333	A1	R620	D1
C501	C3	R337	A1	R621	D1
C502	C3	R401	C3	R622	D1
C503	C3	R403	C3	R623	D1
C504	D3	R404	C3	R624	D1
C511	D3	R405	C3	R626	D1
C513	C3	R406	C3	R628	D1
C515	D3	R407	C3	R629	D1
C516	D3	R408	C3	R630	D1
C519	D3	R409	C3	R631	D1
C520	D3	R410	C3	R632	D1
C522	D3	R412	C3	R633	D1
C523	D3	R413	C3	R634	D1
C524	D3	R414	C3	R636	D1
C525	D3	R417	C3	R637	D1
C526	D3	R418	C3	R654	B2
C527	D3	R419	C3	R655	B2
C528	D3	R420	C3	R656	B2
C529	D3	R421	C3	R702	B3
C532	C3	R422	C3	R703	B3
C533	D3	R424	C3	R913	A3
C534	D3	R426	C3	R914	B2
C539	C3	R428	C3	R945	B2
C601	D1	R430	C3	R946	B2
C602	D1	R432	C3	R948	B3
C603	D1	R436	C3	R949	B2
C606	D1	R438	C3	R950	B2
C609	D2	R442	C3	R951	B2
C612	D1	R443	C3	R952	B2
C615	D1	R450	C2	RM201	C2
C616	D1	R451	C2	RM202	C2
C617	D1	R454	C3	RM203	C2
C701	A3	R461	C3	RM613	D1

Fig. 3-6-8 EU01 Main PC Board (Top pattern, character/symbol)

Fig. 3-6-9 EU01 Main PC Board   (Bottom pattern, character/symbol)

6-5. Front Display PC Board
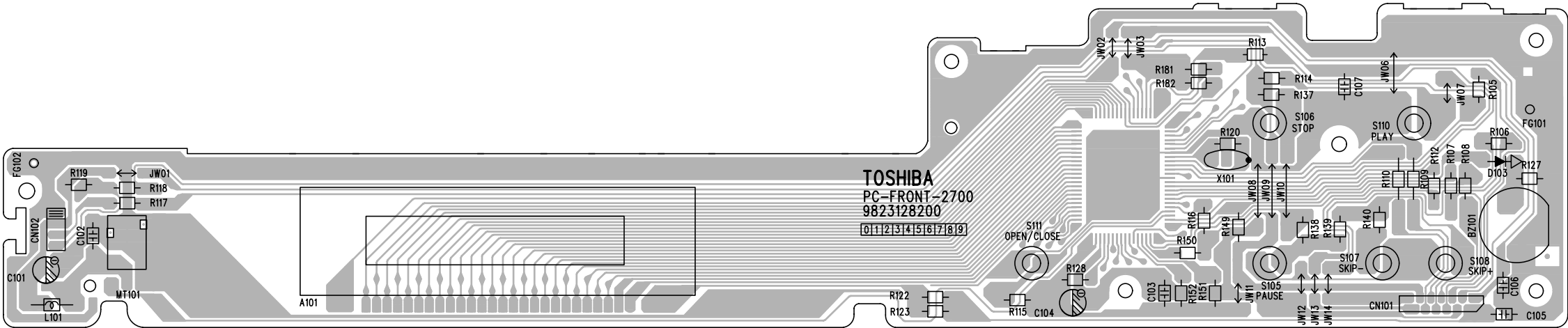
Fig. 3-6-10 EU03 Front Display PC Board (Top Side)
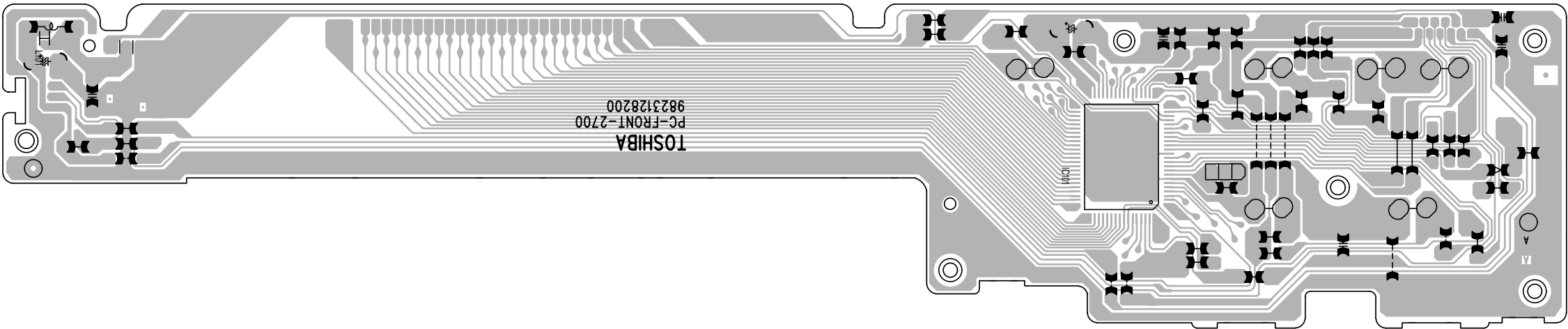
Fig. 3-6-11 EU03 Front Display PC Board (Bottom Side)

The parts location list shows ex.
A1/B1 = top side/bottom side.

Part No.	Location
A101	C3/ −
BZ101	B8/ −
C101	C1/ −
C102	C1/ −
C103	C7/ −
C104	C6/ −
C105	C9/ −
C106	C9/ −
C107	B8/ −
CN101	C8/ −
CN102	C1/ −
D103	B9/ −
FG101	B9/ −
FG102	B1/ −
IC101	− /E6
JW01	B2/ −
JW02	B6/ −
JW03	B6/ −
JW06	B8/ −
JW07	B8/ −
JW08	B7/ −
JW09	B7/ −
JW10	B7/ −
JW11	C7/ −
JW12	C8/ −
JW13	C8/ −
JW14	C8/ −
L101	C1/ D1
MT101	C2/ −
R105	B8/ −
R106	B9/ −
R107	B8/ −
R108	B8/ −
R109	B8/ −
R110	B8/ −
R112	B8/ −
R113	B7/ −
R114	B8/ −
R115	C6/ −
R116	B7/ −
R117	B2/ −
R118	B2/ −
R119	B1/ −
R120	B7/ −
R122	C6/ −
R123	C6/ −
R127	B9/ −
R128	C6/ −
R137	B8/ −
R138	B8/ −
R139	B8/ −
R140	B8/ −
R149	B7/ −
R150	C7/ −
R151	C7/ −
R152	C7/ −
R181	B7/ −
R182	B7/ −
S105	C7/ −
S106	B8/ −
S107	C8/ −
S108	C8/ −
S110	B8/ −
S111	B6/ −
X101	B7/ −

SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ! (⚠) mark are critical for safety. Replace only with part number specified.

The mounting position of replacement is to be identical with originals.

The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

ABBREVIATIONS

1. Integrated Circuit (IC)

2. Capacitor (Cap)

  • **Capacitance Tolerance (for Nominal Capacitance more than 10pF)**

Table 4-2-1

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20	± 30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+ 100 / 0	+ 30 / − 10	+ 50 / − 10	+ 75 / − 10	+ 20 / − 10	+ 100 / − 10	+ 40 / − 20	+ 150 / − 10	+ 80 / − 20

Ex. 10MF J = 10µF ± 5%

  • **Capacitance Tolerance (for Nominal Capacitance 10pF or less)**

Table 4-2-2

Symbol	B	C	D	F	G
Tolerance pF	± 0.1	± 0.25	± 0.5	± 1	± 2

Ex. 10pF G = 10pF ± 2pF

3. Resistor (Res)

  • **Resistance tolerance**

Table 4-3-1

Symbol	B	C	D	F	G	J	K	M
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20

Ex. 470ohm J = 470ohm ± 5%

4. EXPLODED VIEWS
4-1. Packing Assembly

ZF10
ZF11
ZF30
ZF23
(SD-110EE/EL)
ZF20
ZF01
ZK04
ZF23
(SD-110EB)
ZK02
ZK01
ZK02
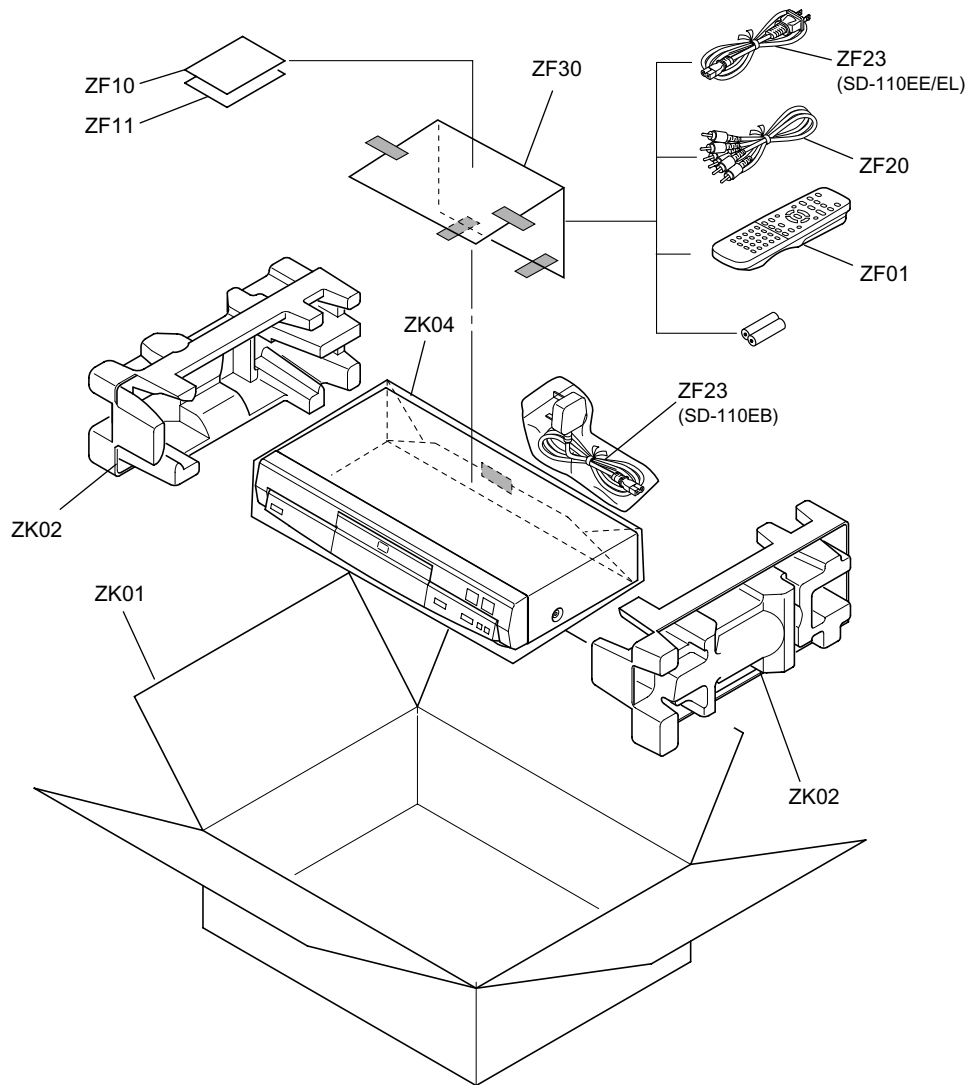
Fig. 4-4-1

4-2. Chassis Assembly
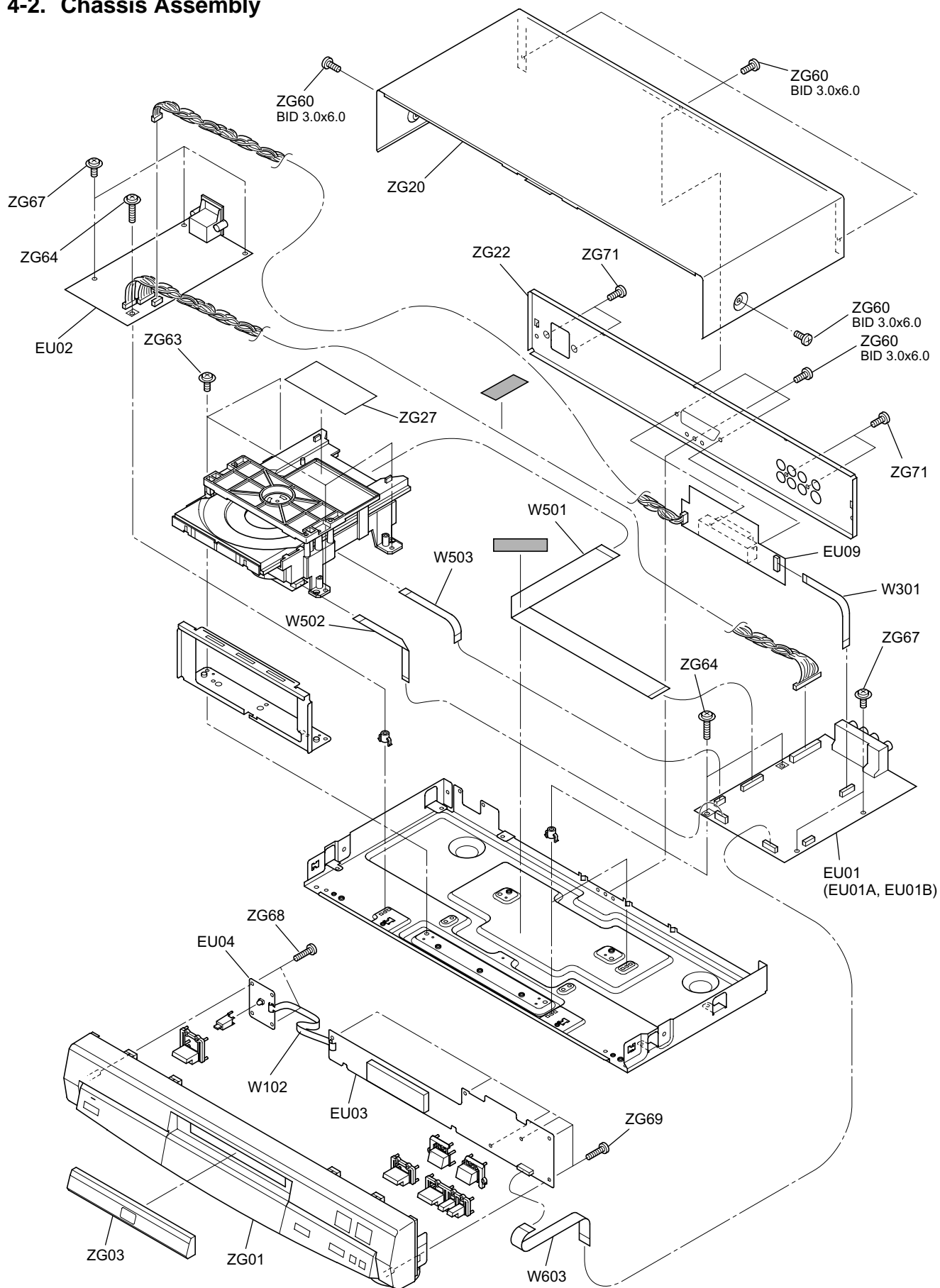
Fig. 4-4-2

4-3. Mechanism Assembly
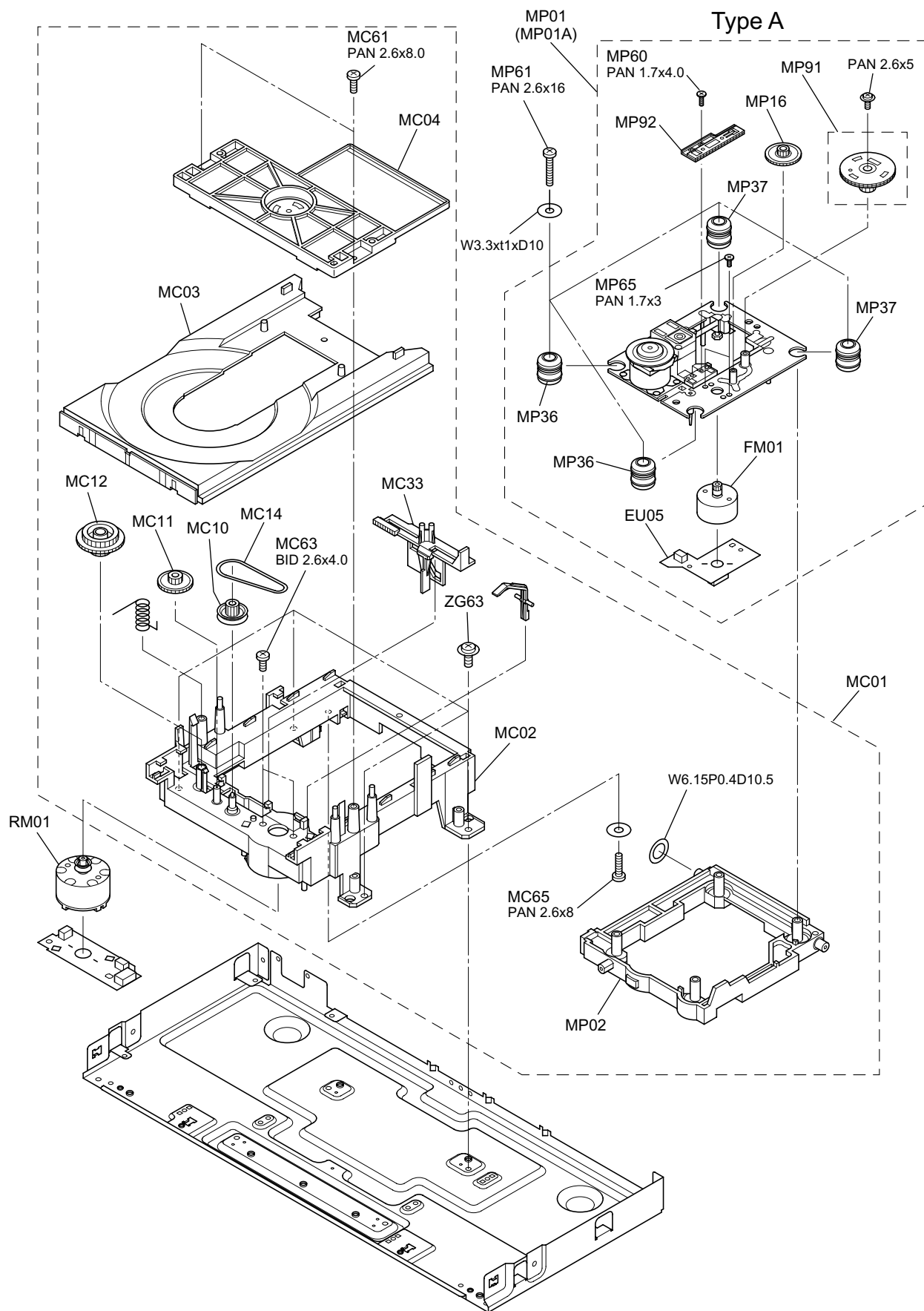
Fig. 4-4-3

Mechanism Assembly (Type B)

Note:

The pickup mechanism assembly has two types, A and B of which shapes differ.

Note that the pickup mechanism assembly has different service parts codes for each type.

Also, the main PC board has two service parts codes depending on the each type of pickup mechanism assembly used.

MP01
(MP01B)

Type B

MP60
PAN 1.7x4.0

MP91

PAN 2.6x5

MP61
PAN 2.6x16

MP92

MP16

W3.3xt1xD10

MP37

MP65
PAN 1.7x3

MP37

MP36

FM01

MP36

EU05
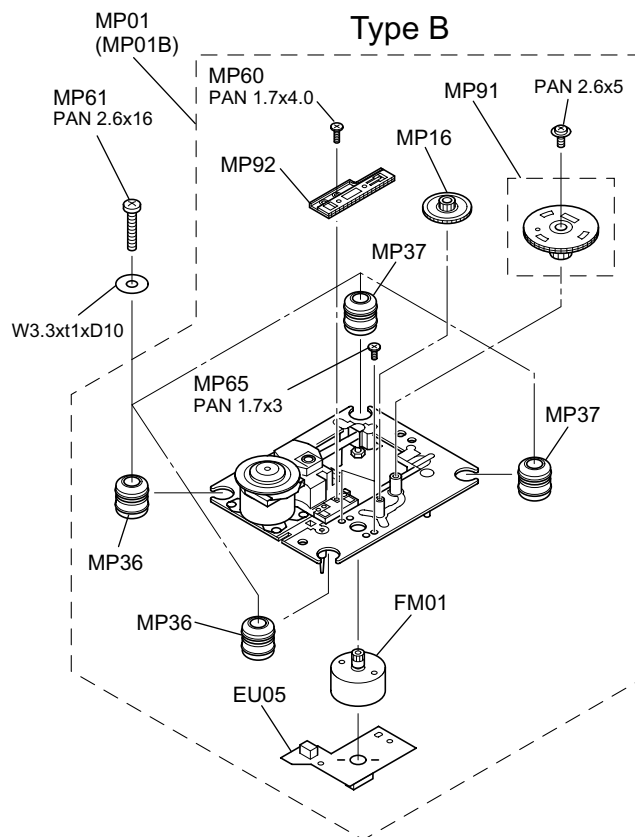
Fig. 4-4-4

```
LOCATION  PART
NUMBER    NUMBER      DESCRIPTION
_____


                      - MECHANICAL PARTS -

   FM01   79070421   Motor Assy,Feed
   MC01   79070416   Chassis Assy,Mechanism
   MC14   79070428   Belt,Loading
 ! MP01A  79070467   Mechanism Assy,Pickup(Type A:PVR202S)
 ! MP01B  79070415   Mechanism Assy,pickup(Type B:SPU3105)
   MP16   79070422   Gear
   MP36   79070458   Rubber,Dumper Kit
   MP37   79070458   Rubber,Dumper Kit
   MP60   79070020   Screw              1.7x4.0mm
   MP61   79079005   Screw              TZPAN2.6x15
   MP65   79079038   Screw              PAN1.7x3.0
   MP91   79070419   Gear Assy,Kit B
   MP92   79070420   Gear Assy,Rack
   RM01   79070427   Motor Assy,Loading
   W301   79080278   Cable,Flexible     FFC,11P,L135
   W501   79080191   Cable,Flexible     FFC,18P,L297
   W502   79080192   Cable,Flexible     FFC,6P,L110
   W503   79080193   Cable,Flexible     FFC,8P,L85
   W603   79080190   Cable,Flexible     FFC,13P,L150
   ZF01   79078066   Remote Control Unit,SE-R0047
   ZF01   79078069   Remote Control Unit,SE-R0049
 ! ZF10   79077136   Owners Manual      English,SD-110EE/EL
 ! ZF10   79077137   Owners Manual      English,SD-110EB
 ! ZF11   79077134   Owners Manual,German/French,SD-110EE
 ! ZF11   79077135   Owners Manual      Italian,SD-110EL
   ZF20   79070037   Cable,AV
 ! ZF23   79088009   Power Cord         SD-110EB
 ! ZF23   79088010   Power Cord         SD-110EE/EL
   ZG01   79071186   Front Panel(Black) SD-110EE/EL
   ZG01   79071187   Front Panel(Silver)SD-110EE/EB
   ZG03   79071179   Panel,Tray(Black)  SD-110EE/EL
   ZG03   79071188   Panel,Tray(Silver) SD-110EE/EB
   ZG20   79073087   Cover,Top(Black)   SD-110EE/EL
   ZG20   79073091   Cover,Top(Silver)  SD-110EE/EB
 ! ZG27   79070468   Label,Caution
   ZZ03   79080074   Kit,Data Update
```

LOCATION NUMBER	PART NUMBER	DESCRIPTION				
		- ELECTRICAL PARTS -				
EU01A	79083080	PC Board Assy, Main(Type A:PVR202S)				
EU01B	79083081	PC Board Assy, Main(Type B:SPU3105)				
		- INTEGRATED CIRCUITS -				
IC201	79040145	IC	NN514800AJ-60T			
IC202	79040154	IC	TC203G08AF-0103Z			
IC301	79040326	IC	ZR36732			
IC302	79040244	IC	S-816A25AMC-BAA			
IC304	79040295	IC	MM1540AFBE			
IC305	79040163	IC	MT48LC1M16A1TG			
IC306	79040163	IC	MT48LC1M16A1TG			
IC401	79040282	IC	TC94A03F			
IC402	79040323	IC	M11B11664A-30T			
IC501	79040006	IC	TC7S04F			
IC502	79040296	IC	TA1323F			
IC503	79040324	IC	BA5813FM-E2			
IC601	79040226	IC	S-24C01BFJ-TB-0			
IC602	79040007	IC	TC7S08F			
IC603	79040323	IC	M11B11664A-30T			
IC604	79040248	IC	S-80145CLMC-J16			
IC605	79040322	IC	TMP94C251AF			
IC606	79040153	IC	MBM29F800BA55TN			
IC608	79040007	IC	TC7S08F			
IC609	79040007	IC	TC7S08F			
IC610	79040087	IC	TC7W241FU			
IC611	79040007	IC	TC7S08F			
IC901	79040328	IC	AD1959XRSRL			
IC903	79040249	IC	TC7SH08FU			
IC907	79040325	IC	S-814A50AUC-BD0			
IC912	79040044	IC	NJM4580E			
IC913	79040074	IC	TC74HCU04AF			
		- TRANSISTORS -				
Q301	79050079	Transistor,Chip	2SA1213-Y			
Q302	79050018	Transistor,Chip	2SA1162			
Q303	79050018	Transistor,Chip	2SA1162			
Q304	79050018	Transistor,Chip	2SA1162			
Q305	79050043	Transistor,Chip	RN1402			
Q306	79050018	Transistor,Chip	2SA1162			
Q307	79050018	Transistor,Chip	2SA1162			
Q308	79050043	Transistor,Chip	RN1402			
Q309	79050014	Transistor,Chip	HN1C03F			
Q401	79050085	Transistor,Chip	2SC3326-B			
Q501	79050015	Transistor,Chip	HN1B01F			
Q502	79050015	Transistor,Chip	HN1B01F			
Q503	79050079	Transistor,Chip	2SA1213-Y			
Q601	79050031	Transistor,Chip	DTA114EKA			
Q602	79050031	Transistor,Chip	DTA114EKA			
Q901	79050001	Transistor,Chip	RN2402			
Q902	79050016	Transistor,Chip	2SC2712			
Q903	79050001	Transistor,Chip	RN2402			
Q904	79050001	Transistor,Chip	RN2402			
Q905	79050001	Transistor,Chip	RN2402			
Q906	79050001	Transistor,Chip	RN2402			
Q909	79050016	Transistor,Chip	2SC2712			
Q910	79050014	Transistor,Chip	HN1C03F			
Q911	79050014	Transistor,Chip	HN1C03F			
Q912	79050012	Transistor,Chip	RN4601			
Q913	79050018	Transistor,Chip	2SA1162			
Q914	79050043	Transistor,Chip	RN1402			
		- DIODES -				
D301	79060028	Diode,Chip	1SS226			
D302	79060028	Diode,Chip	1SS226			
D303	79060028	Diode,Chip	1SS226			
D304	79060028	Diode,Chip	1SS226			
D305	79060028	Diode,Chip	1SS226			
D308	79060012	Diode	ERA15-02			
D501	79060022	Diode,Chip	1SS368			
D502	79060022	Diode,Chip	1SS368			
D901	79060022	Diode,Chip	1SS368			
		- MISCELLANEOUS -				
J301	79089094	Plate,Jack				
X601	79089022	Oscillator,Ceramic 9.00MHz				
X901	79089121	Oscillator,Crystal 27MHz				
! EU02	79085080	PC Board Assy	Power			
		- INTEGRATED CIRCUITS -				
! Q802	79040327	IC	TA1319AP			
Q821	79040146	IC	TA76431S			
		- TRANSISTORS -				
! Q801	79050095	Transistor	FS5KM-16A			
! Q803	79050044	Photo Coupler	TLP621			
! Q804	79050044	Photo Coupler	TLP621			
Q823	79050076	Transistor	2SA1585STP-Q			
Q824	79050077	Transistor	2SC1740STP-Q			
Q825	79050005	Transistor	2SC2236-Y			
Q826	79050005	Transistor	2SC2236-Y			
Q827	79050077	Transistor	2SC1740STP-Q			
Q828	79050076	Transistor	2SA1585STP-Q			
Q829	79050040	Transistor	2SA1048-Y			
Q830	79050008	Transistor	RN1201			
		- DIODES -				
! D803	79060087	Diode	S1WB(A)60			
D805	79060009	Diode	RU-1P			
D806	79060013	Diode	AG01			
D807	79060080	Diode	AK06			
D808	79060088	Diode,Zener	MTZJ-30B			
D821	79060071	Diode	HER152G			
D822	79060017	Diode	RU4Z			
D823	79060089	Diode	HT16G			
D824	79060013	Diode	AG01			
D825	79060013	Diode	AG01			
D826	79060012	Diode	ERA15-02			
D827	79060012	Diode	ERA15-02			
D828	79060012	Diode	ERA15-02			
D829	79060012	Diode	ERA15-02			
D830	79060015	Diode	1SS133			
D831	79060007	Diode,Zener	UZ3.0BSB			
D832	79060034	Diode,Zener	MTZJT-77-10B			
D833	79060034	Diode,Zener	MTZJT-77-10B			
D834	79060068	Diode,Zener	MTZJT-77-8.2B			
D835	79060004	Diode,Zener	UZ5.1BSB			
D836	79060005	Diode,Zener	UZ11BSB			
D837	79060005	Diode,Zener	UZ11BSB			
D838	79060012	Diode	ERA15-02			
D839	79060012	Diode	ERA15-02			
		- CAPACITORS -				
! C801	79020196	Cap,Film	0.22MF	M	275V	
! C802	79020198	Cap,Film	10000pF	M	275V	
! C803	79020028	Cap,Ceramic	470pF	Z	250V	
! C804	79020028	Cap,Ceramic	470pF	Z	250V	
! C811	79020193	Cap,Ceramic	220pF	K	250V	
		- RESISTORS -				
! R801	79030055	Res,Oxide Metal	1Mohm	J	1/2W	
		- MISCELLANEOUS -				
! F801	79087012	Fuse	1.6A,250V			
! P802	79089029	Jack	AC Inlet			
! RF835	79030015	Res,Fusible	2.2ohm	J	1/4W	
! T801	79080006	Line Filter	253YOR7			
! T802	79010026	Power Transformer	SRW3020ED5-210			
EU03	--------	PC Board Assy	Front			
		- INTEGRATED CIRCUITS -				
IC101	79040321	IC	TMP87CH74AF-2C07			
		- MISCELLANEOUS -				
A101	79089126	Display,FL	8-BT-224GNK			
MT101	79080140	Module,RMT	GP1U261X			
S105	79089020	Switch	Push			
S106	79089020	Switch	Push			
S107	79089020	Switch	Push			
S108	79089020	Switch	Push			
S110	79089020	Switch	Push			
S111	79089020	Switch	Push			
X101	79089095	Oscillator,Ceramic 8MHz				
EU04	--------	PC Board Assy	Power Switch			
		- TRANSISTORS -				
Q141	79050086	Transistor,Chip	RN2202			
Q142	79050086	Transistor,Chip	RN2202			
		- DIODES -				
D141	79060033	Diode,LED				
		- MISCELLANEOUS -				
S141	79089020	Switch	Push			
EU09	--------	PC Board Assy	Output-RGB			
		- INTEGRATED CIRCUITS -				
ICV01	79040295	IC	MM1540AFBE			
ICV02	79040029	IC	TC74HC4053AF			
		- TRANSISTORS -				
QV01	79050018	Transistor,Chip	2SA1162			
QV02	79050078	Transistor,Chip	DTC114EKA-T			
QV03	79050078	Transistor,Chip	DTC114EKA-T			
QV04	79050078	Transistor,Chip	DTC114EKA-T			

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
QV05	79050031	Transistor,Chip	DTA114EKA
QV06	79050078	Transistor,Chip	DTC114EKA-T
QV07	79050016	Transistor,Chip	2SC2712
QV08	79050016	Transistor,Chip	2SC2712
QV09	79050016	Transistor,Chip	2SC2712
QV10	79050016	Transistor,Chip	2SC2712
QV11	79050016	Transistor,Chip	2SC2712
		- DIODES -	
DV01	79060028	Diode,Chip	1SS226
DV02	79060028	Diode,Chip	1SS226
DV03	79060028	Diode,Chip	1SS226
DVO4	79060028	Diode,Chip	1SS226
		- MISCELLANEOUS -	
JV01	79089145	Jack,Scart	

TOSHIBA   CORPORATION

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